

1931.

Series S.



MANUFACTURED THROUGHOUT BY

A. J. STEVENS & CO. (1914) LTD.,

GRAISELEY HOUSE, WOLVERHAMPTON,

ENGLAND.

PRICE ONE SHILLING.

FOREWORD.

THE information given in this booklet has been very carefully compiled in the hope that it will prove of assistance to the rider in keeping his machine in the best possible condition, and aid him in elucidating any little difficulties which may arise from time to time.

The reader's attention is especially drawn to the pages devoted to Driving Instructions and General Care of the Machine, these apply with equal significance to all types of 1931 A.J.S. Models. Particular attention should be given to those parts of the instructions which are emphasised by being printed either in italics or heavy type.

This booklet covers the whole range of the 1931 A.J.S. Models, and as there is much in their constructional details that is common to all types, these will be found grouped under such headings as "Driving Instructions," "Care of the Machine," "Change Speed Gear," "Detachable Wheel," etc. Where, however, differences in design occur, they are dealt with in separate sections.

It has always been our aim to construct A.J.S. Motor Cycles on such simple and straightforward lines that their management, running and upkeep shall present no difficulties, even to the motor cyclist with little or no previous experience.

Re Supply of this Publication.

A copy of this booklet is supplied free with every new A.J.S. Motor Cycle. Applications for extra copies must be accompanied in every case by a remittance for 1/- to cover cost and postage.

A. J. STEVENS & CO. (1914) Ltd.

November, 1930.

CONTENTS.

	Page
Foreword	2
Driving Instructions	5-6
Engine Lubrication	8
Engine Adjustments, Cleaning, and Removal of Cylinder Magneto	8-11
"	12
Contact Breaker Point Adjustment	13
"	13
Timing	13
Ignition Trouble	13
Engine Tuning	14
Gear Box	15
Clutch Adjustment	16
Adjustment of Chains	17
Care of Chains	17
Chain Repairs	18
Chain Rivet Extractor	18-19
Steering Head, Steering Damper and Handbar Adjustment	19-20
Spring Fork Adjustment	20
Rear Wheel Adjustment Gauge	20-21
Removal of Wheels	21-22
Brake Adjustment	23-24
Adjustable Saddle	24
Inflation Pressure	24
General Instructions	25
Safety Hints	25-26
Hints and Tips for Hill Climbs and Speed Events	26-27

DRIVING INSTRUCTIONS, ETC.

For 2.48 h.p., 3.49 h.p., 3.99 h.p., 4.98 h.p., and 9.96 h.p. Motor Cycle.

INDEX TO ILLUSTRATIONS.

	Page
Lubrication	7
Push Rod Extractor	10
Valve Extractor	11
Valve Grinding Tool	11
Valve Timing Adjustment	12
Arrangement of Timing Gear	14
A.J.S. Carburetor	15
Clutch Parts	16
Chain Repair Parts	18
Chain Racer Extractor	19
Front Forks and Adjustable Handlebars	20
Rear Wheel Adjustment	21
Quick Detachable Rear Wheel	22
Internal Expanding Brake	23
Adjustable Saddle	24

AFTER receiving the machine, thoroughly examine it and get conversant with its details. Fill up with petrol and oil.

The oil tank will be found situated behind the rear down tube. For further instructions respecting lubrication see "Care of Machine—Engine," page 8.

To Start the Machine.

See that the gate change lever is in the neutral position marked on the gate change quadrant.

Release the ignition lever about $\frac{1}{2}$ or $\frac{3}{4}$ its travel. This is to prevent back-firing.

Move the lever to the left to retard the ignition and vice versa.

The ignition lever is the small finger on the left handlebar, and to advance is pushed towards the left, and to the right to retard. The air lever is the trigger on the right handlebar, and is open is pushed to the right and vice versa. These movements are when the rider is seated on the machine.

If the cables are properly adjusted, the least movement should begin to operate against the springs in the carburetor. If there is any slackness in the cable, the adjusting screw in the top of the carburetor should be raised to remove the slack.

(a) Turn on the petrol by pulling the top to the "on" position, and when the float chamber needle has risen, give it one or two taps with the finger to flood the carburetor.

(b) Shut the air lever.

(c) Open the throttle very slightly, that is about $\frac{1}{2}$ in. pull on the wire after you have felt the resistance of the throttle spring.

All models are fitted with twist grip throttle control on the right handlebar. The grip is moved towards to open, i.e., anti-clockwise when seated on the machine. Twist grip control pulls the throttle cable like a ordinary lever, but working around the bar instead of on top of it. Open the throttle very lightly by twisting towards about 1 in. movement of the diameter of the rubber grip, after you have felt the resistance of the throttle spring.

When Starting up—Twist Grip.—See that the position of the twist grip is not altered, this may easily take place by the movement of the body when depressing the footstarter pedal.

Footstarter.—Now lift the exhaust lever and turn the engine over, say twice with the footstarter to get gas into the cylinder. Then give one smart kick downwards, and the engine should start. Take the foot off the pedal immediately the engine fires, but do not allow the footstarter to spring back with a bang. Bring the foot back with the pedal and so prevent a heavy blow being given to the stoop.

Carburettor Adjustment.—If the engine has been started with the air closed it will be found that the mixture is very rich, so steadily open the air lever until the engine runs smoothly. After the engine has warmed up the lever can be left open.

The correct position of the air lever of course varies with atmospheric conditions, the quality of petrol, etc., but in a short time the rider should be able to get the correct setting of the air lever from the behaviour of the engine on the road. If the air lever is set properly, the carburettor should be practically automatic throughout its tuning range.

If the engine does not start easily after the first attempt, the rider is usually inclined to heavily flood the carburettor, and so cause the mixture to be so rich that starting is impossible. If it is thought the mixture is too rich, open the throttle and air lever fully. Raise the exhaust valve lifter and turn the engine over a few times with the footstarter. This will get rid of the excessive petrol in the engine. Then proceed to start the engine again as described in the first part of these instructions.

To run up for Starting.—Do not flood the carburettor except when cold or when petrol has been turned off for any length of time.

There is no need to shut the air lever if the engine is hot.

Do not open the throttle more than the slightest amount.

