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INSTRUCTION BOOK

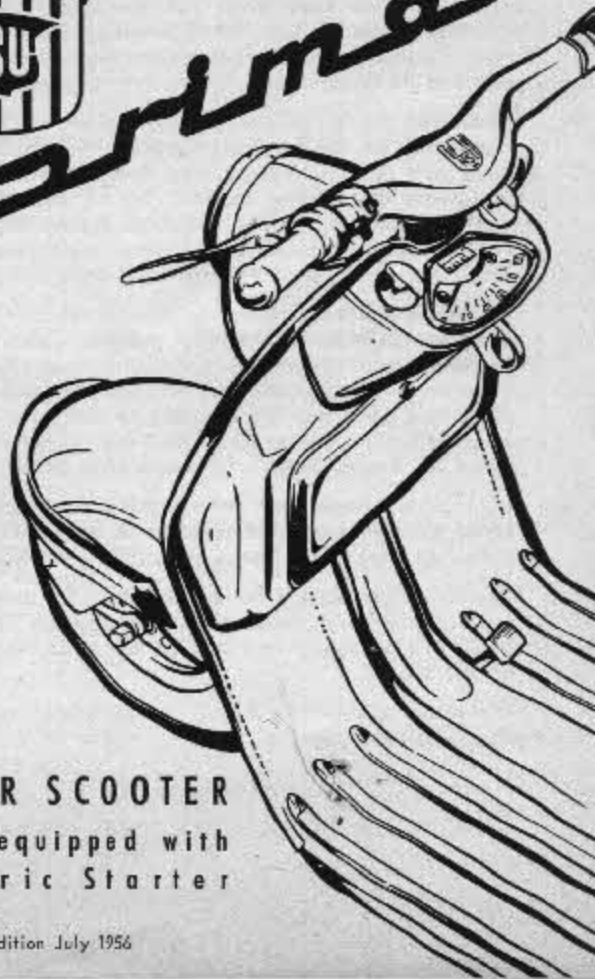


Prima





Prima



MOTOR SCOOTER
150-cc, equipped with
Electric Starter

Edition July 1956

Dear NSU Fan,

This **Instruction Book** gives you the opportunity to familiarize yourself with the interesting details of your new machine and with our recommendations for handling and servicing it, etc.

Moreover, we would call your attention to the instructions given on the **Servicing Card** and would ask you to have your machine looked after and the prescribed service work carried out expertly by an **authorised NSU workshop** at the intervals specified. Please contact your NSU dealer also should a fault develop on your machine which you would like to have rectified under our guarantee.

Workshop servicing of our customers' vehicles under our directives **is reserved to NSU dealers**. Their workshop personnel are specially trained and have the special equipment, repair handbooks and genuine spare and replacement parts that enable them to carry out any work in an expert manner and, on the basis of our "Standard Times for Repair Work", at reasonable cost.

We must emphasise that **you cannot expect your machine to be examined or reconditioned at our works** without a written agreement between us and your NSU dealer.

This Instruction Book is not binding in so far as the equipment supplied with the machine is concerned. The general conditions of supply and sale of the NSU Werke apply on this subject.

We would appreciate if you would follow our instructions and wish you

Good Riding on NSU!

NSU WERKE AKTIENGESellschaft NECKARSULM

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TECHNICAL

ENGINE — CLUTCH — GEARBOX

Cycle	Two-stroke
Stroke	58 mm
Bore	57 mm
No. of cylinders	1
Capacity	147 cc
Compression ratio	6.3:1
Output	6.2 h.p.
Speed	5000 r.p.m.
Control of petrol flow	By cylinder ports
Lubrication	Petrol-oil mixture
Cooling	Fan-cooled
Ignition	Coil ignition
Point of ignition	4.25 mm (0.17 in) before TDC
Carburettor	Bing single-lever carburettor
Air filter	Wet air filter with choke slide
Clutch	Multi-plate clutch running in oil bath
Clutch operation	By hand
Gearbox	3-speed gearbox built in unit with the engine
Gear-change mechanism	Manually operated (twistgrip on left-hand handlebars)
Gear engagement	Driving pin

Gear ratio, engine — gearbox 1.3125 : 1

Gear box ratios	
Bottom gear	2.9629 : 1
2nd gear	1.4672 : 1
Top gear	1 : 1

Gear ratio, gearbox — rear wheel 3.77 : 1

Overall gear ratios	
Bottom gear	14.66 : 1
2nd gear	7.259 : 1
Top gear	4.948 : 1

Transmission: Engine-gearbox: spiral bevel drive
Gearbox-rear wheel: shaft, spiral bevel gears, and gear wheels

Maximum speed about 80 km/hr (50 m.p.h.)

The right to make alterations in the design and specifications is reserved.

