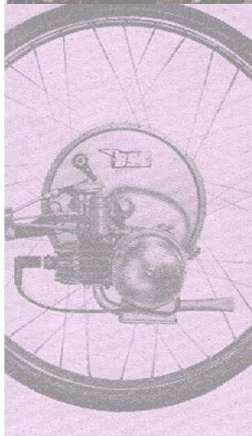


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PHILLIPS

Motorised Bicycle *Instruction Manual*



PHILLIPS CYCLES LIMITED - BIRMINGHAM 40

SPECIFICATION

ENGINE — Two-stroke, single cylinder, with flat piston.

STROKE — 38.25 m/m (1.1/2 ins.).

BORE — 40.5 m/m (1.19/32 ins.).

PISTON DISPLACEMENT — 49 c.c. (3.0 cu. ins.).

COMPRESSION RATIO — 6 : 1.

CYLINDER — Aluminium alloy, with cast liner.

CYLINDER HEAD — Aluminium alloy, detachable.

IGNITION — BOSCH special rotary flywheel magneto.

IGNITION SETTING — 3.5 m/m (.138 ins.) in advance of top-dead-centre.

CARBURETTOR — Incorporates special "rich-mixture" device for easy starting, self-cancelling from the twist-grip without dismounting.

TRANSMISSION DRIVE — Roller chain 1/2 in. \times 3/16 in., from multi-plate dry clutch.

ENGINE GEAR REDUCTION — 1 : 4.

CHAIN REDUCTION — 1 : 4.5.

TOTAL REDUCTION (GEAR AND CHAIN) — 1 : 18.

PETROL TANK CAPACITY — Approx. 5/8 gall. (sufficient for approx. 120 miles).

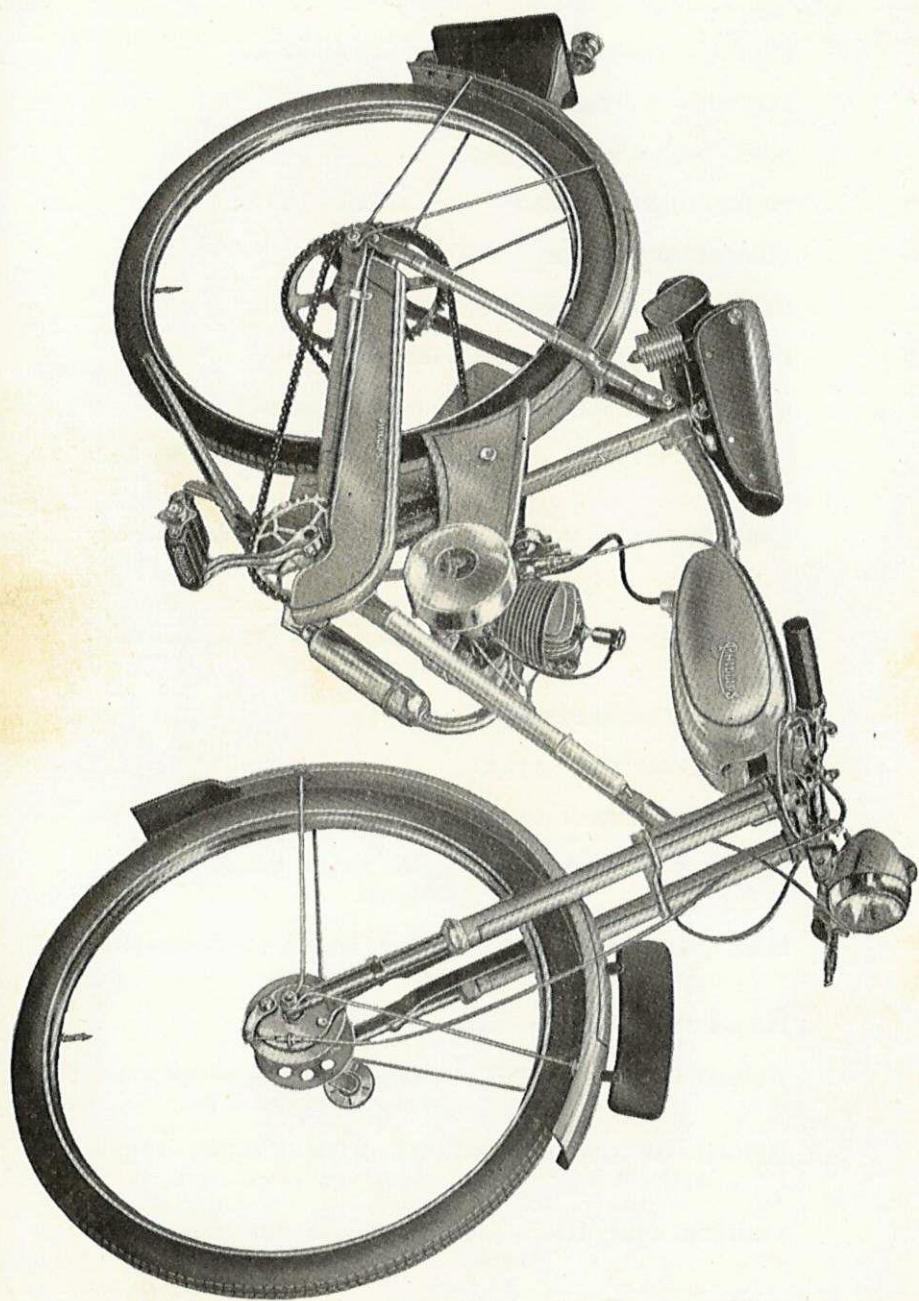
FUEL AND LUBRICATION — By petrol mixture — 24/25 parts petrol to 1 of oil.

