

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.

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## 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 Cycles-

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**A**FTER 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.

Retard the ignition lever about  $\frac{1}{2}$  or  $\frac{1}{4}$  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 trigger on the left handbar, and to advance is pushed towards the left, and to the right to retard. The air lever is the trigger on the right handbar, and to 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 carburettor. If there is any slackness in the cable, the adjusting screw in the top of the carburettor should be raised to remove the slack.

(a) Turn on the petrol by pushing 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 carburettor.

(b) Shut the air lever.

(c) Open the throttle very slightly, that is about  $\frac{1}{8}$  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 forward to open, *i.e.*, this slackness when rested on the machine. Twist grip control pulls the twist grip like an ordinary grip, but twisting around the bar instead of on top of it. Open the throttle very lightly by twisting inward about 1 in. movement of the diameter of the rubber grip after you have felt the resistance of the throttle springs.

**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 again back downward, and the engine should start. Take the foot off the footstarter 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 stop.

**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 touring 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.

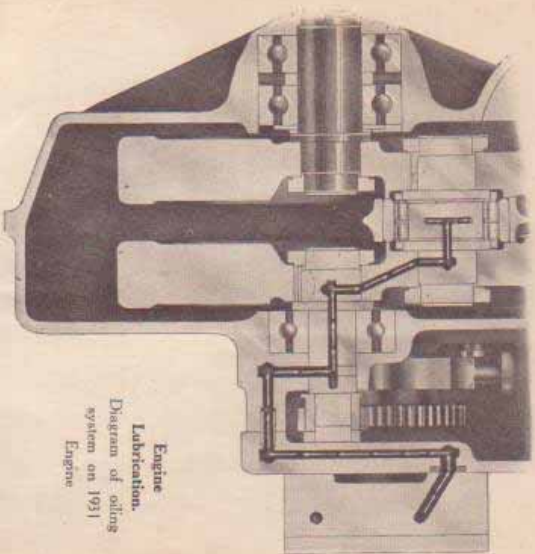
Set the ignition lever a quarter or half retard, and when the engine is started, advance the ignition fully.

Presuming 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 handlebar, 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 brake.

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

—7—



**Engine Lubrication.**  
Diagram of oiling system on 1931 Engine

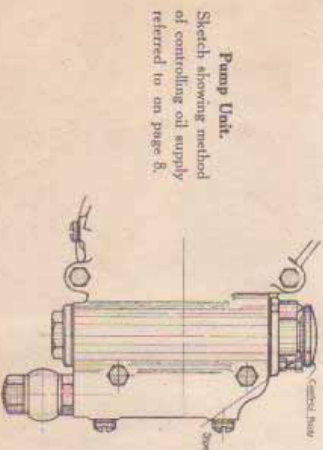


Illustration 1.

—7—

## CARE OF THE MACHINE. ENGINE.

**Lubrication**—Only best quality oils should be used. **We use and recommend** **Wakfield Control "C"** motor suitable oils are **Goldam Shell**, **Mobilol "B"**, **Shell**, **Mobilol "T"**, **Winters** (for side valve engine); **Mobilol "D"**, **Summit**, **Mobilol "T"**, **Winters** (for OHV Engine); **Price's** **Motorine "C"** de Luxe **Winters**, **Motorine "B"** de Luxe **Summit**.

**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 50 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 slightly down to stop, then increasing the oil supply by screwing it up a little more. Oil can be lowered to 2,000 to 3,000 miles down oil from crankcase, immediately by 1 pint of clean oil. A plug in 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. 1006 in. inlet and .008 in. exhaust is 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 despozzing unscure 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, prising the head centrally off the barrel from both sides. Take great care not to break the radiating fins. **Prise upwards not downwards.** When gaps form, the head can then be lifted off. If the head is desired to remove the cylinder barrel as well, the head must be drilled out. If the barrel will have to be removed, first remove the four main clamping bolts of the base. The base should be turned over until the piston is at the lowest position of its stroke, and the lift off the barrel carefully, taking care when the piston is free not to let it fall sharply against the connecting rod, as this may bruise 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 foreign matter 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 out this operation see that no side strain is thrown on the piston. If the rings are free in their grooves they need not be removed, but if they are obviously choked 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 gudgeon pin from the piston, take out one of the retaining springs, one of which will be found on either side of the gudgeon 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 gudgeon pin can be pushed out.

