

Thor Vegas 24.1*

Checklists & Users' Guide

V. 8.0

(3 Jun 2019)

Derived from *Thor Forum* Owners' Experiences and Suggestions

[Thor Owners' Forum](#)

Compiled by Ed Felker



*This Manual requires modification for specifics of other Vegas/Axis floor plans and model years beyond 2015

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EDITOR'S NOTE:

I developed these checklists and owner's guide as a tool to become familiar with my new **2015 Vegas 24.1**. I noticed that in many places the Thor manual was either too generic or did not cover my specific floor plan at all. The other guides from the manufactures of the installed equipment were detailed; however, it sometimes took quite a while to find specific information I desired. For these reasons I decided to compile a "one-stop-shop" for my specific floor plan. Additionally, I collated and assembled suggestions, ideas, and recommendations of numerous Vegas/Axis Owners from the *Thor Forums* Owners Website ([Thor Owners' Forum](#)) as well as other sites.

I analyzed many threads on several RV forums and I compiled the best of the suggestions (at least best in my humble opinion). Vegas/Axis owners contribute their suggestions and comments to websites with the sole purpose of helping other owners. Compiling these checklists in no way transferred intellectual ownership from the original contributors to me. By sharing ideas on various forums, I assumed those contributions were implicit permission to share with as many Vegas/Axis Owners as possible. These checklists represent a composite and ready resource of material. I intended it to be a compendium, not a representation of intellectual originality of the editor to claim as my own.

Other Axis/Vegas owners can use these checklists and owner's guide for their own use by editing the specific paragraphs to match the configuration in their specific floor plan. The major differences for varying model years and floor plans other than the 24.1 that served as the basis for these checklists and manual are the location of specific items (switches, valves, cables, plumbing, etc.)

The steps in these checklists do not represent the opinion, position, or endorsement of Thor Industries. They represent the opinion of the editor and the website forum sources I used. The factory assumes no responsibility for the accuracy of the information contained herein. This manual of checklists is intended as a guide only, and do not represent empirical data from the designers or manufacturers of the product. Thor Industries assumes no responsibility for their accuracy.

The original version of this manual was downloaded from the Thor Forums more than 1400 times. In Mar 2019 I completely rewrote the manual, reformatted it, and removed superfluous information. I designed the Quick Checklists to be laminated in plastic and used as quick references after I became familiar with the operations of the various systems on my Vegas 24.1. I separated the checklists with blank pages where necessary so that each new checklist started on an odd numbered page to facilitate printing each one as a separate and isolated checklist if desired.

I designed the Handbook section to provide more detailed information about my 2015 Vegas 24.1 systems. The Tips and Improvements section contains great facts about Vegas/Axis systems that even the factory manuals may not have described. It also has suggestions to make life better when camping in my Vegas. The Periodic Maintenance section contains helpful hints on how to ensure my motor coach lasts a long time and delivers years of joy to my camping experience. Owners of other model year or Vegas/Axis floor plans can take the basic information from my 24.1 and modify it to fit the specifics of their specific floor plan.

Finally, use and enjoy this guide. Register on Thor Forums – a great place with great folks who will go out of their way to answer your Vegas/Axis questions or share their great ideas about Vegas/Axis. If you have a good idea or find one somewhere else, share it with others on the forum. Enjoy the checklists. I hope they save you time and make things a little easier for you. Travel safe,

camp often, enjoy one another – hopefully we'll see each other out on the trail!

Special Note:

The default camping situation in all the descriptions is for a full hook up campsite. **Variance for boondocking (no power, water, and/or sewer availability) is noted otherwise and appears in Blue text.** Throughout the checklists, where a switch must be activated or changed or an action taken, the action is in **BOLD** text.

Throughout this guide I used the following taxonomy:

- **Note** – additional information to provide greater understanding
- **CAUTION** – ignoring the notice or violating this step in a procedure could result in damage to the equipment
- **WARNING** – violating this step could result in damage to the equipment as well possible injury (or death). This is a serious safety notice -- ignore them at your own peril or the peril of the RV.

****Special thanks to Thor Forum participants** [groswald](#), [aa9zz](#), [FW28Z](#), [SailingVehicle](#), [Chance](#), [Dstankov](#), [Hooligan2](#), [RustyJC](#), [DocMike](#), [revjeffrey](#), [Oneilkeys](#), [Vkb](#), and [JamieGeek](#) for editing and other suggestions regarding these checklists and manual.

ABOUT THE EDITOR



Ed Felker is a retired Air Force Colonel. He commanded two different B-52 aircraft maintenance squadrons and was the 2d Logistics Group Commander at Barksdale AFB LA. He served as a Joint Service Officer developing doctrine, policy, and war fighting concepts. He also had assignments on the HQ USAFE staff, US Embassy London, Air Staff, and Joint Staff. He is a recognized author of military strategy, doctrine, and operational art. At the time of his retirement he was the Air Force's Chief of Munitions, Nuclear Weapons, and Space Plans and Policy. After retirement he worked for Booz Allen Hamilton as a military policy analyst. He has developed owners' operating manuals and checklists for Casita Travel Trailer, Trailmanor, and Camp Inn Travel Trailer Owners' Forums. He currently resides in Mount Joy, PA with his wife Bev.

List of Revisions

Version 1.0

Rev 1 – Inclusion of appendix 2, 7, 8, 9, 10, 11; inclusion of text about Bi-directional Isolator Relay Delay (BIRD); inclusion of directions for Ford warranty extension; and hyperlink to Harris Battery Company battery guide.

Rev 2 – Inclusion of notice of Ford Warranty provision for no cost front end alignment within first 12 months or 12,000 miles.

Rev 3 – Added appendix 12 Battery Control Center Schematic.

Rev 4 – Added note about leaving shore power connected while in storage and location of generator output circuit breaker

Rev 5 – Added appendix 13 for Schwentek systems operation and troubleshooting

Version 2.0 – Changed format to 5.5" X 8.5" and compiled revisions from Version 1.0

Rev 1 – Format changed to 5.5 X 8.5"

Rev 2 – Added vehicle towing info and appendix 14 for towing

Rev 3 – Added website for TriMark Corp to obtain entry door key blanks

Rev 4 – Added Appendix 15 showing Ford E-350 stripped chassis relay and fuse locations

Rev 5 -- Added paragraph describing how batteries are charged

Rev 6 – Added park power pedestal electrical tutorial

Rev 7 – Added black tank maintenance tips to the Tips and Modification section

Version 3.0 – Changed format to A5 paper (which is almost 5.5" X 8.5") for Personal organizer. Also added source for replacement windshield wiper blades to Tips section

Rev 1 – Added rear skid and radiator protection mod

Rev 2 – Removed Thor proprietary drawings and schematics from appendix and provides instructions for owners to obtain drawings

Rev 3 – Added Arc Shower Curtain Rod Mod

Rev 4 – Added awning manual retract procedure

Version 4.0 – compiled revisions and edited

Rev 1 – Reorganized appendices and provided list of construction drawings

Rev 2 – added 2015/16/17 floor plans

Rev 3 – added Ford VIN information

Version 5.0 – added compressed air winterization and complete reorganization of material

Rev 1 – added 2017 Girard Tank Less Water heater operation and winterization

Rev 2 – added description of Battery Control Center and headlight replacement

Rev 3 – added coach battery disconnect paragraph & photo

Rev 4 – added notes about 2nd black tank valve on 25.3 floorplan and stainless-steel kitchen sink mod

Rev 5 – corrected BIRD/Trombetta operation description and BCC operation

Rev 6 – Added refrigerator hinge reinforcement tip

Rev 7 – Added changes for 2018 model year

Version 6.0 – added additional info on Trombetta & BIRD, modified chassis battery removal procedure

Version 7.0 – Complete manual rewrite.

Version 8.0 – Added "Important Things..." checklist.

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Checklists

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SETUP AND TEARDOWN ABBREVIATED CHECKLIST

BEFORE TRIP

- ☐ Check propane, batteries & tire pressure
- ☐ Pack food & clothing; Pre-cool refrigerator; water heater **OFF**
- ☐ Find RV Park: Go to [RV Park Reviews](#) and search by state

SETUP

- ☐ Position in site
- ☐ **LEVEL** motor coach
- ☐ Shore Power main Circuit Breaker (CB) at campsite connection: **OFF**
- ☐ Surge Protector: **CONNECT**
- ☐ Shore AC Power Cable: **CONNECT** (pg. 34)
- ☐ Shore power AC Circuit Breaker: **ON**
- ☐ Sewer line: **CONNECT** (pg. 42)
- ☐ Gray Water Tank: **DRAIN** if any water was left in
- ☐ City Water & pressure regulator: **CONNECT** & turn **ON** (pg. 42)
- ☐ Cable TV: **CONNECT** cable TV wire to exterior connection (if using cable TV)
- ☐ LP Tanks: **OPEN** (if using stove top or heat) (pg. 44)
- ☐ Use/Store Switch: Ensure switch is in **USE**
- ☐ Awning: **EXTENDED** (pg. 36)
- ☐ Awning side arm tilt latches **SET** to tilt awning for water runoff (Pg. 46)
- ☐ **INSTALL** door bumper on front awning side arm (Pg.64)
- ☐ Living Room Slide **EXTENDED** (pg.40)
- ☐ Set up outside furniture, carpet, etc.
- ☐ Refrigerator Power set to: **AUTO** (pg.45)
- ☐ Heat or A/C: **ON & TEMPERATURE SET** as required (**GENERATOR must be running first for air conditioning if boondocking**) (pg.45)

Note: When boondocking, the generator will be required for systems using AC power (A/C, microwave, TVs, water heater if on electric, and any electrical appliance plugged into a wall socket). All other systems (heat, water pump, lights, slide, electric bunk, canopy, refrigerator if on gas, radio) use 12 VDC from the house batteries. The generator would have to be run periodically to recharge house batteries.

- ☐ **ADJUST** A/C slide covers on unit vents so that A/C air is forced into all the ceiling ducts
- ☐ If boondocking -- Water pump: **ON**
- ☐ **OPEN** hot water faucets in the kitchen and bathroom before turning on water heater

CAUTION: Turning on the faucets before turning on the water heater, ensures all air is purged from the water heater tank and the tank is filled with water.

- ☐ Water heater set to: **ELECTRIC** on Monitor Panel (set to **PROPANE** if boondocking) Turn both on if you want hot water in a hurry (pg.41)
- ☐ Roof Vents: **RAISED** if desired (leave closed if using A/C) (pg.46)
- ☐ Cooktop Cover: **OPEN**
- ☐ Electric Bunk: **LOWER** if desired (pg. 41)

CAUTION: REMOVE bunk safety lock pins behind driver and passenger seat and recline both seats before trying to lower bunk

- ☐ Couch: **CONFIGURE** as bed with air mattress if needed
- ☐ Tables: **CONFIGURE** dining table and table between driver and passenger seats (as required)
- ☐ Antenna: **RAISE**; Booster: **ON** (If using campsite Cable TV do not raise antenna and ensure Antenna Booster is **OFF**)
- ☐ TV Remotes: **SCAN** each TV for stations (Go to Menu on each TV remote, SCAN for either CABLE or AIR for antenna)

TEAR DOWN

INTERIOR

- ☐ Lights: **OFF** (including porch & awning LEDs)
- ☐ **STOW** all loose items, close all cabinet doors and drawers
- ☐ Refrigerator: Set to **OFF**
- ☐ Water Heater: **OFF**
- ☐ Heater or AC: **OFF** (at thermostat)
- ☐ Windows: **CLOSED**
- ☐ Overhead vents: **CLOSED**
- ☐ Water pump: **OFF**
- ☐ Couch Bed: **CLOSED** if set up (stow air mattress under driver side bed)
- ☐ Electric Bunk: **RAISED** if set up (stow air mattress under driver side bed)
- ☐ Electric Bunks Safety Pins: **INSERTED** (behind driver and passenger)
- ☐ Dining & Side Table: **STOW** tops and posts behind couch
- ☐ Cabinet and appliance doors, drawers: **CLOSE & SECURE**
- ☐ Cook Top Cover: **CLOSED**
- ☐ **RETRACT** living room slide
- ☐ TV Antenna: **LOWER** (ensure turning indicator points are aligned)

EXTERIOR

- ☐ Awning: Remove and stow door bumper
- ☐ Awning: **RETRACT** (ensure awning LED lights are off before retracting)
- ☐ Black Tank: **DRAIN**
- ☐ Gray Tank: **DRAIN**
- ☐ Sewer Hose: **DISCONNECT** from coach (rinse hose and connector with hose provided at park sewer connection)
- ☐ Sewer Hose and Coach Sewer Connection: **CAPPED**
- ☐ Make sure external plumbing valves are closed
- ☐ Sewer Connection Access Hole: **CAPPED**
- ☐ Sewer hose: **STOWED**

NOTE: These same steps apply if boondocking, with the exception that the motor home must be taken to a dumping station first

- ☐ City water hose and regulator: **DISCONNECT** and **STOW**
- ☐ Shore Power: Campsite AC Circuit Breaker **OFF**
- ☐ AC cord, Cable TV cord, and Surge Protector: **DISCONNECT** and **STOW**
- ☐ **STOW** all chairs, rugs, grill, etc.
- ☐ **SECURE** all storage compartment access doors

TIPS FOR NEWBIES (AND SOMETIMES OLDIES AS WELL):

This list contains items that being aware of them could save you lots of frustration and angst later.

General

- Level RV using Lynx Blocks (Yellow plastic Lego-like stacking blocks).

Electrical

- Chassis battery (under hood) and House batteries (under entry steps) all charge off the converter, voltage regulator, and/or generator (depending on charge state of batteries). If one battery set is not charging, check they are wired correctly or for a failed component or blown fuse.
- House batteries **ONLY** charge when the USE/STORE switch is in **USE** (**memorize this!!!**)
- Use a portable surge protector on the shore power cable at the power pedestal. This protects you from hundreds (possibly thousands) of dollars of damage should you have an electrical surge from the RV park electrical system.
- When connecting shore power – before connecting the cable to the RV, connect the surge protector into the 30 Amp plug on the pedestal and turn on the 30 Amp circuit breaker on the park pedestal. Be sure there are 3 green lights on the surge protector (if not, the park power pedestal is bad, ask for a new site). If the 3 lights are on, turn off the park circuit breaker, connect the cable to the RV, and turn on the park pedestal 30-amp circuit breaker. You should hear the RV power coming on.
- AC power is used to operate the wall receptacles, air-conditioning, water heater (in electric mode), microwave, and converter. DC operates the lights, sensors, detectors, and everything else not powered by AC. Some of the things that use AC also has sensors and detection devices powered by DC.
- DC protection uses fuses. AC systems use circuit breakers.
- If you lose power (like from a storm), turn the USE/STORE switch to STORE until power comes back on. This keeps from draining the house batteries.
- When there is a power outage or you are traveling down the road, be sure to turn the refrigerator operation mode switch from AUTO to OFF. If left in AUTO and power is removed, the refrigerator will automatically switch to GAS mode and will try to ignite the gas in the refrigerator burner. After a few tries the refrigerator will go into fault mode and continually flash the power light.
- When you are tearing down to leave an RV park and you had your refrigerator set on Auto, be sure to put the refrigerator control in OFF for the same reason as the item above.
- The ceiling light above the cab area is operated by a switch (called Cab Light) on the center console below the radio.

Propane Operation

- If the furnace, water heater, or refrigerator ignitor does not light the propane burner when first coming on, open the stove and light a few burners for a minute – then try the furnace, refrigerator, or water heater again. Often there is air trapped in the propane lines if the RV has set for a prolonged period without use.

Televisions

- When using the TVs on cable, be sure the antenna amplifier on the top shelf of hanging kitchen cabinet is OFF. TVs will not operate on cable with the antenna amplifier on.

