

Summer 2017
Issue #45

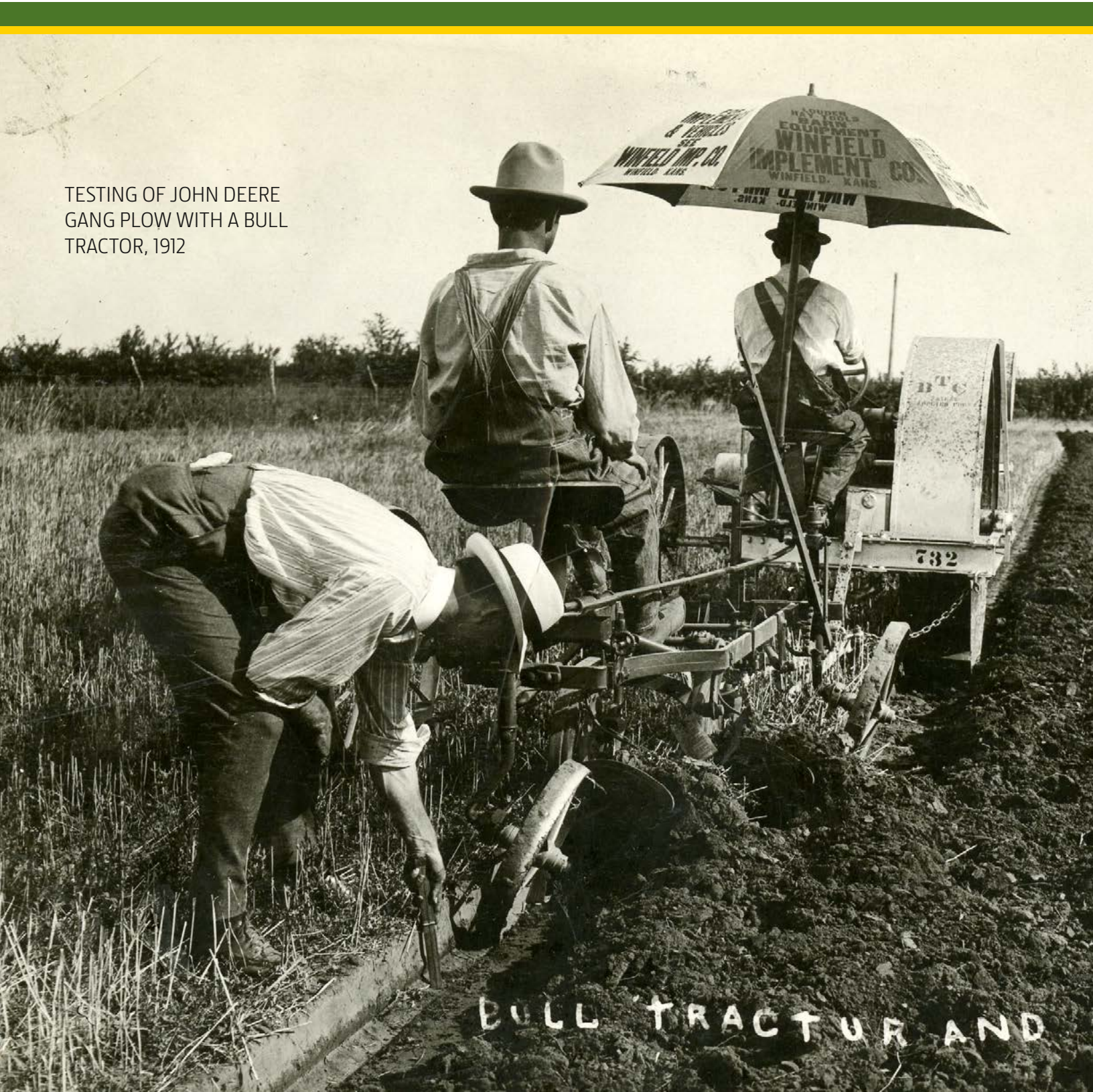
THE PLOWSHARE

History for John Deere Collectors



JOHN DEERE

TESTING OF JOHN DEERE
GANG PLOW WITH A BULL
TRACTOR, 1912



BULL TRACTOR AND

It was a bold move.

