

SUNBEAM

"SPEED MODEL"

HANDBOOK of INSTRUCTIONS

FIRST EDITION.
SUNBEAM "SPEED MODEL"
INSTRUCTION BOOK.

REGD. NO. 430.

MARCH, 1933.

Handbook of Instructions
for the
SUNBEAM
"SPEED MODEL"

Extract from the Maker's current catalogue of
Sunbeam Cars :

"Illustrations are given as a general guide and
are not binding in detail."

"The Makers reserve the right to alter their
catalogues and lists, and the standard specifications
stated therein, without any previous notice."

This Handbook is published for the
use and assistance of owners of Sun-
beam "Speed Model" Cars. It embodies
in a concise form the advice and
suggestions of the Company's Technical
Staff in regard to lubrication and the
general care and maintenance of this
Model, together with supplementary
information regarding the necessary
adjustments which may be required
from time to time.

Price 5/- Nett

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THE SUNBEAM MOTOR CAR CO., LTD.

Moorfield Works, Wolverhampton

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PRINCIPAL CHASSIS DIMENSIONS

OF THE

SUNBEAM "SPEED MODEL"

				English.	Metric.
Bore	..	..	..	2.95"	75 m/m
Stroke	..	..	..	4.33"	110 m/m
Cubic capacity of cylinders	..		177.9 cu. in.		2916 c.c.
Wheelbase		..	..	10' 0"	305 c/m
Track	..	..	..	4' 7 $\frac{7}{8}$ "	142 c/m
Ground clearance	..	..		6"	15 c/m
Length overall	..	..		13' 8"	416.5 c/m
Width overall	..	..		5' 10"	177.8 c/m
Gear Ratios :—					
	4th	3rd	2nd	1st	Reverse.
	4.9 to 1	7.13 to 1	10.89 to 1	19.6 to 1	14.82 to 1
Tyre sizes	..	..	..	..	5 $\frac{1}{4}$ " for 20" rim. (30"×5.25")
R.A.C. rating		..	..	..	.. 20.9 h.p.
Tax	..	..	..	..	.. £21

FOREWORD

As a preface to this Handbook of Instructions for the Sunbeam "Speed Model," it may be advisable to define the meaning of the term "Speed" as applied to it. It has not been our aim to design a car with an abnormally high maximum speed. Instead, we have concentrated on producing a car with a high cruising speed—between 60 and 70 miles an hour—on average roads, which can be driven at all times with the same ease and comfort as an ordinary touring car. This high average speed has been obtained by careful attention to weight and streamlining without sacrificing any refinements in suspension, economy in fuel consumption or stability on the road.

The illustrations in this book, apart from the lubrication diagram, wiring and timing diagrams, etc., are from actual photographs. In some instances, certain parts (such as wings, running boards, etc.) adjacent to the particular part of the chassis referred to, have been removed. This has been done merely to give an uninterrupted view for the camera, and does not necessarily imply that in practice such parts need be removed to enable adjustments or lubrication to be effected.

All Sunbeam cars are guaranteed in accordance with the terms of Guarantee printed in our current catalogue. In the rare event of any unforeseen trouble developing it is requested that the matter should at once be brought to the notice of the Company, when advice and assistance will promptly be given.

With regard to accessories not of our own manufacture, such as electrical equipment, carburetter, etc., brief instructions on their care, based on information supplied by the respective makers, are included in this Handbook, but in the event of any difficulty being experienced with these accessories customers are recommended to consult the makers themselves.

The Sunbeam Motor Car Co., Ltd.

March, 1933.

.. EASY STARTING IN COLD WEATHER. ..

SPECIAL INSTRUCTIONS TO FACILITATE EASY STARTING IN COLD WEATHER.

ENGINE LUBRICATING OIL.

In cold weather use Wakefield's "Castrol AA," Double Shell or Vacuum Mobiloil "A." The term "cold weather" is intended to cover the period between October 1st and April 30th, and during this time it is important that one of these oils should be used.

BATTERY.

Keep the battery in proper condition. Both starting and lighting make the heaviest demands upon it from October to April.

When changing over to the "cold weather" grade oil, (see paragraph above) make a point of examining the battery, and if necessary have it "topped up" to bring the Electrolyte to the correct level. Apart from this it is recommended that the battery should always be examined after 2,000 miles.

Assist starting by declutching. It is always advisable to depress the clutch pedal when starting up, and especially so in cold weather. By doing this current is not wasted by turning the gears in the gearbox.

DRAINING THE WATER SYSTEM.

The instructions given on page 29 in regard to draining the radiator and cylinder block should be strictly observed. It is advisable to commence this practice early in the winter season to avoid any risk likely to occur from early frosts. **Do not forget to refill the radiator before again starting the engine.**

.. THE CAR ON THE ROAD. ..

STARTING UP & GENERAL RUNNING HINTS.

Treat the new car with consideration. Although the engine, gearbox, back axle, etc., of every Sunbeam Car are "run in" before being assembled in the chassis, and the complete car exhaustively tested on the road, the first few hundred miles should be done at moderate speed. The owner who treats his car considerably during this initial period, instead of immediately attempting to attain a high rate of speed, will make doubly sure of getting the utmost satisfaction from his car and add appreciably to its life.

The illustration below shows the controls for the ignition and carburetter, dipping headlamp reflectors, clutch, brake and accelerator pedals, ~~and the pedal for the chassis lubrication system.~~

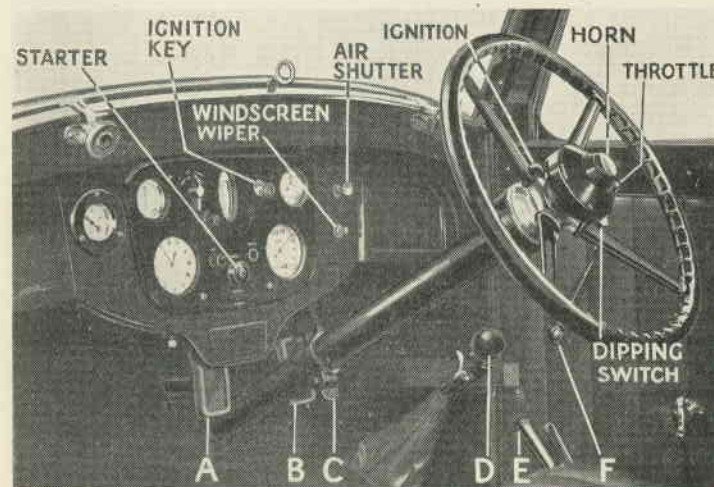


Fig. 1.

Showing Steering Wheel, Instrument Board and principal Controls. The Controls in the lower part of the illustration are Clutch Pedal (A); Brake Pedal (B); Accelerator Pedal (C); Gear Lever (D); Handbrake Lever (E); Quick-lift for offside window (F).

GENERAL RUNNING HINTS.

PETROL.

Before attempting to start the engine ascertain that there is an ample supply of petrol in the tank, which is carried at the rear of the chassis and has a capacity of 14 gallons. The supply is constant, no petrol tap being fitted. The level is shown by means of the gauge on the instrument board which has a reading of 12 gallons main supply, and "R," the latter representing a reserve of 2 gallons.

OIL.

Test the level of the engine oil by means of the "indicator and cock" mounted on the nearside of the engine. There are two positions marked on the indicator quadrant "On" and "Off." The cock is situated directly under the indicator and the oil level is tested by turning the indicator to the "On" position, when, if there is sufficient oil in the sump, there will be a slight drip of oil from the cock. If there is no drip the supply is below the proper level and should be replenished until "drip" occurs.

Test the oil level in the gearbox and rear axle as instructed on pages 30 and 32.

WATER.

Test the water level in the radiator. This should reach to within 2" of the top of the filler neck.

TYRES.

Test the air pressure of the tyres and keep to the recommendations of the makers, as the maintenance of the proper pressure has a distinct bearing upon the life of the tyres and the riding comfort. The pressures recommended are given on page 41.

STARTING UP.

Assuming that the car is ready for its first road run after reaching its owner, and the above items have received attention, the hand brake lever should be on and the gear lever in the neutral position. See diagram Fig. 4, page 10. The throttle should be slightly opened by means of the control lever on the

GENERAL RUNNING HINTS.

steering wheel, and the ignition switched on through the key switch on the instrument board. Advance the ignition by moving the lever on steering wheel to half its full travel, close the carburetter air shutter by pulling out knob on fascia board and press starter. The engine should fire readily.

On certain models the air shutter control is automatically locked in position when the knob is pulled out. See that this is not left in the locked position after the engine has been started up.

The air shutter should not be held in the "closed" position, *i.e.*, with the knob pulled out, if the engine does not start quickly, as the very rich mixture induced, practically pure petrol, will be too rich to fire and is liable to wash the oil from the pistons. A very rich mixture is as likely to prevent starting as a weak one. By opening the throttle further and releasing the air shutter control knob air is admitted to reduce the richness of the mixture.

NOTE.—If the weather is cold, and the car has been standing any length of time, it is advisable to turn the engine over a few times by hand in order to break the oil film. This eases the pistons and, with the ignition switched "off," there is no danger of backfire.

SPECIAL INSTRUCTIONS TO FACILITATE STARTING IN COLD WEATHER ARE GIVEN ON PAGE 4.

DRIVING.

Do not "race" the engine to warm up. It will be found much better to run gently in neutral gear for a few minutes before starting out. It is, perhaps, unnecessary to add that when adopting this procedure in the garage the doors should be thrown open, as the fumes, no matter how small, given off by the exhaust are unhealthy.

With the engine running, the ignition should be kept at about half advance, but this is a matter which is left to the judgment of the driver, and the same applies to the throttle control. When driving at any speed over 30 m.p.h. the ignition should always be kept advanced as far as possible. The ignition system is described more fully on page 21. Note carefully the remarks regarding "switching off."

THE "SPEED MODEL" ENGINE.

