

HANDBOOK

OF

*The Austin
Seven*



Publication 352

THE AUSTIN MOTOR CO. LTD
LONGBRIDGE, NEAR BIRMINGHAM

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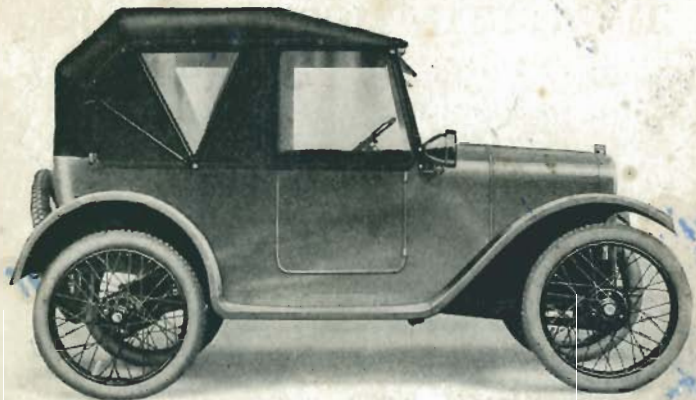
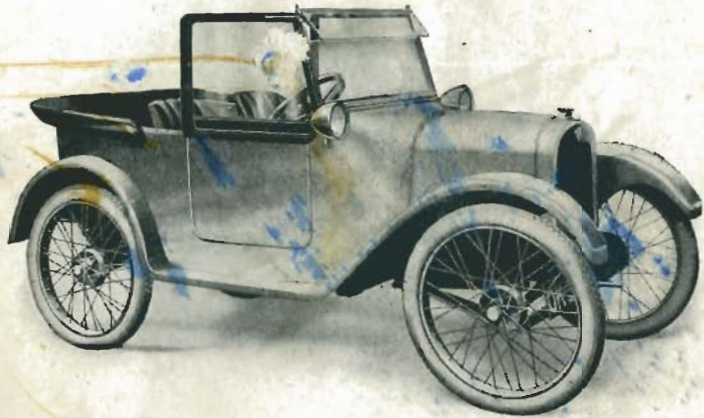
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The "AUSTIN SEVEN"



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THE "AUSTIN SEVEN"

THE "AUSTIN SEVEN" was introduced to supersede the sidecar combination. It seats two adults and three small children, or if children are not carried, a large space is available for luggage. Everyone is brought within the hood, while the car is fitted with a double-windscreen, and side curtains opening with the doors. It has a 4-cylinder, water-cooled engine, three-speed gearbox, and bevel drive through differential. Lubrication is by pump, and cooling on the thermo-syphon system. Electric light is fitted, and spare wheel and tyre are included in the equipment. Brakes are fitted on all wheels, which have 3 in. tyres. As the body is stove enamelled, the car is extremely easy to keep clean.

This little car, which can be run for about a penny a mile is, an ideal car for a woman to use herself, enabling her to do the shopping without fatigue, to visit her friends more frequently and attend social and recreative functions. Another appeal is to the business man as it enables the executive to make the utmost use of his time, while his expenditure is no more than it would be on tram or bus fares, and there is no need to point out the value of such a car for the commercial traveller, who can penetrate into districts which poor train services would make it hardly worth his while to cover otherwise.

The "Austin Seven" also serves as a tender for the country house, enabling a servant to go down to the village or post, or to the doctor at any time of the day or night, without the expense and trouble of getting out a big car. The speed, economy and road holding qualities of this small car place it beyond all comparison with the sidecar combination, and it is in addition, a thoroughly good job, planned and made with the car instead of the motorcycle aspect in mind.

Its Leading Features

- DIMENSIONS . . Overall length, 8 ft. 10 in. ; Overall width, 3 ft. 10 in. ; Wheelbase, 6 ft. 3 in. ; Track, 3 ft. 4 in. ; Weight, 7 cwt.
- ENGINE . . . Four-cylinder water-cooled detachable head.
Bore 2.2 in. }
Stroke, 3 in. } 747.5 c.c., R.A.C. rating, 7.8 h.p.
Brake horse-power : 10.5 at 2,400 rev.
Ignition : Magneto.
Oil circulation : by pump.
Cooling : Thermo-syphon with film radiator.
Roller crankshaft bearings.
- CLUTCH . . . Single-plate.
- GEARBOX . . . Three speeds forward, and reverse ; ratios : 5.4, 9.8, and 17.5 to 1 ; 23 to 1 reverse ; Ball bearings throughout.
- REAR AXLE . . Semi-floating, with differential and torque tube.
Ball bearings and thrusts throughout. Final drive by shaft and helical bevel ; metal universal joints.
- SPRINGS . . . Semi-elliptic cross spring in front.
Quarter elliptics at rear.
- STEERING . . . Worm and sector, having provision for taking up wear.
- FRONT AXLE . Forged, "H" section.
- BRAKES . . . On all four wheels ; compensated and instantly adjustable. (All parts of the brakes are interchangeable). Hand brake to the front wheels.
Foot brake to the rear wheels.
- WHEELS . . . Special wire detachable, fitted with 26 in. x 3 in. non-skid tyres. One spare wheel with tyre.
- CONTROLS . . . Of magneto and carburettor on steering wheel.
- PETROL TANK . 4 gallons.
- LIGHTING . . . By gear-driven dynamo, with accumulators.
- BODYWORK . . . Two bucket seats for driver and passenger, instantly adjustable and detachable. Rear seat to carry two or three children. Ample tool box accommodation under seats. Spare wheel and tyre carried on back of car. Hood, double screen, and full side curtains (those over the doors open with them). Electric horn. Road clearance, 9 in. The panels are stove-enamelled for durability of finish and ease of cleaning.
- WORKMANSHIP AND MATERIALS . . Austin quality.
- INSURANCE . . Special Insurance has been arranged at £8 10s. 0d. per annum.

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The NEW CAR

ON taking possession of a new car it is advisable to give it a general examination to see that all is complete and in order.

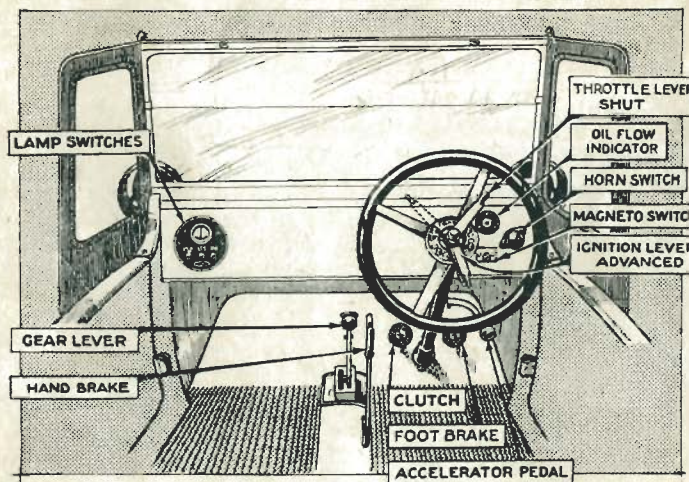
Before running see that the car is supplied with fuel and water, and that the engine and gearbox have the necessary quantities of oil. The battery should contain the required amount of acid. For quantities of oil and acid see sections "Lubrication" and "Electrical Equipment."

Make sure that the tool-kit is complete, check it over according to the list given on page 37.

If you are not already familiar with Austin cars, we strongly recommend that the Handbook be carefully studied.

Should the car be delivered by road it will be in a runable condition, but if it has been transported by rail or overseas, the engine may have become stiff through the gumming of the oil on the pistons. They may be freed by the injection of a little paraffin into the cylinders, through the compression plugs, and then turning the engine and crankshaft a few revolutions with the starting handle.