FUEL CONSUMPTION — Approx. 190 m.p.g.

WEIGHT OF ENGINE UNIT — Complete with tank, silencer and all accessories, approx. 22 lbs.

WEIGHT OF CYCLE COMPLETE WITH ENGINE, ETC. —
Approx. 69 lbs.

LIGHTING CIRCUIT — 6 volt, 6 watt, complete with Front and Rear Lamps.



ABOUT THE PHILLIPS ENGINE IN GENERAL

The engine is of "over square" design, i.e., the diameter of the cylinder bore and piston is greater than the length of the stroke. This is in accordance with the most recent trends in engine design for racing motor-cycles and certain popular motor-cars, and it provides the slick acceleration and good hill-climbing qualities which are so desirable.

THE ENGINE : ITS MAIN PARTS AND HOW IT WORKS

1. The Cylinder, Piston Unit, and Carburettor

- (a) The cylinder and cylinder head form the top part of the engine. The cylinder-barrel has a pressed-in cast liner, and ports leading from the carburettor (for gas feed) and to the exhaust (for the expulsion of used-up gas). The cylinder head is drilled for the de-compressor and the sparking plug. The cylinder and cylinder head are firmly bolted together, the joint being sealed by a gasket. Both cylinder and cylinder head have cooling fins to ensure satisfactory cooling.
- (b) The carburettor is mounted to the rear of the cylinder. Its function is to atomise the fuel and to mix it with air so as to produce a combustible mixture. The fuel enters the carburettor from the tank by way of the fuel tap and the fuel feed pipe. This pipe is connected to the carburettor by a union, which contains a fine filter to remove from the fuel any impurities which may remain after it has passed through the first filter on top of the fuel tap. The supply of air passes through an air filter at the extreme rear of the carburettor. A special design of sliding shutter, or "strangler," is incorporated in the carburettor. By pressing down the "strangler stud," which protrudes through the top of the carburettor body, a secondary air-way is closed, enabling a rich mixture to be drawn into the engine, which is needed for easy starting from cold. After the engine has started to fire, the "strangler" action is automatically cancelled (or opened) merely by opening the twist-grip momentarily to the full-throttle position, thus obtaining the correct mixture for normal running. It is unnecessary to use the "strangler" when re-starting a warm engine.
- (c) The flat-topped aluminium piston carries two compression rings, and slides up and down in the cylinder, or, more precisely, in the cylinder liner. It sucks the petrol-oil-air mixture, or "gas" into the bottom chamber beneath the cylinder, known as the crankcase, and compresses the gas in the top chamber (combustion chamber). The spark then makes this gas explode, which pushes the piston down again. The result is that the mixture which has been drawn into the crankcase is compressed (pre-compressed). The mixture thus pre-compressed is carried into the top part of the cylinder by way of twin transfer-ports which, by entering the cylinder at an angle, ensure efficient flow of the fuel gases (petrol vapour) during the engine operating cycle. The piston is returned to the top by the momentum of a flywheel and the process is repeated in rapid succession. The little-end bearing has a

phosphor bronze bush with an alloy steel gudgeon pin retained by spring circlips, whilst the big-end bearing runs in parallel rollers. The mainshaft and magneto shaft is carried on three ball races, the mainshaft being counterbalanced to reduce vibration. A synthetic rubber seat ensures the effective sealing-off of the crankcase from the magneto unit.

2. The Reduction Gear

Underneath the cylinder, in what is known as the crankcase, the vertical reciprocal motion of the piston, caused by the force of the explosion, is converted into a rotary motion of the crankshaft. Gears transmit the drive from the crankshaft to the output-shaft, reducing the number of revolutions in the ratio of 4 : 1. The gears and ball bearings in the gear housing are constantly lubricated by the oil mixed with the petrol. Please leave it to an expert to open the crankcase and inspect the gears; this also applies to the cylinder and piston.

3. The Ignition System

On the right-hand side of the crankcase we find the housing for the ignition system with a round cover bearing the Phillips trade-mark. The ignition system comprises the stationary "armature plate" carrying the "magneto armature" and dynamo armature, and the flywheel magneto mounted on the crankshaft. A small location peg in the tapered portion of the mainshaft fits into a keyway in the flywheel and gives an **approximately** correct ignition timing. The **precise** ignition timing is arrived at by slackening the two small screws which retain the stationary armature plate, slightly twisting round this unit (clockwise to advance the timing; anti-clockwise to retard the timing), and re-tightening the two screws. The rotation of the flywheel magneto about the magneto armature generates an electric current in the armature. This current is interrupted ("controlled") by a contact breaker, the correct width of gap between contact points when fully open being .015 in. The controlled current is conducted by the high tension cable and terminal to the sparking plug screwed into a hole in the centre of the cylinder head. The bottom end of the plug protrudes into the top chamber of the cylinder, in which the gas is compressed by means of the piston. From the end of the plug project two pin-shaped electrodes, one straight, one bent at right-angles so that the ends of the two pins almost meet—the gap is .020 in./024 in. The electric spark, the function of which is to produce the explosion of the mixture, jumps from one to the other. When the engine is running at a normal speed approximately 3,600 explosions take place per minute.

4. The Sparking Plug

The purpose of the sparking plug is to ignite the gas by means of the spark which jumps from one electrode to the other. This can only occur if the electrodes are insulated from one another. The process of combustion in the cylinder chamber results in a deposit of carbon on the electrodes. As carbon is a conductor of electricity, the insulation could eventually become ineffective. The plug should therefore be just hot enough to burn away the carbon deposit, but not hot enough for the gas to be ignited by mere contact with red-hot parts.

