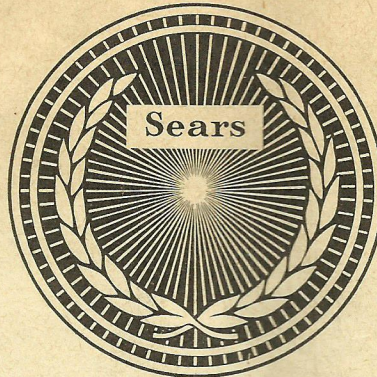


**SETTING-UP INSTRUCTIONS  
MAINTENANCE MANUAL  
REPAIR INSTRUCTIONS AND PARTS LIST FOR**



*Serial no.  
17 28330*

**MOTOR CYCLE**

**MODELS NUMBER 810.94222**

This is the Model Number of your SEARS motor cycle. It will be found on a plate fastened to the steering head. Always mention this number when communicating with us regarding the motor cycle, or when ordering parts.

**HOW TO ORDER REPAIR PARTS**

All parts listed herein may be ordered through Sears, Roebuck and Co. or Simpsons-Sears Limited. When ordering parts by mail from the mail order house which serves the territory in which you live, selling prices will be furnished on request or parts will be shipped at prevailing prices and you will be billed accordingly.

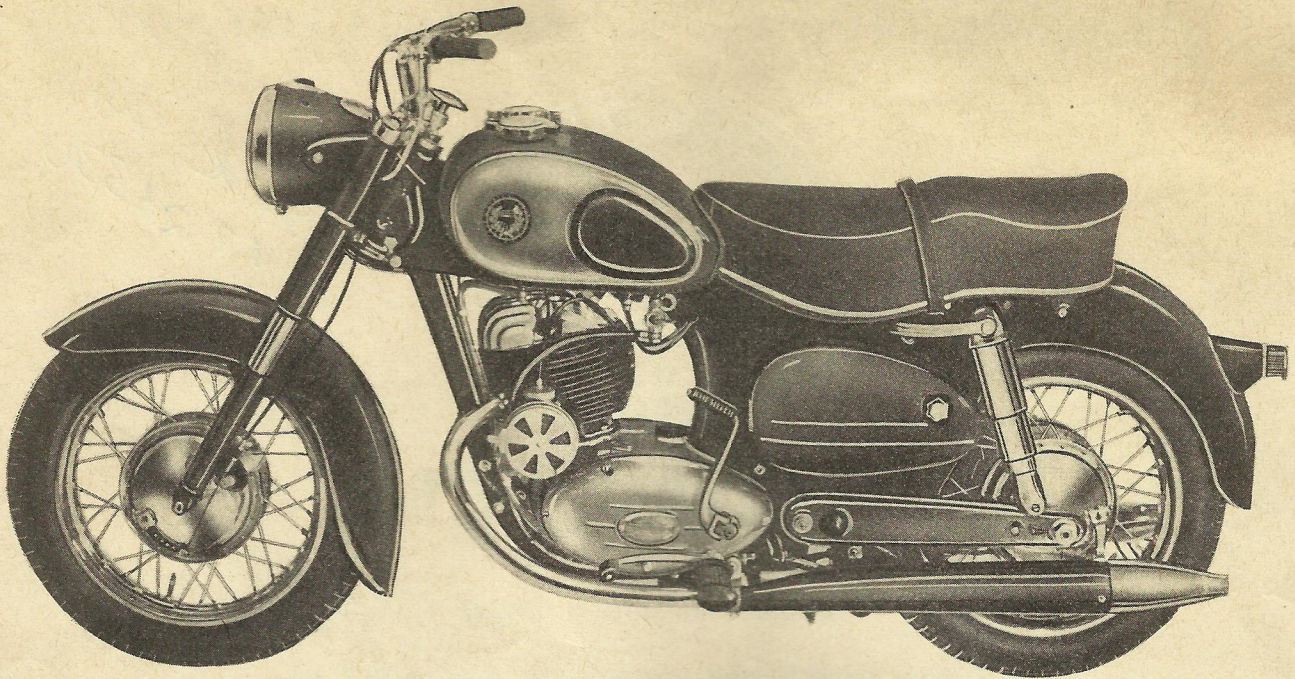
**WHEN ORDERING REPAIR PARTS: ALWAYS GIVE THE FOLLOWING INFORMATION AS SHOWN IN THIS LIST.**

- |                    |                                |
|--------------------|--------------------------------|
| 1. The PART NUMBER | 3. The MODEL and SERIAL NUMBER |
| 2. The PART NAME   | 4. The NAME of item            |

This list is valuable. It will assure your being able to obtain proper parts service at all times. We suggest that you keep it with your other valuable papers.

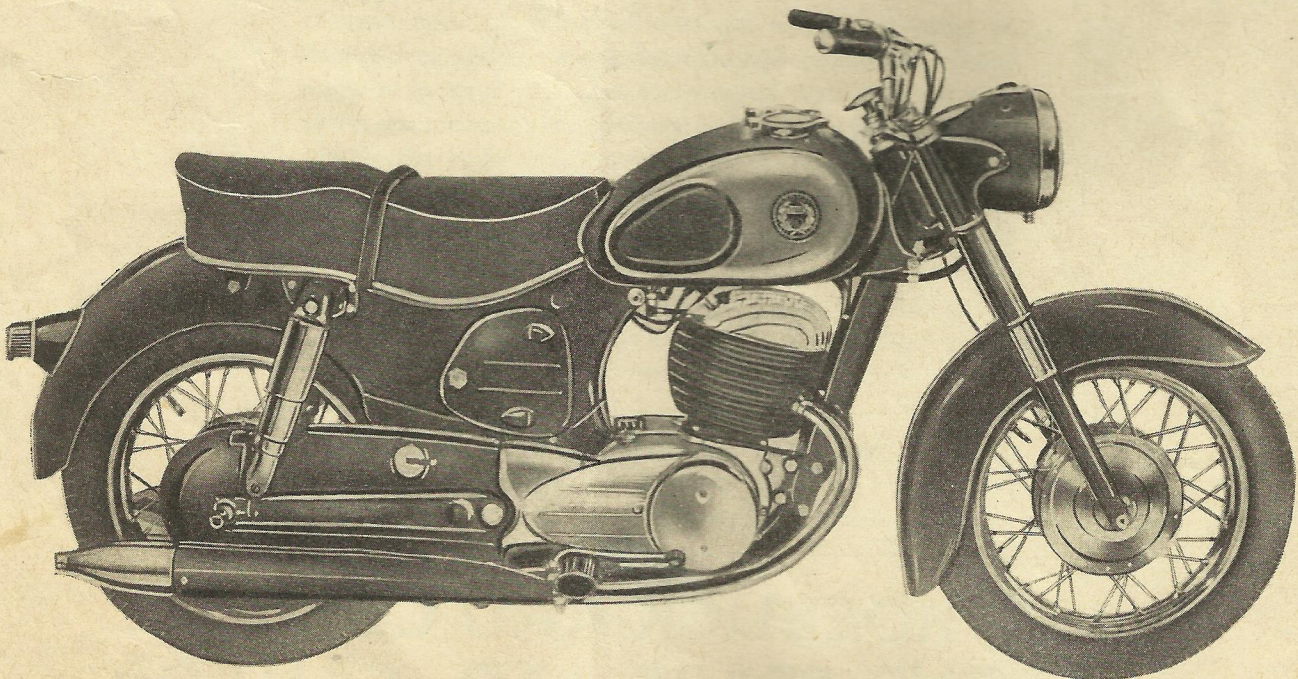
**SEARS, ROEBUCK AND CO. U.S.A.  
SIMPSONS-SEARS, LTD. CANADA**





1100

SEARS MOTOR CYCLE



1099

MODEL NUMBER 810.94222



We are glad to learn that you have become owner of a

## **SEARS MOTORCYCLE**

In more than half a century of producing bicycles and motorcycles our machines have been acknowledged international as products combining both broad experience and technology. To help this SEARS motorcycle to be your best friend, please read this rider's handbook carefully in order to become acquainted with the correct handling procedure and adjustments which are required from time to time.

If you have any questions about your motorcycle, please apply to your dealer who will be happy to assist you.

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# Part 1

## SETTING-UP INSTRUCTIONS

Instructions for unpacking, assembling and carrying out final operations.

Carefully follow the procedure explained hereafter for getting your motorcycle ready to start!

### Opening the Crate:

1. Lay crate on a level open surface, so that you are able to move freely around it.
2. Remove Statement of Origin and manual ("A").
3. Remove the nails securing the lid to the crate and the lid itself.
4. Remove 14 and 19 mm wrenches fastened on the top of the packing.
5. Unscrew the nuts of the tie rod "C" between the left and right wall of the crate (if screws and nuts are used).
6. Remove the nails out of the side walls and lay them flat on the floor and pull out the iron bar ("J").

