1933 SEASON

HANDBOOK

OF

A·J·S

Motor Cycles

MODELS

33-2, 33-5, 33-6,
33-B6, 33-8, 33-B8,
33-9 and 33-12

ALSO COVERING

1934 MODELS

MANUFACTURED BY

A.J.S. MOTOR CYCLES

PLUMSTEAD, LONDON, S.E.18

ENGLAND

PRICE ONE SHILLING

Supplied free with each new Cycle

HANDBOOK

OF

Motor A·J·S Cycles

INSTRUCTIONS FOR OWNERS
ON THE CARE AND MAINTENANCE
— OF A.J.S. MACHINES —

SERIES 1933

ALSO COVERING
1934 MODELS

Manufactured throughout by

AJS. MOTOR CYCLES

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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 specially drawn to the pages devoted to Driving Instructions and General Care of the Machine, these apply with equal significance to all types of 1933 A.J.S. Cycles. Particular attention should be given to those parts of the instructions which are emphasised by being printed in italics or heavy type.

This booklet covers the whole range of the 1933 A.J.S. Touring 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 is 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 1s. to cover cost and postage.

A.J.S. MOTOR CYCLES.

January, 1933.

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GENERAL INFORMATION.

TAKING OVER A NEW MACHINE.

HAVING filled up with petrol and oil it is advisable before starting the engine to sit on the cycle and to become familiar with the controls. Neutral or free engine position on all models, whether hand or foot-change, is the notch first removed from low gear or extreme downward position. The engine must always be started with the gear in this neutral position. The ignition is controlled by a trigger on the left side of the handlebar, and the air by a similar trigger on the right side, while the throttle is controlled by the right-side handlebar grip. All controls open or advance by an inward movement, and for starting, the air should be completely closed and the ignition only about half advanced. This latter is necessary to avoid back-firing. A small milled-edge screw at the bottom of the mixing chamber controls the air supply to pilot jet. This screw is accurately set at the works, but on account of variation in fuel or temperature, it may be found desirable to alter the adjustment occasionally. It should be explained, therefore, that by unscrewing, more air is admitted, thereby weakening the mixture, or *vice versa*, screwing in enriches the mixture by decreasing the air supply. This adjustment only affects carburation on very small throttle openings and dead slow running. The taper needle attached to the throttle piston controls the petrol supply on large throttle openings. To weaken the mixture this needle must be lowered, or alternatively, to enrich it is necessary to raise same. These remarks are intended only to roughly convey some idea of the carburettor working, and owners are advised to refrain from making any adjustments without good cause.

The petrol is turned on by pushing inwards the end of the sliding plunger marked ON. Assuming that the tanks have been filled with petrol and oil of the recommended brand, and that all levers have been set as above, to start the engine first flood the carburettor by depressing the tickler button on float chamber until petrol actually overflows from the vent hole. Then with the valve lifter raised, turn the engine over a few revolutions in order to charge the cylinder or cylinders. Then give the kickstarter pedal a vigorous push, releasing the valve lifter lever when the pedal has almost reached the bottom of its travel, when the flywheels should have sufficient momentum to carry over compression. Repeat if necessary and immediately the engine starts reduce the throttle opening to check speed.

Do not under any circumstances race the engine while cold, but allow it to idle for a moment or two in order to warm up, and see that the oil is circulating properly. Then, while seated on the cycle, disengage the clutch by drawing inwards the lever situated on the left side of the handlebar and engage the first gear. Then gently release the clutch lever, when the cycle will commence to move forward. When well under way, smartly declutch and simultaneously move the gear into second position, releasing the clutch lever gently as before when the change has been made, after which repeat the operation until top gear is reached. In all changes of gear the clutch should be released a fraction of a second only before shifting the gear lever, and with reasonable care a change of gear can be made without a sound.

The movements of the gear lever must be made slowly and firmly, **under no circumstances should the gears be allowed to grate.**

IMPORTANT NOTE RE FOOT-CHANGE GEAR CONTROL.

With a foot change a totally different method of operation should be observed from that described overleaf for hand control.

The effort obtained with the foot and the leverage on the control is very much greater than with hand change, and certain precautions must be observed to avoid damage to the gears and control mechanism.

Under no circumstances should a violent kick be given to the pedal, a steady pressure being all that is required. It must be clearly understood that under certain conditions the layshaft and mainshaft gears may be rotating at equal speeds, and the dogs on the gears may be positioned against each other. Therefore, if undue force is used, breakage of the gear selectors or control mechanism could result from violent pressure on the pedal. A downward pressure engages the lower gear, and *vice versa*, an upward movement makes a change upward.

In making a change of gear, the clutch should be released and the pedal simultaneously moved with a steady toe movement. When the end of the pedal travel has been reached, the pedal must be held firmly with the foot until the clutch has been re-engaged. It is not sufficient to just kick the pedal and remove the foot when the end of the travel has been reached.

"DONT'S" IN DRIVING.

DO NOT race the engine unnecessarily, or let the clutch in sufficiently suddenly to cause the wheel to spin. Take a pride in a silent, smooth getaway.

DO NOT use the brakes with violence. Brake early and drive on the throttle instead of the brakes.

DO NOT allow the engine to labour on high gear on a steep gradient, and remember that an easier, faster and better ascent can be made on the next lower gear.

DO NOT make a practice of starting in second speed.

DO NOT under any circumstances allow the chains to run very slack or very dry. Either will soon cause trouble and adjustments are easy. Slack chains will inevitably cause harshness of transmission.

DO NOT force engine or drive above a maximum speed of 30 m.p.h. for the first 500 miles. Mention is made of this warning on account of the natural desire of a new owner to ascertain his mount's maximum capabilities. However, until all bearings are well run in, it is advisable to refrain from speed bursts, and the accompanying possibility of seized bearings, piston rings, etc. The first 500 miles of an engine's existence is far more important than the next 5,000.

DO NOT race the engine in neutral gear position, violently accelerate from a standstill, or drive at full speed on full throttle, etc., when in a residential district. Any motor cycle (or, for that matter, any motor vehicle) when so driven creates abnormal noise, and in the interests of all motorists we earnestly implore every A.J.S. owner to studiously refrain from any of the practices enumerated, or any calculated to cause annoyance to the public in general. Recollect that the degree of silence of your cycle is judged not by the actual noise it is making, but by comparison with other noises present. For example, in a busy street your cycle might be inaudible, while in a quiet, narrow street of high buildings, it might be heard for several hundred yards, although in each case being driven in exactly the same manner.

LUBRICATION.

ENGINE.

Proper lubrication is of vital importance, and the use of only the best lubricant will be repaid many times over by long wear and good service. After extensive tests we have decided to recommend Wakefield Castrol X.L. as the most suitable oil for touring purposes, and advise all owners to use this and no other. The identifying letters used by most oil firms, denoting the different grades in which that oil is supplied, are imitated, so that it is essential when ordering oil to specify the brand as well as the grade; for example—Wakefield Castrol X.L., and not just X.L. As an additional precaution it is advisable to buy from the branded cabinets or from sealed tins. See where your oil is drawn from.

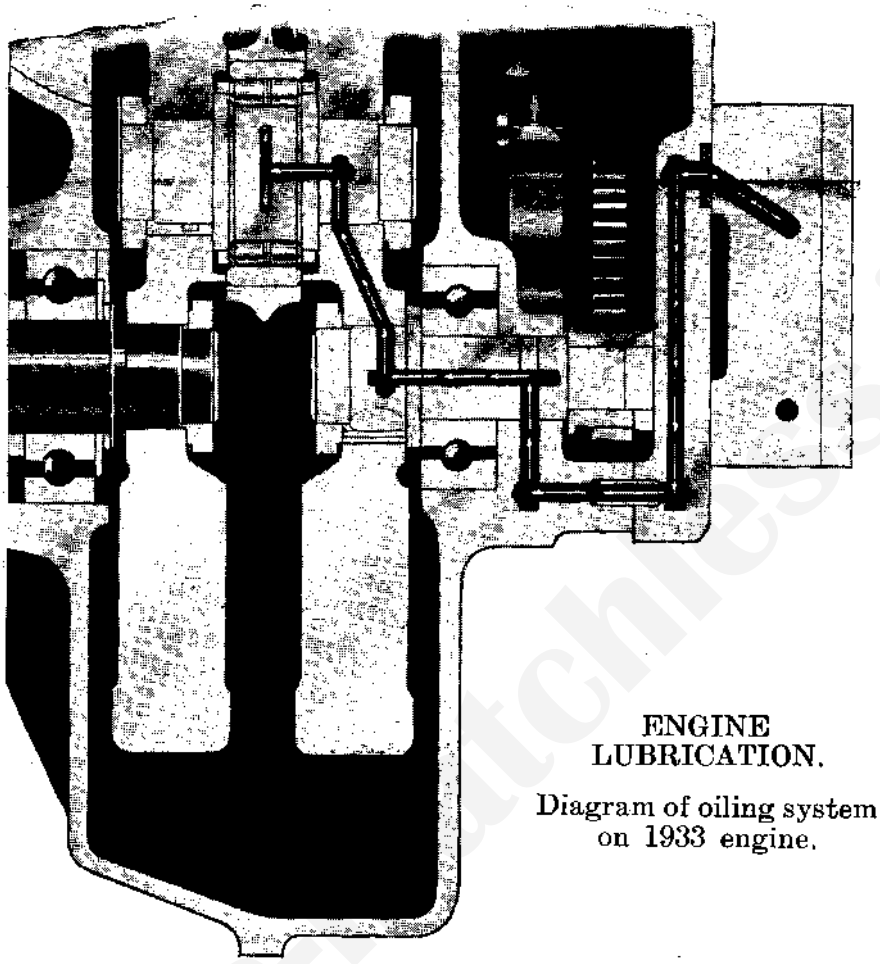
Note.– For Sports Models used for competition purposes Wakefield Castrol R. should be used, but on no account should this oil be mixed with any other.

