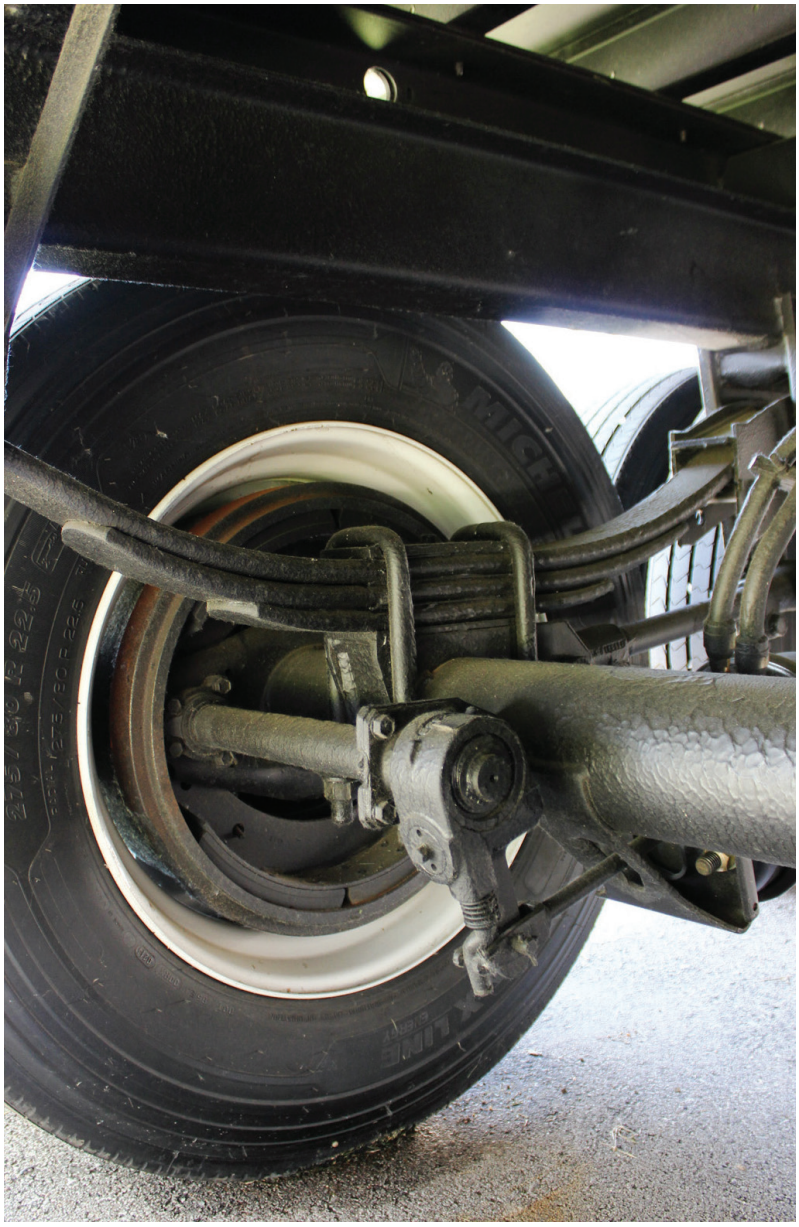
Why Spring-ride?

WHAT YOU MAY NOT KNOW ABOUT SEMI-TRAILER SUSPENSIONS

The spring-ride suspension is the XTRA Lease standard on dry vans and refrigerated trailers. This paper illustrates the cost and operational advantages of this technology.



PROVEN PRODUCTS

When it comes to trailer technology, spring-ride suspension is quite simple, but quite impactful.

It can affect the safety of your shipments, the utilization of your fleet, the quality of your driver's job and the long-term profitability of your business.

But maybe not exactly in the way you're thinking.

Twenty years ago, a trend in trucking began with the advent of air-ride suspension, first on tractors, then on trailers. XTRA Lease took part, building a large fleet of trailers with air-ride suspension. But the spring-rides never went away. And for good reason.

The simple spring-ride suspension gets the job done well and with much lower maintenance cost and issues. Spring-ride suspension has met the demands of trucking for many decades.

Today, XTRA Lease is turning the tide. We don't know every possible thing that's going to be hauled in our trailers, so we need a versatile product, good for multiple types of trucking. And we need assets that last, that are proven and that work—no matter the environment—and spring-rides fill the bill.