When a car is crated for dispatch overseas, water, fuel, and oil are removed and the battery left empty and uncharged.



Starting the Engine

Make sure that the change speed lever is in neutral position, and the hand brake on if the car is not on level ground.

Turn on petrol tap at the bottom of the petrol tank (this will be found under the bonnet).

Set the engine control levers at the top of the steering wheel as follows :—

Throttle—slightly open.
Ignition—retarded slightly.

Give the engine a few turns with the starting handle to make sure that the crankshaft is free, then switch on, and again give the crankshaft a few sharp turns by means of the starting handle, making sure to pull the handle upwards to commence with.

It is most important that the engine be not allowed to race when first starting up, as time must be allowed for the oil to circulate and lubricate various bearings.

The car itself should never be allowed to run at high speeds for the first 300 miles.

If after the foregoing instructions have been carried out under the heading of "Starting the Engine," but the engine fails to start the reason will probably be due to faulty ignition or carburation.

Ignition : First examine the wires and see that the sparking plugs are connected. Then test the gap of the plug points by means of the gauge provided in the tool kit. The distance should be .014 in. to .016 in. If the points are dirty, clean them before replacing. For fuller details on the ignition system see page 16.

Carburation : The slow running tube may be stopped up or the jets choked. For fuller details about the carburetter see page 14.

In cold weather starting may be slightly more difficult than in summer, and it may be advisable to flood the carburetter by lifting the needle of the carburetter float chamber. Another aid to easy starting is to refill the radiator with boiling water.



CONTROL OF THE CAR

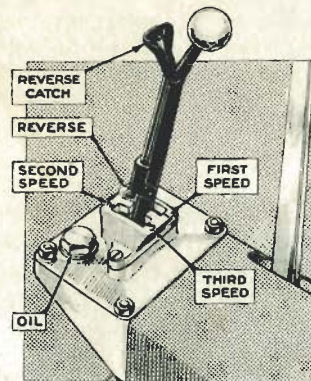
Setting of Control Levers

AFTER having started the engine, keep the ignition lever in the advanced position ; should the engine commence to knock, retard the lever, but advance it again as soon as the load on the engine is lessened. The "gas" lever should be set generally for slow running and the speed of the car controlled by the accelerator pedal.

Changing Gear

Double declutching will be found the best method of gear changing on the "Austin Seven" and should be adopted straight away. It will be understood that when changing up the foot should be taken off the accelerator pedal, and that when changing to a lower gear it should be held down. The car should be well accelerated on each speed when changing up, and a deliberate pause should be made with the gear lever in neutral position. The catch below the knob of the gear lever must be raised to allow the reverse gear to be engaged.

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.



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, supplement the action of the foot-brake at intervals by the use of the hand-brake for brief periods. It is often advisable to engage one of the

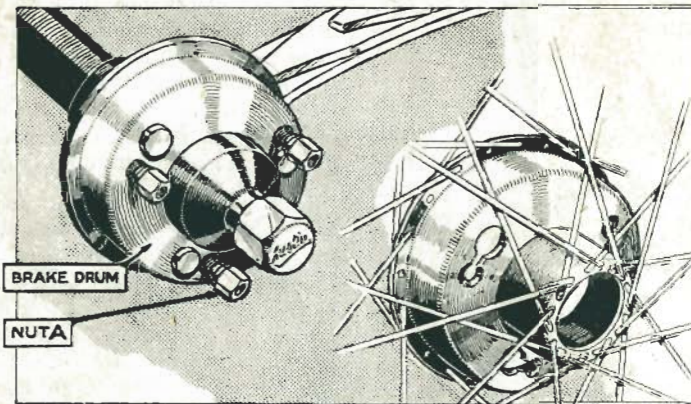
lower gears before commencing a steep descent, with throttle closed. When using the foot brake, keep the clutch in, disengaging it at the last moment if stopping the car.

The seats of the "Austin Seven" are adjustable for position and this convenience should be taken advantage of so as to obtain the greatest comfort in driving.

HOW TO CHANGE A WHEEL

When it becomes necessary to change a wheel because of a puncture or for any other cause, it will be necessary first to disconnect the rear lamp and remove the number plate. The spare wheel is fastened on a bracket with three screws, in a similar manner to its fixing on the hub.

To detach a road wheel from the hub loosen the three right-hand threaded nuts A which are in the hub of the wheel, by means of the brace: it is not necessary to remove them entirely. Now pull the wheel outwards about $\frac{1}{2}$ in. and turn it so that the large hole will pass over the nut. The wheel can now be pulled off the hub. When replacing make sure that the large hole in the hub is properly fitted over its peg.



PERIODICAL ATTENTIONS

THE importance of giving careful attention and regular inspection to the modern automobile cannot be over-estimated. If this is done systematically considerably greater pleasure will be derived from motoring as the car will always be kept in tune and will not require adjusting at inopportune moments.

Further, by following out the instructions given in this book, expensive repairs may even be avoided, as much of the trouble experienced by motorists could have been avoided if attention had been given to details at the proper time.

The following instructions are arranged on a daily, weekly, or monthly basis. The estimated needs of the car for such periodical attention is based on the assumption that the maximum mileage for a week should not exceed 300 miles.

Daily Attentions—See also Lubrication Chart, page 21.

1. Examine water level in radiator and fill up to within 2 in. of the top. Always use the strainer when re-filling as dirty water will cause the radiator film to become choked.
2. Examine oil level in the crankcase and add more oil if necessary. The tell-tale dipper rod indicates the level of the oil (see illustration, page 22).
3. Fill up the petrol tank if necessary. Care should be exercised when filling the tank so as not to spill the petrol over the engine.

Weekly Attentions

1. With the grease gun charge—
Front spring shackle pins (4).
Rear spring pins (2).
Brake cam spindles (2).
2. Oil the following—
Handbrake gear.
Pedal gear and jaw joints.
Front wheel swivel pins (top).
Engine control and jaw joints.
Clutch release ring.
3. Examine both sets of brakes, and adjust if necessary. For method of doing this see page 33.
4. Inject one gunful of grease each into the front and rear universal joints of the propeller shaft and torque tube end.
5. Oil the joints of the steering side tube and steering cross tube with the oil can.
6. Tyres should be examined and tested for pressure—35 lb.

Monthly Attentions

1. Examine the oil level in the gear box which should contain two-thirds of a pint.
2. Charge the back axle case with a gunful of grease and oil mixed half and half.
3. Fill the two front hub caps with grease.
4. Charge with grease the steering worm case through the connection.
5. Examine the battery and see that the connections are tight.

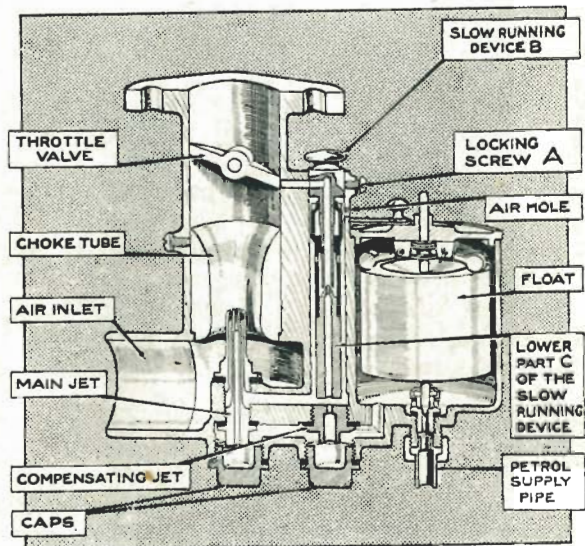
Occasionally

Examine all bolts and nuts, and any other parts such as steering connections, neglect of which might lead to failure and breakdown which would be followed by an expensive repair and the inability to use the car for a lengthy period.

