

A Lot Riding on Them

THE LEAF SPRING—
A TIMELESS NECESSITY
FOR HAULING TODAY,
TOMORROW, AND
THE FUTURE



ATW's Big Tex Trailers builds a wide variety of trailers and uses EMCO leaf springs on its dump trailers.

From the earliest days of modern hauling trailers to their horse-drawn wagon forbearers, one component that has remained a constant is the highly functional and reliable leaf spring.

IF IT AIN'T BROKE . . .

The leaf spring design has been in use for centuries and its origins can be traced back to medieval times. These springs, typically made of layered strips of steel or sometimes iron, provided a suspension system for wagons and carriages that made the ride smoother and more bearable over uneven terrain. By absorbing and distributing the forces of the road, leaf springs helped protect the wagon's contents and provided comfort to its occupants.

The basic principle behind the leaf spring is relatively simple: when a force is applied to the spring (such as from the road's surface bumps), the layers (or "leaves") of the spring flex and

spread out the force. Once the force is removed, the spring returns to its original shape. This mechanism has made leaf springs a durable and reliable suspension solution for many types of vehicles over the years.

Their widespread use in horse-drawn wagons and carriages eventually transitioned to their application in the automotive and trucking industry as vehicles became motorized. Even today, leaf springs are used in various vehicles, especially in heavy-duty applications like trucks and trailers.

UNWAVERING BACKBONE

Trailers made for hauling come in three varieties: light-duty, medium-duty, and heavy-duty. Whatever size or type of load they are hauling, one thing they all have in common is that they need the right kind of suspension. Everything literally rides on the suspension.

In the ever-evolving landscape of the transportation industry, where technologies are routinely developed and shelved, one might wonder why leaf spring suspensions have remained indispensable. Let's delve deeper into the reasons for its enduring relevance, the intricacies behind its manufacturing, and how the leaf spring will continue to serve the hauling needs of the work truck market today—and tomorrow.

RELIABILITY & AFFORDABILITY

Despite the emergence of newer suspension technologies, leaf spring suspensions stand out as both reliable and cost-effective. They have been serving the hauling industry for years, with a proven track record. Compared to alternative suspensions, like torsion or air ride, leaf springs entail less maintenance and offer a greater return on investment.

“We use air springs on some of our heavy-haul trailers, but we use leaf spring suspensions on the majority of the trailers we manufacture,” says Joel Schubach, chief operating officer of Pratt Industries US LLC., an OEM trailer manufacturer. “The primary reason is that leaf springs get the job done and they do it at a very reasonable cost.”

As a trailer component, the critical nature of leaf springs became readily apparent during the COVID-19 Pandemic. Like many manufacturers, Pratt suffered from supply-chain shortages, particularly a shortage of leaf springs from its then Indonesian supplier.

“Without leaf springs, you simply can’t finish a trailer build. We really had to scramble to find a more reliable source,” Schubach muses. “Fortunately, we were introduced to EMCO Industries, an Oklahoma-based leaf spring manufacturer capable of supplying us with the heavy-duty, 22.5K axle leaf springs we needed.”

In choosing EMCO as its supplier, Pratt ended up being part of what is being called the Great Reshoring Movement—the trend of realigning with suppliers in North America generally, and in the US specifically. Reshoring has become a hot topic and EMCO, with its high quality and competitive pricing, is uniquely positioned to compete with offshore manufacturers.

THE CRAFTSMANSHIP

Manufacturing leaf springs correctly is a meticulous operation. EMCO begins with automotive-grade, high-carbon specialty steel. The material is then specifically processed to create EMCO’s leaf springs. EMCO has advanced heat-treating capabilities and the steel undergoes rigorous preparation for its final purpose.

“It’s the quality of steel and the sophisticated heat-treating processes that is at the heart of our leaf spring

quality,” says Marcus Hester, president of EMCO Industries, LLC. “We focus on consistent quality and repeatability, and to do that at scale.”

The company’s highly automated operations seamlessly produce hundreds of thousands of leaf springs every month, meeting the demands of their customer base. It’s this quality and capacity that has made EMCO the undisputed leading supplier of leaf springs to the light- and medium-duty trailer market and that has driven their expansion into the heavy-duty, 22.5K axle leaf spring segment.

