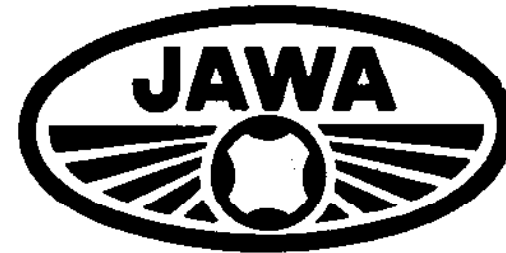


# ULTRA-LIGHTWEIGHT MOTORCYCLE



**50 c. c. model 555**

**SPECIFICATION AND SERVICING  
AND MAINTENANCE INSTRUCTIONS**

<b>Model</b>	<b>555</b>
<b>Cylinder capacity</b>	<b>49.9 c. c.</b>
<b>Bore</b>	<b>38 mm</b>
<b>Stroke</b>	<b>44 mm</b>
<b>Engine output</b>	<b>2.2 HP at 5500 r. p. m.</b>

1958

**MOTOKOV • PRAHA • CZECHOSLOVAKIA**

[JawaMoped.com](http://JawaMoped.com)



1. JAWA 50 ultra-lightweight motorcycle, model 555 — from the right.



2. JAWA 50 ultra-lightweight motorcycle, model 555 — from the left.

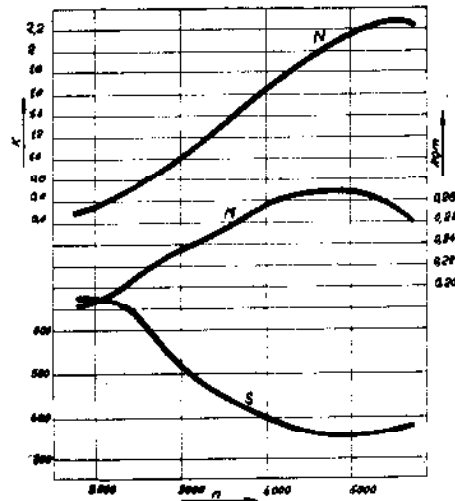
The ultra-lightweight motorcycle which you have bought is an improved version of the JAWA 50 c. c., ultra-lightweight model 555. Its up-to-date design, higher engine output, improved springing and perfect protection of the rider are the guarantee of reliability, riding comfort and easy handling of this machine.

This manual will help you to become acquainted with your machine, to know its components and their operation. It will advise you on maintenance and how to repair possible minor defects. In your own interest rely on the manual for information, so as to prevent accidental damage to your machine! Accept our best wishes for thousands of pleasant and joyful miles on your new model.

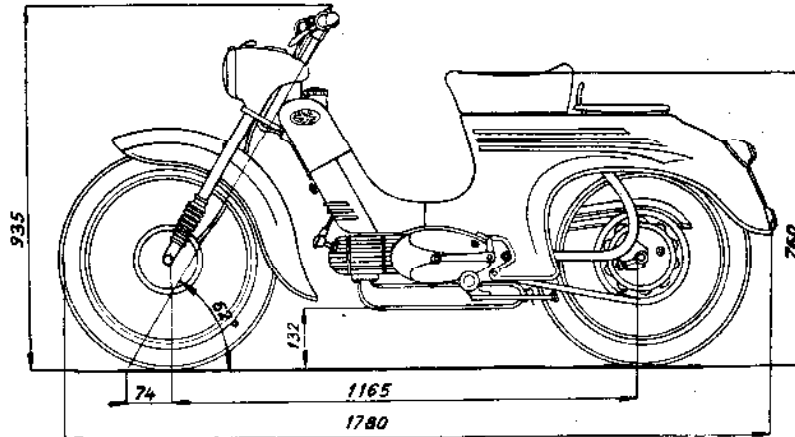
## INDEX

I. <i>Specification and driving instructions</i> . . . . .	7
1. Technical data . . . . .	7
2. Description of motorcycle . . . . .	9
3. Description of electrical equipment . . . . .	10
4. Running in a new motorcycle . . . . .	15
5. Driving instructions . . . . .	16
6. What to avoid . . . . .	19
II. <i>Maintenance</i> . . . . .	21
1. Cleaning the motorcycle . . . . .	21
2. Lubricating the motorcycle . . . . .	22
3. Adjusting the brakes . . . . .	23
4. Tyres . . . . .	27
5. Adjusting the chain . . . . .	28
6. Adjusting the clutch . . . . .	28
7. "JIKOV" 2914 carburetter . . . . .	29
8. Maintenance of electrical equipment . . . . .	30
9. Decarbonisation . . . . .	32
III. <i>Dismantling and assembling without the aid of special tools</i> . . . . .	33
1. Removing the front wheel . . . . .	33
2. Removing the rear wheel . . . . .	33
3. Replacing the wheel ball bearings . . . . .	34
4. Replacing the chainwheel ball bearing (6004-20/42 × 12) . . . . .	34
5. Removing the cylinder head and cylinder barrel . . . . .	35
6. Replacing the piston rings . . . . .	37
7. Removing the saddle . . . . .	37
8. Dismantling the twist grip . . . . .	37
9. Dismantling the headlamp . . . . .	37
10. Dismantling the front fork . . . . .	38
11. Pivoted rear fork . . . . .	38
12. Removing the cowls . . . . .	39
13. Removing the engine from the frame . . . . .	40
IV. <i>Dismantling with the aid of special tools</i> . . . . .	41
V. <i>Defects, causes and rectification</i> . . . . .	41
Description of two-stroke engine operation . . . . .	45

## I. SPECIFIKATION AND DRIVING INSTRUCTIONS.



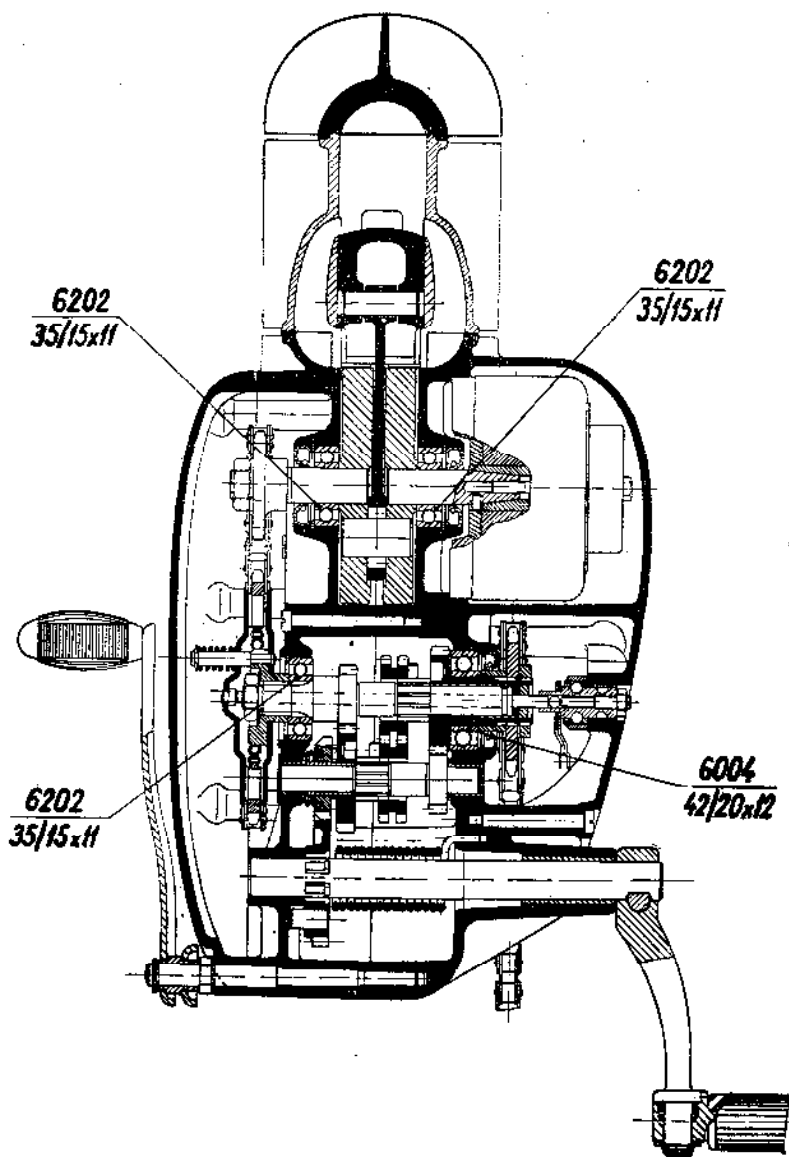
3. Power output, torque and fuel consumption diagram with regard to r. p. m.



4. Motorcycle — dimensions.

### 1. Technical data.

Engine	Two-stroke, air-cooled
Number of cylinders	One
Bore	38 mm
Stroke	44 mm
Cylinder capacity	49,9 c. c.
Compression ratio	6,6 to 1
Engine output	2,2 BHP at 5 500 r. p. m.
Maximum noise level	80 dB
Fuel tank capacity	7½ pts. (3,5 litres)
Maximum speed	37 m. p. h. (60 km p. h.)
Maximum climbing ability	30%
Weight — dry	119 (+ 6,5) lbs (54 kg/+ 3)
incl. fuel	126 (+ 6,6) lbs (57 kg/+ 3)
Carrying capacity (payload)	286 lbs (130 kg)
Weight of fully laden machine	312 lbs (220 kg)
Front wheel spindle maximum load	154 lbs (70 kg)
Rear wheel spindle maximum load	257 lbs (117 kg)
Primary drive by chain	9,5 × 5,8 in.; 44 links
Final drive by chain	12,7 × 5,2 in.; 111 + 1 link
Drive ratios: primary	2,43 to 1 (34/14 T)
final	4,23 to 1 (55/13 T)
bottom gear	2,94 to 1 (24/14 × 24/14 T)
second gear	1,716 to 1 (24/14 × 19/19 T)
third gear	1 to 1 (direct)
Overall gear ratios: bottom gear	30,22 to 1
second gear	17,64 to 1
third gear	10,28 to 1
Overall kickstarter ratio	7,74 to 1
Internal expanding brakes	dia 125/20
Braking distances from 25 m. p. h. (40 km p. h.)	
hand brake	101 ft. (30,8 metres)
both brakes applied	50 ft. (15,4 metres)
Front wheel suspension travel	90 mm
Rear wheel suspension travel	50 mm
Carburettor	JIKOV 2914 HZ
Wheels — size of rims	1,50 A × 2 in.
size of tyres	2,5 × 16 in.
Speedometer	PAI, dia 46



5. Engine 50 c. c., model 555 — sectional view.

## 2. Description of motorcycle.

The ultra-lightweight 50 c. c. — model 555 is a solo motorcycle suitable for carrying one person. It is an improved version of the popular JAWA 550 model. It has a higher power output, higher speed, better suspension and gives perfect protection to the rider. Its design is purposeful and its appearance graceful.

