

## What Made the 9N Tractor with Ferguson Implement Hitch a Success

**N**ow that I have celebrated my 52nd anniversary of my 39th birthday, and I have many inquiries as to the above subject, it seems timely that I record my observations having been the project manager of the program. I served my apprenticeship at the knee of Henry Ford I, and his small staff of engineers and master mechanics. Ford had no organizational chart and as a micro-manager assigned projects to his small staff. In 1939 I was given the opportunity to take on the assignment of the development of the Ford tractor incorporating the Ferguson three point hitch principal

of attaching implements.

A bit of prologue is offered to indicate why Henry Ford was willing to take on the project.

Ferguson and David Brown produced several hundred tractors incorporating his hitch idea in England. This project failed because of major failures of the hitch and the cost of the tractor and its implements. Ferguson and Brown's relationship diminished and Ferguson approached several U.S.A. tractor manufacturers to promote his design. These manufacturers were all producing row-crop high clearance tractors with front mounted cultivator. This was before

the advent of herbicides for weed control, and front mounted cultivator were the standard of the industry. The industry and engineering management would not accept the idea of a rear mounted cultivator and plowing without a gage wheel. Ferguson finally convinced Eber Sherman (U.S.A. distributor of the Fordson tractors) to approach Henry Ford and let him demonstrate his hitch.

Henry Ford (my mentor) was a visionary with large financial resources and an insatiable desire to use his resources to the betterment of mankind. He had eliminated the horse and buggy by putting

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'the world on wheels with the Model "T". He also had a keen desire to eliminate animal power from farming. Having been raised on a farm he understood the inefficiency of working with animals and how labor intensive it was. Additionally, he recognized the hardship of caring for the animals after a long day of physical labor. He believed that reducing this labor and using the 10 acres necessary to feed the animals for other productive crops would be of real benefit to the farm community. Therefore a utility tractor to replace animals would be of benefit to the farm community.

Ford engineers Gene Farkas, Karl Schultz, and Howard Simpson had designed the Fordson during World War I and was competitive during the pre-9N concept. The Fordson and competitive tractors were limited in utility functions to replace animals. Ford had a few engineers such as Karl Schultz and Howard Simpson continue to explore new concepts of chassis design. None of these fulfilled his objectives. Ferguson was a master demonstrator and displayed the benefits of his implement control to Henry Ford and a small group. Ford was so impressed with the demonstration that he proposed a handshake agreement with Ferguson that he would design and develop a tractor incorporating the hitch idea. The small Ford management staff were not a part of the decision-making process and were at a disadvantage in future negotiations with Ferguson. As project manager, after the agreement I had more personal relations with Ferguson than Ford management.

In the development of the 9N tractor, Schultz and Simpson had

input as to the chassis concept. I also developed a tractor experimental design termed the 9R that included a worm-driven rear axle similar to the Fordson. This was not accepted and I designed a transmission and rear axle using many truck components. This offered lower cost and fewer new parts for dealerships. The David Brown concept was not acceptable for the utility tractor concept that would be used for tillage and cultivating row crops. Further, the design with its unique hitch concept would make it possible for both young people and the farmer's wife to operate.

The design of the tractor was assigned to me and a staff of nine engineers. Ferguson was given responsibility to oversee the design with his assistants, Chambers and Sands. Ford engineers also had input from Ford, Sorensen (Chief Operating Officer), and Sheldrick (Head of Project Engineering). The objective was to replace the 19 million animals being used for farm production and not to copy any competitive tractors. Additionally, the tractor should not cost more than a team of animals, their harnesses, and the ten acres of land it took to feed them. Ford indicated that if we were successful it would be of real value to the farming community.

Ford was an industry leader in design and production of low-cost products. This talent played an important part in developing a low-cost tractor concept. Further, using many high-production car and truck components reduced cost and tooling requirements. The tractor followed Ford's previous success in not offering any options, such as his Model T where you

could only have it in black. My instructions included designing a tractor to ship fourteen identical units in a box car, which would also reduce cost. This established the overall length of the tractor and was a major concern in providing front-end stability with hitch mounted implements. This resulted in the design of light-weight implements just clearing the tire and power-take-off.