Engine Lubrication—Models 33-5, 33-6, 33-B6, 33-8, 33-B8, 33-9 and 33-12, Single Cylinder.

On all the above models a wet sump non-circulating oiling system is employed. A double acting oil-pump plunger is used, one end of which delivers oil to the engine, and the other end draws oil from the tank and immediately returns same, in order to provide a tell-tale by which the correct functioning of the pump unit can be determined at a glance upon lifting the oil tank cap. As the oil supply to the engine is decreased so also, at the same time, the return to the tank is decreased. The amount of oil pumped into the engine is varied by altering the setting of the control knob on pump unit (see Illustration 1). Screwing this knob down, i.e., in a clockwise direction, cuts down the 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-testing 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 lightly down to stop, then unscrewing half a turn. Every 2,000 to 3,000 miles drain off oil from crankcase and replace by half-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 the crankcase.**

Engine Lubrication—Model 33-2, Twin.

The engine fitted to this model, unlike any of the singles, has a dry sump crankcase, and the lubrication system is entirely different. No adjustment is provided, the correct supply of oil to all parts of the engine being controlled by means of suitably dimensioned passages. As on other models, the oil is carried in a tank underneath the saddle, but unlike other models the oil level must not be allowed to fall below the half-full mark. In fact, so far as is practicably possible the level should be maintained at approximately one inch below the return spout immediately underneath the tank filler cap. The reason for this is that the more oil the tank contains, the cooler and less



ENGINE LUBRICATION.

Diagram of oiling system on 1933 engine.

PUMP UNIT.

Sketch showing method of controlling oil supply referred to Page 7.

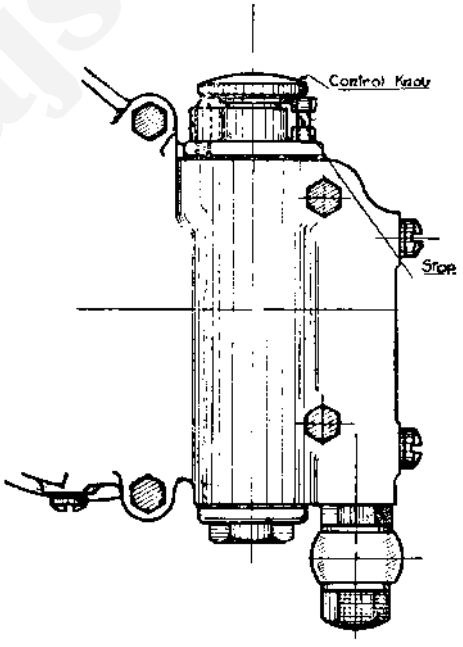


Illustration 1.

contaminated it will remain in its incessant circulation. A very efficient system of filtering the oil is provided, consisting of a felt cartridge, through which the oil is compelled to pass on its way back to the supply tank. This filter cartridge is readily removable upon unscrewing the screwed plug cap on the top of the oil tank. It should be thoroughly washed in clean petrol every 2,000 miles, while once each season or every 5,000 miles the entire tank should be removed, and after thoroughly washing out with petrol and allowed to drain, it should be refitted and filled to the correct level with fresh oil.

Notes on the Dry Sump Oiling System Model 33-2.—If the engine is for any reason dismantled, the crankcase must not on any account be separated until the oil pump plunger has been withdrawn. To withdraw this plunger, first remove both end caps and also the guide screw, when the plunger can be pushed out large end first. When re-assembling, the plunger must be inserted after the crankcase sections have been bolted together, and before refitting the end caps, the guide screw must be replaced with its relieved tip engaging the profiled cam groove in the plunger. By moving the plunger to and fro while this screw is being introduced, the correct location of the groove can be easily felt, and the screw in question must be firmly screwed home. The entire oiling system is simplicity itself, only one moving part being employed, viz., the double diameter plunger. This plunger is rotated by the engine shaft, and moves backward and forward while rotating, under the influence of a small guide screw which engages with the profiled annular groove cut in the plunger end. As the plunger moves in its housing in one direction, the large end draws oil from the sump, while at the same time the smaller end is delivering fresh oil to the various channels provided. Upon the reverse movement of the plunger the large end returns to the tank the oil already drawn from the sump, while the smaller end draws a fresh charge of oil from the tank in readiness for delivery to the engine upon the following movement of the plunger. This action, of course, goes on all the while the engine is revolving, and since the exhausting plunger is the larger one, the engine sump is always kept clear of oil, hence the term "dry sump," while at the same time a large quantity of clean, cool oil is being forced under pressure to all working parts.

CHAINS.

The primary chain runs in an oil bath and should need very little attention other than occasional adjustment, and the oil kept up to the correct level in the case. The inspection cap orifice is so positioned to make overfilling impossible. If it is desired to get the maximum degree of service from the rear chain, it is advisable to entirely remove same once every 3,000 miles in summer, and 1,500 miles in winter, and thoroughly wash in paraffin. After carefully wiping, it should be immersed in molten tallow, or as a poorer substitute, ordinary engine oil. If the latter is used, the chain should be laid in soak overnight in order to ensure penetration to all link joints.

GEAR BOX.

Once every 1,000 miles about two ounces of Wakefield Castrolease (Light) should be injected into the gear box. About twice each season, or at intervals of about 2,000-3,000 miles, an egg-cup full of ordinary engine oil should also be added. It is desirable to verify occasionally the level of lubricant in the box. The correct level is from third to half full. If the above described injections fail to maintain this correct level, the interval between each should be

FORK SPINDLES.

Every 500 miles the fork spindle bearings should be flooded with a good quality grease, preferably Tecalemit grease or Wakefield Castrolease (medium). This flooding process takes a few seconds only by means of the special grease gun provided. This requires merely holding the nozzle end against the rounded nipples and given a few sharp strokes.

HUBS.

Every 500 miles (or more frequently in continuous bad weather) the lubricators in the centre of both front and rear hubs should have a **small quantity** of grease forced into them. (Wakefield Castrolease Medium suitable.)

Note.—Castrolease Medium can be obtained in special push-down lid canisters, for easily filling the grease gun, in ½ lb., 1 lb. and 2 lb. sizes.

BRAKE AND GEAR ROD JOINTS, ETC.

In addition to the foregoing, all moving parts, such as brake and gear rod joints should be oiled occasionally, particularly in bad weather. Bicycle lubricating oil or machine oil suitable.

ADJUSTMENTS & MAINTENANCE.

Valve and Tappet Clearance.—The correct clearance between tappets and valve ends must be accurately maintained. The clearance recommended for O.H.V. models is the nearest approach to nil possible. On side valve models the recommended clearances are .004 for the inlet and .006 for the exhaust. Check the clearance when the engine is warm, not when cold. Suitable spanners for the adjustment are provided in the tool kit.

DECARBONISATION.

The period for which an engine will run satisfactorily without being decarbonised depends to a great extent upon driving conditions. Generally, however, this process should be carried out every 1,500 to 2,000 miles. The need for decarbonising will be indicated by a tendency to pink or knock when ascending hills, or upon accelerating after rounding a corner, and particularly so when the engine is hot. Although to remove carbon deposit it is only necessary to take off the cylinder heads, it is advisable to remove the cylinders each 5,000 miles in order to inspect the piston rings and remove any deposit from the grooves in which they operate.