The two-stroke, air-cooled internal combustion engine with inverted scavenging is in principle identical to the 550 model. Its higher output has been obtained by modifying the ports and by using the JIKOV 2914 carburetter. The engine is well balanced within its extent of revolutions, its noise level is within the prescribed limits, and it is capable of performing at maximum output for long periods.

The exhaust silencer ensures efficient silencing. The noise does not exceed 80 dB at maximum engine revolutions.

The exhaust silencer can be dismantled.

The one-plate clutch runs in an oil bath. The cork lined clutch plate forms the chainwheel of the primary drive. The clutch is controlled by a hand lever on the L. H. side of the handlebars.

The gearbox is of unit construction with the engine. The three gears are suitably selected for flat and hilly ground.

The gear shifting is foot operated by means of a lever on the L. H. side of the engine.

The power transmission is effected by means of chains.

The primary chain — crankshaft to gearbox — is fully enclosed by the L. H. crankcase cover and runs in an oil bath.

The secondary chain — taking the torque from the gearbox to the rear wheel — is on the R. H. side of the motorcycle and is partially protected by a cover.

The JIKOV 2914 carburetter is located above the cylinder barrel and is enclosed by the main frame tube cowl. The choke diameter is 14 mm, the correct main jet 65. The throttle valve is controlled by cable from the twist grip on the R. H. side of the handlebars. The carburetter is provided with an air cleaner of dia 70, forming an induction silencer at the same time.

The wheels are identical — front and rear — and therefore interchangeable. The wheels have full width hub brakes and steel rims dia 16 in. Both are easily detachable after slackening the nut and pushing out the spindle.

The rear wheel brake is operated with the right foot, the front wheel brake is controlled with the right hand. Both are very efficient and reliable. The full width hub brake drums ensure perfect cooling.

The frame is open (without top frame tube) and of simple, sturdy construction. The open frame makes mounting of the machine easy and riding for women in normal clothes possible.

The fuel tank is a steel sheet pressing. Capacity 7½ pts., a fuel reserve of approx. 1 pint being secured by a two-position fuel tap with fuel filter. The fuel tank filler cap is of plastic material. An oil measure is fixed to the filler cap.

The saddle has a foam rubber padding. It is very comfortable even on long rides. It is hinged in front and the space underneath serves for the storing of

tools, tyre inflator and battery. When swung back, the saddle is secured automatically by a spring.

The *footrests* are fitted to the frame by means of a bracket. Their position will suit every rider.

The *front wheel suspension* is realized by a telescopic fork of simple design. The slider suspension travel is 90 mm.

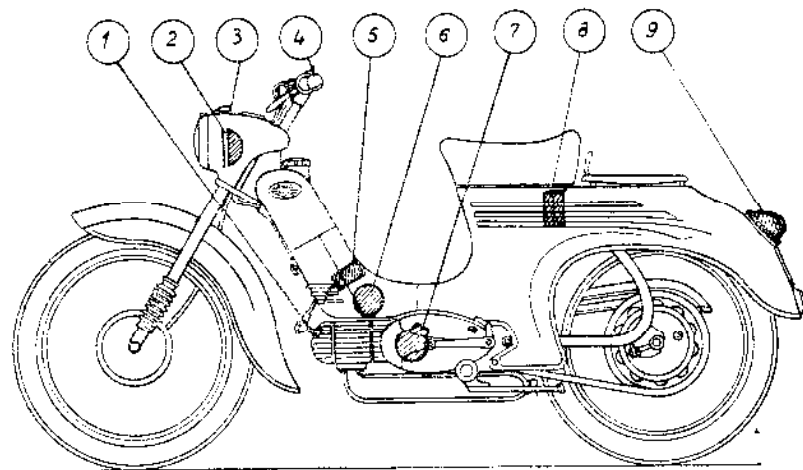
The *rear wheel suspension* is realized by a pivoted rear fork sprung by two springs secured to the frame underneath the saddle. The rear wheel operates on a circular path, the direct rear wheel spindle suspension travel being 50 mm.

The *stand* is fitted to the bottom of the engine block and ensures stability of the motorcycle on firm, level ground. It is not dimensioned for the rider's weight. As long as the motorcycle is on the stand, do not mount it to start the engine.

*Speedometer*: the model 555 is equipped with a speedometer with a mileage recorder. The speedometer is located in the headlamp, its housing diameter being 48 mm. The transmission of the drive from the driving box, located on the rear wheel spindle is taken by a flexible shaft enclosed in a steel casing.

### 3. Description of electrical equipment.

The *magneto* employed on the motorcycle is in principle a small A/C generator in which a permanent magnet fitted to the crankshaft rotates in the stator. The output



6. Electric current supply and appliances.

- |  |                            |
|--|----------------------------|
| 1. Sparking plug                       | 6. Electric horn           |
| 2. Headlamp                            | 7. Magneto (on R. H. side) |
| 3. Light and ignition switch           | 8. Electric horn battery   |
| 4. Dip switch and electric horn button | 9. Tail lamp               |
| 5. Ignition coil                       |                            |

of the magneto is 20 W, voltage 6 V. The permanent magnet is of special steel. It has two pole extensions covering the ring of the permanent magnet and held in a light alloy casting. The electric current for ignition and lighting is taken from the coils. The winding is two phase with eight coils. The current induced in the four coils in one phase supplies through the contact breaker the primary winding of the independent ignition coil. The four coils of the second phase supply the current for the lights. Both branches, i. e. ignition and lighting, are electrically independent of each other and do not affect one another.

The *stator* with the coils is held to the crankcase by two brackets and M 5 screws. *The stator can be rotated through 20° for ignition advance setting. The ignition advance should be 2.8 to 3.1 mm before TDC.*

The *stator cover* forms the contact breaker complete (consisting of: the base plate, condenser, fixed contact, contact breaker arm and lubricating felt pad).

*Never rotate the contact breaker complete* in order not to shift the magnetic field and make the spark weaker. The correct position of the contact breaker complete is located in the Works when setting the magneto. The fastening screws of the contact breaker complete are secured by red paint. If the securing paint has been tampered with, the manufacturers take no responsibility for possible damage, burning or faulty operation of the electrical equipment.

The *contact breaker point gap* is set by shifting the contact plate in relation to the contact breaker arm. The contact breaker point gap should be approx. 0,4 mm. (For detailed description see Part II, para 8).

The *terminal base* — fitted to the stator, has the following terminal numbers:

- "15" — for the ignition coil lead
- "55" — for the light switch lead

The *rotor* is fitted to the taper of the crankshaft (its position is marked by an arrow) and held by a M 5 × 55 screw with a hexagonal head and cut. The screw fastens also the cam.

**Warning:** When removing the stator a steel sheet ring has to be slipped immediately over the rotor to prevent demagnetisation of the magnet.

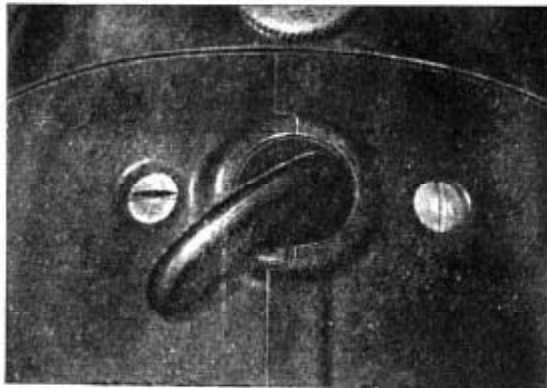
The *ignition and light switch* is located in the headlamp and has three positions obtained by shifting the lever (Fig. 7).

The *dip switch*, containing also the electric horn button, is fitted on the L. H. side of the handlebars. By means of the dip switch the main beam is dipped and vice versa. The dip switch contacts are made so as to ensure that the tail lamp bulb is always under current at the same time as one filament of the main bulb. This prevents burning of the tail lamp bulb.

The *ignition coil* 6 V is fitted to the frame of the machine under the fuel tank. It transforms the 6 V current to high tension required for the spark on the sparking plug points.

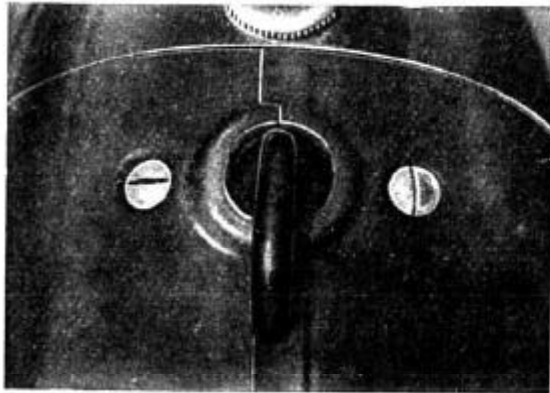
The *sparking plug* used is of the PAL 14/175 type. The sparking plug lead has a terminal with an ignition suppressor.

The *headlamp* dia 110 mm with two filament bulbs — 6 V — 15/15 W — controlled by the dip switch gives the main beam and dipped beam light.

