TELEGRAMS "HOPIT, WOLVERHAMPTON."
TELEPHONE 1731 (FIVE LINES).

A·J·S

Motor Cycles

7·99 h.p. 3-SPEED A.J.S. PASSENGER COMBINATION.

1926 Models G 1 and G 2.

HOW TO MANAGE THEM

APPLICABLE ALSO TO 1921-1925 MODELS, AND ALSO IN ESSENTIAL DETAILS TO 6 H.P. 1920 MODEL

A. J. STEVENS & CO. (1914) Ltd.,
GRAISELEY HOUSE, WOLVERHAMPTON

HEMMING & CHAMBERS, WOLVERHAMPTON

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

The side car 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 along side both wheels of cycle and the other against the side car wheel, and when measured across ends and the distance should be equal.

If, although the alignment is correct, the machine keeps continually to steer to the left, the cycle should be adjusted to lean a little to the right. If the steering leads to the right, slightly lean the machine to the left towards the side car.

Always drive the machine sitting in an upright position, and do not fall into the unsightly habit of leaning the body permanently towards the side car. It is not only unnecessary but it puts a great strain on the side car attachments.

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

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

Always endeavour, however, to turn a corner at a reasonable speed especially when turning to the left, as centrifugal force puts a great lateral strain on the machine and tends to lift the side car 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 side car axle via the torque rod. When taking a corner to the right at high speed this strain is terrific and is a fruitful cause of side car axles breaking.

The A.J.S. side car axle 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 side car tends to turn the machine to the left. When turning to the right under the same conditions the driver and passenger should lean well to the right.

When climbing a very steep hill the passenger should get in a position that will put as much weight as possible on the back wheel of cycle. It will prevent the wheel slipping, and will counteract the tendency of the side car 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 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 taking 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 lot 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 final word on this page, we would extremely advise our friends to order the complete combination of this kind [illegible] already been found and not fit any of the ultra cheap side cars with which the market is flooded. Such not only give continual trouble but in some cases are positively dangerous. [illegible] however reliable the motor cycle may be, a side car which is always giving trouble spoils the whole combination.

A·J·S

MOTOR CYCLES.

FOREWORD.

We have pleasure in providing the riders of A.J.S. Machines with a comprehensive Instruction Book, dealing with our 7·99 h.p. Motor Cycle and Sidecar.

The Booklet has been very carefully compiled, and we trust that the information contained in the following pages will be of assistance to the rider in tackling little adjustments, or elucidating any troubles which may from time to time take place.

Many adjustments and little troubles can, however, be avoided if the new rider will carefully read—and remember what he has read—that portion of this Booklet devoted to Driving Instructions, and general care of the machine, and particularly take note of those instructions which are emphasised by being printed in italics.

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 in every case be accompanied by a remittance of 6d. to cover cost and postage.

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

Contents.

Index to Illustrations

General.

Remember you have a bicycle as well as a power plant. Frequently oil the forks of spring fork. Periodically put oil in the forks or fill with vaseline. Oil occasionally any little moving parts about the machine, such as brake stanchion, Bowden lever joints of control rods, change speed lever, gear box clutch lever etc. An oil gun is a most useful accessory. A charge of oil can be drawn out of the oil tank and used for lubricating every part of the machine. If a sidecar is fitted, don't forget to lubricate the spring shackles, etc., if squeaks are to be avoided. If the leaves of the springs creak 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 in the petrol tank or carburetter, and cause trouble. Remove mud by means of a sponge and a bucket of water.

Load 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 leather of side car where they will not be subjected to such punishment as which packed on the pannier bags or 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 board hard, and see that security bolts are tight. It is not necessary to have the front tyre inflated as hard as the back.

When the machine is used as a solo mount do not fit all-steel studded tyres. They are positively dangerous on greasy setts or tramlines, especially if wet.

It is not necessary to carry a load of spare parts with the machine. The only parts that may be required under ordinary conditions are:—

One spare valve complete with spring, washer and cotter, a good substantial tyre repair outfit, one each spring link and half link for chains, two good sparking plugs, an inflate plaster for tyre in case of a hole cut or burst, and a good supply of electric cut-in-one-use.

For very long journeys or an extended tour it is wise to carry in addition to the above a spare front chain complete with spring link, and a spare cover and tube in case of serious tyre trouble if a spare detachable wheel is not carried.

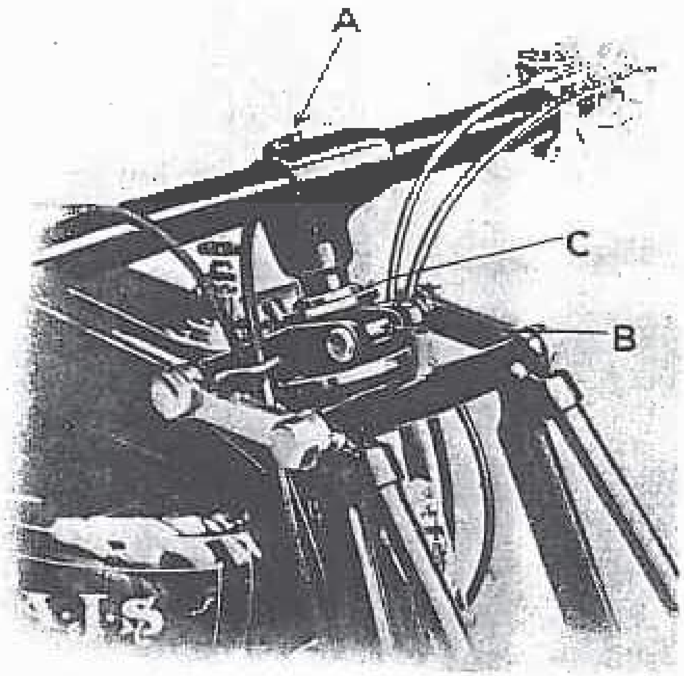
The T.T. Model A.J.S. is designed to carry two persons, and luggage, anywhere, and do it easily, but if you have a trunk built in your sidecar, do not try to climb it with all your friends heaped up in the side car and on the carrier. It is not fair to the machine, your pocket, or the makers.

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.

Steering Head.



1. Loosen Bolt A four turns and give it a sharp tap with hammer.
2. Slacken Nut B.
3. Adjust steering head by Nut C.
4. Lock up Nut B and Bolt A.

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.

Driving Instructions, &c.

For 6 & 7'99 h.p. Three-speed A.J.S. Motor Cycle.

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

Only oil suitable for air cooled engines must be used. The [illegible] *recommend is Wakefield's "Castrol C."*

Turn on the petrol by pushing the knob of the petrol tap which is marked "on" and flood the carburetter by pressing the "tickler" on top of float chamber. The oil tap will be found below the elbow beside the tank, and is similar to the petrol tap. This tap can be left in the "on" position while riding, and need only be turned off when the machine is left standing for a long period. For further instructions regarding lubrication see "Engine Lubrication" on Page 8.

Inject a small quantity of petrol into the cylinders through the compression taps by means of priming pipes under the tank. It will greatly facilitate the entry of the petrol into the cylinders if the exhaust valve lifter is raised. After the petrol has been injected see that the compression taps are closed again.

Unless the engine is cold and difficult to turn, it is seldom necessary to inject petrol into cylinders.

To start the machine carry out the following operations.

