

# Part 1. Timeline in the Development of Agricultural Tractors and Power Units

*Note: the italic letters at the end of each entry refer to the references.*

- 1705** Atmospheric steam engine invented by Englishmen Thomas Newcomen, 1663-1729, with John Calley (or Cawley), ??-1725, and partnered with Thomas Savery, c. 1650-1725, for its application. *EB EWB GI MWBD*
- 1769** Steam, three-wheeled, road wagon built and demonstrated in France by Nicolas J. Cugnot, 1725-1804, first used for moving artillery pieces. *DDI EB GI AT WOI*
- 1769** Steam engine using a separate condenser patented by Scot James Watt, 1736-1819, who is often credited as the inventor of the steam engine. This engine was manufactured from 1774-1806. *ATEN EB EWB HT MWBD*
- 1781** Steam engine that provided means of changing the motion of the piston to rotation for driving machinery patented by James Watt, 1736-1819. *EB*
- 1791** Gas engine using coal gas awarded British patent to John Barber of England. *HFP*
- 1792-1794** Steam carriage built by William Murdock, 1754-1839, an associate of James Watt, 1736-1819. *EB*
- 1794** Internal combustion gas engine using piston and cylinder patented in Great Britain by American Robert Street, 18th century, the gas being hydrogen-air mixtures or “illuminating gas,” a vaporized gas from oil or coal. *EB HFP MWBD*
- 1799** Coal gas engine that compressed a mixture of gas and air before ignition patented and constructed by Frenchman Philippe Lebon, 1767-1804. *HFP HI MWBD*
- 1801, 1802** Practical steam (vertical boiler) vehicle (carriage) made by Englishman Richard Trevithick, 1771-1833. *ATEN SWABI AT*
- 1803-1829** Several people in England and France worked on development of steam powered locomotives. The most successful appears to have been the Rocket built by George Stephenson, 1781-1848, in England, and purchased for use in the USA. *ATEN EB SWABI*
- 1808** Steam power used for running stationary equipment by Oliver Evans, 1775-1819, Philadelphia, PA, earliest date recorded in USA. Twenty-two manufacturers listed for period 1808-1855. *NC6:65 SPAF*
- 1812** The first locomotive, the Trevithick, built by Englishman Richard Trevithick, 1771-1833. *DID SWABI*
- 1815** An arrangement patented for attaching connecting rods by George Stephenson, 1781-1848, providing a major advancement in propulsion. *BDPE GI MWBD*
- 1818** Earliest stationary steam power used for agricultural purposes made by Boulton and Watt, Ltd. (Matthew Boulton, 1728-1809), Birmingham, England. *DNB HT EWB SPAF*

- 1825** “Universal railway” leading the way for tracklaying traction engines, invented in England by George Cayley, 1773-1857, followed by others in England, and James Boydell, who invented and patented tracklaying power units. *DID EB WOI*
- 1829** Earliest date of steam use for agricultural field operations. This was a boiler on wheels, not an agricultural field traction device, that used cables to move equipment across a field. *SWABI WOI*
- 1832** Stationary steam engines, used for agricultural and other purposes, manufactured by James P. Allaire, 1786-1858, of New York, NY. *NC24:355*
- 1833** Cable plowing machine (powered by stationary steam boiler on wheels, moved by horses) invented and patented in USA by E. C. Bellinger of South Carolina. *ATEN*
- 1840** Portable steam engine (boiler on wheels) built by Hoard and Bradford Co., Watertown, NY. *SPAF*
- 1849** Among the first portable steam “farm engines” produced in the USA was the Forty-Niner, built in Philadelphia by A. L. Archambault. From 1849-1915, there were 108 portable steam engine manufacturers in USA and Canada. *ATEN SPAF*
- 1852** M. & J. Rumely firm started by Meinrad Rumely, 1823-1904, who purchased John Rumely’s share in 1882, incorporating as M. Rumely Co. in 1887, in La Porte, IN (see 1863). *PHAT*
- 1854** Steam plowing traction engine exhibited in England by Englishman John Fowler, 1826-1864, of Woolston, Lincolnshire, UK. *DID DUB*
- 1856** Most recognized person for early development of steam locotractor was Frenchman Monsieur Albaret. *SWABI WOI*
- 1856** Steam traction engines tried unsuccessfully on the American farm. *AH(25Oct1951) CLAA*
- 1858** Traction engine built by Englishman Thomas Aveling, the steam boiler made portable by Clayton & Shuttleworth, followed by a traction engine with all-gear drive in 1870. *DID AT*
- 1858** One of the first successful “steam plows” produced in the USA, patented in 1859, by John W. Fawkes, Christiana, PA. Earlier steam units were used for powering a cable that moved implements. *AH33(1959) ATEN FPMA HFP*
- 1858** Chain drive added to the development of an otherwise ordinary engine that aided the development of the steam traction engine. *AT*
- 1858-1860s** Portable self-moving steam traction engine developed by Englishman Thomas Aveling (see 1856). *DID AT*
- 1859** First commercially successful oil well drilled near Titusville, PA, by Edwin L. Drake, 1819-1880. At this general location natural gas resources discovered. *DUB EB*
- 1859** Commercially successful internal combustion gas (coal gas or illuminating gas) engine (two cycle, one cylinder) developed (pat. in 1860) by Belgian-French Jean-Joseph Etienne Lenoir, 1822-1900, Paris, France. *AGE GLSB HFP HI MWBD WOI WWWS*

**late 1850s** Gasoline invented after the discovery of oil and was a byproduct of kerosene production. *EB WOI*

**1863** Rules for four-cycle internal combustion gas (coal gas or illuminating gas) engine operation presented by Frenchman Alphonse-Eugen Beau de Rochas, 1815-1893 (see 1877). *BDPE WOI WWWS*

**1863** Early steam engine built by M. & J. Rumely Co., La Porte, IN (see 1852). *ATEN*

**1865** Aultman and Taylor Machinery Co. founded in Mansfield, OH built steam engines and threshers; Advance-Rumely Co. obtained company assets in 1923. *PHAT*

**1866** Originator of revolving track plan of locomotion using a 10 hp steam engine, followed by a patent in 1867, first used for road building through a swamp and for railroad construction, by Jesse S. Lake, 1825-1896. *NC20:228 SWABI*

**1867** Early form of internal combustion engine invented (patented in 1877) by Germans Nikolaus A. Otto, 1832-1891, and Eugen Langen, 1833-1895. *MWBD WOI*

**1870** All gear-drive traction engine, claimed to be first, built by Englishman Thomas Aveling. *DID*

**1870ff.** Formative years for the traction engine, initially with vertical boiler and resilient rubber tires, invented by Scot Robert William Thomson, 1822-1873. *AT*

**1870** Farm steam traction engines manufactured in the USA and Canada from 1870-1920. There were 65 manufacturers of farm steam traction engines. *SPAF*

**1870** Case Steam Engine No. 1, built by J. I. Case Threshing Machine Co. (Jerome I. Case, 1819-1891), Racine, WI. *ATEN EASTE FPMA SPAF*

**1870-1888** Road steamers (traction engines) built by Mr. Thomson in Scotland. *AT*

**1870** Three thousand steam cable plowing outfits in England and four in the USA. *EASTE*

**1871** Traction engine steam motor for farm and road patented by R. C. Parvin, UK. Parvin produced a steam plow in 1873, consisting of an integral unit of a plow and steam traction engine, a type of tracklaying. *ATEN FPMA*

**1872ff.** Hundreds of small gas engines developed and marketed, many by equipment manufacturers and other small businesses, in 1<sup>1</sup>/<sub>2</sub>, 2, 3, 5, 6, and 8 hp sizes, and used on the farm or home for driving pumps, generators, separators, etc. *AGE*

**1872-1876** Gasoline (petrol) carburetor developed by George B. Brayton, 1830-1892, used to regulate supply of fuel to vapor engines in 1883. *BDPE HT*

**1876** Considered the birthdate in USA of the steam traction engine, replacing the steam plow. One of the first commercially successful steam traction engines built by C. & G. Cooper Co. *AST EASTE*

**1876** Gas engine built by Scot Dugald Clerk, 1854-1932. In 1881 he patented a two-stroke gas engine. *DUB EB*

**1877** Germans Nikolaus August Otto, 1832-1891, and Eugen Langen, 1833-1895, received the first USA patent for a commercially successful four-cycle combustion gas engine with a piston and cylinder. *HFP WOI*

