

**DRIVING & ADJUSTMENT  
INSTRUCTIONS**

**MODELS**

**35 4**

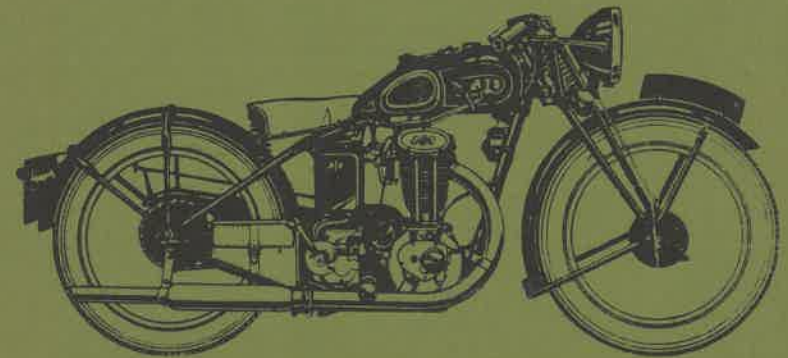
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**MOTOR A.J.S. CYCLES**

*Manufacturers,*

**44-45, Plumstead Rd., Plumstead,  
London, S.E.18, England**

## INTRODUCTION.

### A Personal Message to all A.J.S. Owners.

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It is our desire that you obtain from your A.J.S. the service, comfort, enjoyment and innumerable miles of low-cost travel that we have earnestly endeavoured to build into it.

A motor cycle, it must be remembered, is a highly specialised piece of engineering, and while it does not call for great engineering skill in driving, the exercise of a little mechanical sense, and the occasional use of a spanner, cleaning cloth, etc., is very necessary if the maximum service is to be obtained with the requisite degree of satisfaction. In the following pages we give, without going into intricate technical detail, much valuable information that you should have, in order to give your cycle the careful attention which it merits.

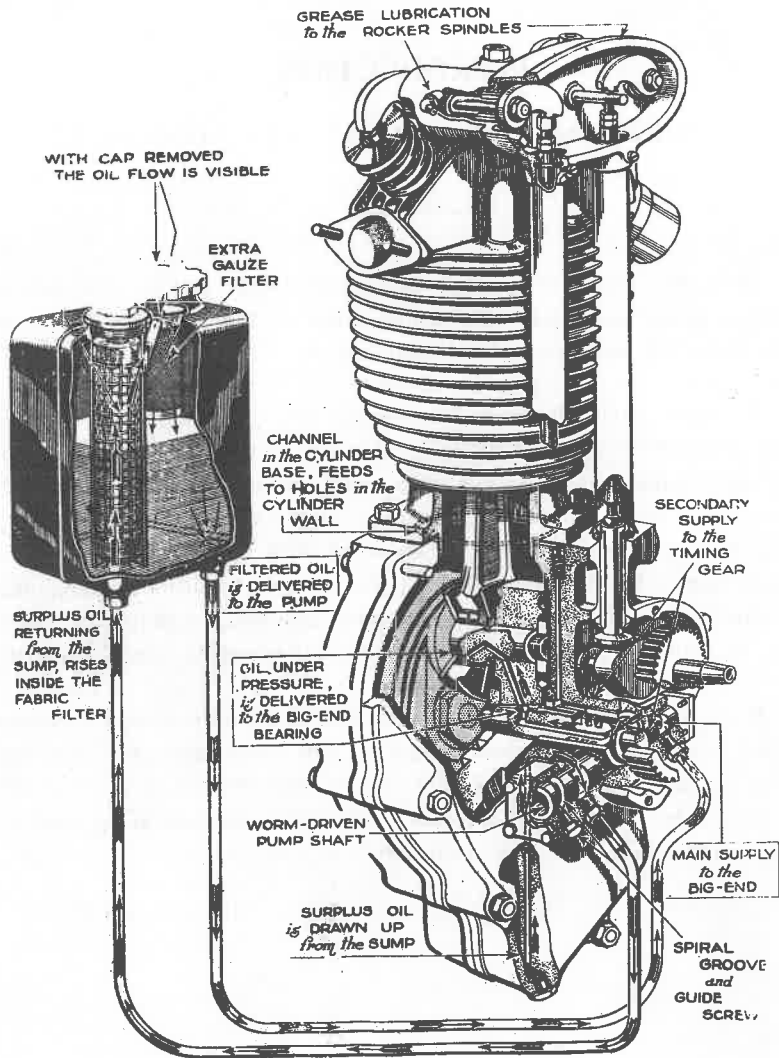
Neglect to make necessary adjustment, or only casual attention to the lubrication of important parts, will soon neutralise the best efforts of the designers who have whole-heartedly devoted their skill and knowledge to the production of your cycle, and may bring needless trouble and expense to you, its owner.

A.J.S. MOTOR CYCLES.