Spring clips and cylinder head nuts should be tightened up occasionally when the car is new, and the nuts whenever the cylinder head has been replaced.

The CARBURETTER

THE following instructions have reference to the Zenith carburetter, adjusted by determining the correct sizes of the choke tube, main jet and compensator. The purpose of the choke tube is to obtain the correct velocity of air around the jet in order to get the best mixture at all speeds. The main jet



has most influence at high speeds. The compensator, which corrects the irregularities of the main jet, has the greatest influence at slow speeds. Besides these three parts there is a special device to provide for slow running. The carburetter is tuned and set at the works to give the best results under ordinary conditions; should the car be taken to districts where the atmospheric conditions vary considerably, or a different fuel be used, it may be advisable to adjust the carburetter accordingly. Before making alterations to the carburetter, make quite sure that the engine is in good running order, particularly the ignition. The standard carburetter setting is:—

Choke	15 mm.
Main Jet	·070 mm.
Compensating Jet	·075 mm.

Method of Adjustment

Before altering the carburetter setting, turn off the petrol by means of the tap underneath the tank. A jet key is sent out with each car for the purpose of taking out the main and compensating jets. The caps below the jets must be removed by means of the adjustable spanner when the jets can be unscrewed with the special key. When replacing either, make sure that they have washers on them, and are well down on the shoulder.

Slow Running

Too much petrol for slow running causes choking and hesitation in the pick-up. Although the engine may start easily and keep running, it commences to run jerkily. A want of petrol, on the other hand, causes a loss of power and misfiring at the same time. It is, therefore, necessary to regulate the slow running as carefully as possible. First release the small locking screw A and then withdraw the tube B, as illustrated. To reduce the quantity of petrol unscrew the lower part C of the tube B, one notch at a time. Reverse the operation to increase the flow of petrol. There are other factors quite apart from the carburetter which have a great influence on slow running (slow running when the engine is out of gear and the car is stationary). These factors are:—

- Cylinder head and induction pipe joints not air-tight.
- Valve guides worn. Valves not seating tight.
- Ignition too much advanced.

These points must always be taken into consideration, and one should not blame the carburetter only if slow running is not satisfactory.

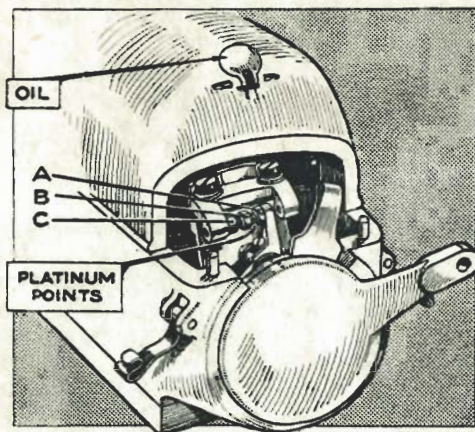
Leakage from the Carburetter

The cause is that the float control is out of adjustment—the float perforated—or there is dirt on the needle seating, which should be cleaned. The two defects first mentioned should be remedied by an expert.



The IGNITION SYSTEM

IGNITION is effected by a high tension magneto, which under ordinary conditions requires very little attention. The period of ignition is controlled by the lever on the steering wheel, which advances or retards the spark. The contact-breaker should be examined occasionally to see that it is in good condition. The opening between the platinum screws A and B should be tested by the gauge provided for the purpose. (The distance should be between .014 in. to .016 in. when fully open). The points must be kept free from oil and their ends should be flat. Should they become ragged, have them trimmed by a skilled man. Adjustment is made by turning the screw B after releasing the lock-nut C. Screw up the lock-nut again when the adjustment has been completed. A gauge for the distance between the points is supplied with the car, and the thick end should be used for the contact-breaker and plug points.

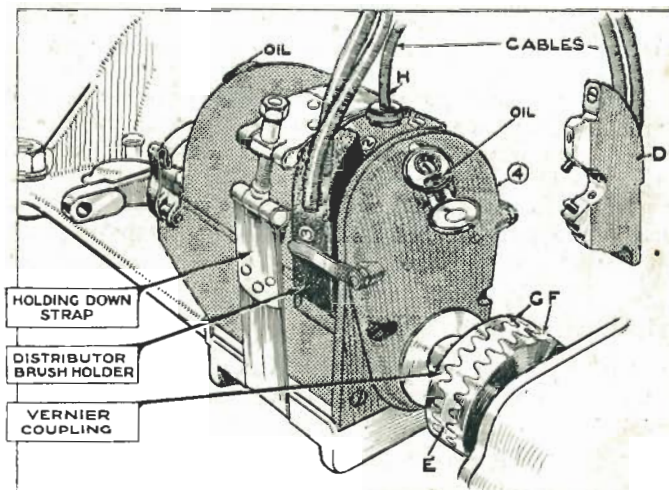


- A.—Fixed platinum point.
- B.—Adjustable point.
- C.—Lock-nut.

It is advisable to remove the block D holding the carbon brushes occasionally in order to see that the distributor is clean. To do this, it is not necessary to remove the cables. Carbon dust can generally be removed by means of a soft dry cloth.

Re-timing Ignition

Should it become necessary to re-time the magneto, place the ignition control lever in the full retarded position, remove all the compression plugs (except the front, No. 1) leaving this in while turning the crankshaft till compression is felt in this cylinder. Now remove No. 1 plug and continue turning till the figures 1 and 4 on the flywheel appear on the top, see illustration on page 24. No. 1 piston is then at the top of its stroke ready for the explosion. Turn the magneto spindle by hand until the figure No. 1 on the distributor gear wheel is seen, see illustration below. It is at this instant that the breaking of the platinum point occurs, and contact is made between one of the segments and the carbon brush of No. 1 cable. Couple the magneto drive and fasten the magneto holding down strap.



Very fine timing of the magneto can be secured by means of the vernier coupling. Having obtained position of lever, piston, distributor brush and contact-breaker as described, push the magneto coupling together, turning the rubber disc E till it accommodates itself. If it is then thought well to advance the timing a little, it can be done by gradations smaller than the degrees of a circle. On the front coupling F are 20 round teeth, and on the armature coupling G, 19. Therefore, if the rubber disc E is moved away from the operator one tooth on the front coupling ($1/20$ of a revolution), and the magneto coupling one tooth over the rubber disc towards the operator ($1/19$), the net movement towards one (advance) will be $1/19$ minus $1/20$ of a revolution, or $1/380$.

Re-timing Ignition—continued.

Timing can be retarded by moving the magneto coupling G a tooth away from one, while holding the rubber disc stationary, and then moving the disc a tooth towards one at its front end: The order in which the cylinders fire is (from the front) 1, 3, 4, 2.

Faults in Ignition

Faulty ignition will cause difficulty in getting the engine to "fire" or fire regularly. First examine the wires and see that the sparking plugs are connected. Then test the gap of the plug points by means of the gauge provided in the tool kit. The distance should be .014 in. to .016 in. If the points are dirty, clean them before replacing. A sudden stoppage of the ignition may result from the short circuiting of the switch cable attached to the top of the magneto. This can be readily detected by disconnecting the cable from the terminal H, when the engine should fire properly.

Irregular firing may result from the contact-breaker not being in proper adjustment or from carbon dust lying on the track of the distributor brush, and these should be given the attention previously described. No attempt should be made to dismantle the magneto further than necessary, and if additional difficulties arise, or repairs become necessary, it should be returned to the Austin Works.

Lubrication of Magneto

It is only necessary to give the magneto a few drops of oil occasionally—a spring cap is provided at each end for this purpose. Over lubrication is detrimental.



The COOLING SYSTEM

THE cooling of the engine is maintained by a capacious radiator which should be filled, with rain water, if available, up to within 2 in. of the top of the filler. The capacity of the radiator, pipes and cylinder jackets is 9 pints.

