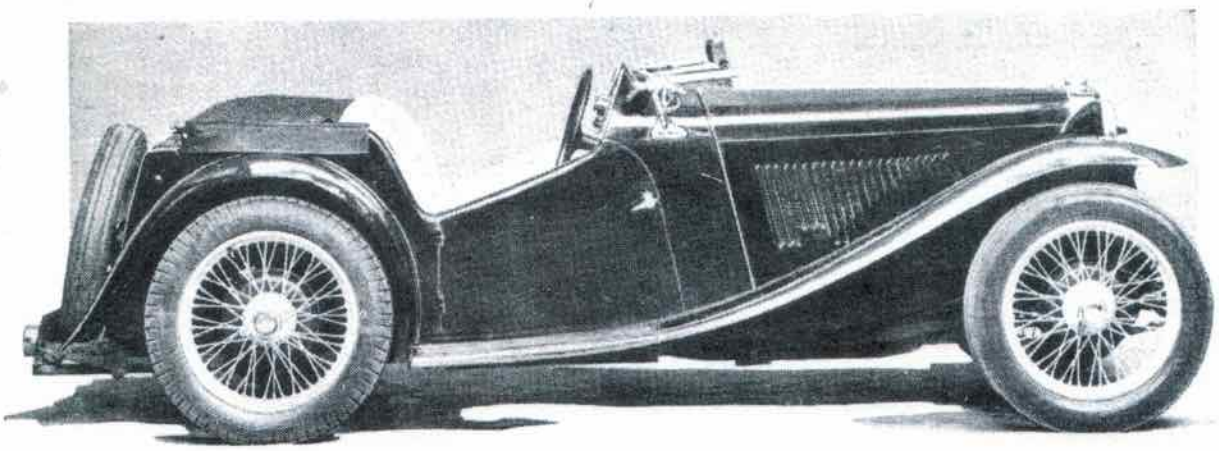
Reprinted from "The Motor," October 10, 1945



A New M.G.

Introducing the TC Midget

M.G. TYPE TC DATA

Present tax	£13 15s.
Cubic capacity	1,250 c.c.
Cylinders	4
Valve position	Push rod o.h.v.
Bore	66.5 mm.
Stroke	90 mm.
Comp. ratio	7.25-7.50 to 1
Max. power	54.4 b.h.p.
at	5,200 r.p.m.
Max. torque	64 lb./ft.
at	2,700 r.p.m.
H.P. : Sq. in. piston area	2.5 b.h.p.
Wt. : Sq. in. piston area	81.5 lb.
Ft./min. piston speed at max. h.p.	3,068
Carburetter	Twin S.U. semi-downdraught
Ignition	12-volt coil, auto advance distributor
Plugs : Make and type	Champion L. 10 S., 14 mm.
Fuel pump	S.U. electric
Oil filter (by-pass, full flow)	Full flow
Clutch	Borg and Beck single-plate, dry
1st gear	17.32 : 1
2nd gear (s)	10 : 1
3rd gear (s)	6.93 : 1
Top gear (s)	5.125 : 1
Reverse	17.32 : 1
Prop. shaft	Hardy Spicer
Final drive	Spiral bevel
Brakes	Lockheed
Drums	9 ins. × 1¼ ins
Friction lining area	104 sq. ins.
Car wt. per sq. in.	16.53 lb.
Suspension	Semi-elliptic Luvax Girling dampers
Steering gear	Bishop cam
Steering wheel	Bluemel adjustable 17 ins.
Wheelbase	7 ft. 10 ins.
Track, front	3 ft. 9 ins.
Track, rear	3 ft. 9 ins.
Overall length	11 ft. 7½ ins
Overall width	4 ft. 8 ins.
Overall height	4 ft. 5 ins.
Ground clearance	6 ins.
Turning circle	37 ft.
Weight—dry	15.5 cwts.
Tyre size	4.50 × 19
Wheel type	Wire 19 × 250 W.B
Fuel capacity	13 gallons
Oil capacity	10½ pints
Water capacity	14 pints
Electrical system	Lucas 12-volt (earth return, automatic voltage control battery charging)
Battery capacity	51 amp. hr. capacity 10 hr. rate

Top Gear Facts:	
Engine speed per 10 m.p.h.	632 r.p.m.
Piston speed per 10 m.p.h.	374 ft./min.
Road speed at 2,500 ft./min. (piston)	67 m.p.h.
Litres per ton-mile	3,050

Weights dry. (s) synchromesh.

