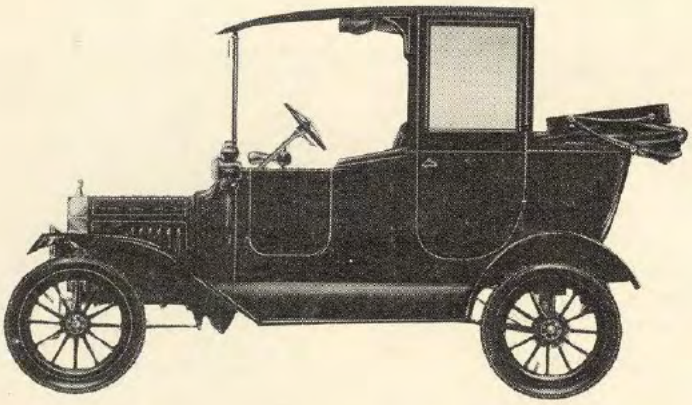
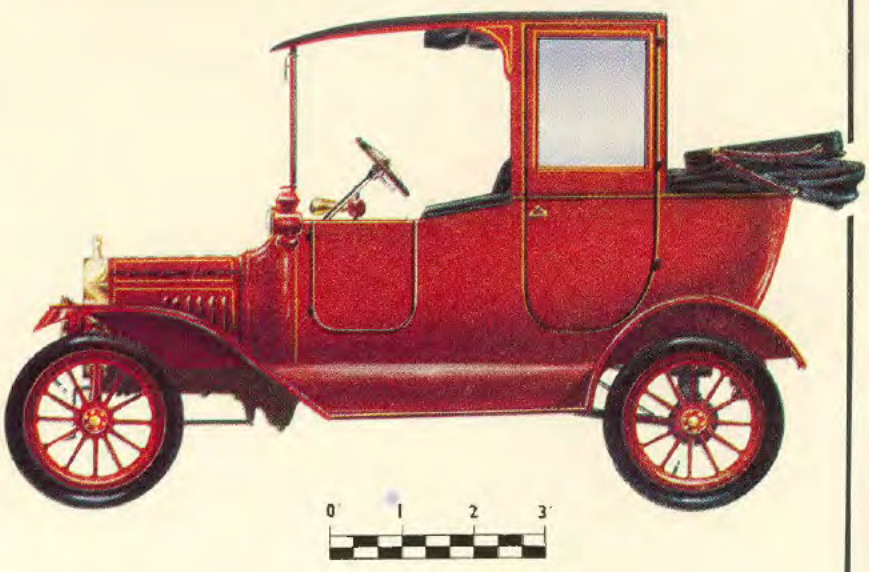
The Model T Ford



