

THE 3-LITRE  
**SUNBEAM**

SUPER-SPORTS CAR

---

HANDBOOK of INSTRUCTIONS

Date.....192

Dear Sirs,

Kindly enter my name and address in your records, and send me from time to time any printed matter or revised instructions you may issue for my 3-Litre Sunbeam Car, No.....\*

Name.....

Address .....

From whom car purchased (through agent or direct)  
.....

Date car received.....192.....

*\*The car number will be found (a) on a brass plate on the dash, under the bonnet, (b) stamped on the second cross member of the frame.*

FOURTH EDITION.

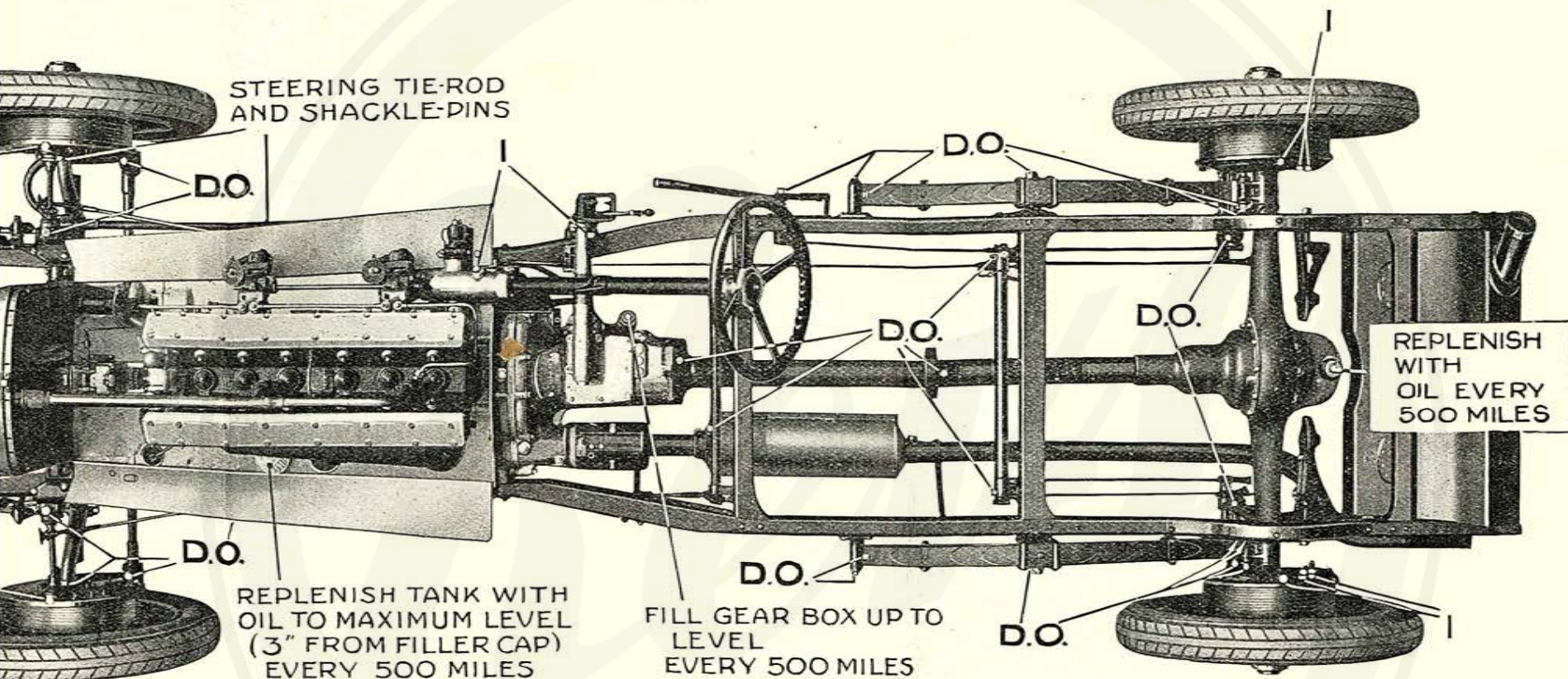
REG. No. 341. JUNE, 1928.

INSTITUTE





# LUBRICATION DIAGRAM FOR THE 3-LITRE SUPER-SPORTS SUNBEAM ENGINE AND CHASSIS.



## OILS RECOMMENDED.

**ENGINE.**—Use Wakefield's "Castrol R." This is suitable for both Summer and Winter use. It is important when purchasing "Castrol R" to specify that it is required specially for the 3-litre Sunbeam engine. If any difficulty is experienced in obtaining "Castrol R" use pure Pharmaceutical Castor Oil.

**GEAR BOX and TRANSMISSION.**—Wakefield's "Castrol S," Shell-Mex Gear Oil, or Vacuum "Mobiloil C."

**CHASSIS.**—We recommend oil instead of grease for Chassis lubrication, as the latter is apt to solidify in cold weather. Oils recommended :—Wakefield's "Castrol S," Shell-Mex Gear Oil, or Vacuum "Mobiloil C."

INJECT OIL EVERY 500 MILES.  
INJECT OIL EVERY 1000 MILES.  
INJECT OIL OCCASIONALLY.

**IMPORTANT.** DIFFERENT BRANDS OF ENGINE LUBRICATING OIL MUST NOT BE MIXED. IF IT IS DESIRED TO CHANGE OVER TO A DIFFERENT BRAND THE ENGINE AND SUMP MUST BE COMPLETELY EMPTIED, AS EXPLAINED IN THIS HANDBOOK, BEFORE THE NEW OIL IS USED.

**THIS INSTRUCTION MUST BE OBSERVED.**

# Handbook of Instructions for the 3-Litre SUNBEAM Car.

*Extract from the Company's current catalogue  
of Sunbeam Cars:*

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

The Company reserves the right to alter  
its 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  
3-Litre SUNBEAM 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 Super-Sports Model, together with  
supplementary information regarding  
the necessary adjustments which may  
be required from time to time.

Price 5/- Nett.

Compiled and Published by  
**THE SUNBEAM MOTOR CAR CO. LTD.,**  
Moorfield Works, Wolverhampton.

TELEPHONE :  
WOLVERHAMPTON 985 (SIX LINES).

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## FOREWORD

This handbook is not intended to be a complete manual of motoring, or a treatise on the principles governing automobile practice. It has been compiled solely with a view to providing owners of 3-litre Super-Sports Sunbeam Cars with the information necessary for their proper care and maintenance.

This model has been evolved from the wide experience gained in designing and building the famous Sunbeam racing cars. The valve timing, carburetter setting, etc., have been arrived at after very exhaustive tests and experiments carried out under every conceivable condition, and the Company cannot be held responsible for trouble which may be incurred through altered valve timing or unnecessary experimenting after the car has left their hands.

All Sunbeam cars are guaranteed in accordance with the terms of guarantee printed in full in our catalogue. In the rare event of any unforeseen defect or unusual trouble developing, it is especially requested that the matter should be **at once** brought to the notice of the Company, either at their Head Office or at any of their Depots, a list of which appears on page 1.

Brief instructions as regards the various accessories not of our manufacture, such as electrical equipment, carburetters, etc., are included in this book, but in the event of difficulty we strongly recommend our clients to consult the Makers themselves. Most of them issue their own instruction pamphlets, which are generally supplied gratuitously on request.

The Sunbeam Motor Car Co. Ltd.

June, 1928.

## PRINCIPAL CHASSIS DIMENSIONS

OF THE

### 3-LITRE SIX-CYLINDER SUNBEAM.

	English.				Metric.
Bore	...	...	...	...	2.95" 75 $\frac{m}{m}$
Stroke	...	...	...	...	4.33" 110 $\frac{m}{m}$
Cubic capacity of cylinders	...				177.9 cu. in. 2916 c.c.
Wheel base	...	...	...		10' 10 $\frac{1}{2}$ " 331.4 $\frac{c}{m}$
Track	...	...	...	...	4' 7" 140 $\frac{c}{m}$
Ground clearance		...	...		8" 20.3 $\frac{c}{m}$
Length overall	...	...	...		15' 8" 4 $\frac{m}{m}$ 5 $\frac{c}{m}$
Width overall	...	...	...		5' 7" 170 $\frac{c}{m}$
	4th.	3rd.	2nd.	1st.	Reverse.
Gear ratios	4.5	6.46	9.2	14.26	12.46
Tyre sizes	...	...	...	...	5 $\frac{1}{4}$ " for 21" rims.
R.A.C. rating	...	...	...	...	20.9 h.p.
Tax payable	...	...	...	...	£21
Capacity of petrol tank			...	...	18 gallons.
Capacity of oil tank		...	...	...	5 $\frac{3}{8}$ gallons.
Chassis weight, (approximate)					1 ton 6 cwt. 1 qr. 14 lbs.
(including petrol, oil and water).					

## READ THIS CAREFULLY.

The 3-litre Super-Sports Sunbeam is a car of remarkable efficiency and performance. It must be borne in mind, however, that this model more closely resembles racing car design than any of our other standard products. For this reason it is very necessary that the information given in this book should be closely studied, and the instructions and advice carefully followed out.

The chapters dealing with Lubrication call for special mention. On all cars lubrication is a matter of the utmost importance, but particularly with such a high-speed engine as that fitted to the 3-litre Sunbeam Car. Always use the correct brand and grade of oil (see our recommendations on page 14) and observe that the oil pressure is regularly maintained.

Treat the new car with consideration. Although the engine, gear box, 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 after the car is delivered should be done at moderate speed. No attempt should be made during this early period to attain the very high speed of which the 3-litre Sunbeam is capable.

## GENERAL DESCRIPTION.

Although the 3-litre model incorporates in its design many features similar to those embodied in other Sunbeam models, the engine is a distinct design, based on the experience accumulated in building successful racing cars over a period of many years. It is, therefore, desirable to describe the 3-litre engine more fully than the other types are dealt with in the respective handbooks we publish for them, and the following description will be of interest to the owner who desires more than a superficial acquaintance with the engine of his car.

### LAY-OUT OF ENGINE, etc

The engine, clutch and gearbox are combined in a single unit, and mounted in the chassis by three point suspension. The clutch and brake pedals are mounted on the unit and the torque and thrust are also taken on the unit via the sphere at the rear of the gearbox. This method of construction gives greatly increased efficiency, due to elimination of joints and to accurate alignment, the bearings also being more rigid.

**DYNAMO.** The dynamo is driven direct from the front end of the crankshaft. The magneto is mounted on a bracket at the front of the engine. See illustrations on pages 6 and 7.

**CYLINDERS.** The six cylinders form a one-piece casting of "Y" pattern, the casting including supports for the two overhead camshafts. The combustion chamber is hemi-spherical in shape and carefully machined. The valve mechanism is enclosed by two aluminium covers, which are easily removable.

**CRANKCASE.** Both upper and lower portions are of cast aluminium, the upper portion having a tray extending completely round the engine and preventing dirt and grit from reaching the engine and its accessories. The oil tank is supported from the tray on the near-side, the filler being very accessible. The lower portion of the crankcase contains a filter tray.

(Continued on page 8).



OFF-SIDE VIEW OF ENGINE.