1. See that the gear lever is in the "Neutral" position marked on gate change quadrant (illustration [illegible]).
2. Nearly **close** the air lever (the shorter one) of carburetter control and open throttle lever (the longer one) about one-third. The levers **open** to the left inwards and close to the right outwards. **The** carburetter is the BINKS. For full details and instructions, adjustments, etc., see separate instructions.
3. Lift the exhaust valve by means of the lever on the right handle bar grip.
4. Engage the foot starter with the right foot using the instep of the boot and press smartly backwards and downwards, at almost the same time release the valve lifter and the engine should then start. Take the foot off the foot-starter pedal immediately the engine fires, but do not allow the foot starter to spring back with a "bang" after starting the engine. Bring the foot back with the pedal, and no pressure is being [illegible] to the stop.

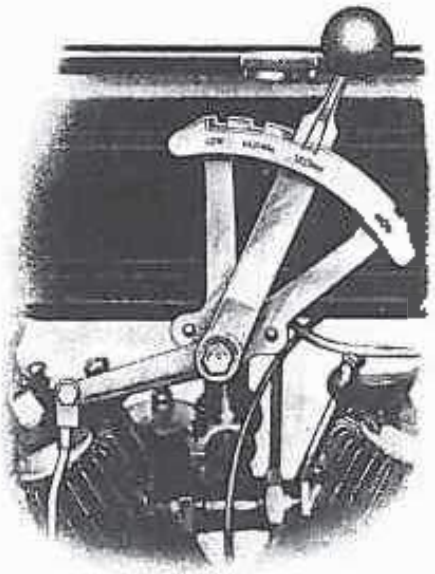
Presuming these instructions have been carried out take out the clutch by means of the clutch lever on the left hand side of handle bars, place the gear lever in the low position, speed up the engine by opening the throttle a little, and gently release the clutch lever. The machine will then move forward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

Repeat the operation to engage high gear. When running in high gear the machine must be controlled by means of the throttle lever and brakes. To stop, close the throttle and when the machine is almost at a standstill, take out the clutch and apply the footbrake.

The change speed lever is operated as follows:—To engage the low gear from neutral, press the lever lightly to the right and pull back wards (see important warning below). To move to second gear, again press lightly to the right and move the lever forward into second gear position. To engage high gear from second, press the lever to the left and move it forward into the high position. How to operate the gear lever will be discovered by careful examination of its construction. The gate in the lever has a positive stop for each gear, when changing up or down, and is automatically locked in each position when released by the hand.

Important Warning

If the change speed lever does not move positively into position, do not attempt to force it. Turn the machine slightly backwards or forwards, or turn the back wheel, while keeping a little pressure on the lever. This will bring the driving dog in the gear box into proper position for engagement, and the gears will engage without using unnecessary force. Under no circumstances must this lever be forced into position, or the working parts will be strained and damage done.



The A.J.S. Patent Change Speed Lever

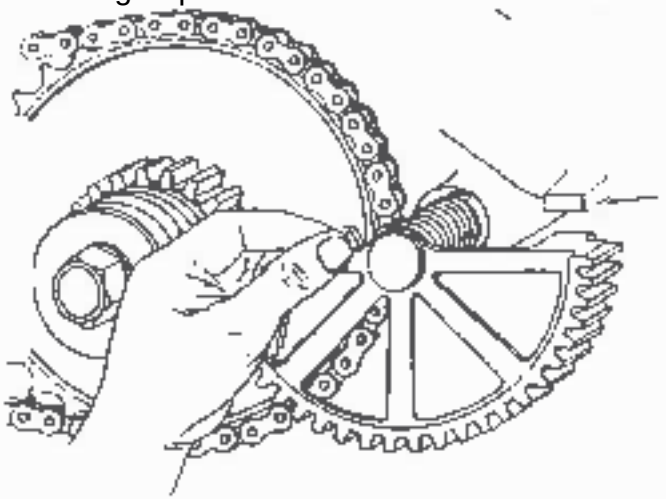
This warning only applies when the machine is stationary, not when being ridden.

Always drive with the air lever of carburetter open as far as possible consistent with the engine firing properly. It is not always necessary to stop the engine when the machine is brought to a standstill, but it can be left quietly running until ready to start away again. This can be done by taking out the clutch momentarily, and slipping the gear lever into the neutral position, afterwards releasing the clutch again. The engine will now be running free. Do not "race" the engine while standing. Throttle it down just sufficient to keep it running sweetly ready to start away again. In the case of a short stop, as when obstructed by traffic, the clutch only need be taken out, but always remember to engage low gear when starting again.

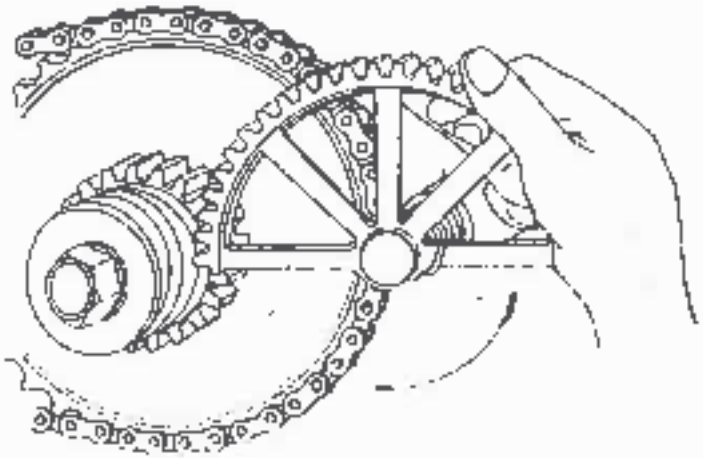
Although it is not absolutely necessary to do so, it will be found a much nicer method of changing gear if the following instructions are carried out. When changing from a low to a higher gear, slightly shut the engine down by closing the throttle a little immediately before changing. When changing down let the engine accelerate slightly with the clutch out before engaging the lower gear. A little practice will soon make the rider proficient.

The most common cause of damage to gears is changing to a low gear whilst the machine is travelling fast. Many riders make a practice of approaching a corner at a high speed, and to bring the machine to a safe pace to negotiate it, they forcibly engage lower gear. If it is desired to turn a corner on a lower gear, the machine should be brought down to a safe pace by means of the throttle and brakes before changing to the lower gear. Changing from a high gear to a low one when travelling fast, for the purpose of braking the machine, is abuse which no motorcycle gear-box will put up with for long.

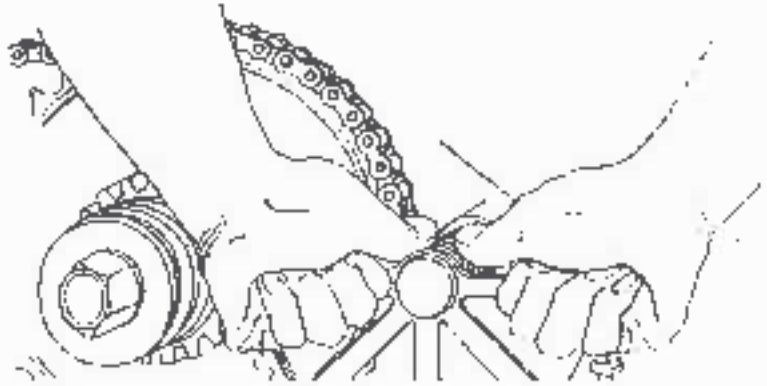
Method of Replacing Footstarter Spring



1. Hook free end of Spring over Top Spoke of Footstarter Quadrant.



2. Turn Quadrant a complete Revolution in Direction of Arrow.



3. Push Quadrant into position, at the same time pressing it in, both ends of the outer coils of the Spring down and over Footstarter

Rear Stand.