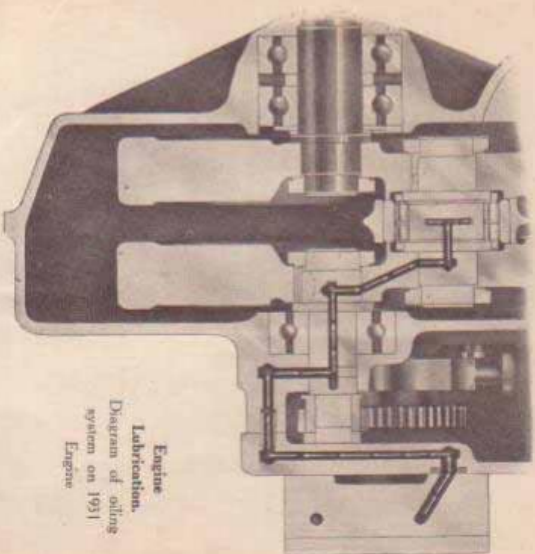
Set the ignition lever a quarter or half retard, and when the engine is started, advance the ignition fully.

Pretuning these instructions have been carried out, and you are seated in the saddle, take out the clutch by means of the clutch lever on the left-hand side of the handlebars, place the gear lever in the low position, speed up the engine by opening the throttle a little, and gently release the clutch lever. The machine will then move forward on the low gear. When the machine has attained a fair speed on this gear, again pull out the clutch and move the gear lever into second gear position, immediately re-engaging the clutch.

Repeat this operation to engage high gear. When running on high gear, the machine must be controlled by means of the throttle lever and brakes.

To stop, close the throttle, and when the machine is almost at a standstill, take out the clutch and apply the foot brake.

-4-



Engine
Lubrication.
Diagram of oiling
system on 1931
Engine

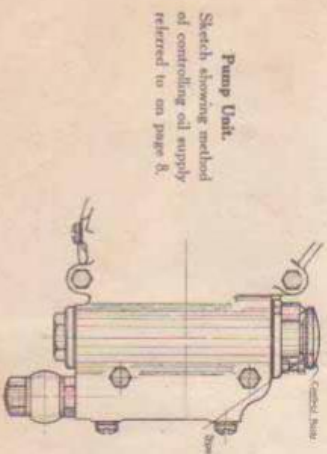


Illustration 1.

-5-

CARE OF THE MACHINE. ENGINE.

Lubrication.—Only best quality oil should be used. We use and recommend **Wabco Control "C"** oil (for all valve engines); **Michell "D"** Summer, **Michell "T"** Winter (for side valve engines); **Michell "D"** Summer, **Michell "T"** Winter (for OHV Engines); **Free's** Motorine "C" or **Lure** Winter, **Motorine "B"** or **Lure** Summer.

Engine Lubrication.—The amount of oil pumped to the engine can be varied by altering the setting of the control knob on pump unit (see sketch). Screwing this knob down i.e. in a clockwise direction cuts down amount of oil, turning the reverse way increases the amount of oil. A stop is fitted underneath the control knob so that the oil supply cannot be cut right off. When the engine leaves the factory the oil supply is set a little on the generous side. After the engine has been run in well, say after 500 to 600 miles, or if the engine smokes excessively, the control knob should be screwed down about one-eighth of a turn, then re-set for say 90 miles, if still too much oil, screw down a further one-eighth of a turn and so on. Endeavour to set the oil supply so that when the throttle is opened smartly with the engine idling or running on low gear, a puff of smoke issues from the exhaust pipe. An approximately correct setting is obtained by screwing the control knob lightly down to stop, then unscrewing it up till the engine is functioning. The amount of oil should be between the 2,000 and 3,000 miles mark immediately after the engine has been run in. Every 2,000 to 3,000 miles draw oil from crankcase, and top up by 1 pint of clean oil. A plug to the bottom of the crankcase, and a plug near the base of cylinder on the driving side is provided for this purpose. Do not put petrol or paraffin in crankcase.

Adjustments and Cleaning.—See that the valve tappets of side valve and overhead valve models are always properly adjusted. .006 in. inlet and .008 in. exhaust in the correct clearance, or about the thickness of a visiting card between the tappet top and valve stem when the valve is on its seat. Check the clearance when the engine is hot, not when cold. Use two spanners to undo the adjusting nuts on side valve models.

Removal of Cylinder on Side Valve Models, S2, S4 and S8.—To remove the cylinder head for despoiling, unscrew the seven holding down bolts on top of the cylinder head, and disconnect the sparking plug cable. To detach the head insert a screw driver or similar tool between the top cylinder fin and the head, passing the head carefully off the barrel from both sides. Take great care not to break the radiating fins. **Prime upwards not downwards.** When great care is taken the head can slide off the cylinder. It is desired to remove the cylinder barrel as well, the four nuts which hold the barrel to the base will have to be removed. The four nuts which hold the barrel to the base should be removed and the piston and the connecting rod should be removed from the crankcase, and the crankshaft should be turned round so that the piston is free and so that it will slide off the barrel carefully taking care when the piston is free and so that it will slide off the barrel against the connecting rod, as this may break or distort the skirt of the piston.

ENGINE—Continued.

Having removed the cylinder, wrap a clean cloth or rag round underneath the piston to prevent any deposit from getting into the crankcase. The top of the piston should be scraped free of all deposit, using an old blunt knife or chisel, and while carrying this out be careful not to see that no side strain is thrown on the piston. If the rings cannot be scraped free, use a wire brush. The rings should be scraped free in the grooves they need not be removed, but if they are obviously cracked up with burnt oil, loosen them very carefully, take them off the piston and clean the grooves thoroughly. Take the piston off the connecting rod to do this. To remove the piston pin from the piston, take out one of the retaining springs, one of which will be found on either side of the piston pin. These fit into recessed rings in the piston bosses and to withdraw must be squeezed together with the special small pliers provided. Afterwards the piston pin can be pushed out.

After replacing the piston, we that both the piston pin retaining springs are in place. Having scraped all deposit from both the head and piston, wash all particles off with kerosene. Before replacing the cylinder after cleaning, carefully oil the piston and see that the points of the piston rings are on opposite sides of the piston. Take care when replacing the cylinder on to the crankcase to see that the packing washer is inserted between the top of the crankcase and base of the cylinder. If the washer between the cylinder head and barrel has been damaged in detaching the head, replace with a new one. Smooth the face of the cylinder head with a thin film of oil or vasoline. This will act as an adhesive to which the washer can be fixed, and will retain the washer in its correct position whilst fitting the cylinder head on to the barrel. Place the cylinder head squarely on the barrel and then screw on the four holding-down bolts, afterwards tightening these evenly.