In Cold Weather

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 spaces and fracture of cylinder and pipes will result. In Great Britain, the climate does not very often call for the cooling system to be drained, but it is well to err on the right side and take due precaution against damage if frost be threatened.

Glycerine mixed with the water will reduce its freezing point by several degrees. It should be added in the proportion of 15% or 20%.

In order 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. Rain-water, syphoned from the top of the barrel where it is clean, should be used, or, failing that, water from the hot-water tap.

Causes of Overheating

Overheating may be attributed to one or more of the following :
Excessive carbon deposit in cylinders. See "Running Adjustments."

Running with ignition too far retarded.

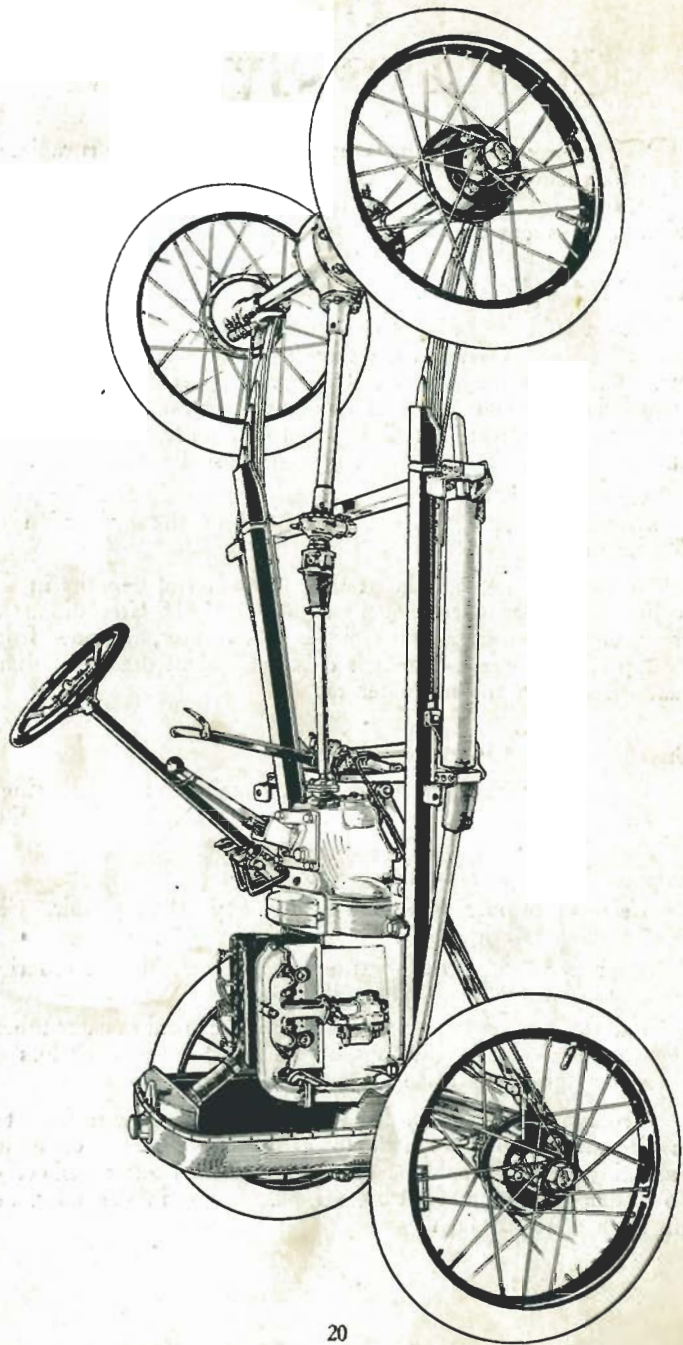
Using oil of poor quality, or lack of oil in the reservoir. See "Engine Lubrication."

Improper carburettor adjustment, giving a mixture too rich or too weak. See "The Carburettor."

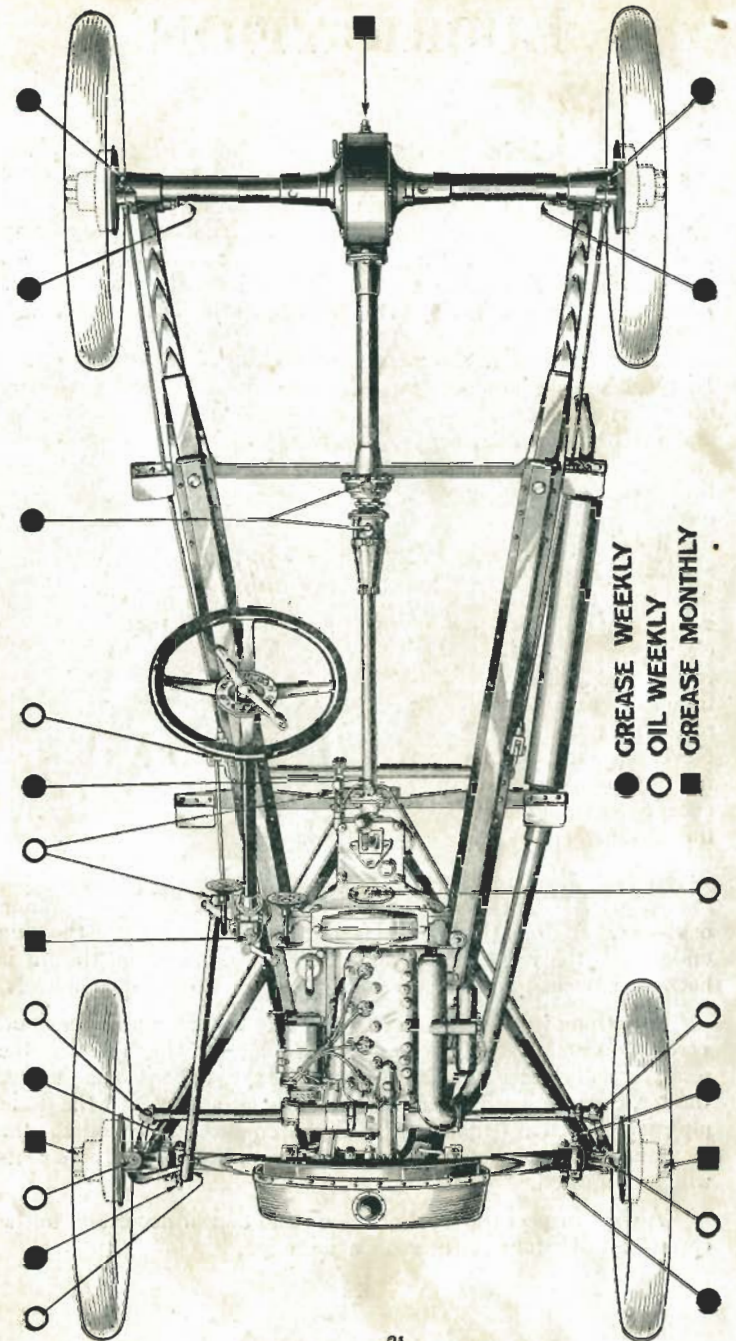
Failure of water to circulate, because of choked radiator tubes, water level below the tops of the radiator tubes, or loss of water through leakage from connections.

Trouble arising from a damaged radiator generally necessitates its dismantling and despatch to a repair depot. The entire circulating system should be thoroughly flushed out occasionally. To do this open drain tap at bottom, place a hose in the filler, and run fresh water through.

