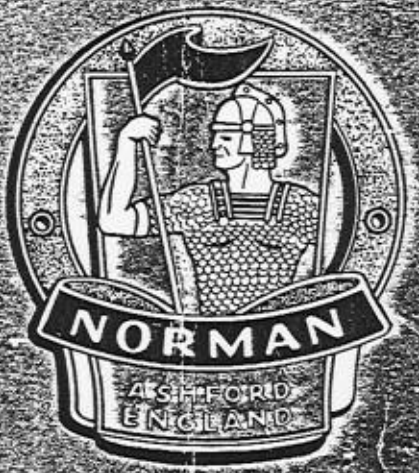


NORMAN Nippy

DE LUXE

HANDBOOK

Price 3/6

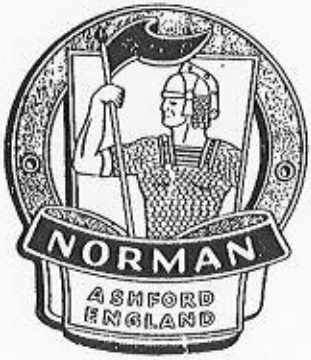
INTRODUCTION

In taking delivery of your NORMAN " NIPPY," you are taking over a very fine well-designed and well-tried motorised bicycle. A type of machine which has come to be known internationally as a " Mo-ped ".

We want you to enjoy every minute of your possession of your " NIPPY." You will not have to know a lot to ensure this enjoyment, but we would like you to learn the best way to ensure this right from the start.

This booklet, in its following pages, will help you off on the " right foot " as the saying goes, and once started right, we hope you may have many miles of pleasure in using your " NIPPY " for your daily journeys, whether for business or pleasure.

NORMAN CYCLES LTD.,
Beaver Road,
Ashford, Kent.



NORMAN Nippy
DE LUXE

INSTRUCTION BOOK

FOREWORD

The operation, lubrication and running maintenance of the NORMAN " NIPPY " is extremely simple. Before we describe these three essentials we would say a word in regard to the NIPPY'S capabilities.

Before you can expect the very best performance the machine needs to be gently run in. A running-in period of 300 miles, during which period you keep the top speed down to within 20 m.p.h. will, quite apart from enabling you to get fully accustomed to your NIPPY also ensure that all bearing surfaces throughout the engine and the machine become nicely bedded in.

After the machine has been run in you will find it will have a maximum speed of around 30 m.p.h. and its fuel consumpion will work out between 180–200 m.p.g. The actual economy which you achieve in fuel consumption will depend a great deal on how you drive your machine. In hilly districts or a great deal of town driving you would undoubtedly find that the lower of the two figures would be about your average, and similarly, if you were driving at 30 m.p.h. for long stretches you would also achieve approximately the same mileage per gallon. A good average speed for your NIPPY should be considered around 20 m.p.h., when on fairly long runs you will find your petrol consumption will work out at around 200 m.p.g.

In the following pages you will find illustrations of various views of the Norman NIPPY and each of these views has its special purpose ; one is to indicate the various controls of the machine, another deals with lubrication.

GENERAL SPECIFICATION

NORMAN "NIPPY"

ENGINE—Sachs 2-stroke 47-c.c., incorporating corked plate clutch, 2-speed gearbox.
BORE—38 mm.
STROKE—42 mm.
COMPRESSION RATIO—6 : 1.
BRAKE HORSE POWER—Short term, 1.25 at 4,100 r.p.m.
CONTINUOUS OUTPUT—1 at 4,000 r.p.m.
IGNITION SYSTEM—Flywheel magneto dynamo by BOSCH Type LM/UR 1/115/17 R3 (17W).
DYNAMO OUTPUT—6v. 17w. AC.
SPARKING PLUG—KLG F70, 14 mm.
IGNITION TIMING—0.078"-0.098" before top dead centre.
CARBURETTER—Bing carburetter model 1/12/20 with oil moistened air filter.
CARBURETTER SETTINGS—Main jet 54. Needle jet 2.10 needle. Position 3rd groove from top.
SILENCER—Completely detachable.
TRANSMISSION—Engine—Gearbox—Roller chain. Ratio 3.78–1.
CLUTCH—Two plate cork insert.
GEARBOX—Two speed in unit construction with engine.
GEARBOX RATIOS—1st gear 2.78—1 ; 2nd 1.77—1.
FINAL GEAR RATIOS—1st gear 24.5 ; 2nd 15.6.
TRANSMISSION TO REAR WHEEL—Roller chain $\frac{1}{2}$" x $\frac{3}{16}$".
LUBRICATION—Petrol oil in the ratio 1 : 25 SAE 50 oil. (1/3 pint oil 1 gallon petrol.)
Gearbox—1/3 pint SAE 90 oil. (See recommendations inside back cover.)
TYRES—23" x 2"
TYRE PRESSURE—25 lb. Front ; 37 lb. Rear.
TOTAL WEIGHT—91 lbs. (dry).
WHEELBASE—46$\frac{1}{2}$".
OVERALL WIDTH—23".
OVERALL LENGTH—72".
GROUND CLEARANCE—Under engine—4$\frac{3}{4}$".
FUEL CONSUMPTION—180–200 m.p.g.
MAXIMUM SPEED—30 m.p.h.
CRUISING SPEED—20 m.p.h.

OPERATION

To become fully acquainted with the operation of your NIPPY you would be advised to study your machine in conjunction with the scale drawings shown and also with figure 1 on the following page.

Figure 1 deals with the controls of the machine, which are grouped around the handlebars, and you will notice that every control has a separate numeration, so we will commence with the controls which are grouped from left to right.

Control No. 1 is a combined twist grip and clutch lever. The clutch lever has the use of disengaging the drive between the engine and the back wheel by pulling the lever towards you. The twist grip engages one or other of the two speeds or gears which are available. It will be noticed that the movable parts of the lever and twist grip has stamped on it three figures—1, 0 and 2, and on the stationary part of the grip or lever there is a small indication mark. When the machine is stationary and not in use, the "0" on the grip should register with the indication mark ; this then shows that the gears are in neutral.

To operate the gears at all, it is first necessary to withdraw the clutch lever as far as it will go ; the twist grip and clutch lever combined can then be turned in the desired position so that one of the figures registers with the mark. The Figure 1 of course refers to first gear ; "0" is neutral and 2 is second or top gear, and it is this latter gear that is in use the major part of the time the machine is being driven.

Control No. 2 is the light switch ; this also is a combined control since it incorporates the main light switch, the dipped beam position and also the horn button. When the switch is turned to the right as far as possible the lights are off, when turned to the left one notch the dipped beam is available, and when turned to the left as far as it will go, the main beam of the head light is available.

Control No. 3 is the front brake lever and hardly needs comment other than to say that it operates the front brake in the orthodox manner.

Control No. 4 is the twist grip operating the throttle on the engine, and when turned inwards towards you will open the throttle and speed up the engine. Once you have the machine under way and in top gear it is only necessary to regulate the speed which you wish to travel by turning the twist grip Control No. 4 to the desired position.

As far as driving the machine goes, the only other controls coming under this heading are the pedals and these can be used for pedalling the machine, for starting the engine and yet again they are used for applying the rear brake when they are pedalled backwards.