IN PRACTICE

The primary reason for the tidal wave of air-ride suspensions over the last two decades is that shippers or brokerage services requested it. They were absolutely certain the only way to guarantee a safe shipment was to have it hauled on an air-ride suspension. So every trucking company that wanted to stay in business was compelled to spec air-ride.

Well, trucking's making a u-turn.

Today, more than 50% of dry vans built have spring-ride suspension. And they're not sitting around empty; they're moving freight.

What changed? Quite a few things.

These days there's less potential for cargo damage. Product packaging has greatly improved. Cargo can be better secured thanks to logistics posts as a standard in van trailers. And shippers have improved the configuration of pallets and are optimizing the way cargo is packaged and loaded to get optimal use from a trailer.

Now driver retention is influenced more by pay, technology and length of haul, than by the suspension on the trailer they pull. Long-haul trucking is a difficult job. Many years ago, drivers had to do a lot of bobtailing, and EMPTY spring-ride trailers do a lot of bouncing around. To retain drivers, trucking companies tried to give them a nice, smooth ride by putting air-ride suspension on tractors and trailers.

Today very few miles are driven empty, thanks to regional and dedicated trucking, and the comfort of today's new cabs, coupled with more cargo-appropriate types of trailer doors, have made the driver's job easier.

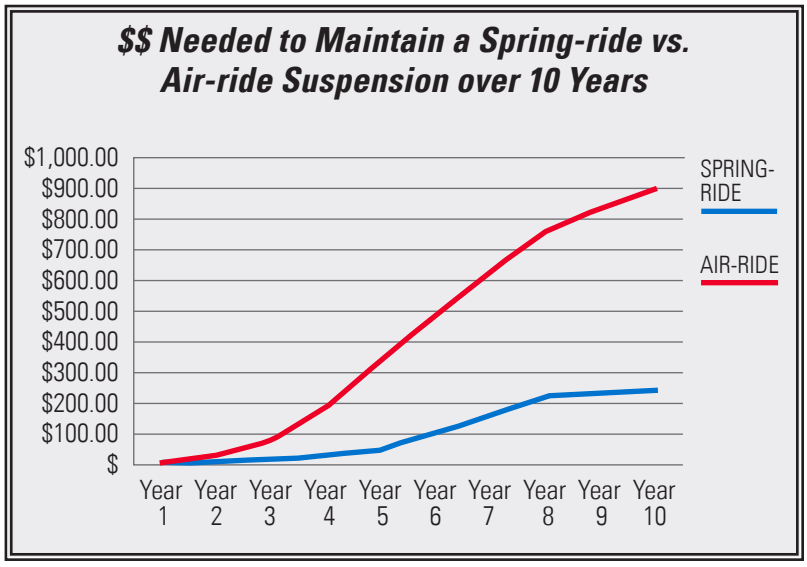
Shippers have been on board with spring-ride for many years.[1] With the boom in international containerization and in putting domestic shipments in intermodal containers—all of which travel on spring-ride suspensions—spring-ride technology has built a strong track record.

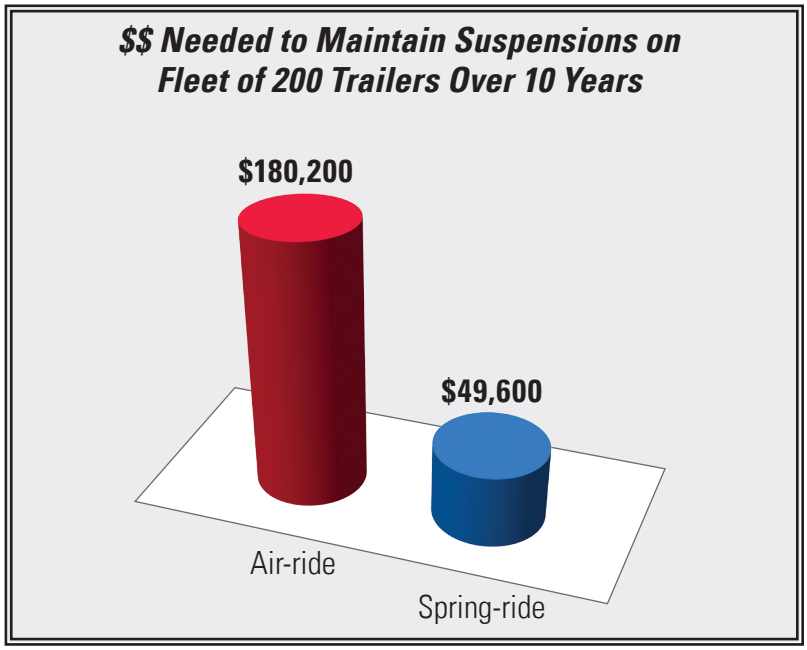
So, think about this: if freight can cross an ocean, then bounce around on railroad tracks for hundreds of miles, what difference could air-ride suspension make on the highway leg of its trip?