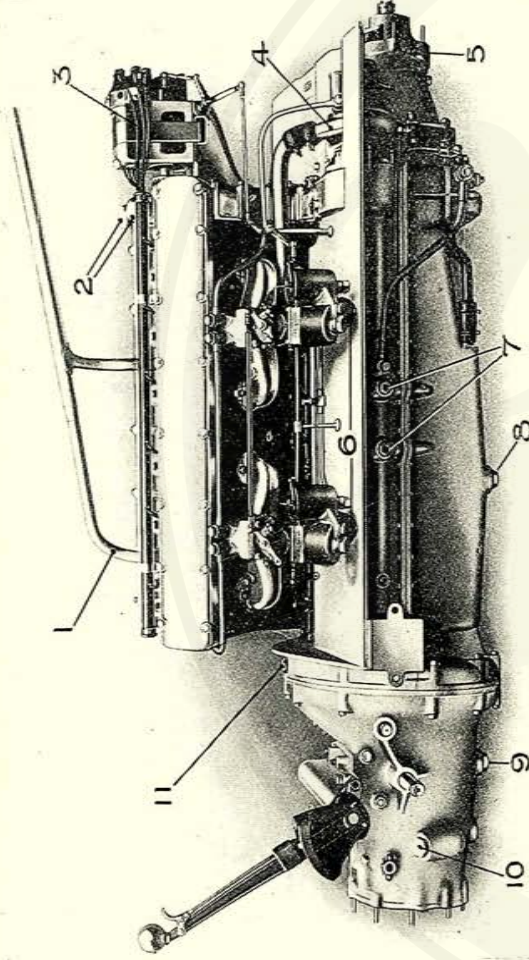


Fig. 1.

View of off-side of 3-litre Engine, shown out of chassis to illustrate more clearly the following parts:—1—Water outlet pipe; 2—Air vents (do not put oil in here); 3—Magneto; 4—Water pump; 5—Dynamo; 6—Carburetters; 7—Oil relief valves; 8—Drain plug for sump; 9—Oil filler plug for gearbox; 10—Oil filler plug for gearbox; 11—Air vent (do not put oil in here).

NEAR-SIDE VIEW OF ENGINE.

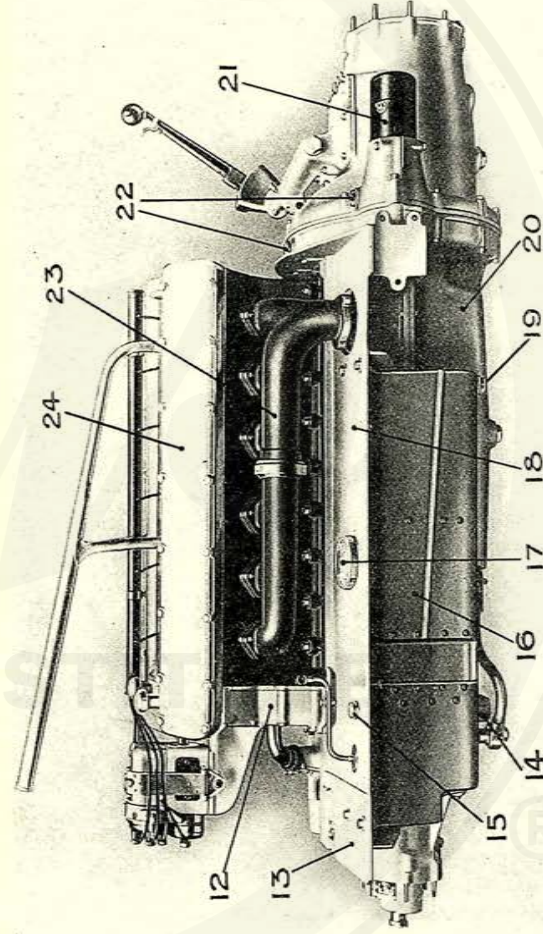


Fig. 2.

View of near-side of 3-litre Engine, shown out of chassis to illustrate more clearly the following parts:—12—Timing-gear cover; 13—Support cover; 14—Oil pumps; 15—Dip stick; 16—Oil tank; 17—Oil filler cap (gauze inside); 18—Crankcase (top half); 19—Oil tank drain plug; 20—Crankcase (bottom half); 21—Self-starter; 22—Air vents (do not put oil in here); 23—Exhaust Manifold; 24—Valve Cover.



**VALVES.** There is one inlet and one exhaust valve to each cylinder, operated from the overhead camshafts through tappet levers which are mounted to provide adjustment for clearance. Instructions in regard to tappet adjustment are given on page 18. The valves are set at an angle and two springs are fitted to each valve.

**PISTONS.** The aluminium alloy pistons, although light, are of a particularly strong design, fitted with four rings, the lower ring acting as an oil scraper.

**CAMSHAFTS.** The two overhead camshafts run in seven bearings, being driven by a train of helical spur wheels. The camshafts are hollow and the bearings and cams lubricated by oil supplied to the centre of each shaft. An important feature of this engine is the spring-balancing device, consisting of three double cams placed on each shaft, these working on a spring, ensuring a steady torque on the camshaft and timing wheels and preventing snatching.

**CONNECTING RODS.** The connecting rods are steel forgings of "H" section machined all over and accurately weighed and balanced. The crankshaft is a very robust steel forging drilled for the passage of oil and running on eight die-cast white metal bearings, one of which is a steady bearing. Exceptionally fine quality metal is used for the main bearings. The flywheel is bolted to the flange on the end of the crankshaft, which also carries the spigot ball bearing for the front end of the primary gear shaft.

**LUBRICATION SYSTEM.** Lubrication is on the dry sump principle, and is fully dealt with on pages 13 to 17.

**CARBURATION.** Two Claudel Hobson carburetters are fitted, these being of the A.Z.P. inclined type, choke 25. The inlet pipe is heated by a hot water jacket. See also pages 22 and 23.

**IGNITION.** High tension B.T.H. CE 6 type magneto. Spark controlled from steering wheel.

## GENERAL RUNNING HINTS.

Every endeavour has been used to avoid making this handbook a highly technical description of the 3-litre car. It is assumed that the reader has, at least, a fair knowledge of a motor car and of the art of driving, therefore the information given in the following pages should be easily understood. Careful attention to the instructions will assist in maintaining the car in the best condition and in obtaining the maximum efficiency from it.

The illustrations on this and the following pages show the instrument board, the clutch, brake and accelerator pedals, the gear lever and its respective positions in the gate.

Before commencing the first trip after delivery of the car, observe the following points. See that there is an ample supply of water in the radiator, sufficient oil in the tank (see page 16), a supply of petrol in the fuel tank, and that the petrol tap at the base of the Autovac is turned on and the petrol reaching the carburetters. Always see that the gear lever is in neutral position (see Fig. 5) before attempting to start up the engine.

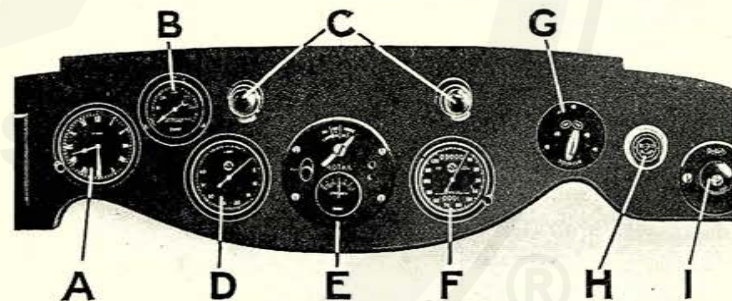


Fig. 3.

The above illustration shows the instrument board, the respective instruments being as follows:—A. Clock; B. Oil pressure gauge; C. Dash lamps; D. Revolution counter; E. Ammeter; F. Speedometer; G. Magneto switch; H. Ki-gass Petrol injector; I. Electric starter.



## STARTING THE ENGINE.

To facilitate easy starting the Ki-gass Injector is fitted to the 3-litre model. This device consists of a force pump mounted on the fascia board (see fig. 3, page 9) and connected by copper pipes to unions fixed on the induction pipe and the Autovac pipe. For starting up the engine the magneto should be advanced midway between the advance and retard positions. The throttle should be opened very slightly.

Before attempting to start the engine by means of the electric starter the plunger of the Ki-gass pump should be unscrewed and pulled back to its full extent. Then press home the plunger and screw up tightly. The action of the pump will force a fine spray of petrol through the open valve ports. Immediately this has been done, close the carburettor air shutter or strangler (on some cars no holes are provided in the air shutter, in which case it should not be completely closed) and depress the electric starter. The engine should fire in the first few revolutions.

The following points should be borne in mind when starting the engine:—

- (1) **THROTTLE**—As the carburetters are fitted with large choke tubes to obtain maximum output at high speeds, it is very necessary that the throttle should only be slightly open, so that the slow running and starting jet is in full action.
- (2) **MAGNETO**—It is advisable to advance the ignition as far as possible without actually obtaining backfires. It will be found that as a general rule about half way is correct.

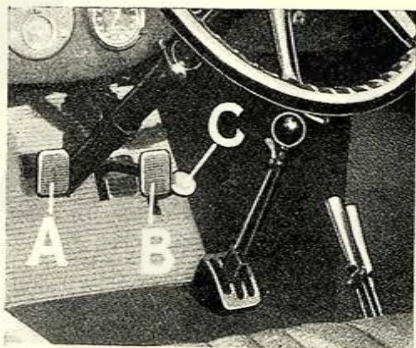


Fig. 4.  
This illustration shows the Clutch pedal (A);  
Brake pedal (B); and Accelerator pedal (C).

(3) **AIR SHUTTERS**—The act of closing the air shutters strangles the in-going air and causes a flow of petrol through the jets. This operation must be carried out with a certain amount of restraint. It must be clearly understood that if the air shutters remain closed for too long while the engine is running, whether firing or not, an excessive quantity of petrol will be drawn into the carburation system and cylinders, *i.e.*, the engine will be "flooded," under which circumstances, owing to the mixture being too rich, the engine will not start. If this has inadvertently occurred, the air shutter must be opened, the throttle opened wide, and the engine turned by hand for a few revolutions to clear out the excess of petrol. See that the magneto is switched off before doing this, to prevent any possibility of a backfire occurring.

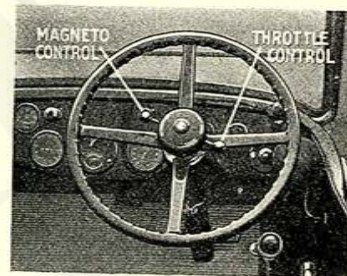


Fig. 4a.  
Showing Throttle and Magneto Controls  
on the Steering Wheel.

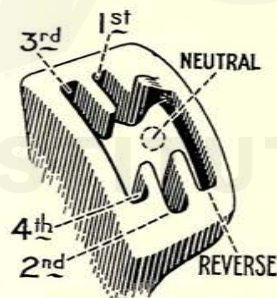


Fig. 5.  
Diagram showing Gear Lever  
Positions in gate.

The lubricating oil used very largely determines the ease of starting of these engines. If the oil is too thick the engine will not be turned fast enough by the electric starter to obtain a sufficiently hot spark from the magneto. For the 3-litre Sunbeam we strongly recommend Wakefield's "Castrol R" as being the most suitable oil for the engine. When any difficulty is experienced in obtaining this, pure Pharmaceutical Castor Oil is satisfactory.

