

September 16, 2014

A B Spring

7:00 PM

4537 Roger B Chaffee Mem Dr SE,
Grand Rapids, MI 49548

Executive Board Meeting - Family Fare

7:00 PM October 15, 2014

Metro Health Plaza 2275 Health Drive SW (Close to Byron Center Ave & Gezon Dr.)

Everyone Welcome

Meeting Dates Dates, times, & locations are subject to change.

Sept. 16, 2014 7:00 PM A B Spring Service in Grand Rapids
Date and time may change.

Oct. 15, 2014 Executive Board Meeting Family Fare 7:00 PM

Nov. 8, 2014 Annual Christmas Party at Old Country Buffet
28th St, Grand Rapids

Jan. 13, 2015 Annual Picture and Movie Night Grand Haven Gospel Chapel Grand Haven MI.

Show Dates

Sept. 12-14, 2014 - 19th Annual Richard Crane Memorial Truck Show St. Ignace, MI

**A B Spring
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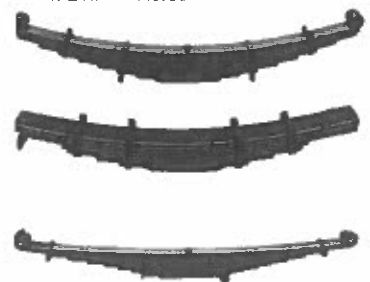
7:00 – 9:00 PM

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A B Spring is a full service garage specializing in suspension. They handle everything from small cars to the big stuff but their main focus is 4x4 and larger. A B Spring has the equipment to do axle alignments on vehicles with multiple axles. A B Spring does frame replacements and frame alignments but they do not straighten frames. A B Spring can boar and sleeve worn axles and replace kingpins. They not only replace springs but also make the springs including forging the eye on the end. A B Spring also does custom work

and recently built and installed all 4 springs on a 1949 Chevrolet.

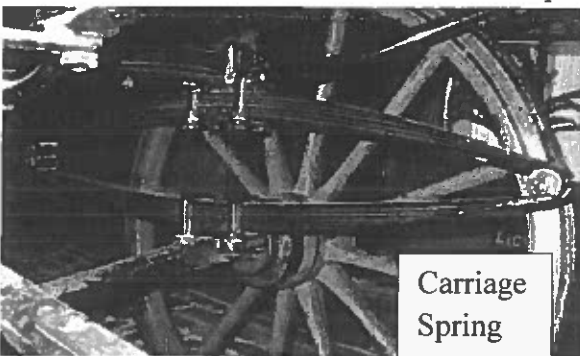
A B Spring is open from 7:00 AM to 11:00 PM. We will be touring a working business therefore open toed shoes are not allowed. It is recommended that you do not wear white clothes. Please bring safety glasses if you have them. If you do not want to stand during the business meeting you will need to bring a chair. This is a rare opportunity for a behind the scenes look at how springs are made.



A Brief History of Leaf Springs

By C. L. Miel

A leaf spring looks nothing like a leaf it is a relatively thin arc shaped length of spring steel. The leaf spring suspension system was patented in 1804 by Obadiah Elliot, a carriage builder in London, England. Obadiah's patent was for an elliptical leaf spring. At each wheel he took two steel arcs, pinned their ends together and then attached the center of the top leaf to the body of the carriage and attached the axle to the center of the bottom leaf. It was considered one of the most important innovations in transportation at the time and within a decade almost all British carriages were equipped with leaf springs of either wood or metal.