Now the machine is approachable.

The two rubber plugs for sealing the holes in the frame are in the tool box.

### Preliminary Work:

1. Remove packing and oil paper and remove protecting grease from all chromium plated parts. Now the handlebar is to be put in place (see point 1 "Final work") to avoid damage to bowden cables.
2. Loosen nuts on fixing clamp "D" and remove it.
3. Loosen screws on both fixing clamps "E" with 19 mm wrench but be sure to loosen the lower nuts at first to avoid damage to the foot rest axle thread. Don't loose the screws. Now the machine can be taken out of the crate.
4. When the machine is taken out of the crate put it on central stand.
5. Open tool kit on the left hand side of the shell frame (behind the cylinder) and prepare 11 mm wrench.

### Final Work:

1. Loosen the four bolt screws "F" with 11 mm wrench of handlebar fixing clamp and detach the connecting link "C".
2. Put handlebar with rubber clamping sleeve, levers and bowden cables pointing slightly downwards in symmetrical position between handlebar fixing clamps and tighten the four bolt screws "F". Choose handlebar position after riding experience as individually wanted!
3. Fix clutch cable to hand lever on l.h. half of the handlebar.

- a) First of all completely screw in hand lever adjusting screw "1" and appropriate lock nut "2" and turn until the slits of adjusting screw, lock nut and hand lever bracket "3" aline (so that the bowden cable may be inserted).
  - b) remove r. h. crankcase over (see page 13, fig. 8/2) and push external clutch lever on the crankcase forward.
  - c) At the same time put nipple "5" of the cable into hole on the bottom of the hand lever "4" and put cable into slits.
  - d) Release clutch lever on the crankcase so the cable covering fits into the bracket of the adjusting screw.
  - e) Loosen adjusting screw until the clearance of the lever is 5 mm. Tighten lock nut.
4. Mounting of the electrical switch.

The electrical switch, during transport fixed to the fork, is to be mounted on the left-hand side of the handlebar. It is connected with the switch by two bolt screws which are tightened with a screw driver.

5. Attachment of the foot rests.

Fit foot rests "G" as indicated in drawing. Tighten fixing screw bolt "H" with 19 mm wrench on both foot rests.

Choose position of foot rests as individually wanted, but don't place them too low as you would then be unable to change gear without taking the left foot from its rest!

6. Battery.

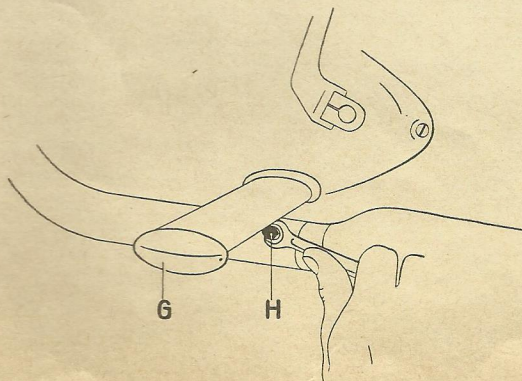
Note! The battery is charged, but delivered without any electrolyte. Make the battery ready for service according to the handbook. Have this done at a good workshop.

7. The ignition key is in the tool box.

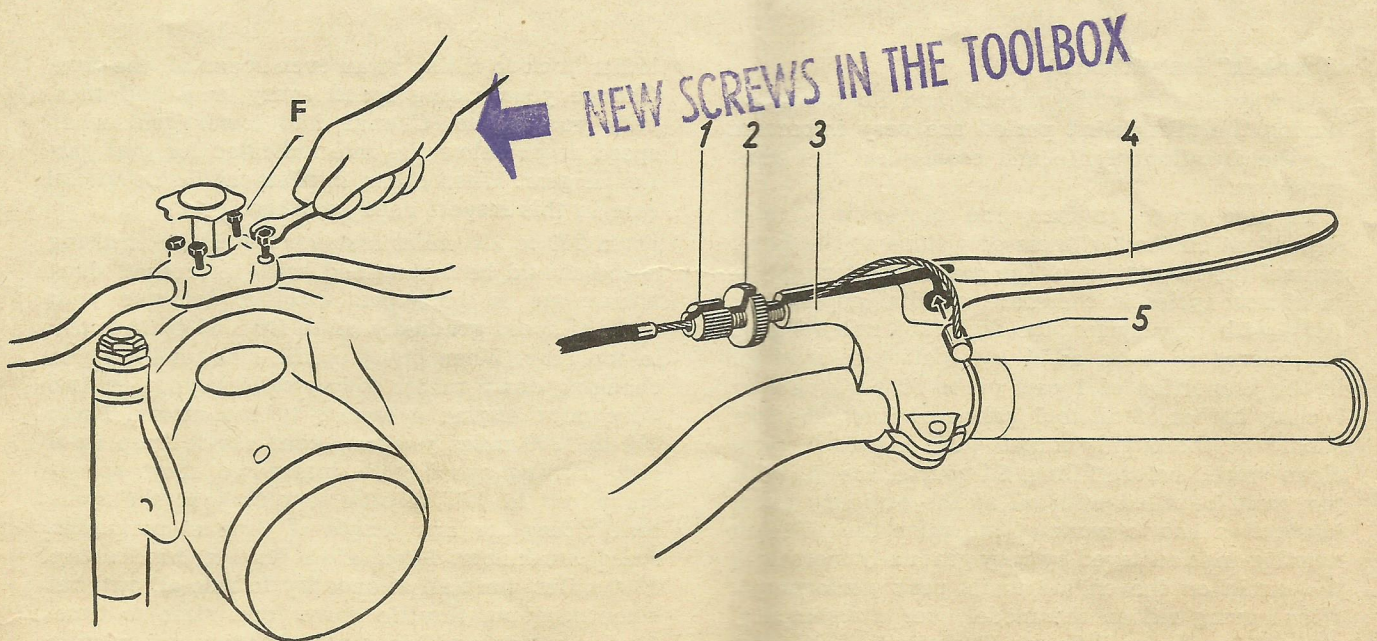
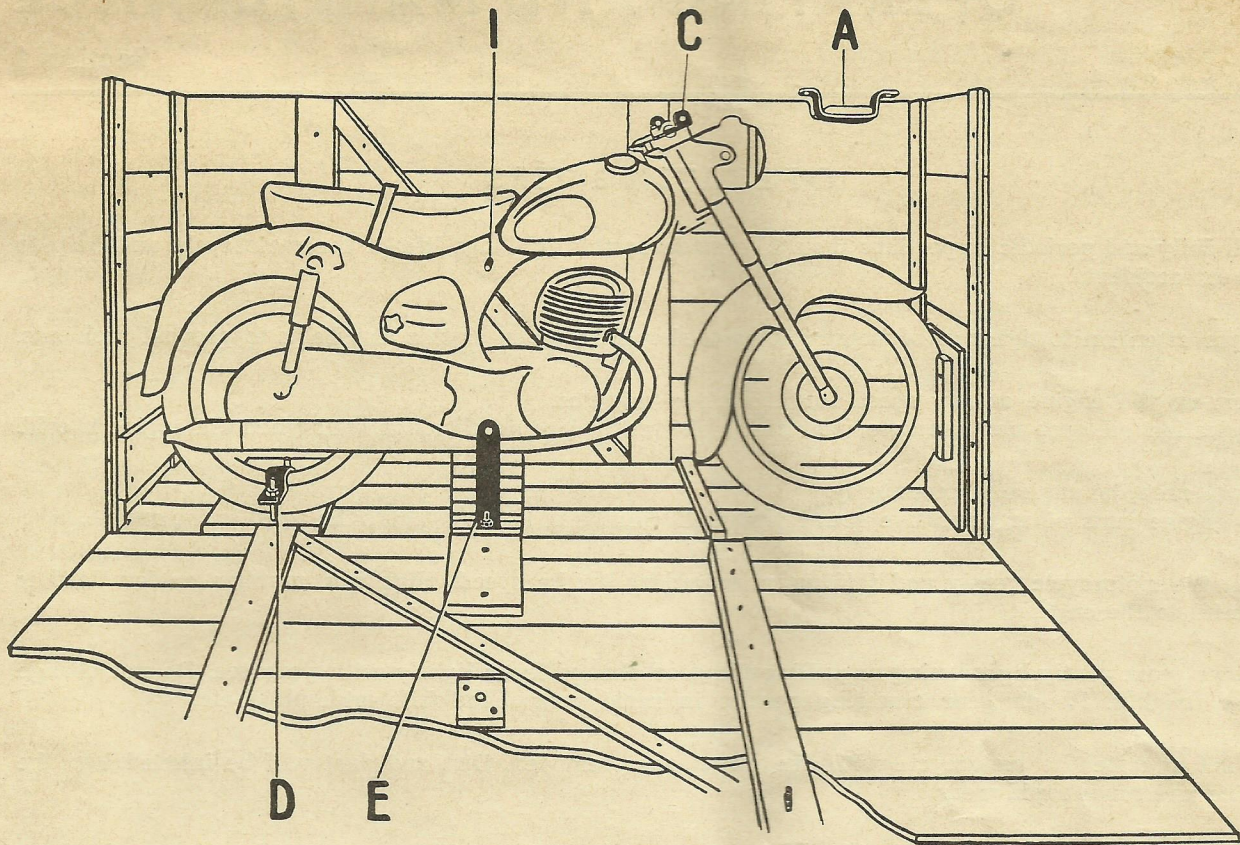
Before starting to ride, don't fail to read the paragraph "Sundry Hints" of your Maintenance Manual.