# GENERAL INFORMATION.

## TAKING OVER A NEW MACHINE.

Having filled up with petrol and oil of one of the brands specially recommended (see Lubrication), it is advisable before starting the engine to sit over the cycle and memorise the various controls. Neutral position of the gears must always be obtained before starting up. This neutral position is the first one forward of the extreme rear-most or low-gear position. The ignition is advanced or retarded by means of the small lower lever on the left handlebar. The throttle control is operated by a twist-grip on the right handlebar, while the valve-lifter is controlled by means of a small lever on the same side. The valve-lifter and clutch controls are fixed to the left side bar, and the front brake control to the right bar. All controls advance or open by an inward movement of the various levers. For starting from cold, the ignition should be about half advanced, the throttle very slightly open only, and the air completely closed. The petrol is turned on by pressing inward the end of the tap sliding plunger marked "On." The ignition is switched on by turning the panel switch to the position marked "C" (coil ignition models only), or to "H" or "L" for night riding. On these coil ignition Models 35/4, 35/12 and 35/16, a red light will be observed through the small window on the panel top when the switch is at any of the above positions and the engine idle. The object of this red light is to indicate that current is flowing to the ignition coil, and unless the switch is turned to the "Off" position for daylight, or the "PK" position at night-time if parking lights are required with the engine idle, a quickly run-down battery will result. The red light which, incidentally, only shows when the contact points are together must, therefore, be regarded as a warning indicator and is in actual fact provided for that purpose. A separate dipping switch ring is fitted to the left handle grip to enable the head light to be dipped instantly, as and when required. Assuming that all the controls have been set as described, to start the engine first flood the carburettor until petrol actually overflows from the vent hole, then with the valve-lifter raised and ignition switched off, turn the engine over a few times in order to draw a charge of gas into the cylinder. Then switch on and give the kickstarter pedal a violent push downwards, releasing the valve-lifter lever when the pedal is nearly at the lowest position, when the impetus should be sufficient to carry the engine over at least one compression or firing stroke. If the engine does not start at the first attempt, repeat the last operation. As soon as the engine starts, close the throttle to check the speed, and while it is warming up, raise the oil tank filter cap in order to observe that oil is circulating (see notes on oiling system). After allowing the engine to idle for a moment or two to warm up, sit over the cycle and give a gentle push forward to release the prop stand. Then release the clutch by drawing inward to the fullest possible extent the lever on left handlebar and without delay, gently engage first gear, after



Engine Unit Showing Oiling System.

### Taking Over a New Machine—contd.

which slowly release pressure from the clutch lever, when the cycle will commence to move forward. When under way, again release the clutch and simultaneously shift the gear lever into second speed position, releasing the pressure on the clutch lever gently immediately the change of gear has been made. Repeat the movements until top gear is reached, and remember that for all changes of gear, whether up or down, the clutch must be released just a fractional part of a second prior to moving the gear lever. When in motion, it will be found sufficient to move the clutch lever only just sufficient to ease the drive and with reasonable care it will be found possible to make changes of gear without a sound.

### DRIVING.

In general driving, it is always advisable to advance the ignition as far as possible without causing knocking. When ascending a steep hill, as the engine slows, retard the ignition just sufficiently to prevent knocking, and if a change of gear then be made, the ignition should be again advanced, as the speed of the engine is increased by the use of the lower gear. For descending exceptionally steep and dangerous hills, the second gear may be engaged, enabling the frictional resistance of the engine to assist in retarding the descent. Under no circumstances, however, should the bottom gear be used for this purpose, as by so doing, an abnormal and unfair strain would be imposed upon the rear driving chain under certain circumstances.

It is advisable to ease the clutch slightly when rounding acute corners or when travelling slowly in top gear. If this practice is adopted from the first, much unnecessary gear changing will be avoided.

**IMPORTANT NOTE.**—On Models 35/12, 35/16, 35/22 and 35/26 the petrol tap should always be turned off immediately the engine is stationary after a run, as otherwise, owing to the downswept inlet port, there is a possibility of neat petrol entering the cylinder interior should the carburettor flood. Obviously, in addition to a risk of fire, there is a real danger of oil thinning and consequent engine seizure, if this simple precaution is not taken. Therefore, turn the petrol off after every run.

### "DON'TS" IN DRIVING.

- DO NOT rev the engine up immediately from cold, but allow the oil to circulate first.
- 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 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.

### "Don'ts" in Driving—contd.

- DO NOT make a practice of starting on 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 the 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, etc., 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 open 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.
- DO NOT forget to shut the petrol off, or to see that the red light in head lamp is not showing after a run (coil ignition models only).

## LUBRICATION.

### ENGINE.

Proper lubrication is of vital importance and the use of only the best of lubricants will be repaid many times over by long wear and good service. The following oils and greases are specially recommended:—

#### Engine:

(Summer) Patent Castrol X.X.L., Mobiloil D., or Aeroshell.  
(Winter) Patent Castrol X.L., Mobiloil D., or Aeroshell.

#### Gear Box:

Castrolase Medium, Mobilgrease No. 2, or Shell Motor Grease (soft).

## All Grease Gun Points:

Castrolase Medium, Mobilgrease No. 2, or Shell Motor Grease (soft).

Oil is carried in the tank underneath the saddle, and in use the level of oil in the tank should never be allowed to fall below the half-full mark. The integral oil pump is of the single-plunger double-diameter type, the larger diameter being used for exhausting the crankcase sump, and the smaller end for delivering oil to all the essential parts of the engine interior, from whence it drains into the sump to be returned to the tank. Provision is made to observe the oil in circulation and a practice should be made of checking this before each run. To do so, it is necessary to raise the oil tank filler cap while the engine is warming up, when the returning oil will be observed running from the small spout immediately underneath the cap. No provision is made for external adjustment of the oil supply, the correct delivery to each part being arranged internally by suitably dimensioned passages. It might here be explained that the oil is forced direct to the timing gear chamber which, after filing same to a pre-determined level, overflows into the flywheel chamber and so drains away to the sump. Oil is also forced into the timing gear side flywheel axle and thence through a drilled passage in the flywheel to the big end bearing, the splash from which passes up into the cylinder interior. In addition to this splash, the cylinder receives oil via a direct ball valve controlled oil passage, which ensures a very adequate supply under all conditions for this, the most vital part of the engine. No attention to the oiling system is required other than observing the return of oil to the tank prior to a run, and the continual replenishment of the supply tank, the level of oil in which, as mentioned above, must be above the half-full mark and must not be filled when engine is cold to a level higher than one inch below the return pipe outlet. (See Oil Circulation illustration.)