To Decarbonise S.V. Models 33-2 and 33-9.—To remove the cylinder head for decarbonising, unscrew the seven holding-down bolts on top of the cylinder head and disconnect the sparking plug cable, the head can then be lifted off. If it is desired to remove the cylinder barrel as well, the base fixing nuts must be unscrewed from the studs (on the 33-2 Model one nut is inside the valve spring compartment, and on this Model it is necessary to remove the exhaust pipes before the cylinders can be withdrawn), but before drawing off the

DECARBONISATION.—Continued.

cylinder barrel the engine should be turned over until the piston is at the lowest position of its stroke, and then 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.

Having removed the cylinder, wrap a clean cloth or rag round underneath the piston to prevent any foreign matter or dirt 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 quite 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 which will be found on either side of the gudgeon pin. These fit into recessed rings in the piston bosses, and to withdraw, the ends must be squeezed together with the special small pliers provided. Afterwards the gudgeon pin can be pushed out.

Note.—It is advisable not to reverse the position of the piston on single cylinder models, and imperative on the 33-2 Model, upon which also the pistons must not be inter-changed on account of the fact that front and rear differ. **After replacing the piston, see that both the gudgeon pin retaining springs are in place and a tight snug fit.** Having got rid of 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 joints 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 the 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 vaseline. 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 on to the barrel. Place the cylinder head squarely on the barrel and then screw in the holding-down bolts, afterwards tightening these evenly.

If it is required to remove or inspect the valves of Side Valve Models 33-2 or 33-9, the detachable head must be removed as mentioned previously and the valves will then be exposed.

If the seatings are all pitted, grind in the valves with fine emery flour mixed with oil into paste, or with one of the specially prepared pastes marketed, 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 33-5 Machine, the cylinder head and barrel are in one piece, and the former therefore cannot be detached as is the case with all other models. The general instructions for decarbonising, however, will hold good in the case of this particular model. In order to remove the cylinder of the 33-5 Model, the exhaust pipe and the steady bolt 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. Next unscrew the four nuts which hold the cylinder barrel to the crankcase, when the cylinder complete can be lifted off. The decarbonising of the head can be accomplished with the aid of a long screwdriver or similar tool with which to scrape or chip off the carbon. It is desirable to remove valves on side valve models while cylinder is *in situ*.

Examine periodically the bolts which hold the engine in the 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 can of paraffin or petrol.

To Decarbonise O.H.V. Models.—To remove the cylinder head for cleaning, valve grinding etc., first disconnect all such fitments as exhaust pipes, carburettor slides, sparking plug, petrol pipe etc. Then unscrew the bottom push rod covering tube nuts and telescope these tubes by forcing the bottom portion upwards. Next turn the engine until both valves are closed, after which unscrew the four pins holding down the rocker box assembly, removing entirely the two nearest the valves. The rocker box assembly, together with the push rods, can now be taken away, after which it only remains to remove the four cylinder head fixing bolts, when the head will be free to be lifted off. Be careful to avoid damage to the cylinder head gasket, and see that all faces are scrupulously clean upon refitting.

Not Applicable to 1934 Models

Illustration 2.

PUSH ROD EXTRACTOR.

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 Tecalemit nipple, and by means of the grease gun a little grease can be forced through the nipple, which automatically finds its way to the push rod ball joints. It is important when this is being done that both valves are in a closed position. If the inspection cover is removed, care should be taken to see that the two coil springs, which fit inside the rocker spindles, are not lost. These coil springs press against the inside of the cover, and have their other bearing against the end of the hollow rocker spindle.

DECARBONISATION.—Continued.

Should it be desired to remove the valves when the head is detached, the special valve extractor should be used, price 5s. 9d. (see Illustration 3). This is a clamp-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, keep screwing, and it will be found that the spring is compressed so that the two small split cones can be taken away from the recess in the valve stem, and the valves withdrawn. If the valve seats are at all pitted they should be carefully ground in as instructed for S.V. Models. A special valve grinding tool is supplied in the standard tool kit, and the method of use is shown in Illustration 4.

Illustration 3.
VALVE EXTRACTOR.

Carburettor Fitting.—The carburettors on all the 1933 models 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.

Adjustment.—The contact breaker points should be examined after 1,000 miles, and if the break should be more than the thickness of a visiting card they should be adjusted. The proper distance of the gap is 0.5 mm. or roughly 1/64th inch 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 removing the contact breaker from the magneto. If it is necessary to take the contact breaker out, unscrew the long taper fixing screw, and pull the contact breaker off. The points only need attention at very long intervals, and we warn users against unnecessarily interfering with the setting. **The points must only be dressed with a dead smooth file** if the surface has become at all pitted, and then the **least possible amount taken off,** the greatest care being exercised.

Timing (all single cylinder models).—If the magneto has been removed from the machine it will be necessary to see that it is timed correctly after it is refitted. The engine magneto driving sprocket is secured to its shaft by means of castellations, which render wrong replacements 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 at first sound a trifle complicated, but in reality it is perfectly simple. Fitted to the armature shaft of the magneto is a sleeve (1), which has thirteen holes ranged in a circle. (2), which has twelve holes similarly arranged. Now on the sprocket on 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 timing 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 free in the fingers and moved a tooth backwards or forwards in the chain until the correct setting is arrived at. When this is so, place the magneto sprocket on to the sleeve, and turn the armature shaft of magneto until a mark found punched over one of the twelve holes 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 peg 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 the timing shifting in the process, as is often the case with other models. As a means of verifying the timing, or if the sleeve (1) has been removed from the mag-

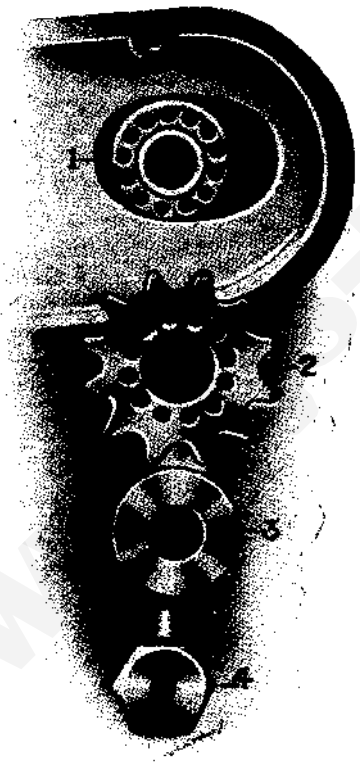


Illustration 5.
VERNIER TIMING ADJUSTMENT.

neto armature shaft, set the piston its correct distance from top of compression stroke (see ignition timing for details of settings of each particular model), making sure it is not on the exhaust stroke. With the piston in this position take off the sleeve lock nut on magneto sprocket and remove the peg washer. This will leave the armature free from the engine drive, but still connected via the chain to the engine. See that the sprockets have their arrows facing as previously mentioned. Move the ignition control lever to the limit of its motion of advance. Remove the cover of contact breaker and slowly turn the armature until the fibre block of the make and break lever arises on the inclined plane of the steel segment just sufficient to separate the points. This is the firing point, and with the piston in the position referred to above the sleeve and sprocket 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.

Timing 33-2 Twin Model.—The magneto chain sprockets on the 33-2 Model are both plain taper bore, and to re-time this model after dismantling, re-assemble in the usual manner and tighten the sprocket on the cam wheel securely, but leave the sprocket on magneto armature loosely fixed. Then revolve the engine by hand until the back piston is approximately three-eighths of an inch from the top of the compression stroke (i.e., the stroke upwards immediately after inlet has closed). Then with ignition lever in fully advanced position, and magneto sprocket loose on shaft (the other sprocket having been previously tightened) turn the magneto armature backwards until the points are just about to break on the No. 1 cam. Holding carefully in this position, tighten up the magneto sprocket nut.

Note.—No. 1 cam is the one farthest from rear cylinder when looking at contact breaker end of magneto.

Ignition Timing.—The ignition is timed to take place $\frac{3}{8}$in. before the top of the compression stroke on Models 33-5, 33-B6, 33-12 and 33-2; 7/16in. on 33-6; and $\frac{1}{2}$in. on Models 33-8, 33-B8 and 33-9. The above measurements are with ignition fully advanced.

Magdyno.—This instrument, if fitted to a machine, provides ignition for the engine and generates the current for the electric lamps. A full description of the working, care and maintenance of the "Magdyno" is contained in the Lucas Book of Running Instructions, a copy of which is sent out with each new A.J.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 end. The dynamo commutator end bearing can easily be lubricated by removing the hexagon nut securing end cover and placing a small quantity of grease or a few drops of oil in the bearing housing. The magneto bearing at the contact breaker end should run perfectly without any attention, owing to the manner in which it is protected. Should the gears run completely dry they can be packed with a high melting point grease such as Price'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 turn the engine over slowly and watch if the contact breaker arm works properly. This is bedded in a fibre insulating bush, and in moist weather there is an occasional danger of the material swelling. If this happens prise the rocker arm off its bearings and clean the pin on which it works with fine emery cloth, and smear 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.