FUEL TANK, FUEL AND LUBRICATION

1. The Fuel Tank

The fuel tank is clamped to the frame top tube and holds about 5/8 gallon. The filler cap should be unscrewed anti-clockwise as far as possible before removal of the cap. This will ensure its easy and effective replacement.

- (a) The Phillips Motor requires a fuel mixture of 24/25 parts of petrol and one part of oil, i.e., approx. $\frac{1}{5}$ pint of oil per gallon of petrol (or approx. $\frac{1}{2}$ pint per $1\frac{1}{2}$ gallons). Whilst any good quality oil should prove satisfactory, we particularly recommend the use of one of the following :—

Shell X-100 20/20W.
Essolube 20.
B.P. Energol SAE.20.
Castrolite.
Mobiloil Arctic.

- (b) If one of the special two-stroke, self-mixing oils be used, then the instructions issued with that particular brand of oil should be followed. Normally, rather more of such oils are required to be used with the petrol, because they are already mixed with a percentage of spirit to ensure complete mixing.
- (c) Certain of the Oil Companies whose lubricants are recommended in this manual provide dispensing equipment which gives a mixture of petrol and oil already combined in the correct proportions. Service by means of such equipment is approved by us.

3. The Two-level Fuel Tap

This is found between the tank and the fuel pipe leading to the carburettor, and carries a filter at the top end. The tap handle is marked "R" and "Z" and must be turned to the vertical when you are starting up. The fuel then flows automatically into the carburettor and requires no regulating. Remember to turn off the tap to "Z" (Zero) when you have finished your ride, as the carburettor float is there to ensure that the fuel enters the carburettor steadily, and not to stop the flow of fuel altogether. If you unexpectedly run out of petrol, the tap can be turned to "R" (Reserve) which engages a very generous reserve supply, and gives the rider adequate warning that re-fuelling has become necessary.

THE CONTROLS OF THE PHILLIPS ENGINE

1. The Twist Grip Control

This is on the right end of the handlebar, and is connected to the slide of the carburettor by a flexible control cable. The further you turn the twist grip towards you the further the slide rises, and the greater the volume of fuel/air mixture entering the cylinder. By means of the twist-grip you thus control the supply of gas, and consequently the power output of the engine and the speed of the machine. If you turn the twist grip as far as it will go, you are said to be travelling "full throttle."

2. The Decompressor Lever

This is mounted on the left-hand side of the handlebars in front of the dummy grip and is connected by a control cable to the decompressor on the front of the cylinder head. The decompressor is a valve which closes an aperture in the top cylinder chamber—where the gas is exploded—and which opens when the lever is operated. When the hole in the top cylinder chamber is opened the compressed gas can of course escape, with the result that the explosions cease at once. Thus the primary function of the decompressor is to stop the engine, but it should also be used when starting up.

3. The Phillips Clutch

This is mounted on the output shaft adjacent to the driving sprocket, the output shaft being carried on ball races at each end. By disengaging the clutch, the engine and the cycle can run independently. It is therefore possible for the cycle to coast down hills and to stop at crossings, etc., without stopping the motor. The cycle can also be wheeled with the clutch disengaged, so saving the effort required to move the various parts of the motor. The clutch is operated by the clutch lever fitted on the left-hand side of the handlebars in front of the dummy grip. It is fitted with a pawl and ratchet. When the clutch lever is depressed (and “notched” as desired) the clutch is disengaged, and the engine and its gears are independent of the cycle. To let in the clutch, depress the “notch lever” and carefully release the clutch lever. **NOTE:** When moving off, the clutch should **ALWAYS** be let in gently and smoothly and without excessive “revving” of the engine. The clutch comprises three driving friction discs (asbestos-fibre faced) and two driven steel plates, which being carried within a cup-shaped steel housing are protected from mud and grit. The total friction area of the clutch plates is 16.3/4 sq. ins. Positive driving of the clutch is obtained by the combined pressure of six compressed springs.

FUEL TANK, GUARDS, COVERS, ETC.

Part No.	Per Unit	Part Name
19-U14601	1	Fuel Tank, complete with Filler-cap and Fuel-Tap
19-1414602	1	Fuel Tank only
19-14611	1	Filler-cap
2-U-105	1	Petrol-tap (with reserve)
19-782	1	Joint Washer
19-14633	1	Rubber Fuel-pipe
19-U-14603	1	Tank Attachment bracket, complete
19-14612	1	Tank Clamping Bracket
19-14613	1	Tank Clamping Bolt
19-14604	1	Tank Clamping Plate
19-U-617	1	Magneto Cover
19-14201	1	Offside Cover-plate
19-U14203	1	Clutch Cover
19-14204	1	Rubber Seating-ring
19-14202	1	Nearside Chainguard
19-14606	1	Ornamental Strip
19-14609	2	Tubular Rubber Seating
19-14610	1	Chamfered Rubber Seating
19-14215	2	Chainguard Securing Clips
19-14210	1	Nearside Distance Tube
19-14211	1	Offside Distance Tube
19-14209	1	Guard Supporting Stud
19-14212	2	Chainguard Washer (Inner)
19-14214	2	Chainguard Washer (Outer)
M5DIN466	2	Knurled Thumb-nut
A5, 3, DIN6797	6	Spring Washer
M5DIN934	6	Hexagon Nut
M4×10DIN84	2	Screw
A4, 3, DIN6797	2	Spring Washer
M6×15DIN91	1	Securing Bolt (Ornamental Strip)
M5×12DIN84	3	Chainguard Securing Clip Screw