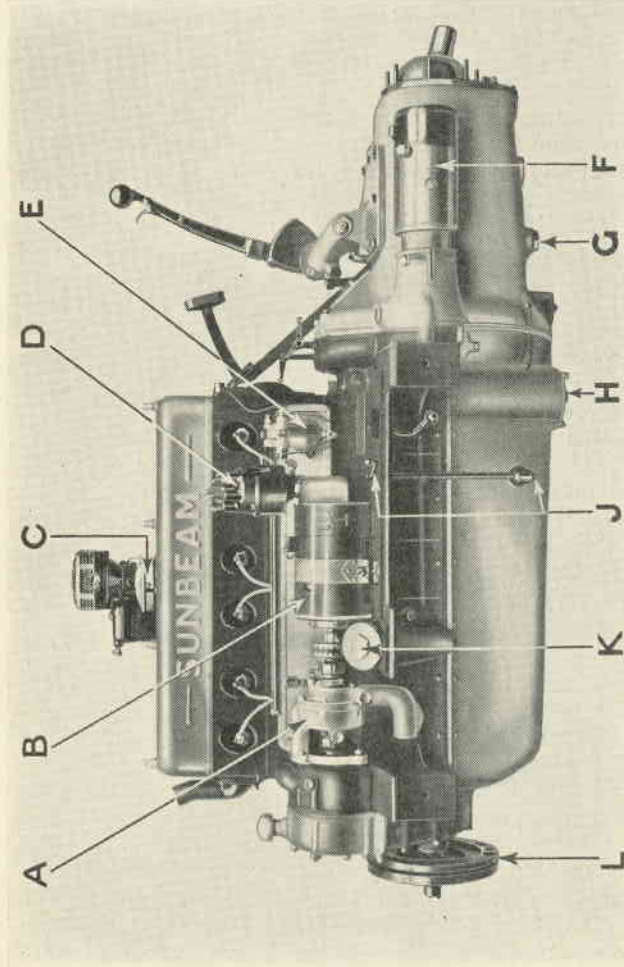


Fig. 2.

Near side view of "Speed Model" engine, clutch and gear box unit, shown out of the chassis to illustrate more clearly the Water Pump (A); Dynamo (B); Oil Filler (C); Coil Distributor (D); Petrol Pump (E); Electric Starter (F); Gear Box Drain Plug (G); Crankcase Filter and Drain Plug (H); Oil Level Cock (J); Oil Pressure Filter (K); Vibration Damper (L).

THE "SPEED MODEL" ENGINE.

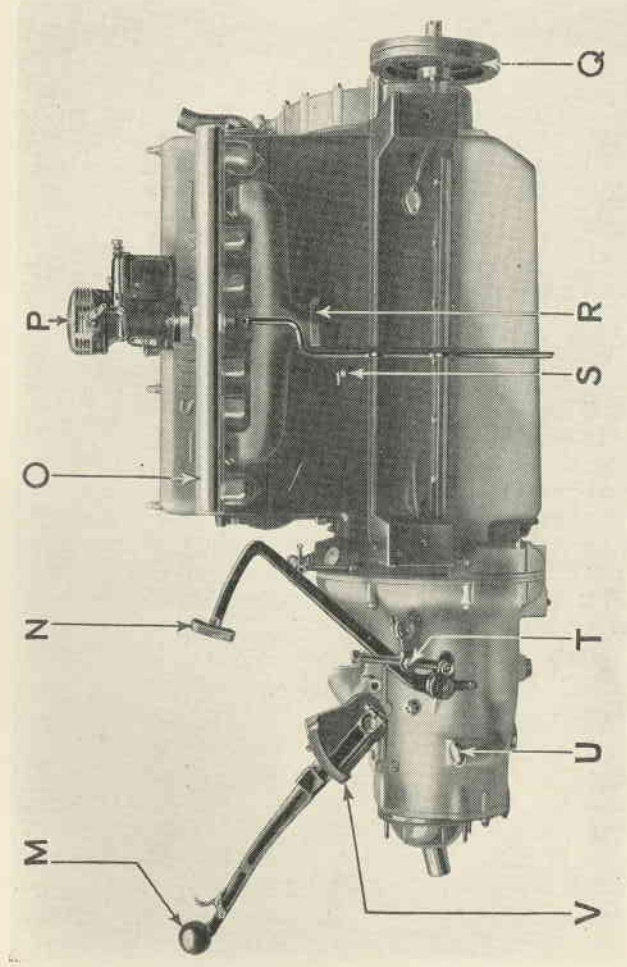


Fig. 3.

Off side view of the "Speed Model" engine, clutch and gear box unit shown out of the chassis to illustrate more clearly the Gear Lever (M); Clutch Pedal (N); Inlet Manifold (O); Carburettor (P); Vibration Damper (Q); Exhaust Manifold (R); Cylinder Block Drain Tap (S); Clutch Pedal Adjustment (T); Gear Box Oil Filler (U); Change Speed Gate (V).

CARE AND MAINTENANCE.

If the position of the front seat is not just suitable for the individual driver as regards leg reach, etc., when the car is first delivered, on all Sunbeam "Speed Model" Saloons the driving seat is adjustable and can be moved backwards or forwards until the most comfortable position is obtained.

The recommended speeds for changing gear are as follows: First to second 10 m.p.h., second to third 25 m.p.h., third to top 35 m.p.h.

Gear changing is accomplished easily and smoothly by "double-declutching" as follows.

Declutch and move the gear lever to neutral position, let the clutch in for a moment and press lightly on accelerator pedal so that the engine speeds up the gearbox layshaft; again declutch and move gear lever in to next gear. If the engine has been accelerated to the correct speed the gear will engage noiselessly. The change will be considerably facilitated if it is remembered that the clutch pedal should not be fully depressed for this operation, but eased only sufficiently to release the pressure plate.

CARE AND MAINTENANCE.

The "Speed Model" six-cylinder engine, clutch and gearbox are a combined unit and suspended directly from the main frame. Inspection of the chassis plan on the lubrication diagram (attached to the inside front cover) will show the clean lines of design and accessible position of lubricating points. The illustrations of the near and offside of the engine given on pages 8 and 9 illustrate the principal accessories.

It will be found that it is necessary only to treat the car with ordinary care, attend regularly to lubrication, and follow the instructions given in these pages to obtain the best possible service.

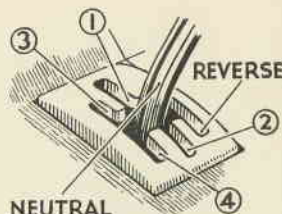


Fig. 4.
Showing positions of Gear Lever in the gate on the Sunbeam "Speed Model."

ENGINE LUBRICATION—OIL LEVEL.

It should always be remembered that lubrication is of first importance if the owner wishes to get the best out of his car. Most of the troubles with which motor repairers have to deal are directly traceable to lack of proper lubrication. The absence of oil will damage any bearing and may necessitate costly repairs. For this reason the instructions on the lubrication diagram should be carefully followed.

Chassis lubrication is greatly simplified by means of the "grouped" lubrication system.

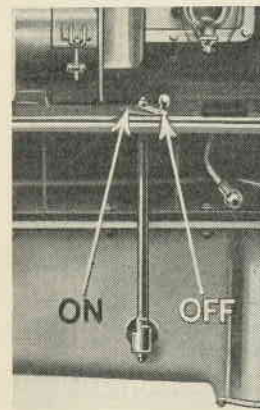


Fig. 5.
Oil Level Cock and Indicator.

OIL LEVEL.

The "Speed Model" engine is designed to provide perfect lubrication automatically, at the same time giving off a clear exhaust. The oil filler is conveniently situated on the top of the engine, and fitted in the filler neck is a gauze filter which is easily removable for cleaning by placing the fingers inside and withdrawing. The oil level is indicated by means of the cock situated on the nearside of the engine (see Fig. 5). After approximately every 500 miles the oil supply should be replenished until it reaches the level required. See note on page 6 re oil level.

LUBRICATING OIL.

Regarding lubricating oils, only the best quality oil marketed by firms well acquainted with the requirements of high speed internal combustion engines should be used.

It is false economy to buy a very low priced oil, which in all probability will be deficient in the properties necessary for efficient lubrication.

For the engine we recommend certain brands of oil which we have found after exhaustive tests to be most suitable, and this also applies to the oils for the rear axle, gearbox and chassis lubrication generally. A full list of the oils recommended is given on the lubrication diagram at the front of the book.

It is advisable not to mix different brands of engine lubricating oil. When changing over to a different brand, the engine and sump should be completely emptied of oil, as explained on page 14, before the new oil is used.

ENGINE LUBRICATION SYSTEM.

The engine lubrication system consists of a gear pump situated in the lower half of the crankcase, driven by means of skew gearing from the camshaft. The oil is first drawn through the detachable gauze filter surrounding the pump, and enters an external pressure filter positioned on the rear side of the engine. The oil is then forced through the crankshaft oil-ways to the main bearings, and big-end bearings. The surplus oil from the crankshaft is thrown by centrifugal force on to the cylinder walls, and into the interior of the pistons, and this supply adequately lubricates the connecting rod small end bearings. The oil then drains back into the crankcase after passing through a filtering plate.

The rocker shafts, rockers and push rods are also lubricated from the main oiling system. An oil lead carries oil to the overhead shaft and effectively lubricates each rocker, the surplus oil passing to the push rods and falling by gravity on to the tappets and cams.

The two filters mentioned above are easily detachable for cleaning. To remove the pump filter, detach the cover plate on the underside of the sump, see "H," Fig. 2 (page 8) and withdraw the gauze filter, which can be cleaned by rinsing in paraffin. To remove the filtering element of the pressure filter, unscrew the nut and withdraw, taking care to see that the spring retaining cup does not get mislaid. This filter should also be rinsed out with paraffin.

OIL PRESSURE.

With the supply of lubricating oil properly maintained, and the crankcase cleaned out periodically, it is almost impossible for the engine lubrication system to fail. One point to note carefully is the maintenance of the oil pressure. This should be for all average purposes 20 lbs. per square inch, although in cold weather it may be found when starting that the oil pressure gauge on the instrument board will register a higher pressure than this, but it will fall back again to its normal reading when the oil becomes thoroughly warm.