If it is required to remove or inspect the valves of Side Valve Models S2, S4 and S8, the detachable head must be removed as mentioned previously and the valves will then be exposed. Next place the hooked end of the special valve extractor, which is provided in every tool kit, on top of the valve and press the extractor down to lift the valve spring to allow the latter to be withdrawn. The valve can then be drawn out.

If the valve settings are at all varied, grind in the valves with fine emery flour mixed with oil into a paste, taking care that all emery is removed out of the valve chamber after the operation. The valve should, generally speaking, be ground in about every 1,500 miles.

In the case of the S5 machine the cylinder head and barrel are in one piece, and the former cannot therefore be detached as in the case with all other models. The general instructions for despoiling, however, will hold good in the case of this particular model. In order to remove the cylinder of the S5 model, the exhaust pipe and equally look between the cylinder and front down tube must be removed, also high tension wire to the plug. The carburettor can either be left in place on the cylinder by removing the slides and the petrol pipe from the bottom of the float chamber, or alternatively the carburettor can be detached from the inlet port by removing the two pins that hold it to the manifold. Next unscrew the four nuts which hold the cylinder head to the barrel. When the cylinder complete can be lifted off. The special tool with which to accomplish this with the aid of a long screwdriver with the aid of the extractor referred to above, and pushed out via the valve cap aperture.

Examine periodically the bolts which hold the engine in frame, and tighten any nuts that may have worked loose. Keep the engine clean externally, which can be done quickly and easily with a painter's brush and a pan of paraffin.

Removal of Cylinder on O.H.V. Models S₆, S₈ and S 12.—To remove the cylinder for cleaning, first disconnect all such lines as exhaust pipes, carburetor tubes, then proceed to remove the tubes which enclose the push rods by telescoping them over the other. To do this the lock nuts at top and bottom of the tubes must be unscrewed. To detach the push rods the special extractor tool should be used; this is not supplied with the kit but can be had, Price 1/-. Place the end of the tool with the round hole over the rocker adjusting screw (see Illustration 2) and press down until the valve

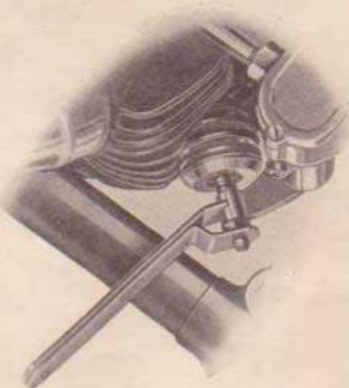


Illustration 2.
PUSH ROD EXTRACTOR.

spring is compressed. Hold down firmly and take hold of the bottom of the push rod which will be seen passing upwards from the camshaft to the rocker. Lift this up from the hollow cap and withdraw. The push rod is now open to the rocker. To remove the rocker spring and the push rod, it is necessary to operate the top of the push rod. The rocker adjusting tube and wall of course have to be dealt with as mentioned in the previous paragraph. Next unscrew the four pins holding down the rocker box. The two pins at the right of push rod side of the rocker box need only be unscrewed until they are free, but those nearest to the valves must be withdrawn entirely. The rocker box can now be drawn off the cylinder head from the right hand side. Next unscrew and remove the four holding down bolts on top of cylinder head. To detach the head insert a screw-driver or similar tool between the top cylinder fin and the head, prising off carefully upwards from both sides.

The rocker gear can be inspected by removing the inspection cover, but this need not be taken off for the purpose of lubricating the upper ball joints of the push rods. In the centre of the inspection cover will be found a 1/2 inch oil nipple, and by means of the grease gun a very little grease can be forced through the nipple, which automatically finds its way to the push rod ball joint. It is important when this is being done that both valves are in the closed position. If the inspection cover is removed, care should be taken to prevent the two oil nipples which fit inside the rocker adjusting tube from being pressed against the inside of the cover, and have their other bearing against the end of the hollow rocker spindle.

Should it be desired to remove the valves when the head is detached, the special valve extractor should be used. Price 3/6 (see Illustration 3). This is a clamp-



Illustration 3.
VALVE EXTRACTOR.

like tool to extract the valve from the cylinder head when the latter has been taken from the engine. For portability the tool is made to fold up. Unfold this and place the end opposite the screw over the valve spring, as shown in the illustration. Screw up until it presses inside the hollow of the valve head. Hold the cylinder head firmly, all clamps securing, and it will be found that the spring is compressed so that the two valve ball joints can be taken away from the recess in the valve stem, and the valves withdrawn.

Carburettor Fitting.—The carburetors on all the 1911 models, except the Twin Cylinder Machine, are fitted to the cylinder by means of a flange and two bolts, and care should be taken that a perfectly air tight joint is made between these two faces if the carburettor has been taken off. If the washer is damaged do not hesitate to replace it with a new one, as a bad joint will cause air leaks, and consequently erratic running.



Illustration 4.
HOW TO USE THE A.J.S. VALVE GRINDING TOOL.

MAGNETO.

Lubrication.—The instrument is provided with ball bearings throughout, which are packed with grease before leaving the manufacturers. Fresh lubricant should not be required under normal circumstances until the machine has run from 10 to 12 thousand miles.

Alignment—The contact break points should be examined after 1,000 miles and if the break should be more than the thickness of a writing card they should be replaced. The proper distance of the gap is 62, 50 or possibly 114 in. full. To ground a gap will advantage. The contact breaker should be examined after 1,000 miles and if there is the correct distance for the jump of the points. This adjustment, owing to the arrangement of the contact breaker, can be carried out without removing the contact breaker from the magneto. If it is necessary to take the contact breaker apart, unscrew the long spring fitting screws, and pull the contact breaker off. The points only need attention at very long intervals, and you will save against wear by making the contact breaker work at the correct distance. The contact breaker should be examined at all points, and then the *four* possible amount *inches off*, the greatest can being corrected.

Tuning. If the magnetos has been removed from the machine it will be necessary to see that it is tuned correctly after it is refitted. The engine magnetos driving spark-plugs are tuned to its shaft by means of castellations, which render wrong replacement impossible. The sparkplug on the armature shaft of the magnetos is supplied with a vernier tuning

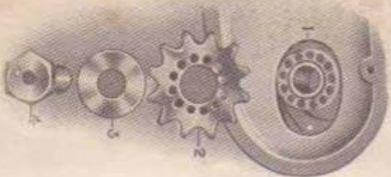


Illustration 5.

