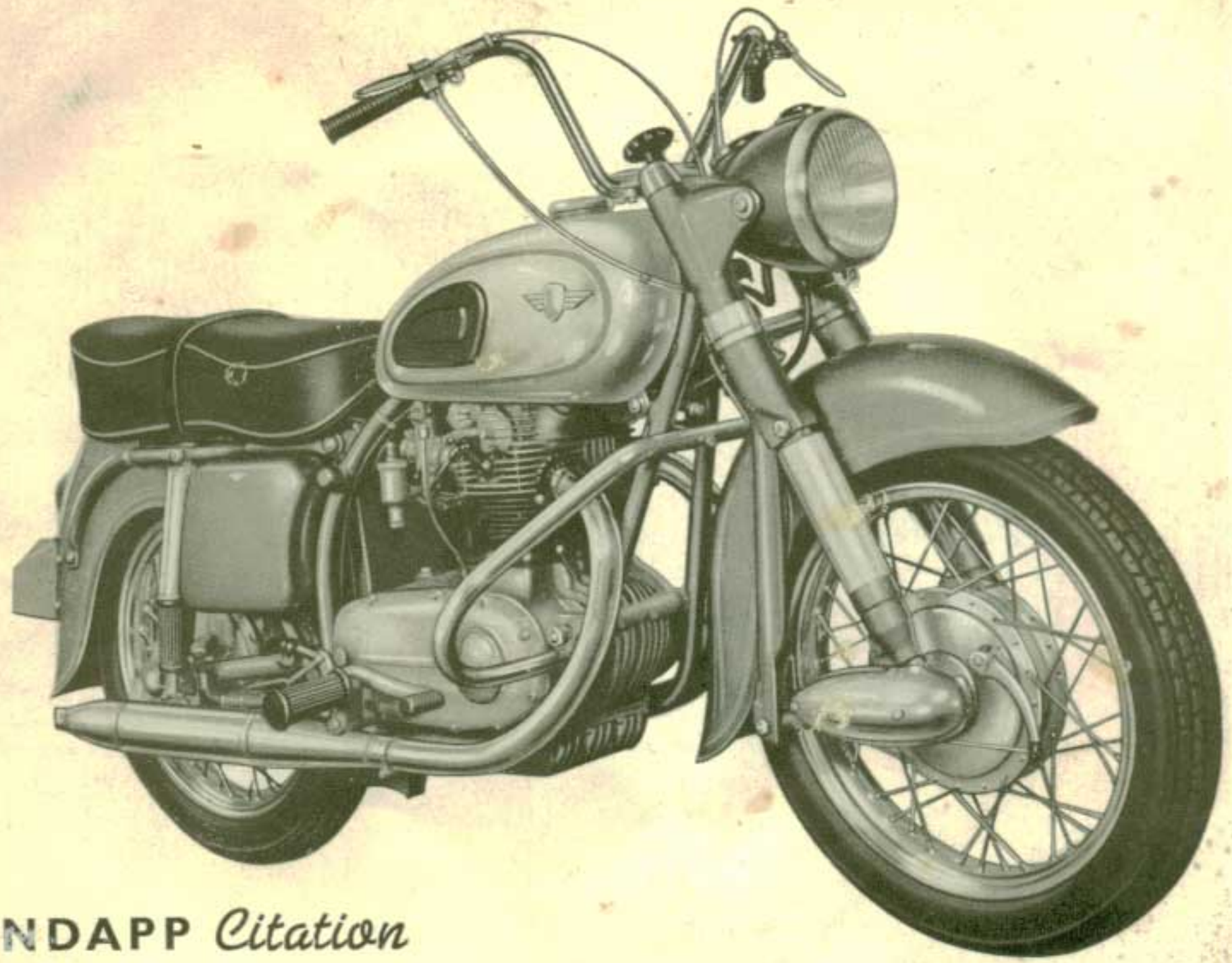
INSTRUCTION BOOK

ZÜNDAPP-WERKE GMBH

Service Department

Nürnberg



ZÜNDAPP *Citation*

LIST OF CONTENTS

	Page
Technical Data	6
Riding Instructions	11
Preparations for use	13
Starting the engine	15
Starting off and changing gear	16
Riding	16
Stopping	17
Running in	17
Winter operation	18
Design Features	19
The engine	21
Ignition and lighting generator	27
The cycle parts	31
Care and Maintenance	39
Care and maintenance chart	40
Cleaning the machine	42
Changing the oil	43
Clutch play	45
Care of the carburetter	45
Cleaning the air filter	45
Generator	46
Contact breaker	46
Sparking plugs	47
Battery	47
Adjusting tappets	48
Timing chain	48
Rear chain	49
Lubrication the rear chain	50
Changing oil in telescopic forks	51
Swinging links on front forks	51
Steering	52
Brakes	53
Hubs	53
Rear chain sprocket	54
Hand control levers and Bowden cables	54
Tyres	54
Practical Hints	55
Equipment supplied with the "Citation"	57
Removing and fitting front wheel	58
Removing and fitting rear wheel	58
Fitting tyres	59
Adjusting the headlamp	60
Changing double-filament bulb	60
Changing fuse in headlamp	60
Adjusting idling mixture	61
Laying the machine up	61

TECHNICAL DATA

Engine

Number of cylinders	2
Arrangement	vertical and parallel
Bore/Stroke	66/66 mm = 452 ccm 2.598/2.598 inches
Compression ratio	8 : 1
Arrangement of valves	o.h.v. (overhead)
Valve clearance (cold engine)	inlet 0.05 mm exhaust 0.1 mm

Valve Timing

At a valve clearance of 2 mm

inlet opens	26° before TDC
inlet closes	20° after BDC
exhaust opens	45° before BDC
exhaust closes	4° after TDC

Lighting-Ignition-Battery-Installation

Generator	Bosch LJ/CJE 60/6/1600 L 2
Ignition timing	0.5 mm before TDC
Automatic ignition advance	40°
Contact breaker gap	0.3–0.4 mm (0.012–0.015 inches)
Sparking plugs	please use sparking plugs of heat ranges between 240 and 280

Carburettor

Type	right side: Bing 1/27.5/10 left side: Bing 1/27.5/9
Main jet (on application of normal silencers)	110
Main jet (on application of racing mufflers)	120
Needle jet	2,68
Position of needle	2nd notch from to
Mixing chamber insert	5
Pilot jet	45
Throttle slide	1673 c

Gearbox
Reduction Ratios

Engine:Gearbox(clutch)	2.128:1 =	teeth 39:83
Gearbox: Rear wheel..	3 :1 =	teeth 13:39
Within the gearbox....	1st (bottom)	gear 2.54 :1
	2nd	gear 1.556:1
	3rd	gear 1.142:1
	4th (top)	gear 0.916:1
Total reduction ratio in 4th (top) gear		5.7:1

Frame

Frame	welded double tubular frame
Front springing	Telescopic forks or tubular steel Earles-type pivoted forks
Rear springing	Pivoted forks
Brakes	Full-width hub brakes
	Drum dia. 7 1/2 in (190 mm)
	Width of linings 1 9/16 in (40 mm)
	Brake area per wheel 19 1/2 sq in (127 sq cm)
	Foot-brake: rod-operated brake acting on rear wheel
	Hand-brake: cable-operated brake acting on front wheel

Wheels

Rim size (wheel-base rim, 40-hole)	
Front wheel	2.15 B×18
Rear wheel	2.15 B×18
Tyre sizes	
Front wheel	3.25×18
Rear wheel	3.50×18
Tyre pressures	
Front wheel	21–24 lb/sq in 1.5–1.7 atm
Rear wheel	26–28 lb/sq in 1.8–2.0 atm

Output and Consumption

Horse-power	34 h.p. at 6900 r.p.m.
Max. horse-power	39 at 8000
Max. speed	100 m.p.h.
Fuel consumption	2–2.5 gals./100 miles
Oil consumption	1 qt. / 1000 miles

Capacities

Fuel tank capacity	15 litres = 4 gallons, of which 1.5 litres are for reserve
Oil capacity of engine case (engine and gear-box)	3.5 litres — 7.5 pints SAE 30
Oil capacity of telescopic front fork	80 cm³ SAE 80 (gearbox oil) in each spring leg

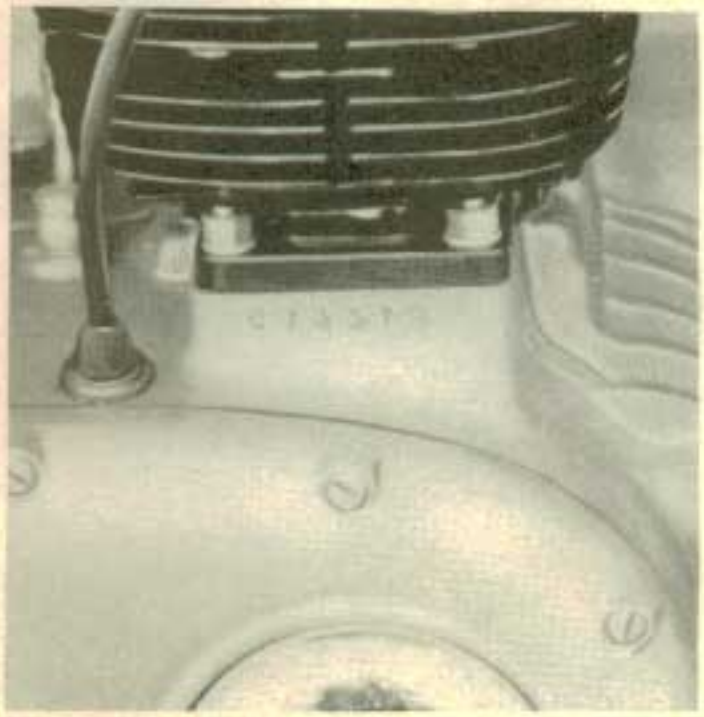
Vehicle

Lenght overall 84¹/₄ in (2140 mm)	Height of saddle 3029/32 in (785 mm)
Height 39 in (990 mm)	Ground clearance 7 in (180 mm)
Wheelbase 54¹/₄ in (1380 mm)	Dry weight 385³/₄ lb (175 kg)
Unladen weight ready for use, with full fuel tank, 5¹/₂ pints (3 litres) of oil, tools, and dual seat	432 lb (196 kg)
Permissible total weight	771¹/₂ lb (350 kg)

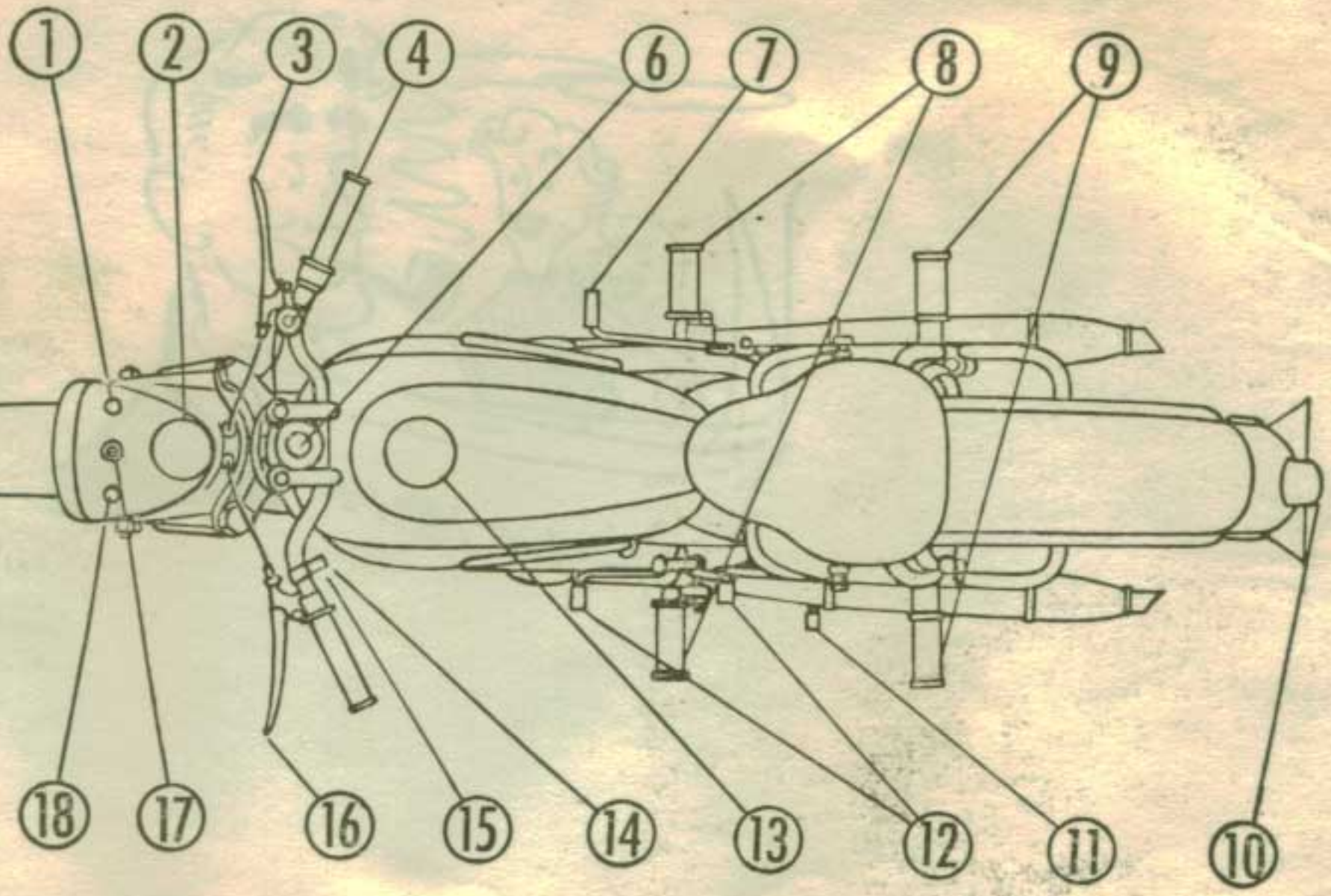
The engine number is stamped on the right-hand half of the crank-case.

The name plate is mounted in an easily accessible position on the right-hand side of the frame saddle tube.

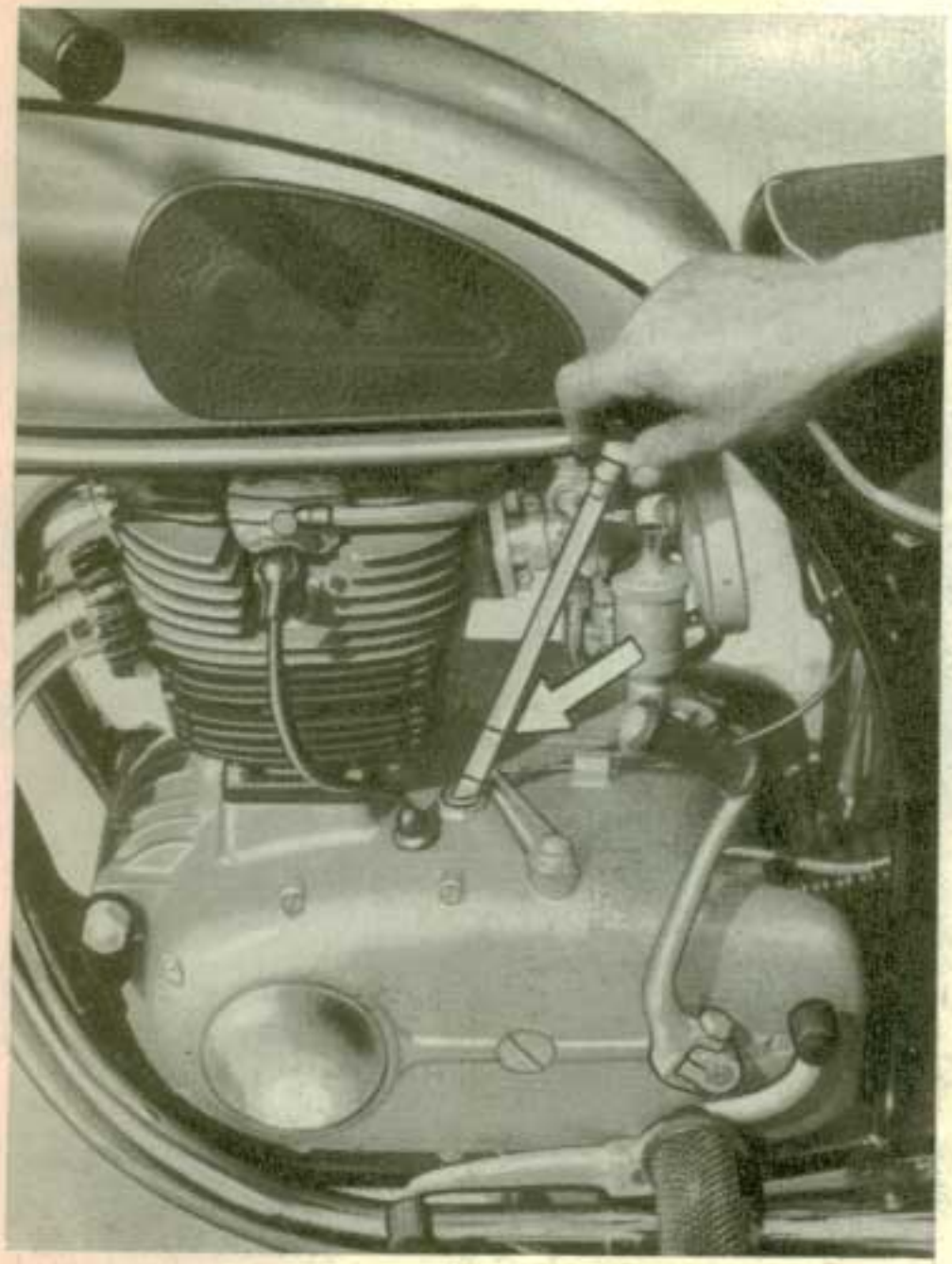
The frame number is stamped on the right-hand side of the steering head.



RIDING INSTRUCTIONS



(1) Charging indicator lamp – (2) Speedometer – (3) Hand brake lever – (4) Throttle twistgrip – (6) Knob for steering damper – (7) Foot brake pedal – (8) Rider's foot rests – (9) Pillion passenger's foot rests – (10) Stop and tail light – (11) Central stand – (12) Foot-change pedal (heel and toe) – (13) Fuel tank filler cap – (14) Horn knob – (15) Dipper switch – (16) Clutch lever – (17) Ignition key – (18) Neutral indicator lamp



Fill Up with Fuel

Use only high-quality branded fuels, such as a petrol/benzole mixture.

Stop the engine when filling up with fuel, and if it is raining take care not to let any water get into the petrol tank. You should of course not smoke or use a naked light while filling up.

Check Oil Level in Engine and Gearbox

Oil is poured thrugh the inlet opening on the side of the crankcase until it is level with the upper mark on the dip stick.

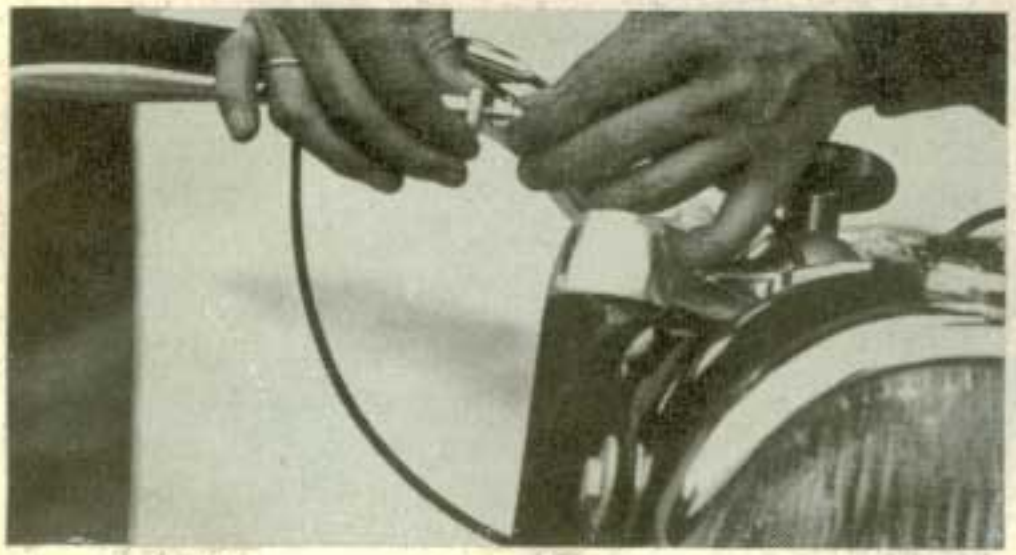
When checking the oil level, merely insert the dip stick in the hole; do not screw it in.

During summer and winter use: –
SAE 30 Grade branded oils
Upper mark on dipstick = maximum level
Lower mark on dipstick = minimum level

Test the Tyre Pressures

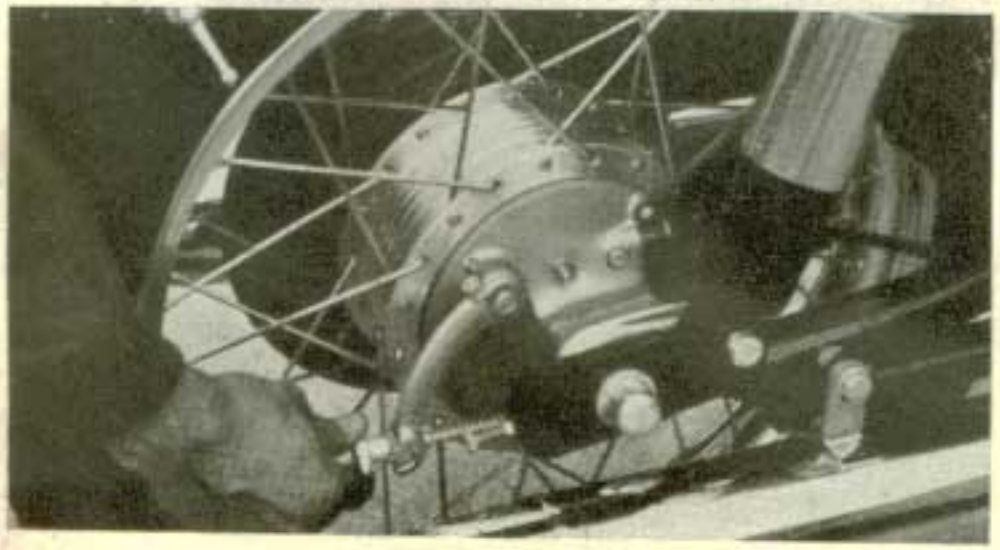
	Solo operation	Combination
Front wheel	22–24.1 lb./sq.in. (1.5–1.7 atm.)	22–24.1 lb./sq.in. (1.5–1.7 atm.)
Rear wheel	25.6–28 lb./sq.in. (1.8–2 atm.)	31.2–34.1 lb./sq.in. (2.2–2.4 atm.)
Sidecar wheel	—	22–24.1 lb./sq.in. (1.5–1.7 atm.)