A relief valve of the usual ball type is fitted in the crankcase and deals with any excess pressure of oil and returns it to the sump. **When first starting up the engine should never be "raced" while the oil is cold, as this will damage the pressure gauge, and may also cause serious damage to the engine itself.**

FAILURE OF OIL PRESSURE.

Although, as mentioned above, it is practically impossible for the lubrication system to fail, the following instructions are given to provide for the rare occurrence when trouble may be experienced. If the system fails to function the needle of the oil gauge will either move erratically to and fro across the dial, or will not register at all. The trouble may be due to one or a combination of several of the causes given below:—

1. Lack of oil supply, *i.e.*, an empty crankcase.
2. Oil pressure filter corroded or not cleaned periodically; pump filter needs cleansing.
3. Oil gauge pipe choked or broken.
4. A blocked system, due to not keeping the crankcase clean, or inferior or dirty oil being used.
5. Damage to oil pump or oil gauge.

When failure of pressure is indicated on the gauge the engine should immediately be stopped. First ascertain if there is the correct quantity of oil in the crankcase by opening the oil level cock. If this is correct, remove the pressure filtering element by unscrewing the cover nut (see "K" Fig. 2) and clean. Replace and if the failure is still prevalent detach pipes and inspect. The trouble should easily be remedied if the above mentioned points are kept carefully in mind.

CLEANING OUT CRANKCASE, REFILLING, Etc.

CLEANING AND REFILLING CRANKCASE.

It is important that attention should be regularly given to the oil level. As previously mentioned, after about every 500 miles the oil level should be checked, and if necessary the supply replenished, until it reaches the level indicated by the oil level cock (see Fig. 5, page 11).

Under normal running conditions the crankcase should be thoroughly emptied and cleaned after about every 2,000 miles. It is more economical to change the oil regularly and ensure the most efficient lubrication, than to run with old oil.

To empty and clean out the crankcase, remove the drain plug underneath (see "H," Fig. 2). Drain off all the oil, which will drip more readily and bring away with it any accumulation of "sludge" if the engine is warm when the operation is commenced.

By unscrewing the four nuts on the filter cover (see "H," Fig. 2) the filter in the base of the crankcase can be removed and cleaned at the same time. After allowing sufficient time for all oil to drain away, insert the drain plug and carefully screw it up until it is quite secure.

It is also recommended that the bottom half of the crankcase should be taken down after about every 10,000 miles and thoroughly cleaned out. It is preferable to do this either with a paraffin squirt or a stiff brush dipped in paraffin, care being taken to see that all dirt and sediment is completely removed. Cloths or rag of a linty nature are not advisable for cleaning, as particles of the lint may be left inside the crankcase and find their way into the oil-ways.

Do not run the engine under power until the supply of oil in the crankcase has been renewed.

Open the overflow oil tap, or oil level cock (see Fig. 5), by moving indicator to the "On" position. Then pour oil in through the filler until it drips from the overflow tap. Leave the tap open a few minutes to allow the oil to distribute itself evenly. Then turn the lever to the "Off" position. **Do not forget this.** When refilling after the crankcase has been completely emptied about 11 pints of oil will be required to fill up to the proper level.

NOTE.—When refilling the crankcase see that the car is standing on level ground. If the crankcase is tilted even at a slight angle it is impossible to gauge correctly the oil level.

:: VALVES AND VALVE GRINDING. ::

VALVES.

One of the advantages of the overhead valve engine is that the operation of "grinding in" valves is required less frequently than with the side valve type of engine. This is largely due to the design of the valve seats, which, on the "overhead" type of engine, ensure more effective valve cooling, and the liability to burning and distortion is very appreciably reduced.

VALVE GRINDING.

A definite "period" cannot be given for "grinding in" valves. This is determined by the mileage covered, and it is generally left to the discretion of the owner as to when they require attention. Usually it will be found that "grinding in" will be required approximately every 10,000 miles, which is also a normal period for de-carbonising. In some instances it may be found that the exhaust valves require "grinding in" earlier than the inlet valves owing to the continual passage of the hot gases over their faces and seatings.

"Grinding in" valves is not a difficult matter with a Sunbeam engine if the following procedure is adopted. Strict attention to the sequence of operations laid down will ensure that the work is done correctly, and without waste of time. After draining the water from the cylinder block proceed as follows: (1) Disconnect the high tension wires; (2) Remove the sparking plugs; (3) Remove the hose clip on the water outlet connection and detach hose; (4) Disconnect carburettor controls; (5) Remove the nuts which hold down the valve cover and lift latter away; (6) Remove the inlet and exhaust manifold and the carburettor; (7) Remove the cylinder head holding down nuts (the nuts should be unscrewed in the order shown in Fig. 8); do not remove nuts directly, each nut should be unscrewed slightly in turn; (8) Carefully lift the head clear of the locating studs, taking care not to damage the threads.

When the push rods are removed from the cylinder block they should be carefully replaced in their original positions as

they may vary slightly in length to suit their respective positions. For the adjustment of individual tappets, see pages 18 and 19.

No difficulty should be experienced in lifting the head off the cylinder, but if the head should be a little tight care must be taken not to damage the gasket (the use of a screw-driver or other sharp implement is likely to injure it). Special lugs are provided on the cylinder head corners to facilitate removal. Free the joint by lightly tapping these lugs with a mallet.

DEPRESSING VALVE SPRING.

Having removed the cylinder head, place it in position as shown in Fig. 6 with a packing of wood under each end. This will allow the hook end of the valve removing tool (included in tool kit) to be placed in the cup of the valve head, and the fork of the tool under the washer of the valve spring.

When the spring is depressed the washer can be easily removed and the spring withdrawn from the valve.

GRINDING IN VALVES.

To grind in a valve turn the head on its side, smear a little valve grinding compound on the valve head (the compound is obtainable from motor and accessory dealers) insert a tool in the head slot as shown in Fig. 7, and give it a light semi-rotary backwards and forwards motion. During this operation the position of the valve should from time to time be moved round, thus ensuring a true and even seating. A simple method is to place a suitable spring under the valve heads so that when the pressure is released it automatically comes off its seat.

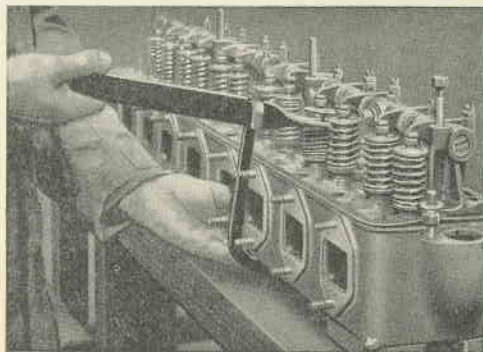


Fig. 6.
Using Valve Removing Tool.

The grinding compound should be mixed to a stiff paste with oil and only the smallest quantity must be used. The valve should occasionally be wiped with a clean piece of rag in order that the surface may be seen. As the operation is continued the "pitting" will be found to be gradually disappearing. As soon as the "pitting" has been removed it is advisable to blacken the valve seat in a candle flame and carefully replace the valve, very lightly pulling it on to its seat. On withdrawing the valve the soot should show an even contact all the way round, and if this is so it can be taken the valve is tight and is seating properly. Scrupulous care should be taken to wash out with a brush and petrol all particles of the valve grinding compound, paying particular attention to getting well into the valve guides.

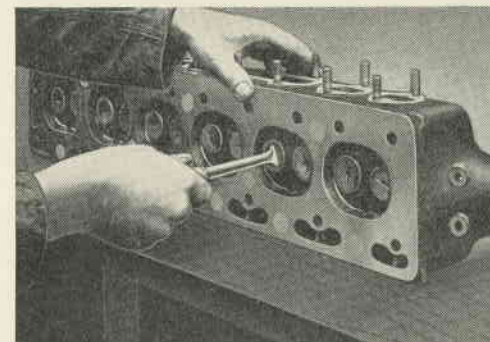


Fig. 7.
Showing method of Grinding-in Valve.

After replacing the valve springs and cups, and before replacing the head, make a careful inspection of the gasket. It is essential that this should not be damaged in any way. Before fitting the gasket on it is advisable to smear a little engine oil all over it with the finger. The gasket can then be located over the studs, care being taken not to "rip up" the edges of the holes. It should be pushed down by means of a piece of tube (a box spanner will do quite well) as this will free the gasket. If it is inclined to stick ascertain if the holes in the gasket that coincides with the water passages are registering exactly.

REPLACING HEAD. :: TAPPET ADJUSTMENT.

In replacing the head a certain amount of care and attention is necessary, firstly to ascertain that it is perfectly clean, and secondly to see that the stud end threads are not damaged. Any nut which shows a tendency to tightness on the stud should not be used, otherwise the stud itself is likely to come out when the head is again removed.

. After the valves have been ground-in, the tappets will require re-spacing. Instructions on tappet adjustment are given in a later paragraph.

TIGHTENING NUTS.

The nuts should be tightened progressively ; that is, each nut should be given about one-third of a turn at a time (see Fig. 8).

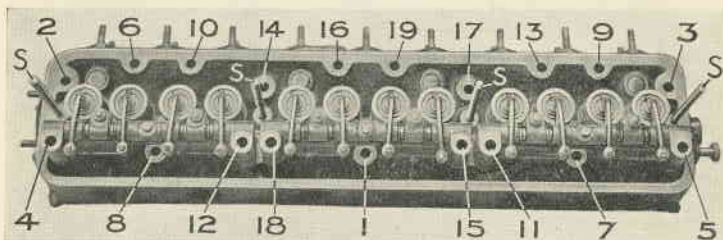


Fig. 8.

The numbers give the order in which the Cylinder Head Nuts should be removed and replaced. The Studs marked "S" are for retaining the cover.

TAPPET ADJUSTMENT.

Grinding in the valves slightly reduces the tappet clearances, and these should be reset as follows. With the engine at an average running temperature—not cold, .006" (six

TAPPET ADJUSTMENT. :: DECARBONISING.

thousandths of an inch) for the inlet and .008" (eight thousandths of an inch) for the exhaust valves. The adjustment of each tappet is a simple method. Loosen the locknut (see Fig. 9) and with a screwdriver turn the valve tappet adjusting screw until the correct clearance is obtained ; this can be determined by the use of "feelers." Note : Take care to tighten lock nut again when the adjustment has been effected.