Water System

- When you take the cover off the city water connection there is a washer with an imbedded screen in the connection. Be careful not to lose this washer/screen. When you attach the water hose it depresses the screen so that it pushes in a button to open the inlet check valve. If that screen is not there the check valve will not open and there will be no water pressure or water flow into the RV.
- While connected to city water, water may back flow through a check valve in the water pump causing the freshwater tank to fill and overflow out the vent near the freshwater tank fill intake. If this happens, turn off city water to the RV, and operate the water pump for a minute or so to clear the obstruction in the water

pump check valve. Open the freshwater tank low point drain under the passenger bed to drain the freshwater tank, then turn the city water back on. Listen to ensure water from the city water system is not continuing to backflow through the pump into the freshwater tank.

- If you have an On-Demand Hot Water system (not on Vegas/Axis models earlier than 2017), be sure to use an adjustable water pressure regulator at the RV park faucet (set regulator to 50-55 psi). Owners have reported hot water problems when the water pressure is too low.

Holding Tanks

- Dump BLACK water tank before GRAY water tank. This way the gray water will rinse the sewer line.
- When getting ready to dump the BLACK tank, run additional water into the toilet (or run water into the bathroom vanity sink). The more water in the BLACK tank the more paper and solids will be flushed from the tank.
- The black tank drains best when there is plenty of water in the black tank. Ensure you use plenty of water when flushing the toilet. The water drain on the bathroom vanity empties into the black tank. You can add water to the black tank by running water into the bathroom vanity.
- Use only RV toilet paper or SINGLE ply toilet paper. Toilet paper like Charmin or other multi-ply will not dissolve or break down and could lead to blockage in the black tank draining system.
- After about every 2 black tank empties, run freshwater into the black tank by holding down the toilet flush and/or running the bathroom vanity. Look down the toilet with a flashlight to be sure the tank becomes full of fresh water. Then go back outside and drain the black tank. This ensures all solid matter is flushed from the black tank and helps to keep the sensors for the tank monitor clean.
- NEVER put anything in the toilet other than water, urine, fecal matter, single ply toilet paper (RV toilet paper), or black tank treatment chemicals.
- The sensors on both tanks are highly unreliable. They tend to have debris inside the tank stick to them and thus provide unreliable indications. You can help keep the sensors indicating correctly by keeping them clear. Periodically fill both tanks with clear water and then drain.
- Gray tank capacity is 37 gallons, black tank is 30 gallons. Normal usage to fill the tanks for two people while camping is about 3 days for the gray tank and 4 days for the black. The gray tank always fills faster from showering and washing dishes.

Generator

- The generator can be operated from a start switch on the generator, from a switch on the middle dash console, or a start switch on the monitor panel on the side of the hanging kitchen cabinet.
- The generator will not operate (or start) if the RV gas tank is under ¼ full or if the generator oil level is low.
- The generator starts quicker if it is primed first. To prime – depress and hold the generator start switch to STOP, and when the START light comes on move the switch to START and hold until the generator starts.

Door Latch/Lock

- The main door latch has a cylinder that is made from a zinc alloy. This door cylinder has been known to break making it impossible to open the door from the outside or inside. In the event this happens, and you are outside, someone will have to enter through one of the sliding windows on the driver or passenger side of the RV (passenger preferably). So, you might want to keep the passenger window unlocked and a Philips screwdriver in a kitchen cabinet drawer. After getting inside you will need to remove the 3 screws on the lock mechanism cover and remove the cover and handle to get access to the cylinder so it can be retracted. After removing the cylinder, the door will open; however, you'll need to use the dead bolt to keep it closed until you get home and can have the lock replaced.

Schwentek-Lippert Slide/Bunk System

- The living room slide and overhead bunk operate off the same Schwentek-Lippert Rail and slide motor system. Whenever operating either the bunk or the slide, press and hold the applicable switch until the motors stop running, and continue to hold the switch for about 5 seconds after the motors stop. This prevents the motors from getting out of sync and jamming the bunk or slide on the rails.
- Retracting the bunk or slide MANUALLY if the need occurs can be found in Appendix 6 (it is not an easy procedure).

FAMILIARIZATION

The illustrations show the features of the exterior, right and left sides of my 2015 Vegas 24.1 coach. It shows where the various hookups, compartments, and features are located. Familiarize yourself with where the various functions are located.



Figure 1 Left side of Coach



Figure 2 Right Side of Coach

PRE-SEASON GETTING READY

CHASSIS

- ☐ Service motor & drivetrain as required (fluids clean and topped off)
- ☐ Check belts, pulleys, hoses, etc. making sure they are in good condition

WHEELS AND TIRES

- ☐ Check tire air pressure (75 psi front; 65 psi rear)
- ☐ Check tire condition (inspect for cuts, excessive wear)
- ☐ Replace tires at least every five years (Michelin recommendation) or seven years (Good Sam recommendation) - sooner if excessive wear

Note: The tire **DATE CODE** is usually found on the inside of the sidewall within an oval. The code is usually 3 to 4 letters. The first denote the week of the year that the tire was manufactured, while the end digits denote the year. For example, a code of 2803 would denote that the tire was manufactured during the 28th week on 2003.

GENERATOR

- ☐ Perform annual service
- ☐ Conduct good test run

BATTERIES

- ☐ Check chassis and house battery water levels, and fill with distilled water if the water level is low
- ☐ Check chassis & house battery's terminals & wire connections for corrosion and clean if required
- ☐ Replace batteries in smoke, CO, and gas detectors (test detector functions)

AC POWER SYSTEM

- ☐ Check all outlets and that batteries are being charged

BLACK TANK

- ☐ Flush with flushing wand down toilet
- ☐ Check waste valves for any leaks

EXTERIOR

- ☐ Wash and wax coach
- ☐ Wash and condition awning (lubricate as required)
- ☐ Clean windows inside and out (check for any leaks)
- ☐ Clean exterior seals with mild abrasive detergent, such as *Soft Scrub* or *Scrubbing Bubbles*. You may also spray the seals with lubricant, such as silicone if they appear to cause excessive drag during opening or closing
- ☐ Clean and condition rubber slide seals with slide seal preservative
- ☐ Run slide in and out several times to ensure it is operating smoothly
- ☐ Lubricate all exterior storage bay doors, latches, and locks
- ☐ Lubricate entrance and screen door hinges, locks, and striker plates

ROOF

- ☐ Inspect ladder for cracks in rungs
- ☐ Clean and condition roof and slide out tops
- ☐ Check for worn rubber seals and sealant along seams
- ☐ Remove vent covers and check sealant around vents and skylight
- ☐ Remove air conditioner cover and clean dust, debris, twigs, and leaves, etc.
- ☐ Test TV antenna mechanism and lubricate as required

FRESH WATER SUPPLY

- ☐ Purchase new water filter for the year (if using filter)
- ☐ Sanitize system with bleach (see Sanitizing the Water System Checklist)
- ☐ Ensure all hot and cold faucets are closed (don't forget outside shower)

- ☐ Check all fixtures for proper operation
- ☐ Check toilet flush mechanism
- ☐ Look in cabinets and under beds to ensure there are no leaks

APPLIANCES

- ☐ Test TVs, A/C, Microwave, Electric Fans, Stove, etc., for proper operation

REFRIGERATOR

- ☐ Check refrigerator vents for insects or wasp nests
- ☐ Open exterior refrigerator panel and remove any debris, sticks, leaves, insect nests, etc.
- ☐ Clean interior of refrigerator & freezer
- ☐ Clean door seals
- ☐ Check doors to ensure the gaskets seal and doors close securely
- ☐ Ensure refrigerator works in electricity and gas modes

WATER HEATER

- ☐ Check for obstructions in the burner box (spider webs, etc.)
- ☐ Check the screen in the door to see that no foreign matter has accumulated
- ☐ Check wiring and connections for any corrosion or over heating
- ☐ Drain and flush water heater tank
- ☐ Close water heater bypass valve and open the hot water out valve and the cold water in valve to the hot water heater. Refer to **Figure 5** (page 16) to identify these valves. (The water heater bypass valves are located behind the wooden grill near the floor on the right side of the hallway opposite the bathroom.

CAUTION: Failure to configure the bypass valves correctly will prevent the water heater from filling after taking the RV out of storage. Turning on the water heater in either 110 V electric or propane gas mode will result in damage to the water heater. NEVER run the water heater with no water in the tank. Configuring the bypass valves correctly ensures water fills the water heater tank when shore water source or the freshwater tank (using the pump).

FURNACE

- ☐ Inspect the furnace for presence of rodents or insects

LP SYSTEM

Leaks

- ☐ Since the motorhome is subjected to road vibrations, **connections and fittings can develop leaks**. Use a bubble solution of soapy water to check for leaks on connections and fittings. When tightening connections (not the bottles), use two wrenches with opposing torque to prevent twisting of the copper tubing

Rusting of Tank

- ☐ The outside of the tanks should be kept from rusting by a periodic coat of paint

Propane Detector

- ☐ Use one of the flame lighting sticks (without a flame) to place some propane next to the detector – **it should go off!!! If it does not, have it serviced or replaced!!**

LIGHTS

- ☐ Ensure all light bulbs work in all ceiling lights (replace bulbs as required)
- ☐ Check lights in storage compartments, flasher, headlights, clearance lights, brake lights, porch light

INTERIOR

Interior General

- ☐ Wash floors, cabinets, & walls
- ☐ Vacuum entire interior (including heat & A/C vents)

- ☐ Wash & disinfect sinks, toilet, & shower (to include shower curtain)
- ☐ Clean windows shades and make sure they operate freely (no broken strings)
- ☐ Clean microwave and around stove elements
- ☐ Wipe out inside of all cupboards, wardrobe, and drawers (check for signs of rodent or insect activity)
- ☐ Tighten any loose hinges or hardware

Cushions

- ☐ Vacuum or lightly brush to remove dust and grime.

Curtains

- ☐ Drapes should be dry-cleaned (to avoid shrinkage) as needed

Interior Seals

- ☐ Clean with mild abrasive detergent, such as *Soft Scrub* with bleach (or *Scrubbing Bubbles*). You may also spray the seals with silicone

Drains

- ☐ Freshen all drains with baking soda

INITIAL INVENTORY

Customize this list as you see fit. It represents suggestions from numerous Vegas/Axis owners and other campers

KITCHEN PANTRY

- ☐ Baked Beans
- ☐ Barbecue sauce
- ☐ Bottled Water
- ☐ Cereal
- ☐ Coffee K-cups
- ☐ Cookies
- ☐ Crackers (snack, soda, graham)
- ☐ Garlic powder
- ☐ Hershey Bars
- ☐ Jelly/jam
- ☐ Juices
- ☐ Olive oil
- ☐ Pasta
- ☐ Peanut butter
- ☐ Peanuts
- ☐ Pepper
- ☐ Popcorn
- ☐ Salad dressing
- ☐ Salt
- ☐ Soda
- ☐ Soup
- ☐ Spaghetti sauce
- ☐ Sweetener
- ☐ Tea bags
- ☐ Vinegar

KITCHEN PERISHIBLES

- ☐ Bacon
- ☐ Bread
- ☐ Butter
- ☐ Cheese
- ☐ Chicken
- ☐ Eggs
- ☐ Half & Half
- ☐ Hamburger
- ☐ Hamburger/Hot Dog Rolls
- ☐ Hot Dogs
- ☐ Ketchup
- ☐ Lettuce
- ☐ Meat
- ☐ Milk
- ☐ Mustard
- ☐ Onions
- ☐ Pickles
- ☐ Potatoes
- ☐ Salad Dressing
- ☐ Tomatoes

KITCHEN HARDWARE

- ☐ Aluminum foil
- ☐ Keurig pot
- ☐ Dish cloths
- ☐ Dish towels
- ☐ Gas lighter
- ☐ Large baggies
- ☐ Measuring cups
- ☐ Measuring spoons
- ☐ Paper products
- ☐ Paper towels
- ☐ Plastic Wash Basin
- ☐ Saran wrap

- ☐ Small baggies
- ☐ Toaster
- ☐ Wax paper

CLOTHING

- ☐ Activity clothes
- ☐ Hats
- ☐ Jackets/cool weather
- ☐ Ponchos/slickers for wet weather
- ☐ Rain Gear/Umbrellas
- ☐ Socks
- ☐ Swimwear & shorts/warm weather
- ☐ Umbrellas
- ☐ Underwear (bottoms & tops)

BATHROOM ITEMS

- ☐ Bath towels
- ☐ Clothesline, clips
- ☐ Toilet paper
- ☐ Wash cloths
- ☐ Black Tank Treatment

CLEANING SUPPLIES

- ☐ Black tank chemicals
- ☐ Bleach
- ☐ Broom & dustpan
- ☐ Cleanser (No bleach)
- ☐ Clothes bag
- ☐ Detergent
- ☐ Glass cleaner
- ☐ Rags
- ☐ Scratcher pads
- ☐ Soap
- ☐ Softener
- ☐ Sponges

PERSONAL ITEMS

- ☐ 4x4 gauze & tape
- ☐ Ace bandage wraps
- ☐ Alcohol Wipes
- ☐ Aloe Vera lotion
- ☐ Antacid
- ☐ Aleve
- ☐ Band Aids
- ☐ Benadryl
- ☐ Books, magazines
- ☐ Bug spray
- ☐ Hand Sanitizer
- ☐ Hydrocortisone ointment
- ☐ Hydrogen Peroxide
- ☐ Tissues
- ☐ Latex Gloves
- ☐ Neosporin
- ☐ Personal medications
- ☐ Rubbing Alcohol
- ☐ Scissors
- ☐ Sun block

ELECTRONICS

- ☐ Batteries (AA, AAA, D)
- ☐ Music & Movie CDs
- ☐ Camera

BEDROOM

- ☐ Pillowcases
- ☐ Pillows
- ☐ Sheets
- ☐ Comforter

SETUP/ TAKEDOWN ITEMS

- ☐ 8" Level
- ☐ Compressor for tires
- ☐ Copy of DL, insurance
- ☐ Large Garbage Bag for sewer hose
- ☐ Lynx Levelers
- ☐ Rags
- ☐ Wheel Chocks

TRAVELING ITEMS

- ☐ Drinks / Water bottle
- ☐ Ice chest
- ☐ Road atlas
- ☐ Snacks

Toolbox

- ☐ Flashlights
- ☐ 5, 10, 15, 20 W Fuses
- ☐ Hammer
- ☐ Light Bulbs
- ☐ Screwdrivers
- ☐ Wrenches
- ☐ Pliers

Repair Bag

- ☐ Booster Cables
- ☐ Bungee Cords
- ☐ Camping Shovel
- ☐ Duct Tape
- ☐ Electrical Tape
- ☐ Emergency Flares
- ☐ Emergency Reflectors
- ☐ Multi Tool/Knife
- ☐ Tire Pressure Gauge
- ☐ Work gloves

MISC

- ☐ Bucket
- ☐ Citronella Candles
- ☐ Drying Rack
- ☐ Folding Table/Chairs
- ☐ Grill
- ☐ LP Gas bottles for grill
- ☐ Notepad/Pencils
- ☐ Outside rug
- ☐ Picnic tablecloth & clips
- ☐ Small Sewing Kit/Safety Pins
- ☐ Twine
- ☐ Rope
- ☐ WD40
- ☐ RTV Silicone Sealant
- ☐ Silicone spray

Inside Cab

- ☐ Cell Phones/charger
- ☐ Insurance Card
- ☐ Maps/Atlas
- ☐ Vehicle Registration
- ☐ Spare keys - extra set
- ☐ Thor/appliance Manuals

Items in Basement Storage Areas

Electrical

- ☐ 30 Amp Power Cable
- ☐ 50A male/30A female adapter
- ☐ Park pedestal surge protector
- ☐ Circuit Tester
- ☐ Coax for Cable TV hook up

Sewer

- ☐ Anti-bacterial Soap
- ☐ Extra Sewer Hose Connectors
- ☐ Latex Gloves
- ☐ Sewer Hoses

Water

- ☐ Water filter
- ☐ Water Hose (Green)
- ☐ Water Hose (White)
- ☐ Water Pressure Regulator

Games/Recreation

- ☐ Bicycles/Helmets
- ☐ Cards

EQUIPPING

MUST HAVES

- ☐ **Water Pressure Regulator**
- ☐ **Fresh Water Hose**
- ☐ **Garden Hose** (for cleanup around campsite & sewer hose cleanup)
- ☐ **In-Line Water Filter**
- ☐ **Sewer Hose** (short & long pieces -- 10' & 20' pieces)
- ☐ **Surge Protector** – for shore power connection
- ☐ **Electrical Extension Cord** (for inside motor home)
- ☐ **Electrical Adapters** - A range of adapters to be able to plug your unit into whatever electrical service is available.

