

How to Run An Old Fashioned Maintenance Rally

INTRODUCTION

April 30 thru May 3 at the Queen Anne's County 4-H Park

Join us for an Old Fashioned Maintenance Rally at this beautiful 4-H park with electric and water provided at each site (Dump available). We will get our rigs ready for the Camping season and enjoy some fun and fellowship (to coin a phrase). This is an equal opportunity rally so bring your wife, buddy, children or grandchildren. This is also a '**Do it yourself maintenance Rally**' where the teachers (**Phil Broomall and Howard Lefkowitz**) provide the expertise and you, your mate, children, etc. provide the hands. The only exceptions are (1) you are older than Howard; (2) you are handicapped; (3) it is too complicated to explain in a short time period so we will just do it; or (4) you are the Demo.

WHAT IS COVERED

Areas we will cover include all of the propane appliances for gas leaks and proper operation, tank regulators, fittings, connections and gas pressure; external electrical connections for appliances, electric jacks, breakaway switch and tow vehicle connections; lubrication of the electrical connections; clean all external compartment hinges with WD40 and lubricate with Silicone spray; check and lubricate locks; check all external lights; check operation of the breakaway system; check proper setup of trailer hitch including torque of mounting bolts and ball mount; check batteries, charger and connections; check wheel lug torque and age of tires; clean Air Conditioner filter; lubricate all rubber seals and lubricate anything else that moves including the awnings. Provide advice and/or repair of any problem areas found.

PROGRAM

Thursday has been added as a free day with all meals on your own. We will have a general discussion on RV problems that drive us crazy and how to troubleshoot them. At Friday **Happy hour** (4:00 pm) we will discuss how we do the maintenance rally and what will happen on Saturday and Sunday. **Friday evening**, after dinner, while doing justice to the dessert, we will have a **Roundtable discussion** on any RV problems or question's you might have. Saturday we will spend the day maintaining. Saturday after dinner, we will have our Business Meeting (Unit Option). Sunday we will finish off any leftover work (or food).

FOOD

At the Friday night potluck dinner we will supply the main dish. Please coordinate side dishes and/or dessert with Howard. **Saturday, Pancake & Sausage Breakfast; Sunday Bagel & Bun Breakfast;** Saturday dinner do your own cookout or visit the local fish restaurants; **lunches are**

on your own all three days. Total rally cost \$65 per rig for everything (**no Clown rigs with 10 campers hidden in the basement**).

REGISTER

Name _____ ***WBCCI#*** _____

Email _____

RV Type _____ ***Number Attending*** _____

Phone _____

I will bring for Potluck

Make Checks Payable to Howard Lefkowitz, 11508 Colt Terrace, Silver Spring, MD 20902, wa3vez@comcast.net

Typical Schedule

April 30 Thursday:

This is an optional early arrival day where you can meet the teachers and get ready for the Rally. All meals are on your own.

Happy Hour: 3:30 pm (Discussion of your problems and Q & A)

May 1 Friday:

Arrival, Check-in and Park 10:00 am to 4:00 pm

Happy Hour: How we will do the Maintenance Rally 4:00 to 5:00 pm

Dinner: Bring a side dish and/or dessert, main dish will be
Provided please coordinate your dish contribution with

	Howard (wa3vez@comcast.net)	6:00 to 7:30 pm
Roundtable	Problems you are having,	7:30 to 8:30 pm

May 2 Saturday:

Breakfast:	Pancake & Sausage	8:00 to 8:45 am
Demo	Live demo on cleaning and treating gaskets	9:00 to 9:30 am
Maintain	All day. (Lunch on your own)	
Happy Hour	(Questions and list of open problems)	4:00 to 5:00 pm
Dinner	(Cook-out or local eatery on your own)	5:30 to 7:00 pm
	UNIT Business Meeting (optional)	7:30 to 9:00 pm

May 3 Sunday:

Breakfast:	Coffee, bagels, buns	9:00 to 10:00am
Maintain	Finish any leftover work, questions, answers, Recommendations	9:30 to 12:00 am
Hot Dogs	End of Rally lunch cook out and disposal of leftovers.	

Have a safe trip home and enjoy the coming Rally Season.

The Rally announcement, registration, schedule and directions to the site are emailed to each member of the Unit and posted on their Web Site. They are also sent to the local Air Stream Dealer for his bulletin board.

The Unit Membership Chairman should also send them to each new Airstream purchaser in the area to encourage them to attend the Rally. Once a new RV owner finds out how much he can learn about his rig from the local WBCCI Unit he will clearly see the value of joining our club.

ARRIVING AT THE SITE

Set up a check-in crew and have them direct the rig to a flat sight. Each participant should be given a copy of the Inspection charts and Maintenance check lists. These can be used to record any data measurements , problems found and recommendations.