The operation of the rear stand requires very little explanation.

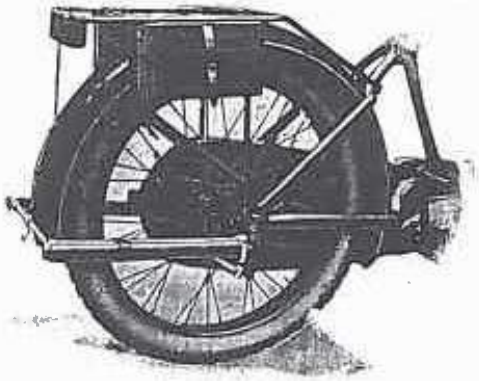


Illustration 1.

Illustration 1 shows the stand in the normal position. Illustration 2 depicts the stand let down and the rider about to pull lever over backwards, which instantly rises, causes to raise the machine on to the stand. Illustration 3 shows the final stage of the movement, the levering action being fully completed and back wheel raised clear of the ground. To bring down machine release clip which holds it to the stand tube, and swing it over towards the engine. Now push down the stand in the ordinary way on to the ground and pull lever right towards

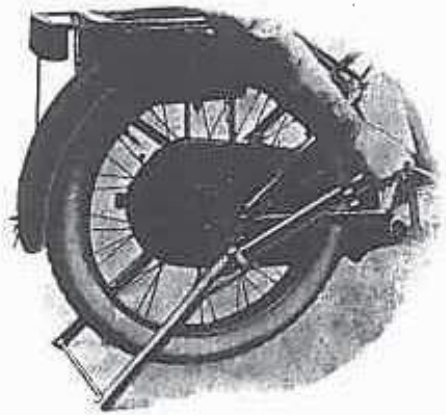


Illustration 2.

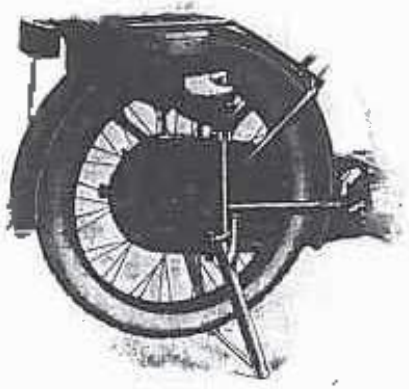


Illustration 3.

rear of machine. When the operation is completed release right the lever slowly regain and slip it to stand. To lower the machine simply reverse these operations.

Driving Instructions. (for Continued

When climbing a steep hill which necessitates changing down to a lower gear, always change while the machine has reasonable "way" on it. Do not let the machine come almost to a standstill before changing.

If the machine will not climb a hill on top gear, do not force it to do so by slipping the clutch but change to a lower gear. If the clutch is allowed to slip for a lengthy period under such a heavy driving load it will—owing to the intense heat generated by friction—burn out the cork inserts, in fact would destroy, by heat, any material of which a clutch may be composed. There is really no excuse for the rider who destroys his clutch by this practice. It is not only bad driving, but it is trying to make the clutch do the work of the gear box which is utterly impossible.

Do not run the machine unnecessarily on low gear. This gear is only provided for ease of starting, and climbing unexpectedly steep hills, or when negotiating thick traffic demanding a very slow rate of progress. Using the low gear unnecessarily, simply means extra wear and tear, high petrol consumption, and shortens the life of the engine, and transmission.

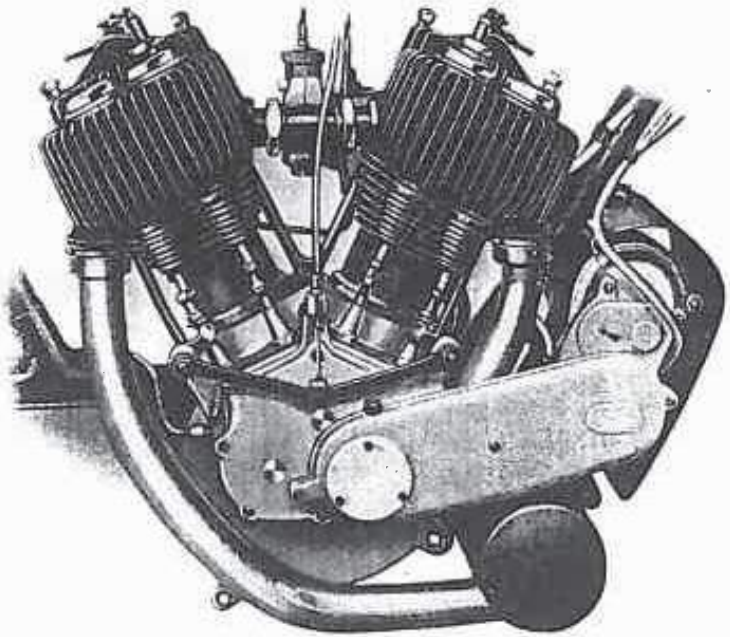
Never race the engine with the machine stationary. Racing the engine will reach you nothing, and may cause serious damage to the piston, big end, and connecting rod. More load is put on these parts when the engine is running at very high speeds with a small throttle opening than at the same speed at full throttle with the engine under load.

When climbing an exceptionally steep hill it is sometimes an advantage to slightly retard the spark, but under normal conditions the spark lever should be kept in the "full forward" position. If the engine has any tendency to "kick back" when starting it with the foot starter, slightly retard the ignition. The lever on the left handle bar is turned inwards to advance and outwards to retard.

When running at very low speeds on top gear a slight harshness in the drive may be felt, common with all petrol driven vehicles, however well influenced the engine may be, but the drive can be made just as silent and as comfortable as one may wish, by easing the clutch a little, by means of the clutch lever on the handle bar. A slight pressure of the hand on this lever allows the clutch to slip slightly under the impulses of the engine, and so the clutch is gradually converted into a perfect shock absorber at the will of the rider. The foregoing hints also refer to "picking up" again after slowing down for a corner, or any other occasion when the machine is to be accelerated suddenly from a slow to a higher speed. It must be quite understood, however, that the clutch is not disengaged so much that it slips to the extent that the engine can "race." Only just so much pressure should be exerted on the lever to allow the clutch to absorb the impulses of the engine. We earnestly commend this paragraph to those riders who are anxious to get the best results and long life from the engine, gears, and chains, to say nothing of the added comfort and satisfaction.

Do not control the speed of the machine with the free engine clutch, excepting in very congested traffic as previously mentioned. Always drive "on the throttle." The object of the Clutch is not to control the speed, the throttle in conjunction with the gear box and brakes should be used for this purpose.

After a short run it will be found that the control of the machine is quite simple, and the disposition of the levers, controls, the footrests and the clutch, gives the rider absolute mastery over his mount. In low gear the machine can be driven at a perfect crawl and on high gear it is capable of attaining a speed to satisfy even the fastest of riders.



A.J.S 799 h.p. Engine ILLUSTRATION C.

Lubrication—The most important point in connection with the engine is lubrication. Give about one pumpful every 8 miles and rather more if fast riding is indulged in.