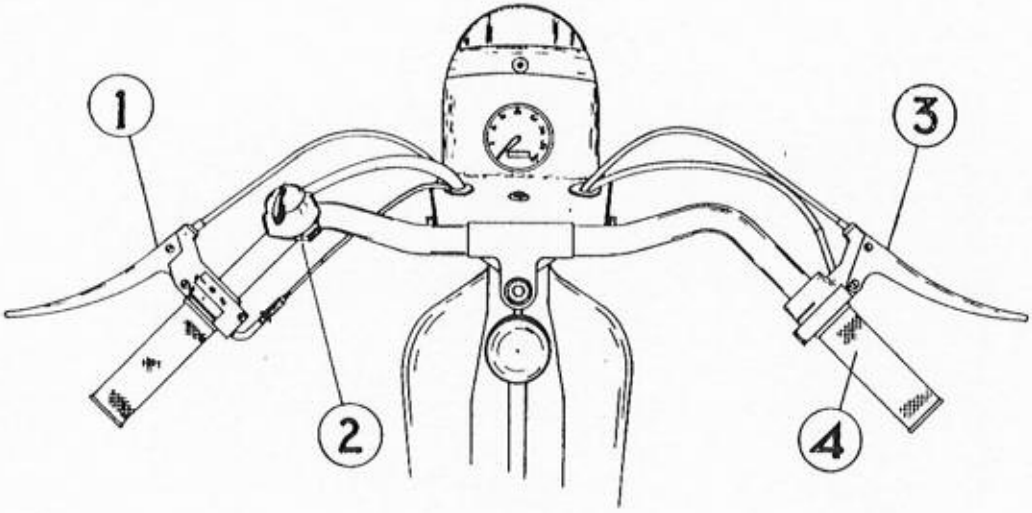
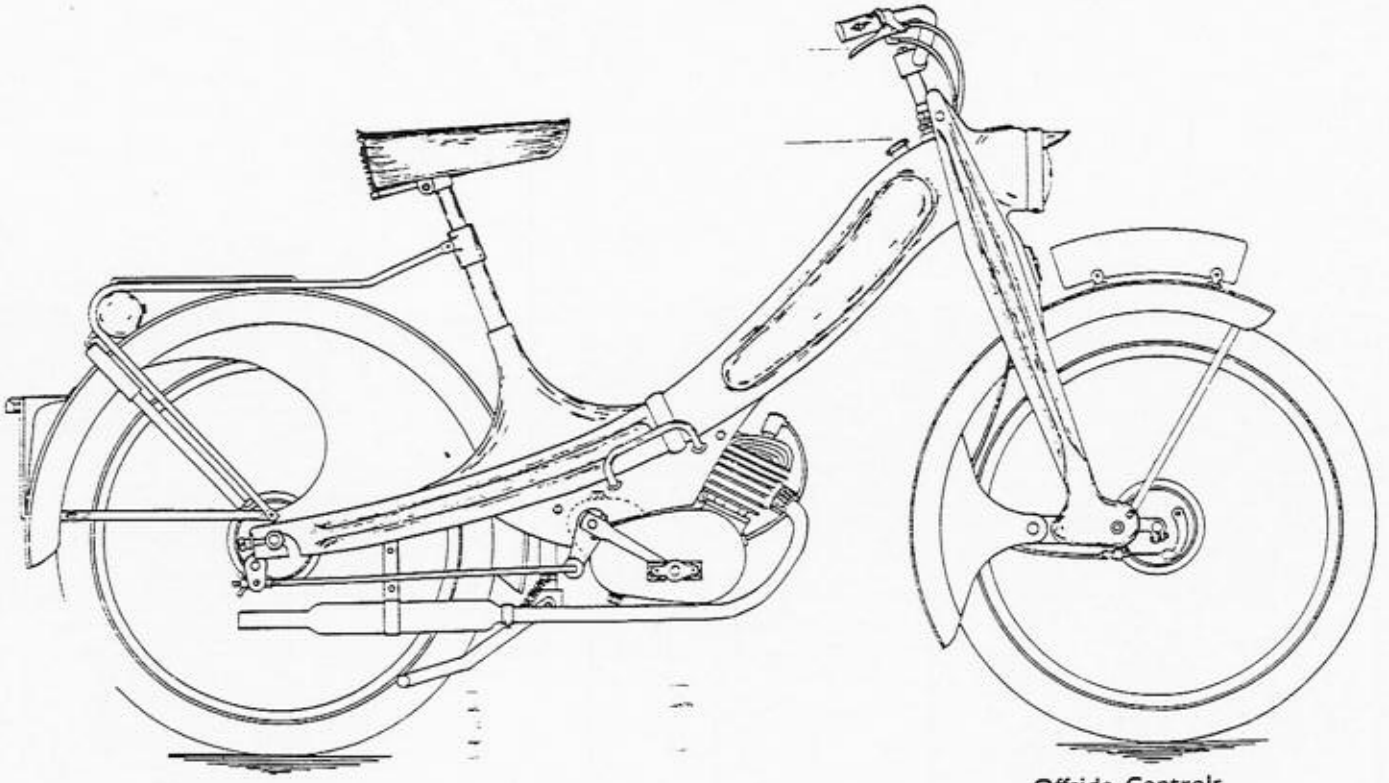


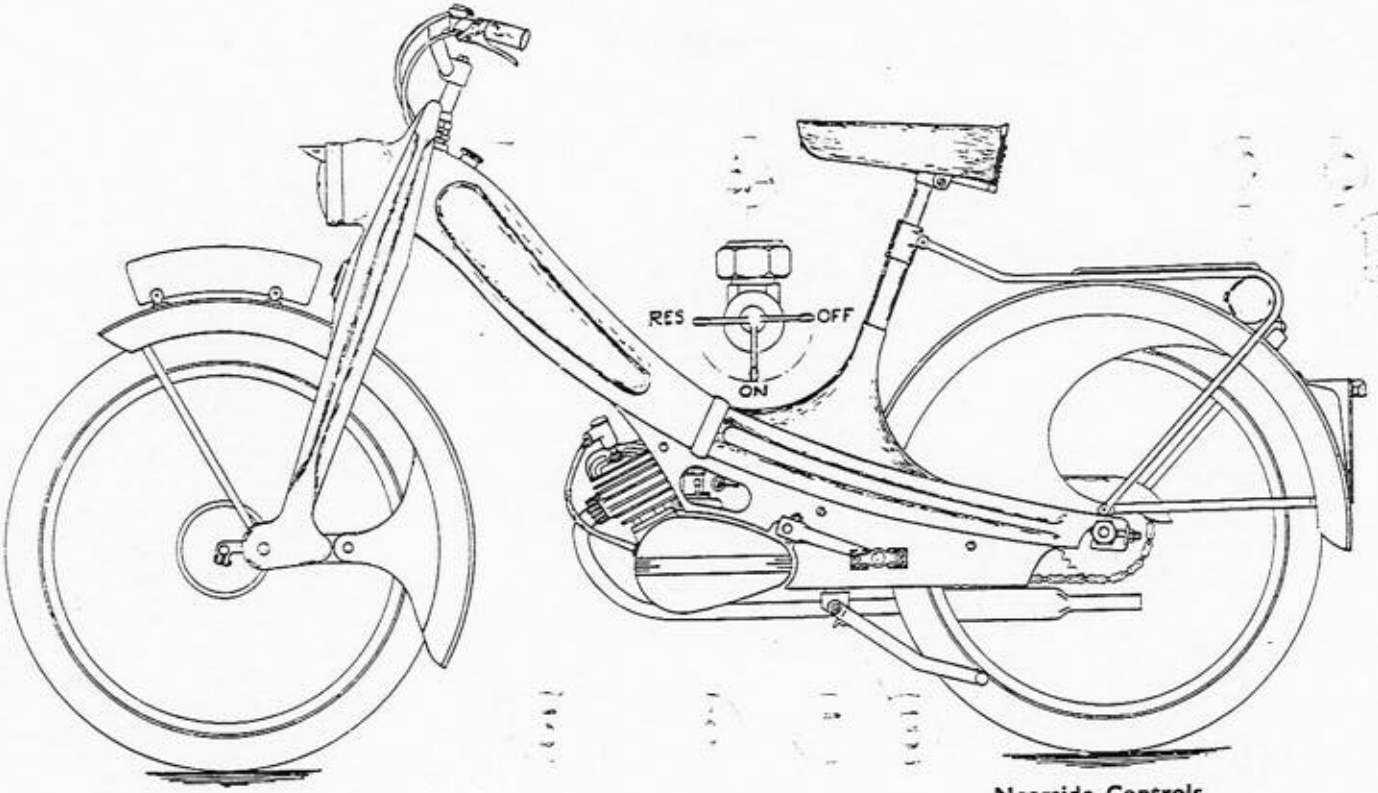
FIG. 1

A study of Figure 2, which shows near and offside views of NIPPY, will at once make clear all controls and other essential points of operation. These points are also indexed below :—

1. Clutch and gear control.
2. Lighting switch.
3. Front brake.
4. Throttle twist grip.
5. Carburetter tickler or primer.
6. Petrol tap. (See also enlargement of tap No. 6a ; this shows clearly the three positions of the tap handle.)
7. Pedal crank.
8. Stand.
9. Carrier parcel clip.
10. Toolbox.
11. Petrol tank filler cap.
12. Tyre inflator.



Offside Controls



Nearside Controls

DRIVING "NIPPY"

When your machine left the factory it had been tested, the gearbox filled with oil, generally lubricated and adjusted ready for riding. All that is needed now is to fill the petrol tank, start the engine and away you go.

Pour into the petrol tank a gallon of petrol-oil mixture. This mixture should be made and thoroughly mixed in a separate container before pouring into the tank. The correct proportions of petrol-oil mixture are as follows :—

One gallon of premium grade petrol.
One-third of a pint of SAE 50 motor oil.

We recommend one of the following brands of oil be used :—
SHELL X100 Motor oil 50. ESSOLUBE 50. CASTROL XXL or GRAND PRIX. ENERGOL SAE 50. MOBILOIL D.

Now turn the petrol tap on, place a finger on the carburetter tickler knob and press downwards, holding this position for about 6 seconds or until petrol overflows. Turn the clutch and gear control lever so that the " 0 " coincides with the indication mark. Leave throttle control in the near closed position. Now get the pedalling crank at the highest point and give a smart push down in a forward direction, when the engine should start. If it does not start at the first attempt, try again, since you will have to acquire a knack before you can make starting easy every time.

Once the engine has started acquaint yourself with the throttle control by turning it first one way and then the other, but under no circumstances hold it in a fully open position, that is to say, turned as far towards you as possible, otherwise the engine will race unduly.

Having acquainted yourself with how this control works and how it speeds up and slows down the engine, turn it back until the engine is running very, very slowly. Now sit astride the machine, one hand on the throttle control and the other on the clutch and gear lever control ; pull the clutch lever up as far as it will go and turn the twist grip and lever combined to position 1. Now release the clutch lever very gently, at the same time twisting the throttle control towards you very, very slowly, thus speeding up the engine as the clutch takes up the drive to the back wheel.

You will, no doubt, need quite a little practice in engaging the clutch slowly and gently and at the same time opening the throttle just the right amount, but it will not take you long to get used to these two controls and when you have done so you will find that the machine will glide smoothly away from rest.

Immediately you have the machine travelling, open the throttle about $\frac{3}{4}$ of its travel, thus speeding the machine up, and then turn it back to almost closed position and at the same time operate the clutch lever and turn the lever and twist grip to position 2, letting the clutch in rather quickly this time

and again speeding the engine up with the throttle control.

Now do not go too fast, just cruise along at about 15–20 m.p.h. to get the feel of your NIPPY, bearing in mind all the time that you have the front brake immediately under your right hand and the rear brake under the control of your feet by the action of back pedalling of the pedals, should you wish to come to rest.