NUMBER 13

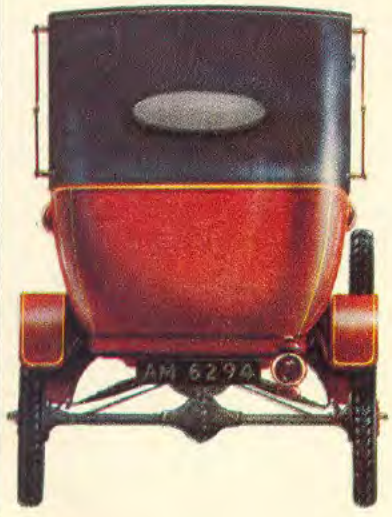
TWO SHILLINGS

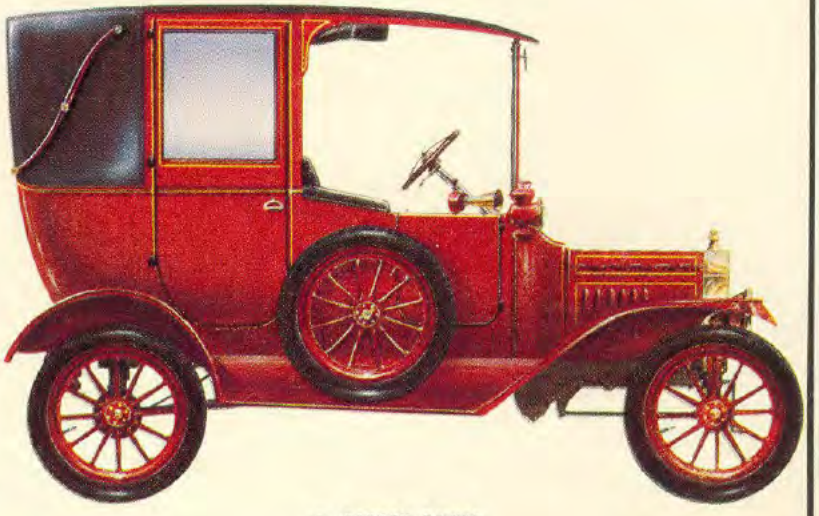
PROFILE PUBLICATIONS

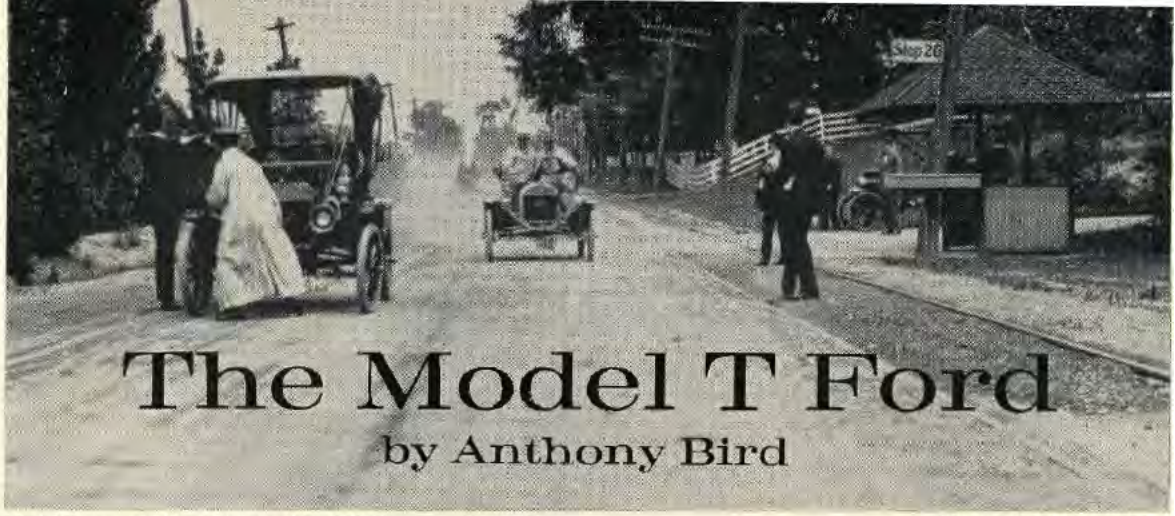


Ford

1915 MODEL T FORD "TOWN CAR" with landaulette body by the Ford Motor Company.
Owner: George Evan Cook. Esquire, O.B.E.







The Model T Ford

by Anthony Bird

Model Ts approaching Cleveland in 1909 Ocean-to-Ocean Race. (Photo: Ford Motor Co.)

To say of the Model T Ford that it was a remarkably bad car would be tantamount to doubting the judgement of the 15,007,033 satisfied customers who bought the 'Lizzie' during her production life of 19 years in plants and factories in America, Canada and England. Therefore to placate their shades and to turn aside the howls of angry derision which must greet the statement let it be re-phrased and say that Henry Ford, like Carl Benz before him, was an obstinate man whose undeniable ingenuity was tinged with perversity, with the result that his masterpiece was marred by some curiously maladroit features.

As more Model Ts were sold than any other single model (and in relation to its period the figures are even more astonishing than they would be to-day), it had a greater influence than any other man-made object on the American way of life. John Steinbeck wrote, in *Cannery Row**, 'Two generations of Americans knew more about the Ford coil than the clitoris, about the planetary system of gears than the solar system of stars . . . most of the babies of the period were conceived in Model T Fords and not a few were born in them'. Myths and legends have been woven about the Model T which distort the historical perspective occasionally, and many of these originate from the Ford Motor Company. This is not to accuse the Ford Co. of deliberate distortion but, in common with most American motor firms, their view of the early days is parochial and leaves European and English technical progress out of account.

EARLY FORD DESIGNS

The broad outlines of the Ford story are too well known to need dwelling upon. Henry Ford built his first experimental motor quadricycle in 1896; the often-quoted date of 1892 originated with Ford himself but cannot be substantiated. Further experiments followed, but nothing was done commercially until 1901 when Ford resigned his job with the Edison Co. and became Superintendent of the Detroit Automobile Company. After constructing thirty rather uninspired horizontal-engined runabouts this concern collapsed. Henry Ford's next move was to build a sprint car to attract publicity at local track events and so help him to find backers. This policy succeeded and in June 1903 the Ford Motor Company was incorporated with a modest capital of $28,000.

*William Heinemann Ltd., 1945

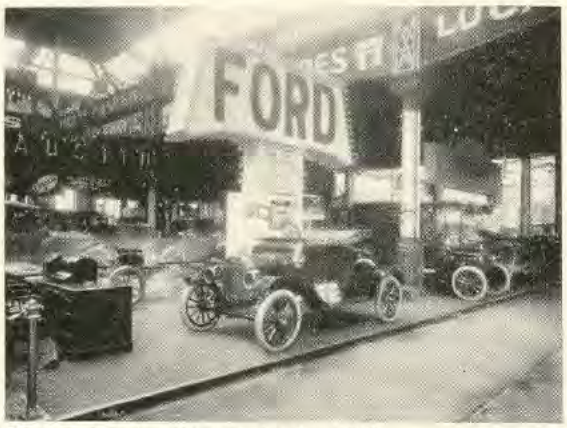
In conjunction with Tom Cooper, and again strictly for publicity (Ford was not really interested in racing), two more large, but very crude, cars were built for competition work in the short-distance track events then popular in America. These cars, with their unsprung rear axles and exposed mechanism, could not have survived long in the European road races but were mightily effective for their intended purpose. The second of them, the famous 999, is usually described as having an exposed crankshaft, but photographs of the machine (which survives) clearly show a very much exposed camshaft perched in inadequate looking bearings nearly a foot above the cylinder block.

Having got his name before the public Ford now settled down to the task he had chosen; which was to make a sound motor car cheaply enough to sell, not as a rich man's plaything, not, as most cheap cars were then, as an underpowered and inadequate runabout fit only for fine weather use on the few good roads the States possessed, but as an essential tool for the use and pleasure of ordinary people. Plenty of other manufacturers had the same urge, but none held to it as firmly as Ford, and most allowed themselves to be diverted into improving their cars until they were out of reach of the 'man of modest means'.

Ford's first production Model A followed the accepted layout of the typical 'Yankee gas-buggy'; that is, it had a centrally placed, transverse horizontal

The 'go anywhere, do anything' car—c. 1911. (Photo: Ford Motor Co.

The 'farmer's friend'. (Photo: Ford Motor Co.)



The Ford Stand at Olympia, London, 1912.
(Photo: Radio Times Hulton Picture Library.)