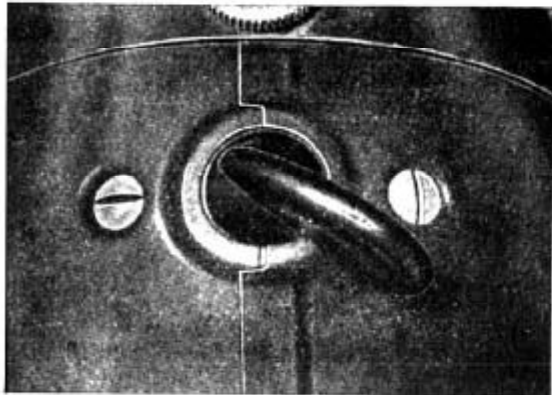


7. Electric wiring diagram and ignition lever positions.

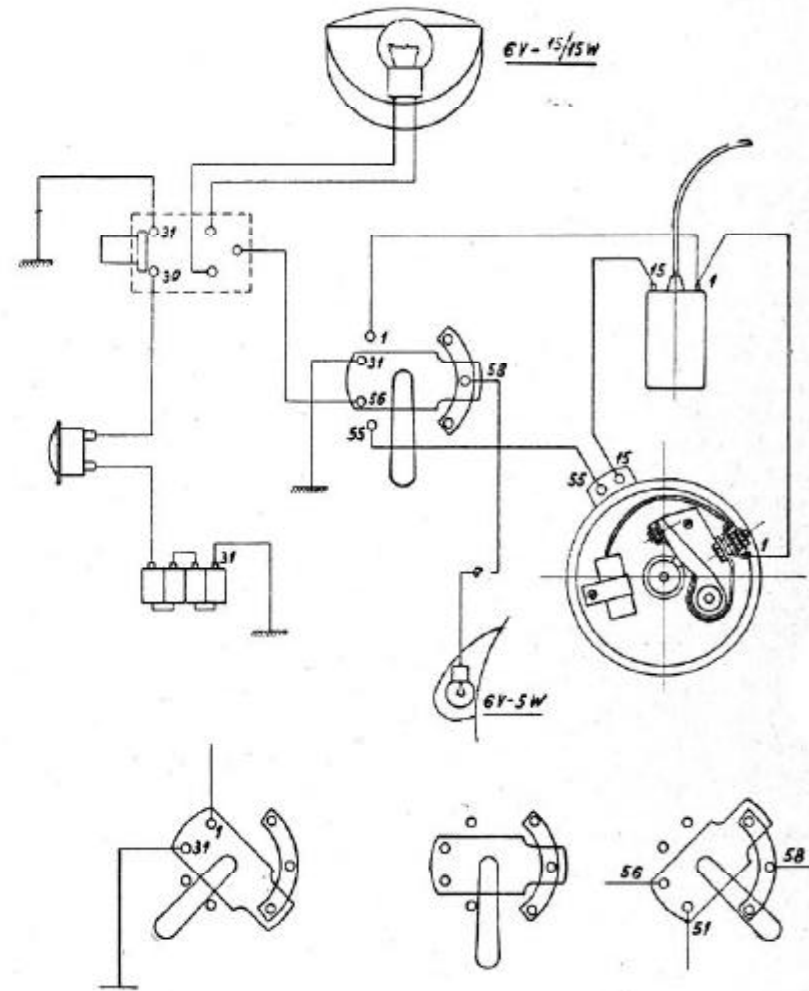
a) Engine off -- cut out



b) Day riding



c) Night riding.



7. Electric wiring diagram.

For correct lighting check the lights against a vertical wall at a distance of 11 yds (10 metres) from the headlamp on which a horizontal line should be drawn at the level of the headlamp centre above ground.

The *dipped beam* — the top edge of the light must be 4 to 6 in. (10 to 16 cm) below the horizontal line.

The *main beam* — its middle beams should reach the wall max. 2 in. (5 cm) above the line and min. 4 in. (10 cm) below the line. In horizontal direction the headlamp should be adjusted in accordance with the middle beam which should be in the axis of the machine. The check should be carried out on level ground with the tyres inflated as prescribed and the rider sitting on the machine. The required intensity of light 0.25 lux, measured on the vertical wall 6 in. (15 cm) above ground and 8 ft. (2.5 metres) on both sides of the axis of the machine is guaranteed with the prescribed bulbs.

The *tail lamp* is equipped with a 6 V—5 W bulb.

**Warning:** Should bulbs of other values be employed, there is danger of their burning or the possibility of their not giving enough light.

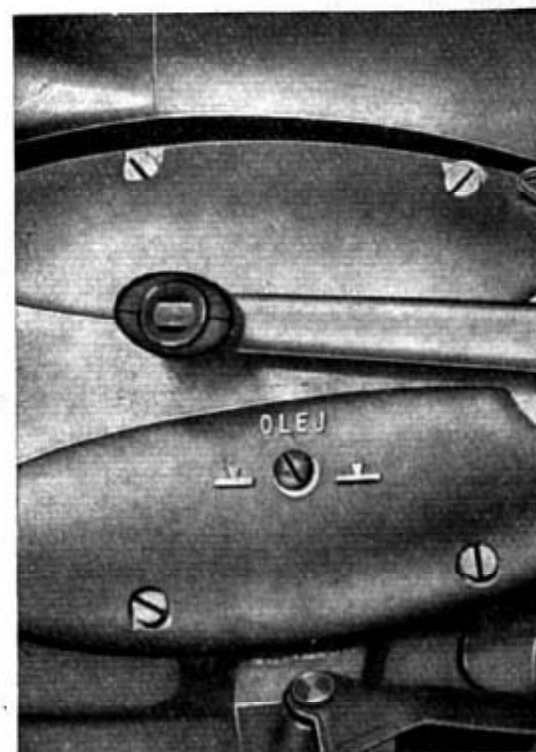
The *electric horn and battery*. The electric horn is fitted to the frame under the fuel tank. It is supplied with current from the battery located in the compartment under the saddle. The battery consists of 4 dry cells connected in line. It will stand several thousand signals on the hooter. One pole of the battery is earthed.

The *leads*: The majority of leads are of 1 sq. mm. section. The colours of the leads indicate the following connections:

- Green lead . . . . . connection between the magneto terminal "15" and the ignition coil.
- White lead . . . . . connection between the magneto terminal "55" and the light switch in the headlamp.
- Red lead . . . . . light switch terminal "56" to handlebar dip switch.
- Blue leads . . . . . handlebar dip switch to headlamp.
- Yellow lead . . . . . headlamp light switch terminal "58" to tail lamp.
- Green lead . . . . . connection of the battery via the horn to the dip switch horn button.
- Black leads . . . . . earthing of the battery, switch ("31") and dip switch and connection of the ignition coil with the contact breaker and the headlamp switch ("1").

#### 4. Running-in a new motorcycle.

When taking over a new machine, the customer is advised to check the equipment of the motorcycle (tool kit) and the oil level in the gearbox. The oil level can be checked through the oil level inspection hole, closed by an oil level screw M 6 × 8 (Fig. 8). The dry cell battery to feed the electric horn is supplied with the machine and it is automatically connected by placing it in the container and the lid closed. Check the connection by sounding the electric horn.



8. Oil filling and inspection hole.

Correct running-in affects the performance, fuel consumption and life of the new motorcycle greatly.

The following instructions should be observed:

- a) Mix the petrol mixture in the prescribed ratio:  
Before covering the first 600 miles (1000 km) 16 to 1, i. e. 7 ozs. oil to 5¼ pts. petrol (3/16 litres oil to 3 litres petrol),



after the first 600 miles (1000 km) 24 to 1, i. e. 4 ozs. oil to  $5\frac{1}{4}$  petrol ( $\frac{1}{3}$  litres oil to 3 litres petrol).

The oil measure, combined with the fuel tank filler cap, has a capacity of 1,5 liquid ozs. ( $\frac{1}{24}$  litres). To obtain the correct mixture add 2 full measures of oil to  $3\frac{1}{2}$  pts. of petrol (1 full measure to 1 litre of petrol).

- b) Before covering the first 300 miles (500 km) do not open the throttle more than half way.
- c) On long uninterrupted rides cool the engine by opening and closing the throttle from time to time.
- d) When stopping keep the engine running at the lowest revolutions. Do not use the bottom and second gear for too long.
- f) Check periodically all screws and nuts for slackness.
- g) Drain the oil from the gearbox after the first 300 miles (500 km). Rinse the gearbox with rinsing oil and fill with fresh oil (see Part II, para 2).
- h) After the first 300 miles (500 km) the throttle may be opened by more than half, but only for short periods.
- i) Change the oil for the second time after 1000 miles (1500 km) when the machine can be considered as run-in; careful maintenance is necessary, however also after the engine has been run-in.

#### 5. *Driving instructions.*

##### A. *Before starting:*

1. Make sure there is *fuel in the fuel tank* (the filler cap is opened anticlockwise; after having run-in the machine mix the fuel with oil in the ratio of 24 to 1 and use the strainer when filling the tank).
2. Check the *brakes, lights and electric horn.*
3. Check: the *spares* (spare tube, sparking plug, bulbs), *tools* (tyre inflator, spanners).
4. Check the *tyre pressure* (it should be 14 and 21 lbs. sq. in. — 1.00 + 1.5 atm.).

##### B. The *controls* are located as follows:

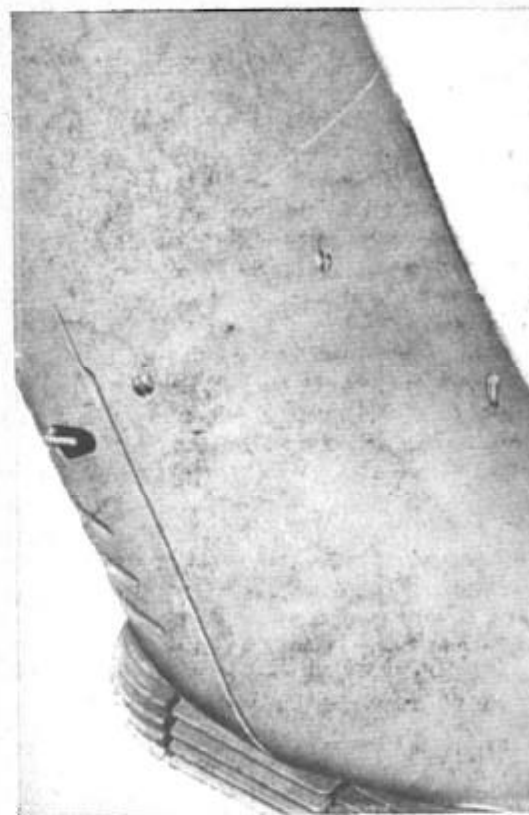
*Throttle twist grip* — R. H. side of the handlebars (right hand).  
*Clutch* — lever on the L. H. side of the handlebars (left hand).  
*Starter lever* — R. H. side of the engine (right foot).  
*Gear change lever* — L. H. side of the engine (left foot).  
*Front wheel brake* — lever on the R. H. side of the handlebars (right hand).  
*Rear wheel brake* — pedal on R. H. side of the engine (right foot).  
*Electric horn* — button on the L. H. side of the handlebars (left hand).  
*Dip switch* — on the L. H. side of the handlebars (left hand).  
*Ignition and light switch* — on the headlamp nacelle.

##### C. *Starting the engine:*

1. Make sure the gear change is at neutral.
2. Open the fuel tap (Fig. 9).
3. Flood the carburetter by pressing the tickler pin (Fig. 22).
4. Push the ignition switch lever (in the headlamp) into the middle position (Fig. 7).
5. Start the engine by kicking down the starter lever (in the direction of travel).