NOTE: You should purchase two adapters to use various RV Park power pedestal configurations. One is a 15amp to 30amp adapter and the other is a 50amp to 30-amp adapter—



15amp to 30amp adapter



50amp to 30amp adapter

- ☐ **Leveling Blocks** - The orange *Lynx Levelers* work great, but any pieces of wood cut into squares will do just fine.
- ☐ **Level or Stick-On Levels**
- ☐ **Extra Fuses** – variety of 5, 10, 15, 20 automotive DC fuses
- ☐ **Extra Bulbs**
- ☐ **Fire extinguisher** (OEM)
- ☐ **First Aid Kit**
- ☐ **Black Water Chemicals** - Don't even think about using your toilet without adding waste chemicals first; trust me! Look down the toilet and open the valve. You are looking directly into the Black Tank. There is no drain trap to keep the Black Tank odors from coming into the coach every time you flush. Use a good tank deodorizer/digester to help digest solids, toilet paper, and freshen the smell. The type that comes in packets are the most convenient.
- ☐ **RV Toilet Paper** - the degradable type used for RVs and portable toilets. Using regular toilet paper will clog your black holding tank eventually. RV specific toilet paper is expensive (over a dollar a roll). Use a single ply from the grocery store or any "septic safe" toilet paper (Regular *Scott's* is a good substitute or Costco's *Kirkland*). To find a good RV substitute, put a small amount of the toilet paper in a glass and add water. If it digests into a slurry or pulp quickly – use it.
- ☐ **Rags**
- ☐ **Disposable Rubber gloves** (never touch a sewer connection without these)
- ☐ **Flashlights**
- ☐ **Matches** (and/or butane grill lighter)
- ☐ **Duct Tape**
- ☐ **Electrician's Tape**
- ☐ **Lubricating Oil (WD-40)**
- ☐ **Silicon Spray**

Tools - Make sure you carry the basics, such as:

- Assortment of flat-head & Phillips screwdrivers
- Basic Wrenches, both box and open end
- Needle-Nose Pliers- Square tipped screwdriver
- Channel Lock pliers
- Truck tire gauge
- Socket Set, if you're so inclined
- Torpedo level
- Booster cables
- Hammer & mallet

NICE TO HAVES

- ☐ **Propane grill (outside)**

- ☐ **Sewer Hose Supports**
- ☐ **Bungee Cords**
- ☐ **Trash Can**
- ☐ **Coax Cable** - For Cable TV.
- ☐ **Broom and Dustpan**
- ☐ **Ant Spray and Ant Traps**
- ☐ **Swiss Army Knife**
- ☐ **Rope and/or String**
- ☐ **Carpet or Fake Grass**

POST TRIP ACTIVITIES

Once we get home, there are some things that should be done as part of “trip wrap-up”. Many are common sense clean-up tasks. The other tasks, such as draining the water, should keep the coach systems fresh for the next trip. If you can plug the coach into AC power at home to keep the refrigerator running, these do not need to be done immediately upon return, but probably within a day or two.

CLEAN-UP TASKS

- ☐ Wash and replace bed linens & towels
- ☐ Pull dirty clothes out of closet
- ☐ Empty the refrigerator, clean it, turn it off, and leave door partially open using button built into door handles
- ☐ Vacuum floor, carpet/wash floor & rugs
- ☐ Restock basics (toilet paper, paper towels, non-perishable food staples, etc.)
- ☐ Remove perishable groceries
- ☐ Clean toilet
- ☐ Scour shower enclosure

POST TRIP MAINTENANCE

- ☐ Make sure the water heater's electric switch is **OFF**
- ☐ Drain the water system (freshwater tank low point drain, hot & cold-water system low point drains including the heater and outside shower)
- ☐ Check battery water levels
- ☐ Check propane level and refill, if necessary
- ☐ Dump black & gray tanks if they need it.
- ☐ Rinse toilet if it needs it and flush deodorizer/digester packet into black tank.
- ☐ Clean bug & tar from shell
 - RV Bug & Tar remover ok
 - After using, restore the wax/sealant by using a “quick detailing” sprays from *Mothers*, *Maguire's*, *Sonus*, etc.
- ☐ USE/STORE switch – position to **STORE** if the RV is to set for a period, or if the shore power is not connected and ON while in storage

WINTERIZING

Note: The Thor factory states that no special tools or materials are needed to prepare it for storage in freezing conditions. Simple draining of the water system, as described in the Thor Owner's Manual, is enough.

Several Owners who live and store their RVs in areas where the winter temperature goes well below freezing have suggested additional winterization steps "just to be sure." If you feel more comfortable knowing that you have blown out the water lines and/or added antifreeze to the water system, here are the steps. In most cases these aren't necessary, but owners have suggested them as a "belt and suspenders" approach to winterization when storing an RV outdoors in very cold (below zero) climate.

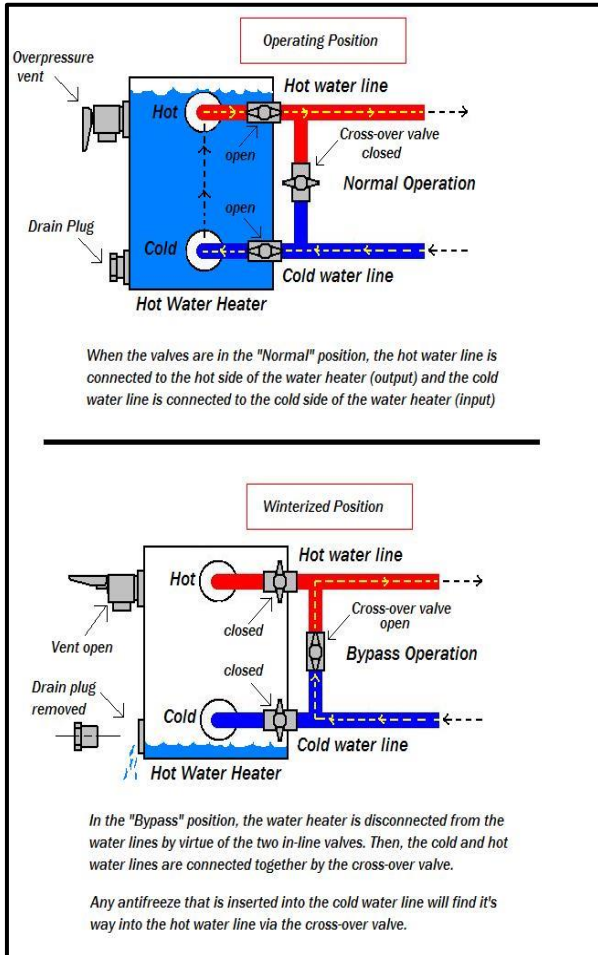


Figure 4 Water Heater Bypass Valves

WATER HEATER BYPASS

Axis and Vegas RVs are plumbed with a water heater bypass. **Figure 4** developed by FW28z, another contributor to the Thor Forum, shows and explains how to position the water heater bypass valves for normal operation and for the winterization position. In this way you connect the cold and hot water lines and bypass the water heater tank. If you don't bypass the water heater you are going to need an additional 6 gallons of RV antifreeze (if you winterize using the RV Antifreeze method) because you'll be trying to fill the water heater with the antifreeze.

DRAINING FRESH, BLACK, GRAY AND WATER HEATER TANKS

- 1) Drain Black and Gray tanks if not already drained
- 2) Relieve pressure off your water system and remove the water heater's drain plug (on Axis/Vegas 24.1 it's a 15/16" plastic plug near the bottom left of the unit (**Figure 3** orange circle -- a pain to unscrew because it's behind a pipe).

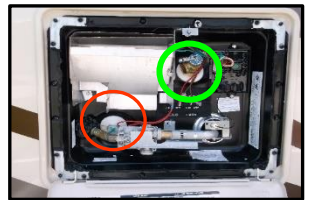


Figure 3 Water Heater Drain Plug

NOTE: Using an offset universal and extension on a ratchet makes accessing the plug much easier than just using an open-end wrench.

- 3) If you want the water to drain faster you can open the safety valve at top of water heater (**Figure 3**, green circle).

- 4) Remove the cold-air return grate in hallway under refrigerator to get to the water heater bypass valves from there. **Figure 5** above shows the bypass valves (Valve 1 – Bypass Valve, Valve 2 – Hot Water Outlet Valve, Valve 3 – Cold Water Input)



Figure 5 Water Heater Bypass Valves Location

5) Open the Low Point Drain Valves #1 (Fresh Water Tank), #2 (Cold Water Supply Line, and #3 (Hot Water Supply Line) under the passenger bed as shown in **Figure 6**. Close the Feed Valve #4, so the water pump doesn't draw water from the tank. These valves are right next to each other right where the waterlines leave the tank. You can tell the feed valve because it's hooked to the pipe going to the water pump. The freshwater tank drain valve is the one with the right-angle fitting that goes through the floor.

CONFIGURE WATER HEATER BYPASS VALVES

6) Refer to **Figure 5** and configure the valves as follows:

- Valve 1, Bypass Valve – **OPEN**
- Valve 2, Hot Water Outlet – **CLOSED**
- Valve 3, Cold Water Inlet -- **CLOSED**



**Figure 6 Low Point Drains
(under passenger side bed)**

WINTERIZE USING COMPRESSED AIR INSTEAD OF RV ANTIFREEZE

I prefer winterizing and evacuating all water from the RV water lines using compressed air. I prefer this method because there is no pink RV antifreeze that must be purged from the lines when de-winterizing. To me, the compressed air method is clean, easy, and effective. To winterize using compressed air:

- ☐ First you need to obtain a compressed air adapter that screws on to the city water inlet point from an RV supply store, Amazon, Walmart, etc. Screw the adapter onto the city water supply connection
- ☐ Drain Black and Gray tanks as in Step 1 above
- ☐ Drain hot water tank as described in Step 2 above. After the tank is completely drained, reinstall the water heater drain plug.
- ☐ Configure the water heater by-pass valves as described in Step 4 and 6 above
- ☐ Drain freshwater tank as described in Step 5 above
- ☐ Connect the air compressor to the compressed air adaptor, and set up the compressor for approximately 30 psi
- ☐ You will now open each water valve (hot and cold) one at a time from the valves furthest from the city water inlet to the closest. Open each valve separately and keep open until all water is blown out. Start with the kitchen sink (cold then hot), bathroom vanity (cold then hot), inside shower (cold then hot), toilet, outside shower (cold then hot)
- ☐ Ensure all valves in the previous step are closed. Go inside to the low point drains under the passenger bed (See **Figure 6** above) and open the cold water low point drain (Valve 2) and hot water low point drain (Valve 3). When water stops blowing out the drains under the RV, close the low point drain valves
- ☐ Turn off the compressor and disconnect the compressed air adaptor from the city water input point.
- ☐ Connect a container of RV antifreeze to the antifreeze injection point as described in Step 7 above. Run the water pump for a few second to siphon antifreeze from the container to flow through the water pump to purge the water from the pump
- ☐ Pour antifreeze into all the drains (sink, vanity, shower) and the toilet as described in Step 15 above
- ☐ Perform Steps 17 and 18 below.



**Figure 7 Compressed Air
Adapter**

Continue below if winterizing using pink RV Antifreeze

WINTERIZING USING PINK RV ANTIFREEZE

Setup RV Antifreeze Containers

7) - Hook up some hose to the "antifreeze injection point (**Figure 6**, Cap 5)." The injection point is a tube sticking up that is capped. Get a fitting to screw in there and some hose--I use clear vinyl so I can see the antifreeze go through it:

8) It usually only takes about 1.5 gallons of pink stuff to winterize my Axis (**Figure 8** shows the antifreeze bottle configuration and hookup) -- get extra just in case.



Figure 8 RV Antifreeze Configuration and Connection

Completing Winterization

9) Now turn the pump on with the kitchen faucet open slightly (using kitchen because it's right next to the pump switch). The idea here is to have a faucet open so the pump can suck up the antifreeze -- try it with all the faucets closed you won't get very far LOL.

10) Once you see the clear line filled and hear the pump slow down because it has some antifreeze in it close the faucet. Now you're ready...

11) Starting at the furthest faucet turn on one cold water valve at a time until pink antifreeze flows out (**Figure 10**), then close the faucet. Make sure it is pink coming out. Then do the same thing to the hot water faucet. Make sure you get **EVERY** cold and hot water faucet (shower, bathroom sink, toilet flush, kitchen, and outside shower).



Figure 9 RV Antifreeze Flowing Out Bathroom Sink

12) You'll probably empty the first gallon during this process. When you hear the pump running with no antifreeze coming out just turn off the pump, replace the bottle with a full one, and repeat the priming like you did with the first bottle.

13) When all the sinks are done, I also go and briefly open both low point drains (right next to the water tank) and the two water heater bypass valves so that they all get antifreeze going through them. NOTE: On the 25.2 the low point drains are behind the drawer under the refrigerator, and the hot water shutoff can only be found by feel just above the cold-water shutoff.

14) Lastly, I leave the system semi-pressurized (not fully), take the strainer out of the city water hookup, and lightly press on the check valve there to get some antifreeze to come out there. Don't do this with a fully pressurized system because you could damage the check valve. (There was some discussion about me doing this in another thread--some people recommended not to if I'm remembering correctly.)

15) When I'm all done, I pour any remaining antifreeze into each sink, the shower, and the toilet to make sure that there is antifreeze in the traps and the waste tanks (even though there probably is from the winterizing process but, in this case, more is better). In addition, this allows me to use up all the antifreeze and recycle the bottles (no real reason to have a 1/2

full bottle of RV antifreeze sitting around).

16) Antifreeze is not required in the hot water tank if it's nearly empty -- just leave the Teflon hot water tank drain plug removed after you finish the antifreeze fill.

17) When finished, and the water pump is turned off, open all faucets ½ turn to relieve pressure on the valve seats while in storage

18) Clean out all sinks, shower pan, and toilet to prevent staining from the antifreeze



Figure 10 Antifreeze Pumping Through System

ADDITIONAL TIPS

CAUTION: When eventually installing the Teflon hot water tank drain plug, use plumbing Teflon tape and do not over tighten plug or you will strip the threads.

WARNING: DO NOT USE AUTOMOTIVE ANTIFREEZE! – It's poisonous. Only use RV (Pink) Antifreeze.

NOTE: Don't forget – the intent of winterizing is getting RV antifreeze in **ALL** the water lines. So, when you do the procedure make sure you have opened every cold and hot water faucet (to include inside **AND OUTSIDE** shower faucets) and the toilet flushing valve. You want to see pink RV antifreeze come out the faucet when it is opened.

Remember the valve locations shown above use the 2015 Vegas/Axis 24.1 as the reference. If you have a different model year and/or floor plan the valve locations will be different. As a rule, the water heater bypass valves will be somewhere behind the water heater. The low point drains should be near the freshwater tank.

Winterizing Vegas/Axis Equipped with the Girard Tank less Water Heater

Since this type of water heater contains no hot water tank, there are no bypass valves associated with it. Winterizing can be accomplished using the antifreeze or compressed air processes. Simply skip the steps discussing configuring by-pass valves or draining the hot water tank. The tank less water heater is winterized as if where just part of the cold and hot water plumbing.

SANITIZING THE WATER SYSTEM

Note: If you winterized the system with antifreeze, the pink antifreeze must be well-flushed before first use. You also need to reconfigure the water heater bypass and the hot & cold-water valves on the water heater. A new RV should also be sanitized before first use.

- ☐ Fresh Water Tank: **FULL** (add $\frac{3}{4}$ cup of bleach to water and pour diluted mixture into tank while filling)

NOTE: The Vegas 24.1 has a 42-gallon freshwater tank. Recommended bleach sanitation mixture is $\frac{1}{4}$ cup per 15 gallons. The full Vegas tank; therefore, requires $\frac{3}{4}$ cup of bleach for sanitizing the freshwater system. Never pour straight bleach into the freshwater tank.