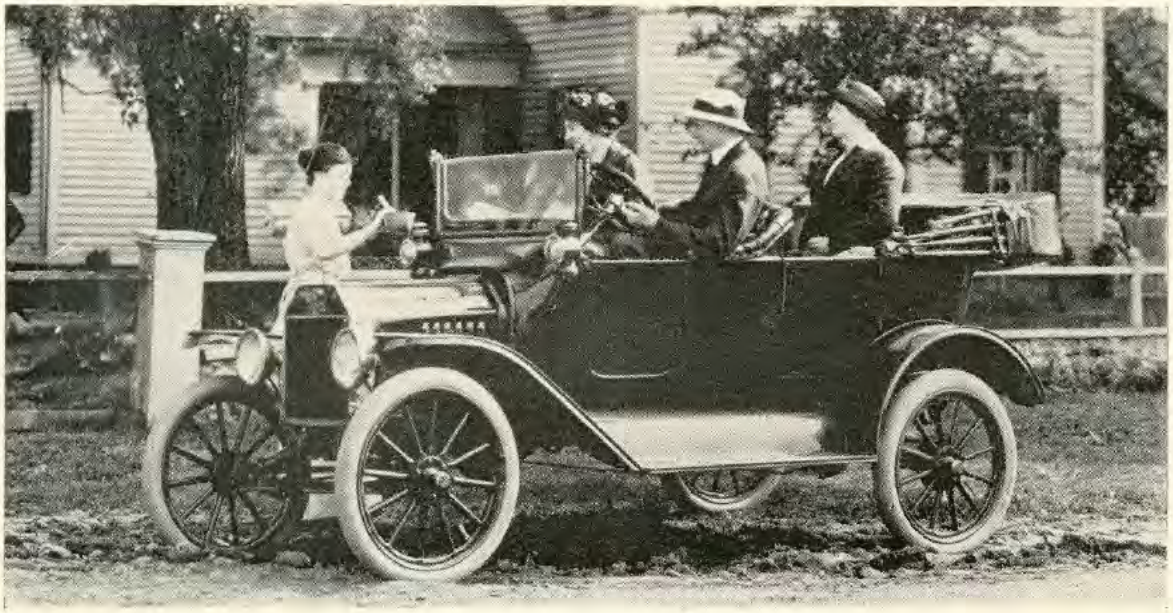
1915 touring car with the new electric headlamps operated from the flywheel magneto. (Photo: Ford Motor Co.)

engine, two-speed epicyclic gear and final drive by central chain to a live axle. Model B was his first four-cylinder car, but it was not very successful, and Models C and F were dressed-up versions of the A. Leaving plenty of gaps in the alphabet, Model K was launched against Henry Ford's wishes to pacify his associates' desire to break into the luxury market. It was wholly unsuccessful both mechanically and financially and its torsional vibration was such that Ford forswore the six-cylinder engine for ever. The little 15 h.p. four-cylinder Model N, a very good car for its period, was also marketed in 1906 and Model T was developed from it by Ford and his assistants during 1907.

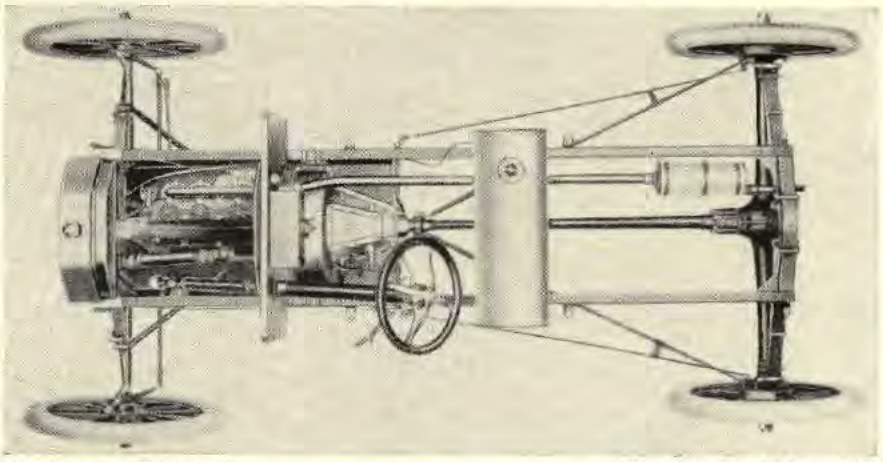
ENTER THE MODEL T

With Model T Henry Ford considered he had produced not only the car he most wanted to sell, simple, cheap to make, and light but with ample power—but the car which the public would most want to buy. With the disaster of Model K to reinforce his arguments, and despite the brief appearance of Models R and S (de luxe versions of N) he was able to prevail on his associates and backers to concentrate on Model T, to sell nothing else, and to continue it absolutely unchanged mechanically for so long that it could be sold for less money, but at greater relative profit, to an ever-increasing volume of buyers. It was a gamble, and one which paid off more handsomely than any other in the history of gambling.

It was October 1908 before Model T reached the market, as much preliminary work and planning for big sales had to be done first. The five-seat touring car was sold at $850 in 1909 and $100 dollars more in 1910. Thereafter sales and profits increased and prices fell year by year as Ford had predicted. The one-model policy was set fair to be the most spectacular commercial success of all time, and by 1916 the touring car was selling for $360 and the runabout or two-seater for $345. Production stood at 10,607 units in 1909, 168,220 in 1913 and reached a peak of 2,011,125 in 1923 from which point slow but inexorable decline set in.



Amongst the claims made in the official *Highlights in History of Ford Motor Co.*, are that Ford was the first manufacturer to use wheel instead of tiller steering in 1901, first to mount the engine with its crankshaft in the longitudinal instead of the transverse line of the chassis in 1904 and that the Model T was the first car in the world to have left-hand controls, a monobloc cylinder casting and a detachable cylinder head. It was also said to be the first car in which chrome-vanadium steel was used. None of these things is true, as any student of European and English motor history will know, but there is no doubt that the mechanical specification of the Model T was up to the minute by 1908 standards and that, although the finish may have been a bit rough, the materials were as fine as those used in the most expensive cars.



No chassis could be simpler. (Drawing: Ford Motor Co.)