##### D. *Riding:*

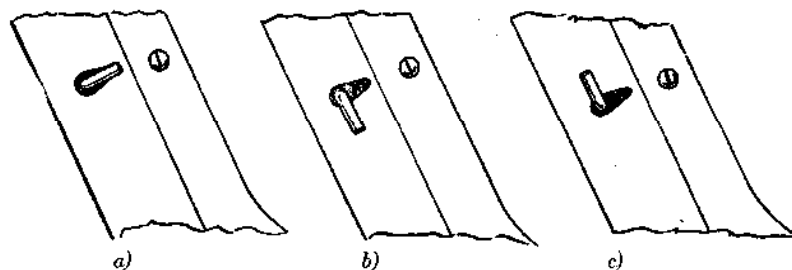
- A) *Starting:* Press the clutch lever. With the tip of the left foot depress fully the gear change lever and release it. The lever will return immediately to its original position. At the same time open the throttle gradually and release slowly and gradually the clutch lever (especially in the second half of its travel, when the engine starts pulling). As soon as a speed of 7 miles (10 km) is attained, engage the second gear in the following manner:



9, Fuel tap.

Press the clutch lever and close the throttle at the same time. With the tip of the foot lift the gear change lever fully and release it.

Release the clutch lever, opening the throttle at the same time. The two movements must be quicker than when starting from standstill. After attaining a speed of approx. 13 miles (20 km), engage the third gear in a similar way.



10. Fuel tap positions.

a) Fuel shut off, b) Fuel main supply open, c) Fuel emergency supply open.

**B. Climbing:** As soon as the engine, when climbing in third gear, starts losing revolutions it is necessary to engage a lower gear. To change down declutch and partly close the throttle pressing the gear change lever down. Changing down must be carried out more quickly than the engaging of higher gears, because the climbing motorcycle loses speed after declutching.

Engage the bottom gear in the same way.

When changing gears keep in mind that after engaging a higher gear the engine runs at lower revolutions than before.

**C. Braking:** When riding down-hill or when slowing down to stop, apply the brakes. On closing down the throttle use first the rear wheel and then the front wheel brake. If possible, apply the brakes carefully and gradually, as hard braking will cause the wheels to skid. Particular care should be taken when braking on slippery ground, or when coming from a metalled (paved) surface on to a dusty road.

**D. Stopping:** When slowing down to stop, close the throttle, declutch, apply the brakes and shift to neutral between the bottom and second gear. To engage neutral press (lift) the gear lever half-way. Stop the engine by turning the switch lever to the left (Fig. 7). After stopping do not forget to turn off the fuel tap (Fig. 10). Having finished riding for the day, let the engine run at low revolutions after shutting off the fuel until the fuel in the carburettor is consumed. The oil contained in the petrol mixture settles and might choke the jet.

**E. Night riding:** When riding in the dark (fog) switch on the headlamp and tail lamp by turning the switch lever to the right (Fig. 7). To dip the main beam use the dip switch lever on the L. H. side of the handlebars.

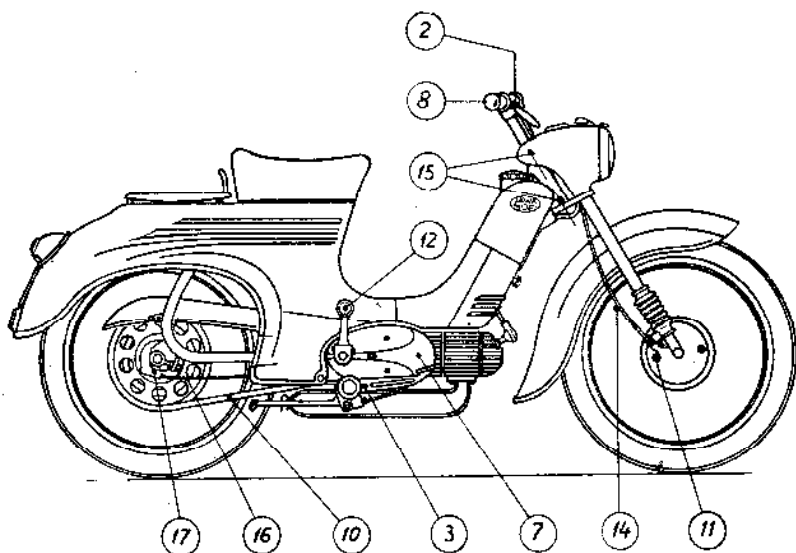
#### 6. What to avoid.

To let the engine race while the motorcycle is standing is harmful as it is not being cooled as when being ridden. Do not keep declutched for any considerable time, as the cork inserts of the clutch plate would be subjected to unnecessary wear. Never help the engine uphill by letting the clutch "slip", but change down in good time. Do not, however, ride for an unnecessarily long time in lower gear.

#### List of Necessary Tools for the Maintenance of the Type 555 Ultra-Lightweight Motorcycle.

- |                                |                              |
|--------------------------------|------------------------------|
| 1. Canvas tool kit             | 8. Screwdriver 3 mm          |
| 2. Double ended spanner, 14/17 | 9. Double screwdriver        |
| 3. Double ended spanner 9/10   | 10. Tyre levers              |
| 4. Box spanner 10              | 11. Grease gun               |
| 5. Handle dia 5                | 12. Tyre inflator            |
| 6. Combined spanner            | 13. Tyre inflator connection |
| 7. Feeler gauge                |                              |





13. Lubrication chart — R. H. side.

## 2. Lubricating the motorcycle.

The engine is lubricated automatically by adding oil to the fuel in the ratio of 1 to 24.

Fill the gearbox with approximately 450 c. c. of oil, according to the lubrication chart on page 19. Change the oil after 3 000 miles (5 000 km), having finished a trip while both the engine and oil are warm. Drain the oil through the draining hole at the bottom of the engine. Pour approximately 400 c. c. of rinsing oil (Fig. 8) into the gearbox filling hole and let the engine run for two to five minutes at low revolutions (ride a short distance). Change to all gears. Drain the rinsing oil into a clean container, let the impurities settle down and pour off the clean oil for further use. Pour in the fresh oil having tightened the draining screw, until it starts coming out through the inspection hole in the L. H. cover. When closing the filling hole do not forget the seals under the screws.

The clutch runs in an oil bath (oil from the gearbox).

The fork legs must be lubricated with the grease gun after every 300 miles (500 km).

The wheels (bearings) must be lubricated after every 3 000 miles (5 000 km). Dismantle the wheels (see Part III, para 3 a, b) and press the grease into the bearings using the grease gun.

The pivoted rear fork must be lubricated after every 300 miles (500 km) by several strokes of the grease gun (Fig. 17).

The primary chain is totally enclosed by the L. H. crankcase cover. It runs in an oil bath and does not require any attention. If worn, it should be replaced.

The secondary chain must be serviced after every 2 000 miles (3 000 km) in the following manner: rotate the chain until the connecting link reaches the rear chainwheel, loosen the spring clip with a screwdriver (Fig. 18), remove it and the chain is disconnected. Wash it in paraffin. After drying it, place the chain for about three hours in a slightly warm graphited grease; the warm lubricant will then penetrate the chain links better. Take the chain out, let the lubricant solidify and wipe off the excess grease. The chain is then ready to be fitted. When replacing the chain, the spring clip must face with its full curve the direction of the rotation of the chain.

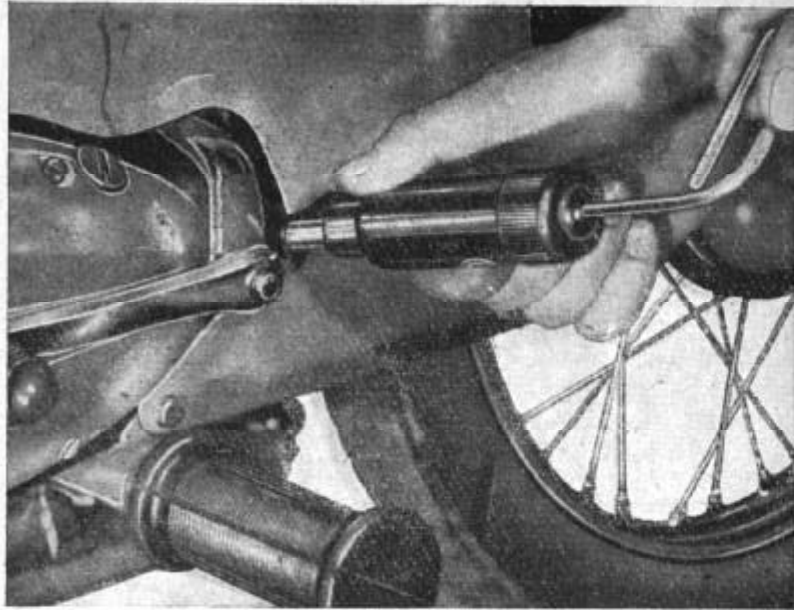
The magneto. After 2 000 miles (3 000 km) remove the R. H. side crankcase cover and lubricate with a few drops of oil the contact breaker arm pin (Fig. 20). Take care that no oil gets on the contact breaker points. The felt on the contact breaker base must be soaked with grease.

The clutch, front wheel brake, throttle and rear wheel brake control cables must be lubricated every 2 000 miles (3 000 km) with a few drops of oil.

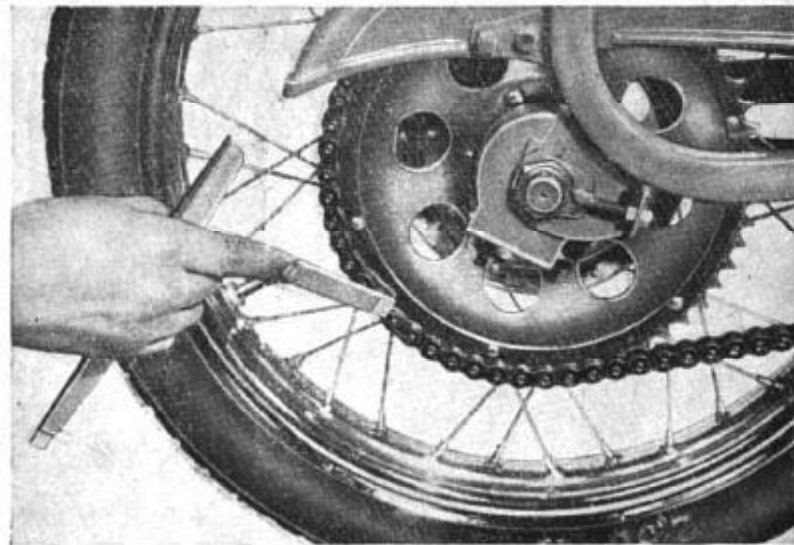
The speedometer drive must be lubricated every 300 miles (500 km) by means of the grease gun and the speedometer shaft after every 2 000 miles (3 000 km) with oil.