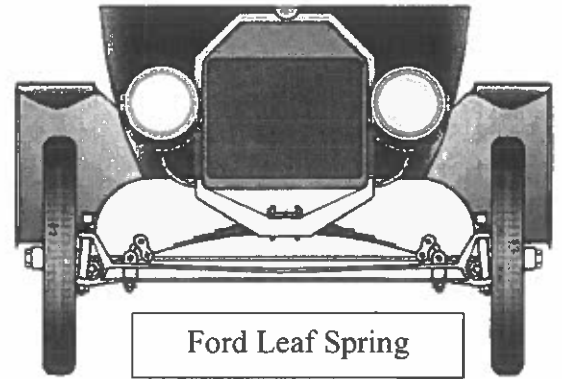
The British style elliptical leaf spring didn't work well on America's rougher roads. However as roads improved and speeds increased there was a demand for a better suspension system. This demand increased as the newly invented automobiles became more popular. Rather than the elliptical

leaf spring arrangement popular in Britain, Americans used the half elliptical leaf spring. In this configuration the ends of the leaf are attached to the chassis frame rather than to another leaf and the vehicles axle rests on the middle of the spring, and is attached to it with "U" bolts, one on either side. . In some cases, a leaf spring may be attached to the vehicle frame on one end and the other end will be attached to a short swinging arm known as a shackle, allowing for more movement. The shackle spring configuration provides a softer, less rigid suspension system.

Leaf springs continued to improve with advancements in metallurgy and as cars and loads became heavier more leaves were added. The leaves were stacked one on top of another each leaf shorter than the one above it centered on the axle. By adding leaves or changing the shape from full elliptical to three quarter to half elliptical the spring could be made to support varying weights.

The advantage of leaf spring suspension is its ability to distribute the weight over a greater area of the chassis making them ideal for load

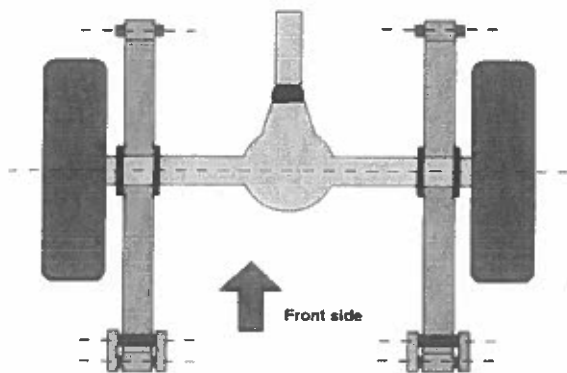
carrying. Leaf springs are much sturdier than coil springs and have less deflection when carrying heavy loads. One disadvantage to early leaf springs is that they had to be spread apart and lubricated periodically to keep them from squeaking.



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Henry Ford's 1908 Model T Ford used Obadiah's elliptical leaf spring in a new way. Using high-strength vanadium steel he mounted the elliptical leaf spring across each axle instead of at each wheel. First used on a French racing car vanadium steel allowed him to save weight and cut costs without compromising durability. Soon after WW II leaf springs fell out of favor with car manufacturers and coil springs replaced leaf springs, especially on the front wheels. Generally, large, heavy vehicles are equipped with leaf springs, while small light ones have coil springs.

Hotchkiss Drive



A live axle is a type of beam axle in which the shaft transmits power to the wheels. In rear wheel drive vehicles the rear axle's motion must be limited so that the wheels remain in contact with the ground as much as possible. When a vehicle slows down, speeds up or changes directions it exerts force on the axle assembly that cause it to try and move or twist. For a live axle to do its job properly it must be connected to the body in such a way as to resist these forces. As live axles began to replace chain drives a new a new type of suspension was needed. From the 1920s until the late 70s the Hotchkiss Drive, invented by Albert Hotchkiss, was very common on rear wheel drive cars and trucks. It is still used on

many pick-up trucks and SUVs. One reason that the Hotchkiss Drive was so popular is that its simplicity made it inexpensive to manufacture. A Hotchkiss Drive Suspension uses semi-elliptical leaf springs mounted lengthwise and attached both in front of

and behind the differential. This keeps the axle in place as well as supporting the weight of the body. The front portion of each spring works like a trailing arm, transmitting the drive torque during acceleration to the body helping it resist squat and wheel hop. The rear portion of the spring acts as a leading arm, resisting wheel hop during braking. The stiffness of the springs also help keep the axle from moving laterally. In the early years the defects of the Hotchkiss Drive design were suppressed by the enormous weight of US passenger vehicles. And then came the oil crisis and the U.S. Congress implemented laws that required vehicle manufactures to improve fuel economy for their whole fleet. Lighter vehicles and smaller

engines needed a different kind of suspension system and the Hotchkiss Drive fell out of favor. The Hotchkiss Drive is very sturdy, making it a good choice for heavy-duty

vehicles like trucks.

