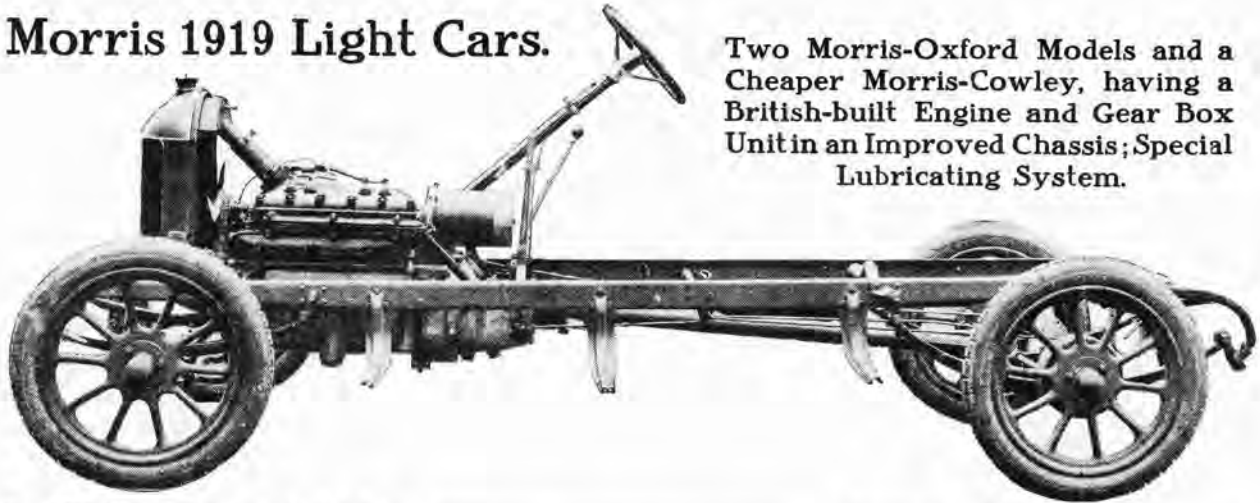




Morris 1919 Light Cars.

Two Morris-Oxford Models and a Cheaper Morris-Cowley, having a British-built Engine and Gear Box Unit in an Improved Chassis; Special Lubricating System.



VERY few new cars find a way straight to the heart of the motor user with the speed and completeness that attended the *début* of the original Morris-Oxford and later the Morris-Cowley cars. An old adage—"Nothing succeeds like success"—seems to meet this particular case. The specification of the early car sounded well, but the performance and the quality of the vehicle itself were more than up to expectations. In fact, there is little exaggeration in saying that the adequacy with which the car fulfilled a want, only half appreciated at the time, exercised a considerable influence in the creation of the modern light car market.

Expectations Exceeded

In view of these considerations the arrival of post-war Morris models is a matter of some moment, not the least interesting feature of which is the adoption of an engine and gear box unit of Morris design, but British built by the Coventry branch of that eminent French firm, Hotchkiss et Cie.

Anent this change from the American to the British-built unit there is a point worthy of record. Satisfied with the running and power output of the American engine, the designers did not reckon to obtain any better results from the British-built motor, but nevertheless they have been agreeably surprised to obtain an even better performance from the Hotchkiss engine, despite the early stage in its production as opposed to that re-

SPECIFICATION.

- 11.9 h.p., four cylinders, 69 x 100 mm. bore and stroke (1,495 c.c.)
- Engine and gear box in one unit.
- Multiplate clutch.
- Three-speed and reverse gear box.
- Spiral bevel final drive.
- Semi-elliptic front, and three-quarter elliptic rear springs, with gaiters.
- Tyres, 710 x 90 mm. on detachable wheels. 700 x 80 mm. on Morris-Cowley.
- Wheelbase, 8ft. 6in. Track, 4ft.
- Approximate weight: two-seater, 15 cwt.; four-seater, 16 cwt.
- Electric lighting and starting.
- Electric lighting only on Morris-Cowley.