VERNIER TIMING ADJUSTMENT

nut (4), which can be done without fear of the timing shifting in the process, as is often the case with other methods. As a means of verifying the timing, or if the sleeve (1) has been removed from the magneto armature

has

table, set the piston to the correct distance from top of compression stroke (see ignition timing for details of setting of each particular model), making sure it is not on the exhaust stroke.

With the piston in this position take off the sleeve lock, run the magnetos and remove the pipe to the spark plug. The spark plug will be fired by the magnetos, and will connected via the chain to the governor. The simulator lever on the engine drive, but facing as previously mentioned. Move the simulator lever to the limit of its movement of advance. Remove the cover of contact breaker and slowly raise the contact breaker by the back of the make and break lever until on the inclined plane of the contact till just sufficient to separate the points. This is the firing point, and with the piston in the position referred to above the sleeve and sparkplug should register if correctly fitted up. If so, the drive should be fixed up as before detailed. It is, however, always advisable to check the timing after tightening up.

It will prevent misfiring and make starting easier if the **clip ring** is closed occasionally. This is done by pulling the right tension arm down, and while the magnetos are being revolved by slowly turning the crank, the points are found in a lead point, the end of which is covered with a clean rag, moistened with oil. The petrol should be placed on the revolving clip ring.

Ignition Timing.—The spark is timed to take place 1 in. before the top of compression stroke on Models S2, S9 and S12, 1 in. before top of compression stroke on Models S4, S5 and S6, $\frac{3}{4}$ in. before top of compression stroke on Model S6. In all cases there are with the magnetos control in the fully advanced position.

Malaysia.—This instrument, if fitted to a machine, provides ignition for the engine and generates current for the electric lamps, and although the two are relieved as separate units they are housed so as to form one instrument. A full description of the working, care and maintenance of the "Nappdyro" is contained in the *Lacina Book of Running Instruments*, a copy of which is set out with each new A.J.S. machine.

The observations are in the same way as the ordinary negro. Usually sufficient greens would grow from the soil without addition of liberate. All bearings on the driving end. The dynamic commutator and bearing can easily be lubricated by removing the bearings and securing and covering and injecting a small quantity of grease or a few drops of oil in the bearing housing. The magnet bearing at the contact breaker end should run perfectly without any attention, owing to the manner in which it is protected. Should the pins run smoothly they can be greased with a light melting point grease such as the GPM-100.

Warning! Ignition Trouble Is Suspected. Before interfering with the magneto verify that the sparking plug, the cable and contact are correct. If there are no other faults, the engine cover should be switched off. If the contact arm works properly, this is located in a fibre insulating bush, and it must work without any occasional danger of the material swelling. If this happens raise the contact arm off its bearing and clean the steel pin on which it works with fine emery cloth, and spray a light quantity of oil on it before replacement. Do not take the magneto to pieces needlessly. It is easily possible to damage it.

Most important.—If it is necessary to take out the miniature first see that the carbon collectors and supply gas valve are removed, or the collector ring will be broken during removal. Keep all parts clean and free from oil, particularly the contact finger. Oil or dirt between the points will cause arcing trouble.

Magneto Adjustment. Models S2, S4, S6, S8 and S9—Examine the driving chain occasionally, and if slack, it must be tightened. The magneto is carried behind the cylinder, on a platform which is pivoted at its rear end, and can be raised in order to take up any chain slack. To adjust the chain, the front and rear bolts should be tightened a turn or two and the platform raised from the forward end. When the desired chain tension is arrived at, carefully retighten the bolts.

Magneto Adjustment. Models S5, S7, S12 and S10.—On these models the magneto is carried in front of the engine and adjustment is obtained by slacking off the platform adjusting pins and moving the magneto along the platform in a forward direction. When the correct chain tension has been obtained secure the pins up again tightly.

一

It is not necessary to remove the magnet chain cover to test for correct chain tension, as all models are fitted with an inspection door on the chain cover.

When adjusting, turn the engine very slowly to check for any tight places in the chain. Examine also the nuts securing the chain sprocket to the engine shaft and armature shaft of the magnet respectively. To do these two latter operations, it will of course be necessary to take off the magnet chain cover entirely. After examining and before replacing the cover, oil the chain.

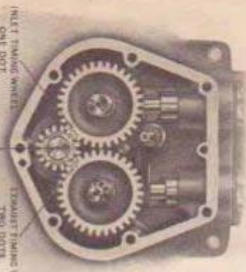


Illustration 5.

ARRANGEMENT OF TIMING GEAR.

Single Cylinder, OH V. and Side-Valve Models.

Engine Tuning—Model

S2.—The registering marks for two cylinder models are as follows—small timing pinion—single dot and double dot. These marks register with corresponding marks on the crankshaft. Turn the engine on the crankshaft until the front exhaust wheel bearing stamped with one and the front exhaust wheel must be meshed with those of the small pinion so that the single dot registers with the single dot on the small pinion, and the two dots on the front exhaust must register with the two dots on the small pinion. There now only remains the double inlet cam wheel which meshes with the front exhaust cam wheel. Upon this wheel 12 dots are marked which must be placed opposite the corresponding dash which will be found upon the front exhaust cam wheel. The correct setting of the valve timing is then arrived at.

With the exception of carrying out the above instructions, do not touch with the engine, nor fancy you can do better than the makers by tampering with the valve timing gear.

Engine Tuning—Models S4, S6, S8, S10 and S12.

Except in the case of the S12, no tampering with the valve timing arrangement. However, if the engine has been completely dismantled for any reason, we make it a practice to so mark the timing pinions that replacement is a matter of perfect ease if the following instructions are carried out. To facilitate correct setting and meshing of the pinions these are marked with a dot system of identification as shown in Illustration 6. On the small timing pinion will be found a single dot and a double dot. These dots correspond to similar marks on the inlet and exhaust valves. The marks on the inlet valve place the pinion dot in line with the mark on the inlet valve. Thereon in register with the single dot on the small pinion, and similarly in the case of the exhaust wheel which has two dots stamped on it.



Illustration 7.

ARRANGEMENT OF TIMING GEAR.

936 k.a. Twin Cylinder Engine.

GEAR BOX.

The gearbox fitted to all A.J.S. machines is of the three-speed countershaft type, and beyond carrying out the following instructions should require no attention whatever.

Lubrication.—Wakfield "Castrolene" is specially recommended for the gearbox. If the gearbox has been dismantled, charge with 1 lb. of the "Castrolene" and 1 pint of oil used for the engine. Recharge with 1 pint of oil every 1,000 miles.