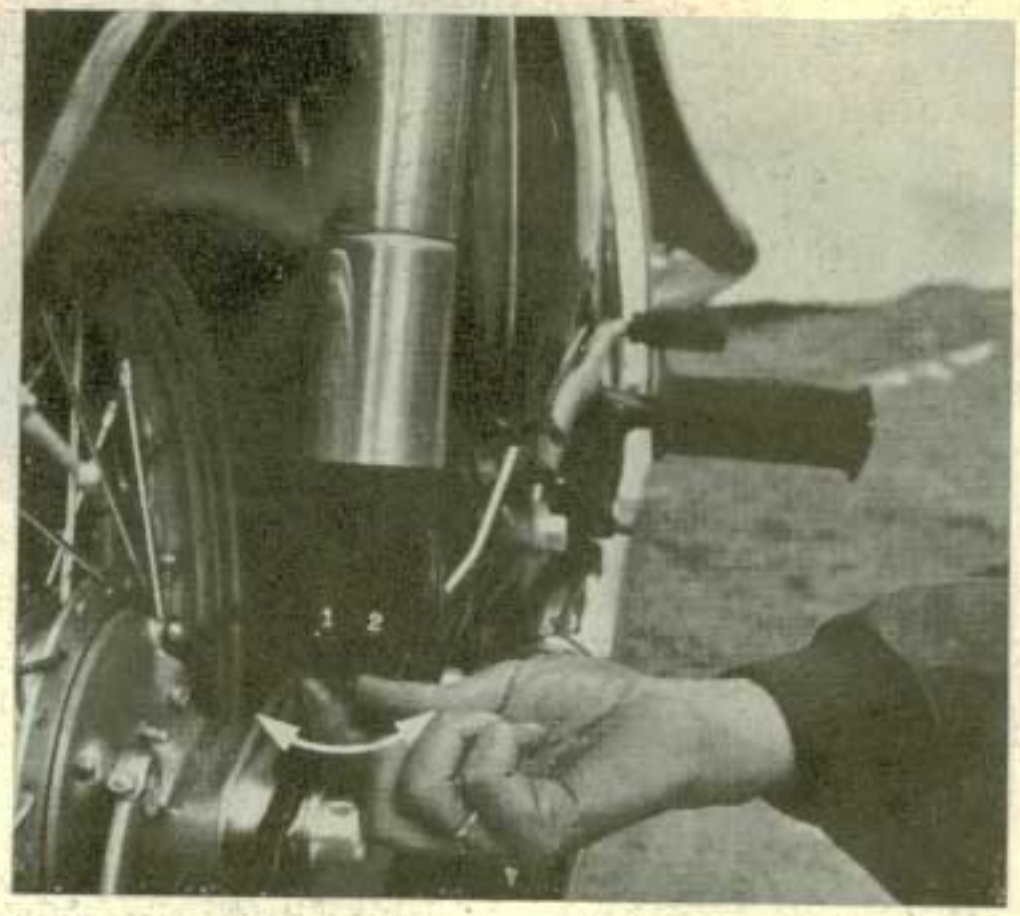
The life of the tyres, the road-holding properties of the machine, and the safety of the rider all depend on the tyre pressures being correct. Since the air pressure varies, it should be checked at frequent intervals.



Check the Brakes

Before each trip make sure that the brakes are working properly. The front brake should be adjusted as necessary by means of the knurled nut at the handlebars, and the foot brake by means of the adjuster on the brake rod at the rear brake.



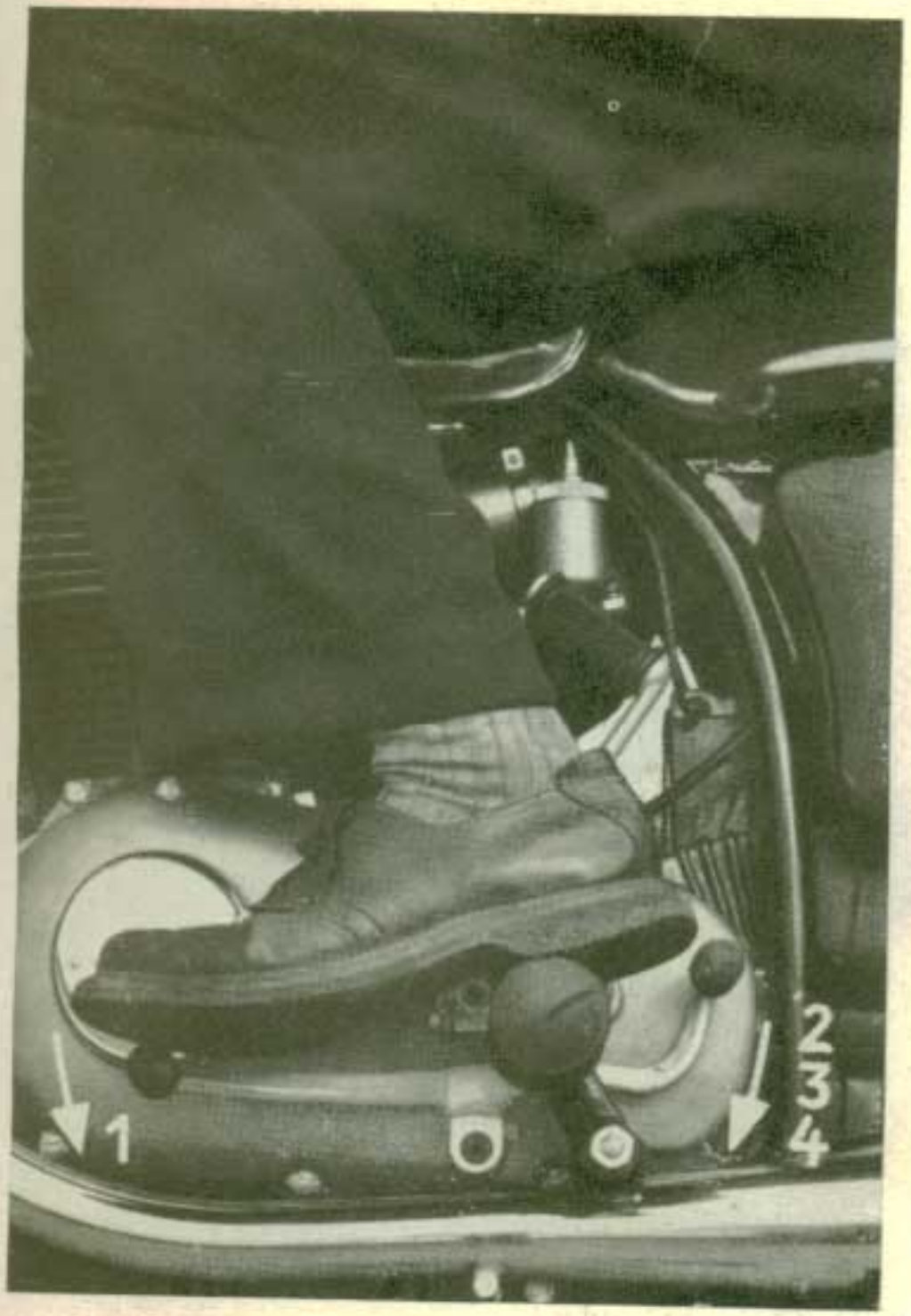


Adjust Rear Springing

The spring units fitted to the rear suspension can be adjusted to suit either solo operation or the use of a sidecar.

If the machine is to be ridden solo without a pillion passenger set the spring adjuster to 1. If a sidecar is fitted or a pillion passenger is to be carried, set it to 2.

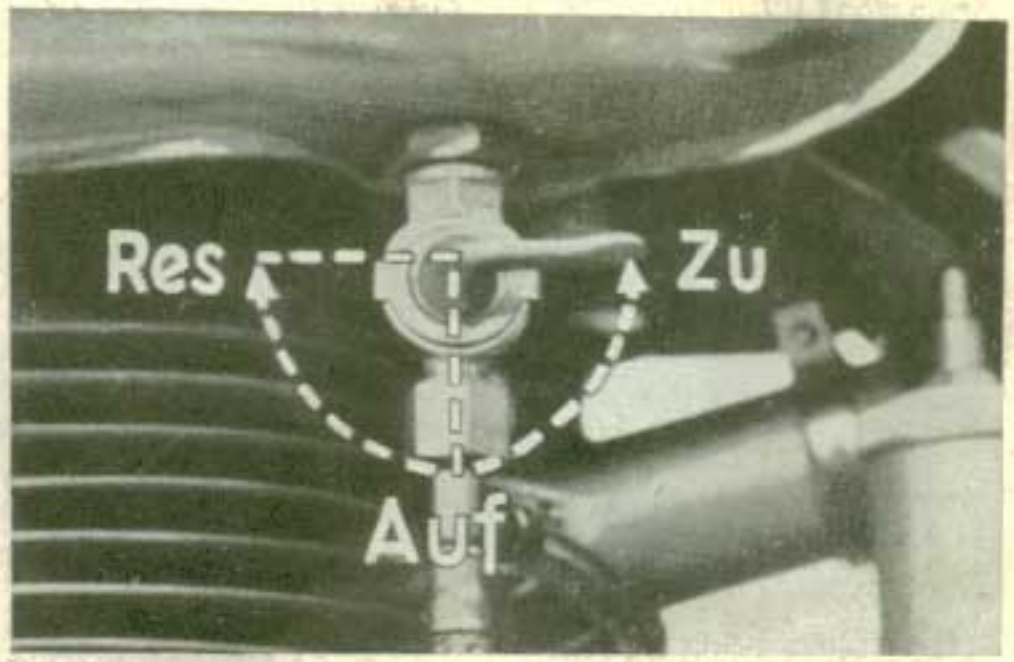
Make sure that both spring units are always set to the same number. Alter the adjuster only when the machine is unloaded.



STARTING THE ENGINE

Place the gearchange pedal in the neutral position. (When the ignition is switched on the neutral indicator lamp in the headlamp casing will show a green light.) Push the machine forwards slightly, and pull the central stand up until it is held by its clip.

Open the fuel taps. Depress the carburetter tickler knob a number of times. (Necessary only when the engine is cold and in cold weather.)



Open the throttle twistgrip slightly (turn towards rider).

Turn the engine over once or twice by depressing the kickstarter with the ignition switched off.

Switch on the ignition, i.e. push down the ignition key in the headlamp until it clicks home. The charging indicator lamp in the headlamp casing will show a red light.
Now push the kickstarter down vigorously, and the engine will start. Don't open the throttle too wide when you do this.
Let the engine run at a medium speed for about two minutes to warm up. Never open the throttle fully when the engine is cold. It is absolutely essential that you allow the engine to warm up, since if you make it work while it is cold the wear will be heavy.

STARTING OFF AND CHANGING GEAR

Pull the clutch lever on the left-hand handlebar right back and push down the front gearchange pedal with your toe. The neutral indicator lamp will go out, and 1st gear will be engaged.
Slowly release the clutch lever, at the same time opening the throttle slightly.
Engage 2nd, 3rd, and 4th gear by pushing down the rear gearchange pedal with your heel.
Each time you change gear, pull back the clutch lever and close the throttle. Then change gear, and release the clutch lever slowly, at the same time opening the throttle. Change down from 4th into 3rd, 2nd, and 1st gear by pushing down the front gearchange pedal.

RIDING

Always open the throttle slowly, not suddenly.
In the event of sudden danger, first close the throttle, and then apply the brakes. De-clutch.
If the engine speed starts to fall, when climbing hills for instance, change down into the next gear in good time. Under no circumstances allow the engine to labour at a low speed. This is very important, since it is a characteristic of the high-performance four-stroke engine that it performs best at medium and high engine speeds.
For solo operation the steering damper should be loosely adjusted; this is specially important in the case of pivoted forks.
Adjust the steering damper by turning the knob on the top of the steering head.
(Turning anti-clockwise loosens the steering damper, while turning clockwise tightens it.)
If a sidecar is fitted the steering damper on a machine fitted with pivoted forks need be tightened up only slightly.
If the steering damper is carefully adjusted the machine will be found to have excellent road-holding properties.
For night driving the machine is fitted with a long-beam headlamp. The headlamp is switched on by turning the ignition key inserted in the headlamp to the right (1).
The switch for the main and dipped beams is fitted on the left-hand handlebar where it is readily accessible.

Pushing it up will give the main beam, while pushing it down will dip the beam.
If the ignition key in the headlamp is turned to the left (2), the parking light will be switched on. The key can be withdrawn when the parking light is on.

Aufblenden
= main beam

Abblenden
= dipped beam

STOPPING

Close the throttle. When the speed has dropped, engage neutral gear slowly and apply the brakes. The footchange pedal must be in the neutral position. Neutral indicator lamp (green) will light up.
To stop the engine, pull out the ignition key.
It is essential that the fuel taps be closed, since otherwise the fuel that penetrates into the engine will cause damage.

RUNNING IN

Running in is a very important process, since the life and the output of the engine will depend on this being done correctly.
For the first 300 miles (500 km) the machine should be used especially carefully, i.e.
speeds not to exceed: in 1st gear 22 m.p.h. (35 km/hr)
in 2nd gear 34 m.p.h. (55 km/hr)
in 3rd gear 47 m.p.h. (75 km/hr)
in 4th gear 59 m.p.h. (95 km/hr)
On the other hand the speed should on no account be allowed to drop below:
37 m.p.h. (60 km/hr)
28 m.p.h. (45 km/hr)
22 m.p.h. (35 km/hr)
When climbing hills, always change down in good time to the next lower gear.
Don't keep running continuously at the maximum permissible speeds, but close the throttle slightly every now and again.
Especially when riding on main arterial roads with no natural speed checks take care not to run for more than 2 or 3 minutes at a time at any particular throttle setting. After about 1000 miles (1500 km) have been covered, accustom the engine gradually to the use of full throttle, first opening the throttle wide only for a short time, and then gradually increasing this.
After the conclusion of the running-in period the following speeds must not be exceeded in the various gears:

1st gear 31 m.p.h. (50 km/hr)
2nd gear 50 m.p.h. (80 km/hr)
3rd gear 68 m.p.h. (110 km/hr)

If the "Citation" is to give the sporting performance expected of it, the speed should not be allowed to drop below the following values for the various gears:

4th gear 37 m.p.h. (60 km/hr)
3rd gear 31 m.p.h. (50 km/hr)
2nd gear 22 m.p.h. (35 km/hr)

For high-speed work and long trips on main arterial roads it is advisable to use sparking plugs with a heat range of 260 (long thread) after the conclusion of the running-in period.

WINTER OPERATION

Provided certain precautions are taken, your "Citation" will prove fully reliable and always ready for use even during the winter months. Allow the engine to warm up before starting off. This is absolutely essential in winter.

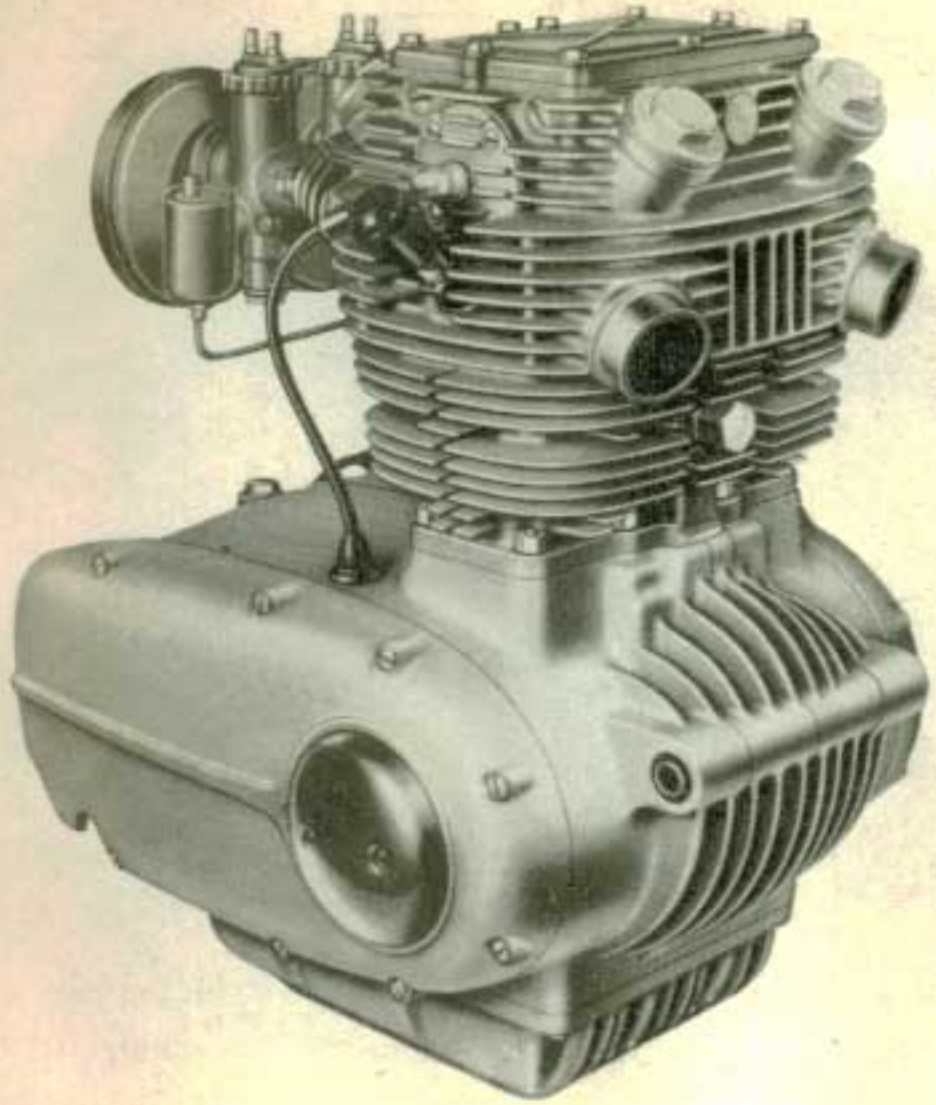
Even in cold weather the SAE 30 grade of oil will be thin enough, so that this one grade can be used both in summer and in winter.

It is advisable to fit plugs with a heat range of 240 for winter operation. Please ensure that only plugs with a long reach are used (see Technical Data for details of recommended plugs). The increased use that is made of the lighting equipment during the winter months increases the load on the battery, quite apart from the fact that at lower temperatures its output decreases.

To match the current consumption to the dynamo output as far as possible, it is advisable not to switch the lights on until immediately before moving off, and also to use the lower gears as much as possible, and to use the headlamp main and dipped beams only when this is essential (in towns where the street lighting is adequate, run on the parking light only).

Special attention should be paid to the care and maintenance of the machine during the winter months. In particular the chromium-plated parts should be treated with Chrome Protective Compound to protect them against damaging influences (rock salt, etc.).

DESIGN FEATURES

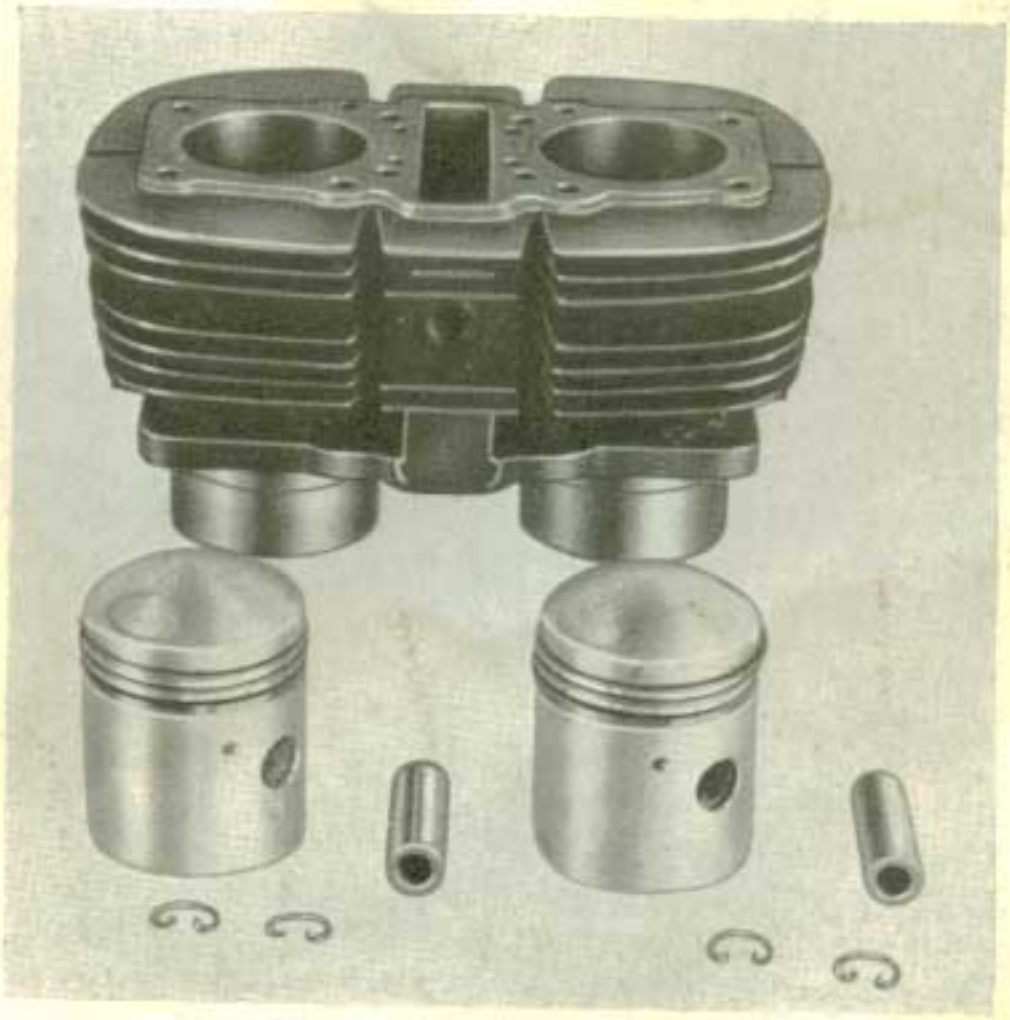


ENGINE

The technical data of the vertical twin-cylinder four-stroke engine, which is of the overhead camshaft type, indicate that it is a high-speed engine with a pronounced sporting character.