Despite assertions from the company's sales managers that the "foundation of the John Deere business is building agricultural implements for use with horses," John Deere purchased the Waterloo Gasoline Engine Company in Waterloo, Iowa, on March 14, 1918. The acquisition not only marked

Deere's permanent entry into the manufacture of stationary engines and tractors, but it would also play a key role in reshaping the company.

In 2018, the company will mark 100 years of John Deere tractors and engines with a variety of global activities. Over the next year, *The Plowshare* will take a closer look at the impact of this milestone event.

Our first installment, in the spring 2017 edition, outlined John Deere's decision to develop a "tractor plow." This month, we look at the burgeoning tractor industry and the challenges companies faced to build, sell, and service the equipment. The final installment in early 2018 will kick off the 100 years of John Deere tractors celebrations.

Welcome to the July Issue

Whoever said "The more things change, the more they stay the same" had a point.

As I look over this edition of *The Plowshare*, I'm struck by the great advances in tractor technology in the 100 years John Deere has been in the business.

Today we have mammoth, 600-hp tractors that can cover acres and acres of land in just a few hours. That's a far cry from the 12-hp "gasoline traction engine" machines of a century ago that John Deere and many other companies were manufacturing.

But regardless of tractor size and power, regardless of the generation, farmers have always shared the same needs – to produce more crops on less ground with less manpower. The tools to do that, however, have changed drastically.

Here's some food for thought. In 1900, it was rare to find tractors on the American farm, with horses and mules the primary source of power. Manual navigation was the norm, unless you had a team of horses that knew what to do. Today's tractors need almost no manual navigation.

In the early 1900s, a farmer used the stars to navigate at night. Today's farmer uses satellites. One-row planters then vs. 48-row seeding monsters now. Hand picking one row at a time to 16-row harvesting corn heads. From oil lanterns to LED lights that can light up the back forty. You get the idea.

Yes, a lot has changed over the past century. It's both exciting and sobering when you consider how farming has changed in just a little over three generations.

Today's farmer is more efficient and productive and ready to feed an ever-expanding world population thanks to hybrid corn seed, genetically-modified-organism soybeans, and drought-resistant wheat strains. It's truly an exciting time for farming technology, and I wish I could look into a crystal ball to see what's around the corner!

And although I'm still a two-cylinder kind of guy, I do like being able to see with LED lighting. I wonder how I can combine those two?

Keep your hand on the throttle and your plow in the ground.

BRIAN HOLST

Historical Equipment Manager
Deere & Company

OUT OF THE VAULT: JD570 MOTOR GRADER

Fifty years ago, John Deere introduced its breakthrough first-to-market articulated motor grader. The JD570 featured front-wheel and articulated frame steering, offering operators more maneuverability than ever before. The JD570 was also the first grader to have a cab and canopy with the rollover protective structure (ROPS) available from the factory.



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JOHN DEERE CELEBRATES 50TH ANNIVERSARY OF ARTICULATED MOTOR GRADER AT CONEXPO-CON/AGG

Under the bright lights of CONEXPO-CON/AGG last March, John Deere's first-to-market articulated motor grader celebrated its 50th anniversary.

The innovative motor grader was a breakthrough for the industry in 1967. The JD570 provided front-wheel and articulated frame steering, giving operators more maneuverability than ever before. Prior to the JD570 introduction, graders of the time were straight-frame machines with solid rear axles and typically only featured front-axle steering that led to poor maneuverability. The addition of frame articulation enabled operators to work more efficiently than any previously built grader, especially in confined areas.

An immense effort went into the design and development of the saddle as well. The result was a design that would allow the operator to place the blade into a

90-degree bank, or any other banking position, in less than one minute without leaving the operator's seat. The saddle was secured to the mainframe with a unique tapered-pin design that was held into engagement by hydraulic pressure — also a grader industry first.

The JD570 was also the first grader, and possibly the first piece of construction equipment, to have a cab and canopy with the integral rollover protective structure (ROPS) available from the factory. The year prior to its development, John Deere introduced the first commercially available ROPS for farm tractors.

