

The Three Wheelers

By Ian M. Johnston, the Tractor Historian

The term “three wheeled tractors” is generally associated with the tricycle row-crop tractors, first introduced by International Harvester Co. in 1924 and quickly replicated by all other American tractor manufacturers. But there were numerous tractors produced that were never intended as row-croppers, which also embraced the three wheel configuration. Five examples of these technically interesting early machines are examined in this article.

1903 IVEL

Ivel tractors were designed and built by Dan Albone at his bicycle manufacturing workshop, located in Biggleswade, Bedfordshire. Credited as being Britain’s first volume selling tractors, considerable numbers were exported to Australia, South Africa, the US and various European nations.

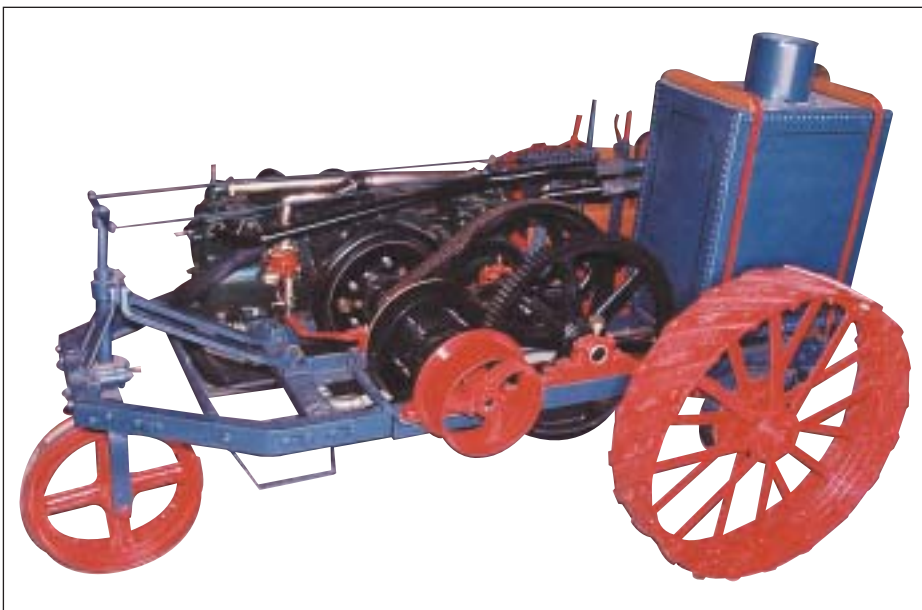
Undoubtedly the success of the Ivel was due to its diminutive dimensions, when compared with the majority of early tractors that were almost exclusively heavyweights and built along the lines of steam traction engines. Albone designed his tractor to suit the acreage of a typical British arable farm and occupy a space no larger than a Suffolk Punch draught horse. Accordingly it was affordable and unlike most self propelled



The 1903 Ivel, owned by NSW grain farmer Norm McKenzie, is Australia’s oldest tractor and one of only six remaining Ivels in the world. The photo was taken at the 2003 Rusty Iron Rally, an annual event held at Macksville, NSW. The Ivel was celebrating its 100th birthday. (Photo I.M.J.)

vehicles at the turn of the twentieth century, it was efficient and reliable!

Drive for the two rear wheels was provided by an 18 hp water cooled engine, featuring two horizontally opposed cylinders with atmospheric inlet valves. A cone clutch was connected to a single forward and reverse gear by a segmented leather belt.



This photo of the Ivel shows the segmented belt drive between the engine and transmission. The large tank on the operator’s right is the water hopper for the thermal siphon cooling system. (Photo I.M.J.)

1908 SAUNDERSON TYPE A

H.P. Saunderson and Co of Ulstow, Bedfordshire, introduced their astonishingly advanced design Type A tractor in 1908, featuring a clever all-three-wheel drive configuration.

The single rear wheel was driven by a balance gear from the front drive differential shaft. Neither of the two front wheels could slip unless the rear also slipped. As no wheel followed in the footprint of another, the tractor was rendered almost bog proof.

The Type A was one of the world’s first tractors to be fitted with modern type Ackerman steering, and this all the more remarkable considering the front wheels were drivers! A fully enclosed gearbox provided three forward and reverse gears with a shuttle directional control.

The four cylinder petrol/kero engine was water cooled by forced circulation and incorporated a large capacity fan cooled radiator. The engine was of the “square” design having a bore and stroke of six inches, with overhead inlet and side exhaust valves. It developed 50 bhp at an unfussed 900 rpm. A battery powered a high tension trembler coil for starting and a magneto then provided the spark to the two plugs per cylinder.

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Weighing in at 3.5 tonnes, this three-wheel-drive masterpiece produced a remarkable drawbar pull of 18 tonnes at seven mph on a hard level surface. It also had a rear cart body and provided a second seat enabling a passenger to be safely accommodated.

1915 BIG BULL

The three wheeled Big Bull had only one driving wheel! This stood five feet tall and was positioned on the right hand side, enabling it to run in the furrow whilst ploughing. It tracked the single front steer wheel, which also ran in the furrow. The left side rear wheel served purely as a balancing attachment.