- First measure the total length, maximum height and maximum width of the rig.
- Check all of the rig lights and record any that require repair.
- Individually measure the level of the trailer and tow vehicle or the motorhome & towed vehicle.
- Disconnect the electric cable and pull the breakaway switch. The trailer breaks should lock.
- Inspect the breakaway cable attach points on the tow vehicle and make sure it is mounted correctly
- Make sure the breakaway chains are properly crossed and are not dragging on the ground.

Figures (1), (2) and (3) are the checklists where any discrepancies or problem areas are recorded.

After the initial checks, the rigs should be parked and connected to shore power in order to fully charge the batteries.

OPERATING PROCEDURES

I use a bucket approach for the different tests and operations. The number of duplicate buckets depends on the size of the group.

- Clean & Lube (WD-40, Silicone Spray, Spray Grease)
- Electrical Contacts (Crocus cloth and electric contact spray)
- Gaskets, rubber seals and locks (303 and lock lube)
- Propane tests (gas tester and professional meter)
- Batteries (Battery clean spray, silicon dielectric, terminal protection spray, battery load tester, digital voltmeter, special wrench)

- Wheel nut & Hitch bolts torque (Torque wrench, black 6-point air socket set, large wrench handle, PB blaster)

When each member finishes his rig, he passes on the bucket to his neighbor along with the proper test procedure. Each bucket also contains a roll of paper towels. Dirty towels are kept in the bucket until it gets too full at which point the current user empties them into the trash container at the Rally leader's site. You typically need a bucket for each ten attendees for the Clean & Lube and Gasket buckets.

How the different chemicals and equipment are used is reviewed during Happy Hour on Friday night.

Airstream Service Checklist Year _____ Length _____ Height _____ WBCCI # _____

Exterior Tasks	20	20	20	Notes
Light Check (should do w/ each trip)				
Running - front & rear				
Brake				
Reverse				
Turn Signals				
Brakes and Breakaway				
Disconnect electric & breakaway - pull away - trailer brakes should lock				Unplug electric cable Before pulling breakaway.
Check level - Hitched on flat surface				
Measure from ground to bumper of front and rear of trailer and vehicle. Front and rear bumper for each component should be the same distance off the ground. Ok if height of trailer and vehicle are different.				
Check sway control				
Battery Compartment				
Clean terminals & compartment(s)				
Clean pins on vehicle				
Check voltage - 12.6 volts				
Cut off Solar to check voltage				
Check H2O level				
Solar Panel Voltage - 18 - 24 volts				
Check with battery disconnected				

Figure (1)

Airstream Service Checklist

WBCCI # _____

Exterior Tasks	20	20	20	Notes
Propane				
Check Pilot Light - color should be blue, occasional yellow flicker is ok				
Sweep for leaks with detector				
Regulators & Fittings				
Fridge compartment				
Stove, Heater and H2O heater				
Test gas pressure				
Turn on all stove burners, and the heater, Light H2O heater. If it does not light, the pressure is low.				
Clean exhaust stacks				
Fridge & H2O Heater				
Electrical Contacts - as needed				
Clean with Crocus Cloth (fridge, light sockets, etc)				
Spray with Radio circuit spray				
Clean (WD 40) & Lube (Silicone Spray)				
Compartment hinges				
Sliding windows				
Steps (Use Spray Grease to lube)				
Locks				
Dry graphite door & compartments				
Air Conditioner				
Remove and Clean filter				

Figure (2)

Airstream Service Checklist				WBCCI # _____
Exterior Tasks	20	20	20	Notes
Wheels & Tires				
Tighten lugs				
Aluminum (75 - 85) / Steel (90 - 95)				
Check tire pressure				
Check for wear, dry rot, side wall cracks. Note "birth" of tires. Age of tires - last 3 or 4 #s = week and year of manufacture. 3=1990's / 4=2000's.				Replace if over 5 years
Hitch				
Tighten platform & hitch bolts				
Tighten hitch ball				
Replace ball that gets loose >2x				
Lube (silicone or grease)				
Use non detergent motor oil on latch				

Figure (3)

Figure (4) Adjusting Equalizer Hitch details a method for determining if the hitch is adjusted correctly. Follow this procedure and record the measurements.

ADJUSTING AN EQUALIZER HITCH

Begin by getting the trailer level

- Park the trailer on a flat firm surface and disconnect it from the tow vehicle
- Adjust the trailer so that the distance from the bottom of the frame to the ground is the same in the front and back of the trailer.
- Measure the distance from the top inside of the hitch connector (on the trailer) to the ground. Record that measurement.
- Set the height to the top of the hitch ball (on the tow vehicle) $\frac{1}{2}$ to 1 inch higher than that measurement – depending on the spring capacity of the tow vehicle – to allow for settling when the trailer is hooked up.