The type we employ gives a direct feed to the engine, oil being delivered on the plunger rod ascends on the up stroke. To give a charge of oil to the engine, depress the plunger to its full extent. This will fill the barrel with oil, and the plunger being spring loaded it will automatically ascend and in so doing force the oil into the engine, the plunger rising during the process until it is in position for the next charge to be delivered.

To cut off the oil supply at any moment, such as when the machine is left standing, the tap should be turned off. As a further precautionary measure the lubricator can be put out of action by pressing down the plunger to its full extent, and fixing it in this position by means of the small catch provided.

Climate and riding conditions vary, so it is absolutely necessary to leave the question of lubrication to each individual's judgment to a certain extent.

The engine working heavily, and a falling off of power are the usual symptoms of under lubrication. Over lubrication is shewn by oil unduly wetting part of the valve tappets, and smoke issuing from the silencer. Over oiling will sometimes cause the exhaust valves to stick or move sluggishly in their guides. The symptoms are mostly apparent when the engine is cold. Missing ensues, also explosions in silencer and difficulty of starting. The remedy is to take out the valves and clean the stems and guides with petrol.

Adjustments and Cleaning—See that the valve tappets are always properly adjusted. With the inlet and valve exhaust, or should the clearance of a visiting card is the correct clearance between the tappet nut and valve stem when the valve is on its seat. Check the clearance when the engine is hot, not when cold. Use the cylinders to check the oil nipple gate. The inlet valve tappet of front cylinder is free to revolve. This can be held stationary by inserting a small locking bar in the hole drilled in the tappet stem, after the bolt nut has been slacked off.

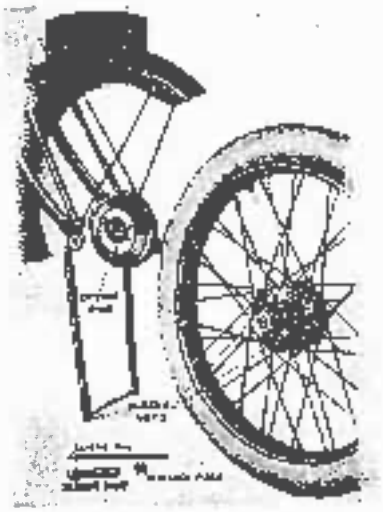


ILLUSTRATION R.

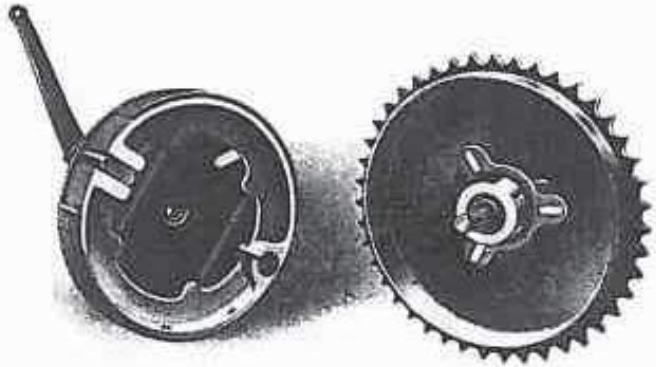
Front Wheel—The front wheel is interchangeable with the back, and to remove this first jack up the wheel on the front stand. Unscrew the three driven bolts and take out the centre pin, which will allow wheel to be drawn off the driving studs on the brake drum exactly as in the case of the rear wheel.

The adjustment of the hub bearings is perfectly obvious. Both are the adjusting. Don't let the ball run loosely, but take care that they are not adjusted too tightly.

This is a common cause of broken balls and cracked ball races. When properly adjusted, the weight of tyre valve should revolve the wheel, if placed above the centre of wheel. At the same time the wheel should have no shake.

Before attempting to lift the *front stand into* position, always place the machine on the *Rear Stand First*, otherwise the machine will run backwards, through the strain on the legs of the front stand and with the possibility of damage to the front brake operating mechanism.

The accompanying illustration shows the Rear Brake Drum with the Expanding Shoes. Operation of the Rear Brake is by Pedal and Rod on the left-hand side of the machine, whilst the front, which is of identical construction, is by a Pedal and Hanger Stays on the right-hand side. Both Brakes follow the best car engineering practice, and their strictly-symmetrical mechanism affords almost everlasting wear.



The A.J.S. Internal Expanding Rear Brake.
The Expanding Shoes are shown detached from the Drum.
ILLUSTRATION S.

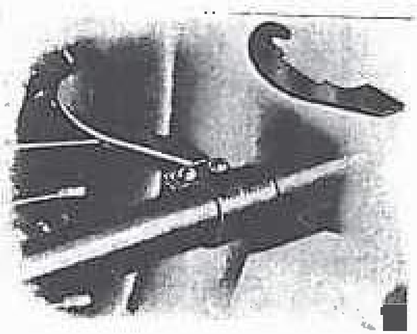
The Brakes require no attention, with the exception of occasional adjustment of the control mechanism. In the case of the Rear Brake this is effected by

Periodically test the entire pin and sleeve nuts with the spanner, and keep them tight. If the above 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 drum, case 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 chain case, take off spindle nuts and detach brake cable by unscrewing the pin in clevis. Take the chain off the sprocket by means of the spring link, and unscrew the anchor pin which projects into slot of brake anchor plate sufficient to clear. The wheel will then fall out of slots in fork ends.

Care should be taken to prevent the ends of chain falling back into chain case while removing the wheel. The upper portion of chain should be folded back over the top of chain case and hooked up to the pin provided. The lower portion of chain will hang down below the bottom half of case.

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

When the wheel is replaced, see that the brake anchor pin is screwed into the slot in anchor plate and the spindle nuts are tight.



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). 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. 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.

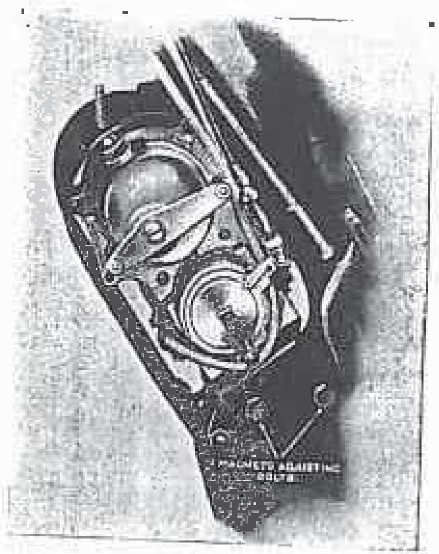
When replacing the chain it will facilitate the fitting of spring link if the ends of the chain are engaging an equal portion of the sprocket. This also applies to removing the spring link.

When the wheel is replaced, see that the brake anchor pin is screwed into the slot in anchor plate and the spindle nuts are tight.