In pricing the tractor, the lowest cost tractor on the market was an Allis Chalmers Model B. Ferguson convinced Ford that the Model B could be a competitor. The A.C. Tractor had a hand crank and simple drawbar attachment, and very basic sheet metal. The Ford 9N model had a safety starter, fenders, hydraulic hitch system, and much more costly sheet metal. The retail price was established at \$585 before Ford knew what the cost would be. The tractor production was placed in the car manufacturing facility; therefore actual costs were not available. When tractor production was moved to its own facility and actual costs determined, Ford management found they were selling the tractor at a loss to Ferguson. Management didn't want to admit to Henry Ford that they could not meet cost objectives, which caused strained relations with Ferguson. Ferguson suggested that he would hire a consulting group to review Ford's design and manufacturing, and make suggestions for cost reduction. Unfortunately I was asked to give Ferguson copies of Ford's design details and the operation sheets to produce the product. This

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was done in good faith. Ferguson never returned with suggestions but used Ford drawings and manufacturing techniques to explore having other manufacturers such as Bendix to produce a tractor for him. When Bendix CO.E. Breech became Ford Motor Company CO.E., a decision was made to stop providing Ferguson with a tractor. Ferguson took Ford's design drawings to produce the Ferguson TE20 tractor.

Ferguson was to have developed implements for the three-point hitch by introduction date of the tractor in June, 1939. However, the implements he had provided in England were not suitable for the U.S.A. market. My staff had to design and develop a unique plow manufactured by Ford of cast steel and low weight. Ford also developed cultivator, mowing equipment, planters, and disc harrows because the tractor would not sell without proper equipment.

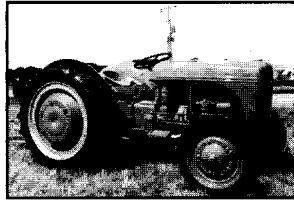
The low cost of the tractor and equipment provided the consumer with a tractor and basic equipment at a price lower than of the base competitive tractors. Inasmuch as the Ford tractor required new implements, its marketability would have been questionable had the cost been excessive.

### What made the 9N tractor a success?

Henry Ford being a visionary without profits as an objective, was the only person willing to accept the challenge of a new concept to help farmers be more productive. The expertise of his small engi-

neering and manufacturing staff produced a design and manufacturing technique to advance the industry. This was done in a six month design-to-production time frame. Without the direct input of Ford and his small management staff, the program would have been a two year project.

The product concept permitted



the established marketing and distribution system of Eber Sherman (Fordson tractors and mostly Ford car dealers) to offer the 9N tractor with small investment. Many parts of the tractor were already in the dealer inventory, and at very low cost. The war period shut down major production of the tractor, which permitted the farm public to become acquainted with the advantages of the new concept.

When I returned from helping the U.S.A. Department of Defense design the Ford Jeep and Sherman Tank, Henry Ford was not in good health and current management was not friendly with Ferguson. My group updated the basic 9N-2N model with many feature advantages and introduced the Model 8N, after the break with Ferguson. The post war "seller's market," with a new product introduced by the Dearborn Motor Distributors, set record production sales of 100,000

tractors per year. This resulted in Ford supplying twenty-five percent of the total U.S.A. tractor sales. This was most unusual, as Deere, International Harvester Company, Allis Chalmers, Oliver, Case, and others, with many model sizes, shared the balance of the market.

In working with the chief engineers of these competitive companies on standards for the industry, it was pleasant to remind them that in 1939 they collectively agreed that farmers would not accept the concept of tractors with rear cultivation and a plow without a depth wheel. It is noteworthy that after the patents expired in the late 1950s, that all tractors worldwide, have now adapted the concept.

I left the Ford Motor Company in '1959 to help John Deere update the older two-cylinder models. The new generation of tractors of Deere in the 1960s advanced the features of hydraulic controls of all functions, better operator station and ergonomics to enhance operator comfort. As Deere's first Director of Worldwide Tractor Engineering, my staff introduced the first industry quiet, air conditioned cab and powershift transmissions. These advances finally placed Deere in a leadership position.

Any successes I have had are directly as a result of having been an apprentice to Henry Ford I, and his visionary philosophy of "thinking outside the box:'

-Harold Brock  
Waterloo, IA