Castrolene is also recommended as being entirely suitable for the gearbox. This lubricant can be obtained in 1-lb. tins, the use of which facilitates filling.

It is very important to see that these instructions are carefully observed. No harm is done by an additional charge, but on the other hand a large percentage of gear trouble can be directly attributed to insufficient lubrication, or by using a lubricant which is not suitable.

It is not advisable to use thick grease, as it may prevent the free operation of the lock starter panel.

The various joints in the gear changing lever mechanism should also be kept oiled regularly to ensure freedom of action.

Do not put oil into the clutch under any circumstances, as this is designed to run dry.

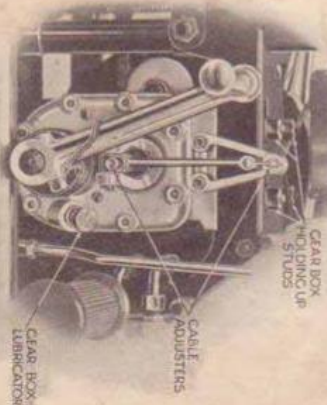


Illustration 8.

THE A.J.S. GEAR BOX.

CLUTCH.

If the clutch should slip when climbing hills, see that there is a little back lash in the handthrust lever, otherwise the clutch springs cannot exert all their pressure on the plates, also when taking up excessive back lash in the adjusting bolt, see that a little play is left to allow the plates to compress when the engine is pulling hard.

The adjustment for the handthrust lever is by means of an adjusting pin on the gearbox clutch operating lever. When all the adjustment on this is exhausted, further adjustment will be found with the milled nut at the end of the clutch cable, which screws into the lug on the gearbox.

There is no adjustment for the tension of the springs of the clutch on any model, the pins should be screwed up dead tight.

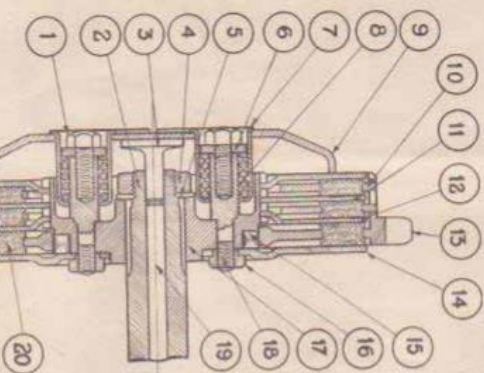


Illustration 9.

CLUTCH PARTS.

- | | |
|--------------------------|--------------------------|
| 1. Clutch Spring Dowel. | 17. Clutch Spring Dowel. |
| 2. Clutch Spring Dowel. | 18. Clutch Spring Dowel. |
| 3. Clutch Spring Dowel. | 19. Clutch Spring Dowel. |
| 4. Clutch Spring Dowel. | 20. Clutch Spring Dowel. |
| 5. Clutch Spring Dowel. | |
| 6. Clutch Spring Dowel. | |
| 7. Clutch Spring Dowel. | |
| 8. Clutch Spring Dowel. | |
| 9. Clutch Spring Dowel. | |
| 10. Clutch Spring Dowel. | |
| 11. Clutch Spring Dowel. | |
| 12. Clutch Spring Dowel. | |
| 13. Clutch Spring Dowel. | |
| 14. Clutch Spring Dowel. | |
| 15. Clutch Spring Dowel. | |
| 16. Clutch Spring Dowel. | |

Tension of Kickstarter Return Spring.—If any difficulty is experienced with the return of the footstarter crank after starting up the engine, this would be due to the spring not having sufficient tension. To overcome this difficulty, the kick starter crank should be removed, also the cover for the spring. You will then notice that the end of the spring is fixed into the first of a series of five holes. To get additional tension, the end of the spring should be fitted into one or more holes to the right, which should have the desired effect. Under no circumstances whatever should the spring be given an additional complete turn.

TRANSMISSION.

Adjustment of Chains.—To adjust the chain from engine to gear box it is only necessary to slack off the nuts on top of the bracket and slide the box bodily backwards by means of the adjusting bolt. In the case of Model S2 the nuts are below the bracket.

It is important that the nuts are screwed tightly again after adjustment.

Back Chain.—Slack off the nuts on each side of back hub spindle and move the wheel backwards by means of the adjusting screws in fork ends. Care must be taken to adjust each side equally or the wheel will be out of alignment (see adjustment gauge, Illustration 13). Screw the spindle nuts up tightly again after the chain is properly adjusted. It may be found that moving the wheel back has caused the brake to be "on." This is easily rectified by means of the brake adjustment.

If the chain is too slack it is apt to "whip," which intensifies the wear and tends to break the rollers, especially in the case of the front chain. If on the other hand it is too tight, a crushing effect is produced on the rollers, and the whole chain is strained unduly.

The chains should be adjusted and kept adjusted, so that they can be pressed down in the centre with the finger from $\frac{1}{2}$ in. on the front chain, and about $\frac{3}{4}$ in. on the back chain.

CARE OF CHAINS.

Lubrication.—Only the rear chain need be lubricated, the front chain being automatically oiled by a pipe from the oil tank. It is a good plan to oil the rear chain every day before starting out, one oiling being sufficient for a day's riding whatever the mileage done.

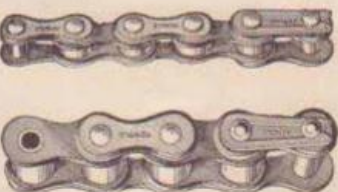
Long life, less need of adjustment, and complete satisfaction with the transmission is assured if the rider will make a point of oiling his chains frequently, to say nothing of the knowledge that they are regularly having a supply of fresh clean oil.

CHAIN REPAIRS.

A chain hardly ever breaks if properly adjusted, since it is usually worn out long before the breaking point is arrived at.



Illustration 10.



CHAIN REPAIR PARTS.

If lubrication or adjustment is neglected, broken rollers may occasionally be found. The chain can, however, be easily repaired with the Permanent Chain Rivet Extractor (Illustration 11) and a few spare parts. This tool provides a simple means of removing the rivets which cannot be filed down, as they are case-hardened. It can also be used for putting in a new outer link.

Outer links can be removed with this tool by pushing the rivet heads through the plate.

The illustration shows clearly the method used in the removal of the outer link by means of this tool.

CHAIN RIVET EXTRACTOR.

To Remove Complete Link.—Screw down the punch on to the head of each rivet in turn through the top plate. Both rivets should be pushed out from the same side of the chain.