Help the "SEARS" motorcycle to work for you efficiently. We trust it will afford you great satisfaction.

Use only original spares!









# Part 2

## OPERATING AND MAINTENANCE

### Section 1

#### OPERATING TIPS

- Both daily and periodic inspections should be made as this prolongs life of the motorcycle and help to prevent accidents.
- Proper attention to tightness of important parts should be given as this also helps to prevent accidents.
- Warm-up the engine at low speed for about two minutes.  
Lubrication oil does not circulate well and carburettor does not function well when the engine is cold.
- Do not race the engine unnecessarily.  
The engine runs at an excessive speed with full throttle at no load. This is harmful to the engine.
- Start the motorcycle gently and shift gears according to the speed. High rev. number on low load is harmful to the engine.
- Change gears gently by pressing or pulling the gear change lever lightly with your toe. Do not change gears roughly. Rough gear changing results in rapid wear of the shift guide plate, etc.
- Do not operate the motorcycle with the air cleaner removed. Dirt and dust will be inhaled into the engine and cause rapid wear.
- Remove the switch key and lock the steering head when parking. This prevents the motorcycle from being stolen and the battery from being discharged.

#### „Break-in“ Instructions

The way of riding the vehicle and its treatment during the „Break-in“ period are very important for the duration of life and economical fuel consumption.

With two-stroke engines, the power is greatly dependent on the tightness of pistons as the latter control the movement of the gas. Correct running-in of new cycles is, therefore, of vital importance. Also, with new cycles, the first 1250 miles should be covered with an additional petrol-oil mixture in the proportion of 1 part oil to 50 parts fuel or 5 cubic inches of oil to 1 gallon of fuel. The fuel should be thoroughly mixed with the oil in some clean vessel, before filling. Of course, the oil tank, too, must be filled with oil as the ordinary pump lubrication has to work at the same time. Proper running-in is achieved by very gradually increasing the strain on the engine to its peak performance after having ridden the model over a distance of about 200 miles on little gas. These initial 200 miles must be done without carrying a pillion passenger and without tackling any stiff gradient. Don't ride faster in top gear than about 31 to 43 m.p.h. Don't

either stick to riding at an even speed all the time. Change your riding speed every now and then, vary your speed. Change into lower gear when speed drops below the rate indicated for that particular gear. When riding in town-traffic, no special care in this respect need be taken.

From 200 to 600 miles a steady, moderate cruising speed should be maintained, with interposed short sprints up to half-open throttle. Increase your average speed gradually up to from 43 to 53 m.p.h. in top gear. When going uphill, ride on little gas, changing down rather than straining your engine. Give your engine a chance to cool down. From 600 to 1300 miles you may continue to keep up a fast cruising speed with interposed short speed-bursts up to full throttle, avoiding at the same time riding for any length of time at maximum speed attainable. Even after having done above 1300 miles, don't all at once try to ride all out, but when speeding throttle down from time to time. At the beginning, this should be done every mile or so. With progressing running-in, these intervals may gradually become less frequent. But even when your model has finally completed its running-



in period, it will be expedient — when driving at speed — to throttle down just for a short time. It is advisable to run in your model without stopping over some distances longer than 70 miles. We point out once more that too low revolutions are also unfavourable. Change speed in time, that is, from top to 3<sup>rd</sup> at about 27 m.p.h., from 3<sup>rd</sup> to 2<sup>nd</sup> at about 20 m.p.h. and from 2<sup>nd</sup> to 1<sup>st</sup> at about 12 m.p.h.

### **Important!**

During the period of "Break-In" don't fail to repeatedly examine all screws, bolts and nuts, in particular those holding the engine (as also those of the rear engine suspension) nor fail to perform controls, tests and lubricating just as prescribed (Service-Station). You are also earnestly advised to drain the oil from the gearbox after about 500 miles, and to rinse it with rinsing-oil and then to fill it up with fresh oil.

### **Fuel**

The Cycle is not run on a petrol-oil mixture. The fuel and lubricating oil are kept separate, the fuel being filled into the right half of the tank and the oil into the left half.

Insure that dirt or dust not become mixed with the fuel.

Insure that water does not become mixed with the fuel.

### **Lubricating oil**

For engine lubrication (in the oil tank): Always use a good grade oil. Use only nondetergent oil. At temperatures over 50° F ( 10° C) SAE 50.

At temperatures from +15° F (— 10° C) to 50° F (+10° C) SAE 40.

At temperatures below +15° F (— 10° C) SAE 30.

For gearbox and telescope forks: Use heavy oil in summer, in winter a thin winter oil. Thicker oils may cause the clutch to stick or lead to stiffness in the front fork.



## RIDING INSTRUCTIONS

**Sundry hints**

Before starting a new engine, be sure that the telescope fork has been filled up with a sufficient supply of oil. For this purpose unscrew drain plug screws (slotted screws) placed at the fork of the first (fig. 1/1) and the nuts placed at the top bridge piece (fig. 8/5). For checking the quantity of the oil contained, it will be advisable to drain off all of the oil and then re-fill again. Normal quantity of filling 5 cu. in. (80 ccm) each leg. Damping, and subsequently, the softness of the springing depends on the viscosity of the oil. After having covered about 3000 miles (5000 km) drain off the oil and fill up with fresh oil. With new motorcycles, pull out (without dismantling) telescope fork until the interior tubes are bared. Then squirt a few drops

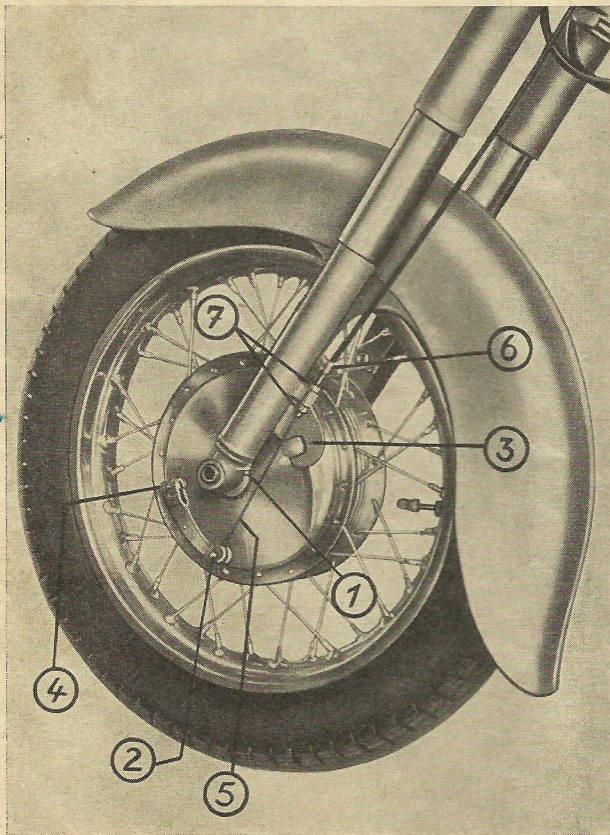


Fig. 1

of oil upon these tubes to prevent the rubber seals from sticking, which might occur if they are left dry. Test oil level in engine-gearbox while the cycle stands perfectly vertical: To ascertain whether there is sufficient oil, oil must escape from the opening after the oil level screw (fig. 2/1) has been unscrewed.

Entire quantity of oil contained about 1,6 pints. Test tire pressure (front 14,5 lbs/squ. in. = 1 at), rear wheel 20 lb./squ. in. (1,4 at); with pillion pas. 29 lbs/squ. in. (2,0 at). The battery, too, has to be filled up and charged from an outside source (battery charger! — See chapter on electric equipment).