DATA

FRAME — WHEELS — BRAKES — EQUIPMENT

Frame	Central tubular frame with sheet-metal stiffeners
Front forks	Pivoted-link forks
Rear springing	Hydraulically-damped swinging arm
Stands	Centre stand and prop stand
Tank capacity	7 litres (1½ gallons)
Wheel base	1259 mm (49½ in)
Length overall	1905 mm (75 in)
Width	680 mm (26⅜ in)
Maximum height	985 mm (38⅞ in)
Height of saddle	795 mm (31¼ in)
Ground clearance	140 mm (5⅝ in)
Wheels	Interchangeable
Rims	Split flat base 2.45x8 DIN 7824
Tyres	4.00 x 8
Front brake	Internal expanding brake
Rear brake	Internal expanding brake
Brake operation	Front, hand lever. Rear, foot pedal
Weight, with full tank	130 kg (277 lb)
Maximum permissible weight	300 kg (662 lb)

EQUIPMENT

12-volt Electrical System with Dynastarter

Flywheel dynamo and starter, with contact breaker, battery, headlamp, parking light, and electric horn.

Instruments

Illuminated speedometer, fitted with fuel-supply warning light and ignition-warning light. Combined starter, ignition, and lighting switch. Knobs for operating choke slide and tickler.

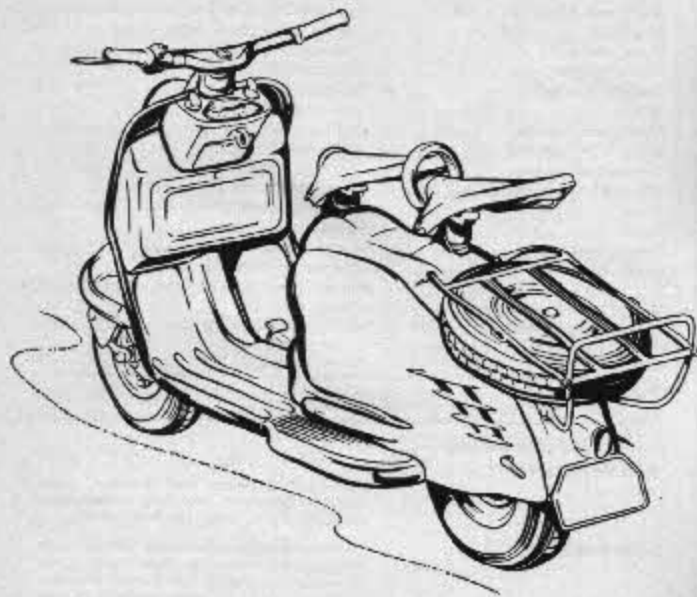
Equipment

Safety hook for hand bag. Rider's saddle. Pillion seat. Spare wheel and luggage carrier. Thief-proof lock in steering head. Tool kit.

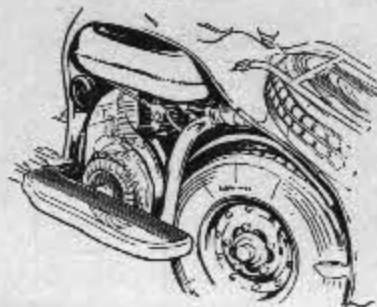
The right to make alterations in the design and specifications is reserved.

DESCRIPTION

Engine



The NSU Scooter is fitted with an air-cooled single-cylinder engine unit with a detachable light-alloy cylinder head.



The Crankshaft

is mounted in two grooved ball bearings on either side. The connecting-rod big-end bearing is a roller bearing.

Working Cycle

The engine operates on the two-stroke cycle. The flow of the gases is controlled in the conventional manner by means of the flat-crowned piston, which covers and uncovers inlet, transfer, and exhaust ports cast into the cylinder as it ascends and descends.

Engine Lubrication

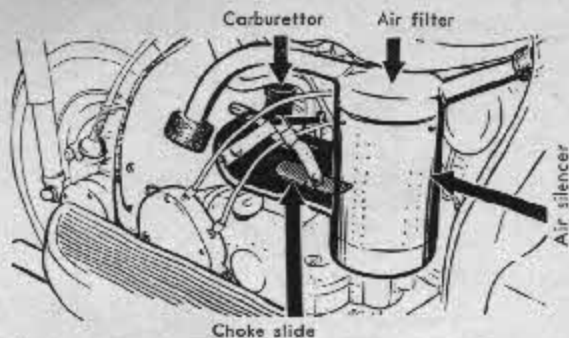
The engine is lubricated by means of oil mixed with the fuel.

While running in, or if the engine is heavily loaded, e.g. if it is used in mountainous country

add 1 part of oil to 20 parts of petrol;

otherwise

add 1 part of oil to 25 parts of petrol.