What shippers REALLY want these days is for trucking companies to reduce delivery costs in their supply chain. Greater payload from weight-saving components helps. But fuel efficiency has the greatest impact, and that has nothing to do with suspension type.

PARING DOWN PRICES

Every trucking company is hanging on to trailers longer, squeezing the last dollar they can out of them. According to a recent study, the average age of semi-trailers in operation is 8.5 years. And the productive lifecycle of a new trailer is about 15 years, if it's maintained properly.[2]





And there's the rub. Air-rides cost more up-front and require higher capital outlay. Plus their maintenance comes at a high price, beginning in year three.

Air-ride maintenance adds up.
Most wearable parts—such as shock absorbers, ride height control valves and air bags—have shorter warranty periods, only one to three years. And those items begin to wear down over time.

The base suspension structure is only warranted for seven years. It's alarming to think about what maintenance will cost during the remaining eight years of the trailer's life.

Our experience shows that a spring-ride suspension costs much less to maintain over the lifecycle of the asset. Spring-ride maintenance is minimal for the first 6-7 years.

At that point, maintenance associated with bushings, frames and adjustable radius rods may increase, due to extensive road wear and corrosive environments.

Several of our customers, some of the country's largest carriers, report that maintenance costs for air-ride suspensions can be 10 times higher than for spring-ride.

Data from the XTRA Lease fleet, in reviewing maintenance costs for more than 65,000 trailers, shows that in 10 years, it will cost, on average:

- $900 to maintain an air-ride suspension
- $240 to maintain a spring-ride suspension

Also, there's no evidence to suggest certain suspension types have any adverse impact on tire life. If there is a difference in tire wear rates, it's more perception than fact, according to experts at Michelin Americas Truck Tires. They report that "while it is believed there is a difference in wear rates and wear patterns between mechanical and air-ride suspensions, we are not aware of any definitive studies isolating those differences."[3]

Bottom line: It's much more expensive to maintain an air-ride than spring-ride suspension. That's a lot of money we all could be investing in fuel efficiency.

Suspension Benefits and Challenges

SPRING-RIDE	AIR-RIDE
No possibility of dock walk.	Air dump valves or anti-walk devices are required to eliminate dock walk, which is another part that can break. Plus, when it's harder to get loading started, time is wasted.
Level dock height.	Air release or air bag compression can lower the trailer floor to below the level of the loading dock. Equipment and cargo can be damaged, and loading isn't as efficient, if the forklift drops into the trailer with each load.
Lower tare weight.	Air-ride suspension adds 50 - 75 pounds to the trailer.
Lower risk of failure in CSA 2010 inspections.	More parts mean more potential violations.
Visible components.	Most suspension parts are hidden. You can't tell if or when the air bag or a bushing is going to fail. Can lead to even more damage.
Minimal maintenance requirements.	Extensive and expensive maintenance program.
Low labor cost on repairs. Inexpensive parts.	Complicated repairs and the need for specific OEM parts lead to longer out-of-service periods.
Low damage risk in intermodal service.	Because suspension parts hang when the trailer is lifted, they're more easily damaged.
Smooth ride with fully loaded trailer.	Smooth ride with fully loaded trailer.

We know fuel costs have the greatest impact on your bottom line. So to help you cut those costs, we spec low rolling-resistance tires and aerodynamic add-ons. According to EPA testing, that combination leads to about 6.5% in fuel savings.

Challenges in operating an air-ride suspension

- Wearable parts have short warranty periods—from one-to-three years. The base suspension structure has a seven-year warranty. Breakdowns in wearable items, such as shock absorbers, air bags and ride height control valves are more likely to occur.
- Getting parts can be problematic.Not all air bags are the same; bushings are proprietary to the manufacturer.
- While the break-in period is the same as spring ride, inspections need to occur more frequently.