Engine—continued.

carefully off the cylinder on both sides, taking care not to break the radiating fins. Prise upwards not downwards. When the heads are removed it is an easy matter to draw the cylinders off the pistons. In doing this the engine should be turned over until the pistons are at their lowest position, and draw off the cylinders carefully, taking care that when the pistons are free not to let them fall sharply against the connecting rod, as this may crack or break the skirt of the piston, which is easily done. Having removed the cylinders, wrap a clean cloth or rag round underneath the pistons to prevent any foreign matter or dirt getting into the crank case. If the combustion head is badly carbonised this must be cleaned. The generally accepted method being to scrape the chamber free of the carbon deposit, which can be done with an old screwdriver or similar tool. The top of the pistons should also 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. First remove the gudgeon pin from the piston, take out the retaining springs, one of which will be found on either side of the gudgeon pin. These fit into recessed slots 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 from the driving side. Having got rid of all deposit from both the heads and pistons, wash all particles off with paraffin. Before replacing the cylinders after cleaning, carefully oil the pistons and see that the joints of the piston rings are on opposite sides of the piston. Take care when replacing the cylinders on to the crankcase to see that the packing washer is inserted between the top of crankcase and the base of cylinder. When everything is in position, fit up the inlet pipe and connections before bolting the cylinders down, as this will enable the cylinders to twist into proper position to make perfect joints at each end of the inlet pipe. This is a very important matter. The exhaust pipes can be partly screwed after the cylinders are bolted down permanently. If one cylinder only is to be taken off it is only necessary to disconnect its exhaust pipe and one side of the inlet pipe.

If it is required to remove the valves at any time for inspection, grinding in, etc., there is no need to touch the cylinders. All that has to be done is to unscrew and take out the valve cap, then place the hooked end of the special valve extractor, which is provided in every tool kit, on the top of the valve, using the valve cap shoulder, which fits at the bottom of the hook, for the necessary leverage to lift the valve spring to allow the cotter to be withdrawn.



Lucas "Magdyno" in position, showing adjustment.

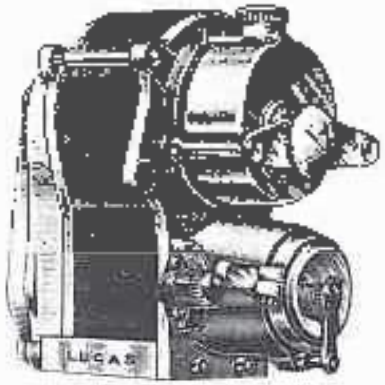
ILLUSTRATION D.

The valve can then be pushed up and drawn out of the head, via the valve cap aperture. If the valve seatings are at all pitted grind in the valves with fine emery flour, 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 2,000 miles.

Drain old waste oil out of the crankcase of engine about every 1,000 miles. For this purpose a drain plug is fitted on chain case side of crank-case. See that four to five pumpfuls of fresh oil are pumped into the engine again, after draining out the old oil.

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.

"Magdyno."



Lucas "Magdyno."

ILLUSTRATION M.

The instrument shown on the left is known as the Lucas "Magdyno," provides lighting for the Engine and generates current for the electric horn. It consists of a Lucas Dynamo No. E.1 and a Lucas Magneto, and although the two are retained as separate units they are housed and so form one instrument. A full-size working drawing of the "Magdyno" is contained in the Lucas Book of Instruction Notes, a copy of which is sent out with each new Dynamo.

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. 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 screwing cap cover and placing a small quantity of grease on a few drops of oil on the bearing retaining. The Magneto bearing at the contact breaker end should be partially defended by attention owing to the situation in which it is placed. Should the gears run completely dry they can be packed with a high melting point grease such as Price's H.M.P. grease.

Adjustment. The platinum contacts should be examined after about 3,000 miles, and if the break cannot be more than the thickness of a sheet of cartridge paper they should be adjusted. The proper distance of the gap is 0.3 m/m or roughly 1/100". 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 to move the contact breaker from the timed position. It is necessary to take the contact breaker cover, unscrew the long screw fixing same and pull the contact breaker off. The points only need attention at very long intervals, and we warn users against unnecessarily tampering with the setting. The platinum points must only be dressed with a clean smooth file if the surfaces are somewhat pitted, and then the least possible amount taken off. The greatest care must be exercised, as platinum is very expensive to buy.

Timing. If the "Magdyno" has been taken to bits for some reason it will be necessary to see that the magneto is timed correctly after it is refitted. The engine pinion driving sprocket is screwed to the shaft by means of a taper thread, which makes slipping quite impossible. The sprocket on the armature shaft of the magneto is supplied with a serrated coupling, which also works very accurate and certain method of fixing the driver after the correct setting has been arrived at. The setting of this serrated attachment may at first sound a little complicated, but in reality it is perfectly simple. Keyed to the armature shaft of the dynamo there is a sleeve D, which has thirteen index engravings on it. Fitting over this sleeve is the chain sprocket C, which has twelve holes similarly arranged. Now on the splined shaft of the driving shaft

Chain Repairs continued.

The above illustration contains all the tools necessary to effect repairs to a chain;

To shorten a chain containing an even number of pitches replace by parts No. 30 and 28.

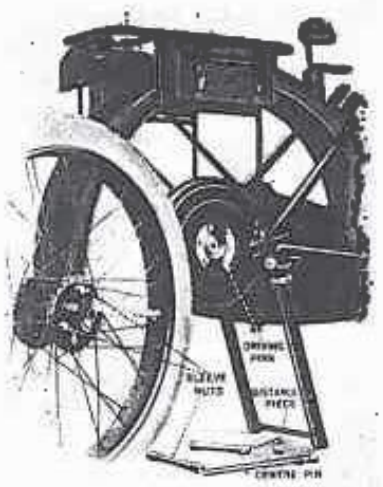
To shorten a chain containing an odd number of pitches replace by parts No. 31.

To repair a chain with a broken roller or faulty inside link, replace by parts No. 11.

For joining up any length of chain where extremities are inside links, use part No. 28.

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 face in the opposite direction to which the chain travels.

Detachable Wheels.



Back Detachable Wheel Removed.

ILLUSTRATION P.

Back Wheel. — To remove the back wheel proceed as follows —Put the machine on the prand and with the box spanner provided first unscrew the three sleeve nuts which pass through the hub flange. To prevent the wheel revolving while unscrewing the sleeve nuts, place the foot against the tyre at bottom of wheel. The three sleeve nuts extend right through the wheel and rear 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 completely out, together with distance piece. The space now left by the distance piece will allow the wheel to be drawn off the driving studs on sprocket. The whole operation should not take more than 30 to 40 seconds.

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 as 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 support is taken off the stand.* 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.

Tyre Repair. 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

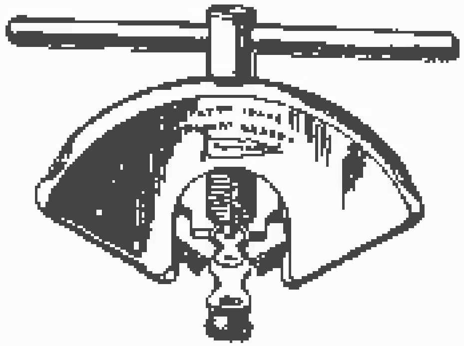


ILLUSTRATION K.

If lubrication or adjustment be neglected, broken rollers may occasionally be found. The chain can, however, be easily repaired with the Renold Chain Rivet Extractor (Illustration K) 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.