Read carefully the further remarks on lubrication given on pages 13 and 14.



## CONDENSATION IN PLUGS.

All high compression engines are inclined to suffer from moisture condensing inside the sparking plugs when first attempting to start the engine, particularly on a cold, humid morning, or if the car has been stored over-night in an unheated garage. If it is found that, after the previous instructions have been carried out, the engine does not start, it will be advisable to examine the sparking plugs for condensation. If they are wet they should be exchanged for a dry set of plugs or thoroughly dried before any further attempt is made to start the engine. If the plugs are oily they should be cleaned with alcohol (methylated spirit).

It is advisable that when first starting up in very cold weather the work of turning over the engine should not devolve wholly upon the electric starter. Assistance should be given with the starting handle in order to free the pistons.

Do not "race" the engine when cold, as this will damage the oil pressure gauge. Leave it running slowly for a few minutes until the oil is warm and circulating freely.

## REVOLUTION COUNTER.

The revolution counter fitted on the instrument board, see Fig. 3, is provided to show at a glance the speed at which the engine is working. It is advisable to watch this occasionally. The normal maximum working speed is 3,800 revolutions per minute, but for short bursts of high speed the engine may be "revved" up slightly beyond this figure.

## DRIVING SEAT POSITION.

It may be pointed out that 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 3-litre Sunbeam cars the front seat is adjustable within a variation of about nine inches, and it can be moved backwards or forwards until the most comfortable position is obtained.

## LUBRICATION.

The lubrication system of the 3-litre engine is on the dry sump principle. By this method oil is not allowed to accumulate in the sump. Three pumps are provided, these being housed in the bottom half of the crankcase at the front end of the engine. The oil is forced by one pump from the oil tank to the pressure filter and to the main crankshaft bearings, and thence to the big ends of the connecting rods. The second pump, which is also a feed pump, supplies oil to the camshafts, valve gear and timing gears. As the surplus oil drains back into the sump it is pumped into the oil tank by the third pump. This is designed to deal with a greater volume than the other two pumps and ensures that the sump is kept practically dry.

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 effectively lubricates the bearings of the small ends of the connecting rods. The oil drains back through a filter into the sump in the base of the crankcase and is pumped from there into the oil tank.

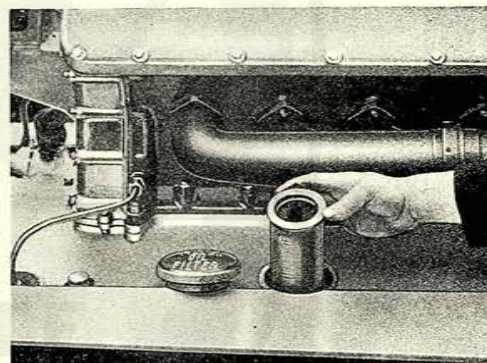


Fig. 6.

Showing Oil Filler Cap removed and Gauze Filter withdrawn.

## LUBRICATING OIL.

As regards lubricating oil, only the oils recommended by us should be used. It is false economy to buy a low-priced oil, which is sure to be deficient in those properties necessary in a good lubricant. For the 3-litre model we recommend the following oil, which we have found from our own



## :: KEEP OILING SYSTEM CLEAN. ::

experience to be most suitable for the engine, Wakefield's "Castrol R." This is suitable for both Summer and Winter use. It is important when purchasing "Castrol R" to specify that it is required specially for the 3-litre Sunbeam engine.

If any difficulty is experienced in obtaining "Castrol R," use pure Pharmaceutical Castor Oil.

### IMPORTANT NOTICE RE LUBRICATING OIL.

Different brands of engine lubricating oil must not be mixed. If it is desired to change over to a different brand the engine and sump must be completely emptied before the new oil is used. **This instruction must be observed.**

Engine lubricating oil is not suitable for the gear box or back axle. See pages 31 and 32 *re* oil recommended for the lubrication of these parts.

### KEEP FILTERS AND SUMP CLEAN.

After every 5,000 miles the oil should be drained from the crankcase sump and also from the oil tank. The drain plugs for the sump and tank are shown in Figs. 1 and 2. The oil should be drained off while the engine is warm, as the oil will then flow more freely. When the engine is cold there is a

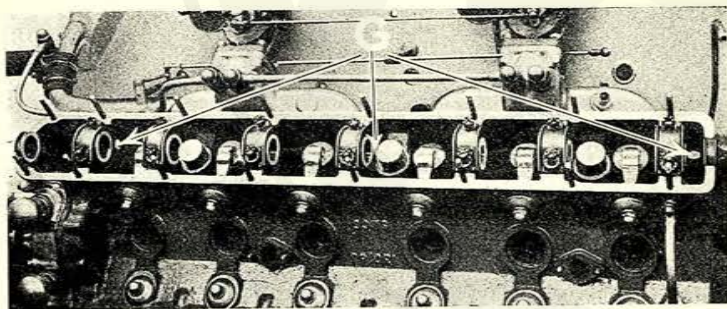


Fig. 7.

Showing positions of Gauges in Cylinder Head. These must be cleaned periodically.

## :: KEEP OILING SYSTEM CLEAN. ::

tendency for the oil to adhere to the sides of the crankcase, and it takes considerable time for it to drain completely away.

After every 10,000 miles the oil should be drained, the drain plugs replaced and three or four pints of benzine poured through the oil filler. Then, with the sparking plugs removed, turn the starting handle vigorously for a few minutes. This will thoroughly circulate the benzine through the oil-ways and cleanse the system. The drain plugs should then be withdrawn and the starting handle again turned until all the benzine has passed through the engine and drained out. It is most important that no benzine should be left in to dilute the fresh supply of oil. When it has been completely drained out replace the drain plugs—see that they are screwed up securely—and fill the oil tank with fresh oil to the correct level. This is three inches from the top of the "dip stick," (see illustration on page 16). The starting handle should again be turned before the engine is run under its own power, to ensure the fresh oil reaching the oil passages. When the sparking plugs are replaced and the engine started up do not "race" it for the first few minutes; and when the car is on the road again, and speed attained, observe the oil pressure gauge to see that this is working properly.

**When using benzine as directed above bear in mind the highly inflammable nature of this compound; and take precautions accordingly.**

The gauze filter under the oil filler cap (see Fig. 6) should be withdrawn about once a month, washed in clean paraffin and thoroughly dried before replacing. The cam-shaft covers should be removed at the same time and the six small gauzes in the cylinder head examined and any accumulation of foreign matter removed. The position of these gauzes is shown in the illustration on page 14, and it is important that they should be kept clean.

The oil pressure filter (see Fig. 9) should be cleaned out every 500 miles. Unscrew cap and gauze can be withdrawn.

It is most important that all these filters should receive periodical attention—the gauze in the oil filler; the six small gauzes in the cylinder head; the gauze in the sump; and the gauze in the oil pressure filter.



## FILLING OIL TANK.

The position of the oil tank is shown in Fig. 2. The filler, which is fitted with a deep gauze filter, is on the near side of the engine (see Fig 6). As mentioned before a "dip stick" (see Fig. 8) is provided for testing the oil level. After

every 500 to 600 miles the level should be tested by means of this stick. If the oil has dropped to any appreciable extent below three inches from the top of the "dip stick" the supply must be replenished until the proper level is regained.

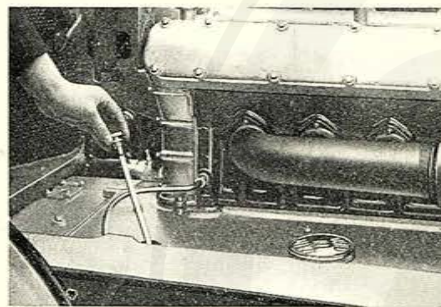


Fig. 8.

Showing "dip stick" for indicating oil level.

## OIL PRESSURE.

With the supply of lubricating oil properly maintained, and the filters and sump cleaned out periodically, it is almost impossible for the lubrication system of Sunbeam cars to fail. One point to note carefully is the maintenance of the correct oil pressure. The pressure gauge is fitted on the instrument board as shown in Fig. 3. For all average purposes the oil pressure should be 20-lbs. per square inch. Two relief valves of the usual ball type are fitted in the crankcase and deal with any excess pressure of oil, the surplus oil being returned to the sump. The position of the relief valves is shown in Fig. 1. To remove either of these unscrew the large hexagon nut in centre. The relief valve can then be withdrawn.

N.B.—When first starting up the engine should never be "raced" while the oil is cold, as this will damage the oil pipes and pressure gauge. Leave it running slowly for a few minutes until the oil is warm and circulating freely.

## FAILURE OF OIL PRESSURE.

Although 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. When the system is not working, the needle of the oil gauge will either move erratically to and fro across the dial or 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 oil tank.
- (2) A broken or choked oil gauge pipe.
- (3) A blocked system, due to not keeping the sump clean, or inferior or dirty oil being used.
- (4) Dirt under the ball of oil relief valve.
- (5) Not cleaning out oil filters periodically.
- (6) Damage to oil pump or oil gauge.

When failure of oil pressure is indicated, the engine should be immediately stopped. First ascertain if there is the correct

quantity of oil in the tank by testing with the "dip stick" (see pages 15 and 16). This should be measured with the car standing on level ground. When the engine is restarted, if the gauge still fails to register any pressure, test for the other causes of trouble enumerated above.

Before examining the oil pump, detach the pipes which connect to the gauge and thoroughly clean these. This may remedy the trouble.

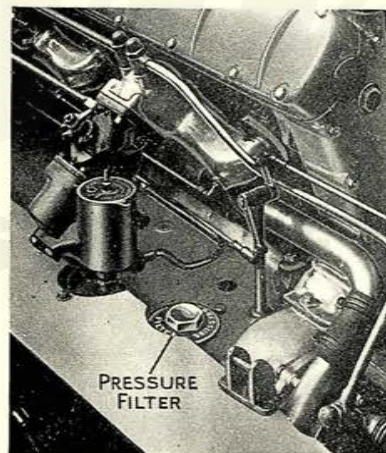


Fig. 9.

Showing Oil Pressure Filter.



## CHASSIS LUBRICATION.

The Tecalemit oil gun is described on page 43. We recommend oil instead of grease for the lubrication of the chassis parts, as grease is apt to solidify in cold weather.

## AIR VENTS.

There are two air vents on the engine (see Fig. 1), two on the gear box and one ball valve vent or "breather" on the rear axle (see Fig. 26.) As these are provided merely as air release vents, do not inject lubricating oil through them.

## TAPPET ADJUSTMENT.

Correct tappet adjustment is very important if the maximum power is to be obtained from the engine.

Before commencing to adjust the tappet for the inlet valve of each cylinder make sure that the exhaust valve of the same cylinder is fully open. In dealing with each exhaust valve the corresponding inlet valve should be fully open. If all the tappets are to be adjusted, the quickest method is to start with No. 1 cylinder and follow with Nos. 5, 3, 6, 2, 4, *i.e.* the firing order.