THE immediate post-war programme of the M.G. Car Co. is to concentrate on one model only, to be called the TC Midget. This car is a direct derivation from the TB model, but, as the latter car was introduced only shortly before the war and made in but limited numbers, it is our purpose to give a detailed description. In this we hope it will be borne in mind that many of the remarks relating to the new TC type apply also to those TB models which are already on the road.

Birthday Presentation

This year is the 21st birthday of the M.G. Co., and during these years cars of this make have won 44 major races, have broken International class records on 121 occasions (including the first cars of their size to exceed 100 m.p.h., two miles a minute, three miles a minute and 200 m.p.h.), and almost innumerable firsts and places in reliability trials and club events. The overwhelming majority of these wins were scored by the earlier series of four- and six-cylinder cars with overhead camshaft engines. In view of their successes it was something of a shock when this type was abandoned in 1937 in favour of a push rod unit of greater capacity and lower specific output, but, although the push-rod valve system is used, the TC is a distinct reversion to the earlier genre. Peak power is reached at over 5,000 r.p.m., and with a compression ratio of 7½ to 1 the very creditable output figures of 2½ horse-power per sq. in. of piston area and nearly 45 b.h.p. per litre are realized. With approximately 55 b.h.p. available at the flywheel, the road speed of the car can be taken as 80 m.p.h. plus or minus, say, 2.5 per cent., according to position of screen and direction of normal wind. At 5,500 r.p.m. the speed on the indirect gears is 64 m.p.h., 45 m.p.h., and 26 m.p.h., respectively. In conjunction with 70 horse-power per ton on the bare weight of the car, the all-round road performance is manifestly very much higher than average.

Turning now to the car as a whole, only one body-type is at present available, this being a two-seater from what may be termed "typically Midget" style. Although similar in outline to TA and TB models, it is, in fact, 4 ins. wider over the seat than the last named, and this makes a very considerable difference to passenger comfort, particularly when the hood is raised and sidescreens are in position.

Increased Comfort

The latter components have received particular attention. They are given very stout frames and fit really closely to the hood and to the windscreen pillars, as can be seen from a photograph. When fully closed the car has a smart coupé-like appearance, and the comfort when driving does not belie the external aspect. Signalling flaps are fitted to the front and side screens (there being no direction indicators), and it is thought that even in really cold weather it would not be necessary to wear an overcoat. In the extreme rear of the body is a locker with a hinged lid to contain the side screens when they are not used. This should prevent undue and premature scratching of the celluloid panels, and if good care is taken the car should be capable of giving excellent service both as an open sports two-seater and as a closed model.

Introducing the TC M.G. Midget—Contd.

In accordance with usual M.G. practice, the 13-gallon fuel tank is placed externally to the body, and has a quick-release filler cap. The capacity gives a cruising range of over 300 miles without calling on the reserve supply. On the TC model there is no reserve tap, but a light indicator on the right hand of the facia panel. This also contains large-diameter Jaeger speedometer and tachometer, in addition to the other conventional instruments. There is now a single position for dynamo charging, as the output from this component is controlled by a constant-voltage unit. The accumulators, which on previous T series cars were placed somewhat inaccessibly below the floorboards of the rear luggage compartment (and thus subject to neglect), are now placed under the bonnet in the pressed-steel dashboard assembly. The rear of the body is reserved as a luggage compartment, and the two front seats have a single squab, the rake of which can be varied. There is also a range of fore and aft adjustment.

The steering column is the Bluemel extensile type, which can be moved by slackening a locking bolt. The screen is, as one would expect, of the fold-forward type, the windscreen wiper motor being placed at the top and driving two arms.