THE CHASSIS



LUBRICATION CHART



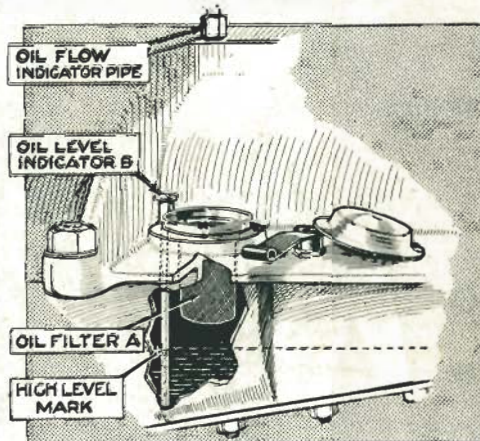
LUBRICATION

The Engine

THE type of oil found to be most suitable for the "Austin Seven" engine corresponds to the specification of "Sternol W.W." and oil of approximately the same constituents and viscosity should be used. If the oil is too thick it will tend to clog and carbonise, and if too thin it might lead to scoring of the pistons and bearings. Assurance that oil is continuously circulating is given to the driver by means of the tell-tale on the instrument board.

It is essential that all receptacles for oil be kept perfectly clean. Dirty oil leads to undue wear of all bearings, or might even clog up the oiling system and prevent it working,

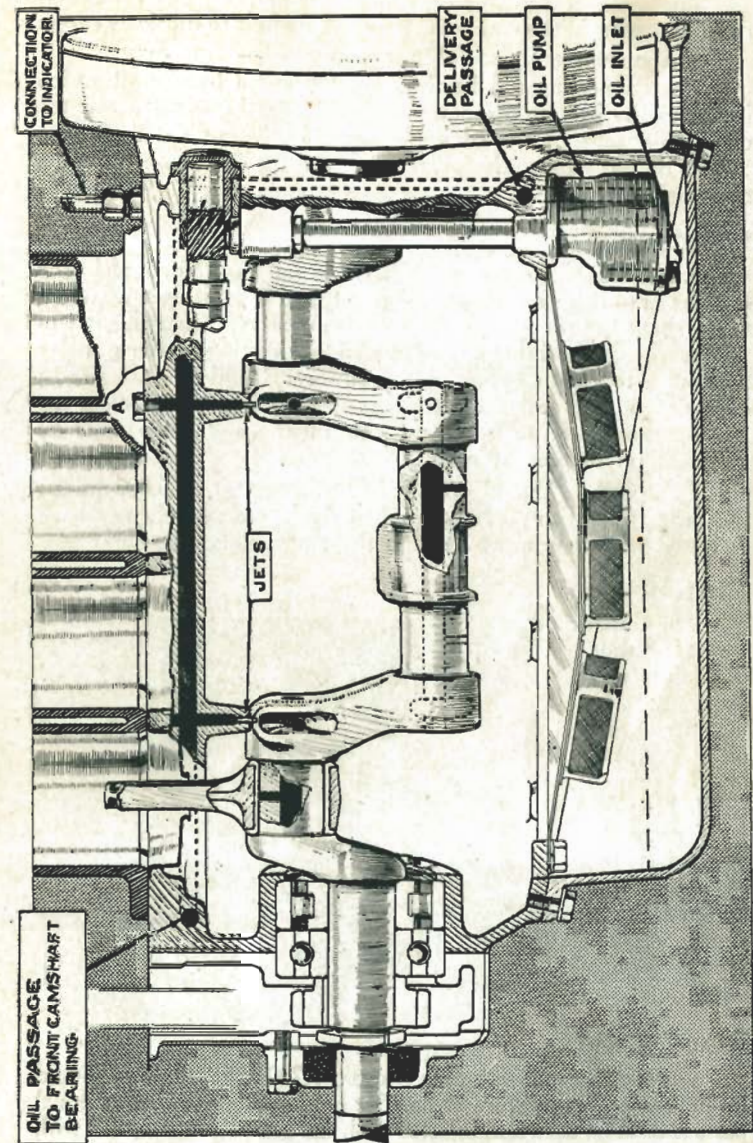
thus causing an engine seizure and much trouble and expense. The oil filler strainer (A) is detachable for cleaning. Add fresh oil from time to time as may be required. Never pour oil into the engine except through the strainer.



It is advisable to change the oil in the engine entirely after every 2,000 miles running or sooner. To drain the dirty oil from the crankcase remove the plug underneath the reservoir. This should be done while the oil is hot and sufficient time allowed for all of it to drain completely.

Now remove the oil reservoir and tray containing the strainer, carefully clean the gauze and remove all dirt from inside the reservoir and replace it. Carefully remake the joint with the packing washer, covering both sides of it with gold size. See that the drain plug is screwed up tight, then fill the crankcase with oil to the maximum level as shown on the dipper rod, B. About three pints will be required.

Always inspect the level of the oil and add, if necessary, to the correct level before starting on a journey.



The main bearings of the engine are of the roller type, and the oily vapour in the crankcase is quite sufficient to lubricate these.

The pistons are also lubricated by the oily vapour.

The connecting rod bearings are lubricated by the oil which is fed to the jets by the pump, being caught in pockets on the crankshaft webs. It is advisable occasionally to clear these jets, and to do so, remove the plug "A" on the crankcase and use a thin wire.

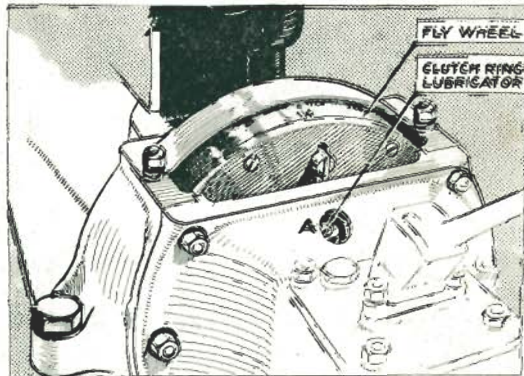
Gearbox

A suitable oil for the gearbox is the same as that used in the engine; but if for any reason another brand of oil is used it should be of about the same consistency and no thicker, otherwise it will not reach all the bearings. The quantity carried in the gearbox is about 2 to 3 pints. The correct oil level should be maintained; excess of oil will leak from the bearings and seriously affect the clutch, causing it to slip; on the other hand there must be sufficient oil to prevent wear.

The gearbox should occasionally (after 4,000 or 5,000 miles) be washed out with paraffin, when any grit, etc., which may have collected will drain away through the plug hole in the sump.

Clutch

The clutch surfaces being of a fabric material must be kept free from oil and grease, or the clutch will fail to grip. It is necessary to lubricate the operating ring at point A, as shown on the sketch, once a week.

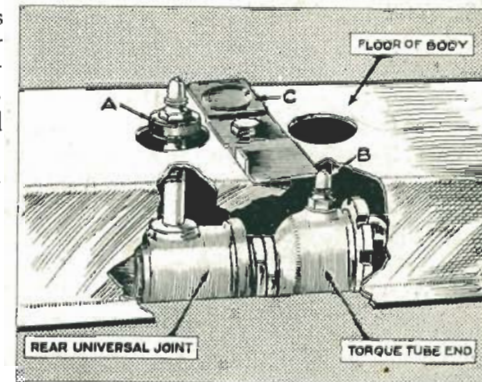


Rear Axle

For the rear axle attention: every 1,200 to 1,500 miles should be sufficient. A mixture of Stauffer grease and engine oil of equal parts should be used and injected with the grease gun supplied with the car. Do not inject too much grease at any one time as the felt rings will fail to hold this grease in the axle case, and it will then leak through on to the brake drums and prevent them from being effective.

Universal Joints

The front and rear universal joints being of metal, must be kept thoroughly well lubricated, the rear one especially, on account of the movement of the rear axle. A special extension piece A for the grease gun is provided in the tool kit for this purpose. The plug in the joint casing should be unscrewed with the box spanner, and the extension piece screwed in its place. Access for greasing this, together with the grease connection B on the end of the torque tube, is obtained through a cover C in the floor of the body, as shown on the illustration adjoining.