To mark the special occasion, one of the first 570 machines ever built, serial number 00025, made the trip from John Deere Davenport Works to Las Vegas, Nevada, for the event. John Deere retirees Don Bagby and Jerry Bode, restored the machine in 2015.

In addition to examining the JD570 up close, customers and visitors to the Deere booth at CONEXPO-CON/AGG could also experience the evolution of John Deere motor graders through an interactive touch screen timeline. The timeline featured archive photos, advertisements, and videos to commemorate the 50-year history.

"While we often focus on the present and future of equipment at CONEXPO-CON/AGG, we wanted to tip our cap to the JD570 and the role it played in the evolution of motor grader development," said Luke Kurth, product marketing manager, motor graders, John Deere Construction & Forestry. "The JD570 is a true testament of innovation and durability, and we can thank it for many of the features we see on G-Series motor graders today including the new 620G and 622G models and the new dual joystick option."



BULL TRACTOR AND JOHN DEERE GANG

John Deere Tractors

The Early Years

Testing of a John Deere Gang Plow with a Bull Tractor, 1912

The Agricultural Tractor Emerges

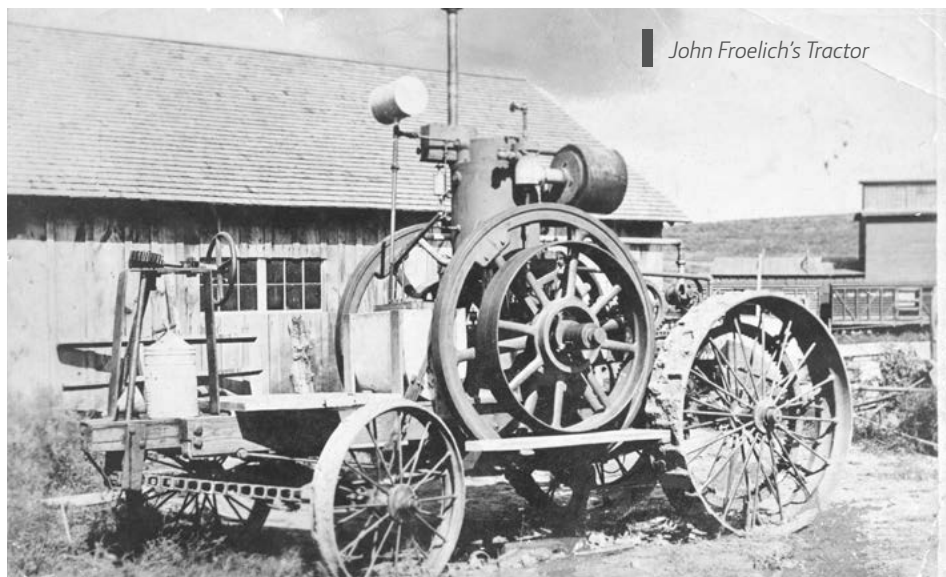
The first operational gasoline tractor can be traced to a town in northeast Iowa in 1892, where 43-year-old John Froelich successfully ran his gasoline powered, vertical, single cylinder engine mounted on the running gear of a steam traction engine. The unnamed machine, which would only later come to be known as a tractor, successfully moved both forwards and backwards.

In its basic form, the Froelich tractor was not an anomaly. Steam traction engines had peppered the American landscape for nearly fifty years, but in the early 20th century the world had become captivated by the automobile. Excitement over the tractor followed the meteoric rise of the automobile industry, which saw more than 500 companies formed from 1900-1910.

Farmers could choose from dozens of kits to retrofit their automobiles and trucks for farm use. With the advantage of vertical integration, automotive manufacturers

were also major forces in early tractor development, and farmers were the earliest adopters of the automobile. In 1915, it was estimated that American farmers bought almost \$200 million worth of automobiles. As one author put it, "The carless Kansas farm is almost a freak." Many of the early tractor manufacturers built their tractors out of automobile parts.

Leaders at Deere took notice of the changing landscape. The technology offered amazing opportunities, but costs were still too high, the machinery unreliable, and the actual needs of farmers weren't well understood. In its early investigations, Deere identified only a small group of successful tractors worth further study.