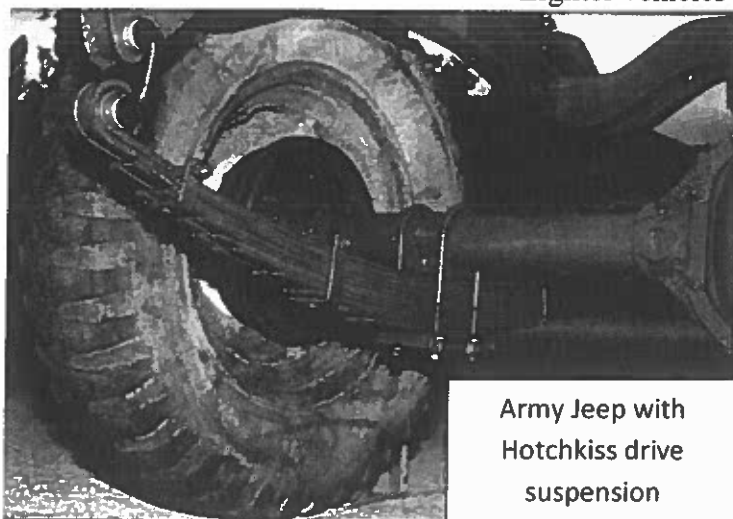
Although leaf springs were invented more than 200 years ago with minor improvements such as rubber spacers between the leaves they are still a popular choice for heavy duty vehicles.