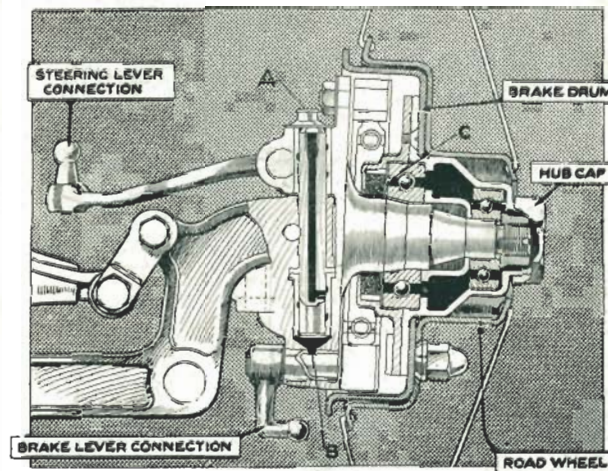
Brake Gear

On the rear brakes there are only two connections for the grease gun—these are on the cam spindle bearings. All other joints, etc., should be oiled once a week with the oil can.

The front brake cam spindle is lubricated from the swivel pin as shown at B, on illustration.

Front Axle

The swivel pins are lubricated by oil fed by the oil can at point A in the illustration below. A liberal supply should be given once a week.



Front Axle—continued.

By removing the front hub caps and filling them with grease once a month, the bearings are lubricated. Do not force in too much grease as it would pass the felt washer C and get on to the brakes and cause them to become ineffective.

Steering Gear

To obtain easy steering it is important to give it regular attention as regards lubrication. The grease gun connection is on the top of the worm case, and if a charge is given once a month it is sufficient to lubricate the bearings of the worm and worm wheel, and also lubricate the worm itself. The bearing at the top of the column, just under the steering wheel, can be given a little oil from the oil-can. The steering connections on the side and cross rods should be oiled once a week.

Road Springs

The ends of the road springs where they are attached to the axles are provided with grease gun connections, and should be given a charge once a week if the car is continually used. After a long period of use it is advisable to lubricate the leaves of the spring with a warm mixture of white lead and tallow in equal parts. This can best be applied with a stiff brush, the leaves being eased apart by a screwdriver; first jack up the car (not under the axles) to take the weight off the springs.



ELECTRICAL EQUIPMENT

THE lighting equipment is a C.A.V. 6-volt system. Very little attention is required to keep this in satisfactory working order.

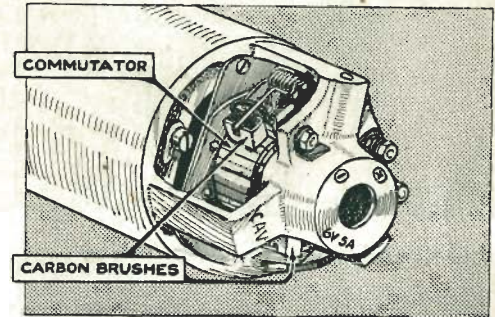
Should difficulties arise that cannot be understood or remedied from the information given below, the difficulty should at once be referred to the Austin Service Department or the nearest depot.

Dynamo

The dynamo is self-regulating, and the only parts which call for any attention are the commutator and brushes. To examine the commutator and brushes all that is necessary is to remove the cover. The commutator should be kept clean. A piece of ordinary soft rag is as good as anything with which to clean it. To clean a dirty or neglected commutator, use very fine glass paper.

Blow away any carbon dust, see that the carbon brushes are wearing evenly, and that they run freely in their slots, also that the flexible leads to the brushes are not caught in any part of the brush gear.

There is a lubricator at each end of the machine. A drop or two of engine oil in each, every thousand miles or so, is sufficient. The best oil to use is ordinary engine oil. When the machines are first assembled the bearings are packed with grease which lasts for a long time.



Ammeter Readings

When the car is running and no lamps are in use, the ammeter pointer should give a "charge" reading of 5 or 6 amp. When the car is running and lamps are full on the pointer will give a small "charge" reading, but when the engine is stopped and lamps are

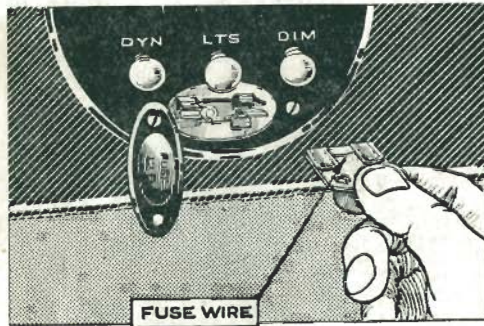
Ammeter Readings—continued.

on, the ammeter will indicate "discharge" 4-5 amp. The dimmer switch should be used when the car is standing, even for a short time.

If the ammeter pointer remains at 0 when the engine is running and no lamps are on, see that all connections are tight, particularly those on the dynamo, switchboard (F, D, CB and CD), and cut-out, that the fuse is intact, and that the battery connections to switchboard are tight and unbroken. Should the reading be but a small one, see if it is necessary to clean the commutator of the dynamo.

Action of the Fuse

A fuse is fitted in the switch to protect the dynamo in the event of its battery connection being broken or the battery removed.



If this fuse melts look carefully over all the battery connections, including those between the cells, and see that no terminal is loose. Don't replace the fuse wire until you have found the fault which caused it to "blow" and remedied it.

Always replace with the proper fuse wire, never using any makeshift.

THE BATTERY

The battery is an item of the equipment that is often neglected or receives insufficient attention. It is most important that it be kept in the best condition and the following instructions should be carefully noted. Whenever the car is running the switch on the switchboard should always be in the charging position, especially when the lights are on.

Should the state of the battery be continually bad, see that all its connections to the switchboard are tight and unbroken, and that no wire has a chafed covering allowing leakage of current to frame.

