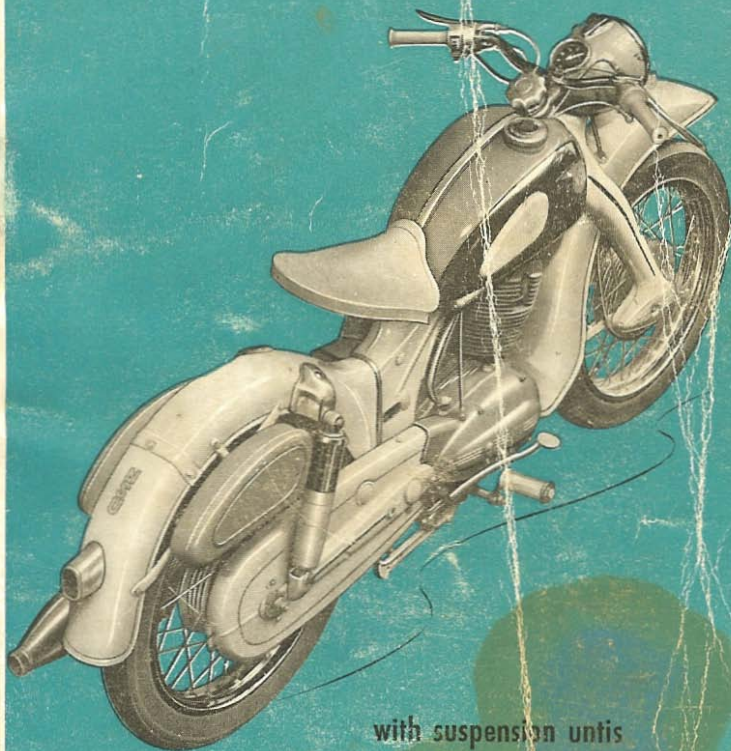




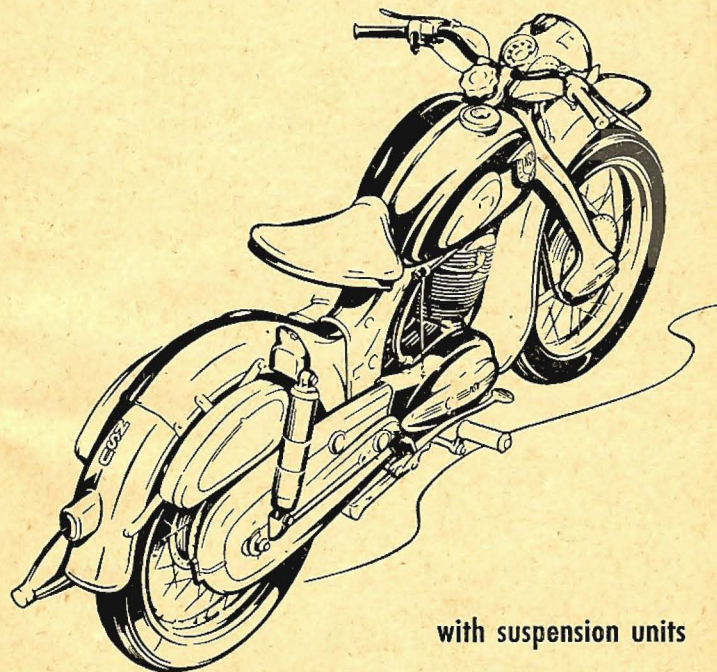
SUPERMAX



with suspension untis



SUPERMAX



with suspension units

Issue of May 1961

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NSU MOTORENWERKE AKTIENGESELLSCHAFT, NECKARSULM

NSU MOTORENWERKE AKTIENGESELLSCHAFT NECKARSULM

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Dear NSU Friend,

We would ask you to study this **instruction book** carefully, and thus acquaint yourself not only with all the interesting details of your new machine, but especially with all the hints and advices we offer you for the correct servicing of your machine.

Furthermore, we would ask you, according to the directions, given in the attached **Service and Inspection Card**, to take your machine to an NSU Dealer's workshop in order to have the various jobs, suggested by the works, carried out by experts. Only NSU Dealers have, besides **original NSU spares**, time-saving special tools and maintenance manuals at their disposal, as well as expert mechanics specially NSU-trained. We would therefore suggest that you take your machine, in case of repair work, too, always to your **NSU-Dealer**.

Any guarantee claims that might arise to be reported to your Dealer for his examination, who then has to bring the case to the General Agent's attention. All guarantee claims submitted direct to the General Agent can only be finalized on having the Dealer's report.

Repair jobs at the General Agent's can only be carried through on appointment made beforehand through your Dealer.

Finally, we would ask you to always adhere to our well-meant advice, and wish you

Many Miles of Trouble-free Riding on NSU!

**NSU MOTORENWERKE AKTIENGESSELLSCHAFT
NECKARSULM**

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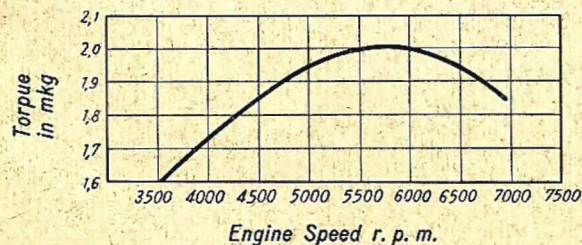
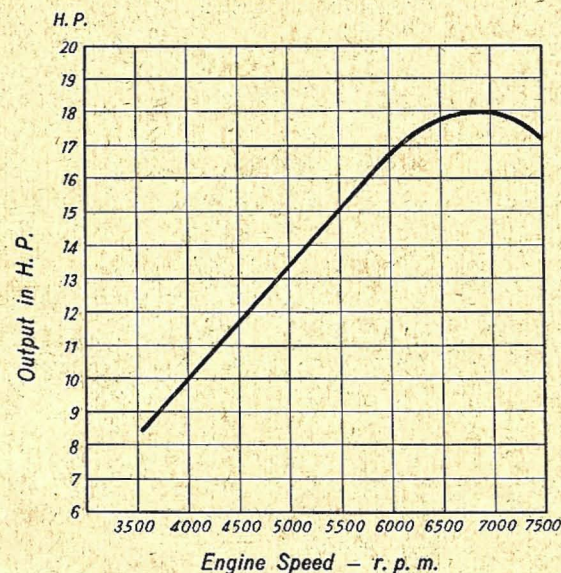
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The Characteristics of the MAX Engine



TECHNICAL

ENGINE — CLUTCH — GEARBOX

Cycle	4 stroke
Stroke	66 mm
Bore	69 mm
No. of cylinders	1
Capacity	247 cc.
Compression ratio	7.4 : 1
Output	18 h. p.
Engine speed	7 000 r. p. m.
Valves	Valves are suspended in light alloy cylinder head and operated by eccentric-driven overhead camshaft

Lubrication	By gear pump
Ignition	Coil ignition
Ignition timing advance	Automatic
Carburettor	Two-slide carburettor
Air filter	Wet air filter on frame
Clutch	Multi-plate dry

clutch with rubber shock absorbers

Clutch control	Manual
Gear box	4 speed gearbox in unit with engine

Type of engagement Dog Clutches

Gear reduction for primary drive 2.583 : 1

Gearbox ratios		Solo operation	Sidcar operation
Bottom gear	3.15 : 1		
2nd gear	2.025 : 1		
3rd gear	1.406 : 1		
Top gear	1 : 1		
Reduction ratio for final drive	2.625 : 1		3.0 : 1

Overall ratios

Bottom gear	21.36 : 1	24.41 : 1
2nd gear	13.73 : 1	15.7 : 1
3rd gear	9.53 : 1	10.89 : 1
Top gear	6.78 : 1	7.75 : 1

Primary drive between engine and gear box
Final drive between gear box and rear wheel

Helical gears
Enclosed chain

Maximum speed approx. 72 m. p. h.

Peak speed approx. 78 m. p. h. one person leaning forward

DATA

FRAME — WHEELS — BRAKES — EQUIPMENT

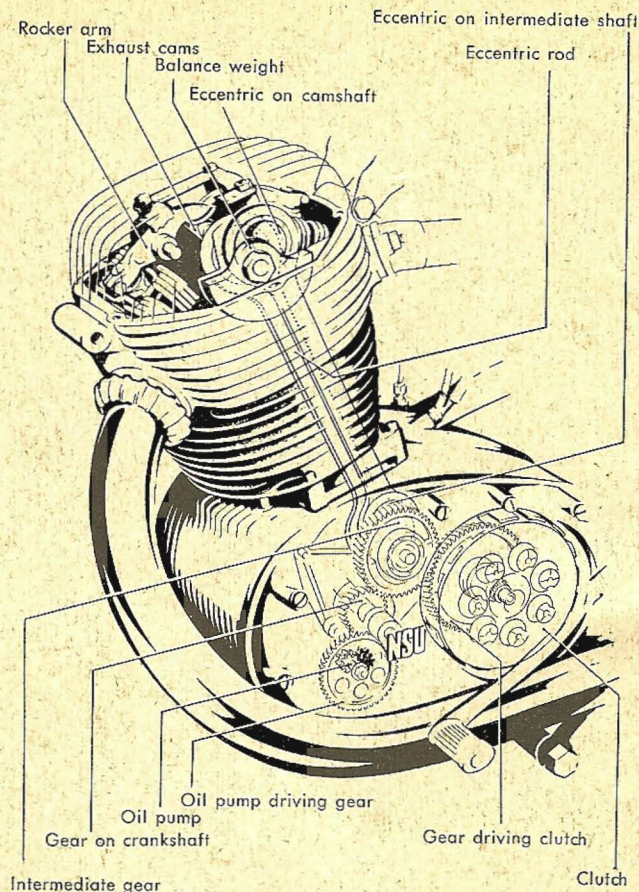
Frame	Central pressed steel frame
Front fork/rear fork	Swinging spring forks
Shock absorber, front	Hydraulic
Shock absorber, rear	Hydraulic
Stand	Centre stand
Tank capacity	3 Imp. galls. (14 Ltr.) (0.33 Imp. galls. reserve)

Length approx.	79" (2010 mm)
Width approx.	26 ³ / ₄ " (680 mm)
Height approx.	37 ³ / ₄ " (960 mm)
Wheels	Interchangeable
Tyres	3.25 - 19
Front brake	Internal expanding brake
Rear brake	Internal expanding brake
Brake operation	Front brakes by hand Rear brake by foot
Weight	384 lbs. (174 kg)
Admissible total weight	715 lbs. (325 kg)

Equipment

Electrical equipment	Generator set with automatic advance and retard, electric horn, battery in locked box
Speedometer	in head lamp
Accessories	Tools, tyre pump
Available against extra charge on request:	Sidcar attachment Pivot-action pillion seat with folding foot rests

Design and equipment subject to change without notice



DESCRIPTION

The Engine

The NSU Max engine

is an air-cooled, four-stroke engine built in unit with the gear box.