## 3. Adjusting the brakes.

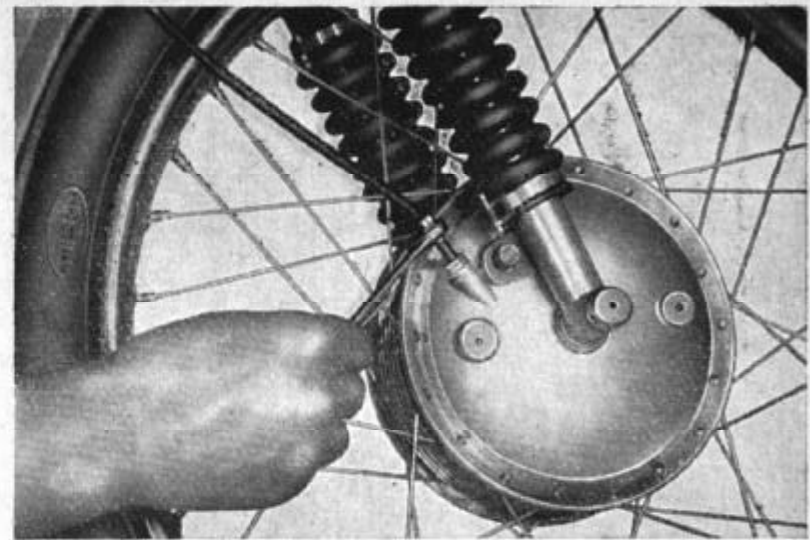
The brakes of the motorcycle are well dimensioned. They require only occasional adjusting, when the brake shoe lining is worn. The brakes are adjusted by lengthening (shortening) the brake control cable — (tightening) slackening the adjusting screw on the brake back plate (Fig. 20). Having adjusted the correct length of the control cable (the cable must be shortened if the brake lining is worn), tighten the adjusting screw lock nut to prevent its slackening. After adjusting the brakes check the wheels for free rotation.



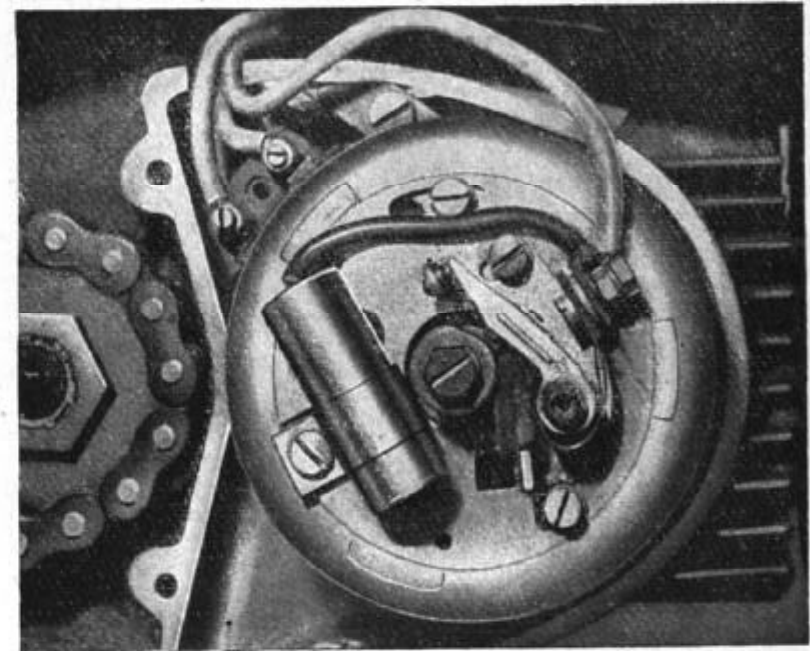
14. Fitting the tyre.



15. Chain adjuster.



16. Rim and tyre — sectional view.



23. Magneto.

LUBRICATION CHART (FIG. 12 AND 13).					
Miles km co- vered	Lubrication point	Point No	Total	Type of lubricant	
				Hot weather	Cold weather
300 (500)	Pivoted rear fork	1	1	Castrol ease grease CL	
	Control lever pins	2	2	Castrol SAE 50	
	Foot brake pedal pin	3	1	Castrol ease grease CL	
	Front fork	4	2	Castrol ease grease CL	
	Speedometer drive	17	1	Castrol ease heavy	
600 (1000)	Gearbox (topping up)	5	1	Castrol SAE 50	Castrol SAE 20
1000 (3000)	Wheels-bearings	6	4	Castrol ease heavy	
	Contact breaker pin	7	1	Castrol SAE 50	Castrol SAE 20
	Contact breaker felt	7	1	Castrol ease heavy	
	Twist grip	8	1	Castrol ease grease CL	
	Secondary chain	10	1	Castrol ease graphited	
	Brake cams	11	2	Castrol SAE 50	Castrol SAE 20
	Speedometer shaft	16	1	Castrol SAE 50	
3000 (5000)	Starter lever pin	12	1	Castrol ease grease CL	
	Stand pin	13	1	Castrol ease grease CL	
	Control cables	14	3	Castrol ease brake cable grease	
	Steering head bearing	15	2	Castrol ease heavy	
Petrol mixture 20 to 1			Castrol two-stroke self-mixing		

#### 4. Tyres.

The life of the outer tyre cover depends on the inner tube air pressure in relation to the load carried. As a rule the tyre has to be inflated so as to keep its original shape when under full load. Running on under-inflated tyres will result in the cover wall cord threads breaking.

The pressure in the front tyre should be 14 lbs. sq. in. (1 atm.) and in the rear tyre 20 lbs. sq. in. (1.4 atm.). It is advisable to check the pressure with a tyre pressure gauge. Attention is called to the fact that oil, petrol, and strong sunshine are harmful to the tyres. Examine the tyres from time to time and remove any foreign matter stuck in the tyre pattern. Check the tyre valves for leakage by unscrewing the valve cap and moistening the valve. Should any bubbles appear, the valve is leaky. In such a case, tighten the valve core, the slotted valve cap serving for the purpose. Should the valve still leak, screw out the valve core and replace it with a new one.

A punctured tube must be patched. Remove the tyre cover from the rim in the following manner:

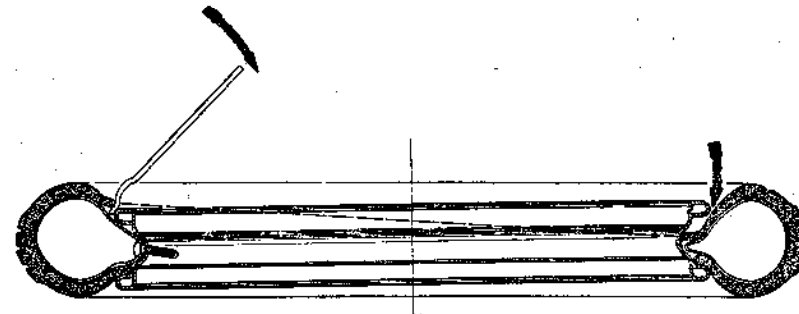
Unscrew the valve core to deflate the tyre completely.

Unscrew the nut securing the valve to the rim. Lay the wheel in horizontal position and press the tyre edge well into the rim base at a point diametrically opposed to the valve (Fig. 16).

Using the tyre levers slip the cover edge near the valve over the rim edge. (Fig. 14.) Take care not to pinch the tube and thus damage it. Having slipped all the cover circumference over the rim edge, press the valve completely out of the rim base and remove the tube.

Having screwed in the valve core and partly inflated the tube, the punctured spot will best be located by plunging the tube in water. Mark the punctured spot (e. g. with a copying pencil), dry the tube and repair it as follows:

Slightly rub the punctured spot with a piece of sand paper. Smear the rubbed spot with rubber solution. Allow the solution to dry and only then place the patch in position after first removing its protective coating. Press the patch well to the tube, particularly at its edges. Powder the patched spot with French chalk (talcum



17. Lubricating the pivoted rear fork.



18. Removing the chain connecting link.

powder) to prevent the tube from sticking to the inner walls of the cover. Examine the outer cover carefully and remove the nail if it is still in.

*Fitting the tyre:* Partly inflate the tube, insert it into the cover, one edge of which has remained in the rim, push the valve through the rim hole and secure it with its nut. (Do not tighten.) Then slip on the cover side over the rim edge, beginning opposite the valve and work both sides towards the valve with the hand or foot and tyre lever. Proceed carefully in order not to damage the tube. Tyre patching is an emergency remedy to be used only during a trip. For permanent repairs of tubes rely on vulcanisation by a repair shop. Rely also on a repair shop for repairing damaged tyre covers.

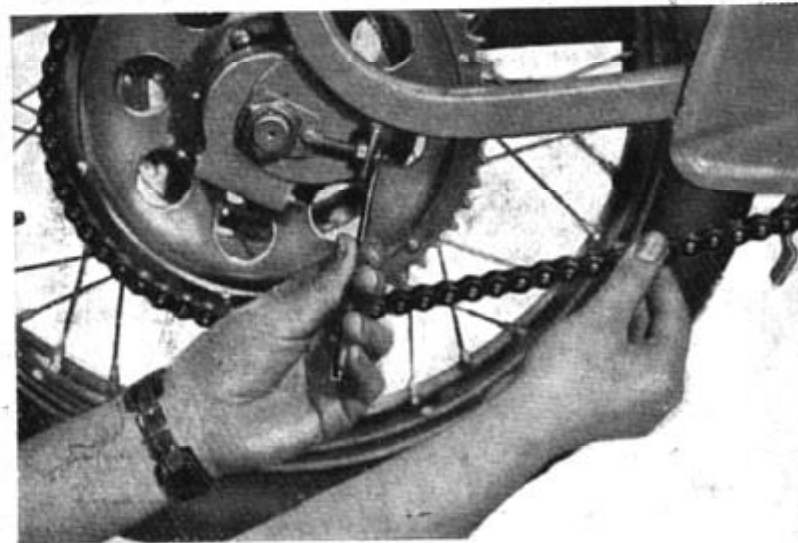
#### 5. Adjusting the chain.

Slacken the rear wheel spindle, i. e. the spindle securing nut № 19 and № 27 first. Then by even slackening of the nuts (№ 10) of the chain adjusters shift the rear wheel spindle. Never use force when slackening these nuts, as the threads might be damaged. After adjusting the chain, tighten the rear wheel spindle nut. The free movement of the chain should be  $\frac{1}{2}$  to  $\frac{3}{4}$  in (1 to 2 cm). Make sure that the wheels are in line. Check and, if necessary, adjust the rear wheel brake to prevent brake drag. Check the chain tension every 600 miles (1000 km).