## NOTES ON THE OILING SYSTEM.

If the engine is for any reason dismantled, the crankcase must not on any account be separated until the 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 re-fitting 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 finally 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 backwards and forwards while rotating, under the influence of the small guide screw which engages 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 end of the plunger is the larger, the engine sump is always kept clear of oil, hence the term "dry sump." At the same time, a large quantity of clean, cool oil is being forced, under pressure, to all working parts. A double system of filtering the oil is provided in the oil tank. The first consists of a gauze screen in the filler cap orifice to prevent the admission of fluff or foreign matter when replenishing, and the second consists of a felt cartridge through which the returning oil is compelled to pass before emerging from the spout immediately underneath the tank filler cap. This cartridge filter can be removed upon unscrewing the hexagonally-headed cap on the top of the oil tank. About once every 1,000 miles both filters should be removed and carefully washed in clean petrol, while once each season, or not less frequently than once every 5,000 miles, the entire tank should be removed, thoroughly washed out with petrol and after refitting, filled to the correct level with fresh, clean oil. To avoid undue waste, it is quite permissible to arrange for this clean-out when the oil is at the lowest recommended level, although it must be pointed out that, normally, it is highly desirable to add fresh oil frequently in small quantities in preference to allowing the supply to become almost exhausted before re-filling, the reason for this being that the more oil there is in the tank, the cooler it will keep in circulation.

## CHAINS.

The primary chain and the dynamo chain both run in an oil bath case and, provided that the oil level is correctly maintained, will require no attention other than occasional adjustment. The inspection cap orifice on the chain case determines the correct level and it is imperative that the level is not allowed to fall more than about 3/16 in. below the height of the bottom edge of this orifice. Failure to maintain this level will result in rapid chain wear and possibly destruction. It is, therefore, advisable to make a practice of verifying the level weekly. The case covering the magneto drive chain of the Models 35/14, 35/22 and 35/26 is packed with grease during assembly. This will be sufficient to last at least 5,000 miles, after which the cover should be removed and the case re-packed with fresh grease, and the opportunity taken to adjust the chain tension if necessary. The rear chain should be removed every 1,500 to 2,000 miles in summer and every 1,000 miles during winter and thoroughly washed in paraffin. After carefully wiping, it should then be immersed in a bath of molten tallow or, as a poorer substitute, ordinary engine oil. If the latter is used, the chain should be laid in soak over-night in order to ensure penetration to all link joints. If treated in this manner, at least 8,000 to 10,000 miles of satisfactory service should be obtained.

## GEAR BOX.

About once every 1,000 miles a small quantity of grease should be added, if necessary, via the aperture on the gear box top covered by an oval metal cap. This cap is slotted at one end to allow of it being twisted round to uncover the aperture. The gear box must not be entirely filled and under normal conditions the addition of about two ounces of grease every 1,000 miles will be found ample. WEEKLY inject a little grease at all grease gun points.

NOTE.—The greases recommended for gear box lubrication are supplied in collapsible tube containers with a suitable bent spout to facilitate injection into the gear box interior.

## HUBS.

Upon assembly, all hubs are tightly packed with grease. To prevent the entry of mud and water in use, a small additional quantity of grease should be injected by means of the grease gun via the nipples provided on each hub, about once every 500 miles.

## FORK SPINDLES.

To maintain efficient front fork action, adequate spindle lubrication is essential and an injection of grease via the various nipples provided, is recommended weekly, or at least once every 500 miles.

## DYNAMO LUBRICATION.

(Models 35/12, 35/16 and 35/4 only.)

Use oil very sparingly. A few drops of oil should be inserted through the lubricator on the driving end once every 500 miles, and a small quantity of grease should be pressed into the hole to be seen on the commutator end once every 1,000 miles. Avoid using too much grease or pressure, otherwise it may be forced through the bearing on to the commutator and cause trouble.

(Models 35/22, 35/26 and 35/14.)

Dynamo bearings on above models are packed with grease before leaving the works and lubricators are not, therefore, provided. After the motor cycle has run several thousand miles, the dynamo should be dismantled for cleaning, adjustment and re-packing the bearings with grease. This is carried out preferably at the nearest Lucas Service Depot.

## BOWDEN CABLES.

To lubricate Bowden inner cables has hitherto meant the entire removal of the cable, unsoldering one end nipple, etc., altogether a difficult and expensive job and one, consequently, usually neglected. By means of a specially designed oil gun, it is now possible to flood the inner wire with lubricant in a few seconds, and we can only state that the effect of this on a dry cable has to be tried to be believed. Oil is injected through a small bared patch on the outer casing and is forced through the spiral casing on to and along the inner wire. All

## Bowden Cables—contd.

Bowden cables are fitted with small metal clips, which will be observed approximately at the centre of each. These clips cover the small bared patch referred to above, and to apply the gun, it is only necessary to slide the clip along the casing to enable the specially constructed gun to be clamped, with the bared patch occupying a central position on the rubber pad on the gun nozzle. A few turns of the screwed plunger is then all that is required to efficiently flood the entire length of the cable with lubricant. The cost of this special gun is 5s. 9d. and we recommend every owner to have one in his home tool kit.

# ADJUSTMENTS & MAINTENANCE.

## 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 head, it is advisable to remove the cylinder each 5,000 miles in order to also inspect the piston rings and remove any deposit from the grooves in which they operate.

## TO REMOVE CYLINDER HEAD.

(Models 35/4 and 35/14.)