- 1877** Self-propelled traction engine produced by J. I. Case Threshing Machine Co., Racine, WI. *OYC*
- 1879** Compound portable traction steam engine developed by Richard Garrett & Son, Liverpool, England. *GSTR AT*
- 1880-1900** Hundreds of manufacturers devoted to building steam traction engines (later called tractors), evolving from steam power to internal combustion engines with various fuels (distillate, diesel, kerosene, gasoline, propane). *ATEN*
- 1880** Westinghouse Co., Schenectady, NY, began building steam traction engines. *EASTE SPAF*
- 1881** Atlas traction engines with chain drive, steam powered, steered by horses, built by Atlas Engine Works, Indianapolis, IN. *ATEN*
- 1884** Steam turbine with condenser (first practical unit) introduced by Charles A. Parson, British, 1854-1931, followed by companies to manufacture turbines. *BDPE HT WWWS*
- 1885** Magneto ignition introduced by F. Forest. *HT*
- 1885** Pressure-ignited internal combustion engine patented in 1892 by German Rudolf Diesel, 1858-1913. Working with Krupp firm built first successful diesel engine in 1896. *ATEN BDPE MWBD WOI*
- 1886** Peerless Engine and Steam Lift Plow built by Geiser Manufacturing Co., Waynesboro, PA. *ATEN*
- 1887** Steam-powered traction engine (later called tractor) patented and manufactured by Daniel Best, 1838-1923, and after 1897 with his son Clarence L. Best, 1875-1951, that became Best Manufacturing Co., CA. Also invented a combined steam-driven harvester and thresher. The company sold to Holt Manufacturing Co. in 1908. *FFFR NC40:544*
- 1889** Geiser Peerless steam engine second only to J. I. Case Co. in the number of engines built during the age of steam, Geiser Manufacturing Co., Waynesboro, PA (George B. Geiser, 1870-1938). *FPMA NC45:597*
- 1889** Gas(oline)-powered internal combustion traction engine built by Charter Gas Engines Co., Chicago, IL (patented by John Charter in 1887) with the power unit built on a Rumely steam traction engine frame, called a Burger traction engine, believed to be named after the developer, but unit could not pull single plow. *ATEN BF82 STF WABI*
- 1890s** Steam traction engines becoming popular in the USA, many built by George White & Sons Co., Ltd., London, Ontario, Canada. *EASTE*
- 1891** Hornsby-Ackroid oil engine patented and originally manufactured by Richard Hornsby & Sons of Grantham, England. *EAM*
- 1891** Steam traction engine built by Avery Co. Peoria, IL (originally called Avery Planter Co., founded in 1874) (Robert H. and Cyrus M. Avery, Galesburg, IL). *EASTE*
- 1891** Massey-Harris Co., Ltd., formed in Canada, existed until 1953, became Massey-Harris-Ferguson Co., Ltd., and became Massey-Ferguson in 1958 (also see Implements timeline). *PHAT*
- 1892** One of first practical gasoline traction engines (20 hp) that was an operating suc-

cess; single cylinder, included a clutch, and could be propelled forward and backward. Built by Van Duzee Gas and Gasoline Engine Co., OH, for John Froelich in Iowa; the forerunner of the Waterloo Boy traction engine later manufactured by John Deere & Co.

*ATEN FTA HYMP OYC SA247(1982) WABI WOI*

**1892** Design and drawings for first gas(oline) traction engines for J. I. Case Threshing Machine Co. by David Pryce Davies, 1870-1948, first used to power a thresher. At the time J. I. Case was the largest manufacturer of steam engines in the world. *FTA NC36:89*

**1892** Engine built to ignite fuel by heat of compression patented by Rudolph Diesel, 1858-1913, first designed to use powdered coal but later used liquid fuels. *ETP*

**1893** Electric traction engine produced by Crompton & Co., Great Britain. *BF03*

**1893** Waterloo Gasoline Traction Engine Co. incorporated in Waterloo, IA, by John Froelich; company reorganized as Waterloo Gasoline Engine Co., Waterloo, IA, in 1895 as one of several leaders in developing and building gasoline agricultural traction engines. The first prototype built for John Froelich in 1892 had a 20 hp engine built by Van Duzee Gas and Gasoline Engine Co., OH. The Froelich traction engine set the stage for the Waterloo Boy and the John Deere line of traction engines. *ATEN FTA WOI*

**1895** Case side-crank steam engine designed by David Pryce Davies, 1870-1948, after which he joined the Edward P. Allis Co. in 1898. He joined the Allis-Chalmers Co. in 1903, and in 1910 returned to the J. I. Case Co. to design traction engines and develop gasoline engines. *FTA NC36:89*

**1896** Diesel engine built in St. Louis, adopted for the agricultural traction engine, patented in USA in 1898 by German Rudolf Diesel, 1858-1913. *ETP HFP*

**1896** First commercially manufactured gasoline truck by Daimler Co. (German Gottlieb Daimler, 1834-1900). *BF82 HT*

**1897** Oil-fired Agricultural Locomotive, 18 hp, manufactured by Hornsby and Son, Grantham, Great Britain. *FTA*

**1897** Hart-Parr Co. organized to build traction engines, Madison, WI, then reorganized and moved to Charles City, IA in 1901. *OHP*

**1898** Huber Manufacturing Co., Marion, OH, which had been manufacturing steam traction engines, entered the manufacture of gasoline traction engines. *ATEN*

**1899, 1905** Rumely steam-powered traction engine using straw burner, available generally in the range of 15 to 25 bhp, as tested at the Winnipeg trials (original date not located) by M. Rumely Co., LaPorte, IN. *ATEN*

**1900** White steam automobile sold, followed by steam trucks, designed in 1899 by Rollin Henry White, 1872-1962. He entered the White Sewing Machine Co. founded by his father in 1858 and led the Cleveland Tractor Co. that perfected the Cletrac crawler tractor in 1915. *NC52:362 NCD:128*

**c. 1900** Straw burning portable engine manufactured by Ransomes, Sims & Jefferies, Great Britain (UK). *EAM*

- 1901** Patents on self-laying track traction engine issued to Alvin O. Lombard, 1856-1937.  
*NC35:250*
- 1901** Allis-Chalmers Co. formed by Edward P. Allis Co., Milwaukee, WI (company named following the death of Edward P. Allis, 1824-1889) and William W. Allis, 1849-1918, and William J. Chalmers, 1852-1938.  
*CDAB*
- 1901** Mogul steam traction engine built by C. Aultman Co., Canton, OH, purchased by International Harvester Co. in 1910, redesigned and marketed as a 45 hp gasoline tractor. Used the name Mogul for one of their series of internal combustion engine powered tractors.  
*ATEN AST SPAF*
- 1902** British traction engine industry pioneered by Ivel Agricultural Motors, Ltd., Biggleswade, UK, with the manufacture of large scale traction engines (24 hp); petrol (gasoline) fueled; Ivel traction engine, three-wheeled, invented and patented in 1901 by Daniel Albone, c. 1860-1906.  
*BDHT BDPE BF82 EHT EAM SWABI*
- 1902** After several years of successful innovations using steam, Charles W. Hart, 1872-1937, and Charles H. Parr, 1868-1941, built first factory in USA to manufacture gasoline traction engines driven by an internal combustion engine, adapted the internal combustion Otto cycle engine that could propel farm equipment; formed Hart-Parr Co. in 1905, specializing in manufacture of tractors; used the word "tractor" beginning in 1906 instead of "gasoline traction engine."  
*ATEN FTA GEA SA247(1982) HL1999 HYMP WABI*
- 1902** Hart-Parr No. 1 tractor with internal combustion two-cylinder engine, 17-30 hp. *ATEN*
- 1902** International Harvester Co. formed with the merger of McCormick Harvesting Machine Co. (originally Cyrus Hall McCormick, 1809-1884, followed by his son, formed in Chicago, IL in 1847); Deering Harvester Co. (formed in 1883 by William Deering, 1826-1913); Warder, Bushnell, Glessner & Co.; Milwaukee Harvester Co.; Plano Co.; and Osborne line of farm machinery. Other acquisitions followed.  
*FIMA NC35:9*
- 1903** Hart-Parr No. 2 tractor with internal combustion two-cylinder horizontal engine, originally in two sizes, 17-30 hp and 22-45 hp at 280 rpm.  
*ATEN*
- 1904** Self-laying track started to replace wheels for steam traction engines, by the Stockton Wheel Co. (which became the Caterpillar Tractor Co., Peoria, IL, in 1925), based on the work of Benjamin Holt, 1849-1920, Daniel Best, 1838-1923, and associates. Some of the rights for self-laying tracks by David Roberts (UK) sold to Benjamin Holt (USA) who built crawler traction engines (see 1906, 1908).  
*AH(Jan1975) BDPE BDHT  
CLAA GEA HL1983 STF*
- 1904** Power take-off (PTO) shaft appeared on the British Scott traction engine (see 1906).  
*EHT*
- 1905** Hart and Parr (Charles Walter Hart, 1872-1937, and Charles Henry Parr, 1868-1941) incorporated first business in USA devoted exclusively to manufacture of traction engines (see 1906).  
*BDPE CLAA OHP STF YA1960*
- 1905** Dauch Manufacturing Co., Sandusky, OH, makers of farm traction engines experimented with gasoline-fueled farm traction engines, by Jacob Julius Dauch, 1857-1918.  
*NC18:101*

**1906** Manufacturing business devoted exclusively to tractors developed by Charles W. Hart and Charles H. Parr, manufacturing the Hart-Parr tractor at Hart-Parr Co., Charles City, IA. The term “tractor” was coined in 1906 by Hart-Parr to replace the phrase “gasoline traction engine,” built first traction engine in 1902; first gasoline-powered track engine built, although first patent for endless-chain traction engine was issued to Charles Dinsmoor, of Warren, PA, in 1886, but did not become a reality until 1904 by Benjamin Holt, 1849-1920.

