

AIRSTREAM

THE DURA-FLEX Rubber Torsion Axle GKN (Henschen)

1961 was the first year for Dura-Torque axle.



Airstream uses a unique independent suspension system that is contained within the axle. The simple compact design gives unparalleled performance compared with other suspension systems.

In 1962, Airstream switched its suspension system from leaf springs to a rubber torsion principle.

The natural cushioning of the special blend of synthetic and natural rubber cords and their self-dampening characteristics made the Henschen axle and the Airstream trailer a perfect match.

Each wheel is completely independent. This provides excellent road-handling characteristics. Because the inner torsion shaft is "cradled" in rubber, the axle is extremely quiet. Road noise is completely absorbed by the rubber cords.

To achieve this, the cords are placed in deforming molds and brought down to a temperature of 200 degrees below zero Fahrenheit for two minutes.

The deformed rods are then removed from the molds. They retain their "deformed shape" for 30 to 45 seconds, because of the extreme cold that they were subjected to. During this very short time, the rods must be placed in position within the axle.

Within less than one minute, the axle is completed because as the rubber compound returns to its original temperature, it also attempts to return to its original shape.

However, it cannot return because it is restricted by the inner torsion bar and the outer axle tube. The rubber compound is held to the restricted shape, and serves as four "cushion ride" bearings.

As the load is applied, the cushion rods are progressively compressed in a rotating action, which gives the ability to absorb road shock. The axle does not need any maintenance or service.

When coupled with "horizontal type shock absorbers" a ride is achieved that's without equal.

The strength in design is within the axle itself. Each axle has two brackets, one welded near each end of the axle tube where the axle is bolted to the frame. It serves as another cross member, and therefore, retards frame twisting.

The axle mounting plates are welded to each side of the frame, and become an integral part of it. This allows weight reduction of the frame and material costs. The mounting plates put additional strength in the frame at the axles.

The installation is simple; four bolts hold each axle in place. Alignment is automatic because of the placement of the mounting holes in the mounting plate.

Along with the advantage of being proven over time, and subject to tough quality standards, an improvement was made in the rods beginning with Airstream 1974 models.

Research and age showed that the original rubber composition in the rods could on occasion, lose its resiliency. This would allow the trailer to settle to a lower ground clearance and ball height.

The torsion arm of the axle is set at a 20 to 25 degree negative angle, at "no" load, with a "maximum" travel of 42.5 degrees. As the load increases, this angle can approach zero degrees on up to a positive degree. Negative is downward from the frame, zero is parallel, and positive is upward to the frame.

The axle has build-in torsion arm stops. The stops restrict the negative and positive angles that the torsion arm can achieve, so that the rubber rods cannot be displaced.

The downward angle stop allows considerable ground clearance, when a tire and wheel is removed. This allows, with a tandem or tri-axle Airstream, because of the independent wheel suspension, restricted continuation of your trip to a tire repair facility.

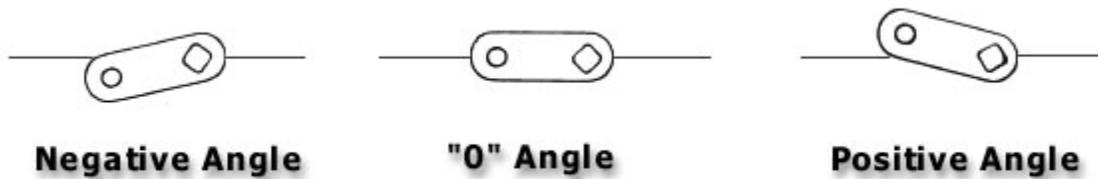
The upper or positive stop prevents the tires from damaging the wheel wells when traveling.

It is wise, especially on pre-1974 Airstream or Argosy trailers, to visually inspect the position of the "torsion arms." This can be done by simple looking rearward from the forward and backside of the front wheel or wheels.

As the torsion arm goes rearward, it should have a negative angle (downward). This angle will be greater when the coach is empty, and somewhat less when the coach is heavily loaded.

Each axle has a maximum weight rating. When the trailer is loaded to the maximum weight rating, the torsion arms should still maintain a rearward slight negative or downward angle, but never more than a zero angle (parallel to the frame).

Should this rearward angle be positive (upward), then the trailer is overloaded, or the rubber rods have lost some of its resiliency.



A positive torsion arm angle will result in the trailer "bottoming out" when hitting bumps. At this point, there is no cushion left, except a small amount provided by the tires.

