



HANDBOOK

OF THE

Austin

“TEN”



PUBLICATION No. 1422A.

PRICE - ONE SHILLING.

THE
AUSTIN MOTOR CO. LTD.
LONGBRIDGE BIRMINGHAM

AUSTIN TEN HANDBOOK - 1422A.

ADDENDA.

- Page 4. Brake h.p. with a downdraught carburetter is 28 at 3,800 r.p.m.
- Page 27. Ignition timing should be done with the flywheel at Top Dead Centre.
- Page 59. Tools and Accessories. A carburetter joint washer is not supplied.

Austin Motor Company Ltd.,
1/12.36.

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OF THE

Austin

TEN

PRICE 1/-

THE AUSTIN MOTOR CO. LTD.
LONGBRIDGE - BIRMINGHAM

Telephones : - - - G.P.O. BOX 41. PRIORITY 2101 (20 lines)
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AND

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(NEAR MARBLE ARCH)

Telephone : MAYFAIR 6271.

In reference to this Book please quote the number **1422A**

A FOREWORD

THE information contained in this Handbook is intended only to guide and assist owners or drivers of an Austin to preserve the car in its proper satisfactory running condition. The publication must not be considered as a complete manual.

The handbook does not in any manner vary or extend the liability of the Company, which is limited to the Warranty issued with the car. Where no information is given for a particular adjustment it may be regarded as one which the average owner would entrust to a garage. When the occasion for adjustments of this character arises the owner should seek the aid of the local Austin Dealer.

Both owner and dealer are encouraged to call upon the Service Department of the Company for advice, whether upon the management of the car, the effecting of adjustment, or methods of repair.

Owners need not suppose that they will have to apply all the attentions given in this book, but careful notice should be taken of the chapters dealing with maintenance.

CAUTION.

Parts of genuine Austin manufacture only should be used when a replacement is made, to ensure that the service given by the original shall be maintained by the replacement. Imitations cannot be relied upon to do this.

If imitations are used, the Company's guarantee is infringed and becomes null and void.

Always get your replacements from authorised Austin Dealers, as they stock only genuine Austin Spare Parts.

Should repairs be executed by other than by an authorised Austin Dealer, for safety's sake always obtain a guarantee that genuine Austin Spare Parts are used.

See statement at the end of the book with reference to Equipment and Accessories.

In correspondence always quote your car number, which is to be found on the tool box and on the frame.

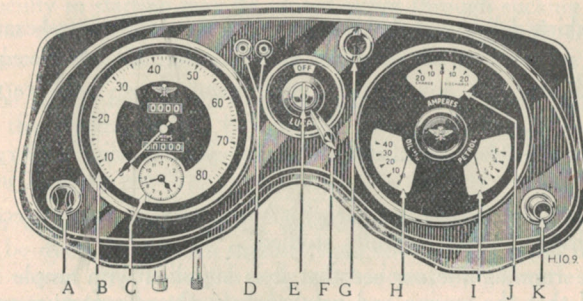
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CHASSIS SPECIFICATIONS

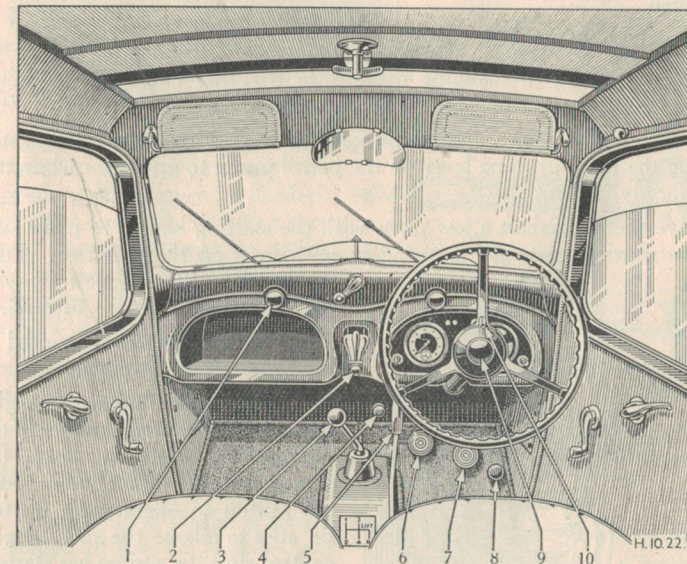
- Engine** Four-cylinders, water-cooled, with detachable head.
Bore, 2.4995 ins. (63.5 mm.).
Stroke, 3.5 ins. (89 mm.).
Cubic Capacity 68.7 cu. ins. (1,125 c.c.).
R.A.C. rating 9.996 h.p.
Brake h.p. 21 at 3,300 r.p.m.
Oil circulation is by positive gear-wheel pump; and cooling by thermo-syphon system, with film radiator and fan and automatic thermostat control.
There are three main bearings.
- Electrical** .. Ignition and electrical equipment by Joseph Lucas Ltd., with 12-volt batteries. Ignition is controlled by automatic advance and retard mechanism incorporated in the distributor.
- Clutch** A special type of clutch plate with spring-loaded friction rings assures smooth and positive engagement.
- Transmission** .. The gearbox has four speeds forward and a reverse. Top, third and second gears have synchro-mesh engagement for smooth, easy, positive and silent change. The ratios of the engine to the road wheels are 5.25, 8.04, 12.78, and 21.1 to one; reverse 27.13 to one.
The rear axle is $\frac{3}{4}$ floating with spiral bevel gears and ball-bearing thrusts throughout.
- Springs** .. Semi-elliptic front and rear, with Luvax hydraulic shock absorbers.
- Steering** .. Special worm and sector type with provision for taking up wear. Steering wheel 16-ins.
- Brakes** Girling cam and roller operated brakes are fitted on all four wheels and are individually adjustable. The pedal and the hand lever operate all brakes.
- Wheels** Special steel spoke detachable wheels are standard, with 5.25—16 Dunlop Extra Low Pressure tyres.
- Controls** .. The ball change speed gear lever and the brake lever are centrally mounted and a pedal switch controls headlight dipping. Horn button and traffic indicator switch are mounted on the steering wheel. Individual front seats are separately adjustable.
- Fuel Feed** .. Rear petrol tank, 6 gallons (27.25 litres) capacity, with A.C. petrol pump and Zenith carburetter.
- Main Dimensions** .. Length: with bumpers, 12 ft. 10 ins.; without bumpers, 12 ft. 5 ins.
Width, 4 ft. 9 ins.
Height, with Sliding Roof, 5 ft. 4 ins.; with ventilator, closed, 5 ft. 5 ins.; ventilator open, 5 ft. 9 $\frac{1}{2}$ ins.
Wheelbase, 7 ft. 9 $\frac{1}{8}$ ins.
Track, Front, 3 ft. 9 $\frac{3}{4}$ ins.; rear, 3 ft. 10 $\frac{7}{16}$ ins.
Ground Clearance, 6 $\frac{1}{2}$ ins. (Export 6 $\frac{3}{8}$ ins.)
Turning Circle, 38 ft.

INSTRUMENTS AND CONTROLS.



The Instrument Panel.

- | | | |
|----------------------------|---------------------|------------------------|
| A. Dash Lamp Switch. | E. Ignition Key. | H. Oil Pressure Gauge. |
| B. Trip Speedometer. | F. Lighting Switch. | I. Petrol Gauge. |
| C. Eight Day Clock. | G. Warning Light. | J. Ammeter. |
| D. Inspection Lamp Points. | | K. Starter Button. |



Austin Ten Controls.

- | | | |
|------------------------------------|----------------------------|---------------------------------|
| 1. Windscreen Wiper Control. | 4. Dip and Switch Control. | 8. Accelerator Pedal. |
| 2. Strangler and Throttle Control. | 5. Handbrake Lever. | 9. Horn Button. |
| 3. Change Speed Lever. | 6. Clutch Pedal. | 10. Direction Indicator Switch. |
| | 7. Brake Pedal. | |

THE NEW CAR.

It will repay You to Read these Notes Carefully.

ON taking delivery of the new car give it a careful general examination to see that all is complete and in order. Check the equipment and see that any special requirements have been carried out to order.

Have the battery certificate signed by your Austin Dealer or local Lucas Depot.

If you are not already familiar with Austin cars we strongly recommend that this handbook be carefully studied.

Before running the car see that it is supplied with ample fuel and water, and that the engine and gearbox have the necessary quantities of oil. The battery should contain the required amount of acid. For quantities of oil and acid see the sections "Lubrication" and "Electrical Equipment."

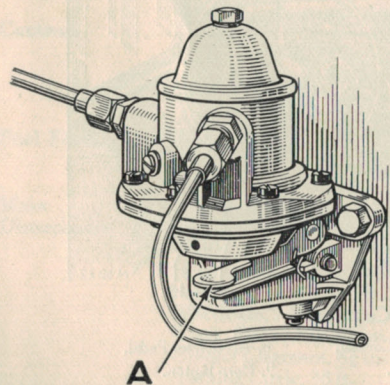
Cars delivered by road are ready for running. There is no oil, fuel or water in cars crated for overseas and the batteries are empty and uncharged.

Starting the Engine.

Before starting the engine make sure that the change speed lever is in the neutral position and the handbrake is on.

If the car has been standing for some time, starting should be assisted by using the hand priming lever on the petrol pump to give the carburetter a full supply of petrol.

Give the crankshaft a few turns with the starting handle to make sure that the moving parts are free and to save drain on the batteries. Push the handle in to engage fully with the starting nut before turning.



Petrol Pump Priming Lever (A).

The ignition key is turned to the right to switch on the ignition.

Pull the combined air strangler and throttle control knob on the instrument board to close the carburetter air inlet, and push the button to operate the starter. Be sure to release the air strangler control after the engine has started. Do not allow the engine to race when first starting up, as time must be allowed for the oil to circulate and lubricate various bearings.

Never leave the ignition switch "on" for any lengthy period while the engine is not running. The warning lamp on the switch board will remind you of this.

Difficulty in Starting.

Difficulty in starting may be caused either through sucking too much petrol into the cylinders, or too little. When starting with the throttle all but closed, a strong suction takes effect on the pilot jet.

If the engine fails to start quickly and the mixture is thought to be too rich the throttle should be opened half-way to reduce the suction. On firing, the engine will race, and the throttle should be almost closed. If the engine does not fire, close the throttle entirely and try again.

After a stop in hot weather, failure of the engine to start is more likely to be due to a too rich mixture than one too lean, and one should stop the engine by the switch only after closing the throttle. Re-start the engine with the throttle closed.

Depress the clutch pedal to lessen the starting load and so help the starter to turn the engine at a higher speed.

If, after the foregoing measures have been carried out, the engine fails to start, the reason will probably be faulty ignition or carburation.

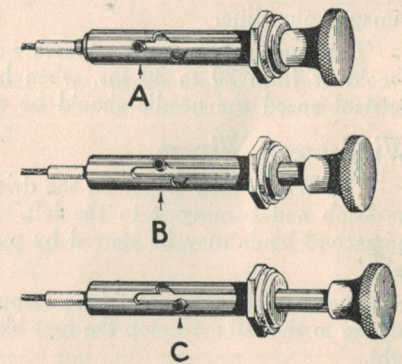
If faulty ignition is suspected first examine the wires and see that the sparking plugs are connected. Test the gap of the plug points by means of the thick end of the gauge provided in the tool kit. If the points are dirty, clean them.

If carburation gives trouble the slow running jet may be stopped up or the main jet choked. Blow them out orally or with a tyre pump. Never attempt to clean them by passing a wire or other small metal object through them; this will definitely injure the jets.

The engine should not be allowed to run at high speeds for the first 500 miles (800 km.).

After Sales Service.

Every Austin Dealer is under agreement to give to Austin Cars purchased from him "After Sales Service" during the period of the first 1,000 miles (1,600 km.) running of such cars.



Air Strangler and Throttle Control.

A. Normal Running Position. B. Fast Idling.
C. Warming Up.

THE INSTRUMENTS.

Petrol and Oil Gauges ; Speedometer ; Windscreen Wipers.

A FULL range of instruments is provided on all Austin cars. They are of the highest quality and the following notes explain their uses.

Petrol Gauge.

The Petrol Gauge is electrically operated and automatically indicates the contents of the tank when the ignition control is switched on.

When the tank is being refilled, switch off and stop the engine and then switch on again and the needle will record the amount of spirit entering the tank.

The gauge requires no attention.

Oil Gauge.

The Oil Gauge indicates that oil is being pumped through the engine lubrication system and it should be looked at frequently when the engine is running to ascertain that sufficient pressure is registered.

When the engine is cold high pressure will be recorded, but this is likely to drop as the oil becomes warmer. If no pressure is registered the engine should be stopped and the cause of the fault ascertained, otherwise serious damage may be caused.

Flickering of the needle may indicate serious shortage of oil or a damaged pipe line.

The gauge may indicate a pressure of 35 lbs. or more when the engine is cold or from 20 to 30 lbs. when hot. With the engine running at constant speed the needle should be quite steady.

Windscreen Wipers.

The Windscreen Wiper on the driver's side is started by pulling out the knob and turning it to the left. After this blade is in operation, the second blade may be started by pulling its knob and turning to the right.

The second blade should be stopped first by pulling the knob and turning to the left ; to stop the first blade, pull the knob and turn to the right.

Ammeter.

The Ammeter indicates the rate of charge or discharge of the batteries, but does not include current used by the starter motor.

No discharge should be indicated with no electrical equipment in use or with headlamps on when the car is running at about 20 miles an hour (30 kms.), or faster.

Switch Box.

When the engine is not in use the ignition key should be withdrawn from the switch box. The red warning lamp indicates when the ignition is "on" and the batteries are discharging.

The dynamo has compensated voltage control and the main switch only operates the lighting of the head and side lamps.

Speedometer.

The trip figures on the top of the speedometer record up to 1,000 miles or kilometres. These figures can be set to zero by pushing the knob at the bottom (right) of the speedometer and turning to the left.

The bottom row shows miles or kilometres up to 100,000 and these figures automatically return to zero.

The speedometer requires no lubrication or attention, but the cable should be greased occasionally.

Clock.

The eight-day clock is wound by turning the knob at the bottom until a definite stop is felt. The hands are set by pulling and turning the knob.

To regulate the clock disconnect the speedometer and remove it from the panel. Slide open the dust cover at the side of the clock and the regulator will be seen underneath. If the clock loses move the lever towards "F," or vice versa.

Traffic Signals.

The Traffic Indicators are controlled from the steering wheel. Normally after the car has turned a corner they automatically return, but when only a slight turn has been made it may be necessary to switch off the indicators.

Panel Lights.

The instruments are illuminated by three lamps controlled by the same switch. The holders can be pulled from the back of the instruments so that the bulbs may be replaced.

Dip Switch.

The headlamp dipping switch has two functions—one to give the normal driving light and one to dip the near side head lamp beam and at the same time switch the offside headlamp off.

If the headlights are on full, a touch of the foot on the switch alters the lights to the "dip-and-switch" position and they remain so until another touch returns them to the "full on" position.

Continental headlamps have dual filament bulbs operated in the same manner.

Windscreen.

The windscreen is opened and closed by turning the handle in the centre. The mechanism requires no attention.

CONTROL OF THE CAR.

How to Change Gear and some Good Driving Hints.

THE driving seats of all Austin cars are adjustable for reach and this convenience should be taken advantage of so as to obtain the greatest comfort.

To engage first gear, push out the clutch and move the gear lever into the first speed position.

Sometimes it may happen that when the clutch is let in again, there is no apparent drive from the engine. That is because there has been no proper engagement of the gears. Therefore, push out the clutch again, and it will almost certainly be found that the lever can then be moved so as to give the proper gear engagement. Do not use force.