MAGNETO.—Continued.

Most Important.—If it is necessary to take out 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 Chain Adjustment.—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 unscrewed a turn or two and the platform raised from the forward end. When the desired chain tension is arrived at carefully re-tighten the bolts.

Valve Timing, Single Cylinder Models.—Except in case of necessity we do not advise 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 valve timing pinions. To set the inlet valve, place the single dot found stamped 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.

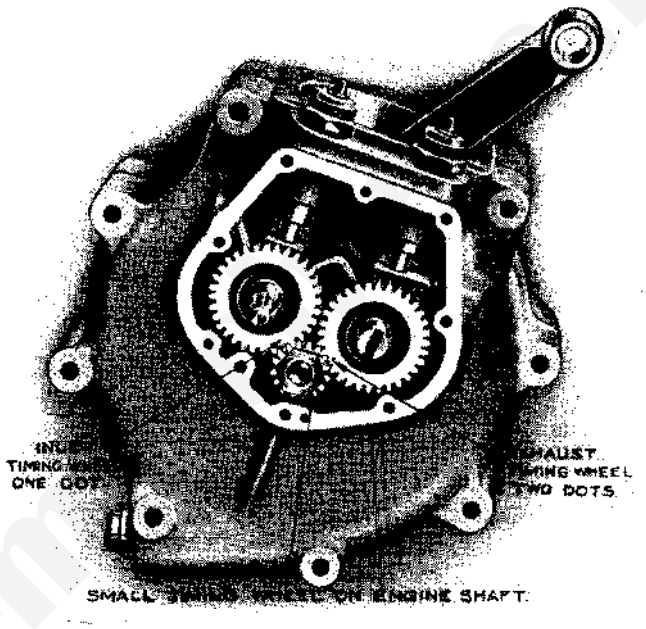


Illustration 6.

ARRANGEMENT OF TIMING GEAR.
Single Cylinder O.H.V. and Side-Valve Models.

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

Valve Timing, Model 33-2.—The timing wheels on this model are also marked for re-setting purposes, and the marked tooth on the small pinion must necessarily mesh with the marked tooth gap on the single cam wheel. To remove the cam wheel after the timing gear cover has been taken off, it is necessary to revolve the engine until the marks referred to coincide, after which, raise the front inlet valve by means of a screwdriver or suitable lever, when the cam wheel can be freely withdrawn. To replace this wheel it is necessary, unless help is available, to hold the front inlet valve in a raised position by means of a small block of suitable height inserted between the cylinder base and the lower valve spring cap. Then holding all four cam levers up with the fingers, gently insert the cam wheel, taking care to see that the marks coincide.

GEAR BOX.

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

Lubrication.—As already mentioned Wakefield Castrolease Light Grade is specially recommended for the gear box. If the box has been dismantled, charge with ½ lb. of this grease with about half-pint of engine lubricating oil added.

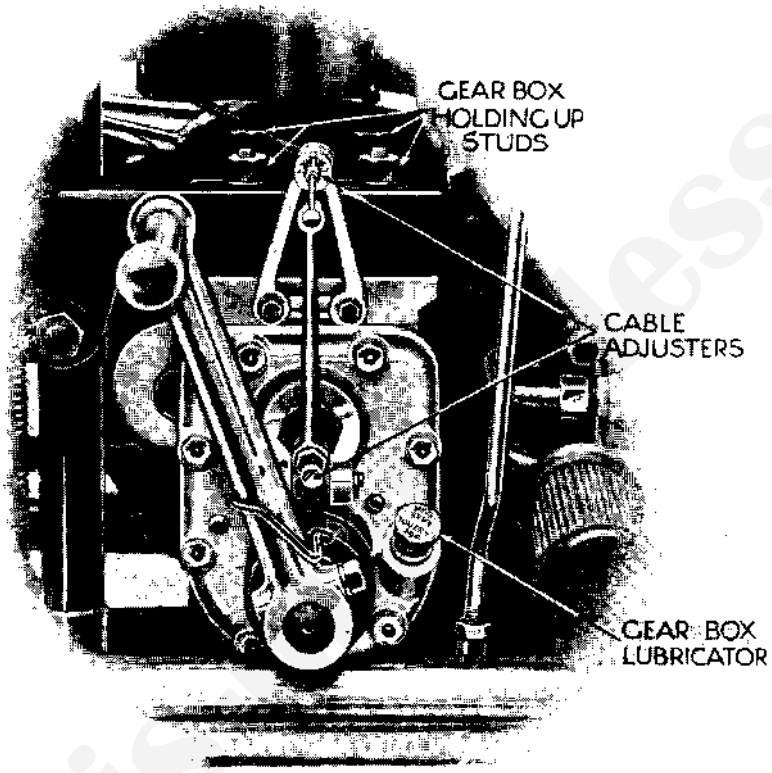


Illustration 7.
THE A.J.S. GEAR BOX.
Models 33-6, 33-8, 33-B8 and 33-9.

CLUTCH.

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

The adjustment for the handlebar lever is by means of an adjusting pin on the gear box 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 gear box.

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

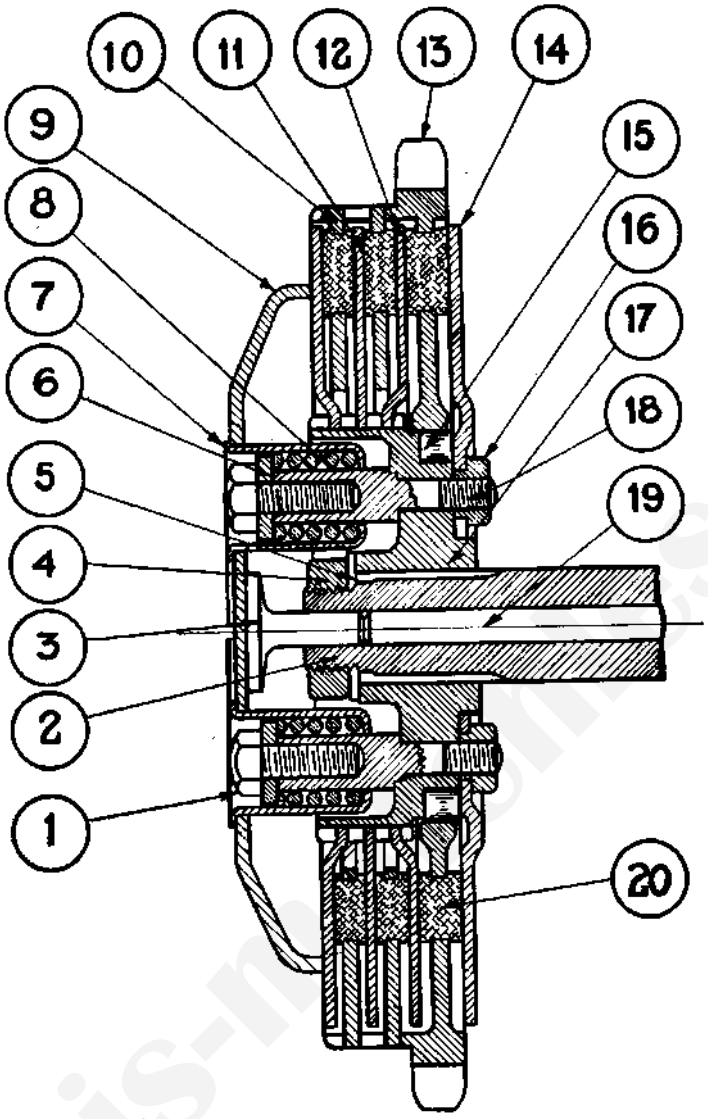


Illustration 8.

CLUTCH PARTS (Heavyweight).

The clutch on lightweight models is similar in construction with the exception that one central spring only is employed.