*ATEN FFFR HYMP SA247(1982)*

**1906** Holt Co. developed tracklaying tractor powered with gasoline engine (see 1904).

*CLAA STF*

**1906** Power take-off (PTO) shaft appeared on the French Gougis tractor (see 1904). *EHT*

**1908** Gasoline-powered farm tractor with crawler tracks manufactured by Holt Manufacturing Co., CA (Benjamin Holt, 1849-1920). The first crawler traction engine in 1904 was steam powered.

*ATEN BDPE BDHT STF*

**1908** Best Manufacturing Co. (Daniel Best, 1838-1923) sold to Hart-Parr Manufacturing Co.

*NC4:544*

**1908** First of many great tractor tests (pulley and drawbar horsepower) and plowing demonstrations and contests held in Winnipeg, Canada (1908-1913) at the Canadian Industrial Exposition followed by similar national events elsewhere.

*HPTCR*

**1908** Square Turn tractor, 15-30 hp, 950 rpm, 4-cylinder (in 1917 model), manufactured in Norfolk, NE, by Albaugh-Dover Co., had a mechanical lift, a first, for 2-bottom, 2-way plow, or a 3-bottom plow and a clutching arrangement of cone units which could be driven either direction and could rotate on the spot or turn conventionally.

*ATEN*

**1908** Model T automobile introduced by Henry Ford, 1863-1947.

*GEA*

**1909** Mogul gasoline tractor, 20 hp, followed by a series with the name Mogul, increasing in size, built by International Harvester Co. from 1909-1918.

*OYIH*

**1909** Avery Co. (originally the Avery Farm Machinery Co., and then the Avery Power Machinery Co.), Peoria, IL, manufactured a tractor truck, 12-36 hp. In 1922 Avery Co. made a caterpillar-type tractor called the Track-Runner. The company originally made cultivating tractors, steam engines, and threshers.

*ATEN*

**1909** Twin cylinder tractor, 45 hp, with two-speed transmission developed by International Harvester Co. (IHC) led by Leonard B. Sperry, 1879-1959.

*NC47:674*

**1909** Rumely Oil Pull tractor, 33.5 bhp, built by M. Rumely Co., LaPorte, IN, introduced and tested at the Winnipeg Trials, designed by John A. Secor, 1847-???. Hart-Parr also claimed to have built the first Oil Pull, perhaps the engine used by Rumely.

*ASABECa(has 1910 date) ATEN*

**1910** Heider tractor manufactured in Carroll, IA (later in Rock Island, IL), had a leather-faced flywheel that ran against a right and left drum allowing variable speeds forward and rearward.

*ATEN*

**1910** Straw-burning steam tractors introduced by J. I. Case Co.

*AT*

**1910** C. L. Best Gas Traction Co. (later called C. L. Best Traction Co.) formed in Elmhurst,

CA, by Clarence L. Best, 1875-1951, son of Daniel Best, 1838-1923; introduced the track-type tractor in 1911. In 1925 this company merged with the Holt Manufacturing Co. to form the Caterpillar Tractor Co. *GEA NC40:545*

**1910-1941** Numerous manufacturers introduced tractors, many with innovative features that enhanced the efficiency, safety, and applications for agricultural use. Details of these many contributions can be seen in Gray (ATEN) and Southwell (AT.). There was continual consolidation of companies in the manufacturing industry, particularly after World War II.

*AT ATEN*

**1910** The Kerosene Annie internal combustion tractor, 33 hp, built by Rumely Co. with an engine that started with gasoline and ran on kerosene. It had a throttle governor and used water injection, was oil-cooled, and ran at a single, governed speed (in contrast with the earlier hit-and-miss engines). Built from John A. Secor patents, manufactured by M. Rumely Co., LaPorte, IN until 1929 (see 1909). *ATEN PHAT*

**1910** Design of J. I. Case tractor implemented by David Pryce Davies, 1870-1948.

*NC36:89*

**1910** Twin City tractors manufactured by Minneapolis Steel & Machinery Co., Minneapolis, MN. *NC34:352*

**1910** Mogul tractor, 45 hp, spur-gear transmission manufactured by International Harvester Co. (IHC) in Chicago. In 1911 a 30-60 hp Mogul was built (see 1909). *ATEN OYIH*

**1910** White truck designed by Rollin Henry White, 1872-1962. *NC52:365*

**1911** Holt tractor, 45 hp, built with internal combustion engine, bull gear and pinion final drive. *ATEN*

**1911** Case tractor, 30-60 hp internal combustion engine, with bull gear and pinion final drive. *ATEN*

**1911** Electric starter introduced by Charles F. Kettering, 1876-1958, first used in automobiles, later in tractors. *BDPE GEA*

**1911** Titan tractor, 45 hp, built by International Harvester Co. (IHC), at Chicago, IL. The Titan series development 1916-1921 was supervised by Leonard B. Sperry, 1879-1959. The first Titan tractor tested in 1920 by Nebraska Tractor Testing Laboratory (NTT 23) was 10-20 hp. IHC sold 70,000 Titan tractors from 1916 to 1921. *ATEN NC47:674 NTTSN*

**1911, 1912** M. Rumely Co., La Porte, IN, acquired Advance Thresher Co., Battle Creek, MI (established in 1885) and the Gaar-Scott & Co., Richmond, IN (established in 1836), forming the Advance-Rumely Co. in 1915. The Allis-Chalmers Co. acquired most of the assets of Advance-Rumely Co. in 1931. *ATEN EASTE*

**1912** Four-wheel drive (4WD) tractors entered the market: the Olmstead (Great Falls, MT), 28 hp with chain drive, and the Nelson (Boston, MA), with chain drive and four-wheel steering, available in three models, 15-24 hp, 20-28 hp, and 35-50 hp. *ATEN*

**1912** Tractor built using anti-friction bearings, patented in 1912 by Clarence Alvin Henneuse, 1879-1939, while working with Best Tractor Co. *NC29:33*

**1912** Production began with 70 hp track-laying tractor by C. L. Best Gas Traction Co. with

name later changed to C. L. Best Tractor Co. (Clarence L. Best, 1875-1951, son of Daniel Best). *NC40:545*

**1912** Hornsby and Sons, Great Britain, sold interest in caterpillar-type tractors to Holt Manufacturing Co., Stockton, CA. *EAM*

**1912** Bear tractor introduced with 4-cylinder engine by Wallis Tractor Co., later purchased by Massey-Harris Co. *PHAT*

**1913** Bull tractor built by Bull Tractor Co., Minneapolis, MN, created interest in smaller tractors and inspired other manufacturers to develop smaller tractors. *FTOY OYIH*

**1913** Titan tractors built by International Harvester Co. from 1913-1917, forerunner of McCormick-Deering line of tractors (see 1911, 1916). *OYIH*

**1913** Wallis Cub and the Bull tractor, 5-12 hp, introduced by Bull Tractor Co., Minneapolis, MN, the leading producer of farm tractors in 1914; superseded in 1915 by the Big Bull with 20 hp. *ATEN WABI*

**1913** Allis-Chalmers Manufacturing Co. incorporated, building on the Allis-Chalmers Co. formed in 1901, acquired several companies over the years, including the Advance-Rumely Co. in 1931. *ATEN*

**1914** Mogul tractor, 8-16 hp, and Titan tractor, 10-20 hp, both of which used kerosene fuel, built by International Harvester Co. (IHC), followed by a series of tractors under those names including the IHC 15-30 (also called McCormick-Deering). *ATEN CR*

**1915** Development of Cletrac, a crawler-type tractor, first sold in 1916 by Cleveland Motor Plow Co., which in 1917 became the Cleveland Tractor Co., OH, trademarked as Cletrac in 1919; led by Rollin Henry White, 1872-1962, followed by his son W. King White, 1901-1947, as president in 1928ff. *NC52:365 NCD:128*

**1915** Ford Tractor Co., Minneapolis, MN, produced a Model B Ford Tractor, gasoline fueled. Its performance led to the Nebraska Tractor Test Law. Company formed by W. Baer Ewing, who hired Paul W. Ford as vice president and used the Ford name. *ATEN FCO FTA SWABI*

**1915** Louisville Motor Plow, 20 hp, produced by B. F. Avery Co., Louisville, KY, (Benjamin Franklin Avery). Company sold to Minneapolis-Moline in 1951. (Note: this is not the same as the Avery Co., of Peoria, IL.) *FTOY*