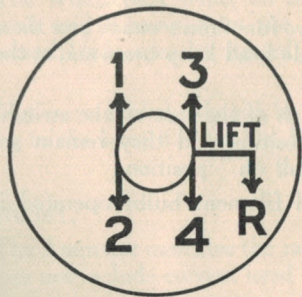
Start on first speed, accelerate to about 8 m.p.h., push out the clutch, move the lever to neutral, and continue the movement of the lever steadily to the second speed position and let in the clutch gently.

In moving from second to third speed, a similar action takes place. Accelerate to about 18 m.p.h., declutch, release the accelerator, move the lever to neutral and continue the movement of the lever steadily into the third speed.

To move from third to top, declutch, and move the lever steadily into the position desired. It assists the change from top to third, and third to second if the accelerator is held down while the change is made.

Change Early.

Always change gear early on a hill. Never allow the engine to labour in any gear and expect it to pick up speed on changing into a lower one when the car has nearly stopped. Do not persist in attempting to drive the car uphill in top gear when the speed falls below 18-20 m.p.h.—change down early.



The Gear Positions

If the car has been driven back in reverse gear, wait until it is stationary before engaging a forward speed. Do not engage the reverse gear when the car is travelling forward. Serious damage to the gears will result.

Keep the foot off the clutch pedal except in heavy traffic. Even then do not allow the weight of the foot to be taken by the pedal. The slipping of the clutch caused by this practice heats and wears it badly.

When descending a long hill, or before commencing a steep descent, engage one of the lower gears, and do not accelerate. The engine will then help to retard the speed of the car. When using the brake, keep the clutch in, disengaging it at the last moment if stopping the car.

Skidding.

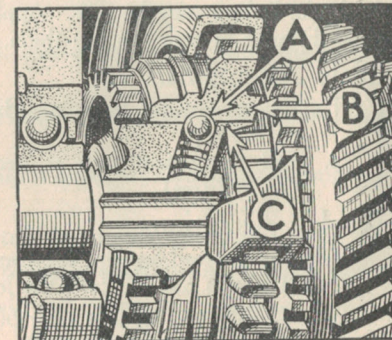
Skidding is sometimes due to sudden braking on a greasy or loose surface and unduly slack tyres contribute to it. If the rear wheels skid, release the brakes and turn the front wheels towards the direction of the skid.

Synchromesh Gears.

The gearbox has four forward speeds and a reverse and the second third and top gears have synchromesh engagement, which ensures silent positive changes.

Gear changing may be slightly stiff in a new car until the moving parts have eased in use. Changing should not be done hurriedly and no attempt should be made to force the gear lever if engagement is not made at the first attempt. Should difficulty be experienced in engaging a gear when the car is standing, release the clutch for a moment and then try again.

The synchromesh mechanism is governed by a series of spring loaded balls as illustrated. The internal cone on the inner member C. makes contact with the gear cone to synchronise the speeds of both members before the dog member B, overcoming the resistance of the ball A, moves on to give positive gear engagement.



First and Second Speed Synchronising Mechanism.

What Not to Do.

Whatever you do, please do not make the following mistakes:—

- Do not forget the ignition switch when starting up.
- Do not make a fast run with the radiator muff closed.
- Do not be cruel to the starter if the engine will not fire.
- Do not touch the starter switch while a gear is engaged.
- Do not leave the car in gear and with the handbrake off.
- Do not coast with the engine running and the clutch held out.
- Do not fill the radiator with cold water when the engine is hot.
- Do not leave the ignition switched on when the car is not running.

On no account run the engine in a closed garage. The exhaust gasses are highly toxic and a very small amount in a restricted atmosphere will produce grave, if not fatal results.

REGULAR ATTENTIONS

A Summary of Daily, Weekly and Monthly Maintenance Work.

ON this and the opposite page is a handy summary of all the attentions described in this handbook. The attentions under the daily, weekly, and monthly headings are based on the assumption that the maximum mileage per week does not exceed 500 (800 km.).

Under more strenuous conditions, for instance, very dusty or very muddy roads, long distances at high speeds or with heavy loads, it will be advisable to attend to the lubrication of chassis parts more frequently.

After the first few days' use tighten all nuts, particularly those on the engine cylinder head. These may loosen a little because of the heat generated, but if they receive this attention, both they and the head will remain secure against air or water leaks or loss of compression.

Warning.—After the car has been washed, or driven through water, the brake linings may be wet. Apply the brakes a number of times for some distance in order to dry them. Wet brakes are dangerous.

Daily Attentions.

1. Examine water level in radiator and fill up to within one inch of the top.
2. Fill the petrol tank if necessary. The capacity is 6 gallons (27.25 litres).

Weekly Attentions.

1. Examine oil level in the crankcase and add more oil if necessary. The dip rod indicates the level of the oil.

Change the oil first after 500 miles (800 km.), then every 2,000 miles (3,000 km.). The sump capacity is 6 pints (3.4 litres).

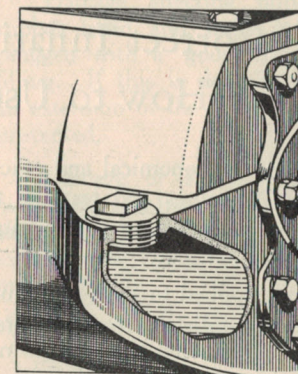


Use only Recommended Oils.

2. With the grease gun charge—
Front wheel swivel pin nipples (4).
Steering cross tube nipples (2).
Steering side tube nipples (2).
Brake pedal shaft (1).
3. Examine the brakes, and adjust if necessary.
4. Test all tyres for correct pressure and examine for cuts, flints and nails.

Monthly Attentions.

1. Examine the oil level in the gearbox. It should be level with the filler plug. Capacity, 1½ to 2 pints (.85—1 litre). Change at first 1,000 miles (1,600 km.), and then every 5,000 miles (8,000 km.).
2. Charge the back axle case with special lubricant, using the adaptor on the grease gun. Change at first 1,000 and then every 5,000 miles.
3. Grease the front hubs, as described later. Grease the brake balance levers (2).
4. Charge the steering box with special lubricant, using the grease gun adaptor.
5. Oil handbrake gear, pedal gear and joints, engine control joints, and top of steering column.
6. Examine the battery and top up if necessary (weekly or fortnightly in hot weather).
7. Give a few drops of oil to distributor spindle bearing.
8. Grease the splined end of the propeller shaft (behind the gear box). Move the car to turn the shaft and expose the nipple.



The Gearbox Filler.

Occasional Attentions.

- Check the alignment of the front wheels.
- Clean the sparking plugs and check the settings.
- Flush the radiator with plenty of clean water until it runs through clear.
- Adjust the tappets and the fan belt, decarbonize the engine and grind-in the valves.
- Clean the ignition distributor, and the contact breaker points (adjust the latter), the dynamo and starter commutators.
- Examine and, if necessary, tighten, all bolts and nuts, such as road spring clips, cylinder head nuts, wheel nuts, these especially when the car is new.
- Examine other parts, such as steering connections, brake rods, and propeller shaft, neglect of which might be followed by an expensive repair and inability to use the car for a lengthy period.
- Occasionally clean the petrol pump and carburetter filters and float chamber strainers, and every 3,000 miles (5,000 km.) the oil reservoir gauze (when the engine oil is changed).

CARE OF THE TYRES.

Correct Inflation Pressures ; How to Use the Jack.

THE key to economical and efficient tyre service is to maintain the correct pressures and test the tyres, including the spare, at least weekly. Any loss of air pressure can be made up with very little effort.

A gauge applied to the valve must be used, for it is seldom possible to detect under-inflation from appearance. A special tool is supplied for tightening or removing the valve "insides."

Shorter tread life, less resistance to accidental damage, and disintegration of the cord foundation are possible results of under-inflation. Tyres in this condition are also conducive to front wheel wobble and skidding.

Minimum pressures are :

TYRE SIZE	FRONT TYRES	REAR TYRES	
		Car light	Fully Laden
5.25—16	.. 24	22	24
4.75—18 (Van)	.. 26	—	36

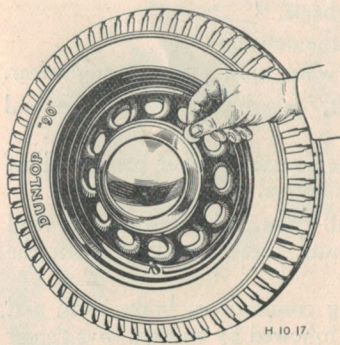
Pounds per square inch.

A tyre that loses more than three to four pounds per square inch in a week should be regarded as a "suspect." First make sure that a new valve "inside" is not required. If the tube is punctured, ascertain before refitting that the puncturing object is not still embedded in the cover.

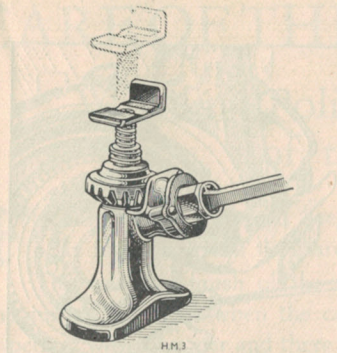
It is important that both the front tyres should be kept at the same pressure. If, because of wear or other causes, the steering develops a tendency to wander or show signs of wobble, the front tyre pressure should be increased.

Dirt and Damage.

Oil, paraffin and grease are injurious to rubber, and should be removed as soon as possible



Use a Screwdriver or Coin
to Remove Wheel Centre.



The Jack, Showing Extension

It is essential that the tyre should be removed immediately damage is sustained.

Fitting Hints.

When fitting a tyre attention is called to the following points.

To avoid trapping the tube between the edge of the cover and the rim, always inflate the tube very slightly before placing it in the cover.

During the final inflation see that the edges of the cover are seated evenly round the edge of the rim. Check this by the moulded line on the cover, which should be about a quarter of an inch from the rim all the way round.

Covers are marked with a red spot near the wire edge. This indicates the lightest part, which should be fitted immediately over the valve.

Uneven Wear.

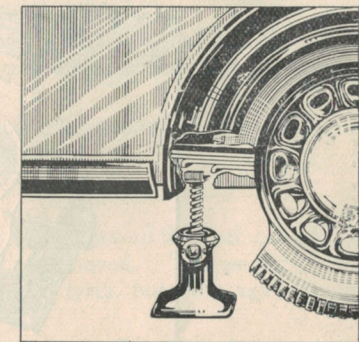
Because the front wheels are "cambered" or lean outwards, the outer side of the tyre tread wears more rapidly than the inner. To minimise the effect of such wear, turn the tyres periodically, say every 3,000 to 4,000 miles (5,000 to 6,000 km.) so that the more worn sides are next to the car.

At the same time exchange the near and offside tyres so that unequal weight distribution and consequent wear caused by road camber are shared. The spare tyre should be used in turn with the others.

by the use of a clean cloth and a very little petrol.

Damage affecting only the rubber tread and walls may be plugged with a good tread cut filling. If this is done promptly an extension of the injury will be prevented.

Damage of a more serious nature affecting the cotton structure should be entrusted only to an expert tyre repairer or tyre manufacturer.



Jacking a Rear Wheel.

If the front tyres begin to wear rapidly, have the tracking of the front wheels checked and, if necessary, adjusted.

Changing a Wheel.

The jack handle is in two parts and is held in the jack by a spring-loaded ball. The head of the bar should be pushed home firmly.

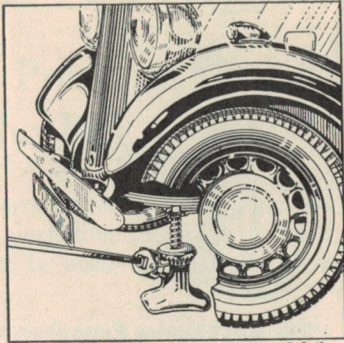
Before removing a wheel see that the handbrake is on firmly and if on a hill scotch one or two of the wheels. Check the spare tyre for correct pressure and adjust the jack extension nearly to the height required by turning the head.

On fitting the spare wheel, tighten the nuts alternately and securely before removing the jack and test the nuts again when the wheel is on the ground.

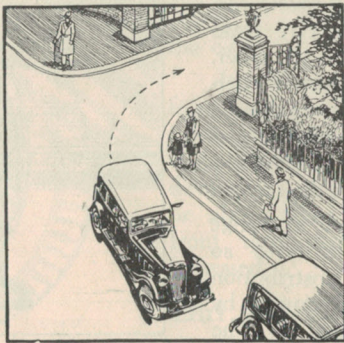
When a front wheel is to be taken off, place the jack head between the two turned-down spring leaf ends immediately in front of the axle.

At the rear, the jack head should be placed between two similar turned-down spring leaf ends between the front edge of the wheel and the forward part of the wing.

The chromium-plated wheel centre can be removed by means of a coin or a screwdriver inserted in one of the slots under the rim.



Jacking a Front Wheel.



Beware of Pedestrians When Reversing.

CARE OF THE BODYWORK.

Washing, Polishing and Storage of the Car.

FOR the car to look and keep its beauty and smart appearance, the body must be given its share of attention.

The cellulose finish of the car is easily cleaned and polished. In the summer weather when the car is only dusty the dust can be lightly wiped off without water and there is no risk of damaging the finish. When the car is muddy, wash off well with clean running water. Wash the mud off, do not rub it off. Remove any grease or tar splashes with petrol.

Do not use the same sponge and cleaning rags for the chassis and springs and other greasy parts as are used for the coachwork.

Polishing.

After washing and drying use a good cellulose polish. Such a preparation imparts a brilliant surface and preserves and beautifies the body. On no account should metal polishes be used.

The more the surface of the cellulose finish is rubbed by the polishing cloth the smoother and the more lasting is the lustre imparted.

Door locks, hinges and other small working parts should be given a drop of oil occasionally. Door rattles can be cured by adjusting the rubber stops. Occasionally tighten the screws of hinges, locks and stops.

Wash chromium plating with soap and warm water. Do not use metal polish on it.

Leather upholstery should be polished occasionally with a little saddle soap of good quality and a vacuum cleaner, or a stiff brush, should be run over moquette or Bedford cord upholstery.

Remove grease spots with a rag dipped in petrol and do not allow grease or oil to remain on rubber parts such as mats and running board covers.

Sliding seat runners should be oiled occasionally but not the runners of the sliding roof.

Storage of the Car.

If the car is to be laid up for a long period the fuel, oil and water should be drained off and the batteries removed. The weight of the car should not be allowed to remain on the tyres, but both axles should be jacked and supported on blocks.

Before storage, the car should be thoroughly cleaned and dried, and it should be left with dust sheets over it.

Have the batteries charged fortnightly.

THE PETROL PUMP.

How Fuel is supplied from the Tank to the Carburetter

PETROL is drawn from the tank at the rear by means of an A.C. petrol pump which advances the fuel in the correct quantity demanded by the carburetter, no more and no less.

Service on the petrol pump is available at all Austin Dealers and at all A.C. service stations, which are prepared with parts and fixtures for repairing and adjusting all pumps if any trouble is experienced with the fuel supply.

Make sure that any difficulty is not due to causes apart from the pump before attempting to do anything to the pump.

If there appears to be lack of fuel at the carburetter, first ascertain if there is any fuel in the tank, and if not, replenish. Make sure that the tubing and connections between the tank and the pump, and between the pump and the carburetter, are not leaking. In case of broken or damaged tubing replacement should be made.

It may be that the filter cover of the petrol pump is loose. If this is the case, tighten the main nut at the top, first ascertaining that the cork gasket lies flat in its seat and is not broken or unduly compressed. A gasket compressed hard may need to be replaced.