Fig. 9.

Showing method of adjusting the clearances for the Valve Tappets, by means of the hardened steel pin in the end of each rocker arm.

DECARBONISATION.

It is difficult to fix the period when decarbonising is necessary because this varies with the conditions under which a car is used. However, it is usually advisable to decarbonise about every 10,000 miles.

The cylinder head should be removed as described on page 15, and the interior, together with the piston crowns, thoroughly scraped, seeing that all particles of carbon are wiped away with a petrol-moistened cloth. Note.—Before each piston top is scraped it is advisable to bring it to top dead centre, and so avoid **risk of damage** to the cylinder walls by scratching with the scraping tool. Smear a little engine oil round the edges of the piston crowns—only a small quantity—before replacing the cylinder head.

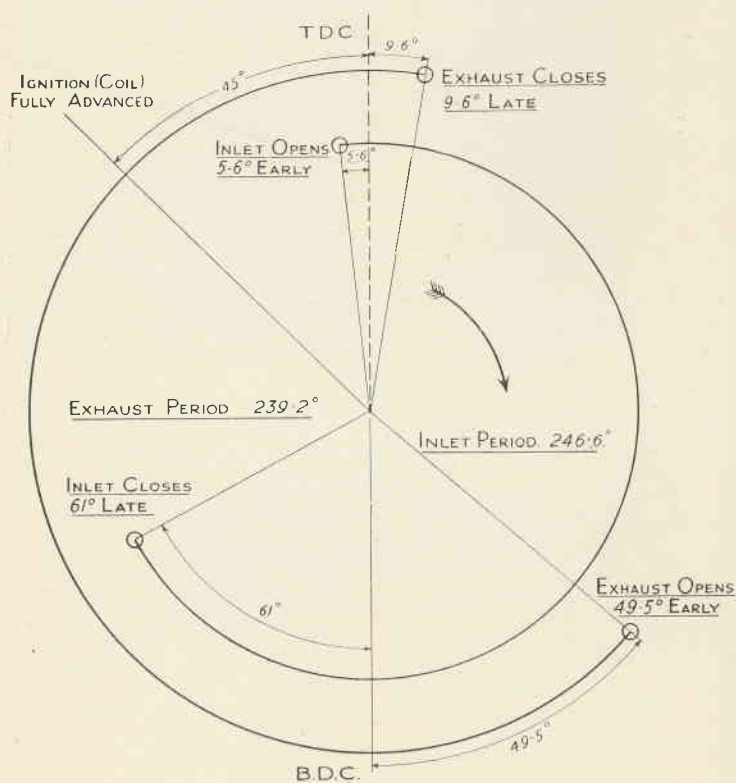


Fig. 10.

Engine and Ignition Timing Diagram for the Sunbeam "Speed Model."
Order of Firing: 1, 5, 3, 6, 2, 4.

ENGINE AND IGNITION TIMING.

On the opposite page a diagram is given which shows the engine timing. This should be followed in detail whenever it is necessary to re-time the engine and ignition. For correct timing of the ignition, the contact breaker should be in the fully retarded position with the points just breaking contact when the piston of the cylinder corresponding to the terminal which the distributor rotor is just entering under, is at the top of the compression stroke.

IGNITION SYSTEM.

The ignition system fitted is of the latest coil type, this having been found most suitable for the "Speed Model" engine. It provides easy starting and a spark of constant intensity at all speeds. The ignition switch is of the lock and key type and is incorporated in the switch box. The firing order of the engine is 1, 5, 3, 6, 2, 4.

The gap between the contact breaker points should be .018" (eighteen thousandths of an inch). It is most important always to remember to switch the ignition "Off" when the engine is not running, as current will flow from the battery through the coil as long as the ignition is switched "On." This, of course, would in time discharge the battery and make starting difficult or even impossible.

The latter remarks are only mentioned as a reminder, as it would take many hours for this condition to occur, and there is no likelihood of trouble except through extreme carelessness.

Fitted in conjunction with the switch is a small red warning signal which lights up whenever the engine is running very slowly or is stopped with the ignition "On."

For the greaser on the Ignition Distributor Spindle use "Mobilgrease No. 4." Screw down the greaser one complete turn every 500 miles.

A booklet dealing with the ignition system, and supplied by the manufacturers, is included with the tool kit of each car.

SPARKING PLUGS.

The sparking plug electrodes burn away slightly with service, and in time the gap space tends to increase. It is advisable to examine and clean the points occasionally (with a file end) and adjust the gaps if necessary to the right space. This should be .018" to .020" (18-20 thousandths of an inch).

CARBURETTER.

The carburetter fitted to the "Speed Model" is the Zenith down-draught type 48VI to which fuel is fed by pipe from the "A.C." petrol pump.

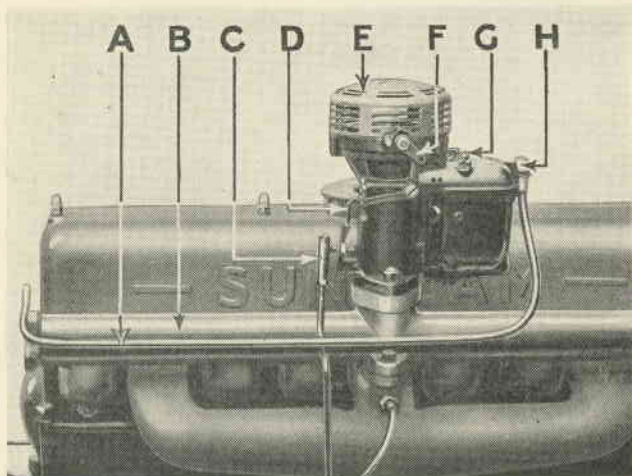


Fig. 11.

Showing Carburetter and Controls. Petrol Pipe to Carburetter (A); Inlet Manifold (B); Accelerator Pedal Rod (C); Accelerator Rod Lever to Carburetter (D); Carburetter Intake Cover (E); Air Shutter Lever (F); Mixture Screw (G); Banjo Arm containing Gauze Filter (H).

CARBURETTER SETTING.

Choke 38, main jet 185, compensator 165, slow running 70.

The above setting has been adopted as standard after careful experiments and will be found to give the best engine performance obtainable consistent with economical con-

sumption. Only in rare instances such as using heavy fuel or altered climatic conditions, is it necessary to make any alteration whatever. In the rare event of adjustment being required, the jets are easily accessible, but before any adjustment is effected ascertain whether the trouble is not originating from slackness of induction pipe joints, or through the engine not being thoroughly warmed up. Remove jets by unscrewing the two body screws and withdrawing body when the jets can be dismantled. Periodically the filter ("H," Fig. 11) in the top of the float chamber at the fuel feed pipe connection should be removed and cleaned, and afterwards carefully replaced. Unscrewing the hexagon cap nut withdraws the filter, which can then be detached by unscrewing the filter centre tube. A full explanation of the working of the carburetter is given in the leaflet issued by the carburetter manufacturers.

PETROL PUMP SUPPLY SYSTEM.

The fuel supply is drawn from the tank by means of the "A.C." pump fitted on the near side of the engine crankcase. It is of the diaphragm type as will be seen from Fig. 12, which also shows diagrammatically the chief constructional features.

The pump is operated by an eccentric on the camshaft and when the carburetter bowl is filled the float in the float chamber will shut off the inlet needle valve and so suspend the supply until more fuel is required. The fuel first enters the pump through the detachable filler and passes through the gauze filter rings, depositing all foreign matter in the sediment bowl.

Very little attention other than cleaning out of the sediment bowl is required, and under no circumstances must the pump be taken apart as the use of a special tool is required for re-assembling. In some instances troubles are attributed to the pump which actually are caused by some other condition, and these should be carefully checked to avoid needless trouble. An instance of the above is that sometimes there appears to be a leak at the diaphragm, whereas the leak actually exists at one of the pipe fittings, and the fuel has run down the pump to the diaphragm flange, appearing to originate there. It is advisable to clean out the filter at least once weekly, the procedure being as follows. Loosen the knurled thumb screw underneath and

PUMP FUEL SUPPLY SYSTEM.

withdraw bowl, clean out gauze filter rings and bowl, and replace after ascertaining that the cork gasket which fits between the filter rings is not broken or damaged and lies perfectly flat on its seat, taking care to tighten the thumb screw securely.

It is advisable, however, to give occasional attention to the following points to ensure perfect functioning of the pump. If any trouble is experienced these points should immediately be checked over.

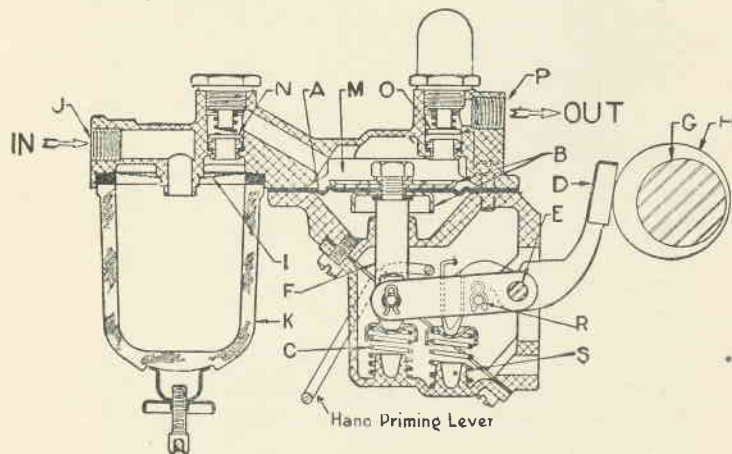


Fig. 12.

Diagrammatic view of "A.C." Petrol Pump.

The parts denoted by the symbols on this diagram are described in the leaflet (enclosed with this book) issued by the manufacturers of the pump.

1. Examine and see that all fuel supply pipe connections at the fuel tank, the fuel pump and carburetter are absolutely tight.
2. See that the glass sediment bowl is always securely tightened up, and the cork gasket in good condition and properly seated.
3. See that the gauze filter rings are kept clean as directed.
4. Inspect the suction and outlet valve and cover plugs, and ascertain that there is no leakage from either. If there is any leak the plug should be screwed up tightly without strain. The joint washer should be renewed if necessary.