John Froelich's Tractor

Testing of a John Deere Gang Plow
with an IHC Mogul Tractor, 1912

Several tractor companies emerged in the early twentieth century. Their machines, and fleeting success, highlighted quickly evolving industry demands. In 1906, the Hart-Parr Co. advertised its “tractor”, popularizing the term that replaced the more familiar “gasoline traction engine” moniker.

“Old Reliable” was a 30-60 hp tractor, the fourth introduced by Hart-Parr since 1902. Powered by a horizontal two-cylinder engine, it could burn any type of fuel, including alcohol. It was chain-driven, weighed 2,000 pounds, and reached a maximum speed of 2.3 mph. Larger versions, including the 50,000 pound, 60-100 hp version, became available in 1911 and 1912.

The International Harvester Company developed its first tractor in 1905, and built more than 1,000 over the next five years in a variety of sizes. The largest, at 20 hp and weighing nearly 5,000 pounds, positioned IH as the early sales leader in gasoline powered tractors. Their most successful tractor, the Titan 10/20, sold over 75,000 units from 1916-1922, and helped drive the transition to smaller, lightweight tractors.

In 1914, the Bull Tractor Company sold more tractors than anyone in the United States, an indicator of the coming transition to smaller, affordable tractors. The “Little Bull” was a single-wheel drive, tricycle tractor with 12 hp at the drawbar. It was replaced by the “Big Bull” in 1915. The tractors were inexpensive and simple, but were also undersized, cheaply constructed, and performed poorly.

The Tractor Boom

The first tractor shows were introduced in the Canadian city of Winnipeg in 1908. That was followed in 1913 by the First Annual National Power Farming Demonstration in the United States in Fremont, Nebraska. Year after year, more and more tractor shows were held across the United States.



In 1914, 60 tractors were tested by 30 manufacturers in Fremont. The next year featured 84 tractors by 43 companies. More than 60,000 spectators were in attendance. In 1916, the National Tractor & Thresher Manufacturers' Association created a national circuit, hosting eight events in eight states. Fifty companies

demonstrated 250 tractors in Fremont that same year.

In towns like Peoria, Illinois; Charles City, Iowa; Minneapolis, Minnesota; and Big Rapids, Michigan; manufacturers stumbled over each other to bring their machines to market. Some tried to bridge the mechanization gap with evocative

transitional names like the Iron Horse, the Steel Mule, Pioneer, or New Age. Others spoke to reliability and ease of use, including Neverslip, Old Reliable, Common Sense, or Happy Farmer. Yet others created fictional characters, or evoked Americana: the K.C. Prairie Dog, Plow Boy, Tom Thumb, Waterloo Boy, Wolverine, Chief, and Eagle.

By 1915, demand began to catch up to the potential, and according to *The Farm Implement News* “the efficient small tractor has arrived.”

According to the press, the tractor was the new great hope of the Allies fighting in the war that broke out in Europe in 1914. The United States would not join World War I

until 1917, but a global demand for food finally positioned the tractor as a solution to a real problem—a global need for increased production. Coupled with an impending labor shortage should the United States enter the war, the tractor would continue to evolve.

At John Deere, Joseph Dain was directed to develop his all-wheel-drive concept. The next year, in 1915, chief engineer Max Sklovsky was asked to develop a smaller tractor that could be sold for \$700. The A-2, the first Sklovsky design, plowed its first field on November 20 of that year. Testing continued through December 18 when the ground froze, and Sklovsky went to work on an updated design.

Sklovsky’s next design, the B-2, was described as a “small edition of the Dain machine.” It included a pivot-axle, automobile-type steering, and a four-cylinder Northway engine. The B-2 was tested for eight weeks during the summer of 1916, with regular updates provided to the Board of Directors, who spent much of their time discussing recent market trends and sales price.

George Mixer, superintendent of manufacturing, who was ultimately leading much of the work, didn’t think a high-grade four-cylinder machine was practical for two-plow work. Nor could it burn kerosene, which he saw more and more as a customer requirement. He eventually concluded: “It is probably true that the inclination of the farmer is to buy a tractor that is as much like an automobile as possible.”