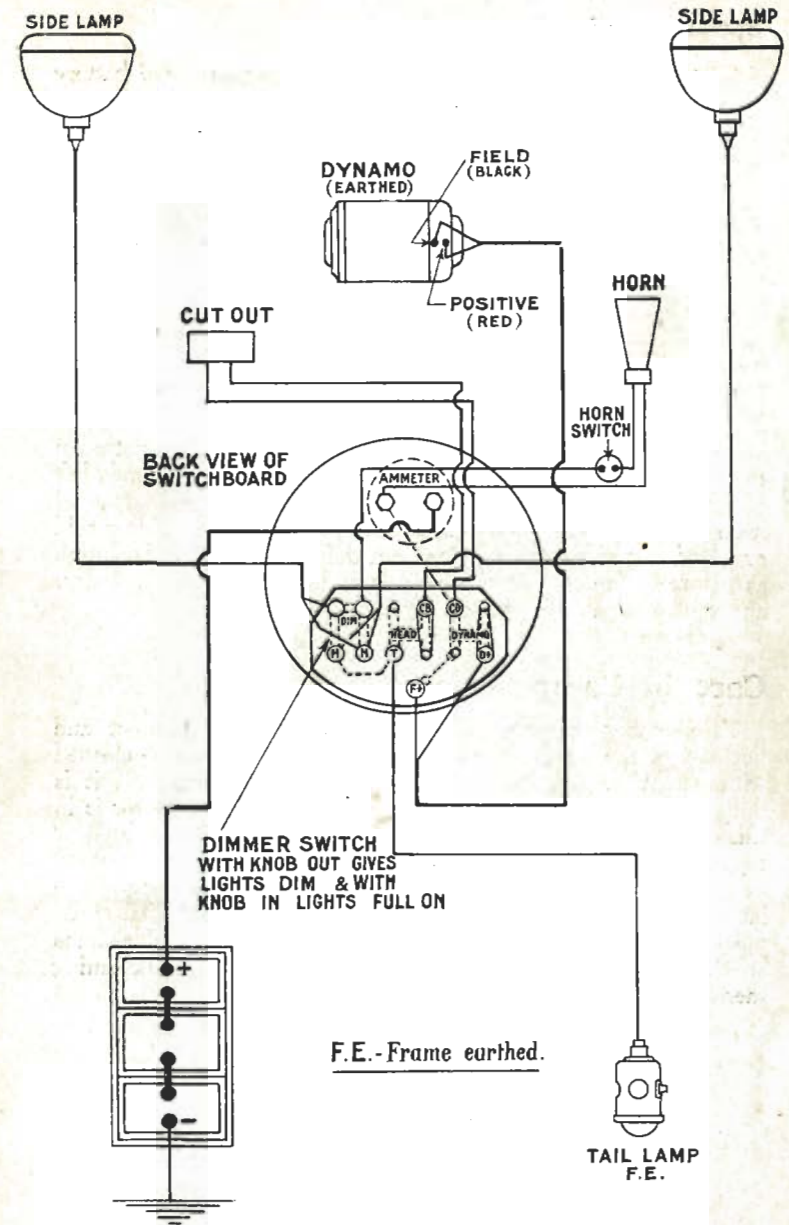


ILLUSTRATION OF WIRING.

Battery—continued.

During periods when the car is unused inspect the battery occasionally and give it a charge if required.

When the battery arrives empty (as in the case of cars sent abroad) the first thing to do is to fill and charge it.

The best indication of the state of the battery is the density of the liquid (known as the electrolyte). Its specific gravity should be 1.275 when the battery is fully charged and should never be discharged so as to bring the specific gravity below 1.170, otherwise sulphating will result and the life of the battery be shortened.

When the specific gravity is too high, that is to say when it exceeds 1.275, diluted acid or distilled water must be added. When the specific gravity falls appreciably below 1.275, add a little sulphuric acid diluted, one part to three of water.

If, after being in use for some time, the battery does not seem to hold its charge properly, and the lights go dim quickly when left on for awhile without the dynamo charging, test the acid. Should it be found too weak do not attempt to correct this by adding acid or water, but give a good charge and then refill with 1.275 solution as before. The tops of the cells should be kept clean and dry, and the terminals screwed up tightly.

Care of Lamps

Remember that the reflector is an optical instrument and not part of the metal work of the car, and should not be cleaned with patent metal polishes, or brick-dust and paraffin. If it is dull or scratched, its efficiency will go, and when a reflector is in this condition, it pays to return it to the makers to be replated or repolished. Special cleaning cloths should be kept for reflectors, and these should be used for nothing else. The efficiency of the lamps depends almost entirely on the reflectors. Special treatment is necessary to preserve the high optical finish. The lamps are themselves both dust-tight and water-tight; continued cleaning therefore, is not necessary.



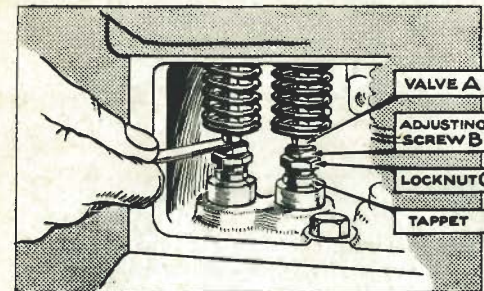
RUNNING ADJUSTMENTS

THE adjustments set out below are all that the amateur owner will find necessary to make to keep the car in good running order, and are fully described in the following pages.

- To keep correct clearance between tappets and valves.
- To remove and clean the cylinder head, clean tops of the pistons, and grind in the valves.
- To adjust and re-line the brakes.
- To adjust steering.

Valve Tappet Adjustment

To ensure obtaining the full power of the engine, and to maintain silence in the valve operation, it is essential to keep the tappets correctly adjusted. Turn the engine slowly round with the hand starting crank. Watch each valve open in turn and note the point at which it stops descending.



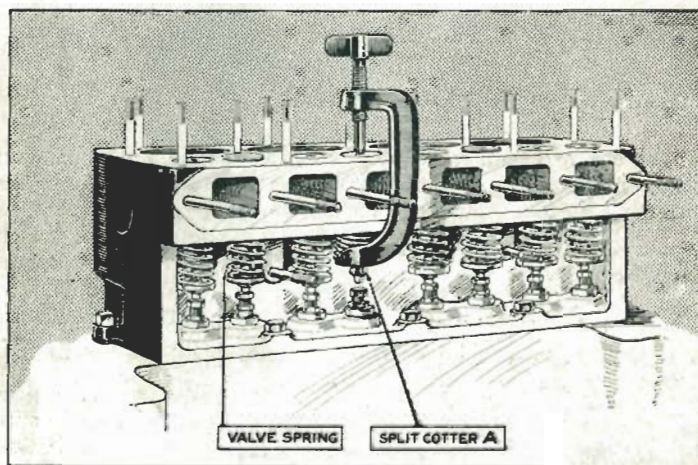
Now turn the engine half a revolution further to make sure that the cam is well away from the tappet. There should now be between the valve stem A and tappet

screw B a clearance equal to the thickness of the "tappet clearance gauge" (which is three-thousandths of an inch). If the clearance is other than this it can be adjusted by loosening the lock-nut C and raising or lowering screw B, being careful to tighten up the lock-nut when the adjustment is completed. A special spanner is provided in the tool kit for this operation.

Cleaning Combustion Chamber

To secure the maximum efficiency from the engine it is necessary to remove the carbon deposit that will have formed on the surfaces of the combustion chamber. This should be done after about 2,000 miles running. When the cylinder head is off it may be advisable to take this opportunity of grinding-in the valves, although this will need a longer time for the work to be carried out. In any case, it is recommended that after about 4,000 miles the work of grinding-in the valves should be undertaken.

First drain off the water through cock under the radiator. Detach the top water tube from the head. Disconnect the high tension wires from the sparking plugs. Remove the nuts holding down the head. Then take hold of the head at each end and lift it off. This should be fairly easy to do, and without damaging the joint washer, which should, in the ordinary course, be in a condition to be replaced. On no account use shellac or anything similar upon it: it will make a tight joint without. A little graphite grease on both sides is beneficial, to prevent it sticking when the head has next to be removed.



When the head has been removed the valves and tops of pistons will be exposed to view. All dirt or deposit should be removed by carefully scraping with a sharp tool. Before grinding-in the valves it will be necessary to remove the inlet and exhaust manifold, first turning off the petrol and uncoupling the pipe under the float chamber, then disconnecting the carburetter control rod. Each valve spring must be lifted by means of the special tool provided to allow the split cotter A to come out, see illustration: then remove the spring. The valve is now free to be rotated on its seat. A little grinding compound should be smeared evenly on its face,

Cleaning Combustion Chamber—continued.

and the valve rotated backwards and forwards, advancing it a step at short intervals until the pitting is removed. Care should be taken that none of the compound enters the cylinders, and the valve and seating should be wiped clean after the operation. When replacing the head take care to tighten the nuts evenly. Don't forget, after replacing the head, to refill the radiator.