Do not attempt to dismantle the pump body.

PETROL SYSTEM. :: ELECTRICAL EQUIPMENT.

Further instructions on maintenance are contained in the leaflet supplied by the manufacturers of the pump.

PETROL PRIMER.

If the car has been standing for some considerable time, and the petrol has evaporated from the float chamber, make use of the hand primer device fitted. This is in the form of a wire hand grip and is fitted to the pump body. It is operated by pulling forward with the hand, this movement injecting a supply of fuel into the float chamber.

KEEP THE PETROL SYSTEM CLEAN.

Always remember that it is very necessary to keep the system between the tank and carburetter clean. There are three filters provided to deal with any foreign matter which may be carried by the fuel. These are the "A.C." pump filter, the carburetter filter, and one fitted in the petrol tank filler neck.

The petrol tank filler neck cap has a small vent hole in the top. This should be kept clean of all dirt in order to admit air to the tank whilst the petrol is drawn out by the pump. If this vent hole becomes stopped up the petrol supply will cease, and the tank may be damaged.

The importance of cleanliness in regard to the whole system of fuel supply cannot be too strongly emphasised.

ELECTRICAL EQUIPMENT.

Rotax electrical equipment is fitted and for information regarding the general care and maintenance we recommend owners to consult the instruction book issued by the manufacturers. A copy is enclosed with this Handbook.

DYNAMO.

The dynamo is driven from the front end of the crankshaft by silent chain. The normal charging rate is 10 amps. at 20 m.p.h. and the speed for "cutting in" 11-12 m.p.h. on top gear. Certain models may be fitted with 15 amp. dynamo.

STARTING MOTOR.

The starting motor is the Rotax type M.T.93/3 and is housed on the clutch casing. It has a Bendix type engagement.

BATTERY.

A 12 volt 75 amp. hour battery is fitted and is carried within the chassis frame.

The battery should be examined about every 2,000 miles and always when the colder weather is approaching. If the level of the electrolyte has fallen, due to evaporation, distilled water should be added until the plates are just covered. Rain or tap water must not be used.

Should the terminals become dirty or corroded, remove and clean these, smearing slightly with vaseline before replacing. See that the battery connections are always kept tight, as road vibration tends to loosen them.

Access to the battery is obtained by sliding the front seats rearwards and lifting up the floor boards. This also enables the Lockheed brake cylinder reservoir to be reached for inspection and filling purposes.

LIGHTING EQUIPMENT.

The lighting equipment is 12 volt, single pole type, with internally wired lamps, and externally operated arrangement for focussing. The head lamps are fitted with "dipping" reflectors operated from a switch on the top of the steering column. Head lamps 36 watt, side lamps 6 watt, tail lamps 6 watt, with bayonet type bulb fitting. Twin-toned electric horns, one on either side of the lamp bracket directly under the head lamps, are fitted. The tail lamp incorporates a "Stop" light which operates automatically when the foot brake is applied.

WIRING DIAGRAM.

A wiring diagram is given at the end of the book and this should be closely followed when re-wiring is required.

ADJUSTING AND FOCUSSING HEADLAMPS.

The lamps are universally mounted which allows the beams of light to be adjusted to the best advantage. To alter the position of the lamps, slacken the mounting nut "A," Fig. 13 and move the lamp to the position desired, afterwards tightening up the lock nut securely.

To remove the lamp front for bulb replacement or focussing, slacken the screw (C) Fig. 13 on the underside of the lamp body and swing aside clear of locating slot (D) and the rim can then be withdrawn. The lamp reflector houses the bulb holder and bayonet, and can be removed by pulling forward clear of the spring loaded reflector supports (B). To focuss the bulbs, slacken screw (G) and move bulb to desired position. Tighten screw clip securely after focussing.

To obtain the best results when adjusting and focussing the lamps, it is advisable to make the adjustments at night time on a straight, level road when better illumination is obtained.

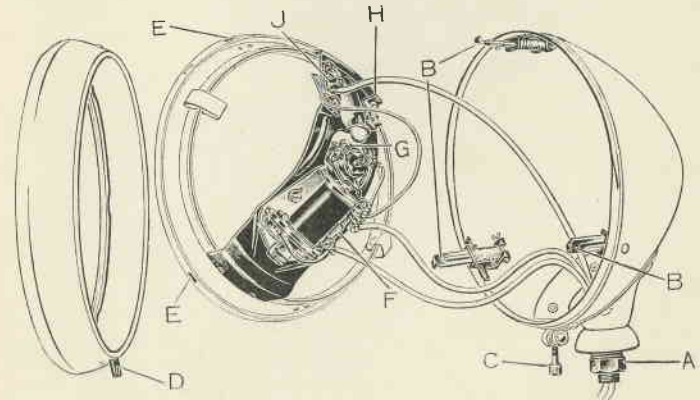


Fig. 13.

Head Lamp dismantled showing electrically controlled mechanism. Adjustable Mounting Nut (A); Reflector Supports (B); Fixing Screw (C); Slot (D); Slots in Reflector Rim (E); Clamping Clip for Bulb Holder (G); Fuse Clip (H); Connection to offside Head Lamp (J).

CLEANING.

Any accidental finger marks can be removed from the reflectors with the use of a chamois leather or soft cloth, without affecting the highly polished surface. **Do not use metal polishes on the reflector faces.** The rims are chromium plated and only need wiping over, first with a damp cloth and then with a soft dry cloth. See also note on page 43 in regard to cleaning chromium plated parts.

SIDE LAMPS.

To remove the lamp front, withdraw the locking screw on the rim top and pull rim clear. When replacing first locate the small stud on rim in the hole at the bottom of the lamp body. Then replace lock screw securely.

TAIL LAMP.

For the removal of rim, slacken lock screw and swing aside from holder, when the rim can be withdrawn. Retighten the screw securely when refitting.

WATER PUMP.

The water pump has no under-water bearings as the impeller shaft is centred in, and driven by, the dynamo driving shaft.

Should it be found necessary after the car has been in use for some time to take up any wear on the water pump glands, proceed as follows. Remove the gland locking plate of the gland which is leaking, and turn gland nut sufficiently to make the water seal. See that the locking plate is securely replaced. The gland nuts are marked "C," Fig. 14.

There is a greaser for each gland (see "A" and "B" Fig. 14), and these should be screwed down one turn every 500 miles. Use Graphite Grease only, as instructed on Lubrication Diagram.

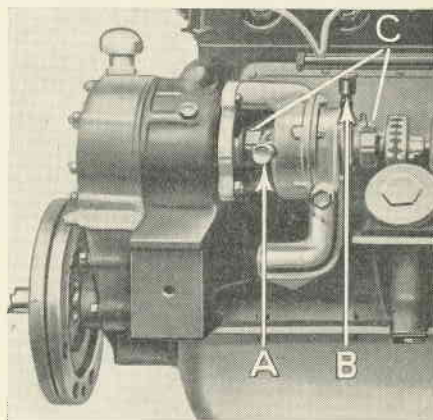


Fig. 14.
Water Pump showing Greasers (A) and (B) and Gland Nuts (C).

RADIATOR—Special Note.

The cooling system is designed to assist easy starting, and to give maximum power in normal temperatures and weather conditions.

During cold and frosty weather, when the car is left for the night or is not being used for any length of time, it is advisable to drain the water from the radiator, cylinder block and water pump. For this purpose a drain cock is fitted at the bottom of the radiator inside the bonnet, on the offside, and drain cock on the cylinder block (see "S," Fig. 3, page 9). Commence the practice early in the winter season to avoid any risk likely to arise from early frosts.

Remember to turn off both drain cocks and refill the radiator before again starting the engine.

RADIATOR SHUTTERS.

The radiator shutters are thermostatically controlled and therefore automatic in operation. A thermometer is fitted on the fascia board so that the temperature of the water can always be ascertained.

CLUTCH.

The clutch and gear box form a unit with the engine. The clutch is of the single dry plate type and no adjustment is required for the springs. The clutch disc, which is positioned between the clutch floating plate and the flywheel, is lined with fabric and runs on a splined shaft. The clutch pit has a removable cover.

Due to the movement of the clutch floating plate being frictionless, and the dry type plate clutch, no lubrication whatever is required. The clutch withdrawal shaft is lubricated through a nipple on the group plate illustrated in Fig. 16. The clutch withdrawal race on the stem wheel is packed with grease when assembled, and no further lubrication is required.

CLUTCH PEDAL ADJUSTMENT. :: GEARBOX.

CLUTCH PEDAL ADJUSTMENT.

It is most important that drivers should not allow the foot to remain in contact with the clutch pedal plate after the change speed or other operation is concluded. It is the first cause of clutch wear. The pedal should have at least $\frac{1}{2}$ " idle movement. When this minimum movement is reached the pedal should be adjusted by unscrewing the nut "A," Fig. 15, until the pedal has a free or idle movement of 1" but no more. The free movement is measured between the position when the pedal is free and then depressed until the clutch action is first felt. The simple adjusting device is spring loaded and the nut has a saddle shaped end which sockets on the eye-pin of the lever "B" every half turn, and in consequence of this ratchet action it is self-locking.

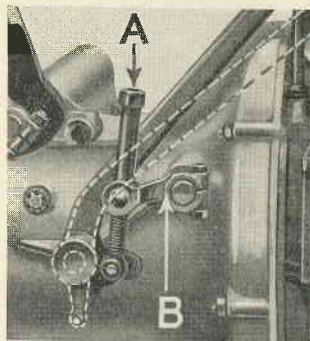


Fig. 15.
The Adjusting Nut for Clutch Pedal is marked (A). The Lever connecting Adjuster to the Clutch Shaft is marked (B). Dotted lines indicate the Foot Brake Pedal.

GEARBOX LUBRICATION.

Although the consumption of oil in the gearbox is very small it is essential that the level should be maintained. The level should be checked when the oil is warm. It is advisable to replenish with oil every 5,000 miles and to do this remove the plug on the offside of the gearbox (see "U," Fig. 3, page 9) and fill to the bottom thread of screwed plug. Pour the oil in slowly and allow it to distribute itself evenly, when a true level will be given.