First remove the sparking plug to avoid damage, then remove, in turn, all the cylinder head fixing bolts, when the head can be lifted off. Carefully remove the "C" and "A" gasket and place it somewhere safe until it is required for re-assembling. Then with a suitable instrument (an old pen-knife will do) gently remove all carbon deposit from the cylinder head interior and also from the top of piston, after which wipe away all traces of carbon chips with a piece of calico, and with the piston at the bottom of its stroke, smear the cylinder walls with a thin coating of clean engine oil, wiping away any surplus observed upon bringing the piston again to the top of its stroke. The gasket should then be carefully wiped and placed in position on the cylinder, after which the head may be applied and all fixing bolts re-inserted. Before inserting these bolts, it is a good tip to coat the threaded ends with a thin layer of graphite grease. This will greatly facilitate their removal next time decarbonisation is necessary. Care must be exercised to ensure even tightening of all the head fixing bolts. It is advised to screw them all down lightly and then go round the head one bolt at a time, tightening only about one quarter of a turn until all are firmly and evenly tight. Do not under any circum-



### To Remove Cylinder Head (Models 35/4 and 35/14)—contd.

stances completely tighten down one bolt while the others are still loose. After re-fitting the sparking plug start up the engine and after allowing it to idle for several moments to warm up, go over each cylinder head bolt again, when slight further tightening will be found possible.

### TO REMOVE CYLINDER HEAD ON O.H.V. MODELS.

First remove exhaust system, petrol pipe and sparking plug. Then unscrew the cap on the carburettor mixing chamber and gently withdraw the throttle and air slides. Next remove all four tank fixing bolts and raise the tank on a wooden block placed across each support bar and in a position as high as possible, to allow access to the cylinder head bolts, etc. (Note: This is not necessary on Models 35/12 and 35/22.) Next detach the cylinder head stay, and to facilitate correct re-assembly, note carefully how this stay is attached. Next unscrew the four rocker box fixing bolts, when the entire rocker box, together with push rods and tubes can be removed. It is now only necessary to unscrew the four cylinder head fixing bolts, when the head can be lifted off. It will be observed that a plain soft copper cylinder head gasket is used for the head joint, and upon removal, every care must be exercised to avoid damage. In the event of any signs of leakage being observed, the gasket should be annealed prior to the re-assembly. This is done by heating to a dull red heat and suddenly plunging in cold water. No jointing mixture or compound of any description is recommended. During the removal and re-fixing process, care must be taken to avoid losing the small hardened steel valve caps, and should the valves be removed for grinding-in purposes, they should not be interchanged. After carefully removing all carbon deposit from both piston top and cylinder head, the interior of cylinder should be carefully wiped out with a clean calico rag and smeared with fresh engine oil. In re-assembling, all cylinder head fixing bolts must be uniformly tightened, and the best method to ensure this is to tighten down finger-tight only and then go over each bolt in turn, giving a little extra pressure. Before replacing the rocker box, first remove the cover plate so as to be able to see that the O.H. rocker ends properly enter the cupped push rod ends, and to facilitate matters revolve the engine until both tappets are down.

### TO GRIND IN VALVES.

In the case of O.H.V. models, valve grinding is advised upon each occasion when decarbonisation is undertaken. After the cylinder head has been removed as described, to remove valves it will be found convenient to rest the head of each in turn on a small block (wood preferably) while the spring is being compressed to allow of the removal of the taper valve cap divided collar. It may be necessary to give the valve spring cap a sharp tap to release this taper collar. After removing all carbon deposit, the face of each valve seating should be smeared with a good grinding paste (this may be obtained already mixed) and the valve revolved slightly backwards and forwards (never

### To Grind In Valves—contd.

revolve completely) while light pressure is applied to the head. During this operation, it is advisable to occasionally raise the valve on its seating and turn in the guide slightly, afterwards repeating the backwards and forwards movement.

Generally, one application of grinding paste will be ample for the inlet, but two or three applications may be necessary to entirely restore the exhaust valve seating. After this grinding-in has been satisfactorily accomplished, all traces of the grinding-in mixture should be carefully washed off with petrol, and both valve stems and guides cleaned thoroughly. Prior to re-fitting, it is advisable to smear each valve stem with graphite grease.

A special tool for compressing valve springs can be supplied at 6s. 6d. (Part Number TTK 8).

A small clamp tommy wrench, to facilitate valve grinding, can also be supplied at a cost of sixpence.

For S.V. models, valve grinding during alternative decarbonisation is sufficient and care is necessary as with O.H.V. models to avoid interchanging the two valves. Tappet and rocker clearances must always be checked after cylinder head removal, and the correct adjustment obtained. See instructions below.

### TO ADJUST VALVE TAPPETS ON S.V. MODELS.

Remove valve spring cover, and with the spanner provided in tool kit, hold the tappet and slack off the lock nut securing the adjustable tappet head. Then screw the head up or down as may be required, to obtain the correct clearance, after which securely tighten the locking nut. The correct clearances are .006 for the inlet and .006 for the exhaust.

NOTE.—Tappet clearances should be tested while the engine is warm, not hot.

### TO ADJUST VALVE TAPPETS ON O.H.V. MODELS.

First remove the rocker box cover secured with three screws, this will expose the adjustable ends of the valve push rods. Next revolve the engine until the valve which requires adjustment is open, and with the spanners provided in the tool kit, loosen the lock nut securing the adjustable rod end. Then revolve the engine until the valve is completely closed and unscrew the adjustable push rod end until the correct clearance is obtained, after which once more revolve the engine until the valve is fully open, and taking care not to disturb the adjustment obtained, carefully secure the lock nut. Always make a point of checking the adjustment obtained after the lock nut has been re-tightened.