*After replacing the piston, see that both the gudgeon pin retaining springs are in place. Having set it all deposit from both the head and piston, wash all particles off with paraffin. 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 rejoining 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. Smear 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 tap 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 other to be withdrawn. The valve can then be drawn out.

If the valve seatings are at all pitted grind in the valves with fine emery flour mixed with oil into a paste, taking care that all emery is cleared out of the valve chamber after the operation. The valves 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 despozzing, 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 gaseity lock 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, or removed by removing the airbox 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 cylinder. Next unscrew the four nuts which hold the cylinder head to the base. In those cases when the cylinder complete can be lifted off. The smaller tool with which the head can be accomplished with the aid of a long screwdriver. The smaller tool with which to scrape or chip off the carbon. The valves for removal with the aid of the extractor referred to above, and pushed out via the valve cap apparatus.

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 56, 58 and 512.**—To remove the cylinder for cleaning, first disconnect all such fittings as exhaust pipes, carburetor slides, then proceed to remove the tubes which enclose the push rods by telescoping them one inside 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

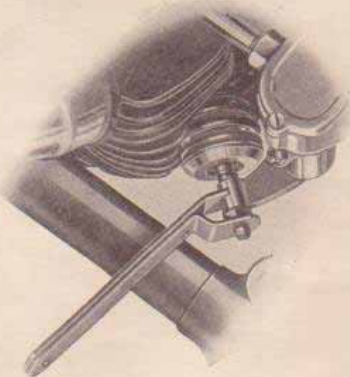


Illustration 2.  
PUSH ROD EXTRACTOR.

spring is compressed. Hold down firmly and take hold of the bottom of the push rod which will be seen protruding upwards from the cap-screw to the rocker. Lift this up from the hollow cap end and withdraw. Remove the cap-screw and push rod to remove the rocker adjusting tubes with the exception of the locknuts at top and bottom of the tube paragraph. Next unscrew the four pins holding down the rocker box. The two pins at the right or 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 T-rectangle nipple, and by means of this the grease gun a very fine grease can be forced through the nipple, which automatically finds its way to the push rod ball joint. If the inspection cover is being done that both valves are in the closed position. If the inspection cover is being done that both valves are in the open position. If the inspection cover is being done that both valves are in the open position, which fit inside the rocker spindle. The inspection cover is secured 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, and screw, and it will be found that the spring is compressed so that the two valve stem cones can be taken away from the recess in the valve stem, and the valves withdrawn.

**Carburetor Fittings.**—The carburetors on all the 1921 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 carburetor 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.S. VALVE GRINDING TOOL.

## MAGNETO.

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

**Adjustment.**—The contact breaker 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 adjusted. The proper distance of the gap is 0.5 mm. or roughly 1/64 in. full. Too great a gap will advance the timing. A special small spanner is provided with each machine, and the gauge of this is the correct distance for the break of the points. This adjustment, owing to the arrangement of the contact breaker, can be carried out without requiring the removal of the magnetos. It is all necessary to break off the points only, to uncover the long tapered magnetos, and to wear down spacers unnecessarily interfering with the setting. The points only must be dressed with a lead smooth file if the surface has become at all pitted, and then the last sensitive amount taken off, the greatest care being exercised.

**Tuning.**—If the magneto has been removed from the machine it will be necessary to see that it is tuned correctly after it is refitted. The engine magneto driving sprocket is secured to its shaft by means of castellations, which render wrong replacement impossible. The sprocket on the armature shaft of the magneto is supplied with a vernier timing adjustment, which allows a very accurate and certain method of fixing the drive after the correct setting has been arrived at. The setting of this vernier adjustment may be done in a simple, convenient, and in reality, a very simple manner. The armature is a sleeve (1) which has thirteen holes ranged in a circle. Fitting over a collar on this sleeve is the chain sprocket (2), which has twelve holes similarly arranged. Now on the sprocket an engine driving shaft and on the magneto shaft will be found an arrow. These must point to each other before anything else is done. The first thing then in tuning up is to set these two arrows so that they face exactly towards each other. To do this turn engine over until the arrow on the driving sprocket is pointing directly towards the arrow on the magneto sprocket. This latter should be held firm in the fingers and lowered a little until the two arrows are in line. The case should then be locked up and the cover removed at. When this is so, place the magneto sprocket on to the sleeve, and turn the armature shaft of magneto until a mark found on the sprocket exactly registers with a similar mark on the outside of the collar of the sleeve. It will now be found that the marked holes in sleeve and sprocket respectively exactly coincide, so that all that has to be done is to push the dog washer (3) into these holes, which effectively prevents the sprocket from moving from its correct setting, and tightly screw up the sleeve lock nut (4), which can be done without fear of