Having got under way, the next point is to learn how to come to a stop without stalling your engine. The art here is to disengage the clutch by pulling the lever towards you, at the same time applying the rear brake by pedalling backwards and simultaneously closing the throttle until the engine is running slowly. Once you have come to rest the gear control lever and clutch should be turned to position "0." The clutch lever can then be released and you will be sitting astride the machine in an "as you were" position, that is to say you will have the engine running slowly and ready for yet another practice run.

When you are driving the machine in traffic, you will on occasions have to release the clutch by pulling the lever up, but without turning the gear control, since if you are only needing to slow down in a traffic block and you are not being held up for any length of time, you can hold the clutch out and then go away immediately by letting it in slowly and opening the throttle. If, however, you are held up in a traffic block for any length of time, always put the gear into neutral, release the clutch lever to its normal position and just keep the engine running slowly on the throttle. Of course, when you start away again you will start in first gear, speed up, operate the clutch and throttle and get again into second or top gear.

If when driving "NIPPY" it is found on a gradient that the speed is dropping considerably, or if in traffic it is necessary to drive so slowly that the engine begins to run unsteadily, you must change down to first. The operation is :—

Almost close throttle, declutch by pulling up clutch lever ; select the gear by turning the twist grip together with the clutch lever away from you as far as the stop ; let in the clutch slowly at the same time opening the throttle.

When you have finished with your machine and it is going to be left standing for several hours before being used again, always turn the petrol tap off, and it is a very good practice to come to rest, keep the engine going and then turn the tap off and let the engine slowly use up the petrol which is in the carburetter. You will then always have fresh petrol to start the engine with, which makes it considerably easier when starting away from cold.

The instructions given above for starting the engine apply only when the engine is cold. If at any time you have to start your engine, and these occasions will be many, when the engine is still warm, do not depress the carburetter tickler, that is to say do not flood the carburetter ; if you do you may find starting exceedingly difficult. The reason for tickling or flooding the carburetter at all is to give the engine an exceptionally rich mixture on which to start

when it is cold, so you will see when the engine is warm it does not require such a rich mixture, and to tickle the carburetter then would only be over-doing things and would not be of any help at all and only make starting extremely difficult, in some cases.

This little point needs bearing in mind. If you happen to be an old hand at driving motor vehicles of any kind you will find it ridiculously easy to acquire the knack of the " NIPPY " and you will no doubt be well away in no time.

On the other hand, if you are a newcomer completely to motoring it will, of course, take you a little while to settle down, but nevertheless, due to the extreme simplicity of " NIPPY," it will not take you very long to find yourself completely at home.

When actually driving " NIPPY " do not use any of the controls harshly ; always use them smoothly and steadily. The throttle control should always be operated progressively and slowly, the clutch must at all times be let in gently and the same will apply to the brakes ; never operate these fiercely, since they are exceptionally strong brakes for such a lightweight machine, and if you really wish to become a good driver your aim should be smoothness and steadiness all the time. Of course, quite apart from this, eventually making you into a good driver, it will also have a great bearing on how your machine wears in service, and since we feel sure that you wish to become a good driver and you wish your machine to serve you long and well without trouble, you will undoubtedly agree with this.

Before concluding our remarks on driving " NIPPY," we would explain another method of starting the engine. This briefly is—turn on fuel tap ; if engine is cold, depress tickler on carburetter for 6 seconds ; leave throttle twist grip closed or nearly closed ; engage first gear and hold the clutch lever out ; keep clutch lever in this position and start pedalling as for an ordinary bicycle ; release clutch lever slowly simultaneously continue to pedal until the engine starts ; only then open the throttle twist grip. You can now follow the notes mentioned earlier in regard to changing up.

To ride your " NIPPY " without using the engine, engage one of the gears, hold out the clutch and pedal as for an ordinary bicycle.

Having dealt with driving and the general operation of " NIPPY," we will pass on to the question of lubrication and general maintenance, and this we will deal with under two separate headings and we will make them as clear as we possibly can.

LUBRICATION

A study of Figure 3, in conjunction with your " NIPPY " will make it very clear to you what parts need lubrication and we have set out below how and when to lubricate each one of them.

Now study Figure 3. Point No. 1 is the lubrication of the bearings in

the steering head and you need not worry over these at all ; they have been packed with grease when the machine was assembled and they will last two-three years without any attention at all. It is then a good plan to have the head dismantled to check the bearing and at the same time repack them with grease for another long term of service.

Point No. 2 shows the petrol tank ; here you have nothing to worry over if you have mixed your petrol oil mixture as described previously ; the general lubrication of your engine is being attended to automatically.

Point No. 3 shows the front and rear hubs ; here again, these have been packed with grease at the time of assembly and no attention whatever will be needed as far as lubrication goes for 2 or 3 years of service, so these can be treated just the same as the steering head bearing.

Point No. 4 shows the pivot on which the central spring up stand works ; a spot of oil applied to this pivot with the aid of an oil can once a week, or shall we say every 500 miles, will be sufficient to keep the stand working easily and prevent the pivot from rusting.

Point No. 5 shows the rear driving chain ; it is recommended that you lubricate this chain with the aid of an oil can at similar periods to the stand, every 500 miles or so. It is also a good plan to have the chain removed about once every 12 months, thoroughly cleaned in paraffin and soaked in warm oil, thus making sure the chain is kept clean and well lubricated inside its rollers.

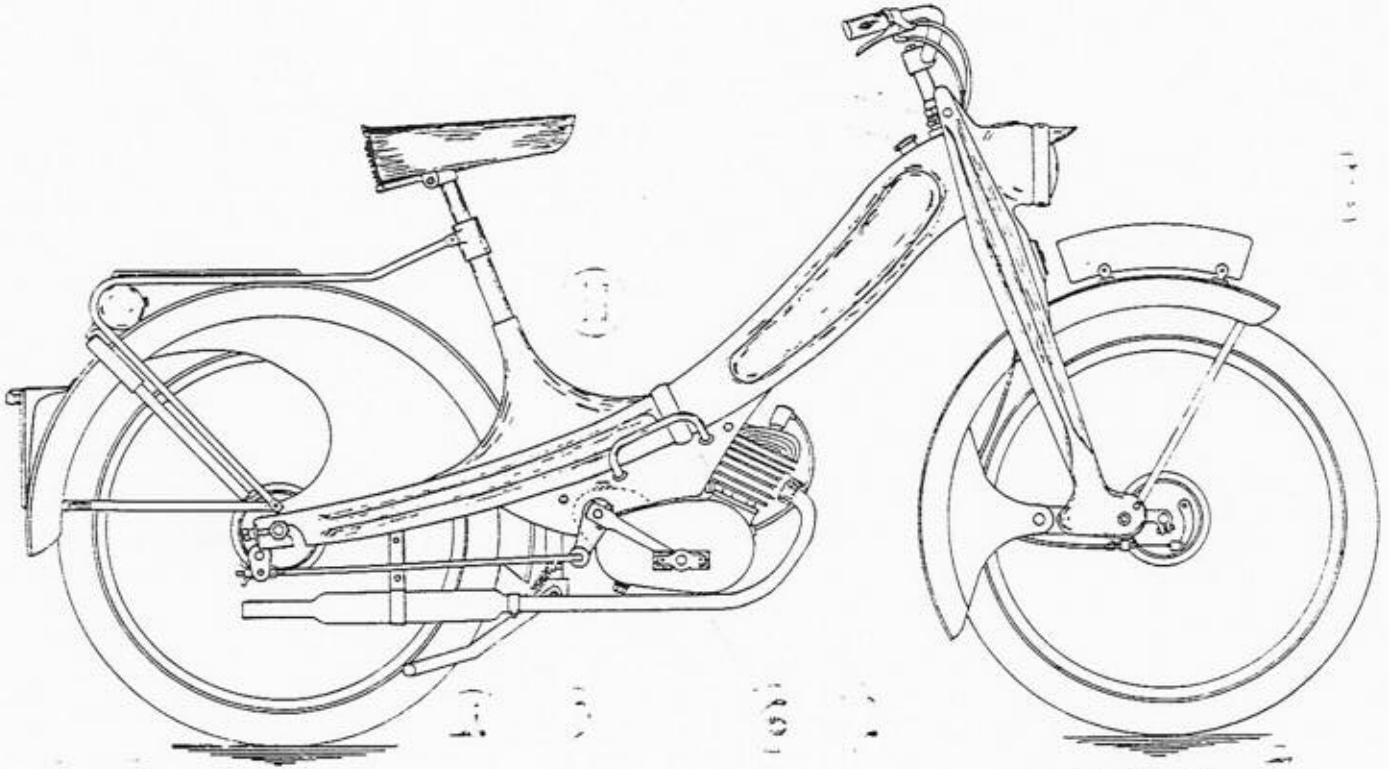
Point No. 6 shows the lubrication point in the pedal end cap ; these should be lubricated every 500 miles with the aid of an oil can.

Point No. 7 shows the pivoting point of the front fork links and these are best lubricated with a grease gun through the nipples provided ; one jab of the grease gun every 500 miles will be quite sufficient to keep the forks working perfectly.

Points 8 and 9 show the pivots of the rear brake mechanism, and these should have a spot of oil applied to them every two or three hundred miles.

