

AXLES and BRAKES



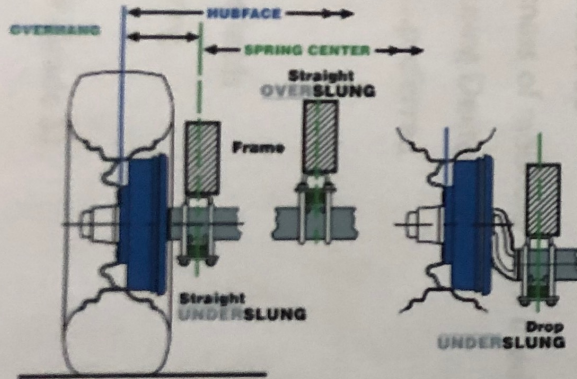
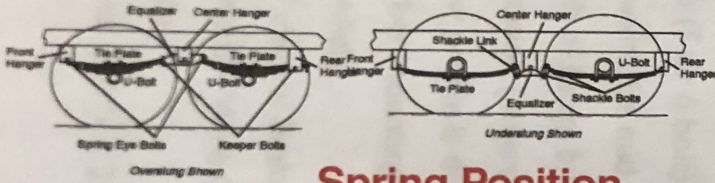
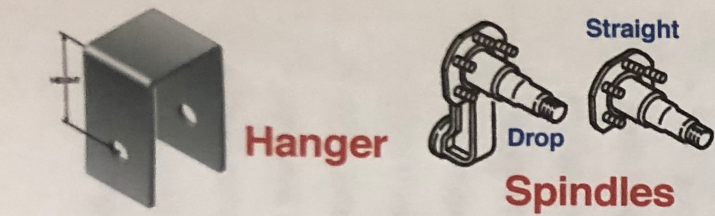
Rodney Sly

March 2022

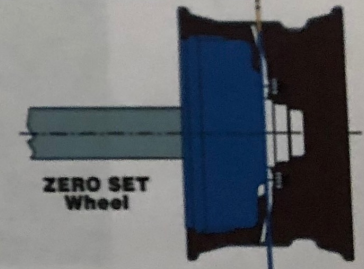
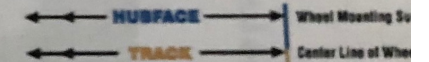
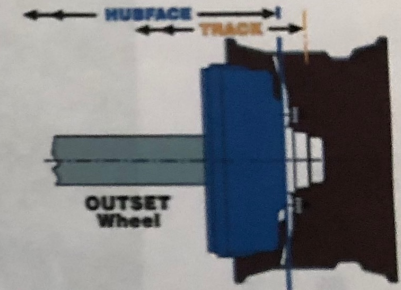
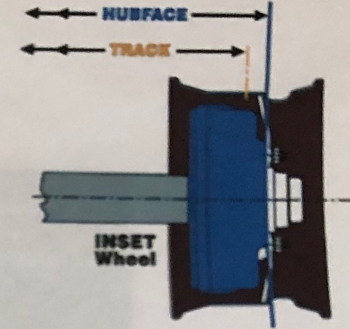
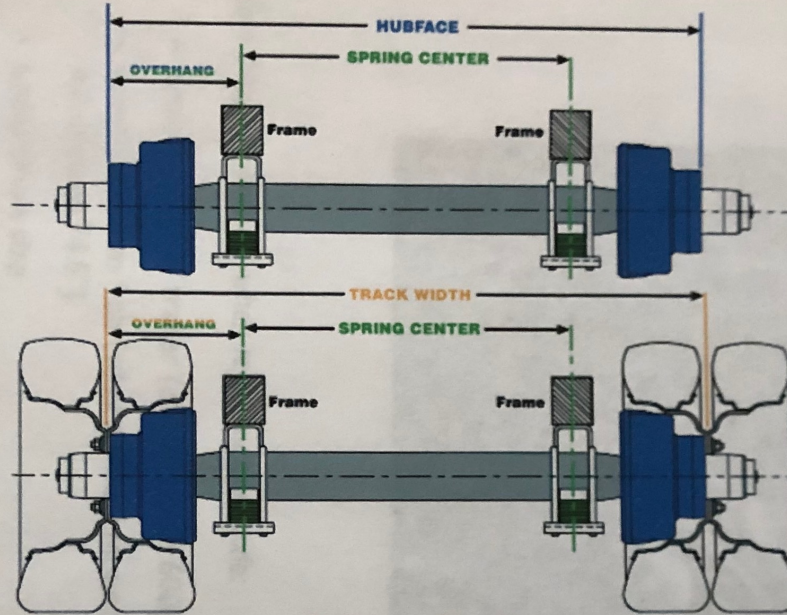
Axles: Torsion vs. Leaf Springs