Clean the Filter.

Occasionally remove the cover and clean the filter screen underneath it. Also remove any sediment from the chamber below the filter.

When re-assembling, take care that the cork gasket is replaced correctly, and that the fibre washer is under the head of the screw.

If petrol appears to be leaking at the edge of the diaphragm tighten the cover screws alternately and securely.

Sometimes there appears to be a leakage of fuel at the diaphragm edge. The leakage may actually exist at one of the pipe fittings, causing the fuel to run down the pump to the diaphragm flange.

In hot weather when petrol is likely to evaporate, or when difficulty might be expected on cold mornings, it is advisable to fill the carburetter by operating the hand priming lever on the pump before attempting to start the engine.

The pumping action of the diaphragm can be distinctly felt until the carburetter bowl is full.

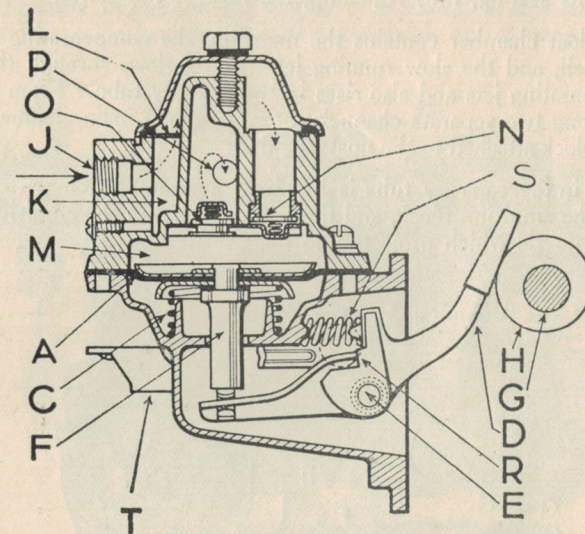
After removal of the upper casting on any type of A.C. fuel pump it is important that the cover should only be replaced while the pump pull rod is at the top of its stroke. This is to ensure sufficient flexing of the dia-

phragm to allow its normal working movement. The pump, however, should only be disassembled by a service station equipped with the necessary special tools.

How it works.

By revolving shaft (G) the eccentric (H) will lift rocker arm (D) which is pivoted at (E) and which pulls the pull rod (F), together with the diaphragm (A), downward against the spring pressure (C), thus creating a vacuum in the pump chamber (M).

Fuel from the rear tank will enter at (J) into sediment chamber (K) and through the filter gauze (L) and suction valve (N) into pump chamber



The A.C. Petrol Pump.

(M). On the return stroke spring pressure (C) pushes the diaphragm (A) upward, forcing the fuel from chamber (M) through pressure valve (O) and opening (P) into the carburetter.

When the carburetter bowl is filled the float in the float chamber will shut off the inlet needle valve, thus creating a pressure in pump chamber (M). This pressure will hold diaphragm (A) downward against the spring pressure (C) and it will remain in this position until the carburetter requires further fuel and the needle valve opens.

The rocker arm (D) is in two pieces, the outer one operating the inner by making contact at (R) and the movement of the eccentric (H) is absorbed by the "break" when fuel is not required.

Spring (S) is merely for the purpose of keeping the rocker arm (D) in constant contact with the eccentric (H) to eliminate noise.

ZENITH CARBURETTER

Cleaning and Adjustment for good Performance.

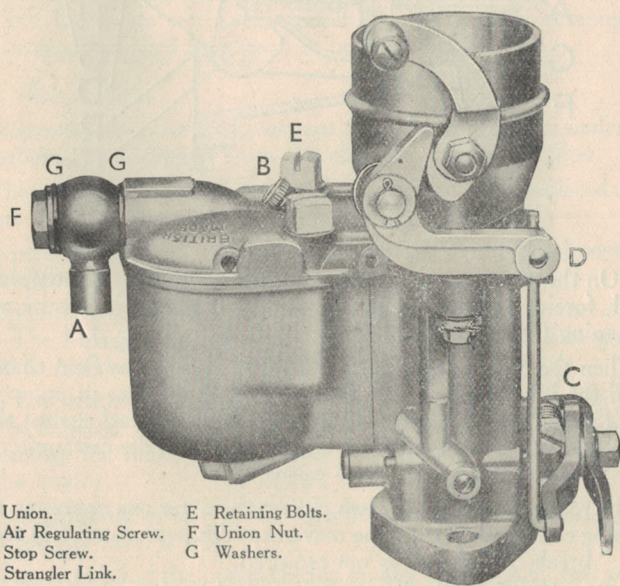
THE carburetter fitted to the Austin Ten is the Zenith, embodying the well known principles of main and compensating jets.

Petrol from the pump passes through the union, the filter and the needle seating into the float chamber. As the float rises it will close the needle on its seating, thus regulating the flow of the petrol.

The float chamber contains the main jet, the compensating jet, the capacity well, and the slow running jet. Petrol flows through the main and compensating jets and also rises in the capacity tube. From the jets it flows along two separate channels into a common main channel in the emulsion block attached to the float chamber.

Petrol in the capacity tube is in direct communication with the air and with the emulsion block, and the main channel in the emulsion block leads to a nozzle which projects into the choke tube.

Downdraught Type Zenith Carburetter.



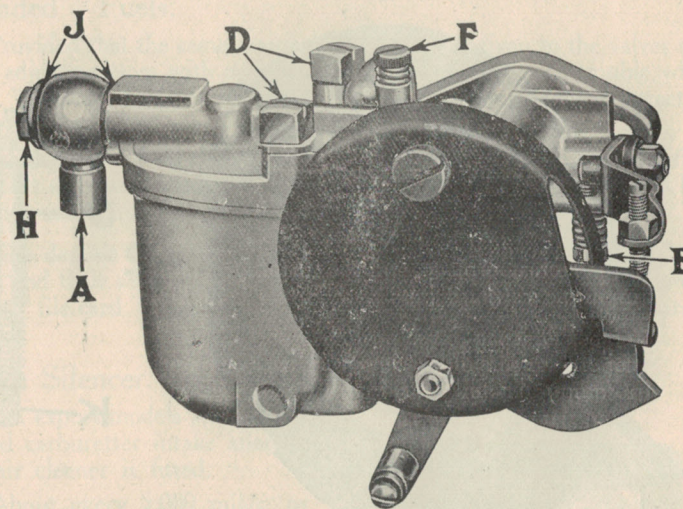
- | | |
|-------------------------|--------------------|
| A Union. | E Retaining Bolts. |
| B Air Regulating Screw. | F Union Nut. |
| C Stop Screw. | G Washers. |
| D Strangler Link. | |

Starting the Engine.

To obtain an easy start from cold the combined throttle and strangler control on the dashboard should be extended to its third position, and the engine should be given, by hand, a few turns to free the moving parts. Then fully extend the strangler control and press the self-starter button. When the engine is running release the strangler control to the first notch.

In cold weather it may be necessary to hold the strangler control out for a few minutes while the engine warms up and to run the car for the first few minutes with the knob in the first or second notch. As soon as the engine is warm, however, the control knob should be pushed right in, otherwise the mixture will be too rich.

If difficulty in starting the engine is experienced, ascertain that the strangler flap is closing the air intake completely and if necessary adjust the wire.



Horizontal Type Zenith Carburetter.

- | | | |
|-------------------|------------------------|---------------------|
| A Union | E Stop screw | H Petrol connection |
| D Retaining Bolts | F Air Regulating screw | J Washers |

A choked slow running jet will also cause difficulty. The jet should be cleaned only by blowing through it, either with a tyre pump or orally.

Trouble can also be experienced if the throttle is not open sufficiently when the strangler knob on the dash is in the first position. In this case turn the stop screw a little to the right to open the throttle wider.

Adjustments.

If the engine does not idle as slowly as desired, turn the stop screw to the left to close the throttle slightly.

A weak mixture may cause difficulty in slow running and this may be adjusted by turning the air regulating screw clockwise to enrich the mixture. Do not make the mixture too rich or the engine will "hunt," or will tend to choke when slow running while warm.

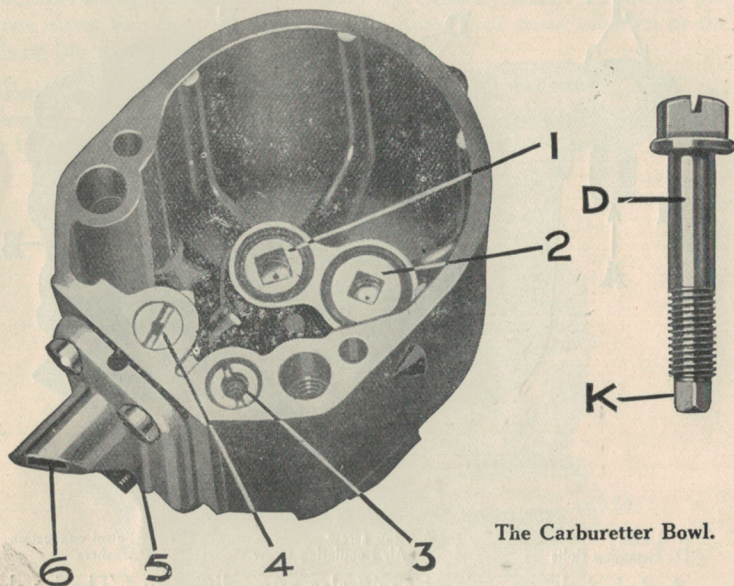
No adjustments should be carried out unless absolutely necessary.

If the engine is positively poor in accelerating when it is running at a sufficiently warm temperature, and the adjustments described will not remedy the trouble, it may be desirable to fit a larger compensating jet.

If there is a lack of power and speed, this may be due to the main jet being partially choked, or if greater power is desired a larger size main jet may be fitted.

Make sure that the strangler flap opens fully, for if this sticks in a partially closed position it will restrict the speed of the car and increase petrol consumption.

Do not, however, alter the jets unless you are quite sure that other parts of the engine, including sparking plugs, ignition and valves, are in order, and that compression is good. There are no moving parts in the Zenith carburetter, so that nothing can get out of adjustment when once set.



The Carburetter Bowl.

- | | | | |
|--------------------|--------------------|-----------------|-------------------------------|
| 1 Main jet | 2 Compensating Jet | 3 Capacity Tube | D Retaining screw |
| 4 Slow-running jet | 5 Emulsion block | 6 Nozzle | K Squared end to form jet key |

Cleaning.

The bowl of the carburetter should be removed occasionally for cleaning. Take out the two retaining bolts and the bowl will drop into the hand. On turning the bowl upside down the float will fall out and reveal the main and compensating jets at the bottom of the bowl.

The jets are removed by fitting into them the squared end of one of the retaining bolts and using a spanner on the other end. To clean the jets wash them in petrol, and blow through them to remove obstruction. Do not use wire.

The connection from the petrol pump should be dismantled and the filter thoroughly cleaned in petrol. When reassembling take care that the washers on both sides of the union are correctly replaced.

Sizes of Zenith jets normally run in 5's—the higher the number the larger the jet.

The provisional settings are:—				Horizontal	Downdraught
Choke Tube	..	..	..	21	23
Main Jet	..	..	..	82	95
Compensating Jet	..	..	..	50	50
Slow Running Jet	..	..	..	60	60
Progression Jet	..	..	..	60	60
Capacity Tube	..	..	..	2	2
Needle Seating	..	..	..	1.5	1.5

“Leaded” Fuels.

Provided that the same reasonable attention is given to the valves and other adjustments as with ordinary petrol there will be no trouble when using “leaded” fuel (petrol containing a small proportion of tetraethyl lead)

The appearance of the valves when running on “leaded” fuel differs from that associated with ordinary petrol but this is a well recognised fact to which no significance should be attached.

The deposit from such fuels can be removed by “scrubbing” the valves and their seats with a stiff wire brush of the type used for cleaning files (a “file card”), after which the valves can be ground-in in the normal manner.

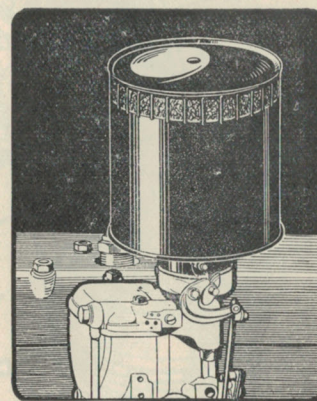
Intake Silencer.

On export models an A.C. oil wetted carburetter intake silencer and air cleaner is fitted.

About every 5,000 miles, or weekly in countries where dust is constantly experienced, the silencer needs cleaning and re-oiling. It is pulled off from the carburetter and the louvered end of the cleaner is swilled in a shallow pan of petrol.

After drying the metal gauze mesh should be re-oiled with engine oil, allowing the surplus to drain off before refitting the cleaner.

If the air cleaner is neglected its cleaning efficiency and valuable protection against engine wear are not maintained.



A.C. type Air Cleaner.

THE IGNITION SYSTEM

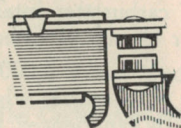
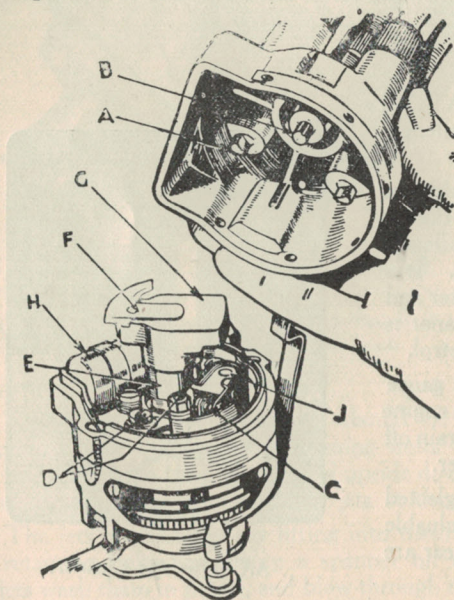
Cleaning the Distributor; Lubrication and Fault Finding.

THE coil ignition equipment is provided with an automatic advance mechanism, which relieves the driver of the necessity of adjustment. Its advantages are particularly evident when accelerating, and during hill climbing, the danger of pre-ignition, knocking or pinking being very much reduced.

The device is housed in the distributor unit, and it consists of a centrifugally operated mechanism by means of which the ignition is advanced in proportion to engine speed.

Very little attention is needed to keep the ignition equipment in first-class condition. We advise that it is inspected occasionally, and the following instructions on lubrication, cleaning and adjustment should be carried out.

After the first 500 miles it is usual for the car to be taken to a service station to have various minor adjustments to the engine. As most of the bedding down of the contacts occurs during this period, at the same time the contact breaker gap should be checked and if necessary re-set to .012in. maximum opening, and the cam must be given a smear of engine oil.



The Contacts

The Distributor and Contact Breaker.

- A Electrode.
- B Carbon Brush.
- C Contacts.
- D Adjusting Screws.
- E Cam.
- F Rotating Electrode.
- G Moulded Rotating Arm.
- H Condenser.
- J Contact Breaker Pivot.

Distributor Unit.

Occasionally remove the distributor cover by pushing aside its two securing springs.

See that the electrodes are clean and free from deposit. If necessary, wipe the distributor with a dry duster and clean the electrodes with a cloth moistened with petrol. Also see that the carbon brush in the centre of the moulding is clean and moves freely in its holder.