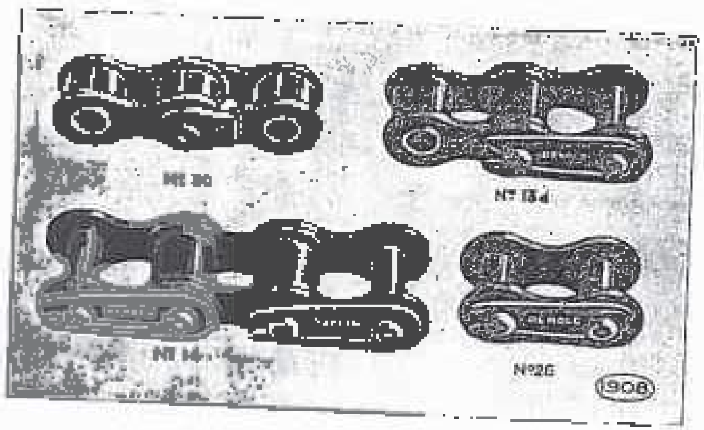
This tool provides a simple means of removing outer links by pushing the rivet heads through the plate.

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

To Remove complete Links.—Screw down the punch on to the head of each rivet in turn through the top plate. Each rivet 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 from 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.



Chain Repair Parts

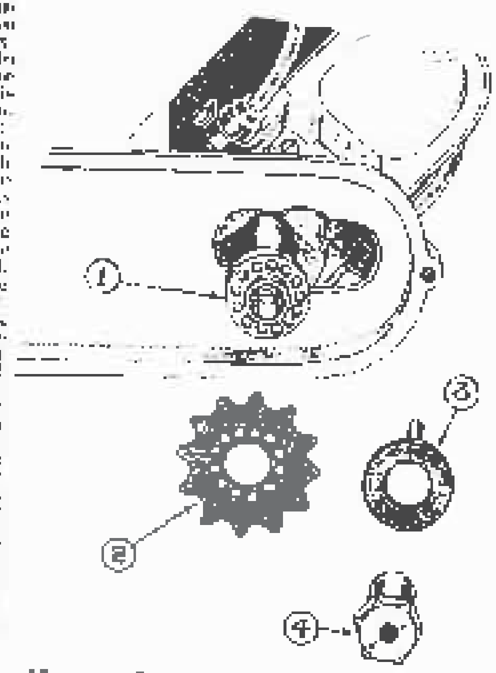
ILLUSTRATION L.

each other before anything else is done. The first thing then in timing up is to set these two arrows so that they point exactly towards each other. To do this turn engine over until the arrow on the driving shaft is pointing towards the armature. The nut on the magneto sprocket [illegible] 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 in place [illegible] sprocket on to the sleeve, and turn the armature shaft of magneto until a small round 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, [illegible] 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 lightly 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 methods. The magneto must be timed for No. 1 cylinder, that is the one that fires first. This is the back cylinder of the twin. The magneto terminals are numbered on the body of the instrument, and care must be taken to see that the high tension wires are correctly connected to the cylinders when dealing with these machines. [illegible] the engine until the piston of No. 1 cylinder is within [illegible] from top of compression stroke—make sure it is not on the exhaust stroke. With the engine 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 [illegible] their arrows [illegible] as previously [illegible]. Move the ignition control lever to the limit of its [illegible] [illegible] the cover of contact breaker and slowly turn the armature till the [illegible] [illegible] No. 1 just sufficient to separate the platinum points. This is the firing point, and in this position the markings previously referred to on the sleeve and sprocket should register if correctly fitted [illegible]. If so, the drive should be fixed up [illegible] tightening up. [illegible] It is, however, always advisable to check the timing after [illegible]

It will prevent knocking, and make starting easier. If the slip ring [illegible] [illegible] occasionally. This is done by taking out the high tension terminal [illegible] the magneto is being revolved by slowly turning the engine round, insert a [illegible] round the end of which is [illegible] with a clean rag moistened with petrol. The [illegible] should be pressed on the revolving slip ring.

When Ignition Trouble is suspected. Before interfering with the magneto itself test the sparking plug, the cable, and the contact breaker [illegible]. If there are [illegible] turn the engine slowly by hand and [illegible] of the [illegible] lever works properly. [illegible] [illegible] there is an occasional [illegible] of the [illegible]. If this happens [illegible]. This is a [illegible] [illegible] and should be watched [illegible] [illegible] take the magneto to pieces unnecessarily. It is easily possible to damage it.

Most Important.—If it is necessary to take out the armature first see that the carbon collectors [illegible] up [illegible] are removed, or the [illegible] will be broken during removal. Keep all parts clean and [illegible] the contact breaker. Oil or dirt between the points will give constant trouble.

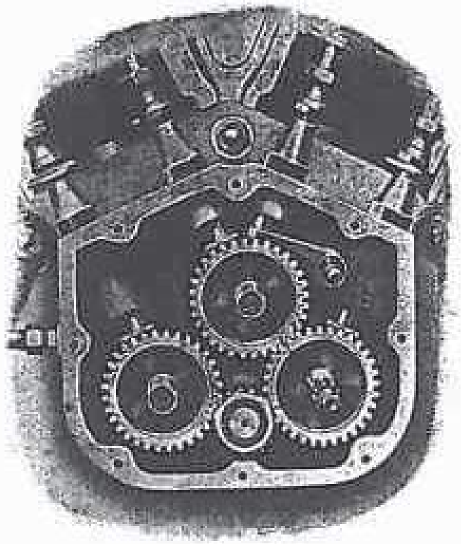


Magneto Timing—Vernier Adjustment.

ILLUSTRATION N.

Magneto Drive.—Examine the driving chain of the magneto occasionally, and, if slack, tighten it by moving the platform to which the magneto is attached in a forward direction. Slacking off the two nuts on the contact breaker side of the magneto platform allows this (see Illustration, page [illegible]). The magneto platform rests on two extensions of the front engine plates. These plates have slots which, when the before-mentioned nuts are slacked off, permit the platform to be moved forward to tighten the chain. When the correct tension has been obtained, screw the nuts up again tightly. Examine also the nuts securing the chain sprockets to the engine shaft and armature shaft of magneto respectively. After examination, before replacing the cover, oil the chain.

Engine Timing.—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 and dash system of identification as shown on Illustration E. On the small timing pinion will be found a single dot and a double dot. These marks register with corresponding dots on the back and front exhaust cam wheels, the back exhaust wheel being stamped with one dot, 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 wheel register with the two dots on the small wheel. There now only remains the double inlet cam wheel which meshes with the front exhaust cam wheel. Upon this double inlet wheel a dash or stroke is marked, which must be placed opposite the corresponding dash which will be found upon the front exhaust cam wheel. The correct setting of the valve timing is then arrived at.



Arrangement of Timing Gear 7-99 h.p. A.J.S.

ILLUSTRATION E.

The spark is timed to take place [illegible] in. or [illegible] in. before the top of the compression stroke, with the magneto control lever in the fully advanced position. The segment of contact-breaker marked No. 1 fixes the rear cylinder [illegible] on "Magneto Timing," page [illegible].

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.

Screw the spindle nuts up tightly again after the chain is properly adjusted. It may be found that moving the wheel back has caused the brake to be "on." This is easily rectified by means of the brake adjustment.

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

The chains should be adjusted, and kept adjusted, so that they can be pressed down in the centre with the finger from [illegible] on the front chain, and about [illegible] in. on the back chain. The chains can immediately be inspected and tested by means of the inspection doors fitted to both back and front parts of the chain case. If desired the whole of the top portion of the case can be readily taken off, whilst the lower half is correspondingly easily removed.

Care of Chains.

Lubrication.—An oil gun is the best means of oiling the chains. With this instrument draw a charge of oil from the oil compartment of tank, and insert spout of oil gun into the chain case oil plug hole, which will be found on top of front of chain case above the front chain. Lift the exhaust valves, and while pressing down plunger of oil gun, slowly turn the engine round with the foot starter, taking care that the oil from the oil gun is falling on the chain. The [illegible] the whole chain being well lubricated. Treat the back chain in the same way by slowly revolving the back wheel.

