Lombard Log Haulers and Tractors

A classic 20 ton steam Lombard

A Most Remarkable Machine
A brief history of the Lombard Log Hauler

PART I
The Development of The Steam Log Hauler

The exact circumstances surrounding the conception of what many believe to be Alvin Orlando Lombard's greatest invention have been lost and clouded by the march of time. The popular version is as follows: In the summer of 1899 E. J. Lawrence, president of Lawrence, Newhall & Page, one of the larger prosperous lumber company working on the Kennebec, by happenstance took a seat next to Lombard as he boarded a trolley. At some point during their conversation Lawrence commented on the hundreds of draft horses employed in the woods by his firm. He then expressed his conviction that a machine could certainly be devised to perform this work and thus spare the suffering of so many fine and expensive animals. Apparently quite aware of Lombard's abilities and talents Lawrence asked Lombard if he would be interested in developing such a machine for hauling logs.

Lombard was by no means the first person to conceive of a track laying vehicle. One of the earliest we know of was built in England in 1825 by a Mr. Cayley. Between 1861 and 1874 Andrew Dunlap of Glasgow, Scotland held several patents such a machine as well. Closer to home Gideon Morgan of Tennessee was granted the first U.S. patent for a track system in 1850. Warren P. Miller was granted a patent May 3, 1858. Miller went on to demonstrate his "Traction Locomotive Steam Car" during the 1858 California State fair. Many other designs existed only as few patents sketches and text. Others such, as the tracklayer built by Thomas S. Minnis of Pennsylvania in 1870, were actually built and operated to varying degrees of success.

Whether or not Lombard was aware of all these efforts that preceded his attempt we simply do not know. What we do know is that Lombard quickly set to work in his typical straightforward manner. Within two days Lombard had a crude working model carved by hand from simple blocks of wood. On the third day he traveled to Fairfield, Maine and presented his idea to Lawrence and his associates. Impressed with Lombard's design, they passed it along to the company's chief mechanic who was also convinced that it was indeed a sound concept.

Throughout the following year with Lawrence, Newhall & Page's encouragement and the use of their shop, Lombard worked out the details of his design and began to build a working prototype. While the work at the shop proceeded at a frantic pace other parts and pieces had to be gathered from a host of suppliers. Injectors, check valves, lubricators, grease cups, valves, sight glass fittings and safety valves all had to be purchased. The biggest item was the boiler itself which was provided by the Ames Iron Works of Oswego, New York. Meanwhile Lombard took measures to protect his exclusive rights to his invention.

On November 9, 1900 he filed a patent application simply titled "Logging-Engine". The patent was assigned on May 21, 1901. Finally on Thanksgiving Day, 1900 Lombard's "Logging-Engine" steamed to life. Lombard's first log hauler or "logging-engine" as he called it. Weighed in at a healthy 15 tons and was affectionately known as Mary Anne. At first glance Mary Anne resembled other steam powered machine of the day such as steam rollers, traction engines or the ever present steam locomotive. Her boiler was of the standard horizontal fire tube locomotive design. It featured a straight topped shell with a large central steam dome and was designed to operate at 150 to 200 p.s.i. In addition Mary Anne had a wooden cab (albeit crude) fitted at the back of the boiler similar to a steam locomotive. Her two cylinder steam engine was situated in "Dutch Wagon" fashion. Meaning they were tucked neatly below the frames and just in front of the tracks. The engine was of the common double acting type with slide valves worked by Stephenson valve gear. The connecting rods drove a cranked shaft with pinion gears located at each end which in turn drove the rear cog wheels that engaged the cogged racks cast into the inside face of the track pads. With a 6-1/2" bore and a 8 inch stroke and equipped with a governor situated just in front of the steam dome, Mary Anne could produce 50 horsepower when running at a speed of 300 to 400 rpm. While Mary Anne's boiler, cab and engine were quite common the rest of her was certainly not. The front of the machine was supported on a stout pair of wooden sled runners similar to those found in nearly every winter logging operation beneath common logging sleds. A conventional pole and harness extended from the runners so a horse could be attached for steering. The steersman had a crude bench to perch upon just in front of the smoke box. A square sided water tank filled the space between the smoke box and frame.