**1915/1916** Tractor catalog listed 62 different manufacturers giving specifications and models of tractors produced. *ATEN*

**1916** Drott Tractor Co. established to expand use of the crawler tractor, particularly for logging operations, by Edward A. Drott, 1887-1956. He developed the skid-loader. *NC48:184*

**1916** Crawler tractor, Model R, marketed in 1916, by Cleveland Motor Plow Co., Cleveland, OH, renamed Cleveland Tractor Co. in 1917, of which Rollin H. White, 1872-1962, was president until 1929 (name Cletrac trademarked in 1919). After 1923, Cletrac tractor developed by Cleveland Tractor Co. by William King White, 1901-1947. His father, Rollin H. White, 1872-1962, invented the White Steamer (automobile and truck) in 1899 (see 1920). *ATEN NC36:386*

**1917** Mechanical lift feature for mounting and using attached equipment built by Emerson-Brantingham, Ltd. in England, used on the John Deere GP tractor in 1929, and in hydraulic form on the John Deere Model A tractor in 1934. *EHT*

**1917** Fordson tractor, 20 hp, produced for the general trade by Henry Ford & Sons Co., Detroit, MI (spinoff of the Ford Motor Co.). First sold to the British government, then sold in the USA in 1918. *ATEN CR GEA*

**1917** Moline Universal Model D introduced the first tractor in the USA to use a storage battery for ignition, starting, and lighting, manufactured by the Moline Co. *ATEN*

**1917** Four Wheel Tractor Co. formed at Clintonville, WI; with name changed to Topp-Steward Co., which manufactured the Model B (D. S. Steward designed this 4WD tractor, perhaps the first); in 1927, became Atlas Engineering Co. *EAFT*

**1917** Standard belt pulley specification for tractors developed in USA. *AT*

**1917** Power take-off (PTO) as optional equipment introduced by International Harvester Co. on Model Junior 8-16 tractor. *EHT*

**1917** Austin Culti-Tractor, 20 hp, petrol (petroleum base) fueled, introduced in England. *EAM*

**1919** The original laboratory, NTTL, built for testing tractors built at Lincoln, NE, a unit of the Department of Agricultural Engineering. *FT1975*

**1919** Introduction of 4WD tractors, the Fitch Four Drive and the Samson Iron Horse. *ATEN HYMP*

**1919** Nebraska Tractor Test Law, known as the Nebraska Inspection Law, went into effect and accepted as the basis for performance tests by industries, states, and other countries; SAE and ASAE involved. *HYMP*

**1919** Farm tractors introduced with PTO manufactured by International Harvester Co. First official tests by NTTL run in 1921 and first standards developed by ASAE in 1925, then updated several times. *ASABECaI AT ETP HYMP*

**1919** First mass-produced tractor claimed by the Ford Motor Co., Detroit, MI., to be the Fordson. *HYMP*

**1920** End of increase in production with 203,207 tractors produced by 166 companies as compared to 2000 tractors produced in 1909 by nine companies. USA census data show that 246,000 tractors were on farms in 1920. *ATEN*

**1920** First official tractor test by the Nebraska Tractor Testing Laboratory (NTTL), the Waterloo Boy N with 26 hp (NTT 1). *ATEN*

**1920** Henneuse Tractor Co. formed, designed crawler tractors in Bucyrus, OH, by Clarence A. Henneuse, 1879-1939, later sold to Huber Manufacturing Co. of Marion, OH. *NC29:33*

**1920** Articulated tractor tested by the NTTL: the Moline Universal, manufactured by the Moline Plow Co., Moline, IL (NTT 33). (A Moline Universal tractor was tested at the Columbus, OH trials in 1917.) Believed to be the first tractor tested with battery, starter, generator, lights and a rheostat control of engine speed by changing the voltage on the field windings of the generator. *ATEN*

- 1920** First crawler-type tractor tested by NTTL, the Cletrac W, 12-20 hp, built by Cleveland Tractor Co. (NTT 45). The tractor was introduced in 1919 and participated in Ohio trials.  
*AE9(1970) ATEN SDCA*
- 1920** Starter and lights made available for tractors. *HYMP*
- 1921** Lead added to gasoline (until 1970s) to reduce knocking in internal combustion engines, developed by Charles F. Kettering, 1876-1958, and Thomas Midgley, 1889-1944.  
*BDPE GEA*
- 1921** Use of tool bar for mounting implements on tractors began. *HYMP*
- 1922** Power take-off (PTO) introduced as standard equipment (although other tractors had PTOs available earlier) on the International Harvester Co. 15-30 (NTT 87), followed by the IHC 10-20. This line of tractors later called McCormick-Deering. PTO was a feature of the 1924 tricycle tractor. In 1946 Oliver and Cockshutt 30 introduced tractors with an independent PTO (NTT 382) (see 1906, 1917, 1946). *ATEN EHT FT1950 GEA RS(Oct2008)*
- 1922** First tractor introduced with ball bearing main crankshft bearings. *FT1950*
- 1922** Wilson 4WD tractor, 12-24 hp, developed by Wilson Brothers and marketed through the Wilson Tractor Manufacturing Co., Ottumwa, IA. *ATEN*
- 1922** The Rogers articulated 4WD tractor tested (NTT 84) produced 34.85 hp, with power steering manufactured by Rogers Tractor and Trailer Co., Albion, PA.  
*AE9(1970)  
FT1950 SDCA*
- 1924** Case Co. stopped manufacturing steam engine tractors. Over the years of production Case built 35,737 steam engine tractors; Geiser, 15,801; and Huber, 11,568.  
*FIMA FPMA GH*
- 1924** George White & Son, Ltd., Ontario, Canada ceased building steam tractors. *EASTE*
- 1924** Tricycle-type tractor introduced by International Harvester Co., Farmall, 20 hp, commercially successful all-purpose row crop tractor, first tested in 1925 (NTT 117), called the Regular Farmall after the F-20 was introduced in 1932 (NTT 264). Development supervised by Leonard B. Sperry, 1879-1959, and developed by Bert R. Benjamin (see1932).  
*ASABE100 ATEN ATTC HL1980 HYMP NC47:647 RS(Oct2008) SDCA TWABO*
- 1924** Mounted-type tractor implements introduced and widely accepted. *HYMP*
- 1924** Minneapolis 22-44 (dhp.-bhp) tractor by Minneapolis Threshing Machine Co., which became Minneapolis-Moline Co. in 1929. *ATEN*
- 1924** First commercial tractor built with a live PTO by Cockshutt Plow Co. Ltd., Brantford, Canada. *AT*
- 1925** Caterpillar Tractor Co. formed, incorporating Holt Manufacturing Co. (1892ff.) and Daniel Best Company (1910ff1111 (Daniel Best, 1838-1923, followed by Clarence L. Best, 1875-1951, of C. L Best Gas Traction Co.)  
*BDPE GEA NC40:545*
- 1925** The Oil Pull 20-30 Tractor produced by the recently formed Advance-Rumely Thresher Co., LaPorte, IN (see 1909 for first Oil Pull tractor). *ATEN*
- 1926** Buda Diesel Engine introduced by Buda Co., Harvey, IL, George Chalendar, designer. Buda adopted German designs. Allis-Chalmers purchased Buda Co. in 1953. *CCS*

- 1926** First tricycle row-crop tractor made by Oliver Hart Parr, with sliding-hub rear wheel for tread adjustment (NTT 176). *PHAT*
- 1926** Snowmobiles designed and manufactured, as well as several attachments to tractors, first as Farm Specially Co., WI, then as Arps Corp., 1923ff, by Bruno Frederick Arps. *NC51:689*
- 1927** ASAE adopted its first standard for tractor PTO, drafted by the Farm Equipment Institute in 1926, with a speed of 536 +/- 20 rpm. The standard has been updated several times since. *FT1995 RS(Feb2008)*
- 1927** Deutz diesel tractors began commercial production in Cologne, Germany. The company became Klockner-Humboldt-Deutz (KHD), in 1985, as a result of mergers and consolidation. *PHAT*
- 1928** Wallis tractor of 1912 absorbed by Massey-Harris Co. *FIMA*
- 1928** Rumely DoAll tractor manufactured by the recently formed company Advance-Rumely (NTT 154). *ATEN*
- 1928** John Deere GP Model D farm tractor, equipped with mechanical power lift to enable operator to raise and lower plows, discs, cultivators, and other attachments. *ATTC ATEN HYMP*
- 1928** Functional independent PTO on Hart-Parr 12-24 and 18-36. *PHAT*
- 1929** Oliver Farm Equipment Co. (Oliver Chilled Plow Co. founded in 1853), headed by Cal Sivright, 1886-1945, merged with Hart-Parr Tractor Works Co., American Seeding Co. (founded in 1850), and Nichols & Shepard Co. of Battle Creek, MI (John Nichols founded in 1848; incorporated in 1886). It absorbed the Cleveland Tractor Co. in 1944 and the Ann Arbor Machine Co. (originally Ann Arbor Hay Press Co., Ann Arbor, MI, founded in 1910) in 1953 (see additional information in the Implements timeline). *ATEN HYMP NC34:338 NC36:386 OHP PHAT*
- 1929** Minneapolis-Moline Power Implement Co. formed by union of Minneapolis Steel & Machinery Co. (founded in 1902), Minneapolis Threshing Machine Co. (founded in 1887), and Moline Plow Co. (founded in 1870), by James L. Record, 1857-1944. Name changed to Minneapolis-Moline Co. in 1949 (see additional information in the Implements timeline). *FT1950NC34:352*
- 1930** American diesel-powered track-type tractor assembled using Cummins engine with four cylinders, placed in an Allis-Chalmers track-type tractor. *FFFR*
- 1930** Allis-Chalmers Co. manufactured the 6-cylinder Rumely tractor, then took over the Advance-Rumely Co, LaPorte, IN, in 1931. *ACS ATEN PHAT*
- 1930** First imported tractor tested by NTTL, Fordson F from Ireland, 23 hp (NTT 173). *FT1975*
- 1930** Cockshutt tractors built by Oliver Corp., Charles City, IA, until 1948. *CCS*
- 1931** Diesel-powered track-type tractor marketed by Caterpillar Tractor Co., Peoria, IL. *ATEN CLAA FFFR HYMP*