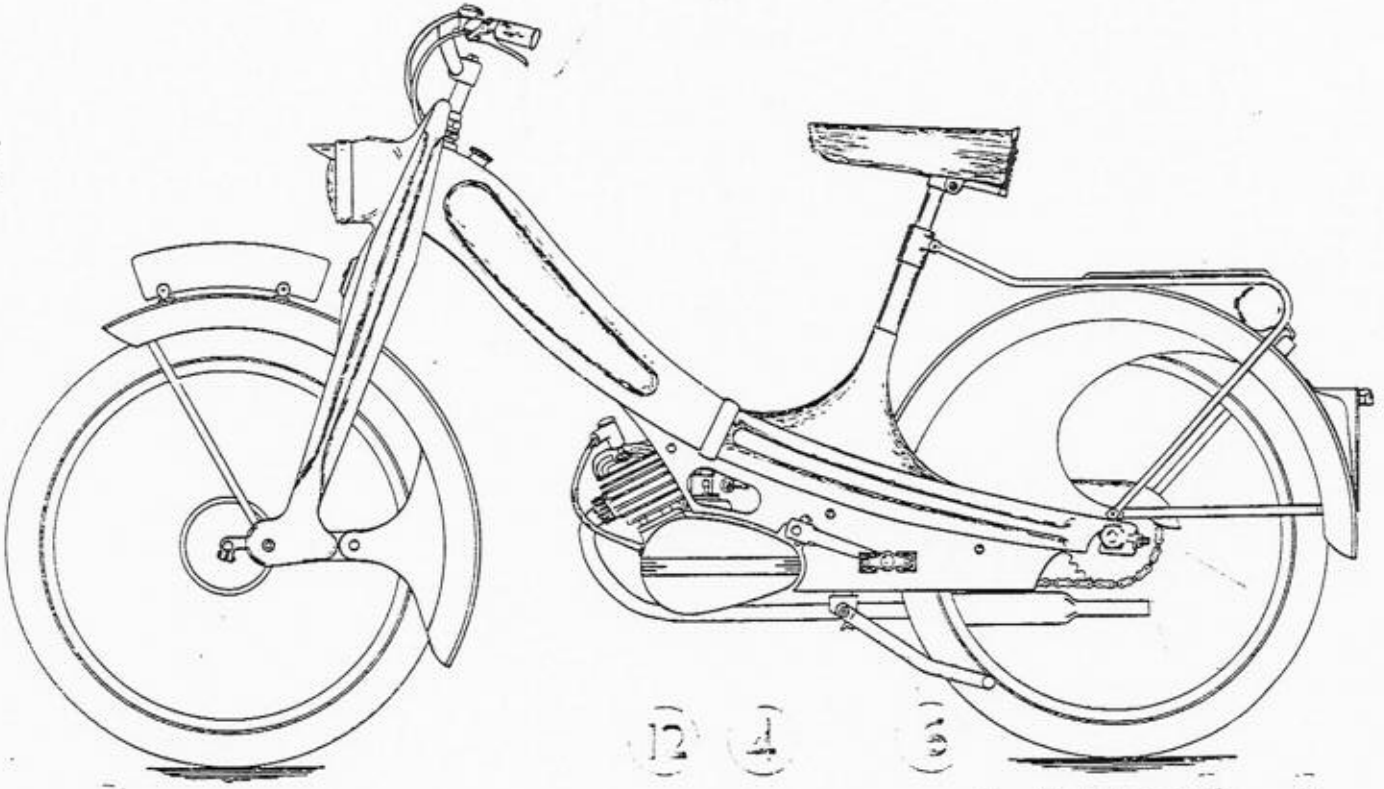
Point No. 10 on the two handlebar levers should be given attention once every week, whether the machine be in use or not. The levers should be pulled up as far as possible and a little oil placed on the exposed cable and the levers worked to and fro and similarly the pivot points on the levers themselves should be sparingly lubricated at the same time. These two points have a great bearing on your comfort when driving your machine, stiff operating levers can be most unpleasant to operate, and indeed, they can be distinctly dangerous.

Point No. 11 shows the lubrication point for the clutch and gearcase on the engine. The detachable engine cover, Point No. 12, should be removed once every 2,000 miles, when the oil in the gearbox should be topped up. To do this the filler cap plug has to be unscrewed and a little oil injected within the hole. This point, however, is dealt with more thoroughly in the following pages.



Offside Lubrication

FIG. 5



Nearside Lubrication

GEARBOX

The gearbox of the SACHS engine is filled with oil before leaving the works. When the engine is running, this oil is in constant circulation between the housing containing the gears and pedal drive and the clutch housing. Check the oil level in the gearbox when you take over your new " NIPPY " and subsequently every 2,000 miles. To do this the oil check plug situated on the right on the underside of the engine should be screwed out. If oil runs out here, this indicates that sufficient oil is present. If no oil appears, the oil filler plug above the pedal shaft should be removed and gear oil added until oil begins to run out at the check plug. The gear oil should be of the type known as SAE90. On no account should hypoid gear oil be used.

Although the gear-box oil may not undergo loss or become contaminated to any appreciable extent in use, it is nevertheless affected in the course of

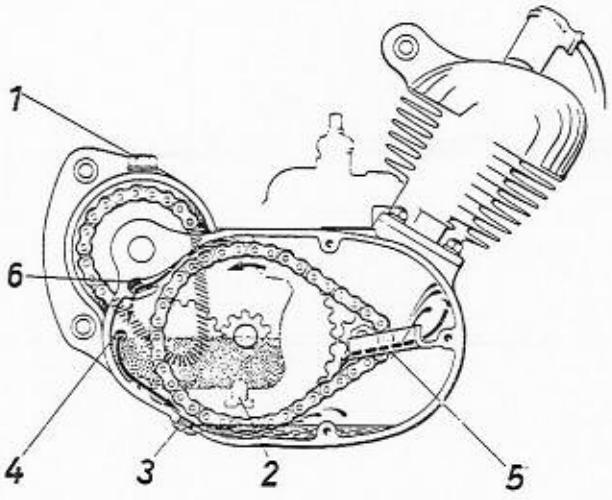


Fig. 4 : **Oil Circulation in Clutch Chamber and Gearbox**
1 Oil filler plug. 2 Oil drain plug. 3 Oil check plug. 4 Oil overflow port from gearbox to clutch chamber. 5 Oil duct for lubricating primary chain 6 Oil return to gearbox.

time by atmospheric oxygen. The oil should therefore be changed once a year. Should you wish to carry out the oil change yourself, run the machine far enough to warm the engine and gearbox thoroughly and then remove the oil check plug and oil drain plug. The oil will then drain off completely from the gearbox.

The clutch housing can be emptied by raising the front wheel of the " NIPPY " until the oil check plug hole on the clutch housing takes up its

lowest position. The oil drain plug is then screwed in again securely and gear oil is poured into the gearbox through the oil filler hole until it starts to emerge

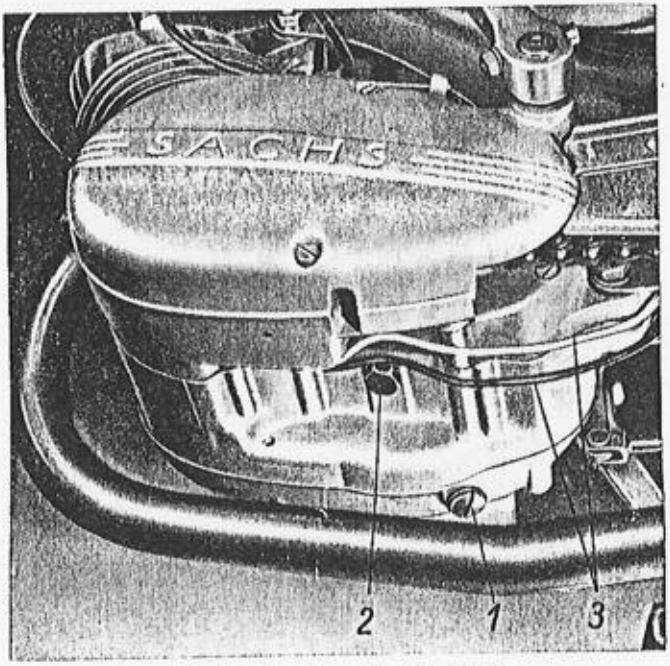


Fig. 5 : **Gearbox Lubrication**

1—Oil check plug. 2.—Oil drain plug.

3.—Lighting cable and short circuiting cable.

at the oil check plug hole. Loosen the "S" cover on the right-hand side of the engine, so that the air from the gearbox can escape. Then screw in the oil filler plug and oil check plug and let the engine run for a short time. This will ensure that the gearbox walls are also thoroughly wetted with oil and that the oil is correctly distributed between the two housings, so that on re-checking the oil level, a correct result can be obtained.

Cleaning the Air Filter

Depending on dust conditions, but usually approximately every 500 miles, the air filter on the carburetter intake must be cleaned.