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

Chain Case.

The top, bottom, and back portion of the chain case can be detached independently, also a part of the front can be removed to expose the clutch and foot starter (Illustration [illegible]). The rear part of the case is divided both horizontally and vertically. To remove the rear part unfasten the set pin which holds together the top and bottom halves of the horizontal division, also unscrew similar pins holding the vertical division. Next take out the two small bolts which will be found to pass through slots cut in the rear part of the chain case. These bolts screw into the anchor plate and must be removed entirely to allow the rear of the case to come away. Having done this the case end can now be withdrawn. To remove the whole of the lower half of the chain case carry out the same operations as detailed above, but in addition take off the nut on the end of the left hand rear footboard rod and push the rod through the lug of crank case just sufficient to allow the chain case to drop away. The front portion previously alluded to is readily removed by partly slacking off the small screws round its outer edge. Also, after these portions have been removed, the top half is quickly detached by simply taking off the nut on the end of the distance bolt which projects from the crank case of engine through the chain case.

Chain Repairs.

A Chain hardly ever breaks if properly adjusted (we have never yet heard [illegible] since it is usually worn out

It will be seen that the Adjusting Pins are secured by a locking device, consisting of two short lengths of spring wire, which fit into a slot in the heads of the pins. The pins have two crescents at right angles to each other, and the locking device wires are correctly set when the clutch plates are assembled by us.

When the adjusting pins are being altered, the first thing that has to be done is to raise the spring wires out of these slots and push on one side. Afterwards, see that the wires register properly in one of the crescents.

To those riders who prefer a light adjustment of the clutch, the following hint will be useful. A clutch that is lightly adjusted will sometimes slip for a time after engaging gear, but the slip will cease if the throttle is momentarily closed when the slip takes place. This is explained by the fact that for the moment the drive is taken off the clutch and allows the plates to settle down to their work.

Transmission.

Adjustment of Chains.—To adjust the chain from engine to gear box it is only necessary to slack off the two nuts on top of bracket and slide the box bodily backwards by means of the adjusting bolt situated at the rear of bottom bracket.

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

Back Chain. Slack off the nuts on each side of back hub spindle, and move the wheel backwards by means of the adjusting screws in fork ends. Care must be taken to adjust each side equally or the wheel will be out of alignment (see Rear Wheel Adjustment Gauge, page 31).

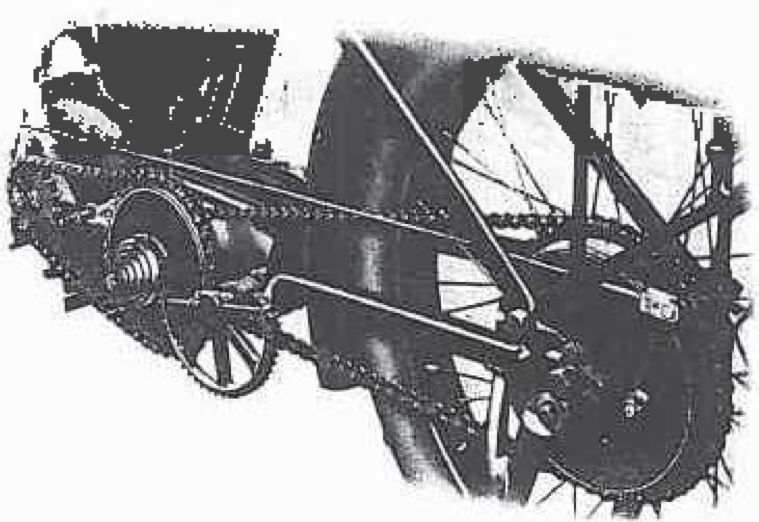
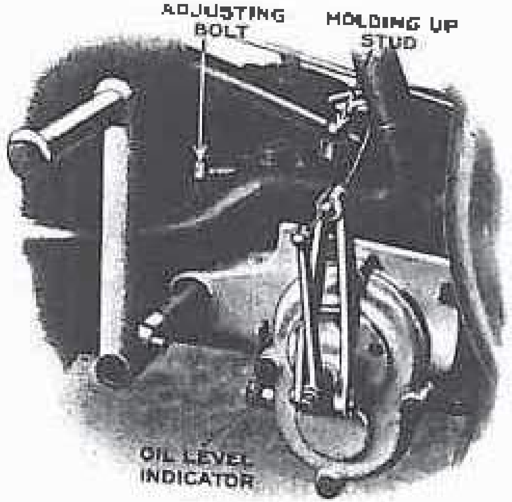


Illustration J.



A.J.S. Gear Box in position

Illustration F.

The gear box needs no attention whatever with the exception of replenishing with oil every 500 to 750 miles. Oil as used for the engine is suitable, but a very thick oil is the most suitable. [illegible] that the filling of oil into the box if the back wheel is slowly revolved with gear in neutral position while pouring in the oil.

An oil level indicator is provided in the form of a small shutter on the left hand side of the gear box, looking at it from the front. When pouring in oil, have the shutter open, and as soon as oil begins to overflow, close it. This is the correct level and no more oil need be inserted.

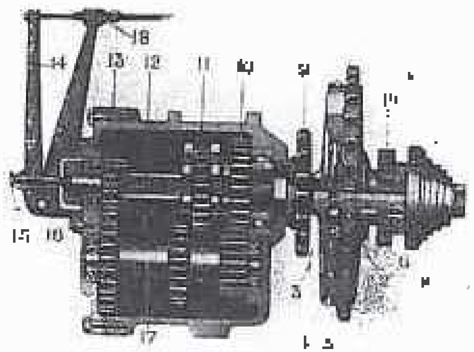
To dismantle the box the following operations must be carried out:—

First detach the Bowden cable from the clutch operating lever on gear box. To do this press the lever inwards sufficiently to allow the nipple of the cable to be slipped out of the slotted end. Next unscrew the 4 small nuts round the cap which hold this to the gear box cover. The clutch operating mechanism can now be taken off entirely. Take care when doing this not to lose the steel push rod. It will be found that on the end of the main shaft a thrust lock nut is fitted. This has a left hand thread, and the punch mark [illegible] should be [illegible] to fasten it. An arrow will be found on this nut pointing towards the left; this is the direction in which the nut must be unscrewed. Behind this nut is the ball thrust and [illegible] this and the thrust washer. To [illegible] the washer the main shaft back a little so as to allow the washer to be withdrawn. This washer fits on a dowel peg and care should be taken when replacing to see that this peg is correctly in place. Now take out all bolts round the cover of the box and pull the cover off. The low gear dog wheel and lay shaft can then be taken out, also the sliding sleeve. The main shaft, complete with clutch, etc., can be drawn out from the opposite side of the box. To reassemble simply reverse these operations.

N.B.—Be sure the Thrust Lock Nut is tight after replacing.