DESIGN OF THE MODEL T

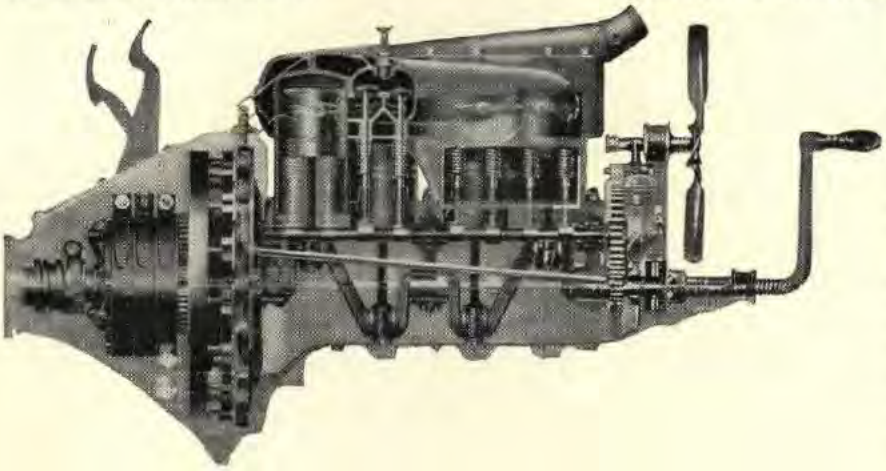
The Model T had a very simple light chassis, suspension by transverse semi-elliptic leaf springs front and back, and the dimensions were: wheelbase 8 ft. 4 in. and track 4 ft. 8 in. As the total weight of the first tourers (they put on a little as time went on) was less than 13 cwt. and the engine developed 20 h.p. the power-to-weight ratio was better than anything previously offered in the cheap car market.

The frame was very narrow in relation to the track width which was dictated by the absolute necessity, in those days, of making use of the cart ruts on dirt roads. This gave the car a rather spidery appearance, and as the roll centre was high it also induced a characteristic side sway at speed.

In their early advertisements the Ford Co. made much of their use of vanadium steel. This had not, apparently, been in use in the U.S. until Henry Ford had some pieces from a crashed French racing car analysed and called in an English metallurgist to advise on production and heat treatment. The Model T's chassis members, axles, steering connections and so forth were criticised in England for being too frail for their work. This judgement was wholly erroneous and the Lizzie soon showed herself to be able to take almost unlimited punishment without flinching.

There were weaknesses of course. The chassis was about as rigid as a bed frame but at that time only Lanchester had demonstrated that a rigid, torsionally stiff, frame allied to flexible suspension was a better solution than the usual combination of fairly stiff suspension with a floppy chassis. Ford advertisements claimed that the three-point suspension of the frame on its transverse springs, and the three-point suspension of the power plant in the frame made all the vital parts immune from stresses set up by chassis flexure. This was demonstrably untrue; a broken Ford chassis was almost as seldom seen as a dead donkey, but the frame did rack, and cracked or broken rear engine bearers were an endemic weakness, leading to leaking crankcases and ultimate failure if undetected. A variety of patent cradles and supports to strengthen the engine bearers was sold. The front cross-member also used to sag or crack to the detriment of the radiator.

The cutaway engine drawing shows the limited oil capacity and explains why the oil-level was supposed to be checked every hundred miles. (Drawing: Ford Motor Co.)



The engine was a true monobloc structure: that is, not only were the four cylinders with their water jackets cast *en bloc*, but the upper half of the crankcase was also integral with the cylinders. It was a very fine piece of foundry work, and although the crankshaft would look inordinately frail and whippy to the modern eye, the rigidity given to the main bearing supports by the monobloc construction was in the best interest of the shaft and bearing life.

The whole transmission system of epicyclic gear trains with their

Engine installation at Highland Park Assembly Plant, Detroit, before the moving assembly line was fully developed.
(Photo: Ford Motor Co.)

The flywheel magneto was the first component to be put together on assembly line principles. (Photo: Ford Motor Co.)

actuating band clutches, the direct drive multi-disc clutch for high gear and the footbrake was built in unit with the engine. This arrangement was almost certainly inspired by the 20 h.p. Lanchester which Henry Ford had for examination according to his own (ghosted) autobiography. The Ford engine and gearbox unit was extraordinarily compact and tidy by the standards of 1908.

At $3\frac{3}{4}$ in. bore and 4 in. stroke, the L-head side valve engine had a capacity of 2·9 litres, and its output of 20 h.p., or just under 7 h.p. per litre, was about average for the period. The small valves and rather tortuous gas passages and ports restricted breathing, maximum power and rotational speed, probably deliberately, but ensured adequate turbulence and good low speed torque.

This was most necessary as, in common with its predecessors, the Model T was endowed with the two-speed and reverse epicyclic or planetary gear system so common at that time in American usage. Though never openly stated it came to be part of the mythology that planetary change speed gear was a Model T innovation; but the only innovations were that the whole change speed system, and the main clutch and footbrake, were enclosed and ran in oil (previous Ford, and many other American cars had the epicyclic gear drums revolving unenclosed, and their lubrication consequently was somewhat haphazard): the other new feature was the beautifully simple and logical foot control of the gear change. Admirable though it was, however, the Model T gearbox had the great weakness of all two-speed systems in that the gap between 'low' and 'high' was necessarily very wide. Hence the need for a flexible engine with good low speed torque. A Model T in good fettle could do most of its work in 'high' but once committed to its low speed progress was far from brisk.

The simplicity of the controls was one of the most important factors in Lizzie's enduring and well-deserved popularity. The gear-changing bugbear haunted the motorist of sixty years ago when inflexible engines, heavy flywheels and clutches, and sliding-pinion gearboxes without benefit of synchromesh made a silent change of speed difficult for the expert and virtually impossible, except by chance, for the mechanically ignorant majority, who never could grasp the theory of double declutching and synchronising two cogged wheels rotating at different peripheral speeds before trying to force the one into mesh with the other. In England and Europe it was recognised that the gearbox was a necessary evil and that the more speeds a car had the better its performance could be; therefore the evil was accepted and the motorist put up with 'the clashing and jarring of changing speeds' and 'the side-grubbing of teeth,' as part of the game.