NOTE.—The correct clearance between the rocker ends and the valve ends when valves are completely closed and the engine cold is the nearest approach to nil possible. It should be observed that the hardened steel valve end caps are free to be revolved with the fingers while at the same time no perceptible up and down movement of the rocker is possible.

## VALVE TIMING.

The timing gears are marked for re-setting purposes, and the correct opening of the valves is as follows: The inlet commences to open 20 degrees, or  $7/64$  in. before top of exhaust scavenging stroke, and closes 67 degrees, or  $25/32$  in. up the compression stroke. Exhaust valve commences to open 75 degrees, or  $31/32$  in. from bottom of firing stroke, and closes 28 degrees, or  $7/32$  in. down induction stroke. To test valve timing, the tappets must first be set to .014 in. clearance. See instruction above for normal running clearances.

## IGNITION SETTING.

The correct ignition setting for Models 35/12 and 35/16 is  $5/16$  in. B.T.D.C., for Model 35/4  $1/4$  in. B.T.D.C., for Models 35/22 and 35/26  $7/16$  in. B.T.D.C., and for Model 35/14  $1/8$  in. B.T.D.C., in every case with the ignition fully advanced.

### TO RE-TIME IGNITION ON MODELS 35/12, 35/16 AND 35/4.

Remove the bakelite contact breaker cap and slacken the screw securing the contact breaker cam. Then with a small punch operating in one of the slots in this cam, give a sharp but light tap. This will loosen the cam on the taper end of the shaft to which it is fitted. Now set the piston and the ignition lever in the position mentioned above, after which gently turn the cam with the fingers in an anti-clockwise direction until the contact points are just about to part, in which position carefully re-tighten the cam fixing screw and replace the bakelite cap. It is essential, in this ignition setting operation, to obtain exactly the prescribed piston setting on the compression stroke, i.e., the stroke at the top of which both valves are closed.

NOTE.—Check contact breaker gap before setting timing (.018 to .020).

### TO RE-TIME IGNITION ON MODELS 35/22, 35/26 AND 35/14.

Remove the outer portion of aluminium magneto chain cover and slack off the nut securing the lower sprocket. Then, with a stout screwdriver, or the hooked end of a stout tyre lever, gently lever the sprocket loose from the taper on the camshaft to which it is attached. Then carefully turn the engine until the piston is at the exact position described above (according to model), observing that it is on the stroke at which both valves are closed. Now fully advance the ignition and remove the contact breaker cap, after which gently turn the magneto with the fingers in its ordinary direction (i.e., contra-clockwise when looking at the sprocket end) until the contact points are just about to break, in which position the sprocket fixing nut must be carefully re-tightened. Needless to add, it is of vital importance to correctly obtain the prescribed piston position and to secure the chain sprocket at the exact position at which the contact points commence to part. To find the exact point of break, place a piece of cigarette paper between the points and turn the magneto armature until the paper is just released, and no more, upon a gentle pull.

## TO ADJUST THE DYNAMO CHAIN (ALL MODELS).

Adjustment is arranged by revolving the dynamo unit in its cradle mounting, and the correct adjustment should permit a movement of about  $1/4$  in. to  $1/2$  in. as the top run of the chain is lightly pressed up and down midway between the sprockets. When checking, try a number of positions and obtain the described adjustment at the tightest place. To adjust, first slacken the dynamo clamp bolt and then twist the unit bodily in its mounting in a forward or clockwise direction to tighten. Always check the adjustment after the clamp bolt has been re-tightened. It will be found that the tension of both dynamo and primary chains can be checked by the fingers passing through the inspection cap orifice, it being, of course, necessary to remove the cap for the purpose. This cap is released upon unscrewing the knurled edge screw.

## TO ADJUST THE MAGNETO CHAIN.

(Models 35/22, 35/26 and 35/14.)

Adjustment to the magneto chain is obtained by tilting the unit bodily on the lower crankcase bolt upon which the platform is mounted, the upper fixing bolt holes being slotted for the purpose. To adjust the chain, first remove the outer cover of crankcase, then slack off slightly only the two crankcase bolts by which the magneto platform is fixed and insert a lever or screwdriver under the top edge to force the back end up until the correct adjustment is obtained, when securely tighten the two fixing bolts and before replacing the outer chain cover smear the chain with grease if necessary.

NOTE.—The correct adjustment allows a whip of about  $1/4$  in. as the top run of the chain is slightly pressed up and down midway between the sprockets.

## TO ADJUST THE PRIMARY CHAIN.

To obtain adjustment for the primary chain, provision is made to swing the gear box bodily upon its lower fixing bolt. It will be observed that the upper fixing bolt operates in slotted holes to permit of the necessary movement. To make adjustment, the off-side nut of the top gear box fixing bolt must first be slackened. Then to tighten the chain adjustment, first slack off the nut on the adjuster bolt nearest the engine and turn the nut farthest from engine clockwise, until the correct chain adjustment is obtained, then re-tighten the nut nearest engine and also the top gear box fixing bolt nut. Correct chain adjustment should allow a whip or movement of  $1/8$  in. to  $1/4$  in. as the top run of the chain is pressed up and down midway between the sprockets.

NOTE.—Owing to the movement of the gear box necessary for correcting chain adjustments, some small alteration to the gear rod adjustment may be necessary; therefore, upon completion of the former, the adjustment of the gear control must always be checked and corrected if necessary. (See gear control adjustment. Hand only.)



## TO ADJUST THE REAR CHAIN.

Put down the centre prop stand, then slack, slightly only, both rear wheel spindle nuts. Then adjust chain as required by means of the bolts which pass through each of the fork ends, after which securely re-tighten spindle nuts. The correct adjustment (which should allow a whip of  $\frac{3}{16}$  in. to  $\frac{1}{2}$  in. when chain is pressed up and down) should be obtained for the tightest place.