Front cover of Theo Brown's copy of the *Tractor Field Book*, 1916.

The United States would not join World War I until 1917, but a global demand for food finally positioned the tractor as a solution to a real problem—a global need for increased production.



Max Sklovsky on his four-cylinder, B-2 tractor.

Disruption: Henry Ford Emerges

During World War I, agricultural and trade publications pushed the tractor as the answer to the world's growing need for food, and the answer for American farms that would eventually experience labor shortages. Total U.S. tractor production in 1917 totaled nearly 63,000 units, with nearly 25 percent built for export.

Enter Henry Ford. World War I gave Ford a profitable incentive to enter the business he had dreamed of since he was a kid. In 1906, Ford began tractor experimentation, largely using Model T parts. His Automobile Plow prototype was sent to his Fair Lane farm in 1907, but testing did not impress Ford's board of directors. His pet project would go into hibernation while he collected competitor machines. Over a ten year period, from 1906 to 1916, Ford spent in the neighborhood of \$600,000 on tractor development, all outside of the operations of the Ford Motor Company.

Ford's arrival was well-known in the industry. Deere President William Butterworth was worried about Ford's resources, not his tractor design. "Ford's active entrance into the tractor business means unlimited capital and resources for marketing..." wrote Butterworth in 1916. Theo Brown, head of the company's experimental department, George Mixer, and others at Deere got a sneak peek at the debut of the "Fordson" in Fremont,

Nebraska, in August 1916. "I got two pictures" wrote Brown, "one of Ford, one of his tractor."

In 1917, the British government ordered 6,000 Fordson tractors. Another 1,000 were ordered by the Canadian government, and in 1918 the Fordson was made available in the United States through government agencies. Very quickly, Ford had a stranglehold over the tractor industry. At \$750, more than 34,000 Fordson tractors, a quarter of industry sales, were sold in the United States in 1918. Ford sold 54,000 units in 1919.

Just as quickly as they were being incorporated, tractor companies began to fail. Makers of the Bull tractor, the industry leader in 1914 and originator of the small tractor concept, was bankrupt by 1918. General Motors purchased the Samson Sieve Grip Tractor Company in 1917, and added the Janesville Machine Co. the following year. General Motors began factory construction, but within two short years liquidated the business.



The first Dain prototype. This photo was taken in the snow in early 1915.

John Deere's Development

At the John Deere Marseilles Works in East Moline, John Deere's tractor development program continued to evolve with versions of a one-cylinder, two-cylinder and four-cylinder tractor developed from 1914-16. In the United States, more than a million farms were still smaller than 20 acres. Government contracts and regulations were in part driving the industry, with tractor sales coming from state-specific allocations that typically required local permits. The behemoths that dotted the western United States and the Canadian prairie were slowly being replaced by much smaller tractors, and the impending oversaturation was the latest concern for leadership at John Deere.

The one-off Melvin design gave way to Joseph Dain's All-Wheel-Drive tractor concept beginning in 1914, which was supplemented by Max Sklovsky's A-2 and B-2 tractors in 1915 and 1916. Deere's decision to build a "tractor plow" continued to be a technological challenge. But the greater challenge was proving to be the quickly changing market and the outcomes of a sales bubble that William Butterworth began to warn about.

Soon Deere would have its first solution. The All-Wheel-Drive would be the culmination of six years of internal development.

In the next issue of *The Plowshare* we will learn more about the development of the John Deere All-Wheel-Drive tractor and its planned roll-out in the summer of 1918.

Out with Waterloo Boy, in with the “H” at the Pavilion

Visitors will notice several changes to the exhibits and displays at the John Deere Pavilion in Moline, Illinois, and the John Deere Tractor & Engine Museum in Waterloo, Iowa, as we prepare to celebrate 100 Years of John Deere Tractors in 2018. The first of these changes include the Pavilion’s display of a 1945 Model “H” tractor owned by John Deere employee Jason Brantley.