#### 6. Adjusting the clutch.

The clutch operation cuts the torque transmission from the engine to the gearbox. The clutch is operated when changing gear to protect the teeth of the pinions

against shocks. The clutch runs in an oil bath and does not require any attention except adjustment of the play in the clutch control cable. The clutch lever must always be free. With time the clutch control cable will stretch and the play of the lever increase. To adjust the play slacken the grub screw lock nut and loosen the grub screw by one or two turns. After checking the clutch lever play, retighten the lock nut. When the lining of the clutch plate has become considerably worn and adjustment of the play by means of the grub screw is not sufficient, adjustment by means of the screw on the R. H. side of the engine block is necessary (Fig. 20).



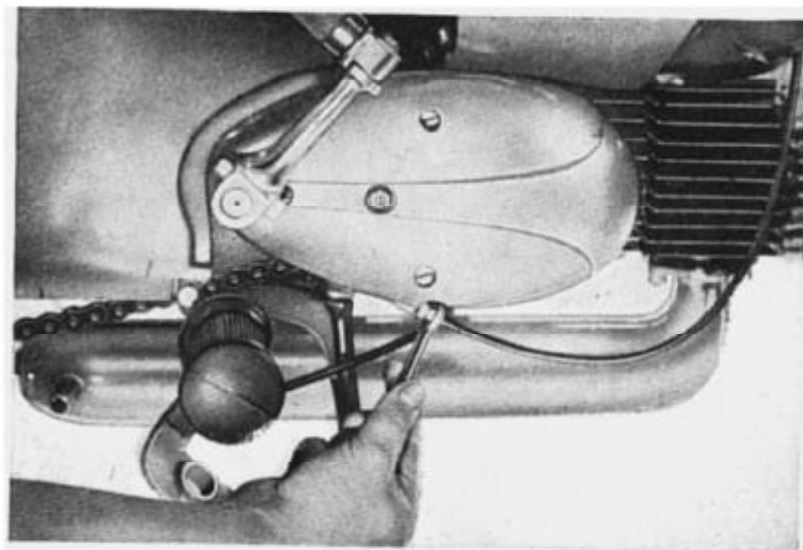
19. Adjusting the brakes.

#### 7. JIKOV 2914 carburetter.

The carburetter is set correctly at the Works. The operation of the carburetter is most efficient with jet 65. Therefore no setting is required, except cleaning from time to time.

For easy starting of the engine the idling must first be correctly set. This is done by shortening or lengthening the throttle cable — screw... (Fig. 21). Before starting the engine flood the carburetter with the tickler pin (Fig. 22). As a result of flooding the level of fuel in the float chamber and in the mixing chamber rises and the stream of air from the air cleaner induces more fuel and makes the mixture rich, improving the conditions for the starting of the engine.

If the jet becomes choked, unscrew the holding bolt with screen (using spanner № 17) and the jet screw (using spanner № 10), and rinse and blow through the jet. (Never clean the jet with a wire or a hard tool, as this might easily damage



20. Adjusting the clutch.

the delicate jet hole and thereby upset the fuel consumption and the running of the engine.) The air cleaner of the 2914 carburetter is controlled by a lever. Access of air can be limited by closing the cleaner strangler when starting the engine in cold weather only. When riding, the strangler must be open.

### 8. Maintenance of electrical equipment.

Check the *leads* from time to time and wind insulating tape round any spot with damaged insulation. The damaged spots might cause a short circuit.

The *sparking plug* must be cleaned from time to time, the carbon carefully scraped off and, if necessary, the point gap adjusted to 0.5 mm by carefully bending the point on the plug body.

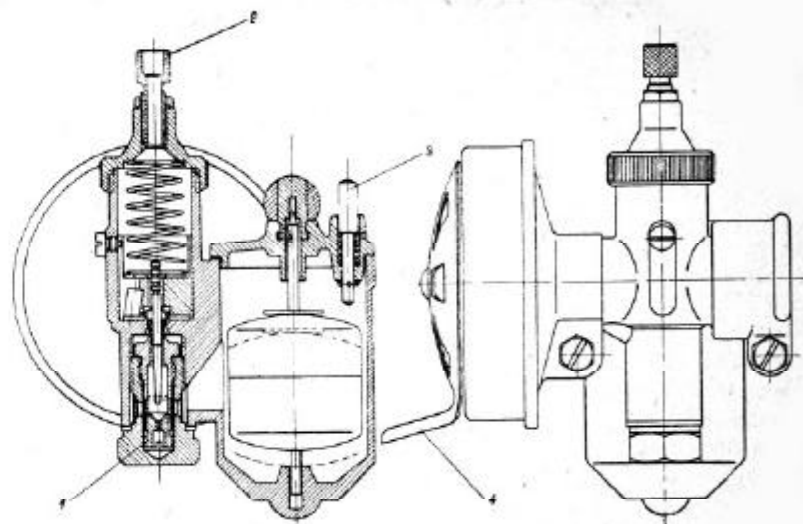
The *ignition coil* is fitted to the frame of the machine. It does not require any maintenance. Care should be taken only that the lead from the coil to the sparking plug is not damaged. Be careful when using water to wash the machine!

If required by the regulations the lead terminal at the plug must be provided with an ignition suppressor.

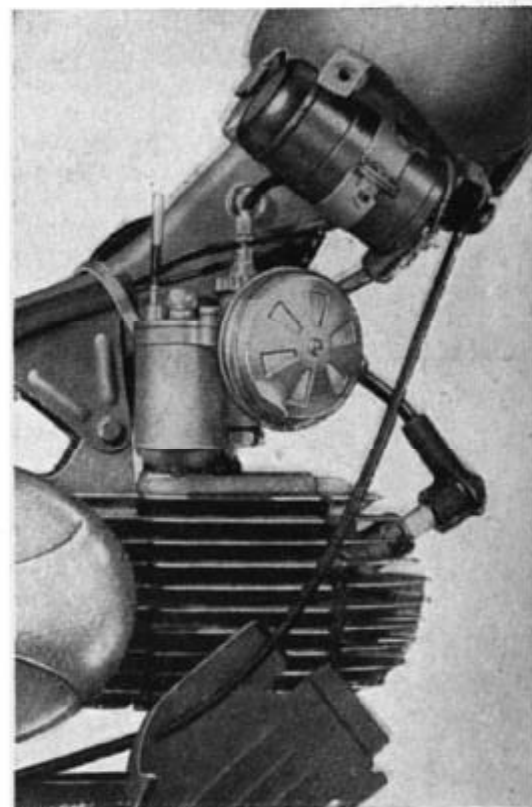
The *electric horn* requires no servicing; only when cleaning care must be taken to see that no water enters it. To adjust its strength, tighten or slacken the regulating screw on the bottom part of the horn cover.

The *battery* — if the battery is weak or discharged, replace all the dry cells.

The *magneto maintenance* consists in checking the contact breaker lubricating felt after every 2 000 miles (3 000 km) and making sure that it does not touch the



21 Carburetter.



22. Carburetter with air cleaner and tickler pin.



cam and that it is properly lubricated. After 3 000 miles (5 000 km) check the contact breaker point gap. Keep the magneto clean — beware of dust and oil.

#### *Setting the ignition.*

Rotate the crankshaft until the piston reaches its TDC (in its most forward position). In this position set the point gap to approx. 0.4 mm (check with the feeler gauge from the tool kit). Having set the point gap, retighten the fastening screw. Place a strip of cigarette paper between the contact breaker points and rotate the crankshaft until the paper passes between the points. At that moment the piston should be 2.8 to 3.1 mm before its TDC. This distance can be measured by means of a rod or depth gauge with the cylinder head removed. If the ignition advance is not correct, slacken the magneto clamps. After setting do not omit to retighten the clamps.

**Note:** The *contact breaker complete* must never be rotated in order not to disturb the length and quality of the spark.

#### 9. *Decarbonisation.*

It is advisable to remove carbon deposits after every 3 000 miles (5 000 km) for instructions regarding dismantling see Part III, para 4). Burnt fuel residues (carbon deposits) cause a drop in the engine output as well as excessive heating of the engine. Remove the carbon from the top part of the piston, cylinder head and exhaust ports by careful scraping. At the same time remove carbon deposits from the piston ring grooves (preferably with an old broken piston ring). When replacing the piston rings fit the rings into the same grooves in which they were before being removed. Having scraped off the carbon, wash the parts in question in clean petrol or paraffin.

Clean the exhaust silencer in the following way:

Unscrew the lock with perforated tube off the silencer back end. (The lock fastens also the spring bracket of the stand.) Clean the tube thoroughly with a wire brush. Scrape the carbon deposit on the inner side of the jacket with a suitably bent piece of wire.

24. *Rear wheel brake torque anchor.* →

### III. DISMANTLING AND ASSEMBLING WITHOUT SPECIAL TOOLS.

#### 1. *Removing the front wheel.*

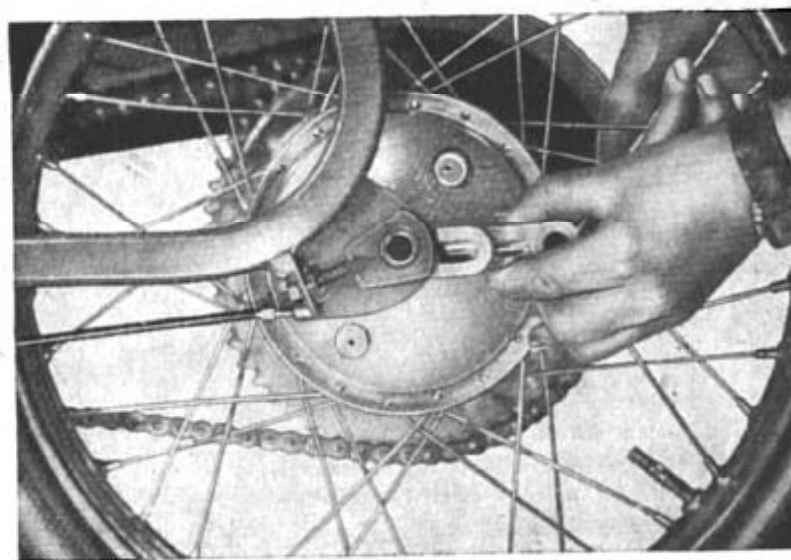
- a) Unscrew the spindle nut and remove the spring washer.
- b) Push out the front wheel spindle.
- c) Pull the front fork sliders apart and push out the brake torque reaction anchor on the back plate out of the opening in the slider and remove the wheel.

#### *Assembly:*

- A. Check the cable abutment in the brake cam lever.
- B. Pull the front fork sliders apart, place the wheel in position and push the brake torque reaction anchor on the back plate into the opening of the R. H. slider.
- C. Insert the front wheel spindle from the left.
- D. Slip on the spring washer, replace the nut and tighten it from the right.
- E. Bring the front fork to full depression several times.