Engine lubricating oils must not be used as lubricants for the gearbox. For gearbox lubrication use Wakefield's "Castrol S," Shell Mex Gear Oil or Vacuum Mobiloil "C." ("CW" for cold weather).

:: STEERING. :: REAR AXLE. ::

STEERING.

The steering is of the screw and nut pattern and provides absolute control with extreme ease of operation. The surfaces in contact are of large area, and there is an absence of all backlash.

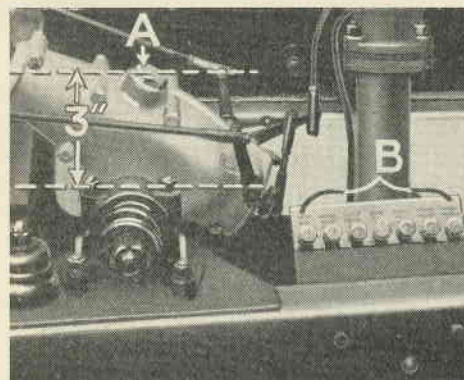


Fig. 16.
Showing the Steering Box Oil Plug (A) and the level at which the oil should be maintained. A battery plate of grouped lubrication nipples, marked for their respective parts, is shown at (B).

3 inches below the top of the plug hole, measured vertically, as indicated in the illustration above.

Oils recommended. Wakefield's "Castrol S," Shell Mex Gear Oil or Vacuum Mobiloil "C" ("CW" for cold weather).

Do not turn the road wheels entirely by the steering wheel when the car is stationary. This is likely to strain the steering joints, etc. If it is necessary to alter the position of the wheels for any purpose when the car is standing, they should be moved or assisted by hand.

REAR AXLE LUBRICATION.

No adjustment for the rear axle is necessary as the gearing is set at the works and no attention is required except lubrication. The consumption of oil is small and only a moderate quantity will be required every 5,000 miles to maintain the proper level.

:: HYDRAULIC FOUR-WHEEL BRAKES. ::

To lubricate the rear axle, remove the filler plug on the near side of the axle casing. Access to this is given by removing the rear seat which exposes an aperture. (See Fig. 17). The filling level is to the bottom thread of the screwed plug hole. Pour in slowly and allow the oil to settle so as to get correct level.

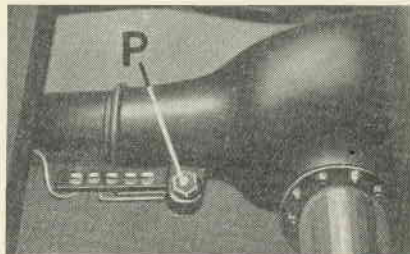


Fig. 17.
Rear Axle Oil Filler Plug (P). The battery of grouped lubrication nipples alongside lubricate the Rear Brake mechanism and centre bearing of Propeller Shaft.

Oils recommended. Wakefield's "Castrol S," Shell Mex Gear Oil or Vacuum Mobiloil "C" ("CW" for cold weather).

THE HYDRAULIC BRAKING SYSTEM.

The braking system fitted to the Sunbeam "Speed Model" comprises a hydraulic foot brake which operates on all four wheels simultaneously, and a mechanical hand brake which operates the rear wheel brake shoes only, independently of the hydraulic braking system.

The single pair of internal expanding fabric lined shoes on all four wheels are operated hydraulically on the Lockheed system which ensures absence of frictional loss and fully adequate braking effect with a light pedal pressure. The brake shoes are applied by the pedal which pulls direct on to the pressure lever of the master cylinder, from which the pressure is transmitted through copper tubing equally to the brake shoe cylinder on each wheel, with flexible hose connections interposed where necessary to allow for steering and other axle movements. The pistons of the wheel brake shoe cylinders connect up with the ends of the brake shoes and expand the latter against the tension of the "pull-off" springs.

:: HYDRAULIC FOUR-WHEEL BRAKES. ::

The head of liquid contained in the supply reservoir box, in which the master cylinder is submerged, keeps the entire system constantly full of fluid under a small pressure which ensures complete and efficient sealing of the system. The fluid level in the reservoir box should be just clear of the underside of the filler plug "A" Fig. 18 and should be inspected once a month by removing the plug, and more fluid added if necessary. If, when adding more fluid, the level should fall rapidly, it indicates a leak at some point in the system.

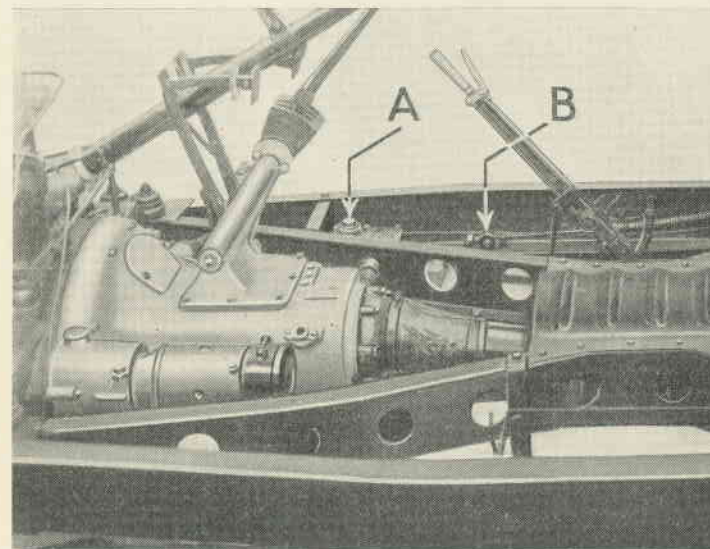


Fig. 18.
Showing the Fluid Reservoir Box (A) of the Hydraulic Braking System and Hand Brake Adjusting mechanism (B).

HYDRAULIC FOUR-WHEEL BRAKES.

NOTE.— It is most important that fluid of the correct Lockheed specification, viz. :—Lockheed Special No. 5 Brake Fluid, a liquid which is immune from freezing and unaffected by high temperatures, should be used exclusively in the system. Any other fluid may injure some part or lack important qualities required for safe and efficient maintenance. Petrol, paraffin and lubricating oils are definitely injurious.

Extreme care should always be taken, and especially when refilling the reservoir box, to ensure that no dirt or foreign matter gets into the system, and when re-assembling or replacing any of the component parts see that these are previously thoroughly well washed and cleaned in brake fluid or alcohol ; no other fluid should be used for this purpose.

“BLEEDING” THE HYDRAULIC SYSTEM.

What is known as “bleeding” is necessary when some part of the fluid system is not entirely full of fluid owing to the presence of air. This is generally detected by the brake pedal being “soft” when first depressed after the car has been standing for some time. To remedy this, remove the filler plug “A” Fig. 18, and fill the reservoir box right up with fluid. Replace the filler plug when this has been done.

Dirt or other foreign matter must not get into the system.

A “bleeder” valve projects from the centre of each wheel cylinder, above the main pipe line connection (see D, Fig. 19) and has a central set screw which should be removed with the special box key (B) supplied in the tool kit. The rubber drain tube “A” (also supplied) should then be passed through the bore of the box key in such a way that the nipple at one end of the rubber tube may be screwed into the place of the set screw.

Now open the valve to the extent of about three quarters of a turn of the box key, allowing the free end of the rubber

FOOT BRAKE ADJUSTMENT.

tube to hang down into a clean glass jar about half full of brake fluid. Press the brake pedal down slowly, allowing it to return to the normal or “full-off” position under the action of the piston return spring in the master cylinder. Repeat this operation about a dozen times taking care that **the reservoir box is kept well filled all the time**, otherwise air will be drawn into the system at this point. By depressing the pedal fluid is pumped through the pipe line and out at the wheel cylinder which is being bled, carrying with it any air that may be present. This will be indicated by bubbles in the glass jar. When all the air has been expelled, screw in tightly the “bleeder” valve with the box key; then unscrew the rubber tube and replace the set screw securely.



Fig. 19.
Showing Rubber Drain Tube (A); Box Key (B); Brake Shoe Adjustment Cam (C); Hydraulic Brake Tube to Brake Cylinder (D); Group lubrication nipples for lubricating Axle, Swivel Pin and Track Rod (E). On the offside front wheel there is a similar plate with a group of three nipples lubricating the Axle, Swivel Pin, Track Rod and Side Steering Rod.

Repeat this operation for each wheel brake cylinder, then refill the reservoir box to the level indicated on page 33, and replace the filler plug, which should be well screwed down.

FOOT BRAKE ADJUSTMENT.

The only adjustment required in connection with the hydraulic foot brake is that of the brake shoes in relation to the drums, when necessary on account of wear of the shoe linings. This adjustment is made by means of the adjustment cam provided for each shoe. After jacking up the wheel being dealt with clear of the ground, apply a spanner horizontally

HAND BRAKE.

to each of the cam nuts "C" on the brake carrier plate (see Fig. 19) and turn the spanner towards the ground until the brake shoe comes into contact with the drum; then turn the spanner slightly in the reverse direction, that is upwards, until the wheel can rotate freely without any appreciable drag. The other wheels are then dealt with similarly, each shoe being adjusted separately. The adjustment cams are held by friction and have no locking device.

HAND BRAKE.

The hand brake is an all mechanical brake, and operates through the medium of a powerful toggle linkage between each pair of rear wheel brake shoes, and is quite independent of the hydraulic system. It is only in an emergency that this brake will need to be used for "pulling up" purposes, as the hydraulic system will adequately meet all normal demands.