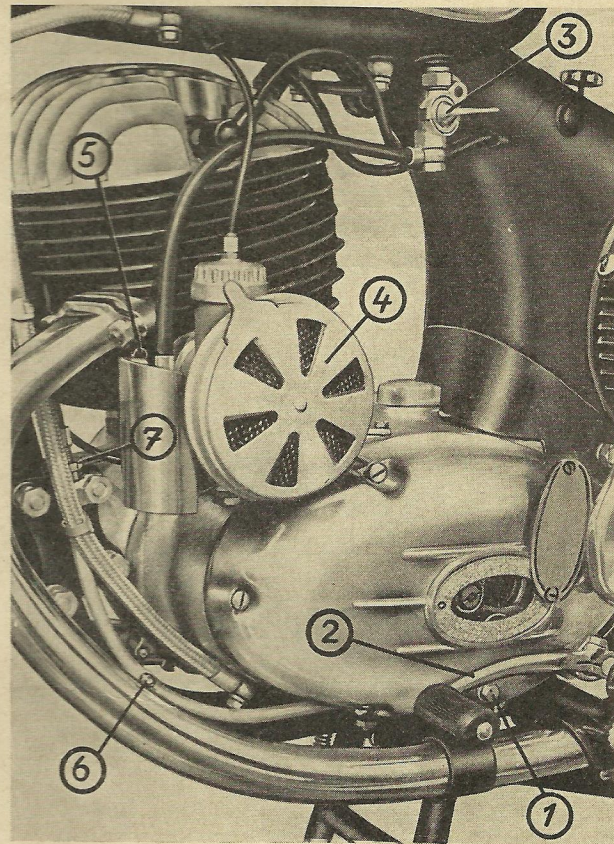


Fig. 2

**Starting the engine**

Put the ignition key into the lock. Having done that, red charging light and green control lamp of idling gear light up. If there is no green light,

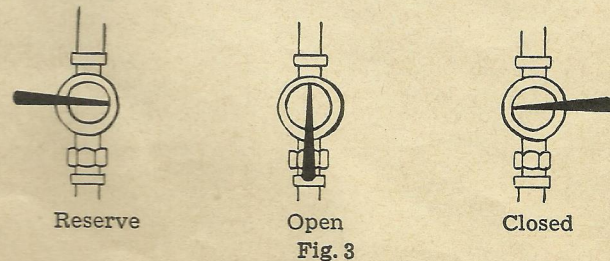


Fig. 3

the idling gear is to be charged by means of gear lever (green light lights up). Open petrol tap (fig. 2/3). Three positions (fig. 3).



Close the starter disc on the air filter (fig. 2/4). The carburettor is provided with a special starter carburettor. The twist grip is turned to full throttle position, then the tickler (fig. 2/5) on the float housing is repeatedly depressed at short intervals, until petrol flows over the opening of the chamber containing starting petrol (fig. 9/1). In summer it is unnecessary to close the starter disc. It suffices to depress the tickler a few times, and there is no need for the fuel to overflow.

Open the twist grip  $\frac{1}{4}$  at most before kick-starting. Depress the kickstarter smartly.

Let the engine warm up a little at a moderate number of revolutions, particularly in winter. If there is a tendency to refuse to fire or to stall, briefly depress the tickler button and open the starter disc, after the engine has got warm.

A hot engine will start without using the tickler or closing the starter disc with  $\frac{1}{4}$  gas at most. Should the engine have cooled down already and fail to start, the tickler can be operated briefly again. Use of the tickler with a hot engine involves the danger of getting too fat a mixture. If the carburettor has been flooded with the engine hot, the mixture is much too fat and the engine will not start. In such a case start with full throttle repeatedly, until the engine is running.

**Important!** Before kickstarting: don't start the engine with the ignition switched off.

#### Stopping the engine

Stop the engine by taking out the ignition. Always switch off the ignition. Then turn off the petrol tap. Otherwise, if the cycle is standing on an incline or resting sideways, the carburettor may overflow, which will lead to starting difficulties (flooding the engine). In this case the overflowed petrol should be drained off by the same screw (fig. 11/1) situated in the bottom of the crankcase.

The stand is put down with the left foot. Then, with your right foot, step smartly on the stand shoe, at the same time drawing the machine upwards and backwards upon both legs.

#### Riding and gear changing

Operating of gear lever: Push foot gear lever (fig. 2/2) down for lower (slower) gears, draw upwards for higher (faster) gears. Always declutch well before changing gear! Gear shifts work easily, don't force your change speed lever.

Putting gears into neutral: Press the gear lever down until you feel it to be free: the 1<sup>st</sup> gear is then in. Then with the point of your toe, slowly draw upwards, until engagement in neutral is felt. Neutral should not be engaged between 2<sup>nd</sup> and 3<sup>rd</sup> or 3<sup>rd</sup> and top gears. Before changing down, do not turn off gas entirely. After starting, change into 2<sup>nd</sup> at about 10—12 m.p.h., into 3<sup>rd</sup> at about 30 m.p.h. The flexibility of the engine is such that it can be run slowly even in top and the accelera-

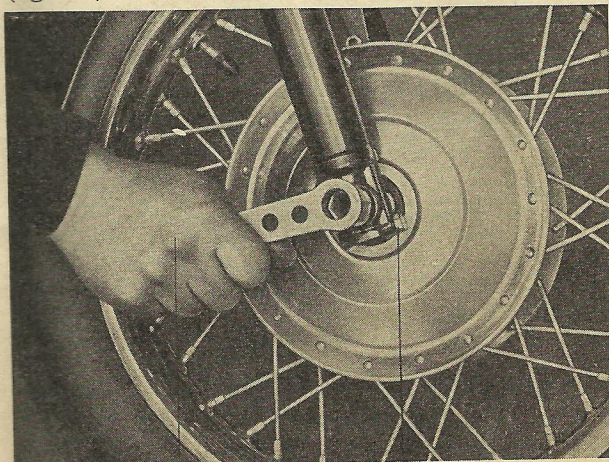
tion is good when the throttle is opened. Below 25 m.p.h., however it is not advisable to run all the time in top and the third gear may be used permanently without hesitation for lower cruising speeds. For instance in town-traffic, acceleration of up to 45 m.p.h. are permissible in 3<sup>rd</sup> gear, although this speed should not be maintained in 3<sup>rd</sup> for any length of time. The gear ratios have been selected for sporting rides. Thus to obtain high average speed in hilly country, the difference of ratio between top and 3<sup>rd</sup> gear is not too great. On mountain roads, when the speed has dropped to some 40 m.p.h., change down to 3<sup>rd</sup>. This applies above all to sporting riders. The excellent pull of the engine allows of outstanding hill climbing performance even at low engine revs., but the speed will be lower than when a timely change-down has been effected.

#### Brakes

Braking effect and braking reliability are particularly good with cycles with rear wheel springing, as the wheels do not give in braking. Make it your rule always to use both brakes. Try it and you will get used to it! You need not hesitate or be nervous to apply the front wheel brake! Its effect is even greater than that of the rear brake on account of the rising load on the wheel. Only when the road is slippery or icy you will have to be careful. Always brake your mount when approaching a bend. Braking on a bend increases the likelihood of a dangerous skid. Violent and sudden braking on slippery bends, particularly with the front wheel brake, is dangerous. You get less braking effect with the wheels locked and the risk of skidding is greater. The brakes are therefore to be "felt" rather than forced. The brakes are soft and very efficient, which greatly facilitates good braking.

#### Removal of wheels

Front wheel: Slacken the clamp screw of the right-hand fork lug (fig. 4/1). Unhook the brake cable (fig. 1/2). Unscrew stub axle (fig. 4/2). While refit-



②

Fig. 4

①



ting, insert the bolt of the brake plate in the hook of the spring fork (fig. 1/3) and then screw up the stub axle. Drive fork down on the springs several

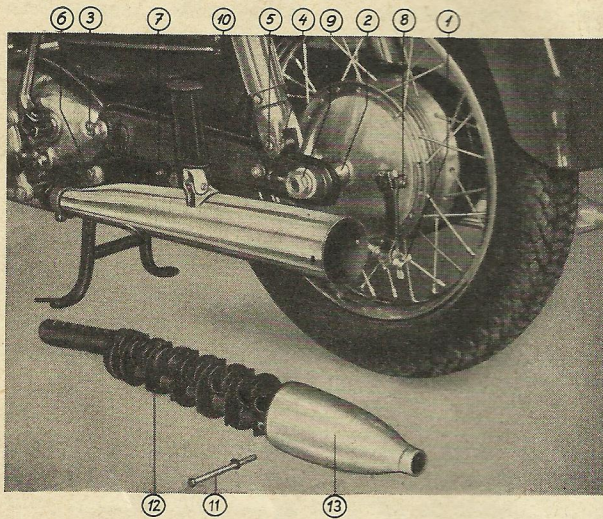


Fig. 5

times before tightening the clamp screw on the right-hand fork lug. Rear wheel: Unhook brake rigging, after having loosened winged nut (fig. 5/1). Unscrew stub axle by means of spark plug wrench. Pull out the intermediate part left-hand (fig. 5/2) — representing brake-stop — and pull the carrier of brake-drum from the flexible coupling. Incline the machine and remove the wheel from under the mud-guard. The hinged part of the rear wheel mud-guard can be taken off by unscrewing it. This makes it possible to remove the rear wheel without inclining the model as in a side car model. Grease stub axle when reassembling.