- Leaf Spring Axle System
 - Used on Airstreams thru the 50s and possibly early 60s.
 - Pros
 - Simple system
 - Proven design
 - Long lasting
 - Used on most automobiles and trucks
 - Easy to add, replace or remove individual springs to adjust height and/or stiffness
 - Leaf springs rarely need to be replaced
 - Cons
 - Heavy
 - Ride can be rough and bouncy if springs are not consistent with trailer weight
 - Can be hard on aluminum trailers
 - Missing and/or popped rivets
 - Original spring sizes no longer available (30" and 24" springs)

Spring Axle

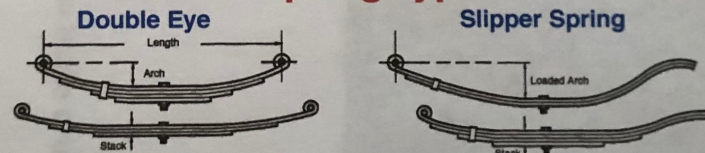


Hubface---Track Width---Spring Center

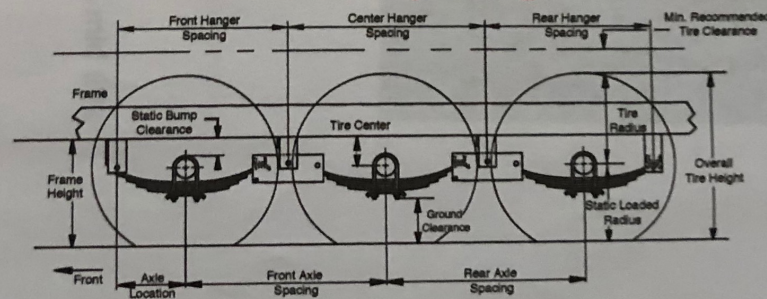


Wheel Offse

Spring Type



Axle Spacing



Leaf Spring Axle System



Leaf Spring System with Skid

Skids can reduce damage from a flat tire



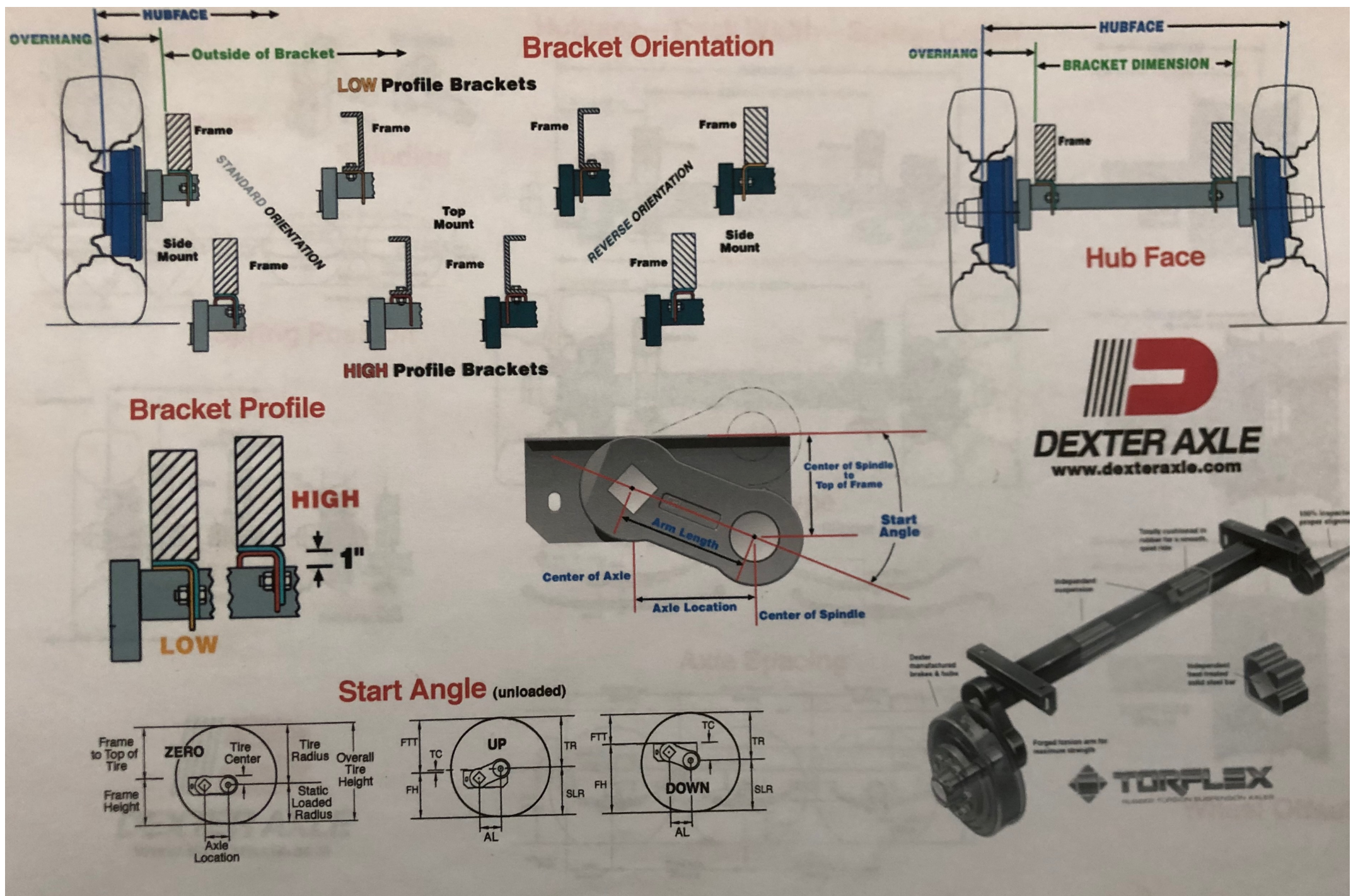
Axles: Torsion vs. Leaf Springs (continued)