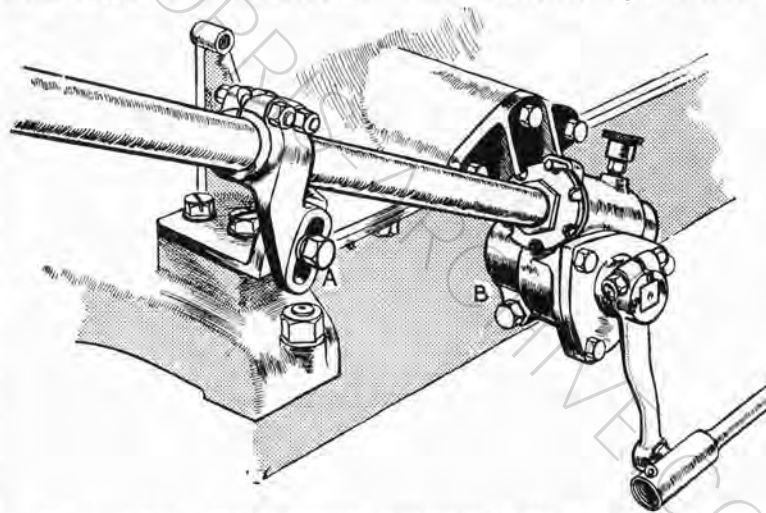
finement which is generally concurrent with long experience of building some particular unit.

Concerning Inspection.

Regarding the manufacture of cars upon the principle adopted by Morris Motors, Ltd., that is, the assembly of complete units and of units built up from small parts obtained in quantity from specialists, the very rigid inspection of parts necessary offers thereafter a very considerable advantage to the eventual owner. It is obvious that the producers of the complete car must specialise in assembly, and the success of their business will depend upon the degree of efficiency they attain. Equally obvious it is that the units and parts which they receive must be exactly to size within very fine limits, otherwise a great deal of hand fitting would become necessary and cost would be prohibitive. Hence, in order to make their business practical, the assemblers are obliged to exercise a most careful inspection of all parts before they pass them into store. By this ultra-rigid inspection the car owner benefits, because spares are thus genuinely interchangeable.

The New Models.

Concentration on one chassis only is the keynote of the 1919 programme, but this chassis forms the backbone of three cars—a two-seater and a four-seater Morris-Oxford, and a cheaper model produced as a two-seater only and bearing the name of the Morris-Cowley, the differ-

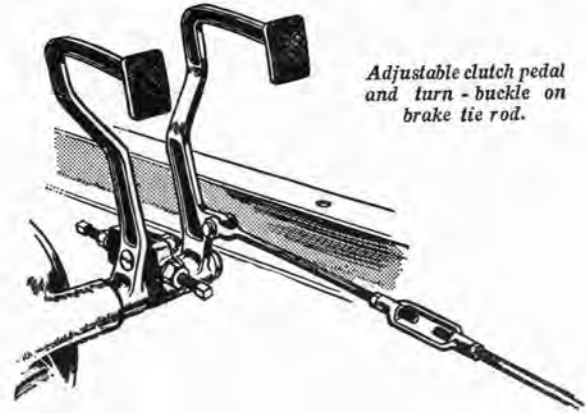


The steering gear (B) in position with the box bolted to the crank case. A short way up the column a bracket (A) is provided to adjust the rake.

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ence being mainly in the omission on the latter of the electric engine starter, the use of 700 x 80 mm. plain tyres instead of 710 x 90 mm. grooved on the more expensive models, the provision of a body without rounded tops to the sides, upholstered in pegamoid instead of leather, and painted in grey varnish colour only, valances being omitted, although electric light is supplied from a combination dynamo and magneto.

As in the cheaper car, the main items are exactly similar to those of the Morris-Oxford, it is proposed to describe in detail the latter. Combined as one unit with the gear box, the engine has four cylinders 69 x 100 mm. bore and stroke, cast *en bloc* and integral with the top half of the crank case and supporting arms, of which there are four. A detachable cylinder head closes the top of the block, and carries at its forward end a metal flanged joint to the rubber connection of the radiator top waterway, this provision being made to facilitate removal at any time when necessary without having to break a rubber water joint. No valve caps are used, and the valves themselves are in line on the near side of the block, there being on this side a ribbed exhaust manifold, the Zenith carburetter being carried on the off side and passing the mixture through passages cast in. A long felt-jointed detachable pressed-steel cover closes in the valve stems and allows access to the skew-cut timing gear, and, as ports are provided in the roof of the crank chamber around the tappets, oil from the crank case can find its way to the valve stems. The tappets them-



Adjustable clutch pedal and turn-buckle on brake tie rod.

selves are of the mushroom-ended variety with adjustable tops, and are slightly offset as regards the cams on the solid shaft, so that the tappet itself receives a slightly rotary movement as well as a reciprocating motion, which minimises local wear.