In America, however, the customers' objections to 'shifting' were very strong indeed: hence the popularity of the simple two-speed epicyclic gear systems which could be made so much easier to operate. Three-speed compound epicyclic gears, à la Lanchester, were not much used in the States, many motorists being prepared to accept the limitations of a two-speed system in exchange for ease of operation, but a proprietory three-speed transmission for Model T was one of the many 'bolt-on goodies' offered in the nineteen twenties.

The first 800 Model Ts had a reversing lever, but on the remaining fifteen million gear control was entirely pedal operated as on the English Adams ('PEDALS TO PUSH—THAT'S ALL'); though no doubt the similarity was purely coincidental. The pedal on the extreme left tightened the band brake or clutch on the low speed drum when pushed right forward, thus starting the car from rest, and engaged the direct drive plate clutch for high gear when allowed right back. The half way position left both clutches free, and this position could be held by pulling back the hand brake lever a few notches. After 'neutralising' the transmission the remaining travel of the lever expanded tiny cast iron shoes in wholly inadequate drums on the rear wheels.

The central pedal tightened the band clutch of the reverse gear, which could, of course, only be operated when the other two clutches were held in their neutral state, either by the driver's left foot or by means of the brake lever. As with all epicyclic geared cars, the reverse could be used as an additional brake. The brake pedal itself, on the right, contracted a band brake, exactly similar to the low and reverse clutch bands, on a drum containing the direct drive clutch which necessarily rotated all the time the car was in motion, whether the drive was direct or through one of the gear trains.

There was no foot control of engine speed and two conveniently angled hand levers below the steering wheel looked after throttle opening and spark advance.

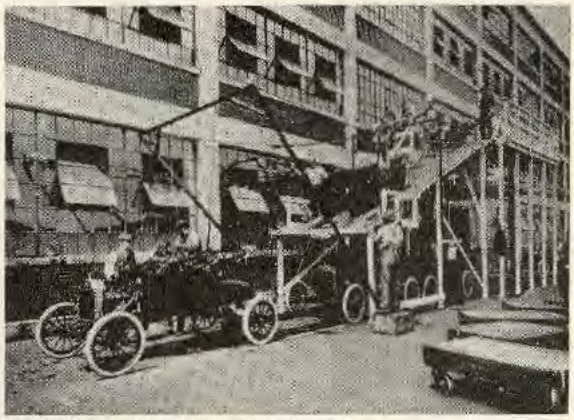
The driving technique could be learnt in a few minutes; the hand brake being put on to hold the clutches neutral and the engine being started, the driver took his place, held the neutral position with his left foot whilst releasing the brake; then with the throttle opened a few notches and the left pedal pressed to the end of its travel the car would move off in 'low'. After a few yards the throttle could be eased and the pedal released whereupon, with a characteristic moan from the planet pinions, Lizzie would trundle away happily in 'high'. Changing from 'high' to 'low', when conditions demanded it, needed no alteration of throttle and was simply a question of pressing the pedal down and holding it down firmly enough to make the low speed clutch grip. This could become very tiring if low gear had to be held for any time, and subconscious slackening of the calf or ankle muscles would allow slipping and wearing of the lining material.

LUBRICATION AND ELECTRICAL ARRANGEMENTS

Like everything else on the car the lubricating system was simple to the point of crudity. The engine and gearbox shared a common base chamber and oil supply. The lowest point in the system was the flywheel well and the flywheel was used to pick up the oil, fling it over the gearbox components and into a small funnel-shaped depression near the top of the flywheel housing from which an oil tube carried a constant supply to the timing gear case at the front of the engine. From the timing gears the oil flowed back to the well, and on its journey maintained the level in four depressions in the sump pan which served as troughs for the big end bearings to dip into. There was no direct supply to the main bearings or camshaft which received an adequate sousing from the oil spray flung about by the big ends. It was not a suitable system for a high-efficiency, high-speed engine, but it was perfectly suited to its task.

Oil level was determined by two rather awkwardly placed try-cocks, one for maximum and one for minimum permissible level, and it was a source of wry amusement to Model T owners that the makers' directions said that best results would be obtained by keeping the oil half way between the two cocks. The only snag to the oil circulating arrangement was that on a very steep gradient the oil supply to the front of the engine might be reduced or stop altogether, and so lead to a scored cylinder or damaged big end bearing. Also, the oil tube occasionally suffered blockage from bits of fluffy material worn off the clutch and brake linings. There was a built-in safeguard (unintentional perhaps) against the former hazard in that the Model T would often baulk at a really steep hill. This was not from lack of power, but from petrol starvation, as the ten-gallon tank, below the front seat, fed the carburettor by gravity, and unless it was nearly full there was insufficient head to cope with a really stiff gradient. Model T drivers soon learnt the knack of backing up steep hills, thereby avoiding petrol starvation and damaged bearings at the trifling cost of a crick in the neck and a furiously boiling radiator. It must be said, in fairness, that if the petrol supply was adequate a Model T in good fettle could scale 1 in 4 without faltering.

Part of the English Assembly Plant at Trafford Park, Manchester, 1914. (Photo: Montagu Motor Museum.)



The 'body drop' at Highland Park 1913. (Photo: Ford Motor Co.)

The 'body drop' at Highland Park 1923. (Photo: Ford Motor Co.)

The unpredictable starting of the Model T, particularly in cold weather, soon became a world-wide jest—and one which many may have thought in rather poor taste as they nursed a broken wrist or strained back. Nearly every Lizzie owner had to learn the dodges of pouring boiling water over the induction manifold or the more desperate expedient of heating it with a little bonfire of petrol-soaked rag, of jacking up one back wheel and taking off the hand brake so as to lessen the drag of the oil in the gearbox, of heating the sparking-plugs to cherry red on the kitchen stove and then having to screw them back without losing heat or burning his fingers to the bone.

Many of these difficulties were avoidable and most were attributable to the ignition system, which

'. . . with Amaryllis in the shade . . .' of the photographer's back-drop, 1920. (Photo: Ford Motor Co.)