To Remove Broken Link.—Insert chain roller between the jaws and screw down the punch in order to press the head of the rivet through the top plate. Remove chain rivet extractor, and link will fall out.

Note.—Before attempting to extract a rivet, compress the ends of the jaws to obtain a grip on the chain roller.

The illustration on page 18 shows all the parts necessary to effect repairs chain.

To shorten a chain containing an even number of pitches replace by parts No. and 2b.

To shorten a chain containing an odd number of pitches replace by parts No. and 2b.

To repair a chain with a broken roller or badly inside link, replace by parts No.

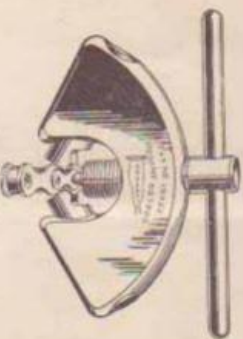


Illustration 11.

CHAIN RIVET EXTRACTOR.

No. 2b. For joining up any length of chain where extremities are male links, use p

When a chain is joined up with a spring clip, it is most important that the clip is correctly fitted over the cover plate. The clip should always face in the opposite direction to the chain track. Fit this so that the plate and spring clip are on the inside of chain link, next the sprocket.

Replacing Chain.—When replacing a chain it will facilitate the fitting of a spring link if the ends of the chain are encircling an equal portion of the sprocket. This also applies to removing the spring link.

STEERING HEAD AND HANDLEBARS.

All the (931) A.J.S. machines are fitted with adjustable handlebars. If the machine wishes to make any adjustment, slacken off the bolts which pass through the upper part of the handlebars to the forks, and partly rotate the handlebars upwards downwards until the desired position is attained. Afterwards carefully tighten up the bolts of the split lug.

To adjust for any play in the ball head, slack off the lag around the steering head and adjust by the large hexagon headed nut on top of the steering column, turning to the right to take up slack and vice versa. Afterwards tighten up the bolt of the lag.

Adjustment of Steering Head.—Slacken the nut which holds the split lag round the ball head, and adjust the large hexagon nut by turning to the right to take up slack and vice versa.

It is advisable in all cases when adjusting the steering head to place a box or some other article under the engine to take the weight off the front wheel, so that the forks may move freely.

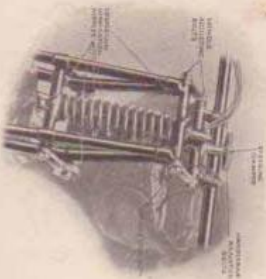


Illustration 12.

FRONT FORKS AND ADJUSTABLE HANDLEBARS, etc.

STEERING DAMPER.

The manipulation of the steering damper will be perfectly obvious. Turning to the right, that is clockwise, has the effect of tightening the steering. The correct tension may be adjusted to suit individual rider's requirements.

SPEEDOMETER.

If it is desired to fit a speedometer on models not having an instrument panel on top of tank, the speedometer is let into the tank where provision is made, and held in position by means of two long pins which pass through the tank and are held by nuts from below. The drive is of course taken from the gearbox where provision is made for this.

On models with instrument panel fitted, to tank, we recommend that the fitting of the speedometer should be carried out by the agent firm whom the machine was purchased.

SPRING FORK ADJUSTMENT.

To take up any play which may have developed in the side forks, unscrew the spring lock nuts on the right-hand side of the forks looking at the machine from the front see Illustration 12, and turn the spindles by means of the heads on the left-hand side until all slackness is taken up. Afterwards tighten up lock nuts.

REAR WHEEL ADJUSTMENT GAUGE.

On the right-hand side of the bottom chain stay will be found a piece of sheet metal, held in position by a clip which passes round the tube.

In the tool kit will be found a flat gauge that can be fitted round the rim (see Illustration 13). When replacing the rear wheel after removal, or after making adjustment to chain, place the gauge on the rim with the extension to the right, and set the wheel so that the edge of the gauge just touches the plate that is held by the clip on the chain stay.



Illustration 13.

REAR WHEEL ADJUSTMENT GAUGE.

This ensures the wheel being correctly aligned and must be done before finally tightening up the spindle nuts. Do not attempt to unscrew the clip from the chain stay, as the position of the plate is set correctly before the machine leaves the factory.

It is important that this gauge should be put properly on to the rim on both sides; the best method of ensuring this being to see that the hook and is properly encircling the head of the rim. Then pull the spring end into place firmly.

DETACHABLE WHEELS.

With the exception of Models S2, S3, S7, S10 and S12, all A.J.S. machines are fitted with hinged rear mudguard and quick detachable rear wheels, and in the case of Model S2, the front wheel also is quick detachable and interchangeable.

To remove proceed as follows.—Put the machine on the stand and unscrew the two pins which hold the stays of the hinged portion of the rear mudguard to the frame. This hinged portion can now be swung up out of the way. Next, with the special box spanner provided, unscrew the three sleeve nuts which pass through the hub flanges. To prevent the wheel revolving while unscrewing the sleeve nuts, place the foot against the tyre at the bottom of the wheel, or alternatively the chain speed lever can be placed in gear. The three sleeve nuts are secured right through the wheel and must have two fine pins on the three flats and a third pin in the middle of the flats. These two fine pins are secured by a lock nut which acts as a dummy driving pin. These fit into the three flats in the hub flange. After the sleeve nuts have been unscrewed then unscrew the centre pin and draw it completely out, together with the distance piece. The spacer now left by the distance piece will allow the wheel to be drawn off the driving axle in the sprocket, and removed from the fork ends.

To replace the wheel, push it squarely on to the driving axle and seat (with the distance piece in position) screw up the centre pin moderately tight. The three sleeve nuts can now be screwed up rigidly, afterwards giving a final turn to the centre pin. It is very important to point out that when the centre pin is removed the wheel is hanging on one foot only, so any rough treatment must be carefully avoided or there is great danger of

straining or breaking the fork ends. Under no circumstances must the center pin be removed until the machine is jacked up on the stand, and the center pin must always be in position before the machine is taken off the stand again. If for any reason the wheel should be difficult to pull off the driving studs, screw in the center pin a few turns (without the distance piece), this will steady the wheel while drawing it off the driving studs.

If the rider wishes to fit a new tube without removing the wheel entirely, he must first take off the one side of the tire and remove the tube in the ordinary way. Now take out the center pin and distance piece only, leaving the sleeve nuts intact. This will be found to give sufficient space between the hub and the fork end to allow the tube to be passed through and drawn completely out. Now replace the distance piece and the center pin and proceed to refit tube and cover. Fitting the center pin first holds the wheel firmly while the tire is being manipulated.