- ☐ Water Heater: **OFF** and ensure water in tank has cooled
- ☐ City Water: **DISCONNECTED**
- ☐ Water Pump: **ON**
- ☐ **OPEN** one faucet at a time, let the chlorinated water run through them for one or two minutes. Be sure to do all faucets, hot and cold. Include kitchen, bathroom sink, shower, and outside shower. Run the water in each faucet until you smell chorine. (Make sure you are using the water pump and not an external water supply.)
- ☐ Top off the RV freshwater tank and let stand for at least three hours (over-night is better). (If you double the amount of bleach to $1\frac{1}{2}$ cups, you can reduce the stand time to 1 hour)
- ☐ Flush the faucets one more time for several minutes.
- ☐ Water Pump: **OFF**
- ☐ Completely drain the freshwater system: Open the freshwater tank low point drain valve under passenger bed to speed up emptying the tank. Open the hot water tank drain plug and drain until it is completely empty. Open the hot and cold-water system low point drains under passenger bed.
- ☐ Close all valves and faucets and drain plugs.

NOTE: When reinstalling the water heater Teflon drain plug, ensure its threads are wrapped with Teflon plumbers' tape and do not over torque.

- ☐ Fresh Water Tank: **REFILL** with fresh water.
- ☐ Flush each faucet for several minutes each repeating until the tank is again empty. Ensure you do hot water faucets as well as cold. When opening the first hot water faucet, the water pump will run for quite a while to refill the hot water heater tank with 6 gallons of water. (Make sure you are using the water pump and not an external water supply.)
- ☐ City Water: **CONNECT**
- ☐ Water Pump: **OFF**
- ☐ Flush all faucets one more time to ensure that all chorine smell is gone.
- ☐ Your RV freshwater system should now be safe for use.

STORING

The following items are useful when you will be storing your TM for any extended period, not just for the winter.

- ☐ Drain and flush all holding, fresh water, and hot water tanks.
- ☐ Drain all water lines, using compressed air or at least the low-point drain lines.

Note: To use compressed air an adapter is required to hook to the outside shore water connection. Use approximately 30 psi of air to purge water lines

- ☐ Close the LP tank valve.
- ☐ *Disconnect shore electric power (USE/STORE switch to **STORE**)*

Additional Tip: Keep the coach connected to shore power while in storage if possible. Doing so allows the converter to keep the house batteries fully charged. Additionally, a small heater set at 45 – 50 degrees can be used in the coach to keep the unit warmer than sub-zero outside temperatures. If connecting to a normal house electrical connection, keep the load low to prevent the circuit breaker in the house to trip. Also, try to plug into a GFI circuit. If keeping the coach plugged in, leave the USE/STORE switch in the **USE** position.

- ☐ Consider removing the two-house batteries and store in a place where they won't freeze. Batteries that have been frozen will never again hold a proper charge and will likely have to be replaced.
- ☐ If you do not remove the batteries while the RV is in storage, ensure they are fully charged – fully charged batteries will not freeze.
- ☐ Visually check your RV for anything that might need to be repaired. Make sure you also check the roof.
- ☐ Defrost and clean refrigerator. Be sure that the plastic clips are extended on the latch, so the refrigerator & freezer doors do not fully close. Place open boxes of baking soda or crumpled newspapers in the compartments to eliminate odors during storage.
- ☐ If storing in cold weather – follow the Winterization Checklist before storing
- ☐ Remove all perishable items from the interior and anything susceptible to freezing, if storing during the winter months.
- ☐ Cover all external outlets, such as furnace outlet, to prevent *critter* entry.
- ☐ Thoroughly wash the interior and the exterior of the RV. You might also consider shampooing the carpet inside and waxing the outside.
- ☐ Close all window.
- ☐ Spread softener sheets throughout the RV.
- ☐ Cover the tires to prevent weather-checking.
- ☐ Cover the roof air conditioner
- ☐ Cover with a tarp during storage. Make sure you invest in a good tarp that can *breathe*. Do not use a non-breathing tarp.
- ☐ Run generator (approximately 1 hour) and engine (approximately 20 min) every month (be sure to place the USE/STORE switch in USE before starting generator
- ☐ After running generator, check water levels in the house batteries
- ☐ Be sure to lock doors after running generator.

NEW VEGAS/AXIS PRE-DELIVERY INSPECTION (PDI)

This checklist is a modification of a universal RV acceptance checklist available from [Tom Boles](#). It was customized for my Vegas 24.1 use.

STARTING POINT

Useful tools -- flashlight with a strong beam, screwdriver with a straight, Philips and square bits, delivery invoice showing standard equipment and ordered options, and pictures from the glossy brochure will also help in your inspection. You will need the understanding & cooperation of your dealer for this process, as it probably involves far more depth & detail than they normally anticipate and schedule. Make sure they know about it in advance. (You may get a better-prepared trailer if you do!) At the very least, tell the person doing the walk through what you intend to do, give him or her a copy of this checklist and work with them to plan the time accordingly. A sense of humor will also come in handy!

Try to avoid the "Ooh, Ahh, Oh, Boy!" reaction. The whole intent of the PDI is to ensure that you got a quality product for the money you paid. It is also the opportunity for the dealer to explain to you, where everything is, how it operates, and answer any of your questions. The last place to find that something was assembled incorrectly, doesn't work, or leaks is on that first camping trip, a million miles from the nearest Thor dealer. This inspection is intended to make you a discriminating consumer, who values the hard-earned money spent on a quality product. Take your time and **INSPECT EVERYTHING**.

Finally, to complete this inspection the following must be available: propane tanks full, shore power, city water and a hose, sewer connections, drain or a dump station, and fully charged batteries must be connected as well.

The intent of this checklist is that at its completion you will ensure all systems function, the unit is free of manufacturing defects, and YOU can operate all its systems and hook it up.

OUTSIDE WALK AROUND

Plan on an hour for the walk around. At this point, you're generally searching for anything that does not look right.

Ford Chassis

- ☐ Oil: **CHECK** and full
- ☐ Windshield washer: **FULL** and **FUNCTIONS**
- ☐ Oil fill cap: **LOCATE**
- ☐ Battery: **LOCATE** and check water level
- ☐ Front engine cowling: Fits properly, locks securely
- ☐ Headlights, Fog lights, Clearance lights, DRL, Parking lights, Brake lights: **OPERATE** correctly
- ☐ Windshield: Free of stress cracks, dings, chips; windshield fits seal properly

Roof Sealing & Fixtures – climb ladder and get on roof.

- ☐ Seams, gaskets, and any holes: **SEALED** well
- ☐ Covers and Caulking: **INTACT, UNBROKEN, SEATED, & SEALED**. Proper polyurethane caulking should have been used to seal all places where the roof has been penetrated.
- ☐ Air conditioners, vents, antennas, sewer vents, and side seams: **SEALED**
- ☐ Roof surface: NO bubbles (large and small), dents, delamination, foreign objects, protruding screw, or nail heads.
- ☐ A/C Mount & vent areas: No depression or "cave-ins"
- ☐ Water test: Spray water onto roof and ensure no leaks around vents or A/C
- ☐ Caulking: Applied liberally, smoothly, with no gaps. Ensure that caulking is not dripped and smeared excessively

Windows

- ☐ **ALIGNED, SEATED, & SEALED**
- ☐ Screens: Smooth & not torn

Entry Door

- ☐ Gasket and seals: proper adhesive, coverage, sealed, no tears
- ☐ Door and Screen Door: **ALIGNED** with jamb and sits **FLUSH** against **INSIDE** of **JAMB**
- ☐ Locks: **KEYS WORK**
- ☐ Operation: **OPEN, CLOSE, & LOCK** without undue effort

Storage Compartments

- ☐ Doors: **ALIGNED**, Gaskets aligned, open and close smoothly
- ☐ Keys & Locks: **WORK**
- ☐ Hinges: **TIGHT & SECURE** and latches hold the door tightly closed and still be easy to open
- ☐ Floor: **DRY**, free of any signs of moisture that might indicate rain leakage, plastic liners not cracked

- ☐ Compartment lighting: **WORKS**

Sewer & Fresh Water Connections

- ☐ Sewer & Fresh water area: nothing broken or deformed
- ☐ Valves & fittings: **UNDERSTAND OPERATION**
- ☐ Sewer Y-Connection: Swivels 90 degrees up and down
- ☐ Black and gray water valves: **UNDERSTAND FUNCTION**
- ☐ Sewer Compartment Floor: 6" round plastic cover installed
- ☐ **Vegas/Axis 25.3 Only:** Ensure dealer shows you the operation of the **TWO** black water tank valves (one on each side of coach)
- ☐ Low point drains (under bed on passenger side): **LOCATE** and **UNDERSTAND** operation

Cable TV Connections- Find and understand the cable connections.

- ☐ Connectors: **WEATHER CAPPED & SEALED**

Propane

- ☐ Regulator: **UNDERSTAND OPERATION**
- ☐ Pigtails & system: **LEAK CHECKED**
- ☐ Main Shutoff Valve: **LOCATE & OPERATE**

Battery

- ☐ Box: **VENTILATED**
- ☐ Cables: **NOT RUBBING** any part of the frame because that will eventually end up with a short circuit and possible fire
- ☐ Battery Type: **UNDERSTAND** type and how to maintain them

Paint & Siding

- ☐ Finish: **CHECK**
- ☐ Sides: **CHECK** for bumps, dents, depressions by sighting down the side of the unit
- ☐ Siding: **INSPECT** by dividing each side of the unit into 2, 3 or 4 sections and inspect for color variations, dents or irregularities
- ☐ Ends: Same procedure as sides
- ☐ Vinyl Graphics: Smooth & free of air bubbles
- ☐ Decals: Edges **NOT LIFTED**
- ☐ Access panels: Not warped and all hardware present
- ☐ Ladder to roof: Tight and rungs not dented

Tires and Wheels

- ☐ Inflation: **CORRECT PRESSURE**
- ☐ Lug Nuts: **TORQUED**
- ☐ Wheels: Properly balanced

Awning

- ☐ Extension/Extraction: **CORRECT OPERATION**
- ☐ Springs/Locks: **FUNCTION PROPERLY** and **ALIGNED**
- ☐ Mounting Points: **VERIFY SOLID**
- ☐ Tilt Latches: **FUNCTION PROPERLY**
- ☐ LED edge lights: **FUNCTION PROPERLY**

Chassis Inspection - Put on some old clothes or coveralls and get a good-sized piece of cardboard or carpet to make it easier to lie on your back while checking around under the RV.

- ☐ Wiring: **SECURED**, properly tied, & not rubbing
- ☐ Frame: Straight and not sagging.
- ☐ Finish: Rust free and evenly applied.
- ☐ Front End Alignment: Verify with dealer that the Thor factory realigned the front end after they built the RV on the Ford chassis
- ☐ Check under left front side to ensure that the transmission shift cable is not routed against the exhaust manifold
- ☐ Hardware: All mounting hardware tight

INSIDE FIT AND FINISH

Now it's time to go inside. In general, you are looking for things that are not finished correctly since it is too late to inspect the design of anything.

Cabinets -

- ☐ Inspect & open all the cabinets to ensure that all the hinges and latches work well.
- ☐ Drawers: Pull each drawer out to its stop, return it closed and then try to open it like road vibration might do.
- ☐ Pipes/plumbing/wiring: No water leaks and that all the wiring and pipes are well fastened.
- ☐ Linings: **FASTENED SECURELY**
- ☐ Finish: **CHECK** for delamination or loose edges on molding or vinyl wraps (you may want to wear gloves for this part)
- ☐ Wardrobe: Open and close all closet doors checking for free operation and proper alignment. Hanger rods should be properly fastened and secure.

Molding & trim - Go over all the trim on walls, doors & furniture.

- ☐ Fit: Fastened on well and not loose or ready to come off
- ☐ Nails/staples/screws: None protruding
- ☐ Velcro: Properly applied throughout
- ☐ Gaps: Properly sealed

Chassis Cabin - Operate every electrical switch and observe its function.

- ☐ Windshield Cover: Understand operation as sun visor and nighttime privacy screen
- ☐ Radio: Works properly
- ☐ Start engine: No problem starting, no excessive exhaust
- ☐ Backup and side cameras: Operate turn signals and place in REVERSE to check operation of rear and side view cameras
- ☐ Captain chairs: Tight, and properly recline and pivots

Monitor Panel - Operate every electrical switch and observe its function.

- ☐ Monitor Panel: **CHECK** battery level, Propane level, Fresh Water Tank level, Black Tank level, and Gray Tank level
- ☐ Ensure shore power is connected
- ☐ Battery Disconnect Switch: **LOCATE** and verify operation
- ☐ Function switches: Operate every function switch so you understand what each does (Refrigerator, A/C, Water Pump, etc.)
- ☐ Front Electric Bunk: Operate so you understand function of the key, where the safety pins to prevent inadvertent lowering while driving are located, and how to raise and lower
- ☐ Awning Switch: Locate and extend and retract awning; inspect awning arms to ensure none are bent and properly lubed; inspect awning cover for stains or tears
- ☐ House Batteries Disconnect Switch: Locate and operate to understand the **USE** and **STORE** positions

Lighting - Operate every light switch and observe its function.

- ☐ Awning LED Light Switch, Hall Light Switch, Porch Light Switch: Locate by entry door and operate
- ☐ Bathroom and Bedroom Light Switches: Locate and Operate
- ☐ Stove Hood Light: Locate and operate
- ☐ Light Above Sink: Operate; notice that the three-position slide is the same as on all the ceiling lights throughout the coach (the slide provides the same function on all ceiling lights)
- ☐ Hall Lights: Operate off switch inside entrance
- ☐ Porch Light: Operate from switch inside entry

TVs -

- ☐ Locate all the TV remotes (generally in top drawer under stove top)
- ☐ Outside TV: Ensure compartment door closes securely and locks
- ☐ Game box hookups: Locate HDMI in cabinet above sink (Living room TV) and outside connections (storage "Basement" beneath outside TV compartment)

TV Antenna -

- ☐ Antenna Control: Raise and lower antenna. Note pointers on knob for rotating antenna and how to position antenna for travel (leave antenna up for TV operational test)
- ☐ Antenna Booster: Locate in cabinet above sink (top shelf, right all the way to the rear)
- ☐ Antenna Booster: Turn ON and OFF and note green light going OFF when Booster is OFF (Leave booster ON for TV operational test)

Furniture - Examine every piece of furniture to check for construction, upholstery, pattern and cloth matching.

- ☐ Sofa: **MAKE INTO BED**
- ☐ Dinette and table in cab: Mounts properly

Drapes - Check for alignment.

- ☐ Valences: **SECURE**

Counter Tops - Inspect all counter tops for alignment and fastening.

- ☐ Trim: **TIGHT**
- ☐ Caulking: **PROPERLY APPLIED**
- ☐ Sink & Faucets: **PROPERLY INSTALLED**
- ☐ Counter tops: No delamination or gluing voids

Windows - Open and close every window and operate the latches.

Pay attention to the safety egress windows or emergency windows and make sure they operate smoothly & easily.

- ☐ Hardware: All screws and hardware properly installed, no missing knobs

Floor Coverings - Inspect carpet and other floor coverings in all corners to ensure that they have been properly fastened down.

- ☐ Tile: **FREE FROM GOUGES**
- ☐ Carpeting: Properly installed, stain-free

Wall Coverings - Check to make sure that all the wall coverings cover and join properly. Look for any discoloration or patch jobs that may cover hidden problems. Try to find any places where it is not perfect since now is the time to get it fixed while matching patterns are in stock.

Sinks, shower tub, toilet:

- ☐ Finish: No scratches, gouges, or cracks

Use/Store Switch

- ☐ Position switch to **USE** and **STORE**. You should hear the battery disconnect relay clicking each time switch is repositioned. Check switch on shore power and on coach battery (shore power disconnected). If you don't hear the relay connecting and disconnecting you will encounter a problem with your coach and chassis batteries being charged.