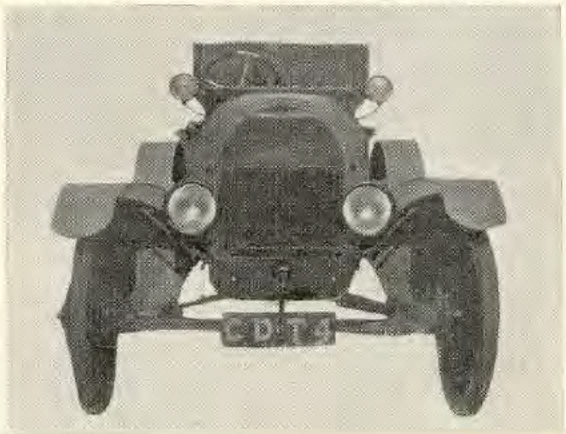
functioned perfectly whilst it was properly adjusted but which needed more constant care than it usually received. Basically, it was very old fashioned with a separate trembler coil for each cylinder and with no high tension distributor, but a low tension 'timer' to shunt the primary current to the appropriate coil and plug as required. It was therefore a similar system to that found on many early cars, and one which was generally going out of favour by 1904, with the vital difference that the primary current was derived not from the usual small accumulator, but from a low tension magneto generator built into the flywheel. Provision was made for carrying a small stand-by battery and a two-way switch allowed this to be used for starting; but all ordinary running was done on the magneto and most owners did not bother to keep the battery up to scratch. The magneto therefore had to be relied on for starting and this called for some pretty brisk efforts with the starting handle.

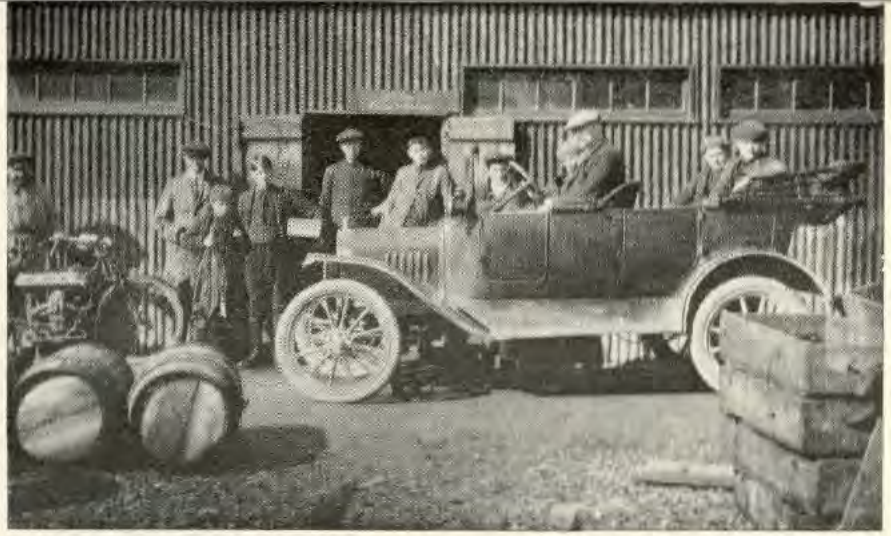
The magneto was, perhaps, inspired by the 20 h.p. Lanchester which Henry Ford investigated. It had sixteen permanent magnets attached to the flywheel itself, and sixteen field coils attached to a suitable stationary ring. Provided graphited oils were not used the Ford magneto was extremely reliable and trouble-free, but the rest of the system had shortcomings. All multi-trembler systems suffered from the defect that inequalities between one coil and the next, and the difficulty of adjusting all the tremblers to buzz at the same rate, led to rough running, loss of power and difficult starting.

The real nigger in the woodpile was the low tension timer which was rather inaccessibly placed on the timing gear case (it was driven from the camshaft), behind

At the British Army Aircraft Trials on Salisbury Plain in 1912. (Photo: Radio Times Hulton Picture Library)

'Bolt-on-goodies': a 'Speedster' body by Turpin of Brighton on 1920 Model T. (Photo: Montagu Motor Museum)





A 1916 tourer at Harper's Kippering Kiln, Galloway. (Photo: Montagu Motor Museum)

the fan where it was difficult to clean and inspect. Unfortunately it really needed very frequent cleaning, and as it was a 'wipe contact' with a roller at the end of the contact arm it also needed sparing but frequent lubrication with very light oil if the roller and contact segments were not to be worn out very quickly. This was a source of much trouble, as the oil would congeal in cold weather, and prevent proper contact at hand cranking speeds; also very few owners were conscientious enough to oil the timer every 200 miles as the Ford Co. advised. Many, indeed, ignored the directions completely and held firmly to the belief that oil must never be used on any electrical mechanism. So in one way and another the inherent weaknesses of the Ford timer were aggravated by the hard life it led, and caused most of the difficult starting and chronic misfiring from which poor Lizzie so often suffered.

After 1915, electric headlamps and horn were fitted as standard equipment, and these derived their power from the Ford flywheel magneto. Consequently switching on the lamps or blowing the horn when the engine was running slowly could starve the coils and set up a fit of the hiccups. After 1919 full-scale dynamo and accumulator lighting and starting equipment was supplied, and many of the starting difficulties were overcome. The 'timer' remained unaltered and was still a weak place in the armour, and many component manufacturers did brisk business in supplying improved varieties of distributor to put on in place of the standard fitting.

Even when the engine fired after an exhausting session at the crank, the Model T owner's troubles were not always over, for Tin Lizzie suffered sadly from the creeps, and every Model T man sooner or later experienced the sensation of having his car gently but inexorably nudging him up against the garage wall. The parking brake was a very poor affair and when the drums were full of grease from the axle tubes (a common trouble) it could not hold the car against the drag of the clutches when the oil was thick. An even worse hazard was not unknown. The engine started best with a fairly generous throttle opening and the resultant vibration could shake the hand brake free if the ratchet and click were worn. As soon as the hand brake was free the machine was, of course, in top gear. Normally when this happened the engine just stalled, but on occasions it might take hold and the car would dart away with the infuriated owner in pursuit. A large chunk of wood to scotch the wheels was to be found in many a Model T.