Engine Crankcase and Cylinder

The engine and gearbox are of true unit construction, the crankcase and gearbox being a single component. The crankcase is cast in a special light alloy, and is heavily ribbed to assist cooling. It contains the whole lubricating system and the ignition and lighting generator.



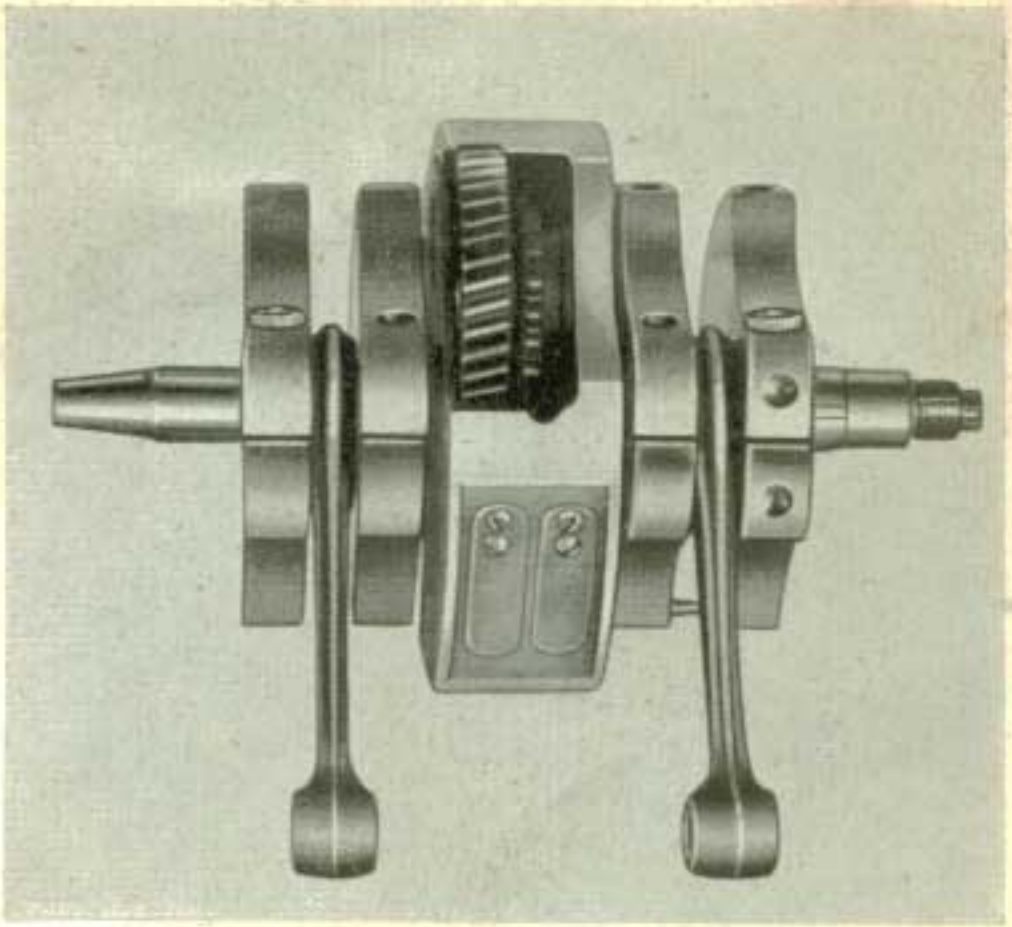
The cylinder block is of grey cast iron, and is also heavily ribbed; in it are the two cylinder bores and a central recess for the timing chain. The two long-skirted aluminium pistons have a clearance of 0.0016 in. (0.04 mm) when fitted, and ensure that the engine runs silently.
The pistons are each provided with two compression rings and one oil scraper ring.

Crankshaft and Centre Bearing

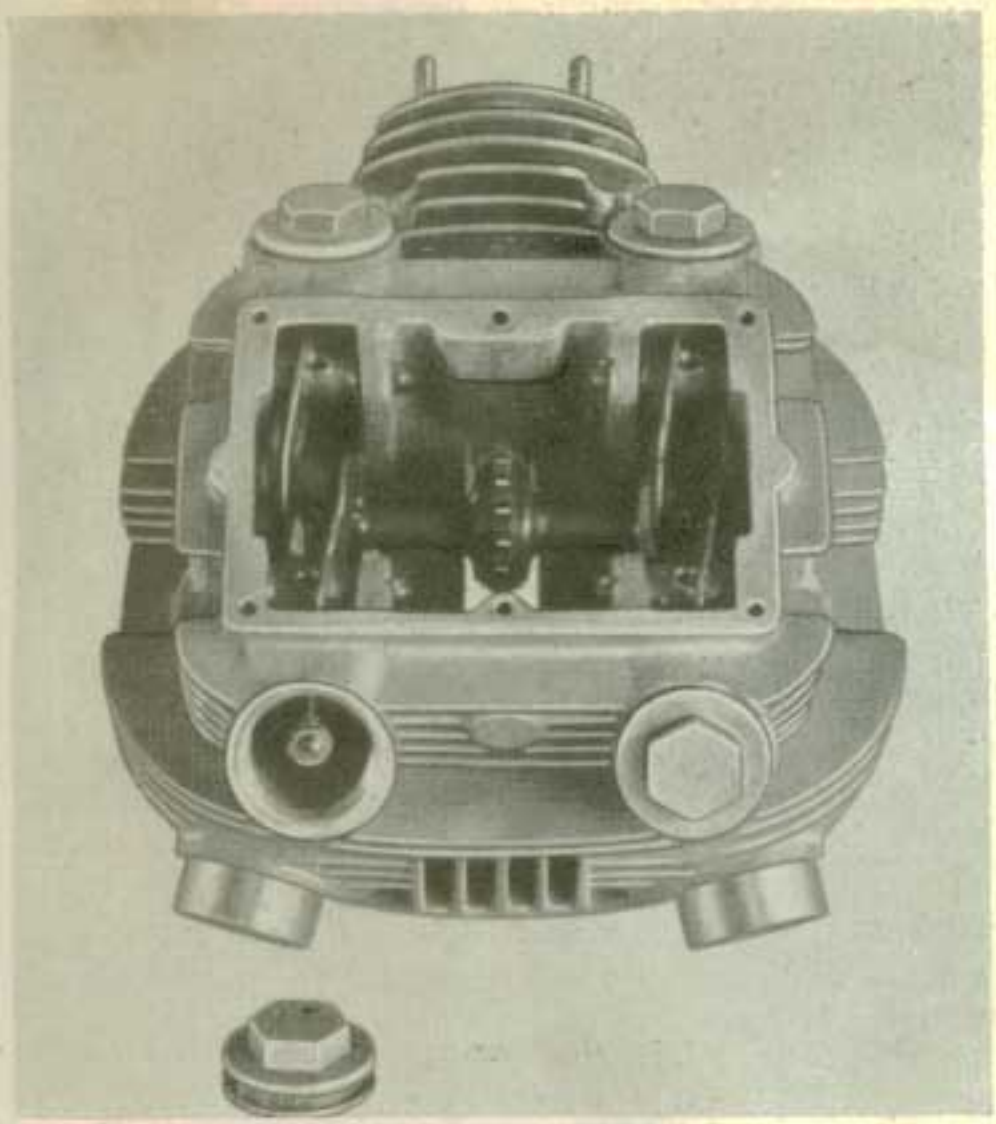
The crankshaft, which is carried in cylindrical roller bearings at its outer ends, is manufactured by the most modern methods. The drive for the oil pump and the gear pinions for the valve timing gear are located in the central bearing plate.
The big-end bearings are caged roller bearings, and are adequately lubricated by the force-feed lubrication system.
The crankshaft, which is made of high-quality heat-treated steel, is dynamically balanced on precision machines of the most modern type, which ensure that the engine runs without vibration.

Cylinder Head

The ribbed aluminium-alloy cylinder head is cast in one piece, and has the camshaft with the rocker arms and the valves mounted on it. The large-sized ribs ensure that good thermal characteristics are obtained. The valve seats are shrunk in. Each valve is provided



with two powerful valve springs which ensure that it opens and closes correctly even at extremely high speeds.
The moving parts mounted in the cylinder head are supplied with oil by means of a removable twinned oil pipe. In addition to lubrication, this supply of oil acts as an effective coolant.
The open top of the cylinder head is enclosed by means of a bolted-on light-alloy cover plate which is also ribbed.



The adjustment of the tappet clearance is simplified by the provision of four openings in the cylinder head which are normally closed by means of screw plugs.

Valve Timing Gear

The overhead camshaft is driven at half engine speed by means of a timing chain and a pair of gears in the central crankshaft bearing plate. An eccentric enables the flank clearance of the gears to be adjusted with accuracy in order that the mechanism may be as silent as possible in operation.

The timing chain is guided in the cylinder block by means of a pair of bearing slippers, one of which is fixed while the other can be adjusted from the exterior.

The camshaft runs in a pair of generously dimensioned ball bearings.

The tappet clearance can be adjusted by means of adjustable tappet screws fitted in the hard-chromed rocker arms which are provided with bronze bearing bushes.

Lubricating System

The engine and gearbox are connected to a common lubricating system, the oil being circulated by a gear type pump in the sump.

The oil passages in the crankshaft are provided with oil in large quantities from an oil chamber in the central bearing plate, so that the lubrication of the big-end bearings is adequate over the entire speed range.

The oil pump also supplies oil to the camshaft through a pair of calibrated passages. A passage is drilled in each cam on the camshaft, and these supply oil directly to the sliding surfaces on the rocker arms.

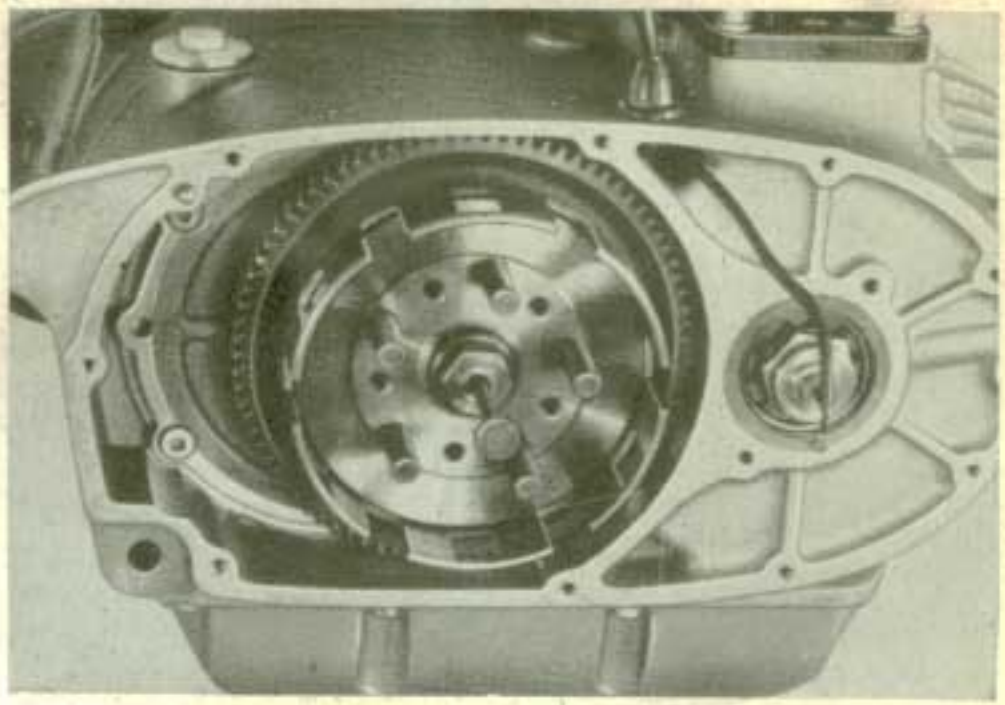
The cylinder bores are splash lubricated. The oil flows back into the sump, and passes through a gauze filter to the pump which forces it through a Micro Filter the inserts of which must be renewed each 1500 km to all the spots of crank- and camshaft etc. which must be greased.

Primary Drive and Clutch

The power is transmitted from the engine to the gearbox by means of helical steel gear pinions, designed to reduce the transmission noise to a minimum. The clutch is fitted in the crankcase and is well protected against dirt; it is of the multiplate type and runs in an oil bath. The clutch linings are made of a novel material which is virtually free from wear.
The clutch body is connected to the large primary gear pinion by rubber shock absorbers so that the clutch will prove soft and flexible in operation.

Gearbox

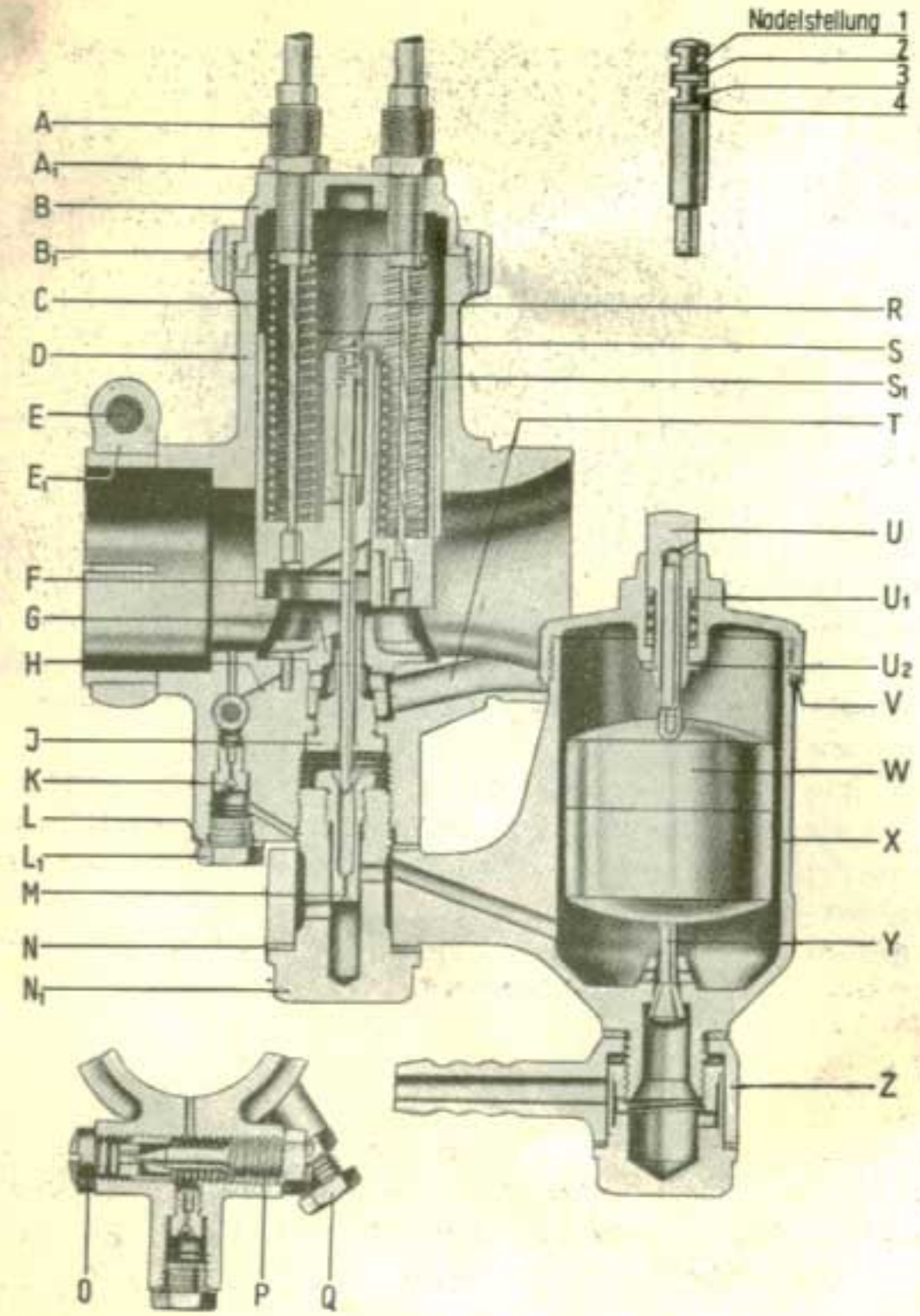
The four-speed gearbox is extremely robust and is designed and built in accordance with the most recent developments in this field. The ratios of the individual gears have been carefully chosen to ensure that the full output of the engine can be utilised under any road and traffic conditions. The gears are mounted on amply-dimensioned ball and cylindrical roller bearings, while the individual pinions run on needle bearings.



A heel-and-toe foot-change pedal actuates an automatic gearchange mechanism.
The contact for the neutral indicator lamp is also mounted in the gearbox. When neutral gear is engaged, the green indicator lamp in the headlamp will light up.
The gearbox can easily be fitted while the engine is mounted in the frame.

Carburetter

The carburetter supplies the engine with air and fuel mixed in the correct proportions. The throttle slide is controlled by the throttle twistgrip on the right-hand end of the handlebars.



needle position

A Adjuster
A₁ Nut
B Cap
B₁ Cap ring
C Slide spring
D Carburetter body
E Pinch bolt
E₁ Clip
F Jet needle
G Mixing chamber insert
H By-pass
J Needle jet
K Jet
L Sealing washer
L₁ Bolt
M Jet
N Sealing washer
N₁ Jet plug
O Pilot air jet
P Pilot air screw
Q Bolt
R Spring clip
S Throttle slide
S₁ Air slide
T Atomiser air passage
U Tickler
U₁ Tickler spring
U₂ Split pin
V Float chamber lid
W Float
X Float chamber
Y Float needle
Z Rotatable banjo union for fuel pipe

The preparation of the correct mixture of fuel and air is effected by means of a jet system consisting of main and pilot jets. At slow speeds the engine is supplied with mixture by the pilot system which comprises the pilot fuel jet, the pilot air jet, and the air regulating screw. The idling mixture will become richer if the air regulating screw is used to throttle the air supply and weaker if the air supply is increased. The pilot jet can be changed. As the engine speed increases, the main jet system takes over the task of supplying the mixture. This system comprises the main jet, the mixing chamber insert, the needle jet, and the jet needle. The interchangeable main jet is fitted in the jet plug which is screwed into the carburetter body from underneath. When the main jet system comes into operation, fuel flows through the main jet into the needle jet. The outlet from the needle jet is in the mixing chamber where the fuel is atomised with air. Little bubbles of air and fuel are formed, and these are carried over into the combustion chamber of the engine by the main air stream. The main air stream, as it flows through the mixing chamber, is deflected off the front raised section, and this produces a partial vacuum on the inclined rear side, which causes a very intensive atomisation of the fuel. The bore of the needle jet is throttled by means of a tapered needle fitted to the throttle slide. If this needle is lowered deeper into the needle jet as the throttle slide moves, the cross section of the passage between the jet and the needle is reduced, and vice versa. A number of notches are cut in the stem of the needle, so that its position relative to the throttle slide can be altered. If the position of the needle is altered so that it penetrates deeper into the needle jet, the engine will be supplied with a weaker mixture. If the needle is fitted higher up in the throttle slide, the unrestricted passage through the jet will be increased, and the mixture will become richer. The jet needle controls the fuel consumption at part throttle, until the throttle slide is $^2/_3$ open. When the throttle slide is fully open, the fuel consumption depends solely on the main jet.

The correct setting for the carburetter have been determined by means of exhaustive tests, so that no alternations should be made to the recommended values.

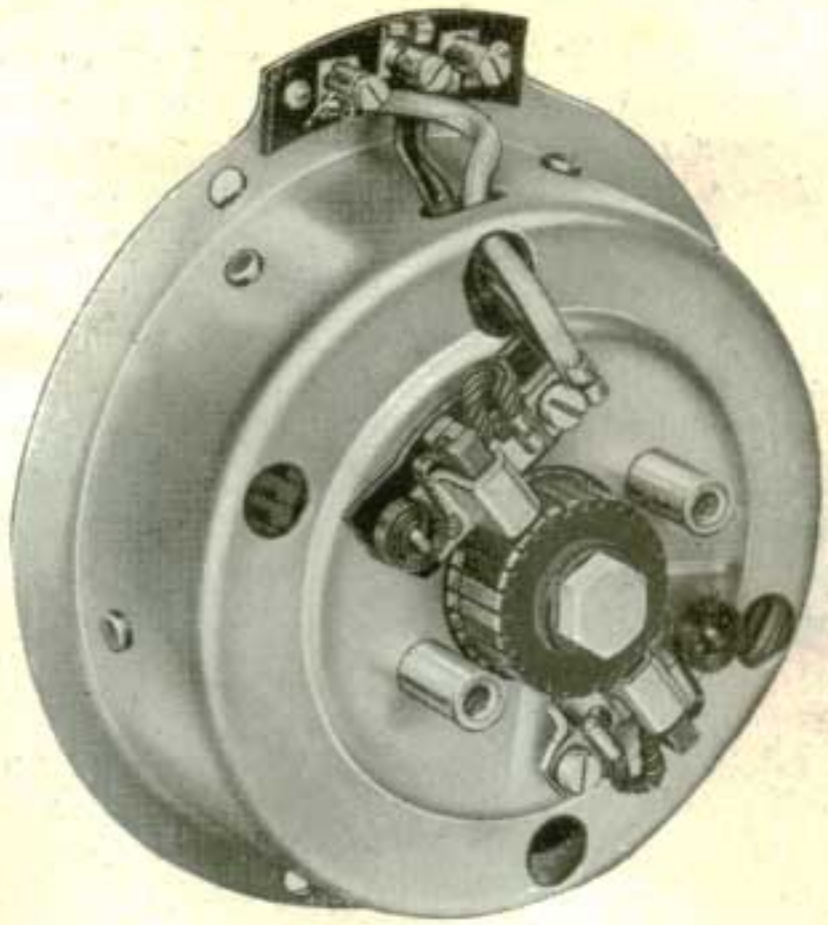
IGNITION AND LIGHTING GENERATOR

Generator

The Bosch LJ/CJE 60/6/1.600 L2 generator is a D.C. shunt-wound machine fitted with voltage control, and is fitted in a completely enclosed position behind the left-hand crankcase cover plate.