NOTE.—Before tightening the rear chain, the adjustment of the front chain should be inspected and if attention to each is required, the latter should be treated first.

IMPORTANT.—Care is necessary when tightening rear chain to leave the wheel in correct alignment. When correct, a piece of thin string stretched taut across both wheels and about four inches from and parallel to the ground, should be observed to just touch each tyre at both sides of wheel centre simultaneously. Alternatively, a straight wooden batten about five feet long is a very handy article to be used for the purpose of checking wheel alignment, applied as in the case of string, parallel to and about four inches from the ground.

## ADJUSTMENT OF GEAR CONTROL (HAND CHANGE ONLY).

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 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, 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 in 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 re-fitted. 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.

## TO DISMANTLE AND ADJUST WHEEL BEARINGS.

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

## To Dismantle and Adjust Wheel Bearings—contd.

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  $1/32$  in. beyond its actual position, to enable the felt washer and its retaining ring, together with the two plates, to be put in and the spring ring to snap into its groove. Care must be taken to put the plate with the larger hole in last. This is most important. 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  $1/16$  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.

## CLUTCH ADJUSTMENT.

In the event of clutch slip being experienced, the most likely cause is incorrect cable adjustment. When correct, it should be possible to move the actuating lever (part to which lower end of cable is attached) inwards and outwards slightly with the fingers, and if this free movement cannot be felt, the cable adjustment must be slackened. This is done by screwing down the cable adjuster on the gear box end plate.

## STEERING HEAD ADJUSTMENT.

The steering head should be occasionally tested for correct adjustment by exerting pressure upwards from the extreme tips of the handlebars while the steering damper is completely slackened off. Should any shake be apparent, the head clip pinch bolt nut should be slackened off and then the large nut underneath the steering damper knob should be turned in a clockwise direction until all trace of shake has disappeared, when the pinch bolt must be firmly re-tightened.

IMPORTANT.—To guard against unconsciously over-tightening the head bearings, the effect of which is extremely difficult steering, it is advisable to jack up the front of the machine (a box of suitable height under the crankcase will serve), in order that all shake may be taken up satisfactorily and the steering head left perfectly free.

## FRONT FORK SPINDLE ADJUSTMENT.

Provision is made for taking up side or end wear of the various fork spindle bearings. The need for adjustment will be made apparent by a click or creaking noise when the steering head is abruptly turned. By placing the fingers partly over the spindle link end and partly upon the lug through which the spindle passes, while turning the steering head, first ascertain which spindle or spindles require adjustment, then after slackening off the right side nut on the spindle to be adjusted, carefully turn the spindle bodily, by means of its hexagonal head, in a clockwise direction to tighten, or vice versa to slacken. Do not adjust more than one half a revolution at a time before a re-trial with the nut again tightened. Care is essential to avoid tight adjustment which will make the fork stiff in action or entirely prevent it functioning. The necessary friction damper effect is provided independently and is adjusted as follows:—

### TO ADJUST FORK ACTION DAMPER.

The fork action damper can best be adjusted while cycle is actually in motion, and a badly corrugated surface such as may be found on many bus routes provides the best condition 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.

## CARBURETTOR ADJUSTMENT.

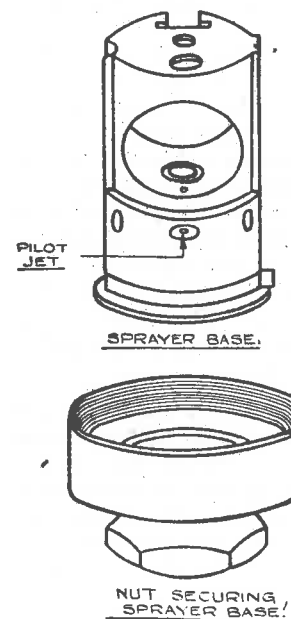
Although owners are advised to refrain from tampering without good cause with the setting of the carburettor, a rough idea how this unit functions and how adjustments may be effected is given below:—

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 petrol supply to the engine is obtained firstly by the main jet, and secondly by means of a taper needle attached to the throttle valve and operating in a tubular extension of the main jet. The main jet controls the mixture entirely from  $\frac{1}{4}$  to full throttle, and the adjustable taper needle from  $\frac{1}{4}$  down to  $\frac{1}{8}$  throttle. The cut-away portion at the air intake side of throttle valve controls mixture from  $\frac{1}{8}$  throttle down to about  $\frac{1}{4}$  open, and a pilot jet with independently adjusted air supply takes care of idling on nearly closed throttle up to about  $\frac{1}{4}$  open. These various stages of control must be borne in mind when any adjustment is contemplated. The correct jet size and throttle cut-away is selected for each model and should not be altered without some very good reason. For Models 35/12 and 35/22, the combination

## Carburettor Adjustment—contd.

is jet 120 and throttle slide 5x3; for Models 35/22 and 35/26, jet 120 and throttle slide 5x4, and for Models 35/4 and 35/14, jet 130 and throttle slide 6x4. With these combinations it is possible to use full or nearly full air under all conditions, except perhaps when the engine is pulling hard up hill on full throttle, when some benefit may be obtained by closing the air down a trifle. Weak mixture is always indicated by popping or spitting at the air intake, whilst a rich mixture usually causes bumpy or jerky running in extreme cases, accompanied by black smoke from the exhaust. A rough test for correct setting is to warm the engine up and then fully retard the ignition, and with the air about  $\frac{1}{4}$  open slowly open up the throttle to full open, during which the engine should respond without a misfire, but upon a sudden opening of the throttle again with fully retarded ignition and about  $\frac{1}{4}$  air, it should splutter and stop. This is, of course, only a rough test, but is, nevertheless, a fairly accurate guide to correct main jet and needle setting. To check the pilot jet and air control setting, warm up the engine, and with the ignition about  $\frac{1}{2}$  advanced and air about  $\frac{1}{4}$  open, with throttle almost closed, the engine should idle positively and evenly. If it fails to do so, slacken the lock nut securing the pilot jet air screw, which will be observed at the base of the mixing chamber, and find a position at which even firing is obtained. The adjustment of this screw is not unduly sensitive and it should be possible to obtain the correct adjustment in a few seconds.