Illustration 14.

THE A.J.S. QUICK DETACHABLE WHEEL.

Periodically test the center pin and sleeve nuts and keep them tight. If the sleeve nuts are loose, a dull hammering will be felt when driving at slow speeds. If this is noticed, tighten the sleeve nuts at once. When the back wheel is removed, the wheel only is taken out, leaving the chain, sprocket, brake, chaincase, etc., remaining in their original position.

If desired, the wheel complete with sprocket, brake, etc., can be taken out, which is quite a convenience. Remove the back portion of the chain guard, slack off spindle nut and detach the rear fork from the frame. Take the chain off the sprocket by means of the spring link, and unscrew the U-bolts. Take the center pin which projects into hole in the anchor plate, and unscrew it. The wheel will fall out. The latter remarks apply also for the removal of the rear wheel of Models S5, S7, S10 and S12, but in the case of Model S12 the right hand tail pipe must be removed.

When the wheel is replaced, see that the brake anchor pin is screwed into the slot in the fork hays.

All wheels are disc-adjusting. Don't let the hubs run loosely, but take care that they are not adjusted too tightly.

All hubs before leaving the factory are packed with sufficient grease to last approximately two to three thousand miles, but an occasional change with the grease gun when going over other parts of the machine is advisable.

IMPORTANT.

INSTRUCTIONS WHICH MUST BE CAREFULLY CARRIED OUT FOR DISMANTLING AND RE-ASSEMBLING TAPER ROLLER BEARING HUBS.—

To disassemble, remove the locking nut and screw out the adjusting ring. The oil-plate containing felt washer and plain plate will then drop out. Take out spring fingers for expanding ends of hub and remove felt washer and holder consisting of two plates and a spring clip. The latter being between the two plates. The spindle can now be pressed or driven out from the other end, bringing with it one of the outer races. The other race can then be driven out.

To re-assemble, press in outer race on fixed or plain end of hub, holding good care that it goes in square. This race is pressed in about 1/32 in. beyond its actual position, to enable the felt washer and its retaining ring together with the two plates to be put in, and the spring ring to snap into its groove. Care must be taken to put the plate with the larger hole in last. This is most important. The spindle race can now be forced back until the plates are tight on the spring ring. The spindle race now can be inserted, the short end being placed in first. The long end of the spindle must be on the adjusting side. The outer race can now be pressed in until there is about 1/16 in. end play in the spindle. Insert plain plate and shield plate with felt washer, screw in adjusting ring, and gradually screw down until there is just a portion of an inch of end play in the spindle. This should be .001 of an inch. It is of the utmost importance that the bearings are not adjusted too tight, as this would ruin them in a few miles. Having got this adjustment correct, the locking ring can be put on and tightened up, again taking care that the adjusting ring does not creep forward and make the bearings too tight.

Removal of Front Wheel.—Model S2.—As previously mentioned, the front wheel of model S2, being interchangeable with the back, the same system of attachment is provided, that is, three sleeve nuts and a center pin. These are taken out in precisely the same way as in the case of the rear, when the wheel can be drawn off the studs on the frame drum. If the front wheel is to be removed, always place the machine on both stands, or the machine will roll forward and damage the forks.

Removal of Front Wheel.—Models S4, S5, S6, S7, S8, S9, S10 and S12.—Disconnect the axle end of the operating rod from the axle end of the fork, and place the plate which passes through the lug between the fork blades, and across the front of the fork ends on either side, the wheel will then fall out of the axle end. When the wheel is replaced, see that the brake anchor pin is screwed in tightly and the spindle nuts are tight.

BRAKE ADJUSTMENT.

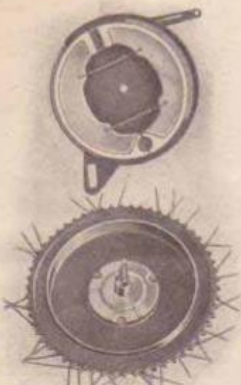


Illustration 15.
INTERNAL EXPANDING REAR BRAKE.

The linkages of A.J.S. machines require no attention with the exception of occasional adjustment of the control mechanism. In the case of the rear brake this is effected by giving a few turns to the adjusting disc, turning to the right to take up slack and vice versa. The front, on all models except S5 and S12, is carried out in a similar manner by means of finger adjustment on top of the fork gables. In the latter, the adjustment is provided by turning the milled nut above the cable stop at the bottom of the fork.

ADJUSTABLE SADDLE.

To suit riders' varying requirements, we have provided an adjustment on the saddles of all models except S5 and S12, which is shown in the accompanying illustration. The saddle is mounted on the frame as in the picture, with a pin of the type that can be fitted into either of three slots on the top bar. The rider may move the saddle forward or backward to permit the saddle to be moved forward or backward. To adjust the position



of the saddle, the pin and nut at the front are unscrewed, and the nut that fastens the top of coil springs to the under-carriage is slackened off sufficiently to allow the saddle to be moved into whichever of the three positions the rider may desire. Afterwards the pin and nut are tightened up and the rear spring fastened down again securely.

TYRE INFLATION PRESSURES.

The inflation pressures given below are those recommended for a given load for each size of tyre. The loads bearing upon each tyre can be ascertained by placing each wheel in turn on a weigh-bridge, the respective weights being taken with the rider seated on the machine. Due allowance should be made for a pillion rider, and, in the case of motor combinations, for passengers.

Maximum Load per Tyre (lbs.) and Recommended Inflation Pressures (lbs. per sq. in.)

Tyre and Size	140	160	180	200	240	280	320	360	400	440	480	500
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
25×3.00	—	—	15	18	20	—	—	—	—	—	—	—
26×3.00	—	—	15	18	20	—	—	—	—	—	—	—
27×3.00	—	—	18	22	24	—	—	—	—	—	—	—
26×3.25	—	—	—	18	22	24	26	29	31	36	39	41
26×3.50	—	—	—	16	18	20	22	25	28	31	34	37
27×4.00	—	—	—	—	16	18	21	24	27	30	33	35

GENERAL.

Remember you have a bicycle as well as a power plant. Frequently with the grease gun, lubricate the balls of spring fork and any other pivoting parts about the machine, such as handlebars, pedals, etc. Remember, grease, joints, control rods, change speed lever, gear box, clutch lever, etc. Lubricate the front fork in the same manner. The front fork oil gun is a most useful accessory. A charge of oil can be drawn out of the oil tank and used for lubricating every part of the machine. If a sidecar is fitted, don't forget to lubricate the spring shackles, etc., if squeaks are to be avoided. If the leaves of the springs crack or squeak, separate them by inserting the end of a screwdriver, and force oil between with the oil gun.