A product of the Bull Tractor Co of Minnesota, US, the Big Bull was the firm's second attempt at tractor production and was rushed onto the market following the dismal sales and performance results of the earlier Little Bull.

Financial problems plagued the company. Initially the tractors were produced under an arrangement with the Minneapolis Steel and Machinery Co, which produced its own Twin City tractors.

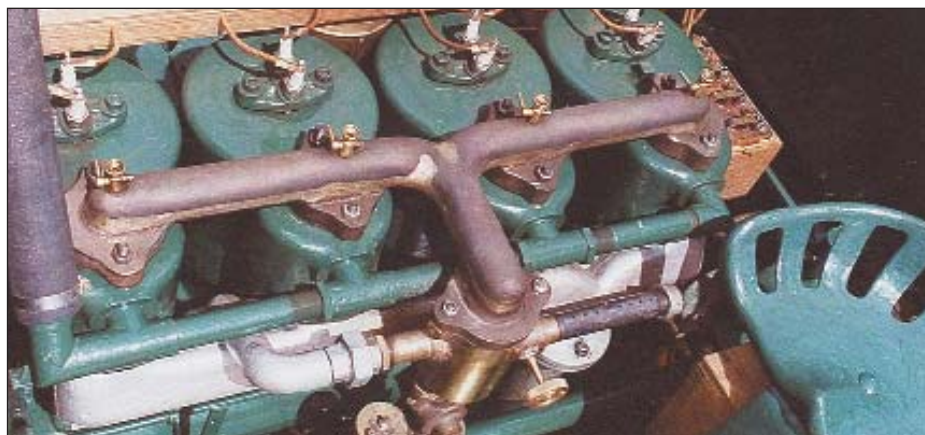
When this arrangement was terminated in 1917, the Toro Motor Co, also of Minneapolis, and which had been producing engines for the Big Bull, took over the manufacturing rights. Despite financial, administration and technical problems, over 15,000 Bulls were made until production ceased in 1920.

The engine fitted to the Big Bull was a

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One of two remaining Saunderson Type A tractors in the world, this unit has been restored by Newton Williams (at the controls) and may be inspected at the Pioneer Settlement, Swan Hill, Victoria. (Photo I.M.J.)



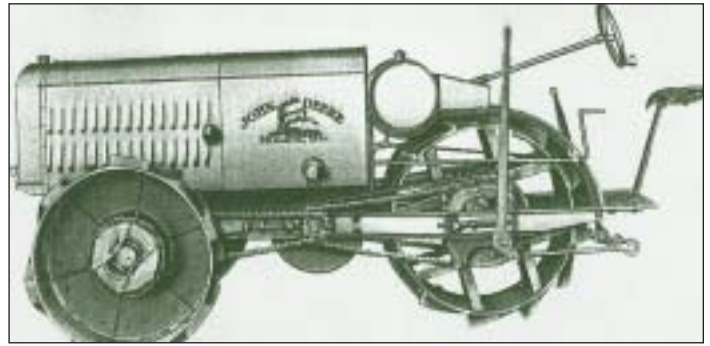
A view of the Saunderson 50 hp four cylinder engine with its two spark plugs per cylinder. Note the overhead inlet and side exhaust valve manifolds. The fuel system is pressurised with a bicycle pump prior to starting! (Photo N. Williams.)



A splendidly restored Big Bull being driven by Norm Johnston. In Britain the tractor was imported by Whiting's Harvesting and Implement Co and marketed as a Whiting-Bull. (Photo I.M.J.)



Considerable effort is required by Norm Johnston to crank the Big Bull's 20 hp engine with its two horizontally opposed cylinders. Note that the right hand rear wheel, through which the crank handle is inserted, is purely an idler balancing wheel. (Photo I.M.J.)



This Deere and Co archival photo shows the three-all-wheel drive Dain ploughing grassland on a North Dakota farm — circa 1919. Note the hazardous position of the operator! A fall from his perch in front of the plough would likely prove fatal.

(Photo courtesy Deere and Co archives)

In this photo, clearly visible are the chains which provided the drive to the two front and single rear wheels of the John Deere Dain. The engine under the neatly styled bonnet was a McVicker four cylinder water cooled of 382 cu inch capacity, developing 12 drawbar hp and 24 bhp.

(Photo courtesy Deere and Co archives)

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horizontally opposed two cylinder unit which produced 20 belt hp at 720 rpm. A single forward and reverse gear provided a work speed of 2.5 to three mph depending on engine rpm.

The Big Bull is not remembered fondly by old timers who were obliged to wrestle with its imprecise steering, awkward controls and reliability problems.

1916 JOHN DEERE DAIN

It is a little known fact that Deere and Co of Moline, US, produced a three-all-

wheel drive tractor in 1916, two years prior to the firm's acquisition of the Waterloo Boy tractors.

Owing to the complexity of the design, it took another two years of overcoming teething problems before the tractor was finally released in 1919. Only 100 were made, all of which were sold through a South Dakota dealership.

