The Ginger SM Roadster

Owners Handbook

THE
OWNER'S HANDBOOK

for

The Singer SM Roadster

THE CAR NUMBER WITH PREFIX AND SUFFIX MUST BE QUOTED IN ALL COMMUNICATIONS.

Below is a reproduction of the Name and Number Plate fixed, to each Singer Car, on the bulkhead under the bonnet on the offside.

SINGER MOTORS LTD.
BIRMINGHAM WORKS.

PATENT Nos
FRONT ANTI-ROLL BAR
LICENSED UNDER BRITISH PATENT 449798.
GEARBOX THRUST COLLAR LOCK
SINGER PATENT 649440.

CAR No.

MADE IN ENGLAND

RECOMMENDED LUBRICANTS.

	VACUUM.	PRICES.	SHELL.	WAKEFIELD	ESSO.
ENGINE SUMMER.	MOBILOIL A.	ENERGOL SAE 30.	DOUBLE SHELL.	CASTROL XL.	ESSOLUBE 30
WINTER.	MOBILOIL ARCTIC	ENERGOL SAE 20.	SINGLE SHELL.	CASTROLITE.	ESSOLUBE 20.
GEARBOX	MOBILOIL BB.	ENERGOL SAE 40.	TRIPLE SHELL.	CASTROL XXL.	ESSOLUBE 40
BACK AXLE	MOBILUBE GX90.	ENERGOL EP SAE90.	SHELL SPIRAX 90 EP.	CASTROL HYPOY.	ESSO EXPEE. COMPOUND 90.

FOR OVERSEAS RECOMMENDATIONS REFER TO CAR-OWNER'S HANDBOOK.

DO NOT REMOVE THIS PLATE.

Address for all correspondence (including service matters in the first instance)

SINGER MOTORS LIMITED, COVENTRY ROAD, SMALL HEATH, BIRMINGHAM, 10.

Telephone: Victoria 2271 (8 lines). *Telegrams:* Singacars, Birming

WORKS AT BIRMINGHAM AND COVENTRY

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FOREWORD

When setting out on our task of compiling this Owner's Handbook, we felt that in view of the Repair and Maintenance facilities which our Distributors and Dealers are now in a position to offer, we should confine ourselves to those servicing instructions, which you, as an Owner of an S.M. Roadster, would normally require to operate the car correctly and maintain it so that it will give satisfactory and improved service. Failure to observe these servicing instructions will, naturally, not only shorten the life of the car, but will also reduce, very considerably, the enjoyment which a correctly maintained S.M. Roadster will give its owner.

If in doubt about any point, the local Authorised SINGER Distributor or Dealer would be willing to place at your disposal his experience in the servicing of Singer Cars, and it would be wise to seek his advice ; particularly before undertaking any adjustment or repair.

Should you feel you would like to write us direct, we should be pleased to hear from you, and to assist us to reply helpfully please quote us the manufacturer's number of the car as given on the Car Name Plate. If your enquiry concerns a Major Unit, such as a Body, Chassis, Engine, Gearbox or Rear Axle, the Unit Number should be also given (for position see page 10).

In your interest, Singer Motors Ltd. have made available through the SINGER Distributor, Dealer, Retailer Dealer, or Trader, from whom the car was purchased new, the 1,000 mile Free of Charge Service which should be carried out, when convenient, after the first 1,000 miles have been completed. (Details of this Service are given on page 5).

The Company have arranged for adequate stocks of Service Parts to be held by their Authorised Distributors at home and abroad.

The recommendations in this book should not be construed as extending or modifying in any way the liability of this Company, as determined by the Singer Guarantee and Conditions of Sale reproduced on pages 53-54.

SERVICE ADJUSTMENTS AFTER 1,000 MILES

Engine

Check and adjust tappets, sparking plugs and distributor points.

Check and adjust slow running if required.

Check and tighten all cylinder head nuts.

Check and adjust dynamo and fan belt, and camshaft chain.

Drain engine oil and refill to correct level.

Check engine for external oil leaks.

Check engine oil pressure and adjust if necessary.

Chassis

Check and top up oil level of gearbox, steering box and rear axle.

Check steering box adjustment, front wheel alignment and adjust if necessary.

Check tyre pressures.

Check steering ball joints and spring U bolts.

Check all chassis and body bolts.

Oil and grease chassis throughout.

Electrical

Check all electrical connections, dynamo charging rate, and adjust if necessary. Top up battery.

Should an Owner, on completion of the first 1,000 miles, find it is not convenient to have the Free of Charge Service carried out by the Distributor or Dealer from whom he purchased the car, he should arrange with the Distributor or Dealer to have the work carried out by the nearest Authorised SINGER Distributor or Dealer.

New Lubricants are chargeable to the Customer.

Ignition. Important.—After the first 500 miles (800 kilometres) check and if necessary set the gaps between the distributor points to .012". For method of adjustment, see page 52.

TECHNICAL DATA

	English	*Metric*
Engine	Four cylinder	
Bore	2.874"	73 mm.
Stroke	3.52"	89.4 mm.
Cubic capacity ...	91.36 cu. in.	1497 cc.
Compression ratio ...	7/1	
Oil pressure warm ...	30/35 lbs. per sq. in. at 30 m.p.h. in top gear	
Firing order	1, 3, 4, 2	
Sparking plug ...	Champion N.8	
Plug gaps	.025"	.63 mm.
Valve clearance warm	.004" Inlet	.1 mm.
Valve clearance warm	.006" Exhaust	.15 mm.
Contact breaker ...	.012" Gap	.3 mm.
Ignition advance ...	5° B.T.D.C. Retarded	
By-pass A.C. Filter ...	Renewable element, type A.C. M.11	
Valve Timing—		
Inlet opens ...	10° before T.D.C. $\frac{15}{16}$" arc on flywheel rim	
Inlet closes ...	50° after B.D.C. $4\frac{11}{16}$" arc on flywheel rim	
Exhaust opens ...	50° before B.D.C.	
Exhaust closes ...	10° after T.D.C.	
Carburetter type ...	Solex F.A.I. Downdraught	
Carburetter setting ...	Choke 24 Main Jet 125 Correction 230 Pilot 45 Starting pilot jet 115 Starter air jet 4	

Gearbox	English	Metric
Overall ratios		
Top Gear		4.875 : 1
Third Gear		6.12 : 1
Second Gear		9.45 : 1
First Gear		14.53 : 1
Reverse Gear		14.53 : 1

Capacities		
Petrol tank capacity	7 galls.	31.8 litres
Water capacity of cooling system	15 pints	8.5 litres
Capacity of radiator block only	7 pints	3.98 litres
Oil capacity of engine sump, dry	7½ pints	4.2 litres
Oil capacity of gearbox, dry	2 pints	1.1 litres
Oil capacity of rear axle, dry	2 pints	1.1 litres

Body Dimensions, etc.		
Overall length	12′ 7.5″	3850 mm.
Overall width	4′ 10″	1473 mm.
Overall height (unladen, hood up)	4′ 10.5″	1486 mm.
Weight, dry	16 cwts. 56 lbs.	838 kgs.

Chassis		
Wheelbase	7′ 7″	2311 mm.
Track (front and rear)	3′ 10.75″	1187 mm.
Ground Clearance, unladen	6.5″	165 mm.
Ground Clearance, 4 up	6″	153 mm.

I.F. Suspension and Steering		
Number of turns of steering wheel from lock to lock	1⅔ turns approx.	
Diameter of steering wheel	16.5″	419 mm.
Front wheel "toe-in" (unladen and measured at centre of tyre tread and at wheel centre height) Total	⅛″/$\frac{3}{16}$″	3.175/4.76 mm
Wheel camber (laden 2 up)	1°	
Wheel castor (laden 2 up)	2°	

	English	Metric
I.F. Suspension and Steering (contd).		
King pin inclination	7°	
Size of wheels	16" × 3.00 D	
Size of Tyres	16" × 5.00"	40.64 × 12.70 cm.
Turning circle	33 feet	10 metres
Rear Axle		
Ratio		4.875 : 1
Electrical Equipment		
Battery	G.T.W. 7A. Capacity, 38 ampere hours.	
Dynamo	C39PV-2. Lucas Service No. 22258A. Two-pole ventilated design, compensated voltage control	
Starter	M35G/I.L.3. Lucas Service No. 25022B. Four-pole design	
Distributor	DKY4A. BP86. Lucas Service No. 40167A.	
Coil Ignition	Q.12. Lucas Service No. 45020A.	
Control Box	RB106-1. Lucas Service No. 37138A. Houses cut-out and dynamo voltage regulator.	
Performance		
Road Speeds at 1,000 r.p.m.—		
Top Gear		15.56 m.p.h.
Third Gear		12.45 m.p.h.
Second Gear		8.04 m.p.h.
First Gear		5.24 m.p.h.
Brake Horse Power—		
11.15 at		1,000 r.p.m.
27.15 at		2,000 r.p.m.
39.1 at		3,000 r.p.m.
46.4 at		4,000 r.p.m.
48.0 at		4,200 r.p.m.
Maximum safe r.p.m.		5,200
Maximum Torque at 2,200 r.p.m.		72 lbs. ft.

NOTES ON CARS SHIPPED ABROAD

On reaching their destinations, cars which are shipped abroad will need certain running preparations.

Check that the level of the water in the radiator, and that the levels of the oils in the engine sump, gearbox and rear axle, are correct (see pages 11, 22, 23 and 27).

Arrange also to have the various grease nipples attended to as soon as possible.

As the engine and transmission will not have been run for some time, all parts above normal oil levels will bear only a thin film of oil, and certain other parts may be quite dry. It is, therefore, essential that the lubricants be thoroughly circulated before severe loads are imposed on moving parts. This can be done by starting the engine (see page 20) and running at a speed of approximately 1,500 r.p.m. for about five minutes, and gradually accelerating when driving off, but *Do Not Travel Above*.

30 miles or 48 kilometres per hour in 3rd gear

45 miles or 72 kilometres per hour in Top gear

Do not exceed the speeds given above until the first 500 miles have been completed: from then onwards, gradually increase the speed in all gears to normal operation. Observance of this rule will ensure prolonged service and smooth running.

When travelling abroad, the customs authorities require the manufacturer's number of the main units. These numbers are located at the following points :—

Enter these numbers **now**

Chassis

On the front end of the chassis offside main side member under the wing and immediately before the bumber support bracket. This number is the same as the chassis number stamped on the Nameplate ... No.....

Engine

On the offside of the cylinder block flywheel housing ... No.....

Gearbox

On the top face of the flange adjoining the clutch housing... No.....

Rear Axle

On the top of the casing ... No.....

Body Number

On the nearside of the bulkhead ... ... No.....

NOTE.—The offside is to the right when seated.

PRELIMINARY SERVICES

On taking delivery.

When preparing the car for the road there are three items which must receive attention, *Water, Petrol and Oil.*

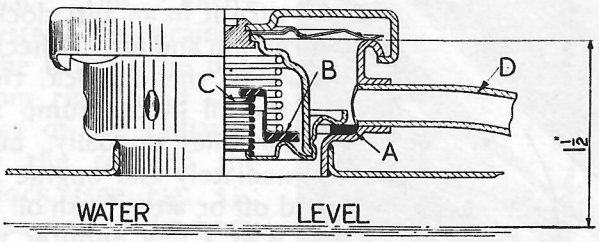


Fig. 1. Section through Pressure-Vacuum Cap.

Water. Open the bonnet to obtain access to the radiator filler. Fill the radiator until the level is 1.5 in. (37 mm.) below the filler opening (see Fig. 1) and use only soft (rain) water to avoid choking the passages of the cooling system with harmful deposits.

The filler cap is fitted with a Pressure Vacuum Valve, which not only prevents possible loss of water but also helps to raise the boiling point several degrees above normal. To be fitted correctly the sealing washer must be in good condition, the seats for the washer in the cap and filler neck clean and free from dirt or foreign matter, and the cap screwed down tightly in the direction indicated on the top of the cap. When draining the cooling system the cap must first be removed.

Petrol. The petrol is carried in a tank at the rear of the car. To open the filler turn the cap in an anti-clockwise direction and lift. The fuel gauge on the instrument panel shows the amount of petrol in the tank when the ignition switch is in the 'ON' position.

The engine has been tuned to give the best results possible with the grade of fuel now available, but a certain amount of incipient detonation or '*pinking*' may be noticed when pulling hard. A high grade fuel, which should be used when available, will help to eliminate these conditions, and also provide smoother running and lower petrol consumption.

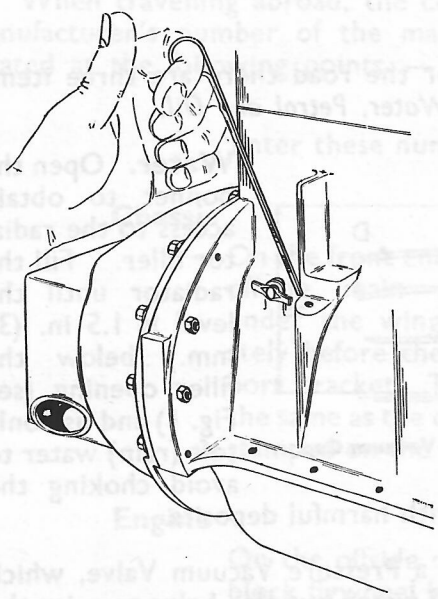


Fig. 2. Dipstick and Cylinder Block Water Drain Tap.

Engine Oil. The recommended grades of oil are given on page 26. The position of the engine oil filler cap is shown in the illustration on page 14. To open the cap turn it in an anti clockwise direction and lift. Check, by means of the dipstick, the level of the oil in the sump at every 250 miles or daily, but not immediately the engine is switched off or after fresh oil is added; wait a few minutes to allow the oil to settle into the sump. To use the dipstick withdraw it, wipe, replace to the full extent and withdraw again. The level of the oil will be shown on the stick, and if not at the "full" mark add clean oil to raise the level to this level. Do not over fill for should there be too much oil in the engine heavy oil consumption and fouled plugs may result.

Engine Oil Pressure. The oil pressure is registered on a gauge on the instrument panel. The reading, which should be checked occasionally, should be approximately 30 to 35 lbs. per square inch. with the car travelling at 30 to 35 miles per hour in top gear.

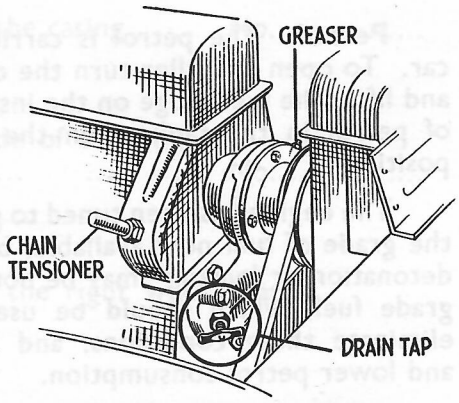


Fig. 3. Chain Tensioner and Water Pump Drain Plug and Greaser.

To Drain the Cooling System. There are three taps which should be opened in order that the entire system be drained. The first in the bottom right-hand corner of the radiator, at the rear of the block (see Fig. 4) ; a second in the body of the water pump on the right - hand side (see Fig. 3) ; a third on the right-hand side of the cylinder block adjacent to the dipstick (see Fig. 2).

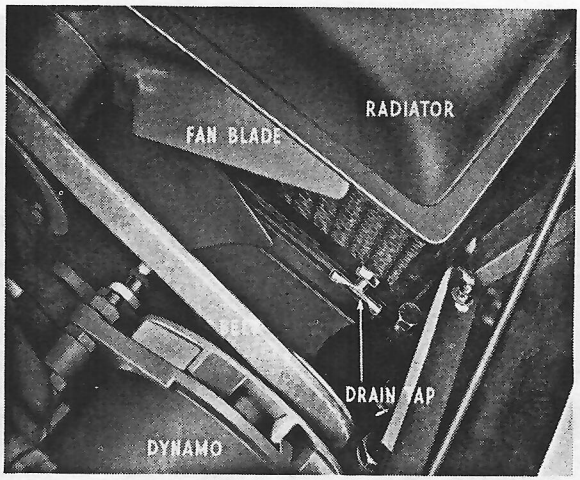


Fig. 4. Radiator Drain Tap.

When frost is expected the entire cooling system should be drained by opening the taps referred to, and removing the Pressure Vacuum Valve Cap. Failure to drain may result in the cooling water freezing and the pressure developed damaging the cylinder block and/or the radiator.

Protection can be obtained by the use of one or other of the reputable brands of anti-freeze mixtures, which should be used as directed by the producers.

Bear in mind to check that the water level in the radiator is correct as instructed on page 11. This procedure reduces to a minimum the loss of anti-freeze mixture down the overflow pipe, and avoids continual topping up which weakens the mixture and reduces the degree of protection.