Chassis Features

The body is mounted on a channel-section chassis, which has a number of interesting features. In particular, the frame is carried beneath the rear axle with the flat semi-elliptic springs out-rigged and also passing beneath the axle. They are supported at the rear on a tubular cross-member which passes from side to side to act as a frame-bracing member. The shackles are now of conventional type fore and aft, and the springs front and back are controlled by the latest type of Luvax-Girling damper. The rear springs are out-rigged to the greatest possible extent to provide resistance to roll, and, on the other hand, the front springs are relatively closely placed in order to provide the excellent wheel lock which is a valuable feature of a trials car.

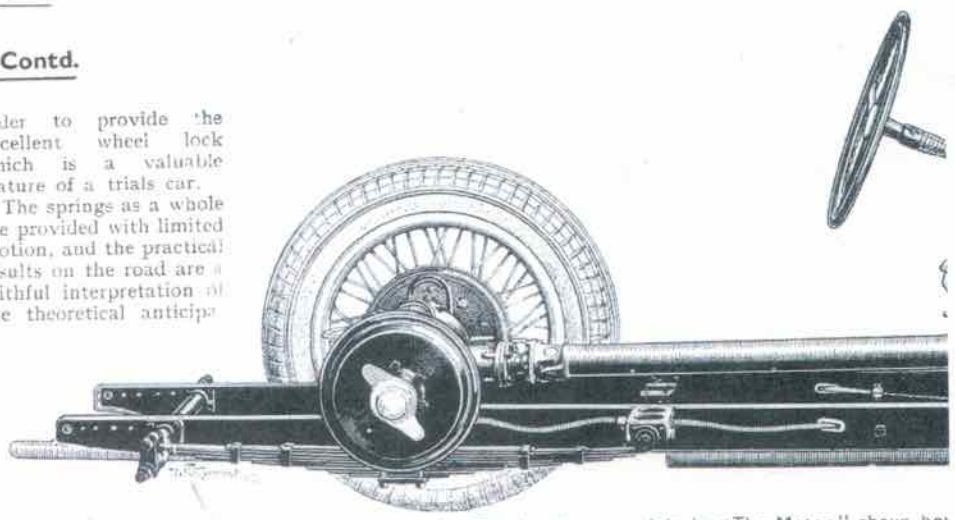
The springs as a whole are provided with limited motion, and the practical results on the road are a faithful interpretation of the theoretical anticipations with this type of layout.

The rear axle has the conventional spiral-bevel drive and is connected with the gearbox by a Hardy-Spicer propeller shaft. Following racing experience, this is of particularly large diameter, so that there can be no question of it running at a critical whirling speed within the limits of the road speed of the car.

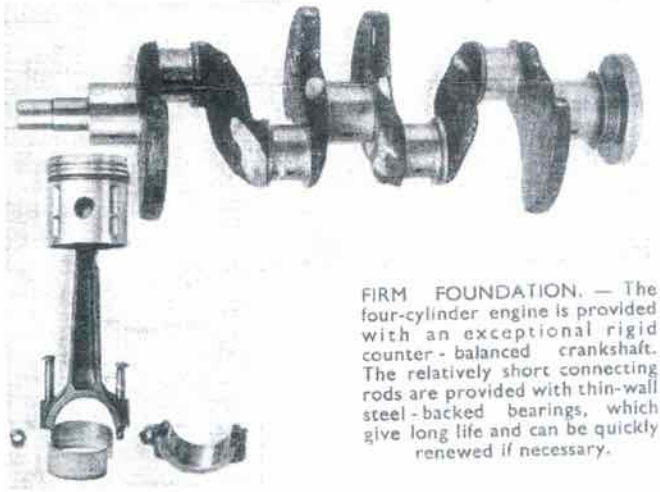
Synchromesh on Three Gears

The gearbox has a remote-control gear lever and provides synchromesh on all the upper three ratios. This is, again, a comparatively new arrangement for the T series, and one which makes possible very slick gear changing without double clutching. Going down, the procedure is to hold the throttle open and steadily press the lever towards the desired lower gear position, whilst changing up can be done with great rapidity. Against this, quiet changes without the clutch require a much higher than average degree of skill if they are to be brought off successfully. Power to the box is transmitted by a dry single-plate clutch of Borg and Beck manufacture; the flywheel is much lighter than on the TA engine, with a correspondingly more rapid response to throttle movements.