The Crankshaft

runs in roller bearings. The driving pinion for the oil pump and for the intermediate gear is fitted on the left-hand end of the crankshaft, while the generator is fitted on the right-hand end. The connecting-rod big-end bearings is a roller bearing. The light-alloy piston is provided with two compression rings and one oil scraper ring.

Valve Gear

The valves are of the overhead type driven from the overhead camshaft by means of two rocker arms. The valve springs are of hairpin form.

In contrast to previous designs in which the drive to the overhead camshaft is by means of a shaft, gears, or a chain, the drive of the Max consists of a pair of eccentric shafts, each carrying two eccentrics at 90° to each other, and two connecting rods. The lower eccentric shaft is bolted to the intermediate gear, and the upper to the camshaft. The two connecting rods which transmit synchronously the rotary motion to the camshaft are carried on the eccentrics in bronze bearings. In order that the expansion of the cylinder barrel and head on heating up may not affect the eccentric drive adversely, the camshaft housing is free to swing, and is held on the left-hand side by the stationary distance rod which is secured to the crankcase at the centre of the lower eccentric shaft.

Lubrication of the Engine

is by means of the dry-sump system.

In this system the **double gear pump** comprises a scavenging and a pressure pump. The scavenging pump has a higher capacity than the pressure pump so that the oil returning from the points of lubrication cannot accumulate at the pump, but is returned to the oil tank. The oil passes through a filter on its way from the tank to the pressure pump, where it recommences its cycle.

The oil for **lubricating the crankshaft** is forced by the pump through passages drilled in the left-hand crankshaft, the left-hand flywheel, and the crank pin, to the big-end bearing.

The cylinder walls and the gearbox are lubricated by oil thrown off from the crankshaft assembly.

For **lubricating the valve mechanism** passages are provided in the crankcase, cylinder, and cylinder head which lead the oil directly to the individual lubrication points. The **dipstick** in the oil tank is provided with two notches the cap of the oil tank.

The return flow of the oil can be observed by removing which indicate the maximum and minimum oil levels.

Breathing

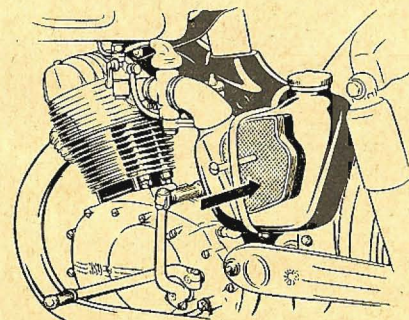
The pressure built up in the crankcase when the piston descends is relieved through passages drilled in the right-hand crankshaft and in the crankcase leading to the rear of the engine.

The Carburettor

is a Bing two-slide carburettor.

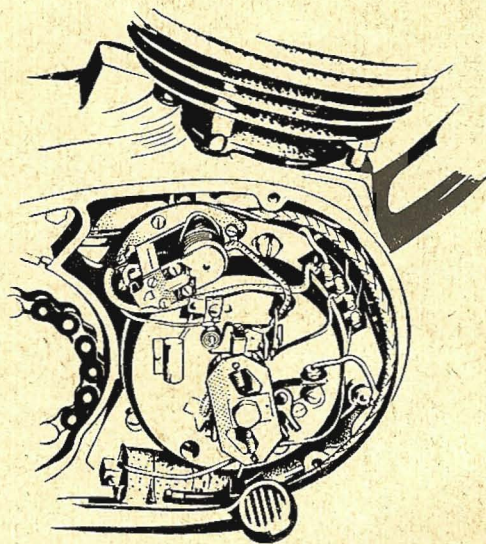
The control cables that **operate the carburettor** are adjusted at the twist grip and the air control lever on the right hand side of the handlebars.

The **wet air filter** is so arranged that the air is drawn in from the frame and enters the filter in a steady stream; there is practically no suction noise.



Electrical System

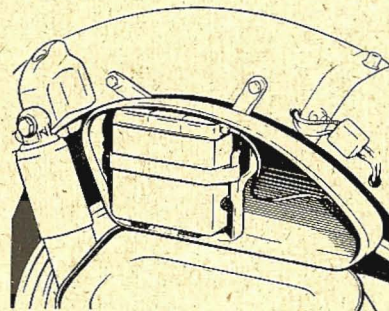
The **generator** with automatic advance and retard, which is of Bosch manufacture, runs at crankshaft speed, and has an output of 60 watts at 6 volts.



The **spark plug** used is a Bosch W 190 M 11 S. The **headlamp** is fitted with a twin filament for the main and dipped beams, **parking lamp**, a **warning lamp**, a **fuse** (15 amps) for all circuits other than the ignition, and a **light switch**.

The **dipper switch** and the **push button for the electric horn** are on the left hand side of the handlebars.

The **tail lamp** on the rear mudguard is a combined rear light and reflector which also serves to illuminate the number plate. It also includes a stop light which lights up when the foot brake is applied.



The **battery** is mounted in a special lock-up container on the left of the rear mudguard. This container is rubber-mounted to protect the battery from vibration. The **electric horn** is fitted on a sprung mounting on the front of the frame under the tank.

Transmission

The **multi plate clutch** which is mounted on the left hand side of the engine is a dry clutch containing three steel and four friction plates and is operated by the clutch lever on the left handlebar, through an adjustable cable and a clutch operating lever with a square thread.

The Four-Speed Gear Box

is built in unit with the engine. The gear pinions are in constant mesh, and are engaged by dogs. The foot-change lever and the folding kick-starter are on the left-hand side of the machine.

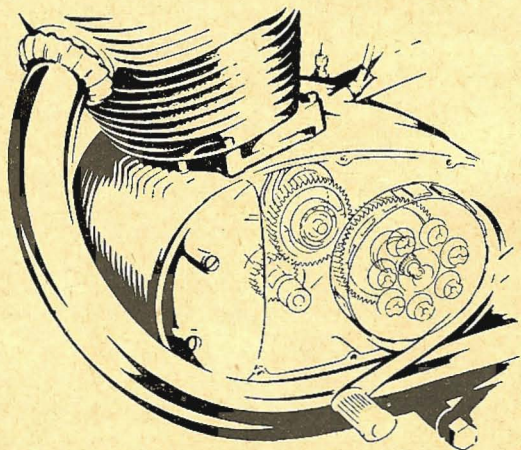
The Gearbox is lubricated

by oil thrown off from crankshaft.

Primary and Final Drives

Engine — Gear box

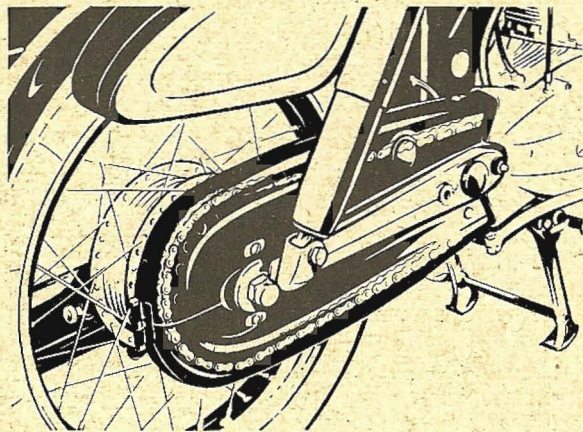
Helical gears running in an oil bath transmit the power from the engine to the clutch through an intermediate pinion and a rubber shock absorber.



Primary and Final Drives

Gearbox — Rear wheel

The final drive is by means of a roller chain which runs in a dust-proof casing, and the tension of which can be adjusted by a pair of cams on the ends of the rear forks. A rubber shock absorber is also incorporated in this drive.



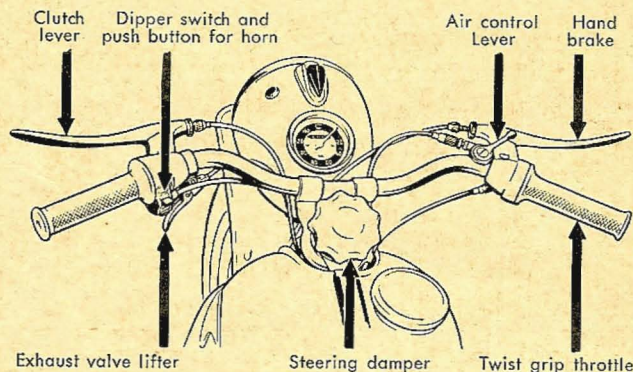
Chassis

The pressed-steel Frame

has the engine mounted on its rear section. In addition the top of the cylinder head is connected to the frame. A **central stand** with curved feet serves to support the machine.

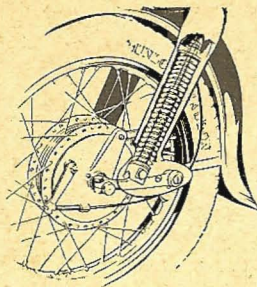
The Handlebars

are mounted in adjustable clips. The **clutch lever** and the **exhaust-valve lifter** are on the left-hand side, the **hand brake lever**, the **air control**, and the **twist grip throttle** on the right.



The **dipper switch** for full and dipped headlamp beams and the **push button** for the electric horn are also on the left handlebar.

The MAX is, of course, also fitted with a **thief-proof lock**; this is at the top of the left-hand front fork.

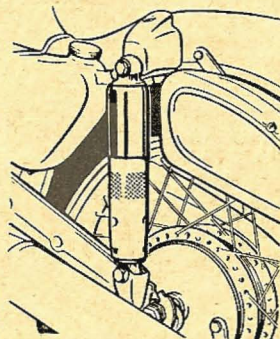


The Front Fork,

mounted on adjustable ball bearings in the steering head of the frame, has at its bottom two swinging arms which accommodate the front wheel. The swinging arms are cushioned in relation to the front fork by one compression spring each. Hydraulic shock-absorbers are built into these springs.

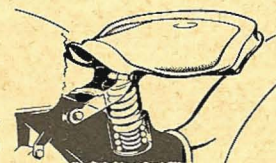
The Pivoted Rear Fork

is cushioned by suspension units and hydraulically damped.