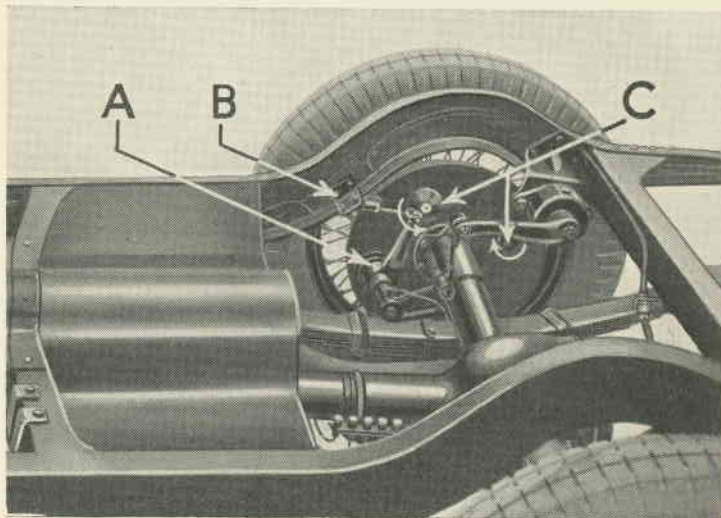


Fig. 20.

Rear Brake Adjustment. (A) is the Hand Brake Camshaft Lever, and (B) are grouped lubrication nipples (a similar plate is on the near-side of chassis frame) for the Rear Springs. The nuts (C) operate the Brake Shoe Adjustment Cams.

HAND BRAKE ADJUSTMENT.

HAND BRAKE ADJUSTMENT.

When any adjustment has been made to the rear wheel brakes operated by the pedal it is advisable also to check the hand brake as a slight adjustment may be necessary to this. The "free" movement of the hand brake lever, i.e., the travel of the lever before the brake action is felt, must always be maintained.

The adjusting device for the hand brake is a spring loaded ratchet arrangement (see Fig. 18), the saddle shaped end nut socketing on the eyepin of the rod every half turn, and consequently the ratchet action is self locking. By rotating the nut the brake cams are pulled half forward and the clearance between the shoe and drums is reduced, whilst the hand brake lever maintains its relative position.

Removing Front Brake Drum for Relining Shoes.

It depends largely upon the care in driving as to the period that will elapse before relining is required. The procedure for carrying out this work is as follows:—Remove the road wheel,

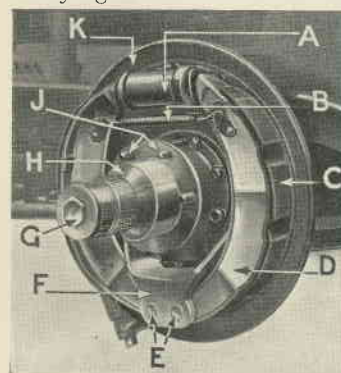


Fig. 21.

Front Wheel Brake with wheel and brake drum removed. Hydraulic Brake Cylinder (A); Brake Return Spring (B); Brake Shoe Liner (C); Brake Shoe (D); Operating Fulcrum (E); Fulcrum Plate (F); Hub Cap Nut (G); Hub (H); Screws retaining Brake Drum (I); Brake Carrier Plate (J); Hub (K).

which exposes the brake drum and hub, unscrew the six screws which hold the drum in position on the hub and withdraw the drum. It is usually found that the drum will come off quite easily, but in the event of any tightness tap lightly around its outer edge with a mallet or raw hide hammer.

NOTE.—To obtain absolute efficiency and silence of the braking system, the final process of machining the drums is accomplished with the hubs assembled in position, and it is advisable when removing the drum to make an identification mark on both the drum and hub to correspond, so that when

REMOVING REAR BRAKE DRUM. ::

re-assembling they will be returned to their original positions and so retain the braking efficiency.

To remove the shoes, release the brake return spring (see "B," Fig. 21), then remove the nuts securing the brake shoe fulcrums "E" which allow the fulcrums themselves to be withdrawn. The shoes can then be pulled clear of the hydraulic braking cylinders "A." Take notice of the lining fixing before removing and endeavour to fix similarly. It is essential that the new lining should fit firmly on the shoe and there should be no sign of bulging.

Removing Rear Brake Drum for Relining Shoes.

Remove the wheel and drum as described for the front wheels, but the removal of the shoes differs owing to the hand brake mechanism, and is as follows:—With the brake drum off, remove the cotter pin holding the fulcrum pin of the toggle arms (L) Fig. 22, and withdraw pin when the toggle will be free. The cotter pin will be found at the back of the fulcrum pin. Then release brake return spring and the shoe fulcrum pin, and pull shoes clear of the hydraulic cylinder as mentioned above in connection with the front brakes. The instructions on the previous page ("Removing Front Brake Drum") in regard to "corresponding" marks for drum and hub should also be followed when adjustment is being made to the rear brakes. Before replacing the brake drums ascertain that the mechanism is functioning correctly.

It is advisable occasionally to remove the brake drums and smear the hand brake toggle joints with graphite grease. With the exception of the greasers on the water pump these toggle joints are the only points on the car to which graphite grease should be applied.

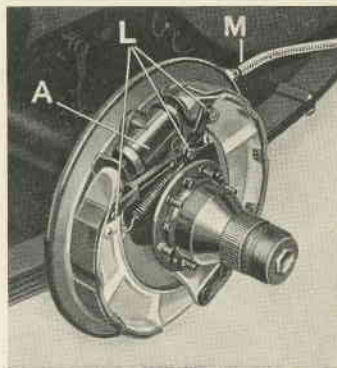


Fig. 22.
Rear Wheel Brake, with wheel and brake drum removed. The details are similar to the Front Brake, shown in Fig. 21, with the exception of (L), which are the toggle arms operated by the Hand Brake Lever. (M) is the armoured hydraulic brake cable.

HUBS. :: SPRINGS. :: SHOCK ABSORBERS.

FRONT HUBS.

The front hubs are fitted with roller bearings designed to take both radial and thrust loads. With the special type of bearing used no adjustment is necessary. The lubrication is provided by removing the inner hub end caps (G) Fig. 21, and the hubs should be kept about half full with **Vacuum Mobilgrease No. 4**. The supply of grease should be replenished when required, usually about every 3,000 miles. Under no circumstances must the hubs be more than half full.

REAR HUBS.

The rear hubs require no special attention as they are automatically lubricated from the axle.

SPRINGS AND SHOCK ABSORBERS.

The semi-elliptic front and rear springs give the most comfortable riding possible at all speeds and are controlled by shock absorbers of the Luvax thermostatically controlled hydraulic type. When the correct adjustment or "setting" has been made, which is done before the car leaves the works, this is automatically maintained by the thermostatic valve, and the "damping" action of the shock absorber is unaffected by any variation of temperature in the fluid. The front springs are lubricated by nipples included in the "battery" of nipples for the group system of lubrication, see Fig. 16, and the rear by nipples situated on the near and offside of the upswEEP of the chassis frame (see Fig. 20). These nipples are also shown on the lubrication diagram.

The shock absorbers are carefully set before the car leaves the Works and no adjustment whatever should be required for a lengthy period. Every 8,000 to 10,000 miles the quantity of oil in the outer or recuperator chamber should be inspected by removing the filler plug in the casing and oil added if necessary, filling up only to the base of the adjusting screw head which is visible through the plug hole. **NOTE.—Do not entirely fill the casing and use Luvax oil only.** A full explanation of the working, care and maintenance of the Luvax shock absorber is given in a booklet issued by the makers.

GROUP SYSTEM CHASSIS LUBRICATION.

Batteries of lubrication nipples are conveniently placed on various parts of the chassis. These should be lubricated as instructed on the chart in the front of the book. Use one of the oils recommended, as these have been proved by exhaustive tests to be most suitable for the purpose. Make full use of the lubrication chart and follow the recommendations.

WHEELS.

The wire wheels fitted to this model are easily detachable whenever removal is necessary. After jacking the wheel clear of the ground remove the locknut, using the raw hide mallet provided in the tool kit (a steel faced hammer must not be used) and the wheel can be withdrawn. The lock nuts on the off or right hand side of the car have left-hand thread and the nearside wheels a right-hand thread. Each nut is stamped with an arrow and the word "Undo," indicating the direction for unscrewing. When replacing the lock nut care should be taken to see that it is quite secure. It is advisable to finish the operation when the jack has been withdrawn and the wheel is resting on the ground. A spare wheel and tyre are supplied with each car.

When fitting a spare wheel the inside of the wheel hub and the outside of the permanent hub should be clean except for a little lubricant. Push the wheel right home on the inner hub and screw up the lock-nut as far as possible while the car is still jacked up. Then withdraw the jack and make the lock nut secure as described above.

When a wheel has been changed it is advisable to test the lock nut after running a few miles to see if there is any slackness. This will be noticeable if the wheel is rocked backwards and forwards (when jacked up), and any tendency to movement should be removed by again tightening up the nut. This slackness is sometimes wrongly attributed to the lock-nut unscrewing, a thing which never happens if it has been correctly put on.

CARE OF THE TYRES.

Tyres have an important bearing on comfort of a car when travelling, and Messrs. Dunlops have published a booklet which gives valuable information and hints for prolonging the life of tyres.

It is of the utmost importance that the air pressure should be maintained in accordance with the figures given below. Frequent examination of pressure is not necessary, but it is important that it should be checked regularly. Once a week should be sufficient unless a tyre is suspected of having a leaking valve or slow puncture. Any loss of air can be made up with very little effort if this is done weekly.

TYRE PRESSURES.

The following figures are given as a guide, but the pressure should not be allowed to fall below these :—

Front wheels :—35-lbs. per square inch.

Rear wheels :—40 lbs. per square inch.

A slight reduction in the pressure of the rear tyres is permissible when the rear seats are unoccupied.

BONNET FASTENERS.

The bonnet fasteners are of the spring loaded type and to lift the bonnet all that is required is that the fasteners should be pressed down and the bonnet side pulled outwards.

LUBRICATION OF SPEEDOMETER DRIVE.

If at any time the speedometer is not registering correctly, or is intermittent in action, it is possible that the drive may require lubrication. If this is so, inject a little thin oil at the speedometer end of the flexible coupling. This is more easily effected if the oil is first warmed. Lubrication will be required only at fairly long intervals.

CARE OF THE COACHWORK.

To preserve the fine paintwork and finish of Sunbeam cars the following suggestions are made as a result of our own wide experience. With the Cellulose finish surface dust and dirt can be removed with a damp sponge without the necessity for hosing down with water, and the car afterwards polished with one of the special polishes recommended for Cellulose finish. This, however, should be done very carefully, and we strongly recommended that the following procedure should be followed when cleaning the car.