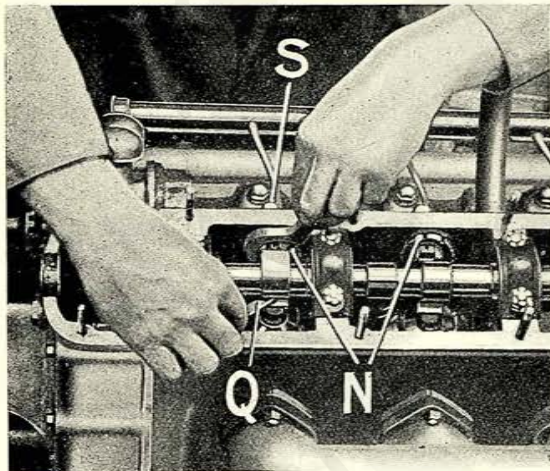


Fig. 10.

Showing method of adjusting Valve Tappets.

To adjust the clearance, release the locknut "S" then by turning the eccentric nut "N" the tappet lever "Q" can be

inserted further or withdrawn from between the cam and the valve thimble. This nut should be turned until the correct clearance is obtained, care being taken to keep the tappet lever square with the valve thimble. The correct clearance is tested by inserting a "feeler" between the tappet lever and the valve thimble. The correct clearance for the inlet valve tappet is ten thousandths of an inch (.010"). For the exhaust valve tappet the clearance is fifteen thousandths of an inch (.015"). These clearances should be measured when the engine is at normal running temperature.

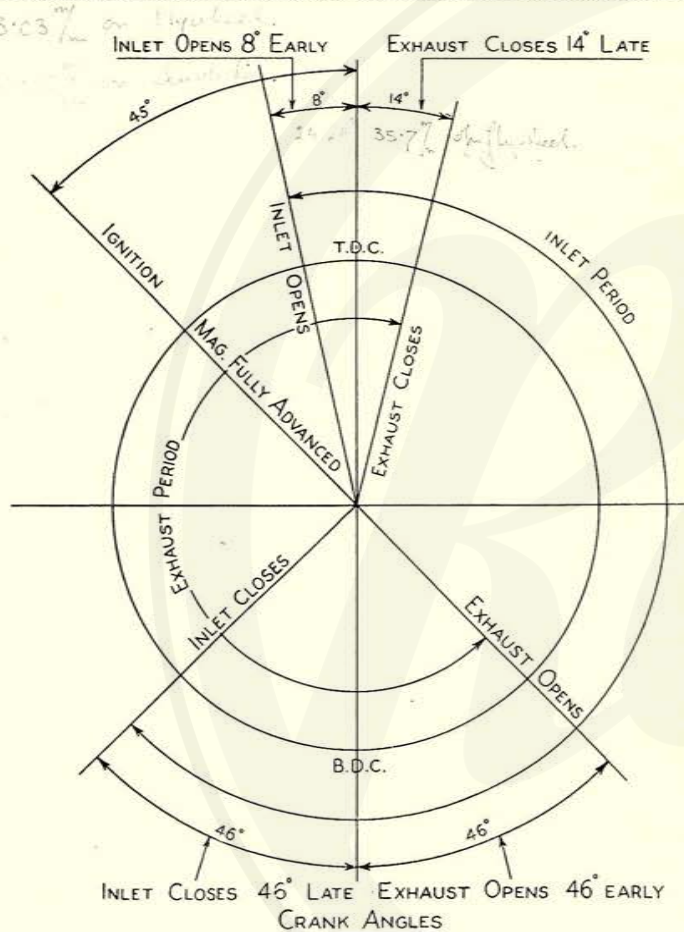
## DECARBONISATION.

It cannot be too strongly emphasised that as the design and construction of the 3-litre engine closely follows racing car practice, the utmost care must be taken when any adjustments or replacements are made. This applies to such matters as decarbonisation, valve replacement, etc., as well as a complete overhaul. The work should be carried out only by skilled mechanics. Naturally, our own repair and service depots are best fitted to deal with repairs and overhauls to this car, but if these are not within convenient reach the work should be entrusted only to a thoroughly competent motor repairer. When an engine is to be overhauled after, say, 20,000 miles, particular instructions should be given for the crankshaft pin discs to be removed and the hollow crank pins thoroughly cleaned out.

## ENGINE AND MAGNETO TIMING.

On the following page a diagram is given which shows the timing for the engine and magneto of the 3-litre Super-Sports Sunbeam. This diagram should be followed whenever it is necessary to re-time the engine or magneto. When timing the magneto the contact breaker should be in the fully advanced position. For correct timing the points should be just breaking when the dead centre line of the flywheel is 45 degrees BEFORE the top centre.





## TIMING DIAGRAM FOR 3 LITRE ENGINE

Fig. 11.  
Engine and Magneto Timing for 3-litre Six-cylinder Sunbeam.  
Firing order of Cylinders: 1, 5, 3, 6, 2, 4.

## MAGNETO.

The magneto fitted to the 3-litre Sunbeam is the B.T.H. CE6 type. The magneto is such a specialised machine that it is not advisable to attempt to take it apart or to make adjustments other than those of a simple nature. If trouble should arise, it should be sent to the actual makers for expert attention.

The platinum points of the contact breaker must be kept absolutely free from oil. This is of the utmost importance. The contact breaker is intended to operate with a gap of .012" to .015", and this should be checked periodically by the aid of the feeler gauge on the magneto spanner.

Whenever the magneto is lubricated this must be done with special magneto oil and the quantities given here should not be exceeded. The following points should be lubricated every 3,000 miles: 2 drops on the contact breaker cam pad, 1 drop on the wick in the contact breaker pivot pin, 6 drops in the driving end cup and 12 drops in the distributor end cup.

These instructions with regard to lubrication are also given on a plate affixed to the magneto itself.

The distributor should be removed after every 4,000 to 5,000 miles and the internal surfaces cleaned with a cloth soaked in petrol. The surface of the brush holder should be similarly treated.

Although the instructions above are based on information supplied by the magneto manufacturers the special instruction book issued by them should be consulted on all matters appertaining to the magneto.

## SPARKING PLUGS.

Keep the sparking plugs free from carbon deposit by occasionally brushing the points with a file card and afterwards washing them in petrol. The gap between the points should be .020".



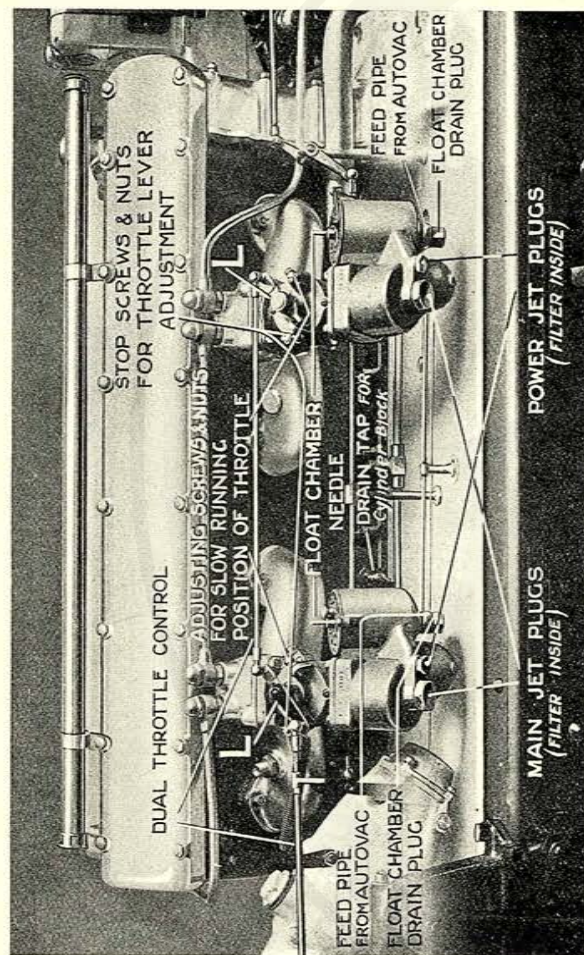


Fig. 12. Showing Carburetters and Controls.

As mentioned on page 23, there are four lubricators fitted on the trunnions to ensure the easy working of the controls. Two of these (marked "L") are shown in the above illustration. The others are fitted underneath the carburetters and are not visible in the illustration.

## CARBURETTERS.

There are two Claudel Hobson A.Z.P. inclined carburetters fitted to the 3-litre Super-sports Sunbeam. This carburetter is of the diffuser type, provided with an arrangement which gives a high degree of atomisation. This is effected by using a diffuser jet in combination with the usual main jet. The function of the diffuser jet is to ensure a correct mixture at all speeds, and its action is perfectly automatic.

From experience it has been found that a 280 c.c. main jet is the most satisfactory for this engine, and this size is fitted. The pilot jet used is 95 c.c. and the power jet 70 c.c. It is not advisable to make any alteration in the standard jet sizes except on our advice and recommendation.

Under no circumstances should the diffuser be tampered with, and in the rare event of adjustment being necessary, it should be confined to the following points:

- (a) Main jet. (b) Slow running jet. (c) Air screw.
- (d) Throttle stop. (e) By-pass screw. (f) Heating.

The petrol level is set by the makers at from  $4\frac{m}{m}$  to  $5\frac{m}{m}$  below the top of the guard tube, and variations between these limits are not highly important.

Before attempting any adjustment of the carburetter, all the induction pipe joints must be rendered air tight, and the engine warmed up to its normal working temperature.

There are two lubricators situated on each carburetter trunnion and these should be packed with grease once every fortnight. We recommend Absorbite Grease manufactured by Frank Smith & Co. (Elland) Ltd., Yorks. (a tube of which is included in the tool kit) for use with these lubricators.

A full explanation of the working of the carburetter is given in the booklet issued by the carburetter manufacturers.

## KEEP THE FILTERS CLEAN.

There are two filters on each carburetter which should be periodically withdrawn and cleaned. These can be reached by withdrawing the main jet plug and the power jet plug. (See illustration on opposite page). The strainer in the Autovac at the end of the main supply pipe from the fuel tank should also be cleaned periodically; also the petrol filter described on the next page.



## AUTOVAC FUEL SUPPLY SYSTEM.

The fuel is fed to the carburettors from the tank carried at the rear of the chassis by means of the Autovac fuel supply system. The Autovac is of simple and durable construction. Full instructions for its care and maintenance are given in the booklet issued by the makers.

## KEEP THE AUTOVAC STRAINER CLEAN.

The strainer in the Autovac, at the end of the main supply pipe from the fuel tank, should be removed and cleaned **every three weeks**. Note exact position when removing, to ensure replacement being properly made.

Every three months, whether it seems to need it or not, flush the Autovac through the fuel connection. At the same time open the drain tap in the bottom of the tank, and let out any sediment or water which may have collected. Also look over the suction and petrol pipe connections to see that they are absolutely tight, and inspect the air vent cap of the Autovac to make sure that the holes drilled therein are kept clear of grit and dirt.

## SPECIAL PETROL FILTER.

A special type of petrol filter is fitted on the engine side of the dash which filters the fuel before it reaches the Autovac. The handle on this should be given one turn about once a week and any sediment collected will then fall into the sump of the filter. By unscrewing the retaining screw at the bottom, the glass sump can be taken off and the accumulated sediment removed.