Next examine the contact breaker. It is important that the contacts are kept free of grease or oil. If they are burned or blackened they may be cleaned with a fine carborundum slip, or a very fine emery cloth and afterwards with a cloth moistened with petrol. Care must be taken that all particles of dirt and metal dust are wiped away. It is possible that misfiring may be caused if the contacts are not kept clean.

Do not attempt to clean the contacts if they become rugged, but have them attended to by a skilled mechanic.

Contact Breaker Gap.

After the contacts are re-set at the end of the first 500 miles they will probably only need adjustment at very long intervals. It is not advisable to alter the setting unless the gap varies considerably from the gauge.

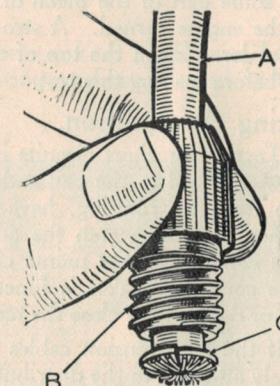
If adjustment is necessary, turn the engine to the position in which maximum opening of the contacts is given and, keeping the engine in this position, slacken the locking screws in the contact breaker base. Then move the bracket carrying the contact until the gap is set to the thickness of the gauge. Afterwards tighten the locking screws. It is advisable to check the gap again to ensure that no movement has taken place.

Lubrication.

The distributor spindle bearing is lubricated by means of an oiler which requires a few drops of oil ever 1,000 miles (1,600 km.).

After lubricating at the end of the first 500 miles, give the cam a smear of engine oil every 3,000 miles, also place a drop of oil on the pivot on which the contact breaker works.

Withdraw the rotating arm from the top of the spindle by lifting it off, and add a few drops of thin oil to the top of the spindle. Do not remove the screw exposed to view; there is a clearance between the screw and the inner face of the spindle through which the oil passes to lubricate the cam bearing. Take care to refit the arm correctly and to push it onto the shaft as far as possible.



High Tension Terminal.

- A. H.T. Cable.
- B. Moulded terminal.
- C. Washer.

About once every year the moving parts of the automatic timing control must be lubricated with a good grade engine oil. To render the control accessible, remove the distributor moulding and lift off the rotating distributor arm. Then remove the contact breaker base moulding by withdrawing its two securing screws.

The Coil.

The coil unit requires no attention beyond seeing that the terminal connections are kept tight and the moulded coil top is kept clean.

High Tension Cables.

When the high tension cables show signs of perishing or cracking, they should be replaced. Use only 7 mm. rubber covered ignition cable for all high tension leads.

To connect up the 7 mm. cable to the distributor or coil terminals, thread the lead through the terminal nut, bare the end of the cable about $\frac{1}{4}$ in., pass it through the washer and bend back the strands. Tighten the terminal to make a good connection.

Ignition Faults.

When the engine will not fire, or fires erratically, the trouble may arise from the carburetter, or petrol supply and not the ignition. A partially choked jet, incorrect petrol level, or air leaks into the induction system may be the faults. Equally, sooted plugs can be suspected. Dis-mantling and cleaning them will remedy this trouble.

If the battery has run down, or its terminals have worked loose, quite obviously there will be no spark, and the same results can be expected if the distributor electrodes and contact breaker have been neglected and are dirty.

The coil can be tested by removing the cable from the centre socket on the distributor cover, and holding the end of this cable about a $\frac{1}{4}$ in. from some part of the metal of the car, while the ignition is switched on and the engine turned. A strong and regular spark will result if the coil is in order. Clean the top of the coil, and ensure that the terminals are tight before making this test.

Testing the Ignition.

To test for short circuits in the low tension wiring (the cables from the switchboard to the coil and coil to distributor) which would equally cause irregular running, have the engine turned while the ignition is switched on, and watch the ammeter reading. It should rise and fall as the contact breaker points close and open. This test will also indicate if the contact breaker is functioning correctly. If the contacts remain open or do not fully close the reading will not fluctuate.

If the high tension cables from the distributor to the plugs are not securely attached to the distributor, misfiring may occur. Or if the rubber insulation on the cables shows signs of perishing and cracking, there may be leakage of the current giving rise to the same symptoms. Renewing the cables is then the remedy.

If, after verifying these points, the trouble remains undiscovered, the equipment should be examined and tested by an Austin Dealer or the nearest service depot of the makers.

Ignition Warning Lamp.

When the engine is stopped, unless only momentarily, the ignition switch should always be turned to the "off" position so as to prevent the battery being discharged by current flowing through the coil winding.

A warning lamp is provided in the panel, which gives a red light when the ignition is "on" and the engine is stationary, thus reminding the driver to switch off.

Should the bulb of the warning lamp fail, it can be withdrawn from its socket when the small cover plate, holding the red glass, is unscrewed. The replacement bulb should be a 2.5 volt, .2 amp. screw cap type (No. C252A.).

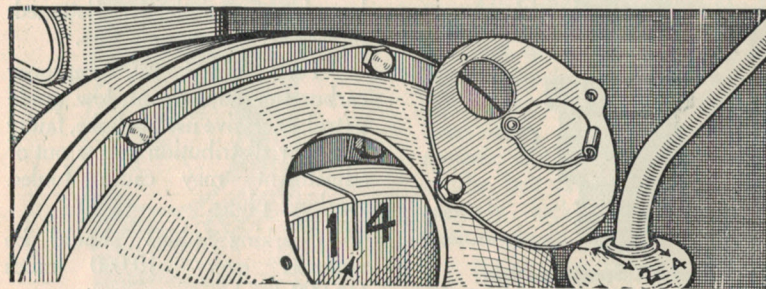
Timing the Ignition.

In order to reset the ignition timing remove all the sparking plugs except the front one, number one, and turn the crankshaft until No. 1 piston is at top dead centre before a firing stroke. This can be ascertained by watching the valves or by removing the rubber gearbox cover and the clutch pit cover. Top dead centre is marked on the flywheel $\frac{1}{4}$.

Turn the flywheel back about $\frac{1}{2}$ in. (12.75 mm.), and, having removed the distributor cover, slacken the screw for the clip to the distributor casing and turn the casing until the contact breaker points just begin to open. This is the position at which the spark occurs in No. 1 cylinder.

Tighten the adjusting screw, refit the distributor cover and test the car on the road. If the ignition seems too far advanced or retarded it can be finally adjusted at the distributor. There is a considerable amount of latitude for adjustment but only extremely small movement should be made at one time.

If the leads from the distributor to the sparking plugs have been disconnected they must be replaced in the firing sequence marked on the cover, 1, 3, 4, 2.



The Flywheel Timing Mark, Top Dead Centre.

THE SPARKING PLUGS.

THE sparking plugs with which the "Ten" is fitted are K.L.G. type 777.

The gaps between the firing point of the central electrode and the earth points are set at .015 to .018 of an inch. Too wide a gap would cause misfiring, especially at high speeds and under heavy pulling at low speeds with an open throttle, while a too small gap causes poor idling.

After every thousand miles it will be necessary to clean the plugs to remove carbon deposit from the interior insulation.

Type 777 is a three-piece plug and the gland nut is a separate component. To clean the plug, the insulated centre must be removed from the plug body by unscrewing the gland nut. When the gland nut is unscrewed the central electrode may be withdrawn.

Wipe the lower mica insulation carefully with a petrol soaked rag. If the carbon deposit is hard, soak the electrode in petrol for an hour or so to soften the carbon. The mica insulation should be thoroughly cleaned and polished, and the central electrode scraped clean.

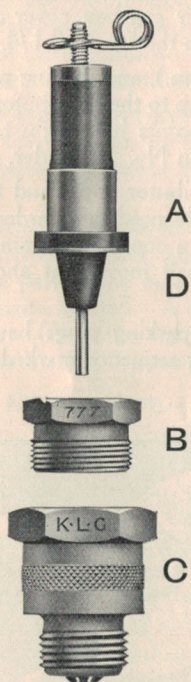
Scrape out the inside of the body and clean the earth points. Wash the plug body in petrol and dry it.

To reassemble, see that the internal washer is in place before inserting the electrode. Tighten the gland nut to secure gas tightness and re-set the earth points to between .015in. and .018in. To do this it may be necessary to bend each earth point toward the central electrode. The central electrode must not be levered toward the earth points.

If the sparking plug washer has been completely flattened, replace it with a new one.

Poor grade oil, improper carburetter adjustment, low grade petrol, excessive use of choke, faulty cables or distribution points out of adjustment may cause fouled sparking plugs.

Sparking plugs should be renewed every 10,000 miles (15,000 km.).



Type 777 Sparking Plug.

A—Insulated Centre. D—Mica Centre.
B—Hexagonal Gland Nut. C—Plug Body.

THE COOLING SYSTEM.

Precautions to take against Freezing and Overheating.

THE cooling of the engine is maintained by a capacious radiator which should be filled with rain water, if available, or clean soft water, up to within about one inch of the filler.

The capacity of the radiator, pipes and cylinder jacket is about 17½ pints.

The Thermostat.

The Smith R. P. thermostat automatically controls the flow of the water to the radiator and maintains a suitable temperature on the road. It also ensures rapid warming up from cold.

The thermostat is in operation, i.e., controlling engine temperature, when the knob is set to the "On" position, as indicated on the dial.

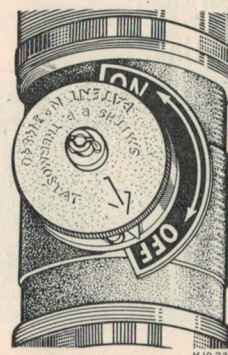
During extremely hot weather or when the car is used in a mountainous country, or ascending a succession of long steep hills, the control may be placed out of action by turning the knob to the "Off" position.

When refilling the radiator after it has been emptied the knob must be in the "Off" position or an air lock will be formed, but it is not necessary to turn the knob "Off" when merely "topping up" the radiator with water.

Failure of the Thermostat.

In the event of the failure of the thermostat it should be turned "Off."

When the engine is being decarbonised the thermostat may be tested by placing in boiling water and the water allowed to circulate over the element. The valve should open so that the stop pin is within a quarter of an inch of the body.



Belt Adjustment.

The fan belt should be adjusted so that it is not too taut but will not slip. To make the adjustment slacken the link locking nut at the front of the cylinder head and raise or lower the dynamo until the desired tension of the belt is obtained. Then securely lock the dynamo in position again.

When the belt is properly adjusted it should be possible to move it about one inch each way.

Winter Precautions.

In winter an anti-freezing mixture should be added to the cooling water, because in very severe weather the water may freeze and damage the cylinder block or the radiator.

Vacuum "Voco Anti-freeze," Smith's "Bluecol," Price's "Zero" and County Chemical "Stop-it-Freezing" are suitable. Follow the instructions of the makers.

Before using anti-freezing mixture tighten the cylinder head nuts to make sure that none of the mixture gets into the cylinders. The mixture may do considerable damage if it contaminates the engine oil.

If such a mixture is not used, care should be taken to see that the water is drained off completely, for in case of freezing it will do harm by lodging in small places and fracture of the cylinder block may result.

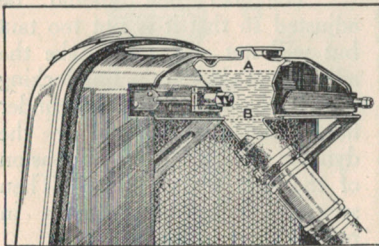
Freezing may occur first at the bottom of the radiator or in the lower hose connection. It is sometimes possible to feel ice in the hose and break it by squeezing. Ice in the hose will stop water circulation and may cause boiling.

A muff can be used to advantage but care must be taken not to run with the muff fully closed or boiling may result.

Flushing.

To prevent the gradual formation of deposits in the cooling system, with consequent impeding of the circulation, the use of hard water should be avoided. Soft rain water, syphoned from the top of the barrel where it is clean, or, failing that, soft water or water that has been boiled, should be used.

Occasionally flush out the cooling system by opening the drain cock at the bottom of the radiator and allowing water to run through until it comes out clear.



A, the Maximum Water Level.
B, the Danger Low Level.

Overheating.

Overheating may be caused by a slack fan belt, excessive carbon deposit in the cylinders, running with the ignition too far retarded, using oil of poor quality, improper carburettor adjustment, failure of the water to circulate, or loss of water.

CORRECT LUBRICATION.

Use Only the Recommended Oils and Greases.

THE correct lubrication of any piece of machinery is of the utmost importance, and for the modern high-speed automobile engine, which operates at sustained high temperatures and speeds, it is absolutely essential that only oils of the highest quality and correct grade be used. Inferior oils, or unsuitable oils, will almost inevitably cause excessive wear in an unduly short time.

We cannot over emphasise the folly of using so-called cheap lubricants.

Modern cars use comparatively little oil, so that the cost of using a good lubricant is negligible compared with the cost of using inferior oil. Good lubricating oil ensures that you always get out of your car the best performance that it can give. It reduces carbon deposit, making frequent decarbonising unnecessary. It makes starting easier, thereby avoiding deterioration of the battery, and it reduces engine wear and eliminates avoidable causes of mechanical breakdown with possible heavy repair bills.

Lubricants represent the smallest proportion of your expenditure on the upkeep of a car, so that it is obviously false economy to use other than the best.

Impurities.

But even the best oil becomes contaminated with certain impurities during use. In the engine, these may be unburnt fuel, carbon, metallic particles, moisture, etc., and although the oil itself does not deteriorate, the presence of these impurities must reduce its efficiency as a lubricant, and in time cause avoidable wear.

Oils of the best quality resist contamination, and reduce consequent wear, to the greatest extent. Nevertheless, it is imperative that the crankcase be drained periodically to remove foreign matter and subsequently refilled with fresh clean oil.

Drain the crankcase when the oil is warm, and therefore fluid and thoroughly agitated. It will then carry away as much of the contamination as possible. Never flush the crankcase with paraffin; some will remain in the sump to contaminate the fresh oil and it may loosen but not entirely remove deposits which are best left undisturbed until the engine is overhauled.



Recommended Lubricants.

	"Shell"	"Wakefield"	"Essolube"	"Prices"	"Duckham's"	"Vacuum"
Engine :						
Summer ..	Triple Shell	Patent Castrol XL	Essolube 50	Motorine C	Aero NP3	Mobiloil BB
Winter ..	Double Shell	Patent Castrol AA	Essolube 40	Motorine M	Aero NP3†	Mobiloil A
Gear Box ..	Triple Shell	Patent Castrol XL	Essolube 50	Motorine C	Aero NP3	Mobiloil BB
Wheel Hubs and Grease Gun	Shell R.B. Grease	Castrol Heavy	Esso Grease	Belmoline C	H.B.B. Grease	Mobilgrease No. 4
*Rear Axle and Steering Box	Shell Spirax	Castrol D	Essoleum Expee 110	Motorine E.P.	XS Press	Mobiloil C
Distributor, Dynamo and Oil Can.	Single Shell	Wakefield Oilit	Essolube 30	Cycle Lubricating Oil	Aero N.P.O.	Gargoyle Velocite D
Upper Cylinder Lubrication.	Shell U.C.L.	Wakefield Castrollo	Petmix	Motorine U.C.L.	Duckham's Tablets.	Gargoyle U.C.L.
Springs, Rusted Parts or Squeaks.	Shell Penetrating Oil	Castrol Penetrating Oil	Essolube 30	Price's Penetrating Oil	Duckham's Easing Oil	Voco Penetrating Oil

* Also Jaba Oil C. † Extreme Cold NP2.

Austin Ten Lubrication.