CRANKCASE, GASKETS, STUDS, BALL JOURNAL BEARINGS

Part No.	Per Unit	Part Name
19-U12101	1	Crankcase and Journal Bearings, complete
19-U12100	1	Crankcase, complete
19-12101	1	Crankcase (Dynamo side)
19-12104	1	Crankcase (Flywheel side)
19-12105	1	Crankcase (Drive side)
19-206	1	Gasket (Dynamo side)
19-205	1	Gasket (Flywheel side)
19-12103	4	Cylinder Studs
19-811	1	Cable Socket
19-651	2	Liner
15×24×7/K200	2	Oil Seals
M5×12DIN85	1	Drain Screw
B.5DIN127	9	Spring Washers

CRANKCASE, GASKETS, STUDS, BALL JOURNAL BEARINGS—*continued*

Part No.	Per Unit	Part Name
Ø5DIN433	1	Washer
M5 × 26DIN931	2	Hexagon Screw
M5 × 30DIN931	2	Hexagon Screw
M5 × 60DIN931	3	Hexagon Screw
M5 × 54DIN87	1	Countersunk Screw
M5DIN934	6	Hexagon Nut
M6DIN934	4	Hexagon Nut
Ø6DIN433	4	Cylinder Stud Washers
16004	1	Crankshaft Journal Bearing
16002	3	High Shoulder Bearing
6002	1	High Shoulder Bearing
19-U392		Tool Bag with Tools
		Flywheel Retaining Peg

THE PALLAS CARBURETTOR (Component Parts)

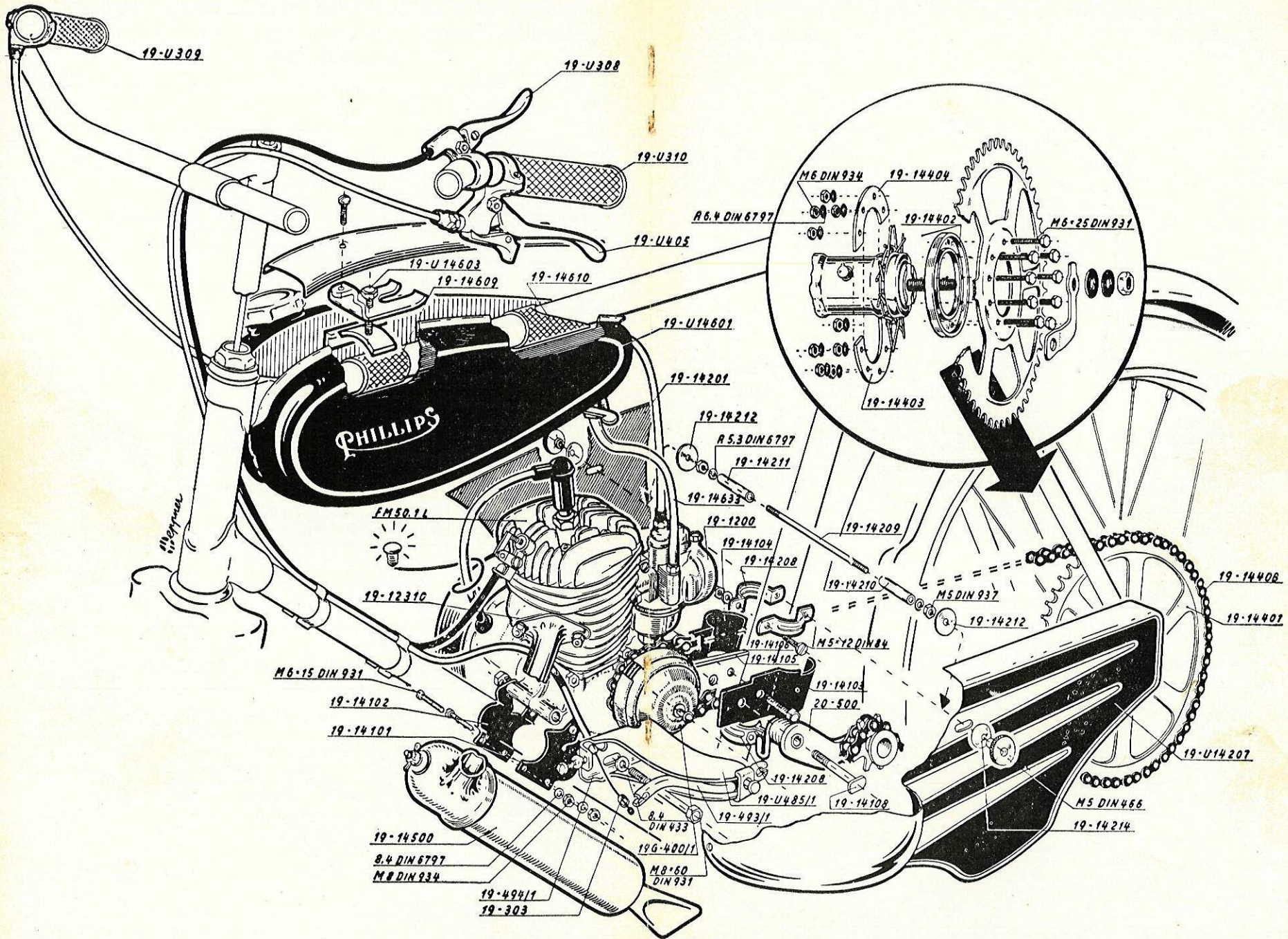
Part No.	Per Unit	Part Name
19-1100	1	Pallas Carburettor, complete
19-1001	1	Body or Mixing Chamber
19-1002	1	Float Needle
19-1003	1	Spray Nozzle
19-1004	1	Control Jet
19-1005	1	Float Chamber Lip Washer
19-1006	1	Float
19-1007	1	Float Hinge Pin
19-1046	1	Float Chamber
19-1009	1	Throttle Slide
19-1010	1	Throttle Spring
19-1011/1	1	Carburettor Top
19-1012	2	Securing Screws
19-1013	1	Fibre Washer
19-1014	1	Filter
19-1015	1	Petrol Feed Nipple
19-1018	1	Air Filter
19-1019	1	Filter Securing Bolt
19-1024	1	Spring Washer
19-1030	1	Choke Plunger
19-1038	1	Jet Screw
19-1027	1	Grub Screw
19-1028	1	Spring
19-1029	1	Fibre Disc
19-1035	1	Carburettor Top Gasket
19-1047	1	Adjuster
19-1048	1	Adjuster Lock Nut
19-1031	1	Rubber Washer
19-1049	1	Carburettor Securing Bolt
19-1039	1	Insulating Bush
19-U1045	1	Carburettor Inlet Union