#### Tire fitting (fig. 6)

To take out a tire first unscrew dust cap of valve, depress valve needle until the air is entirely released, unscrew nut on rim and push out the valve. The drop center rims used derive their name from the groove in their center. The cable-edges of the straight-sided tires can best be removed from the rim by placing a foot upon the rim on the side opposite to the valve, thus having the weight of one's body press the steel cable edges of the tire

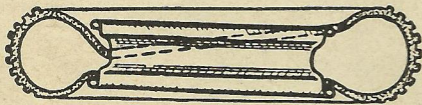


Fig. 6

down into the dropped center or groove of the rim. This action will produce enough space on the valve side of the cover to enable you to insert a tire lever and slip the cable-edge of the tire over

the edge of the rim. Now the edge of the tire which has been slipped over the edge of the rim has to be held in place with the lever, while by means of a second lever the remaining circumference of the tire has to be pulled over the rim edge by slipping the second lever, which has also been inserted between tire edge and the edge of the rim, along the entire remaining circumference of the tire. This done, the inner tube can be removed. When refitting, the inner tube, having been slightly inflated and well powdered with talcum, is inserted into the cover. While doing so, one has to be very careful

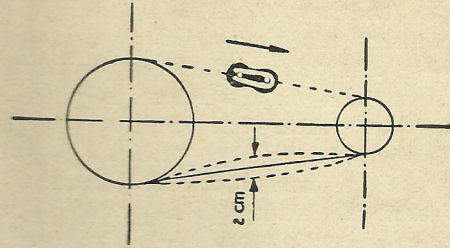


Fig. 7

not to pinch or squeeze the inner tube or twist it unduly and has to see to it that the protective ribbon, which is to protect the tube from the nipples of the spokes, evenly covers the bottom of the groove of the rim. When inserting the wheels, proceed in reversed order of operations as described above. Particular care has to be taken to get the correct chain tension and wheel alignment (see chapter on chain tensioning) as well as to fix and assemble the various removable parts most accurately.

#### Steering damper

On bad roads and at speed, it is advisable to tighten the steering damper (fig. 8/1) to a moderate degree. Since every driver wants the damping to suit his own requirements, the most suitable

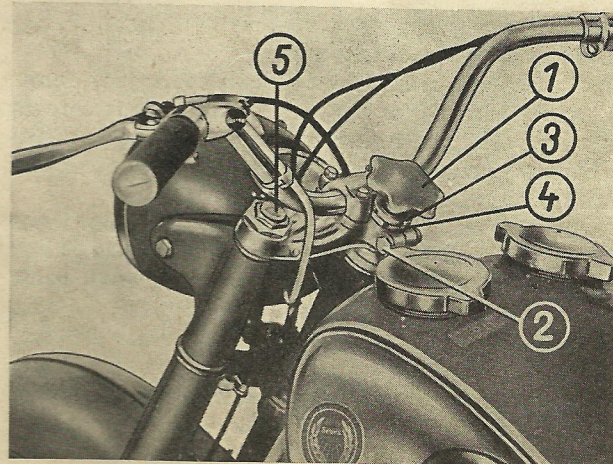


Fig. 8



tension is found out by trial. The outstanding road-holding qualities of Model 250 allows of riding under all conditions with the damper left slack. Thus there is no need to tighten it up too much. It must, however, neither be left too loose!

#### Riding hints

Fuel consumption and wear of the cycle are largely dependent on how the motorcycle is being used. High speeds necessarily mean high consumption. Much variation of speed, constantly turning the twist grip, sharp braking on bends increase wear and consumption with any vehicle. The most favourable consumption figures are obtained with a uniform speed. The fuel and oil consumption of our models are extremely low, and the rider should not unnecessarily increase it by bad riding. Letting in the clutch with a jerk, powerful braking, wrenching at the twist grip at lower engine speeds, brisk gear changing, possibly without proper declutching or regard to engine revs., inconsiderate riding on the worst roads: all these are additional stresses which can only add to the wear. A good rider never jerks his cycle and his gear change proclaims itself only by the gradually changing revolutions of the engine.

### IMPORTANT HINTS

#### The engine knocks

Knocking (pinking) is a metallic ringing sound in the engine, sometimes irregular but mostly synchronized with the firing stroke. The cause of this too rapid (detonating) combustion of the mixture is a fuel too poor in anti-knock quality. The anti-knock value of fuels is dependent on their octane number — the higher the latter, the greater the freedom from knocking.

Standard brand fuels at the present time are approximately octane 72. With these, the 250 c.c. engine runs without knocking, except perhaps briefly when opening out the throttle. Fuels not sufficiently knock-free are bad for the engine and should not be used. If a knocking fuel must be used in case of no other being available, ride carefully and not above average speeds. Permanent knocking must be prevented. Such preventatives are: Advance ignition not to exceed about 0,256 in. (6,5 mm). Rich mixture: If the engine should knock up to half throttle screw up screw for air regulating; lift jet needle, above half throttle fit

larger main jet. Reduce compression ratio by fitting two cylinder head gaskets.

All these preventatives against knocking tend to diminish performance and to raise consumption. However, this trouble inherent to unsuitable fuels, must be accepted when using them.

#### Adjusting the carburettor

For this work see part 3 page 9.

#### Spark plug

There is no such thing as a standard plug which will suit all types of engines equally well. Manufacturers of plugs therefore produce a diversity of types to meet the working conditions of various types of engines.

Use **SEARS-plugs only** (No. 60400)! in case you have none with you, only such plugs should be used as are signified by their makers as suitable for air-cooled sports engines. Plugs for water cooled engines are unsuitable.

We would particularly stress the fact unsuitable plugs, with too low resistance to overheating, and those which start to glow, may damage the engine. Plugs for sport engines are sometimes known as "cold" plugs, since they do not become too hot even with hot engines.

In case of doubt, it is better to employ a plug which is too "cold", which may perhaps oil up sometimes when running slowly but cannot damage the engine in any way.

It is advisable to screw up the plugs by hand as tightly as possible, before using a wrench to avoid damage to the thread.

Plugs made to be dismantled must not be put into a vice, but taken to pieces with a box spanner only.

#### Muffler (Silencer)

With two-stroke engines, the silencer is not an unavoidable nuisance, but an important element in the control of the gas flow through the engine. The engine and silencer of our cycles are designed to cooperate most efficiently with one another and to the best advantage.

Any alteration in the silencer spoils the tuning and unfavourably effects performance and consumption.

The inside of the silencer should be cleaned from time to time as obstructions have an unfavourable influence.



## INSPECTION AND ADJUSTMENT

### ● Daily Inspection

Inspect the motorcycle yourself. Proper inspection prolongs the life of the motorcycle.

1. Does steering handle operate lightly?
2. Is front brake lever play 1 cm (0,4 in.)?
3. Is rear brake pedal travel 1,5—2 cm (0,6—0,8 in.)?
4. Does clutch work properly?
5. Do front and rear cushions work properly?

### ● Periodical Inspection

After about 7000 miles, thorough cleaning and overhaul is to be recommended. This includes taking down the cylinder and thorough de-coking, cleaning the silencer and exhaust ports, cleaning the carburettor and petrol filter of the petrol tap, checking the front chain, draining the used oil of the gearbox, flushing the gearbox and renewing the oil, inspecting the whole of the electrical equipment, checking the brakes, greasing the twist grip, examining chain and renewing chain wheels, dismantling and inspecting front and rear wheel springing and greasing the flexible cable of the speedometer drive. Details of these operations are given under the respective heads. Below we quote all the necessary manipulations in a separate and comprehensive table. These servicing manipulations are due every 500 to 1500 miles. A few miles more or less do not matter, but it is essential that this work is done reliably. On long rides, it is obvious that the rider will himself regularly perform these duties which will take him but a few minutes, e. g. lubricating his chains and keeping them at the prescribed tension, or adjusting his clutch or brakes. The topping-up of the battery can be done at a service station or when refilling at a filling station. It does not matter whether this is done after 450 or 900 miles, but it is important to have it done once every 500 miles or so. This is how these instructions should be understood.