## FILLING UP WITH FUEL.

When filling the fuel tank, it is advisable to use a tundish fitted with a fine gauze strainer. A gauze filter is fitted inside the filler of the tank but the tundish provides a second filter and should almost entirely prevent particles of grit

reaching the tank and eventually finding their way to the carburetters. Avoid using a tundish with a long funnel, as this will damage the gauze in the tank filler.

## KEEP THE FUEL SYSTEM CLEAN.

The filters provided should be regularly cleaned out, as some of the present day fuels are not entirely free from particles of foreign matter, and if the Autovac is to receive a perfectly regular supply of fuel, the pipe system **must** be kept clean.

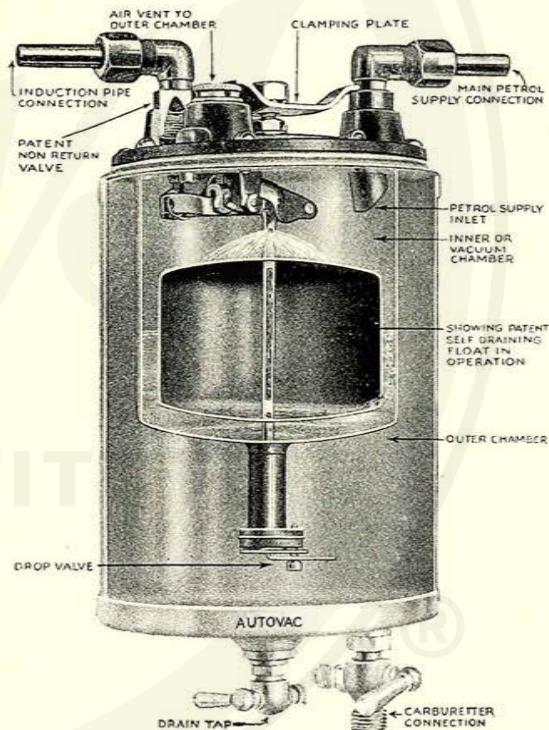


Fig. 13.  
Sectional view of Autovac.



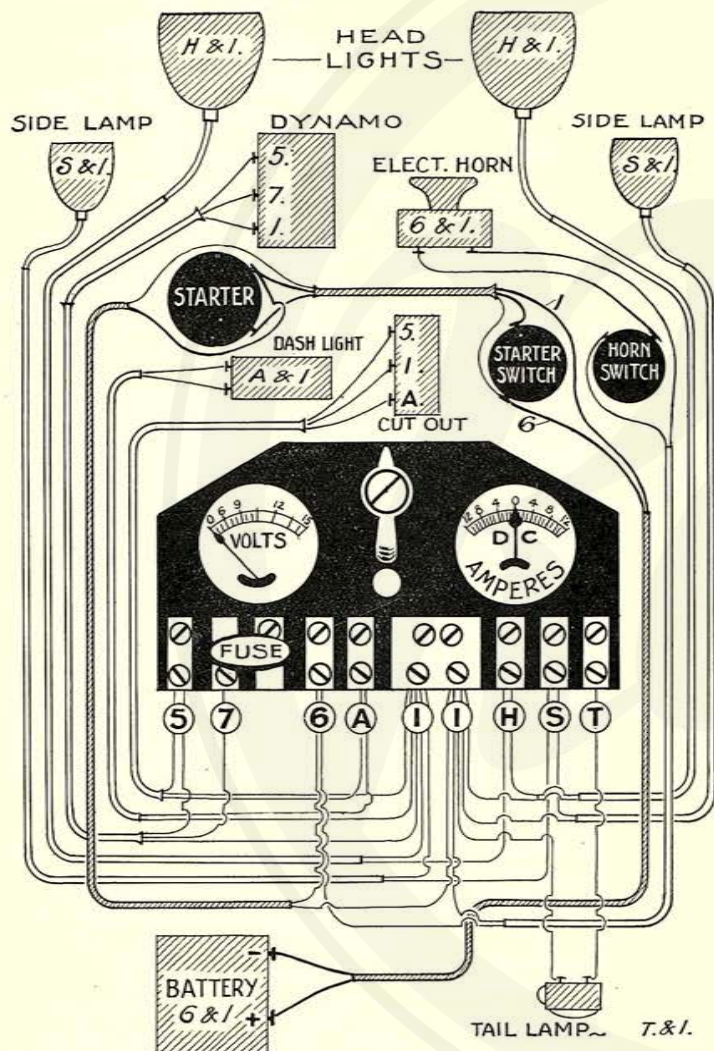


Fig. 14.

If any extra electrical fittings are added these should be wired to terminals 6 and 1.

## ELECTRICAL EQUIPMENT.

Rotax electrical equipment is fitted. For information as to the general care and maintenance of this equipment consult the comprehensive instruction book published by Rotax, Ltd. This is supplied gratis.

### DYNAMO.

Dynamo model A.T. 109 is fitted, this being driven from the front end of the crankshaft. The normal charging rate is 10 amps. at 44 m.p.h., and the speed of "cutting in" 22 m.p.h. on top gear. Rotax Starting Motor M.T. 65 is fitted, being contained in a housing cast integral with the gear box and clutch casing, and has Bendix type engagement.

### BATTERY.

A 12 volt battery is clamped in a container within the chassis frame, and has a capacity of 90 ampère-hours.

### LIGHTING EQUIPMENT.

A Rotax 12 volt set is fitted with internally-wired lamps, and an externally operated arrangement for focussing. The head lamps are 36 watts, 70 candle power, the side lamps 6 candle power, and the tail lamp 6 candle power.

### WIRING DIAGRAM.

See opposite page. On all points affecting the general maintenance of equipment, see the Rotax instruction book.



## WATER PUMP.

A special feature of the water pump is that there are no under-water bearings. The impeller is mounted upon a distribution gear spindle extension, the latter providing the former with a very long support, as well as a splined type of drive. The packing has pressure applied to it automatically, being spring loaded, and adjustment is therefore unnecessary. Leaking from the pump gland should only occur when the packing is completely worn out, when the pump must be removed bodily for the gland to be re-packed. To remove the pump, the detachable portion of the engine tray just forward of the pump secured by three nuts must be removed, then remove cover and unscrew impeller screw. The four securing nuts can then be unscrewed, the water joints dismantled and the pump withdrawn complete. The pump can be taken to pieces on the bench, and a new packing fitted, the gland pieces being inspected to ensure that they are working freely. The shaft responsible for driving the pump is of rustless steel. When the radiator and cylinder block are drained in cold weather, the pump should also be emptied by means of the cock that is provided underneath the casing.

## RADIATOR—Special Note.

During cold and frosty weather, when the car is left standing overnight, it is advisable to drain all water out of the radiator and cylinder block. A plug for this purpose is fitted at the bottom of the radiator just above the starting handle, and a drain cock on the off-side of the cylinder block, close to the rear carburetter. As mentioned above, there is also a cock underneath the Water Pump Casing which should also be drained.

**DO NOT FORGET TO REFILL THE RADIATOR BEFORE AGAIN STARTING THE ENGINE.**

## STEERING GEAR.

The steering fitted on the 3-litre Sunbeam is of the screw and nut type. The surfaces in contact are of large area, the steering very easy in operation, and there is an absence of all backlash. With this steering no adjustment is ever necessary.

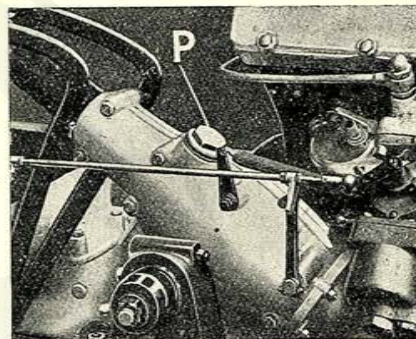


Fig. 15.

Keep the Steering Box well lubricated.

A screw plug "P" is fitted on the steering box, and the box should be periodically filled with oil. Use oil as recommended for gear box.

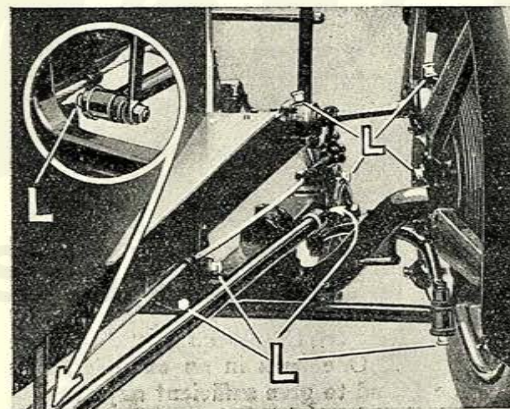


Fig. 16. Showing Lubricators on steering rods.

**Do not turn the road wheels entirely by the steering wheel when the car is stationary, as this practice strains the joints. If it is required to alter the position of the wheels they should be assisted by hand, and not turned by the steering wheel alone.**

The lubricators on the steering side rod, etc., are shown in Figure 16. Inject oil regularly in accordance with the instructions given on the lubrication diagram in this book.



## CLUTCH.

The clutch on the 3-litre Super-Sports Car is of the single plate type. The clutch disc, which is lined with fabric, runs on a splined shaft between the floating clutch plate and the flywheel. The clutch springs are carefully adjusted before the car leaves the factory, and no further adjustment is required. The clutch pit is covered by a removable cover which should be kept securely in position to prevent the ingress of grit and oil. If, after running for some considerable time, any "play" should be apparent in the operation of the clutch pedal, this can easily be removed by adjusting the jaw "J" (see Fig. 17).

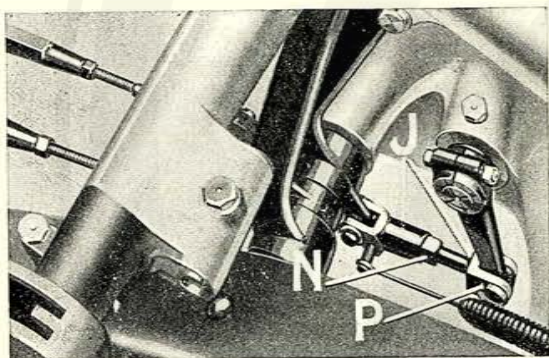


Fig. 17. Showing where Clutch Pedal adjustment is made.

After withdrawing the split pin, release the jaw "J" by removing the pin "P." Release the locknut "N" when the jaw "J" can be turned. One turn in an anti-clockwise direction will usually be found to give sufficient adjustment. The locknut "N" must then be tightened. After replacing the pin "P" do not forget to insert the split pin. The clutch being of the dry type, on no account must oil be applied to the friction surfaces. The clutch withdrawal race on the stemwheel is packed with grease when assembled and there is no need to lubricate this further.

## GEAR BOX LUBRICATION.

In the gear box, as in the case of other units requiring regular lubrication, there is a correct level for the oil. The screw plug "P" shown in the accompanying illustration should be unscrewed and the oil replenished every 500 miles. Although the consumption of oil is small, the level must be maintained.

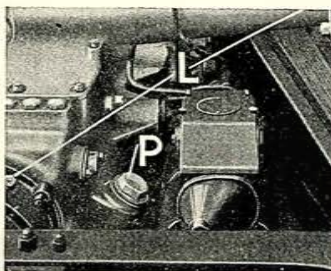


Fig. 18.  
Showing Oil Filler in Gear Box.  
Adjoining Lubricators are marked "L."