The Pivot-Action Saddle

is spring cushioned relative to the frame and is carried in front at its pivot point in oilless bushings.



The rear Mudguard

with detachable end (and luggage carrier) is overhung on the spring cushioned frame.

The Front and Rear Wheels

which are fitted with full-width hubs, are interchangeable. They are fitted with ball bearings, internal-expanding brakes, and wired low-pressure 3.25x19 tyres mounted.

The Foot Brake Pedal

is on the right-hand side of the machine. It also includes a stop light which lights up when the foot brake is applied.

The Fuel Tank

holds 3.0 Imp. galls. The knee-grips are mounted on the tank. Petrol flows to the carburettor through a strainer, a tap with a removable filter, and a flexible feed pipe. A reserve supply of 2½ pints is trapped in the tank.

The Speedometer

is built into the headlamp. It is driven by a flexible shaft from the right-hand side of the front wheel.

The Tool Box

is fitted on the right of the rear mudguard. It is provided with a lock.

The Tyre Pump

is carried under the tank on the right-hand side. Special clips are provided to hold it.

Sidecar Attachment

It is of course possible to attach a sidecar providing a suitable mounting is employed.

RIDING INSTRUCTIONS

Caution!

Do not top up with oil until the engine is running. Make **absolutely** sure you are familiar with the instructions given on page 24 under

"Check the oil level".

1. Running In! Changing Oil!

We emphasise these two points right at the beginning of the section in order to protect Max owners from unwelcome experiences which may prove expensive.

Even if you consider that you are sufficiently familiar with the running-in of new motor cycles, there is always the possibility that you will be able to learn something you will find these instructions of vital importance. In fact we have found that it pays to study the following pages in any case.

Running-In

Brand new and completely overhauled engines should be treated with great care until the main working parts have properly bedded-down.

This can be accomplished by careful driving and with reduced speeds during the running-in period.

During the first 1500 km (1000 miles)

Don't run at full throttle, but on the other hand don't just crawl along. The Golden Rule during running-in is to let the engine **turn freely, and not make it pull.** This keeps the loads on the piston and the bearings within acceptable limits. **When accelerating don't change up too quickly, and on hills don't leave changing down too late,**

or the piston and cylinder may bind, or even seize up. **Special care is necessary during the first 1000 km (600 miles).** The following speed limits are quoted as a guide:

In bottom gear	10 to 15 m. p. h.
in second	20 to 25 m. p. h.
in third	30 to 35 m. p. h.
in top	40 to 45 m. p. h.

These speeds only apply on level ground without a pillion passenger.

During the following 300 Miles

i. e. after the first 1000 miles have been covered, the throttle can occasionally be opened beyond the 2/3 open stage to check the engine output. This does not mean running continuously with the throttle fully open; close the throttle every 500 to 800 yards to give the piston a chance to cool down.

Oil Change

After the first 300 miles

Carry out the first oil change with the engine warm (see page 33)

Check that all nuts and bolts are tight, and tighten-up where necessary. Pay particular attention to the cylinder and cylinder-head bolts (only with engine cold), the nuts on the wheel spindles and the pinch bolts on the front-fork swinging arms, the nuts and bolts holding the handlebars, silencer, and chaincase, and the electrical connections.

After running-in

Carry out the second oil change with the engine warm (see page 33)

Again check up on all the important nuts and bolts: the cylinder and cylinder-head bolts, the nuts on the wheel spindles and the pinch bolts on the front-fork swinging arms, the nuts and bolts holding the handlebars, silencer, and chaincase, the electrical connections, and if appropriate, the sidcar connections.

Use no Graphite Additives in the Lubricating Oil

If this additive is supplied in sufficiently large quantities it will cause the oil passages in the crankshaft to become blocked, so that the oil supply to the big-end bearing is interrupted. This will inevitably cause serious damage to the engine.

Valve clearance

after the first 300 miles and
after the first 1 000 miles, then
check each 1 200 miles; adjust
as necessary, see page 64

Check the Contact Breaker Gap (see p. 57)

And, to economise on petrol, lower the **carburettor needle** one notch, depending on method of driving.

II. Preparing the Machine for the Road

Charge the Battery*

To do this the battery is taken out of its container after the rubber band has been removed, the battery lid is taken off, and the battery leads are disconnected.

The battery is normally not charged on delivery. Since special charging instructions have to be observed, this work should be done by your NSU Dealer or a qualified Service Station.

The battery container is provided with ventilation louvres, and it should be used only to house the battery. **Don't keep cleaning rags or other articles in the battery container**, since they interfere with the proper ventilation of the battery and make it difficult for the heat generated to dissipate. This in turn can cause damage to the battery.

Check the Tyre Pressures

Front wheel: 18 lb/sq. in.

Rear-wheel	{ when riding solo 21—25 lb/sq in. depending on weight	Rear-wheel	{ 28 lb/sq in. with pillion rider or heavy luggage

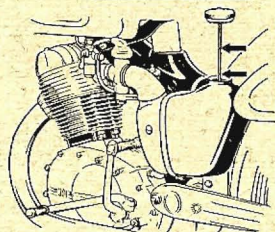
* See also the instructions given on pages 59 and 60

Check the Petrol Supply

The tank holds 3.0 galls. Any petrol that is spilled when filling up should be wiped off or it may damage the enamel.

Check the Oil Level

If your engine is brand new, or if the machine has not been used for any length of time, allow the engine to run in neutral before starting a journey until there is no further change in the oil level in the tank. Then stop the engine and at once add oil* to the level of the upper mark on the dipstick — do not overfill.



III. Starting Up

Turn on the Petrol**

Tap vertical

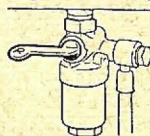
= Open. 1.5 litres (2½ pints) remain in the tank as a reserve supply.

Tap horizontal to the left

= Reserve supply is used

Tap horizontal to the right

= Tap closed

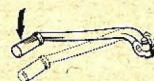


Lower the **machine** from its stand.

* See page 68

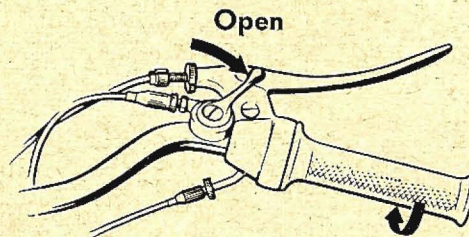
** Positions of tap lever may vary with different manufacturers.

Make sure that neutral is engaged. Neutral is located between first and second gear. In case any gear should be engaged push the machine a fraction forward or backward depressing the foot change pedal several times until first gear slides into mesh; then push the pedal up again, but only halfway.



Briefly depress the **ticker knob** to make sure that petrol is flowing into the float chamber, but don't flood the carburettor. Only in cold weather and when the engine is cold should the carburettor be flooded for a moment to obtain a suitable mixture.

Twistgrip throttle and air lever should be opened about one quarter.

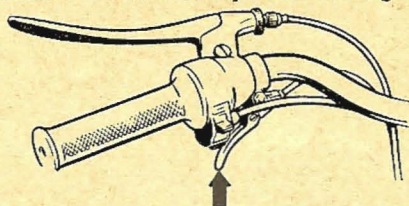


Ignition Key should be pushed in all the way — ignition warning lamp will light up.

Starting the Engine

Raise the exhaust-valve lifter. Swing firmly down on the kick-starter, letting go abruptly the exhaust-valve lifter before reaching the bottom of the swing. When the engine starts, close the twist-grip and the engine will continue to tick over.

Use the exhaust-valve lifter only when starting the engine.



Open the air lever. Should the engine stop, however, keep the air lever closed until the engine is warm and runs regularly.

How to Ensure Easy Starting During the Winter Months. If difficulties are encountered in starting the engine during the winter, the following action should be taken before actually trying to start the engine. It is, of course, also essential that winter oil* should be used.

1. Turn the engine over a number of times with the ignition switched off.
2. Flood the carburettor, letting it overflow for a short time.
3. Close the choke slide completely.
4. Open the throttle only slightly — just a little more than the idling setting.
5. When the engine has started, leave the choke closed for a short time.

IV. Running

Always declutch before changing gear

Changing Gear

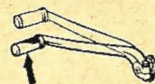
Neutral is located between first and second gear; always change to neutral from first gear — **halfway** between first and second.

From neutral to 1st gear: depress foot pedal

* See page 68



From 1st gear to 2nd, 3rd and 4th:
pull foot pedal up



From 4th gear to 3rd, 2nd and 1st:
depress foot pedal



Getting Away

Pull the clutch lever, engage 1st gear, open the throttle, and **at the same time** gently let in the clutch by releasing the lever, so that the machine will glide smoothly away.

When Under Way

Control the speed with the throttle; open the air lever as far as is possible.

Changing Up

At 12—15 m. p. h. close the throttle, declutch, change to 2nd gear, and open up again, **at the same time letting in the clutch smartly.** In the same way change to 3rd gear at 18—25 m. p. h. and to top gear at 28—35 m. p. h. **Be sure always to release the clutch completely.** Gear changes while on the move must be quick; they will present no problem after some practice. Don't run too slowly in direct (top) gear as this spells damage to engine and transmission (chain).

When Changing Down

release the clutch again as when changing up, but leave the throttle somewhat open to allow the engine to gather speed so that the change can be made without a jerk. On larger hills change down in time. **Letting the clutch slip instead is utterly wrong and will lead to trouble.**

Stopping

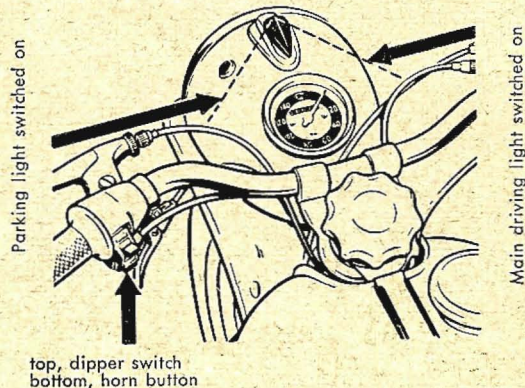
When stopping at intersections or other obstacles do not hold out the clutch all the time, but slip into neutral, and afterwards restart from 1st gear.

At the End of a Run

Do not stop with gears engaged, stalling the engine with the brakes. Instead close the throttle, declutch, and change to neutral, at least hold the clutch out until the vehicle comes to a stop. Apply the brakes if necessary.