The heart of Mary Anne's running gear and her most unique feature was the track system supporting nearly 14 tons of her weight. The system included four cog wheels, two on each side set 5'-6" apart from center to center fore and aft and on axles 5'-6" long. Each cog wheel was 36" in diameter and engaged the lags which were 12 inches wide. F.E. Stanley stated "*There is a framework on which the machine is carried that extends down between the drive wheels [sprockets], curved so as to come very close to the rim of the wheel, the under side of which in on a tangent to the bottom surface of the driving wheels. This under surface forms a track extending from the lower surface of one of the driving wheels to the other. There are two rows of rollers, 2 inched in diameter and 2 ½ inches long, linked together, forming a chain or series of rollers, making an endless belt around the two wheels. The lags are also linked together and are outside the series of rollers… The lags come in contact with the ground or snow on one side and are sliding over the rollers on the other, so the machine has practically*

a steel track over which it is propelled." Although Lombard's track system was not sprung, it was remarkably flexible. A large diameter shaft connected the track frames or runners, as Lombard called them, to the main frame of the machine. This allowed each runner and track to independently osculate vertically allowing the track to follow the dips and hummocks of the road.

By February 1902 Mary Anne had been moved by rail to Carrabassett where she would demonstrate the soundness of the Lombard's design along the banks of Alder stream. At a speed of 3 or 4 miles per hour Mary Anne easily pulled 20,000 board feet of lumber loaded on five sleds with a total weight of nearly 125 tons. Over an icy seven mile haul road she was able to make two turn per day. In logging lexicon "two turns" meant that Mary Anne traveled over the same road a total of four times – twice with loaded sleds in tow. Like many new design Mary Anne had a few teething problems. Initially Lombard used cog wheels as specified in the patent rather than sprockets to drive the lag treads. The cogs engaged cog racks cast into the lag plates. While this arrangement worked satisfactory on a hard solid surface, in mud or snow this particular design proved to be a major problem. *"When we got this machine out and put it on the hard ground or ice where there was no snow or mud the machine worked, and its idea and principle were all right, but just as soon as we struck loose, soft snow, or soft clayey mud, the mud worked right under those cogs and would throw it out of place and haul a belt out so straight ."*

After modifying the design numerous times Lombard replaced the cogs with sprocket wheels engaging thru-slots cast into the lag plates as seen on a modern crawler track. Another problem was the rigid cranked shaft and pinion gears that had driven the cogs. While simple and effective, it did not provide and compensating effect. This made turning corners a bit of a challenge with both tracks moving at the same speed. In addition the pinion gears driving the cogs were exposed to any mud or dirt picked-up by the cogs and wore heavily. In-spite of the problems, Lawrence, Newhall & Page, pleased with Mary Anne's performance quickly purchased her and ordered two more log haulers. These machines differed somewhat from Mary Anne's design. In an effort to provide for a differential Lombard replaced the two cylinder engine situated horizontally beneath the frame with a pair of two cylinder engines each mounted vertically on opposite sides of the boiler just behind the smokebox. Each engine drove a track independently. This doubled the power from 50 horse power up to 100. When making a turn the engine on the outside of the turn would be sped-up while the engine on the inside would be slowed down. Other modification included a fuel bunker hung off the back of the cab. A horse was still used for steering. However, as A.O. Lombard Noted *"[They] tie up the reins and let him go. They never ask him to start or stop."*

With the success of Mary Anne, and orders in hand, Lombard quickly formed the Lombard Traction Engine Company and setup a shop in Waterville, Maine on College Avenue just south of the Keyes Fiber mill. At the same time Lombard was testing another experimental log hauler. Information on this particular machine is hard to find. However, an article appearing in the New York Times of April 3rd 1904 provides a good description. It's described as resembling the flat construction cars used on the numerous street railways of the era and measured twenty feet long and six feet wide. The track system was similar to Mary Anne's. Power was provided by two twenty-five horsepower electric motors. A Westinghouse controller, as used on many of the trolleys of the day, controlled speed and direction. It was geared to run at approximately four miles per hour. Positioned over the center of the track system was a log bunk which could pivot and on which rested the one end of the log load with the other supported by a trailing sled. Other sleds could be towed behind as well. The electric log hauler, named Forest Echo was tested on a seven mile long haul road flanking Alder Stream and drew current, like a