OPERATIONAL TEST OF ALL HOUSE SYSTEMS

You should be about two hours into to the PDI by now and you are ready to test all the house type systems.

Shore Power System- Now is the time to connect to shore power.

- ☐ GFI-protected outlets: **TEST**, understand which receptacles "downstream" from the GFI are protected.
- ☐ Any electrical problems here should be corrected immediately.

Converter - Confirm the operation of the converter/charger that is installed.

- ☐ Turn on several interior lights to create a load for the converter and confirm no excessive converter noise or vibration.
- ☐ Have the PDI person explain the operation of the converter, the AC circuit breakers and the DC fuses.

Water Pump - Fresh water tank needs to be about 1/3 full so you can test the function of the water pump.

- ☐ After turning it on, you should hear it pump for several seconds, even up to a minute to create enough pressure in the system.
- ☐ If the pump does not shut off, there is a problem.
- ☐ Run water in the kitchen and bathroom sink and notice that the pump will come back on until proper water pressure is restored.
- ☐ Now is the time to fix a noisy pump if it is vibrating or making any irritating sounds.

City Water System - Turn off the pump, connect to city water (use a regulator if overly high pressure is suspected) and confirm that the connection works correctly.

- ☐ Leaks: **NONE**
- ☐ Fixtures: **CONFIRM OPERATION**

Monitor Panel – Provides convenient location for system switches and monitors

- ☐ Generator Hours – Check value
- ☐ Battery – Check level
- ☐ Propane – Check level
- ☐ Fresh, Black, and Gray Tank monitors: Check each for level
- ☐ System Switches: Operate each and check result; observe indicator lights if applicable

Windshield Screen – Screen comes down partway with engine operating as sun visor and then comes down all the way for privacy when engine is off

- ☐ Sun visor switch on dashboard – with engine running ensure sunscreen comes down approximately 6" and stops
- ☐ Sun visor switch: With engine off, ensure sun visor comes down all the way to completely block windshield
- ☐ Sun visor: Ensure there are no stains, rips or tears
- ☐ Ensure sun visor completely retracts

- ☐ Ensure PDI representative shows the location of the adjustment wire on wire on the left-hand corner of the screen used to adjust how far the screen comes down as a sun visor while the engine is running

Dashboard Switches – Become familiar with the location and operation of all the dash switches

- ☐ Headlights: Operate headlights, parking lights, taillights, and all top/side/rear marker lights
- ☐ Dash lights adjustment: Does operating the wheel brighten and lower dash light levels
- ☐ Wiper/Washer: Ensure wiper switch operates low, high, and intermittent; ensure intermittent time can be adjusted; ensure washer operates (NOTE: the wiper/washer steering column stalk does NOT operate the wipers/washer. Only the dash switch will operate them)
- ☐ Mirror Heaters: Note location
- ☐ Remote Mirror Adjustment: Ensure switch adjusts left & right outside mirrors; with ignition ON operate turn signal and ensure left and right outside cameras; place transmission in R and ensure rear camera operates
- ☐ Fog Lights: Ensure fog lights work when switch is on
- ☐ Night Light: Does ceiling light in cab area operate with switch
- ☐ Aux Start: This switch allows the house batteries to “jump” the chassis battery if the chassis battery is too weak to start engine
- ☐ Generator Start: Ensure switch turns on Cummins motor/generator
- ☐ Hazard Markers: Does switch on top of steering column operate flashers

Radio – The radio gets its operational power from the house batteries. The chassis battery provides radio power for the station preselects, date, and clock. Because the radio operational power comes from the house batteries, you can operate the radio while camping without drawing power from the chassis battery. The radio in my Vegas 24.1 was an Axxera AV614BH. Operating instructions did not come with the dealer provided literature; however, it is available online at [Axxera website](#).

- ☐ Remote: Locate remote with TV remotes
- ☐ Setup: Use online information to set up radio as desired

NOTE: Several other models of radios are used in older Axis/Vegas RVs. You may have to research online for specific operations manuals that cover your specific radio brand and model.

Gray Water Tank - Re-fill the freshwater tank if necessary and run water into the gray tank to verify the gauge reading and that there are no leaks.

- ☐ Tank: **FILL** until monitor indicates 1/3 full
- ☐ Leaks: **FIX**
- ☐ Tank: **DRAIN**, after toilet is checked, using sewer hose
- ☐ Drains: Tight and no leaks

Toilet

- ☐ Leaks: **NONE**
- ☐ Tank: **FLUSH, RINSE & Drain**

Water Heater - Ensure propane tank is on.

- ☐ Operate heater from Monitor Panel
- ☐ A few seconds after you turn it on, you should hear the click of the igniter and the small pop when the burner lights.
- ☐ The red light should stay on until that process happens. The red light should go out when water is heating.
- ☐ If it does not ignite, then there is a problem.
- ☐ Turn switch to electric. The red light should stay on while the heater element is on.
- ☐ Bypass valves: **UNDERSTAND** operation for winterizing
- ☐ Confirm that hot (or warm water depending on how long the water heater has been on) comes out of the hot tap at the various sinks, shower, and outside shower.

Furnace - Now it's time to understand the operation of the thermostat that controls heating and sometimes the air conditioning.

- ☐ Furnace: ON and set a temperature demand that is at least 10 degrees hotter than ambient temperature. In about 30 seconds, you should hear the furnace fans come on.
- ☐ Shortly thereafter you should hear the click of the igniter and the sound of the burner. If not, then there is a problem. It could also be taking a while for propane to get to the heater, so don't despair.
- ☐ Let the furnace blow and you should get hot air at about 110 degrees coming out of all vents. Check each one.
- ☐ Now turn the furnace down and the hot air will gradually turn cooler and the fans will eventually stop after the furnace has cooled sufficiently.
- ☐ During this process have someone with a good nose checking for any smell of material getting too hot, or exhaust coming out.

Air Conditioner - Some air conditioners also have a heat strip or heat pump feature so now is the time to verify these functions.

- ☐ A/C: ON
- ☐ After a couple of minutes, cool air, 20 degrees cooler than ambient, should be coming out vent
- ☐ Close louver covers on L/R unit vents and ensure cool air comes out all the ceiling ducts throughout the coach

- ☐ Learn how to clean the filters currently.
- ☐ Leaks: None, either from condensation or around mount seals

Propane and Carbon Monoxide Alarms & Smoke Detector - The PDI person should have a small canister of gas that can be sprayed at the alarm to test its operation. Have them perform this test while you watch and learn how the alarms work.

- ☐ Smoke Alarm & CO Alarm: **NEW BATTERY, TEST**

Refrigerator – The refrigerator in My Vegas 24.1 is fully automatic and works on propane or AC. It gives preference to AC and then will switch to propane if AC power is not available.

- ☐ Understand the controls and the status lights and set the unit on AUTO.
- ☐ Set temperature control to **5**
- ☐ Come back in about 10 minutes to feel that the coil/fins are starting to cool.
- ☐ Adjust the cooling temperature reducing the temperature control value.
- ☐ Remove AC power and ensure refrigerator reverts to propane operation.

TV Antenna and Switching – Ensure all three TVs operate properly.

- ☐ Raise the TV UHF/VHF antenna and turn on the amplifier booster.
- ☐ For each TV – turn on and use remote to select MENU and scan for TV stations
- ☐ For each TV – Select one of the stations to ensure TV works
- ☐ Learn how to rotate the antenna to maximize the quality of the picture.

Air Vent Fans

- ☐ Test the operation of kitchen, bedroom, and bathroom air vents making sure they open and turn on properly. Verify that they retract and close tightly. Check for proper operation. Ensure the seals make them leak free.

Propane Stove - Turn on one burner of the stovetop while the AC's and Microwave are running, and the automatic igniters should cause a strong spark to light the burner.

- ☐ Turn on the other burners to verify that there is enough propane flow to operate the refrigerator, water heater and all the burners.
- ☐ Ensure vent in hood works correctly
- ☐ If everything is OK, turn off the burners on the stove.

Radio

- ☐ Turn on radio and ensure it works properly
- ☐ Depress and hold MODE switch for 2 to 3 seconds – the rear camera should come on
- ☐ Depress and hold MODE switch for 2 to 3 seconds – rear camera should turn off.

You have now done a simple test of the major house systems and can shut everything off. By now, you will have a list of things that you feel need correcting, but it may be then the end of the day. Decide if you are going to accept the trailer as is or if it needs to stay with the dealer. If it is appropriate, plan on camping near the dealer for the night. This will give you a chance to further test the various functions. Prepare yourself for waiting until these things are corrected and don't be tempted by the PDI person to sign the acceptance paperwork just yet. For a serious checkout of your new trailer, you should "dry camp" the first night and not be tempted to hook up to shore utilities just yet. Bring enough kitchen equipment and food so that you can prepare an evening meal. There is no better way to test the living facilities than to use them. Don't be tempted, since you've had a tough day to go out to eat.

ACCEPTANCE

When you are satisfied that all systems are "go" then sign the acceptance papers that the PDI person will anxiously provide for you. Schedule your first return trip to the dealer for about a week to a month from now. You are now ready to take your "shake down" cruise.

SHAKE DOWN CRUISE

Select an interesting destination about 100 miles away for your maiden voyage. Use all the systems multiple times to try to detect and infant failures (electronic equipment fails at greater rates at the beginning of its life). Carefully note any problems or discrepancies in a list and make a copy for the dealer when you take the trailer in again.

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Handbook and Modified Owners' Manual

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INTRODUCTION TO YOUR VEGAS/AXIS

CONTACTING THOR CUSTOMER SERVICE

Easiest way to contact Thor Customer Service is through the Thor Motorhome website. Go to Thor Motorcoach Inc., at the top of the page click <Owners>. When the owners page opens, click the <Contact Customer Service> box. A contact form will open. You'll have to provide the year, model, and VIN on the form. Ask your question in the space provided. Additionally, you should ask Thor to send you the .pdf files of the construction drawings (battery schematic, electrical schematic, freshwater schematic, and wastewater schematic) for your model and floor plan). Appendix 3 contains a comprehensive list of the construction drawings I received for my 2015 Vegas 24.1.

Go to the Thor Motorcoach website Owner Resources section and establish an account. The link is (<https://www.thormotorcoach.com/owners/>). You'll need to provide your model, year, and VIN. When you access this account, you should be able to download manuals for everything installed on your RV. Additionally, you should be able to download all the production drawings and schematics for your specific VIN.

FORD WARRANTY

The warranty on the Ford chassis began with delivery to the Thor factory. Ford has a process whereby you can have the

warranty begin when you purchase the Axis/Vegas, appendix 2 – Ford warranty adjustment fcs-900 form process explains how to extend the warranty.

FORD ROADSIDE ASSISTANCE

Check the documentation on your Vegas/axis from Ford. Read the information carefully for what it covers and for how long. The Ford motorhome roadside assistance phone number is 800-444-3311.

FINDING A FORD DEALERSHIP TO PERFORM WARRANTY WORK

To find a Ford dealership that can perform work on the chassis call Ford Motor Home tech support at 800-444-3311.

FINDING AN RV PARK

Go to www.rvparkreviews.com and search for a park by state/city. Site gives star ratings and description of park campsites. Also contains visitor reviews.

FORD STRIPPED CHASSIS

FORD VIN DECODING

Check your Ford VIN number to determine whether the chassis is an E-350 or E-450, engine type, and model year of the chassis. The VIN does not contain a code for the type of transmission. Relevant parts of the VIN code are as follows:

- Position 5, 6, and 7 chassis -- E3K = stripped E-350 chassis; E4K = stripped E-450 chassis
- Position 8 engine – S = 6.8L V-10 gasoline engine
- Position 10 model year – E = 2014, F=2015, G=2016, H=2017

FORD FOR 2016/17 AND IDENTIFYING TRANSMISSION TYPE

The new Vegas/Axis for 2016/17 is on the Ford E-450 stripped frame. It also has a 6-speed transmission. The oil filler tube is moved forward on the engine and the chassis battery is mounted lower making removal from the front much easier.

To tell whether you have a 6-speed or 5-speed transmission, look at the shift labels under the speedometer. A 5-speed will read **PRND321**. A 6-speed will read **PRND421**.

SAFETY RECALL ON 2016 AXIS HEATER SWITCH

There is a safety recall on the heater switch in some 2016 Axis models. Some switches do not allow warm air to come out the defrost ducts to deice the windshield. Axis owners should call Thor Customer Service with their VIN# to see if their coach is affected by the safety recall.

VEGAS/AXIS HANDLING

Driving Vegas/Axis is not just like driving a car. The coach has a large geometry and; therefore, handling in wind and at speed is going to be different. I describe driving an RV to be like driving a shoe box down the road.



Figure 11 Thor Vegas/Axis Ford-based E-350 Chassis

The chassis (2014-15) is Ford E-350 truck, stripped chassis with a 6.8L V10 305HP engine (**Figure 11**). It is designated stripped because it comes from Ford with no cab or windshield. The chassis for the 2016/17 models use a Ford F-450 stripped chassis.

On the left side wall next to the driver, Thor has posted a note and included comments in their manual recommending that the new owner get a front-end alignment. Ford delivers a stripped chassis to Thor that has been aligned. Thor modifies the chassis, changes the wheelbase, and builds a "house" on the chassis weighing about 6,000 lbs. They do not complete another front-end alignment after chassis modification and adding all the additional weight of the coach; hence, the notice to the owner to get an initial wheel alignment after the owner loads the coach as they would use it. I recommend every new user load the coach with everything they plan to use during camping. Fill the freshwater tank as well. Contact the Ford Motorhome Roadside Assistance number provided earlier and ask for the closest Ford dealer that handles your chassis/motorhome. Then call that dealer and have them schedule a front-end alignment.

JamieGeek posted a description of the unique handling challenges of driving the Vegas/Axis. It is an especially good description for an owner who is new to RVs or an owner moving up from a travel trailer. The post can be found on [Thor Owners' Forum](#) and is quoted here in its entirety:

"I've seen a few posts talking about how the Thor's are a bit squirrely going down the road. Having just put 1400 miles on our Axis (yesterday) I thought I'd add a thread here talking about my experiences with it (much of this topic will likely also apply to any E-Series based class C). Having said that....

On the E-Series chassis there is a "dead zone" in the steering. When going straight down the road the steering wheel has a good 1" (or more) of play before turning the front wheels (most likely from the couple of u-joints in the steering shaft). Thus, you may find yourself turning the wheel back and forth attempting to keep the vehicle going straight down the road which may result in swaying back and forth. I try to minimize this by turning the wheel slowly and feeling for the resistance when it does start turning the front wheels easing into that -- I've found that by using slow determined motions I can usually make the Axis track straight down the road and not bounce back and forth between the two lane markers... at least when it isn't windy.

The Axis sits up very high, especially the driver. When looking out the driver's side window you're looking above just about everything on the road. Thor must have raised up the seating position to be like a "normal" Class A (you are even higher than other E-Series based Class C RVs, when going next to Semi's we almost see eye to eye with those drivers). This enhances the rocking and the feeling of being pushed around a bit by the winds; something to get used to. This does mean that you can look far ahead and be able to see traffic situations forming well in advance (and thus not have to violently react). The raised seating also affects the driver's sightlines to the gauges in the dash -- at least for me it seems I must slouch about 6" to be able to fully read the fuel level and other items at the top of the dash (like they raised the seating position more than the dash).

Some drivers can tolerate this behavior better than others: I'm relaxed driving the Axis, and in most instances can do so with a single light hand on the wheel. Others, on the other hand, may find driving it

to be a bit stressful and only be able to go so far before having to stop..."

Handling Improvement modifications

There are several things that owners can do to help improve the handling characteristics of their Vegas/Axis (some with varying degrees of improvement:

- Tire pressure – ensure front (75 psi) and rear (65 psi) is maintained. This is the simplest thing to do to improve handling.
- Front End Alignment – Described earlier above. This is the second-best thing you can do to improve handling. Several people have also recommended the same thing on various RV forums, and several have documented their handling improvement.
- Saf-T-Plus Steering Stabilizers – Several owners have installed these steering stabilizers to reduce driver fatigue from over steering. They also protect against front-tire blowouts and keep the vehicle centered against side winds, passing Semi's. They can also decrease wear-and-tear on front end.
- Other considerations - anti-sway bars front and back, replace camber/caster sleeves.