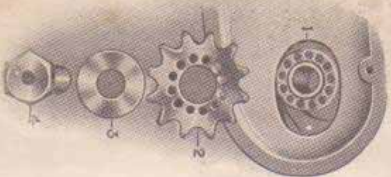


Illustration 5.

## VERNIER TIMING ADJUSTMENT.

The timing adjusting 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

## MAGNETO.—Continued.

shaft, set the piston to correct distance from top of compression stroke (see ignition timing for details of setting of each piston in its cylinder), making sure it is not on the exhaust stroke. With the piston in this position take off the screw lock nut on magneto sprocket and remove the peg washer. This will leave the sleeve free to turn on the engine drive, but facing as previously mentioned. Move the ignition control lever to the position of advance. Remove the cover of contact breaker and draw down the link of the ignition fibre book of the make and break lever across on the inclined plane of the steel support so that the contact breaker points are in the position referred to above the sleeve and sprocket should register if correctly fitted up. The dog drive should be fixed up as before detailed. It is, however, always advisable to check the timing after lightening up.

It will prevent misfiring and make starting easier if the slip ring is cleaned occasionally. This may be done by taking out the high tension terminal, and while the magneto is being revolved by slowly turning the engine round, immerse a lead pencil, the end of which is covered with a clean rag impregnated with petrol. This pencil should be pressed on the revolving slip ring.

**Ignition Tuning.**—The spark is timed to take place 1 in. before the top of compression stroke on Models S2, S9 and S12, 7/8 in. before top of compression stroke on Models S4, S5 and S8, 1/2 in. before top of compression stroke on Models S6. In all cases these are with the magneto control in the fully advanced position.

**Magneto.**—This instrument, if fitted to a machine, provides ignition for the engine and generates current for the electric lamp, and although the two are treated as separate units they are housed so as to form one. A full description of the working, care and maintenance of the "Magneto" is contained in the Ladies Book of Running Instructions, a copy of which is sent out with each new A.L.S. machine.

The lubrication is the same as with the ordinary magneto. Usually sufficient grease works through from the gear wheel casing to lubricate all bearings on the driving shaft. The dynamo commutator end bearing can easily be lubricated by removing the housing and applying a few drops of oil to the bearing. The contact breaker arm works on a roller which is lubricated by two perfectly wetted surfaces. The magneto bearing on the contact breaker end should be greased with a special grease. The magneto bearing in which it is protected. Should as Pecc's H.M.P. grease.

**When Ignition Trouble is Suspected.**—Before interfering with the magneto verify that the sparking plug, the cable and connections are correct. If these are in order the engine over slowly and watch if the contact breaker arm works properly. This is decided in a fibre insulating bush, and in most weather there is an occasional danger of the steel pin on which it works with fibre entry cloth, and insert a very small quantity of oil on it before replacing. Do not take the magneto to pieces needlessly. It is easily possible to damage it.

**Most Important.**—If it is necessary to take up the armature first see that the carbon collectors and safety gap screw are removed, or the collector ring will be broken during removal. Keep all parts clean and free from oil, particularly the contact breaker. Oil or dirt between the points will give instant 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 provided at the front, and can be moved in order to make up any chain slack. To adjust the chain, the front and rear bolts should be removed 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 sliding off the plate and adjusting pins and moving the magneto along the platform in a forward direction. When the correct chain tension has been obtained screw the pins up again tightly.

It is not necessary to remove the magneto 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 the nut on the magneto shaft respectively. To do these two latter operations, it will of course be necessary to take off the magneto chain cover entirely. After examining and before replacing the cover, oil the chain.

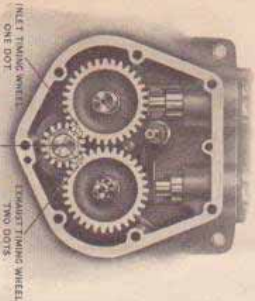


Illustration 6.

ARRANGEMENT OF TIMING GEAR.