Originally purchased by Brantley’s great-grandfather, Henry Elton Seward in Elberon, Virginia, this tractor spent the majority of its life cultivating peanuts and performing utility tasks on the family farm. But like many of the two-cylinder tractors, it would eventually assume a much more important place in family history long after its work was replaced by newer machines. Brantley is the tractor’s fourth generation caretaker and we are proud to share his family story.

To make room for the Model “H,” a 1920 Waterloo Boy tractor, a classic John Deere model, was removed from the Pavilion for minor touch-ups and repairs. This summer, the restored Waterloo Boy will be exhibited prominently in the lobby of the Tractor & Engine Museum. It will remain on display at the Museum throughout 2018 and the company’s historic celebration.





REINVENTING THE WHEEL

CELEBRATING 50 YEARS OF THE JD570 MOTOR GRADER

The JD570 Motor Grader holds a special place in John Deere's history. Produced in Moline from 1967-1970, its industry-leading features, including front-wheel and articulated-frame steering, laid the foundation for the motor grade line of the future.

To celebrate the JD570's 50th anniversary, we went in search of an original machine, and found one that had seen better days.

But thanks to John Deere's very own – Dubuque Works retirees Don Bagby and Jerry Bode – the motor grader was restored.

After 2,200 hours of hard work, Don and Jerry brought the machine back to life – and the result is incredible. The two men sat down to reflect on the experience.

Here's what they had to say:

Don (center) and Jerry (right) join John Deere employee Dave Althaus, manager, Construction & Forestry promotions and events, in front of the restored JD570 Motor Grader at CONEXPO-CON/AGG an international tradeshow for the construction industry.



So how did you get involved with the JD570 restoration project?

Jerry: One day, I ran into a friend and former co-worker of mine who still works at Dubuque Works. He knows I've restored some big machines over the years.

So he asked if I'd be interested in working with John Deere to restore a 570 Motor Grader. And I said yes – but only if I could work with Don (*laughing*).

How did it end up being this particular machine?

Don: John Deere sent out a notice to all its dealers that the company was looking for a 570 to restore. They located one in western Nebraska, and boy, was it in rough condition. When we first looked at it, we didn't know how or where we'd start. But we knew we wanted to work on it.

The JD570 Motor Grader turns 50 this year



The 570 Motor Grader, before and after Don and Jerry restored it.

How did John Deere aid you in the restoration process?

Don: From the very beginning we worked with Greg Swift at Dubuque Works. He was the liaison between the John Deere factory and us.

If we needed something or ran into an issue, the first thing we did was contact Greg. We were always calling to have him check the PDC (Parts Distribution Center) for the availability and cost of parts.

Jerry: We also had a good relationship with Martin Equipment, a local John Deere dealer in Dubuque, Iowa. They were always willing to help. When we were looking for a part that was no longer available from PDC, Martin Equipment would check to see if it might be in another dealer's inventory.

Was it hard to find original parts?

Don: A lot of the parts we wanted weren't available. And some of the parts that were available were too expensive. In those cases, we improvised. For example, we completely rebuilt the steering column using fiberglass. We couldn't get a new

engine hood, so we repaired that on our own. And we completely rebuilt all the wiring harnesses, 28 wires, one wire at a time, with correct color codes, connectors, and not one blown fuse!

Were the original JD570 schematics helpful to your process?

Jerry: No we didn't have them (*laughing*). We took this 570 all the way down to the bare frame and rebuilt it with little more than an old service manual to guide us. We had PDFs of the original parts book and operator manual, too. From those we were able to replicate and piece things together as they were originally. Plus, we documented every disassembly step with pictures so we could see how everything went back together – we had over 700 pictures in all.

Was there a part of the process that proved more challenging than anticipated?

Jerry: Everything we worked on was taken down to bare metal for priming and repainting. We were dealing in 10-plus gallons of code-correct John Deere

construction yellow (TY25678) paint. To ensure even coloration, we mixed each individual gallon, combined them in a large container, mixed it all again, and transferred it back into the original gallon paint cans. It was a lot of hard work, but it's a small price to pay for a good paint job.