WIPER BLADE REPLACEMENTS

Standard OEM wiper blades are 29 1/2" with J-hook mounts. Several owners on the Thor Forum have stated it is difficult to find wiper blade replacements. The blade is a TV8-32 (Tru Vision, PO Box 4112, Elkhart, Indiana, 46514-0112. Tel. 574-266-9430. The model # is TV8-32, their 32" model. They can also be found on Amazon [Axis/Vegas Wiper Blades](#). (Thanks to Oneilkeys and JamieGeek on the Thor Forum)

FORD CHASSIS ELECTRICAL RELAYS AND FUSES

The fuses and relays in the 2015 Ford E-350 stripped chassis found in the Power Distribution Box in the engine compartment and the Passenger Compartment Fuse Panel located to the left of the brake pedal. See Appendix 8 for fuse and relay locations.

POTENTIAL PROBLEM -- ROUTING SHIFT CABLE ON EXHAUST MANIFOLD

Bruce, a member of the Thor Owners' Forum was unable to move his shift out of Drive. The garage that towed him suggested he get under the vehicle and disconnect the shift linkage cable so it could manually change gears. He found the shift cable



Figure 12 Transmission Cable Melted Through

had been routed directly on top of the exhaust manifold (**Figure 13**). The high heat had deteriorated the shift linkage to the point that it was unable to move the shift lever on the transmission. After much discussion and research, he was able to get Ford agree to perform warranty work to fix the

problem. He found a dealer by contacting the Ford Motor Home tech support discussed above. The dealer replaced the shift cable (8C2Z7E395A Cable Assembly) and rerouting the new cable away from the manifold. Find entire discussion with pictures here: [Vegas Shift Linkage Routed against Exhaust Manifold](#). **Figure 12** shows the transmission cable melted through from the heat of the manifold.

DocMike had his transmission cable rerouted as part of the warranty repair authorized by Thor. The transmission cable was replaced, and a clip was added to route the cable away from the manifold

(Error! Reference source not found.). If you discover your cable is misrouted, you

need to contact your dealer about the same warranty repair. If your dealer has not heard about this problem, refer him to the "E350Won't Shift out of Drive" on the Thor Forum. Also, he can contact John Vrydaghs, Thor Motor Coach Warranty/ Customer Service Manager at 574-584-2115 or at email address johnv@TMCrv.com. He is familiar with this problem from handling DocMike's (Michael Reott) problem



Figure 13 Transmission Cable against Exhaust Manifold

CHASSIS CAB SWITCHES

Switches in the cab are located to left of the steering column and on the center dashboard console.

Left of Steering Column (**Figure 14**)

- Headlight Switch
- Console light dimmer wheel. This not only adjusts the dash light brightness, but also turns on the dash map light. If your map light is on all the time, try turning this switch to turn out the map light.
- Wipers/Washer – note that the wipers and washer are controlled by this switch ONLY. Although there is a wiper/washer stalk on the steering column, it is **NOT** functional. The wiper switch also controls the intermittent wiper speed. Push the wiper control in and wiper turns on, raise wiper switch up and fast wipers engage, press wiper switch down for intermittent wipers



Figure 14 Driver Left Side Console



(there are 4 speeds intermittent wipers).

- Left and Right mirror control – a switch allows selection of left or right mirror and a four-position control allows the selected mirror to move up and down or in and out.
- Heated Mirrors Switch – applies heat to the outside mirrors for defogging and to melt frost and ice.

Center Console (**Figure 15**)

- Fog lights – turns on fog lights. A red light in the switch illuminates when the fog lights are on.
- Night Shade – depressing this switch with the ignition ON will cause the shade to lower 5 to 6 inches as a sun visor. To lower the shade the rest of the way for privacy, the ignition switch must be OFF.

NOTE: At the left edge of the shade is a wire with a control button on it (See **Figure 16**). Adjusting this button allows you to increase or decrease the amount the shade will lower as a sun visor while driving. The adjustment button on my Vegas 24.1 was tucked in the recess at the left edge of the sunshade.



Figure 16 Night Shade Control Button

Thanks to mellewjo on the Thor Forums for the website of the sunshade manufacturer ([MCD Innovations](#)). Download the American Duo pdf file and follow the instructions for setting upper and lower limits on the Dual-Range Switch Motor using the Learning Keys on the ends of the wires.

- Generator Start – this switch starts the generator. A light in the switch will illuminate when the generator is running. You can operate the generator from the cab so that the chassis air conditioning can augment the cab air conditioner when it is extremely hot.

Note: Running the generator when the engine is running will reduce your average mpg. The generator consumes approximately .5 to 1.3 gallons per hour depending on generator load.

- Emergency Start -- can be used to start engine when chassis battery is too weak to turn starter. Turning on the auxiliary start applies power from the house batteries just like jumping the chassis battery. As soon as the engine starts, turn off the switch. Please note – this will not work if the chassis battery or house batteries are completely dead. It needs at least 2 or 3 volts for the isolator relay (Trombetta) to close allowing the batteries to be jumped.
- Cab Lights – this switch operates the ceiling light between the two captain chairs in the cab.
- Cab air conditioning/heating controls – regulate fan speed, mode, and temperature like the same controls in a car or truck.
- The console contains the radio with the capability to display the rear, right, and left camera images. There is also a USB connection on the radio that allows you to connect a music memory stick. The radio draws its power from the house batteries (not the chassis batteries) so that the radio can be played while camping. The camera

display will function when the radio is on or off. The rear image displays when the transmission is placed in REVERSE. The left turn signal will cause the left outside camera on the mirror to display the left side of the coach traffic clearance. The right turn signal does the same for the right mirror camera. Refer to the Axxera radio sheet for operating functions to set time, set radio stations, set date, etc.

- The console also contains two 12 VDC connections, a USB port, and a radio HDMI connection. Power for these connections comes from the chassis battery

Note: The fuse (30 amp) for the 12VDC plugs are in the fuse box under the hood (position #70).

ENTRY DOOR AND SCREEN DOOR

There are two key slots on the entry door. The one farthest to the left is to lock the door handle (HINT: Be warned that there are many "master" keys in the RV industry that will fit this lock!)

The second key slot to the right is the deadbolt lock and is the one that should be used for maximum security. (HINT: A small amount of grease on the striker plate and latch will make the door close much more smoothly. These doors are not designed to be slammed and will fail prematurely.)

The screen door can be latched to the entry door so that both open together. The screen door can be separated from the entry door so that the entry door can be left open.

When driving, ensure that the deadbolt is engaged. Don't forget to lock the door at night while camping

KEY BLANKS FOR AIX/VEGAS ENTRY DOOR

Need an extra set of keys for the lock and deadbolt on the entry door? The lock is manufactured by TriMark Corp. Blanks are available at this website: [TriMark Entry Door Key Blanks](http://TriMarkEntryDoorKeyBlanks.com).

ELECTRICAL AND SLIDE SYSTEMS

The Axis and Vegas is powered from three different source options – house battery, generator, or shore power. Additionally, the Ford chassis contains a 12 VDC battery.

SHORE POWER

The 110V AC shore power connection is on the left side of the coach as shown in **Figure 17**. Use a 30A cable to connect power to the coach. In general, a 30A cable is enough. A 50A male to 30A female adapter (**Figure 19**) is handy to have in the event that a campsite only has 50A service available. The coach has a 15A male to 30A female adapter provided by Thor to connect to shore power at home.



Figure 17 Shore Power, City Water, and Fuel

WARNING: Limit the electrical load when using 15A power from home. Too much load (like A/C, microwave, TVs, and refrigerator operating simultaneously) causes the adapter to get very hot. This could result in the adapter shorting out and causing electrical damage or fire.

Park Pedestal Electrical "Tutorial" (using the 50-amp connection and 50 amp – to – 30-amp adapter)

When using the 50amp connection at the park electrical pedestal and the 50amp-to-30-amp adapter, the 50amp pedestal connection, the 50amp plug has 4 connections: The two "hot" legs, a neutral, and ground. The two "hot" legs are 180 degrees out of phase of each other so that the voltage between them will be 240V. The neutral line is



Figure 19 50 Amp to 30 Amp "Dog Bone" Adapter

just that and is always 120V from either "hot" leg. Thus, the 30A adapter just uses one "hot" leg and the neutral line.

The 50A service is really split into two 120V systems (one system for the camper + one A/C unit, and the other system is the other A/C unit). The only things that I know of that really use the 240V in total are:

- Electric dryers
- Electric Ranges
- Electric Vehicles.

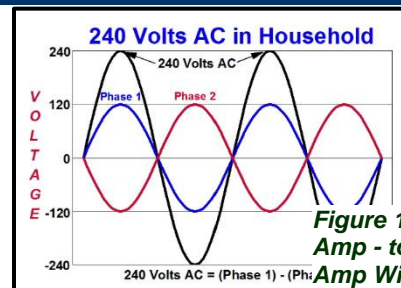


Figure 19 50 Amp - to - 30 Amp Wiring

Figure 20 Power Service (50 Amp/240 VAC)

The 50-amp service (**Figure 20**) provides 2 each 120VAC/50A hot legs for a theoretical power of 12,000 watts (120V x 50A x 2 legs). The 30-amp service provides 1 each 120VAC/ 30A hot leg for a theoretical power of 3,600 watts (120V x 30A x 1 leg). If you plug a 30-amp adapter into 50-amp service, there's 50 amps available at the adapter (check the pedestal breaker box - that's why there are **two** linked 50-amp breakers. Each leg can supply 50 amps.)

With your 30-amp rig, the limiting factor will be the main 30-amp breaker in your RV's power distribution (breaker) box. It will never allow a current draw of more than 30 amps by your RV, even though the pedestal could supply 50 amps on that single hot leg powering the 50 amp-to-30-amp adapter.

50 to 30-amp adapter only uses one side of the 50-amp plug.

(Thanks to JamieGeek, Hooligan2, and RustyJC for the words in the tutorial)

GENERATOR

The generator is located at the left rear of the coach behind a compartment door. The generator provides 110V AC current to the convertor and the AC appliances when off the grid. To operate the generator:

- ☐ The generator can be started and stopped by switches on the generator, on the Monitor Panel just inside the entry door on the side of the kitchen cabinet, or a switch on the chassis center console.
- ☐ Open generator compartment access
- ☐ Check generator oil level
- ☐ Prime engine if the fuel filter had been changed or the coach had been in storage. Note: you can prime the generator from the switch on the Monitor Panel or the Center Console by pressing and holding the switch in the OFF position until the light illuminates.
- ☐ Engine: Press **START** and hold until engine starts (generator can be started from start switch on generator, start switch on Monitor Panel or start switch on dashboard).

NOTE: If the generator fails to start, cranking will automatically stop in approx. 30 seconds. Status indicator will blink indicating an over crank situation. Wait 5 seconds for the control to reset before cranking again. After 5 tries, let the starter cool down for 30 seconds before trying again.

- ☐ The generator can be stopped from the same three start switches discussed above.
- ☐ The generator will consume approximately .5 – 1.2 gals of fuel per hour while operating dependent on the load.

NOTE: The generator has a sensor to detect low oil level. If the level is low, the generator will run for a short while and stop. Ensure that the oil level is at the proper level to ensure the generator will run and operate continuously as required.

CAUTION: If you overload the generator while operating it you might lose power. In this case the output circuit breaker in the generator may trip. It is a simple fix once you know where to find it. It's hard to see without a flashlight, you must remove the cover of the generator and it's on the side of a box on the lower left side.

The generator power rating (kW) determines how much electrical load (heaters, TV, microwave, A/C, etc.) the generator set can power. To avoid shutdowns due to generator set overload or tripping the circuit breaker you may have to shut down some appliances to reduce load.

The Cummins generator on my Vegas 24.1 is rated at 4 kW or 4000 watts. The following chart shows some typical appliance loads.

Appliance	Watts	Appliance	Watts
A/C	1200-2400	Light bulbs	13-100

CD Player	85	Microwave/Convection	750-1100
Coffeepot	900-1200	Refrigerator	400-1000
Laptop	20-50	TV	43-600
Fan	10-175	Water pump	250-1100
Game console	19-200	Water heater	1000-1500
Hair dryer	1200-1875		

See Cummins Operator Manual for more typical load values

BATTERIES AND BATTERY CHARGING SYSTEM

The house 12VDC batteries are in a compartment under the entry steps. The batteries are charged by the converter when on shore power (AC) or when the generator is running. The battery charge level can be checked on the monitor panel. An excellent battery care and maintenance guide is available from Harris Battery Company at [Harris Battery Company Battery Care & Maintenance Guide](#).

The chassis battery is charged off the alternator when the engine is running. The chassis battery is also charged while on shore or generator power (see description of BIRD or BCC below). If the chassis battery has run down and is unable to turn the engine over, you can use the house batteries to boost the chassis battery (just like jumping a dead car battery) by using the Emergency Start switch on the cab center console.

Battery Charging Systems Installed by Thor on Vegas/Axis

The coach is equipped with either a Battery Control Center (BCC) or a Bi-Directional Isolator Relay Delay (BIRD) and Trombetta (isolation relay) that performs two important functions. They provide a method of charging the coach battery from the engine alternator and charges the chassis battery from the converter when the coach is plugged into shore power. When neither battery is being charged, the batteries are isolated from each other to prevent the loads of one battery from inadvertently discharging the other battery. The BCC (if so configured) is in the storage compartment under the driver's seat. It will probably be a RV Custom Products model TH-1020 see Appendix 5).

If not equipped with a BCC there will be a Thor model 0300224 Fuse Box under the driver's seat with the BIRD housed in a plastic enclosure suitable for mounting under the hood, out of direct water spray. It operates in combination with a continuous duty solenoid to connect the two batteries at the proper times for charging (see Appendix 4).

Beware generator circuit breaker when replacing batteries. This problem was discovered by davidspixx on the Thor Forum:

We have a Vegas 2016 mod 25.2. The generator went dead on a previous trip while running. It would not respond to any start or prime commands. I noticed there is a circuit breaker that crowds the battery compartment on the left side (See **Figure 18**). The breaker test trip, a red button extends adjacent to the left battery. If you accidentally touch this or trip it, it may cause the generator breaker to trip later. To reset it, there is a yellow flag that says reset that must be pushed in. So, if the generator goes dead (or if there is no 12DC power), remember this.

Figure 18 Manual Coach Battery Disconnect

BATTERY DISCONNECT AND AWNING EXTEND/ RETRACT SWITCH

The Battery disconnect switch and awning switch (**Figure 22**) to extend and retract the awning are located on the side of the kitchen cabinet below the Monitor Panel in the foot well below the heating duct.

Battery Disconnect – labeled **USE/STORE** (switch on left in **Figure 22**). In the **USE** position the house batteries are connected to the DC circuits. In **STORE** the coach batteries are disconnected from the coach systems. When the switch is depressed, you'll hear a latching relay (Electrical Battery Disconnect Relay described below) engage toward the rear of the vehicle.



Figure 22 Battery Disconnect and Awning Switches

Always put the switch in **STORE** if the RV is going to sit for a period. Connecting to shore power will automatically switch the relay to the **USE** position so that the converter can charge the house batteries.

IMPORTANT – ensure switch is in **USE** when on shore power, operating generator, or driving down to road to ensure that the converter or engine-driven alternator is charging the coach and chassis batteries and to provide power to the radio for the camera system.

Electrical Battery Disconnect Relay

The USE/STORE switch operates the Electrical Battery Disconnect Relay (**Figure 19**). When you activate the USE/STORE switch, this is the relay you hear clunking to connect and disconnect the coach batteries.



Figure 19 Electrical Coach Battery Disconnect Relay

On the 2015 Vegas 24.1 this relay is located on particle board under the refrigerator. The relay is mounted on fiberboard that is on the forward side of the water heater. The relay faces forward. There is a 5-amp fuse and fuse holder attached to two red wires hanging from the relay. There is approx. 6 inches of play in the wire so it can be

reached, and the fuse changed going through the vent panel grill. You can access it by removing the grill beneath the refrigerator in the hallway. It is a pain in the butt to find.