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

**Engine Tuning—Model S2.**—The registering marks for twin cylinder models are as follows—small tuning pinion—single dot, and double dot. These marks register with corresponding dots on the front and back exhaust cam wheels. The back exhaust wheel bears stamped with one and the front exhaust with two. The teeth of the back 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 front exhaust which meshes with the front exhaust cam wheel. The pinion which must be phased 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 tinker with the engine, nor fancy you can do better than the makers by tampering with the valve timing gear.

Engine Tuning—Models S4, S5, S6, S8, S9 and S12.

Except in the case of S4, S5, S6, S8, S9 and S12 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 pinion 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 valve pinions. The inlet and exhaust valve pinions are handle-dotted forward 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.

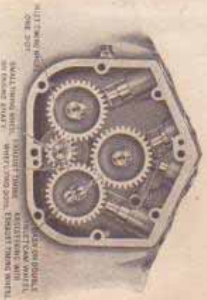


Illustration 7.

ARRANGEMENT OF TIMING GEAR.

996 hp. 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 whatsoever.

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

Gargoyle Mobilgrease 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 kick starter pedal.

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.**

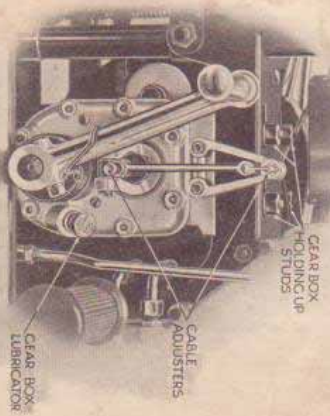


Illustration 8.

THE A.J.S. GEAR BOX.



## CLUTCH.

If the clutch should slip when changing hills, see that there is a little back lash in the hand-halt lever, otherwise the clutch springs cannot exert all their force on the plates, also when taking up excessive back lash in the minor or pulling hand, a little play is left to allow the plates to compress when the engine is pulling hard.

The adjustment for the hand-halt 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.

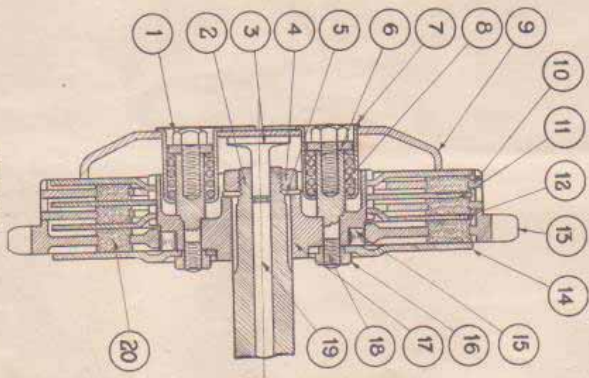


Illustration 9.

### CLUTCH PARTS.

- |                                       |                               |
|---------------------------------------|-------------------------------|
| 1. Clutch Spring Screw.               | 7. Clutch Spring Base.        |
| 2. Clutch Spring Plate.               | 8. Clutch Spring Nut.         |
| 3. Clutch Spring Pin.                 | 9. Clutch Spring Box Plate.   |
| 4. Main Shaft Nut.                    | 10. Friction Plate.           |
| 5. Locking Washer for Main Shaft Nut. | 11. Clutch Gear Plate.        |
| 6. Clutch Spring Screw Washer.        | 12. Clutch Gear Plate Washer. |
|                                       | 13. Clutch Spindle.           |
|                                       | 14. Clutch Back Plate.        |
|                                       | 15. Friction Plate Nut.       |
|                                       | 16. Clutch Spring Stud Nut.   |
|                                       | 17. Clutch Gears.             |
|                                       | 18. Clutch Ring.              |
|                                       | 19. Clutch Ring Stud.         |
|                                       | 20. Coat Inserts.             |

**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 first 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 brackets.

*It is important that the nuts on 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 screw 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 interferes 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  $\frac{1}{8}$  in. on the front chain, and about  $\frac{1}{4}$  in. on the back chain.

## CARE OF CHAINS.

**Lubrication.**—Only the rear chain need be lubricated, the front chain being automatically oiled by a pump 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 adjustments, 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.