trolley, from an overhead catenary wire. To provide power for the system a small hydro plant was erected on the stream. During tests, Forest Echo hauled loads as high as 58,280 board feet per trip. However, in-spite of the initial promising results only one electric Lombard log hauler was ever built. The extra cost of stringing and maintaining the catenary wire (always susceptible to falling limbs) and operating the turbine proved expensive and impractical so Forest Echo became just another idea lost in the mist of time.

With a proven machine and a shop ready to produce them, Lombard then set out to market his creation. While manufacturing log haulers himself was profitable, licensing others to produce them would tap a much larger market segment and generate revenue through royalties with none of the overhead or expense associated with manufacture. In keeping with this strategy, in February 1904 Lombard demonstrated a log hauler for the Phoenix Manufacturing Company of Eau Clair, Wisconsin. Suitably impressed, they purchased the machine for $4500.00 as well as the rights to produce similar log haulers under license. Nearly identical to Lombard's machines, Phoenix replaced the horse used for steering with a stout iron steering wheel jutting forward at a 45 degree angle. In 1914 Phoenix introduced the "Centiped". Powered by a 50 horse power gasoline engine it still used Lombard's original track system. Others would be licensed as well. On January 3rd, 1908 Lombard authorized the Jenckes Machine Company Limited of Sherbrooke, Quebec to manufacture Lombard Log Haulers to be sold at the price of $5000.00 each with a $1000.00 royalty for each machine being paid to Lombard.

In November of 1905 Lombard filed for a new patent in for a revised track system incorporating some of the modifications made to Mary Anne, including the sprockets in lieu of the troublesome cog wheels. Interestingly this design used a series of fixed idlers or rollers similar to those on a modern bulldozer rather then the roller chains. However the fixed rollers broke often and proved un-reliable. One could indeed suspect the questionable metallurgy of the day As a result, after producing four machines of the 1905 design he would revert back to the roller chain arrangement as specified in his 1901 patent. Eventually Lombard settled on a standard design. Though the fixed idlers were a failure the 1905 patent drawings clearly display the general configuration that would be used on nearly all of Lombard's 20 ton machines until production ceased.

This standardized log hauler was a much improved machine over Mary Anne and those produced for Lawrence, Newhall & Page. The boiler was of the locomotive type as before with the exception that the water tank was now carried astride the boiler like a tank locomotive of the era. In addition, the double twin cylinder engines had been replaced with two single piston engines. One, mounted horizontally outside the frame on each side. Power from the engines was transmitted via a common crankshaft to a large compensating gear or differential running in an enclosed oil bath, which drove two half shafts via bevel pinions. Final drive was by chain from chain sprockets fitted to the outer ends of the half shafts to a large chain sprocket fitted to the real axle of each track. Interestingly Lombard's patent drawings show the drive chains and sprocket mounted outboard of the track. In reality they were located inboard.

The track system, merged the best features of the 1901 and 1905 patent designs. However the roller chain system was extensively revised and simplified from the 1901 design. Rather than having the roller chain traveling around guide tracks and confined by side plates, Lombard took the opportunity to

develop a new track design featuring a low, cast steel runner with the roller chain traveling tightly around it. The bottom of the runner was a replaceable manganese steel shoe. At the ends of the runners the rollers traveled around a replaceable nosing. Both the nosing and the shoe featured channels for the roller chain to travel in. Each track required two runners. In addition the width of the tacks was increased from the original twelve inches to sixteen inches. It was a solid design that would see use even on his later gasoline powered machines. Interestingly Lombard would not patent this particular feature until 1910 when he filed a patent for a gasoline powered tractor.