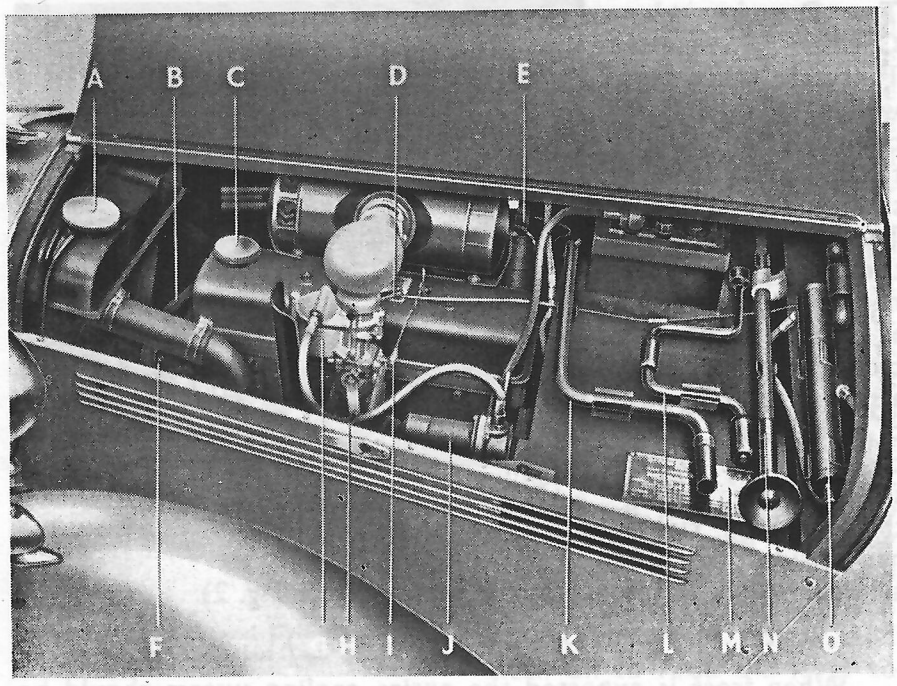


Fig. 5. Engine (nearside).

A. Radiator Filler Cap.
B. Fan Belt.
C. Engine Oil Filler Cap.
D. Choke Control Lever.
E. Ignition Coil.
F. Water Pump Grease Nipple.
G. Carburetter.
H. Bonnet Catch.
I. Throttle Lever.
J. Fuel Pump.
K. Starting Handle.
L. Wheel Brace and Jack Handle.
M. Car Number.
N. Jack.
O. Tyre Pump.

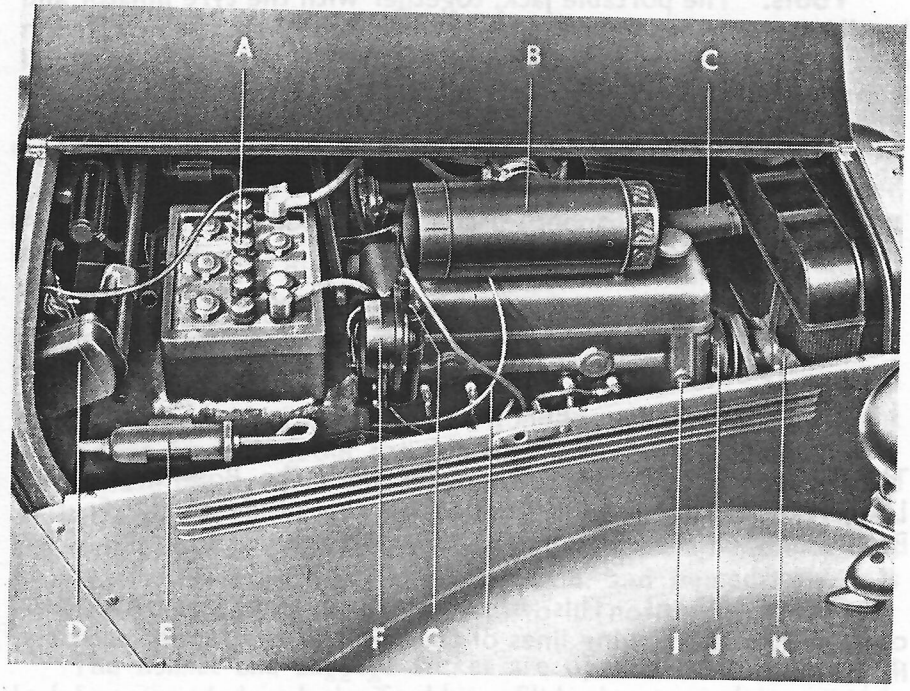


Fig. 6. Engine (offside).

A. Battery.
B. Air Cleaner.
C. Radiator Top Hose.
D. Regulator Box.
E. Grease Gun.
F. Horn.
G. Coil.
H. Throttle Cable.
I. Chain Tensioner.
J. Water Pump.
K. Fan.

Tools. The portable jack, together with the tyre inflator and handle, starting handle, pliers, and wheel brace, etc., are carried in clips on the deck of the scuttle under the bonnet. The tool roll is carried in the luggage locker and contains the following items :—

Screwdriver	Tappet spanner
Adjustable spanner	Open ended spanner
Distributor spanner	Grease gun
Box spanners (1 set)	Tyre levers
Tyre valve remover	Toolbag

Oiling funnel

The Budget Lock Key, which opens both the Bonnet and the Luggage Compartment, is situated on the inside of the Scuttle Boot Casing on the nearside, just forward of the door.

Spare Wheel. This is contained in the luggage locker concealed in the flowing lines of the tail, and is strapped securely in position.

OPERATIONAL SERVICES

Controls

(see *Fig. 7 on page* 18)

The *Accelerator, Brake and Clutch pedals* are of the conventional type.

The *Hand Brake* is of the pistol grip type and is situated under the extreme right of the facia board for a R.H. drive and on the left for a L.H. drive. The control has a thumb trigger release.

The *Screen Wipers* are put into motion by pulling out the handle and turning to disengage it from switch. Then move switch to the left.

The *Bi-Starter* or choke control of the carburetter is brought into action by pulling out the control " Choke." It is not necessary to use the control when restarting a warm engine, nor is it advisable to run the engine for periods longer than necessary, with the control pulled out. As soon as the engine commences to run, push the control to the midway position, and immediately it is possible to do so return the control to its normal position.

The *Bonnet and Luggage Locker* are opened with the budget lock key provided with the Tool kit. Slide the cover plate upwards before inserting the budget lock key in the lock of the Luggage Container.

The *Side and Tail Lights* are switched on by turning the switch containing the ignition key to the right to the position marked 'S.' A second movement to the right to the position marked 'H,' will switch on the *Headlights*.

The *Anti-Dazzle Switch* is situated on the extreme left of the facia board in the case of L.H. drive models and on R.H. drive models will be found on the extreme right. To use the anti-dazzle arrangements, depress this switch and to restore normal lighting, depress again.

The *Horn Switch* is of the pushbutton type and is situated directly above the Ignition Switch.

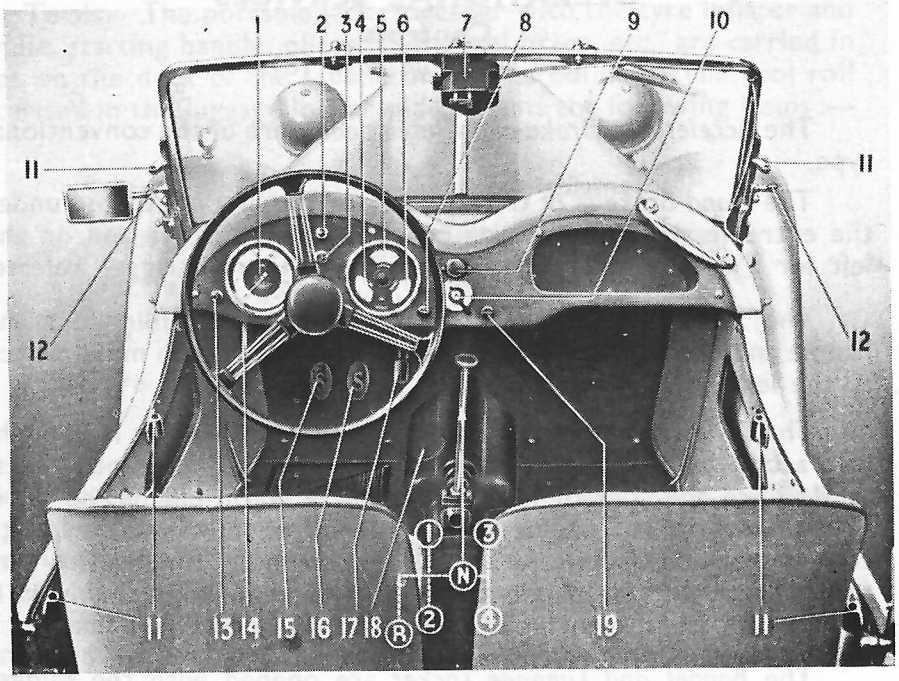


Fig. 7. Facia Board.

1. Speedometer
2. Warning Light
3. Panel Light Switch
4. Oil Gauge
5. Ammeter
6. Petrol Gauge
7. Windscreen Wiper
8. Starter
9. Horn
10. Ignition and Lighting Switch
11. Sidescreen Fixing Bracket
12. Screen Wing Nut
13. Anti-dazzle Switch.
14. Handbrake
15. Clutch Pedal
16. Brake Pedal
17. Accelerator Pedal
18. Gearbox Dipstick Aperture
19. Choke

The *Panel* is illuminated by turning the switch immediately below the warning light, to the right. A second turn to the right will switch off.

The *Speedometer* has no trip arrangement and registers total mileages only.

The *Ammeter* will, during daylight running and with the battery in good condition, seldom register more than a few amperes charge. A discharge reading may be registered when the Headlights are switched " ON," but after a short time the regulator will make the necessary adjustment. On starting the engine from cold the charging rate may be rather high but after about ten minutes' running it will fall to a charge suitable to the state of charge of the battery. At low engine speeds no charge may be registered. This condition is due to the dynamo not rotating fast enough to deliver a charge.

The *Ignition Switch* is operated by a removable key. Turn the key in a clockwise direction to switch ' ON,' and remove it when leaving the car unattended. Immediately the ignition is switched ' ON,' the warning light will glow and will continue to do so as long as the switch is left ' ON ' without the engine running, or when the engine is running but the dynamo not charging. This condition can only be expected when the engine is running very slowly and the dynamo charging rate insufficient to balance the drain on the battery from the coil ignition.

To operate the *Starter* pull out the control marked "START" and release as soon as the engine fires. Do not operate a second time following a false start ; wait until the engine has stopped revolving. Do not also, under any circumstances, operate the control while the engine is running.

By observing the following rules, one will avoid the starter pinion jamming in mesh, but in the event of it doing so, it can usually be released by turning the starter armature by means of a spanner applied to the shaft extension at the commutator end. The extension is exposed by pulling off the small cap.

The *Driving Seat* is locked by a lever situated immediately below and to the front of the seat. When the lever has been released, the seat can be moved backwards or forwards to the position desired.

The *Luggage Compartment.* The lid is held by quadrant links and two straps and can be drawn backward and dropped until the straps operate.

Starting the Engine. It is advisable, particularly in cold weather, to revolve the engine with the starting handle. This will break down the normal inertia of the oil and so conserve the battery and starter.

Check that the gear lever is in neutral and that the handbrake lever is in the "on" position ; switch on the ignition. The red warning light will glow while the engine is not running, and when the engine is running but with the dynamo not charging. This condition can only be expected when the engine is running very slowly and the dynamo charging insufficiently to balance the drain on the battery from the coil ignition. Pull out the carburetter choke control to its full extent, operate the starter switch, and release immediately the engine fires. As soon as the engine gathers speed, push in the choke control to the half-way position.

It should now be possible to drive off at a moderate speed ; but do not forget to push in fully the choke control as soon as the engine is hot enough to run without hesitating.

It is not necessary to use the carburetter choke control when starting a warm engine, nor is it advisable to run the engine for any length of time with the choke control out.

Always remove the switch key when leaving the car unattended.

The **Gear Lever** is situated on the centre line of the car and below the dash. The gear positions are marked clearly on the casting at the base of the gear lever, see fig. 8, page 23 and also Fig. 7, page 18. Note that reverse gear is obtained by moving the lever to the left to the full extent and *against the tension of the spring*, and drawing backward.

Care when Driving. Do not over-drive. It is bad practise, and very harmful to the engine and transmission generally. In addition, it causes wheel spin which in turn gives rise to rapid tyre wear. Change into the top gear as soon as possible for there is no necessity to drive long distances in second before changing to third, and in third before changing into top.

Economy of fuel is achieved by avoiding the habit of changing down and violently accelerating to pass another vehicle, or of changing down at high speeds in order to slow up the car. Bends or corners are either known or are plainly indicated by road signs, traffic in front can always be seen, and it is a simple matter to slow up in time by removing the foot from the accelerator pedal and using the engine as a brake. To slow the car still further, a touch on the brake pedal is all that should be necessary.

It is in your interest to run this car carefully for the first 500 miles or 800 kilometres. Do not exceed 30 miles (48 kilometres) an hour in third gear or 45 miles (72 kilometres an hour in Top. After completing the first 500 miles, (900 kilometres) gradually increase the speed in all gears to normal operation. Observance of this rule will ensure prolonged service and smooth running.

Do not use force when operating the gear lever, or keep your foot on the clutch pedal when the clutch is not in use. It is also bad practise to freewheel by keeping the clutch pedal depressed.

Avoid coasting down hills in neutral; the car is under better control when one of the gears is in engagement and the foot off the accelerator pedal.

In traffic or hilly country, use the second and third gears where possible, but top gear performance is exceptionally good and there is no necessity for frequent gear changes. A little practise will soon make the changing down question almost automatic.

LUBRICATION SERVICES

General Remarks. To a new car owner, we cannot be of greater service than to impress upon him the importance of regular attention to lubrication. A "Summary of Regular Attentions" has been compiled on the assumption that the car will cover about 10,000 miles per year. But even though the car may not be in use or the mileage covered by it during the year be comparatively low, it is good practice for an owner to carry out the routine chassis lubrication regularly at the periods quoted in the "Summary of Regular Attentions" on page 25.

The Name Plate gives the correct titles of five groups of approved Lubricants. We advise you to continue with the selected Group since it is bad practice to mix oils. A facsimile of the Plate is given on the flyleaf.

Use only the recommended Lubricants as directed on the Number Plate which must not be removed from the car under any circumstances.

A list of the Recommended Lubricants is also given on page 26.

Engine Capacity. A gear type of oil pump situated in the engine sump supplies oil automatically to those parts of the engine which require lubrication. To ensure that the lubrication is adequate, one of the recommended grades of oil shown on page 26 must be used and maintained at the correct level. The position of the dipstick for checking the oil level is shown in fig. 2 on page 12. To use the dipstick, withdraw it, wipe, replace to the full extent and withdraw it again. The oil level will be shown on the stick and if not at the correct level, fresh oil should be added to make good any deficiency. A few moments should be allowed before using the dipstick a second time when oil is added or when checking after the engine is switched off. This pause is to allow the oil to drain back into the sump and find its normal level.

Oil Pressure. When starting the engine cold the pressure reading will be rather high, but as the temperature of the engine

increases and the oil thins, the pressure reading will fall to a steady 30 to 35 lbs. per sq. inch when the car is travelling in top gear at 30 to 35 m.p.h. Consequently when the engine is cold, restrict the speed of the car so that pressure remains below maximum gauge reading.

Should the gauge read very low, or the needle oscillate rapidly, it is an indication that the lubrication system is not functioning correctly. First check that there is an adequate supply of oil in the engine sump. If at the correct level, consult as soon as possible the nearest SINGER Distributor or Dealer regarding the low oil pressure reading.

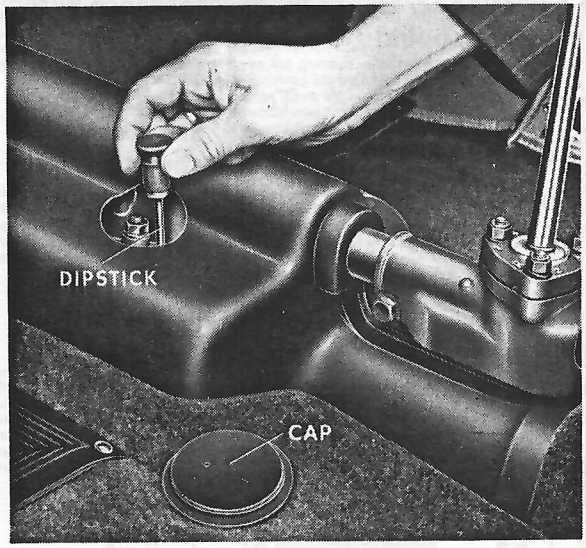


Fig. 8. Gearbox Dipstick.

Gearbox Capacity. Keep the oil at the correct level as shown by the dipstick, access to which can be obtained by removing the rubber cover (see Fig. 8).

Use only the grades of oil recommended on page 26.

Independent Front Suspension and Steering. There are thirteen greasers which need attention at every 1,000 miles, and to ensure that the servicing is carried out correctly, the following method should be adopted.

Jack up the independent front suspension assemblies until the wheels are free of the ground, inject the lubricant until a small quantity exudes from the joint faces of the various connections and

bearings. At the same time turn the steering wheel from lock to lock to help distribute the lubricant over the bearing surfaces.

NOTE.—When servicing the greasers of the tie rods and drag link do not over-lubricate as any such action will burst the rubber boots protecting the joints.

Steering Box. The steering box does not normally use an appreciable amount of oil but add a small quantity each time the 5,000 mile service is carried out. The filler plug is in the cover of the steering box near the adjusting screw. Oil, in accordance with the grade specified, see page 26, should be inserted at this point.