On a flat firm surface, hook up the trailer to the tow vehicle and drive forward so that the trailer and tow vehicle are in a straight line.

- Disconnect the trailer and raise it from the hitch ball without moving the trailer or tow vehicle.
- Measure the distance from a defined front and rear point on the tow vehicle to the ground (I use a straight line through the center of the front and rear wheels to a spot on the fender well). Record these measurements.
- Re-connect the trailer to the tow vehicle and repeat the above measurements (and record them).
- Use the chains on the equalizer bars to adjust the measurements so that both the front and rear of the tow vehicle DROP the same amount.
- If a whole chain link allows too much difference you can get a smaller amount by adjusting the tilt of the hitch head.

Re-check the trailer level when the final adjustment has been made – make any necessary corrections.

Figure (4)

BATTERY CHECK

If the batteries have any corrosion on the terminals clean them with the spray cleaner before making any measurements. You can also make a paste with baking soda and water to apply to the batteries. Thoroughly clean the terminals, batteries and the compartment, with before doing any tests. Each participant who wants a battery test should remove them from the storage compartment and disconnect the ground terminals from both batteries so each of them can be independently tested. The best check is a load test even if it is only for 10 or 15 seconds. Figure (5) illustrates a 100-amp tester from Harbour Freight that we use for load testing RV batteries. The momentary contact switch provides the load for about 10 -15 sec.



Figure (5) Battery Load Tester

You can use the meter and as long as the reading is in the green range, the battery is in reasonable shape. Before re-installing the batteries remove the hot side red cable, clean both the

terminal, and cable clamp using the special wire brush. Lightly coat the terminal with silicon dielectric paste, which protects the connection. Re-install the hot side and then the ground cable. A fully charged battery should measure 12.7 volts with less than 12.0 volts indicating a battery almost in a deep cycle. Spray the terminals with the connection protection plastic coating before re-installing the batteries in their compartment.

When disconnecting batteries always remove the ground cable first. When installing batteries always attaché the ground cable last.

CLEAN & LUBE

All external hinges including every compartment, drawer and door hinge should be lubricated with silicon spray. If the hinges are covered with old grease, oil or just dirty then spray some WD 40 on a pad of paper towel and clean them. After cleaning, you must remove any left over WD 40 before you lubricate them. Lubricate every moving joint on all of the awnings including sliding arms and rollers. Lube all of the moving joints on both the TV and Satellite antennas. Also, lube all of the window arm pivot points. Use the spray grease on all of the moving step joints. Use the minimum spray needed to provide a lite coating.

RUBBER GASKETS & LOCKS

Make a paper towel pad and lightly spray with 303. Wipe every window, compartment and door gasket. This will help to preserve the seals. Also, treat the seals on the internal appliance doors and fan covers. Spray the lock lubricant into every compartment and door lock including the water fill door.

ELCTRICAL CONTACTS & PLUGS

Check the main trailer cable pins for corrosion. Clean them with the crocus cloth and then spray both the sockets and pins with Radio Circuit Spray. This spray leaves no residue for oil or grease to accumulate. Every couple of years you should remove the Refrigerator circuit board cover and unplug each Molex connector, spray with cleaner and reconnect it. Also, do this with the multi-pin socket and the individual wire connectors for the water heater. Check the green ground wire in the water heater to make sure it is tight.

Check all of your major grounds including both the batteries and the Converter wire to be sure they are clean and tight. Check the trailer cable grounding point on the A-frame.

Usually external lights corrode rather than burn out bulbs. It could be the bulb contact surface, the socket or both. These should be cleaned and then install the bulbs after coating the metal contact parts with silicon dielectric.

If you have the newer tank, monitor system there is a phone jack connection to each tank sensor near the valve outlet pipes. This jack is exposed to the elements and will corrode over time. It can be cleaned if you catch it early otherwise, you will have to replace the sensor or the plug. This is a standard phone jack plug except for the wiring. Be sure you note the wire color order if you have to replace the plug. The sensor phone jack socket should be filled with silicon dielectric before you attach the plug. When you order a new sensor, it will come with a small tube of the dielectric for this purpose.