1.—Clutch Spring Screw.
2.—Main Shaft.
3.—Clutch Thrust Pin.
4.—Main Shaft Nut.
5.—Locking Washer for Main Shaft Nut.
6.—Clutch Spring Screw Washer.
7.—Clutch Spring Box.
8.—Clutch Spring.
9.—Clutch Spring Box Plate.
10.—Friction Plate.
11.—Clutch Centre Plate Dished.
12.—Clutch Outer Plate.
13.—Clutch Sprocket.
14.—Clutch Back Plate.
15.—Roller Bearings.
16.—Clutch Spring Stud Nut.
17.—Clutch Centre.
18.—Clutch Spring Stud.
19.—Clutch Rod.
20.—Cork 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 kickstarter crank should be removed, also the cover for the spring. You will then notice that the end of the spring is fitted into the first of a series of five holes. To get additional tension, the end of the spring should be fitted 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 Primary Chain.—On all models except the 33-2 the adjustment of the primary chain is made by sliding the gear box back upon the cradle plates to which it is fixed. To do this, first slack off the top fixing nuts, then screw the adjuster draw bolt in the required direction to tighten or slacken as the need may be. The gear box on the 33-2 Model, it will be observed, is fixed top and bottom between the engine cradle plates, and to allow of chain adjustment the upper fixing bolt operates in slotted holes. To adjust the primary chain on this model first slack off the top fixing bolt, then with the adjuster bolt provided on the right-hand side, move the gear box in the required direction. On all models it is necessary to securely tighten the gear box fixing bolts after an adjustment has been made. The correct adjustment of the chain should allow a movement of $\frac{1}{4}$ to $\frac{3}{8}$in. as the bottom run of the chain is pressed up and down. The chain is, of course, visible upon detaching the oil hole and inspection cover in the lower half of the oil bath case, and while this cover is removed oil should be added if necessary. The aperture is so positioned to provide the correct oil level and prevent overfilling.

Adjustment of Rear Chain. On all models, adjustment of the rear chain is obtained by sliding the rear wheel bodily backwards in the slotted fork ends. To adjust, first slack off the nuts on each side of wheel axle and screw the adjuster bolt in each fork end to exactly the same extent, taking care to leave the wheel in correct alignment. (See adjustment gauge, Illustration 11). It may be found that moving the wheel back will cause the rear brake to bind. This possibility should not be overlooked, and the necessary adjustment is easily made by means of the brake rod adjustment. The correct adjustment for the rear chain should allow a movement of $\frac{1}{2}$in. as the chain is lightly pressed up and down midway between the sprockets.

CHAIN REPAIRS.

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

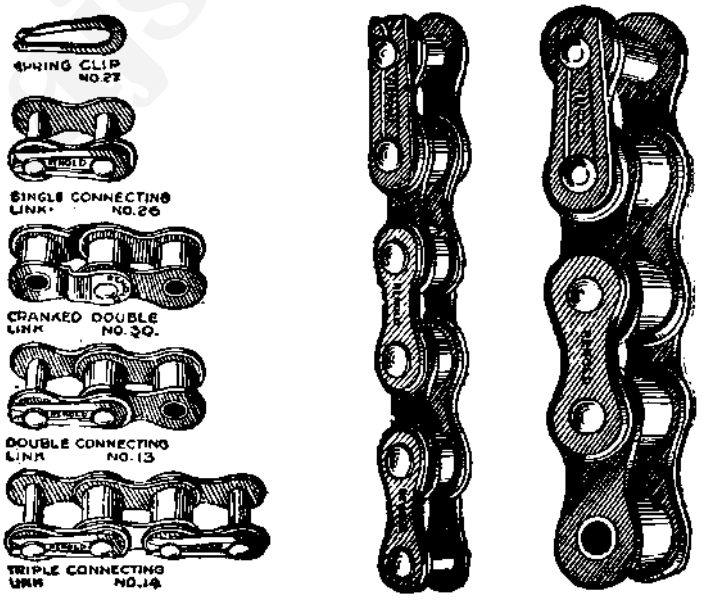


Illustration 9.

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 10) and a few spare parts. This tool provides a simple means of removing the rivets which cannot be filed down, as they are casehardened. 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.

Illustration 9 shows all the parts necessary to effect repairs to a chain.

To shorten a chain containing an even number of pitches replace by parts No. 30 and 26.

To shorten a chain containing an odd number of pitches replace by parts No. 13.

To repair a chain with a broken roller or faulty inside link, replace by parts No. 14.

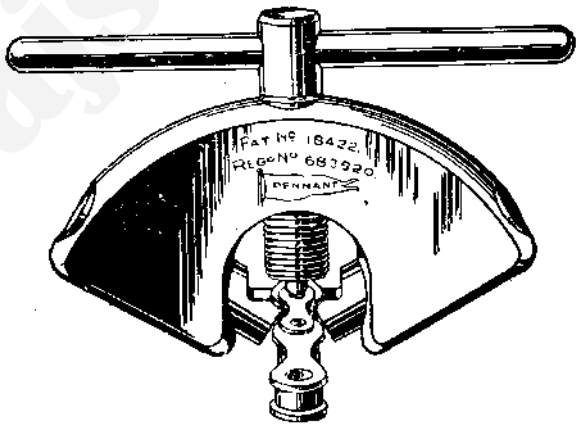


Illustration 10.

CHAIN RIVET EXTRACTOR. Price 4s. 6d.

For joining up any length of chain where extremities are inside links, use part No. 26.

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 open end should always*

CHAIN RIVET EXTRACTOR.—Continued.

face in the opposite direction to which the chain travels. Fit this so that the plate and spring clip are on the inside of the chain, i.e., next the spokes.

Replacing Chain.—When replacing a chain it will facilitate the fitting of the 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 1933 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 lugs that connect the handlebars to the forks, and partly rotate the handlebars upwards or downwards until the desired position is attained. Afterwards carefully tighten up the bolts of the split lug.

Adjustment of Steering Head.—Slacken the nut which bolts 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. Always slack off steering damper fully when making adjustments and take up all shake but leave steering head perfectly free. Tight adjustment will cause difficult steering and slack adjustment is likely to cause damage to the head ball races by the balls hammering small indentations in the races.

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.

SPRING FORK ADJUSTMENT.

To take up any play which may have developed in the side links, unscrew the spindle lock nuts on the right-hand side of the forks (looking at the machine from the front) 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. Do not attempt to turn spindles without first slacking lock nuts. The need for adjustment will be made apparent by a click or creaking noise which will be heard when the steering head is turned abruptly while the cycle is stationary.

TO ADJUST FORK ACTION DAMPER.

The fork action damper can best be adjusted while the cycle is actually in motion and a badly corrugated surface, such as may be found in many 'bus routes, provides the best conditions for the purpose. The ebonite damper hand nut should be screwed sufficiently tight to make the fork action sluggish, under such circumstances as those described, and will subsequently require very little variation for other conditions of road surface to provide the maximum degree of comfort.

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, Models 33-5, 33-B6 and 33-12 excepted.

In the tool kit will be found a flat gauge that can be fitted round the rim (see Illustration 11). 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.

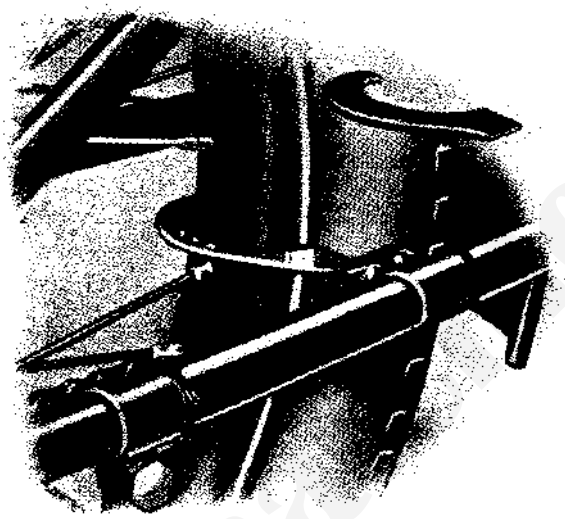


Illustration 11.

REAR WHEEL ADJUSTMENT GAUGE. (Heavyweight Models.)

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 bed properly on to the rim on both sides; the best method of ensuring this being to see that the hooked end is properly encircling the bead of the rim. Then pull the gauge end into place firmly. Some pressure is necessary to apply the gauge when tyre is highly inflated.

WHEELS.

With the exception of Models 33-5, 33-B6 and 33-12, all A.J.S. machines are fitted with hinged rear mudguards and detachable rear wheels.

To Remove Detachable Rear Wheel.—Place cycle on 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 unscrew-

ing 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 extend right through the wheel and off-side hub flange, and screw on to the three threaded studs on the driving sprocket. There are also three plain studs on the sprocket which act as dummy drivers. These fit into the three remaining holes in the hub flange. After the sleeve nuts have been unscrewed, then unscrew the centre pin and draw it out completely, 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 *next* (with the distance piece in position) screw up the centre pin moderately tight. *The three sleeve nuts can now be screwed up tightly*, 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 fork 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 entire, he must first take off the one side of the tyre and remove the tube in the ordinary way. Next 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 12.
THE A.J.S. QUICK DETACHABLE WHEEL.