EVERYTHING IN BETWEEN

Another EMCO customer is American Trailer World (ATW), North America’s leading manufacturer and retailer of professional and consumer grade trailers and truck equipment. ATW’s Big Tex Trailers brand encompasses a broad range of light-, medium-, and heavy-

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Pratt industries is an OEM heavy-duty trailer manufacturer and uses EMCO's 22.5K axle leaf springs because they get the job done and do it at a very reasonable cost.

duty trailer offerings. Its PJ Trailers brand focuses predominantly on the medium-duty market segment and its Carry-On Trailer brand caters to the light-duty needs of the marketplace.

“ATW is on the road to reinvent the trailer industry—we live and breathe trailers, right down to the last bolt,” says Jon Melhorn, vice president of Global Supply Chain at ATW. “EMCO’s high-quality leaf springs are a critical component for our entire spectrum of light-, medium-, and heavy-duty trailers,

and one that provides our end-users with the exceptional carrying capacity, handling, and ride quality they have come to expect from all our trailer brands.”

It’s one thing for a company to say nice things about its able and competent suppliers. It’s quite another to single one out and recognize it for its exceptional contribution. ATW publicly demonstrated its appreciation of EMCO when it awarded the leaf spring manufacturer with its coveted Supplier of the Year Award in 2021.

ATW’s Melhorn observed that it was EMCO’s herculean efforts to keep the supply of leaf springs flowing during the pandemic that helped ATW, as part of an essential industry, keep its production lines in operation. Melhorn adds, “They said they would deliver when others couldn’t. They delivered and we delivered—they earned that award.”

AGE OF AUTOMATION & EVS

While the work truck sector buzzes with excitement over electric and automated vehicles, the role of leaf springs and the trailers they haul remain vital. New parabolic leaf springs that EMCO is exploring may offer one solution. Replacing traditional leaf springs with a single mono-leaf or multi-leaf parabolic design can result in weight reduction, which could become significant in the era of EVs.

These suspensions might accommodate the weight reductions sought by EV users, helping to extend range and battery life. Newer and lighter-weight iterations may continue to emerge, yet their fundamental purpose of efficiently attaching the axle to the trailer chassis or frame rails remains unchanged.

EYE ON THE FUTURE

EMCO is also on the verge of launching a high-performance Military Wrap Leaf Spring, or Double Wrap Eye. There are generally one or two eyes on a leaf spring suspension—that’s what attaches to the chassis or to the frame of the trailer. EMCO’s innovative new design provides redundancy and offers users a safety net in the event of a breakage. This spring ensures trailers won’t face



Carry-On Trailers are designed for the light-duty trailer market.



EMCO engineers and workers discuss the design of a heavy-duty 22.5K axle leaf spring.



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abrupt or catastrophic failures, granting drivers enough time to reach safety if a problem occurs. Other innovative design concepts are also in the offing.

EMCO has also recently decided to move to a new high-performance, matte coating on its leaf springs. The resin-based paint chosen has responded exceptionally well in salt spray testing and, based upon the

results, promises to double leaf spring resistance to corrosion. The company's decision to change paint composition offers customers a finish that's both aesthetically pleasing and more resistant to the elements and wear.

CAUTIONARY TALE

The trailer industry has witnessed a transformation in the past decade. There's an increased emphasis on end users pushing boundaries. Larger trailers are being manufactured to cater to certain industries. These are individuals using a Class C driver's license to haul significant loads, ranging up to 20,000 lbs, across states. This rising demand underscores the crucial need for durable and efficient suspension systems, but also for more than a bit of user restraint.

"We also see some end-users modifying trailers' sidewalls in order to force more cargo onto a trailer that was never designed for such a load," notes Hester. "A lot of effort goes into the engineering of both the trailer and its suspension system, and its good advice for users to both read and observe the

manufactures recommendations for proper trailer use, no matter what size trailer they are using."

A CONTINUING SAGA

The modern work truck industry may be humming with new technological advancements, but the venerable leaf spring suspension, with its reliability and cost-effectiveness, continues to hold its own. Companies like EMCO are not just sustaining this legacy but are innovatively pushing its boundaries, ensuring trailers remain dependable vehicles for hauling for years, if not centuries to come.

"EMCO is proud to carry on the heritage of the leaf spring and to be a part of its evolution," says Hester. "We're excited to see where tomorrow's new materials and technologies will lead us, and to participate in that future." ●



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