- 1931** Solid rubber tire invented by B. F. Goodrich Co. for tractors, soon replaced by pneumatic rubber tires. *WABI*
- 1931** Low pressure pneumatic rubber tires made by Firestone Tire and Rubber Co. introduced for farm tractors. Issued as standard equipment in 1934 on the Allis-Chalmers Model WC (NTT 223) and in 1935 on the Allis-Chalmers Model U, for which Conrad E. Frudden, 1887-1959, and Harry Merritt were instrumental in development. By 1940 practically all farm tractors came with rubber tires; the Allis-Chalmers Model U tractor introduced in 1932 with rubber tires had a 25 percent increase in fuel economy over steel wheels. *EHT GEA HL1997 HYMP RS(Oct2008) SDCA WABI*
- 1932** Farmall F-20 introduced by International Harvester Co. (NTT 264), replacing the 20 hp Farmall (called the Regular) introduced to the market in 1924. *ATEN*
- 1932** Farmall F-12 row crop tractor of tricycle type introduced by International Harvester Co. The F-14 of similar configuration introduced in 1938. *ATEN ATTC*
- 1932** Diesel crawler tractor, Caterpillar Diesel Model 65 introduced in 1931, tested by Nebraska Tractor Testing Laboratory (NTT 208). *ATEN GEA*
- 1933** Pneumatic rubber tires available on certain tractor models of the leading companies including Allis-Chalmers, Case, Deere, Ford, Huber, International Harvester, Massey-Harris, Minneapolis-Moline, and Oliver (see 1931 and 1935). *ATEN*
- 1933** Hydraulic system for lifting, adjusting depth of implements and for draft control developed and introduced by Irishman Harry Ferguson, 1884-1960, first built in England by David Brown Co., manufactured in USA (1939-1948) by Ford Motor Co. *BDPE EHT GEA*
- 1934** Hydraulic lift feature added to John Deere A tractor. *EHT*
- 1934** Last tractor using kerosene tested at NTTL, the McCormick-Deering W-12 (NTT 229). *FT1950*
- 1934** Tractors with pneumatic tires tested by NTTL, Allis-Chalmers Model WC (NTT 223, 237, 238) and others. *ATEN NTTSN PHAT SDCA*
- 1935** High compression tractor engines manufactured to utilize leaded gasoline. *HYMP*
- 1935** Pneumatic rubber tires included as standard equipment on Allis-Chalmers Model U tractor (NTT 227, 228). *ATEN EHT*
- 1935** Diesel engine used in a wheel-type tractor, McCormick-Deering WD-40. *AE9(1970) SDCA*
- 1935** Oliver Farm Equipment Co. produced the Row-Crop Model 70 gasoline-powered wheel tractor. *ATEN*
- 1936** David Brown, Ltd., Huddersfield, Yorkshire, UK, began production of tractors for Harry G. Ferguson, 1884-1960. *BDHT*
- 1936** First tractor over 100 hp, the Caterpillar Diesel RD-8, 107.89 hp, tested by the Nebraska Tractor Testing Laboratory (NTTL), (NTT 257). *ATEN NTTSN*
- 1936** CO-OP Tractor No. 1,  $\frac{8}{16}$  hp, distributed only through cooperatives, not tested by NTTL, followed by CO-OP B-2 in 1941, manufactured by Oliver Corp., Charles City, IA. (Reference states 1930-1948 as period that Cockshutt tractors built by Oliver Corp.) *CCS*

- 1936** Cletrac FG, first track-type tractor fueled with gasoline engine over 100 bhp, tested by the Nebraska Tractor Testing Laboratory (NTTL). *NTT 262*
- 1937** Unitractor, 1<sup>1</sup>/<sub>2</sub> hp, garden tractor designed by Robert D. Eaglesfield, 1887-1946, manufactured by Vonnegut Machinery Co., Indianapolis, IN. *NC35:315 WOI*
- 1938** Compact tracklaying tractor developed by Cletrac to serve farmers. *NC36:386*
- 1938** Factory manufactured all-steel cab installed on Minneapolis-Moline Comfortractor. *PHAT*
- 1939** Farmall H, 25 hp, introduced by International Harvester Co., manufactured until 1953. *NAPA*
- 1939** Allis-Chalmers L, first wheeled gasoline engine tractor with over 100 hp, tested by Nebraska Tractor Testing Laboratory (NTT 338). *NTTSN*
- 1939** Ford-Ferguson 9N tractor introduced in USA. It included a hydraulically actuated hitching and draft system with three links for attaching implements, now known as the three-point hitch, and has become known as a classic tractor (NTT 339) (Henry Ford, 1863-1947, and Irishman Harry G. Ferguson, 1884-1960.) The system had been previously installed on some David Brown tractors in England. *AE1979 AE1990 FT1975  
RS(Jan2000) RS(Oct2008) SDCA*
- 1940** John Deere Model A, used as vehicle for armored AS vehicle by Department of Defense. *NAPA*
- 1941** First factory-built LPG (liquid petroleum gas) fueled tractors introduced by Minneapolis-Moline Co. *FT1950 HYMP*
- 1944** PTO and drawbar dimensions standardized, and later modified (see 1926, 1927). *HYMP*
- 1944** Cleveland Tractor Co., builder of Cletrac, merged with Oliver Farm Equipment Co., became the Oliver Corporation in 1944. W. (William) King White, 1901-1947, guided development of Cletrac tractor. *NC34:338 NC36:386 NC52:365 NCD:128*
- 1945** Cockshutt Model 30 built with a live PTO, credited with being the first on the market leading others to develop similar capabilities, under the guidance of Maurice (Mac) McCurdy. *CCS*
- 1945** National Farm Machinery Cooperative (NFMC) formed, including at least ten USA states with Farm Bureaus and a similar organization with the Canadian Cooperative Implements Limited (CCIL), farmer-owned organizations for distribution of tractors and implements. *CCS*
- 1946** Lindeman Manufacturing Co., Yakima, WA, manufactured crawler tractor conversions for wheel tractors, purchased by Deere & Co.; operations moved to Dubuque, IA in 1965. *AFT*
- 1946** Cockshutt 30, manufactured by Cockshutt Plow Co. in Canada, the first tractor with an independent PTO (transmission clutch for live PTO) tested by the NTTL (NTT 382); also sold in the USA as the CO-OP Model E-3, sponsored by Farm Bureau. Cockshutt CO-OP tractors built until 1958 (also see 1945, 1947, 1950). *ATEN CSFT1995*

**1946** Last tractor with steel wheels tested by NTTL, Ellinwood Bear Cat 3000-1, gasoline engine (NTT 379). *NTTSN*

**1947** Tractor with independent PTO, continuous running, that operated when the clutch was released, introduced on the Cockshutt 30 (gasoline) tractor, 32 hp, manufactured by the Cockshutt Plow Co. of Brantford, Ontario, Canada (NTT 382); other manufacturers, such as the Oliver 88 (similar to the Cockshutt 30) produced in the USA, then developed tractors with the continuous running PTOs (see 1950). *AE9(1970) ATEN FT1950 FT1975 PHAT SDCA*

**1947** Farmall Cub, introduced smallest tractor (one plow) built by International Harvester Co.; discontinued in 1964. *ATEN ATTC*

**1947** American Tractor Corp. formed by the Rojzman family, headed by Marc B. Rojzman, 1917-1967, manufacturing the GT-25 crawler in 1949 and with the TerraTrac trademark. In 1951, produced the GT-30 (NTT 471). The company merged with J. I. Case in 1956. *OYC NC54:246*