CYLINDER HEAD, CYLINDER AND LINER, DECOMPRESSOR, PISTON, CRANKSHAFT, COUNTERSHAFT, GASKETS, ETC.

Part No.	Per Unit	Part Name
19-112315	1	Cylinder Head and Compressor Unit, complete
19-U12314/1	1	Cylinder and Liner, complete
19-12202	1	Piston and Rings, complete
19-U612/1	1	Countershaft Helical Gear, complete
19-U12201	1	Crankshaft, Connecting Rod and Bearings, comp.
19-U618/1	1	Decompressor Lever and Clip
19-12324	1	Cylinder Head and Decompressor Valve
19-12316	1	Decompressor Valve
19-623	1	Valve Spring
19-12319	1	Cylinder Head Gasket
19-12304	1	Exhaust Gasket
19-1043	1	Carburettor Gasket
19-12308	1	Cylinder Liner Gasket
19-122209	1	Piston
19-12210	2	Piston Rings
19-12211	1	Gudgeon Pin
19-12212	2	Circlip
19-12206/1	1	Small End Bush
19-12320	1	Spacer Washer
19-435	1	Counter Shaft Nut
19-650	2	Spacer Washer
19-12323	1	Crankshaft Nut
A.10.DIN127	2	Spring Washer
M.5.DIN934	2	Carburettor Nuts
Ø5DIN433	2	Carburettor Washers
Ø6DIN433	2	Exhaust Washers
M6.DIN934	2	Exhaust Nuts
Ø5DIN433	1	Washer
M5 × 6DIN85	1	Decompressor Securing Screw
Ø43.DIN433	1	Valve Spring Retaining Washer
1.5 × 8DIN94	1	Valve Split Pin

CLUTCH, INTERNAL AND EXTERNAL COMPONENTS

Part No.	Per Unit	Part Name
19-U415/2	1	Clutch and Drive Sprocket, complete
19-U417	1	Clutch Outer Casing and Sprocket
19-U485/1	1	Clutch Arm and Bracket, complete
19-U499	2	Drive Plates
19-434/1	1	Driving Sleeve
19-449	1	Roller Bearing
19-448	1	Distance Washer
19-436	2	Driven Plates
19-446	1	Fibre Ring



CLUTCH, INTERNAL AND EXTERNAL COMPONENTS

—continued

Part No.	Per Unit	Part Name
19-447	1	Pressure Plate
19-491	1	Spring Carrier Plate
19-490	1	Pressure Releasing Dome
19-441/1	1	Spring Ring
19-492	6	Clutch Pressure Springs
19-495	6	Pressure Spring Cups
19-435	1	Nut (Clutch to Countershaft)
21-012/1	1	Dome Tension Spring
19-497	1	Plate Retaining Bolt
19-493/1	1	Operating Lever Arm
19-494/1	1	Bracket
19-498	1	Arm Retaining Pin
19-303	2	Cable Cover and Nipple Stops
19-485	1	Nipple
M5 × 10DIN85	1	Screw with Instrument Head
A5DIN127	1	Lock Washer
H203.1.2.15.2	1	Nipple Clamp, complete
KSRD12	1	Thrust Bearing
5G12DIN471	1	Circlip
SG17DINE471	1	Circlip
8, 4, DIN433	2	Shim Plates
19-E400/2	1	Disc Clutch, Chain Drive, complete
19-U405/1	1	Operating Lever of Control Handle, complete

EXHAUST AND SILENCER

Part No.	Per Unit	Part Name
19-14500	1	Exhaust Pipe and Silencer, complete
19-U14506	1	Exhaust Pipe Curve, complete
19-U1302	1	Baffle Tube
19-U14501	1	Silencer Case
19-1309	1	Baffle-end Cap
19-1314	1	Asbestos String Tape
19-1316	1	Asbestos Washer
19-1315	1	Arched Washer
M6DIN533	1	Slotted Nut
M6DIN934	1	Baffle Nut
A6DIN127	1	Baffle Spring Washer
1, 5 × 15DIN94	1	Split Pin
2210	1	Contact Breaker Arms

TWIST-GRIP, CLUTCH AND DECOMPRESSOR CONTROLS ETC.