This generator supplies current to the various electrical consumers. The current generated that is in excess of these requirements is stored in a battery. When the armature of this D.C. machine rotates, a voltage is generated in the armature windings; as the speed of the armature increases, this voltage also increases, but once it has reached a given value it is kept virtually constant by means of the voltage regulator. Since the pre-set voltage thus generated is higher than the battery voltage, the generator supplies the battery with current, and the greater the voltage difference, the greater the amount of current supplied to the battery.

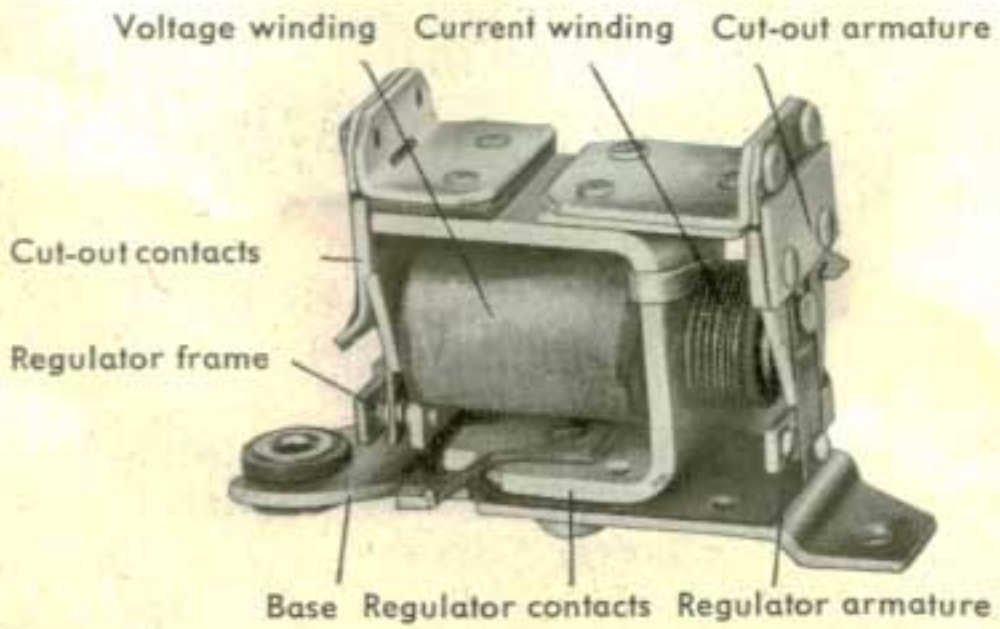
If the battery is discharged or if it is heavily loaded owing to a number of consumers being switched on, its voltage will be low. The generator will therefore supply a high current which is sufficient both for the consumers and to charge the battery up rapidly. If the battery is fully charged, on the other hand, its voltage will be almost the same as that of the generator, and so only a small current is supplied to keep the battery on charge. The voltage-controlled machine adapts itself therefore to the requirements, and so protects the battery. At the same time the constant voltage supplied by the generator enables the machine to be used without the battery if this should for any reason not be available.



Generator LJ/CJE 60/6/1600 L2

Regulating Unit

The regulating unit is located underneath the fuel tank. If the electrical system is to work correctly, the generator must be connected to the battery while the engine is running in order that the battery may be charged up, but when the engine is stopped, or only running very slowly, it must be disconnected in order to prevent the battery discharging itself through the generator windings. This is effected automatically by the cutout switch, which in the Bosch equipment is combined with the voltage control to form a regulating unit. The voltage control unit automatically keeps the voltage at a constant value by switching a resistance into the excitation circuit of the machine, or even by short-circuiting the excitation completely, depending on the engine speed and electrical load.



Charging Indicator Lamp

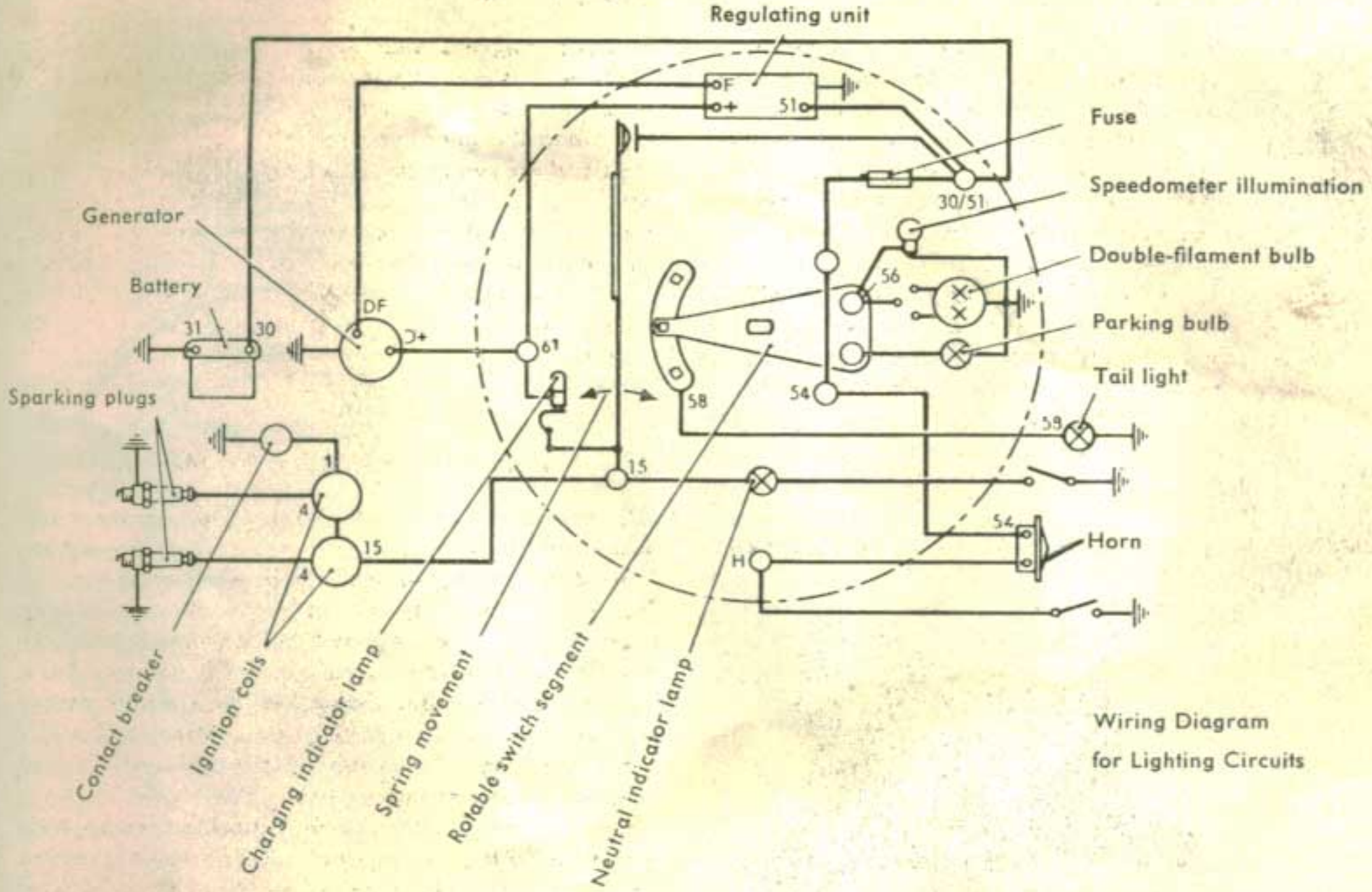
The charging indicator lamp is connected in parallel with the contacts of the regulator switch. It will light up as soon as the ignition is switched on, and will go out when the generator delivers at the required voltage and the switch contacts close. When this light goes out, it merely signifies that the generator voltage and the battery voltage are roughly the same, or that the generator is connected to the battery. It is not possible to use it as an indication of the generator output. This output will depend on the speed, the state of the battery, and the current drawn by any electrical consumers that are switched on.

Automatic Advance and Retard Mechanism

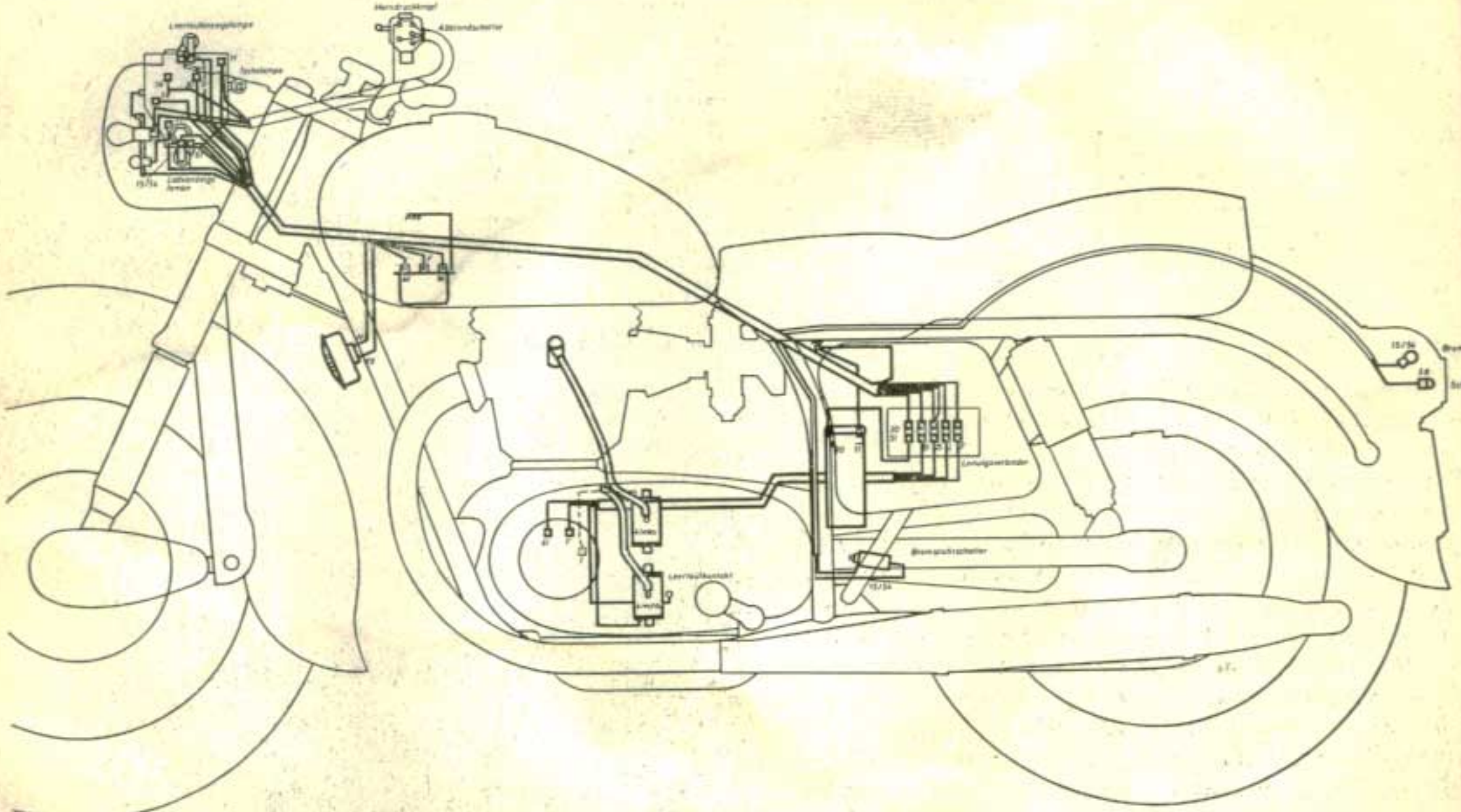
The contact breaker with the automatic advance and retard mechanism is fully enclosed in the right-hand side of the crankcase, where it is easily accessible.

To ensure that the ignition occurs at the most suitable instant for any engine speed, the machine is fitted with an automatic advance and retard mechanism. This is operated by centrifugal force. As the speed increases, the bob weights fly out, and so move the pins formed on the cam sleeve. The contact-breaker cam is turned, and this advances the ignition.

When the engine slows down, helical springs draw the bob weights together again, and this in turn forces the contact-breaker cam back to its original position (retarding the ignition).



Wiring Diagram
for Lighting Circuits



Wiring Diagramm

Terminal No.:	From:	Via.	To	Basic colour:	Tracer colour:	Cross section mm²
1	Ignition Coil		Contact Breaker	green	—	
4	Ignition Coil (H. T. lead)		Sparking Plug		—	
15	Ignition and Lighting-Switch	Cable Connector	Ignition Coil	black	—	1,0
15/54	Ignition and Lighting-Switch		Horn	black	yellow	1,0
	Cable Connector	Stoplight Switch	Stoplight	black	red	1,0
30	Battery +		Cable Connector	red	—	2,5
31	Battery —	Frame earthing Clip	Engine (earthed)	black	—	2,5
3/51	Ignition and Lighting-Switch		Cable Connector	red	—	2,5
	Ignition and Lighting-Switch		Regulating Unit	red	—	2,5
61	Charging Indicator Lamp	Cable Connector	Generator	light-blue	—	2,5
	Charging Indicator Lamp		Regulating Unit	light-blue	—	2,5
L	Neutral Indicator Lamp	Cable Connector	Neutral Indicator	green	—	0,75
F	Regulation Unit	Cable Connector	Generator	yellow	—	1,0
58	Lighting Switch		Tail Light	green	black	1,0
H	Ignition and Lighting Switch		Horn	brown	—	1,0

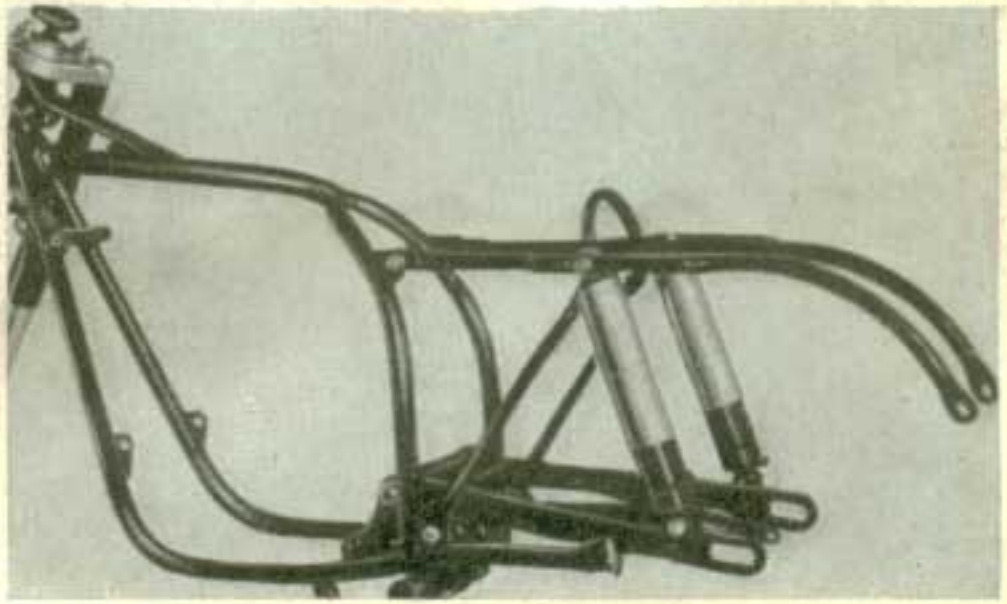
Ignition Coils

The Bosch ignition coils are located under the left crankcase cover where they are well protected. They are connected in series.

The ignition coil comprises the primary winding and the secondary winding, both of which are wound on a laminated iron core. When the ignition is switched on and the contact breaker points are closed, current can flow through the primary coil and magnetise the core. If the current is interrupted by the opening of the contact breaker, the magnetic field in the ignition coil will suddenly collapse, and this will induce a high-voltage surge in the secondary winding, which forms a spark as it jumps the gap at the sparking plug electrodes. A condenser is connected in parallel to the contact-breaker points to suppress the spark at the points, and this ensures that the ignition current in the primary winding is suddenly interrupted.

THE CYCLE PARTS

The design of the cycle parts is based on the results of many years of experience. — The customer has the choice between oil-damped telescopic forks and Earles-type forks for the front suspension.



The Frame

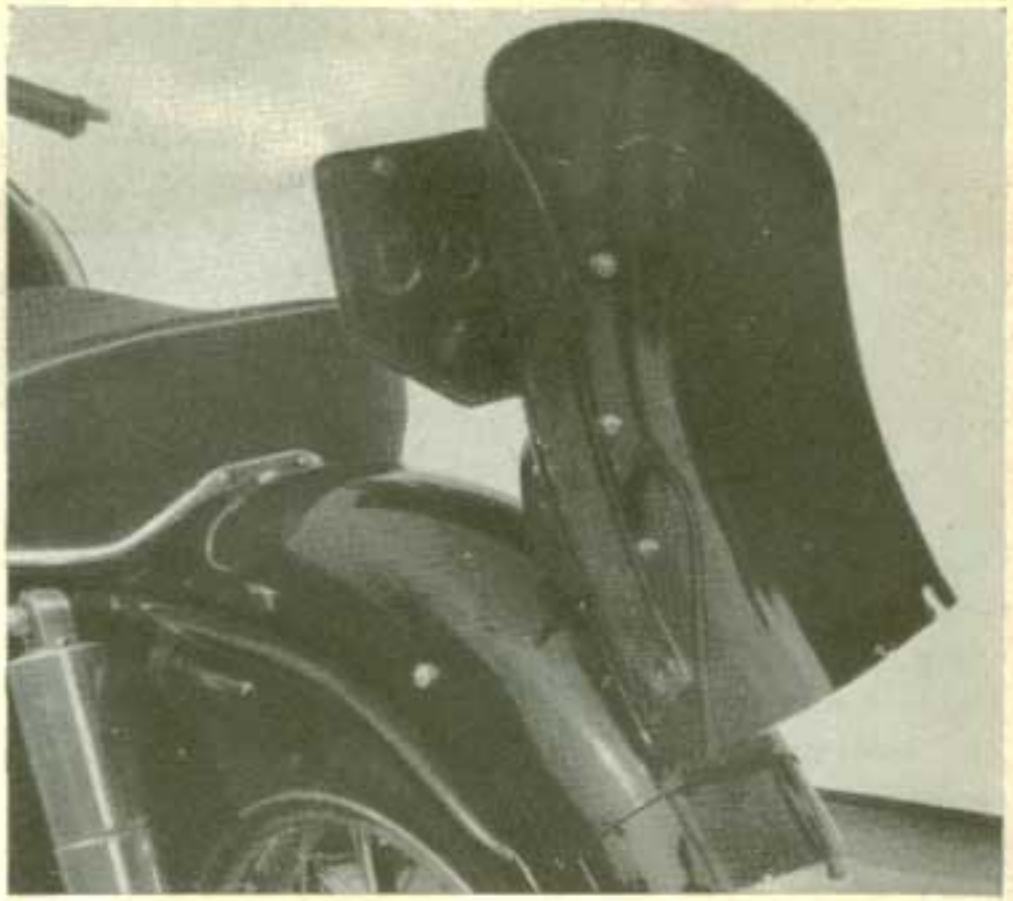
The frame, which is based on the most recent research, is of the double tubular type, and is absolutely resistant to torsion even under the most severe conditions. The steering head is brazed into the welded tubular-steel frame.