Wayne Works

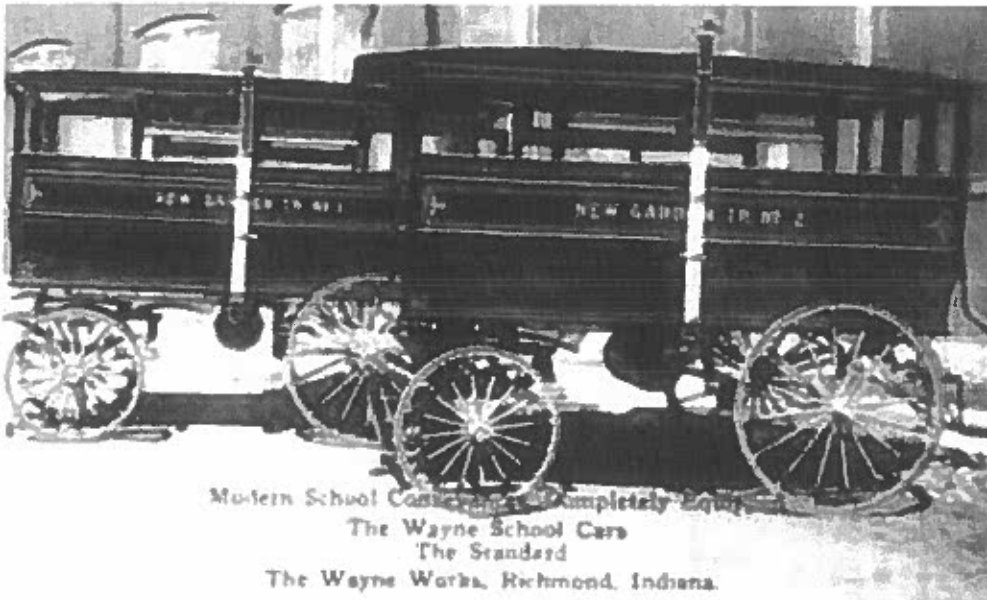
By C. L. Miel



It is the time of year when drivers need to begin watching for that familiar yellow-orange paint officially known as National School Bus Chrome Yellow. There were 115,000 public school buses on the road in the United States in 1950 in fifty years the number had almost quadrupled to 448,307. The first school bus was horse-drawn, introduced in 1827 by George Shillibeer for a Quaker school at Abney Park in Stoke Newington, London, England and was designed to carry 25 children. In wasn't until the late 1800s, when American education began shifting from small local one room schools to multi-room regional schools and many students no longer lived in walking distance, that school transportation became an issue. In 1869 Massachusetts paid local farmers to take children to school making it the first state to enact legislation allowing public funds to be used for school



Army Jeep with Hotchkiss drive suspension



transportation. By the turn of the century only 17 states had school transportation programs but by 1918 only Delaware and Wyoming had not passed public school transportation legislation. The manufacture of school buses was about to become big business.

Wayne Works rose from the ashes of the bankrupt Wayne Agricultural Co in 1887. Although their primary business remained agricultural equipment they soon added carriages to their line of farm wagons. In 1892 the Kingsville Ohio school district commissioned Wayne Works to build them a horse drawn wagon specifically designed to transport children to and from school. Wayne Works called it the "School Car". These early school cars were made of wood with canvas sides. Passengers sat on benches built around the perimeter facing the center. Children entered and exited the bus through a door in the rear to

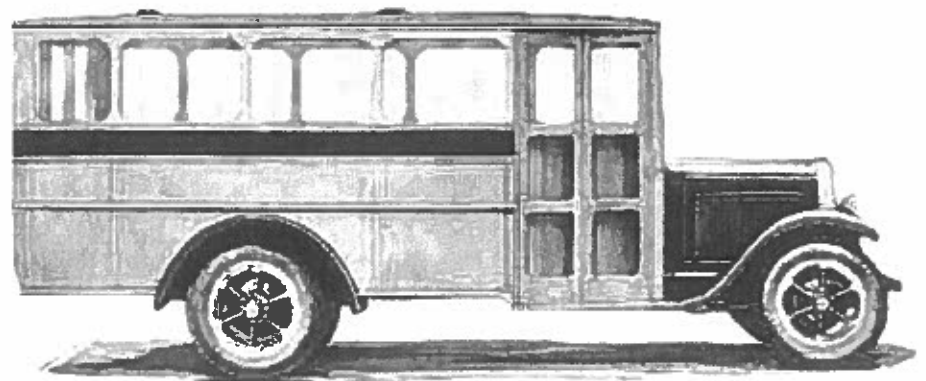
avoid disturbing the horses. The first motorized school bus was built in 1914 when Wayne Works put one of their horse-drawn school cars onto an extended wheelbase Model T chassis. The motorized School Car was made of wood reinforced with metal with a single rear entrance and four padded bench seats. A year later International Trucks made their first school bus, the Model F, for a school district in South Dakota.

It is rumored that both Wayne Works and the Blue Bird Body Company made steel bus bodies in 1927 however they were

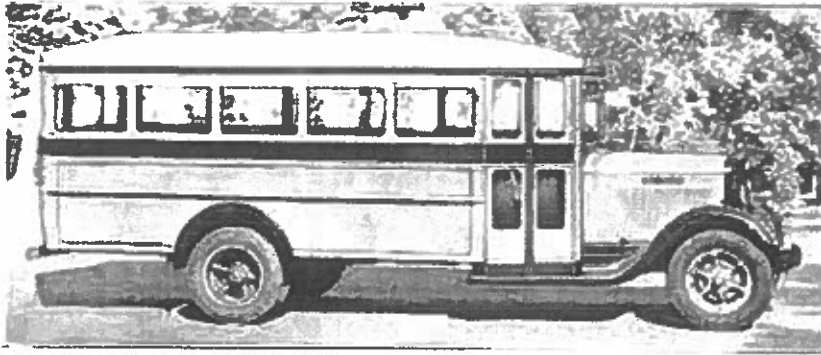
actually steel over wood. It was not until 1930 that Wayne Works introduced the industry's first all-steel school bus body. The steel body was a huge improvement in bus safety. Another safety feature was soon added, heavy-duty collision rails. These rails running down both sides of the bus at passenger seat level added safety and structural rigidity.