Lombard, by this time, had replaced the horse used for steering with a large diameter iron wheel and pinion gear. Rated at 90 horse power this design would be the definitive 20 ton Lombard steam log hauler and was a much improved machine that would serve well until discontinued in 1917. As well as producing large 20 ton log haulers, Lombard appears to have produced a number of smaller machines as well. Though documentation consists mainly of a few faded photographs, these machines appear to have been built to a somewhat standardized design as well. They used the same basic running gear with the exception that the boiler was of the vertical type with the two single cylinder engines mounted vertical on the front of the boiler. The compensating gear and track system appears to have been identical to those of the larger machine with the exception that the tracks were of the earlier narrow width. A long cylindrical water tank was fitted between the frames in front of the boiler. With the steersman seated at the front. Exactly how many of these machines were produced is unknown. Though evidence suggests at least four were built.

By 1908 a 20 ton Lombard steam log hauler could be purchased for approximately $5000.00. As delivered via rail and carefully unloaded and prepared, per the factory instructions, a new 20 ton Lombard had a top speed of 5 miles per hour and with an operating pressure of 175 psi. Its two double acting single cylinder engines with 9 inch bores and a 10 inch stroke produced 90 horse power while operating at 250 rpm. A Lombard as delivered could burn either coal or wood. Coal was more efficient but costly and transporting it to the remote lumber camps posed its own problems. The fuel bunker held 1-1/2 tons of coal or 7/8 of a cord of split seasoned hardwood. Fuel consumption was approximately 7 Miles per cord of wood. Under average conditions it could easily pull 8 sleds with each sled carrying approximately 7000 board feet of lumber. Under ideal conditions a Lombard could be expected to pull

300 tons though there are recorded instances when loads as large as 600 tons loaded on 22 sleds were drawn.

Factory included accessories were 22 feet of suction hose with a strainer for drawing water from brooks or streams. Though preferably water would be taken from a tank, an armored steam hose for de-icing the machine, and a 22 piece tool kit which included various packing materials for valves, fittings etc. A plow could be furnished at extra cost. Fitted in front of the lags, it could be raised and lowered by the steersman. In addition Lombard could also furnish complete sleds built to his 1910 Patent or just the iron fittings if the customer desired to supply his own wood pieces.

Not all logging operations were suited to the operation of log haulers and some that did found the added costs prohibitive. As a general rule a logging operator could expect to realize a cost saving over the use of horses if the haul exceeded 4 miles in length. A 14 mile haul was considered maximum for a steam Lombard. Working night and day under favorable conditions it could be expected to make three round trips in a 24 hour period. A crew of four was generally required; engineer, fireman, steersman and a striker. The striker helped take on water and fuel and was responsible for the sleds - hitching and un-hitching them at the landing and rollways.

For peak efficiency three sets of sleds were required. One set at the rollways being loaded, another set at the landing being unloaded and a third set in transit behind the log hauler. For a typical steam log hauler moving 40,000 board feet of timber this meant 24 sets of sleds would be required each carrying 5,000 board feet. If working 24 hours per day then an extra set of sleds was advisable bringing the total to 32 sets. In addition the haul road needed to be more substantial with care taken to ease the grades and curves. For instance during the 1922-23 hauling season the St. John Lumber Company records reveal that a horse drawn, two sled road cost $48.66 per mile to construct while a steam log hauler road 18 to 20 feet wide cost $323.47 per mile.

Like many steam driven machines, maintenance was a never ending necessity. Plagued with the pour metallurgy of the era it was not un-common for heavy cast parts to fracture and fail in the cold winter temperature or wear-out prematurely. For instance early track pads were made of cast iron and broke frequently. Eventually manganese steel was used which increased the life span of the tracks enormously and helped develop the Lombard steam log hauler into a powerful and reliable machine that was highly prized. As a testimony to this, during the winter of 1917-18 John A. Morrison, a sub-contractor to the St. John Lumber Co., at a cost of $24,000.00 cut a 30 mile road to Chamberlain Lake to retrieve three Lombard's that had been used by the Eastern Manufacturing Company from 1908 until abandoned after the 1913 hauling season. These machines as acquired by Morrison along with a fourth, purchased earlier, were used well into the mid 1920's. Several of these machines still survive today.

To minimize expense and lost time, a competent and skilled crew was required. However, with the industrial revolution (driven by steam) at its peak, good men willing to live the harsh life of the woods camps for minimal pay ($3.00 per day) were far and few between and no doubt the machines suffered accordingly. This of course added to operating costs as well as the inevitable time lost to breakdowns.