For this purpose the two carburetter securing nuts at the cylinder must be taken off and the carburetter removed. The throttle control cable to the throttle slide and the flexible fuel pipe can remain connected. If the carburetter is turned a little so that its underside is visible, it is possible—without the use of tools—to grip the upturned ends of a spring ring and withdraw it from

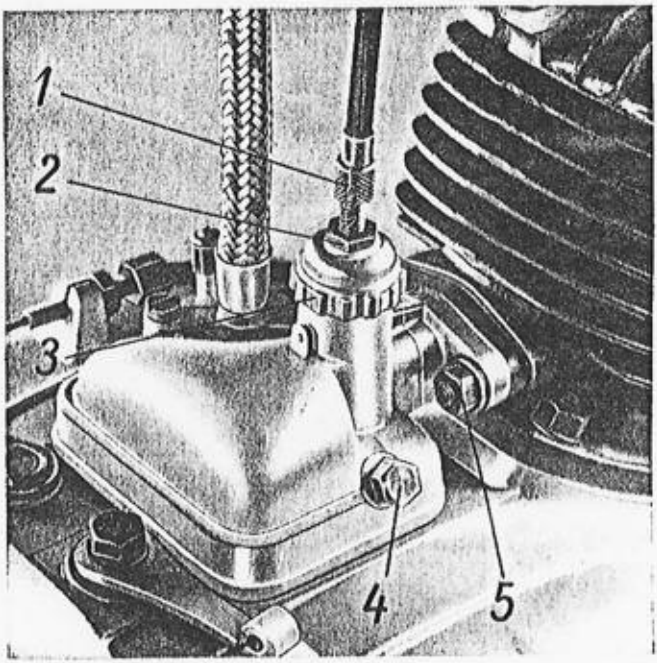


Fig. 6 : **SACHS 50 Carburetter**

1 — Adjuster screw for control cable 2 — Lock nut 3 — Mixing chamber cover
4 — Jet 5 — Securing nut

the grooves in the carburetter housing. On removing the ring, the filter element drops out of the carburetter. The element should be washed in petrol and moistened with motor oil before refitting.

Cleaning the Jet

For cleaning purposes, the jet screwed into the outside of the carburetter must be removed and blown out. It may also be cleaned with a paint brush bristle or a fine strand of copper wire—on no account use steel wire or a needle.

When refitting, do not over tighten the jet, otherwise the transverse holes may be closed up under the excessive pressure.

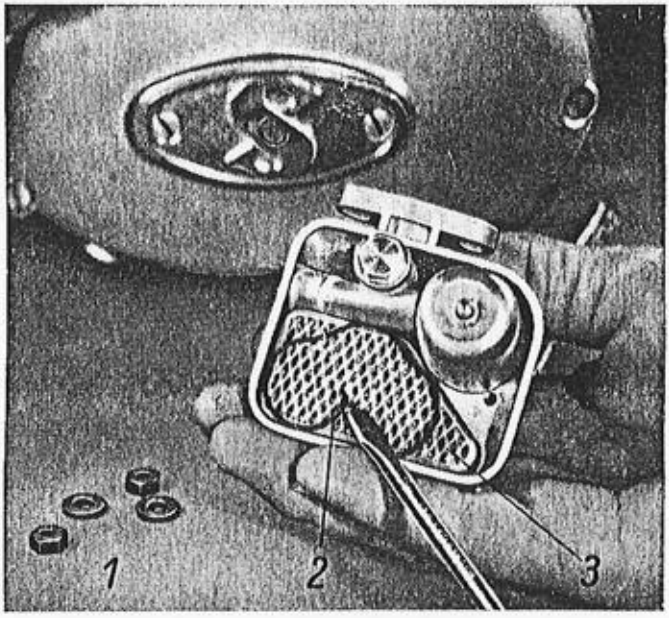


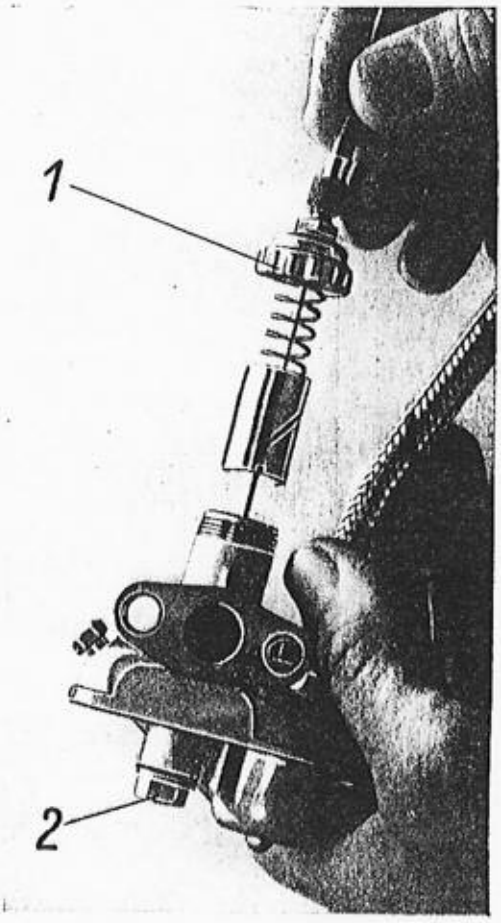
Fig. 7 : **Air Filter in Carburetter**
1 — Securing Nut 2 — Spring ring 3 — Filter element

Cleaning the Carburetter and Fuel Pipe

The carburetter too must be cleaned periodically to remove the impurities which are always present in the fuel. This entails taking it off, along with the fuel pipe. The mixing chamber cover must be removed so that the throttle slide can be lifted out. The slide, spring and cover can be left hanging on the control cable.

If the screws visible on the top of the carburetter are now taken out, the float chamber cover, together with the fuel pipe, can be detached from the carburetter. The float, together with the float needle, can then be removed from the float chamber in which most of the dirt collects. Sludge also settles in the mixing chamber plug on the underside of the carburetter.

Fig. 8 :
1 — Mixing chamber cover
2 Mixing chamber plug



When re-assembling, the throttle slide must *not* be oiled. If the fuel pipe is taken down for cleaning, or blowing out, the fuel tap should be unscrewed from the tank at the same time so that the gauze filters in the tap, which are then accessible, can also be cleaned.

Decarbonising

Every engine burns part of its lubricating oil to form carbon, which adheres to all surfaces in contact with the combustion flame or exhaust gases. In a two-stroke engine, therefore, the parts concerned are the piston, cylinder head, exhaust port, exhaust pipe and silencer. Decarbonising of these parts must be carried out periodically and must be performed without delay if the engine loses power or shows a tendency to four stroke in spite of correct carburetter settings. Decarbonisation is usually necessary after every 2,500 miles.

To remove the carbon from the combustion chamber it is necessary to unscrew the cylinder head. The carbon can then be scraped out of the cylinder head, using a tool which should not be too sharp, e.g. a screwdriver. The cylinder head can be cleaned up to give a bright metallic finish. When dealing with the piston, however, only the burnt brown flakes should be removed from the crown, preferably by wire-brushing.

To clean the exhaust port, take off the exhaust pipe and position the piston at bottom dead centre. The port can then be cleaned conveniently from outside. Any carbon which has dropped on to the piston will be blown out. The exhaust pipe can only be cleaned in a workshop equipped with special brushes. A little carbon [illegible]e does no harm.

The silencer is readily deta[illegible] for cleaning.

MAINTENANCE OF THE ELECTRICAL SYSTEM

A flywheel magneto-dynamo provides both a H.T. supply for ignition as well as a 6-volt A.C. supply for lighting purposes.

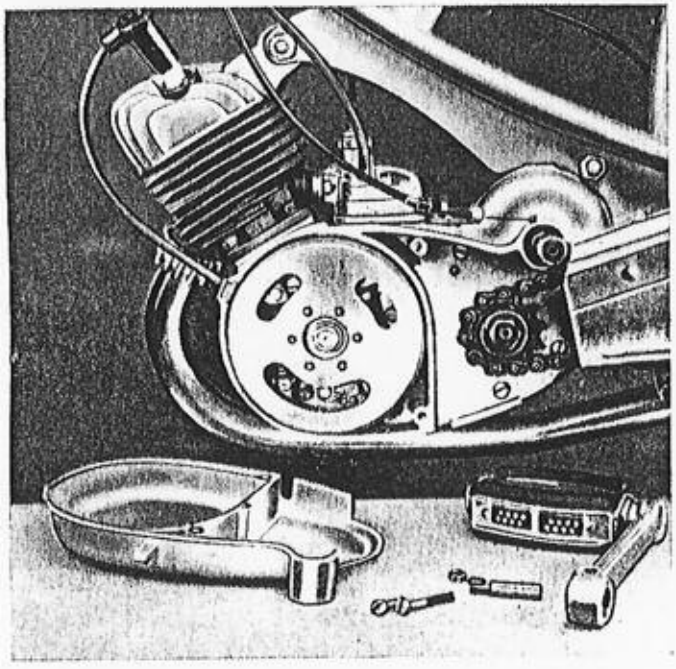
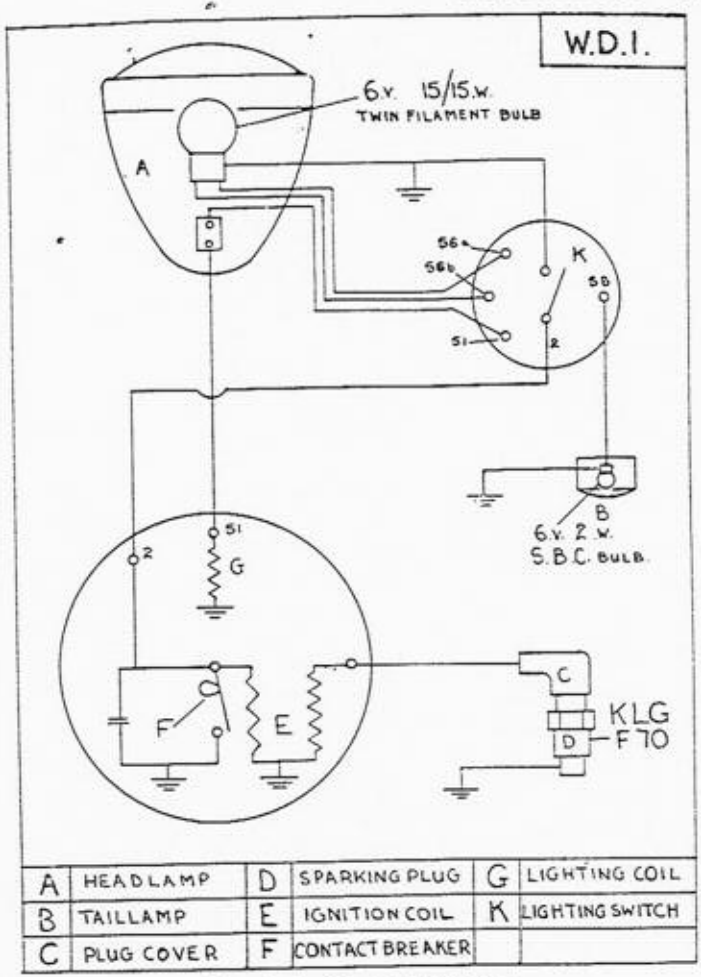


Fig. 9 : **Flywheel-Magneto with Cover Removed**

A 17-watt lighting coil is fitted, the current delivered is sufficient for a 6-volt 15/15-watt twin filament headlamp bulb and a 6-volt 2-watt tail light.