THE TRANSMISSION

The bevel geared live axle of the Model T, though seldom really silent, was as soundly designed and well executed as those of cars costing three times as much. The propeller shaft was enclosed in a tube which delivered the braking and driving torque reaction to a stout ball-joint at the back of the gearbox, and the single massive universal joint was positively lubricated from the communal oiling system. The pinion shaft and axle shafts ran in roller bearings, and some critics made much of 'cheap Yankee finish' because the journal areas of the shafts were not hardened and ground. The longevity of the Ford axle should have taught them to moderate their gibes, as the bearings were so long, and the wear so slight, that the makers were justified in avoiding the expense, and the risk of distortion, inherent in the heat treat-

A 1916 tourer at Hastings, 1920. (Photo: Mr. Joseph Redhouse)

1914-18 War Model T ambulance. (Photo: Offord & Sons Ltd.)

ment processes of the time.

The only trifling weakness of design was that the side thrust of the crown wheel was not taken by the usual ball or roller thrust race, but by a rather old-fashioned arrangement of a babitted washer sandwiched between two steel collars. These wore rather quickly, particularly if the lubricant was too thick, and some owners replaced them with taper roller thrust bearings. On the whole, though, the axle was as trouble-free as one could wish. It even stood up nobly to the chattering and snatching of the footbrake which reached alarming proportions when the lining of the brake band became glazed. This trouble was only overcome entirely by fitting one of the proprietory brake systems which transferred the foot brake action to a pair of auxiliary contracting shoes on the rear wheel drums. Most owners just put up with the footbrake as it was, and never seemed to come to much harm. Though officially known as the 'emergency brake', the hand brake system was of very little use except for parking on reasonably level ground. The 'One Ton Truck' version of Model T had a lower geared axle with worm and wheel gearing: this, too, gave excellent service.

'The poor arrived in Fords, whose faces they resembled,
They laughed to see the lords, and ladies, all assembled.'
Beaulieu, 1913. (Photo: Montagu Motor Museum.)

'SHE JUST WENT ON AND ON . . .'

The Model T therefore was a splendid conception endowed with some infuriating habits, and the fifteen million buyers on the whole came to love its pecca-

SPECIFICATION: FORD MODEL T, 1908–1927
Chief designers, Joseph Galamb, C. H. Wills under direction of Henry Ford.

Engine Monobloc four-cylinder 3¾ ins bore by 4 ins stroke. Capacity 2.9 litres. Output 20 h.p. L-head side valve layout with single gear-driven camshaft; non-adjustable tappets, detachable cylinder head.

Carburettor Holley or Kingston, single jet. Mixture strength adjustable from dashboard.

Ignition. Low tension flywheel magneto, low tension distributor and a separate trembler coil for each cylinder. Standby battery could be switched in for starting.

Lubrication Splash.

Cooling Vertical multi-tube radiator, thermo-syphon and fan.

Gearbox Epicyclic two-speed and reverse.

Clutches For low speed and reverse, by contracting bands on epicyclic gear drums. For direct drive high gear, by multi-disc clutch.

Transmission Propeller shaft enclosed in torque tube; live axle.

Final drive Passenger cars and light vans, straight-tooth bevel gears. One Ton Truck, overhead worm and wheel.

Brakes Foot, contracting band on periphery of direct-drive clutch. Hand, expanding shoes in rear wheel drums.

Steering Epicyclic reduction gear in boss of steering wheel; drop arm directly attached to end of steering column and transverse drag link.

Electrical system 1909–15: none. 1915–19: Headlamps and horn (8 volt) drawing current from flywheel magneto. 1919–27: full dynamo and accumulator starting and lighting–6 volts.

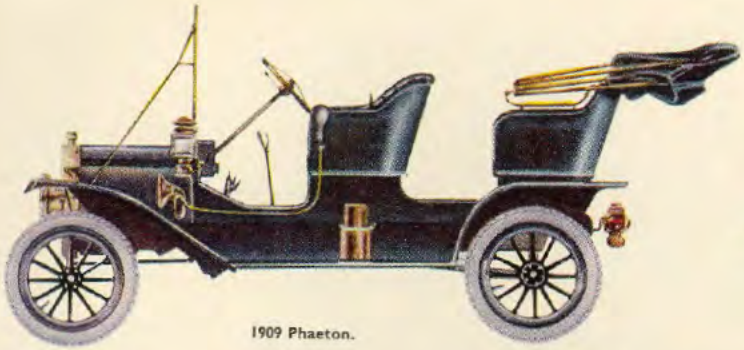
Dimensions Wheelbase 8 ft 4 in. Track, early models, 4 ft 8 in; later 5ft 0 in.

Wheels Wood-spoked artillery, non-detachable with fixed rims. Detachable rims supplied after 1919, and detachable wheel and hub sets supplied by accessory houses. Wire-spoked bolt-on wheels standardised during last year.

Tyres 30 × 3 ins front, 30 × 3½ ins rear, and variants for straight side and balloon tyres during production life.

Maximum speed claimed by makers, approximately 45 m.p.h. Under easy conditions this could be exceeded quite readily, though the 60 m.p.h. claimed by some owners was not possible with cars in standard form. Best level road cruising speed 28–35 m.p.h.