- Torsion Axles
 - Used on Airstream from early 60's to present.
 - Pros
 - Can be customized to trailer weight and width.
 - Independent suspension.
 - Soft ride.
 - Self damping.
 - Used on numerous applications.
 - Horse trailers, utility & boat trailers, etc.).
 - Available at numerous suppliers, including local spring and trailer shops.

Cons

- Axle tubes can be heavy.
- More expensive than leaf springs.
- Should be replaced every 20 years or sooner.
 - Rubber inside the axel tube gets harder with age.
 - Results in a rough ride
 - Reduced to no damping.
- Torsion axles are not easily understood.

Torsion Axle



Torsion Axle



**Rubber Torsion Axles
With The Suspension Built-In**

- Durability and Reliability Proven for Over 50 Years.
- A Soft, Quiet, No Shock Ride With Independent Wheel Action.
- Easy to Assemble (4 Bolts to Mount).
- Load Carrying Crossmember.
- Custom Axle Applications.
- Maintenance Free.
- Eliminates Sway.

No Coil or Leaf Springs Needed

ISO 9001:2000 CERTIFIED

WELDERS AWS D1.1 CERTIFIED

The advertisement features a black and white photograph of a torsion axle assembly. A large white arrow points to the central rubber bushing where the axle meets the crossmember. Various components are shown, including the axle, crossmember, and wheel hubs. The background is a dark, textured surface.

Torsion Axle



Things to Consider when Replacing Torsion Axles

- Size the axle to the actual fully loaded trailer weight
 - Water, propane, food, clothes, spare tire, etc.
 - Weigh trailer both empty and full.
 - Weigh trailer at truck stops with certified scales.
- Prior to ordering new axles
 - Measure width from hub to hub (where wheel mounts to the break drum).
 - Mid 60s Airstreams approximately 74.5”.
 - Measure your trailer twice (or 4-5 times) before ordering axles.
 - Break drum size, bolt pattern (5 or 6).
 - Axle flange width, i.e. mid 60s is about 58”.
 - Reduce width of flange by thickness of mounting kit, if used.
 - Consider using a local spring shop for ordering and installation .
- Shock absorber mounting
 - May be there or not but could be added.
 - Shock absorbers do not make a significant difference.
- Easy lube hubs
- Axle suppliers:
 - Dexter, Henson, Axis, or local shops.