Front Hubs. Pack these with grease. To do this jack each wheel, remove the dust cap, the road wheel and prise out the metal hub cap. Remove the split pin and nut from the stub axle and withdraw the hub assembly from the stud axle. The hub can then be packed with grease and refitted to the car. For grades of lubricants see page 26.

All road wheel studs should be regreased before replacing the wheels, which should be changed front to back and side to side. See Fig. 9, also "Goodyear Tyre" booklet.

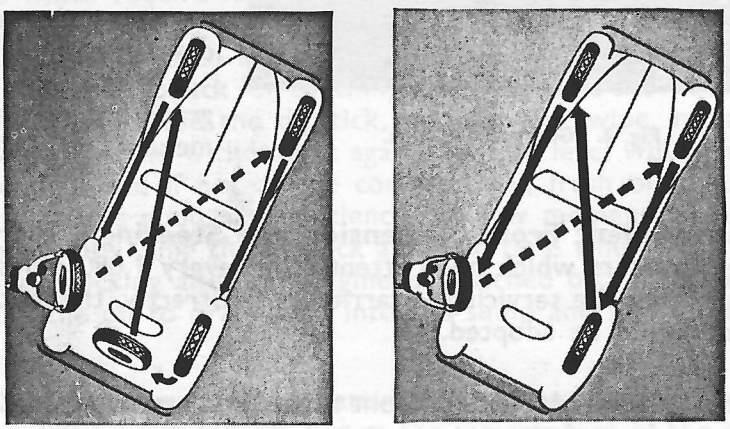


Fig. 9. Exchanging Tyres.

SUMMARY OF REGULAR ATTENTIONS

		LUBRICANT	APPLICATION
DAILY INSPECTION. POINTS "A" ON DIAGRAM	Check fuel supply by switching on ignition and observing gauge.		
	Inspect engine oil level dipstick. Keep the oil at top level by adding the required quantity when necessary.	See page 26.	Fill up at cap.
	Check water level in radiator, use soft (rain) water and keep level to 1.5 m. (37 m.m.) below filler opening.		
	See that the tyres are properly inflated (check pressure each week).		See Goodyear Booklet.
POINTS "B" ON DIAGRAM After each 5,000 miles (8,000 kilometres) running	Wishbones and Swivels, 6 points.	See page 26.	Grease Gun.
	Steering connections, 7 points.	See page 26.	" "
	Inspect gearbox oil level dipstick.	See page 26.	Fill up at dipstick.
	Inspect battery for fluid level.	Add distilled water.	See Lucas book.
	Inspect tyres for damage, and repair.		See Goodyear booklet.
	NOTE.—Rear road springs and inner pivots of wishbones have all rubber bushes and need no lubrications.		
	Inspect distributor.		See Lucas booklet.
POINTS "C" ON DIAGRAM. After each 5,000 miles (8,000 kilometres) running.	Drain and refill engine and clean floating filter.	See page 26.	
	Drain and refill rear axle spiral bevel casing.	See page 26.	Oil funnel.
	Drain and refill gearbox.	See page 26.	Oil funnel.
	Clean by-pass filter element.		
	Clean air silencer.		
	Clean filter in petrol pump.		
	Check spark plugs, distributor and tappets.		See page 30 and 52.
	Check fan belt and timing chain tension.		
NOTE	Grease fan bearings.	See page 26.	Grease gun.
	Grease propeller shaft joints.	See page 26.	Grease gun.
After draining engine and prior to refilling with fresh oil, remove the sump and before re-assembling, clean the sump and the floating filter. Use a new sump joint.	Check front wheel alignment and tracking.		
	Check oil level in steering box.	See page 26.	Oil funnel.
	Front hub. Repack if necessary.		
	Grease rear hub bearings.	See page 26.	Grease gun.
	Grease handbrake, cable, joints and linkage.	See page 26.	
	Adjust brake shoes.		
	Check level of master cylinder supply tank.	Top up with fluid.	Oil funnel.
	Remove road wheels, and change front right to rear left and rear right to front left.		See tyre book.
	Grease wheel studs.	Grease, heavy.	Brush.
	Accelerator controls and cross shaft.		
	Grease and adjust clutch pedal.		
POINTS "D" ON DIAGRAM. After each 10,000 miles (16,000 kilometers) running or every year.	Fit new filter element in main oil filter of engine.		Refill Element ACM.11
	Overhaul dynamo, starter and distributor.		See Lucas booklet.
	Check rear shock absorbers.		Top up if necessary.
	Check steering joints and adjust for toe-in.		
	Inspect and tighten as required, all spring clips, shackles, chassis and body bolts generally.		
	Examine and reline brake shoes if necessary.		
	Check exhaust and silencer clips.		
	Oil door hinges and latches, and bonnet and boot hinges.	Engine oil.	
	Adjust striker plates if necessary.		
	Clean and spray penetrating oil between road spring leaves.		

RECOMMENDED LUBRICANTS

	Vacuum	Price's	Shell	Wakefield	Esso
Engine U.K. {**Summer** / **Winter**	Mobiloil A / Mobiloil Arctic	Energol SAE 30 / Energol SAE 20	Double Shell / Single Shell	Castrol XL / Castrolite	Essolube 30 / Essolube 20
Overseas					
Temps. above 90°F.	Mobiloil AF	Energol Motor Oil SAE 40	Shell X.100 SAE 40	Castrol XXL	Esso Extra Motor Oil 3
32 °F.to 90°F.	Mobiloil A	Energol Motor Oil SAE 30	Shell X.100 SAE 30	Castrol XL	Esso Extra Motor Oil 3
10°F. to 32°F.	Mobiloil Arctic	Energol Motor Oil SAE 20W	Shell X.100 SAE 20	Castrolite	Esso Extra Motor Oil 1
—10°F. to 10°F.	Mobiloil Arctic Special	Energol Motor Oil SAE 10W	Shell X.100 SAE 10	Castrol Z	Esso Extra Motor Oil 1
Below —10°F.	Mobiloil 5W	Energol Motor Oil SAE 5W	Shell X.100-5W	Castrol ZZ	Esso Extra Motor Oil Zero
Gearbox					
U.K.	Mobiloil BB	Energol SAE 40	Triple Shell	Castrol XXL	Essolube 40
Overseas above 10°F.	Mobiloil BB	Energol Motor Oil SAE 40	Shell X.100 SAE 40	Castrol XXL	Essolube 40
Overseas below 10°F.	Mobiloil A	Energol Motor Oil SAE 30	Shell X.100 SAE 30	Castrol XL	Essolube 30
Back Axle and Steering Box					
U.K.	Mobilube GX.90	Energol EP SAE 90	Shell Spirax 90 EP	Castrol Hypoy	Esso XP Compound 90
Overseas above 10°F.	Mobilube GX.90	Energol Transmission Oil EP-SAE 90	Shell Spirax 90 EP	Castrol Hypoy	Esso XP Compound 90
Overseas below 10°F.	Mobilube GX.80	Energol Transmission Oil EP-SAE 80	Shell Spirax 80 EP	Castrol Hypoy 80	Esso XP Compound 80
Front & Rear Hubs					
U.K.	Mobil Hub Grease	Belmoline C	Shell Retinax RB	Castrolease Heavy	Esso Grease
Overseas	Mobilgrease No. 5	Energrease C.3	Shell Retinax RB or A	Castrolease Heavy	Esso Bearing Gr
Chassis Points and Steering Swivels and Links					
U.K.	Mobilgrease No. 4	Belmoline C	Shell Retinax C	Castrolease CL	Esso Pressure G Grease
Overseas	Mobilgrease No. 4	Energrease C.3	Shell Retinax C or A	Castrolease CL	Esso Chassis Gre
Brake and Control Linkage					
U.K.	Mobilgrease No. 4	Engine Oil	Shell Retinax C	Castrolease CL	Esso Grease
Overseas	Mobilgrease No. 4	Engine Oil	Shell Retinax C or A	Castrolease CL	Esso Bearing Gr

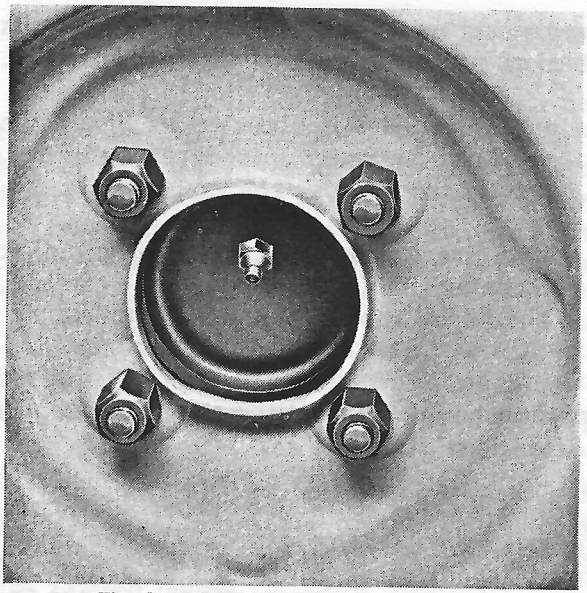


Fig. 10. Rear Hub Grease Nipple.

Rear Hubs. A greaser is provided on each rear hub, see Fig. 10. Remove the hub discs to attend to these. Should a road wheel be removed grease the thread of the studs before replacing the wheel.

Rear Axle. Attention to this unit is of extreme importance. The oils recommended have been carefully tested and found to be entirely satisfactory, and brands other than those recommended by us *must on no account be used.*

The filler plug is located in the centre and on the top of the differential case, the drain plug in the centre and at the bottom of the axle case, and the level plug just below the centre of the axle case rear cover. The capacity of the axle (when dry) is two pints, and care must be taken not to

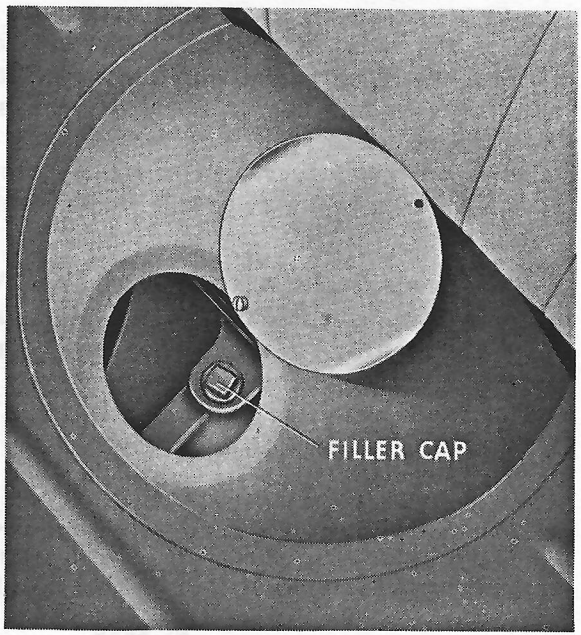


Fig. 11. Rear Axle Filler Plug.

overfill this unit in order to prevent any possibility of oil finding its way on to the rear brakes. Fill only to the oil level aperture.

Access to the filler and level plugs is obtained by lifting the rear seat cushion, and removing the cover in the rear seat pan. The drain plug is best removed from under the car.

Propeller Shaft. Two greasing nipples will be found at the forward end of the propeller shaft, and one at the rear end, to which the grease gun should be applied every 5,000 miles.

Other Details. The times and mileages at which the above and other lubrication points should receive attention are given in "Summary of Regular Attentions" on page 25.

You may wish to attend to the 'daily' and 'group B' recommendations if you are remote from a service station. The remainder of the work will be more expeditiously performed by a qualified operator or your authorised SINGER DISTRIBUTOR or DEALER.

MAINTENANCE SERVICES

Engine. It is not possible to say when or at what mileage the engine should be decarbonised, since its condition depends largely on the manner in which the car is driven and maintained. A general indication is when the engine shows a gradual falling away in power, and for a metallic noise, usually termed " pinking," to be very marked, particularly when the engine is pulling hard.

Decarbonising the engine is not difficult, but it is advisable to entrust it, and any other major adjustments your car may need, to your local Authorised SINGER Distributor or Dealer.

Sparking Plugs. The sparking plug has an important part to play in the running of the engine and has an influence on consumption. Therefore, it fully merits the small attentions that are advised below.

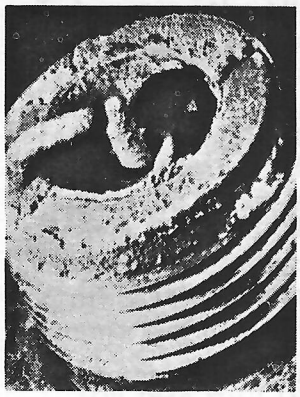
The importance of periodically inspecting, cleaning and testing the sparking plugs cannot be overstressed. Normally, this service should be carried out every 5,000 miles, but during the initial "running-in" period of the car, and after any major overhaul to the engine, it is advisable to carry it out after the first 1,000 miles of running.

Fig. 12. Type N.8.

When removing the plugs always use a box spanner of the correct size, and arrange for each plug to be identified with the cylinder from which it was removed. This helps in many instances to trace the cause of any misfiring which may be occurring.

Should you suspect that a sparking plug is not firing, set the engine running at a fast idling speed and, treating each plug in turn, connect

Fig. 13. Oily, dirty, worn-out Plug.



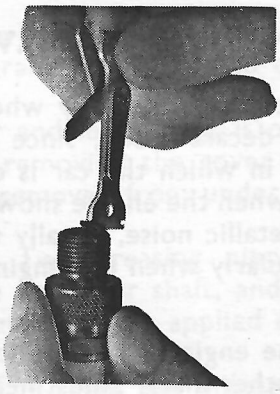
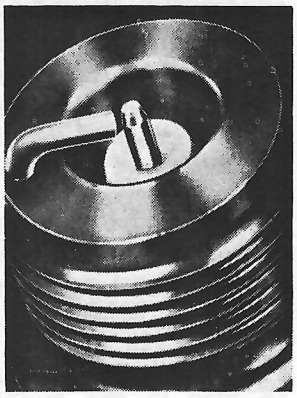


Fig. 14. Setting the Gap between the Sparking Plug Electrode.

Fig. 15. New, clean, efficient Plug.



the terminals to some metal portion of the engine by means of a wood handled screwdriver. When the screwdriver is applied to the plug which is not firing there will be no alteration in the rhythm or beat of the engine. Disconnect the high tension lead, remove the plug with the aid of the sparking plug spanner provided in the toolkit, clean and set, as instructed below, before replacing.

When cleaning a plug on a cleaning machine, it is advisable to wobble it, and if carboned to any considerable extent to remove by scraping as much of the carbon as possible. When cleaning an oily plug first wash it in petrol and allow to dry, as otherwise the cleaning abrasive will stick.

After cleaning do not neglect to blow out all traces of the abrasive and to set the gap to .025"—(.63 mm.) before testing. When setting this gap always bend the side wire, never the central electrode as any such action may split the insulator tip. The condition of the plug insulator is often responsible for poor plug per-

formance. It should be examined for paint splashes; accumulation of dirt and grime; cracks caused by slipping spanners, or the over-tightening of the terminals.

The normal life of a plug is approximately 10,000 miles.

Checking and Adjusting the Valve Timing.

Remove the valve cover and check and, if necessary, set the rocker clearance to .004" (.1 mm.) for the inlet valves and .006" (.15 mm.) for the exhaust valves, (see page 35). Rotate the engine slowly by means of the starting handle, and while doing so, endeavour to oscillate, with the forefinger and thumb, the collar of the inlet valve for No. 1 cylinder. As long as the valve is on its seat oscillation will be difficult, but immediately the valve commences to leave its seat, oscillation will be comparatively easy. Where this condition occurs is the exact opening position of the valve, and for the timing to be correct, the marks 1/4 on the flywheel should, at that point, be 10° or $\frac{15}{16}$" (23.812 mm.), measured on the rim of the flywheel, before top centre.

Any correction which may be necessary should be carried out as follows. Maintain the camshaft in the position of No. 1 cylinder inlet valve just opening and remove the cylinder head front cover. Next disconnect the oil feed pipe from the front pedestal of the rocker shaft. With a $\frac{7}{16}$" open-ended spanner remove the chain adjuster by working on the nut nearest the cylinder head, to avoid altering the adjustment. Bend back the lock tab of the bolt securing the chain wheel to the camshaft and remove the bolt with the plain and tab washers. Prise the chain wheel, complete with chain, off the camshaft. *Do not allow the assembly to drop as this will disengage the chain from the intermediate chain wheel.* Support the chain and wheel to permit the flywheel being moved backwards then forwards and positioned with the marks 1/4 at $\frac{15}{16}$" (23.812 mm.) before top centre. Lower chain and wheel sufficiently to permit the chain being worked over the wheel a tooth at a time, and continue this operation until it is possible to engage the holes in the wheel with the pegs on the camshaft driving flange without altering the positions of the crank or camshafts, and with the

right-hand length of the chain in tension. This last-mentioned instruction is most important and must be carried out if the timing is to be set correctly. Secure the wheel temporarily to the camshaft, re-engage the chain tensioner with a slightly abnormal tension setting—and recheck the valve timing.

If correct, reassemble in the reverse order to dismantling. Do not forget to tighten and secure by tab washers all nuts released, also to set the chain tensioner correctly—see foot of page.