The St. John Lumber Co. records analysis's for the 1923-24 hauling season show that $2,353.50 was spent in maintenance with an additional $3,656.56 spent on fuel to move 2,454,805 board feet of timber. With an average of only 90 days to complete hauling operations many operators found it prudent to buy additional machines as insurance. These necessities all added to the cost of the planned

operation and had to be carefully considered in a cut-throat business where pennies counted.

Even as Lombard's big steamers began making there mark in the woods and our history events were already underway which would lead to there eventual obsolescence. In the winter/spring of 1909 Lombard tested his first gasoline powered tractor. Weighing in at 5 tons and powered by a huge Brennan four cylinder motor, this crude machine with a set of cast iron house radiators providing the cooling would pioneer a long line of Lombard tractors that would reach its final form as a 10 ton diesel behemoth.

Even though the last steam Lombard left the factory in 1918 its amazing how even today these incredible machines capture the fascination of the modern world. Over the ensuing decades they have become an integral part of our history and folklore. Unfortunately as time marches forward facts have been lost and tales or myths have become reality. One often hears of the perils of operating a steam Lombard. Yes, it was daunting sitting in front of that boiler clutching a heavy iron wheel with hundreds of tons of steel and timber pushing from behind. However, the reality in this case was quite different. In its day purchasing a Lombard was the financial equivalent to buying a modern $350,000 dollar skidder today. Great care was taken in planning the haul roads to avoid steep grades and sharp pitches. Road Monkeys were stationed at troublesome grades to spread hay to check the descent. Basically the same precautions that applied to the heavily loaded horse drawn sleds applied to the Lombard operations. The effectiveness of these precautions is born out by the number of machines that have survived out of the few built and the longevity of their service as well as surviving documentation.

Alvin Lombard’s steam log hauler revolutionized woods operations and would become an indelible part of Maine history and folk lore for generations to come. A blacksmiths son from Springfield, Maine had indeed built a most wonderful machine.

PART II
The Lombard Gasoline Tractor

Most people when they hear the words ‘Lombard Log Hauler’ they either return a blank stare or more often immediately think of the big 20 ton steamers that once roamed the Maine woods and have left a indelible mark on Maine history and folklore. Pushed into the shadows by the legend and myth of the steaming giants, Lombard’s gasoline tractors have become a little known footnote of history in spite of the fact that they were indeed the bread and butter product that Lombard relied upon for nearly thirty years. Lombard began experiments with gasoline powered tractors soon after production of his steam log haulers was well underway.

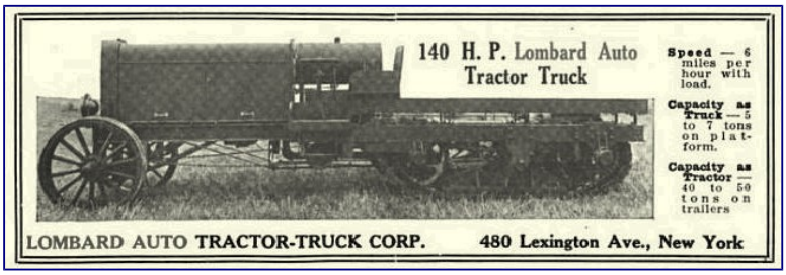
Like the steam log hauler, the early development of Lombard’s gasoline tractors is fragmentary at best and is also clouded with bits of myth that have become fact. During the winter of 1908-09 Lombard tested his first gasoline powered tractor. Based on the track system used by his steam log haulers, this crude, 5 ton tractor was powered by a massive 4 cylinder engine manufactured by Brennan Motors of Syracuse, NY. Mounted at the rear of the tractor, cooling was via a set of four cast iron house radiators with a wooden barrel set horizontally across the top which acted as the expansion tank. Interestingly the engine was mounted with the flywheel at the rear with power taken-off the front. The transmission provided two forward speeds and reverse with chain drive to the sprockets. The driver sat at the front on a simple iron Buckeye seat.