PROPANE

Figure (6) illustrates an inexpensive leak detector that sells for about \$25. Leaks usually occur at joints, valves and connections. Check the tank regulators and shut-off valves for leaks. Check near any of the Propane appliances. If you get any indication then a Professional Detector which has sufficient sensitivity to find the actual component that is causing the leak. If you are going to use Teflon tape to stop the leak be sure and obtain the special yellow tape that is designed for gas fittings. Our Unit purchased a TIF 8800 instrument over 15 years ago and other than a new set of batteries it has worked flawlessly. These sell for about \$175 and can detect almost any type of gas leak. In fact I used it to find a carbon monoxide leak caused by a crack in my home Gas Heater firebox. They can also help to find gas fume leaks in a car, which turned out to be a faulty gas cap. Our Unit purchased the gas detector and a quality torque wrench at the same time, which are made available at every Rally.

WHEELS & TIRES

Every participant should torque his wheel lugs to the specifications in his Manual. Years ago there were only two torque levels one for Aluminum and a different value for Steel wheels. Aluminum wheels have changed and the torque levels increased to levels higher than for the older steel wheels lugs. You must check your Manual to know the correct wheel lug torque. If you are not sure, contact Airstream and provide the year, model and serial number of your trailer. If you have changed, the wheels check with the manufacturer to determine the proper torque level. Our unit purchased a used Snap-on Torque wrench and had it calibrated by one of their sales trucks. It has a simple dial for setting the torque and it does not have to be unloaded after use to maintain the calibration. I recommend that the Unit purchase a quality wrench and have it checked every year or so. I also recommend the use of a black 6-point socket that has been

designed for use with an air-wrench. You should at least purchase the correct size for your wheel nuts and carry this in your toolbox.



Figure (6) Propane Leak Detector

HITCH PLATFORM

Tighten the A-frame and hitch platform bolts. Be sure and check the ball mount. Figure (7) and (8) illustrate how you identify the bolt grade and the proper torque levels. Manufacturers select different grade bolts based upon the holding power required for different mating surfaces. It is very important to properly torque these bolts to their designed level to get the required joint strength. If you are not, sure what size you have, buy a set of different bolt sizes to carry with you.

APPENDIX C

NUT AND BOLT IDENTIFICATION (Cont'd)

Common metric fastener strength property classes are 9.8 and 10.9 with the class identification embossed on the head of each bolt. Customary (inch) strength classes range from grade 2 to 8 with line identification embossed on each bolt head. Markings correspond to two lines less

than the actual grade (i.e. grade 7 bolt will exhibit 5 embossed lines on the bolt head). Some metric nuts will be marked with single-digit strength identification numbers on the nut face. The following figure illustrates the different strength markings.

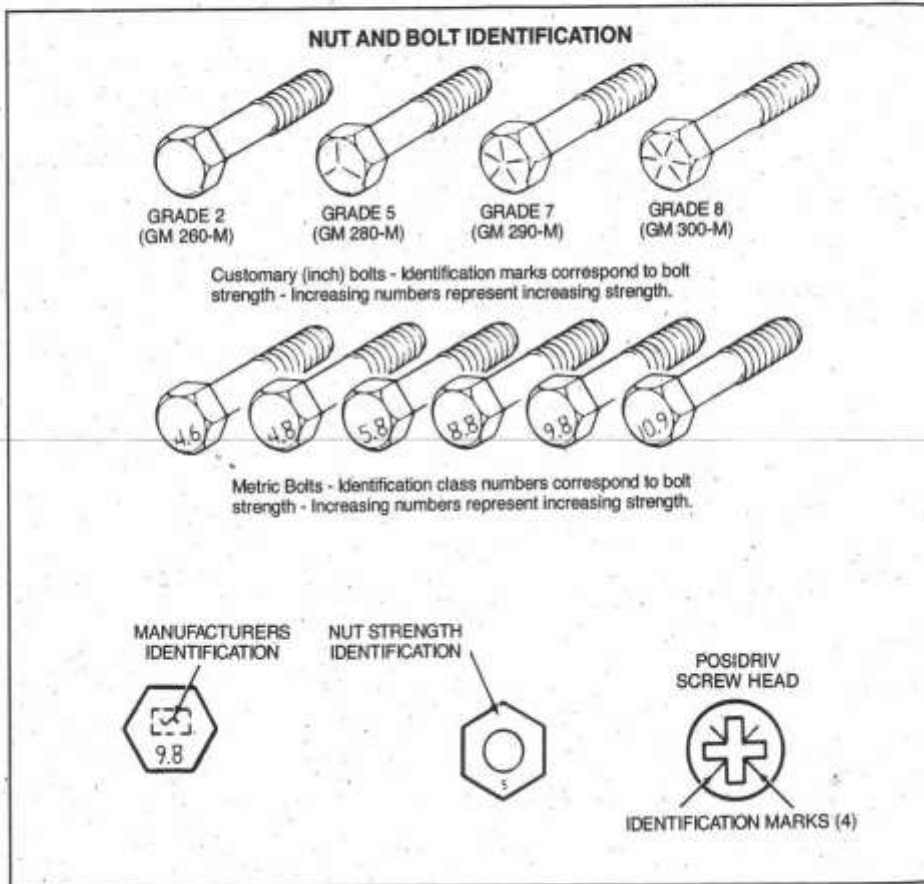


Figure (7) Nut & Bolt Grades

APPENDIX C

NUT AND BOLT IDENTIFICATION (Cont'd)