If the oil is poured in slowly it will drain down into the gear box, and when it reaches a point about one inch below the top of plug hole the correct level has been reached. Do not forget to screw the plug up tightly afterwards.

If the supply of oil is not maintained at the correct level there will obviously be unnecessary wear on all the gears and their life will be shortened. It cannot be too strongly emphasised that proper lubrication is most important.

**SPECIAL NOTE.**—Engine lubricating oil is not suitable for the gear box. We specially recommend Wakefield's "Castrol S," Shell-Mex Gear Oil or Vacuum Mobiloil "C."

On the change speed lever shaft is an oil gun adapter, and oil should be injected every 1000 miles to ensure the shaft sliding easily (see lubrication diagram at front of book).

## LUBRICATION OF THE SPEEDOMETER DRIVE.

If at any time the speedometer is not registering correctly, or is intermittent in action, it is possible that the drive may need lubrication. When required, inject a little oil at the speedometer end of the flexible coupling. This is more easily effected if the oil is first warmed. Usually this operation will be required about once every three months.



## LUBRICATING REAR AXLE.

At the back of the axle casing, as shown in Figure 19, is a screw plug through which the axle is supplied with oil. The supply of oil should be replenished every 500 miles, as indicated on the lubrication diagram at the front of this book.

The consumption of oil is small, and only a very small quantity will be required every 500 miles to maintain the proper level. The correct level is indicated by a line marked on the axle casing. This lubrication **MUST NOT BE NEGLECTED.**

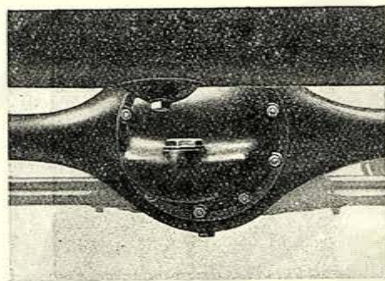


Fig. 19.

Unscrew Plug to replenish oil supply in Rear Axle. The small Plug shown above it is the Drain Plug in the Fuel Tank.

In cold weather the oil tends to form a film across the plug hole. This conveys the impression that the oil level is correct. The film should be pierced and it will then probably be found that a small quantity of oil is required to bring the supply up to the proper level, **USE OIL AS RECOMMENDED FOR GEAR BOX.** See page 31.

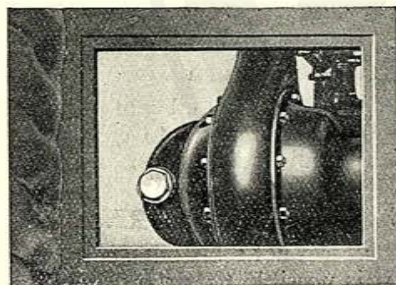


Fig. 20.

The oil plug is reached through the opening under the rear seat.

See that the plug is properly screwed up after the oil supply has been replenished.

## THE BRAKING SYSTEM.

With a high speed car such as the 3-litre Sunbeam a reliable and thoroughly effective braking system is most necessary. Our wide experience in connection with four-wheel braking has enabled us to devise a system giving exceptional stopping powers with extreme smoothness of application.

The brakes on all four wheels are applied by pressure on the brake pedal. They are operated through a Dewandre Vacuum Servo. With this method of braking the physical effort required in application is considerably reduced and only comparatively light pedal pressure is necessary. The braking power is applied progressively and the steering is not affected in any way by the action of the front wheel brakes.

No adjustment of the servo is required, and it is important that neither the mechanism between the brake pedal and the servo, nor the servo unit itself, should be touched in any way.

The joints of the air pipe between the vacuum servo itself and the induction pipe must be kept tight as in the event of an air leak both the efficiency of the servo and the running of the engine will be affected.

After about every 2,000 miles the top cover of the servo box should be removed and oil applied—very sparingly—to the principal working parts. A few drops is all that is necessary. The same grade of oil as used for lubrication of the engine is suitable for this purpose.

The principle governing the Sunbeam front wheel brakes will be easily understood from the following brief description in conjunction with the accompanying diagram (Figure 21). The brake drum on each wheel contains two



shoes, C and D, one smaller than the other. The two shoes are connected together by a pivot B which is free in its housing. The other end of the smaller shoe is connected to the cam gear. E is the main anchor pin.

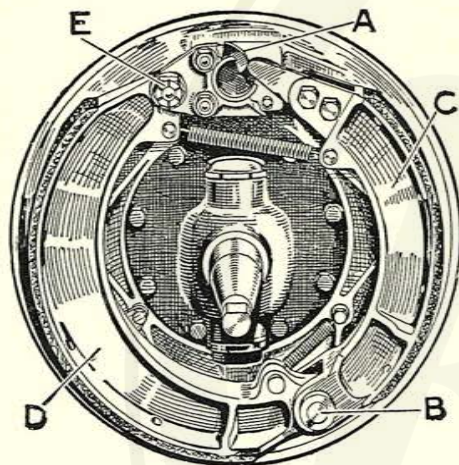


Fig. 21.

Showing lay-out of Sunbeam Front-wheel Brake.  
A portion of the plate has been cut away to show the cam A.

but the main shoe has a greater pressure applied to it than would be obtained by direct pedal application alone.

In each rear brake drum two pairs of brake shoes are fitted. When the pedal is depressed one pair of shoes is expanded. The second pair of shoes provides quite independent braking, being operated by the hand lever and not controlled in any way by the pedal.

It will be seen from this that the braking system on the 3-litre Sunbeam actually provides six brakes—four operated by the pedal through the vacuum servo and the two separate rear wheel brakes operated by the hand lever.

## FOUR-WHEEL BRAKE ADJUSTMENT.

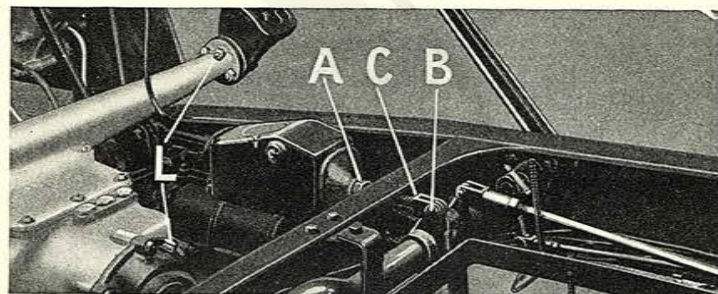


Fig. 22. Showing adjustments between Pedal and Brake Rods.

When any adjustment of brakes becomes necessary the following instructions should be followed. There is individual adjustment provided for each of the four-wheel brakes, but the main adjustment is effected through the jaw "C" (see Fig. 22). If the balance of adjustment between all four brakes has been disturbed by the removal of the brake shoes, rods, etc., it can be restored as follows: the lock nut "A" (see Fig. 22) should be loosened, the pin "B" removed, and the jaw "C" unscrewed for several turns. The car should then be jacked up from underneath each axle so that the weight is on the springs and all the wheels are off the ground. The front brakes should now

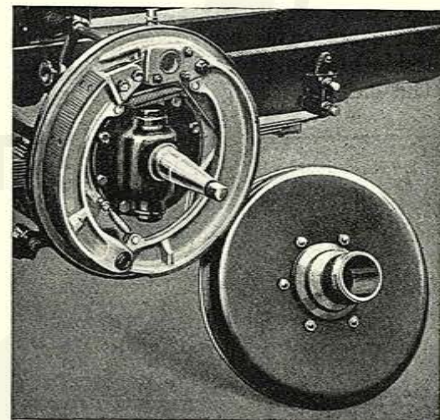


Fig. 23.  
Front Wheel Brake with Brake Drum and Hub removed.



## ADJUSTMENT OF BRAKES.

be adjusted through their independent adjustments. The adjusting nut "F.B." (See Fig. 25) on each side of the chassis should be tightened until both sets of front brake shoes are just touching the drums: THE NUTS AT THE END OF THE SPRING ON THE INSIDE OF THE BRAKE LEVER ARE NOT ADJUSTING NUTS AND NO ATTEMPT SHOULD BE MADE TO EFFECT ADJUSTMENT THROUGH THEM. Now, by means of the adjusting nuts "Q" shown in Fig. 24, tighten the rods until both the rear wheel brakes are just touching the drums. Then finally adjust by turning the jaw "C" (see Fig. 22) to the required position. Replace the pin "B" together with washer and split pin and tighten up lock-nut "A." Both front and rear wheel brakes should then be adjusted so that the shoes are just free of the drums. As a final test apply pressure to the foot pedal when the front and rear wheel brakes should all come into operation equally at the same time. This should be done with the wheels pulled round into full steering lock in each direction.

### INDEPENDENT ADJUSTMENT OF BRAKES.

Independent adjustment is effected by means of the adjusting nuts "F.B." (See Fig. 25) for the front wheel brakes, and by the nuts "Q" (See Fig. 24) for the rear wheel brakes. The hand brake is adjusted by the nuts "K" shown in Fig. 24. In all cases care must be taken to see that the offside and nearside brakes exert the same braking power on application of the foot pedal and handbrake levers respectively.

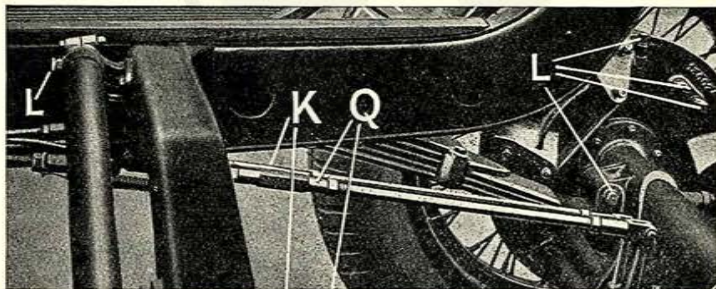


Fig. 24.—Showing Adjusting Nuts K & Q for Hand and Foot Brakes. Lubricators are marked L.

## ADJUSTMENT OF BRAKES.

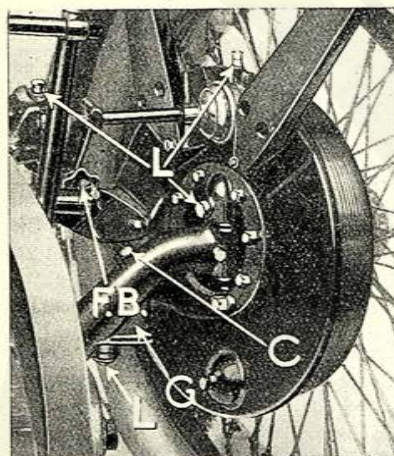


Fig. 25.

Showing near side Front Wheel. F.B. is the Front Wheel Brake Adjusting Nut. C is the eccentric or equalising stop for the brake shoes. G is one of the lugs for jacking up the Front Axle. The Lubricators are marked L.

An eccentric stop marked "C" Fig. 25 is fitted to hold the brake shoes in their proper position relative to the drum. It may be necessary after the car has been running for a considerable time to adjust this stop in order to counteract wear of the shoe linings. Such adjustment would only be slight, about  $\frac{1}{8}$  of a turn of the screw (the nut is a lock nut) being sufficient. The screw must be held firmly with a screwdriver, both while unscrewing the lock nut, and also when tightening up again. After adjustment each wheel should spin freely;

if it does not, the adjustment has been overdone, and the screw will have to be screwed back slightly until the wheel spins freely. This should be tested with the wheels pulled round into full steering lock in each direction. The part marked "G" is a lug under which the jack should be placed when jacking up the car.