6. Do head light, tail light, and stop light turn on?
7. Does horn sound properly?
8. Is engine oil up to full mark on gauge?
9. Does fuel tank contain sufficient gasoline?
10. Does oil tank contain sufficient oil?
11. Is front tire pressure correct?
12. Is rear tire pressure correct?
13. Is colour of exhaust gas proper?

### Every 500 miles

Oil the rear chain and check its tension. Clutch and brake play to be checked. Examine battery and top up grease cable connections. Grease knock-out axles every time you remove a wheel. After the first 500 miles change oil in the gear box.

### Every 1500 miles

Grease with alemite press: Axle of swing fork, foot-brake shafts (2 nipples), clutch cable, brake shaft bearing on brake backing plates. Thus attention is to be paid to all grease nipples. Lubricate with engine oil: Control lever bearing, joint of starter lever, joints of the stand, joint of the foot brake rods, connections of the hand brake cable, spring eyes of the swing-saddle. These are all points for oil lubrication.

Grease with heat-resistant bearing grease: lubricating pad of the contact breaker.

Clean air-filter.

### After every 3000 miles

Check the ignition setting, as also the generator. Clean the carburettor. If required, clean the exhaust ports. Renew oil in front telescope fork. Test steering for play.

### After every 6000 miles

Change oil in gearbox. Thoroughly clean and test the whole motorcycle.

### After about 12.000 miles or so

Dismantle and freshly grease wheel hubs and steering head bearings.



### Maintenance

Proper attention to the mount together with proper handling and regular servicing assures constant reliability.

Attention covers the lubrication of the whole machine checking, adjusting and cleaning. Those who value the appearance of their cycle, however, will not neglect the outside either.

### Lubrication

Engine lubrication is provided by an oil pump driven by the engine, the regulating member of which is coupled with the throttle twist grip, its action depending on the engine revolutions and load.

Use suitable lubrication oil (see chapter on lubricating oil). While running in your cycle also use petrol-oil mixture (see "Running-in").

### Adjusting the oil pump

To check the setting, the small flange on the engine casing (fig. 9/1) is taken off. The fixed red mark on the casing (fig. 9/2) and the marks of the movable white scale (fig. 9/3) will then be seen. The oil pump is properly adjusted when, with the twist grip at full throttle, these marks coincide. This standard setting is also used during running-in.

Only after running-in has been completed, should the setting be altered if necessary. With average cruising speeds (about 40 m.p.h.) the normal oil consumption is 1 pint of oil to approx. 175 miles. With higher speeds and much riding on full throttle, oil consumption rises to 1 pint for about 150 miles. Even with very good lubricating oil, the oil pump should not be set for appreciably less than the quantities mentioned. To change the fresh oil feed, the twist grip is turned to full throttle position and after loosening the lock nut the setting screw of the bowden wire of the oil pump (fig. 9/4) is adjusted. When the screw is unfastened

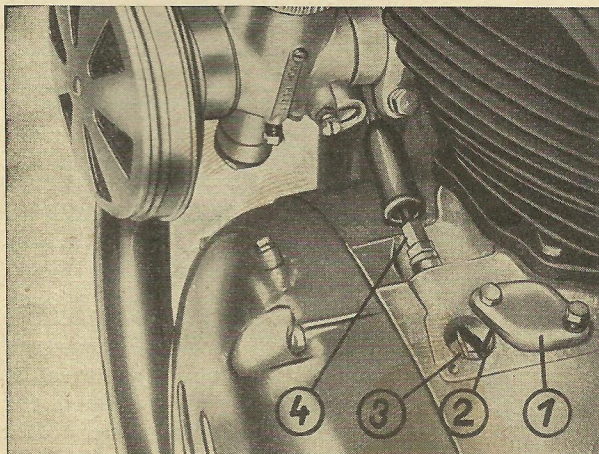


Fig. 9

the movable white scale moves and the + (plus) mark on it shifts towards the fixed setting mark in the casing while the oil feed is increased.

Conversely, screwing up the setting screw decreases the oil feed and the — (minus) mark on the scale moves towards the fixed setting mark.

Do not set consumption to anything above 1 pint of oil to 175 miles at average speed (that is 1400 miles per 1 gal. oil).

### Lubrication of gearbox

This is provided by pouring oil into the gearbox through the opening, after removing plug screws. The normal content is about 700 c.c. (about one and a half pint). On the left hand crankcase cover there

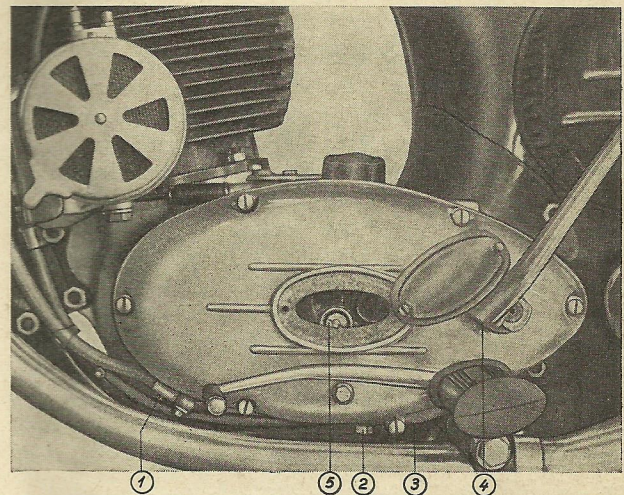


Fig. 10

is an oil level indicator screw (fig. 2/1). Oil is filled into the gearbox until, after removing the oil level screw, oil begins to overflow from the opening. In summer use heavy engine oil; in winter with temperatures below freezing point, use thin winter oil. Heavy oils in winter may cause the clutch to stick and make gear changing hard. Change the oil after the first 500 miles. After about 4000 miles, check the oil level by unscrewing the oil level screw. If no oil issues, refill until it does. Change the oil after about 6000 miles. With the engine hot, the drain screw on the clutch housing (fig. 10/2) and the one under the gearbox with oblique seat (fig. 10/3) are unscrewed until all the oil has been drained. Flushing out the gears with thin flushing oil is recommended. About one pint of flushing oil is poured in, the engine started up, top gear engaged and the machine allowed to run on the stand for a short time. The flushing oil is then drained off and the gearbox filled up with fresh oil as prescribed. By this charge of fresh oil the gear chain of the engine, the clutch, the starter and the gear change mechanism are lubricated simultaneously.



### Telescope front fork

Each leg of the fork is filled with about  $\frac{1}{6}$  pint of oil. After 4000 miles, this oil is drained off (drain screw below on the fork lug, fig. 1/1). Fill up with fresh oil ( $\frac{1}{6}$  pint each fork) after removing upper plug screw. The same oil is used as for the gearbox, in summer heavy engine oil, in winter thin winter oil.

If oil leaks from the fork, have the packing rings put right as soon as possible (renew them if defective).

### Swing fork rear wheel springing

Lubricate axle of swing fork by means of a grease gun after every 1800 miles (1 nipple fig. 5/3). The sliding inner parts of the spring unit are greased by the damper oil.

Oil change of spring unit:

Change oil after the first 3000 miles and whenever damping decreases. If both bottom securing worm screws (fig. 5/4), the top joint bolts and the bottom joint bolts (fig. 5/5) have been removed, the spring unit can be taken off. Dismantle damper cylinder containing the oil and have oil changed. Mind that the quantity of damper oil is correct, that is to say  $4\frac{7}{8}$  cu. in. (80 c.c.). A decrease in damping can easily be ascertained by giving the rear mud guard a hearty push down, while watching whether the swing forks come to rest at once (well damped) or whether they continue swinging up and down several times (badly damped).

**Dismantling the damping cylinder** (see Repair Instructions)

### Other parts to be lubricated:

Nipples to be lubricated with the gun are arranged as follows: One nipple on the outer casing for the bowden wire of the clutch left-hand side at the bottom of the crankcase (fig. 2/6). One nipple on the shaft of the foot brake pedal (fig. 5/6). One nipple on the intermediate lever of the brake rigging (fig. 5/7). Have these nipples supplied by four or five shots of the gun; every 1500 miles one nipple each on the brake shaft bearing of the front and rear wheels (fig. 1/4 and 5/8); every 1500 miles, 1 or 2 shots of the grease gun, not more, to avoid grease getting on the brake shoes. Moreover, a few drops of engine oil to be applied every 1500 miles to the bearings of the controls on the handle bar, the joint of the starter lever (fig. 10/4), the joints of the stand, the joint of the foot brake rod, the lower connection of the hand brake bowden wire on the brake lever of the front brake as well as on the open cable (fig. 1/5) and the spring eyes of the saddle which become accessible when the latter is pressed down into the hollow of the tank. Every time a wheel is taken off, the stub axles should be greased (grease gun lubricant). Every time after charging the battery, clean and grease terminals.