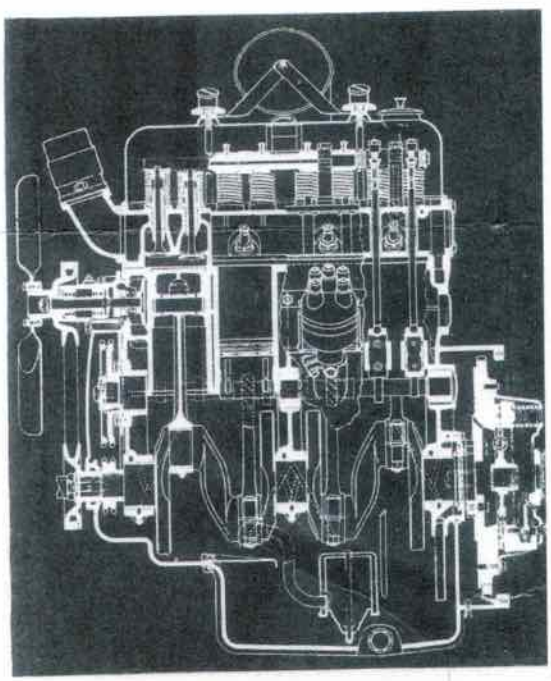
Reference has previously been made to the r.p.m. and output characteristics of the engine. It is important to realize that this power unit has been specially developed for use in this particular car, and embraces a number of meritorious features. In particular, bearing design and stiffness in all the rotating and reciprocating parts has been aimed at. The stroke/bore ratio of 1.35 to 1 is distinctly below average for British automobiles, and the crank itself is very robust and well counter-balanced, as can be seen from an illustration. The connecting rods are short (the centre lengths being under four times the crank radius), and for both main and big-end bearings the thin wall white-metal type of unit is employed.



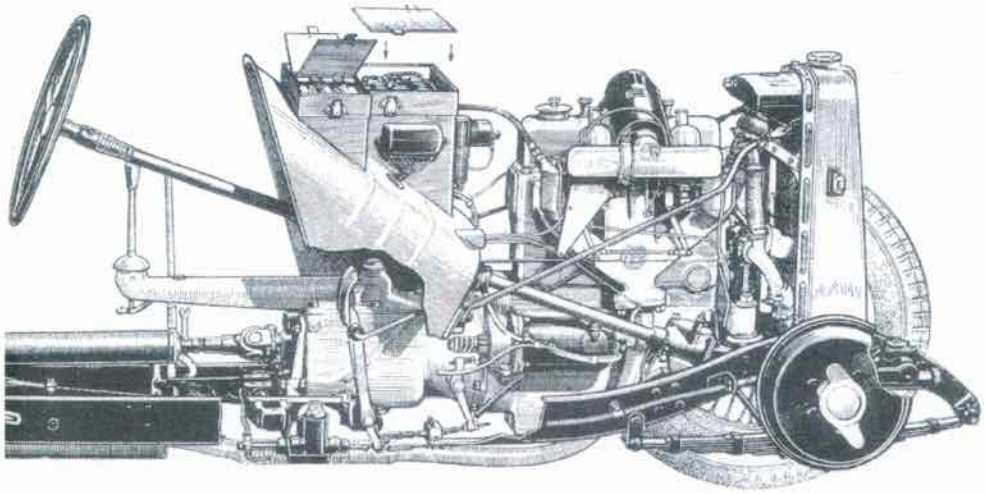
THE WORKS.—This drawing, copyright by "The Motor," shows how by the large pressed steel dash. On the TC model this latter ca diameter Bluemel spring wheel with adjustment for column length. voltage control; the oil pump, which receives oil