#### 2. *Removing the rear wheel.*

- a) Unscrew the rear wheel spindle nut and remove the spring washer.
- b) Partly push out the spindle (inserting the steel rod in the hole of the spindle head) from the right.
- c) Remove the brake torque reaction anchor and the wheel.
- d) The spindle remains partly pulled out in the fork on the right.



**Assembly:**

- A. Check the cable abutment in the brake cam lever.
- B. Place the wheel with the brake back plate between the fork arms and insert the rear chainwheel pins in the holes in the rubber inserts.
- C. Between the wheel and the fork place the brake torque reaction anchor (Fig. 24), push the spindle home, slip the securing ring on and retighten the nut.
- D. Check the rear wheel and brake for correct operation.

**3. Replacing the wheel ball bearings.**

- a) Remove the wheel.
- b) Remove the seals on both sides of the wheel and on the L. H. side the ball bearing circlip.
- c) Push a thin rod through the hole of the left bearing and the distance tube and prop it against the inner edge of the left bearing. Tapping lightly on the rod press out the bearing and remove the distance tube.
- d) Knock out the left bearing, using a suitable piece of tubing.

**Assembly:**

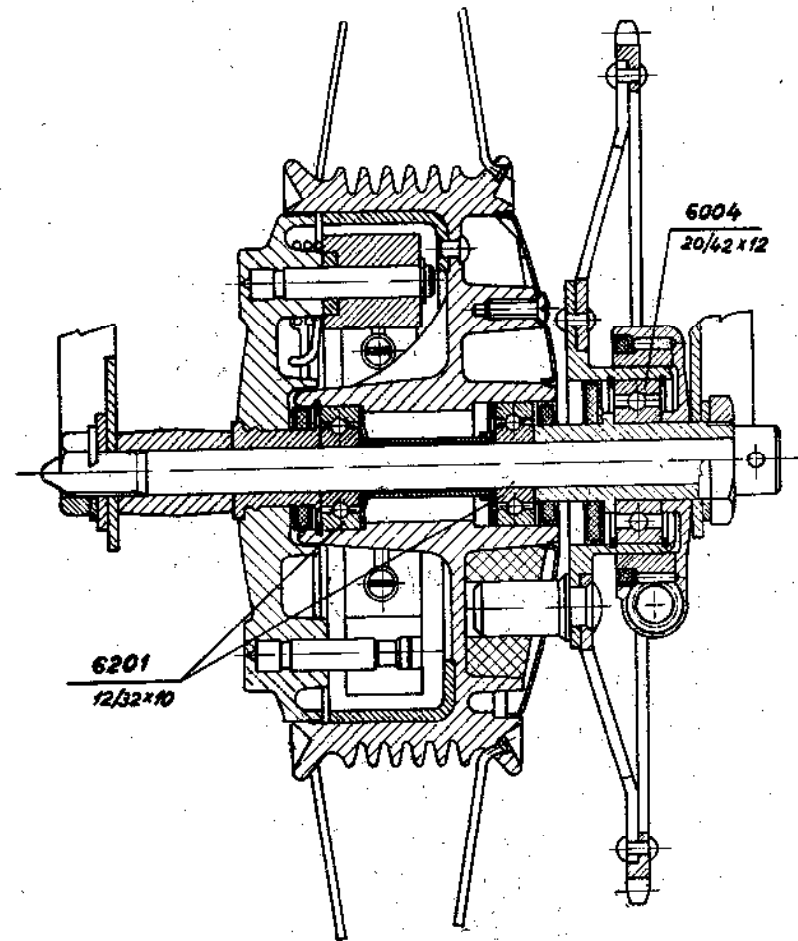
- A. Insert the metal ring from the left and, applying pressure to the outer bearing race, press the bearing in until the circlip can be placed in position.
- B. Place the distance tube from the right and press in the second bearing.
- C. Check whether the L. H. bearing rests on the circlip, then knock on the seals and fit the wheel.

**4. Replacing the chainwheel ball bearing.**

- a) Disconnect the chain and remove the wheel.
- b) Unscrew the nut on the R. H. side of the tube of the rear wheel spindle and remove the chainwheel.
- c) Remove the speedometer drive.
- d) Remove the chainwheel tube together with the seal.
- e) Take out the circlips and knock out the bearing.

**Assembly:**

- A. Place the L. H. circlip in position.
- B. Replace the bearing and place the R. H. circlip in position.
- C. Push in the tube and the seal from the left.
- D. Replace the speedometer drive on the right.
- E. Insert the tube end with thread into the fork and tighten the nut slightly.
- F. Check the rotation of the chainwheel.
- G. Having replaced the wheel, tighten the nut.



25. Rear wheel — sectional view.

**5. Removing the cylinder head and the cylinder barrel.**

- a) Disconnect the sparking plug lead and the exhaust silencer and, having removed the cowls, unscrew the carburetter.
- b) Unscrew the four cylinder head nuts  $\approx 10$ .
- c) Press the kickstarter lever down. A cylinder head stuck due to the carbon will be freed and thus easily removed.
- d) Move the piston to its BDC (rear position) and push out the cylinder barrel with the gasket.

- a) Cover the crankcase opening with a clean cloth to prevent dirt from entering the crankcase.

*Assembly:*

- A. Place a new gasket under the cylinder barrel.  
B. Put the cylinder barrel back.



26. Replacing the piston rings.

- C. Place a new gasket under the cylinder head.  
D. Tighten the four nuts  $\approx 10$ .  
E. Connect the sparking plug lead.  
F. Screw the carburetter, the exhaust silencer and the covers on.  
G. After riding a few miles (to warm the engine) tighten the cylinder head fast.

6. Replacing the piston rings.

- a) Remove the cylinder head and the cylinder barrel (Part III, para 5).  
b) The best way to remove the piston rings is to use three thin steel strips. Insert one strip under the piston ring in the middle and the two others under the piston ring ends (Fig. 26) and pull the ring off.

Replace the piston rings if the ring gap exceeds 0.8 mm (the correct gap being 0.2 mm). To check the gap, place a removed ring into the upper portion of the cylinder.

*Assembly:*

- A. Fit the piston rings one after the other (see Fig. 26).  
B. Check the play of the piston rings in the grooves by part-turning.  
C. Set the ring gaps against the pegs in the piston grooves.  
D. Replace the cylinder barrel and cylinder head. (Part III, para 5).

7. Lifting the saddle.

To lift the saddle pull its rear part slightly upwards and tip the saddle forward. The tools, spare parts and dry cell (to feed the electric horn) compartment is under the saddle.



27. Lifting the saddle.

8. Dismantling the throttle twist grip.

- a) Rotate the twist grip till the countersunk screw is revealed.  
b) Unscrew the countersunk screw and pull out the handlebar end plug.  
c) Pull off the twist grip.

*Assembly:*

- A. Slip on the twist grip, push in the plug and tighten the countersunk screw.  
B. Check the correct operation of the twist grip.  
C. The twist grip rotation can be adjusted with the screw in the metal retention cap.

9. Dismantling the headlamp.

The headlamp consists of two main parts; the rim with reflector and the nacelle. Removing the rim with reflector:

- a) Unscrew the fastening screw in the rim bottom.
  - b) Swing the rim with reflector upwards and take it off.
  - c) Disconnect the leads in the terminals if necessary.
- To get at the bulb there is no need to disconnect the leads; it is enough to press in and turn the socket.

When assembling, make sure that the rim sits well in the top part of the nacelle, before tightening the fastening screw.

To dismantle the telescopic front fork or the steering head the headlamp nacelle must be removed.

- a) Remove the rim with reflector and disconnect the leads.
- b) Unscrew the screws in the light switch, the screw in the rear part of the headlamp and both screws (≠≠ 10) above the steering crown and stem.
- c) Pull apart the headlamp nacelle halves.

When assembling take care not to pinch the leads:

- A. Fit the nacelle halves.
- B. Screw in the screws (≠≠ — 10).
- C. Tighten the light switch and screw in the headlamp rear screw.
- D. Connect the leads and replace the rim with reflector.

#### 10. Dismantling the front fork.

- a) Remove the headlamp nacelle (Part III, para 9).
- b) Disconnect the top clamps of the rubber sleeves.
- c) With a box spanner unscrew the nut ≠≠ 10 in the fork leg top cup and to make the work easier unscrew the plug as well.
- d) Pull out the slider with the coil spring downwards.

#### Assembly:

- A. Lubricate the sliders with the prescribed grease and replace the sliders with the coil springs.
- B. Replace the plugs and the nuts (≠≠ = 10), not forgetting the spring washers.
- C. Tighten the metal clamps of the rubber sleeves.
- D. Test the springing of the fork.
- E. To replace the headlamp see Part III, para 9.

#### 11. Pivoted rear fork.

Before removing the pivoted rear fork the following jobs must be carried out:

1. Remove the rear wheel (Part III, para 2).
2. Remove the cowls (Part III, para 12).

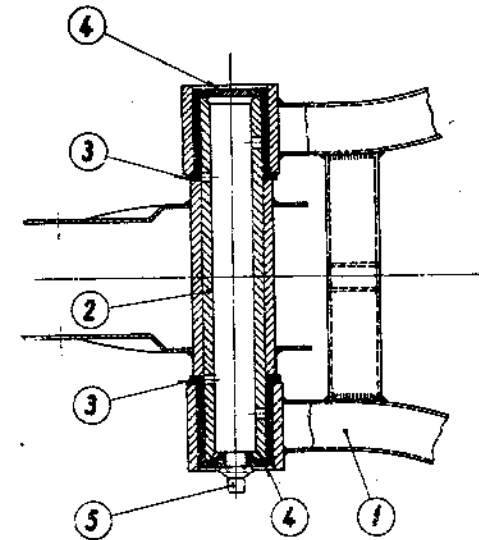
#### Dismantling:

- a) Lift the saddle and unscrew the nut ≠≠ 10 from the bolt fastening the spring. The fork will sink on the pin.

- b) Unscrew the lubricator on the pivoted rear fork.
- c) Screw a M 6 screw into the lubricator opening and, using this screw, pull out the pin lid. Push out the second lid to the other side.

The inside of the fork bearing can now be thoroughly cleaned and properly lubricated.

The next operation requires a puller, with which the pivoted fork pin can be pulled out (pushed out) and the dismantling is completed.



28. Pivoted rear fork bearing — sectional view.

#### Assembly:

- A. Having pressed in the fork pin, move the fork up and down several times to make sure it does not drag.
- B. Push on both plugs.
- C. Screw the lubricator into the left lid and lubricate the pin bearing with the grease gun.
- D. Screw the pressure spring to the saddle hinge. Do not omit to place the spring washer under the nut ≠≠ 10.