Before concluding that incorrect carburation is responsible for heavy consumption, and before carrying out any of the tests described, make quite certain that the ignition is set correctly. This is most important. In the event of adjustment of the air screw failing to effect slow running in the manner described, it may be reasonably assumed that the minute passage for petrol has become choked. 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 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.



### Carburettor Adjustment—contd.

#### Failure to obtain good idling may be due to:—

- 1.—Air leaks, either at the junction of the carburettor and engine, or by reason of a badly worn inlet valve stem or guide.
- 2.—Faulty valve seatings.
- 3.—Sparking plug faulty or points too close.
- 4.—Too much ignition advance.
- 5.—Contact points dirty or setting too close.
- 6.—Defective sparking plug cable.

#### Failure to obtain satisfactory petrol consumption may be due to:—

- 1.—Late ignition setting (carefully follow instructions).
- 2.—Bad air leaks (most likely distorted flange).
- 3.—Weakened valve springs (renew).
- 4.—Leaky float, causing flooding (renew).
- 5.—Taper needle extension insufficient (note position before altering).
- 6.—Compression poor, due to worn piston rings, or defective valve seatings (test compression with wide open throttle).

### INSTRUCTIONS FOR THE ELECTRICAL EQUIPMENT.

Miller equipment is used on coil ignition Models 35/4, 35/12 and 35/16, while Lucas equipment is utilised on magneto ignition models. Both systems are identical with the exception that the latter models are provided with a detachable combined panel and inspection lamp, while the panel lamp on the coil ignition models is a fixture. In each case the head lamp is fitted with a double filament driving light bulb and also a parking light bulb, the dipped filament being brought into instant use as and when required by means of a knurled switch ring on the left handlebar. As in car practice, a red warning light is provided on the panel of coil ignition models to remind the driver to switch off the ignition when cycle is stationary. This warning light only appears when breaker points are together and, consequently, continually flickers while the engine is running.

The dynamo current output is so controlled that when the panel switch is at position "C" (daylight position) only half its normal output passes to the battery (about 2 amps.). When the switch is turned to position "H" or "L," the charging rate is automatically increased to its maximum, which is sufficient to cover the consumption of the lamps and still leave a balance of 1 amp. on position "H," and 4 amps. on position "L" (for town riding). By this combination it is within the rider's control to maintain a fully charged battery under all circumstances and over-charging is practically impossible.

### CARE OF BATTERY.

**Topping Up.**—At least once a month, the vent plugs in the top of the battery should be removed and the level of the acid solution examined. If necessary, distilled water, which can be obtained at all chemists and most garages, should be added to bring to the level above the top of the plates, but well short of the bottom of the vent plugs. When examining the cells, do not hold a naked light near a vent, as there is a danger of igniting the gas coming from the plates.

**Storage.**—If the equipment is laid by for several months, the battery must be given a small charge from a separate source of electrical energy about once a fortnight, in order to obviate any permanent sulphation of the plates. In no circumstances must the electrolyte be removed from the battery and the plates allowed to dry, as certain changes take place which result in loss of capacity.

**Testing the Condition of the Battery.**—It is advisable to complete the inspection by measuring the specific gravity of the acid, as this is a very good indication of the state of charge of the battery.

An instrument known as a "Hydrometer" is employed for this purpose. These can be bought at any Lucas Service Depot, price 4s. 6d.

The specific gravity figures are: 1.285 to 1.300 when fully charged, about 1.210 when half discharged, and about 1.150 when fully discharged.

### DYNAMO.

The only parts of the dynamo calling for occasional attention are the brushes and the commutator, which are readily accessible when the end cover is removed. The brushes should slide freely in their holders. They should be clean and the face in contact with the commutator should appear uniformly polished. Dirty brushes may be cleaned with a cloth moistened with petrol. The commutator surface must be kept clean and free from oil or brush dust.

See earlier instructions re dynamo lubrication.

### CONTACT BREAKER.

Occasionally remove the bakelite contact breaker cover and examine the contacts. If they are burned or blackened, clean with a very fine emery cloth and afterwards with a cloth moistened with petrol. Take care to wipe away all particles of dirt or metal dust.

### ADJUSTMENT.

The contact breaker gap is carefully set and should not be altered unless it varies considerably from the correct setting. If adjustment is necessary, proceed as follows:—

### Adjustment—contd.

Turn the engine until it is seen that the contacts are fully opened, then slacken the nut securing the stationary contact screw and adjust this screw until the gap is about .018 to .020. After making the adjustment, care must be taken to tighten the locking nut by which the stationary contact screw is secured.

NOTE.—Check contact breaker gap at 100 and 300 miles. Owing to an initial settling down, there is a tendency for the gap to decrease in the first few hundred miles of use. This may seriously affect ignition setting. Subsequently, adjustment will only be necessary at long intervals, but should be checked every 1,000 miles.