While on the move the neutral position is found most easily from low gear, i. e. by changing down from the higher gears (raise clutch, close throttle) into low gear and from there into neutral; only then slowly release the clutch again. Turn off the ignition by withdrawing the ignition key from the headlamp to avoid trouble to the electrical system. Close the petrol tap. Unless the stop is to be of short duration, the petrol may be turned off 200 to 300 yards before destination in order to save fuel. When putting the "Max" out of use for any considerable length of time, follow the instructions given under "Laying up for the Winter", page 69.

Lighting Switch Positions for Driving and Parking at Night



CARE OF THE MACHINE

Cleaning

Only by keeping your "Max" in good order can you expect it to be always ready for service. This involves correct handling, regular cleaning, lubrication in accordance with instructions, and checks for safety.

A motor cycle, even if merely dusty, should be cleaned with a soft rag soaked in oil to prevent bright parts and the enamel from becoming dull. Soak hardened dirt before you rub it off; remove large lumps of dirt from corners with a wooden stick, and finally wash down. Be careful about using a hose; don't play the jet directly on wheel hubs or carburettor. Bearings are bound to rust, and the engine will respond with poor starting or stopping during runs to water in the carburettor or fuel tank. Tackle particularly greasy spots with paraffin or washing petrol, rather than fuel which attacks the enamel. For the same reason wipe off fuel spilled while filling up.

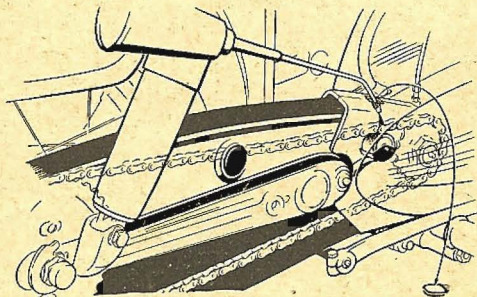
Periodical Lubrication

Clean all Grease Points and Nipples before Greasing.

In bad weather grease the frame and controls (front and rear forks, brake rods, kickstarter . . .) more frequently than specified; if a squeak develops, grease **at once**.

Every 300 miles

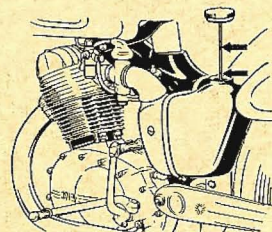
Remove the rubber cap on the top of the chaincase, and **thoroughly** soak the chain-lubricating pad with oil of the grade used in the engine. When the machine is carrying no load, and is not raised on its stand, the lubricating pad should be about 3 mm (1/8") clear of the upper section of the chain. To check this, take off the chaincase after undoing the two front and three rear screws which hold it. If necessary adjust the pad by moving the clip attached to the bearing tube for the rear forks.



Every 600 miles

Check the Oil Level

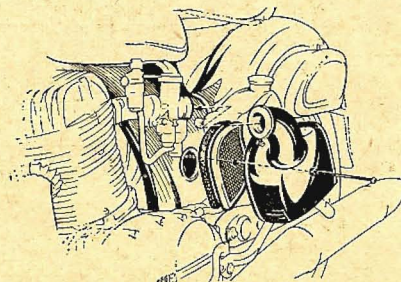
Before starting a journey, allow the engine to run in neutral until there is no further change in the oil level in the tank. Then stop the engine and at once add oil* to the level of the upper mark on the dipstick. Do not overfill.



Every 600 miles

Air Filter

A badly fouled air filter increases the fuel consumption to quite a considerable extent. After removing the cover, flush the filter element with petrol, blow it through with compressed air and then dip it in thin oil and allow to drip. If necessary, clean the filter more frequently.



* See page 68

Every 600 miles

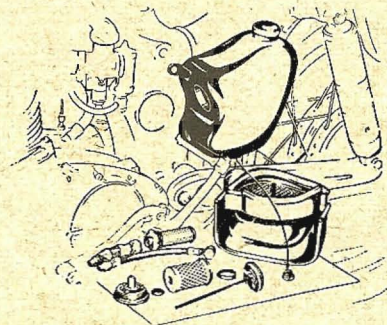
Levers and Joints

Apply a few drops of engine oil to the front and rear brake-cam levers, the joints on the brake rod, the starter spindle, and the bearings for the central stand.

Every 1 200 miles

Change the Oil

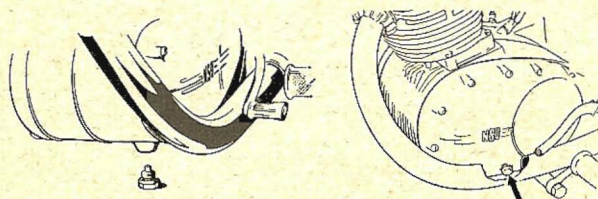
Oil Tank. With the engine warm, remove the air filter hood. Take off the cap (with the dipstick) and the drain plug and allow all the old oil to drain out. Then unscrew the strainer too. Remove paperfilter and clean filter receptacle.



The filter element itself must not be washed out in petrol or a similar liquid, since this would cause the filter paper to dissolve.

Engine

Remove the drain plugs at the bottom of the crankcase and on the left hand crankcase cover. Drain off all the used oil leaning the machine over to the left in order to empty the crankcase cover completely. Carefully clean the three drain plugs and the strainer with petrol and replace them.



Pour one quart of SAE 20 engine oil into the oil tank. Let the engine idle for a few minutes and note that the oil is returned into the oil tank correctly. Then drain this oil off as described above and pour in one quart of engine oil*.

Run the engine until there is no further change in the oil level, and then at once add fresh oil to bring the level up to that of the upper mark on the dipstick — Do not overfill. Oil capacity 2 litres (3½ pints).

Every 1,200 miles

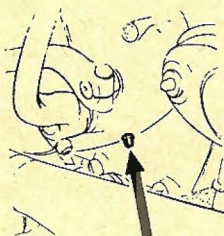
Control Levers on the Handlebars

should be lightly lubricated with engine oil.

Every 1,200 miles

Starter Spindle

Inject a few strokes of grease* into the nipple provided.

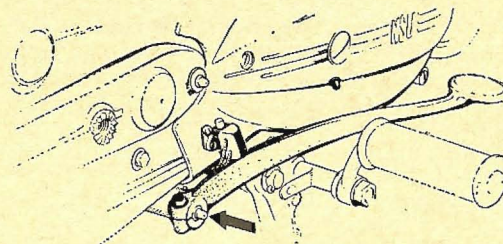


* See page 68

Every 1,200 miles

Spindle for Foot-Brake Pedal

Inject a few strokes of grease* into the nipple provided.



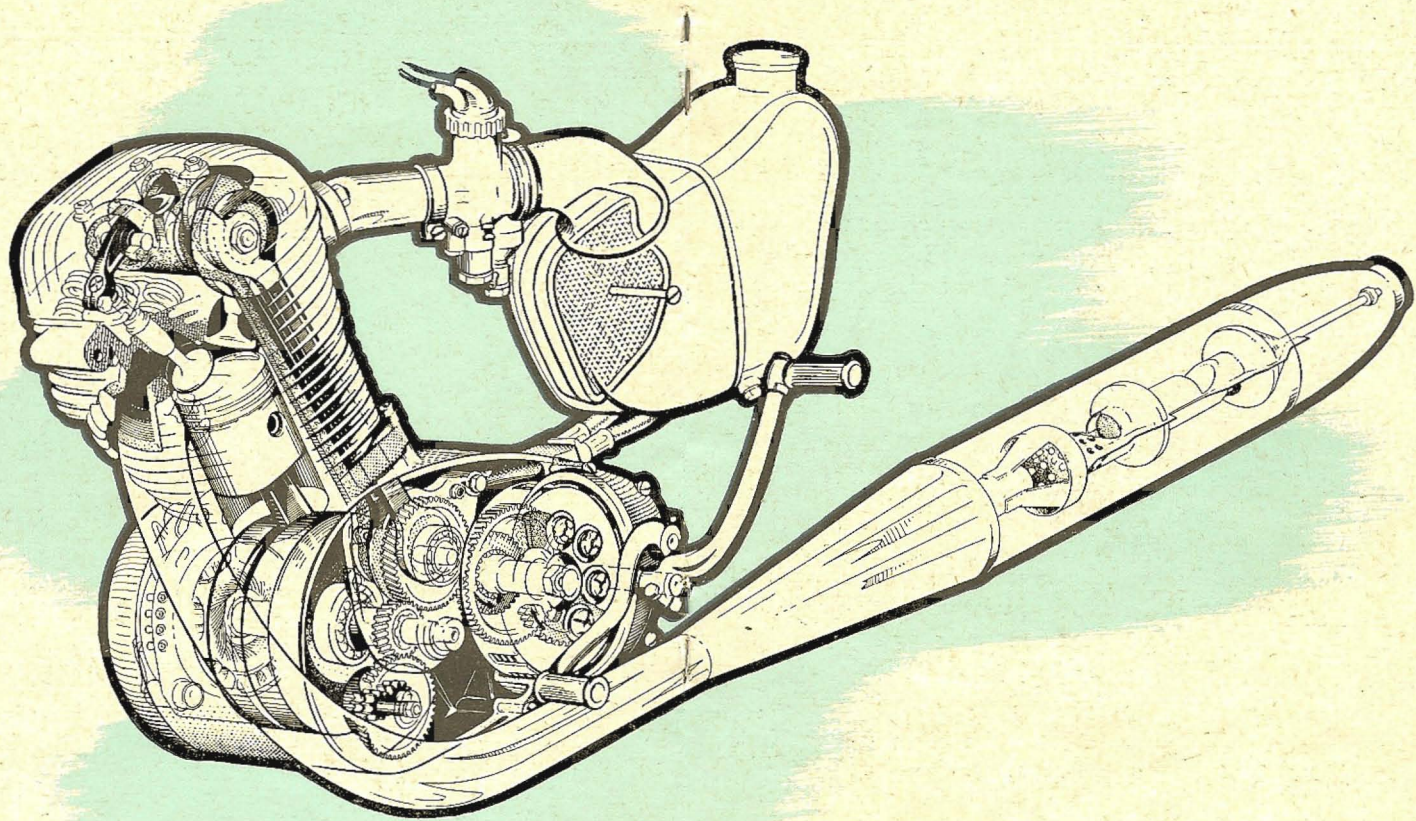
Every 1,200 miles

Control Cables

After unhooking the cables allow some oil mixed with petrol to trickle down between the inner and outer casings until it comes out at the bottom. In order to keep out water, well grease the upper and lower ends of the casings. In this connection, special attention should be devoted to the clutch cable.