#### 12. Removing the cowls.

- a) Unscrew the four screws under the fuel tank, the knob of the lid, the screw in the middle of the cowl down above the engine and the screw behind the engine block cover from the two sides.

- b) Remove the saddle (unscrew the saddle hinge screws).
- c) Unscrew the two fastening screws under the saddle.
- d) Disconnect the tail lamp lead on the battery container.
- e) Remove the cowls (front and rear).

*Assembly:*

- A. Replace the cowls.
- B. Screw in all the screws.
- C. Replace the saddle.
- D. Connect the tail lamp lead on the battery container.
- E. Having ridden a few miles tighten all screws fast. (The cowl screws must be tightened also on a new machine after the first few miles.)

13. *Removing the engine from the frame.*

- a) Remove the cowls (Part III, para 12).
- b) Disconnect the fuel supply, the throttle and clutch cables, the sparking plug lead and the gear change lever rod.
- c) Disconnect the chain.
- d) Unscrew the three fastening bolts M 6 (≠≠ 10).
- e) Remove the engine.

*Assembly:*

- A. Replace the engine in the frame and tighten the three M 6 bolts.
- B. Connect the chain, the fuel supply, the throttle and clutch cables, the sparking plug lead and the gear change lever rod.
- C. Replace the cowls (Part III, para 12).
- D. Check the running of the engine and after a few miles riding tighten all the screws.

IV. DISMANTLING WITH THE AID OF SPECIAL TOOLS.

- 1. Dismantling the engine.
- 2. Dismantling the crankshaft and connecting rod assembly.
- 3. Dismantling the clutch and the primary drive.
- 4. Dismantling the gearbox.
- 5. Dismantling the gear change mechanism.
- 6. Dismantling the magneto.

These jobs require expert skill and special workshop equipment. It is therefore preferable to have them carried out in a specialized repair shop.

V. DEFECTS, CAUSES AND REMEDIES

Trouble		Location	Remedy
Lumpy running	Engine knocks	<p>Engine overheated.</p> <p>Plug points glow, faulty sparking plug.</p> <p>Cylinder head clogged with carbon.</p> <p>Over-advanced ignition.</p> <p>Exhaust silencer clogged with carbon.</p>	<p>Wait until engine has cooled, do not run at high revolutions. Replace sparking plug.</p> <p>Remove head and decarbo-nize.</p> <p>Adjust ignition.</p> <p>Detach exhaust silencer, dis-man-tle and decarbonize.</p>
	Regular sparking	<p>Water or oil in carburetter.</p> <p>Insufficient fuel supply.</p> <p>Temporary short circuiting caused by faulty plug lead.</p> <p>Weak mixture.</p> <p>Improperly mixed petrol.</p>	<p>Clean the carburetter.</p> <p>Open emergency supply tap, refuel, inspect inlet manifolds, clean the filler cap breathing hole.</p> <p>Tape crack in insulation or replace lead.</p> <p>Clean jet - adjust carburetter.</p> <p>Stir mixture properly before refuelling.</p>
	Irregular sparking	<p>Unsuitable sparking plug.</p> <p>Oiled sparking plug.</p> <p>Excessive spark gap.</p> <p>Dirty breaker points.</p> <p>Burnt breaker points.</p> <p>Improperly adjusted breaker points.</p> <p>Faulty condenser, engine runs regularly on low revolutions only, strong sparking between breaker points.</p> <p>Temporary short circuiting caused by faulty plug lead.</p>	<p>Replace sparking plug.</p> <p>Remove and clean sparking plug.</p> <p>By bending outer point adjust the gap to 0,019 in. (0,05 mm).</p> <p>Clean the point using a cloth soaked in petrol.</p> <p>File points using a fine file. Adjust to 0,0019 in. (0,05 mm).</p> <p>Replace condenser.</p> <p>Tape crack in insulation or replace the lead.</p>
Engine misfires			

Trouble		Location	Remedy
Engine will not fire, engine has stopped. Carburettor can be flooded	Compression regular	Engine overheated. Insufficient lubrication.	Allow engine to cool and keep it running at low revolutions. Take care that petrol is mixed properly at a ratio 24 : 1. Replace or adjust the cable.
	Sparking regular. Carburettor is in order	Throttle cable broken or has slipped out. Air leak between carburettor and cylinder.	Renew packing, or tighten mounting flange.
Engine lacks power (does not pull)	Carburettor out of order	Jet choked. Leaking float. Float stuck. Float needle does not sit properly.	Remove jet and clean it. Replace float. Loosen float. Repair or replace faulty needle.
	Permanent occurrence	Carbon accumulation in cylinder, head, exhaust and silencers. Insufficient fuel feed. Faulty ignition.  Improper carburettor setting (improper mixture). Throttle valve stuck.  Exhaust silencer clogged. Worn cylinder interior and piston.  Air leak in engine (crankcase halves or carburettor intake).  Faulty head gasket. Brake drums rubbed by brake shoes.	Remove head, barrel, exhaust piping, decarbonize.  Dismantle and clean piping. Adjust contact breaker point gap and ignition advance. Adjust idling, needle position and clean air filter. Loosen and adjust valve to open fully. Dismantle and decarbonize. Rebore cylinder, renew piston and rings, have piston condition of pin bearing checked (accredited workshop). Take both crankcase halves apart, clean joint faces, apply jointing compound and reassemble properly. Replace packing under carburettor mounting flange. Replace. Adjust brakes.

Trouble		Location	Remedy
Engine lacks power (does not pull)	Temporary occurrence	Fuel supply or cleaner partly clogged. Throttle cable sticks. Engine overheated.  Faulty sparking plug.	Clear supply passages or cleaner. Lubricate or replace cable. Allow engine to cool and keep running at low revolutions. Replace plug.
	Carburettor cannot be flooded	Empty fuel tank.  Fuel tap closed or partly closed. Cleaner above the tap clogged. Clogged pipe or carburettor screen.  Clogged fuel cap breathing hole on the fuel tank.	Transfer fuel reserve (sufficient for 20 miles/30 km), refuel at the earliest convenience. Open fuel tap.  Unscrew fuel tap and clean filter. Remove piping and blow it through, take out carburettor, dismantle jet and clean it. Clean filler cap breathing hole.
Engine will not fire — Engine has stopped Carburettor can be flooded	No spark in sparking plug	Spark at cable end	Oiled sparking plug. Damaged plug insulation. Short circuiting between sparking plug points. Plug points gap too wide.
		No spark at cable end	Remove plug and clean it. Replace plug. Adjust sparking plug gap to 0,019 in. (0,5 mm). Adjust gap to 0,019 in. (0,5 mm).
Engine will not fire — Engine has stopped Carburettor can be flooded	No spark in sparking plug	Ignition and light switch switched off. Faulty ignition coil. Dirty breaker points.  Burnt breaker points. Faulty breaker points.  H. T. lead broken or loose.	Switch on.  Replace ignition coil. Clean using a cloth soaked in petrol. File points using a fine file. Have points repaired or replaced. Tape insulation crack, replace lead at the earliest convenience.

Trouble		Location	Remedy
Engine will not fire — Engine has stopped	Carburettor can be flooded	No spark in sparking plug No spark at cable end	Burnt lead insulation. Faulty condenser. Stator winding insulation damaged. Water in contact breaker. Faulty bakelite lead terminal.
			Tape lead and replace as soon as possible. Replace. Refer to an accredited workshop. Blow out water, wipe off carefully allow to dry. Replace terminal.
Engine will not fire — Engine has stopped	Carburettor can be flooded	Sparking regular Poor compression	Broken piston ring. Jammed piston ring. Sparking plug washer leaks. Faulty cylinder head gasket. Jammed piston.
			Remove ring and fit a new one. Remove ring, clean it and replace. Replace washer. Replace gasket. Dismantle and repair accredited workshop).

## TWO-STROKE ENGINE OPERATION.

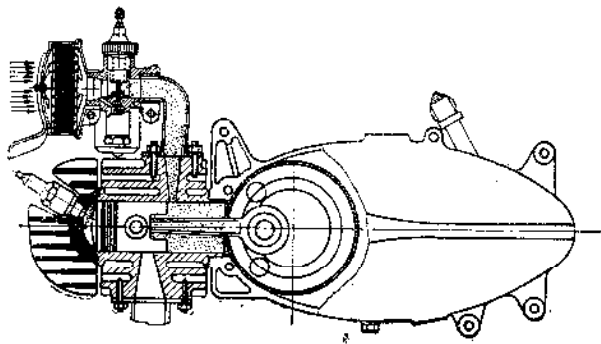
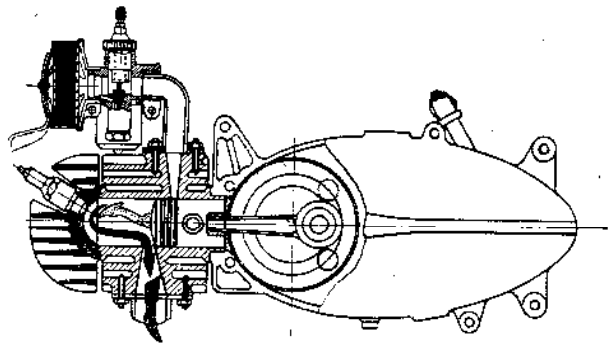
The two-stroke petrol engine is particularly suitable for motorcycles. Having few moving parts it is subject to less wear and consequently is more reliable in operation. The working action of a two-stroke engine is accomplished in a single crankshaft revolution (i. e. two piston strokes).

### 1. Piston moves upwards:

The piston closes first the transfer ports, then the exhaust port and causes compression of the mixture in the compression space of the cylinder head. A few moments before the piston reaches its T. D. C. position the compressed mixture is ignited by the electric spark from the sparking plug. In the meantime a vacuum (underpressure) is created underneath the piston, causing induction of fresh mixture from the carburettor to the interior of the crankcase.

### 2. Piston moves downwards.

After ignition of the mixture the actual working stroke of the piston begins (transmitting the power of the expanding gases by means of the crankshaft mechanism and transmission to the motorcycle rear wheel). The top edge of the piston opens first the exhaust port and exhausting of the burnt gases takes place. Then the top edge of the piston lights open the two transfer ports. Under the piston and in the interior of the crankcase there is fresh mixture, compressed by the piston during its downward stroke. Through open transfer ports this fresh mixture now flows into the cylinder, directed by the shape of the port: the two streams meet, reach the opposite cylinder wall and proceed towards the cylinder head which directs them to the exhaust ports side. The fresh mixture fills the cylinder and at the same time presses out the remaining burnt mixture (scavenging).



29. Two-stroke engine operation diagram.