

# SCHNEIDER POSITION: SPRING RIDE VS. AIR RIDE SUSPENSION

## OVERVIEW

In today's transportation landscape where every penny counts, more and more shippers are looking to protect the integrity of their freight. Selecting a carrier with a robust program for testing and specifying equipment is prudent to ensure the best return on your transportation spend.

When it comes to trailing equipment, air suspensions are a hot topic, and some believe that air ride is better than conventional leaf-spring suspension. In turn, those shippers and carriers are unnecessarily paying more for a system that provides similar or equivalent ride quality.

Schneider, a premier provider of transportation and logistics services, has put these two suspension options through its rigorous testing program, in which company engineers and drivers work with manufacturers to test and validate transportation technologies. The result: Air ride does not guarantee greater ride quality than spring. It's a myth. Knowing this, Schneider can't justify spending more on air ride and recommends shippers don't, either.

## A DEEPER LOOK AT SPRING VS. AIR

Suspension systems contribute to a tractor-trailer's road handling and ride quality (the vertical acceleration to which a tractor-trailer is exposed). Keeping the tires in contact with the road as much as possible, suspension systems help minimize the amount of jarring (bumps, vibrations) for improved load-carrying ability, protecting the trailer and the freight inside from being damaged.

With a variety of suspensions available on the market, spring and air ride are the most commonly used suspensions for heavy-vehicle applications such as tractor-trailers.



### SPRING RIDE

Spring suspensions use semi-elliptic leaf springs to cushion a load from road shock. As one of the most commonly used suspensions, spring ride consists of several layers of flexible steel strips referred to as a "leaf pack." The strips are joined together to act as a single unit. The long and narrow, arch-shaped plates are attached to the frame of a trailer, resting above the trailer's axle.



### AIR RIDE

Air ride uses a variety of valves, air lines and air-spring bags in place of steel suspension. The flexible air-spring bags are made from a woven and rubber-like material. The air supplied to the air-ride suspension uses the same air compressor and air reservoir as a truck's braking system. The supplied air pressurizes the air-spring bags, creating a spring-like motion that raises the chassis from the axle.

## AIR-RIDE SUSPENSION FALLS SHORT IN TESTING

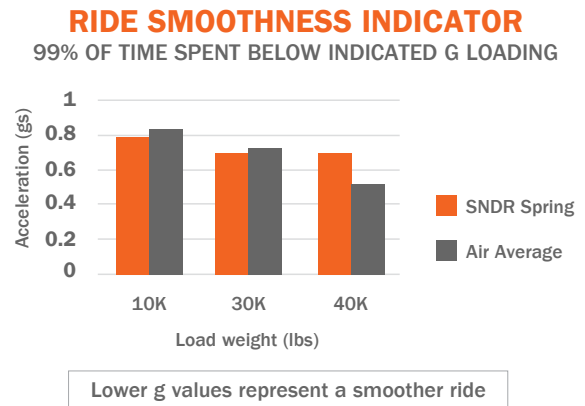
To ensure its fleet is outfitted with the best suspension system, Schneider ran an extensive series of tests between various air- and spring-ride suspension systems to compare the ride quality of the suspensions with three freight weights – 10,000, 30,000 and 40,000 pounds.

A series of vibration and acceleration trials were run using and comparing the values of ride smoothness and the maximum g-force (the maximum force transmitted) to determine ride quality.

Conducted with the load weights mentioned above, Schneider tested the industry standard spring suspension against four common air suspensions. The four air suspensions chosen represent the majority of suspensions in use today.

The tests consisted of:

- **Ride quality at the front of the trailer:** The ride quality of the freight in the front of the trailer was examined and tests showed that the front ride quality was a function of the tractor suspension, not the trailer suspension, proving that the trailer suspension had little effect on the ride quality of the freight.
- **Ride quality at the rear of the trailer:** The graph (right) shows the industry standard spring suspension compared with the average results of the four most popular air suspensions, proving that the average ride quality of the top four air suspensions is very close to the industry standard spring suspension. In fact, under most circumstances, the spring-ride suspension provided a better ride quality.



## SPRING RIDE PROTECTS FREIGHT AND YOUR BOTTOM LINE

Some shippers view air ride as the top suspension choice for handling, lateral control and roll stability, and it's often said to be gentler on freight. On the other hand, spring ride has comparable damping characteristics (the control of motion or oscillation) to air ride for full loads. With limited light or less-than-truckload shipments, the perceived benefits of air ride are minimal at best.

These tests prove that both air- and spring-ride suspensions are capable of providing the proper damping levels needed not only to get the trailer back to a normal state in the least amount of time but also to protect the freight during transport.

Spring ride is less prone to maintenance issues during the lifecycle of a trailer when compared with air ride. Less likely to need replacement, spring ride has been known to last the life of a trailer. Air-ride suspension, on the other hand, is more likely to need replacement over the same life span, depending on the environment in which the unit resides. It is also more prone to failure – subject to puncturing, leaks and collapsing. Should an air-ride suspension collapse while out on the road, freight movement stalls, losing precious time and money.

The conclusion: Air-ride suspension is not superior to spring ride. Not only are air-ride suspensions more expensive to purchase and maintain, which could translate to inflated expense to the shipper, but more importantly, they do not guarantee superior ride quality.