Adjusting the Brakes

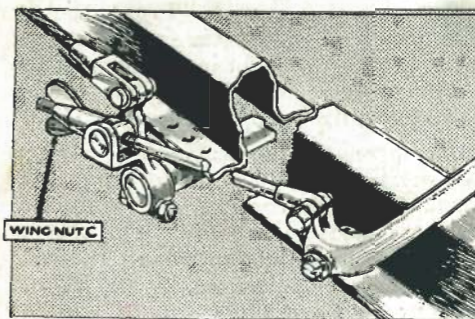
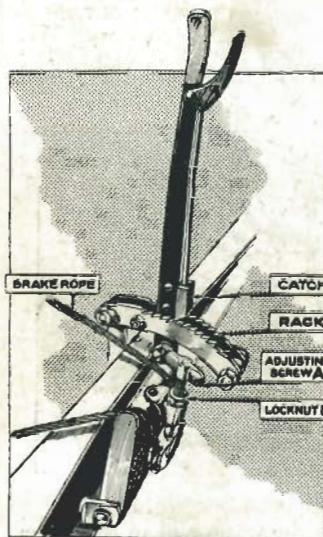
The hand brake operates on the front wheels and the foot brake on the rear wheels. They require adjusting when the hand lever can be pulled right back to the full travel on the rack, and when the foot pedal can be pushed nearly to the floorboard without

either brake holding the wheels. The car should never be taken out when in this condition, but attend to them at once.

To adjust the hand brake pull the lever on about one-third (or to suit driver's reach) of the total travel provided by the rack. Now unlock the nut B and screw up the brake adjusting handle A until the shoes are hard on the drum. If the brake shoes do not then rub on the drum when the lever is right forward, the adjustment is correct. See that the handle is locked again by nut B.

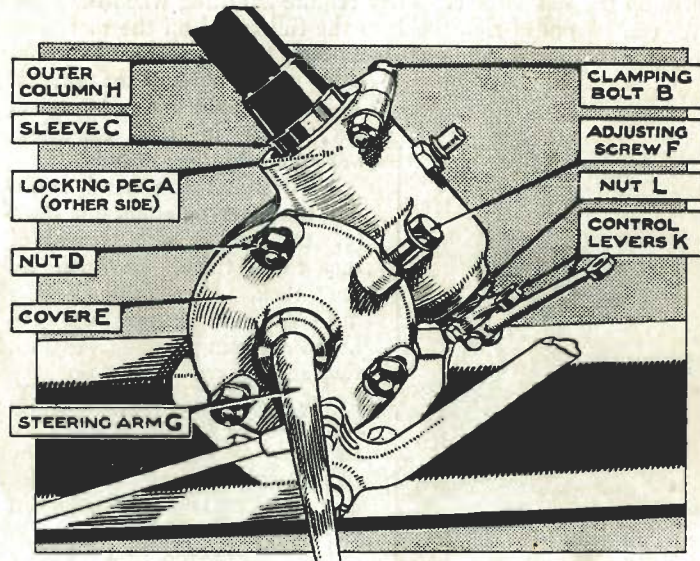
To adjust the foot brake: Under the car and approximately under the foot controls is a wing nut

C. This must be screwed towards the front of the engine until the brakes go full on when the pedal is depressed about 2 in. When the pedal is up, the brake shoes should not rub on the rear wheel drums in which they operate.



Adjustment of Steering

If after continual use slackness should be felt in the steering, two adjustments are provided:—To take up the play in the column, unscrew locking peg "A" and clamping bolt "B," then turn the sleeve "C" with the special spanner provided for the purpose, until the play has been removed. Do not screw the sleeve in too tight or the steering will then become stiff. Having adjusted the sleeve correctly, screw in the locking peg so that it enters one of the slots of the sleeve, and then tighten up the clamping bolt.

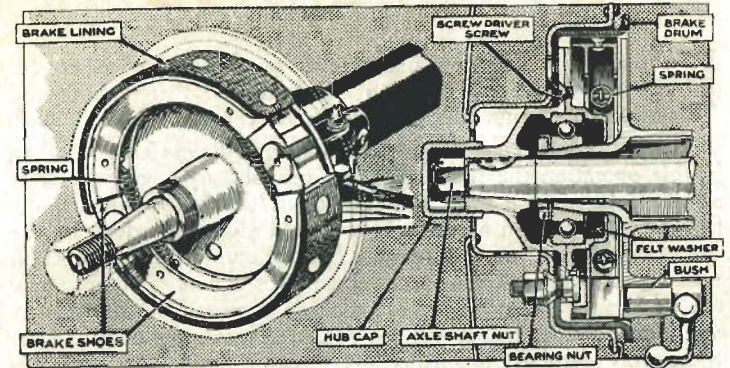


To take up the clearance between the worm and worm wheel, due to wear, slacken the three nuts "D" holding the cover "E" to the worm casing, then turn adjusting screw "F" so as to slightly draw the cover in the direction of the worm. Care must be taken that the worm wheel is not brought too tight into mesh with the worm or it will make the steering exceedingly hard and stiff. Having made the adjustment be sure and tighten up the three nuts "D."

Should it be desirable to remove the steering worm wheel from the casing, it is only necessary to slacken the adjusting screw F and remove the three nuts D when the cover E can be withdrawn together with the worm wheel and steering arm. The steering column H with control rods can be withdrawn by first removing control levers K and nut L, then slacken locking peg A and clamping bolt B and unscrew the sleeve C.

Re-lining Brakes

When the car is used in hilly districts and the brakes are in constant use, it may become necessary to re-line the shoes. To



do this it will be necessary to first remove the wheel and brake drum, then the hub cap and nut holding the hub on the shaft. The near side has a right hand thread and the off side a left hand thread. Next unscrew the three screws with a screwdriver, when the front portion of the hub can be drawn away by means of an extractor tool. Now remove the lock washer and nut holding the ball race and the remainder of the hub can be drawn off. The brake shoes are now exposed to view and can be removed for re-lining.

Tyres

As tyres form such a large item in the running costs of a car, it is advisable to give them periodical examination and attention.

If they have become badly cut, they should be removed and repaired as soon as possible.

They should be pumped to a pressure of 35 lb.



CARE OF BODYWORK

FOR a car to keep its beauty and good appearance, careful attention must be given to the bodywork; ignorance and neglect may ruin the appearance of the car.

It will continually require washing, and unless care is taken in this operation the finish of a car can be easily ruined. It is advisable to remove mud and dust from the bodywork directly the car returns from a run. This should always be done by the use of cold water, either through a hose or syringe, in conjunction with a wet sponge. On no account rub off the mud. Do not apply the water with too much force, and keep it away from the corners and joints, etc., so that it will not be forced inside the body. After thoroughly washing and rinsing, finish with a chamois leather. Do not use the same sponge and leather for the chassis parts.

Care should be taken in folding down the hood to see that the original folds are used. Should the car have been used in wet weather leave the hood up to dry. Never fold it when wet.

The metal plated parts can be cleaned with ordinary metal polish.

Should the car be laid up in the garage for long periods, the fuel and water should be drained off and the batteries removed.

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TOOLS SUPPLIED

- $\frac{1}{4}$ in. and $\frac{3}{8}$ in. box spanner.
- $\frac{5}{8}$ in. and $\frac{3}{4}$ in. box spanner
- $\frac{1}{8}$ in. and $\frac{1}{4}$ in. double open-end spanner.
- $\frac{1}{8}$ in. and $\frac{3}{8}$ in. double open-end spanner.
- $\frac{1}{8}$ in. and $\frac{1}{2}$ in. double open-end spanner.
- Adjustable spanner, 4 in.
- Carburettor jet spanner.
- Hub-cap and steering column sleeve spanner.
- Magneto spanner
- Tappet adjusting spanner
- Sparking-plug box spanner.
- Brace for detachable wheels.
- Tyre levers.
- Tyre pump
- Lifting Jack.
- Screwdriver.
- Sparking plug and tappet clearance gauge.
- "Enots" grease gun.
- Special "Enots" greaser connection with nipple.
- Valve lifter.

Owner's Name John Greaves

Address 53 Downside Rd Erdington
Erdington Birmingham 24.

Birmingham

Car No. ~~(OV 9460)~~ X 1014

Registered No. OV 9460

Driving Licence No. C 27918

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