Reciprocating Parts and Bearings.

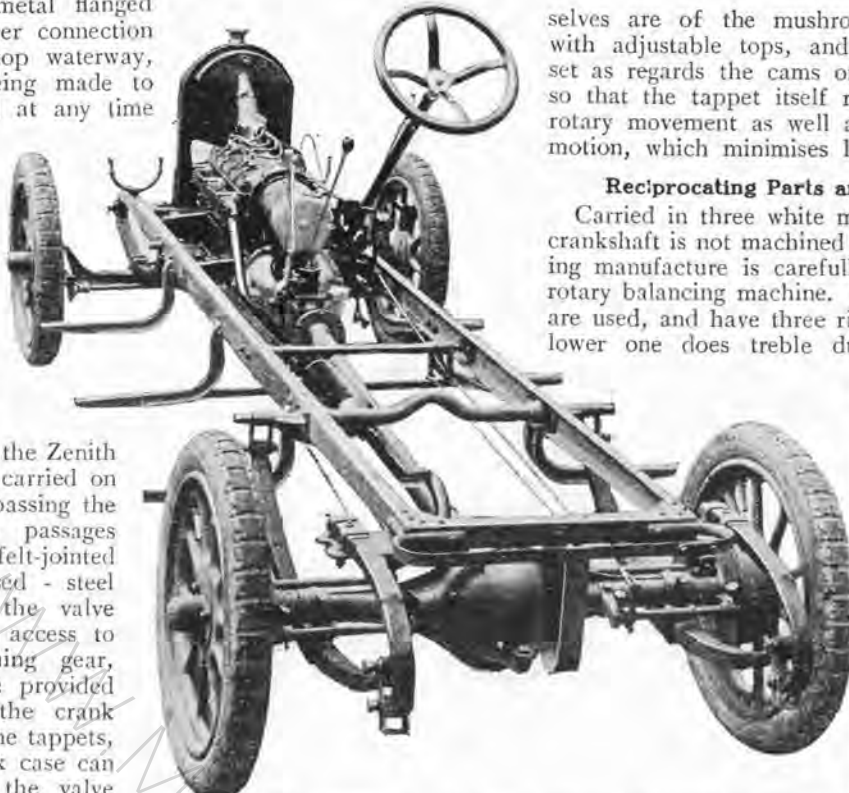
Carried in three white metal journals, the crankshaft is not machined all over, but during manufacture is carefully corrected on a rotary balancing machine. Cast iron pistons are used, and have three rings, of which the lower one does treble duty, acting as a scraper, holes being drilled through the piston, and localising the hollow gudgeon pin, the latter being rigidly attached to the small end of the H section connecting rod by a cotter pin. For the big ends die cast white metal bearings are employed.

Combination of the cylinder

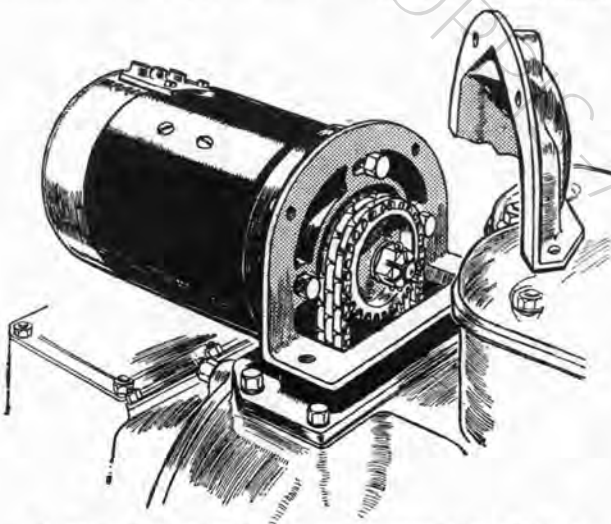
block with the top half of the crank case in cast iron goes to make a very rigid engine, besides a simple one to manufacture. For example, the individual bearings of the crankshaft and of the camshaft are cut dead in line by the simple machining process of pushing a cutting and burnishing broach clean through the crank chamber in each case from end to end, scraping of the bearings thereafter being avoided, and the burnishing ribs of the broach having the effect of closing the surface of the metal.