### Chains

As a matter of principle, chains should never be allowed to run dry and must always be correctly tensioned. For chain tensioning see chapter "Adjustments". Before starting to ride, always have a look through the control gap at the chain and lubricate it with oil if necessary. Any not too thin oil is suitable for this purpose. If nothing else is available, oil can be taken from the tank of the machine. Dry chains become stiff and get tensioned by themselves and then rapid wear is unavoidable. Every 1500 miles remove the chain and wash it thoroughly in petrol, followed by a bath of hot liquid chain grease. Excess grease is wiped off after cooling. In refitting the chain, the spring clip of the connecting link should always be placed with the closed end in front and towards the direction in which the chain moves (fig. 7).

### Contact-breaker of the dynamo

After 1500 miles, the cover of the dynamo must be removed and the lubricating pad of the contact-breaker greased with heat-resistant grease. At the same time, check the contact-breaker (see chapter "Electrical Equipment").

### Twist grip

Turn back the outer end of the rubber sleeve, unscrew the slotted head screw under the bore of the twist grip tube, pull off end cap and grip. Grease interior parts thoroughly.

### Care of tires

Maintenance of the tire pressure as prescribed (see chapter "Specification") is most essential to assuring long life of the tires. If a tire pressure gauge is not available, it is better to run on tires pumped hard than on too little pressure. With slack tires, the wear is greatly increased. The springing of the cycle guarantees comfortable riding even with hard tires. Hard braking increases wear.

Damage to the tread should be repaired by vulcanising because if water is allowed to penetrate through any slits in the outer covers it is bound to ruin the tires.

### Checking, Adjusting, Cleaning

#### Every 500 miles

Check battery acid, top up with distilled water, if plates are not fully immersed (see chapter "Electrical Equipment").

#### Chain Tension

Checking with the machine loaded by the rider! The section of the chain must show the usual sag of about .394 in. (10 mm), that is to say, you must be able to move the chain vertically up and down for about .784 in. (20 mm). Adjust chain tension after partly unscrewing the left and right nuts of clamp sleeve (fig. 5/9) by giving equal turns to both ten-



sioning screws (fig. 5/10). If the wheel is screwed up when in a slantwise position, that is, when alignment is incorrect, this will cause rapid wear of the chain and sprockets. Having tensioned your chain and tested whether or not the chain is too tight in one place, the sag mentioned above must be in evidence even in the tightest part of the chain.

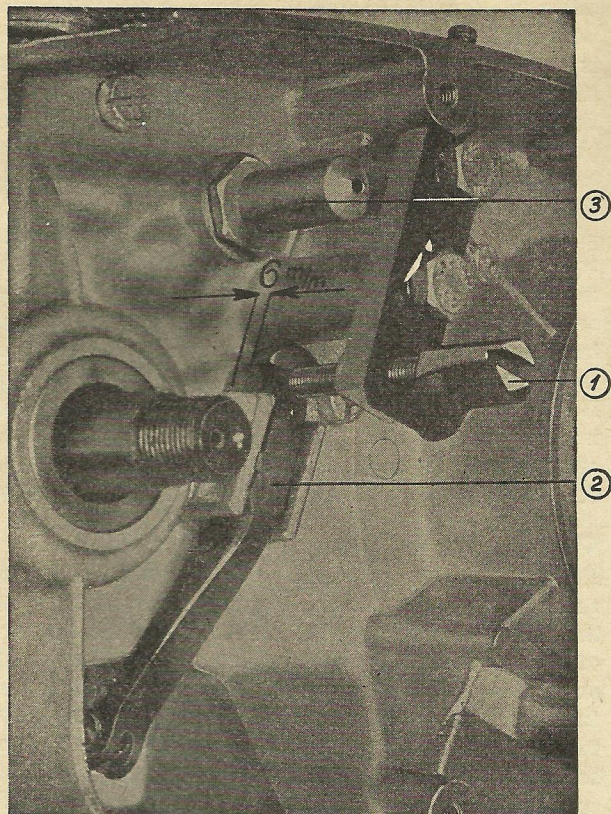


Fig. 11

### Clutch

The clutch hand lever must, as usual, have a little play. If no play at all is observed, or if the play, measured at the end of the hand lever, exceeds about  $.472$  in. (12 mm), adjustment is required. This is done by turning the setting screw (fig. 11/3 and 11/1) behind the dynamo in the middle of the cover plate. Tightening this screw decreases the play of the clutch hand lever. If the clutch cable is much stretched, it may be found that this screw cannot be screwed up any more. In such a case the set screw (fig. 11/1) is loosened by some 3 turns and the clutch cable adjusted by means of the set-screw (fig. 2/7) placed on the left in front of the engine block. While doing this, the hexagon head of the screw must be held and only the nut need be turned. Fine adjustment is now performed by means of the set-screw (fig. 11/1).

### Brake adjustment

The hand and foot brake levers must also have a slight play. The front wheel brake is set by means

of the wing nut (fig. 1/7) situated on the left hand fork. Unscrewing this nut causes a decrease of the play. First slacken the lock nut (fig. 1/8); the foot brake is set by the wing nut on the foot-brake lever (fig. 5/1). Turning it clockwise (seen from the front) reduces the play.

### Every 1500 miles

Clean the air filter (on dusty and sandy roads every 500 miles). Remove filter after partly unscrewing the retaining screw, rinse by immersion in petrol, then condition the filter cloth by dipping in engine oil and allow excess oil to drain off. Clean spark plug electrodes with a wire brush. If necessary, bend over the side electrode so that the gap is  $.024$  in. to  $.028$  in. using a spark gap gauge. Check up the contact breaker in the generator when greasing the lubricating pad (see "Electrical Equipment").

### Every 3000 miles

Check the ignition setting and also the generator (see chapter "Electrical Equipment"). Clean the carburettor (see chapter "Carburettor").

### Check steering play

If there is any play, with the front wheel of the raised cycle — especially in a direction transverse to the pivoting axle — when the steering main bearing is tested, the latter will have to be adjusted. To do so, proceed as follows. Loosen clamp screw (fig. 8/2) and slacken carefully upper lock nut (fig. 8/3), tension the lower setting nut (fig. 8/4) — it has normal righthand thread — until play has disappeared almost entirely. It is dangerous to screw up the main bearing too tight and for this reason, leave slight play. Screw up clamp screw. Hold the lower setting nut and tighten the upper.

### Adjusting the twist grip

The smaller of the two slotted screws on the inner end is provided for setting the resistance of the twist grip. Set the resistance, so that the twist grip does not move back of itself.

### Adjusting the headlamp

This adjustment can best be made at night on a straight level road. Slacken the two fixing screws in the headlamp bracket and, while seated with a pillion rider on the machine, that is, with the normal load on the cycle, adjust the headlamp in such manner that the beam strikes the road about 262 ft. ahead. Then tighten up the fixing screws again.

### Cleaning

When washing down the machine with a hose, the jet of water should be kept away from the following parts: Generator, carburettor, space between brake drum and carrier plate, space between wheel hub and cover plate, steering head bearing, speedometer. If petrol or paraffin is used for cleaning, see



that it does not get into the brakes as the brake linings may become defective.

### Electrical Equipment

For this work see part 3.

## OVERHAULING

### General

The work described can be carried out by any rider who is technically minded. Small manipulations which would be obvious to the latter are not therefore described in detail. Those not versed in such work had better leave it to an expert. Thoroughness and cleanliness should be the principles observed in overhauling.