Mudguards

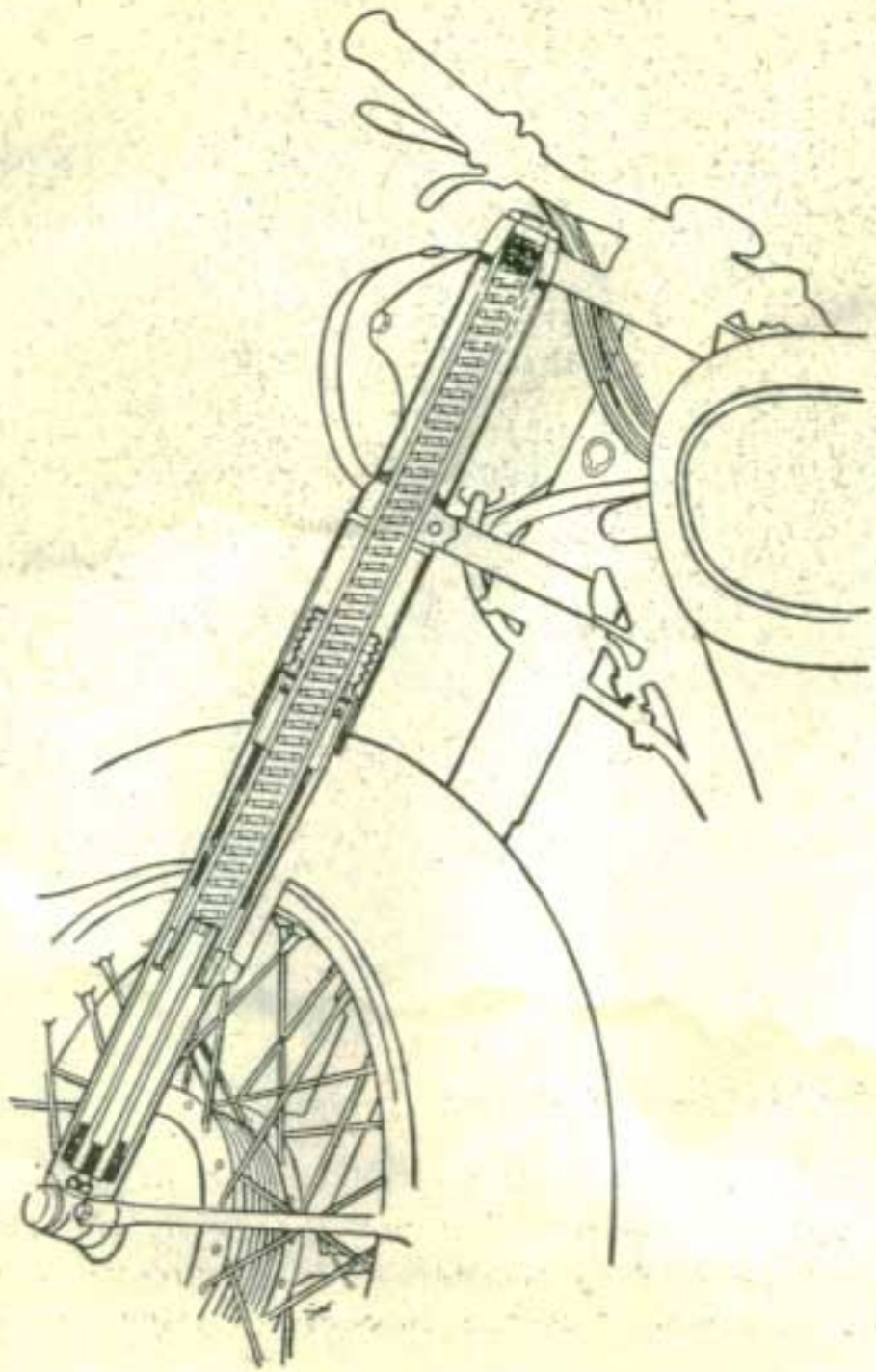
The deeply-valanced mudguards provide excellent protection against dirt and splashes. Like the frame they have been enamelled by means of a new process. The end section of the rear mudguard is hinged, so that it can be swung upwards and thus make the task of removing the rear wheel easier. After raising the dual seat you find the battery in an enclosed box.

The Fuel Tank

The fuel tank blends harmoniously into the general lines of the machine, and with its two knee pads it enables the rider to obtain the firm grip with the knees which is so essential for comfort and for complete control of the machine. The tank is made of sheet steel and is chromium-plated. It has a capacity of 4 gallons (15 litres), of which about 3 pints (1,5 litres) is reserve supply. The fuel remaining when the fuel taps are switched over to the reserve position is sufficient for about 20 miles (30 km). The fuel tank is fitted to the frame by means of flexible rubber mountings, and the large filler opening simplifies the task of filling up with fuel.



The fuel is supplied from the tank to the engine through two fuel taps, each of which is equipped with a fine-mesh gauze filter, so that even small impurities which may be present in the fuel cannot penetrate into the carburetter.



Rear Springing

The pivoted rear forks are resistant to sideways movement, and are mounted on a pair of Silentblocks which require no maintenance. They are supported by a pair of spring units fitted with hydraulic shock absorbers. The spring units can be adjusted to suit either solo or pillion or sidecar operation.

Rear Transmission

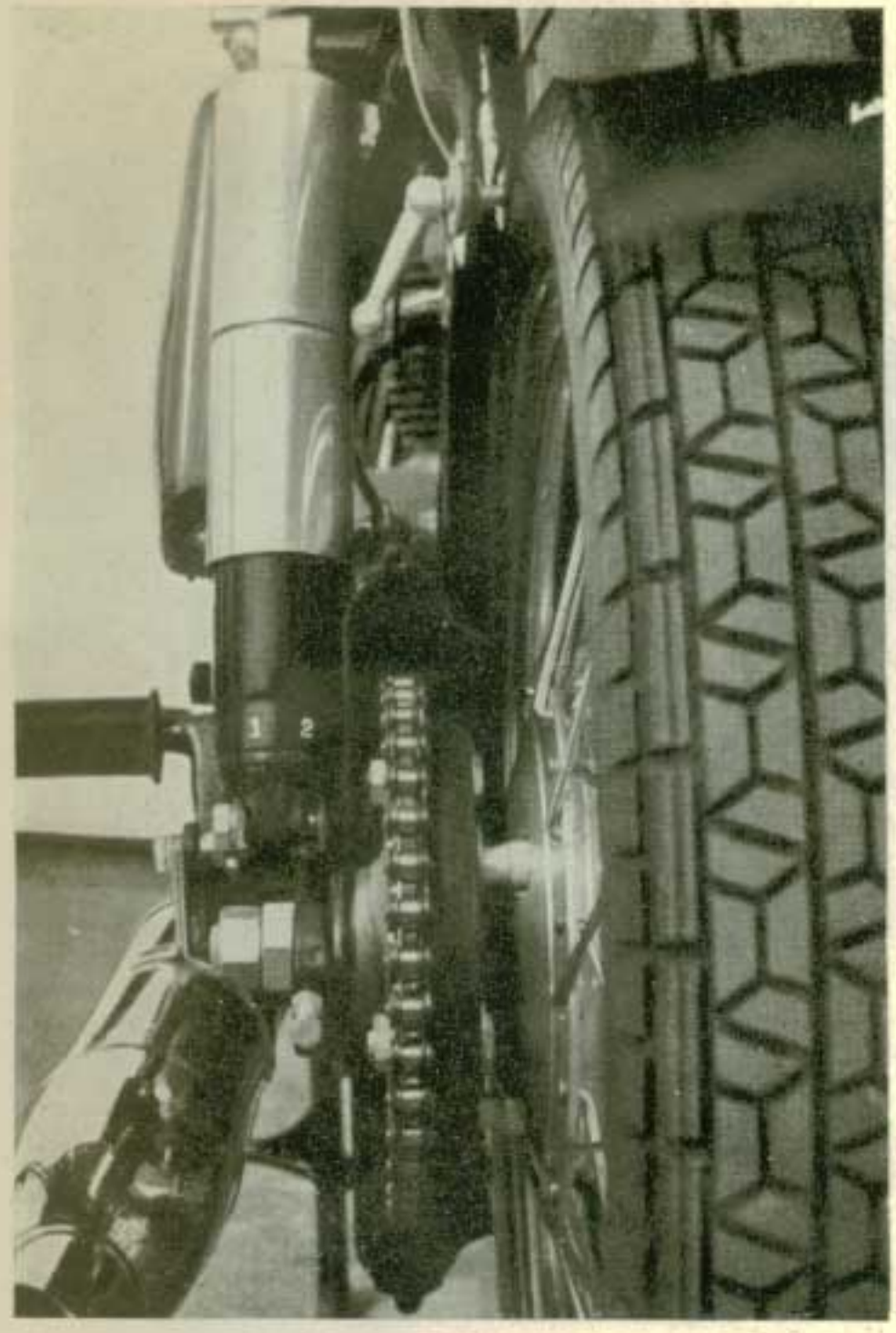
The drive to the rear wheel is effected by a $^{5}/_{8} \times {}^{1}/_{4}$-in. roller chain which is protected against dirt and water by means of a totally-enclosed chain case which moves with the pivoted forks.

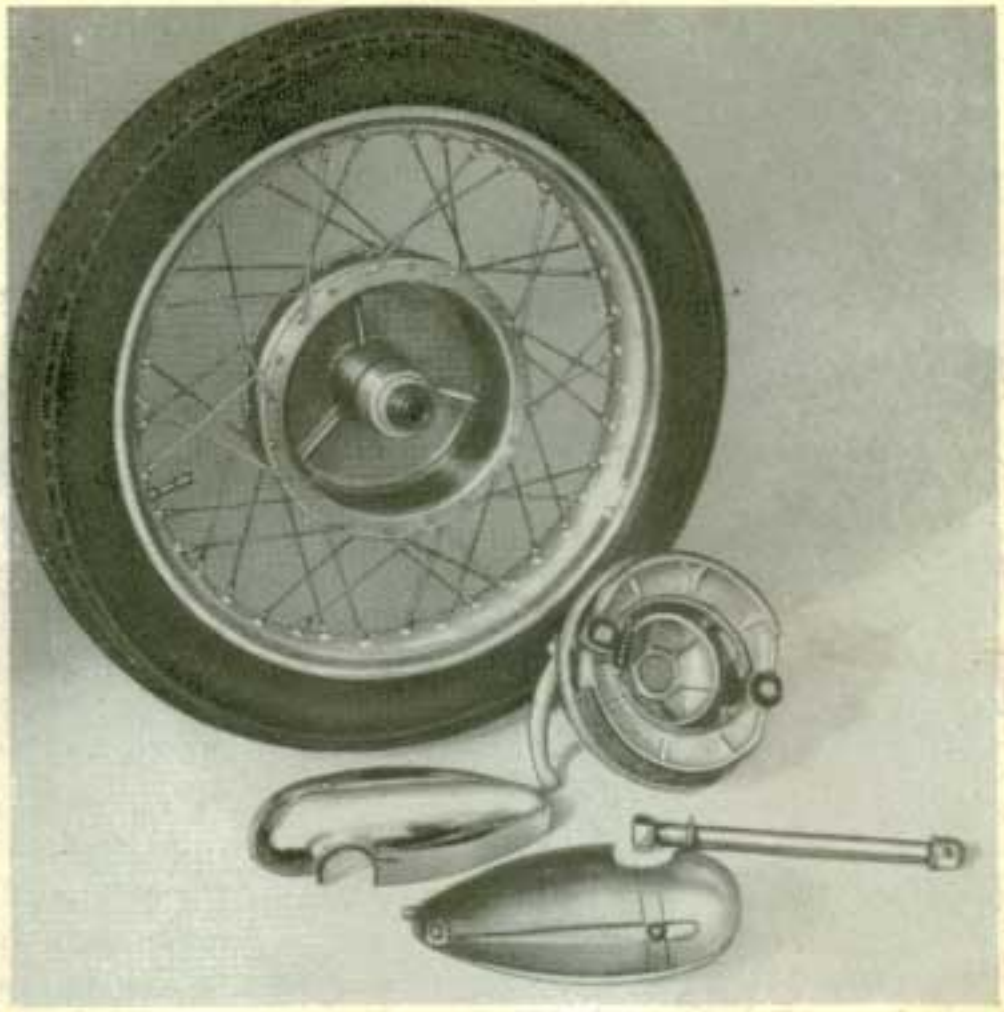
The chain is lubricated by means of a pair of oil-soaked felt pads built into the chaincase.

The flexible shock-absorbing disc which connects the rear chain sprocket with the rear wheel not only helps to cushion out road shocks when riding, but is an important factor in reducing the wear of the rear chain and of the whole transmission system.

The Central Stand

The central stand is fitted underneath the double tubular frame. When not in use it is held up by a pair of leaf springs. Pressing down the foot lug on the stand will release it and it can then be used to support the machine.





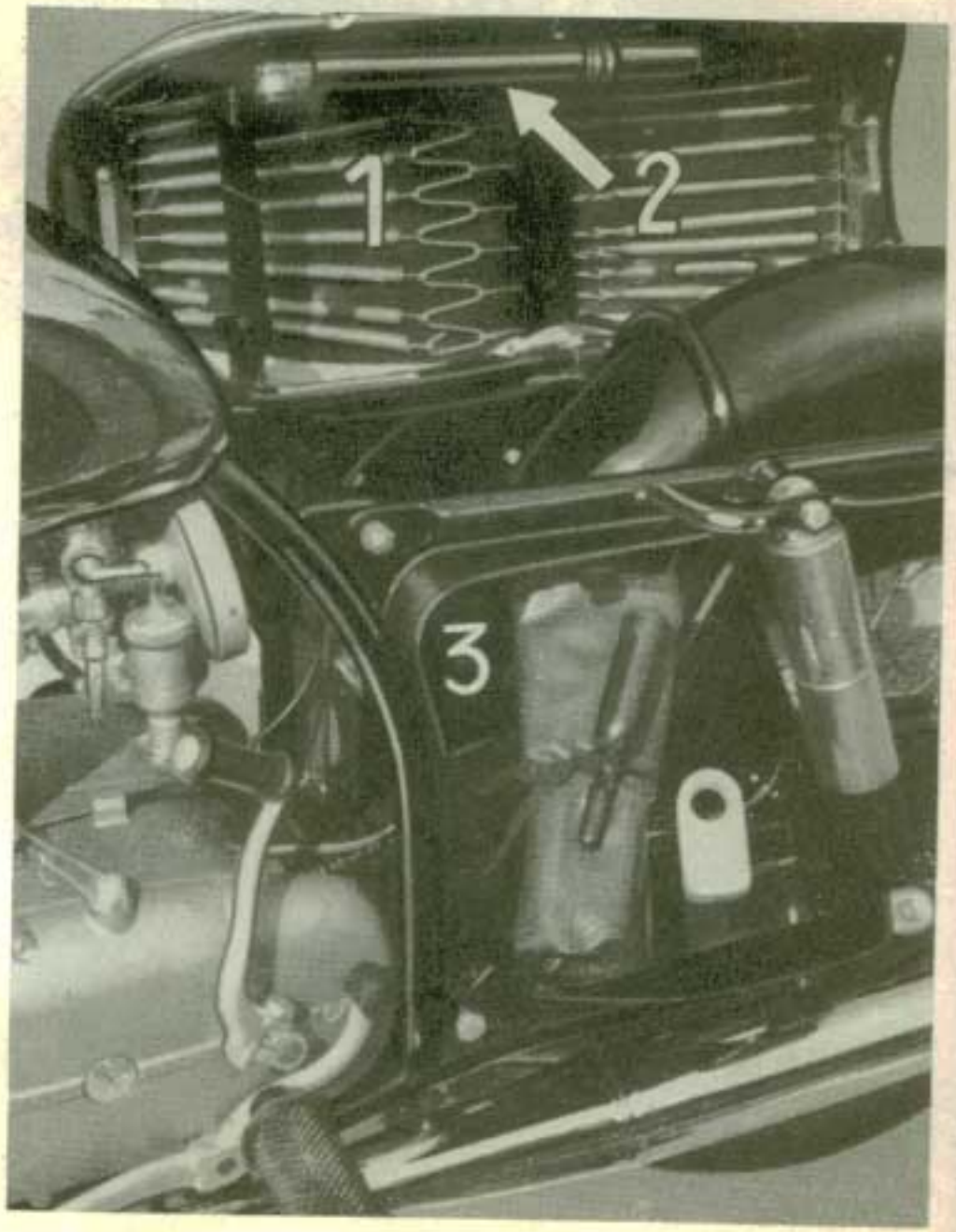
The Wheels and Brakes

The 18-in. road wheels with their light-alloy rims ensure that the centre of gravity is kept low, which gives good riding qualities, and, in conjunction with the accurately matched suspension system, ensures

good road-holdings on bends. The wheels run freely on ball bearings which are protected against the penetration of dirt and water.

The Citation full-width hub brakes, made of light-alloy forgings and equipped with oversize brake drums having a diameter of 7 1/2 in. (190 mm) and a brake lining width of 1 9/16 in. (40 mm) ensure absolute safety at all speeds.

Quite apart from the superb braking effect, the ribbed surface of the drums is carefully designed to ensure optimum heat dissipation.



Dual Seat and Tool Boxes

Under the dual seat (1), which is fitted with a quick-release catch, battery and tyre pump are situated. This seat provides a comfortable riding position which will not prove tiring even on a long run. It can easily be removed.

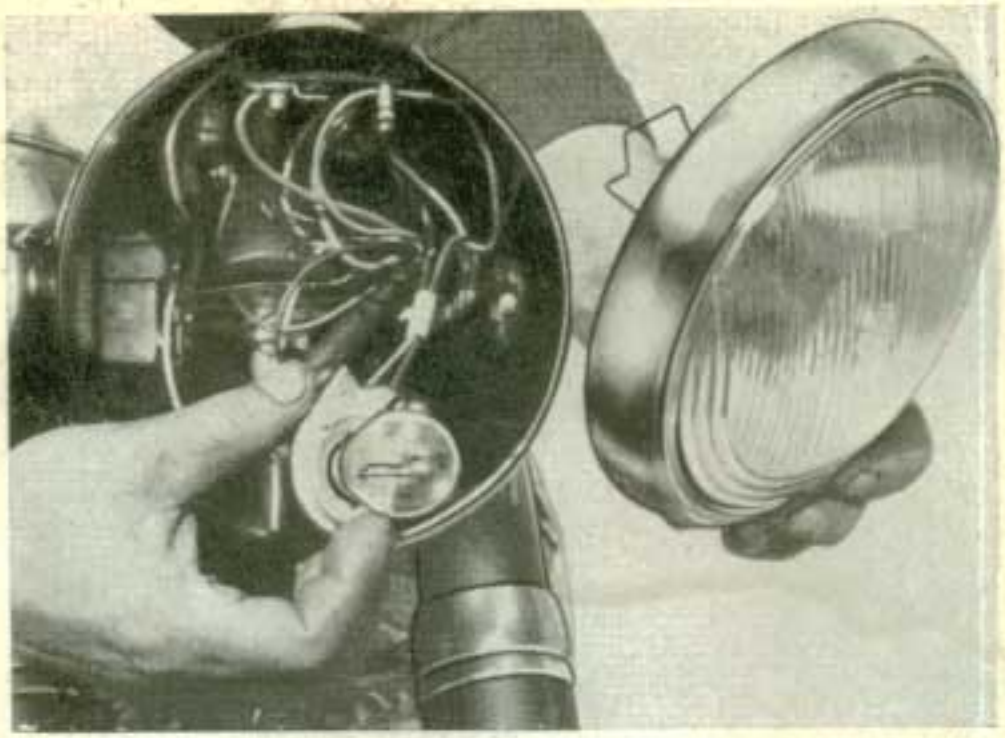
The tool boxes (3) fitted on either side on the frame are large enough to enable a number of spare parts or other small items to be carried in addition to the tool kit.

The tool kit containes a carefully-chosen selection of tools which will be found of great assistance in the event of any trouble being encountered.

The Headlamp

The adjustable rubber-mounted headlamp provides a long-range beam of light for night driving.

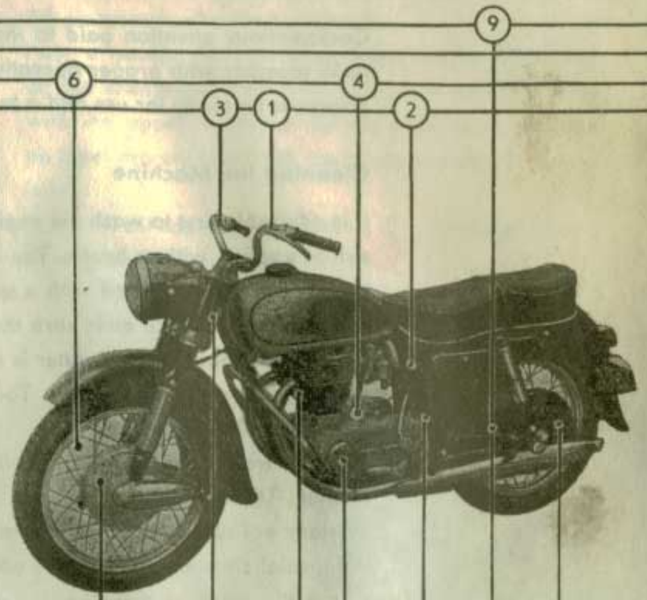
Mounted on the headlamp, where they are easily seen by the rider, are the speedometer and, beside it, the charging indicator lamp and the neutral indicator lamp. In addition the ignition and lighting switch is mounted on the headlamp. When the ignition key is withdrawn a sliding plate covers the ignition switch opening and prevents water entering.

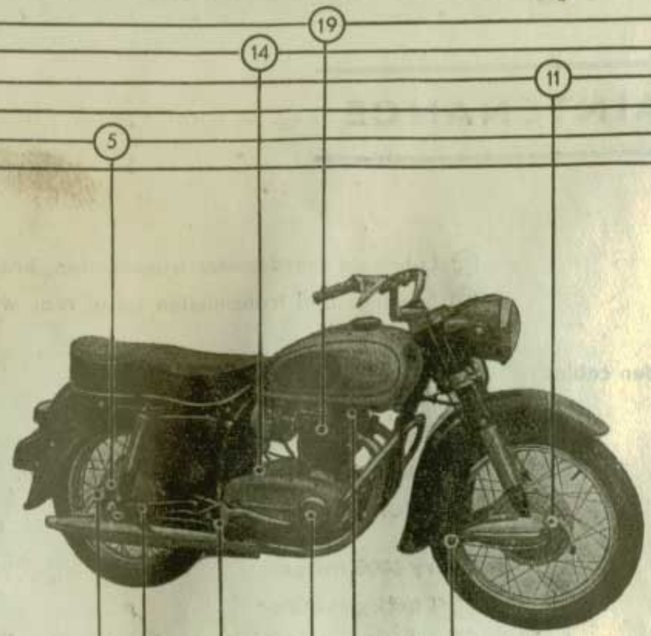


6000 miles – 10000 km
3000 miles – 5000 km
1500 miles – 1500 km
1000 miles – 1500 km
300 miles – 500 km
Before each trip
As required

Use of the Chart

Follow the line drawn against the mileage covered, and carry out the work specified by the numbers as described in detail in the following pages.