Clutch Pedal. When the standard free movement of approximately $\frac{3}{4}$" is not present in the pedal, attention is necessary, and it is advisable to entrust the adjustment to an authorised SINGER Distributor or Dealer. The term "free movement" means the amount the pedal travels before resistance can be felt and is measured between the pedal pad and the floorboards.

Oil Filters. There are two filters in the engine lubricating system. One in the sump and the other an A.C. by-pass type with a renewable element bolted to the crankcase on the nearside. These should be attended to as directed in the "Summary of Regular Attentions," on page 25.

Petrol Filter. This is situated in the body of the petrol pump. The filter should never be cleaned with a rag, but with a stiff brush and a quantity of petrol. The times and mileages at which this operation should be carried out are given in the "Summary of Regular Attentions."

Camshaft Chain Adjustment. Secure from turning, with a fairly thin $\frac{7}{16}$" spanner, the lock nut of the chain tensioner, and with the aid of a second $\frac{7}{16}$" spanner, remove the cover of the tensioner—the lock nut is the one nearest the cylinder head.

Release the lock nut and, with a $\frac{3}{16}$" spanner, screw "in" or "out" the threaded plug of the tensioner until the distance between the end of the cottered plunger and the end face of the threaded

plug is $\frac{11}{32}$" inches. It is important that this dimension is not exceeded or reduced as any such action will cause the chain to wear abnormally.

Fan Belt Adjustment. Release the nuts securing the Dynamo to its front and rear support brackets and also the nuts securing the adjusting link to the Dynamo and Water Pump casing. Raise the Dynamo until it is possible to depress the length of belting between the fan and the crankshaft pulley approximately $\frac{1}{2}$". Then securely tighten the adjusting link nuts, and also those securing the Dynamo to its front and rear support brackets.

Servicing the A.C. Combined Air Cleaner and Carburetter Intake Silencer. Detach the Air Cleaner by removing the nut holding the forward stay to one of the valve cover studs and then releasing the clip securing the cleaner to the carburetter air intake.

Clean and re-oil the oil-wetted cleaner portion by swilling the windowed end of the cleaner in a shallow pan of paraffin. After drying, the mesh should be lightly re-oiled with engine oil, allowing any surplus to drain off before refitting to the engine.

The Air Cleaner should be removed and cleaned, in the manner described above, after each 5,000 miles (8,047 kilometres).

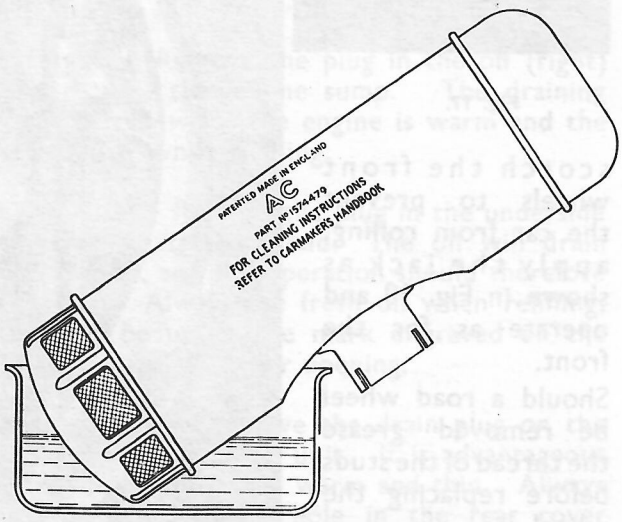


Fig. 16. Method of Cleaning A.C. Cleaner.

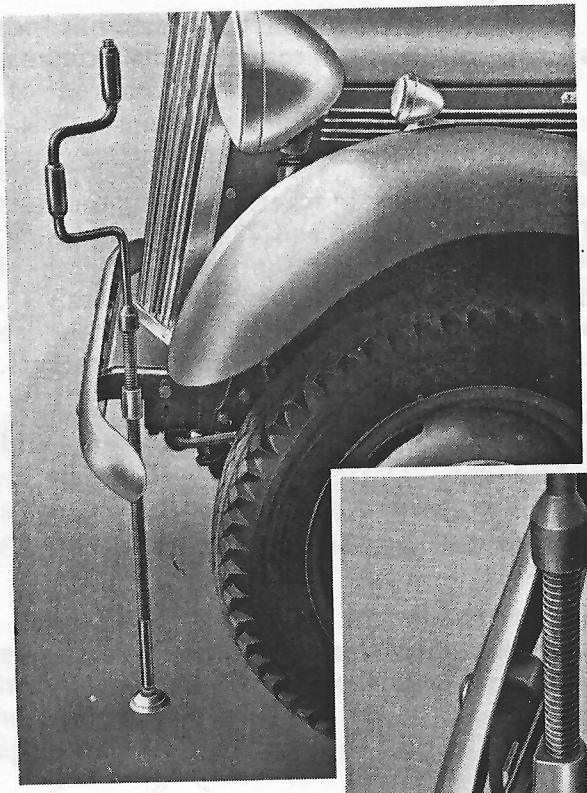


Fig. 17.

To Jack up a Front Wheel, see that the hand brake is in the fully on position, then apply the jack as shown in Fig. 17. Raise by winding the wheel brace in a clockwise direction ; to lower, wind anti-clockwise.

To Raise the Rear of the Car, scotch the front wheels to prevent the car from rolling, apply the jack as shown in Fig. 18 and operate as for the front.

Should a road wheel be removed grease the thread of the studs before replacing the wheel.

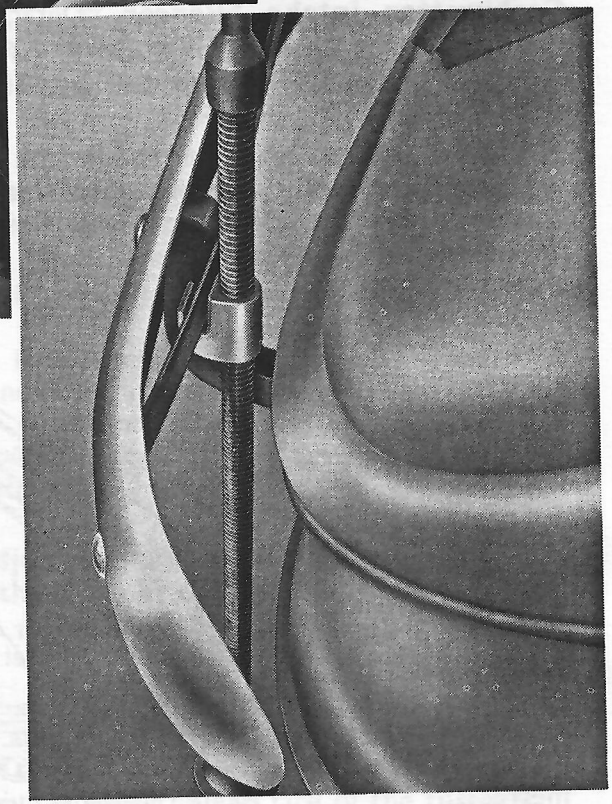


Fig. 18.

To Adjust the Rockers. Rotate the engine slowly by means of the starting handle until the cam follower on the rocker to be adjusted is in the centre of the neutral portion of the cam. Release the lock nut on the valve end of the rocker and, with a screwdriver, screw "in" or "out" the adjusting screw until in the case of an inlet valve, the clearance between the adjusting screw and valve stem is .004" (.1 mm.) and an exhaust valve .006" (.15 mm.). *Use feeler gauges of .004" and .006" thickness.*

Tighten the lock nut and recheck the clearance.

The use of the following table will help to position the rockers readily, and to complete the adjustment with the minimum amount of engine turning.

No. 1	Tappet	with	No. 8	Valve	fully	open.
No. 3	,,	,,	No. 6	,,	,,	,,
No. 5	,,	,,	No. 4	,,	,,	,,
No. 2	,,	,,	No. 7	,,	,,	,,
No. 8	,,	,,	No. 1	,,	,,	,,
No. 6	,,	,,	No. 3	,,	,,	,,
No. 4	,,	,,	No. 5	,,	,,	,,
No. 7	,,	,,	No. 2	,,	,,	,,

To Drain the Engine. Remove the plug in the off (right) side and towards the rear of the engine sump. The draining is best carried out after a run when the engine is warm and the oil thin. Always use fresh oil when refilling.

To Drain the Gearbox. Remove the plug in the underside of the gearbox and towards its front end. The oil will drain away readily when it is warm, and the operation should therefore be carried out after a run. Always use fresh oil when refilling, the level of which should be up to the mark engraved on the dipstick which forms the plug of the filler opening.

To Drain the Rear Axle. Remove the drain plug on the underside and in the centre of the axle unit. It is advantageous to drain after a long run when the oil is warm and thin. Always refill with fresh oil up to the level hole in the rear cover of the axle unit—the hole is normally covered by a knurled cap.

Front Wheel "Toe-in." Apart from normal routine lubrication an occasional check that all securing bolts and nuts are tight and that the front wheel alignment or "toe-in" is correct, no special attention is necessary. "Toe-in" is the amount by which the distance between two points on the centre line of the tread of the front tyres, taken at wheel centre height and forward of the swivel axles, is less than the distance between these same two points when rear of the axles and at wheel centre height. The total "toe-in" for both wheels is $\frac{1}{8}$"—$\frac{3}{16}$" that is $\frac{1}{16}$"—$\frac{3}{32}$" for each wheel.

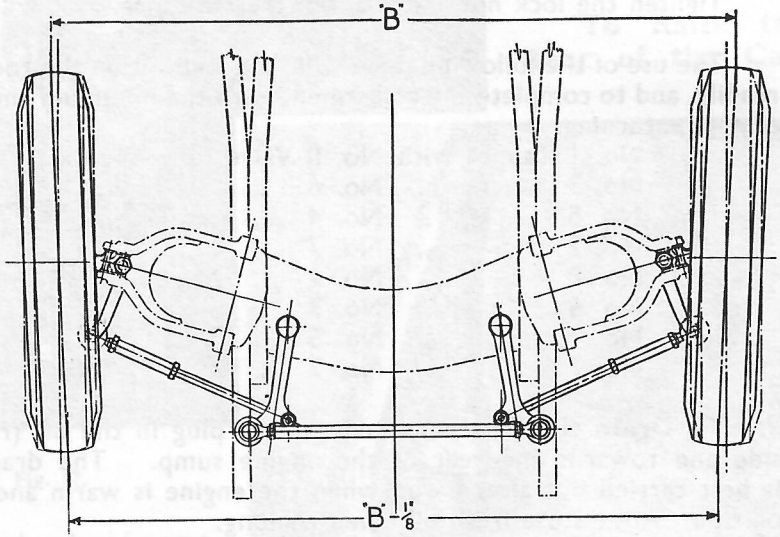


Fig. 19. "Toe-in".

To Check and Rectify "Toe-in."

(1) Check and correct as necessary the tyre pressures (see page 44).

(2) Check the "toe-in" of each wheel by means of one of the proprietary types of checking gauges available and if it is not between $\frac{1}{16}$" and $\frac{3}{32}$", reset as follows :—

(3) Set the steering so that the steering lever of the Steering Box and the idler steering lever occupy the position shown in Fig. 19.

(4) Measure by means of a trammel the distance between the centres of the steering box rocker shaft and that of the idler lever. The distance between the centres of the side tie rod inner ball pins should be of this dimension. If not, lengthen or shorten the tie rod to make it so.

(5) Ensure that the steering levers are in the position shown in Fig. 1 and then adjust the lengths of the side tie rods so that each wheel "toes-in" $\frac{1}{16}$"—$\frac{3}{32}$", thus giving a total "toe-in" of $\frac{1}{8}$"—$\frac{3}{16}$".

(6) Set the lock-stops on the chassis frame to give maximum equal locks to right and left.

Tie Rod Adjustment. To adjust the length of the tie rods, release lock nut at either end of the central tube and turn the tube in the required direction for lengthening or shortening. Re-tighten the lock nuts, and before doing so make sure, to avoid cross-binding on locks, that the ends of the cylindrical bodies of the tie rod joints are in the same plane.

To Remove Front Shock Absorber. Jack up the car on the side to be treated by placing the Jack Pad of a bottle jack under the lower wishbone and just clear of the nut securing the lower member of the shock absorber to the wishbone. Remove the front wheel. Remove the four bolts securing the shock absorber top bracket to the spring top support bracket, and also the nut securing the lower member of the shock absorber to the wishbone. The shock absorber complete with top bracket can now be withdrawn. Note the distance piece between the arm of the spring bottom carrier bracket and the wishbone, also the spring washer under the head.

To Remove the Coil Spring. For convenience we have divided the operation into three stages which are clearly shown in Fig. 20, page 38. To help illustrate all the operations in Stage 2 we have shown the extractor alone turned through an angle of 90°.

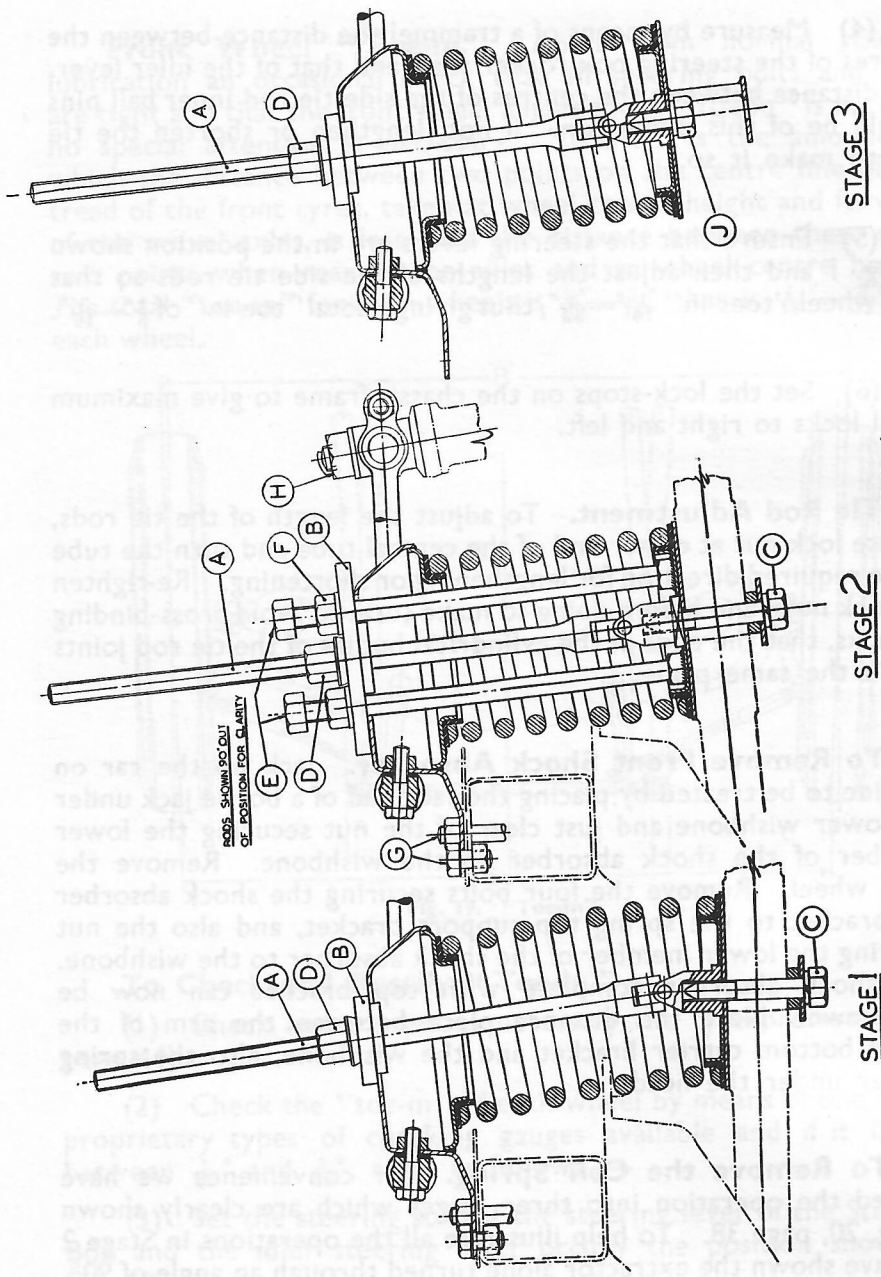


Fig. 20. Method of Removing Coil Spring.

(This tool can be obtained from our Service Department, Coventry.)

Stage (1). Insert the rod "A" of the extractor complete with plate "B" and nut "D" into the spring as shown in illustration Stage (1). Make sure that the square of the bottom joint of the extractor fits into the square formed in the bottom carrier of the spring. Insert the original distance piece between the arm of the carrier and the wishbone and secure the bottom joint of the extractor by means of the long bolt "C" and the original spring washer. Now tighten up the nut "D" down to the shoulder of the rod "A".

Stage (2). Insert the securing bolts "E" through the holes in the plate "B" and screw them into the nuts welded to the bottom carrier bracket. Lock the bolts with the nuts "F". Remove the nut "H" and the swivel axle and swing the top wishbone, complete with trunnion, upwards and from off the swivel pin. Then allow the swivel pin and hub assembly to pivot downwards out of the way. Remove the nut "C" and withdraw the rod assembly "A" out of position. Remove the five securing bolts "G"—four long ones inserted from underneath and one short from above—and withdraw the spring top support bracket complete with top wishbone and spring.