**1948** Allis-Chalmers Co. introduced a small tractor, Model G, 9.04 dhp, one plow with the engine mounted in the rear, with tool carrier. *AT ATEN PHAT*

**1949** Hydraulic remote control cylinder dimensions standardized by ASAE. *ASABES<sup>t</sup> HYMP*

**1949** First tractor fueled by LPG tested at NTTL, the Minneapolis-Moline U; first introduced in 1941 as a converted Model G. *ATEN PHAT*

**1949** Peak year for production of wheel tractors (555,523) and track-laying tractors (44,613) by 141 manufacturers in USA. *ATEN*

**1950** Two-plow tractor, Avery BF, with hydraulic controls and other wheel features introduced by B. F. Avery Co., Louisville, KY; the company acquired by Minneapolis-Moline Co. in 1951. *ATEN*

**1950** Terratrak Gasoline Crawler Tractors (GT) and Diesel (DT) built by American Tractor Corp., Churubusco, IN, later (1957) merged with Case Co. and moved to Burlington, IA. *FT1950 OYC*

**1950** Nuffield Diesel tested (NTT 663), followed by additional models tested in 1962 (NTT 809) and 1965 (NTT 905), manufactured by Morris Motors, Ltd., Birmingham, England. In 1969 the Nuffield tractor was redesigned and built at the Leyland Scotland plant, West Lothian. *FT1950*

**1950** First tractor with independent PTO (live PTO with independent clutch) tested at NTTL (NTT 442), the Cockshutt 30 gasoline-fueled tractor, with main headquarters Brantford, Ontario, Canada. *FT1950*

**1950** Uni-Tractor developed by Minneapolis-Moline; redesigned in 1960, built until 1991. Company sold to New Idea Co. in 1963 and discontinued in 1991 when AGCO acquired White-New Idea. *PHAT*

**1950** Commercial production of a 4WD drive tractor began after being introduced in 1922, such as the Harris Power Horse tractor, powered with a 96 hp Chrysler engine, manufactured by the National Implement Co., Stockton, CA, and the Powerbilt tractor with a 36 hp

- engine built by the General Tractor Corp., Detroit, MI. *ATEN*
- 1951** Disc brakes began to be used on farm tractors. *FT1950*
- 1952** Diesel tractor Model U introduced by Minneapolis-Moline Co. Increased use of diesel engines followed until all new tractors were diesel-fueled, using electric starting, in 1976. *RS(Oct2008)*
- 1952** Cockshutt 50 diesel tractor, manufactured by Cockshutt Farm Equipment Co., Brantford, Ontario, Canada. *NTTSN*
- 1952** Power steering systems began, first with a kit to be added to tractors, manufactured by Behlen Manufacturing Co., Columbus, NE (Walt Behlen). This was rapidly followed by many manufacturers including power steering as standard equipment. *FT1950*
- 1953** Massey-Harris-Ferguson Co. formed by Irishman Harry G. Ferguson, 1884-1960, and Massey-Harris Co. (see 1958). *FT1950 WABI*
- 1953** Deere & Co. produced 4- and 6-cylinder engine tractors, replacing manufacture of 2-cylinder engine tractors. *NCL79*
- 1953** Turbochargers began to gain in use as a method for increasing horsepower of tractors. *FT1950*
- 1953** Allis Chalmers WD 45 first tractor to have a snap coupler for a remote cylinder with control lever mounted on the steering pedestal (NTT 499). *FT1950*
- 1954** Number of tractors on farms exceeded the number of mules and horses for the first time. *VCDFE*
- 1954** International Harvester Co. introduced the torque amplifier (TA), a major development in transmission design. *FT1950*
- 1954** Minneapolis-Moline produced their last tractor using distillate fuel (see 1956). *FT1950*
- 1955** First Minneapolis-Moline diesel tractor tested at the Nebraska Tractor Testing Laboratory (NTT 568). *FT1950*
- 1955** Ferguson TO-35 tractor introduced variable speed PTO (two different speeds), and could shift PTO speed in relation to the ground speed or in relation to engine speed (NTT 564). *FT1950*
- 1955** Detachable half-track for tractors patented by Bruno Frederick Arps, 1890-1965. *FT1950 NC51:689 WWWW*
- 1956** Concrete test track approximately a half-mile long built at the NTTL, replacing earthen surface, providing more consistent tests. *FT1950*
- 1956** John Deere 720, last tractor using distillate fuel, produced and tested at Nebraska Tractor Testing Laboratory (NTTL) (NTT 606). *FT1950*
- 1956** Deere & Co. opened Research & Engineering Center devoted exclusively to design and testing tractors, in Waterloo, IA. *NCL:79*
- 1956** Roll-over protective structure, ROPS, for tractors introduced and tested in California, developed by Lloyd H. Lamoria, Ralph R. Parks, and Coby Lorenzen at the University of

California, Davis, CA. First commercial ROPS offered by Deere & Co. in 1966 through the efforts of Charles Morrison. ASAE standard adopted in 1967. *ASABE100 HL1986*

**1956** Caterpillar D-9 Tractor, first tractor using a turbocharger, tested at the Nebraska Tractor Testing Laboratory (NTT 584). *FT1950*

**1957** Large tractors built by Steiger Co., Fargo, ND, initiated by brothers Douglass Steiger and Maurice Steiger, using a Detroit Diesel engine, earlier involving Carl E. Steiger, 1896-??, and Emil H. Steiger, 1871-1929. *FT1950 NC37:454 NCG:355*

**1957** Someca 47 BD tractor manufactured in Saint-Denis-(Seine), France; with the SomecaSom Diesel engine manufactured in Milano, Italy (NTT 625). *FT1950*

**1957** Unimog 30 Diesel tractor first West German tractor tested by NTTL (NTT 607). *FT1950*

**1957** The 4WD Wagner TR-9 Diesel, powered with Cummins engine, 87.45 hp (NTT 631), renewed interest and replaced many crawler tractors, manufactured by Wagner Tractor Co., Inc., Portland, OR. *FT1950*

**1958** Massey-Ferguson Co. formed from Massey-Harris-Ferguson. *GH WABI*

**1958** Standard approved by the Farm Equipment Institute (FEI) for 1000 rpm PTO on tractors, and later (1976) combined with other PTO standards and approved by ASAE. *HYMP RS(Feb2008)*

**1958** Volvo T-55 diesel tractor manufactured by A-B Bolinder-Munktell, Eskilstuna, Sweden (NTT 630); with 15.2 hp.-hr/gal. *FT1950*

**1959** Standards for 3-point hitch for attaching implements and tools to tractors adopted by ASAE and the Farm and Industrial Equipment Institute (FIEI). *FT1950 RS(June2000)*

**1959** Massey-Ferguson acquired F. Perkins, Ltd., originally formed in 1932, Peterborough, England, manufacturer of diesel engines. *FT1950 GH PHAT*

**1959** First wheeled tractor over 100 hp tested at NTTL, the Wagner TR-14A Diesel, 122.29 hp, manufactured by the Wagner Tractor Co., Portland, OR. *NTTNSN*

**1959** Experiments conducted in cultivating row crops with automatically steered tractor. *CLAA YA1960*

**1959** Large 4WD tractors (200+ hp) and associated equipment produced by Deere & Co. *NCL79*

**1959** Allis-Chalmers demonstrated a fuel cell tractor, approximately 20 hp, but not commercialized. *ATEN FT1950 HYMP*

**1959** Porsche L318 diesel tractor, three-cylinder air-cooled, 37.2 hp, made in Friedrichschafen, West Germany (NTT 728) and a lighter one-cylinder model, L108, tested (NTT 699). Renault later acquired manufacturing rights for the Porsche tractor. *FT1950*