Part No.	Per Unit	Part Name
22-U403/4	1	Decompressor Cable Unit
22-U402/4	1	Throttle Cable Unit
19-U483/3	1	Clutch Cable Unit
19-U308	1	Decompressor Lever and Clip
19-U405	1	Clutch Lever and Clip
19-U310	1	Fixed Grip
19-365	1	Twist Grip
19-366	1	Twist Grip Housing
19-U309	1	Twist Grip, complete
19-303	2	Cable Cover Stops
19-14710	2	Cable Securing Clips

CHAIN TRANSMISSION AND ENGINE MOUNTINGS

Part No.	Per Unit	Part Name
19-14401	1	Driven Sprocket
19-14406	1	Roller Chain, $\frac{1}{2}$ " pitch $\times \frac{3}{16}$ ", with Spring-link
19-14402	1	Distance Ring
19-14403	1	5-Hole Clamping Plate
19-14404	1	4-Hole Clamping Plate
19-14101	1	Crankcase Clamp (Left side)
19-14102	1	Crankcase Clamp (Right side)
19-14105	1	Crankcase Adjusting Plates (Left side)
19-14106	1	Crankcase Adjusting Plates (Right side)
19-14103	1	Seat-tube Clamp (Left side)
19-14104	1	Seat-tube Clamp (Right side)
20-500	1	Chain jockey
20-407	1	Jockey Spring
19-14108	1	Jockey Pivot Bolt
M6 \times 15DIN931	3	Hexagon Screws
M \times 8 \times 60DIN931	1	Crankcase Clamping Bolt
M6DIN934	4	Seat-tube Clamping Nuts
A6 \times 4DIN6797	4	Spring Washers
M8DIN934	2	Hexagon Nuts
M8, 4, DIN6797	2	Spring Washers
8, 4DIN125	2	Washers
M6 \times 25DIN931	9	Clamping-plate Bolts
M6 \times 18DIN931	1	Seat-tube Clamping Bolt
A6, 4DIN6797	9	Clamping-plate Washers (Spring)
M6DIN934	9	Clamping-plate Nuts

PRACTICAL HINTS FOR USERS OF THE PHILLIPS ENGINE

A. DO YOU TAKE SUFFICIENT CARE OF YOUR PHILLIPS ENGINE?

1. We want you to get the most out of your motor, but it can only give of its best if you do your share by giving it the care to which it is entitled. Always run it on the correct fuel mixture, and always keep both engine and cycle clean and in good order.
2. Take care to see that the control cables leading to the twist grip control the decompressor valve, and the clutch lever always work smoothly. Should, for instance, the decompressor cable jam, the valve will fail to close completely and there will be no "pull" in the engine, since there is insufficient compression. Also, keep your cables adjusted so that when the controls are in the "OFF" (or "CLOSED") position, there is just the **finest** amount of slackness in the inner tension member.
3. Take care that the nut connecting the curved silencer with its tail is always tight. Tighten it if necessary, with the 10 mm. spanner (right-hand thread), and remember to replace and spread the split-pin.
4. After every 600—900 miles the exhaust port and exhaust pipe should be decarbonized. Unfasten the two nuts (10 mm. across flats) which clamp the exhaust pipe to the front of the cylinder and remove it carefully. If the gasket between the exhaust pipe flange and cylinder is in any way damaged, a new one must be fitted when re-assembling. Scrape out the carbon deposit from the cylinder exhaust port and from the exhaust pipe. An old knife is a convenient tool for this job, but do not be too energetic with the scraping. If you are not very practical with mechanical things, leave this cleaning process to your Phillips dealer, who will do this for you in a few minutes.
5. Don't try to ride with a dirty air filter in your carburettor. The filter is secured to the carburettor by a screw with a cylindrical head. When this screw is undone the filter may be removed and cleaned in petrol. As soon as it is dry it should be given a bath in oil and allowed to drain a little before being replaced and secured by the screw.
6. From time to time, the two small filters in the fuel tap and the carburettor union, i.e., at both ends of the fuel feed pipe, should be rinsed in clean petrol. Both attachments have a right-hand thread and can be unscrewed from the tank and the carburettor respectively.
7. Don't attempt to clean the carburettor unless you have received practical instruction from an expert in how to dismantle and re-assemble this part. It is advisable to leave all treatment of the carburettor to your Phillips dealer until you have acquired the necessary skill.
8. It is of the utmost importance that the area around the clutch be kept clean. From time to time a few drops of oil should be applied between the engine casing and the driving sprocket, the machine being tilted a little to the right (looking forward) and wheeled backwards and forwards several times in this tilted position, with the clutch disengaged.

9. Make sure that the petrol and drive chains are oiled at regular intervals. Only a few drops need be sprinkled on the chain. **Over-oiling** the chains only:
 - (a) Increases the possibility of oil finding its way on to the clutch plates.
 - (b) Encourages dirt and grit.
 - (c) Soils the rider's clothing.
10. When dismantling alloy parts, particularly threaded alloy parts, take extra care so as not to damage them.

B. DO YOU RUN YOUR PHILLIPS ENGINE PROPERLY ?

1. Re-fuelling

After having been run in, the Phillips engine requires a mixture of petrol and oil in the ratio of 24/25 : 1. As far as possible use only high quality proprietary products, and be especially careful in your choice of oil : only best quality two-stroke motor oil will do (1/3 pint to the gallon of petrol). Inferior oil soon plays havoc with any engine, and the Phillips is no exception. Before filling up with petrol and oil make sure that the vessel in which they are to be mixed is clean, stir or shake the petrol and oil together well, see that the tank is clean, and fill up through a funnel.

2. Running-in

All new engines have to cover a certain distance before reaching their full power ; the Phillips requires approx. 600 miles. In the first 200 miles you should not exceed 16 m.p.h. After 200 miles you can gradually open the throttle to 22 m.p.h. without harming the motor, although it will not develop its full power until some 600 miles have been covered. While the engine is being run in it is advisable to use a fuel containing a greater proportion of oil (20 : 1 instead of 24/25 : 1). At this stage the engine consumes slightly more fuel than it will later on.