WHEELS.—Continued.

Periodically test the centre pin and sleeve nuts with the spanner 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 simple operation. Remove the back portion of the chain guard, slack off spindle nut and detach brake rod from lever. Take the chain off the sprocket by means of the spring link, and unscrew the brake drum anchor pin which projects into slot of brake anchor plate, sufficient to clear. The wheel will then fall out of slots in fork-ends.

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

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 or three thousand miles, but an occasional charge with the grease gun when going over other parts of the machine is advisable.

WHEEL BEARINGS (IMPORTANT).

Instructions which must be carefully carried out for dismantling and re-assembling taper roller bearing hubs:—

To dismantle, release the locking nut and screw out the adjusting ring. The dished plate containing felt washer and plain plate will then drop out. Take out spring ring from the opposite side of hub and remove felt washer and holder consisting of two plates and retaining ring, the latter being between the two plates. The spindle can now be pressed or driven out from either 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 1/32nd 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.* This outer race can now be forced back until the plates are tight on the spring ring. The spindle can now be inserted, the short end being placed 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 1/16th in. *end play in the spindle.* Insert plain plate and dished plate with felt washer, screw in adjusting ring, *and gradually screw down until there is just a fraction 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.—Disconnect the yoke end of the operating rod from the brake drum lever, remove anchor plate bolt which passes through the lug between the fork blades, and after slackening off 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.

ADJUSTMENT OF HAND GEAR CONTROL.

To test for correct gear rod adjustment proceed as follows:—Place cycle on the stand and remove the split pin from the top gear rod yoke end pin (i.e., the pin which passes through the end of the gear lever). Also at the same time slack off the lock nut securing this top gear rod yoke end. Now place the gear lever into third gear position, and after removing the top yoke end pin from which split pin has already been withdrawn, lightly alternatively pull and push the gear rod by hand in order to feel the action of the gear box internal spring indexing plunger. As the sliding gears move either side of the correct third gear position the resistance of the spring plunger will be plainly felt, and the exact position at which this plunger is in full engagement with the third gear notch must be accurately and definitely found. Having established this correct position, offer up the gear rod to gear lever, which latter must, of course, be in the third gear position, in the case of four-speed models (second gear position on three-speed models) and screw the top yoke end up or down as the need may be until the pin can be quite freely inserted. Before locking the yoke end into position, it is advisable to again obtain by hand the exact position of third gear as already described, and check the rod length for correct setting, after which the yoke end may be secured by means of its lock nut and the pin refitted. It must be understood that if the correct adjustment is obtained for the third gear all the remaining gears will also be correct as regards rod adjustment.

CARBURETTOR ADJUSTMENT.

Although owners are advised to refrain from tampering without good cause with the setting of the carburettor, a rough idea how this unit functions, and how adjustments may be effected, is given below. The correct level of petrol is maintained by means of a float and needle valve operating in much the same manner as the ball float and valve of an ordinary domestic water cistern. The correct level is obtained by the carburettor manufacturers, and no alteration, under any circumstances, should be made. In the event of a leaky float or worn needle valve, the part in question should be replaced. Control over the main petrol supply to the engine is obtained firstly by the jet or orifice, and secondly by a taper needle passing through the jet and attached to the throttle valve. As the throttle valve is opened a smaller part of the taper needle comes into operation, and thereby increasing the passage for the petrol. This needle, being adjustable in length, provides a fairly wide range of control without actual alteration to the jet size. A pilot, or slow running jet, is provided to take care of slow running or idling, and a throttle stop controls the actual speed at which the engine runs when the throttle is closed to the maximum extent posible, in which position the engine should run or "tick over" (to use an expression favoured by motor cyclists), slowly but positively. The correct setting of the main jet should permit full air being used when running fast on full throttle. To test for correct setting, start up engine, and after allowing a few seconds to warm up, fully retard the ignition and fully open throttle. If it is now possible to open the air beyond one-third or half-open position it would indicate a too large jet, and the needle attached to throttle valve must be lowered or lengthened. This needle, it should be explained, is secured by a flat cotter engaging with a small notch in the needle. Several of these notches are provided to permit adjustment. When correct, the engine should commence to splutter immediately the air lever is opened more than about one-third, but should run satisfactorily on the fully closed air position. Under no circumstances should the engine be run for more than **a few seconds** with the throttle fully open and ignition fully retarded. The only other adjustments are the air supply

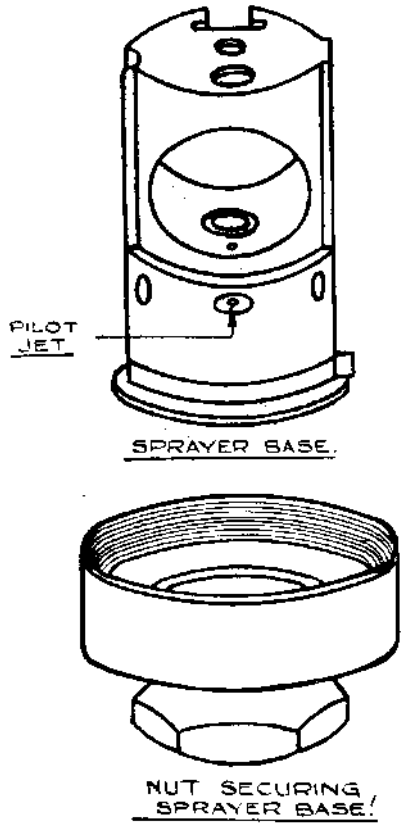


Illustration 13.

to the pilot jet and the throttle stop. The adjusting screw for the pilot jet air supply will be observed in the base of the mixing chamber. Screwing in enriches the mixture, and *vice versa*, unscrewing weakens it. It must be clearly understood that adjustment to this screw affects the mixture only on extremely small throttle openings. Having set the throttle stop screw to give the desired idling engine speed, the pilot jet air screw is turned in the required direction to give even firing. The adjustment is not particularly sensitive, and no difficulty should be experienced in finding the correct position, when the locking nut should be tightened down to prevent any movement by vibration. Adjustment, if any, should be made to this air screw while the engine is warm and the ignition fully or nearly fully advanced, and air lever one-third open. We mention this in order to remove the possible impression that the pilot jet setting is not correct should the engine stall when started up from cold. Once correctly set, the pilot jet should not require attention except perhaps in extremes of temperature.

In the event of adjustment of the air screw failing to affect slow running in the manner described, it may be reasonably assumed that the minute passage for petrol has become chocked. This is always a possible danger unless meticulous care is taken to prevent the entry of dust or foreign matter of any description into the petrol tank. The jet or petrol passage in question consists of a small hole drilled in the side of the sprayer base. This sprayer base may be pushed out of the mixing chamber upon removing the float chamber and the large nut at the bottom of the mixing chamber. To make the location of the petrol passage in question quite clear, a line illustration is shown, and in the event of difficulty being experienced, a fine piece of steel wire (a strand of Bowden cable will do) should be passed through the very small hole indicated by an arrow.

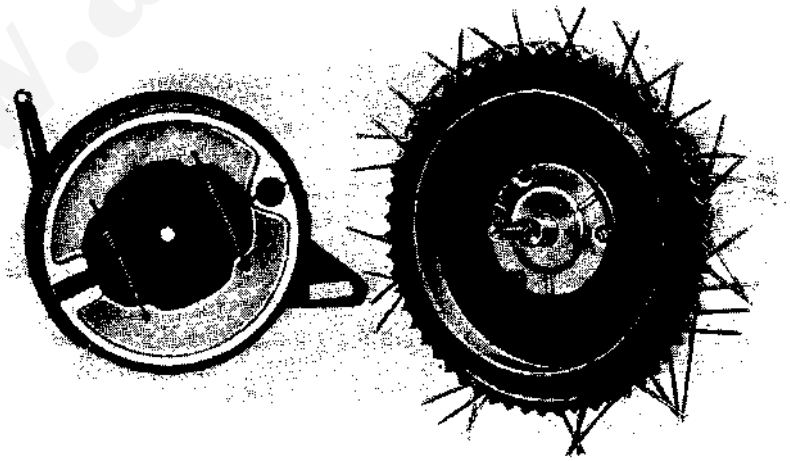


Illustration 14.
INTERNAL EXPANDING REAR BRAKE.

BRAKE ADJUSTMENT.