Carburettor, Air Silencer, and Air Filter

The carburettor, which is made by Messrs. Bing, is a float-type single-lever carburettor, controlled by means of the throttle twistgrip on the right-hand end of the handlebars.

The inlet air silencer is fitted to the carburettor. The air drawn into the engine enters through the air filter, and passes through the air silencer and past the choke slide into the carburettor.



The carburettor float is depressed, or "tickled", and the choke slide is opened and closed, by means of a linkage controlled through a Bowden cable by a knob on the instrument panel.

Exhaust System

The silencer, which can be dismantled, not only effectively silences the engine noise, but also provides the exhaust back pressures necessary if a two-stroke engine is to give of its best. No alterations should therefore be made to the exhaust system, since these will in all probability lead to a reduction in the engine power and an increase in fuel consumption. The engine may also be damaged.



Electrical System

The source of electric current is a **flywheel dynamo**, which also serves as the starter, and which is provided with a **contact breaker** and with an automatic centrifugal **advance-and-retard mechanism** to assist in starting; this is arranged so that on starting, the point of ignition occurs approximately at the TDC of the piston. As the engine speed increases (to about 500-600 r.p.m.), the fly-weight alters the position of the contact-breaker cam so that the full amount of pre-ignition is obtained, and ignition will then occur at 4.25 mm (0.17 in) before TDC. The flywheel dynamo and starter is mounted on the left-hand end of the crankshaft, and so of course runs at engine speed. This D. C. dynamo, which has an output of 60 watts at **12 volts**, supplies the H. T. current to the sparking plug through an ignition coil mounted on the frame, and also the lighting current and the charging current for the **batteries** through the cut-out.

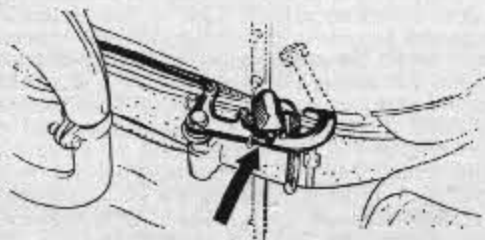
When the **ignition key** is inserted in the combined **starting, lighting, and ignition switch** on the instrument panel, the ignition warning light will first come on when the switch is in position 1; this indicates that current is available from the batteries. Pushing the ignition key **right down** will operate the dynamo as a starter.

The **headlamp** is recessed into the fork cowl, and is fitted with a twin-filament bulb controlled by the **dipper switch** on the left-hand handlebars, and also with a parking light. When the ignition key is in position 2, the parking light is switched on, and in position 3 the headlamp. The ignition key can be withdrawn in either position. The cap on the ignition switch is slidable, and when it is turned half-way it will keep rain out of the ignition switch.

The **horn**, which is situated under the headlamp, is connected to the batteries, in order to comply with the regulations, which require that the horn shall be operative even when the engine is not running. The **horn button** will be found on the dipper switch mentioned above.

The **sparkling plug** fitted to the machine is a Bosch W 240 T 11. **All the lamps run off 12-volt circuits.** The **batteries** have a capacity of 10 amp. hr. at 12 volts.

The **rear light** contains a **stop lamp**, which lights up when the foot brake is actuated.



Fan

A fan is fitted on the dynamo. This runs at crankshaft speed and will supply the necessary amount of cooling air under any conditions. The air is forced through ducts and cowls to the cylinder and the cylinder head.

The Primary Drive (engine-gearbox)

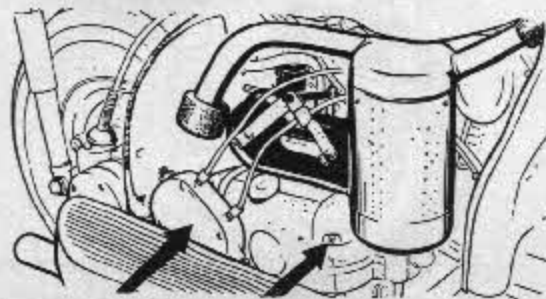
consists of a pair of bevel gears, which transmit the power through the clutch to the gearbox.

The Clutch

is a multi-plate clutch, comprising three outer steel plates and two inner friction plates. The necessary clutch pressure is produced by means of six radial compression springs. The clutch is operated by a Bowden cable controlled by a lever on the left-hand handlebar.

The Gearbox

The three-speed gearbox is built in unit with the engine. The gear pinions are permanently engaged, and are coupled to their shafts by means of driving pins. The gearchange mechanism is controlled by a twistgrip on the left-hand handlebars, which is connected with the gearbox by a pair of Bowden cables.