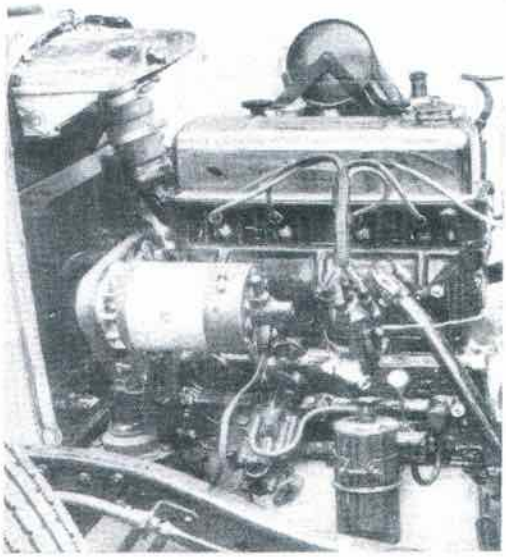
FIRM FOUNDATION. — The four-cylinder engine is provided with an exceptional rigid counter-balanced crankshaft. The relatively short connecting rods are provided with thin-wall steel-backed bearings, which give long life and can be quickly renewed if necessary.



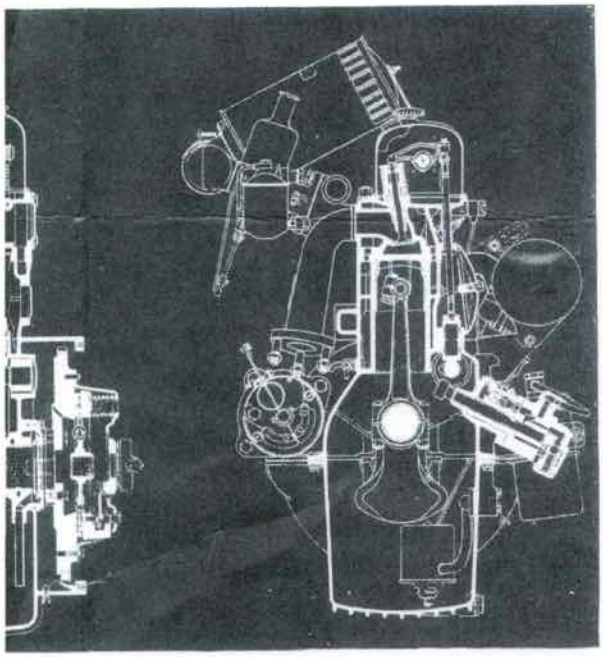
INSIDE INFORMATION.—These drawings show the develops nearly 55 b.h.p., representing the highly cr b.h.p. per square inch



r," shows how the engine is set well back in the frame, the latter being stiffened amidships l this latter carries toolbags and accumulators. The well-raked steering column carries a large lumn length. (Right) The near side of the engine. The large capacity dynamo has constant- :h receives oil through a floating pick-up, delivers to an external full-flow filter.



A large-capacity oil pump feeds the lubricant through a full-flow filter. A relief valve limits the oil pressure between 40 and 50 lb. per sq. in., but the capacity of the pump is such that this figure can be well maintained throughout the useful life of the bearings. Clean oil is also ensured by the use of a floating oil pick-up in the deep, ribbed sump, which contains over a gallon of oil. The camshaft is driven by a duplex chain and the push-rods are shortened by placing the lower ball and cup at the top of the tappet. Adjustment is provided on the rocker and the slightly inclined valves are controlled by double-valve springs.



gs show the general arrangement of the TC engine, which the highly creditable output of 45 b.h.p. per litre and 2.5 square inch of piston area.

As can be seen from the cross-sectional engine drawing, there are ample water passages around the valve seating and the cooling water is specially directed around the cylinder head. The water from the pump is carried through a conduit cast into the manifold side of the block, and from this is taken into the rear of the cylinder head. The flow of the pump is, therefore, directed almost entirely through the head, but there are passages drilled between the head and the block so that the latter receives virtually static water. This has the effect not only of keeping the head temperature down, but keeping the block temperature up, thus reducing wear on the cylinder bore and maintaining high mechanical efficiency.

Even Cooling

Additional to this feature, the normal thermostat, cutting out the circulation of water to the radiator during the initial warming-up period, is retained. A fan is also employed in the cooling system, the water pump being mounted on the fan-drive shaft on the front of the cylinder block. As can be seen from the sectional drawing there is a water space between each cylinder bore, a particularly desirable feature on a high-output engine.