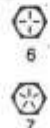
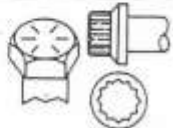
STANDARD CAPSCREW MARKINGS AND TORQUE				
Current Usage	Much Used	Much Used	Used at Times	Used at Times
Minimum Tensile Strength	To 1/2-69,000 [476]	To 3/4-120,000 [827]	To 5/8-140,000 [965]	150,000 [1,034]
PSI	To 3/4-64,000 [421]	To 1-115,000 [793]	To 3/4-133,000 [917]	
MPa	To 1-55,000 [379]			
Quality of Material	Indeterminate	Minimum Commercial	Medium Commercial	Best Commercial
SAE Grade Number	1 or 2	5	6 or 7	8
Capscrew Head Markings Manufacturer's marks may vary These are all SAE Grade 5 (3 lines) 	 (GM260)	 (GM280)	 6 7 (GM290)	 (GM300)
Capscrew Body Size (Inches) – (Thread)	Torque Ft.-Lb. [N-m]	Torque Ft.-Lb. [N-m]	Torque Ft.-Lb. [N-m]	Torque Ft.-Lb. [N-m]
1/4 — 20	5 [7]	8 [11]	10 [14]	12 [16]
— 28	6 [8]	10 [14]		14 [19]
5/16 — 18	11 [15]	17 [23]	19 [26]	24 [33]
— 24	13 [18]	19 [26]		27 [37]
3/8 — 16	18 [24]	31 [42]	34 [46]	44 [60]
— 24	20 [27]	35 [47]		49 [66]
7/16 — 14	28 [38]	49 [66]	55 [75]	70 [95]
— 20	30 [41]	55 [75]		78 [106]
1/2 — 13	39 [53]	75 [102]	85 [115]	105 [142]
— 20	41 [56]	85 [115]		120 [163]
9/16 — 12	51 [69]	110 [149]	120 [163]	155 [210]
— 18	55 [75]	120 [163]		170 [231]
5/8 — 11	83 [113]	150 [203]	167 [226]	210 [285]
— 18	95 [129]	170 [231]		240 [325]
3/4 — 10	105 [142]	270 [366]	280 [380]	375 [508]
— 16	115 [156]	295 [400]		420 [569]
7/8 — 9	160 [217]	395 [536]	440 [597]	605 [820]
— 14	175 [237]	435 [590]		675 [915]
1 — 8	235 [319]	590 [800]	660 [895]	910 [1234]
— 14	250 [339]	660 [895]		990 [1342]
1. Always use the torque values listed above when definite specifications are not available. Note: Do not use standard values in place of those specified for the above engine groups. Special attention should be observed in case of SAE Grade 6, 7 and 8 capscrews. Refer to applicable Shop Manual. 2. The above is based on use of clean and dry threads. 3. Reduce torque by 10% when engine oil is used as a lubricant. 4. Reduce torque to 20% if new plated capscrews are used. CAUTION: CAPSCREWS THREADED INTO ALUMINUM MAY REQUIRE REDUCTIONS IN TORQUE OF 30% OR MORE, UNLESS INSERTS ARE USED.				

Figure (8) Nut & Bolt Torque

TRAILER CHECKLISTS

Figures (9) & (10) are a maintenance checklist for your Trailer to insure that you are ready for a hopefully trouble free Camping Season. Instructions for sanitizing your fresh water tank are included. I recommend completely draining your tanks and lines after every trip. Make this an easy task by providing external or easily accessed drain valves. My 1990 classic Motorhome had three valves for draining the hot, cold and fresh water tank. The problem is they were located under the rear bed and could only be accessed by removing the bed mattress and removing two large plywood panels. This meant removing about 30 screws. After doing this a few times I opened all of the built in drain valves permanently and attached fourth valve that I located underneath the outside shell. Now. By simply opening one easy to access valve I could completely drain the water system.