3. Don't forget to turn off the fuel tap at the end of your journey.

4. Starting

To attain its full capacity the engine requires a certain temperature, known as the operating temperature. When cold it consumes more petrol. The best method of starting is as follows : Having turned on the fuel tap, depress the "tickler" stud on the right side of the carburettor until the carburettor float chamber is full. Then completely close the twist grip control and push down the air strangler stud which protrudes through the top of the carburettor body. Now mount the cycle, open the twist-grip control **NOT MORE THAN 3/16 in.** and pedal away with the clutch engaged and the decompressor open. After pedalling about 8 yards, let in the decompressor lever and the engine will start. Continue to let it run like this for about a further 20 yards then momentarily open the twist grip to its fullest extent, which has the effect of opening the "strangler" and gives you the correct mixture for continued running. If in cold weather, the engine fails to respond, repeat this starting procedure step by step paying strict attention to the point

that you must not open the twist-grip control MORE THAN 3/16 in. after having depressed the air strangler stud.

An alternative method of starting is to carry out the steps similarly to those described above, but to pedal away with clutch disengaged and decompressor closed, in which case care should be taken to let in the clutch very gently at a road speed of not more than 10 m.p.h. **The first-mentioned method of starting is to be preferred.**

5. To Stop Completely

Fully close the throttle; apply the brakes; disengage the clutch when your speed has dropped to about 6 m.p.h., and depress the decompressor lever.

6. To make a short halt with the engine running

You can make a short halt, e.g., at cross-roads, by depressing and "notching" the clutch lever. This disengages the clutch and enables you to stop for a few moments with the engine still running. To re-start, withdraw the ratchet and re-engage the clutch gently and smoothly.

7. Braking

It helps when braking fully to close the throttle and to leave the clutch engaged, as the engine then has a supplementary braking effect, but if this be done you should ALWAYS remember to de-clutch when your road speed drops to about 6 m.p.h. Failure to do this will subject your transmission to unnecessary shocks, and can cause your flywheel to shift round on the mainshaft, thus upsetting your ignition timing.

8. Sparking Plugs

The sparking plugs normally recommended for this engine are as follows :

14 mm. BOSCH PLUG W. 95 T.1.

14 mm. LODGE PLUG B.14.

14 mm. CHAMPION PLUG L-8.

14 mm. K.L.G. PLUG F.20.

9. Tyre Pressures

The pressures recommended for 1.3/4 in. tyres are as follows :

FRONT :	45 lbs. per sq. inch.	} If the rider is under 12 stone.
REAR :	50 lbs. per sq. inch.	
FRONT :	50 lbs. per sq. inch.	} If the rider is over 12 stone.
REAR :	55 lbs. per sq. inch.	

10. Pedal position

The best position for the pedals when they are at rest, is horizontal. Be most careful not to move the pedals backwards unless you want to brake or slow down. The least back-pressure on the pedals applies the "COASTER BACK-PEDAL BRAKE" which the engine must overcome. This causes undue wear and spoils its performance.

C. WHAT TO DO IF ANYTHING GOES WRONG

1. In general

If you are not a motor expert please do not tinker about with your Phillips engine, as you might cause serious damage. It is far wiser to go to your Phillips dealer, as we make a point of supplying engines and spare parts only to recognized agents. This is the only way in which we can guarantee our customers the efficient service which all uses of engines—whether of Phillips or other makes—need at some time or other. In particular, do not interfere with the cylinder or the crankcase unless you have a fair knowledge of two-stroke internal combustion engines. It is also as well to refrain from interfering with the ignition system or the carburettor until an expert has given you the necessary practical instruction. It is far better to go to your Phillips dealer as soon as you have a breakdown or think you can detect some irregularity in the running of your motor, as you may have full confidence in him. It also goes without saying that our advice is yours for the asking at any time.

2. If the engine completely fails to start

- (a) See whether there is any fuel in the tank.
- (b) See whether the fuel tap is turned on.
- (c) See whether the fuel feed pipe or the filters are clogged. To do this, first remove the pipe from the carburettor. If the fuel does **NOT** run through freely, examine the pipe and the filter of the fuel tap, and clean out whichever requires it. If the fuel **DOES** run through freely, neither the pipe nor the filter in the fuel tap can be clogged, so then try cleaning the filter in the carburettor union.
- (d) See whether the air filter of the carburettor is choked with dirt. Proceed as in Section A, No. 5.
- (e) Another possibility is that either the nozzle or the valve in the float chamber is clogged. Until you have had expert practical instruction in taking a carburettor to pieces you would be well advised to leave it to a mechanic to check this and remedy it if necessary.

3. If the sparking plug fails to fire

- (a) Check the plug itself.

It may have a carbon deposit, i.e., a layer of burnt oil may have been deposited on the electrodes (the two pins at the ends of the plug), producing a short circuit. In this case, clean the electrodes with a wire brush, or penknife if necessary.

The gap between the electrodes (.020 in./0.024 in.) may have altered. This may be remedied with a screwdriver if they are too close, or with a light tap of a hammer if they are too far apart.

- (b) The ignition cable connecting the ignition system to the terminal may be chafed and consequently not properly insulated, or the ignition coil damaged; the insulation of the condenser may be faulty. You should have these defects remedied by an expert.

- (c) It may be that it is only necessary to clean and re-set the contact points in the ignition system. This, too, you should leave to the expert until you have received practical instruction and acquired the necessary skill.

4. If the engine gets too hot

- (a) You are probably using fuel with an incorrect proportion of oil, or oil of an inferior quality. Good quality oil should always be used in the right proportion to the petrol.
- (b) See whether the engine is covered with dirt, particularly between the cooling fins, with consequent poor cooling. Clean it !
- (c) The exhaust port and exhaust pipe may be congested, due to a carbon deposit. (See Section 4. 4).