The second firm to build an all-steel school bus body was Lima, Ohio's Superior Body Co. which introduced their all-steel body in early 1931. Safety glass came standard on Superior Body Co.'s bus making it the first all-steel school bus with safety glass. Although safety glass was available as an option on Wayne Works' buses, it did not become standard equipment for at least two more years. For two years from 1949-1950 Wayne Corporation built busses for Ford at their Indiana plant.

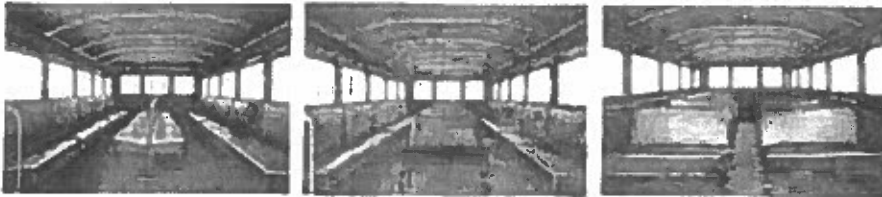
By the 1960s, most school bus bodies were made up of fairly small individual steel panels usually attached by rivets. The first all-steel Wayne Works bus bodies were assembled using bolts instead of rivets. Using bolts meant that the buses could



WAYNE ALL-STEEL BUS BODIES



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GREATEST SAFETY! LONGEST LIFE!**



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be shipped completely knocked down to distributors. Once the bus arrived at the dealership the body would be assembled and then mounted on the customer's chassis. This made Wayne Works buses cheaper to ship giving them a big advantage in the marketplace and Wayne Works quickly became the nation's number one manufacturer of school buses.

As school busses evolved people became more concerned about the safety of children should the bus be involved in an accident. A known structural failure in catastrophic school bus crashes were the joints where the panels fastened together. Sometime around 1967 the Ward Body Company took one of their buses and rolled it over several times. They noted how the panels separated at the joints and

pointed out that they were using more rivets than any other bus manufacturer. Wayne Works, now Wayne Corporation, took the results of the Ward Body test seriously and began their own tests. They quickly discovered that no matter how many fasteners were used, the joints

were always the weak point under high stress.

The Wayne Corporation engineers noted how during an impact the side guard rails tended to spread the stress from the point of impact. This discovery led to a revolutionary new design in school bus construction. The Wayne Corporation used huge roll-forming presses to make single steel pieces that extended the entire length of the bus body. The idea being that by reducing the number of joints the number of places where the bus body could separate during a catastrophic impact. They marketed the new design under the name Lifeguard.

The Lifeguard design had several advantages over the traditional school bus design. It reduced the overall body weight, the number of fasteners used and it was faster to assemble. But it also had some disadvantages not only did it require huge roll-form presses and special equipment to handle the enormous panels, each panel