Airstream Maintenance Checklist

*We have most of the supplies/tools mentioned below for your use
(grease, carwash, bleach, soda etc)*

Towing Safety

- ✓ Verify good trailer brake operation by manually operating Airstream brakes only. Did you stop or slow down?
- ✓ Check running lights, turn signal, and stop lights are operating.
- ✓ Check breakaway switch operation AFTER trailer cord is disconnected from the tow vehicle.
- ✓ Check tire pressure
- ✓ Are your tires more than 4 or 5 years old. If so you are on borrowed time.
- ✓ Check to ensure lug nuts are tight

Hitch

- ✓ Check all bolts are tight including the hitch ball
- ✓ Check for wear on safety chains
- ✓ Clean ball/socket/ spring bar sockets and regrease

12 Volt Electrical System

- ✓ Check battery water level (non gel)
- ✓ Clean battery terminals
- ✓ Check all interior lights work.
- ✓ Check voltage level while unhooked from tow vehicle and shore power. Should be 12.6 volts or higher

110 Volt Electrical System

- ✓ Check the blades on your shore power 110 volt power cord. Are the metal blades clean bright copper/brass? If not, file to clean them or replace the plug

Figure (9) Maintenance Checklist One

Air Conditioner

- √ Remove and clean the AC filter

Sanitize Fresh Water Tank

- √ Drain/flush fresh water tank
- √ Fill tank half full
- √ Add $\frac{1}{4}$ cup bleach to a gallon of water for each 15 gallons of tank capacity.
- √ Pour mixture into fresh water tank
- √ Fill tank to capacity
- √ Run a quart of water out of each cold water faucet. Run a gallon out of each hot water faucet
- √ Drain tank before leaving park

- √ Mix $\frac{1}{2}$ cup of baking soda with a gallon of water and pour into the tank. Fill tank and pump thru the water lines again. Leave this in the tank for a few days then drain and flush again.

Propane System

- √ Check propane level in tank by pouring hot water down the side of the tank. Feel the side of the tank. The liquid propane will be colder than the upper part of the tank.
- √ Use soapy water to check for leaks around all fittings near the tanks. Bubbles indicate leaking gas

Airstream Exterior

- √ Wash Airstream with car wash
- √ After washing/rinsing check all windows, vents etc for leaks.

Figure (10) Maintenance Check List Two

MOTORHOME CHECKLISTS

Motor Home Spring Check

- Remove covers from tires and thoroughly inspect them for damage. Inflate the tires to the correct pressure for the actual weight on the tires.
- Remove any obstructions from engine and transmission openings.
- Check engine compartment for obstructions or animal nests.
- Check for fluid leaks. Repair as necessary.
- Check engine oil level. Add oil if needed.
- Check coolant level in reservoir and radiator (do not open cap on hot engine).
- Check hydraulic fluid level in reservoir. Add fluid if needed.
- Check engine belts for wear, damage or excessive cracking.
- Check engine fan for damage.
- Check fuel water separator. If empty, prime fuel system per instructions in your operators manual.
- Check for leaks and damage to hoses and wiring.
- Check rear axle lubricant.
- Lubricate chassis and drive train.
- Check that batteries are full and charged.
- Clean ends of battery cables
- Turn the ignition to RUN position. Verify that the fuel and volt meters are operating properly.
- With hydraulic brakes, check to make sure that the electric brake pump runs with the engine not running. Bleed and adjust brakes if necessary.
- Run engine until warm. Re-check for fluid leaks.
- Check transmission fluid level using the Cold check method in your Allison transmission operators manual. Add fluid if necessary.
- Check all exterior lights and replace as necessary.

Figure (11) Motorhome Spring Checklist

AIRSTREAM

MOTORHOME

MAINTENANCE SCHEDULE



WARNING: FAILURE TO MAINTAIN YOUR COACH CAN CAUSE PREMATURE AND UNEXPECTED PARTS BREAKAGE AND/OR ERRATIC OPERATION THAT MAY BE HAZARDOUS.

EVERY 1,000 MILES OR 60 DAYS

Escape Window	Check operation of latches and upper hinge.
Battery (Lead acid)	Check water level.
Smoke Alarm	Test and replace battery as required.
Tires	Check tire pressure (105 psi max.)
GFI Circuit Breaker	Test and record.

EVERY 5,000 MILES OR 90 DAYS

Exterior Door locks	Lubricate with dry graphite
Exterior Hinges	Lubricate with light household oil
LPG Regulator	Check bottom vent for obstructions
Main Door Striker Pocket	Coat with paraffin.
Range Exhaust Hood	Clean fan blades and wash filter.
Roof Vent Elevator Screws	Lubricate with light household oil
Main Door Step	Check and lubricate moving parts.

EVERY 10,000 MILES OR 6 MONTHS

Exterior	Clean and wax.
Hitch	Check bolts and welds. (60 Ft. Lbs.)