Don: On the other hand, what we thought was going to be a big problem turned out to be a fairly easy issue. The 570 featured the "4 legged stag" John Deere logo decal on the fuel tank. But that decal isn't available through John Deere anymore. We weren't going to settle for an inauthentic detail – especially one that important. So we contacted the original decal supplier and arranged for a high-quality reproduction.

Is there anything about the finished product that makes you particularly proud?

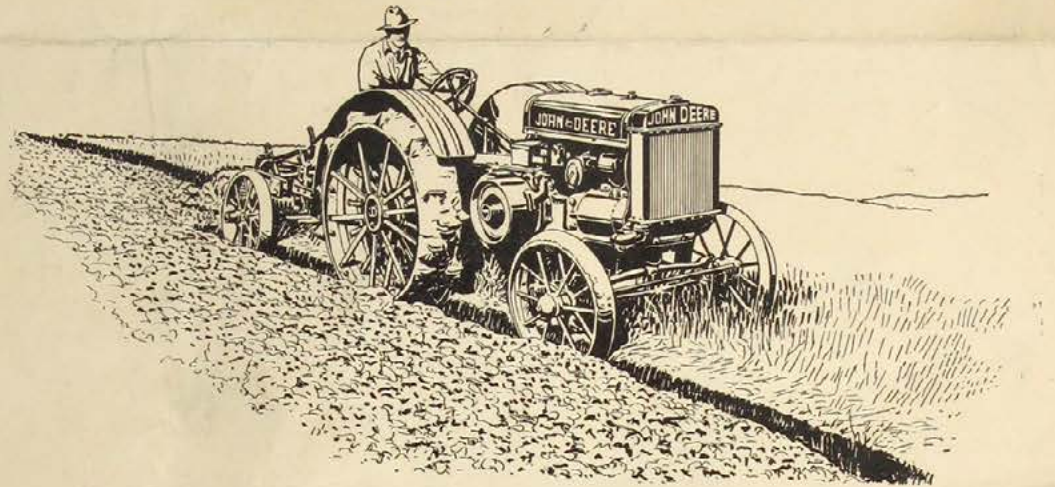
Don: No detail was too small. Everything on this machine works as it should – and we're really proud of that. For example, the original cab defroster fan included a light that indicated fan speed. It didn't do anything when we got it. But now it works like new!

Here's Your Opportunity

TO SEE THE POWERFUL LIGHT WEIGHT

JOHN DEERE TRACTOR

Doing Farm Work



WE WANT YOU TO OPERATE IT YOURSELF

—Get the Feel of Its Great Power

—Know How Easy It Handles

—Know Why It Does More Work with Less Fuel, Oil,

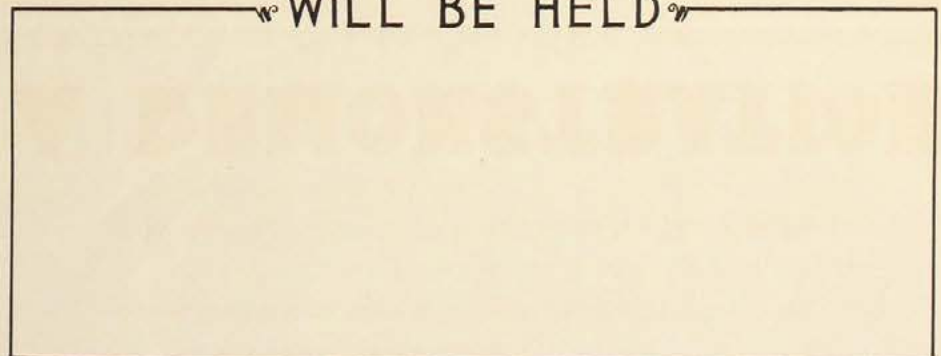
And Upkeep Costs, Than Tractors Hundreds of Pounds Heavier

—Why this Simple John Deere Farm Tractor Is a Money Maker

For Its Thousands of Users.

A DEMONSTRATION

WILL BE HELD



IT WILL PAY YOU TO COME

FROM THE ARCHIVES

This broadside, a popular form of advertising poster, was available to dealers to help advertise demonstrations of the new John Deere Model "D" tractor. This one does not yet include the dealer imprint.