A. Crankcase—Replenish to the full mark **weekly**.

B. Gearbox. — Replenish **monthly**.

C. Rear Axle and Steering Box—**Replenish Monthly** (special oil).

E. Steering Side Tube (2), Cross Tube (2), Swivel Axles (2 each). Brake pedal shaft (1). **Grease Weekly**.

G. Propeller Shaft splined end, Brake Balance Levers (2). **Grease Monthly**.

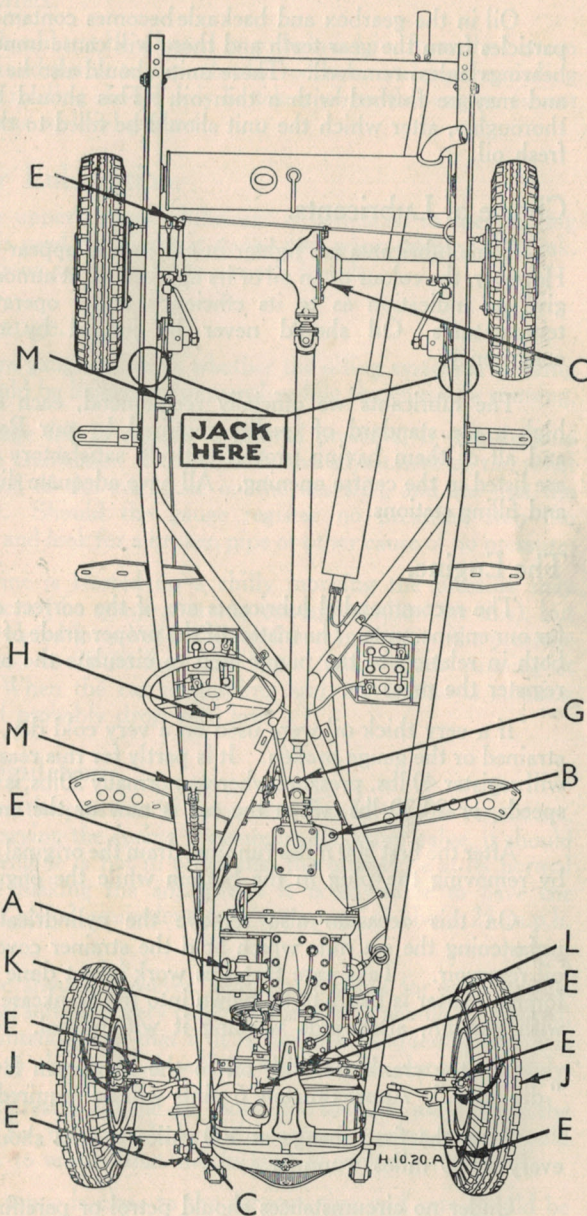
H. Top of Steering Column on Wheel—**Few Drops of Engine Oil Monthly**.

J. Front Hubs — **Grease Occasionally**.

K. Distributor—**Oil** (sparingly) every 1,000 miles.

L. Dynamo bearing—**Grease Occasionally**.

M. Brake and Throttle Control Joints—**Oil Occasionally**.



Grease Spring Shackles **Weekly** on certain **Export** models.

Rinse the gauze filter in petrol and allow to drain before refitting. Do not wipe with fluffy rags.

Oil in the gearbox and backaxle becomes contaminated with metallic particles from the gear teeth and these will cause unnecessary wear of the bearings unless removed. These units should also be drained periodically and may be flushed with a thin oil. This should be allowed to drain thoroughly, after which the unit should be filled to the correct level with fresh oil.

Choice of Lubricants.

Some lubricants are lighter in colour and appear thinner than others. However, the colour of an oil or its appearance at atmospheric temperatures give no indication as to its efficiency under operating conditions and temperatures. Oil should never be judged by colour or apparent consistency.

The lubricants we officially recommend, each of them having the high grade standard of quality required by our Research Department, and all of them having proved entirely satisfactory in extended service are listed in the centre opening. All have adequate distribution at garages and filling stations.

The Engine.

The recommended lubricants are of the correct quality and viscosity for our engine units. The matter of the proper grade of oil is very important both in relation to the pump used to circulate the oil, and the gauge to register the pressure.

If a very thick oil were used on a very cold day, the pump might be strained or the gauge broken. It is partly for this reason that the oil gauge will register 40 lbs. pressure whereas normally 20 lbs. is sufficient at ordinary speeds, or 20-30 lbs. when the car is new or the engine is first started.

After the first 500 miles running, drain the original oil from the reservoir by removing the plug in the bottom while the engine is hot.

On this occasion also remove the cylindrical gauze strainer by unfastening the six nuts which hold the strainer cover to the base of the oil reservoir. Take care that this work is not done where dust or other foreign matter is likely to be blown into the crankcase. Clean the strainer with paraffin, afterwards washing it with petrol. Replace the strainer.

Fill the crankcase with oil to the maximum level indicated on the "dip stick." Approximately 6 pints will be required.

After the first change at 500 miles the oil should be changed after every 2,000 miles' running.

Under no circumstances should petrol or paraffin be poured through the oil filler to clean the engine.

After refilling with fresh oil to the correct level, run the engine for a few moments to check that the oil is circulating and that the oil pressure gauge reading is correct.

The oil level should not be allowed to go below $\frac{1}{4}$ in. from the bottom of the dip rod. It is advisable to wipe the dip rod before taking the reading of the level and the reading should only be taken when the engine is not running and the car is on level ground.

Upper Cylinder Lubrication.

The use of an upper cylinder lubricant is beneficial to the running of the engine. It is used by adding it to the fuel when refilling the tank. Follow the instructions given with the various brands.

Oil Pressure Gauge.

The oil pressure gauge indicates whether the oiling system is working properly and it should be looked at frequently while the engine is running.

Should the gauge fail to register a normal pressure, it may be due to lack of oil in the crankcase. If not, verify the adjustment of the relief valve at the rear end of the crankcase on the nearside, and see that the ball seats properly. Should the gauge register no pressure, stop the engine immediately and look for a broken pipe or other cause of no pressure.

When the engine is started on a chilly morning the pressure may rise to 35 lbs. or more (the gauge is strong enough to allow for this), but after the oil has circulated for a little while and becomes warm the pressure should gradually drop to 20-30 lbs., the lower figure when running at moderate speeds. When the car is standing and the engine is running slowly pressure will probably drop very low.

Oil Pressure Regulation.

If for any reason the pressure in the system should require regulation, which is made by varying the spring pressure on the relief valve, it should be made when the engine is hot in order that the oil may be at its normal consistency. While making the adjustment it is advisable to have the engine running at a speed equivalent to a car speed of about 25 m.p.h. on top gear.

The relief valve should, however, only be adjusted for some special reason, as the original setting is very carefully made, and should be marked, if any alteration is intended, so that if it is found subsequently that it is desirable to revert to the original setting, this can be done accurately.

To increase the pressure of the oil, loosen the lock nut and tighten the regulating screw. To reduce, slacken the screw. Great care should afterwards be taken to ensure that the locknut is securely tightened.

The regulating screw is close to the exhaust pipe and care should be exercised by the operator not to burn his hands.

Gearbox.

The same grade of oil used for the engine is most suitable for the gearbox. Do not use thick gear oil or seizure of bearings may result.

To replenish the gearbox, first remove the screws holding down the rubber cover over the left of the gearbox. This permits the cover to be raised and the plug of the oil hole is then accessible. Remove the plug and fill up to the bottom of the plug hole. This is the correct level.

The gearbox should be drained, flushed with thin oil and refilled to the correct level after the first 1,000 miles and every 5,000 miles subsequently. Allow time for all the thin oil to drain away before refilling with new oil.

The capacity is approximately $1\frac{1}{2}$ —2 pints.

Rear Axle.

Keep the oil level of the rear axle up to the plug hole on the nearside at the front of the casing and just below the centre. This is also the filling orifice.

Use the special adaptor on the grease gun for replenishing every 1,500 miles. An outlet for excess lubricant is provided in the dust shield over the brake drums.

The capacity is approximately $\frac{7}{8}$ pint. Do not exceed the correct oil level when replenishing.

Drain the rear axle every 5,000 miles. Flush out with thin oil, drain thoroughly, and replenish to the correct level.

Brake and Pedal Gear.

Oil all brake and pedal gear joints weekly, and grease the nipple on the brake pedal shaft.

Nipples on the brake balance levers, forward of the front axle and behind the rear axle, should be greased monthly with the gun.

Propeller Shaft.

With the grease gun grease the nipple on the forward end of the propeller shaft to lubricate the splines every 1,000 miles.

As the nipple revolves with the shaft, it may be necessary to move the car a little before the nipple is properly located.

Speedometer Drive.

The flexible shaft of the speedometer drive from the gearbox should be lubricated by oiling from the speedometer end every 2,000 miles. To do this uncouple the union nut behind the speedometer.

The shafting should also be taken down and thoroughly cleaned every 6,000 miles. It should be lubricated along its length by applying thin

grease so that when the shaft is replaced in its tubing there will be a good supply of lubricant.

Grease should also be smeared round the flange where it rubs the washer of the key piece which connects to the speedometer.

Spring Shackles.

For all cars not fitted with Silentbloc non-lubricated shackles the lubrication of the shackle pins and bushes on the springs is by means of grease nipples, which should be given three or four strokes of the grease gun weekly.

Road Wheels.

Only the front wheel hub caps require filling with grease once a month. Do not overload them.

The rear hub bearings obtain their lubricant from the axle.

All hub caps have right hand threads.

Road Springs.

The road springs should be sprayed occasionally with penetrating oil to prevent squeaks and similar treatment will minimize the possibility of squeaks at other parts of the chassis. Rock the car while the springs are being sprayed.

Steering Gear.

The worm and sector steering box should be given a small charge of special oil monthly. To do this take out the hexagon plug on the elbow at the top of the box and use the grease gun adaptor. It is advisable to remove the road wheel. Don't touch the square headed adjustment screw. See illustration on page 56.

The small hole on the top of the steering column should be oiled occasionally.

The steering cross tube and the steering side tube should be greased at each end weekly and also the two nipples on each swivel axle.

Grease Nipples.

If a grease nipple becomes choked, unscrew and remove it. It can usually be cleaned by soaking it in paraffin or petrol and syringing either of these through it, but should it be found impossible to clean it fit a new one.

Other points.

Instruction regarding the lubrication of the ignition and electrical equipment will be found under appropriate headings.

No lubrication is required at the clutch.

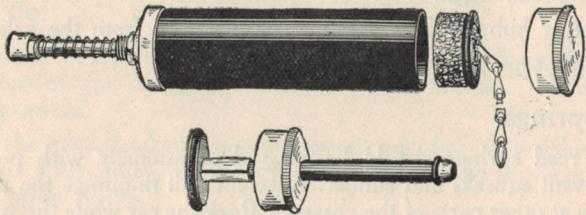
THE GREASE GUN.

THE type of grease gun supplied in the tool kit of all Austin cars is known as the Enots "Autolub," and it incorporates features by which the chassis lubrication of the car is greatly simplified.

Once the gun has been charged all that is necessary is to keep pushing the ram of the gun against the nipple until the contents are exhausted.

The ram is automatically returned to its extended position by a spring. This action creates a vacuum in the gun by means of a valve and thus refills the high pressure chamber contained in the ram.

Three or four strokes of the gun for each nipple are sufficient.



The ram is used for forcing grease through nipples and the adaptor for lubricating the back axle and steering box. For this operation, first replace the screw-on cover of the ram, then remove the end cap from the barrel of the gun, pull out the cork plunger by means of the chain, and charge the gun with special oil to about three-quarters of its capacity.

Put the cap of the adaptor on the open end of the gun, and after removing the plug from the back axle or steering box, place the end of the adaptor into the greasing hole, and, grasping the barrel, push. This will inject a large quantity of lubricant quickly.

When charging the gun with grease it should be filled to about three-quarters of its capacity.



ELECTRICAL EQUIPMENT.

Cleaning the Commutators and Brushes ; Battery Attention.

THE lighting and starting units on Austin cars are arranged for wiring on the single wire system, the return path of the current being provided by the frame instead of a second wire. It is essential that all units are in good metallic contact with the frame.

The electrical system on the Austin "Ten" is twelve volt and the positive pole of the batteries is earthed.

Should difficulties arise that cannot be understood or remedied from the information given below application should be made to the Austin Service Department, an Austin Dealer, or the nearest service depot of the makers of the equipment.

The Dynamo.

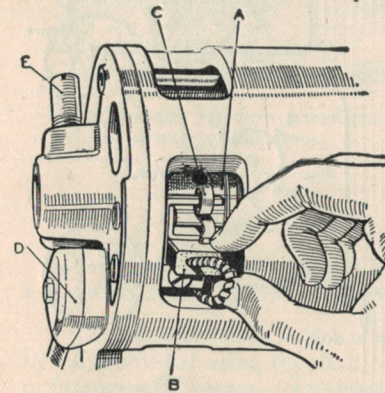
The dynamo is specially designed to work in conjunction with a compensated voltage regulator unit, mounted on the engine side of the dash, which automatically controls the dynamo output to meet the varying requirements of the batteries and load.

When the batteries are discharged the dynamo gives a high output so as to bring the batteries back to their normal fully charged state in the minimum time. When the batteries are fully charged, the dynamo only gives a trickle charge, which is sufficient to keep the batteries in good condition without possibility of damage through over-charging. The dynamo gives an increase of output to balance the current taken by the lamps or other accessories when these are switched on.

The control of the dynamo output is entirely automatic. Hence there is no charging switch.

The only parts calling for any attention are the commutator and brushes, which are readily accessible when the cover is removed.

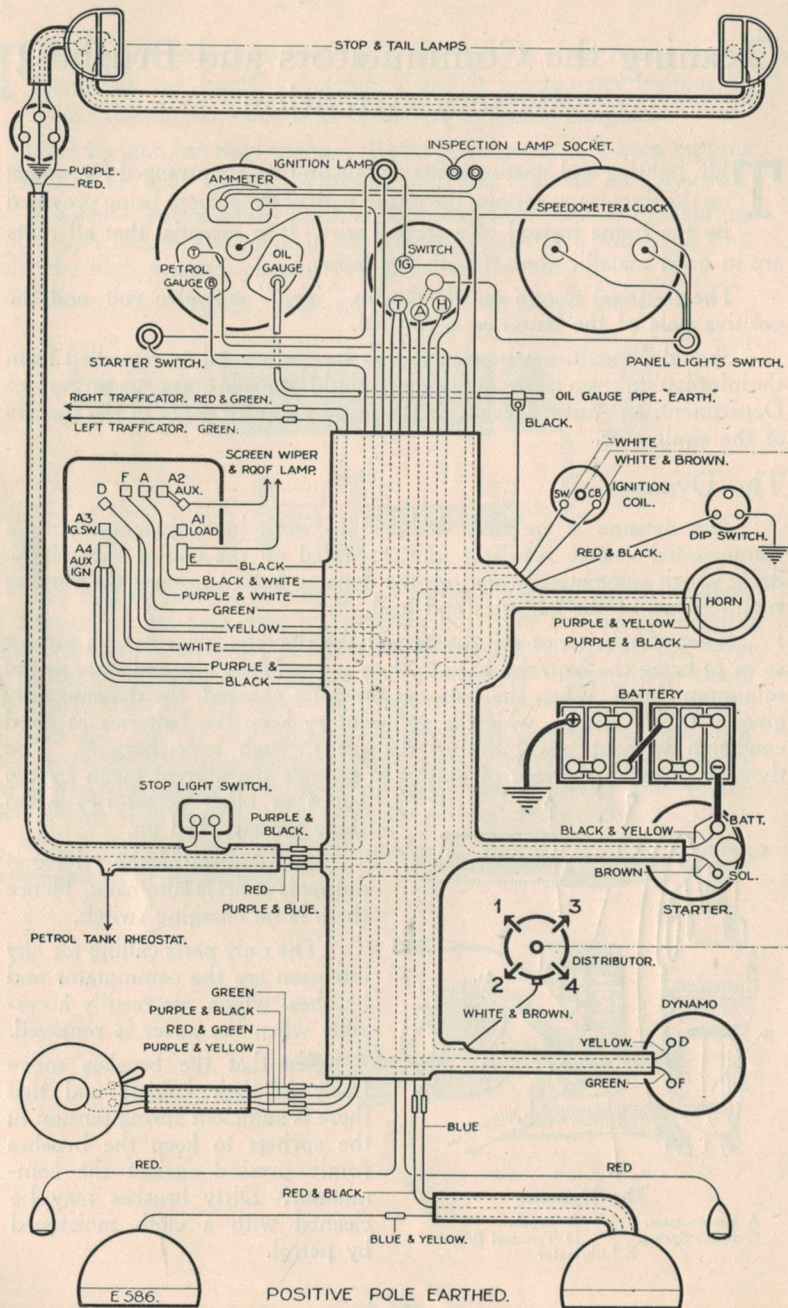
See that the brushes move freely in their holders and that there is sufficient spring tension in the springs to keep the brushes firmly pressed against the commutator. Dirty brushes may be cleaned with a cloth moistened by petrol.