EVERY 12,000 MILES OR 12 MONTHS

Battery	Clean, neutralize and coat terminals with petroleum jelly.
LP Tank	Have purged by an LP supplier.
Seams	Check and reseal exterior seams, windows, lights and vents if necessary. Reseal with Bostik urethane sealant or equivalent as needed.

Figure (12) Motorhome Mileage Maintenance Schedule WINTERIZING YOUR RV

(Based on an article by Dave Schumann)

1. Drain and flush fresh water tank
2. Drain and flush gray water holding tank
3. Drain and flush black water holding tank
4. Drain and flush hot water tank
5. If you have low-point drain lines under your RV:
 - Open the hot and cold faucets in your RV
 - Uncap the low-point drain lines; let water drain completely
 - Recap Drain Lines
 - Close the hot and cold faucets
6. Blow out the water lines:
 - Screw on compressed air adapter onto main fresh water inlet
 - Apply compressed air, keeping pressure to less than 60 psi
 - Open each faucet, one at a time, to force water out of lines
 - Drain water filter canisters
 - Depending on your unit you may have a washing machine, icemaker or dishwasher; the lines to these would also have to be drained and blown out. (Consult owner's manual)
 - If you have, a tank flush be sure to blow out also
 - Make sure to open **each** faucet in the RV, including the shower and toilet (Don't forget the hand sprayer)
 - Open hot water drain plug and blow out the water in this tank
 - Remove compressed air and compressed air adapter
 - Replace drain plug in hot water heater and close all faucets

7. Put Antifreeze in the water lines:

(If you are confident that you have successfully blown out all the water from your system, at this point you would add antifreeze to all traps. One cupful in each is usually enough. Winterizing would be complete at this point. This would be followed by the addition of vegetable oil as outlined below (n.).

If you have special equipment (washer, Aqua-Hot, dishwasher, etc.) or want to be certain you are winterized then you may also fill the system with antifreeze as follows:

- a. Use **RV Non-Toxic Antifreeze ONLY**
- b. Approximately 1-2 gallons should be plenty

- c. Make sure water pump is off and all faucets are closed
- d. Close the Water Bypass Valve to your hot water tank

NOTE: If you do not have a Water Bypass Valve for your hot water tank, seriously consider having one installed. Otherwise, in addition to the water lines you will end up filling the hot water tank with antifreeze. It is not harmful, but you will use an additional six gallons of antifreeze.

- e. Disconnect the water line where it joins the fresh water tank -or-

If your RV is so equipped, shut off the valve coming from the fresh water tank and open the valve for the winterizing inlet line

- f. Place the water inlet line (either from the main system or the winterizing line) into the jug or other source container with the RV antifreeze.
- g. Switch on the water pump; it will start to suck up the antifreeze into the lines
- h. Open each valve of each faucet slowly, one at a time, until the red antifreeze starts coming out. Once flowing shut off the faucet valve. **Note:** If for some reason you can't drain the water lines using the low point drain lines and you can't blow out the lines with compressed air, you will have to wait until the antifreeze pushes out the fresh water in the lines before closing the valve. A rule of thumb; do not shut off the valve until the antifreeze starts coming out.
- i. Remember to also do this for the toilet and the shower.
- j. Be sure to drain water filter. Remove filter before adding anti-freeze and store in zip loc bag.
- k. Shut off the water pump
- l. Remove the inlet line from the antifreeze, then either: Re-attach the water line to the fresh water tank -or-

Close the winterizing inlet valve and reopen the fresh water valve, if your RV is so equipped.

- m. Pour a small amount of antifreeze down each drain to ensure that the sink traps have antifreeze in them.
- n. Pour about a cup of vegetable oil into into each holding tank and put about one inch in the toilet bowl. This will help keep your drain valves and toilet seal lubricated during the winter.

8. **You Are Done!**

RV STORAGE

Storing Your RV

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

- For motorhomes, fill up the gas tank. This will prevent moisture buildup in the tank. Also make sure all your fluid levels under the hood are full.
- Drain and flush all holding tanks; fresh water, gray water, black water and hot water tanks.
- Drain all water lines, using compressed air or at least the low-point drain lines. Note: If storing for the winter, follow the *winterizing* steps above.
- Close the LP gas tank valve(s). If your LP tanks don't already have a cover, consider purchasing at least a vinyl LP tank cover.
- Disconnect shore electric power to the RV.
- Remove all batteries from the RV and store in a place where they won't freeze. Batteries that have been frozen will never again hold a proper charge, and will more than likely have to be replaced.
- Visually check your RV for anything that might need to be repaired. Make sure you also check the roof.
- Defrost and clean the refrigerator and freezer. Place open boxes of baking soda or crumpled newspapers in the compartments to eliminate odors during storage.
- Remove all perishable items from the interior. Include in this any items that are susceptible to freezing, if storing during the winter months.
- Cover all external outlets, such as furnace outlet, to prevent *critters* from entering.
- Thoroughly wash the interior and the exterior of your RV. You might also consider shampooing the carpets inside and waxing the outside.
- Close all windows; leave the roof vent(s) open *ever so slightly* for air circulation during storage.
- Cover the tires to prevent weather-checking.
- Cover the roof air conditioner.