**1959-1963** Era of commercial production of large (over 100 hp), wheeled tractors began, including:

1959 Wagner TR-14A diesel, 155.25 dhp (NTT 700)

1961 International 4300 diesel, 214 dhp, 4WD, crab steering, first agricultural tractor with turbocharger (NTT 815)

- 1962 Oliver 1800 B, Oliver's first tractor over 100 hp (NTT 831)
- 1962 Minneapolis-Moline G705 diesel, 101 and 101.6 hp (NTT 833, 835)  
1963 Massey-Ferguson 97 diesel, first 100 hp tractor by M-F (NTT 822, 835)
- 1963 John Deere 5010 diesel, 121 hp (NTT 828)
- 1963 Steiger 1700 diesel (est. 216 hp), Steiger 2200 Diesel (est. 265 hp), and 1963 Steiger 3300 diesel (est. 318 hp); no test by NTTL. *FT1950 NTTSN*
- 1960** John Deere ended production of all two-cylinder engine tractors. *FT1950 HYMP*
- 1960s** 4WD tractors introduced and used on a large scale. Several 4WD tractors previously introduced but not used in large numbers, include the Fitch Four Drive (1919), Sampson Iron Horse (1919), Wilson Four Wheel Drive (1922), Wizard 4 Pull (1926), Fitch Four Drive E (1929), Massey-Harris Four Wheel Drive (1930), Massey-Harris Four Wheel Drive (1936), Detroit (1949), Dodge Four Wheel Drive Power Wagon (1949), Harris Power Horse (1950), General Powerbilt (1950), Willis Farm Jeep (1953), Mercedes Benz Unimog (1957), Wagner TR9 (1957), Land Rover 88 (1960), International Harvester 4300 (1962), Case 1200 (1964), John Deere 7020 (1971), Minneapolis-Moline A4T-1600 (1971), Steiger Bearcat (1971), Massey Ferguson 1500 (1971), White 4-180 (1975), Allis Chalmers 7580 (1976), Versatile 875 (1978), Ford FW30 (1978), Belarus 1500 (1979), and Big Bud 524/50 (1981). *FT1950 HYMP*
- 1960** Tandem hitching or semi-tandem hitch, in which two tractors connected to get increased drawbar horsepower, developed by engineers at Iowa State University. *FT1950*
- 1960** Zetor 50 Super, 49.47 hp, a Czechoslovakian tractor tested (NTT 748), manufactured at Brno, Czechoslovakia, followed by several models. *FT1950*
- 1960** David Brown 850 diesel, 33.56 hp, manufactured in England by David Brown, Inc. (NTT 734). *FT1950*
- 1960** Land Rover 88 gasoline tractor, 30.9 hp, tested (NTT 749), manufactured by Rover Company, Solihull, Warwickshire, England. *FT1950*
- 1960** Holder A-20 Diesel, 4WD, 24 hp, manufactured by Gebruder Holder Maschinenfabrik, West Germany (not tested at NTTL). Tractors sold by Tradewinds, Inc., Tacoma, WA from 1960-1967. *FT1950*
- 1960** White Motor Co., a builder of trucks, Cleveland, OH, acquired Oliver Corp., which was consolidated at Charles City, IA, for tractors; in South Bend, IN, for plows and tillage tools; in Shelbyville, IL, for haying equipment. *FT1950*
- 1961** Tractor equipped with a turbocharger, Allis-Chalmers D19, tested at the NTTL (NTT 811). Also, the International diesel 4300 with a turbocharger tested at NTTL (NTT 815). *FT1995 PHAT*
- 1961** Largest horsepower wheel tractor tested by NTTL (crab steering) until this time, the International diesel 4300, 214 dhp (NTT 815) equipped with a supercharger. *AE9(1970)*  
*FT1950 SDCA*
- 1962** Front-wheel power-assist tractor, Oliver 1800, 77 hp, tested at the NTTL (NTT 832). *FT1975 PHAT*

- 1962** Slow Moving Vehicle (SMV) emblem, approved by ASAE and National Safety Council, introduced in 1964, approved as an ASAE Standard; adopted as ASTM Standard in 1972 (see 1964). *AE9(1970) ASABE100 ASABESt*
- 1962** White Motor Corp. acquired Cockshutt Farm Machinery Co., Ltd., Brantford, Canada, and combined with Oliver Corp. *FT1950 PHAT*
- 1962** Kramer KL diesel tractor with air-cooled Deutz engine, built by Kramer-Werke, Uberlingen, Bodensee, West Germany (NTT 821). *FT1950*
- 1962** Two-wheel drive (2WD) tractor over 100 dhp tested (NTT 828), John Deere 5010 diesel, introduced by Deere & Co. *FT1950 NCL:79 NTTSN*
- 1962** Nuffield 460 diesel (NTT 809) made in England and introduced in USA. *FT1950*
- 1962** Allis-Chalmers D-19 Tractor with a turbocharger tested at NTTL. *FT1975*
- 1963** Deere & Co. introduced 52 hp crawler tractor used in agriculture and industry. *NCL:79*
- 1963** Deere & Co. introduced 8 hp lawn and garden tractor. *NCL:80*
- 1963** M-R-S Manufacturing Co., Flora, MS, introduced 4WD tractor, Model A-80, 141 hp, with "All-Wheel Steering." *FT1950*
- 1963** Minneapolis-Moline Co., Hopkins, MN, became a subsidiary of White Motor Co. In 1969 the company became White Farm Equipment Co., a subsidiary of the White Motor Co. *FT1950*
- 1964** Slow Moving Vehicle Emblem (SMV), to be used for vehicles traveling less than 25 mph. on public roads, ratified as ASAE Standard, ratified by ANSI in 1972, became an OSHA regulation (USA). Developed 1961-1963 at the Ohio State University, Columbus, OH, by Kenneth A. Harkness. In 1965 Nebraska was the first state to adopt the SMV Emblem. *HL1992 SDCA*
- 1964** Oliver diesel 1950, first 4WD drive over 100 hp (NTT 872), with other manufacturers following. *NTTSN*
- 1964** J. I. Case Co. acquired the Colt Manufacturing Co., Winneconne, WI, for production of small lawn and garden tractors, 10-12 hp. *FT1950*
- 1964** Hydrostatic transmission introduced then further developed by IHC. *GH*
- 1964** Zetor diesel 4011 manufactured in Brno, Czechoslovakia (NTT 867, 748) with performance over 14 hp-hr/gal. *FT1950*
- 1965** Kubota, the first Japanese-built tractors tested at NTTL, available for gasoline or diesel fuel, produced by Kubota Iron and Machinery Works, Osaka, Japan (NTT 906). *FT1950*
- 1966** Roll-over protective structure (ROPS) on John Deere tractors, first on the JD 4020, following considerable research and joint work with industrial, educational and government organizations (NTT 934) (see 1956). *HL1996&1997 FT1950*
- 1966** Electronic fuel system, which controlled the air and fuel of the engine for greater efficiency, developed in Great Britain. *GEA*

- 1966** Versatile Diesel Tractor, D-100, manufactured, first Versatile 4WD, estimated 125 hp, no test by NTTL. *FT1950*
- 1967** David Brown diesel 1200 tractor introduced, manufactured in UK, in 1972 absorbed by J. I. Case Co. (NTT 976). *FT1950*
- 1967** Roll-over protective structure (ROPS) performance standard approved for tractors. *HL1997 RS(June2000)*
- 1968** Big Bud tractor, the articulated HN 250 diesel, designed by Willie Hensler and Bud Nelson; sold to Northern Manufacturing Co., Havre, MT in 1974. *AFT FT1950*
- 1968** Terra Tiger, six-wheel drive, 10 hp, all-terrain vehicle (ATV) introduced by Allis-Chalmers Co. *ACS*
- 1968** Recommendations for standard flashing lights for tractors and self-propelled equipment by ASAE, and later combined with SAE Standards. *ASABES<sup>t</sup> HYMP*
- 1968** Deutz D-4006 diesel tractor manufactured by Klockner-Humbold Deutz (KHD), AG, Cologne, West Germany (NTT 1075). *FT1950*
- 1968** Ursus C-350 diesel tractor, approximately 40 hp, manufactured by Zakłady Mechaniczne Ursus, Warsaw, Poland (NTT 982). *FT1950*
- 1968** Last NTTL test of a tractor using LPG fuel, the Minneapolis-Moline G900 (NTT 979). *FT1950 NTTSN*
- 1969** Ford 8000 diesel, 106 hp, tractor tested with roll over guard cab (NTT 1026). *FT1975*
- 1969** Satoh S605G gasoline tractor, 22.03 hp (NTT 1106), built by the Satoh Agricultural Machine Co., Ltd., Tokyo, Japan, merged and later a new company, the Mitsubishi Agricultural Machinery Co., Ltd., was formed. *FT1950*
- 1969** White Farm Equipment Co., a division of White Motor Corp., absorbed Minneapolis-Moline, Oliver, and Cockshutt. *PHAT*
- 1970** Official sound testing by NTTL done on tractors henceforth. First tractor tested for sound, the Case 970 Diesel tractor, 86 hp (NTT 1034), using dB(A) decibel scale and followed in test procedure for tractors tested at the NTTL, as requested by OSHA of the U.S. Department of Labor. Beginning in 1971 all tractors tested for sound at the operator station for tractors with and without cabs, and at a position 7.5 meters to the side. *FT1950 NTTSN*
- 1970** J. I. Case Co. became a wholly-owned subsidiary of Tenneco, Inc., Houston, TX. *FT1950 OYC*
- 1971** First 4WD tractors by Massey-Ferguson, the M-F 1500 and M-F 1800, introduced. *PHAT*
- 1971** Tractor tested at NTTL with both a turbocharger and intercooler, John Deere 7020 (NTT 1063), as well as other models that year, JD 4320 and JD 4620. *FT1950 FT1975*
- 1972** National Safety Council approved tractor overturn protection system, certified as ROPS (roll-over protective structure). *FT1950 HYMP*
- 1972** Long U-445 diesel, 41.93 hp (NTT 1108) and two other models (NTT 1107, NTT 1109) manufactured by Uzina Tractorul Brosov (UTB), Romania, tested. *FT1950*