The Dynamo

- A Commutator.
- B Brush.
- C Brush Spring.
- D Terminal Box.
- E Lubricator

Austin "Ten" Wiring Diagram.



The surface of the commutator should be kept clean and free of oil and brush dust. The best way to clean the commutator is to insert a fine duster, held by means of a suitably shaped piece of wood, against the commutator surface, slowly rotating the armature at the same time.

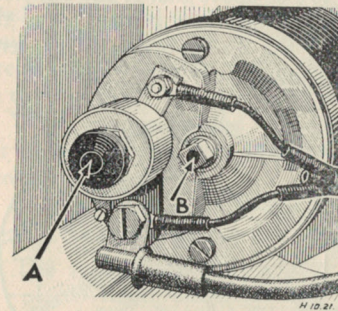
The dynamo bearings are packed with grease during assembly and this will last for a considerable time. Once a year unscrew the wick-type lubricator, with slotted end, and if the wick is dry refill the cup with vaseline.

When the car is undergoing a general overhaul the dynamo should be dismantled for cleaning, adjustment and repacking the bearings with grease. This should be done by a Lucas Service Depot.

Starting Motor.

The starter motor requires very little attention beyond keeping the commutator clean and free of oil and brush dust, as with the dynamo.

Before starting from cold do not neglect the preliminary precautions that you should observe if starting by hand. Although the starter by hand for two or three revolutions as this will considerably diminish the load for starting, especially in cold weather



Use a Spanner on the squared-end if the starter pinion jams.

- A Rubber Cap on Solenoid.
- B Squared end of Shaft.

If the starter pinion jams when operating the starter motor switch it can be released usually by turning the squared end of the starter shaft by means of a spanner. To obtain access to this squared end withdraw the metal cap protecting it, if fitted.

Should the engine fail to start at the first attempt do not press the starter switch until the crankshaft has come to rest or the starter pinion, or the teeth with which it meshes on the flywheel, may be damaged.

Never use the starter motor to propel the car as this throws too great a strain upon the batteries and starting motor.

The solenoid starter switch is arranged so that it can be operated directly by hand without using the dash control when making engine adjustments or for any other reason. The switch is mounted on the starter end bracket and can be operated by pressing the rubber end cap. The control must be operated firmly to prevent the burning of the switch contacts—press smartly and release smartly.

Ammeter Readings.

The centre zero ammeter indicates the rate at which the batteries are being charged or discharged. For instance, suppose 2 amperes are consumed when the side and tail lamps are switched on, and that the ignition coil takes 2 amperes, then if the dynamo is generating 7 amperes the meter will show 3 amperes on the charge side of the scale. This is the current in excess of the lamp and ignition load that is available for charging purposes, if necessary.

Normally, during daytime running, when the batteries are in good condition, the dynamo only gives a trickle charge, so that the charge reading will seldom be more than a few amperes.

The ammeter does not indicate the amount of current used by the starter.

Cut-out and Regulator.

The cut-out and regulator are mounted with two fuses as one unit, which also forms a junction box.

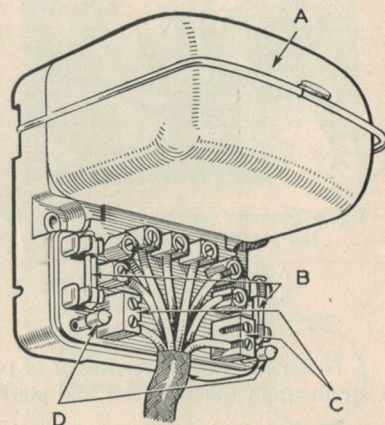
The working of the regulator in conjunction with the dynamo has already been described.

The function of the cut-out is to close the charging circuit as increasing engine speed causes the dynamo voltage to rise above that of the batteries. When the engine slows down the dynamo voltage falls below that of the batteries and the reverse action takes place; the cut-out opens and prevents the batteries discharging through the dynamo.

The cut-out and regulator are set before leaving the works and do not need adjustment. The cover protecting them is sealed.

One fuse protects the accessories which are operative only when the ignition is switched on, (e.g. stop lamp and direction indicators). The other fuse protects those accessories which can be operated irrespective of whether the ignition is on or off.

If any of the units fail, inspect the fuse protecting them and if it has blown examine the wiring for a short circuit and remedy. If the new fuse blows the cause of the trouble must be found and we advise that the equipment is examined by an Austin Dealer or a Lucas Service Depot.



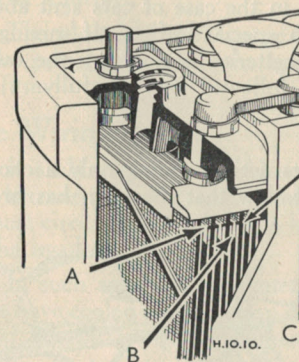
Regulator and Fuses

A Regulator and Cut-out Cover. B Accessories Fuse. C Accessories Terminals. D Spare Fuses.

The Batteries.

Once a month, or more frequently in hot weather, unscrew the filler caps of the batteries and pour a small quantity of distilled water into each of the cells to bring the acid just level with the tops of the separators.

Do not use tap water as it contains impurities detrimental to the batteries. If any acid is accidentally spilled from the batteries it must be replaced by a dilute sulphuric acid solution of the same specific gravity as the acid in the cell.



The Battery.

A. Top of Separators. B. Top of Plates. C. Acid Level.

Keep the terminals clean and tight, and well-smeared with vaseline. A liberal smearing of vaseline protects the terminals from the corrosive action of the acid, which, if allowed to continue unchecked, may eventually result in a break in the battery wiring.

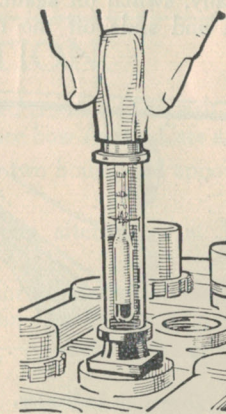
Keep the outside of the batteries clean and dry, particularly the tops of the cells. Dirt and moisture will form a conductor of electricity and if such a path is allowed to form between the positive and negative terminals of the batteries, or between the negative terminal and the chassis, there will be a leakage of the current which will cause the batteries to run down. Wipe the cell tops regularly to avoid this.

When examining the batteries do not hold naked lights near the vent plugs as there is a possible danger of igniting the gas coming from the plates.

Once a month examine the batteries by taking hydrometer readings. There is no better way of ascertaining the state of the batteries.

The specific gravity readings are:—1.285-1.300 batteries fully charged, 1.210 about half discharged, and 1.150 completely discharged. These figures are at an assumed temperature of the solution about 60 degs. F.

Do not leave the batteries in a discharged condition. If the car is to be out of use for any length of time have the batteries charged about every fortnight. In no circumstance must the electrolyte be removed from the batteries and the plates allowed to dry as certain changes take place which result in loss of capacity.



Test the specific gravity of battery

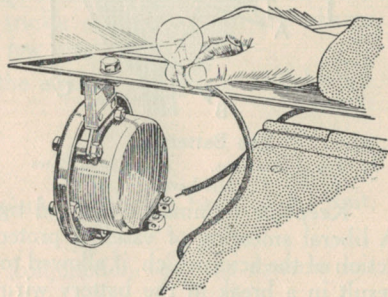
When the batteries arrive empty, as in the case of cars sent abroad, instructions for charging are given on a special leaflet. If mixing the acid, filling the cells and charging the batteries is done by the owner, the manufacturer's instructions must be followed very carefully.

Electric Horn.

If the horn becomes uncertain in its action, giving only a choking sound or does not vibrate, it does not follow that the horn has broken down or is out of adjustment. First ascertain that the trouble is not due to some outside source, for instance, discharged batteries, a loose connection or short circuit in the wiring of the horn, or a blown fuse.

It is also possible that the performance of the horn may be upset by the horn becoming loose on its mounting.

If the cause of trouble cannot be located, do not attempt to dismantle the horn, but return it to your Austin Dealer or a Lucas Service Depot for examination.



Test the horn lead with a bulb to ascertain if the wiring is faulty.

Direction Indicators.

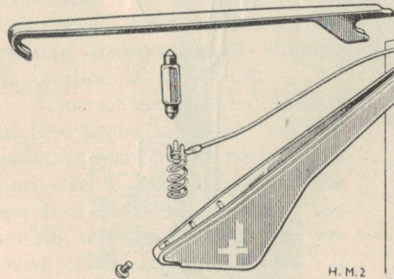
Every two or three months raise each direction indicator arm and apply a drop of thin oil, by means of a brush or other suitable article, to the catch pin between the arm and the operating mechanism.

If the arm fails to light up when in operation examine the bulb. To remove the bulb, switch the indicator on and, holding the arm horizontally, switch off again. Withdraw the screw on the underside of the arm and slide off the metal plate, when the burnt out bulb can be replaced.

To replace the metal plate, slide it in an upward direction so that the slide plate engages with the slots on the underside of the spindle bearing.

The bulbs are Lucas No. 256 3-watt festoon type.

If the direction indicators fail examine the fuse protecting them. If it has blown inspect the wiring for a short circuit. If the new fuse blows the cause of the trouble must be found and we advise that the equipment be examined by a Lucas Service Depot.



Direction Indicator.

Petrol Gauge.

The electric petrol gauge is automatic and registers the contents of the petrol tank when the ignition is switched on. If it fails examine the fuse.

The Wiring.

If a short circuit should occur in the wiring at any time the wires will become very hot, with a result that the insulation is liable to burn. A short circuit may be due to a loose connection, a broken wire, or chafing of the insulation.

In such an event disconnect the battery terminals. As soon as the wires have cooled an inspection can be made and the cause of the trouble traced, but we strongly recommend that the car be taken to a service station.

Provided the batteries are not completely run down it may be possible in an emergency to reach home by connecting the ignition system directly across the battery terminals. Disconnect the lead from the coil terminal and connect a temporary insulated lead from this terminal to the battery terminal. The other terminal of the battery should be earthed as before, the main lead being left disconnected.

The engine, of course, must be started by hand.



AN INVITATION.

AUSTIN OWNERS, and others interested are invited to visit Britain's largest self-contained motor works and see how Austin Cars are made.

The normal tour of the Works occupies two hours, and appointments should be made for parties in excess of ten.

Tours commence daily, except Saturday afternoons, at 10 a.m., 11 a.m., 2 p.m. and 3 p.m.

Visitors should ask the Commissionaire for the Reception Department, or make arrangements through a local Austin Dealer.

THE LAMPS.

Dip and Switch Mechanism and How to Replace Fuses.

THE head lamps are provided with an electrically operated anti-dazzle device for operation by the foot switch. When the switch is moved to the "dip" position, the near-side headlamp beam is dipped and turned to the nearside of the road, while at the same time the offside headlamp is switched off, thus causing no discomfort to drivers of approaching traffic.

The dipping of the head-lamp beam is effected by a movement of the reflector, which is made in two parts. The centre portion is pivotted in a fixed rim which is in turn secured to the body of the lamp.

Movement of the reflector is controlled by means of a solenoid and plunger which, when the current is switched on, tilts the reflector to give the dipped beam.

To remove the lamp front, slacken the fixing screw at the bottom of the lamp and swing it aside from the slot. The front can then be withdrawn. When replacing, press the front on to the lamp body, locating the top of the rim first. Finally swing the screw into the slot and tighten it to lock the front into position.

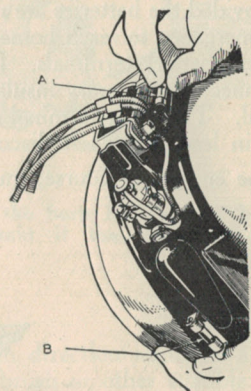
To remove the reflector turn back the ends of the cork washer and remove the screw opposite the medallion in the top of the lamp. Turn the reflector until the markings "O" stamped on reflector rim and lamp body coincide. The reflector can then be withdrawn.

When replacing the reflector, engage it with the lamp body, then turn it until the screw hole in its rim is opposite to the left-hand screw hole on top of the lamp body. Secure the reflector by means of the screw.

Focussing.

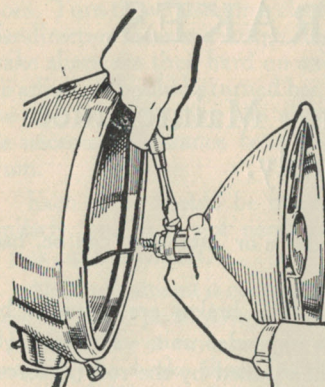
It is of the utmost importance that the lamps should be set correctly in relation to the road and we recommend that they be aligned so that the normal driving beams are projected straight ahead, that is, the beams should be parallel to the road and to each other.

The alignment of the lamps is very easily carried out, as they are fixed on an adjustable mounting which is locked by a single nut.



Dipping Headlamp Reflector.

A Dipper Fuse B Spare Fuse



Headlamp Focussing Screw.

to function, remove the fuse from its holder and see whether there is a break in the fuse wire. A spare fuse is clipped to the reflector bracket.

If the fuse should blow repeatedly, and the cause cannot be found, have the reflector examined at the nearest Lucas Service Depot.

Side Lamps.

The side lamp front can be removed when the fixing screw at the top of the lamp is withdrawn.

Stop Tail Lamps.

The front of the combined stop and tail lamp can be swung aside for bulb replacement when the clamping clip is unfastened.

Bulb Sizes.

The bulbs are of the 12 volt, single contact type.

Headlamps, Lucas No. 54 36 - watts.

Side, Stop, and Tail, Lucas No. 207 6-watts.

Panel Lights, Lucas No. 1224M.

Ignition Warning Lamp, Lucas No. C252A.

Direction Indicators, Lucas No. 256 3-watts, festoon type.

Roof Lamp, 12-v. 6-w. double contact, bayonet fitting, Lucas No. 209.

For Continental Headlamps with dual filament bulbs and no dipping reflector use Lucas No. 81 36-24 watts Lucas-Graves bulb.

Reflectors.

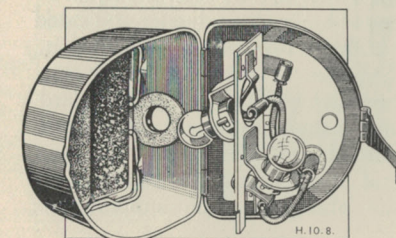
The reflectors of the lamps are covered with a protective coating, and any marks can be easily removed by means of a soft cloth.