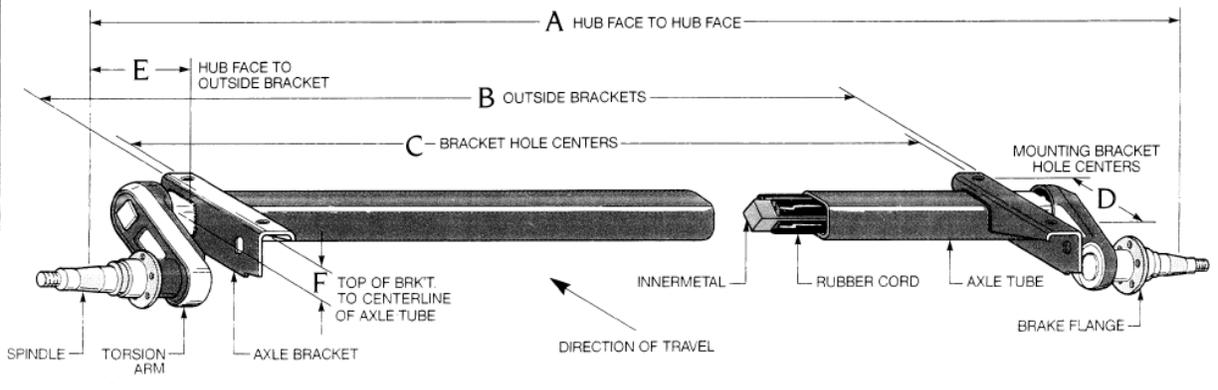
The "bottoming out" condition places very high loads on tires and can cause tire side wall failure. Additionally, shell and frame damage usually occurs, along with rapid "rear end separation," (the frame separating from the shell at rear of the coach). It can also cause many other types of damages, such as to the furniture, bulkheads pushed away from the shell, among other things.

Should it be found that the axle or axles have a positive torsion arm angle, they should be replaced, to protect your trailer. At the same time the brake system and hub and drums should also be replaced, as some parts for the original brakes are "no longer available".

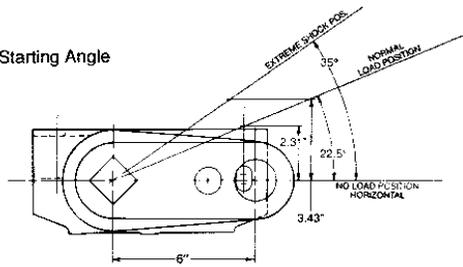
New type electric brakes use oval magnets, instead of the old style round magnets. This in part has added to the braking efficiency. The oval type brakes have a much greater stopping ability than the old style round magnet type brakes.

Checking your Axle

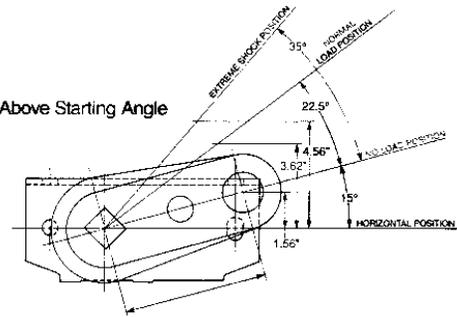
The correct way to check the angle of the arm is under a "no load" situation. Jack the trailer up off the ground and check the angle. If the arm returns to a below horizontal positions under "no-load" it is function correctly. The position of the arm under a "load" situation is dependent upon the weight of the trailer. The more weight the more above horizontal the arm will ride.



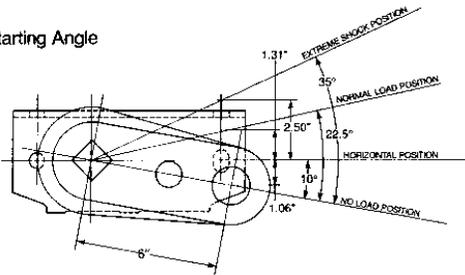
0° Starting Angle



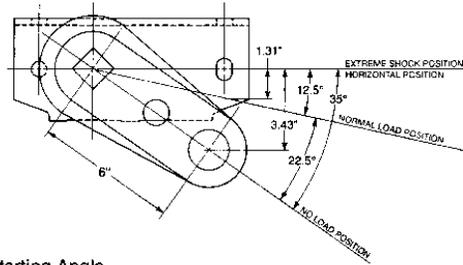
15° Above Starting Angle



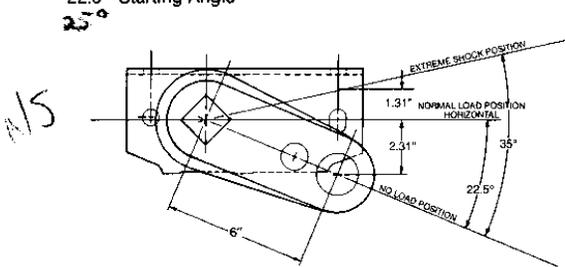
10° Starting Angle



35° Starting Angle



22.5° Starting Angle



45° Starting Angle