This work is simplified if a Bowden-cable lubricator, which is obtainable from accessory dealers, is used.

* See page 68



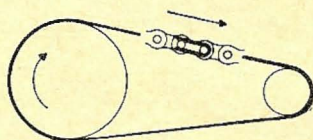
Every 1,200 miles

Rear Chain

Check lubrication and up-and-down movement through the inspection hole of the chain case. After loosening the two front and the three rear screws the chain case can be removed.

To remove the chain itself take out the spring and undo the spring link. Wash the detached chain thoroughly in paraffin or petrol with a brush, moving each link to and fro until all dirt has been dissolved and washed out. Then rinse the cleaned chain once more in paraffin or petrol and dip into warmed up chain grease moving it to and fro.

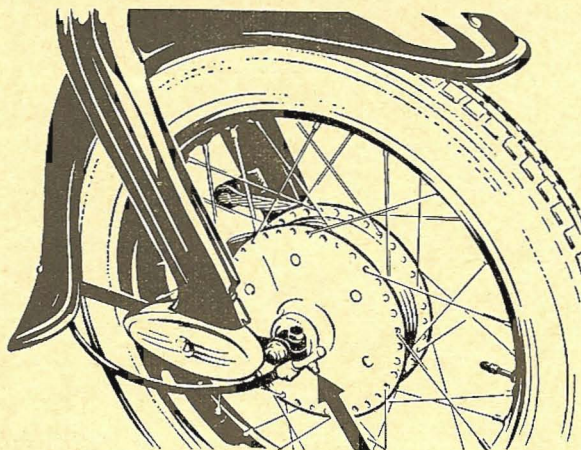
Take the chain out when half cold and allow surplus grease to drain off. The spring should be placed on the spring link with its open end facing away from the direction in which the chain travels.



Every 2,400 miles

Speedometer Drive

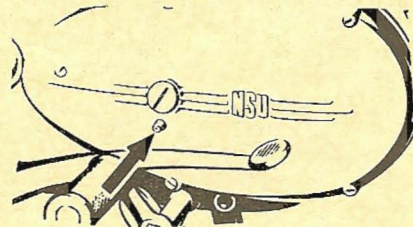
Apply a few shots of grease* to nipple.



Every 2,400 miles

Clutch Operating Rod

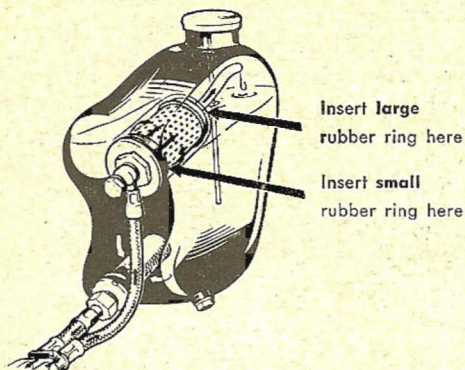
Apply a few shots of grease* to nipple.



* See page 68

Every 3,600 miles

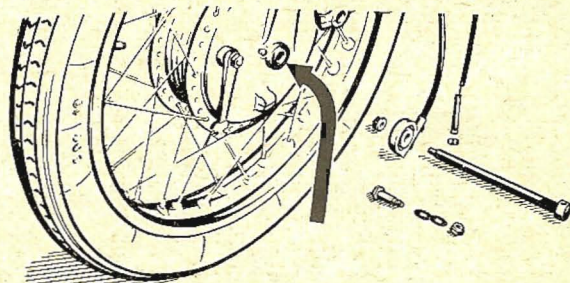
Change the paper filter



Every 6,000 miles

Front and Rear Wheel Bearings

Remove the wheel and grease*. First withdraw the bearing sleeve and remove all traces of old grease. Have this work carried out by your NSU Dealer.

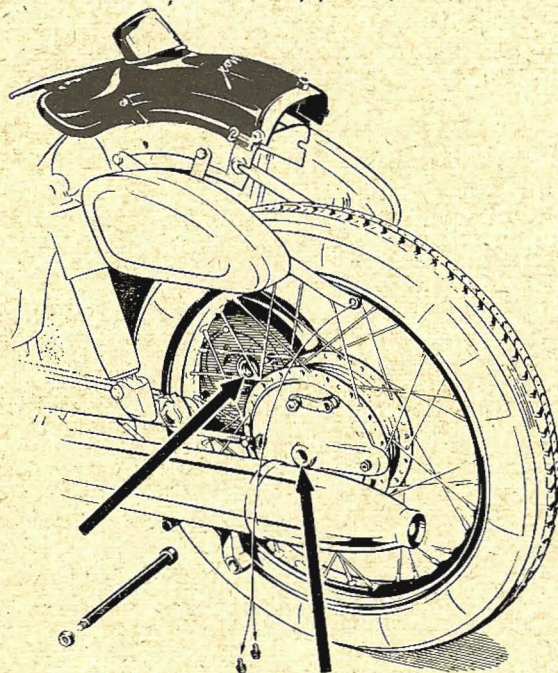


* See page 68

Every 6,000 miles

Grease* the Bearings for the Chain Sprocket and the Driving Wheel with Cush-Drive.

To do this, remove the rear wheel, the chaincase, and the rear chain. Unscrew the nut on the rear of the forks. Withdraw the bearing sleeve from the dismantled drive assembly, clean out old grease, and apply new grease* to the components of the bearings. Have this work carried out by your NSU Dealer.



* See page 68

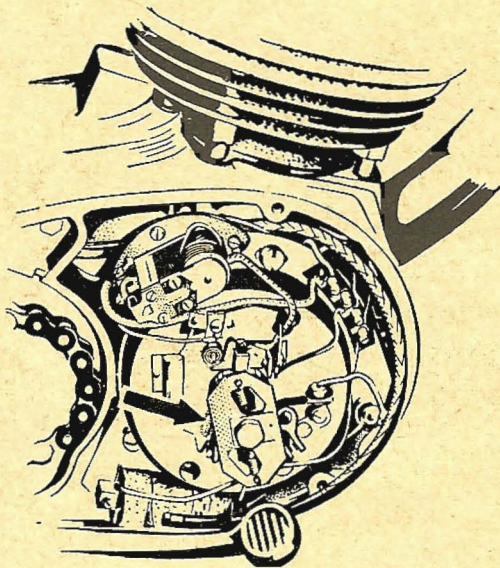
Every 6,000 miles

Twist grip. Grease the internal parts.*

Every 6,000 miles

Lubricating Pad for Contact Breaker

Apply heat resistant bearing grease with a melting point of 300—320° F 1 mm (3/64") thick and rub in.



Steering Head Bearings - In case of overhauling, after cleaning the bearings, bed the balls in grease*. For adjustment of the steering head bearings s. page 65.

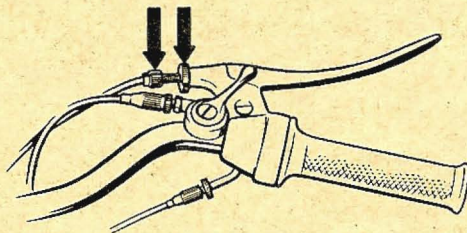
* See page 68

MAINTENANCE

Brakes, Transmission, Wheels

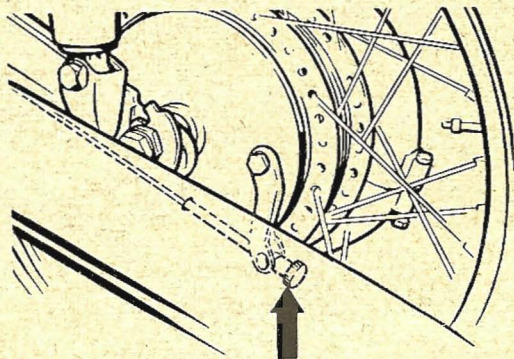
If the Brakes are no longer effective, then —

On the **front brake**: After loosening the lock nut, adjust the control cable by means of the adjuster at the hand-brake lever on the handlebars until the front wheel is just free to turn without the brake binding, but the brake acts immediately the hand lever is pulled. **Tighten the lock nut.**

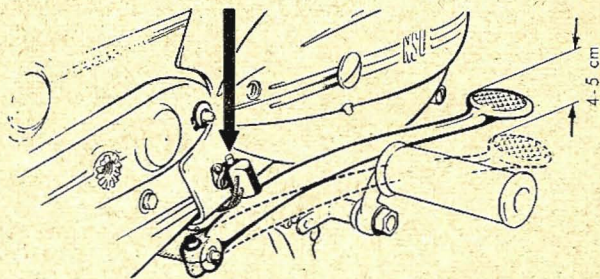


Rear Brake

Readjust the knurled nut at the rear end of the brake traction rod allowing the brake pedal about $1\frac{1}{2}$ " to 2" (4—5 cm) free movement.

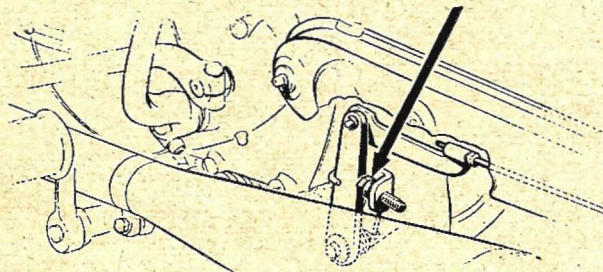


Stop light switch

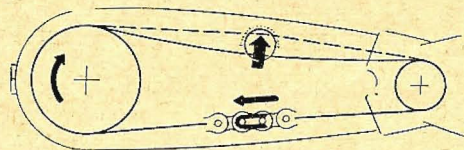


Depending on the position of the right-hand footrest the brake pedal can be adjusted to the most convenient position for operation by means of the set screw. **Retighten the lock nut.** Each time the rear brake is adjusted, it is advisable to check that the stop light works correctly.

Clean brake linings in petrol if oily, replace if heavily worn.