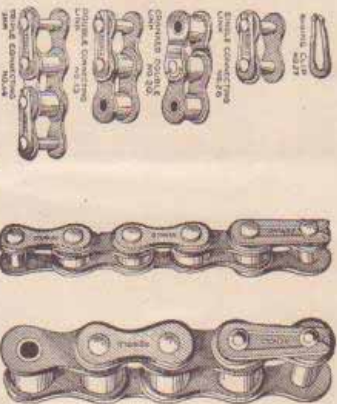


Illustration 10.

### CHAIN REPAIR PARTS.

If lubrication or adjustment is neglected, broken rollers may occasionally be found. The chain can, however, be easily repaired with the Pennant 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 Links.**—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 Links.**—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 26.

To shorten a chain containing an odd number of pitches replace by parts No. 10, 26 and 27.

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

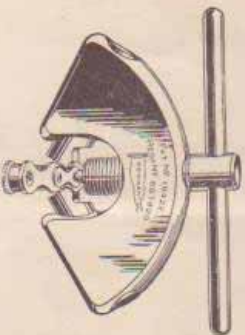


Illustration 11.

### CHAIN RIVET EXTRACTOR.

No. 26. For joining up any length of chain where extremities are made 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 which the chain travels. Fit this so that the plate and spring clip are on the inside of chain link, next the spokes.

**Replacing Chains.**—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 1931 A.J.S. machines are fitted with adjustable handlebars. If the rider wishes to make any adjustment, slacken off the bolts which pass through the split levers that connect 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 levers.

To adjust for any play in the ball head, slack off the lug around the steering levers 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 lug.

**Adjustment of Steering Head.**—Slacken the nut which holds the split lug 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.

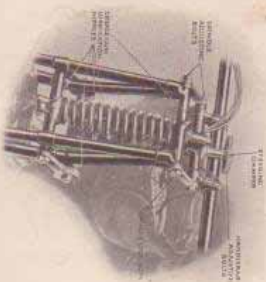


Illustration 12.

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.

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 fixed to tank we recommend that the fitting of the speedometer should be carried out by the agent from whom the machine was purchased.

## SPRING FORK ADJUSTMENT.

To take up any play which may have developed in the side flange, unscrew the spindle 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 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 bead of the rim. Then pull the gauge end into place firmly.

## DETACHABLE WHEELS.

With the exception of Models S2, S5, S7, S10 and S12, all A.J.S. machines are fitted with hinged rear mudguard and quick, detachable and interchangeable. 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 change speed lever can be placed in gear. The three sleeve nuts are turned right through the wheel and into the hub flange and screw on to the three turner pins through the wheel. The three turner pins are then screwed on to the three turner pins set in dummy discs. These fit into the three turner pin holes 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 space now left by the distance piece will allow the wheel to be drawn off the driving studs in the sprocket, and removed from the fork ends.

To replace the wheel, push it squarely on to the driving studs and seat (with the distance piece in position) screw up the centre pin moderately tight. The three loose nuts can now be screwed up tightly, afterwards giving a final turn to the centre pins. 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 end. Under no circumstances must the centre pin be removed until the machine is jacked up on the stand, and the centre 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 centre 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 tyre and remove the tube in the ordinary way. Now take out the centre 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 centre pin and proceed to refit tube and cover. Fitting the centre pin first holds the wheel firmly while the tyre is being manipulated.



Illustration 14.

### THE ADJ. QUICK DETACHABLE WHEEL.

*Periodically test the centre pins and sleeve nuts with the spanner and keys 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 subject 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 simple operation. Remove the back portion of the chain guard, slack off spring nut and detach fork end from rear. Then remove the chain off the sprocket by means of the spring link, and unscrew the brake anchor pin which projects into hole of the anchor roller, sufficient to clear. The wheel will fall out. The latter remains apply also for the removal of the rear wheel of a Model 55, 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 legs.

All wheels are dis-adjusting. Don't let the tubes 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 charge 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 dismantle, remove the locking nut and screw out the adjusting ring. The slotted plate containing felt washer and plain plate will then drop out. Take out spring rings from the opposite side of hub and remove felt washer and holder consisting of two plates and screw ring. The silver bearing between the two plates. The spindle can now be pressed or drawn out at the silver 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, taking great 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 tail. This is most important. This outer race can now be forced back until the plates are tight on the spring ring. The spindle can now be inserted, the other race can now be pressed in first. The long end of the spindle must be on the adjusting side. The other race can now be pressed in until there is about 1/16 in. end play in the spindle. Insert plain plate and slotted plate with felt washer, screw in adjusting ring, and *gradually screw down until there is just a fraction of an inch of 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 centre 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 stands on the brake drum. If the front wheel is to be removed, always place the machine on to both stands, or the machine will roll forward and damage the forks.