On no account use any metal polish on reflectors.

To focus a headlamp bulb, slacken the clamping clip on the bulb holder at the back of the reflector and move the bulb backwards and forwards to find the best position, finally locking the adjustment by tightening the clamping clip.

The Fuse.

A fuse is provided with the electrical dipper unit to protect the equipment in the event of the reflector failing to function properly. The fuse is of the cartridge type and is carried in spring clips alongside the dipping mechanism. If the reflector fails

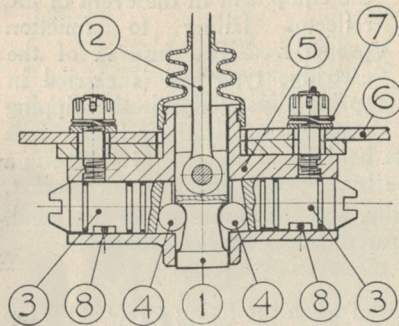


Stop and Tail Lamp.

GIRLING BRAKES.

Operation, Adjustment, Maintenance and Assembly.

GIRLING brakes are fitted and advice or attention can be had from any Austin Dealer.



Expander Unit.

The brakes are actuated by the expander unit. The cone (1) when pulled by the rod (2) forces apart the plungers (3) by means of the rollers (4). The plungers engage with the webs of the brake shoes.

The housing (5) is lightly held on the back plate (6) by nuts and spring washers (7) so that it floats between the brake shoes, which are thus self-centering. When the brake shoes are removed the pins (8) hold the plungers (3) in the housing.

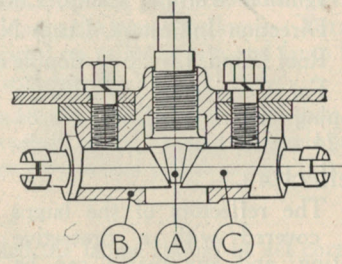
The adjuster unit, which is held firmly on the back plate by its housing (B) has two somewhat similar plungers (C) held apart by the adjuster (A), a conical ended screw, which provides adjustment to the shoes.

Adjustment.

In making adjustment to take up the wear of the brake linings the rods and linkages under no circumstances should be altered. There is only one operation necessary at each wheel to adjust the brake shoes.

This is as follows:—

On the opposite side of the drum whence the operating rod protrudes will be seen the square-ended brake shoe adjuster, indicated by the arrow in the illustration. This can be turned a notch at a time, which can be felt and heard and is the engagement of the four flat sides of the cone on the inner end of the adjuster engaging with the plungers which support the



Adjuster Unit.

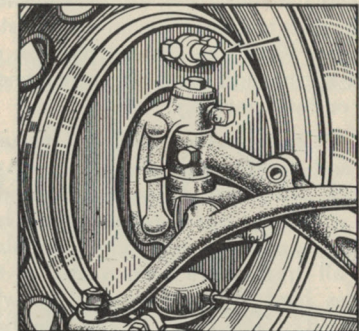
shoes. Turn the adjuster in a clockwise direction as far as it will go. The brake shoes are then hard on and the adjuster should be turned back one full notch to give the shoes the necessary clearance from the drum.

Each drum should be treated similarly, and it is not necessary to jack up the wheels.

After adjustment is completed, press the brake pedal down as hard as possible once or twice in order to centralise the brake shoes in the drums.

It is important that no attempt should be made to adjust the brakes with the handbrake on.

The illustration shows the adjuster of a front brake; on the rear brakes the adjuster will be found immediately in front of the axle.



H.10.12

The Arrow Indicates the Adjuster.

Dismantling the Brakes.

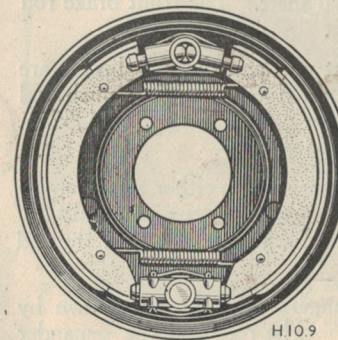
First jack up the car and remove the road wheels.

The brake drum is mounted on the hub and held by three small countersunk screws. Mark the position of the drum on the hub, take out the screws and remove the drum. If there is any difficulty in taking out the three small screws the whole hub and brake drum assembly can be removed complete.

To remove the shoes place a large screwdriver, or other lever, against one of the studs on the back plate behind the shoes and lift one shoe out of the groove in the plunger at the expander end.

Both shoes and springs can now be removed, leaving the expander and adjuster units in position on the back plate. Do not detach these units and be careful not to overstretch the springs.

Clean down the back plates, check the expander and adjuster units for free working and slack back the adjuster anti-clockwise as far as it will go. The adjuster should turn quite freely in the housing. Inspect the shoe pull-off springs and replace if they are stretched or damaged.



H.10.9

The Brake Assembly.

When relining do the four shoes of one axle at the same time.

In refitting the shoes be sure that the springs are between the shoe webs and the back plate. Hook the shoes together with one spring at the adjuster ends and assemble on the adjuster unit first, crossing the two shoes to do so. Place one shoe in position on the expander unit, replace the second spring and lever the other shoe into position. Refit the brake drum or hub assembly.

To centralise the shoes and ensure correct clearance between the shoes and the drums, slack off the set pins that hold the adjuster unit to the back plate, and, by turning the adjuster in a clockwise direction as far as it will go, put the brake shoes hard on. Then screw up the pins holding the adjuster unit tightly and slack off the adjuster one full notch. When all drums have been treated in this manner press the brake pedal down as hard as possible once or twice, to ensure that the shoes are centralised. The shoes should now be quite free of the drums.

While the shoes are removed it would be as well to make sure that the expander unit is able to float on the back plate. Should it be removed, when refixing it to the back plate, screw the nuts up quite tight with the double coil spring washer underneath. Then slack the nuts back one complete turn before inserting the split pin. The unit will then float on the back plate and be self-centralising.

Rods and Linkages.

Should it be necessary at any time to adjust one of the rods, or fit a new one, the following precautions should be taken:—

When the handbrake is in the off position the adjusting screw (A) below the cross shaft should be adjusted until it protrudes approximately $\frac{1}{8}$ in. from its boss and there is a clearance of $\frac{1}{32}$ in. between the face of the screw and the bottom of the handbrake lever. The rear brake rod (F) should be adjusted to suit this position.

When the brake pedal has from $\frac{1}{4}$ in. to $\frac{1}{2}$ in. free movement from the floorboard there should be $\frac{1}{32}$ in. clearance between the face of the forward adjusting screw (E) and the lever on the pedal shaft. The front brake rod (F) should be adjusted to suit this position.

The front brakes are operated by direct pull and the rear brakes are operated through a special spring (C) mounted on a sliding push rod between the pedal shaft and the brake cross shaft. There should be $\frac{1}{32}$ in. clearance between this spring and the locking nut (D).

Should it be necessary to fit new transverse rods on either axle, remove the shoes as previously described. Next remove the expander unit by undoing the two castle nuts holding it to the back plate, drawing the rod attached to it through the rubber cover.

To remove the rod, the expander plungers must be withdrawn by removing the split pins which retain them. The rod and the expander

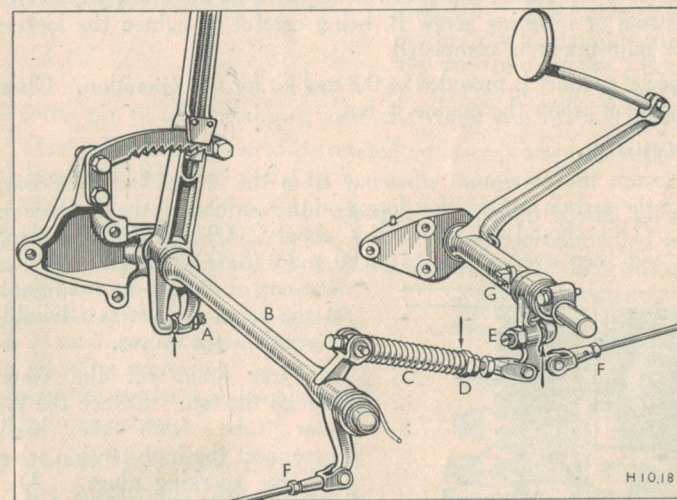
cone can now be drawn out, taking care that the two small rollers are not lost. Knock out the pin attaching the short rod to the expander cone, and fit the new rod. Re-assemble the expander unit, making sure the rollers are properly in place.

If there is any difficulty in re-assembling the rollers, a little grease smeared on them and the slots in which they work will hold them in place while being assembled.

Now push the rod through the dust cover, and tighten up fully the two castle nuts holding the unit to the back plate, not forgetting the double spring washer underneath them. Slack back the castle nuts one complete turn, thus allowing the unit to float on the back plate in the manner it is intended, and insert a split pin in them. Re-assemble shoes and brake drum or hub assembly.

Re-connect the brake rods and press the brake pedal down as hard as possible once or twice in order to centralise the brake shoes in the drums.

The brake balance levers should be greased monthly and the nipple on the brake pedal shaft weekly. Oil all brake joints weekly.



The Brake Operating Assembly.

- | | | |
|-------------------------------|-------------------|-------------------------------|
| A. Handbrake adjusting screw. | C. Spring. | E. Footbrake adjusting screw. |
| B. Cross shaft. | D. Locknut. | F. Brake Rod adjustments. |
| | G. Grease nipple. | |

(Arrows indicate clearances of $\frac{1}{32}$ in.)

RUNNING ADJUSTMENTS.

How to Keep the Engine in Tune; Clutch Adjustment.

THE adjustments set out below are all that the owner will find it necessary to make to keep the car in good running order. Unless the work is thoroughly understood, however, it is strongly recommended that the car be taken to an Austin Dealer.

Valve Tappets.

To ensure that the full power of the engine is obtained, and to maintain silent valve operation, it is essential to keep the tappets correctly adjusted. To make this adjustment, first remove the valve cover and have the engine slowly turned with the hand starting crank. Watch each valve open in turn and note the point at which it stops descending.

From that point until the valve begins to lift again there should be between the valve stem A and the tappet screw B a clearance of .004 ins. ; the thickness of the thin blade of the "tappet clearance gauge." If the clearance is other than this it can be adjusted by loosening the locknut C and raising or lowering screw B, being careful to tighten the locknut when the adjustment is completed.

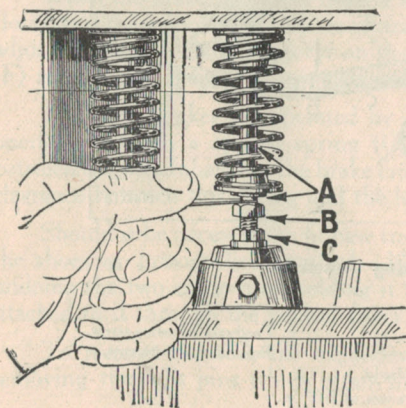
A special spanner is provided in the tool kit for this operation. Check this adjustment when the engine is hot.

Decarbonising.

To secure the maximum efficiency from the engine it is necessary to remove the carbon deposit that forms on the surfaces of the combustion chamber. This should be done after about 2,000 miles, (3,000 km.) running, and then every 5,000 to 6,000 miles (8,000 to 10,000 km.), as necessary according to conditions. At the same time it is advisable to grind in the valves.

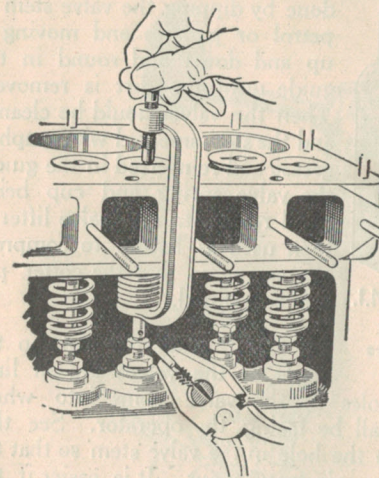
First drain off the water through the tap. Detach the top water tube from the head. Disconnect the high tension wires from the sparking plugs. Disconnect the dynamo wires, slacken the belt adjustment and remove the belt. Unfasten the nuts holding the dynamo bracket and remove the dynamo, with bracket and fan.

Remove the remainder of the nuts holding the cylinder head and in place of the front sparking plug insert the cylinder head



Tappet Adjustment.

A Valve Stem, B Tappet Screw,
C Locknut.



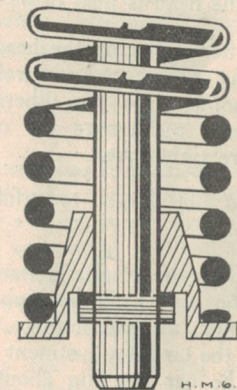
Valve Lifter and Cotter Pin.

spring must be lifted by means of the special tool provided, to allow the cotter pin to be withdrawn and the cotter cup to be removed.

The valve is now free to be rotated on its seat when the tappet screw has been lowered clear of the stem.

After it is cleaned, a little grinding compound should be smeared evenly on the valve face and the valve rotated backwards and forwards by means of a screwdriver, advancing it a step at short intervals until the pitting is removed. Lift each valve a little from its seating at the end of each step to allow some of the grinding compound to enter between the two faces and facilitate the cutting action.

Care should be taken that none of the compound enters the cylinders or the valve chambers. The valve and seating should be wiped clean after the operation. It is essential for each valve to be ground in and refitted on its own seating as indicated by the number on the valve head. The valves are numbered from 1 to 8, starting from the front.



The Cotter Pin.

lifting screw and gently rock the head until the joint is broken.

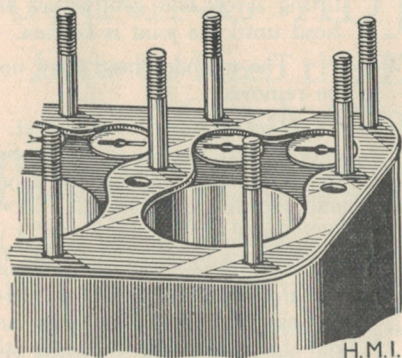
The cylinder head may now be removed.

The cylinder head gasket, if care is used, may be in a condition to be replaced. Otherwise a new one should be obtained.

All dirt or deposit should be removed by carefully scraping with a sharp tool, care being taken not to damage the piston crowns and not to allow dirt to enter the cylinder barrels or the valve chambers.

Valve Grinding.

Before grinding in the valves it will be necessary to remove the carburetter and connections complete. The valve cover, with washer, can be removed on undoing the two milled nuts. Each valve



Replace the Gasket Beaded Edges Downwards.

because this indicates that the holes in the valve stems into which the cotter pins are inserted will all be facing the operator. See that the cotter pin is placed properly in the hole in the valve stem so that the cup fits evenly over it, otherwise the pin may fly out. It is easier if the end valves are fitted first, working towards the centre ones.

Pliers will be found more convenient than the fingers for removing and replacing the valve cotter pins.

The Gasket.

When refitting the manifolds ensure that the joints are good. The cylinder head joint washer should be replaced with the side showing the beaded or turned-up edges facing downwards and a little grease should be smeared over each side to make a good joint and to prevent it sticking when the head is next to be lifted.

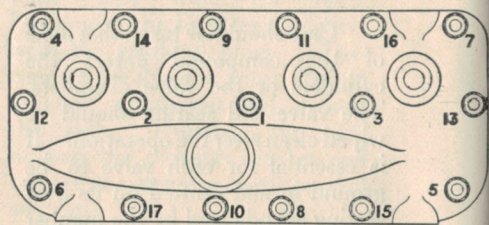
When replacing the head take care to tighten the nuts evenly, commencing at the centre and working to the outside. Do not tighten any one right home while the others are loose and make sure the centre nuts are tight first.