Stage (3). Secure the assembly in a vice, insert the rod "A" and secure the lower joint with the short bolt "J". See that the nut "D" is tightened down onto the shoulder of the rod, and then remove the bolts "E". Release nut "D" when the various parts can be dismantled.

Re-assembly is carried out in the reverse order to dismantling, and on completion the wheel camber should be checked and if necessary corrected as shown in the Fig. 22, on page 40.

Shock Absorbers. The shock absorbers controlling the front suspension are of the Armstrong Telescopic type with integral bump and rebound stops.

The Armstrong Double-Acting Self-Regulating Hydraulic shock absorbers on the rear suspension are of the Vertical Cylinder type.

Any queries concerning these units should be addressed direct to:—

Armstrong's Patents Co. Ltd.,
Eastgate, Beverley, Yorks.

To Check and Adjust the Camber Angle. The Camber Angle is the angle at which the topmost point of each front wheel leans away from the vertical and from the centre line of the car. The dimension of the angle is 1° with a passenger in each front seat. The angle can be measured by any of the proprietary gauges now available, and if necessary altered in the manner suggested in Fig. 22.

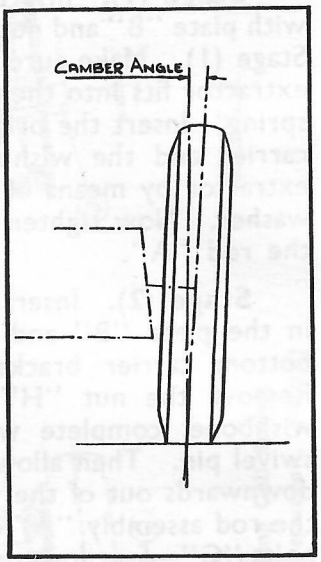


Fig. 21. Camber Angle.

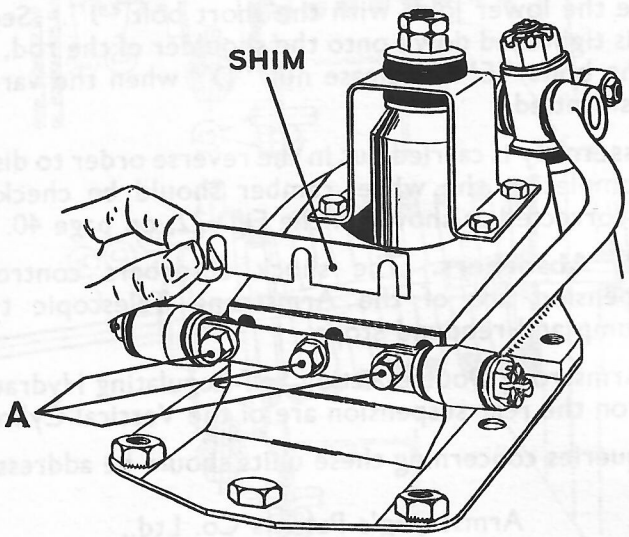


Fig. 22. Method of Adjusting Camber Angle.

Brakes.

The Brakes fitted to the front wheel are the Girling 9 × 1¼ Hydraulic Leading Shoe, Sliding Show Type. The shoes are not pivoted but slide on their abutment and expander ends.

The brakes fitted to the rear wheels are of the mechanically operated type.

A balancing linkage is provided between the front and rear brakes and this is correctly adjusted before the car leaves the factory. Should any re-adjustment be necessary, it is advisable to entrust this work to your local SINGER DISTRIBUTOR or DEALER. In the case of an emergency, the brakes should be balanced as instructed on page 43.

Front Brake, Master Cylinder and Reservoir Assembly. The reservoir is attached to the lower portion of the steering column (see Fig. 23) and the only service attention necessary is to check, and maintain, the level of the fluid to approximately three quarters full, by adding GIRLING CRIMSON BRAKE FLUID. When adding fluid, exercise great care to avoid dirt or foreign matter entering.

On no account must a lubricating oil be added to the system.

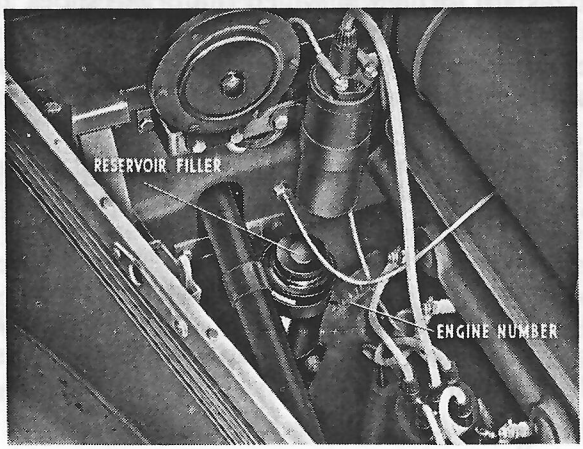


Fig. 23. Master Cylinder Reservoir.

Adjusting the Front Foot Brakes. Girling brakes are adjusted for liner wear only. The adjustment is made at the brakes themselves.

To adjust, jack up the car until a front wheel is clear of the ground and release in an anti-clockwise direction both hexa-

gon headed adjuster bolts on the brake plate. Turn one of the adjuster bolts in a clockwise direction until the brake shoe touches the brake drum. Release the adjuster until the shoe is just free of the drum. Repeat the procedure for the second adjuster, and spin the wheel to check that the brake shoes are quite free of the drum. Repeat the adjustment for the second front wheel. The adjusters, operating snail type cams against the shoes, are frictionally held in position and require no locking device.

When replacement shoes have been fitted, release the adjuster to one additional click from the normal setting to allow for expansion of the new linings. When the shoes have "bedded" down, the brakes should be re-adjusted to the normal setting.

Adjusting the Rear Foot Brakes. Adjustment for brake lining wear is made by the adjuster to be found on each brake plate.

A hardened steel cone (a), on the Brake diagram, the spindle of which is screwed with a fine thread, is carried in a steel housing (b) which is spigotted and bolted firmly to the backplate. On the outside end of the cone spindle are machined flats which enable a spanner to be used, and on its inner face four flats of a pre-determined depth are cut.

The cone engages two plungers (c) also with a bearing in the housings (b) which have inclined faces. On the outer end of these plungers, actuate grooves are formed in which the brake shoes are carried. The housing and cone are both cadmium plated to prevent rust, and the thread of the cone spindle remains inside the housing at all times, thus preventing damage.

The rotation of the cone, in a clockwise direction, causes it to move inwards, forcing apart the plungers and expanding the fulcrum ends of the brake shoes. All cones operate in a clockwise direction.

When adjusting, rotate the cone with a spanner until a resistance is felt (this is the shoe coming into contact with the drum), then slack back the cone one full notch or two clicks ; these clicks can be felt and heard quite plainly.

Adjustment for lining wear should be made with the car in its running position, that is, on the ground. Jacking up is

unnecessary and is not recommended for this operation. The car should stand on a flat and level surface and the hand brake should be released before any attention is given. *This is most important.* After the adjustment is completed, it is advisable to give the brake pedal a firm application before test in order to ensure that the expanders are centralised and the shoes quite free in the drums. *This is the only adjustment required. Do not tighten up the brass expander nuts on the outside of the backplate. These should be one turn slack. The aluminium housing must be freed to float.*

To balance front to rear brakes refer to the diagrams between pages 40-41 and proceed as follows:—

1. Jack up the car until all four wheels are clear of the ground, and adjust the brake shoes so that they all bear hard against their brake drums.

2. Disconnect the long intermediate rod 8 from the long lever Z on the chassis cross member.

3. Check that the brake pedal W is being kept hard up against the floorboards by the pull off spring.

4. Adjust the length of the master cylinder push rod M so that the pin N, working in the slot S, is approximately in the position shown in the diagram in relation to the ends of the slot S, and the hardened steel end of the push rod just bearing against the master cylinder piston. Remove the rubber boot to check this condition (see Fig. 3).

5. Draw the lever L forward so that it bears against the stop X and adjust the rod R so that with the push rod bearing lightly against the piston of the master cylinder, the pivot T is one-sixteenth of an inch from the front end of the slot V.

6. Maintain the linkage in this position, and adjust the long rod 8 so that with the long lever Z pulled fully forward, the clevis pin can just couple the rod to the lever.

The linkage can now be considered to be correctly adjusted. Normally this adjustment should not be necessary since it is correctly set before the car leaves the factory, and should therefore need no attention unless replacement parts to the linkage have to be fitted or a complete overhaul of the braking system has been carried out.

Handbrake. The handbrake is attached directly to the foot brake mechanism and requires no independent adjustment.

TYRES AND BODY SERVICES

Tyres. By courtesy of the Goodyear Tyre and Rubber Company, their Booklet "How to make your tyres last longer" is supplied with the car. Follow the advice given closely, and you will be well repaid.

It is a good point to make a practice of checking the tyre pressures weekly, and these should be as follows:

Size ... 5.00 in. × 16 in.

Pressure ... Front wheels—18 lbs. per sq. in.
Rear wheels 20 lbs. per sq. in. with two passengers
23 lbs. per sq. in. with four passengers

Take care to keep the tyres on one axle at the same pressure. Unsteadiness of the steering is often due to under-inflation or unequal inflation of the front tyres and this also results in a tendency for the steering to pull to either side.

Care of Paintwork. The exterior of the body is finished in cellulose and dust can be removed with a soft cloth, but mud should always be removed by washing either by pressure or by means of a large sponge and plenty of water. The body should then be dried with a leather and polished. The appearance of the cellulose finish is actually improved by frequent polishing and there are many excellent polishes on the market, which, if used in accordance with the directions printed on the container, give very satisfactory results. On no account should metal polish be used.

Care of Chrome Plating. Do not use metal polish on the chromium plated fittings, these should be cleaned by washing, and, when the dirt has been removed, polished with soft duster.

Care of Carpets. The carpets should be well brushed out once a week and on convenient occasions cleaned with a vacuum cleaner.

Care of Upholstery. The upholstery may be cleaned by wiping over with a cloth damped with warm water and a small quantity of good quality toilet soap, and then dried. Caustic soaps, petrol or spirits of any kind must not be used as these have a deleterious effect.

Doors. Inspect the door hinges periodically as instructed in the summary of attentions and apply a little oil to ensure they are working easily. It is also advisable to smear the door catches and striking plates with a little grease at the same time as the hinges receive attention. Do not put too much grease on the catches and striking plates otherwise clothes may suffer on entering or leaving the car. Check over body bolts occasionally and keep the floor and pedal boards tight—the latter are a frequent cause of rattles and a little care will always prevent them from working loose.

Washing Road Wheels. The best and correct way of washing road wheels is to remove them from the car. They can be washed in position if water is applied by means of a brush or large sponge but if water is forced on to the wheels at high pressure there is a very big chance of it entering the drums and causing a certain amount of inconvenience, so far as braking is concerned.

Storing Hood and Side Curtains. The erection, lowering and stowing away of the hood and side curtains is quite a straightforward matter, but the following hints are given and will be found useful when doing this for the first time. Assuming that the hood and curtains are erected, the procedure for lowering and storing away of the hood and side curtains is as follows :—

(*Note that Operation 4 is not necessary on later models fitted with a spring-loaded hood*).

1. Release the Press Studs inside the car for the Side Panels of the Hood.

2. Release the Zipp Fasteners in the Side Panels of the Hood.

3. Release the lift-the-dot fasteners from the Front Windscreen and throw the Hood back over the hoop sticks.

Fig. 24. Releasing Lift-the-dot Fasteners.

To release these fasteners, insert the tips of the fingers of one hand behind the piping of the hood material, and, while drawing the hood forward, raise the fasteners with the other hand as shown in fig. 24.

4. Unscrew the knurl nuts on the hoop stick props. See Fig. 25.

5. Pull the back squab forward.

6. Lower the hoop sticks and neatly fold back, into the recess in the body, the rear light of the hood; at the same time pull the material from between the hoop sticks to prevent creasing.

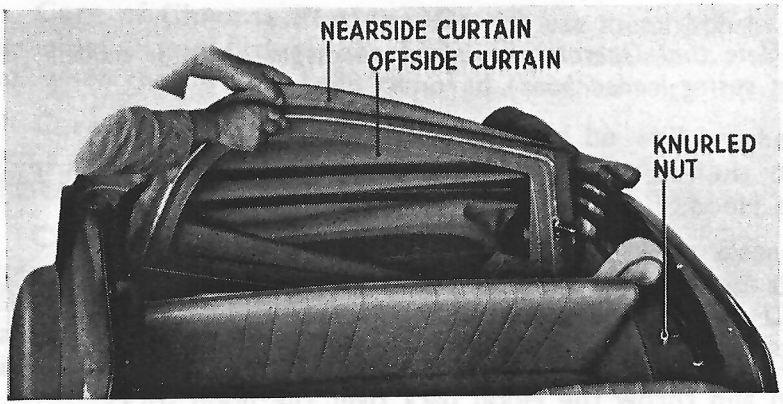


Fig. 25. Placing Curtains in Recess.

7. Place the near-side curtain in the recess at the back of the rear squab with the pegs pointing downwards and the inside of the curtain facing forward. See Fig. 26.

8. Place the off-side curtain in the recess with the outside facing the rear squab board, and, as before, with the pegs pointing downwards. It may be necessary to lift the near-side curtain slightly to ensure that both curtains can be inserted well towards the bottom of the recess.

NOTE.—When glass side curtains are being stored, position the rear-side curtains between the rear panel of the body and the outside of the near-side glass side curtain.

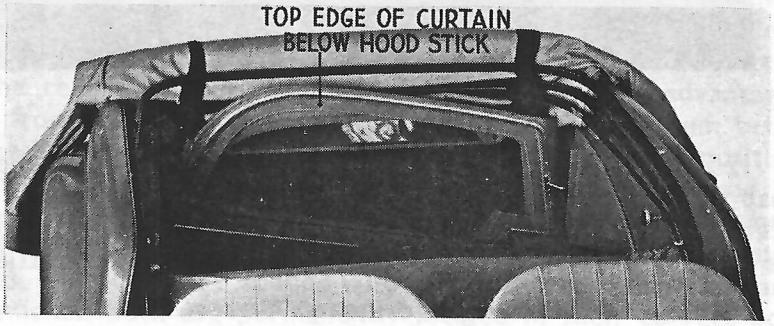


Fig. 26. Curtains in Recess.

9. Fold inwards the off-side rear side curtain along the seam of the triangular light, and place the complete rear side curtain against the offside curtain, as shown in Fig. 27, page 48.

Similarly treat the nearside curtain.

10. Fold for about 6" both the side edges of the Hood and also the front edge for about a foot. The hood should now be folded over the two side curtains in the recess and tucked well in between the curtains and the forward wall of the body recess.

11. Replace the back squab into position and fasten first the central lift-the-dot fastener on cars with nine fasteners, and the two central studs simultaneously on cars with ten fasteners.

The remainder should then be fastened alternately on either side.

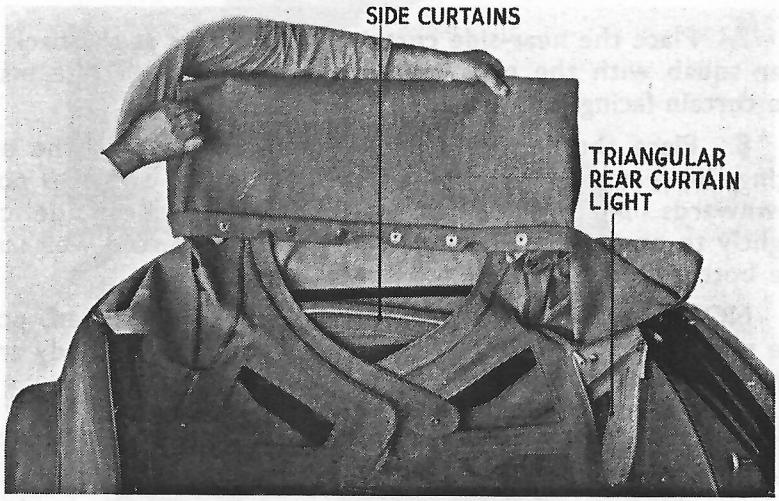


Fig. 27. Folding Rear Curtains and Hood.

12. If these instructions are carefully carried out, the rear squab will go back sufficiently far enough to allow the cover to be fastened satisfactorily. A slight amount of tension, however, in this cover may be present, and is necessary to eliminate rattle.

Method of Fitting Tonneau Cover.

1. The zipp fastener on the tonneau cover must be closed.

2. Fit tonneau cover completely across scuttle.

3. Fit tonneau cover to nearside rear corner stud, and then to the corresponding stud on the off-side.

NOTE.—The studs referred to above are the rear-most studs of the three on each side of the body.

4. Fit the cover to the centre stud on a car with nine studs, and on a car with ten studs to the two centre studs.

5. Fit the cover to the rear studs—left first, then right.

6. Finally, fit the cover to the studs on the sides of the body.

If the driver requires to use the tonneau cover for the protection of the remainder of the car while on the road, then the zipp fastener should be released and the tonneau cover removed from the driver's seat.

ELECTRICAL EQUIPMENT

Headlamps.