As required
Before each trip
300 miles – 500 km
1000 miles – 1500 km
1500 miles – 1500 km
3000 miles – 5000 km
6000 miles – 10000 km

CARE AND MAINTENANCE

As required

① Adjust clutch
② Check battery
③ Oil hand levers and Bowden cables

Check before each trip

④ Oil level
⑤ Front brake
⑥ Tyre pressures

Every 300 miles

⑦ Lubricate rear chain
⑧ Lubricate front swinging fork

Every 1000 miles

⑨ Adjust tension of rear chain
⑩ Check steering head and grease same
⑪ Grease brake cam levers on front and rear wheel
⑫ Lubricate speedometer transmission, brake lever
⑬ bearings and transmission set of rear wheel

Every 1500 miles

⑭ Change oil
Renew oil filter inserts
⑮ Check valve timing chain
⑯ Adjust valves

Every 3000 miles

⑰ Check generator
⑱ Adjust contact breaker
⑲ Check sparking plugs
⑳ Clean rear wheel chain

Every 6000 miles

Change oil of telescopic front fork
㉑ Clean and grease wheel bearings

CARE AND MAINTENANCE

Conscientious attention paid to the specified care and maintenance tasks together with proper operation are essential if your machine is always to be ready for use and is to have a long life.

Cleaning the Machine

It is advisable first to wash the engine down with paraffin or washing petrol applied with a brush. The engine and frame should then be hosed down, and cleaned with a sponge or a soft brush and a gentle spray of water. Make quite sure that the engine is cold before hosing it down and that the jet of water is not directed on to engine openings, the brakes, or the carburetter. Too strong a jet of water may cause damage to the paint-work.

The best way of drying the enamelled parts is by means of a chamois leather. The enamelled parts can then be treated with normal proprietary polishes, while the chromium-plated parts are treated with the special chrome preservative and rust preventative. It is a mistake to rub the machine down with a dry cloth when it is dry, since this causes damage to the paintwork.

After the machine has been washed down, it is essential that the brakes be tested before starting out on a run, since it is possible that water may have penetrated into them. If this has in fact occurred, apply the hand and foot brakes in turn until they are again fully effective.

① Changing Oil, Engine/Gearbox

In the "Citation" model the oil supplies for the engine and the gearbox are not separate.

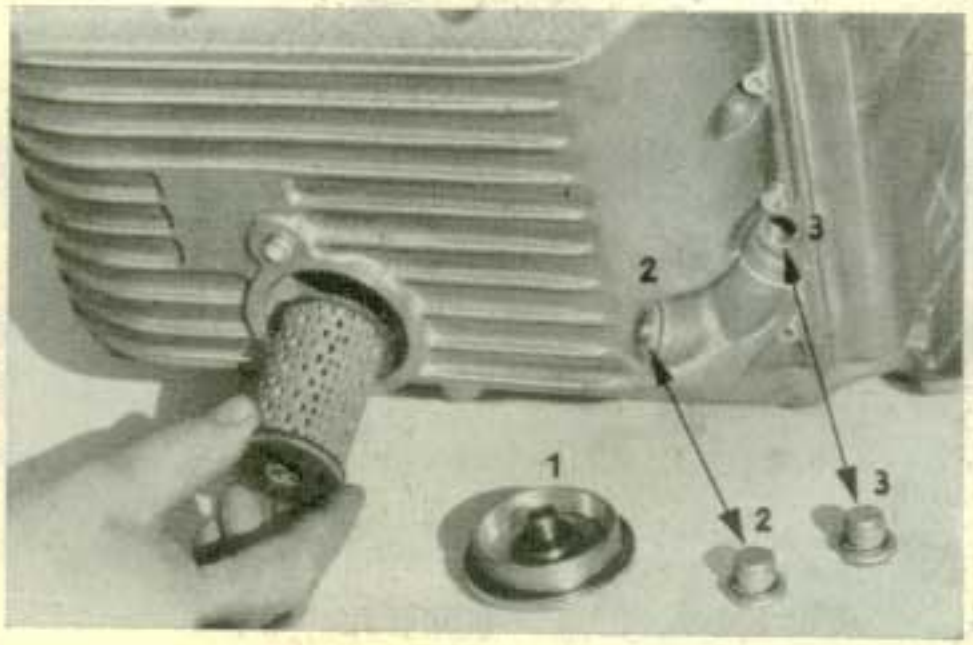
Change the oil as specified in the Service Booklet, and then every 1500 miles (2500 km).

Absolute cleanliness is essential when changing the oil. It is recommended to change oil only when engine is warm. In order to drain the old oil unscrew the screws No. 2 and 3 and filter plug No. 1 and take off the filter inserts. Renew filter inserts and rescrew plugs No. 1, 2 and 3, tighten up firmly. Now 3.5 liters = 7.5 pints fresh oil must be filled in.

Pour a good-quality oil in through the filler opening on the crankcase (above the gearbox) until it is level with the upper mark on the dip stick. To check the oil level merely insert the dip stick, and do not screw it in.

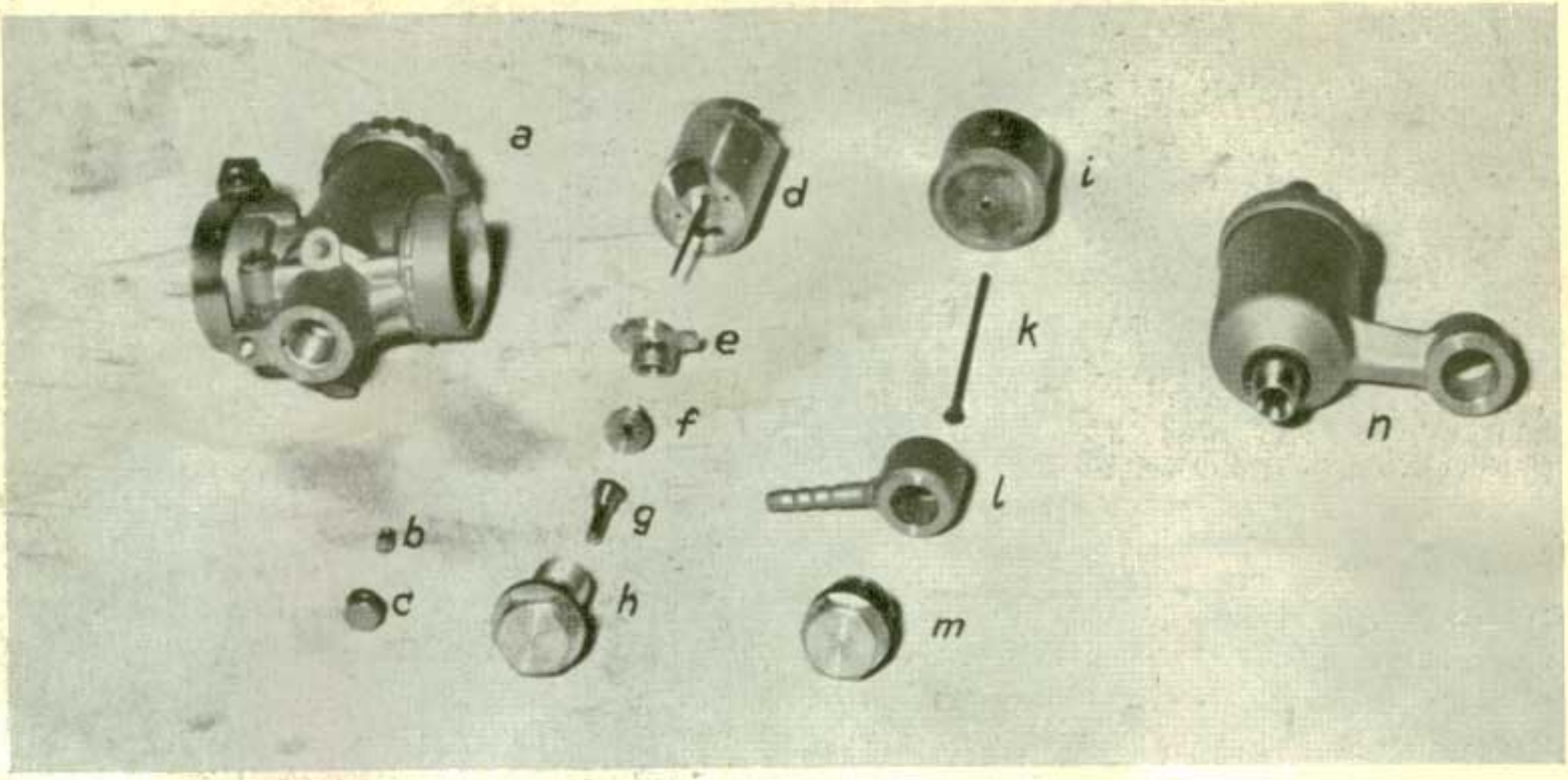
The total oil capacity is 7 1/2 pints (3 1/2 litres) of a good quality SAE 30 engine oil.

Prein off oil



Oil filter (1) magnetic insert (2)

Filling up with oil



a) Carburetter body with cap ring

b) Pilot jet

c) Bolt and sealing ring for closing jet aperture

d) Throttle slide and jet needle

e) Mixing chamber insert

f) Needle jet and sealing washer

g) Main jet

h) Jet plug

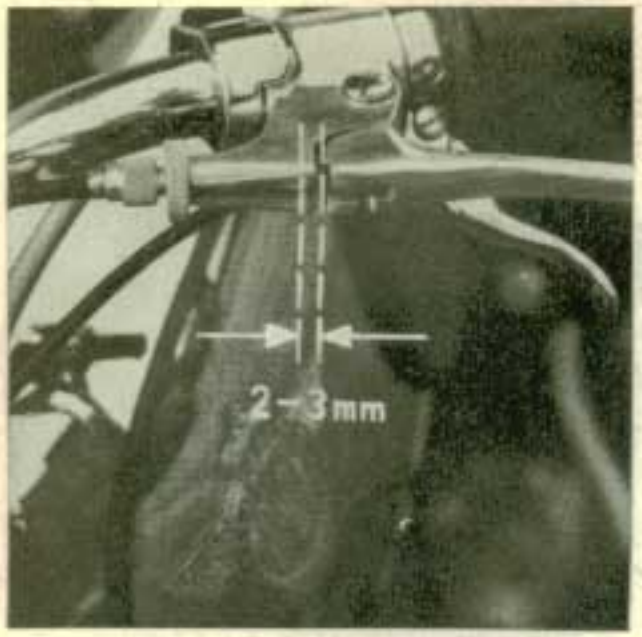
i) Float

k) Float needle

l) Rotatable banjo union for fuel pipe

m) Union bolt with gauze filter and sealing washer

n) Float chamber with cap and tickler



② Clutch Play

The clutch play measured at the clutch hand lever should be 0.08–0.12 in. (2–3 mm), and should be adjusted as necessary. The adjustment is effected by means of the knurled nut on the clutch hand lever.

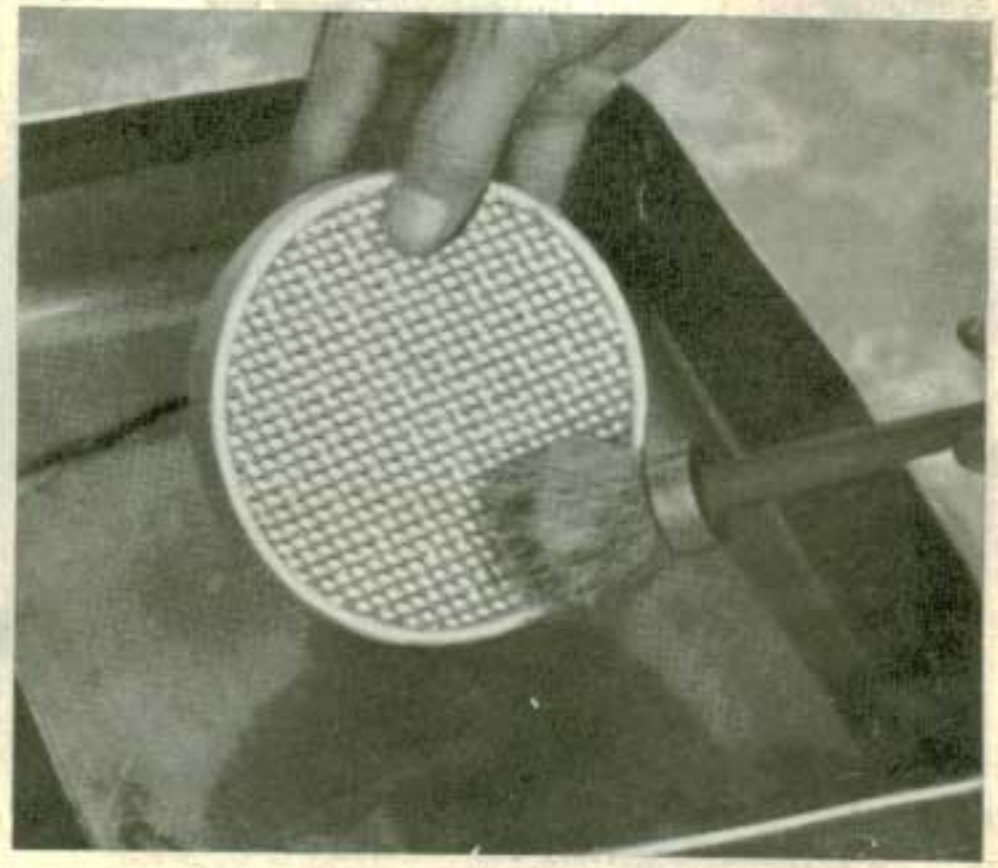
③ Care of the Carburetter

The carburetter should be washed through with petrol and cleaned from time to time. When this is done, check to make sure that all the parts are in good condition. Worn float needles, needle jets, jet needles, or throttle slides must be renewed, since they affect the output and fuel consumption of the engine.

④ Clean Air Filter

In order to reduce the wear of the engine to a minimum, it is advisable to clean the air filter every 1500 miles (2500 km), or more frequently if the machine is used on dusty roads. Loosen the pinch bolt and take off the filter.

In the case of the single-carburetter model, open the protective casing by undoing the quick-release catch and take out the filter element. Clean the filter by washing it out in petrol, and damp it slightly with engine oil.



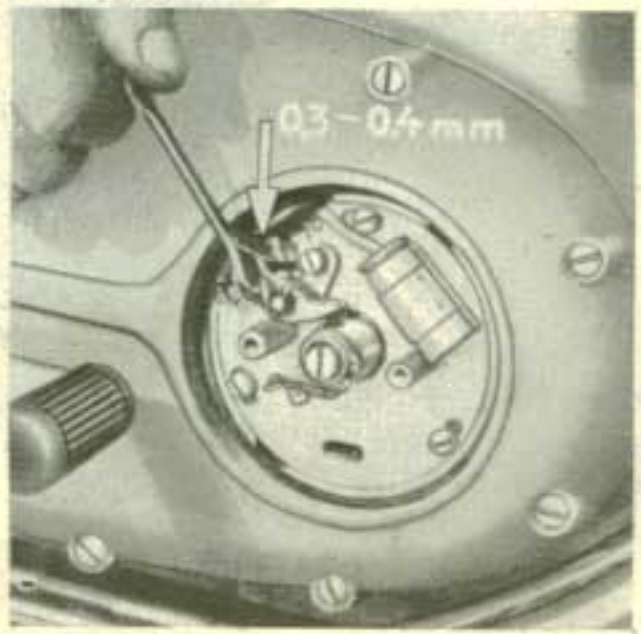
⑤ The Generator

The Bosch generator should be checked over every 3000 miles (5000 km). Carbon dust should be wiped off. Use only a clean rag soaked in petrol for cleaning the commutator. The blackening of the commutator where the carbon brushes rub on it assists current flow, and this should therefore not be removed. Emery cloth must not be used on the commutator. If the commutator is badly worn, have it turned down by a good specialist workshop. Fit new carbon brushes if those on the generator are badly worn (use only genuine replacement brushes). No oil or grease must be allowed to drop on the commutator.

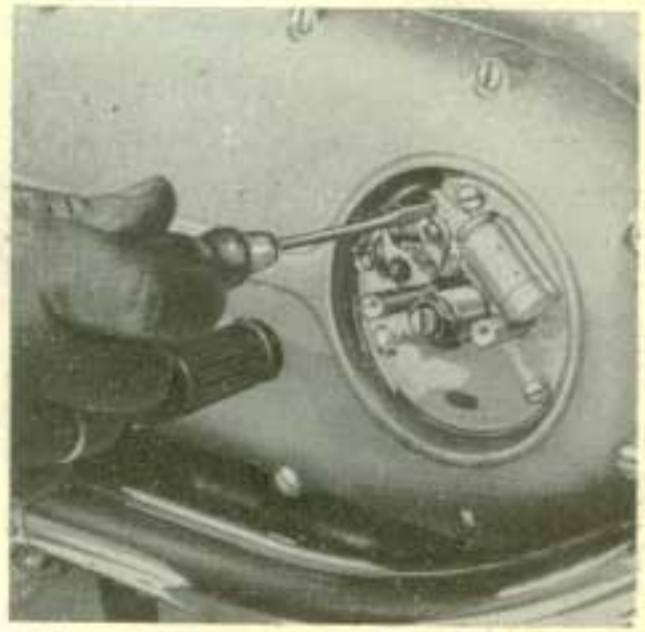
⑥ The Contact Breaker

The cover plate should be removed and the gap at the contact breaker points be checked every 3000 miles (5000 km). Dirty or oily contacts can be cleaned by means of a magneto file. When the contact breaker is fully open (with the moving contact arm resting on the highest point of the cam), the gap at the points should be 0.012 to 0.016 in. (0.3 to 0.4 mm).
To adjust the contact breaker, loosen the clamping screw slightly and move the contact bracket until the gap, which should be measured with a feeler gauge, is correct. If the bracket is moved upwards, the contact gap will be reduced, and if it is moved downwards the gap will be increased.

Wiping out the carbon dust

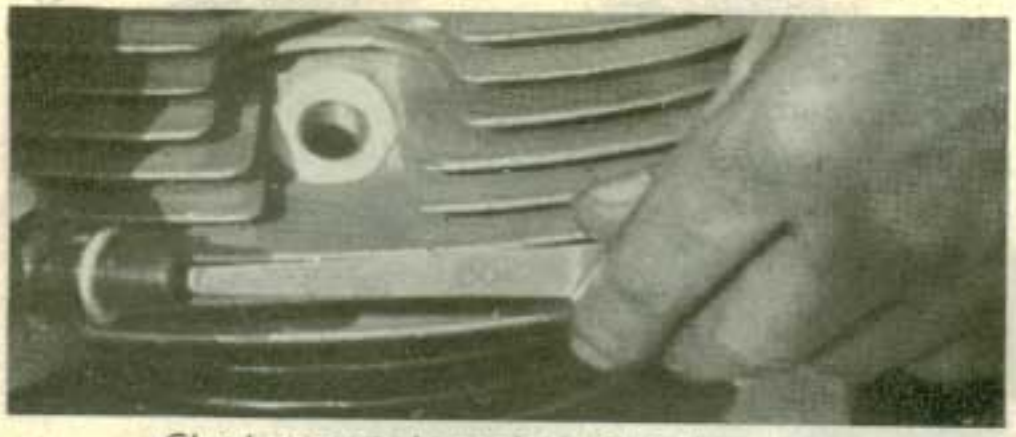


Contact-breaker gap



Adjusting the contact-breaker

Tighten the clamping screw up firmly, and smear the lubricating felt pad lightly with heavy-duty grease.



Check gap at electrodes with feeler gauge

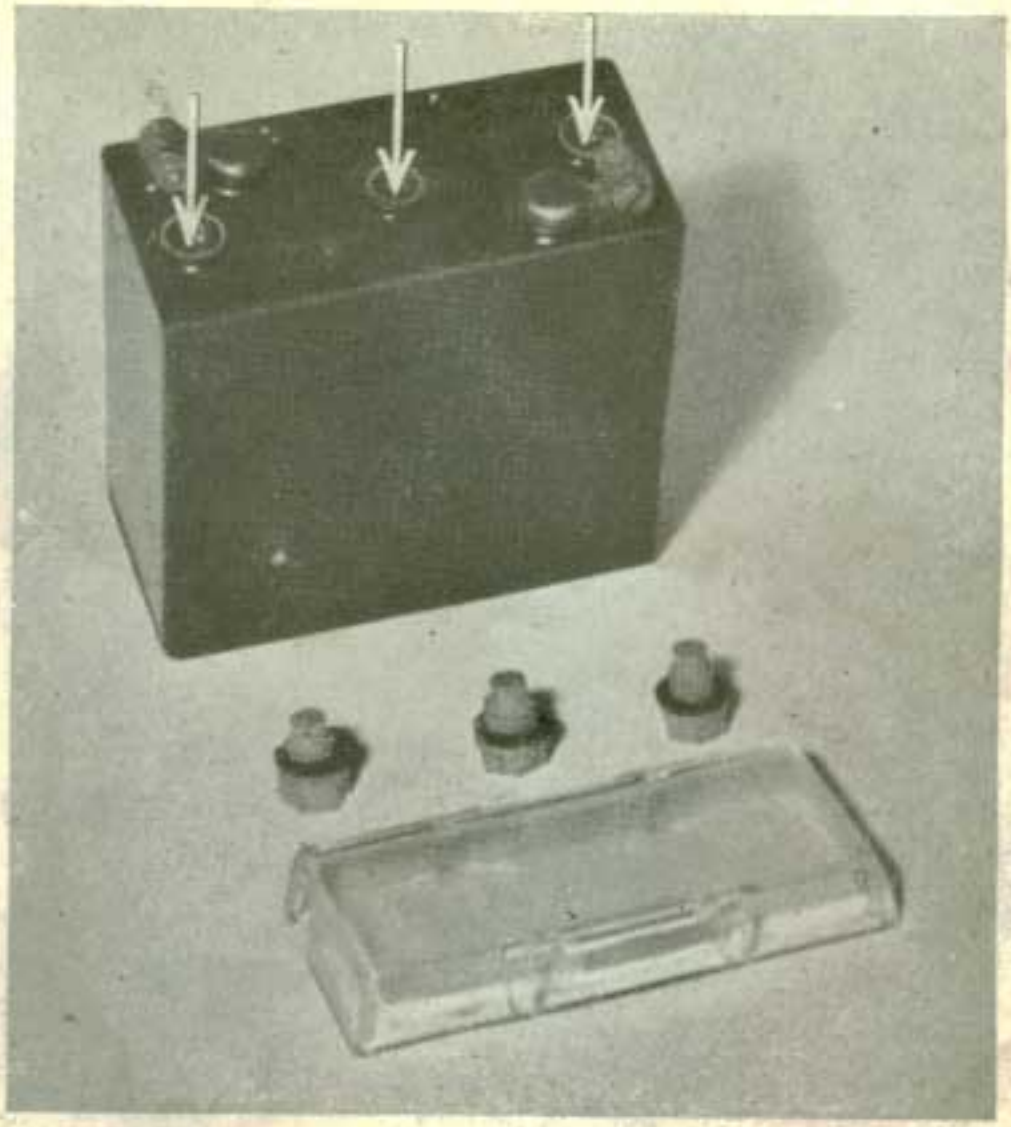
⑦ The Sparking Plugs

Use only sparking plugs with the heat ranges specified in the Technical Data and with a long-reach thread.