### Decarbonising the engine

Residues from combustion (oil-carbon) mainly accumulate in the exhaust ports, restricting the opening and reducing the performance. After about 4000 miles, the exhaust pipe is removed and a pocket torch used to see how far the exhaust ports are coked. If the clear opening is still approximately rectangular in shape, carbonisation is still unimportant, but if the form of the opening is irregular it should be decarbonised. Reduced engine performance is likewise a symptom of coked-up exhaust ports. When decarbonising proceed as follows: Unscrew bolts holding down cylinder head (fig. 12/1)

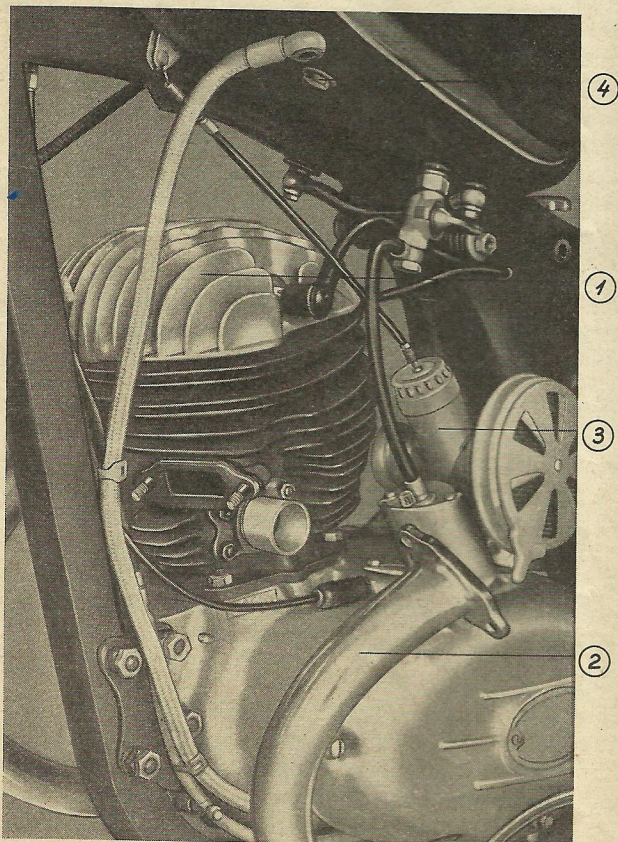


Fig. 12

with care (use box spanner) and take down gasket. Unscrew union of exhaust pipes and turn pipes (12/2) away (from engine) so that they allow of free access to the engine. Take off carburettor (12/3). When removing the cylinder the tank has to be lifted. The front part of the tank is lifted and kept in this position by the handle of a hammer, which is placed on the edge of the steering damper. For this purpose remove the front fixing bolt first and then rear fixing bolt. The oil hose is disconnected from the tank by removing the oil nipple. The oil is either drained off or prevented from leaking by inserting a suitable screw at once (fig 12/4). As the fuel connecting hose allows of this movement it need not be taken off.

Lift off the cylinder. Clean exhaust ports (by means of a scraper or screw driver). Scrape carbon deposit from the top of piston or piston head and clean interior of cylinder head. Test piston rings. When reassembling, take care not to damage the cylinder head gasket and fit it properly. The fixing bolts of the cylinder head should be screwed up crosswise. Removal of the cylinder becomes easier, if the tank is entirely removed. Then the fuel has to be drained off. Before refitting the tank, the cable distributor fixed to the top tube of the frame should be oiled.

### Cleaning the mufflers

For the purpose of cleaning it is not necessary to remove the muffler complete, it will do to take out the inner member of the silencer. First loosen nut of fixing screw for interior parts (fig. 5/11) and pull out screw. After having removed slotted screw, take out inner member (5/12). The separation of the two halves of the interior parts is done by unscrewing the two connecting screws. Now all the spaces in which the expansion of the gas takes place are accessible and can easily be cleaned. Change asbestos twine if ruined. Clean steel wool in petrol. Assembling in reversed order.

We urgently warn against changing the mufflers or removing some of the interior parts, as this operation would cause a drop in performance of the engine as well as an increase of fuel consumption. On no account will you obtain an increase of performance, as is sometimes erroneously believed.

### Cleaning the carburettor (fig. 20 of "Repair Instructions")

Loosen clamp (fig. 9/5) of the carburettor and take off the latter. Unscrew fixing nut (6) of the float chamber and take off the latter. Unscrew the needle jet (7) together with the main jet (4). Unscrew the cover of the float chamber (8) and take out of the float (9). Wash all parts in petrol. Blow through the bore of the main jet (4).

Cleaning the idling jet.

Unscrew idling jet (10). Blow through the bore. Refrain from forcibly tightening the idling jet as this may damage it, but screw up well. Before re-



fitting, close the throttle twist grip so that the jet needle is visible in the lower part of the carburetor. Push the needle jet (7) with main jet on to the jet needle (11) and then only start to put parts in place and to tighten threads. Before putting on the float housing cover, insert the float needle (12) in the guide of the cover (8). Finally, the petrol pipe, the tap and its filter are to be cleaned. The tap must be unscrewed for this purpose.

#### **Electrical equipment**

Everything we need to know regarding servicing

of the electrical equipment is quoted under the appropriate heading (see "Repair Instructions").

#### **Overhauling the brakes**

When the wheels have been removed, the brake plates together with the brake shoes can be taken out of the brake drum.

Never use petrol or paraffin on the brake linings! Use a wire brush to clean them.

If the rivets of the brake linings are worn down the lining should be renewed. This work should be done by an expert motor mechanic.



## SPECIFICATIONS

**Engine**

Number of cylinders: 1 split single-cylinder  
 Bore: 2×1,77 in. (2×45 mm)  
 Stroke: 3,07 in. (78 mm)  
 Cubic capacity: 248 c.c.  
 Compression ratio: 6,2 : 1  
 Peak performance: 16,5 HP at 5800 r.p.m.  
 Maximum torque: 2,3 mkg at 3200 r.p.m.  
 Ignition advance: 0,256 in. to 0,276 in. (6,5 mm to 7 mm)  
 Spark plug: SEARS No. 60400  
 Spark gap of plug: 0,024 in. to 0,028 in. (0,6 to 0,7 mm)  
 Lubrication: by oil-pump  
 Cooling: air-cooled by wind in riding.

**Carburettor**

Puch-single throttle-slide carburettor Type P 32/1  
 1,28 in. (32 mm) diameter with needle jet  
 Air filter: Wet air filter with starting disc  
 Main jet: No. 150  
 Position of needle: Clamp-spring clamped to 4<sup>th</sup> notch from top (see "Adjusting the carburettor")  
 Idler jet: 40  
 Throttle-slide: width of slit: 0,748 in. (19 mm)  
 Idler screw: about 1/2 turn open

**Battery-Ignition-Lighting**

Voltage regulating Puch D. C generator  
 Performance of generator: 6 V 45/60 W  
 Battery capacity: 6 V, 7 Ah  
 Headlamp: 5,91 in. (150 mm) light outlet  
 Main head light: 6 V 35/35 W.

**Gearbox**

Transmission from engine to gearbox: 51 : 22  
 $i = 2,31$   
 Transmission in gearing  
 1<sup>st</sup> gear: 22 : 8  $i = 2,75$   
 2<sup>nd</sup> gear: 18 : 12  $i = 1,5$   
 3<sup>rd</sup> gear: 15 : 15  $i = 1$   
 4<sup>th</sup> gear: 13 : 17  $i = 0,76$   
 Transmission from gearbox to rear wheel 46 : 15;  
 $i = 3,07$   
 Total Transmission:  
 1<sup>st</sup> gear:  $i = 19,5$   
 2<sup>nd</sup> gear:  $i = 10,6$   
 3<sup>rd</sup> gear:  $i = 7,1$   
 4<sup>th</sup> gear:  $i = 5,4$

Clutch: Multiple-disc clutch, friction disks running in oil bath

**Chain**

Front chain of engine: Duplex-sheet roller chain  
 3,8 × 5,16 in.  
 Diameter of sheet 0,196 in.  
 (5 mm)  
 Number of sheets: 64  
 Rear chain: Roller chain 1/2 × 5/16 in.; 118 rollers,  
 1 block, 2 connecting links

**Wheels**

Rim size: Drop center rim 1,85 × 16 in.  
 (2 1/2 × 16 in. DIN 7816)  
 Tire size: Tires 3,5 × 16 in.

**Tire pressure**

Front wheel: 14,5 lb/squ. in. (1,0 atü)  
 Rear wheel: 20 lb/squ. in. (1,4 atü) with pillion  
 passenger 29 lb/squ. in. (2,0 atü)

**Front and rear brake**

Brake drum: diameter 7,08 in. (180 mm)  
 Width of the brake lining: 1,575 in. (40 mm)

**Fuel tank**

Capacity 3,43 gals. (13 litres) of which 0,8 gals.  
 (3 litres) are reserve fuel

**Performance Data**

Top speed: about 68,34 m.p.h. (110 km/h), 1 person  
 riding upright;  
 Fuel consumption: about 0,70 gals. of petrol and  
 about 1/3 pint of oil for 62,13  
 miles (100 km) at approxima-  
 tely 43,5 m.p.h.  
 Hill climbing capacity: with pillion passenger about  
 40%  
 Action radius: about 217,4 miles (350 km) with one  
 tank filling

**Measurements**

Length 78,15 in. (1985 mm)  
 Height 36,22 in. ( 920 mm)  
 Width 25,39 in. ( 645 mm)  
 Wheel distance: 52,55 in. (1345 mm)  
 Road clearance: 5,91 in. ( 140 mm)  
 Saddle height: 28,9 in. ( 735 mm)

**Weights**

Weight without fuel, toolkit, and pillion seat 309 lbs.  
 (140 kg). Weight ready for riding with fuel, toolkit,  
 and pillion seat 341,7 lbs. (155 kg)