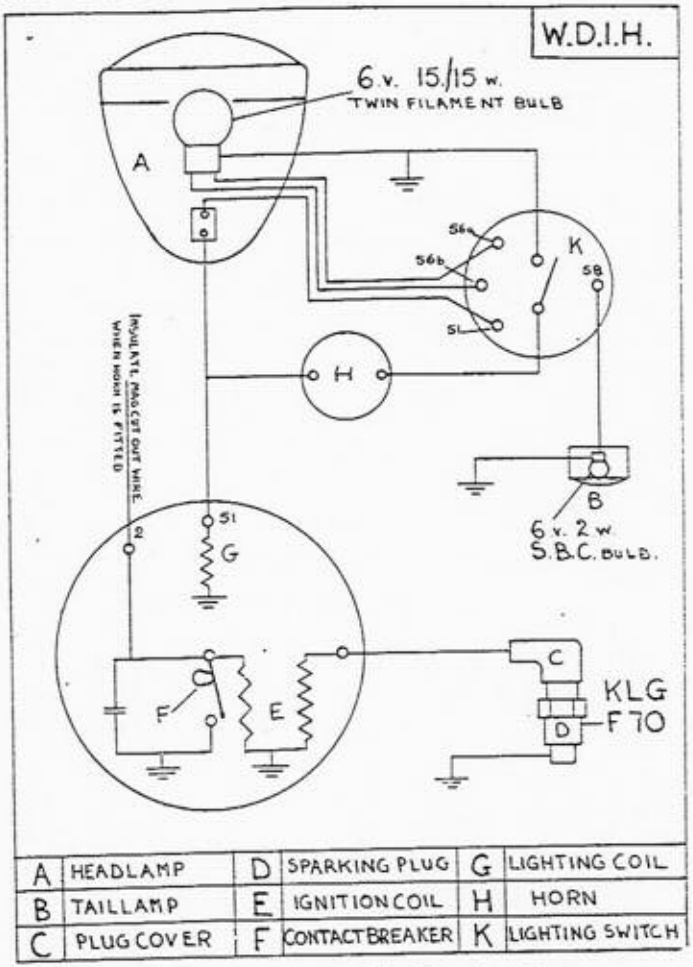
Trouble may be experienced with the lighting system if bulbs or wiring become defective. Make sure that the terminal screws for the various connections in the headlamp are tightened securely. If the tail lamp bulb burns out prematurely and the headlamp has a dip switch, always ensure that at the instant of operating the dip switch, the main beam and dipped beam filaments burn simultaneously. If this is not the case, the tail lamp bulb will inevitably burn out. The only attention required by the magneto-dynamo is a check on the contact breaker gap approximately every 3,000 miles. Remove the left-hand crank and take out the two cheese head screws on the left-hand side of the housing so that it is possible to remove the cover, below which are situated

ELECTRICAL WIRING DIAGRAMS



A	HEADLAMP	D	SPARKING PLUG	G	LIGHTING COIL
B	TAILLAMP	E	IGNITION COIL	K	LIGHTING SWITCH
C	PLUG COVER	F	CONTACT BREAKER		

Standard Circuit Diagram



A	HEADLAMP	D	SPARKING PLUG	G	LIGHTING COIL
B	TAILLAMP	E	IGNITION COIL	H	HORN
C	PLUG COVER	F	CONTACT BREAKER	K	LIGHTING SWITCH

Circuit Diagram with Electric Horn

the magneto flywheel and the driving sprocket. The magneto flywheel has large openings affording easy access to the breaker contacts. To check the gap, turn the flywheel in the normal direction of rotation until the breaker contacts just begin to separate.

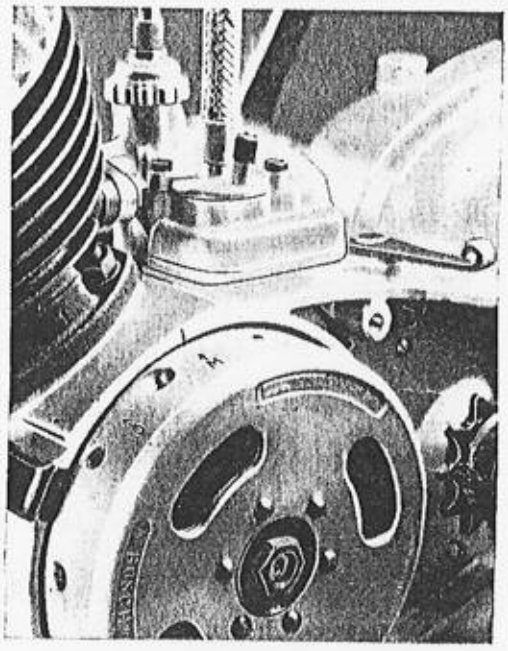


Fig. 10 : **Marks on Flywheel**
o = T.D.C. m = timing mark

The contact breaker gap and the engine timing are correct if at this instant the mark " M " coincides with the line scribed on the housing. The piston is then in the firing position. If at this moment the marks are more than approx. 0.078"–0.098" apart, the contact breaker gap needs adjustment. If on rotating the engine in the normal direction the mark " M " has not reached the mark on the housing, the gap between the contacts must be reduced, otherwise it must be increased. To do this the screw which secures the anchor plate, i.e. the fixed breaker contact, to the base plate, must be slackened.

With the aid of a screwdriver, which should be inserted between the recess on the anchor plate and two small pins on the base plate, the contact breaker gap can then be accurately adjusted. Finally, the clamping screw must be securely retightened and the adjustment checked again.

Any work on the flywheel magneto which entails removal of the flywheel from the crankshaft should be entrusted to a competent workshop—and preferably to a SACHS or Bosch service station. For withdrawing the flywheel, extractor 277 750 and cap 277 700 are absolutely essential.

Apart from contact breaker contacts, the only other component liable to natural wear is the sparking plug. The plug gap, when in new condition, is 0.016–0.02" (0.4–0.5 mm.), but gradually increases due to erosion. If the gap has increased beyond 0.031" (0.8 mm.), the outer earth electrodes should be bent in towards the centre electrode, by using a suitable tool or by tapping lightly until the gap has been restored to the original value of 0.016–0.02".

If ignition trouble is experienced, always examine the sparking plug first, as the electrodes and insulator must not be allowed to become fouled with combustion residues or oil.

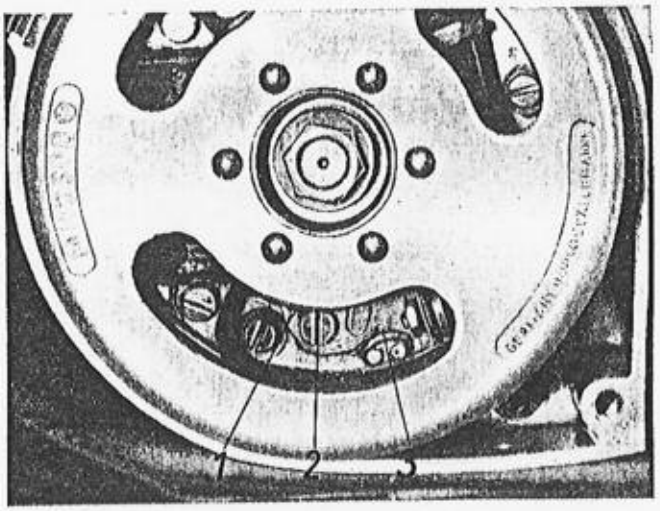


Fig. 11 : **Adjustment of the SACHS 50 Contact Breaker**
1 — Breaker contacts. 2 — Clamping screw.
3 — Adjusting slot of fixed contact

If when trouble occurs, a fault in the ignition system or sparking plug is suspected, the strength of the spark can easily be tested. When the engine is turned by hand, e.g. using the crank, the length of the spark formed in the open air between the end of the H.T. cable (remove the plug connector) and some part of the engine, i.e. the cylinder, must be at least $\frac{5}{32}$" (4 mm.). If this is so, the igntion system itself is working satisfactorily. The plug can be tested for serious defects by unscrewing it, clipping on the H.T. cable and earthing the plug body, i.e. by holding it against some part of the engine such as the cylinder or cylinder head. By turning the cranks again a vigorous spark should now jump across the electrodes.