5. If the engine "4-strokes" (i.e., misses every other cycle)

- (a) See whether the air filter is dirty, and clean it if necessary (see Section A. 5). There may also be too much oil in the fuel.
- (b) It is also possible that the float and float valve of the carburettor leak. Or the carburettor nozzle may be too large. Leave these to be checked by an expert.

6. If the engine uses too much fuel

- (a) First see whether the tank is leaking around the fuel tap. If it is, then fit a new joint washer. Check whether the fuel feed pipe leaks. If so, fit a new one.
- (b) There may also be a leak in the carburettor, the nozzle or jet in the carburettor may be too large, the ignition system not properly adjusted, the decompression valve leaky or the exhaust port and exhaust pipe congested due to carbon deposit. Leave it to your expert to find this out !
- (c) It could also be that your petrol mixture contains too much oil.

7. Decarbonising the power unit and silencer

After not less than 1,500 miles, poor performance and general sluggishness in your engine may show that it needs decarbonising. We cannot emphasise too strongly that there is no point in doing this before it is really necessary, and in fact 2,000 or even 3,000 miles may frequently be travelled before this point is reached.

We recommend that when this time comes, you arrange with your Phillips dealer to have this done by him, for he will have been selected as competent to perform such maintenance jobs as this, and will, moreover, have all the necessary tools and spare parts available.

If, however, you feel competent to undertake this job yourself, we suggest it be tackled in the following stages :

- (a) First obtain the following items from your dealer : Cylinder head gasket; Exhaust gasket; Asbestos packing and a 5/64 in. dia. \times 3/4 in. split-pin for the silencer.

- (b) Get together the necessary tools, namely a 10 mm. tubular spanner tubular plug spanner (1/2 in. B.S.F. size), pliers, an old knife or scraper, and a screw-driver. A wiper or clean piece of rag will also be useful.
- (c) Slacken off the clip-screw which attaches the decompressor actuating unit to the cylinder head, and remove this unit from the head.
- (d) Disconnect the H.T. (ignition) lead from the sparking plug and unscrew the plug from the cylinder head.
- (e) Remove the two exhaust pipe attachment nuts and washers, and take off the exhaust pipe and silencer.
- (f) Remove the four cylinder head nuts and washers, and lift the head from the cylinder barrel.
- (g) By turning the rear wheel with the clutch engaged, bring the piston to the position where it is just a little below the exhaust port, (whilst doing this, it is advisable to hold down the cylinder barrel).
- (h) Carefully scrape away the carbon deposit from within the exhaust port, finishing off by drawing a narrow strip of cloth through it to remove the loose carbon.
- (i) Bring the piston up to the top of its stroke, by turning the rear wheel with the clutch engaged, (hold down the cylinder barrel whilst doing this, otherwise it may move upwards with the piston).
- (j) Carefully scrape away the carbon deposit from the top of the piston, finishing off by wiping it clean.
- (k) Now scrape away the carbon deposit from inside the cylinder head, and wipe clean.

If you have reason to suspect that your decompressor valve is no longer gas-tight (i.e., if cylinder compression has been poor), this is now a good time to examine it, proceeding as follows :

- (l) Compress the decompressor spring and washer, and withdraw the split-pin from the cross-hole in the valve stem. Remove the decompressor valve from the cylinder head.
- (m) Clean out the decompressor port (which connects up to the exhaust port), taking care not to damage the valve seating of the cylinder head.
- (n) Examine the conical head of the decompressor valve. If it is burnt or pitted you will need a new one, but if it is in good condition it can be re-assembled into the cylinder head.

Now dismantle your silencer by removing the split-pin and castle-nut from the screwed centre-rod, and lifting out the internal parts. Clean them thoroughly, and with a piece of wire clear the apertures in the baffles inside the bottom end of the silencer body.

- (o) Re-assemble the silencer, using the new asbestos packing and split-pin.
- (p) Re-assemble the cylinder head to the cylinder barrel, using the new cylinder head gasket.

- (q) Replace the exhaust pipe on the front of the cylinder barrel, using the new exhaust gasket.
 - (r) Screw the sparking plug firmly back into the cylinder head, after having cleaned the points and set the gap to .020 in. (see Section C. 3a). DO NOT OMIT the copper washer from the bottom of the sparking plug. Re-connect the H.T. (ignition) lead.
 - (s) Return the decompressor actuating unit to its operating position on the cylinder head, and re-tighten the attachment clip screws.
- The engine is now ready for starting up.

D. TOOLS

It is essential that any work carried out on the Phillips Motorised Bicycle be done only with the correct tools (screwdrivers, pliers, spanners, etc.). In particular, the nuts and bolts by which the engine is secured should only be tightened with spanners of the correct size. If for any reason it becomes necessary to remove the flywheel, a special flywheel extractor is available. If in doubt consult your dealer.

E. SPARE PARTS

Spare parts are available only from authorised Phillips dealers. The engine and frame numbers must be quoted when ordering.

F. TAX AND INSURANCE — MOST IMPORTANT

Your Phillips Motorised Cycle must be taxed and insured, and the driver must be in possession of a driving licence before he may actually ride the motorised cycle on the public highway.

If you are not the holder of a current driving licence, then you must apply for a PROVISIONAL LICENCE which can be obtained from your local Motor Taxation Dept., after which you must apply to take your driving test. (For further information, see your dealer who will advise you). The Licence-Holder is on the nearside front hub mounting.

Finally, we wish you many pleasant hours on your Phillips Motorised Cycle. Treat it with care and attention and it will give you long and faithful service in return.



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