Headlamps using "block pattern" lens make it possible to revise completely the existing methods of headlighting for vehicles, and enable the use of a double-dipping system which, whilst giving double the amount of light for driving in the dipped position, restricts the amount of dazzling light to the level of present dip-and-switch systems. Effective utilisation of all available light from the bulb and reflector has also resulted in a marked increase of usable light for illuminating the road when driving in the non-dipped or normal headlight position.

In the new double-dipping system, the "block pattern" lens are used in conjunction with the well-known Lucas Light Unit, a method of headlamp construction which employs a reflector and front lens permanently fixed to each other and a specially designed bulb fitted into the reflector from the rear. Several important advantages accrue from this method of construction, the chief of them being that the bulb—by virtue of its design, can be fitted in one position only in the reflector; once this position has been determined by the designer to give correct focusing, it cannot be subsequently altered. With the double-filament bulb used to provide dipping facilities, this advantage applies with equal force to both main and dip filaments, both are permanently located in their correct positions with respect to the focal point of the reflector.

Replacement of Bulbs. Lucas Genuine Spare Bulbs are sold by any reputable garage. To assist identification Lucas Bulbs are marked on the metal cap with a number. When fitting a replacement see that it is the same number as the original bulb (see pages 50-51).

It is advisable to replace bulbs after long service before they actually burn out as often the filament may sag.

Headlamps. To gain access to the bulb, slacken the screw at the top of the lamp and remove the front rim and Light Unit Assembly. Twist the back shell in an anti-clockwise direction and pull it off. The bulb can now be removed from the rear of the

reflector. Place the correct replacement bulb (see below) in the holder and engage the projection of the backshell with the slots in the bulb holder, press on and secure by twisting to the left.

Stop Tail Lamps. Fold back the rubber lip and withdraw the front rim; next fold back the inner rubber lip and withdraw the glass. Press gently on the bulb and turn in an anti-clockwise direction. The bulb can now be withdrawn. Note that the replacement bulb cannot be inserted incorrectly since it is fitted with offset pins. To replace the glass, hold the rubber lip down with the fingers and after inserting the glass, release the lip which will grip the glass tightly. Replace the front rim in a similar manner.

Side Lamps. Slacken the screw at the top of the lamp, and the front together with reflector can be withdrawn. The bulb holder is clipped on the back of the reflector and should be withdrawn by twisting to the left and pulling off. When replacing the bulb holder, position it so that the slots in its rim will engage with the springs in the back of the reflector on pressing it home.

Number Plate Lamp. To obtain access to the bulb, remove the screw situated in the centre of the cover and detach the cover.

The lighting equipment is grouped as follows:

Group	*Specification*	*Countries*
A.	Headlamp S.700 with Bulbs No. 354 pre-focus 12v. 42/36w.	For Australia, British East Africa, British West Africa, Ceylon, Channel Islands, Cyprus, Gibralter, Hong-Kong, India, Irish Republic, Malta, Malaya, Mauritious, New Zealand, Pakistan, S. Rhodesia, Union of South Africa, Great Britain.
B.	Headlamp S.700 with Bulbs No. 301, pre-focus 12v. 36/36w.	For Argentine, Bermuda, Brazil, British West Indies, Canada, Iran, Iraq, Israel, Siam (Thailand), U.S.A., Uruguay, Venezuela.
C.	Headlamp S.700 with Bulbs No. 360, 12v. 45/35w.	For Belgium, Canary Islands, Denmark, Dutch East Indies, Egypt, Finland, Germany, Morocco, Netherlands, Norway, Portugal, Spain, Switzerland, Sweden, Turkey.

Side Lamps used with Headlamps A, B, C
Bulb No. 207. 12v. 6 watt. S.C.C.
Stop and Tail Lamps Bulb No. 361. 12v. 6/18 watt. S.B.C.
Number Plate Lamp Bulb No. 989. 12. 6 watt. M.C.C.
Warning Light on Instrument Panel
Bulb No. 970. 2.5v. 0.2 amp. M.E.S.
Panel Light Bulb No. 987. 12v. 2.2 watt. M.E.S.

Battery. The battery is situated under the bonnet, and provided it is serviced as advised in the "Summary of Regular Attentions" and maintained as directed in the Lucas Instruction book supplied with the car, it will function satisfactorily. If in doubt about any condition consult the nearest Lucas Depot.

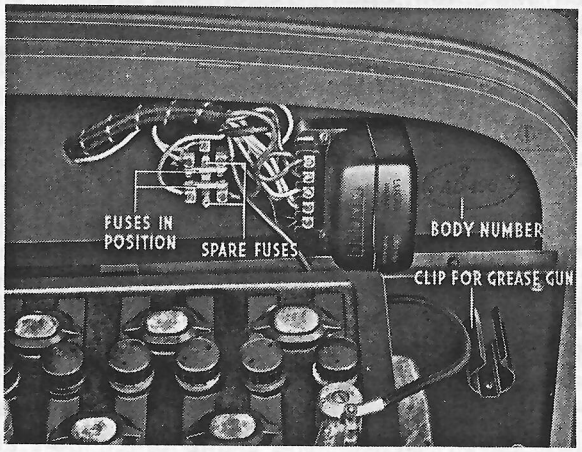


Fig. 28. Position of Fuses.

To Replace a Fuse. A fuse is blown when the wire inside the glass tube is broken. There are two fuses each of 35 amp. value in the electrical system and positioned alongside the Regulator Box fitted to the Bulkhead. Two spare fuses are positioned between the fuses in use, see Fig. 28. It is most important that a replacement fuse of the correct value is fitted to replace one that has blown. To replace a fuse, withdraw the blown fuse from its spring clips and press in the replacement ; make sure that it is sitting in its clips firmly.

To Check and Set the Distributor Points.

Remove the moulded distributor cap and turn over the engine by hand until the contacts in the distributor are fully opened. Check the gap with the gauge on the screwdriver supplied in the toolkit ; if the setting is correct the gauge should be a sliding fit. If the gap varies appreciably from the gauge, keep the engine in the position to give maximum opening of the contacts and slacken the two screws which secure the contact plate. Move the plate until the gap is set to the thickness of the gauge and then fully tighten the locking screws.

To Check and Adjust the Ignition Timing.

Check that the gap between the distributor points is .012" (.3 mm.) when in their maximum open position, and turn the engine slowly by means of the starting handle until No. 1 cylinder inlet valve commences to open. Now watch the distributor points and cease turning the engine when they just part. For the setting to be correct, this condition should occur 5° or $\frac{15}{32}$" (10.319 mm.) before Top centre.

Should any correction be necessary, release the nuts securing the distributor clamp or index plate to the adaptor, set the pointer to zero and tighten the nuts. Set the flywheel so that the marks 1/4 stamped on the rim of the flywheel are 5° or $\frac{15}{32}$" (10.319 mm.) before top centre. Then release the pinch bolt of the distributor clamp or index plate, rotate the body in a clockwise direction until the points are closed ; then in an anti-clockwise direction until the points just part ; tighten the clamp pinch bolt and re-check opening position of points.

Any slight alteration to the setting to suit running conditions should be made by releasing the nuts securing the clamp or index plate and moving the distributor as required, within the movement of the slotted holes in the plate. Do not omit to tighten all nuts released.

CONDITIONS OF SALE

All new cars and chassis and parts thereof manufactured by SINGER MOTORS LIMITED (hereinafter referred to as "the Company") are sold subject to but with the benefit of the Conditions of Sale hereinafter set forth, and this is so whether the sale is (a) by the Company to a Distributor, Dealer or Retail Dealer, or (b) by the Company direct to the user, or (c) by Distributor or Dealer to a Trader, or (d) by a Distributor, Dealer, Retail Dealer or Trader to the user :—

1. GUARANTEE. The Company's Guarantee, a copy of which is endorsed hereon, shall be deemed to be incorporated in these Conditions : to the intent, in the case of a sale by a Distributor, Dealer, Retail Dealer or Trader that he shall pass on the benefit of the Guarantee to his purchaser, who shall be subject to its obligations ; but such transfer of the benefit of the Guarantee shall not create any privity of contract between the Company and such purchaser ; and every Distributor, Dealer, Retail Dealer and Trader contracts as a principal and not as an agent, and has no authority to give any warranty or make any representation or otherwise act on behalf of the Company.

2. PRICE AND PAYMENT. Prices quoted are for delivery at the Company's Works at Birmingham, net cash on delivery. Freightage therefrom to the depôt of a Distributor, Dealer, Retail Dealer or Trader is extra.

3. DELIVERY. Neither the Company nor any Distributor, Dealer, Retail Dealer or Trader shall be liable for any delay in delivery on the part of the Company (whatever the cause of such delay), nor for any damage caused thereby.

4. ALTERATIONS IN PRICE AND CONDITIONS. The Company's prices and Conditions of Sale may be altered at any time without notice, and all cars and chassis and parts therefor are sold subject to the prices and Conditions of Sale ruling at the time of delivery.

In the event of increase of price, however, a purchaser may in writing cancel his order within seven days of receiving notice of the increase.

5. ALTERATIONS IN SPECIFICATION. The Company's specifications may be altered at any time without notice ; and in such event the seller may cancel any order, or goods conforming to the altered specification may be delivered in fulfilment of such order unless, in the case of substantial alterations, the purchaser in writing cancels that order within seven days of receiving notice of the intention to deliver in conformity with the altered specification.

6. SPARE PARTS. When ordering spare parts, it is essential that the identification number thereof, as shown in the Company's Spare Parts List, should be given, as well as the chassis and engine number of the car for which they are required.

7. DISTRIBUTORS AND DEALERS. (a) Every Distributor, Dealer, Retail Dealer and Trader shall incorporate these Conditions in any contract it makes with a purchaser, either by reference or by setting them out in extenso in the order form. Where such incorporation is by reference only, the Distributor, Dealer, Retail Dealer or Trader shall see that a copy of the Conditions is handed to such purchaser prior to the completion of the contract, and that such purchaser's attention is specifically drawn to them. (b) If any purchaser from a Distributor, Dealer, Retail Dealer or Trader shall commit a breach of these Conditions, the Distributor, Dealer, Retail Dealer or Trader shall, on being required by the Company or his Vendor so to do, take such steps as the Company may think fit, whether by instituting legal proceedings or otherwise, in order to enforce these Conditions.

8. EXHIBITIONS AND COMPETITIONS. No car or chassis or part thereof shall be exhibited at any exhibition or show or permitted to take part in any competition unless the same is held or approved by the Society of Motor Manufacturers and Traders Limited. Anyone who commits or allows a breach of these conditions renders himself liable to pay damages not exceeding £250.

9. GENERAL. (a) The Company may allocate any order placed direct with it to its authorised Distributor or Dealer in the appropriate territory. (b) These Conditions and any contract to which these Conditions apply shall be construed according to English Law.

Guarantee

WARRANTY.

The Company warrants that in the manufacture of new vehicles it has taken all precautions which are usual and reasonable to secure excellence of materials and workmanship and undertakes that if any defect is disclosed in any part of a new vehicle within six months of the date of delivery of such vehicle to the retail customer it will (provided such defective part is returned to the Works carriage paid) examine the part alleged to be defective and if on such examination the fault is found to be due to defective materials or workmanship for which it is responsible it will repair or replace the defective part free of charge.

This Warranty is given only in respect of a vehicle purchased by the retail customer as a new vehicle, for which the Company's full retail List Price has been paid.

The foregoing Warranty is limited to new vehicles manufactured by the Company and is in lieu of any Warranty (or Condition) whether expressed or implied by Common Law Statute or otherwise as to the description, quality or fitness for their purpose of any goods manufactured, replaced or repaired by the Company every such Warranty (or Condition) whether expressed or implied being in all cases excluded and the liability of the Company under the terms of this Warranty is strictly limited to the replacement or repair and despatch to the Sender carriage forward of the part replaced or repaired. The Company shall not be responsible for any other liability, expenses, damages or loss which may occur consequent upon any misdescription, defective material or workmanship of any description.

The Warranty shall not apply to any defects caused by or arising in the following circumstances and in which instances all other Warranties (or Conditions) whether expressed or implied by Common Law Statute or otherwise are also expressly excluded.

This Warranty shall not apply to any defects caused or arising under the following conditions :—

(a) During or caused by motor racing.
(b) Wear and tear, accident, misuse or neglect.
(c) Defects in any vehicle which has been altered in any manner whatsoever or upon which the identification numbers have been altered or removed.
(d) Defects in any vehicle which has been or is let out on hire.

This Warranty shall be construed as including and shall be limited in its application to :—

(a) New vehicles or goods manufactured by the Company and which are bought direct from the Company or from one of its duly authorised Distributors, Dealers or Retail Dealers.
(b) Repairs done or replacements supplied by the Company direct,

and all other Warranties (or Conditions) whether expressed or implied by Common Law Statute or otherwise are excluded.

The Company gives no Warranty of any description in respect of any Secondhand vehicles or goods sold by it or by its authorised Dealers or by any other person nor is any Warranty (or Condition) expressed or implied. whether arising by Common Law Statute or otherwise in respect of such vehicles or goods.

All agreements and quotations by the Company to supply goods execute repairs or make replacements shall be deemed to include the above Warranty and the exclusion of all expressed or implied Warranties and/or Conditions.

The Company does not warrant the Specialities of other manufacturers fitted to its vehicles such as tyres, electrical fittings, lamps and horns. It endeavours to secure the best quality in these articles and the Makers whose names usually appear thereon are generally willing to replace any defective part. The Company will be pleased at all times to furnish the Maker's name and address.

CONDITIONS OF WARRANTY.

If a defective part be found in any vehicle or goods it must be sent to the Company's Works carriage paid and accompanied by an intimation from the Sender in writing that he desires to have it repaired or replaced free of charge under this Warranty. The Sender must also furnish at the same time :—

(a) The number of the car.
(b) The name of the dealer if any from whom the car was purchased.
(c) The date of the purchase of the car or the date when the repairs were executed or replacements made as the case may be.

The Sender shall accept the Company's decision as final and conclusive on all claims for replacement of or repairs to defective material and/or workmanship and to the exchange of defective parts.

If these conditions are not strictly complied with the goods received by the Company will be at the risk of the Sender and this Warranty shall not be enforceable.

The Company shall not be responsible for the cost of any labour involved in connection with the removal or replacement of any defective parts from or to the vehicle.

REPAIRS AND REPLACEMENTS

All parts sent for repair or replacement must be forwarded carriage paid and bear the Sender's Name and Address; the car number and year of manufacture should also be given. The foregoing Warranty is given by the Company in respect of all repairs to vehicles or parts of vehicles executed by it or replacements supplied by it direct but for three months only and subject nevertheless to the reservations limitations and conditions therein contained and all other conditions or warranties whether expressed or implied by Common Law Statute or otherwise are excluded. The Company shall not be responsible for any other liability expenses damages or loss which may occur consequent upon any misdescription defective material or workmanship of any description in connection with any replacements supplied or repairs executed by it.

The Company accepts no responsibility whatsoever for any replacements or parts which are not fitted by it to a vehicle even if such replacements or parts are supplied by it.

Cars which are sent for repairs will only be driven by the Company's employees at the risk and responsibility of the owners and repairs of cars are undertaken only on the assumption that the owners give authority to drive the cars on their behalf.

The Company accepts no responsibility for damage by fire or otherwise to customers' cars or parts thereof whilst on the Company's premises.

CONTENTS

CONTENTS

EDWARDS THE PRINTERS LTD., COVENTRY

THE S.M. ROADSTER

WITH

TWIN CARBURETTERS

SUPPLEMENT TO THE OWNERS HANDBOOK

The S.M. Roadster Owners Handbook covers in general, the maintenance and repair of both Single and Twin Carburetter models, but where the data given is inapplicable to the latter, the appropriate information is given in this supplement. This supplement should therefore be used in conjunction with the S.M. Roadster Owners Handbook.

TECHNICAL DATA

Engine.

Compression ratio	7.47 : 1
Sparking plugs	Champion N.A.8
Plug Gaps...	.032"
Contact Breaker Gap	.014"/.016"
Ignition Advance :—	
Pool Petrol	9°-10° B.T.D.C. max. $\frac{27}{32}$" — $\frac{15}{16}$" on flywheel rim.
Branded Petrol	14°-15° B.T.D.C. max. $1\frac{5}{16}$" — $1\frac{13}{32}$" on flywheel rim.
Carburetter Type	Twin Solex F.A.1 Downdraught
Carburetter Setting :—	
Choke	21
Main Jet	110
Correction	220
Pilot	45
Starting Pilot Jet	115
Starter Air Jet	4
Emulsion	'O'
Gearbox Overall Ratios :—	
Top Gear	4.44 : 1
3rd Gear	5.58 : 1
2nd Gear	8.62 : 1
1st Gear	13.25 : 1
Reverse	13.25 : 1

Rear Axle :—

Ratio	4.44 : 1

Electrical Equipment :—

Distributor (Vacuum Advance) ...	DM2A4 Lucas Service No. 40363A.
Coil	B.12 Lucas Service No. 45012.

Performance. Road speeds at 1,000 r.p.m. :—

Top Gear	17.1 m.p.h.
3rd Gear	13.63 m.p.h.
2nd Gear	8.82 m.p.h.
1st Gear	5.74 m.p.h.