If the coach batteries are not charging be sure to make sure there are no popped breakers on the converter panel under the refrigerator. Also be sure to check there are no GFCI plugs popped. Also be sure to check the manual disconnect shown in **Figure 18** above. As a final check, check the 5-amp fuse inline on the electrical battery disconnect described above.



Awning Switch – (Switch on right in **Figure 22**) holding the switch in the **EXTEND** position deploys the awning. Holding it in the **RETRACT** position stow the awning.

NOTE: It is very easy to accidentally push the battery disconnect switch when meaning to deploy or retract the awning. Before pushing the switch, ensure you have the right one for the operation you are intending.

CONVERTER/CHARGER

The Vegas/Axis is equipped with a WFCO ULTRA III Distribution Center WF-8900 Series converter/charger. All WFCO power converters are automatic three-stage switching power supplies. The converter senses which mode it needs to be in by checking the RV system voltage. The three modes/stages of operation include:

- **Absorption mode/Normal operation** -- Nominal battery charge and supplies power to appliances. During this mode, the converter output is in the 13.6 VDC range. This is the normal operation mode. This mode provides the 12 VDC and current required by the 12 VDC RV appliances, as well as slow charging the battery.
- **Bulk mode/Charge mode** -- Fast battery charge and supplies power to appliances. In this mode, the output voltage of the converter will switch to 14.4 VDC range for a maximum of four hours. If the converter cycles between "Absorption and Bulk mode", there could be a shorted battery cell or other issues.
- **Float mode/Trickle charge** -- **Trickle** battery charge during storage. In this mode, the converter is charging the battery with a trickle voltage of 13.2 VDC when connected to shore power or when the generator is run while in storage. When the converter senses a demand (by turning on lights), the converter automatically returns to the "Absorption mode". This mode ensures that the batteries will not boil away the water by overcharging while in storage.

The converter/charger is a fully automatic unit. When the RV is plugged into a shore power 110 VAC receptacle it automatically powers all 110VAC appliances, TVs, lights, etc. as well as charging the 12VDC house batteries. A slight audible hum is normal from the unit. The 12VDC fuses and the 110VAC breakers are located inside the electric panel located near the floor under the refrigerator as shown.

12 Volt DC Fuses – refer to **Figure 20**. Vertically on the right side of the picture are the system and fuse size. The fuses are common automotive fuses.

Figure 22 Battery Control Center inside Cover

- 1- 15 Amp Water pump
- 2- 15 Amp Left side
- 3- 15 Amp Right side
- 4- 15 Amp Rear
- 5- 15 Amp Appliance
- 6- 15 Amp Audio/ Video
- 7- 5 Amp LP & CO detectors
- 8- 15 Amp Cargo lights
- 9- 15 Amp Tank heater
- 10- 30 Amp Slide motor power
- 11- 15 Amp Awning

110 Volt AC Circuit Breakers

Shown on the left side of Figure 20 are seven AC circuit breakers.

- 1- 30 Amp Main
- 2- 20 Amp Air Conditioner
- 3- 15 Amp Microwave
- 4- 15 Amp GFCI Receptacles Circuit
- 5- 15 Amp General receptacles (non-GFCI)
- 6- 15 Amp Converter
- 7- 15 Amp Water Heater

HOUSE AND CHASSIS BATTERY CHARGING

To manage battery charging the RV will be equipped with either a Battery Control Center in the storage compartment under the driver's seat or a BIRD and Isolation Relay (Trombetta) under the hood. You need to determine which of



Figure 21 Battery Control Center Located under Driver's Seat in Storage Compartment (selected Thor applications)

the two battery charging systems is applicable to your Vegas/Axis. **For the house batteries to charge the USE/STORE switch must be in USE regardless of which charging system is installed.** The house batteries will charge when driving down the road from the engine driven

alternator regardless of what position the USE/STORE switch is in.

Battery Control Center (BCC) Configuration

Normal charging by the BCC of chassis and coach batteries as a set depends upon the source of charging. For example, if the coach is under way, when the chassis battery

charges to 13.2vdc from the engine

alternator, the interconnect relay will pull in after a 10-15sec. delay. If the engine were to be turned off, when the chassis/coach battery set discharges to 12.6vdc, the interconnect relay disengages after a 2 sec. delay. When the coach is on shore power and the coach battery disconnect is engaged, the converter will charge the coach battery until it reaches 13.2vdc, at which time the interconnect relay will close after the 10-15sec. delay. As before, should shore power be disconnected, the coach/chassis battery set will discharge to 12.6vdc and the interconnect relay will release after a 2 sec. delay. The interconnect relay requires 0.75 DC amps for its coil whenever it is engaged.

The BCC also is used as a power distribution center and fuse and circuit breaker control panel. **Figure 22** shows the inside of the BCC cover with the fuse and circuit breaker locations. See appendix 5 -- fuse panel battery control center under driver's seat schematic for troubleshooting guidance.

BIRD and Trombetta Application

The Axis/Vegas can be equipped with a Bi-directional Isolator Relay Delay (see Appendix 4). The BIRD automatically sends charging current from the alternator to the chassis and the house batteries by connecting and disconnecting the coach and chassis batteries using the isolation relay (Trombetta). Additionally, it sends charging current from the converter's battery charging circuit to the house and chassis batteries when running the generator or when on shore power.

How the BIRD and Trombetta Work

The BIRD operates in conjunction with a continuous duty solenoid to provide the isolator/ battery charging functions of a motor home. It senses voltage on the coach and chassis batteries. If the voltage on either one is above 13.1 volts, indicating the battery is being charged, it closes the isolator relay, paralleling the batteries, charging both. It operates in two directions, charging the batteries from the engine alternator and charging the

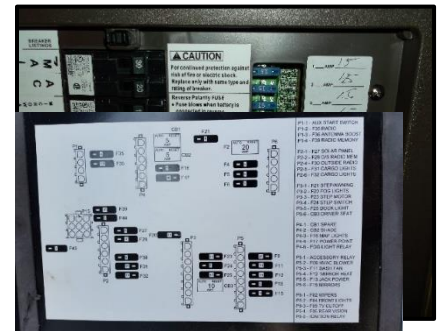


Figure 20 Converter Fuses and Circuit Breakers

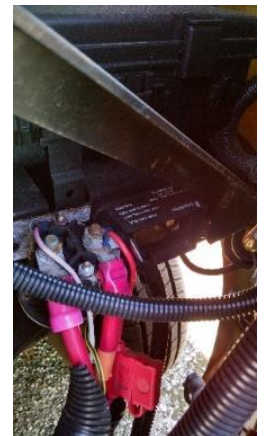


Figure 23 Trombetta under Hood on Driver's Side

batteries from the converter. These functions are similar but operate at different thresholds.

Engine Alternator Charging Batteries

When the ignition switch is turned on and the engine is running, the system senses the level of voltage on the chassis 12-volt system. When this voltage goes above 13.1 volts for approximately 2.5 minutes, as happens when the engine is running normally (normal alternator output voltage of a cold engine is approximately 14.4 volts), it will close the isolator relay (Trombetta) providing charging current to the coach battery. This delay allows a cold engine an opportunity to start and warm up before having the heavy load of a discharged coach battery placed on it.

If the voltage should fall below 12 volts for more than about 1 minute, the relay will drop out to feed all the alternator's available output to the chassis battery to keep the engine running. This might happen when the alternator is not able to supply enough current to all the loads and charge the coach battery at the same time. When the chassis voltage goes above 13.1 volts again, the relay will again close in about 2.5 minutes to retry to charge the coach battery. The resultant flickering of lights would alert the driver of the system overload.

Converter Charging the Batteries

When the coach is plugged into shore power and the ignition is off, the unit senses the voltage on the coach batteries. When this voltage goes above 13.1 volts for approximately 2.5 minutes, as happens when the converter isn't heavily loaded, it will close the isolator relay providing charging current to the chassis battery.

If the voltage should fall below 12.6 volts for more than about 1 minute, the relay will drop out to prevent the coach loads from discharging the chassis battery. This might happen when the converter is heavily loaded by coach loads. When the coach battery voltage goes above 13.1 volts again, the relay will again close in about 2.5 minutes to retry to charge the chassis battery.

If you have a digital voltmeter, you can easily check whether your Trombetta and BIRD are operating correctly. With the coach off, measure the voltage at the two large posts of the Trombetta one at a time. If the voltages are different, then the Trombetta is open and working correctly. Now start the engine and let it run for about 3 minutes. Measure the voltage at the two posts again, with the engine running. The voltage should be the same indicating the BIRD has closed the Trombetta and all batteries are charging. Turn off the coach and leave it for 10-15 minutes. Measure the voltages again. They should be a little different (depending on how far apart the voltage of the house and coach batteries were in the beginning) indicating the Trombetta has opened and separated the chassis and house batteries. Now start up the generator or plug in to shore power.

When the house batteries are fully charged (should show somewhere around 13.1-13.3v charging) measure the voltages at the Trombetta again. They should be the same, indicating that the Trombetta has closed, connecting the house and chassis batteries. Finally, turn off the generator/shore power, wait 10-15 minutes and check the voltages at the Trombetta one more time. They should be a little different indicating that the Trombetta has opened and is working correctly.

If the house batteries do not charge off the engine's alternator (BIRD & Trombetta Application)

If you have a voltmeter, plug into shore power and measure the voltage at the chassis battery. If the system is working correctly, after a few minutes the voltage at the chassis battery should read above 13 volts - it should read the same voltage as the house batteries which are also being charged. Since the chassis battery terminals are not that easy to reach, it might be easier to read the voltage off of the two large terminals of the Trombetta (See **Figure 23**) on the right side (driver's side) front of the engine. It is easily accessible with the front grill down. The voltage should be the same at both terminals if both the house and chassis batteries are charging. Put your red wire from the voltage meter on one of the large terminals and the black wire on any silver bolt in the area for a ground. In my Vegas the left hand Trombetta terminal (looking at it from the front) is connected to the house batteries and the right hand one is connected to the chassis batteries. If you search Trombetta and BIRD in the Thor Forum you will learn more than you want to learn about this subject as well as how I fixed mine. Also, see Appendix 4 of this manual.

If the BIRD and Trombetta are working correctly, after you turn on your engine, the alternator charges only the chassis battery. When the voltage of the chassis battery gets above 12.8v for one minute, the BIRD senses that and opens the Trombetta to allow both banks to charge. It does that by sending voltage from the BIRD to the Trombetta. If the house batteries are not charging, either the BIRD is not sending that signal or the Trombetta is receiving the voltage, but the contacts are not opening.

If you had checked the voltages of the batteries while hooked up to shore power and they were good, then the BIRD works in that direction and the Trombetta is working. If you waited for the house batteries to charge above 13.1v, from the voltages you recorded while under shore power the Trombetta is not opening that way either. This means that you cannot rule out the Trombetta as the problem. However, if the BIRD is supposed to put out 13.2v to the Trombetta continuously and yours is only putting out less, then the BIRD is probably bad.

MONITOR PANEL

The Monitor Panel (**Figure**) is in the entry on the side of the cabinet above the sink. The 2016/17 models have a different monitor panel; however, most switches on that panel are the same as illustrated below. The switches/indicators on the Monitor Panel are as follows:

- Generator Time indicator – indicates the hours that the generator has run
- Start/Stop Switch – starts the Generator. Red light will come on when generator is running
- Capacity indicators – there are a series of buttons for LPG (propane), BATT (Battery), FRESH, BLACK, GRAY for the capacity of the three water tanks. When each small square button is depressed a series of red lights will come on indicating the capacity E (empty), 1/3, 2/3, or F (full).

NOTE: In general, the gray tank will fill faster than the black tank. The kitchen sink and shower drain into the gray tank. The toilet and bathroom vanity sink drain into the black tank.

- Slide – Extends and retracts the slide section of the living room. When extending and retracting the slide depress the switch until the motor stops. Continue to hold the switch depressed for 3 to 5 seconds to ensure full extension or extraction. Ensure that you checked the clearance at the side of the coach to be sure the slide does not hit any obstructions.

CAUTION: The Schwintek slide system are designed to be operated to full extension or full extraction during any one use. Do not stop the slide in partial extension or extraction because it may result in the slide out motors losing synchronous operation causing the slide to bend and stop prior to full extension. The same system is also used on the cab electric bunk, so the same caution applies to that as well.

NOTE: See Appendix 6 for troubleshooting Schwintek system.

- Tank Heaters – there is a separate switch to activate heat pads on the sides of the Black and Gray tanks to prevent freezing when camping in extremely cold weather.
- Water Pump – turns on water pump (use when boondocking). When the water pump is ON the red light above the switch will be on.
- Water Heater – separate switches allow you to use propane or 110VAC for the water heater. When propane is selected the red light will be on when the pilot for the propane water heater is on. When on full hookup, 110 VAC electric is the preferred method to heat hot water. When first arriving at a campsite and you want the water to get hot fast, turn on BOTH propane and electric switches. Once the water is hot, turn off the propane and just use electric

110 VOLT PLUG LOCATIONS

110VAC plugs are located as follows:

- Living area on bathroom wall next to couch
- Overhead storage above couch (left and right side)

- Inside cabinet above sink top shelf (for cd player or game box)
- Bedroom under rear upper storage centered on rear window
- Bedroom on bathroom wall, bathroom under storage cabinet above toilet
- Exterior storage compartment under TV compartment for game box.



Figure 28 Monitor Panel and Slideout Control

GROUND FAULT CIRCUIT INTERRUPTER (GFCI)

The 110VAC plug located in the bathroom above the toilet on the bottom of the cabinet (**Figure**) is a GFCI plug. The AC plugs on the exterior (right side) and left side of the sink cabinet in the kitchen are wired through this GFCI circuit. If a short or overload occurs in any of the 3 plugs, the GFCI will be tripped. The GFCI circuit is a protection against electrical shock should a ground not be present. If a glowing light is present, then the GFCI has been tripped and needs to be reset by pressing the reset button located in the center of the two plugs. If there is no power available to any of these plugs, press the reset button to restore power.



Figure 29 GFCI Plug in Bathroom above Toilet

FRONT COACH FUSE BOX

The front coach fuse box is in the storage compartment under the driver's seat. It is mounted to the aft wall. The cover has a diagram inside showing the location and values of all the fuses. The Fuse Box will be either a Battery Control Center TH-1020 or Thor Part 0300224 depending on battery control application.

COMMON OWNER REPORTED POWER PROBLEM

When reviewing the Thor Forum, there are several threads regarding power problems encountered by Thor owners. Frequently the problem involves having 110VAC on shore power but no 12VDC, batteries will not hold charge, or house batteries will not charge. Many times, these three problems are related to the same thing.

Thor RV Electrical Primer – The Axis/Vegas is equipped with a converter/charger as previously discussed. This converter (located in the hallway under the refrigerator) converts 110VAC into 12VDC, provides the 12VDC and 110VAC to the DC and AC circuits, and charges the house batteries. The converter provides this function whether taking 110VAC from shore power or from the generator when it is running. The Axis/Vegas does not come stock from the factory with

an inverter to take 12 VDC from the house batteries and convert it to 110VAC (used when boondocking to run the AC appliances without running the generator). The Axis/Vegas AC circuits are used to operate the microwave, air conditioning, electric heater portion of the water heater, and the TVs. Everything else in the coach uses 12VDC for its operation.