Things to Consider when Replacing Torsion Axles (Continued)

- Removing old axles
 - Spray penetrating oil on bolts (PB Blaster) for a day or two.
 - Bolts are usually rusted on and can be difficult to remove.
 - Impact wrench helpful.
 - Lift trailer and support both front and rear frames with wood blocks and/or jack stands.
 - **When jacking the trailer, place jacks under the frame, NOT the axle.**
 - **A level surface is strongly recommended.**
- Installing new axles
 - Recruit friends or other Airstreamers as their trailer may be next in line.
 - Hydraulic jacks are very useful.
 - New axles are cumbersome to install as they are heavy and awkward.
 - Original bolt holes may not all align with new axle.
 - May require drilling a new hole in the mounting bracket to align with new axle.
 - **CAUTION** – Drill bits can occasionally get stuck while drilling. A high torque drill could continue to rotate. If this occurs, the drill operator will experience an unpleasant rotational ride under the trailer. Not recommended but very entertaining.
 - Mounting Bolts & Nuts: 5/8" x 1.25" NF Grade 5.
 - **DO NOT** use cheap hardware as you want your axles to stay under your trailer.

Torsion Axle – why you replace them

- Dry rubber in axle tube - No damping, resulting in spindle fatigue and failure.

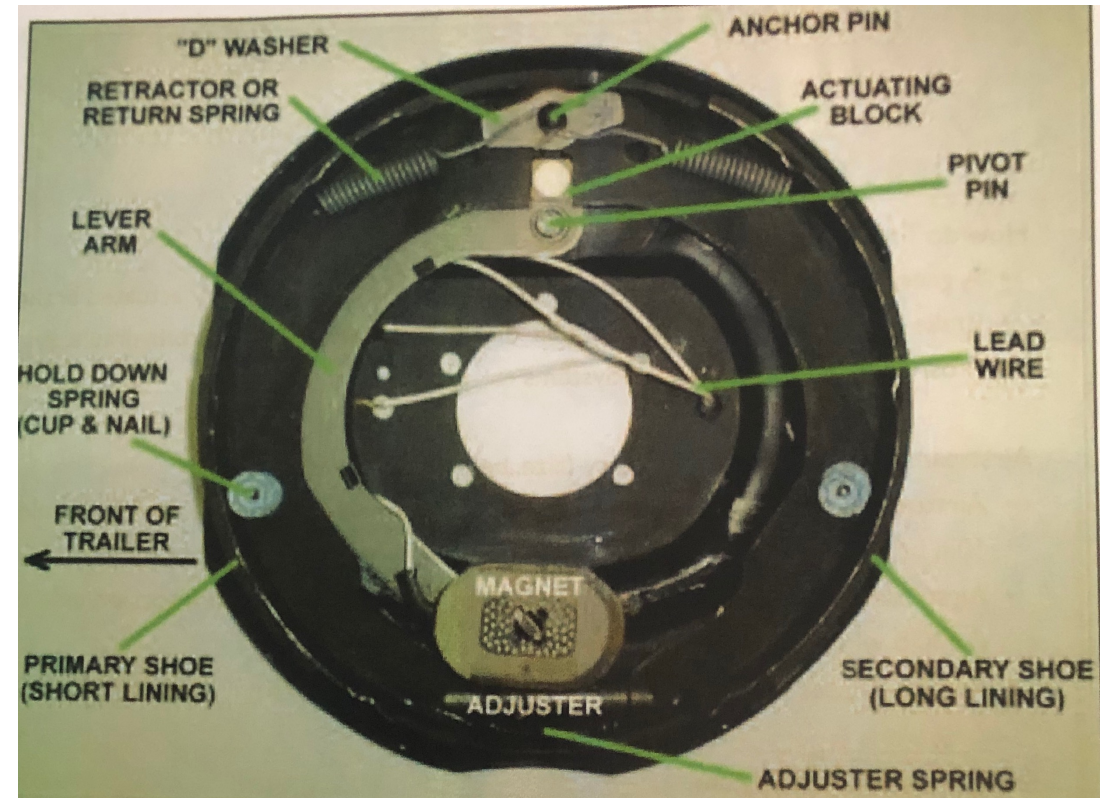


Brake Types

- Electric drum, hydraulic drum, electrohydraulic systems.
- There are Pros and Cons to both Disc vs. Drum Systems.



Hydraulic Disc Brake



Backing plate for electric Drum Brake

Airstream Brakes

- Airstream Brakes vs. RV Industry
 - Airstream mostly uses 12" brakes with 6-bolt wheel flange.
 - Other trailers use 10" brakes with 5-bolt on smaller axles (this varies by manufacturer).
 - Airstream advertises being able to travel on 3 wheels (not recommend for long distances).
 - Tandem torsion axle system with 2,600 lbs. rated wheels required.
 - Airstream uses only heavy-duty brakes on a light duty axle system.
- Sizing a New Brake System
 - Consider tow vehicle size in future.
 - For a larger trailer, consider upgrading brakes depending on tow vehicle.
 - Larger tow vehicle for larger trailer vs. smaller tow vehicle for smaller trailer.
 - Traveling habits and routes.
 - Riding brakes vs. downshifting.
 - Mountain travel may require larger trailer brakes vs. flat land towing.