The brakes 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 33-5, 33-B6 and 33-12, is carried out in a similar manner by means of finger adjustment on top of the fork girder. 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 33-5, 33-B6 and 33-12, which is shown in the accompanying illustration. The under-carriage of the saddle at the front is provided with a bolt which can be fitted into either of three holes in a lug on the top tube. The rear end of the under-carriage is slotted to permit the saddle to be moved forwards or backwards. To adjust the position of the saddle, the pin

Illustration 15.

and nut at the front are unscrewed, and the nut that fastens the top of coil springs to the under-carriage is slacked 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.

Recommended for 1933 Models.

Models 33-12, 33-5 and 33-B6.

Front tyre ...	25x3.00 ...	15-16 lbs.
Rear tyre ...	25x3.00 ...	22-24 lbs.

Models 33-6, 33-8, 33-B8 and 33-9.

		Solo.	Single S.C.	Double S.C.
Front tyre ...	26x3.25 ...	15-16 lbs. ...	15-16 lbs. ...	17-18 lbs.
Rear tyre ...	26x3.25 ...	18-20 lbs. ...	20-22 lbs. ...	24-26 lbs.
S.C. tyre ...	26x3.25 ...	— ...	15-16 lbs. ...	20-22 lbs.

The above figures apply to average weight drivers. For abnormal weight or carrying pillion passenger add 2 lbs. to rear tyre pressure only.

Model 33-2.

		Solo.	Single S.C.	Double S.C.
Front tyre ...	26x3.25 ...	15-16 lbs. ...	16-17 lbs. ...	17-18 lbs.
Front tyre ...	27x4.00 ...	14-15 lbs. ...	14-15 lbs. ...	14-15 lbs.
Rear tyre ...	26x3.25 ...	20-22 lbs. ...	22-24 lbs. ...	22-24 lbs.
Rear tyre ...	27x4.00 ...	16-18 lbs. ...	18-20 lbs. ...	16-18 lbs.
Side tyre ...	26x3.25 ...	——— ...	16-17 lbs. ...	18-20 lbs.
Side tyre ...	27x4.00 ...	——— ...	14-15 lbs. ...	15-16 lbs.

GENERAL.

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 cloths, 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.

Do not test the compression of your engine by standing on the footstarter pedal. Put the machine on the rear stand, place the gear lever in "top" position, and pull the rear wheel over by hand, with throttle well open.

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 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 seven or eight 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 sidecar fittings will take a permanent "set," causing the cycle to lean slightly towards the sidecar. This is easily remedied by means of the adjustable arms.

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 sidecar 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 sidecar axle via the torque arms. When taking a corner to the right at high speeds this strain is terrific and is a fruitful cause of sidecar axles breaking.

The A.J.S. sidecar 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 sidecar 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 the cycle. It will prevent the wheel slipping, and will counteract the tendency of the sidecar to drag. When descending very steep hills it will help the steering also if the passenger will put as much weight on the driving wheel as possible. This paragraph only refers to "freak" hills.

With the exception of the instances mentioned, 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 toil of what should be a pleasure.

The old saying "the race is not always to the swift," is very true when applied to motoring. 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 sidecars, we should earnestly advise our friends to order the complete combination (if this has not already been done), and not fit one of the ultra cheap sidecars 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 sidecar 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 on the engine shaft would be faster, and as a rule in a hill climb it is better to gear too low than too high. Deciding on a suitable gear for any particular hill can only come from experience. Where the rider is continually competing in hill climb events, 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 4.98 h.p. machines from 18-tooth to 20-tooth.

Lubricating Oil.—For racing, the oil we use and recommend is Wakefield Castrol "R."

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

Sparking Plugs.—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 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 slow speeds, but in speed events and hill climbs one is more concerned with high speeds than slow speeds.

LEGAL MATTERS.

Note.—In view of the public objection to noisy motor cycles, a word of warning on this subject may not be out of place here. Firstly, it has been noted, and frequently commented upon, that much of the noise complained of is unnecessary, being due to injudicious driving—as, for instance, violently accelerating from a standstill, racing the engine when stationary, driving on full throttle when ascending hills in residential districts, etc. Any motor cycle (or, for that matter, any motor vehicle) driven in this manner creates abnormal noise, and in the interests of all we earnestly implore every "A.J.S." owner to refrain from any of the practices enumerated.

To comply with the Law relating to motor cycles, the owner must :—

1.—Hold a driver's licence, which can be obtained from the Chief Constable or Corporation of a County Borough, or from the County Council. The charge for this licence is 5s. yearly, and must be renewed annually from the date of issue. A motor car driver's licence covers the driving of a motor cycle.

2.—Insure against Third Party Risks (other risks may also be embodied in the Insurance Policy as owner may desire, but are not compulsory by Law), and obtain from the Insurance Company decided upon, either a Certificate of Insurance covering the full period of twelve months, or alternatively, as is most general, a temporary Certificate, which must be produced when applying for Revenue Licence.

3.– Apply to the Taxation Department of the Local Authority of the district in which the vehicle is to be ordinarily kept, for Inland Revenue Licence and Registration Form R.F.1/2 (motor cycles only). The address of the above Taxation Department can be obtained, by enquiry, at the Post Office.

4.—The Form R.F. 1/2, when obtained, must be filled in and returned, accompanied by the Insurance Certificate referred to above, and the requisite remittance, which varies according to the date of registration and the terms to be covered. For a full year, January 1st to December 31st, the fee is £1 10s., Model 33-12 only. All other models £3 (solo), or £4 with sidecar attached. In some districts, evidence that the vehicle to be licenced is new and has not been previously registered may be demanded. Manufacturer's or Agent's invoice will serve.

5.—Never drive at a speed which is dangerous to the public.

6.—Wherever necessary, give audible and sufficient warning by horn, or other instrument, of the approach of his cycle.

For registration purposes, the following particulars will be requested :—

Weight of cycle unladen (with equipment required by Law), 240 lbs. Model 33-12, 235 lbs. ; Model 33-5, etc. (see Useful Information, Centre Pages).

Type of Model.—A.J.S. 33-5, A.J.S. 33-6, etc., as the case may be.

Manufacturer's horse power.—Model 33-12, 2.48 c.c. ; Models 33-5 and 33-6, 3.49 c.c. ; Models 33-8, 33-B8 and 33-9, 4.98 c.c. ; and Model 33-2, 9.90 c.c.

GUARANTEE AND CONDITIONS.

GUARANTEE.

We give the following guarantee with our motor cycles, motor cycle combinations and sidecars, which is given in place of any implied conditions, warranties or liabilities whatsoever, statutory or otherwise, all such implied conditions, warranties and liabilities being in all cases excluded. Any statement, description, condition, or representation contained in any catalogue, advertisement, leaflet or other publication shall not be construed as enlarging, varying, or over-riding this guarantee. In the case of machines which have been used for "hiring out" purposes, or racing, or from which the trade mark name or manufacturing number has been removed, no guarantee of any kind is given or is to be implied.

WE GUARANTEE, subject to the conditions mentioned below, that all precautions which are usual and reasonable have been taken by us to secure excellence of materials and workmanship, but this guarantee is to extend and be in force for six months only from date of purchase, and damages for which we make ourselves responsible under this guarantee are limited to the free supply of a new part in exchange for the part of the motor cycle, motor cycle combination, or sidecar which may have proved defective. We do not undertake to replace or refix, or bear the cost of replacing or refixing, such new part in the motor cycle, motor cycle combination or sidecar. We undertake, subject to the conditions mentioned below, to make good at any time within six months any defects in these respects. As motor cycles, motor cycle combinations, and sidecars are liable to derangement by neglect or misuse, this guarantee does not apply to defects caused by wear and tear, misuse or neglect.

The term "misuse" shall include, amongst others, the following acts:—

1.—The attaching of a sidecar to the motor cycle in such a manner as to cause damage or calculated to render the latter unsafe when ridden.

2.—The use of a motor cycle or motor cycle and sidecar combined, when carrying more persons or a greater weight than for which the machine was designed by the manufacturers.

3.—The attaching of a sidecar by any form of attachment not provided, supplied or approved by us.

CONDITIONS OF GUARANTEE.

If a defective part should be found in our motor cycles, motor cycle combinations or sidecars, or any other part supplied by way of exchange before referred to, it must be sent to us CARRIAGE PAID, and accompanied by an intimation from the owner that he desires to have it repaired or exchanged free of charge under our guarantee, and he must also furnish us at the same time with the number of the machine, the date of the purchase, or the date which the alleged defective part was exchanged, as the case may be.

Failing compliance with the above, such articles will lie here at the risk of the owner, and this guarantee and any implied guarantee, warrantee or condition shall not be enforceable.