Keep the machine clean. If mud, etc., is allowed to accumulate, it will work into bearings, especially the hubs, and cause undue wear. Do not wash the machine down with a hose pipe. By so doing it is easy to get water into the petrol tank or carburettor, and cause trouble. Remove mud by means of a sponge and a bucket of water.

Pack tools tightly in the tool case with cleaning cloth, and so prevent them rattling about. Treat spare parts the same, or better still, carry tools and spare parts in the locker of sidecar, where they will not be subjected to such punishment as when packed in the pannier bag on carrier. The pannier bags can be used for carrying spare tubes if they are carefully and tightly packed, but it means certain destruction if they are not.

Keep the back tyre fully inflated, but not banded hard. It is not necessary to have the front tyre inflated as hard as the back.

Do not test the compression of your engine by standing on the footrests and pulling the machine on the rear stand, place the gear lever in "top" position, and pull the rear wheel over by hand.

Any further information required we shall only be too happy to give if communicated with direct, but it will save unnecessary correspondence if our patrons will ascertains first that the information is not already given in this booklet.

"SAFETY FIRST" HINTS.

1. Never drive faster than you can pull up in the distance you can see.
2. Never attempt to overtake another vehicle on a blind corner.
3. Always keep closely to your right side of the road when taking a blind corner.
4. If the machine will not comfortably climb a hill on high gear it is no disgrace to change down, and besides it is faster to do so.

SIDECAR HINTS.

It is highly important that the sidecar be in perfect alignment with the cycle or all-round satisfaction cannot be obtained.

The sidecar wheel should be dead parallel with the wheel of cycle and also perfectly vertical. The cycle also should be quite upright, and not leaning either outward or inward. Two straight pieces of wood about 7 or 8 feet long should be used to test the alignment. One piece should be placed alongside both wheels of cycle, and the other against the sidecar wheel, and when measured across each end the distance should be equal.

If the machine has a tendency to steer to the right or to the left, other than that caused by the camber of the road, the motor cycle is either not upright or the sidecar is out of alignment.

After the machine has been in use a little time it sometimes happens that the sidescraper will take a permanent "set," causing the cycle to lean slightly towards the side of the set. This is usually remedied by means of the telescopic torque rod between the seat pillar and the sidescraper axle.

When turning a corner sharply to the left, lean the body to the left, when turning to the right lean the body to the right. It is not sufficient, however, to simply lean the body; the rider should throw the weight of his body in the direction he leans.

Always endeavour, however, to turn a corner at a reasonable speed, especially when turning to the left, as centrifugal force puts a great lateral strain on the machine and tends to lift the sidescraper wheel from the ground. When turning to the right the lateral strain is thrown in the opposite direction and has a crushing effect on the sidescraper axle via the torque rod. When taking a corner to the right at high speeds this strain is terrific and is a fruitful cause of sidescraper axle breaking.

The A.S. sidescraper is made specially strong for this reason, but the rider will be well advised if he takes corners at a reasonable and safe speed.

When turning to the left while climbing a very steep hill at a moderate speed it is not so necessary to lean in that direction, as the natural side-drag of the sidescraper tends to turn the machine to the left. When turning to the right under the same conditions the driver and passenger should lean well to the right.

When climbing a very steep hill the passenger should get in a position that will put as much weight as possible on the back wheel of cycle. It will prevent the wheel slipping, and will counteract the tendency of the sidescraper to drag. When descending very steep hills it will help to keep the machine steady also if the passenger will put much weight on the driving wheel as possible. This paragraph only refers to "break" hills.

With the exception of the instances mentioned above, there is no necessity for the passenger to be continually leaning to the left or to the right, especially if ordinary corners are taken at a reasonable and safe speed. It is not an uncommon sight to see a passenger continually leaning in one direction or the other, even when turning a very slight curve in the road, with the mistaken idea that it helps the steering. It is not only unnecessary but it makes a real of what should be a pleasure.

The old saying, "the race is not always to the swift," is very true when applied to motorcycling. The careful driver who keeps up a consistent reasonable speed is usually much more certain of reaching his destination, not only in good time, but in comfort and safety.

As a last word on sidescraper, we would earnestly advise our friends to order the complete combination (if this has not already been done), and not for one of the ultra-cheap sidescraper with which the market is flooded (some of the expensive ones are very badly designed). They not only give continual trouble but in some cases are positively dangerous. However reliable the motor cycle may be, a sidescraper which is always giving trouble spoils the whole combination.

HINTS AND TIPS FOR HILL CLIMBS AND SPEED EVENTS.

As regards Hill Climbs, it is very difficult to give any definite information regarding gear ratios, as everything depends upon the steepness of the hill, but a 19 tooth sprocket on the engine shaft will suit the average hill, but if the hill be fairly steep, an 18 tooth sprocket would be better. As regards the chain, it would be advisable to see a rule in a hill climb is better to go on low than too high. Descending a hill it is better to go on a high gear than a low one, as it is a great advantage to have different engine sprockets with a chain for each gear, so that an alteration in the gear ratio can be effected with the minimum of trouble. For 3.49 h.p. machines we advise from 18 tooth to 22 tooth, and for 4.88 h.p. machines from 18 tooth to 20 tooth.

Lubricating Oil. For racing, the oil we use and recommend is Wakefield Castrol "R," other first-class oils are Shell Super Heavy Oil, Mobil "10," or Price's Motorine "B" de Luxe.

Fuel. On all models we have found an advantage by using a mixture of first-class Vergil and Benzole in equal proportions. There are many several varieties of motor spirit on the market, some genuine, but others are not, and we are in a position to give any advice on these fuels—it is all a matter for individual experiment.

Starting Plug. A high-class plug is absolutely essential. There are many good plugs on the market, particularly the K.L.G., Type 341. A cheap unsuitable plug usually causes pre-ignition, giving symptoms of the engine apparently seizing up. The engine suddenly falling off in power, as though a piston seizure is taking place, is usually caused by an unsuitable plug.

Carburettor. To get maximum power it is, per large enough to give a correct mixture with the throttle and air levers wide open. The jet, large enough to give best results with full throttle and full air, would probably cause erratic running at low speeds, but in speed events and hill climbs one is more concerned with high speeds than low speeds.