Airstream Brakes (continued)

- Trailer Brake Quality and Engineering
 - Heavy and clumsy electric brakes.
 - Pretty much industry standard.
 - Unbalanced brake hubs.
 - Problematic for riveted shell trailers or any other trailers.
 - Minimal progress until recent years.
 - Exception is Airstream's Hydravac / disc systems.
 - Hydravac / disc systems – Engine vacuum can influence brake activation.
- Brake Controllers
 - Inertia type controllers (pendulum or electric).
 - Ramp up type controllers.
 - Mechanical proportional controllers.
 - Combination thereof.
- Newer trucks and SUVs come with brake controllers installed by factory or dealer.
 - Newer trucks have up to 10 gears and downshift automatically on steep terrain.

Safety Items and Considerations

- Check Safety Items
 - Fire extinguishers - both tow vehicle and trailer.
 - Carbon monoxide detector.
 - Propane detector.
 - Check for propane leaks when you smell propane.
 - Have an RV deal perform a propane leak test.
 - Option using a gauge: Pressurize propane system (light gas burner to verify system is pressurized).
 - Turn burner off, close propane tank valve.
 - If pressure in gauge goes down in 5-10 minutes, you have a leak.
 - Smoke detector.
 - Verify emergency braking device is still functional.
 - Pull cable from braking device, pull trailer forward - should feel like the brakes are activated.
 - Cross safety chains in a X shape as this will cradle the tongue if trailer unhitches.
- Water Leaks
 - Body – lawn sprinkler is a good way to check for leaks.
 - Some dealers can do pressure tests to locate leaks.
 - Fresh water – water pump intermittently turning on.
- Water Heater / Refrigerator
 - 9 volt Igniter available on some models.
 - Carry a long stick butane lighters cooktop/oven water heater and refrigerator.

Safety items and Considerations (continued)

- Tires

- Check tire pressure and spare prior to road trips.
 - Tire Pressure monitor system – Highly recommended.
 - Notification of slow and/or rapid tire pressure loss.
 - Reduces damage to trailer.
 - Various makes and models – Pressure Pro, Tire Minder, etc.
 - Torque lug nuts.
 - Replace tires every five (5) years maximum.
 - Carry tools to change tires, including a torque wrench.
 - Carry proper clothing and a tarp to change tires (summer, winter, rain and snow conditions).

- Batteries

- Disconnect battery or consider a battery tender if not using trailer for 30 days or longer.
- Consider storing batteries inside during winter.
- Batteries stored at less than 75% charged.
 - Continue to lose their charge and bring back to a full capacity.
 - If battery acid and/or water freezes, plates warp – battery damage results.

- Bent Axle

- Results in uneven tire wear, typically on one wheel.
 - Replace Axle as soon as possible
- Inspect new axles as they can be damaged in shipment.

Safety items and Considerations (continued)

- Tires (continued)
 - Why tires should be relaced at least every 5 years.
 - They may look great but are not safe.
 - This blowout happened on a return trip home in May 2021 from Dolores, CO.
 - The exact age of tires was unknown but estimated at eight (8) years.
 - Luckily only minor damage resulted to the inner fender well.
 - ALWAYS carry tools to change your tires.
 - Make sure your spare is properly inflated.



Safety items and Considerations (continued)

- Trailer Prep at Rallies
 - **DO NOT** distract owner(s) when they are unhooking or hooking up trailer.
 - Their routine (critical steps) might be interrupted and steps missed.
 - Especially important when hooking up trailer.
 - Trailer jacks / stands could be left in the down position.
 - Receiver hitch may not be properly secured to the tow vehicle.
 - Personal experience I have done all the above.
 - Embarrassing and can result in damage to the trailer and/or tow vehicle.
 - Items can be left behind.
- Some material included herein was proudly stolen from:
 - Luke Bernander
 - Luke's Maintenance & Repair Company, Fort Collin, CO. AirstreaminCO@msm.com
 - Uwe Salvendar
 - Area 63 Productions, Orange County CA salwendar@sbcgobal.net