Do not forget to refill the radiator.

When the engine is warm go over the nuts again making sure they are all absolutely tight. Check the tappet adjustment again after the car has run about 100 miles as the valves have a tendency to "bed down" again.

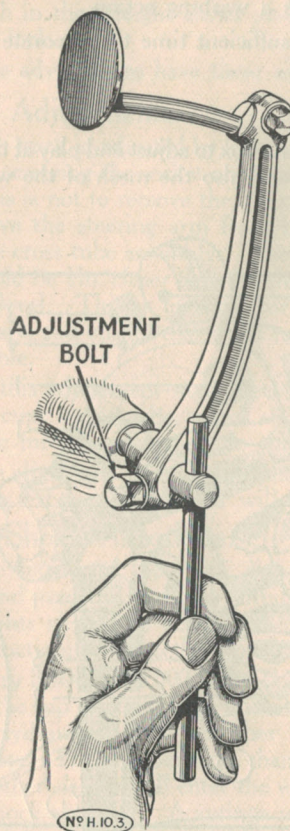
It is also desirable to clean the valve guides. This can be done by dipping the valve stem in petrol or paraffin and moving it up and down and round in the guide until the dirt is removed. Then the valve should be cleaned and the stem smeared with graphite grease and reinserted in the guide, the valve spring and cup being fitted round it. The valve lifter is then used as before to compress the spring so that the cotter pin can be refitted.

See that all the slots in the heads of the valves are in line,



Tighten Cylinder Head Nuts from the Centre and Work Outwards.

Clutch Wear Take-up.



Adjusting the Clutch Pedal.

After the clutch has been in use for some time the wear of the friction surfaces will give rise to a need for adjustment in order to ensure the continued full engagement of the clutch.

The adjustment should be such as to allow at least $\frac{3}{8}$ in. free movement of the clutch pedal with one finger. After depressing the pedal to this extent the stronger resistance of the clutch springs will be obvious, so that it is easy to ascertain that the amount of movement is correct. Lack of free movement is serious for it does not permit the clutch to engage fully. The pedal should be tested from time to time, otherwise damage may be done to the clutch owing to the slipping of the plates.

To adjust the pedal movement first put a tommy bar into the hole in the clutch operating shaft to hold it in position. Then slightly slacken the clamping screw at the bottom of the clutch pedal lever and depress the pedal sufficiently to give the necessary free movement. Securely tighten the clamping screw and check the adjustment.

Clutch Slip.

If the clutch slips when this adjustment has been made it is almost certainly due to the clutch having been misused. Some drivers are inclined to use the clutch instead of changing to a lower gear. Foot pressure is applied to the clutch to create a certain amount of slip and this highly polishes the frictional surfaces and will eventually be the cause of persistent slip. In addition to burning the clutch rings such practice will probably also distort the centre plate and make renewal necessary.

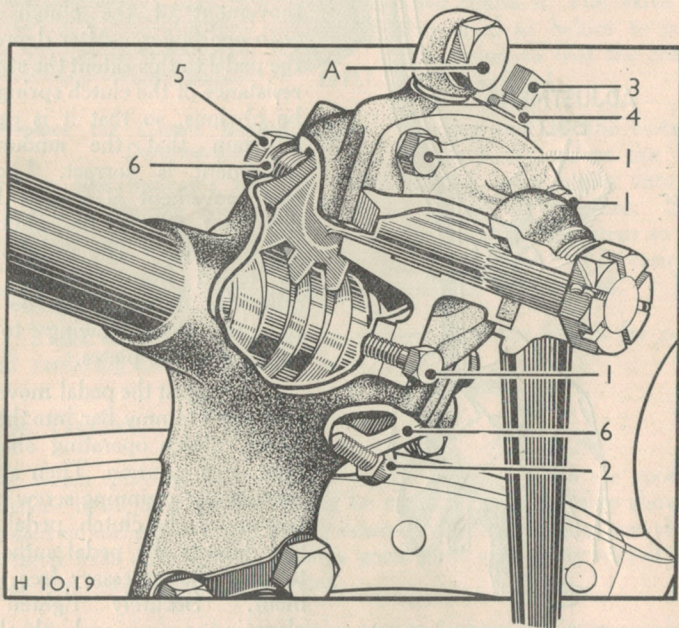
Sometimes, however, clutch-slip is also due to oil penetrating to the clutch. In such circumstances petrol can be syringed on the clutch plate to wash off the oil so that the clutch regains its frictional characteristics. When injecting the petrol have the engine

turned so that the plate is properly washed and the petrol and oil are given an opportunity to drain away. Push the clutch in and out by the pedal so that the petrol gives a washing action.

The petrol and oil should have sufficient time to evaporate or drain off before the car is used.

Steering Adjustments.

Facilities are provided at the steering box to adjust end play at the worm, end play in the steering cross shaft, and also the mesh of the worm and sector.



Steering Adjustments.

1, 3 and 4 Mesh Adjustment. 2 End Cover Nuts. 5 Cross Shaft Locknut. 6 Shims.
A Oil Plug

To take up end play at the worm, remove the end cover by taking out screws (2). With a knife blade separate and remove one or more of the shims. Replace the end cover and test for end play, removing further shims if necessary.

To take up end play at the steering cross shaft, unbend the lock washer, unscrew the nut (5) and remove one or more of the shims, as required. Replace the nut, test for end play and turn up the lock washer.

To adjust the mesh of the worm and sector, slightly loosen the three nuts (1) and the locknut (4) and turn screw (3) clockwise to take up the slack. Tighten the screws and locknut and test for mesh.

The adjustment should be carried out with the road wheels in the straight ahead position. On this type of steering there is the minimum back-lash in the straight ahead position, the back-lash increasing towards the full lock.

It is advisable to have these adjustments made by an Austin Dealer.

Track Adjustments.

The track is adjusted by lengthening or shortening the steering cross-tube by screwing the socket on or off the tube as required. The best way to do this is not to remove the steering ball pin from the steering arm, but to remove the steering arm from the swivel axle without dismantling it from the cross tube assembly. The wheels should not be lined up parallel but should be $\frac{1}{8}$ in. closer between the rims in front of the axle than behind, at axle level. This is to allow for working clearances and slight spring of the parts and ensure that when running the wheels are as nearly parallel as possible.

As this adjustment may affect the engagement of the ball pins with the ball cups in the tube, which engagement is determined by shims, it is advisable for a mechanic to do this work.

The alignment should be regularly checked and adjusted if necessary, otherwise excessive tyre wear will occur.

Luvax Shock Absorbers.

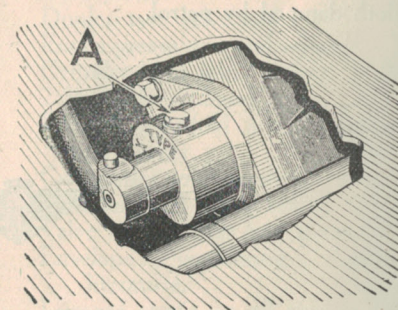
The setting of the shock absorbers is accurately determined at the works and remains constant throughout the life of the car so that no adjustments should be necessary. If the shock absorbers do not appear to be functioning correctly consult a Lucas Depot or an Austin Dealer.

Every 8,000 to 10,000 miles (12,000 to 15,000 km.) unscrew the filler plug at the top of the casing, and examine the fluid level. Add sufficient Luvax Hydraulic Shock Absorber Fluid to bring the level within $\frac{3}{4}$ in. of the top. The recuperation chamber must not be allowed to become empty, otherwise air will enter the working chamber and impair the action of the shock absorber. A syringe with a rubber tube can be used.

A full description of the working, care and maintenance of Luvax Hydraulic Shock Absorbers is given in a separate booklet issued by the manufacturers, Messrs. Joseph Lucas, Ltd., Great King Street, Birmingham, 19.

Export type shock absorbers are distinguished by a metal tag attached to the filler plug bearing the words "Luvax Export Fluid." Care must be taken that only Luvax Export Hydraulic Shock Absorber Fluid is used.

Export fluid will not mix with the standard fluid.



Shock Absorber Filler Plug (A).

THE CABRIOLET.

Instructions for Raising and Lowering the Hood.

THE CABRIOLET hood is easily operated but care must be taken not to damage the fabric and not to roll it up while wet. Always leave the hood up to dry after rain or after the car has been washed.

To lower the hood first unfasten the two clips over the windscreen. Then lift the hinged stretcher arm holding the hood to the canopy rail and separate the leading edge of the hood from the arm.

The hood is now free to be pulled over to the back of the car. Standing behind the car, roll up the hood and secure it by the two straps, one on either side, which turn outward over the roll and fasten on the outside.

The hood may be left in this position if desired.

The forward cross stick should be folded over and clipped on to the front canopy rail.

To lower the hood, unfasten the two clips, one over each quarter window, and lower carefully. Do not allow the rear window glass to fall on the luggage compartment, but fasten it to the two straps on the cross member.

When erecting the hood take care to see that the edges are in the channelling on either side of the car before fastening either the rear or the forward clips.

When fixing the front edge to the stretcher arm see that the register stud in the centre is properly located.

Dust may be brushed from the hood and oil or tar spots removed with a cloth dampened by petrol.



AFTER SALES SERVICE.

AUSTIN DEALERS are under agreement to give "After Sales Service" during the period of the first thousand miles running of Austin cars purchased from them.

They will without charge:—

Adjust brakes.

Oil and grease all points of the car.

Check and correct carburettor mixture and reset slow running adjustment.

Check and correct ignition timing and tappet clearances.

Drain crankcase at 500 miles and the gearbox and back axle at 1,000 miles and refill.

Tighten cylinder head nuts.

Check front wheel alignment.

Examine battery and bring up to proper level with distilled water or diluted acid as may be required.

Examine all wires and terminals.

Tighten all nuts and bolts on the body, steering, springs, etc.

Adjust clutch and brake pedals.

Adjust fan belt.

Adjust timing chain.

Test the tyres for correct pressure.

Clean dynamo commutator.

All materials will be charged for.

TOOLS AND ACCESSORIES.

The following are supplied with the Car:

Double-ended spanners:—

3/16in. × 1/2in.; 5/16in. × 3/8in.;
7/16in. × 1/2in.

Box spanners:—

3/16in. × 1/2in.; 5/16in. × 3/8in.;
7/16in. × 1/2in.; 5/8in. × 3/4in.

Tommy bar.

Sparking-plug spanner (ring type).

Adjustable spanner, 6 ins.

Tappet adjusting spanner.

Screw-driver.

Distributor Screwdriver and Gauge.

Tappet clearance and sparking plug gauge.

Starting handle.

Ignition key.

Combination pliers.

Hub-cap and starting nut spanner.

Wheel-nut brace.

Lifting jack with handle.

Tyre levers (2).

Tyre pump.

Dunlop tyre valve tool.

Enot's grease gun and adaptor.

Cylinder-head joint washer.

2 Straps for radiator hose.

Exhaust manifold and induction pipe washer.

Carburettor joint washer.

Cylinder head lifting screw.

Valve spring lifter and screw.

Envelope containing Austin literature.

Luggage straps on all models on which the spare wheel is carried enclosed at the rear of the car.

This list is subject to modification from time to time.

EQUIPMENT.

THE Austin Motor Co., Ltd., accept no liability under the terms of their Warranty for Tyres, Speedometers, or the Electrical Equipment, or other Goods, including Coachwork, not of their own manufacture.

All claims relating to any of these parts or fittings or orders for repairs to them should be addressed to their manufacturers.

For our clients' convenience, we give below the names and addresses of the manufacturers, or suppliers of the goods in question.

When claims under guarantee are being made, it is absolutely necessary to quote the type and number of engine, and also the commissioning date.

ELECTRICAL.

Also (Mirrors)	{ Horns Lamps Cutouts Starters Dynamos Batteries Trafficators Switchboards Windscreen Wipers }	Joseph Lucas, Ltd., Great Hampton Street, Birmingham, 18. Dordrecht Road, Acton Vale, London, W.3. And Branches.
"LUCAS"		

SHOCK ABSORBERS

"Luvax"

INSTRUMENTS.

"SMITH"	{ Speedometers Petrol Gauges Oil Gauges Clocks Thermostats }	S. Smith & Sons (M.A.), Ltd., Cricklewood Works, London, N.W.2.
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DRIVING MIRRORS.

Interior and Exterior	Desmo Ltd., 31, Stafford Street, Birmingham.
Interior only	Pennant Manufacturing Co., 350, Reddings Lane, Acock's Green, Birmingham.
Also	Joseph Lucas, Ltd. (some models).

TYRES AND TUBES.

"DUNLOP"	Dunlop Rubber Co., Ltd., Fort Dunlop, Birmingham.
------------------	---

CARBURETTERS.

"ZENITH"	Zenith Carburetter Co., Ltd., Honeypot Lane, Stanmore, Middlesex.
------------------	---

SPARKING PLUGS.

"K.L.G."	K.L.G. Sparking Plugs, Ltd., Putney Vale, London, S.W.15.
------------------	---

GREASE GUNS AND OIL INJECTORS.

"ENOTS"	Benton & Stone, Ltd., Bracebridge Street, Birmingham, 6.
-----------------	--

PETROL PUMPS & AIR CLEANERS	"A.C." Sphinx Sparking, Plug Co., Dunstable, Beds.
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LIFTING JACKS	R. T. Shelley, Ltd., Aston Brook Street, Birmingham.
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LUCAS SERVICE DEPOTS.

	Telephone.	Telegrams.
BELFAST. 3-5, Calvin Street, Mount Pottinger	57291	Servdep
BIRMINGHAM, 18. Great Hampton Street	Central 8401	Lucas
BRIGHTON, 4. 85, Old Shoreham Road, Hove	Hove 1146	Luserv, Brighton.
BRISTOL. 345, Bath Road	76001	Kingly
CARDIFF. 54a, Penarth Road	4603	Lucas
COVENTRY. Priory Street	3068	Lucas.
DUBLIN. Portland Street North, North Circular Road	Drumcondra 434	Luserv
EDINBURGH, 11. 60, Stevenson Road, Gorgie	62921	Luserv
GLASGOW. Corner of Grant Street & St. George's Road	Douglas 3075	Lucas
LEEDS. 64, Roseville Road	28591	Luserdep
LIVERPOOL, 13. 450-456, Edge Lane	Old Swan 1408	Luserv.
LONDON. Dordrecht Road, Acton Vale, W.3.	Shepherd's Push 3160	Dynomagna, Ealux, London.
757/759, High Road, Leyton, E.10	Leytonstone 3361	Luserdep, Leystone, London
155, Merton Road, Wandsworth, S.W.18	Putney 5131	Luserv., Put., London.
MANCHESTER. Talbot Road, Stretford	Longford 1101	Lucas, Stretford
NEWCASTLE-ON-TYNE, 2. 64-68, St. Mary's Place	25571	Motolite.

The AUSTIN MOTOR Co., Ltd.,

Longbridge, BIRMINGHAM. P.O. Box 41.

Telephone: Priory 2101 (20 lines). Telegrams: "Speedily, Telex, Northfield."
Cables: "Speedily, Birmingham, England." Code: Bentley's.

LONDON:

479-483, Oxford Street, W.1. (near Marble Arch).

Telephone: Mayfair 7620 (18 lines).
Telegrams: "Austinette, Telex, London."

Holland Park Hall, W.11.

Telephone: Park 8001 (9 lines).

25, North Row, Oxford Street, W.1 (Seven h.p. repairs).

Telephone: Mayfair 6271 (7 lines).

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