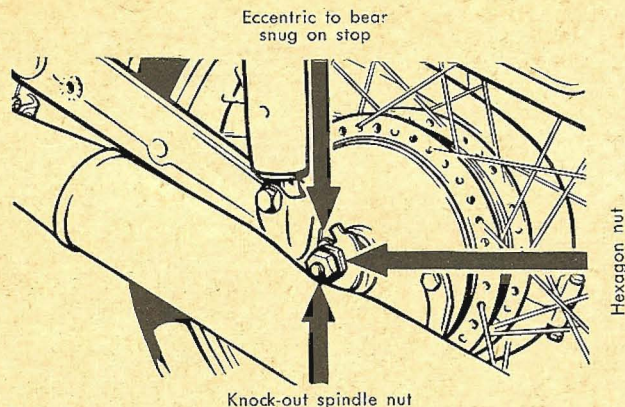
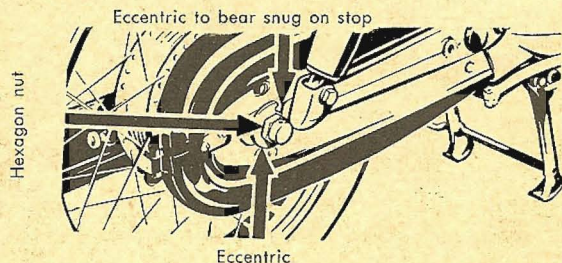


Correct Chain Adjustment Chain sag

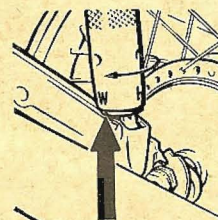


Lower machine from its stand and engage neutral. With the machine normally loaded (1 person) and the suspension units in "W" position the sag of the chain is correct if you can lift it at least $\frac{63}{64}$ in. through the inspection hole of the chain case.

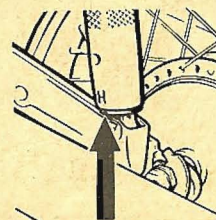
If adjustment is necessary, slacken the knock-out spindle nut, the hexagon nut on the eccentric adjuster (right-hand side), and the hexagon nut on the left-hand side. The rear-wheel should then be pushed forwards or backwards as required (taking care to maintain correct wheel alignment), until the correct amount of chain tension has been obtained. When re-tightening the nuts, see that the eccentric discs do not slip out of position; they should bear snugly against the anchorage at the fork ends.



To allow for the extra load provided by a pillion passenger, change the suspension unit settings from "W" (weich = soft) to "H" (hart = hard) by adjusting at the serrated portions at the bottom of each unit



Position W



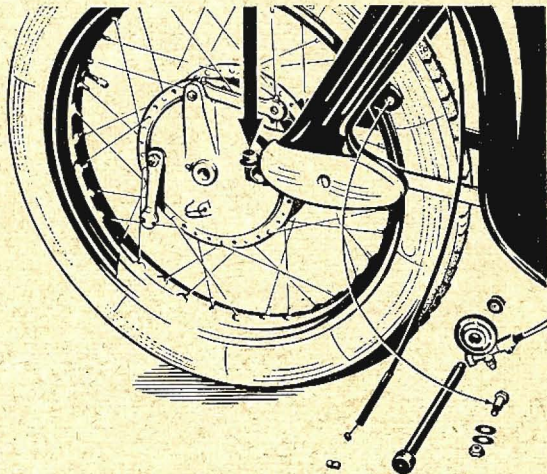
Position H

If a new chain is necessary, badly worn sprockets should also be renewed or the new chain will rapidly become distorted.

Removing the Front Wheel

Disconnect the control cable. Unscrew the pinch bolts on both swinging arms. After unscrewing the hexagon nut, withdraw the spindle while supporting the left-hand swinging arm. Remove the speedometer-drive casing on the right-hand side of the forks, and finally the fitted bolt for the brake-anchorage link on the left-hand fork. (Take care not to lose the parts belonging to this bolt). Before reassembling grease the spindle, using with oil.

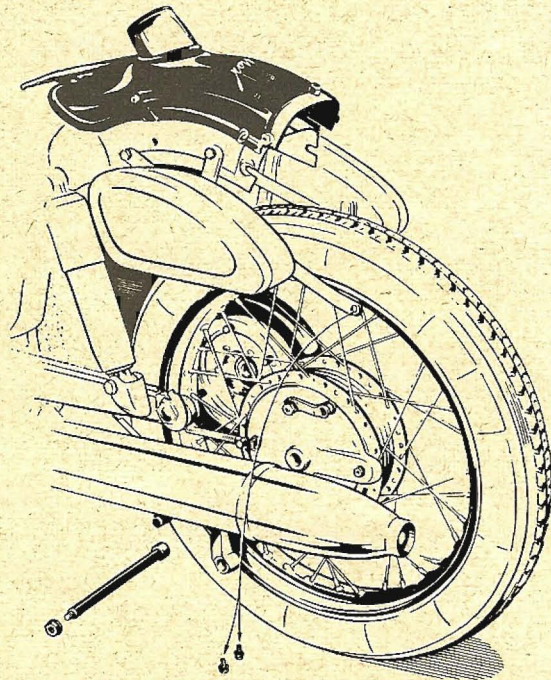
When reassembling the front wheel, make certain that the two driving dogs for the speedometer drive engage correctly in the slots in the hub.



Removing the Rear Wheel

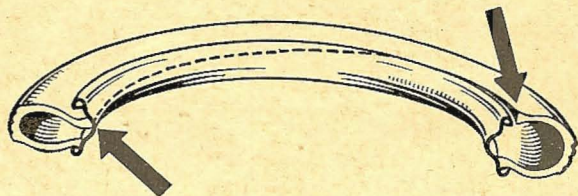
Take off the end section of the mudguard. Disconnect the brake traction rod from the rear brake-cam lever. After unscrewing the hexagon nut withdraw the spindle. Drop the brake-anchorage link downwards clear of the groove in the back plate. Pull the rear wheel over towards the exhaust pipe until it is clear of the driving pins. Pull the rear wheel out to the rear.

Before reassembling grease the spindle, using with oil.



Fitting Tyres

Once you have grasped the knack, the job of removing and refitting the low-pressure wired-on tyres mounted on well-base rims as employed in the "Max" is simplicity itself. The secret of easy tyre removal and refitting is to press the wired edge right down into the well at one point with the tyre wholly deflated; this will loosen the point diametrically opposite, so that it can be levered over the edge of the rim. Using force is very dangerous — the steel wire in the cover edge may be rent in the process, which would wreck the tyre beyond repair.



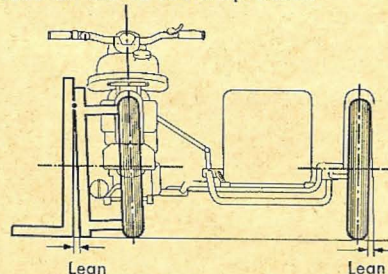
Attaching a Sidecar

is a very simple matter. The sidecar bracket is fitted to the bottom of the frame. By means of ball connections, the "Max" can be quickly and conveniently converted into a sidecar machine and back into a solo.

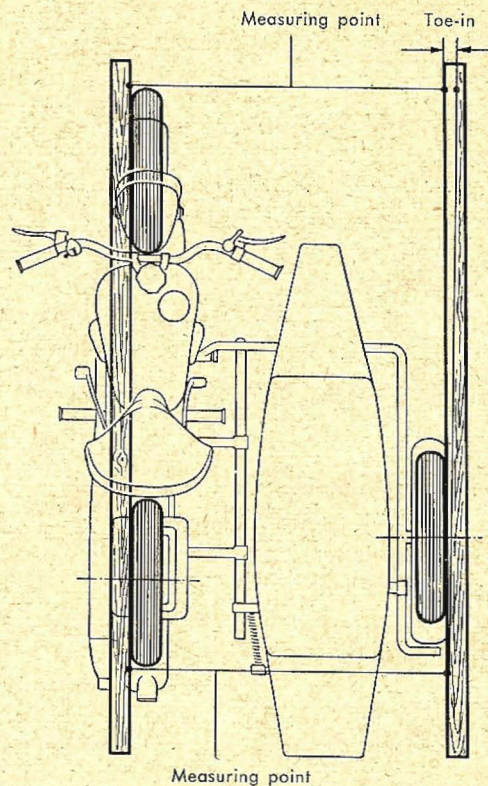
To ensure easy steering and minimum tyre wear, the combination must be adjusted for toe-in and lean. Therefore, when fitting a sidecar for the first time remember the following points: — The sidecar wheel should point in slightly ($1''$ to $1\frac{1}{8}''$) (25—30 mm) towards the front wheel. Measurements should be taken by means of a straight edge which, when placed against the sidecar wheel, must not be parallel with another straight edge placed against the wheels of the machine, but must "toe-in" towards the front wheel.

Moreover, the machine should have a lean of $\frac{5}{8}''$ to $\frac{3}{4}''$ (15—20 mm). In other words, with the sidecar empty, the machine must lean this amount outwards, away from the sidecar. This allows the combination to run straight ahead at the most frequent cruising speed of about 37 m. p. h. on level or slightly cambered roads with the hands taken off the handlebars. If the machine pulls towards the sidecar, **increase** the lean; if it pulls away from the sidecar, **reduce** it.

The sidecar wheel also should be given some lean $\frac{3}{8}''$ to $\frac{5}{8}''$ (10 to 15 mm). If the sidecar has a floating axle, this amount should be measured with the sidecar loaded. For sidecar work, a 14-tooth chain sprocket should be fitted in place of the 16-tooth sprocket.

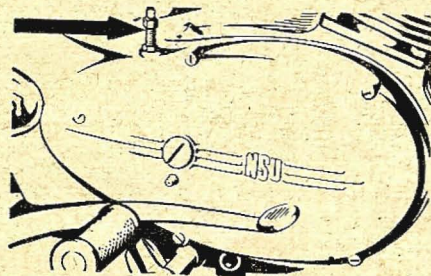


Attaching a Sidecar



Engine Maintenance

If the clutch slips or fails to disengage properly adjust the control cable on the right hand side of the engine after slackening the lock nut, until there is about 1/20th of an inch play between the sleeve of the cable and the housing. **Retighten the lock nut.**

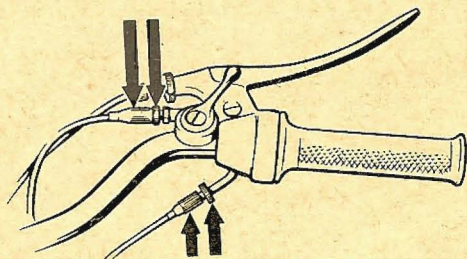


In the event of gear box trouble contact a qualified service station. If necessary, the gear change pedal can be moved one tooth of its serration either way after slackening the pinch-bolt.

The Carburettor

Is a Bing double-lever carburettor.

The cables for the throttle and air slides are adjusted at the handlebars, by means of a knurled nut. Make certain the lock nut is tightened up again after making the adjustment.