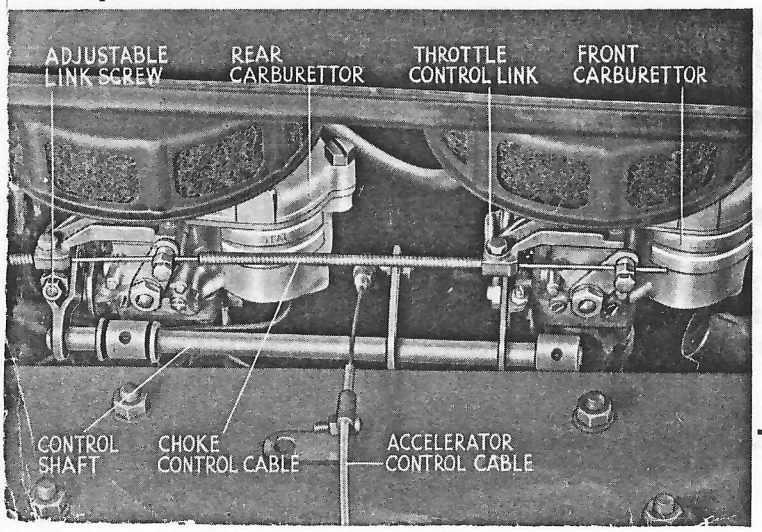
Brake Horse Power :—

30 at	2,000 r.p.m.
44 at	3,000 r.p.m.
55 at	4,000 r.p.m.
58 at	4,600 r.p.m.
56 at	5,000 r.p.m.
Maximum safe r.p.m.	5,200
Maximum Torque at 2,600 r.p.m. ...	77 lbs. ft.

METHOD OF SYNCHRONISING THE TWIN CARBURETTERS.

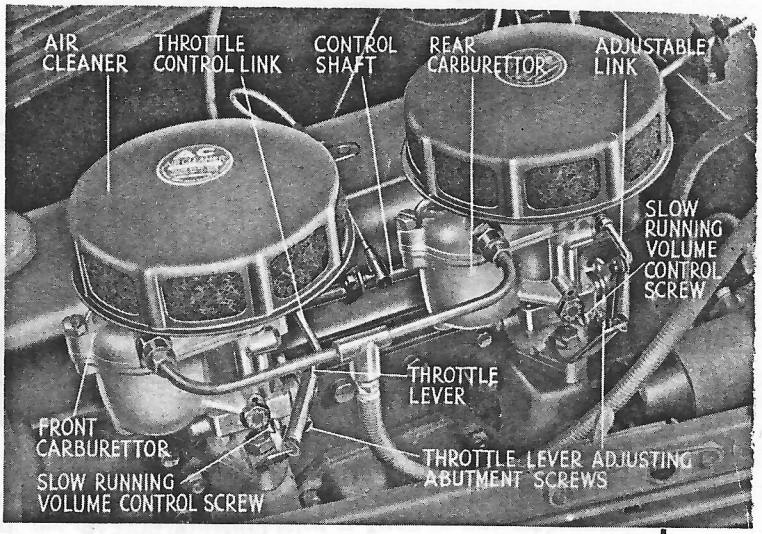
Throttle adjustment. (**Important**—This adjustment must be made when the engine is at normal running temperature).

1. Detach from the control shaft lever, the throttle control link connecting this lever to the throttle lever of the Front Carburetter (nearest the Radiator), thus retaining the spring on the throttle lever.



2. With the Air Filters and their fittings removed from both Carburetters, screw in the throttle lever adjusting abutment screw on the Front Carburetter, thus opening the throttle, until fuel is seen to issue from the spraying orifices towards the choke tube.

3. Adjust the throttle



lever adjusting abutment screw on the Rear Carburetter until the foregoing conditions exist on this Carburetter also.

4. The engine will now be running at more than idling speed. Screw back the throttle lever adjusting abutment screws on the Carburetters half a turn, each screw, at a time, until the engine idles without stalling. The engine may not now be running evenly. It is important that the adjusting abutment screws on both Carburetters be moved exactly the same amount at each adjustment.

5. Then release the locknut locking the adjustable link between the rear Carburetter and the control shaft lever and move the screw until the fixed link between the Front Carburetter and the control shaft lever mentioned in Instruction 1, can be replaced.

SLOW RUNNING ADJUSTMENT

Screw in the volume control screws on the Carburetters until they are both right home, but without forcing them. Then release them half a turn, each at a time, until the engine idles evenly. If necessary, further adjust, by equal amounts the throttle lever adjusting abutment screws.

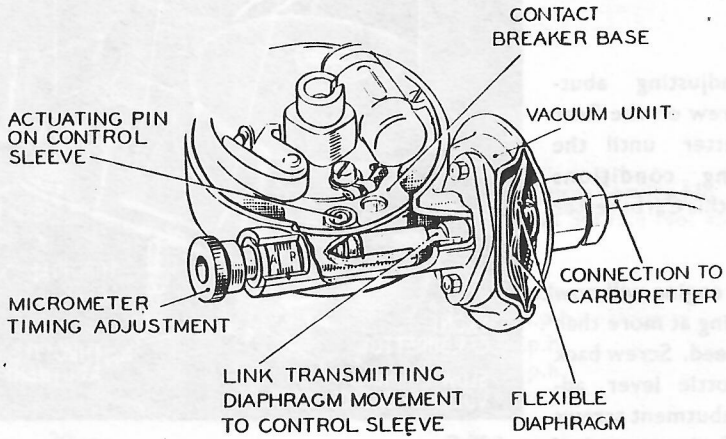
SERVICING THE AIR CLEANERS

Two 'pan' type Air Cleaners are fitted to the Twin Carburetters and they should be serviced as instructed below at every 5,000 miles.

Release the hose clips securing the necks of the Air Cleaners to the Carburetter Air Intakes and detach the Air Cleaners. Clean the oil-wetted mesh by swilling each Cleaner in a shallow pan of petrol, and, when dry, lightly re-oil the mesh with engine oil, allowing any surplus to drain off before refitting the Air Cleaners to the engine.

VACUUM-OPERATED IGNITION TIMING CONTROL

The correct timing of the ignition for maximum efficiency is dependent not only on the speed of the engine but also on the load. In addition to the



centrifugally-operated control which automatically advances or retards the ignition timing in accordance with engine speed, a vacuum-operated mechanism, responsive to the engine loading, is incorporated in the distributor ; this combination produces the ideal timing control.

Advantage is taken of the fact that with a light load the suction in the intake is of a comparatively high order, whilst on full load it falls to a low value. This variation in pressure is utilised to actuate a flexible diaphragm in the vacuum control unit. The diaphragm is linked so that when acted upon by the vacuum in the induction pipe of the engine its movement rotates the contact breaker base relative to the driving spindle, and so advances or retards the timing. The micrometer timing adjustment is solely for manually setting the ignition and to help adjust readily this setting so that optimum performance can be retained when different grades of fuel are used.

The vacuum unit is connected by a length of tubing to a point on the Carburetters slightly on the atmospheric side of the butterfly valve.

When the engine is idling, with the throttle nearly closed, there is practically no vacuum (since the tapping is on the atmospheric side of the butterfly) and the controlling spring tension is not overcome ; the ignition timing then remains unaffected. The result of opening the throttle is to bring the tapping on to the engine side of the butterfly valve, the degree of vacuum is increased, and the timing is advanced. This occurs up to about half-throttle, after which, greater opening causes a decrease in vacuum, thus retarding the ignition timing. In this way, a completely automatic timing control is produced, ensuring the maximum possible power under all conditions.

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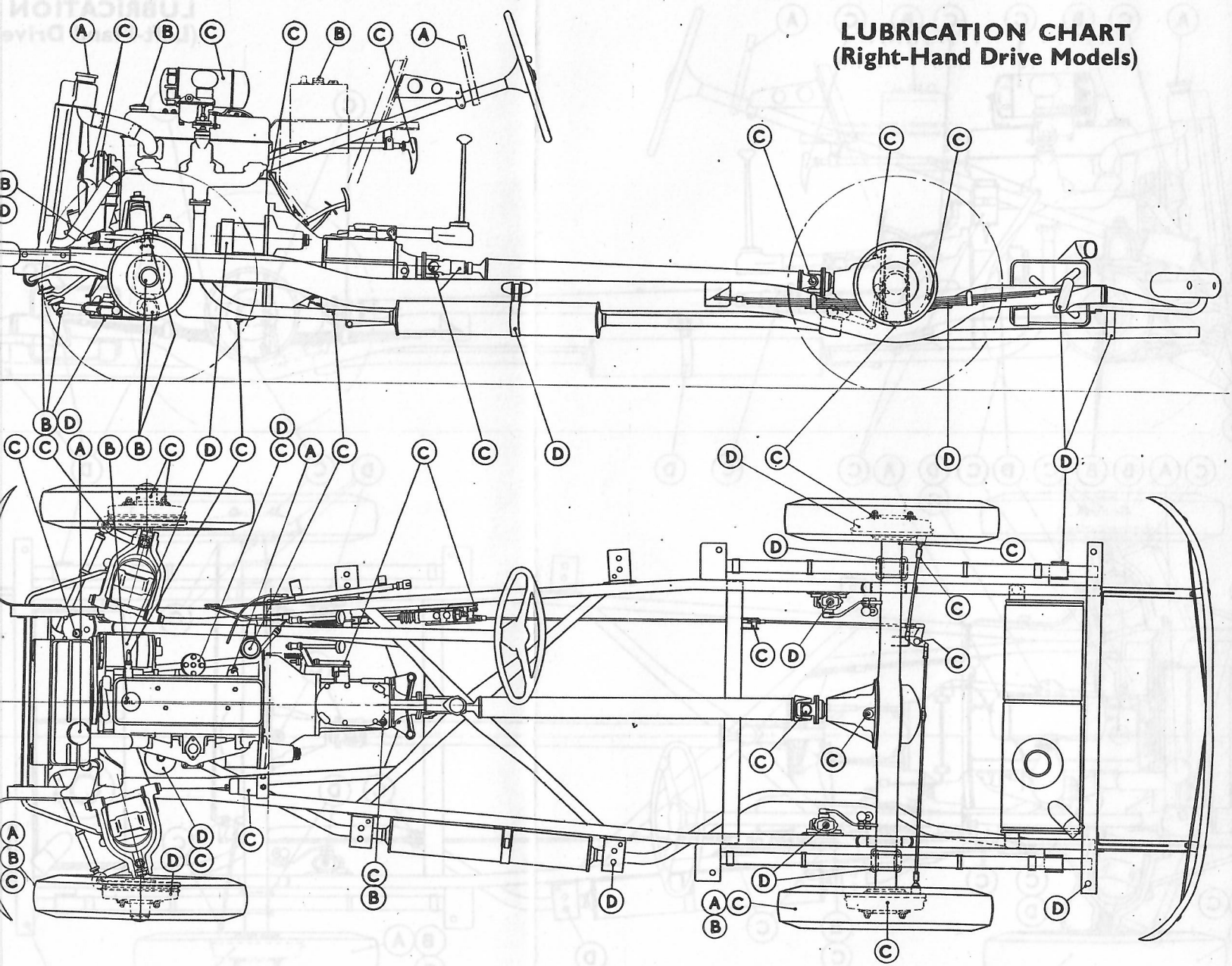
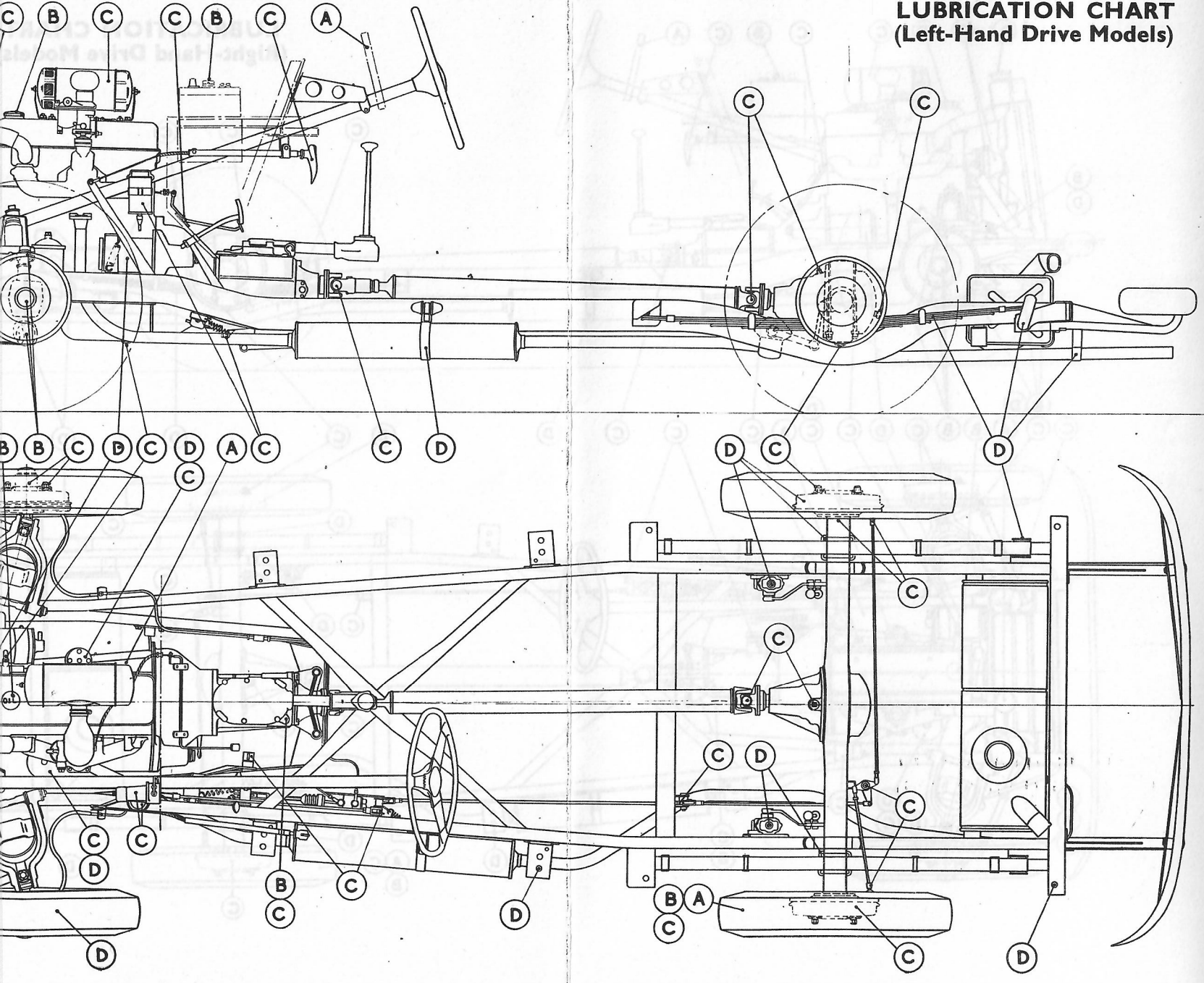
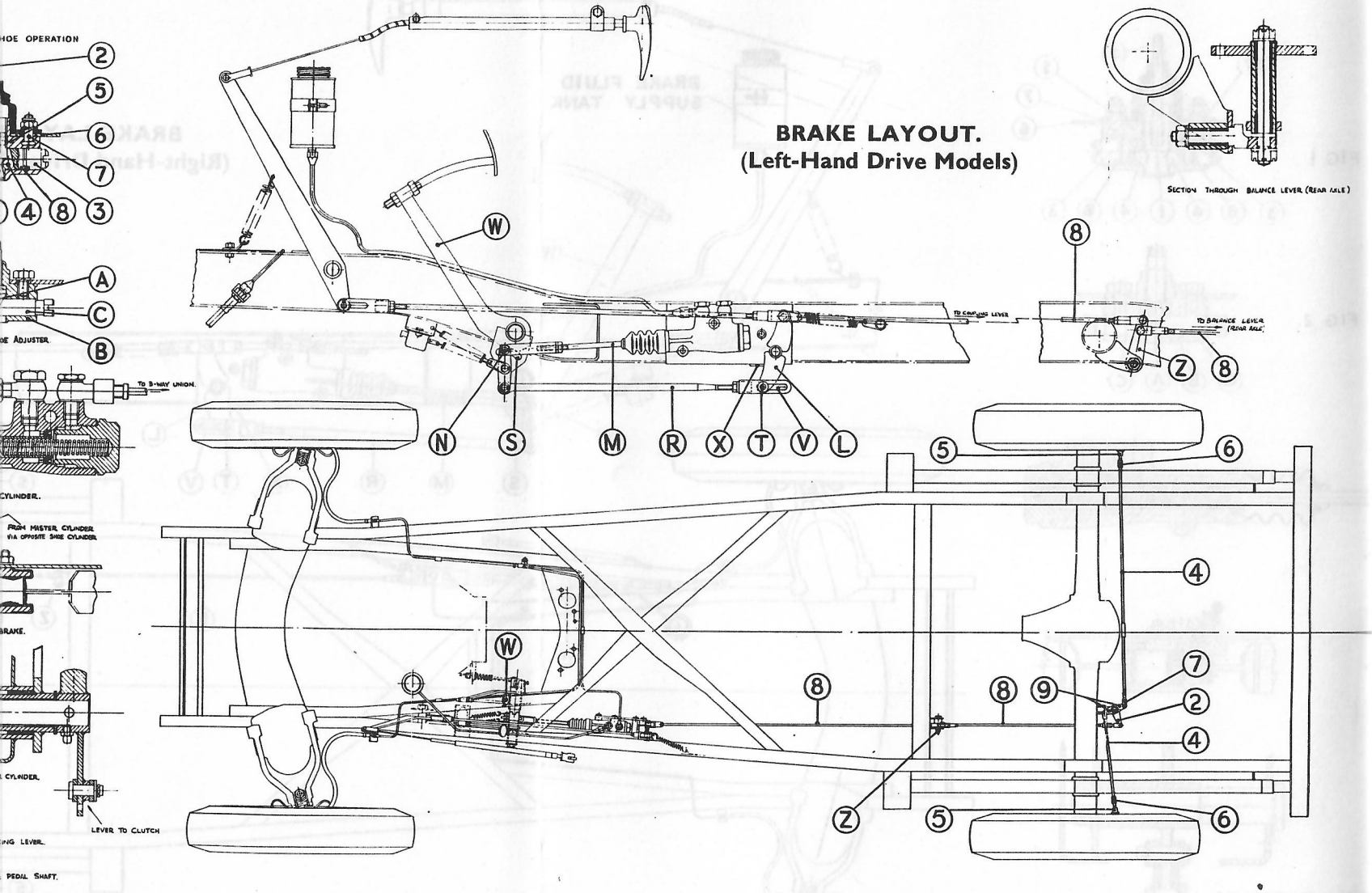
LUBRICATION CHART
(Right-Hand Drive Models)