Lombard stated that the design was suitable for agricultural work as well as hauling and that skis could easily be swapped for wheels. This would appear to indicate that while Lombard was indeed focused on heavy log haulers for the logging industry he apparently had his eye on the much larger agricultural market. This is also evident in a surviving photograph of a latter, small four cylinder tractor with a scaled-down Lombard style track system (1917 patent) and a single steel front wheel. Obviously intended for agricultural work, no information has been forth coming concerning this particular machine.

Following the success of his first prototype, Lombard constructed another tractor in 1909 that was very similar to his first but used a Brennan opposed piston engine situated between the frames. This allowed for a flat, continuous deck. At least one photograph survives of this machine indicating that it may have been operated in Massachusetts. Its final disposition is unknown. A similar machine was built for H.H. Linn. Linn, a native of Washburn, Maine operated a traveling Dog Show. During the off-season he worked for Lombard acting as a field representative and sales agent. Linn would gain fame as the inventor and manufacturer of Lombard's most direct competitor – The Linn Tractor as well as hold numerous patents before his tragic and untimely death. But that's another story. This particular tractor could be called the first motor home. It featured a full length wood body similar to a Pullman railcar of the period. It even boasted a generator to provide lighting for Linn's show. It was a frequent sight throughout New England as it trundled from town to town with several wagon in tow.

The next development occurred in 1910 when Lombard filed a patent for small single track design. Interestingly, the track system in this patent featured the now familiar roller chains but running tightly around a long, low runner. Lombard apparently had already applied this design to his steam log haulers as early as 1908 but hadn't patented it. Similar to Lombard's first prototype, this tractor appears to have been designed specifically with the agricultural market in mind. At least one worked on a potato farm in Aroostook County. Discarding the big cumbersome motor home, Linn would use one of these tractors to haul his show for a number of years. Like his first prototype, Lombard powered this design with a four cylinder Brennan though mounted in front with a more conventional radiator. Lombard would build a total of four of these single track machines.

At this point the story gets a bit vague. Lombard records are nearly non-existent and the information that has survived is somewhat contradictory. To add to the confusion Lombard's serial number system seems to have been very arbitrary. For instance there are two tractors listed with serial number 7. One was sold in 1912 the other in 1916! What we do know is that by 1910 Lombard was offering what the factory referred to as a 'Lag bed Tractor' These were twin track machines powered by 4 cylinder engines from several manufacturers including Stearns, Van-Blerck and amazingly for such a small manufacture, by 1914 Lombard was offering an L-head 4 cylinder engine of his own design and manufacture. Though twin tracked, the lag bed design followed closely that featured in the 1910 patent.

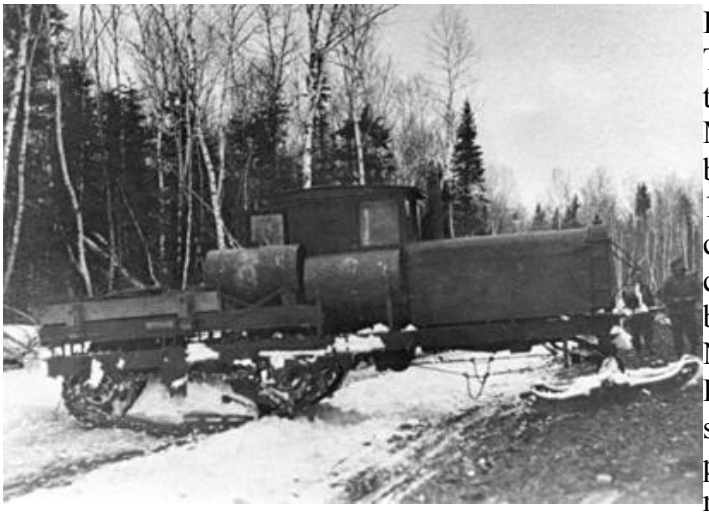


In 1916 Lombard introduced the Model F which was based on a patent filed in April of that year and approved in 1917. This was a big 6 cylinder tractor built specifically with the logging industry in mind. However, one contemporary advertisement touts it as being ideal for pulling a 12 bottom plow! In addition to the Model F, the earlier 4 cylinder 'Lag bed' design was replaced with a new 4 cylinder model based on this design as well. The basic design outlined in the 1916 patent application would

form the basis of all subsequent Lombard tractors for the remainder of production. The Model F was offered exclusively with a 6 cylinder L-Head engine of Lombard's own design and manufacture. While the 4 cylinder version continued with the Lombard engine as well. One Model F survives in derelict condition at Cunliff Depot in Maine's Allagash Wilderness Waterway. In 1917 Lombard ceased production of his own engines and once again relied on engines from other manufacturers. Waukesha, Stearns and Wisconsin's were all offered at various times.