**Removal of Front Wheel.**—Models 54, 55, 56, 57, 58, 59, S10 and S12.—Disassemble the fork end of the operating rod from the back of the frame, and place the bolt which passes through the lug between the fork blades and screw head, into one of the spindle nuts on either side, the wheel will then fall out of the slots in fork ends. When the wheel is replaced, see that the brake anchor pin is screwed in tightly and the spindle nuts are tight.

### BRAKE ADJUSTMENT.

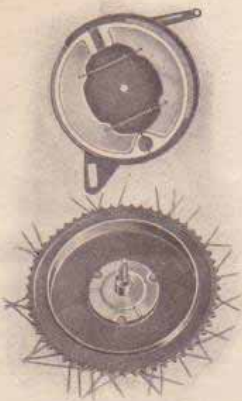


Illustration 15.  
INTERNAL EXPANDING REAR BRAKE.

The handles 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 guides. 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 front springs adjust on the fork in the same manner as the rear, which can be fitted into either of three positions on the front nut, T, by means of the wedge-shaped adjuster 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 weight-bridge, the respective weights being taken with the beam seated on the machine. Due allowance should be made for a pillion rider, and, in the case of mixed combinations, for passengers.

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

Tyre and Size	140 lbs.		160 lbs.		180 lbs.		200 lbs.		240 lbs.		280 lbs.		320 lbs.		360 lbs.		400 lbs.		440 lbs.		480 lbs.		500 lbs.	
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
25x3.00	—	—	15	18	18	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26x3.00	—	—	—	—	13	18	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27x3.00	—	—	—	—	22	24	26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26x3.25	—	—	—	—	18	18	18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26x3.50	—	—	—	—	—	—	16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27x4.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

## GENERAL.

Remember you have a bicycle as well as a power plant. Frequently with the grease gun, check the links of spring fork and any little moving parts about the machine, such as handle bars, pedals, chain, rollers, gears, control rods, change speed lever, gear box, clutch lever, etc. Lubricate the front fork to the bottom. The front fork oil gun is a most useful accessory. A charge of oil can be dropped out of the oil tank and used for lubricating every part of the machine. If a valve is fitted, don't forget to lubricate the spring mechanism, etc., if sprockets 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 carburetor, and cause trouble. Remove mud by means of a sponge and a bucket of water.

Pack tools tightly in the tool case with cleaning cloths, and so prevent them rattling about. Treat spare parts the same, or better still, carry tools and spare parts in the locker of sidestay, 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 hoard 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 footrest or pedal. Put 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 ascertain 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 easier to do so.

## SIDECAR HINTS.

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

The sidestay 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 sidestay 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 sidestay is out of alignment.

After the machine has been in use a little time it sometimes happens that the sidescraper fittings will take a permanent set, causing this cycle to lean slightly towards the sidescraper's, and is easily 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 centrifigal 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 action 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 M.S. sidescraper is made specially strong for this reason, but the rider will be well advised if he takes corners at a reasonable road side 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 it will help to extract the tendency of the sidescraper to drag. When descending very steep hills it will help to prevent the passenger from falling off. When descending very steep hills it will help to prevent the passenger from falling off. When descending very steep hills it will help to prevent the passenger from falling off.

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 toll 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 sidescraps, we would strenuously advise our friends to order the complete combination (if this has not already been done), and not fit one of the ultra cheap sidescraps 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 that will suit the average hill, but if the hill be fairly steep, an 18 tooth sprocket is better. Described as having more as a rule in a hill climb, it is better to gear too low than too high. Described as having more as a rule in a hill climb, it is better to gear too low than too high. Described as having more as a rule in a hill climb, it is better to gear too low than too high.

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

**Fuel.** On all models we have found an advantage by using a mixture of first-class Petrol and Benzine in equal proportions. The petrol we use is more correct than that of motor spirit on the market, some gunning oil, but we are not 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 241. A cheap unsuitable plug usually causes pre-ignition, giving symptoms of the engine apparently setting 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 fit a jet 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 slow speeds.