Oil where Oil is Due.

Very thorough steps have been taken to ensure that sufficient lubricant reaches the various moving parts. The aluminium bottom half of the crank case is detachable, and is provided with a false bottom or tray of pressed steel, in which are stamped troughs. Dippers on the end of the connecting rods pick up from these troughs the necessary oil for the big end bearings, and the mist of oil in the case is collected by pockets above the main journal bearings. A very simple form of plunger pump, driven by an eccentric on the cam-



At the rear of the frame is mounted a simple form of spare wheel carrier.



A silent chain drive is used for the dynamotor, which is mounted eccentrically to provide adjustment.



shaft, keeps the level of oil correct in the troughs and also attends to the lubrication of the timing gear. Further interesting points are to be found in the lubricating system, in that when the bottom half is detached the pump comes away with it complete, and it is possible to apply visual test to the system. To maintain the oil level in the troughs at the correct height when climbing, the rear edges thereof are slightly raised. The pump itself operates in a filler shroud of gauze.

On the off side of the engine, forward of the carburetter, is a combined crank case breather, oil filler, and level indicator, this latter consisting of a metal rod attached to the filler cap and reaching to the bottom of the sump. The rod has marked on it divisions which indicate the depth of the case, and the level is read from the oil marks on the rod.

Electrical Components.

Carried at the front of the engine, the B.T.H. magneto is driven by a skew gear operated transverse-shaft, and has a flexible and adjustable coupling. Between the rear bearing of the crankshaft and the fly-



Mushroom ended tappet, connecting rod with cotter gudgeon pin fixing, and three-ringed cast iron piston of the Morris-Oxford engine.

this important bearing. The layshaft is carried on plain bearings, and the gear wheels of the driven-shaft slide on splines. Carried in the cover of the gear box, the selector mechanism is operated through a ball and socket lever, this latter, together with the hand brake, being in the centre of the car.

An oil-filling cap is provided in the top of the gear box, and a draining cap in the bottom, there being also draining caps at the lowest point of the flywheel casing and beneath the clutch withdrawal mechanism, suitable baffle flanges being cast in to prevent, as far as possible, over-oiling of the clutch itself.

At the back of the gear box is bolted a housing to receive the ball end of the enclosed propeller-shaft casing, the drive passing through a Hookes joint, lubricated from the gear box, to the solid propeller-shaft, which terminates in a spiral bevel pinion mounted on ball bearings. This final drive has a ratio of 4.75 to 1 and can be removed without taking the axle off the car. A rear axle of the banjo pattern is used, made of steel pressings, and is provided with a filler spout accessible from the rear, of the kind which prevents over-filling. The bearings of the rear wheels are of the semi-floating kind—that is to say, ball races on the outside of the axle tubes carry the wheel hubs, and the alignment of these is assured through further ball bearings at the inner ends

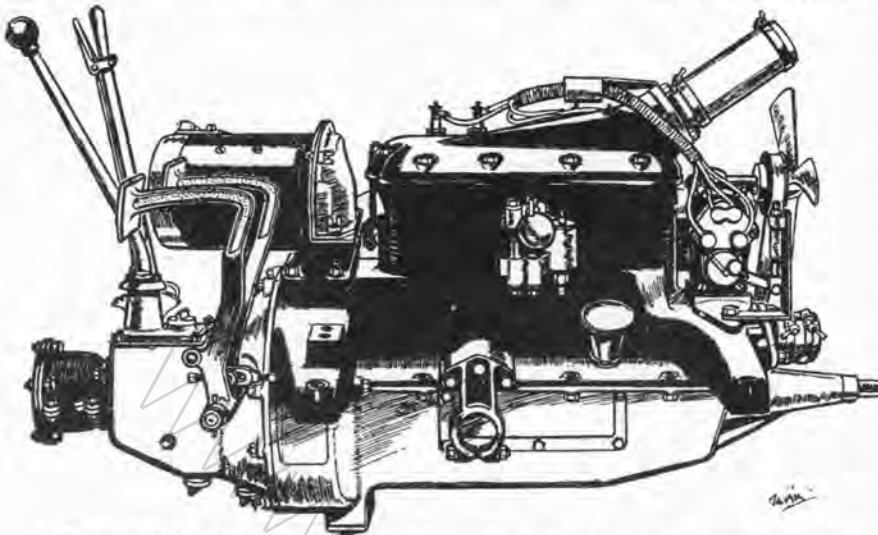
of the axleshafts themselves. Both hand and foot brakes are of the internal expanding type, carried within drums on the rear wheels, and are operated through tie-rods and compensator gear lubricated from outside the frame, turn-buckle adjustments being provided of the type shown in one of the annexed sketches. It should be mentioned that both brake pedal and clutch pedal are arranged as part of the engine and gear box unit, and a simple form of adjustment is provided for the clutch pedal.