By 1918 with Lombard gasoline tractors finding acceptance in the logging industry, Lombard discontinued production of the big steam log haulers. Nevertheless, many would continue in service well into the 1920's. Also of note, by this time the James Barron Corp. of Elizabeth, NJ became an agent and licensed manufacturer. However, no records survive to indicate how many tractors were constructed by Baron. What we do know is that by 1920 Baron had exported a number of tractors to various places around the world including Russia, the Dutch East Indies, Guatemala, Mexico and Japan.

Beginning in 1919 Lombard offered the Sterling Model F, 6 cylinder, T-head engine in a big ten ton tractor. With a 5-1/2" bore and 6-3/4" stroke it produced 145 hp at 1200 rpm. Great Northern Paper Co. would use this model almost exclusively. One tractor so equipped survives today in a private collection.



In 1922 Lombard introduced the Model N Auto Type Tractor. This was once again a big ten ton tractor. Power was provided by a Wisconsin Model PT 6 cylinder T-head engine with 5-3/4" bores and 7" stroke which produced 104 hp @ 1000 rpm. Weighing in at 17,885 lbs. a model N could haul 250 tons or more depending upon conditions. At full throttle the big Wisconsin burned 8 gallons of fuel per hour. New, a model N cost approximately $5000.00 As with all Lombard gasoline tractors, wheels could be substituted for skis as desired. A Lombard patented five plate clutch provided power to a massive Cotta three speed transmission which gave a speed of 1.75 mph in 1st, 3.5 mph in 2nd and 7 mph in 3rd. Final drive was by a very rugged worm gear. Unlike the steamers, Lombard's gasoline tractors featured a brake band operating on the drive shaft. The Model N Auto Type Tractor would define the classic Lombard tractor. Today, at least 6 survive with one in operating condition.

During this period (1926-1929) Lombard attempted to capitalize on the construction industry and sales to municipalities by once again offering a smaller, lighter tractor. At least two models were introduced - The 8 ton Contractors Special (CS-88) and the Model-T. Both were offered with four cylinder engines by Climax and Hercules as well as dump bodies. Interestingly Lombard used a more conventional steel idler design rather than roller chains. Photos survive of these machines equipped with dump bodies, plows and even a tank for oil delivery. One model T and one Contractor Special survive today. In addition Lombard advertised the big Model N for municipal road work as well. The records show that in 1929 a model 'N' was sold for $7,250.00 plus an additional $1,800.00 for a Frink plow. Eventually,

by 1930, Lombard replaced the Wisconsin Model PT in the Model N with the later Wisconsin model D-4. This was a 6 cylinder, overhead valve design with a 5-3/4" stroke and 6-1/2" bore it produced 125 hp at 1200 rpm.

In 1936 Lombard's first diesel tractor rumbled out of the shop doors. This was the model LD. Powered by a Fairbanks Morse 36-A-5 ½ diesel it featured prominently in Lombard advertising and was demonstrated in Maine and New Hampshire and appears to have eventually been purchased by Great Northern Paper. Ironically, this first diesel would be the last Lombard built.

Today, the exact number of gasoline tractors produced is un-clear. Some researchers place the number at around 260 while others speculate that it was closer to 1000. In the end Lombard lost the race with technology. The development of heavier and more durable trucks coupled with the development of

reliable pneumatic tires allowed trucks to make inroads into the woods. In addition the development of bulldozers and other earth moving equipment allowed the construction of cheap all-weather roads. No longer was the movement of timber restricted to winter. Lombard itself would survive for several more decades by continuing to provide process machinery to the pulp and paper industry.