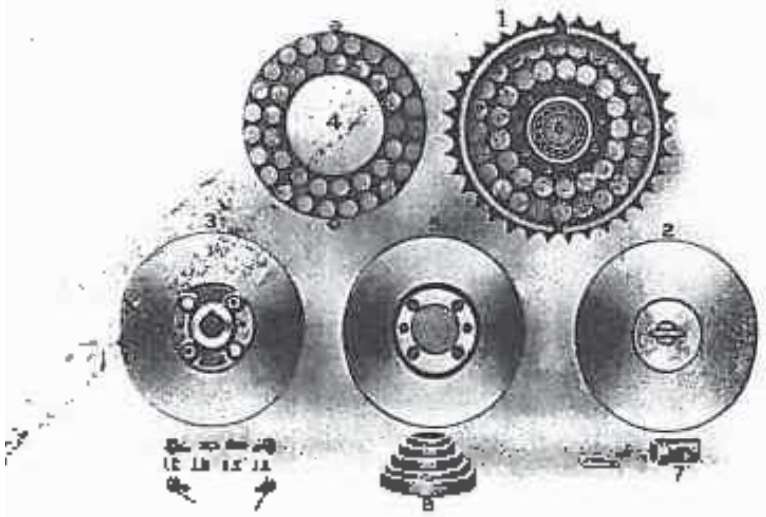
Do not forget to put fresh oil in the box after dismantling.

1. Sprocket for transmitting power to Road Wheel.
2. Sliding Plate.
3. Fixed Plate.
4. Floating Plate.
5. Inside Plate.
6. Ball Bearing for Clutch Sprocket.
7. Clutch Spring Adjusting Nut.
8. Clutch Spring.
9. Sprocket for transmitting drive to Rear Wheel.
10. High Gear Dog Wheel.
11. Sliding Sleeve.
12. Main, or Primary Shaft.
13. Low Gear Dog Wheel.
14. Clutch Operating Lever.
15. Push Rod Adjusting Screw.
16. Steel Push Rod.
17. Lay or Secondary Shaft.
18. Bowden Cable attached to Clutch Lever.
19. [illegible] Wheel.



Sectional view of A.J.S. 3 Speed Gear Box.

Illustration G.



A.J.S. 7·99 h.p. Clutch Parts.

ILLUSTRATION H.

1. Clutch Sprocket fitted with Cork Inserts.
2. Sliding Plate locks key in correct position when passing through inside Gear Box Shaft.
3. Thrust Plate, with Adjusting Pins and Locking Device.
4. Plate fitted with cork Inserts (driven by No. 1).
5. Dished Plate driven by No. 3.
6. Ball Bearing on which No. 1 revolves when clutch is disengaged.
7. Clutch Spring Adjusting Nut.
8. Clutch Spring.

The Clutch parts are assembled in the following order :- No. 3, 4, 5, 1, 2, 6 and 7.

Adjustment—

If the clutch should slip when climbing steep hills, tighten up the clutch spring a little by means of the adjusting nut at end of the clutch shaft, after noting the flywheel mark until there is a little play in the lever. Do not tighten up the spring more than necessary to obtain a perfect grip, as unnecessary strain will be put upon the Gearbox control, &c., when the clutch is disengaged.

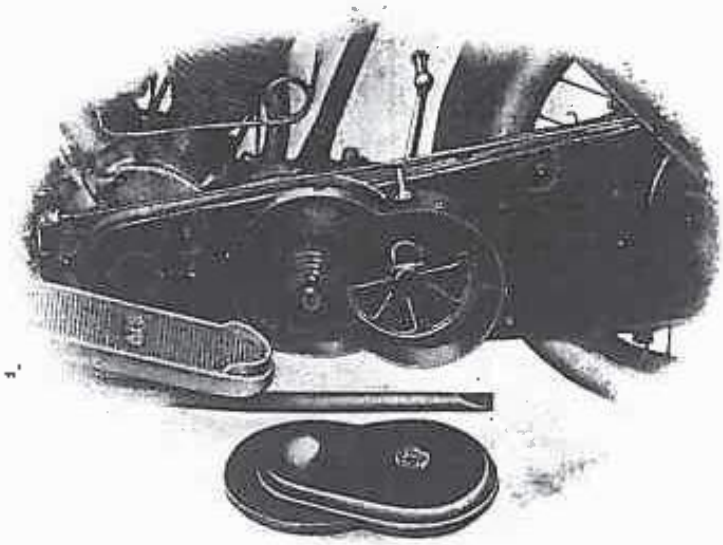
Do not put Oil into the Clutch under any circumstances.

To take up excessive backlash in throttle lever or handle bar adjust by means of the operating shaft adjusting screw No. 1 (Illustration E). A further adjustment is also provided at the point through which the throttle cable passes. (See Illustration G, No. 3). However, although allow a little backlash in the lever, or the clutch spring cannot pull the pressure on the plates. If the clutch slips without any external reason, take it apart and reassemble. If any portion of the operating mechanism is fouling another, and so keeping the plates apart. If the key in boss of clutch plate No. 2 (Illustration H) should foul the end of slot in shaft it would prevent the clutch operating.

To dismantle the clutch, take off the front cover of chain case by unscrewing the two pins on the front and rear of same (the cover can then be removed) (see Illustration I.

Unscrew the clutch spring adjusting nut No. 7 (Illustration H) and remove the spring No. 8. Take out the cotter pin of foot starter crank and remove crank. This will allow the starting pinion and with it the spindle to be drawn out until it can pass the step on chain stay. The pinion can then be swung clear of the clutch and allow the plates to be drawn off the clutch shaft. Before replacing, wipe the clutch plates clean, and smear a thin film of oil on the portion of

It is, of course, necessary to take the chain off the clutch sprocket before this can be removed (see Illustration J, for instructions of chain joint). It will be found that a dog key passes through a slot in the end of the clutch shaft, and fits in the boss of fixed or sliding plate. Great care must be taken to see that this key is in its proper position or the clutch cannot be disengaged. This key is clearly shown in Fig. 2 (Illustration H) across the centre of the plate. To fit this key when re-assembling the clutch, turn the shaft till the slot is perfectly horizontal. Then put key in slot with each end projecting equally on each side of the shaft. The sliding plate should then be slipped on shaft with the keyway in a corresponding horizontal position.



A.J.S. Chain Case with Front Cover removed, exposing Clutch and Foot Starter. The hinged Covers for Chain Inspection are also shown.

ILLUSTRATION I.

If on disengaging the clutch becomes difficult smear a little oil on that portion of shaft on which the outer plate slides.

If the clutch should "drag" even when fully disengaged, it will make gear changing very difficult, especially when changing down, for the reason that the drive is not properly taken off the gears, thus making it difficult to move the gear lever. This difficulty can be temporarily overcome by suddenly closing the throttle before changing down, immediately opening the throttle again after the change is made. The closing of the throttle takes the drive off the gears, and so allows easy disengagement. The cause of "drag" is usually that plate No. 4 (see Illustration H) has too much lateral movement, and "tilts up" the plate in front of it, when the clutch is disengaged. If the dog clutches No. 1 and 2 are removed, it will be found that plate No. 3 is retained by four pegs on the back plate No. 1. There will also be seen two adjusting pins.

On the outside circumference of plate No. 3 will be seen two small pillars. Half one of these in the left hand, the other in the right hand, and see if this plate can be moved backward and forwards between plates 2 and 5. If so, screw up the two adjusting pins until the plates just touch each side of plate No. 1. Do not screw the two adjusting pins up tightly. The plates may be set to touch plate No. 1, but have them sufficiently easy to allow No. 1 plate to be moved from left to right by the hand down, without much force.

It is, however, a very easy thing for the plates to "drag," and care only