GEAR CONTROL ADJUSTMENT

The gear actuating lever on the engine—the small lever on the top of the gearbox at the right-hand side—is operated via a control cable from the gear twist grip on the handlebar. The gearbox incorporates a spring which always tends to rotate the gear actuating lever into the position giving second or high gear. Thus, even if the control cable is damaged it is always possible to ride in second gear.

To ensure that the projection on the clutch grip drops into the grooves of the gear-locking catch on the gear twist grip and that the marks on the gear position indicator are correct, the control cable from the twist grip to the gearbox must be correctly adjusted. The control cable adjuster screw on the right-hand side of the gearbox is used for this purpose. If the control cable is taken down at any time, the lock nut must be screwed to the full extent on to the adjuster screw and the latter in turn screwed as far as possible into the housing lug. After selecting second gear by means of the twist grip, the free end of the control cable can easily be hooked into the gear actuating lever. The control cable adjuster screw must be unscrewed until only a very small amount of clearance can be felt in the cable sheath. Then select neutral by means of the handlebar control, pull up the clutch lever until the gear-locking catch is released, and try to find the mid position between the two gears by turning the gear twist grip.

ADJUSTING THE CLUTCH

The clutch in the SACHS 50 must transmit the full engine output power. On the other hand, when stopping or changing gear it must also completely disconnect the engine from the gearbox.

It will always perform these duties realiably if it is properly adjusted and if the slight amount of normal wear which occurs is promptly taken up.

The following is the procedure for correct adjustment :—

1. Detach the cable from the clutch actuating lever on the top of the gearbox at the left-hand side and check whether the end of the lever can be moved through approx. $\frac{3}{8}$". With the engine cold, set the adjuster screw on the clutch control cable to give a free travel of 3/64"–3/32" at the clutch control lever on the handlebar.
2. As the corked plates wear the free travel at the handlebar control lever decreases. The necessary amount of free travel can be restored by screwing in the cable adjuster screw.
3. When it is no longer possible to screw in the cable adjuster any farther, the " S " cover on the right-hand side of the housing should be taken

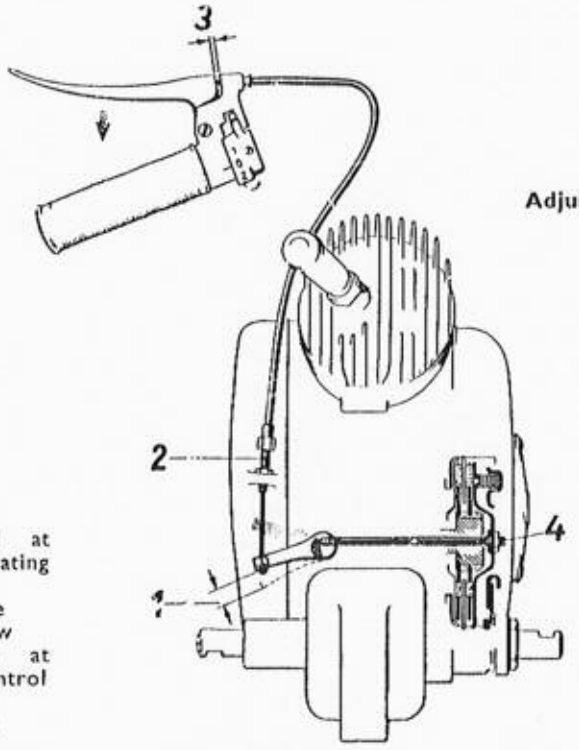


Fig. 12 :
Adjusting the Clutch

1 — Free travel at clutch actuating lever
2 — Control cable adjuster screw
3 — Free travel at handlebar control lever
4 — Ajusting nut

off. The inner adjuster screw, together with the lock nut, will then be accessible. After slackening the locknut, the inner adjuster screw should be turned until the free travel specified for the clutch actuating lever in para. 1 above has been restored.

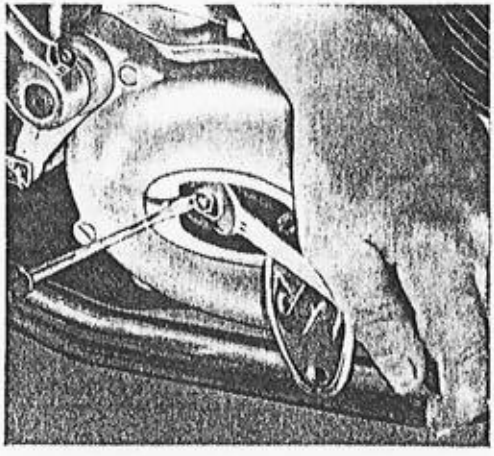


Fig. 13 :
Adjusting the Clutch
(See 4 Fig. 12)

ADJUSTING THE CARBURETTER

Steady, slow running which does not alter even when the machine is stopped for a fairly long time, e.g. at a cross-road, always speaks well for both machine and rider. This slow running can be achieved with the SACHS 50 if care is taken in setting the adjuster screw on the carburetter control cable. The adjustment should be made when the engine is thoroughly warmed up, since a thoroughly warmed-up engine will run too quickly if the slow running adjustment is made when the engine is cold. Make sure also that steering movements of the handlebar do not affect the slow running speed. If any such movements do have this effect, the control cable from the handlebar to the carburetter is too short or not correctly routed.

Main jet No. 56 in the carburetter need not be changed under any operating conditions, even during the running-in period.

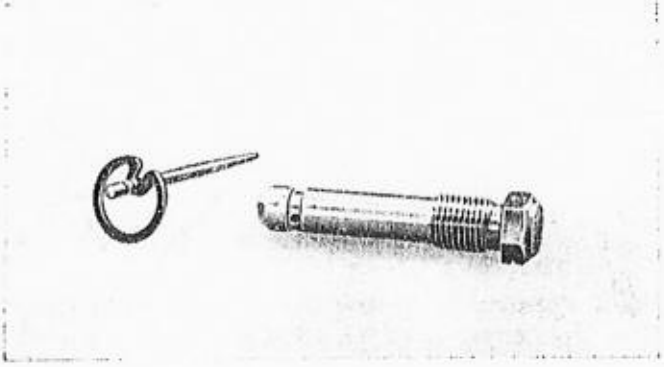


Fig. 14 : **Jet and Jet Needle with Clip**

HUBS AND HUB MAINTENANCE

The hub brakes on the " NIPPY " are designed on very robust lines and are so effective that the machine is always under perfect control, even when travelling at top speed or in dense traffic.

The hubs run on adjustable bearings which are sealed against ingress of dust and dirt. There is no need to carry out any routine lubrication of the hubs, the only time when it is necessary is during a main overhaul of the machine. The wheels should then be removed, the hubs stripped down and all parts washed in petrol and fresh oil and grease applied. Before re-assembling, check whether the oil seals require renewal.

FRONT WHEEL HUB

Adjusting. After a long period of service the handbrake lever on the handlebar may develop too much free travel, and in this event it will be necessary to adjust the control cable. Pull out or unscrew the cable adjuster from its stop until the play in the brake lever is restored to normal. Repeated re-adjustment of the brake over a long period of service may result in the brake cam lever on the hub making a larger angle than 90 degrees with the control cable when the handlebar lever is pulled right up. This condition indicates that the brakes must be relined.

The brake must always be kept properly adjusted so that the hub is able to spin freely without rubbing on the brake shoes. At the same time, the handlebar lever must allow a certain amount of free travel before the brake begins to bite.

REMOVING THE FRONT WHEEL

If it is intended to remove the front wheel from the forks, first slacken the brake cable by unscrewing the locknut and cable adjuster far enough to allow the cable fork to be unscrewed from the hub brake lever. Remove the spindle clamping bolts under the fork bottom link. Unscrew and remove completely both wheel nuts, the front wheel will then drop out of the fork. Refitting of the wheel is the same operation in reverse.

Front wheel removal is facilitated by placing a block under the engine to lift the wheel clear of the ground.

Adjusting the Bearings. When the hub is out of the frame the hub bearings should show a barely perceptible amount of end play. After the hub spindle has been refitted to the fork and securely tightened the rim should still permit a very slight trace of sideways movement. If this condition is not obtainable, check to see whether the fork ends are dead flat and parallel with each other. If the degree of play in the hub is incorrect, slacken the thin locknut below the speedometer drive box and re-position the adjustable cone located behind the nut. When doing this, however, remember that the bearing play will be reduced by a small amount when the locknut and spindle nut are re-tightened.

REAR WHEEL HUB

Adjusting. The end of brake pullrod carries either a knurled nut or a wing nut which must be turned clockwise if it is desired to lessen the free travel in the brake linkage. Do not overtighten and make sure after adjusting

that the hub still spins freely and without rubbing on the brake shoes. Repeated re-adjustment may ultimately result in an angle larger than 90 degrees being formed between the brake cam lever on the hub and the brake linkage when the brake is in the applied condition. This indicates the brake must be relined.

REMOVING THE REAR WHEEL

Disconnect brake rod from hub lever by screwing back the knurled nut until brake rod can be disengaged in a downward direction. Remove chain by taking out spring connecting link. Slacken chain adjusters, undo both wheel spindle nuts, pull wheel to one side to clear brake anchor arm from stud. Wheel will then drop out in a forward and downward direction. The refitting of the wheel is the same operation in reverse.

One word of warning, however, when replacing the spring in the spring connecting link, make sure that the closed end of the link is facing the direction in which the chain normally runs.