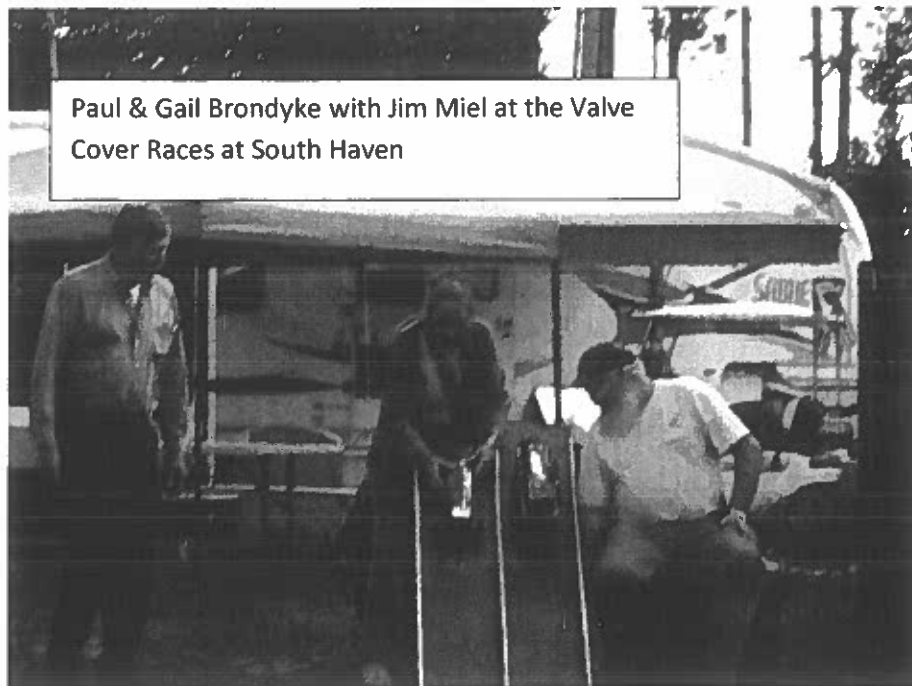
had to be cut to order creating a distinct marketing disadvantage. The Lifeguard required a greater manufacturing lead time and parts were no longer interchangeable.

However in the years after Wayne introduced the Lifeguard design in the 1973 model year, competing body manufacturers began moving towards using fewer side panels and joints, although none went as far as Wayne. By the 1980s Wayne was one of the top bus manufacturers in the U.S; competing with Bluebird Body Co., Superior Coach Co., Carpenter Body Works, and Thomas Built Busses, Inc. However as the baby boomers completed their public school education the bidding for school contracts became fierce and Wayne was unable to compete declaring bankruptcy in 1980.

Thoughts From the President

By Jim Miel

Pierre Jalvings new truck was too big for my little camera at the South Haven Show



Paul & Gail Brondyke with Jim Miel at the Valve Cover Races at South Haven

I've had a busy end of summer with the valve cover track. Dan Engel and I had a great time on Labor Day with the track at the Cars for Cancer show on the Muskegon Mercy Health Center Campus. This show gets bigger every year and even with the rain it was still a great show. This year there were 5 people in the

Builders Class and the Fun Run was very well attended with at least 20 people participating. Just a little less than a week later my wife and I took the track to the South Haven Tractor and Engine Show on Saturday morning September 5th. Although this event is not as popular as it is in other places those kids who did participate had a great time. I want to say a special thank-you to Paul and Gail Brondyke from the Antique Farm Power Club. Paul not only built 2 cars this year he and Gail helped run the races at South Haven.

Normally at this time of year I would be asking you to be thinking about what truck to feature at next year's show. However last year we not only picked our truck for 2014 but for 2015 as well. The 2015 truck will be Chevrolet/GMC. I would like to purpose that we choose the

2016 truck at our January meeting.
I look forward to seeing everyone at A B Spring.

Executive Board

By Jim Miel

Please consider attending the October Executive Board Meeting Oct. 15 at 7:00 PM. We hold 2 Executive Board Meetings a year and it is at these meetings that we choose meeting places and activities for upcoming meetings. The more people who attend the better our upcoming meetings are.

Advertisements

(Advertisements are free to chapter members, \$5.00 for non-members and run for 2 issues.)



Web Sites

www.ATHS.org
Official website of the American Truck Historical society

<http://ateupwithmotor.com/about/>
Ate Up With Motor provides in-depth histories of interesting cars and the people behind them. It primarily focus on older cars, but we may occasionally talk about newer models if they're interesting enough.

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Map to A B Spring
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