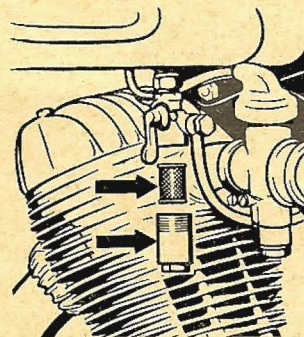


Don't change the carburettor setting. It should be maintained because it will bring the best results in respect of performance and petrol consumption. A readjustment is seldom required. If it becomes necessary for any reason, remember the following:

With the throttle slide up to three-quarters open, the mixture is largely controlled by the jet needle. When the twistgrip is closed, the engine should tick over rather than stop, which means that the slide should then be just a trifle open. This is achieved by adjusting the throttle slide stop screw which, after adjustment, should be secured with its lock nut. If the engine still runs irregularly adjust the air screw accordingly. The tick-over can only be adjusted while the engine is warm. Readjustment with the engine running calls for some experience and should therefore be entrusted to an NSU dealer or other competent expert.

If the carburettor is to function properly, regular **cleaning** is highly essential. For this purpose take the carburettor to pieces and wash the parts in petrol. Clean the jet bores with a bristle of hair and blow through; do not use a needle or end of wire as these will spoil the accuracy of the calibrated bore. Before stripping the carburettor, keep track of the setting of the jet needle, throttle slide stop, and air screw.

It is also advisable when cleaning the carburettor to remove the **filter** on the petrol tap, to empty it and to flush it out with petrol.



The appearance of sparking-plug electrodes gives some indication of the correctness of the carburettor settings.

Plug Sooted Up

Velvety, matt-black carbon deposits. The carburettor is set to give too rich a mixture, i. e. jet needle is placed too high, or main jet is too large. Insufficient air. If the fuel tap is closed while the engine is running, and the throttle setting is unaltered, the engine will speed up before it stops.

Plug has a Light-Coloured Deposit

i. e. insulator is burnt white, and has beads of molten metal adhering to it; the thread and electrodes show signs of overheating (plug has caused hot-spot ignition). Carburettor set to give too weak a mixture, i. e. jet needle placed too low, main jet too small or partially blocked. The engine tends to stall when accelerating, engine output is low, and engine overheats. If the tickler knob is depressed the engine tends to speed up.

Plug Insulator Light Brown in Colour

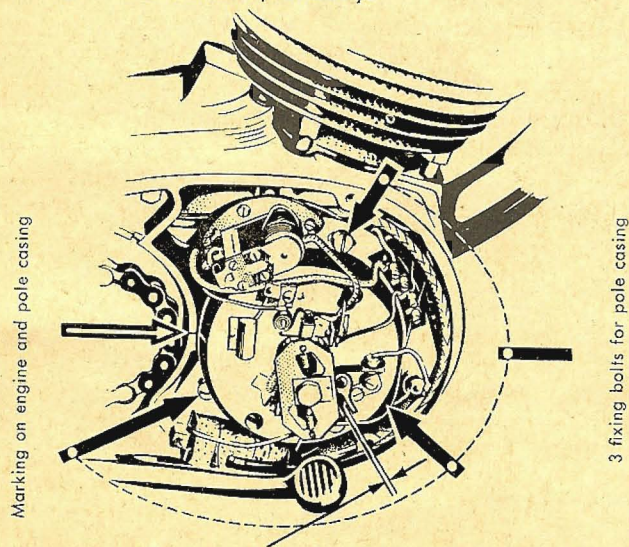
Body of plug dark grey in colour; light dry carbon deposits on plug body. Carburettor settings are correct.

If the plug fails to spark and foreign bodies (soot particles) are discovered between the plug points, it is time to decarbonise the cylinder head and the crown and underside of the piston.

Electrical System

It is advisable to abstain from doing any repair work on the "electrics" — apart from checking the cable connections (earth connection) and replacing bulbs, fuses or wires. Instead, see your NSU dealer or other competent workshop whose staff of specialists will often cure within a few minutes a trouble which it may take you hours to spot — if you are lucky. In the interest of the mechanically-minded type of rider, we do mention a few points, however.

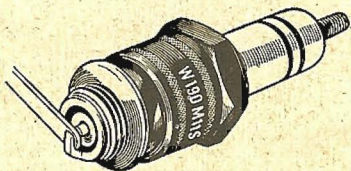
The **contact breaker points** are set to a gap of 0.16". If the contact breaker rocker arm is lifted an insufficient amount due to wear on the fibre follower, the contact carrier must be adjusted by turning the eccentric until the points again open 0.16". Retighten the contact carrier fixing screw slackened previously.



The ignition is automatically advanced and retarded by means of a centrifugal mechanism. To time the ignition raise out the fly-weight; there is no stop that would limit its movement. With the automatic advance-and-retard mechanism in this position, and the piston placed 7.6 mm before TDC, the contact breaker should just be on the point of opening. The position of the piston is checked in the normal manner, by inserting a strip of metal or a wire, with a mark placed 7.6 mm from the end, through the plug hole. A feeler gauge 0.03 to 0.05 mm (0.0012" to 0.0020") thick clamped between the contact-breaker points should just become free and capable of being withdrawn when the flyweights and piston are in the positions described. Do not use a piece of paper between the points.

There must be no alteration in the position of the pole casing. **Before** dismantling this item at any time, make certain therefore, that its position is marked, and if necessary make suitable marks on the casing and the crankcase (see illustration on p. 57).

The contact breaker gap of 0.4 mm (0.016") should be checked when a new machine has done 1200 miles and if necessary corrected*.



The gap at the points should be .024" to .028" (0.6 to 0.7 mm). If the electrode is bent, bend it back to the correct setting. When fitting a new plug obtain either a Bosch W 190 M 11 S or an equivalent plug made by another manufacturer.

* Have this work carried out by a Service agent.

To test the sparking plug, unscrew it from the cylinder head, and hold it so that a non-insulated part (thread or hexagon) is in contact with the cylinder head. When the kickstarter is depressed, a spark must jump the gap between the electrodes.

In the event of **intermittent firing** due to fouled or oily contact breaker points, clean these by inserting between them a clean smooth strip of tin the thickness of a postcard and moving it several times to and fro. In the course of time the contact breaker points will become pitted, i. e. show small high and low spots. These however, will not generally interfere with good running. If ignition trouble is caused by badly pitted contacts, these must be removed and cleaned up on a oil stone (do not use files or emery paper). After the contact points have been refaced, clean them carefully with petrol to remove all traces of oil and grease. Take care not to handle the contacts with dirty fingers. If pitting is very bad and when the machine is being completely overhauled, renew the contact breaker points. Work on the contact breaker points. Work on the contact breaker points is best left to a specialist service station.

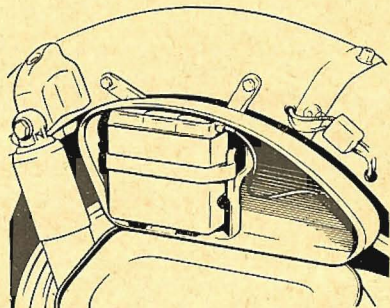
The Battery*

has an output of 7 Ah at 6 volts. Its maintenance is governed by the general rules. An essential point to watch at regular intervals is the acid level.

Use only **distilled** water. Water which has merely been boiled is not satisfactory, since it contains metallic and chloride impurities which may cause damage. Make certain that there is a good earth connection. The terminals must be kept clean, and it is also advisable to

* See Special Instruction of the battery manufacturer.

treat them with an acid-free grease, preferably a special battery grease, to prevent them corroding. The lock on the battery case should also be greased.



The Headlamp

is equipped with a 6 volt 35/35 watt **twin-filament bulb** for the main and dipped beams, and a 6 volt 2 watt bulb for the **parking light**. The bulb for the **speedometer illumination** is rated at 6 volt, 1.2 watt, and that for the **ignition warning light** at 6 volt, 2 watt (or 6 volt, 1.2 watt in the case of Hella headlamps).

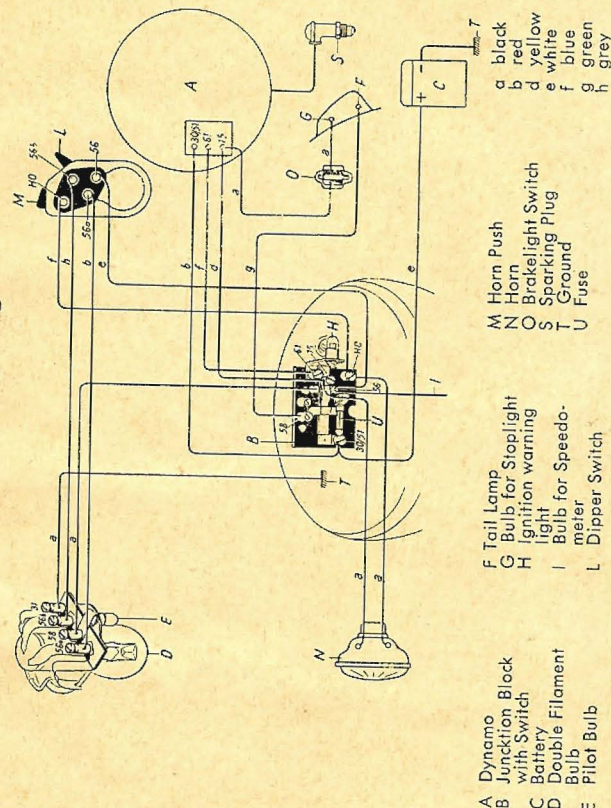
To replace the bulbs remove the headlamp rim after loosening the securing bolt. The main bulb and the parking-light bulb can then be removed after detaching the bulb holders (unhook the securing spring). Never grip a bulb directly with the naked fingers, but always use a piece of clean rag or paper. When fitting a new bulb, make absolutely certain that it is completely free from oil and grease, since otherwise the oil vapour formed will condense on the reflector and dull it. It is not practicable to try to clean the reflector. Finally, don't forget to replace the spring holding the bulb holders in place.

The Combined Tail and Stop Light

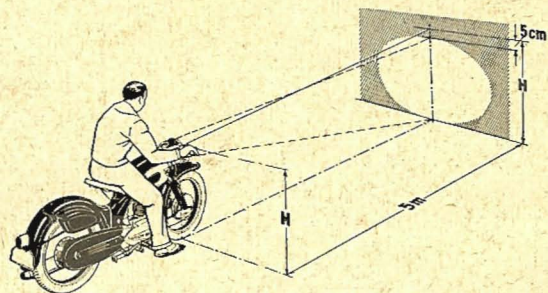
is equipped with a 6 volt 5 watt bulb, with a 6 volt 15 watt bulb for the stop light.