Check the gap at the electrodes with the aid of a feeler gauge every 4000 miles (6000 km). The gap should amount to 0.02 to 0.024 in. (0.5 to 0.6 mm). Fit new sparking plugs after covering about 10.000 miles (15.000 km).

⑧ The Battery

The level of the acid in the battery should be checked at least every 4 weeks, and more frequently during the hot summer months. The acid should always be kept level with the parted insert in the filler holes. When necessary top up with distilled water.



Take care not to spill the acid. The acid level must not be allowed to rise above the stated value. The battery terminals should be cleaned and then lightly greased with terminal grease.

Special care should be taken to give the battery the necessary attention when the machine is laid up (see also "Laying up the machine").

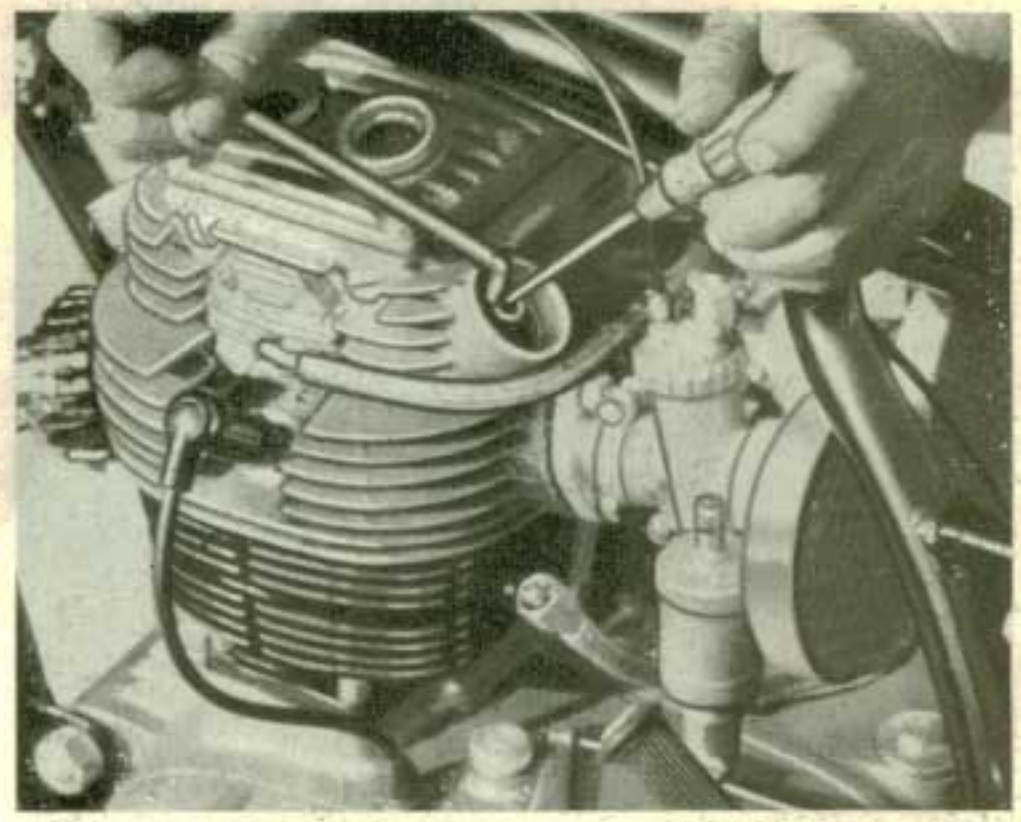
⑨ Adjusting Valve Tappets

The tappet clearance should be checked each time the machine is serviced in accordance with the Servicing Booklet, and thereafter every 1500 miles (2500 km). The use of the correct tappet clearance is not only of vital importance for the output of the engine, but also for the life of the valves. If the tappet clearance is too small, not only will the engine power be reduced, but it may also cause the valve to burn out.

Make it a general rule:

To adjust the tappets only when the engine is absolutely cold.

It is of assistance to remove the fuel tank when adjusting the tappets. Turn the engine over until the valves of the left-hand cylinder are on the rock, i.e. a slight rotation of the engine in either direction will cause either one or the other valve to open, and then adjust the tappets of the right-hand cylinder (with its piston at TDC and both valves closed) until there is no tappet clearance. Carry out this adjustment in the following manner: Unscrew the plug, loosen the lock nut, and loosen the tappet screw slightly; then tighten the tappet screw up gently until a slight resistance is felt. Tighten up the lock nut and replace the plug. Turn the engine



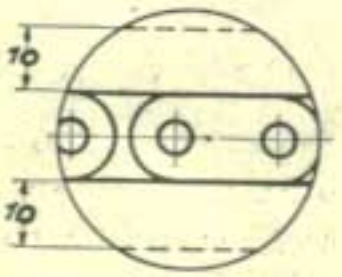
Adjusting the tapped clearance

over until the valves of the right-hand cylinder are on the rock, and then repeat this adjustment for the left-hand cylinder. It is advisable to have the tappet clearances adjusted at a Dealer's workshop.

⑩ Timing Chain

The timing chain on the engine should be checked each time the engine is serviced, and thereafter every 1500 miles. Here again it is advisable to have this work carried out by a Dealer's workshop.

Adjusting the timing chain



The Rear Chain

Chain tension about $^3/_8$ in. (10 mm) movement

⑪ The Rear Chain

The tension of the rear chain should be checked regularly every 1500 miles (2500 km).

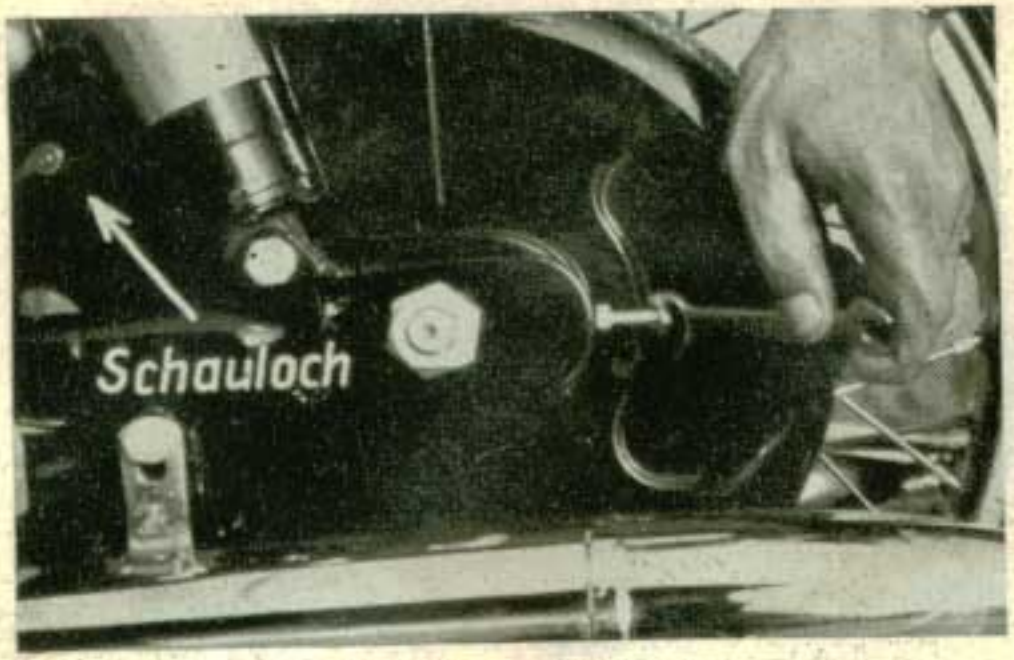
The spacer block included in the kit of tools supplied with the machine is placed between the left-hand rear frame tube and the pivoted fork, and both spring units are set to "Solo" operation (i.e. to "soft" or "1"). The rubber plug is then removed from the observation port in the chaincase.

When the chain is moved up and down by means of a finger inserted through the observation port, the total distance moved should amount to about $^3/_8$ in. (10 mm).

If the free movement of the chain is too great or too small, excessive wear and unnecessary noise will be caused.

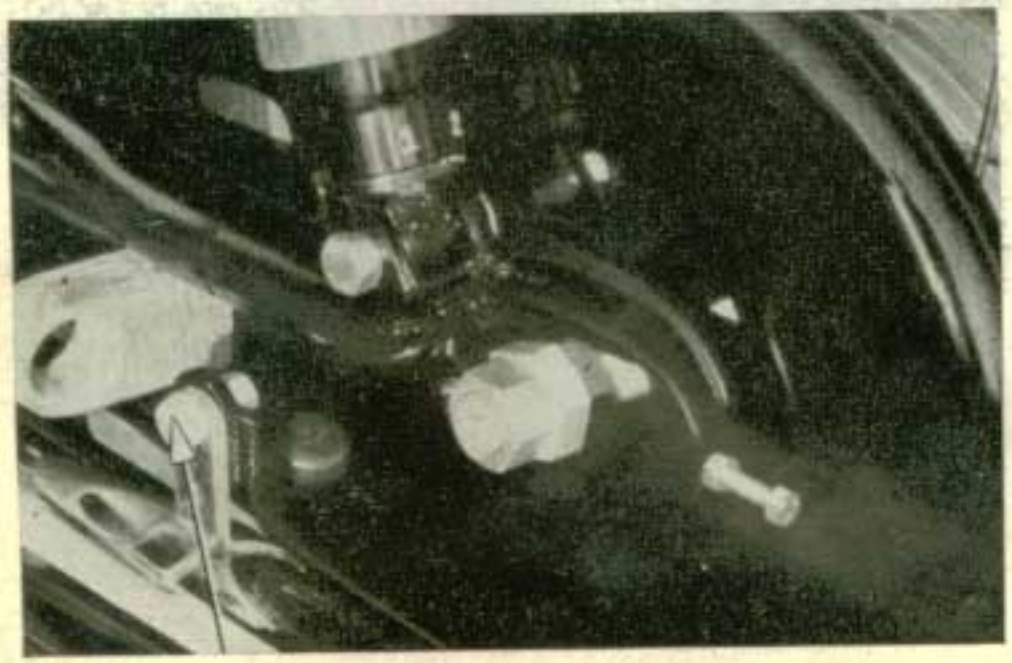
To adjust the chain tension, both nuts on the rear axle are loosened slightly. The chain adjusters on either side of the pivoted arm should be tightened up evenly, or the wheel will go out of alignment, which impairs the road-holding qualities and causes rapid wear of the chain and the sprockets.

After adjusting the chain tension, tighten all nuts and bolts up again properly. Replace the plug in the observation port.



Adjusting the chain tension

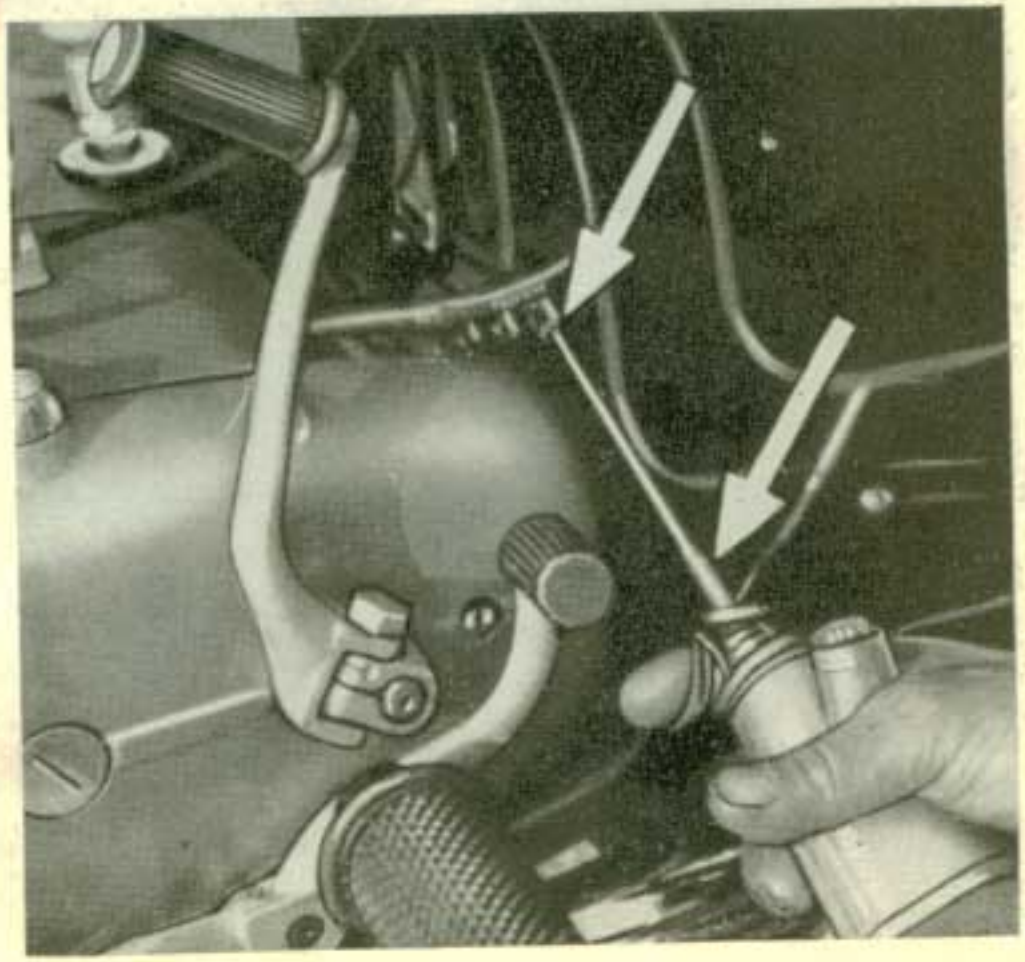
Spacer block. Spring unit set to "1" (felt pad)



⑫ Lubricating the Rear Chain

The felt pads riveted in place inside the corrugated rubber bellows pieces between the engine and the chaincase should be soaked with SAE 30 engine oil every 300 miles (500 km). This is best done by means of an oil can inserted through the two lubrication holes in the bellows pieces.

Greasing the rear chain



⑬ Changing the Oil in the Telescopic Forks

Every time the machine is serviced, and thereafter every 6000 miles (10,000 km) the oil in the telescopic forks should be changed.

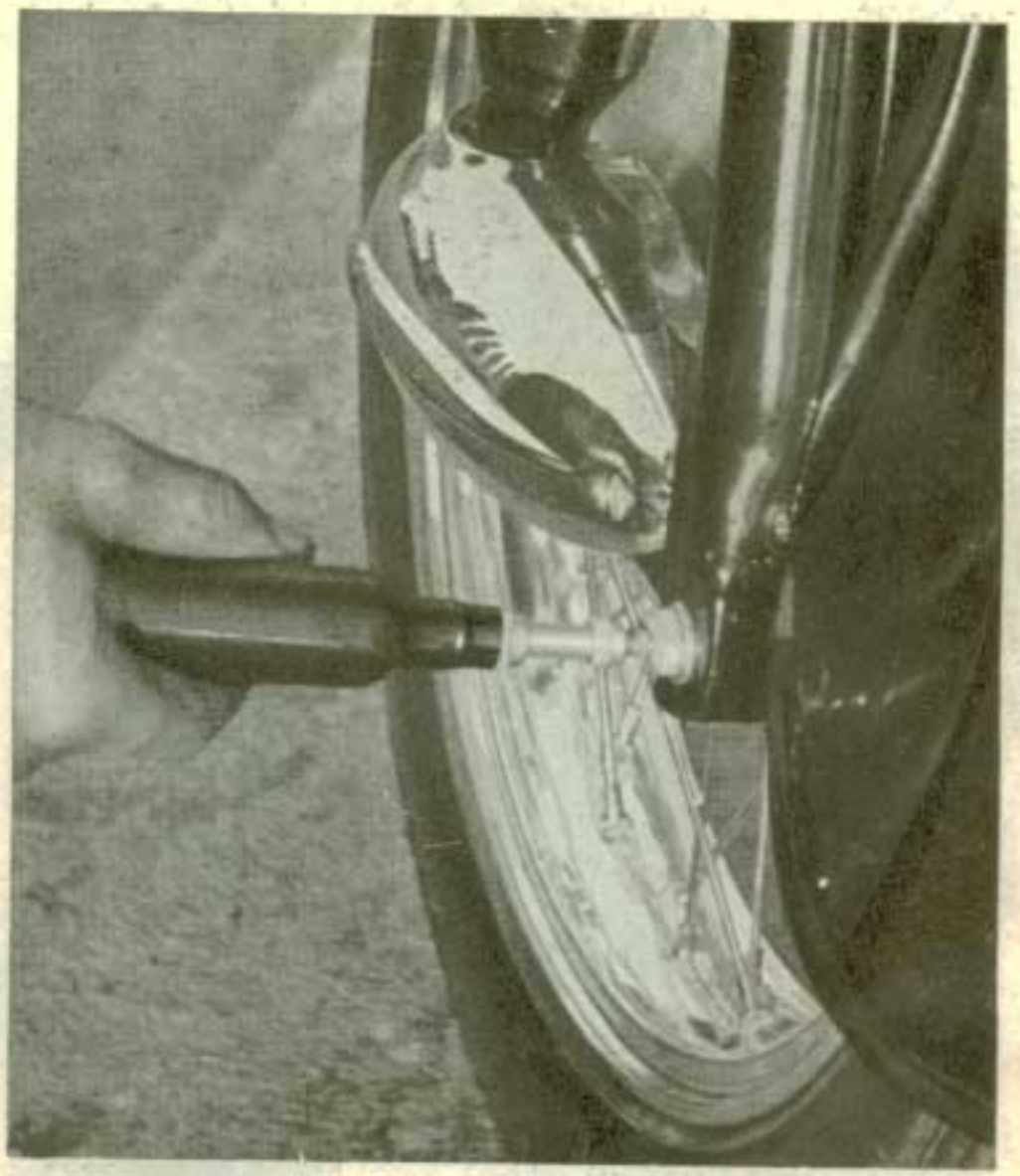
To change the oil, the slotted screws at the lower ends of the two fork tubes should be unscrewed. The large hexagon bolts on the upper fork cross bar are also removed. The machine must be supported on the central stand while this is done.

The front wheel is then moved up and down a number of times in order to pump out the oil. Rinse through the forks with a little washing petrol and then pump this out of the system.

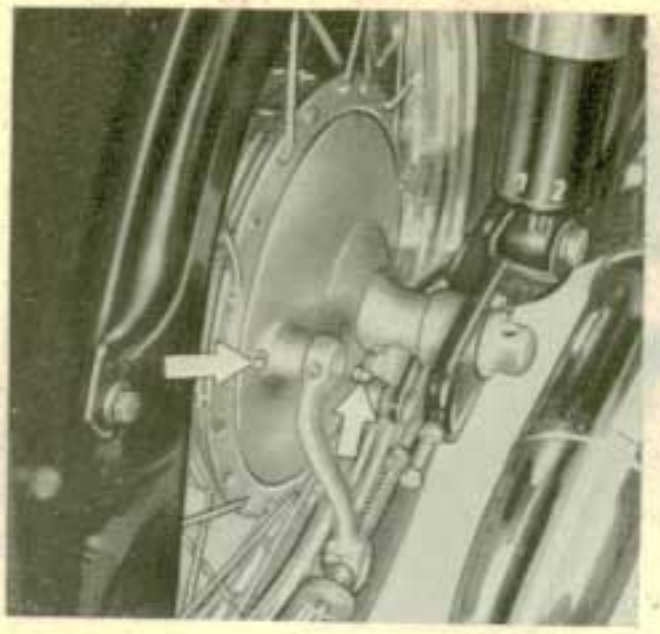
Replace the slotted screws and pour 3 fl. oz. (80 cc) of SAE 80 gear oil into the top of each fork tube. Then replace the two hexagon bolts and tighten them up firmly.

⑭ Front Forks

In addition to the work specified to be carried out when the machine is serviced, apply Mobilgrease No.4 to the two grease nipples on the pivoted arms with a grease gun every 300 miles (500 km).



Greasing the pivoted front forks



Grease nipples on cam levers and speedo drive

Grease nipple on foot brake pedal

Grease nipple on cam lever

If any adjustment proves to be necessary, it is advisable to have this work carried out by a Dealer's workshop.

The two grease nipples on the steering head should be greased with the grease gun, which is filled with Mobilgrease No. 4, every 1000 miles (1500 km).