We do not guarantee specialities such as tyres, saddles, chains, magnetos, lamps, etc., or any component parts supplied to the order of the purchaser differing from standard specifications supplied with our motor cycles, motor cycle combinations, sidecars, or otherwise.

Important Note.—Any part sent to us for any reason whatsoever must bear distinctly the sender's name and address and instructions or requests relative to parts must be sent separately by letter post.

MACHINE NUMBERS.

The frame number will be found stamped on the right-hand side of lug under saddle.

The engine number is stamped on the aluminium crankcase, transmission side, immediately beneath the cylinder base.

A.J.S. MOTOR CYCLES.

A.J.S. USEFUL INFORMATION

	ITEM 1933 Models	MODELS								NOTES
		33-12	33-5	33-B5	33-6	33-B8	33-8	33-9	33-2	
MEASURE-MENTS	Length	6′ 7″	6′ 7″	6′ 7″	6′ 10″	6′ 10″	6′ 10″	6′ 10″	7′	
	Width	30½″	30½″	30½″	30½″	30½″	30½″	30½″	30½″	
	Wheelbase	52″	52″	52″	56¼″	56¼″	56¼″	56½″	58¼″	
	Ground Clearance ...	5¼″	5¼″	5¼″	5½″	5½″	5½″	5½″	5½″	
	Saddle Height ...	28″	28″	28″	29″	29″	29″	29″	28″	
FUEL	Petrol Tank Capacity	(1) 1¾″	1¾″	1¾″	2″	2″	2″	2″	3½″	
	Oil Tank Capacity ...	(1) 3½″	3½″	3½″	4½″	4½″	4½″	4½″	5″	
	Petrol Consumption	(2) 100	90	80	75	70	75	75	70	
		120	95	85	80	75	75	80	80	
	Oil Consumption ...	(2) 1800	1500	1500	1200	1200	1200	1200	1100	
TRANS-MISSION	Front Chain Size ...	½x305	½x305	½x305	½x305	½x305	½x305	½x305	½x305	
	Front Chain Links ...	66	64	66	67	67	67	67	70	
	Rear Chain Size ...	½x305	½x305	½x305	½x305	⅝x⅜	⅝x⅜	⅝x⅜	⅝x⅜	
	Rear Chain Links ...	113	114	113	124	99	99	99	105	
	Mag. Chain Size ...	½x125	½x125	½x125	½x125	½x125	½x125	½x125	½x187	
	Mag. Chain Links ...	34	34	34	38	38	38	38	58	
GEARS	Gear Ratio, Top ...	5.8	5.8	5.25	(5) 5.8	(5) 4.88	(5) 4.81	(5) 4.81	(5) 4.3	
	Gear Ratio, Third ..	7.73	9.0	7.0	7.0	5.9	5.8	7.0	5.7	
	Gear Ratio, Second ...	11.36	16.0	10.29	12.6	8.63	10.4	12.85	7.6	
	Gear Ratio, Bottom ...	17.22	——	15.59	17.4	14.49	14.4	——	12.6	
TYRES	Size of Tyres	25x3	25x3	25x3	(3) 26x3.25	(3) 26x3.25	(3) 26x3.25	(3) 26x3.25	27x4	
	Pressure, Front (4) ...	15-16	15-16	15-16	15-16	15-16	15-16	15-16	15-16	
	Pressure, Rear (4) ...	22-24	22-24	22-24	18-20	18-20	18-20	18-20	20-22	
Speed, Miles Per Hour		65	60	70-72	65-68	78-80	75-78	65	75-80	
Total Weight in Pounds (6) ...		240	235	242	320	313	335	317	356	
ENGINE	Bore in Millimetres ...	65	74	74	74	84	84	84	85	
	Stroke in Millimetres	75	81	81	[illegible]	90	90	90	85	
	Cubic Capacity in c.c.	248	349	349	[illegible]	498	498	498	990	
	Jet Size	100	75	150	150	180	180	140	130	
	Throttle Slide ...	5/4	4/5	6/4	6/4	29/4	29/4	6/4	6/4	
	Std., Compres. Ratio	6.6	4.3	6.1	6.3	6.1	5.7	4.9	4.8	

Sidecar Gears.

	33-6	33-B8	33-8	33-9	33-2
5.	6.41	5.53	5.53	5.53	4.8
	7.77	6.7	6.7	8.12	6.4
	13.9	12.0	12.0	14.7	7.6
	19.23	16.5	16.5		12.6

1. Petrol in gallons; oil in pints.
2. In miles per hour.
3. 26x3.50″ optional extra.
4. In pounds per square inch.
6. With electric lighting solo.

A.J.S. USEFUL INFORMATION

	ITEM 1934 Models	34/12	34/5	34/B6	34/6	34/B8	34/8	34/9	34/2
MEASUREMENTS	Length	6′ 7″	6′ 7″	6′ 7″	6′ 10″	6′ 10″	6′ 10″	6′ 10″	7′ 4″
	Width	30½″	30½″	30½″	30½″	30½″	30½″	30½″	30½″
	Wheelbase	52″	52″	52″	56¼″	56¼″	56½″	56½″	60″
	Ground Clearance ...	5¼″	5¼″	5¼″	5½″	5½″	5½″	5½″	5″
	Saddle Height ...	28″	28″	28″	29″	29″	29″	29″	28″
FUEL	Petrol Tank Capacity	(1) 1¾ Gls.	1¾ Gls.	1¾ Gls.	2 Gls.	2 Gls.	2 Gls.	2 Gls.	3½ Gls.
	Oil Tank Capacity ...	(1) 3½ Pts.	3½ Pts.	3½ Pts.	4½ Pts.	4½ Pts.	4½ Pts.	4½ Pts.	5 Pts.
	Petrol Consumption ...	(2) 100	90	80	75	70	70	75	60
		110	95	85	80	75	75	80	65
	Oil Consumption ...	(2) 1200	1200	1100	1000	1000	1000	1000	1100
		1300	1300	1200	1100	1100	1100	1100	
TRANSMISSION	Front Chain Size ...	½x305	½x305	7/16x.263	½x305	½x305	½x305	½×305	½x305
	Front Chain Links ...	66	64	77	67	67	67	67	70
	Rear Chain Size ...	½x305	½x305	½x305	½x305	5/8x⅜	5/8 /x⅜	5/8 /x⅜	5/8 /x⅜
	Rear Chain Links ...	112	114	113	124	99	99	99	105
	Mag. Chain Size ...	½x125	½x125	½x125	½x125	½x125	½x125	½x125	½x187
	Mag. Chain Links ...	34	34	34	38	38	38	38	58
GEARS	Gear Ratio, Top ...	5.8	5.8	5.25	(5) 5.8	(5) 4.88	(5) 4.81	(5) 4.81	(5) 4.53
	Gear Ratio, Third ...	7.73	9.0	7.0	7.0	5.9	5.8	7.0	5.48
	Gear Ratio, Second ...	11.36	16.0	8.15	12.6	8.63	10.4	12.85	8.01
	Gear Ratio, Bottom ...	17.22	—	15.85	17.4	14.49	14.4		13.45
TYRES	Size of Tyres	26x3.25	25x3	26x3.25	(3) 26x3.25	(3) 26x3.25	(3) 26x3.25	(3) 26x3.25	27x4
	Pressure, Front (4) ...	15–16	15–16	15–16	15–16	15–16	15–16	15–16	15–16
	Pressure, Rear (4) ...	22–24	22–24	22–24	18–20	18–20	18–20	18–20	20–22
Speed, Miles Per Hour		60–65	60	68.70	65–68	78–80	73–75	65	75–80
Total Weight in Pounds (6) ...		250	235	258	320	325	335	320	415
ENGINE	Bore in Millimetres ...	65	74	74	74	84	84	84	85
	Stroke in Millimetres	75	81	81	81	90	90	90	85
	Cubic Capacity in c.c.	248	349	349	349	498	498	498	990
	Jet Size	100	75	150	150	180	180	140	130
	Throttle Slide ...	5/4	4/5	6/4	6/4	29/4	29/4	6/4	6/4
	Std., Compres. Ratio	6.6	4.3	6.0	6.0	6.0	5.7	4.9	4.8
	Brake Horse Power ...	12	11.2	16	16	19.6	19	14	26

NOTES

5. Sidecar Gears.

	34–2	34–9	34–8	34–B8
34–6	5.0	5.53	5.53	5.53
6.41	6.05	8.12	6.7	6.7
7.77	8.85	14.7	12.0	12.0
13.9	14.85	—	16.5	16.5
19.23				

1. Petrol in gallons ; oil in pints.
2. In miles per hour.
3. 26×3.50″ optional extra.
4. In pounds per square inch.
6. With electric lighting sets.