Before starting off on every trip make certain that the lighting system is in perfect condition. Failure of the twin-filament headlamp bulb, or of the tail or stop lights could prove dangerous both for yourself and for others.

Wiring diagram



Adjustment of the Head Lamp



Correct focusing of the head lamp not only provides most efficient illumination of the road, but — equally important — also keeps you from dazzling oncoming road users with your dipped beam. Remember the way you feel when hit by the full glare from the head lamp of an inconsiderate driver. Official regulations require that, with the light dipped, the cut-off between the upper dark and the lower bright zone be at least 2" (5 cm) below the centre of your head lamp glass when the machine is $5\frac{1}{2}$ yards (5 m) from a blank wall. The test should be made with the machine loaded, i. e. not supported on the stand. In order to obtain a sharp borderline between the bright and the dark zone, it is essential to avoid

soiling the reflector. The same is true of bulbs, which should therefore not be removed or fitted with bare fingers, but with a clean piece of cloth or paper. Also, the flutes on the head lamp glass must be in a vertical position.

The "Max" is furnished by our Works with this head lamp adjustment.

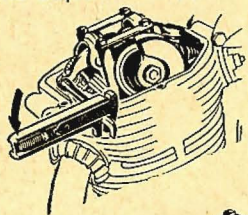
If the load is increased, the headlamp must be readjusted.

Adjusting the Valve Clearance

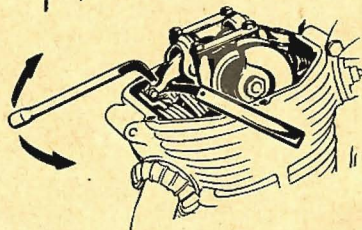
The clearance between the spherical end of the adjustable tappet and the valve stem should amount to

0.002" in the case of the inlet valve
0.004" in the case of the exhaust valve

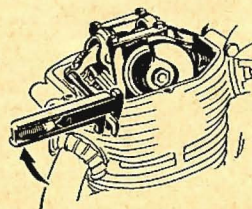
Use a feeler gauge to check this clearance. Adjustments should be made with the engine cold and with the piston at TDC on the firing stroke. The pinch bolt on the rocker arm, which must be slackened off when making the adjustment, must be well tightened up again to prevent the adjustable tappet working loose in service.



Slacken locking screw



Adjust clearance



Tighten locking screw

Periodical Lubrication and Inspection

Every conscientious rider will keep his machine in a roadworthy condition, and so will pay particular attention to the proper functioning of the brakes. We consider it advisable that the operation of the brakes be checked before every journey. See page 43/44.

Every four weeks check the battery and have it charged if necessary.

Every 600 miles check the chain tension and adjust if necessary.

Every 1,200 miles Check valve clearance, adjust if necessary, see page 64. Check the clutch adjustment, make certain that all important nuts and bolts are tight. The principal ones are: the cylinder and cylinder head bolts (only with engine cold); the nuts on the wheel spindles and the pinch bolts on the front-fork swinging arms; the handlebar, silencer and chain guard mountings and the electric cable connections, and the sidecar connections if one is fitted.

Every 2,400 miles check the sparking plug gap (see page 59). Clean the plug if necessary. Check the play in the steering head bearing and adjust it for free movement, but without perceptible play.

(When the machine is on the stand and the steering damper is completely slackened, the front forks after being put practically into their central position must return to the left or right lock).

Every 4,000 miles clean the generator, check the contact breaker gap (see page 57). Check the electric cables and their connections. Tighten the terminal screws.

About every 6,000 to 10,000 miles renew the sparking plug.

Periodical Lubrication

and Inspection

	Instruction Book page	every	600	1200	1800	2400	3000	3600	4200	4800 miles
Lubrication	First and second oil change	22								
	Every 300 miles chain lubricating pad.	30								
	Check oil level, top up as necessary	31	×	×	×	×	×	×	×	×
	Air filter	31	×	×	×	×	×	×	×	×
	Levers and joints	32	×	×	×	×	×	×	×	×
	Routine oil change	33		×		×		×		×
	Control levers on handlebars	34		×		×		×		×
	Starter spindle	34		×		×		×		×
	Spindle for foot-brake pedal	35		×		×		×		×
	Control cables	35		×		×		×		×
	Transmission chain	38		×		×		×		×
	Speedometer drive	39				×				×
	Clutch operating rod	39				×				×
Inspection	Change paper filter	40						×		
	Every 6000 miles front and rear wheel bearings, bearings for rear chain sprocket and driving wheel with cush-drive, internal parts of twistgrip, lubricating pad on contact breaker	40/42								
	Check main bolted joints on engine and frame, and tighten as necessary	22/65		×		×		×		×
	Check valve clearance, adjust if necessary	64		×		×		×		×
	Tighten terminal screws in headlamp and tail lamp, check electrical leads and connections	22/65						×		
	Every 4 weeks check battery, and have it charged if necessary	23/65								
	Check chain tension	46/65	×	×	×	×	×	×	×	×
	Check clutch adjustment	53/65		×		×		×		×
	Check gap at contact-breaker points	57/65						×		×
	Check gap at sparking-plug electrodes (replace sparking plug within 6,000—10,000 miles)	59/65				×				×
	Check play of steering-head bearings	65						×		
	Clean ignition and lighting set	65				×				×

Recommended Lubricants

Lubrication Points	Lubricant
Engine* and gear box	{ In warm weather proprietary oil Grade SAE 20 { In cold weather proprietary oil Grade SAE 10
Control levers, control cables, brake rods, and joints	{ Proprietary oil Grade SAE 30
speedometer drive on front wheel, front and rear wheel bearings, bearings for chain sprocket and driving wheel with cush-drive, spindle for foot-brake pedal, rear-fork spindle, clutch-operating rod, kick-starter spindle, twistgrip, steering-head bearings.	{ High pressure grease

* Use no Graphite Additives in the Lubricating Oil

If this additive is present in too large a quantity it will cause the oil passages in the crankshaft to become blocked, so that the oil supply to the big-end bearing is interrupted. Serious damage to the engine will then be inevitable.

Laying the Machine Up for the Winter

In the case of engines which will be out of service for some time or are laid up for the winter, we recommend that when changing the oil (see page 33) the engine should be flushed out but should not be refilled with oil. Instead pour 2—4 fluid ounces of branded anti-corrosive oil through the plug hole into the **cold** cylinder with the piston at TDC and the valves closed. To ensure that this anti-corrosive oil is evenly distributed over the cylinder bore, and the combustion chamber, turn the engine over with the kick starter several times making certain first that the carburettor is empty and the fuel turned off, and then return the piston to TDC when the valves will be closed.

The engine should be turned over every four to five weeks. Do not replace the sparking plug and oil drain plugs in order to prevent condensation in the cylinder and crankcase. These openings should be covered with a clean cloth or a fine mesh filter gauze. It is also advisable to attach a notice to remind you to replace the oil drain plug and fill with engine oil before using the machine.

* Tracing Troubles

Petrol does not overflow when carburettor is tickled

Engine fails to start

Petrol overflows when carburettor is tickled

Petrol tap closed or tap not turned to reserve supply. Out of petrol. Float and float needle out of place. Sticking float needle.

Faulty operation of twist grip or air control lever. Slide does not open. Water in carburettor. (clean carburettor and filter). Jet choked. Carburettor overflooded. Sparking plug soaked.

(remove sparking plug, turn off fuel, open twist grip wide, turn engine over several times, replace the dried sparking plug and start the engine with the fuel supply cut off. Turn on the fuel only when the engine is running).

Ignition not turned on. High tension lead disconnected or loose. Short circuit. Sparking plug oiled up, carboned up, or points bridged by foreign matter. Wrong plug. Wrong plug gap. Defective plug (insulation cracked). Poor earth connection or cable worked loose, generator not operating, battery run down. Cut out not working properly.

Engine stops suddenly or fires unevenly.

Fuel tap not turned to "reserve" or running out of petrol. Water in the carburettor. Jet needle come adrift. Float and float needle out of place. Punctured float. Air leaks (carburettor loose). Sparking plug loose

Engine will not pull or becomes unduly hot

or short circuit. Defective or incorrect sparking plug. Contact breaker points oiled up, dirty or badly pitted.

Clutch slipping, brakes binding, air filter blocked. Air leaks (loose carburettor), jet needle come adrift, float needle or tickler sticking.

Wrong sparking plug. Silencer closed by carbon deposit. Piston rings gummed up, worn out or broken. Mechanical fault in the transmission or wheels.

Engine stops

Petrol used up with exception of reserve supply but tap not turned to reserve position. Out of fuel. High tension lead come adrift. Defective sparking plug. Sticking contact breaker.

Float chamber overflows

Punctured float. Float needle out of position. Float needle or tickler jammed.

Lamps fail to light

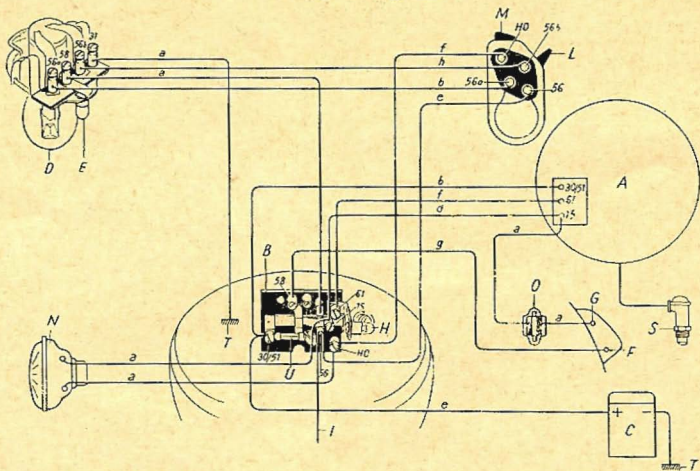
Loose or defective bulb. Faulty earth. Cables loose or adrift.

* In case of doubt get in touch with service agent.

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Wiring diagram



A Dynamo
 B Junction Block
 with Switch
 C Battery
 D Double Filament
 Bulb
 E Pilot Bulb

F Tail Lamp
 G Bulb for Stoplight
 H Ignition warning
 light
 I Bulb for Speedo-
 meter
 L Dipper Switch

M Horn Push
 N Horn
 O Brakelight Switch
 S Sparkling Plug
 T Ground
 U Fuse

a black
 b red
 d yellow
 e white
 f blue
 g green
 h grey