- 1973** Belarus MTZ 80 diesel, 74.79 hp, built in the USSR at the Minsk Tractor Plant (NTT 1139). *FT1950*
- 1973** First tractors to have 20 forward speeds, the Allis-Chalmers Models 7030 and 7050, introduced. *PHAT*
- 1974** Most powerful 2WD tractor tested to date at NTTL, Allis-Chalmers 7080 Diesel, 153-181 hp (NTT 1168). *FT1950 PHAT*
- 1974** 4WD tractors with dual tires, over 100 bhp, Steiger Cougar II diesel (NTT 1170), manufactured by Steiger Tractor Co., Inc., Fargo, ND. *NTTSN*
- 1975** Leyland diesel tractors with three models tested (NTT 1176, NTT 1177, NTT 1178), manufactured by British Leyland, Ltd., Bathgate, West Lothian, Scotland. *FT1950*
- 1975** SAME Buffalo 4WD diesel and SAME Panther 4WD diesel (NTT 1185, NTT 1186), manufactured by SAME S.p.A., Treviglio, Italy. *FT1950*
- 1975** Yanmar YM 240 diesel, 19.76 hp (NTT 1199), manufactured by Yanmar Diesel Engine Co., Ltd., Osaka, Japan. *FT1950*
- 1975** Leaning-wheel tractor introduced by the Slope Tractor Co., Inc., Harper, KS, in which the axles could tilt 30° while the tractor remained horizontal. *FT1950*
- 1975** OSHA in USA required ROPS (roll-over protective structure) for all tractors over 20 hp. *AE9(1970)*
- 1976, 1977** Massey-Ferguson Model 2800, 190 hp with turbocharger, claimed to be the most powerful 2WD tractor at that time (not tested at NTTL). *FT1975 PHAT*
- 1978** Big Bud 16V-747, claimed to be the most powerful wheel model produced until that time and thought to be the largest articulated 4WD farm tractor built to date, claimed a rating of 760 engine horsepower (not tested by NTTL) using a Detroit Diesel engine. Included rear view closed circuit television scanner. The tractor conceived by Willie Hensler. Big Bud sold (1982) to Northern Manufacturing Co., Havre, MT, and later purchased by Meissner Manufacturing Co. (1982-1987). *AFT FT1975*
- 1978** Last gasoline engine tractor, the International Harvester 284, 26 hp, tested by the NTTL (NTT 1277). *FT1975*
- 1978** First satellite launched for Global Position System (GPS), from which many applications developed including steering of tractors and implements. Initial development based largely on support by the USA DOD. *BF03*
- 1979** Nebraska Tractor Testing Laboratory (NTTL) at the University of Nebraska moved into a new building capable of testing large tractors of the day (see 1919). *FT1975*
- 1980ff.** Some selected tractors built outside the USA tested at NTTL:
- 1980 Belarus 7100 with Yamz diesel engine, 269 hp (PTO), Belarus Machinery Co., Inc., Minsk, USSR
  - 1980 Kubota M5500 diesel, Kubota, Ltd., Osaka, Japan
  - 1980 White-Iseki, Iseki & Co., Tokyo, Japan
  - 1981 Deutz D 4507 et al. of Deutz Corp. of Klockner-Humboldt-Deutz, Germany
  - 1981 Hesston 780 DT, Fiat Diesel, Fiat Trattori S. p. A., Modena, Italy

- 1981 Long 510 diesel, Universal Tractor Brasor (UTR), Brasor, Romania
- 1982 Versatile 1150 diesel, Versatile Farm Equip. Co., Winnipeg, Canada
- 1984 Massey-Ferguson with manufacturing in Robinson, France, Warwickshire, England, and Beauvis, France
- 1981** Big Bud tractor 525/50, 525 engine hp, 421.5 dhp, diesel, conceived by Willie Hensler and built by Northern Manufacturing Co. of Havre, MT, with four double-drive wheels at the corners, at this time the most powerful wheel-type tractor tested at the NTTL (NTT 1400). *AFT FT1975*
- 1981** Knudson 4360 Diesel (Cummins engine) (360 engine hp) and 4400 Diesel (est. 400 engine hp) self-leveling second-generation wheel tractor, to provide increased traction on hill land, originally developed by Jerome Knudson, manufactured by Allmand Brothers, Inc. (no NTT). *FT1975*
- 1982** The largest wheel tractors tested by the NTTL: John Deere diesel 8850, 303.99 mbhp (NTT 1434); Steiger Panther diesel CP 1360, 334.33 mbhp (NTT 1455); Steiger Panther diesel KP 1360, 326.12 mbhp (NTT 1456); and Steiger Panther diesel KP 1325, 301.21 mbhp (NTT 1465).
- 1984** Case diesel 4994 Power-Shift, 344.04 mbhp (NTT 1530). *FT1975*
- 1984** First hydraulic lift test, Hesston 60-66 DT, 51 hp (NTT 1531). *FT1975*
- 1985** Ford Motor Co. purchased the New Holland division of Sperry Corp. to form a full-line farm tractor and equipment company, with tractors known as Ford New Holland. *FT1975*
- 1985** J. I. Case Co. and International Harvester tractor lines combined under the control of J. I. Case Co.; tractors called Case International or Case-IH. *FT1975 OYC*
- 1985** Allis-Chalmers Co. sold to Klockner-Humboldt-Deutz (KHD), AG, Cologne, West Germany. *ACS*
- 1986** Electronic control of fuel injection systems for diesel engines for tractors introduced. *AE(1986)*
- 1986** Nebraska legislature changed the tractor test law to accept the OECD (Organization for Economic Cooperation and Development) tests and in 1988 OECD designated the Nebraska Tractor Testing Laboratory (NTTL) as an official tractor testing station for the USA. *EPAM*
- 1987** Track-type tractor introduced with rubber tracks, the Caterpillar Challenger 65, with 270 engine hp and higher. *FT1975 HYMP*
- 1988** First OECD test at NTTL (see 1986), Case International diesel 7110, 131.97 hp (NTT 1609). *FT1975*
- 1988** Ford New Holland tractors and implements formed operating company, New Holland, PA (see 1985). *FT1975*
- 1990** AGCO, Allis-Gleaner Co., formed as a new company to produce tractors and implements, initially incorporating the Deutz-Allis Corp. of North America and the Klockner-Humboldt-Deutz (KHD) of Cologne, Germany (see 1994). *FT1975*

- 1991** Prototype rubber belt system for a 4WD tractor developed by Kelderman Manufacturing Co. *FT1975*
- 1993** Best fuel efficiency for wheeled tractor to date, 18.58 hp-hr/gal, by the Massey Ferguson diesel 3670, 152 hp (NTT 125). *FT1975*
- 1994** AGCO purchased the Massey Ferguson division of Varsity Corporation (not including the Perkins Engine Group) and the McConnell 4WD tractors. *FT1975*
- 1994** Farmers began using Global Positioning System (GPS) for management of resources. *GEA*
- 1995** Front-wheel assist used to apply power to the largest row-crop tractors for drawbar work. Five companies with new tractors over 200 PTO hp had the front-wheel assist as standard equipment: AGCO Allis, Case International, John Deere, Ford, and White. *FT1975*
- 1996** 4WD tractors with three wheels at each corner (12 wheels) manufactured by AGCO Star (NTT S216) and Case IH 9380 (NTT S209). *FT1995*
- 1997** International ASAE (later ASABE)  $1/4$ -scale tractor student design competition inaugurated. *RS4(2007)*
- 1998** Best fuel efficiency for track-type tractor to date, 19.01 hp-hr/gal, by the Caterpillar Challenger 95E diesel, 305 hp (at PTO) (NTT 267). *FT1995*
- 1998** The original Nebraska Tractor Testing Laboratory (NTTL) became the Lester F. Larsen Tractor Test and Power Museum at the University of Nebraska. *FT1995*
- 2004** Of 133,775 tractors sold in USA, 19,885 were 2WD over 100 hp; 3604 were 4WD over 100 hp. *HYMP*
- 2005** First tractor marketed with over 500 hp having rubber tracks, the Challenger 875B Diesel, manufactured by the Caterpillar Tractor Co., Peoria, IL, later marketed by AGCO. The manufacturer estimates 570 engine horsepower (no NTTL test). Other manufacturers producing tractors with over 500 hp with rubber tracks were John Deere and Case International. *FT1995 Personal correspondence with W. E. Splinter*
- 2008** AGCO Challenger MT975B, claimed to be the most powerful, articulated 4WD (three wheels at each of four corners) tractor with 584 hp (at PTO), although claims of higher horsepower made at this time at the corporation plant, Duluth, GA. *RS(June2008)*