LUBRICATION CHART
(Left-Hand Drive Models)

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CYLINDER.
FROM MASTER CYLINDER
VIA OPPOSITE SIDE CYLINDER
BRAKE.
CYLINDER.
LEVER TO CLUTCH
ING LEVER.
PEDAL SHAFT.
BRAKE LAYOUT.
(Left-Hand Drive Models)
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V
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TO COUPLING LEVER
TO BALANCE LEVER (REAR AXLE)
8
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SECTION THROUGH BALANCE LEVER (REAR AXLE)
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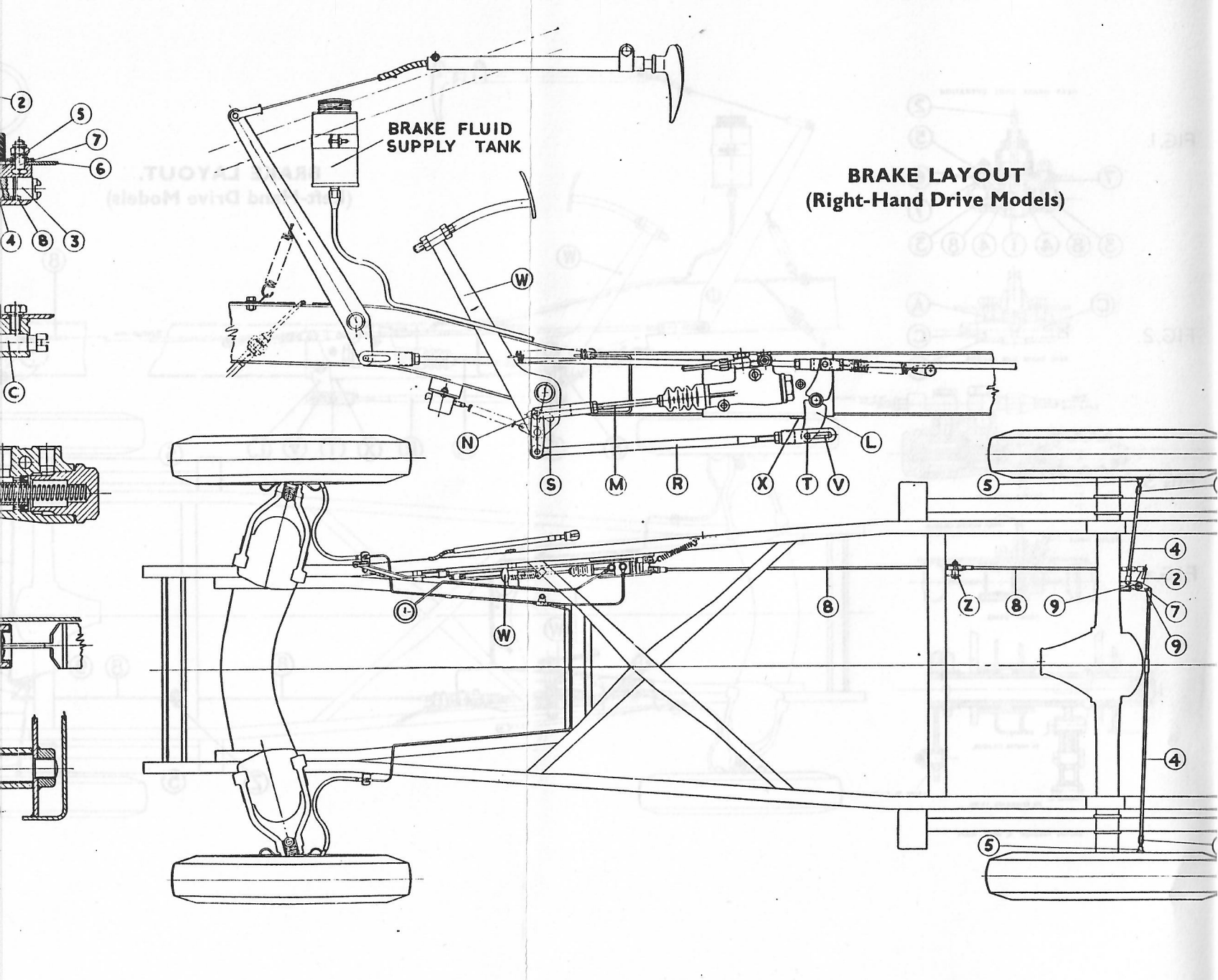
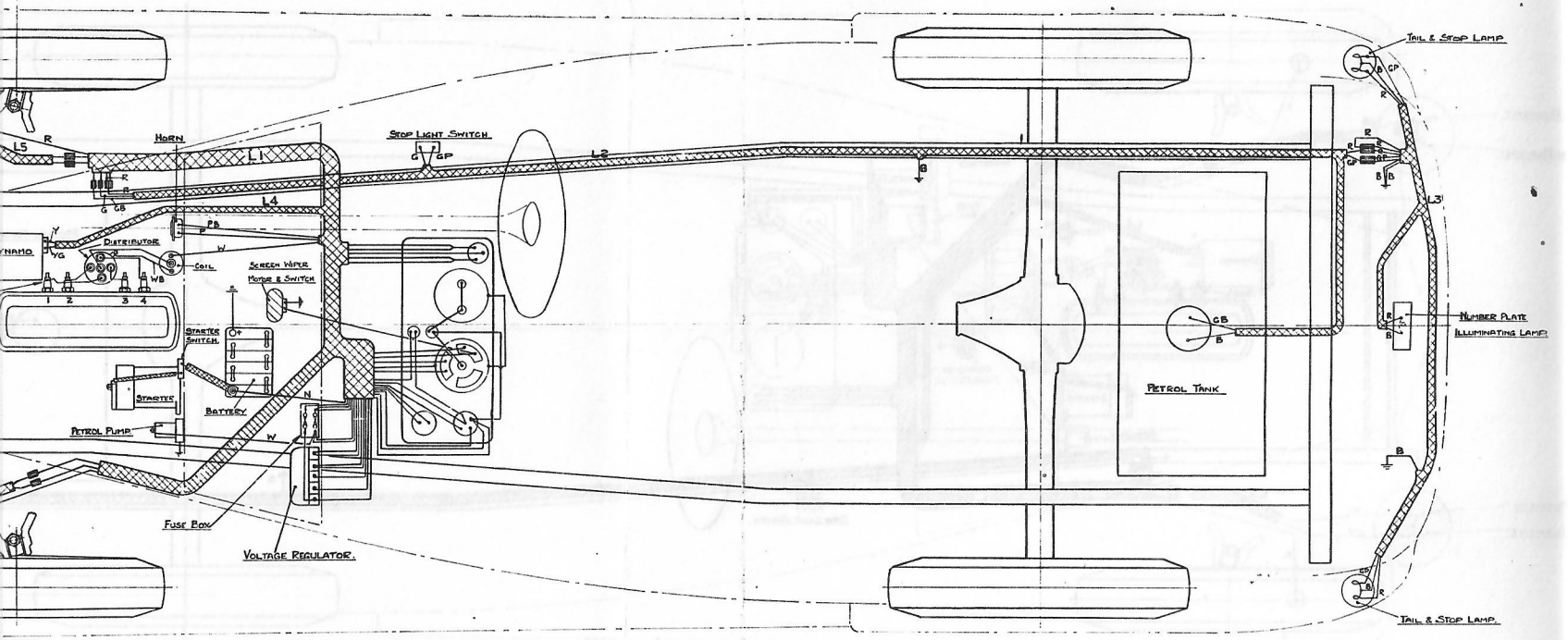
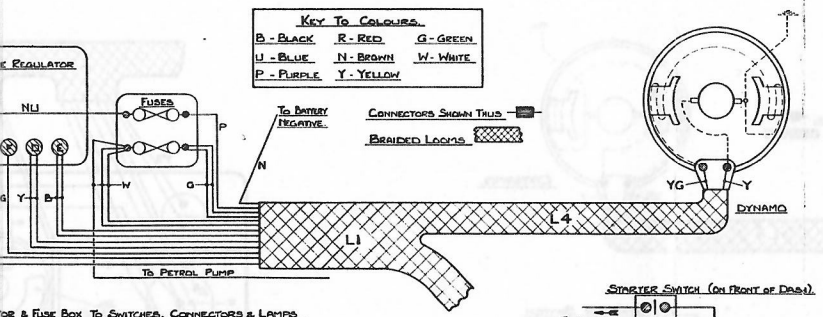
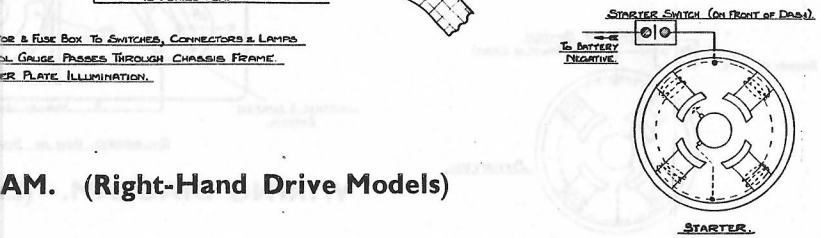
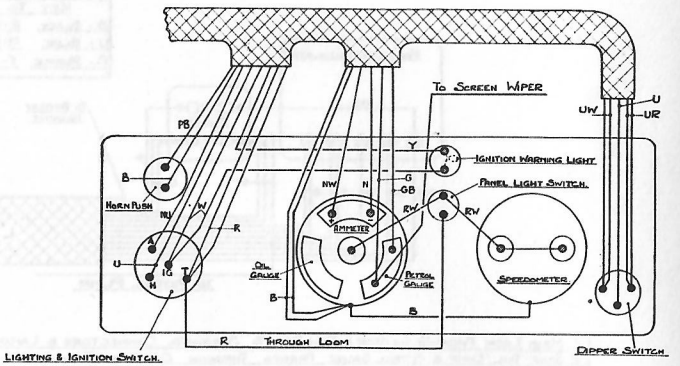


BRAKE LAYOUT
(Right-Hand Drive Models)



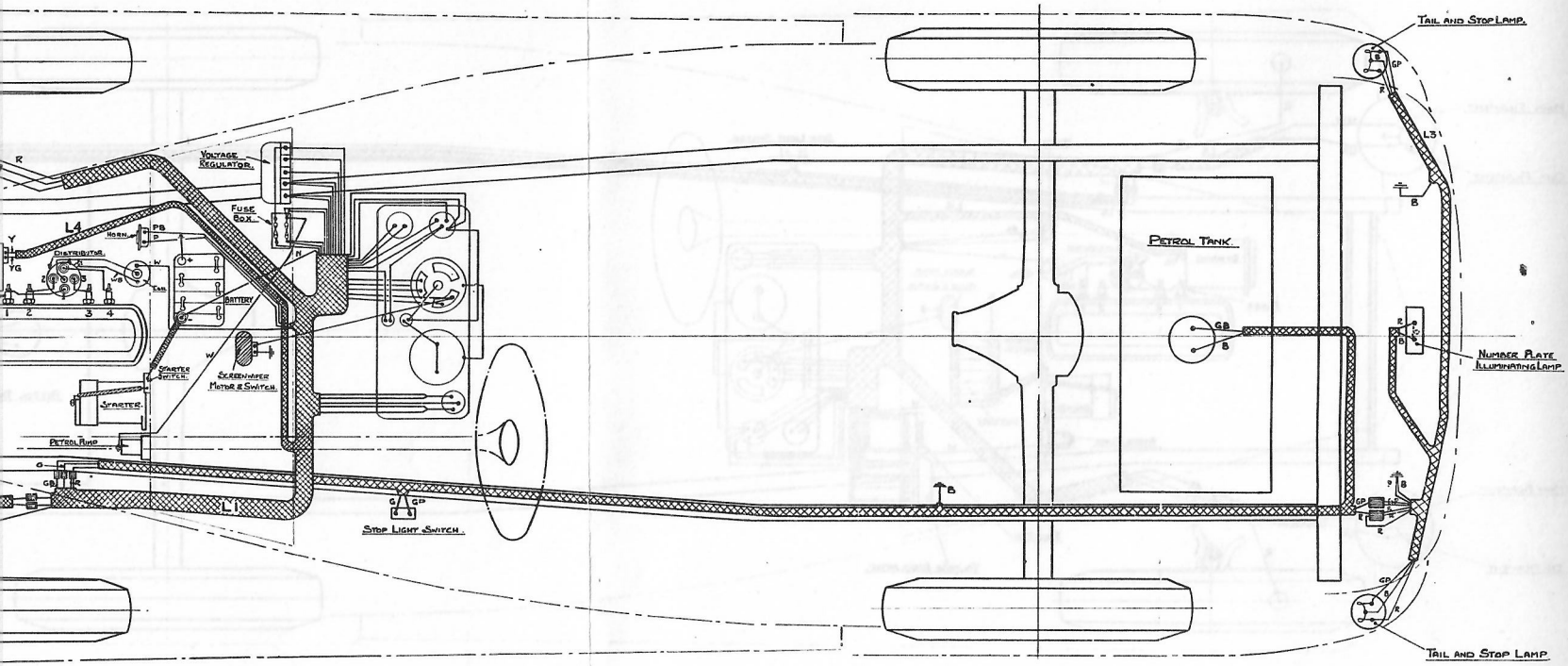


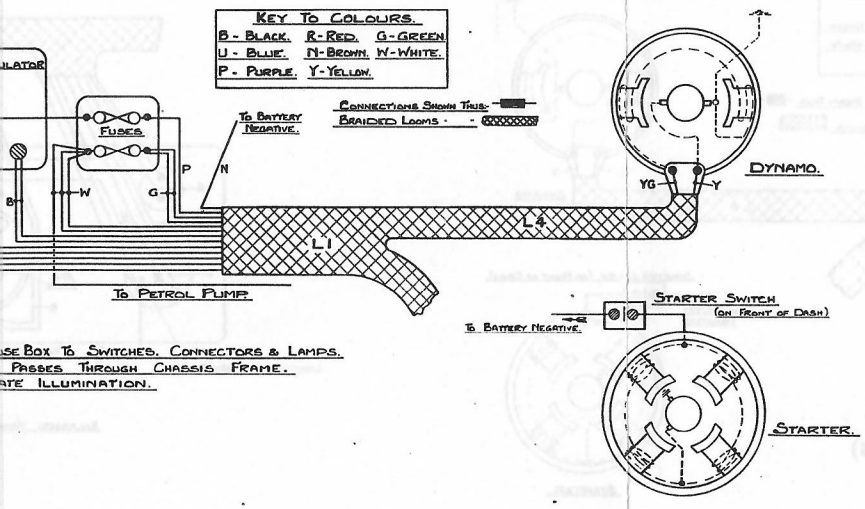




ENLARGED VIEW OF INSTRUMENT PANEL.

AM. (Right-Hand Drive Models)





SE BOX TO SWITCHES, CONNECTORS & LAMPS.
PASSES THROUGH CHASSIS FRAME.
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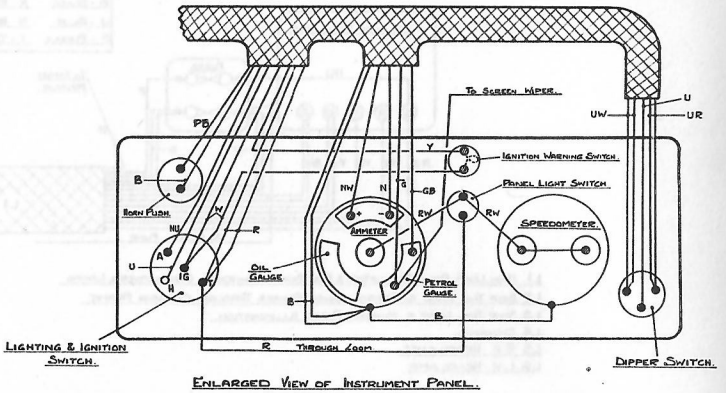

ENLARGED VIEW OF INSTRUMENT PANEL.

WIRING DIAGRAM. (Left-Hand Drive Models).