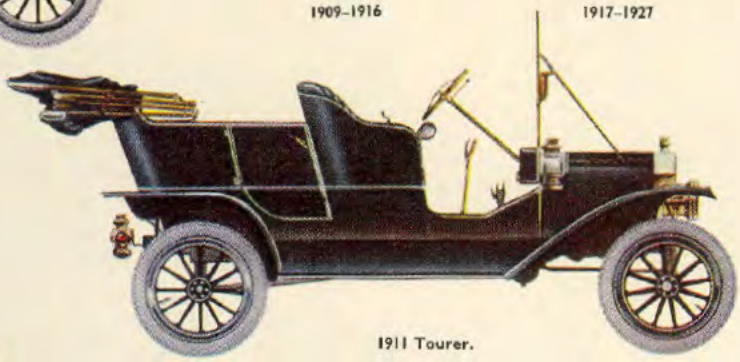
Ford



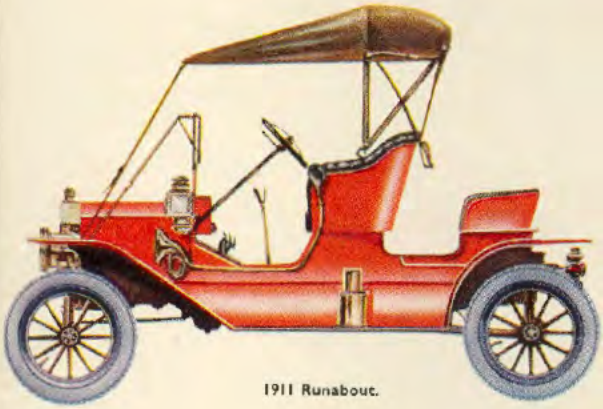
1909 Phaeton.

1909–1916

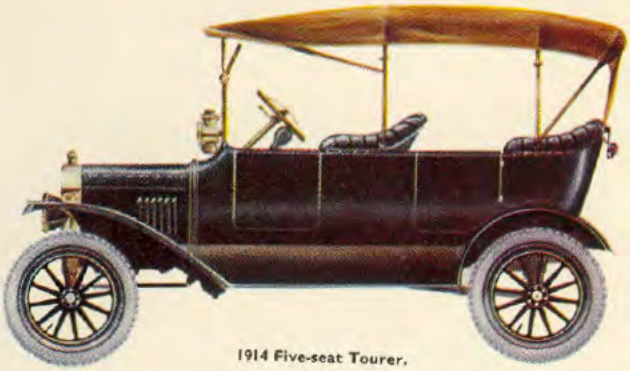
1917–1927



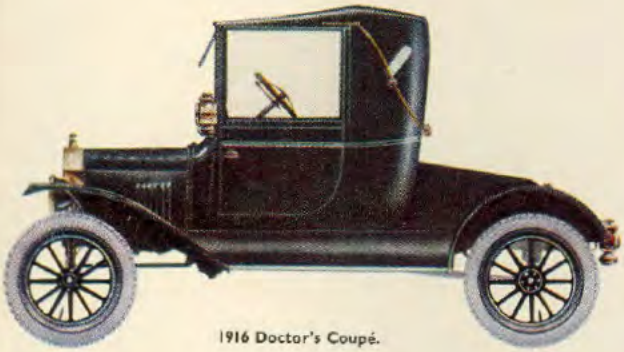
1911 Tourer.



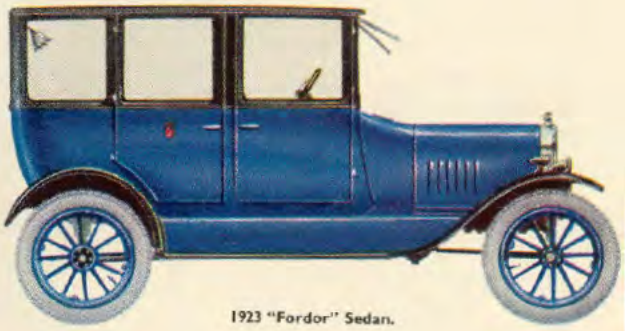
1911 Runabout.



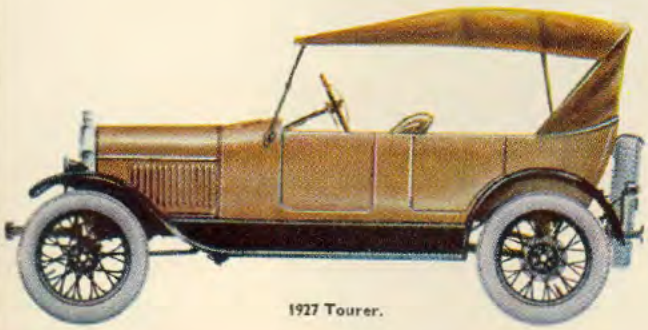
1914 Five-seat Tourer.



1916 Doctor's Coupé.



1923 "Fordor" Sedan.



1927 Tourer.

Right: A long way from the start, and still a long way to go: 1919 tourer. (Photo: Mr. C. T. W. Pearce.)

Below: Char-à-banc on 'one-ton-truck' version of Model T, c. 1923. (Photo: Montagu Motor Museum.)

dillos because, of all the cars in the world, the Ford was endowed with the strongest and most endearing personality.

Many of its faults could have been eradicated easily, but to have done so would have cut across Henry Ford's concept of mass production and interchangeability. A parallel may be drawn between Model T and the Silver Ghost Rolls-Royce which had a comparable production run, from 1906 to 1925. The Ghost, however, was extensively modified in almost every detail in the light of experience and technical development. It had, for example, three totally different gearboxes and as many rear suspension systems, to say nothing of alterations to pistons, bearings, and compression ratio which almost doubled its developed horsepower.

By contrast, the Parts List for Model T show how astonishingly few mechanical or chassis parts were altered. Underneath Lizzie's changing outward appearance she just went on and on. Her angular brass radiator may have given way to a more rounded one encased in sheet iron in 1916, but it still boiled as vigorously on the slightest provocation. The 1927 Model T may have had a sleek body style, detachable wire wheels in place of the wooden ones, nickel-plated radiator shell and lamp rims, but it was still the old faithful 1908 two-speed 'flivver' with rather sketchy two-wheel brakes and a tendency to wander if pushed up to maximum speed of 45–50 m.p.h.

Lizzie had had her day—but what a memorable day it had been.

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