The Dain was named after the founder of the Dain Manufacturing Co of Iowa, which was acquired by Deere and Co in 1911. Joseph Dain, highly respected as an innovative engineer, drew up the

design for the three-wheeled tractor.

The engine selected by Dain for his tractor was a product of the McVicker Engineering Co of Minneapolis. The big slow-revving four cylinder unit had a capacity of 382 cu inches and developed 24 hp. A complicated layout of drive shafts, universal joints and chains provided the drive to the three wheels. It was possible to shift up or down through the two forward gears whilst on the move and under load, without clutching.

But the Dain was overly complex, uncompetitively priced and suffered from

constant breakdowns. It was discontinued in 1919, leaving Deere and Co to concentrate on the production and marketing of its highly successful Waterloo Boy range.

1917 SAMSON SIEVE GRIP

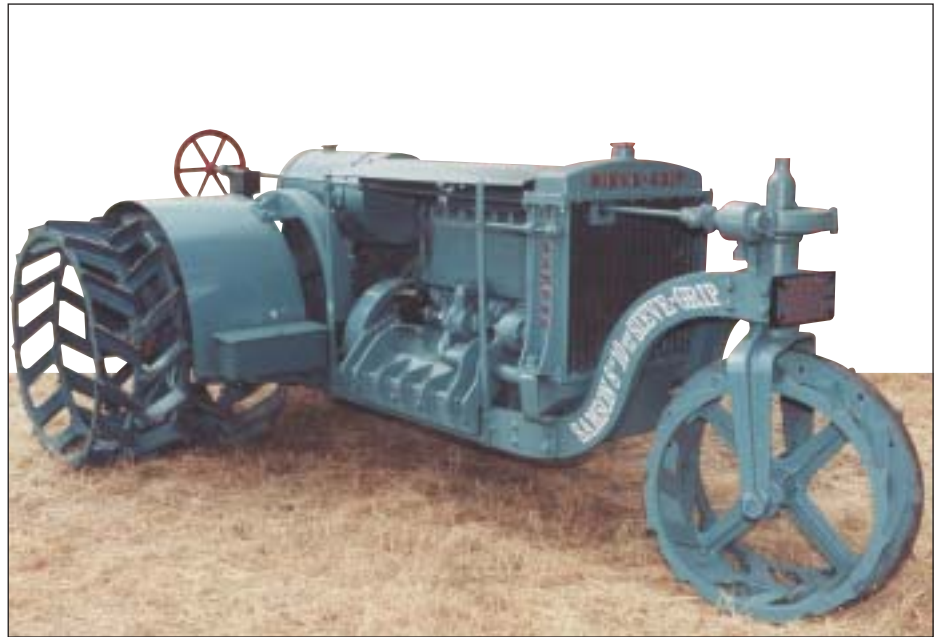
The Samson Sieve Grip Tractor Co of Stockton, California, produced a magnificently engineered three-wheel tractor with an inbuilt degree of reliability and endurance, uncommon in its era.

The two rear driving wheels were fitted with an exposed ring gear which was driven by a pinion extending from the single speed gearbox. The centrally positioned front steer wheel was supported on a gooseneck frame and, as it was out of sight of the operator, an elevated indicator arrow was provided to point the direction of the wheel.

The term "Sieve Grip" was on account of the patented open slatted wheels, which prevented a build up of mud or clay. (This was a constant problem with conventional steel flat surfaced wheels fitted with grip lugs).

The side valve engine, suspended low in the chassis, had four upright cylinders cast in pairs. It developed 25 bhp at a leisurely 650 rpm. A Holly carburettor and a Bosch Duplex high tension magneto were standard items.

Despite the fact that the appearance of the Samson was suggestive of a "beast" to drive, in actual fact all the controls, including the steering, were light, silky and precise. But like most early American tractors,



Pictured is a Samson Sieve Grip which was originally sold into New Zealand, but now is a jewel in the Eric Howe collection in Tasmania. Note the steering shaft passing through the radiator core. Also note the size of the exposed engine flywheel. (Photo I.M.J.)

its fuel consumption was horrific. But this was perhaps of little regard as the price of kerosene in America was only a few cents a gallon.

The Company was taken over by the General Motors Corporation in 1918, which was desirous of having a tractor in its range of vehicles, with which to compete against Henry Ford's sales leading Fordson. Various models of Samson tractors were produced by General Motors, until the line was discontinued in 1922.

IAN'S MYSTERY QUIZ

QUESTION: Can you identify the make of engine and the tractor in which it was installed ?

CLUE: This question is so difficult — a clue wouldn't help!

DEGREE OF DIFFICULTY: Impossible — unless you are a sort of tractor Einstein! Or, if you paid attention whilst reading my last book.

ANSWER: See page 88.



This rear view of the Samson Sieve Grip illustrates the patented design of the driving wheels. Although appearing perhaps elementary in their construction, the Samson wheels with their open slats were unique, as they did not clog with mud or clay, a common problem with conventional steel tractor wheels. (Photo I.M.J.)