Springs, Frame, and Steering.

Threequarter-elliptic springs attach the rear axle to the frame, semi-elliptic being used in front, and all springs being provided with proper lubricant-retaining gaiters. It will be noticed that a straight-sided frame of the utmost simplicity is used, this



Three-bearing balanced crankshaft of the Morris engine.



Engine and gear box unit showing the positions of the magneto, oil filler, carburetter, and Lucas dynamotor at the rear of the cylinders. In the centre of the crank case is a bracket to which the steering gear is bolted.

wheel a toothed wheel is mounted to drive an inverted toothed chain running upwards to the Lucas dynamotor, this latter being bolted to the crank case at the rear of the cylinders, and set eccentrically in its housing to permit chain adjustment.

A casing around the flywheel is bolted to a clutch pit forming the forward portion of the three-speed and reverse gear box, to which the drive is conveyed through a four-plate clutch running practically dry, and provided with loose interleaved Ferodo rings, these being attached neither to the driving nor to the driven plates, a method which ensures a very sweet take-up.

Gear Box Details.

Within the three-speed and reverse gear box the driving and driven shafts are carried on ball bearings, the spigot running in a phosphor bronze bush, whilst the clutch spigot is on self-aligning ball bearings. With regard to the gear box spigot, it is a feature that holes are drilled radially inwards from the bottom of the teeth of the constant mesh driving pinion into the bush and oil-way of the spigot bearing, with the result that the teeth of the driven member of the constant mesh train have the action of forcing lubricant into



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being braced at the front and at the rear with a channel cross member and further stiffened laterally by the engine feet at the front and a tubular cross member towards the rear.

Several improvements are to be found in the front axle—journal ball bearings are now fitted instead of cups, and a neat cover is placed over the inner sides of the hubs to prevent dust and mud getting in. Hardened and ground swivel pins are employed, and hard steel bushes are used in the steering arms, the cross tie-rod being adjustable. A complete worm wheel and worm form the steering gear, the box of which is bolted direct to the side of the engine, and is further supported by a stay rising from the rear engine bearer arm, the steering column being adjustable for rake. This same bracket, by the way, carries the accelerator pedal, the latter being equipped with a set screw for adjusting the slow-running position. An additional ball bearing is now mounted at the top of the column, which is surmounted with a 16in. wheel dished to a considerable depth.

Gear box portion of the Morris-Oxford unit removed, showing the plate clutch.



General lubrication of the working parts of the chassis has been provided for on sound lines. Large oil cups are used instead of greasers, and part of the equipment of the car consists of an oil pump with a screw-down fitting, having a flexible delivery pipe, at the end of which is a cock and a union with the same thread as that of the grease cups, all of which are exactly the same size. By this means, when going the round of the car, oil can be positively forced into each bearing.

Approximate Prices.

Approximate prices are as follows: Morris - Oxford two-seater, £360; four-seater, £390; coupé, £450; chassis, £335; and of the Morris-Cowley two-seater, £315. With the bodywork we may deal later. With regard to deliveries of these cars in the near future, we are asked by Messrs. Morris Motors, Ltd., to state that at the present stage intending purchasers should consult their agents on this matter, since the makers are booked up for some considerable time ahead.



In the equipment is a screw-down oil gun, the union of which fits every oil cup on the car.