Mud and dirt must be removed **at the earliest opportunity**. This should be carried out by using only **clean cold water**. Nothing should be mixed with it—certainly not petrol or paraffin, which act detrimentally on the painted surface.

To remove accumulated mud well soak all over the body with the water just trickling from the hose pipe. Water applied at pressure direct on to the mud only tends to fix it rather than to soften it, especially in the case of a newly-painted car. If water is used with any force then the nozzle of the hose should be held at an angle (pointing downwards) so that the water slides down the body instead of reaching it at right angles. Cleaning materials should be kept specially for the chassis and under-work where oil and grease are likely to be picked up. The sponge and leather for the body of the car **should never be used for anything else**. A honeycomb sponge is the best kind. When drying off after washing, always use the smooth side of the chamois leather. The rough or "flesh" side may cause minute scratches.

Stains can be removed with the aid of a good Varnish Reviver. This should be a really good preparation, as some revivers contain ingredients which may ultimately prove harmful if used too frequently.

It is advisable to oil the door locks and hinges, also the bonnet hinges, occasionally. Use the oil sparingly and keep it off the paintwork and upholstery.

Important Note re Chromium Plating.

It is important to note that Metal Polish or any similar preparation must not be used for cleaning chromium plated parts.

Such parts should be cleaned by washing carefully with clean cold water and then polished with a soft, clean wash leather. Afterwards smear lightly, except on door handles, with a little thin oil. Such oils as Wakefield's "Oilit," Gargoye Velocite Oil D, or Shell Sheet Finishing Oil P.5 are suitable for this purpose.

CARE OF THE UPHOLSTERY.

The leather selected for the upholstery of Sunbeam cars is of the best possible quality, only first-grade hand-buffed hides being used. The result is that the leather work retains its appearance and wears for a very long period. Very little attention is needed beyond an occasional brushing to remove dust from around the buttons and from the folds.

We do not recommend the use of creams, polishes or other similar preparations as there is often a risk that the leather may be adversely affected by some ingredient in the polish itself.

To clean leather upholstery the use of pure soap and water is advised, but on no account should this be used on cloth upholstery or furniture hide. In any case it must be used very sparingly and quickly wiped off.

Cars upholstered in cloth require only occasional light brushing to remove dust. A brush should be kept specially for this purpose, and washed periodically, so that there is no likelihood of grease or oil getting on to it. If grease marks accidentally get on to the cloth, they can usually be removed with petrol applied with a piece of clean rag. The important thing is to remove them at the earliest opportunity, before the grease has had time to penetrate deeply into the cloth.

When coupés of the folding head type are standing in the garage for any length of time the head should always be raised. A touring car should also have the hood raised if the car is not likely to be used for a considerable time.

TOOL KIT FOR SUNBEAM "SPEED MODEL."

The following tools are supplied with each car :

1 Double-ended box spanner, 6 m/m and 8 m/m nuts.
1 Double-ended box spanner, 10 m/m and 12 m/m nuts.
1 Double-ended box spanner, $\frac{3}{8}$ " and $\frac{7}{16}$ " nuts.
1 Double-ended open spanner, 6 m/m and 8 m/m nuts.
1 Double-ended open spanner, 10 m/m and 12 m/m nuts.
1 Double-ended open spanner, $\frac{3}{8}$ " and $\frac{7}{16}$ " nuts.
1 Double-ended open spanner, $\frac{5}{8}$ " and $\frac{1}{2}$ " nuts.
Special box spanner to fit $\frac{1}{4}$ " square nuts.
Box spanner for differential shaft nut.
Box spanner for rear axle casing filler plug.
Spanner for sparking plugs.
Spanner for adjusting water pump gland.
Spanner for carburetter.
Spanner for ignition distributor.
~~Spanner for differential shaft nut.~~
~~Spanner for rear axle casing filler plug.~~
Spanner for petrol tank filler cap.
Box spanner for gearbox filler plug.
Spanner for front hub grease caps.
Spanner for tappet adjustment.
Adjustable spanner (large).
Adjustable spanner (small).
Raw hide hammer for wheel nuts.
"Bleeder" box key wrench for hydraulic brakes.
"Bleeder" drain tube for hydraulic brakes.
1 Tommy bar, $\frac{1}{4}$ " dia.
1 Tommy bar, $\frac{3}{8}$ " dia.
Hydraulic jack with 2-piece handle.
Grease gun, "Tecalemit" type.
Tyre pump.
1 set of valve thimbles.
Valve lifting tool.
Screw-driver (large).
Pair of pliers.
Chisel.

Oilcan.
1 pair of valve springs.
Hammer.
Screw-driver (small).
Peg punch.
Sponge cloth and tool bag.

TERMS OF GUARANTEE.

TERMS OF GUARANTEE.

The Sunbeam Motor Car Co., Ltd. (hereinafter called the Makers), desire to draw the attention of Purchasers of Sunbeam cars to the Terms of Guarantee applying to their cars.

The makers take all usual and reasonable precautions to secure the use of the best materials and the best workmanship. All warranties or guarantee as to quality, or as to the fitness for the purpose for which goods are sold, or as to other matters implied by Common Law or Statute, are excluded, but the makers give to purchasers from them or from any authorised dealer in the makers' products, a guarantee for one year, for which written application must be made to the makers by the purchaser, on a special form provided for the purpose and attached prominently to each new car or chassis, and no other warranty or guarantee is intended or shall be implied.

The makers do not warrant or guarantee or accept any responsibility for accessories not made by them, nor for the method of fixing, nor do they accept responsibility for the breakage of, or for any damage to, the windscreen or other glasswork of a car after delivery from their works.

The chassis supplied by the makers are intended to be fitted with bodies similar in weight and general character to those shown in the makers' catalogue, and unless the makers are allowed to inspect, test and finally approve the chassis after a body, not of the makers' manufacture, has been fitted, the forementioned guarantee will not apply to the said chassis.

The makers do not give any guarantee in respect of second-hand goods sold by them.

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This Handbook of Instructions

for the

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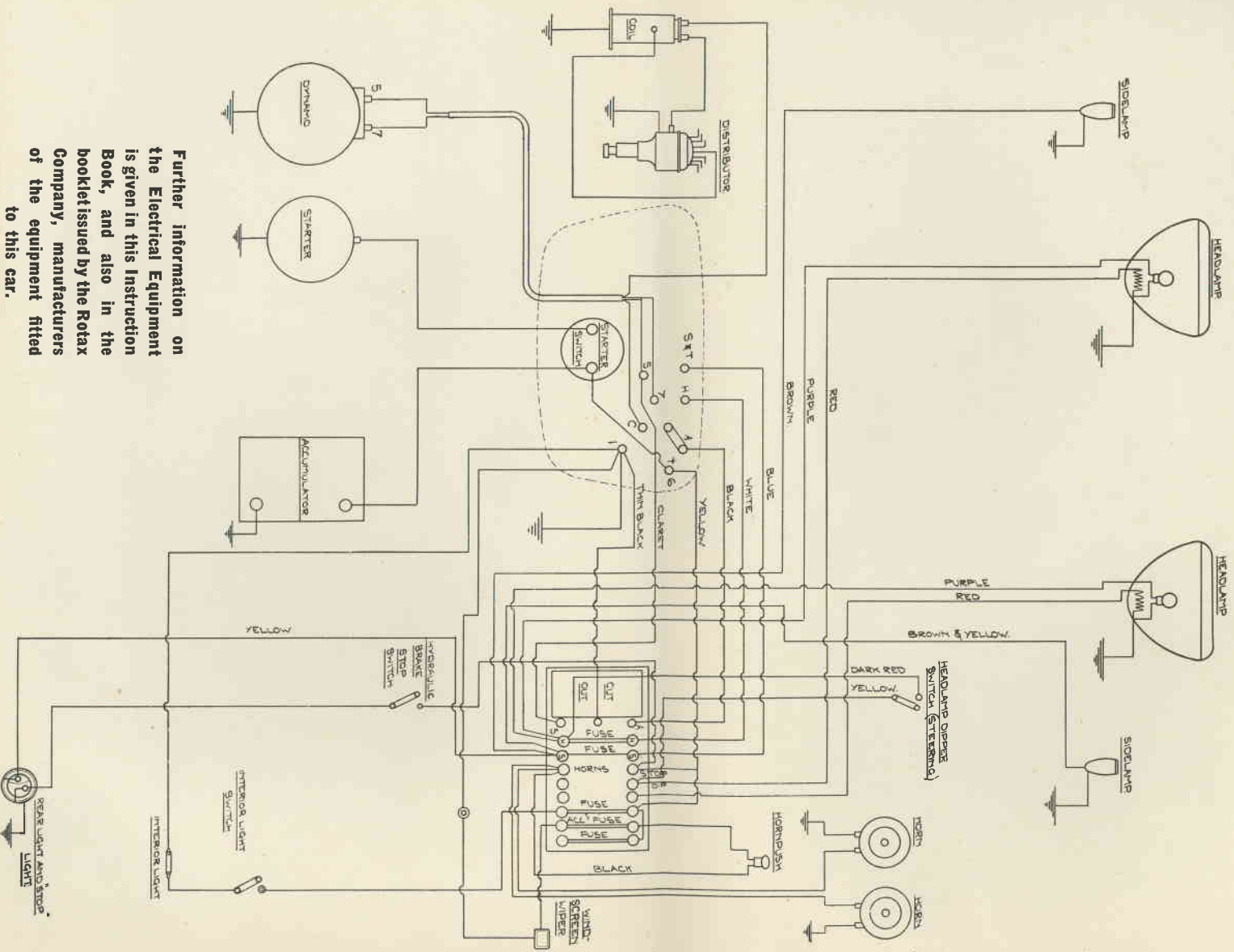
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*In the event of loss, will finder kindly
return this book to the above address.*

ELECTRICAL WIRING DIAGRAM for the SUNBEAM "SPEED MODEL."



Further information on the Electrical Equipment is given in this Instruction Book, and also in the booklet issued by the Rotax Company, manufacturers of the equipment fitted to this car.