### PERIODICAL INSPECTION OF NUTS, ETC.

Satisfactory service depends largely upon the necessary immediate attention to details. The old adage, "A stitch in time saves nine," applies with particular force to motor cycle maintenance. Make a point of occasionally testing with a spanner the security of all nuts. There is possibly more dissatisfaction and damage caused through neglecting details, than for any other reason. It must be remembered that a motor cycle is a highly specialised piece of engineering and that while it does not call for great engineering skill in driving, the exercise of a little mechanical sense and the occasional use of a spanner, cleaning cloth, etc., is very necessary if the maximum service is to be obtained with the requisite degree of satisfaction. Therefore, do not wait until tomorrow, but adjust it now.

### CLEANING.

If the machine is used to any extent in bad weather, a small hose is almost indispensable for removing mud. Care should be exercised to avoid directing water on to the engine, carburettor, or other such parts. If a hose is not available, soak dirt with paraffin before removing. Do not attempt to rub or brush mud off an enamel surface when dry, or the polish will soon be destroyed. For the engine, magneto, etc., a good stiff paint brush and pot of petrol is preferable.

### TYRES AND SERVICE.

To obtain satisfactory life and service from the tyres is largely within the user's control, and the first essential to obtain this is proper inflation. The correct amount of pressure is governed substantially by the load to be carried and it is, therefore, difficult to lay down a hard and fast ruling. Assuming the weight of driver to be normal, the pressures recommended may be regarded as satisfactory, and we urge all users to make a practice of checking the actual pressure by means of a low-pressure Schrader tyre gauge. This takes a few

### Tyres and Service contd.

seconds only and will amply repay the owner by reason of additional service and immunity from failures.

|                         | Solo.      | With Pillion. |
|-------------------------|------------|---------------|
| Front tyre, 26x3.25 in. | 14-15 lbs. | 16-17 lbs.    |
| Rear tyre, 26x3.25      | 20-22 lbs. | 22-24 lbs.    |
| Sidecar tyre, 26x3.25   | ...        | 14-15 lbs.    |

The above recommended pressures apply to average weight drivers. For abnormal weight drivers, or for carrying pillion passengers, add two pounds per square inch to rear tyre only.

### CORRECTIVE MEASURES.

No adjustment should be made or any part tampered with until the cause of the trouble is known. Otherwise adjustments which are correct may be destroyed.

#### Engine Suddenly Stops:—

- Petrol shortage in tank.
- Choked petrol supply pipe or tap.
- Choked main jet.
- Water in float chamber.
- Oiled-up or fouled sparking plug.
- Water on H.T. pick-up or on sparking plug.

#### Engine Fails to Start, or Difficult Starting:—

- Lack of fuel, or insufficient flooding if cold.
- Excessive flooding, allowing neat petrol to enter cylinder.
- Oiled-up sparking plug.
- Stuck-up valve, or valve stem sticky.
- Weak valve spring, or valve not seating properly.
- Too liberal throttle opening.
- Pilot jet choked.
- Contact breaker points dirty, or gap incorrect.

#### Loss of Power:—

- Valve or valves not seating properly.\*
- Weak valve spring or springs.
- No tappet clearance, or excessive clearance.
- Lack of oil in tank.
- Brakes too closely adjusted.
- Badly fitting or broken piston rings.
- Punctured carburettor float.
- Creeping ignition lever.

**Engine Overheats:—**

Lack of proper lubrication.  
Weak valve springs.  
Pitted valve seats.  
Worn piston rings.  
Late ignition setting.  
Punctured float, causing rich mixture.  
Air control to carburettor out of order.  
Creeping ignition lever.

**Engine Misses Fire:—**

Valve spring weak.  
Defective or oiled plug.  
Incorrectly adjusted contact breaker.  
Incorrectly adjusted tappets.  
Defective sparking plug cable.  
Oil on contact breaker points.

**Excessive Oil Consumption:—**

Stoppage or partial stoppage in pipe returning oil from engine to tank.  
Clogged or partially clogged cartridge filter in oil tank.  
(Drain sump and test with filter removed.)  
Badly worn or stuck-up piston rings, causing high pressure in engine crankcase.  
Air leak at rear oil pump end cap.

**LEGAL MATTERS.**

NOTE.—In view of the growing 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 freely commented, 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 studiously refrain from any of the practices enumerated.

To comply with the law relating to motor cycles, every 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 (motor cycles only). The address of the above Taxation Department can be obtained by enquiry at a Post Office.
- 4.—The form, 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 term covered.
- 5.—See that the rear number plate is illuminated at night.
- 6.—Never drive at a speed which is dangerous to the public.
- 7.—Wherever necessary, give audible and sufficient warning by horn, or other instrument, of the approach of his motor cycle, except between the hours of 11.30 p.m. and 7.30 a.m.

NOTE.—In view of impending alterations in road traffic regulations in the near future, new owners are advised to make further enquiries unless quite conversant with all new regulations at the date of purchase.



# 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 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 the manufacturers, or to a motor cycle which is not designed for such use.

Any motor cycle, motor cycle combination or sidecar sent to us to be plated, enamelled or repaired, will be repaired upon the following conditions, i.e., we guarantee that all precautions which are usual and reasonable have been taken by us to secure excellence of materials

## Guarantee—contd.

and workmanship, such guarantee to extend and be in force for three months only from the time such work shall have been executed, or until the expiration of the six months above referred to, and this guarantee is in lieu and in exclusion of any common law or statute warranty or condition, and the damages recoverable are limited to the cost of any further work which may be necessary to amend and make good the work found to be defective.

## CONDITIONS OF GUARANTEE.

If a defective part should be found in our motor cycles, motor cycle combinations or sidecars, or in any 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 at 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, warranty 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.

A.J.S. MOTOR CYCLES.