- Often there are not enough inspections of these trailers because they move around so much, so there's a danger of progressive damage if they are not inspected and maintained properly.

- During the inspection process, a mechanic can't see a bad bushing. So they just check for loose bolts.

- If a bushing IS bad, a mechanic diagnoses it through symptoms—which typically show up AFTER damage has occurred to the suspension hangers. If other parts have been torn up, you could be looking at a very expensive road call and repair.

SPRING FORWARD

When it comes to trailer technology, spring-ride has always been the most commonsense suspension available, costing much less to maintain over the lifecycle of the asset and fitting multiple applications.

That said, not every product can or should be hauled on a spring-ride suspension—some easily bruised produce, for example. For that, XTRA Lease does have air-ride trailers available. But the far more versatile, simple, and proven spring-ride trailer will continue to make up the majority of our fleet purchases.

Factors such as a trailer's gross weight capacity, the amount of time it spends on the road, and how much drag it generates affect your operating costs more than its type of suspension does. That's why XTRA Lease has invested hundreds of millions of dollars in equipment spec'd for durability, long life, and fuel efficiency. So you get the optimum choice in rental and leased trailers.

Drivers: Spring-ride vs. air ride?

Here's what some drivers have to say about hauling spring-ride trailers [4]:

*"**Air ride is over-rated … always has been.** [...S]prings only ride rough when empty, when they are under a load, operating in the load range they were designed to they ride just fine and no airbags, leveling valves, shocks to go bad and dig into your wallet."* -KyleTexas

*"You will hear people say that spring-ride vans are only good for storage or local heavy freight, etc. But, just remember **we used to haul everything on spring ride,** even eggs, etc. You may not even notice much of a difference pulling it, some of them ride like a Cadillac with about 45,000 on. I mean, did youever ride on an old school bus when you were a kid? Pretty bumpy if you had a seat right over the axle, but if you sat towards the front it wasn't bad. Same thing with a spring ride trailer and when they're loaded heavy they ride great!"* -Dannythetrucker

*"And your air compressor won't need to cycle on as often, **increasing fuel mileage.**"* -double yellow

*"We are buying all springs going forward. **Cost of operation is much lower.** We haul auto glass and [electronics] products and no issues. I honestly don't think you have much difference in the ride."* -BigBadBill

COMPARING MAINTENANCE REQUIREMENTS FOR SUSPENSIONS

In general, as long as the fasteners are maintained, the spring-ride suspension is basically maintenance-free, whereas an air suspension has shock absorbers, air bags and additional valves which can be more susceptible to damage. Inspecting an air ride-suspension requires much more time and effort, too, due to the number of potential failure points on the system.

Air-ride Maintenance	Spring-ride Maintenance
• Harder to inspect. Some components hard to see/access. • Requirements:[5] Torque check at break-in period (500-1,000 miles). Monthly check for loose pivot bolts and u-bolts. If loose, align the axles before tightening the bolt. Monthly inspect pivot bushings, which requires measurement of beam assembly to bottom of frame bracket. If measurement exceeds limit, pivot connection must be disassembled and the beam assembly lowered to more closely inspect the bushing. Monthly check of air springs; if sitting idle, condensation can build. Every 25,000 miles, check: Bushing tube spacers, shock absorbers, shock mounting brackets/bolts. Axle connections. Inspect welds for cracks at the trailing arm, axle subassembly and hanger assemblies. Ride height, which requires measuring distance between axle and suspension mounting surface. If not within the acceptable range, ride height must be adjusted. Air system hoses, tubing, fittings, and valves. Check for leaks in air lines, at the air spring upper bead plate, piston and mounting studs.	• Easy to inspect. Components are highly visible. • Minimal requirements: Torque check at break-in period (initial 500 – 1000 miles) Visual inspection every six months or 25,000 miles Springs, axle seats, spring hangers, equalizers, torque arms and U-bolts
• Expensive labor and parts cost for repairs.	• Low labor cost for repairs--about a half-hour's-worth of labor and $50 for a spring. • Simple alignment process. (If aligned properly at the factory, the trailer usually never goes out of alignment.)
• 1-3-year warranty on wearable parts; 7-year-warranty on base suspension structure.	• 10-year warranty on parts and labor.

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