### REMOVING BRAKE DRUMS.

To remove a front hub and brake drum unscrew the hub dust cap, remove small pin, and the nut on the end of shaft inside the hub can then be reached with a box spanner. A rear brake drum can be removed without disturbing the hub, merely by unscrewing the nuts which retain it on the hub. See Figures 23 and 27.



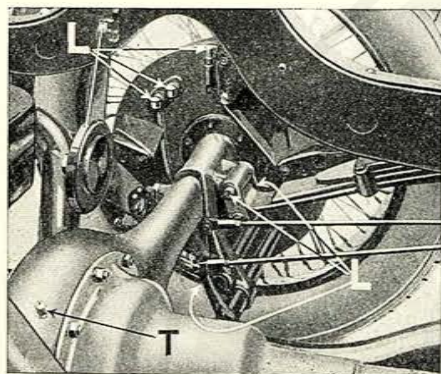


Fig. 26.

Showing Lubricators, marked L, on Rear Axle, etc. T is not a Lubricator but a "breather" for the Differential Casing.

In all the illustrations on this and the preceding pages the lubricators are marked L. Regular lubrication is most important.

The axle casing, which is retained by the nuts "Z," is not an inspection cover. It cannot be taken down until the hubs and shafts have been withdrawn. See page 42 for instructions on removal of hubs.

As shown in Fig. 27 twin brake shoes are fitted on the rear wheels; the hand brake operating separate shoes to those actuated by the four-wheel brake pedal. This braking system actually provides six brakes in all.

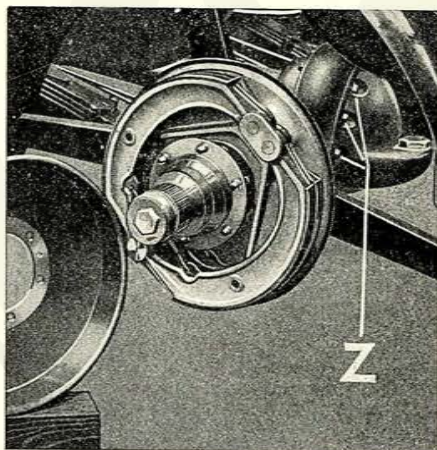


Fig. 27.

Rear Wheel Brake with Wheel and Brake Drum removed, showing Twin Brake Shoes.

## SPRINGS.

The springing of the 3-litre Sunbeam provides unusual comfort at all speeds. Full cantilever springs are fitted at the rear, and semi-elliptic springs at the front, the latter being considerably offset.

The springs and their attachments need regular attention, as they are such highly important features of the car. The principal points for lubrication are indicated on the lubrication chart at the front of the book, and also on the accompanying illustration.

The lubricator which is on the cantilever spring seat underneath the spring is a very important point, and this must not be neglected. Oil should be injected regularly through the lubricators marked L. See also spring lubricators marked on Figure 26. There is considerable frictional movement on the springs and shackles, and it is highly important that these should be regularly lubricated, both front and rear springs being given proper attention in this respect.

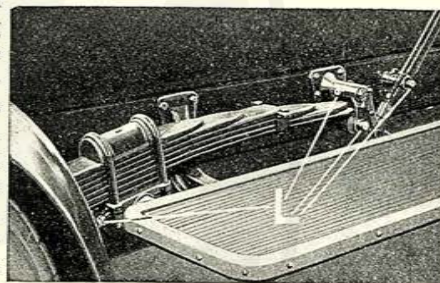


Fig. 28.

Showing Lubricators on Cantilever Spring Seat and shackle.

On cars which are fitted with spring gaiters, provision is made for lubrication on the gaiters themselves, a grease gun being supplied which fits the nipple on each gaiter. Lubrication is advisable after about every 1,000 miles.

Whether spring gaiters are fitted or not it is necessary periodically to separate the springs, as shown in the illustration Figure 29, and apply a mixture of Russian Tallow and graphite. The leaves of the springs are the ONLY PARTS OF THE CAR TO WHICH GRAPHITE SHOULD BE APPLIED. The illustration shows the method of lubricating the leaves. The



## THE SPRINGS—LUBRICATION IS IMPORTANT.

corners of the frame—not the axles—must be supported, the two corners of the back of the car when dealing with the rear springs, and the two corners of the front for the front springs. A strong trestle with a baulk of timber across the top and under the dumb irons of the

frame is the simplest method of supporting the car at the front end (see Figure 29). As the illustration clearly shows, this takes the weight of the car off the springs, the leaves of which can then be easily separated by means of a screwdriver or similar tool, and the graphite grease inserted between the leaves with a thin-bladed knife.

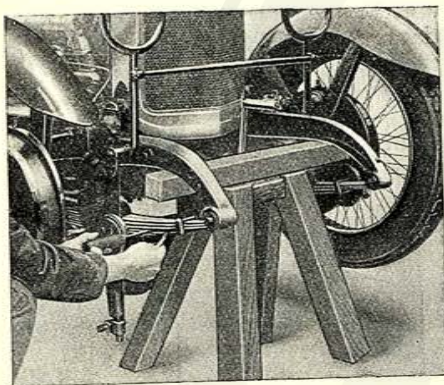


Fig. 29.  
Showing method of Greasing Leaves of front Springs.  
Note the Shock Absorbers so old be released.

In order to insert the baulk of timber, the front shock absorbers must be released as shown, care being taken to replace these after the operation. The casing over the dynamo at the front of the engine is a cover to prevent the ingress of dust and dirt, etc., and on no account must the weight of the car be supported on this.

To apply the grease to the leaves of the rear springs the weight of the car must be taken off them by raising the frame at the rear. The leaves should then be separated in a similar manner to that described in connection with the front springs, and the grease inserted between the leaves with a thin-bladed knife.

When jacking up either of the front wheels, the jack should be placed under one of the lugs which are cast on either side of the front axle. (See "G" on Fig. 25).

## :: :: DETACHABLE WIRE WHEELS. :: ::

### TYRE PRESSURES.

The following are the minimum tyre pressures recommended for the 3-Litre model, and it is important that the pressures should not be allowed to fall below these figures:—

Front.	Rear.
43 lbs. per square inch.	40 lbs. per square inch.

### DETACHABLE WHEELS.

To remove a wheel, the car should be jacked up and the lock nut on the wheel unscrewed by turning it in the direction in which the wheel revolves when the car goes forward. A special wheel spanner is provided with the tool kit. The lock nuts on the off, or right hand, side of the car have a left hand thread. Each lock nut is marked, (e.g. "Left side, near side" or "Right side, off side") and arrows are stamped on showing the direction in which the lock nut should be turned.

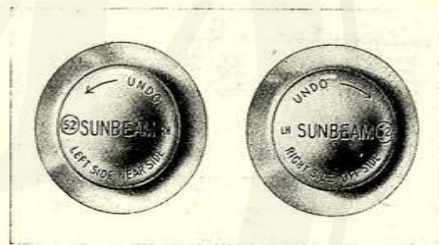


Fig. 30.  
Showing lock nuts of Detachable Wheels.

In fitting a spare wheel the inside of the wheel hub and the outside of the permanent hub should be quite clean except for lubricant. Push the wheel right home on the inner hub, fill the inside of the lock nut with oil and screw up the lock nut, while the car is jacked up, until it is quite tight.

After changing a wheel it is advisable to test the lock nut after the car has been running fifteen to twenty miles to see if there is any slackness. This will be noticeable if the wheel is rocked backwards and forwards, and any tendency to movement should be removed by again tightening up the nut. Slackness will not occur if the lock nut has been correctly put on.



## REMOVING REAR HUBS.

The rear hubs are very easily removed. After detaching the wheel and brake drum (see Fig. 27) six small nuts marked "A" will be seen at the rear of the flange plate. If these are removed the hub and axle shaft can easily be withdrawn. To release the hub from the axle, AFTER THESE HAVE BEEN WITHDRAWN BODILY, unscrew the cover "D" and a castle nut and split pin will be seen. If these are removed the hub can be withdrawn from the axle shaft. When replacing the hubs and shafts the nuts "A" must be screwed up tightly.

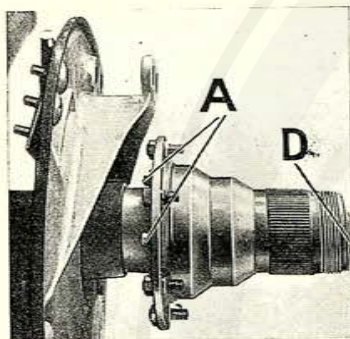


Fig. 31.  
Unscrew Nuts "A" to remove Hub.

For the sake of convenience the brake shoes and anchor pins have been removed in order to show the six nuts "A" clearly. It is not necessary, however, to do this in order to remove the hub and axle shaft. To lubricate hub, remove cover "D." We recommend Gargoyle Mobilubricant Soft Grease.

## SHOCK ABSORBERS.

Hartford shock absorbers are fitted to the springs both front and rear on the 3-litre Sunbeam. The shock absorbers are set to the proper initial tension and no adjustment should be made until the spring action seems too free or not free enough. If the spring action is too free, the frictional resistance can be increased by tightening the centre adjusting nut, turning it in a clockwise direction. On the other hand, should the spring action seem too stiff, this can be relieved by turning the centre adjusting nut in an anti-clockwise direction. The full benefit of shock absorbers is felt when the car is travelling at speed over bad roads, and when adjusted they should be tested under these conditions.

**IMPORTANT.**—When adjusting, the pressure should not be increased more than is absolutely necessary.

## OIL GUN.

The shackle pins of the springs, control gear and steering connections and the other principal chassis parts requiring regular lubrication, are fitted with special ball lubricators through which thick oil can be forced by means of the gun supplied with each car.

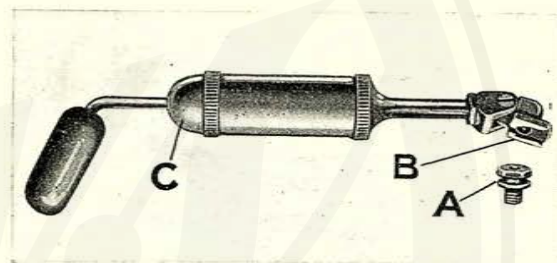


Fig. 32. The "Tecalemit" Oil Gun.

We recommend the use of "Shell-Mex" Gear Oil for chassis lubrication instead of grease, as the latter is apt to solidify in cold weather. The "Tecalemit" gun is suitable for use with oil. To fill this gun the cap of the plunger, marked C, Figure 32, is unscrewed, which brings away the plunger. The oil is then poured into the barrel, the plunger and cap replaced and the cap screwed tightly on to the barrel. In operation the grooved end-piece of the nozzle B is pushed on to the lubricator as far as it will go by a forward movement, and lubricant can then be forced in at very high pressure. One of the ball lubricators as fitted to the chassis is shown at A, Figure 32.

The only parts of a car where graphite lubricant should be used is between the leaves of both front and rear springs. Lubrication of the springs and leaves is fully dealt with on pages 39 and 40.