Light-alloy Aerolite pistons are employed, there being two compression and one slotted scraper ring. The inlet valves are approximately 10 per cent. larger than the exhaust valves and receive mixture from a pair of semi-downdraught S.U. carburetters. These have a manual mixture control and long pipes leading from the flow-chamber vent, so that if for any cause flooding should occur there would be no danger of fire as a result of fuel dribbling over the exhaust manifold. The latter has four branches arranged in Y formation to join a single tail pipe. Each carburetter is joined to a light-alloy manifold connecting to a single air silencer and cleaner.

On the exhaust side a single Burgess silencer is used with a flexible connection in the exhaust pipe to take care of engine movement on the rubber mountings.

Ignition is by 14 mm. Champion plugs, which are inserted at an angle in the cylinder head on the side opposite to the manifolds, a feature which obviously assists in plug maintenance, and irrespective of type and position. This is in turn a matter of considerably more importance on high-output engines than on less developed and more soberly driven types. The advance and retard mechanism is governor-controlled so as to vary with engine speed, the distributor being driven by a skew gear off the camshaft.

High Mechanical Efficiency

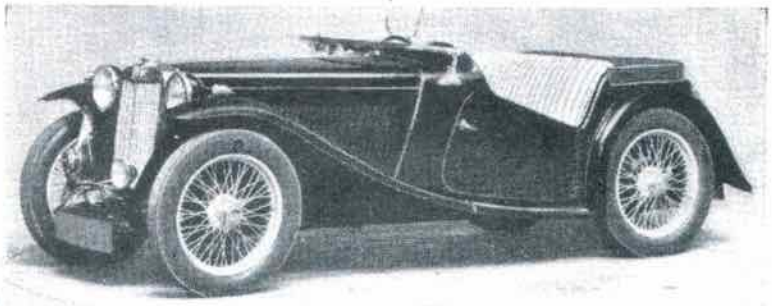
The comparatively high specific output has not been obtained at the expense of low end torque. On the contrary, the power curve reveals a b.m.e.p. in excess of 100 lb. at 1,000 r.p.m. and over 120 lb. between 1,700 r.p.m. and 4,200 r.p.m. These figures have been secured not only by careful porting and camshaft design, but also by maintaining a better than usual mechanical efficiency over a wide speed range. The figure on this count reaches 90 per cent. at 800 r.p.m., and is held to 80 per cent. at 4,000 r.p.m., which is the equivalent of 2,350 ft. per minute piston speed.

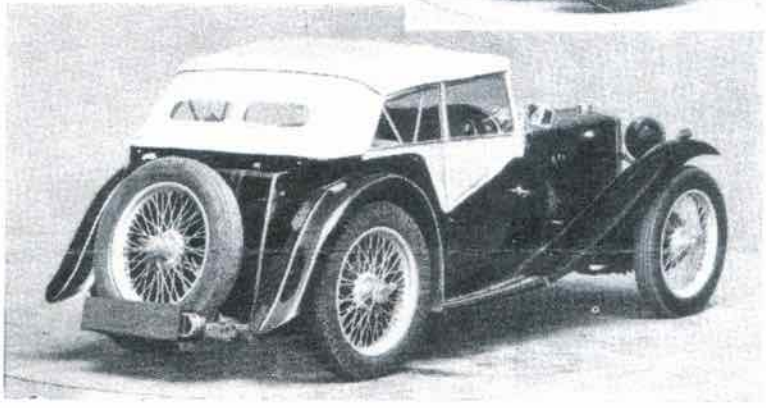
As one might expect, these factors reflect an excellent specific consumption on full throttle. This is less than 0.52 pint per b.h.p. hour over a speed range 1,500-4,500 r.p.m., and only rises slightly to 0.55 pint per b.h.p. hour at the peak speed of 5,400 r.p.m.

As can be seen from the data panel, the gearing is such that 67 m.p.h. can

Introducing the TC M.G. Midget—Contd.

be maintained at 2,500 ft. per minute piston speed, and at this velocity the engine will be working at approximately 60 per cent. of full throttle. It is, therefore, reasonable to suppose that this car is fully capable of a sustained cruising speed of 65-70 m.p.h., where road conditions permit, without overstressing the engine.