When experiencing a power problem, the first thing to do is determine whether the problem involves both AC and DC, or just DC. Typically, the problem involves no DC. Troubleshooting the problem involves:

1. Is the problem only DC?
 - a. Check to see if the microwave or any of the TVs come on. If they do the problem is only DC.
 - b. Are the batteries disconnected? Check the **Use/Store** switch just inside the entry door on the left side of the kitchen cabinet to ensure it is in the **Use** position. Operate the switch from **Use** to **Store** and you should here a relay clicking or clunking sound. The clunking would be the contactors connecting the batteries. If not, the relay contacts may be frozen in the store position thereby causing the problem. The relay is in the black box in the driver's side storage compartment.
 - c. Check the battery reset inside the battery compartment on the wall next to the left-hand battery. Be sure the small red reset button is depressed.
 - d. Are the batteries fully charged? Typically, a lead acid battery is 100% charged at 12.6V, 50% charged at 12.2v and fully discharged under 12V. However, the voltage test is only accurate on a disconnected battery at rest for at least 1 hour with no load or charger connected during the rest period (24 hours rest is better, but 1 hour gives you a reasonably accurate reading). Battery charge voltage is typically around 13.5V or so. If your DC converter was hooked to the battery and on shore power, you should measure 13.5V or higher (depending on the converter charge mode), which would indicate the shore power converter is maintaining a charge on the battery. If you start the engine, you should see 14.4 VDC on both batteries.
 - e. Check fuses and circuit breakers on the converter (**Figure 20** above) and also on the fuse panel in the driver's front storage compartment.
2. Is the problem AC?
 - a. Check circuit breakers on converter and fuses on front fuse box.
 - b. Check that AC power is automatically switched between shore and generator source. If not, the problem is probably the Automatic Transfer Relay under the passenger bed.

LIGHTING

All lighting inside and outside of the RV are low voltage 12VDC lighting utilizing LEDs. Several are operated by a rocker type switch. Hall ceiling lights and porch light are controlled by the triple rocker switch panel in the entry way. The bedroom and bathroom lights are controlled by rockers switches in each of those rooms. The light above the sink and above the couch are controlled by the slides on the lights. Two reading lights above the beds are controlled by switches on the lights. Each outside storage compartment has a light controlled by a switch on the light. To access the

LED bulb simply squeeze the lens to remove. The bulbs can be changed to different wattages to achieve the desired lighting levels.

All ceiling lights have a three-position slider – two lights, one light, or off. The ceilings that are controlled by wall switches also need to be adjusted with the sliders to select one or two bulb illumination.

TRIPLE LIGHT SWITCH

In the entrance of my Vegas 24.4, left side, down low on the sink cabinet side is a triple light switch as shown in **Figure** . The switches from left to right control:

1. Porch Light
2. Ceiling lights in living room and hallway to bedroom
3. Awning edge blue LED lights (check applicability on other floor plan and model years)



Figure 30 Triple Light Switch Inside Entry Way

Note: Specific switch configurations may vary depending on other model year or floor plans.

SCHWINTEK-LIPPert SLIDE/LIFT SYSTEMS

All Vegas/Axis coaches are equipped with Schwintek-Lippert slide and lift systems on their slides and electric bunk. Each slide and bunk consist of two geared tracks, two 12-volt DC motors, an electronic controller, and required wiring. The controller for each installation is located somewhere near the slide and bunk. On my 2015 Vegas 24.1 the slide controller is located on the rear wall of the storage area under the driver's seat and the bunk controller is in the kitchen cabinet above the sink, top shelf, behind a false panel on the left side wall. Appendix 6 (Pg. 87) provides trouble shooting guidance and how to manually close slide or retract bunk.

LIVING ROOM SLIDE

The living room couch wall is a slide that can be extended approximately 4' from the coach's driver side. When extending the slide ensure that there are no obstructions that could interfere with extending the slide. The slide is on the same side as the shore power, water, and sewer connections. Ensure there is adequate clearance between the coach and the campground power pedestal.

The slide uses the same Lippert Schwintek system that is used to raise and lower the front electric bunk. The same cautions apply to the slide as the bunk.

Extending Slide

- ☐ Ensure there is adequate clearance on driver's side to extend slide
- ☐ On Monitor Panel – depress and hold slide switch to EXTEND
- ☐ Hold switch depressed for 3 to 4 seconds after the slide stops to protect the Schwintek slide motors.

Retracting Slide

- ☐ Ensure there is no obstructions blocking the movement of the slide
- ☐ Ensure there is no debris (pinecones, twigs, leaves, etc.) on the slide awning
- ☐ On Monitor Panel – depress and hold slide switch to **RETRACT**
- ☐ Hold retract switch depressed for 3 or 4 seconds after slide stops.

For a description of exactly how the Lippert Schwintek system operates see their excellent You Tube Video [How Schwintek System Works](#).

Lubricating Slide (Source: [Thor Owners Forum](#))

FredG provided a YouTube reference showing how to lubricate the slide system on [YouTube Lippert Schwintek Slide Lube](#). He says,

"I lube mine about every month to 6 weeks. It only takes a quick squirt and I do it on the outside and on the inside if I can get to it. Usually, there are only 2 motors on the top of the slide and that's what you want to lube. Do not lube the indentations on the tracks."

Manually Retracting Slide -- If the Lippert Schwintek slide fails while extended there is a procedure to retract it manually. This is a very complicated affair and it is best to study the Lippert video that explains the procedure. It is found on YouTube at [Schwintek Troubleshooting Procedures](#). In addition, if your Schwintek system becomes out of sync and all sides are not extending or retracting in alignment, there is also a You Tube video detailing how to re time the Schwintek system ([Retiming Schwintek System](#)).

ELECTRIC LOWERING FRONT BUNK

The electric overhead bunk in the cab is controlled by a key and switch below the Monitor Panel (**Figure**). The key must ON to lower or raise the bunk. The key can be removed while driving to ensure no one inadvertently lowers the bunk on the driver and passenger's head. The bunk lowers and raises using the Schwintek lift system.



Figure 31 Front Bunk Electrical Control Panel

The bunk also has a cable attached to the front part of the bunk and routed through a series of pulleys to the bottom of the rear of the bunk. You can see from **Figure 24** that as the bunk lowers the cable on the right gets shorter playing out cable thus lowering the front of the bunk. Likewise, when the bunk goes up the bunk pulls on the cable on the right pulling up the front of the bunk.

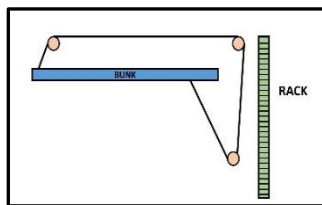


Figure 24 Front Bunk Cable Routing

- ☐ Remove safety pins (**Figure**) behind the driver's and passenger's captain's chair in the bunk track.
- ☐ Tilt the backs of the two captain's chairs so that they do not obstruct lowering the bunk
- ☐ Turn the key on the bunk controller on the Monitor Panel
- ☐ Depress the switch to lower the bunk
- ☐ Hold the switch until the bunk fully descends (hold the switch for 3 to 5 seconds after the bunk motor stops)



Figure 33 Front Bunk Safety Pin (Located on Driver's and Passenger's side)

CAUTION: The bunks uses the same Schwintek system as the slide. It is designed to be operated to full extension or full extraction during any one use. Do not stop the bunk in partial extension or extraction because it may result in the motors losing synchronous operation causing the bunk arms to bend and stop prior to full extension.

- ☐ Remove ladder from behind couch and install on bunk
- ☐ After lowering the bunk, place the twin sized air mattress on the bunk platform and inflate with the 4 D-Cell supplied air pump

To Raise Bunk

- ☐ Remove ladder and stow behind couch
- ☐ Deflate air mattress and stow air mattress and bedding

CAUTION: Do not raise bunk with the mattress or bedding on the bunk platform. There is insufficient clearance between the coach ceiling and the bunk platform to store the bedding

- ☐ Insert key in bunk controller below the Monitor Panel and turn it ON
- ☐ Depress switch to raise and keep switch depressed for 3-5 seconds after the motors stop
- ☐ Insert safety pins (**Figure**) in bunk tracks behind driver and passenger captain's chairs
- ☐ Raise backs of captain's chairs

NOTE: See Appendix 6 for troubleshooting Schwintek lift system.

To lower bunk

WATER AND SEWER SYSTEMS

CITY WATER INLET

A special water hose (white ones) available at camping supply outlets should always be used for the freshwater hook-up. Also, a **MUST** is a water pressure regulator (placed on the campgrounds faucet to also protect the hose) to control varying water pressures at different campgrounds (you wouldn't want to come back to a flooded coach).



Figure 25 Sample Water Pressure Regulators

The "City Water Connection" is located on the driver's side of the coach, aft of the shore power connector. It has a built-in one-way valve so that when you are not hooked up to city water pressure the 12VDC water pump will not "push" water out this inlet. This one-way valve is opened when connected to city water by the city water hose pushing in on a washer with an imbedded screen. When depressed the screen pushes a button that opens the one-way valve allowing city water to flow into the RV. Don't lose this washer/screen!!!

FRESHWATER TANK, WATER PUMP, AND SANITIZING FRESHWATER SYSTEM

The freshwater tank on the Vegas has a 42-gallon capacity. It is located under the passenger bed. The freshwater fill connection is on the passenger side of the coach under the bedroom window as shown.



Figure 35 Fresh Water Tank Filler

The tank should be sanitized at least once a year. The freshwater system should be sanitized after long periods of nonuse and after any suspected contamination.

You can use a commercial solution designed for RV use or prepare your own. Here is the procedure using your own preparation.

- ☐ Prepare a bleach solution using one gallon of water to ¼ cup of household bleach (5% sodium hypochlorite).
- ☐ Empty the freshwater tank and pour one gallon of solution into the tank for every 15 gallons of tank capacity.
 - Since the Vegas tank capacity is 42 gallons, you'll need ¾ cups of bleach in solution.
- ☐ Complete filling the tank with fresh water
- ☐ Open faucets to release air
- ☐ Turn on water pump until water flows from the faucets
- ☐ Turn off the pump and close the faucets
- ☐ Allow to stand for 3 hours
- ☐ Drain and flush system with fresh, potable water
- ☐ If a taste or odor of chlorine remains, then
 - Prepare a solution of one quart of vinegar to 5 gallons of water and allow this solution to agitate in the freshwater tank (by vehicle motion) for several days, if possible.
 - Drain freshwater tank and again flush with potable water.

A new Vegas should also be sanitized because it is not performed at the factory after construction. If you are using

a brand-new white-water hose, sanitize it too. If not, the water on a new RV connected to city water will have a terrible chemical taste.

The water tank should be filled using a freshwater filler as shown in **Figure** .

To operate the 12VDC water pump:

- ☐ Make sure the freshwater tank is at least 1/3 full!
- ☐ Open at least one hot and one cold water faucet inside
- ☐ Turn water pump switch on and purge any air. The switch is located on the monitor panel. This will maintain water pressure while using water from the freshwater tank.

CAUTION: Ensure that the water pump is OFF when connected to city water, if not – you'll damage the pump!!!

SEWER CONNECTIONS

There are many different types of sewer hoses and connectors available at camping supply outlets. Top of the line heavy duty hoses are worth the extra money. All states require an airtight seal between the RV and the campground sewer. The large "black" valve is referred to as the "Black Tank Valve" and the smaller "grey" valve is referred to as the "Grey Tank Valve". These valves empty the "black" and the "grey" holding tanks.



Figure 36 Thor Vegas/Axis Sewer Hose Connection and Black (black handle above) and Gray (white handle above) Dump Valves

My Vegas 24.1 sewer connections (**Figure**) are in a compartment on the driver's side of the coach. There is a round (approximately 6") plastic plate that screws in the hole of the compartment to route the sewer hose to the y-connector. The y-connector swivels approximately 90 degrees.

Vegas/Axis 25.3 Only: This floorplan's black water tank is mounted under the bathroom on the passenger side of the coach. There are **TWO** black water drain valves on each side of the coach. They both must be open to drain the black tank.

To connect sewer hose:

- ☐ Wear disposable rubber gloves!
- ☐ Open sewer connection compartment access door.
- ☐ Ensure black and gray dump valves are closed
- ☐ Remove 6" plastic cover from hole in floor of compartment and stow so it does not get lost
- ☐ Remove cover from sewer hose connection (gray cover in **Figure**), and rotate y-connection down so that it aligns with the hole in the floor of the compartment

CAUTION: Many new Thor Vegas/Axis owners did not realize that this connection rotates downward and tried connecting the sewer hose in the awkward upward position.

- ☐ Route sewer hose with bayonet connector under coach and up through hole to align with the y-connector
- ☐ Twist connector so that bayonets fully engage connector. Wiggle hose to ensure connection is tight
- ☐ Connect opposite end of hose to campsite sewer connector
- ☐ Be sure sewer hose is connected properly!

To operate the dump valves:

- ☐ Wear disposable rubber gloves!
- ☐ Be sure sewer hose is connected properly!
- ☐ Tanks should be close to full before dumping (if they are not, add water)!
- ☐ Open the "Black Tank Valve" first and empty tank
- ☐ Close valve and fill tank almost full of fresh water and empty again (you can add water to the black tank by running the water in the bathroom sink since it is plumbed to the black tank in my Vegas 24.1
- ☐ Close valve and open "Grey Tank Valve" and empty tank
- ☐ Close valve disconnect sewer hose and using another freshwater hose (**NOT THE WHITE HOSE**), rinse out the sewer hose while still connected to the campground sewer.
- ☐ Lift the hose and drain into campground sewer
- ☐ Remove from campground sewer and store in RV
- ☐ Add approximately 2 gallons of water to the "black" tank by filling and flushing the toilet bowl along with your favorite toilet chemical.

CAUTION: The sewer dump connector swivels up and down.

WARNING: Use rubber gloves while performing sewer tasks!

Black Tank Treatment -- To be indelicate -- the black tank is going to stink. When you look down the toilet there is no trap to keep gas and odors from seeping up into the coach. You need to treat the black tank with a deodorizer and digester to help break up the solids and paper. Use one that comes in pods that you drop down the toilet. Also look for one that provides bacteria to also help digest the solids. Thetford, Odorlois Walex, and Campco all make good ones.

Do not use bleach as a deodorizer for your black tank. Bleach kills the bacteria and organic compounds that help to digest the solids. Using bleach in your black tank is counterproductive to what you are trying to accomplish.

Keeping the number of times that "solids" are involved will also help (use the campground facility for that). People who have a chemical sensitivity or asthma should avoid any treatments that contain formaldehyde. There are numerous organic treatments that are extremely effective.

See the Tips and Modifications section of this manual for more suggestions on maintaining a healthy black tank.

Gray Water Tank -- When hooked up at a site, it's a good idea **NOT** to keep the gray water valve open. By allowing the tank to fill and empty periodically, you can use the gray water to flush the sewer hose after black water dumps.

Additionally, by keeping the valve closed, you'll eliminate sewer gases and smells from coming up through the drains into the coach.

HOT WATER HEATER

The 2014 – 2016 and possibly early 2017 models are equipped with a standard Atwood RV Water Heater. This water heater has a tank and the plumbing contains water heater by-pass valves (**Figure 5**) for winterizing. The water heater operates off propane, 120 VAC, or both simultaneously. The operation of the water heater is controlled by two switches on the Monitor Panel (See **Figure**). One switch is used for propane operation, the other for AC operation. Both propane and AC can be used simultaneously to heat water quickly when first arriving at an RV park.

Tank-Less Water Heater

In 2017 Thor began installing Girard Tank less water heater in their Vegas/Axis RV. This water heater operates on-demand and contains no water tank. It operates off propane only and its operational controls are operated by 12 VDC. In addition, it has no by-pass valves for winterizing the water heater. The tank less water heater is winterized as if it were part of the inline hot and cold-water plumbing. To operate the tank less water heater:

- Ensure the propane bottle is on
- Open the water heater door on the outside of the RV
- Turn the Power Switch On
- Set the Mode Switch to Auto

When you open a hot water valve the unit will automatically light and start heating the water. Do not use cold water to adjust the water temperature. Water temperature is adjusted at the faucet by increasing or decreasing the hot water flow.

NOTE: When using propane for either water heater it is a good idea to purge any air trapped in the propane manifold and lines. Simply light a few of the burners on the stove for a few minutes.

SHOWER

To operate:

- ☐ Open both shower faucets and adjust to obtain correct water temperature
- ☐ The shower head has a button to turn the water on and off

HINT: Don't forget to remove anything from shower that you don't want to get wet!

TOILET

The toilet uses a foot pedal to put water in the bowl and to flush it.

- ☐ To Flush – depress the pedal all the way until water rinses the bowl. Be sure to release the pedal slowly.
- ☐ To add water to the bowl – depress the pedal halfway



Figure 37 Vegas/Axis Toilet