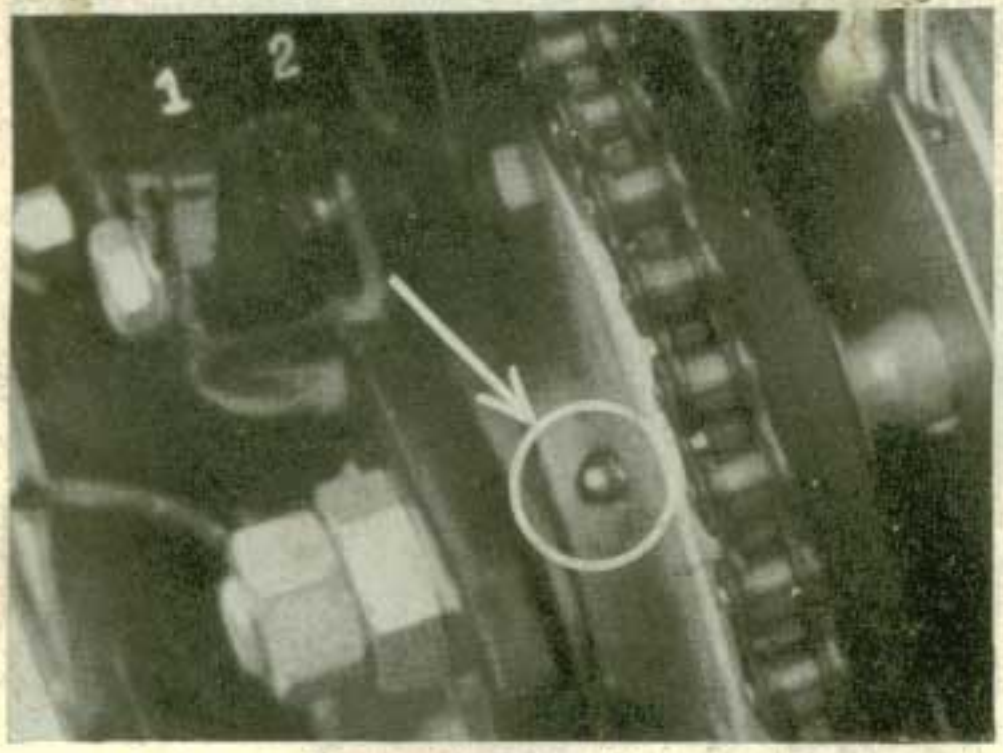
⑯ The Brakes

The brakes should be checked before starting off on each trip, as mentioned in the section on "Preparations for use". When adjusting the brakes, make sure that the adjusters are not turned too far for the wheels to be able to turn freely when the brakes are not applied. If adjusting the brakes brings no improvement, it is possible that the brake linings have become contaminated with oil or grease, in which case they must be cleaned off with clean washing petrol. If the brake linings are worn they will have to be renewed. The grease nipples on the brake cam levers should be greased with the grease gun (Mobilgrease No. 4) every 1000 miles (1500 km). This task should be carried out carefully, and only a moderate amount of grease should be applied, or the effectiveness of the brakes will be reduced. The foot brake pedal and the speedometer drive should be greased at the same time.

⑰ The Hubs

The wheel bearings should be dismantled every 6000 miles (10,000 km) and repacked with Mobilgrease No. 5.

It is advisable to clean the dust worn off the brake linings out of the brake drums at the same time.



Grease nipple on driving

⑱ Rear Chain Sprocket

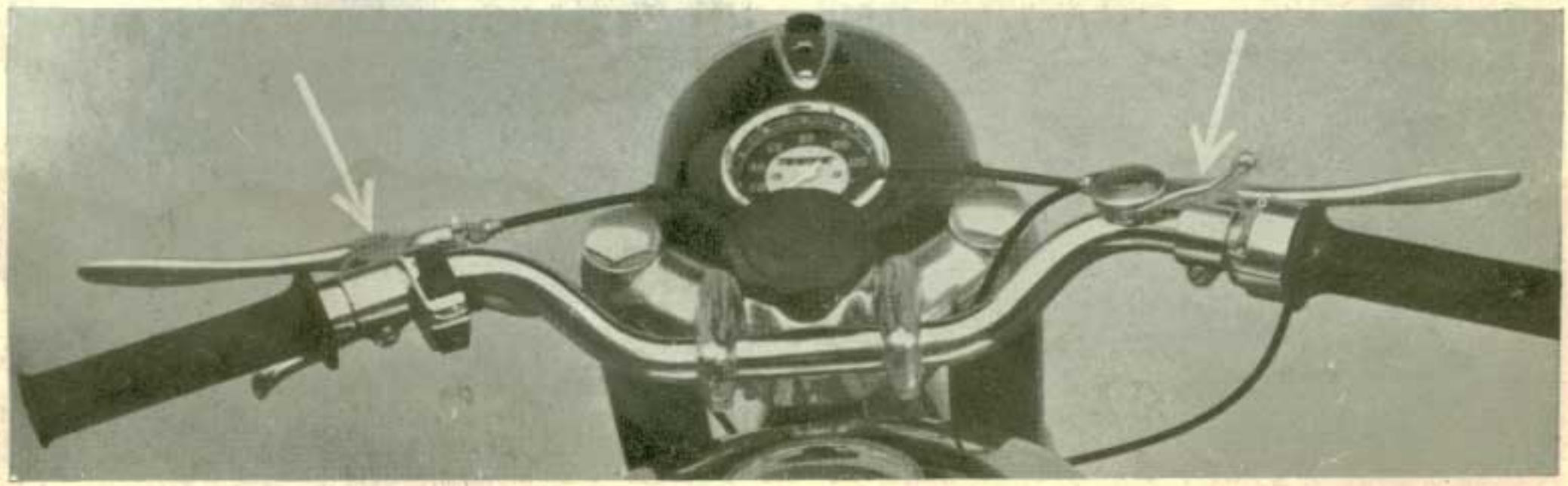
The rear portion of the chaincase is removed to provide access to the grease nipple.
The bearings of the rear sprocket must be greased with Mobilgrease No. 4 every 1000 miles (1500 km).

⑲ Control Levers and Bowden Cables

The pivots of the hand levers and the Bowden cables should be lubricated from time to time with a few drops of SAE 30 engine oil applied with the oil can.
At the same time the bolts holding the handlebars should be checked and tightened up as necessary.

⑳ The Tyres

Check the tyre pressures before each trip (for correct tyre pressures see "Technical Data"). Do not expose the tyres to the full force of the sun's heat, and do not allow the machine to stand in a pool of oil.



Control levers and Bowden cables

PRACTICAL HINTS

For your Citation

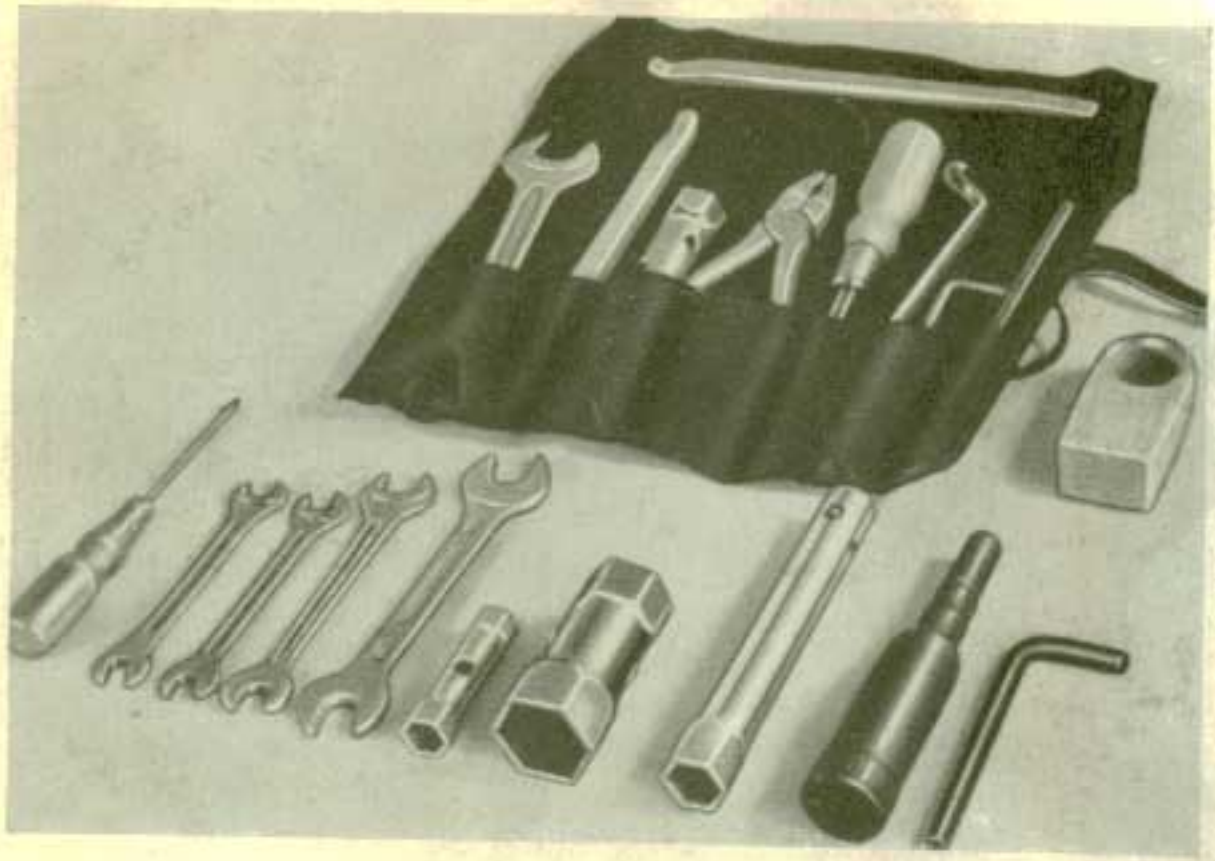
you should use only genuine Spar Parts. These can be obtained from your Dealer, and it is only with such parts that you can be sure that the dimensions are absolutely correct, that the material is the best obtainable, and that the resistance to wear will be a maximum.

There are suitable accessories obtainable from the factory. Your Dealer will be pleased to give you full details and to advise you.

No frontiers exist. Throughout the world workshops will provide you with a first-class service.

If, when you are planning a foreign tour, you let us know in good time where you intend to go, you will be provided with free travel advice, together with a list of Agents by your

Service Department.



PRACTICAL HINTS

Equipment supplied with the "Citation"

1 canvas tool roll containing:

- 1 Screwdriver 1 × 1.2 mm
- 1 Screwdriver 0.5 × 0.6 mm
- 2 Tyre levers
- 1 Pair combination pliers, 160 lg.
- 1 11-mm and 14-mm 65-mm long box spanner
- 1 27-mm and 32-mm 80-mm long box spanner
- 1 19-mm single-ended box spanner
- 1 17-mm/21-mm sparking-plug spanner
- 1 Tommy bar for box spanners 8 mm dia. × 160 mm
- 1 19-mm/22-mm double-ended spanner
- 1 12-mm/14-mm double-ended spanner
- 1 9-mm/11-mm double ended spanner
- 1 8-mm/10-mm double ended spanner
- 1 Ring spanner 10/11 mm
- 1 5-mm Allen key
- 1 8-mm Allen key
- 1 14-mm/17-mm double-ended spanner
- 1 Spacer block
- 1 Tyre pump
- 1 Grease gun
- 1 Spanner for generator with feeler gauge for contact-breaker points

Removing and Fitting the Front Wheel

Raise the machine on the central stand.
Pull up the brake cam lever on the brake back plate far enough for it to be possible to disconnect the brake-cable nipple.

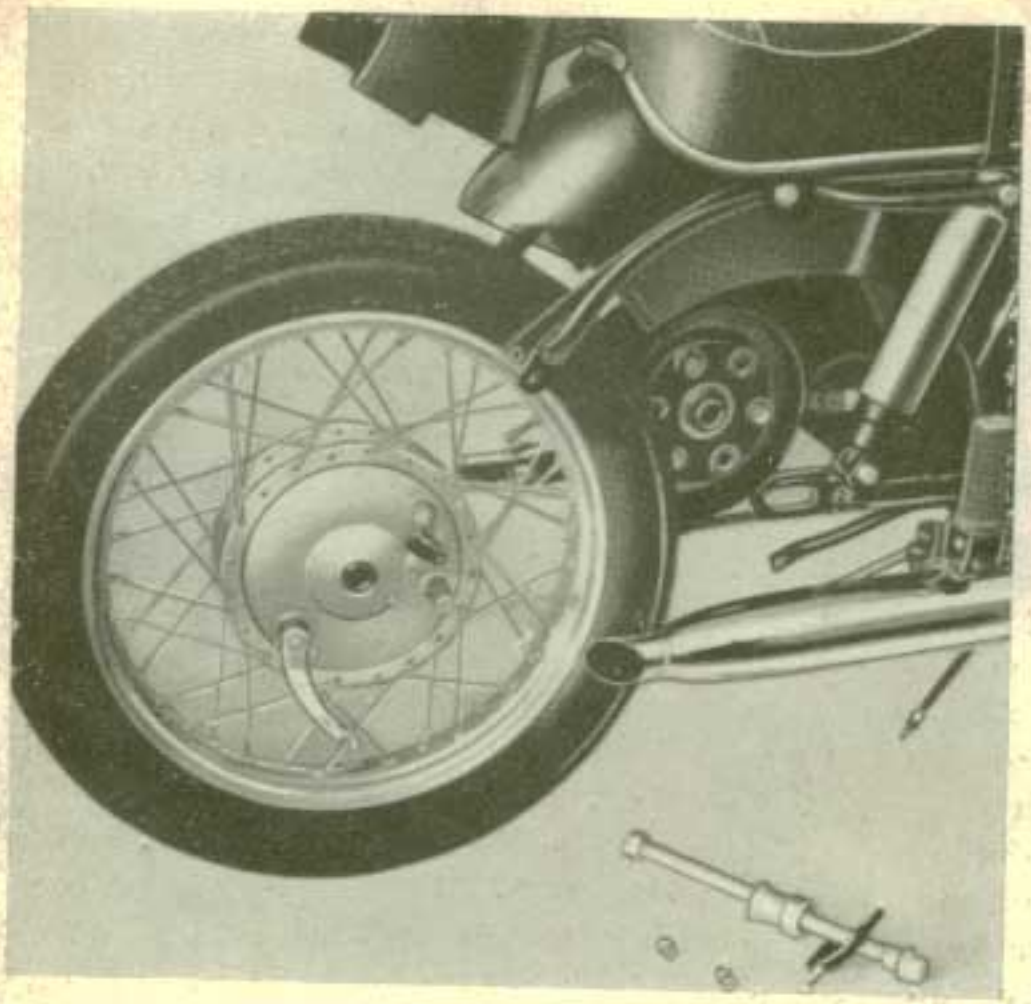
To remove the wheel, first unscrew the cover plates from the pivoted fork arms. Then unscrew the axle nut on the left-hand side, and pull the pin axle out of the forks to the right. The wheel is then free, and can be slid forwards out of the forks.

In the case of the telescopic forks the axle nut on the left-hand side is again unscrewed, and the axle is pulled out to the right. The front wheel is then free and can be slid forwards clear of the forks. Replace the wheel in the reverse order. Make sure that the lugs on the brake back plate engage with the guide on the right-hand suspension unit.

Removing and Fitting the Rear Wheel

Set the two adjusting levers on the spring units to "1". Bear down on the machine to compress the springs, and insert the spacer block supplied with the tool kit between the frame and the swinging fork on the left-hand side immediately in front of the mountings for the pillion footrests. Place the machine on its central stand and disconnect the speedometer shaft from the brake back plate (lift the spring catch and pull out the speedometer shaft).
Unscrew the knurled nut on the brake rod and disconnect the brake rod.
Unscrew the two bolts on the hinged end of the mudguard and turn the end upwards. Unscrew the brake reaction rod from the brake back plate and slightly loosen the bolt on the swinging fork. The outer of the two large nuts on the left-hand end of the axle is then unscrewed and the axle pulled out to the right.
Pull the wheel about 3/4 in. (2 cm) to the right, so that the three driving studs on the hub are freed from the shock absorber plate. The complete wheel can now be rolled out to the rear.

The wheel is replaced in the reverse order. It is advisable to hold the driving sprocket by engaging one of the gears.
Make sure the spacer bush is properly fitted (cylindrical section outermost).



FITTING THE TYRES

1. Remove the Wheel

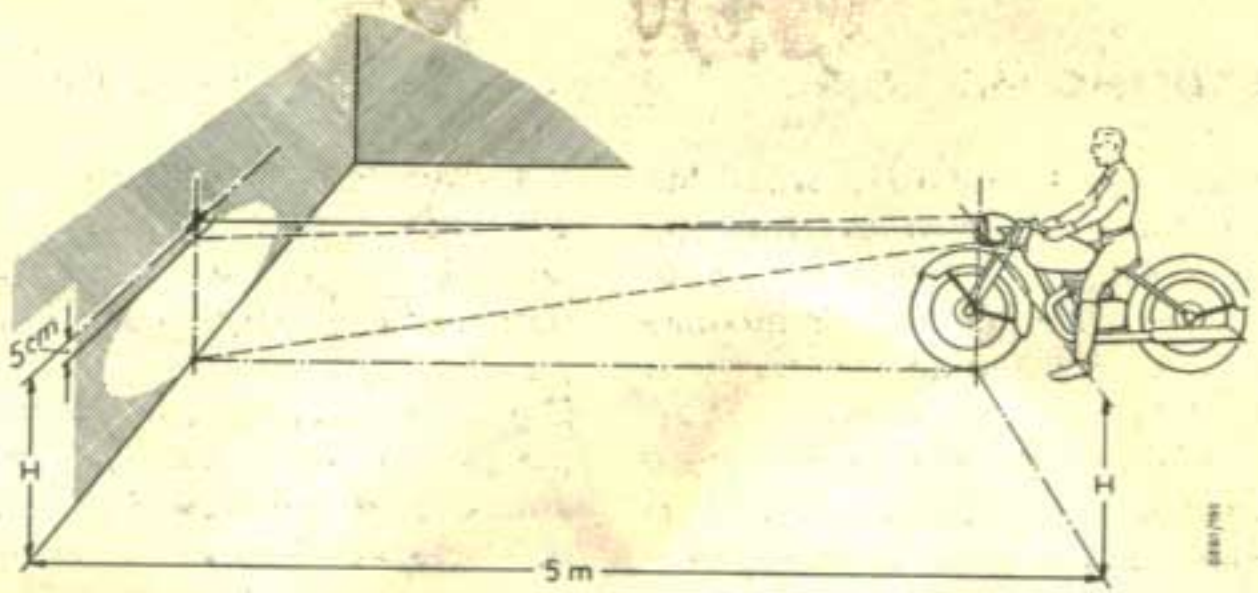
The essential factor in fitting and removing the tyres is to avoid using any force and not to employ a sharp tool such as a screwdriver, etc.

2. Remove the Tyre

Unscrew the valve cap. Let all the air out of the tyre by unscrewing the valve plunger, using the key on the end of the valve cap.
Unscrew the valve nut and push the valve through the hole in the rim.
Lay the wheel on a clean and level surface.
Push the edge of the cover on the side opposite to the valve into the well of the rim and lift the edge of the cover near the valve over the edge of the rim by means of a tyre lever. Use the second tyre lever to lift the remainder of the cover over the rim bit by bit. Carefully remove the inner tube.

3. To Fit the Tyre

First inspect the cover to make sure that nothing has penetrated through to the inside.
Pump the tube up slightly and place it inside the cover taking care not to nip it. The valve must be vertical. Push the valve through the hole in the rim and screw the nut up a few turns.
Push the edge of the tyre on the side opposite the valve down into the well of the rim and from there gra-



dually ease the remainder of the cover over the edge of the rim. Tighten up the valve nut.
Pump up the tyre and make certain that the moulded line on the side of the cover is the same distance from the edge of the rim all round the wheel.

ADJUSTING THE HEADLAMP

If this work is not carried out by a Service Station, proceed as follows: Draw a line level with the centre of the headlamp on a light coloured wall. Push the machine back so that the headlamp glass is exactly 16 ft. 5 in. (5 meters) away from the wall.
The main beam must fall exactly on the centre of the line.
When the beam is dipped, the upper limit of the illuminated area must be at least 2 in. (5 cm) below the line.
The boundary between the light and the dark areas must be precisely horizontal. If this is not the case, either the bulb holder is incorrectly fitted or the double-filament bulb has been put in incorrectly.
To adjust the headlamp, loosen the mounting bolts on either side. After adjustment tighten up the bolts.

Replacing the Double Filament Bulb

If the double-filament bulb is faulty, a new one will have to be fitted; this should be inserted with the wording "oben" or "top" pointing upwards.
Hold the bulb only by means of a clean cloth.

Replacing the Fuse in the Headlamp

If a short circuit in the electrical system causes the fuse in the headlamp to blow, this must be replaced by a new one. To do this the headlamp reflector must be removed. Before fitting a new fuse determine the cause of the short circuit.

ADJUSTING THE IDLING MIXTURE

The idling mixture must only be adjusted when the engine is warm. Turn the stop screw to close the throttle slide until the engine runs slowly. The pilot air screw controls the strenght of the fuel-air mixture supplied by the pilot jets. If the pilot air screw is turned clockwise, the mixture will become richer, while if the screw is turned anti-clockwise the mixture will become weaker. When the adjustment is correct the engine will run evenly and steadily at a low speed (make sure the correct pilot jet is fitted—see Technical Data). The position of the pilot air screw should then not be altered since this also affects the running of the engine at low and medium speeds, and so could cause an increased fuel consumption. When the throttle is opened slowly the engine speed must gradually increase. The engine must not tend to stall as the throttle is opened nor slow down at any throttle position. If the engine runs heavily or jerkily or black smoke is emitted from the silencer, the mixture is too rich. Frequent spitting or spluttering, backfiring through the carburetter with a blue flame, and difficulty in starting indicate that the mixture is too weak.

Note that the engine will run efficiently only if the carburetter is properly adjusted.

LAYING THE MACHINE UP

If the machine is not going to be used for any considerable time (e.g. laying up for the winter), it is advisable to proceed as follows: Clean the machine thoroughly, change the oil, and grease all grease points.

If possible spray a commercial preservative through the sparking-plug hole and into the cylinder bore by means of an atomiser: the piston should be at bottom dead centre when this is done. Then turn the engine over a number of times, and the pistons are set to top dead centre (on the firing stroke).

The sparking plugs are then replaced.

Drain the fuel out of the carburetter by disconnecting the fuel-pipe union, and clean the carburetter.

Remove the battery from the machine, and store it in a dry room where it will be protected from frost. Every 6 to 8 weeks have the battery recharged and the acid level checked by an electrical workshop.

Spray a preservative compound over the enamelled parts.

Treat the chromium-plated parts with chrome preservative. Store the machine in a dry room, and chock it up so that both wheels are relieved of weight. Do not allow the tyre pressure to fall to less than half the values specified in the Technical Data. Place a cover over the machine to protect it from dust and dirt.