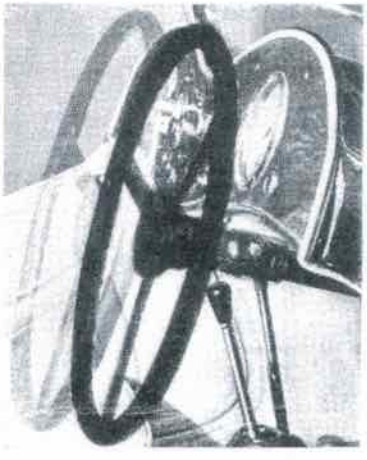


ALL-WEATHER.—Fully open or adapted for winter wear.

From the factors of horse-power per ton and litres per ton mile, as previously mentioned, one can expect a 0-60 acceleration time of approximately 22 seconds, and 10-30 m.p.h. acceleration time of approximately 10 seconds. Although it is at present difficult to obtain accurate figures, tests made after calibrating a production-type speedometer indicate that the former figure can be reached, and that the latter is 12.2 seconds with a carburetter set on the lean side and using existing Pool petrol. The acceleration time in top gear between 30-50 m.p.h. improved substantially to 9 seconds.

Hydraulic Brakes

The high performance provided by this power unit is matched by the stopping powers of the Lockheed brakes, which have cast-iron drums of 9-in. diameter with deep stiffening ribs. Due to the comparatively low all-up weight of the car, the loading per sq. in. of Ferodo brake-lining area is about 25 per cent. less than usual practice for conventional saloon cars, and the brakes can be used heavily without giving trouble from fade. Directional control is by Bishop Cam-gear working a transverse track rod and designed to provide reasonable high gearing with lightness of control at low speeds.

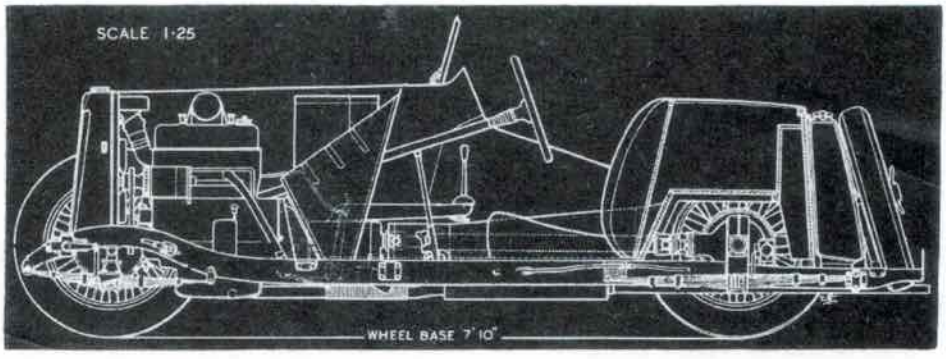


VARIABLE REACH. — The range of adiustment of the Bluemel steering wheel.

Control Gear

The handbrake is of the racing "fly-off" type; that is to say the ratchet is engaged by pressing down the knob on the top of the handle, release being obtained by pulling back and letting go. This brake is connected to the rear shoes by enclosed cables and provides a really powerful stopping effect. Thus, it is not only useful in emergency but also materially assists handling under competitive conditions. The clutch and brake pedals project vertically through the floorboards with dust excluders, an arrangement which gives very comfortable pedal action when employed in conjunction with comparatively low seating position. Moreover, the dash assembly can be brought down to the frame without slots being needed for the pedals, a feature which materially assists in excluding draughts, noise and engine fumes.

The wheels are Dunlop knock-off R.W. wire type, and are worthy of note in that they are considerably larger in diameter than the present fashion. The technical arguments in the large versus small wheel controversy are evenly distributed, but there can be no doubt that the former score very much in the aspect of appearance. In this case they undoubtedly contribute towards the well-balanced aspect of a high-performance small car, and one that will doubtless give great pleasure to a large number of sporting motorists.



EXPERIENCE TEACHES.—As can be seen from this drawing, showing the position of the principal chassis components in relation to pedals, seating and steering, the design of the TC Midget owes much to competition and racing experience. In these endeavours the Company have had exceptional successes during the past 21 years.