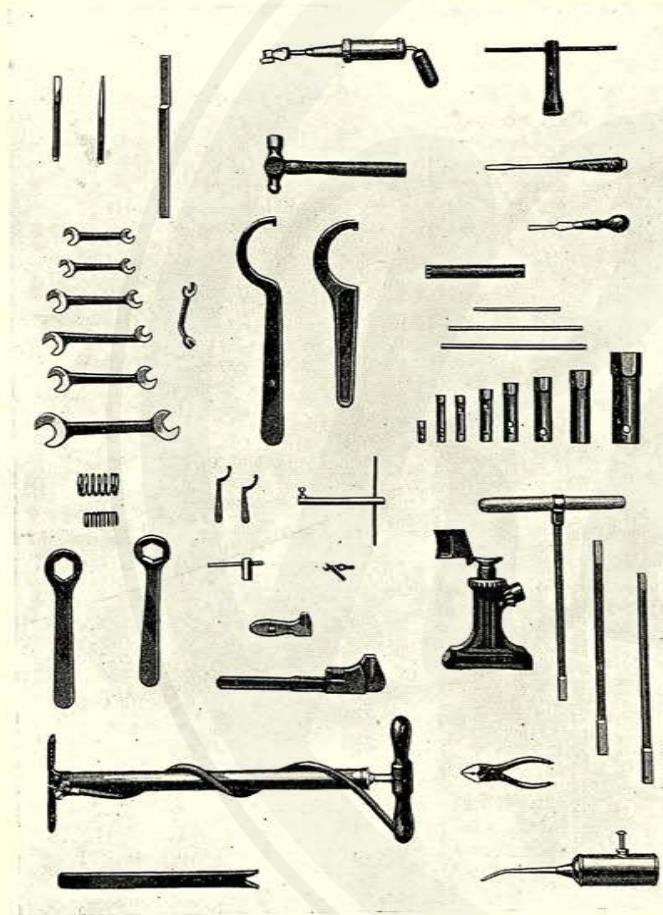


Fig. 33.

The above illustration shows the complete kit of tools supplied with the 3-litre Sunbeam Car.

## LIST OF TOOLS.

Complete list of the tools provided with each 3-litre Car :—

- 1 double ended spanner,  $\frac{1}{4}$ " —  $\frac{3}{8}$ ".
- 1 " " "  $\frac{3}{8}$ " —  $\frac{1}{2}$ ".
- 1 " " "  $\frac{1}{2}$ " —  $\frac{3}{4}$ ".
- 1 " " "  $6\frac{m}{16}$ " —  $8\frac{m}{16}$ ".
- 1 " " "  $10\frac{m}{16}$ " —  $12\frac{m}{16}$ ".
- 1 " " box spanner,  $6\frac{m}{16}$ " —  $8\frac{m}{16}$ ".
- 1 " " "  $10\frac{m}{16}$ " —  $12\frac{m}{16}$ ".
- 2 box spanners,  $\frac{3}{16}$ " —  $\frac{1}{4}$ ",  $\frac{3}{8}$ " —  $\frac{1}{2}$ ".
- Hub cap spanner.
- 3 Water pump adjusting spanners.
- Box spanner for differential shaft nut.
- Spanner for Hub grease cover.
- Valve Lifting Tool.
- Box spanner for back axle oil plug.
- Spanner for camshaft nut.
- Spanner for inlet and exhaust pipe.
- Valve Grinding Tool.
- Exhaust Manifold Nut Spanner.
- Spanner for oil pump locknut.
- Box Spanner for removing Wings.
- Spanner for cylinder crankcase nuts.
- Magneto spanner.
- Petrol tank filler cap spanner.
- Carburettor jet key.
- Large and small spare valve springs.
- Peg punch.
- Chisel.
- Large movable spanner.
- King Dick spanner.
- Pliers.
- 2 Screwdrivers.
- Box spanner for sparking plug.
- Jack.
- Tyre pump.
- 3 Tommy bars.
- Hammer.
- Oil can.

Grease gun, sponge cloth, tool bag and valve thimbles.



## 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. These apply to painted and varnished cars. On cars finished in Cellulose, mud 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.

**WASHING 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 varnish.

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 finished 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 a right angle. 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 to the varnish if used too frequently.

Cars fitted with Weymann bodies should be washed down with CLEAN COLD WATER and the surface of the fabric afterwards dried in the same way as a coachbuilt body would be treated.

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.

## 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. Leather of the quality we use has a finish which needs no reviving assistance of this kind, and 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 soap and water is strongly advised, but on no account should this be used on cloth upholstery or furniture hide.

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 remaining on 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 cars are standing in the garage for any length of time the hood should be raised and left in this position.



## LOWERING THE HOOD.

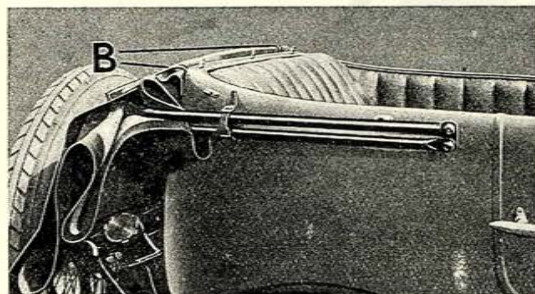


Fig. 34.

When the Hood is lowered all the folds of material must be pulled clear of the frame. Note the straps "B" for fastening the flap.

Fig. 35.

The "flap" should be folded as shown. Note the fastening straps "A" for the frame irons.

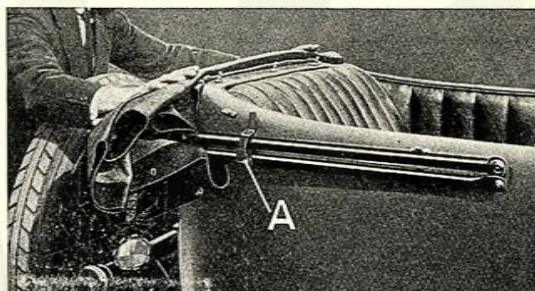
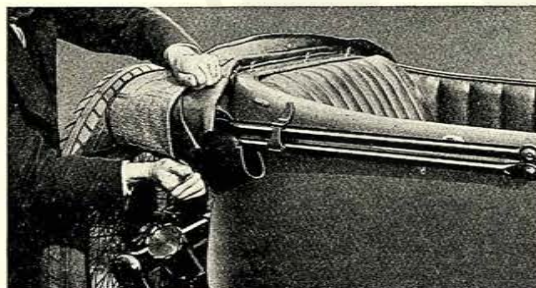


Fig. 36.

When placing the cover on the Hood turn back the corner as shown. It will slip on more easily.



## RAISING AND LOWERING THE HOOD.

### RAISING THE HOOD.

Having removed the cover, or hood envelope, unfasten the leather straps on the frame irons see "A" Fig. 35 and release straps "B," Fig. 34. The hood can then easily be raised. The front end of the hood consists of a flap, and care should be taken when raising that the cross bar at the front of this does not fall and injure the paintwork. The holes at each end of the cross bar must be brought in line with the rounded tops of the windscreen pillars. The cross bar is then pulled down on to the windscreen pillars and the wing nuts tightened see Fig. 37.

### LOWERING THE HOOD.

If the hood is wet it should be kept up until dry before lowering and fixing the hood cover. Unscrew the wing nuts inside the hood frame so that the front cross bar can be detached from the windscreen pillars. The hood should be lowered to the position shown in Fig. 34, all the hood material being pulled out in folds. Note also the instructions accompanying Figs. 35 and 36.

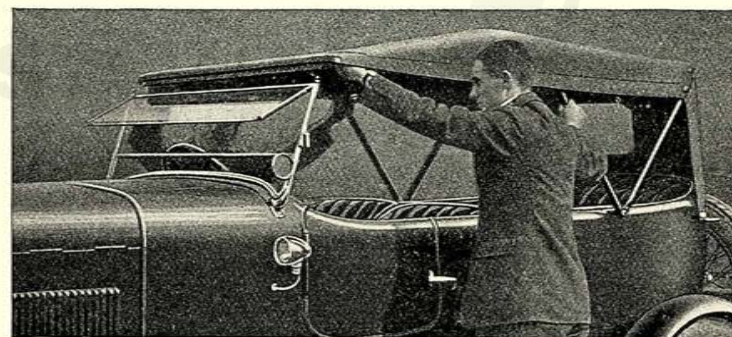


Fig. 37. The Hood extended ready for fixing to the Wind Screen.



## :: AFFIXING THE SIDE-CURTAINS. ::

### SIDE-CURTAINS.



Fig. 38. Fixing front Side Curtain.

When required, the side curtains can be quickly fixed in position and without disturbing the passengers. The side curtains open with the doors so that entrance and exit to the car is not impeded.

There are six curtains in all and each is marked with its respective position left front, etc. to facilitate correct fixing. As the curtains are rigid when in position they can be used, if desired, without the hood.

In erecting the curtains notice the instructions for position. Each is fixed by placing the bracket mounted on the lower edge of the curtain in the socket fitted to the inside of the body. The top of the curtain is fixed to the leather valance of the hood by means of turn-buttons.

The curtain on the front door is fixed by placing the pivot on the curtain frame in the socket on the windscreen pillar. A spring allows this to be pushed upwards until the cup on the frame at the bottom edge of the curtain slides on to the ball top of the door hinge. (See Fig. 38).

When not in use the side curtains should be carefully placed in the special receptacle provided for their storage. This is situated behind the rear seat and is easily accessible. Care should be taken to see that the hinged flap in the front curtain from the driver's side is not bent over when it is put away.

## :: SUNBEAM SERVICE DEPOTS. ::

### SOUTHERN SERVICE AND REPAIR DEPOT.

For the convenience of Sunbeam car owners in London and the South Western Counties, large and well-equipped repair shops are available at 177, The Vale, Acton, W.3. ('Phone: Chiswick 0800.) Here necessary repairs and complete overhauls can be efficiently dealt with by skilled Sunbeam mechanics. Stocks are maintained of spare parts of all Sunbeam models, including those of the Company's early manufacture.



### NORTHERN SERVICE AND REPAIR DEPOT.

Similar facilities are available for Sunbeam car owners in the Northern Counties, a service and repair depot being provided at 208, Eccles New Road, Weaste, Manchester ('Phone, Pendleton 507/8), on the main road to Liverpool. Stocks of spare parts are carried, and clients may rely upon receiving efficient service, whether in the case of repairs or overhauls.





## THE SUNBEAM WORKS.

### MOORFIELD WORKS.

The best testimony to the success achieved by Sunbeam cars, since the inception of the first model over twenty-eight years ago, is the size of the present Sunbeam works. As the years have passed by, development and extension have proceeded apace. To-day, Moorfield Works possesses every conceivable facility for the production of motor cars of the high quality associated with the Sunbeam name.



MOORFIELD WORKS, WOLVERHAMPTON,  
where Sunbeam Motor Cars are manufactured.

The factory, offices, playing fields, and other property and land of the Company cover an area of over 60 acres, the total floor space of the various shops is nearly 30 acres, and the employees number nearly 4,000. The Sunbeam Company gladly welcomes visits from owners or potential owners of Sunbeam cars, so that they may personally see the extent of the works and the thoroughness of the manufacturing methods employed in the production of Britain's Supreme Car.

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