Adjusting the bearings. Correct hub adjustment is indicated when a barely perceptible amount of end float is present in the spindle with the wheel removed from the machine. With the wheel refitted and the spindle nuts securely tightened, this end float should disappear, but there should still be a slight trace of sideways motion at the rim. If this play disappears completely on tightening the spindle nuts, check to make sure that the forks ends are true and parallel with each other. To alter the play in the hub bearings, first unscrew the spindle nut on the sprocket side of the hub and then slacken the thin locknut at the back of the spindle nut until it is possible to turn the adjustable cone.

Screw in cone to reduce bearing play and screw out to increase. When doing this remember that the play will be slightly reduced on tightening the locknut and spindle nut.

TROUBLES AND THEIR REMEDIES

Engine will not start

Cause	Remedy
Fuel tap shut.	Open tap.
Tickler has not been used.	Press tickler on carburetter down for 6 seconds.
No fuel in tank.	Fill up.
Jet blocked.	Unscrew jet and clean by blowing out.

Fuel pipe blocked (carburetter fails to flood even after using tickler for some time).	Clean fuel pipe, tap and tap filter.
H.T. cable detached or damaged.	Clip plug on again or renew cable.
Sparking plug sooted up, bridged or defective.	Replace sparking plug or clean.
Earth fault in H.T. cable.	Check and repair H.T. Cable
Spark too weak.	Bend in sparking plug electrodes temporarily to 0.012". Have ignition system checked.

Engine starts but quickly stops

Cause	Remedy
Blocked air hole in tank filler cap.	Loosen or remove filler cap. Clear vent. If necessary drill extra air holes.
Fuel pipe blocked. (Carburetter fails to flood even after using tickler for some time.)	Clean fuel pipe, tap and tap filter.
Sparking plug electrodes bridged.	Clean or replace sparking plug.

Engine runs with reduced power or stops

Cause	Remedy
No fuel in tank.	Fill up.
Jet blocked.	Clear the jet.
Fuel pipe blocked. (Carburetter fails to flood even after using the tickler for some time.)	Clean fuel pipe, tap and tap filter.
Blocked air hole in tank filler cap.	Loosen or remove the filler cap. Clear the vent. If necessary, drill extra air holes.
Exhaust system blocked.	Clean exhaust port and silencer.
Air filter blocked.	Clean air filter.

Engine runs unevenly

Cause	Remedy
H.T. cable loose or damaged.	Fix cable or renew.
Sparking plug sooted up, bridged or defective.	Replace sparking plug or clean.
Ignition system defective.	Have ignition system checked in a special workshop.

Engine four strokes and pulls badly

Cause	Remedy
Carburetter flooding owing to dirt on float needle seating.	Use tickler vigorously or clean.
Float needle and seating in float chamber cover out of alignment.	Renew float needle and float chamber cover.
Float leaking.	Fit new float.
Jet loose in carburetter.	Tighten jet.
Exhaust system blocked.	Decarbonise exhaust port and silencer.

Engine will not pull

Cause	Remedy
Jet blocked.	Clean jet.
Fuel supply inadequate owing to dirty fuel pipe.	Clean float chamber, jet and mixing chamber plug.
Clutch slipping.	Check setting of clutch and clutch control cable, renew the corked plates if necessary.

Engine misfires with blow-back in carburetter

Cause	Remedy
Sparking plug electrodes or insulator bridged.	Clean or replace sparking plug.
Engine receiving too little fuel.	Check and clean fuel pipe air vent in tank filler cap, and carburetter.

Engine cannot be started because clutch slips.

Cause	Remedy
Wrong clutch setting.	Check setting, make sure there is adequate free travel and that control cable works easily.
Too much or too viscous oil in gearbox.	Check gearbox oil level. Use gear oil as recommended.

Fuel consumption too high.

Cause	Remedy
Leak in tank, fuel pipe or carburetter.	Check and repair.
Fuel level in carburetter too high.	Carbretter must not over-flow when machine is standing still. Check float, float needle and seating.
Needle and needle jet seriously worn after long service.	Replace needle and jet.

Guarantee

CONDITIONS OF SALE AND GUARANTEE

We give the following guarantee with our motor cycles and auto-cycles, including all accessories and component parts other than tyres, saddles, chains and lighting and electrical equipment and other than accessories and component parts supplied to the order of the Purchaser and differing from those comprised in the standard specifications. This guarantee is given in place of any implied conditions or warranties or any liabilities whatsoever, statutory or otherwise; no guarantee except that hereinafter contained and no condition or warranty whatsoever statutory or otherwise is given or is to be implied, nor are we to be under any liability whatsoever except under the guarantee hereinafter contained.

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, or date of exchange in case of any accessory or part supplied by way of exchange as hereinafter provided, and damages for which we make ourselves responsible under this guarantee are limited to the free repair of or supply of a new part or accessory in exchange for the part of the motor cycle or accessory which may have proved defective. We undertake, subject to the conditions mentioned below, to make good in manner aforesaid any part or accessory covered by this guarantee which has proved defective within the said period of six months. We do not undertake to replace or refix, or bear the cost of replacing or refixing, any such new part or accessory in the motor cycle.

As motor cycles and auto-cycles are easily 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 in the following act :—

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

We do not guarantee tyres, saddles, chains or lighting and electrical equipment, or any accessories or component parts supplied to the order of the Purchaser differing from those comprised in the standard specifications. As regards all such tyres, saddles, chains, lighting and electrical equipment, accessories and component parts, no guarantee, condition or warranty of any kind statutory or otherwise is given or is to be implied, and we are to be under no liability whatsoever in respect thereof.

CONDITIONS OF GUARANTEE

If a defective part or accessory should be found in our motor cycles, or in any part or accessory supplied by way of exchange as before provided, 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 when the alleged defective part or accessory 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 enforced.

We reserve the right to alter specifications and/or prices without notice.

NORMAN CYCLES LIMITED, ASHFORD, KENT, ENGLAND.

RECOMMENDED LUBRICANTS

—.	Shell	Esso	Wakefield	Energol	Mobiloil
*Engine.	X100 Motor Oil 50	Essolube 50	Castrol Grand Prix or XXL	Energol SAE 50	Mobiloil D
Gearbox	Dentax 90	Esso Gear Oil 90	Castrol ST	Energol SAE 90	Mobilube C90
Oil can	X100 Motor Oil 50	Essolube 50	Castrol XXL	Energol SAE 50	Mobiloil D
Hubs and other bearings lubricaced with grease	Retinax A or RB	Esso grease	Castrolease CL	Energrease C3	Mobilgrease M.P.

NOTE (*).—Some of the oil companies market a special oil for 2-stroke engines. We have not included these special oils in our recommendations, since they are in the main ready mixed for adding to the petrol in the ratio of 1—16. The difference in the proportions of 1—16 and 1—25 as advised in this book may lead to confusion.

NORMAN CYCLES LIMITED

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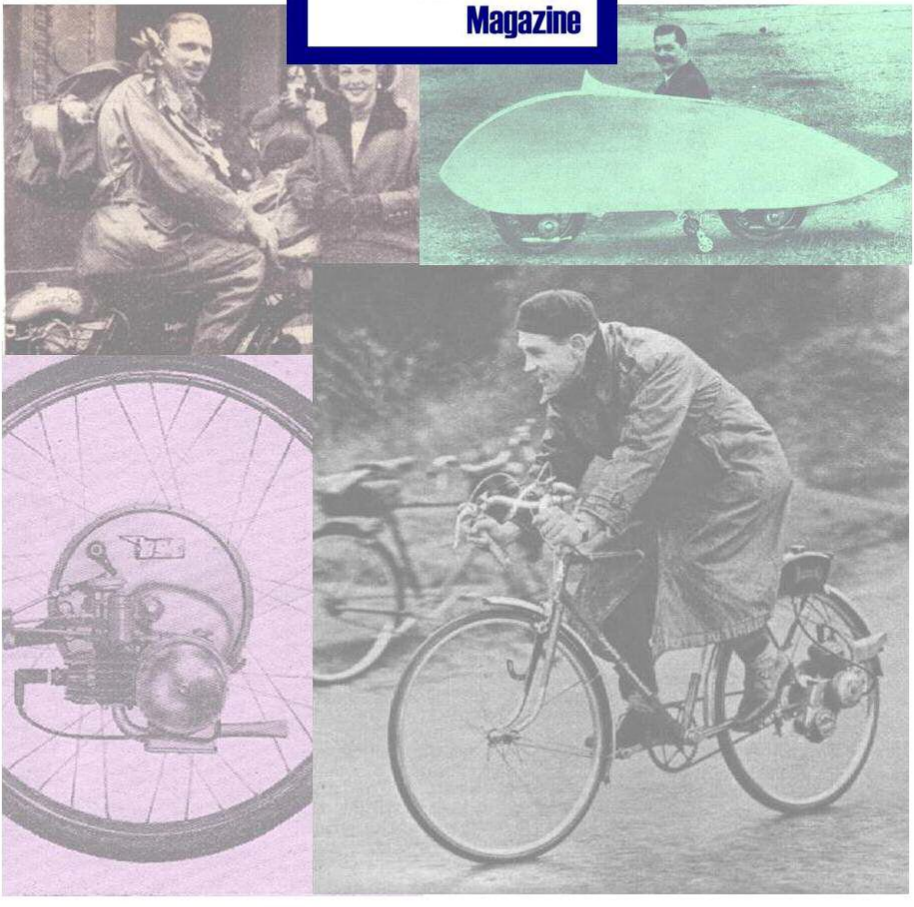

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