Figure (13) Storing For The Winter

GENERATORS

During the Winter months generators should be run 2 to 3 times for at least two hours, under load (turn on the Air Conditioner heat strip). Figure (14) details the maintenance for both gas and diesel units.

AIRSTREAM

PERIODIC MAINTENANCE SCHEDULE GAS GENERATOR

MAINTENANCE PROCEDURE	MAINTENANCE FREQUENCY					
	Every Day or Every 8 Hours	After First 20 Hours	Every Month	Every 50 Hours	Every 150 Hours	Every 450 Hours
General Inspections	X					
Check Engine Oil Level	X					
Clean and Check Battery			X (3)			
Clean Spark Arrestor				X		
Change Engine Oil & Oil Filter		X (1)			X (2,3,4)	
Replace Air Filter Element					X (2)	
Replace Spark Plugs						X (5)
Clean Engine Cooling Fins						X (2)
Replace Fuel Filter						X (5,6)
Adjust Valve Lash						X (6)
Clean or Replace Cylinder Heads						X (6)

1.-As a part of engine break-in, change the engine oil after the first 20 hours of operation
2.-Perform more often when operating in dusty environments.
3.-Perform more often when operating in hot weather
4.-Perform at least once a year
5.-Perform sooner if engine performance deteriorates
6.-Must be performed by a qualified mechanic (authorized Onan dealer)

PERIODIC MAINTENANCE SCHEDULE DIESEL GENERATOR

MAINTENANCE PROCEDURE	MAINTENANCE FREQUENCY				
	Every Day	Every Month	Every 150 Hours	Every 500 Hours	Every 1000 Hours
General Inspections	X				
Check Engine Oil Level	X				
Check Engine Coolant Level	X				
Clean and Check Battery		X (3)			
Change Engine Oil & Oil Filter			X (1,2,3,4)		
Clean Spark Arrestor			X (4)		
Replace Engine Air Filter				X (2,4)	
Replace Fuel Filter				X (4)	
Check Coolant Anti-freeze Protection				X (4)	
Flush Coolant System					X (8)
Replace Coolant Pressure Cap					X (5)
Replace Engine V-belt					X (6,7)
Clean Crankcase Breather					X (6,7)
Replace Coolant Hoses and Thermostat					X (6,7)

1.-As a part of engine break-in, change the engine oil and oil filter after the first 50 hours of operation
2.-Perform more often when operating in dusty environments.
3.-Perform more often when operating in hot weather
4.-Perform at least once a year
5.-Perform at least once every two years
6.-Perform at least once every five years
7.-Must be performed by a qualified mechanic (authorized Onan dealer)

Periodic maintenance is essential for top performance and long genset life. Use the table as a guide for normal periodic maintenance. In hot and dusty environments some maintenance procedures should be performed more frequently, as indicated by the footnotes in the table. Keeping a log of maintenance performed and hours run will help you keep genset maintenance regular and provide a basis for supporting warranty claims.

Maintenance, replacement or repair of emission control devices and systems may be performed by any engine repair establishment or individual. However, warranty work must be completed by an authorized Onan dealer.

Figure (14) Generator Maintenance

WHY RUN AN ANNUAL MAINTENANCE RALLY?

Besides the obvious benefits to our current membership, it showcases the most important resource available from **WBCCI**:

THE EXTENSIVE KNOWLEDGE OF AIRSTREAM RV PRODUCTS (how to properly use and take care of them).

Over the 25 years I have constantly heard that we are not growing because this new generation of Airstream buyers are not joiners, they are too busy, they do not have the time, they still work, there are too many competing activities , etc., etc.

With Airstream, enjoying the largest annual sales growth in its history our membership should be significantly growing every year. What WBCCI has to sell is our knowledge of the products the new **potential members** are buying. Yes, I said **sell**, which is absolutely required when we are competing for the leisure time of a new member.

WBCCI Units should be running Maintenance Rallies all over the country (maybe 15 or 20) every year during April. These should be on every Airstream Dealers Bulletin Board and extensively advertised. Every owner of an Airstream Product should be invited to attend. It does not have to be a free Rally. It has never been a cost problem. Once the potential new member finds the answers to their questions they will begin to learn about the Caravans and the Fun, Fellowship and Adventure will follow.