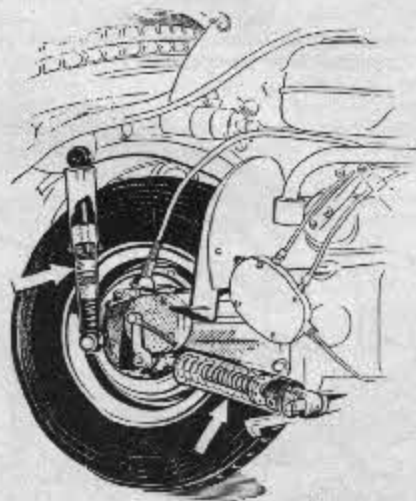


3-speed gearbox and:
gear-change mechanism

Clutch

The Secondary Drive (gearbox — rear wheel)

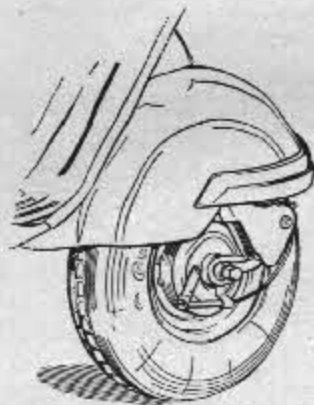
Power is transmitted from the gearbox by means of a torsion bar shaft to the spiral bevel gears and gear pinions of the **intermediate gearbox**. The casing for this is bolted to the engine and gearbox unit. The rear hub (and the speedometer) is also flexibly driven, the transmission being mounted on a swinging arm, the bearings of which are on the intermediate gearbox, and which is supported by means of a pair of helical compression springs placed underneath it. These springs are enclosed in a telescopic casing to protect them from spray and dirt. The rear springing is also damped, a hydraulic shock absorber being fitted between the swinging arm and a frame member.



Chassis

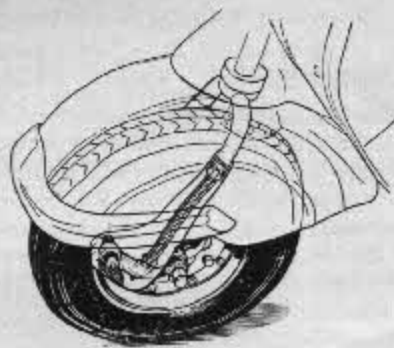
The Central Tubular Frame

This forms the backbone of the scooter, and so a tube with a generous cross-section has been chosen for this duty. The various lugs and brackets welded to this frame, and such bolted-on body units as the floorboard and legshield, the centre section of the rear panelling, etc., ensure that the frame as a whole is very resistant to torsional stresses. The bottom link of the rear frame section is formed by the engine.

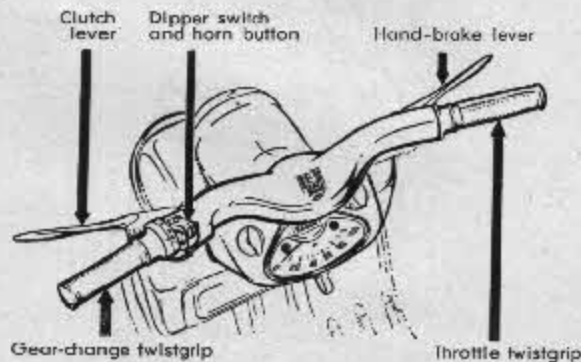


The Front Forks

are mounted in adjustable ball bearings in the steering head on the frame. At the lower ends of the forks are fitted two pivoted links, which carry the front wheel.



Each link is equipped with a compression spring bearing against an anchorage in the front forks.



The Handlebars

differ from the conventional tubular handlebars in that they are of U-section, open at the bottom. As a result all the control cables can be located out of sight.

The following controls are situated on the handlebars:

Left-hand-side: Gear-change twistgrip with clutch lever, dipper switch with horn button,

Right-hand side: Throttle twistgrip. Hand-brake lever.



Both the saddle and the pillion seat are pivoted saddles.

A stronger spring can be fitted if a heavy person is to be carried.

The Wheels

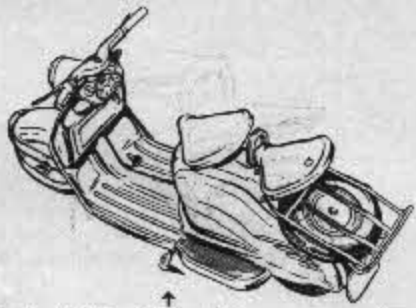
are equipped with ball bearings, and are interchangeable. They take 4.00-8 tyres, and are equipped with split, flat base 2.45-8 DIN 7824 rims.

Brakes

The front and rear brakes are both of the internal-expanding type. The front brake is actuated by means of the hand lever on the right-hand side of the handlebars, and the rear brake by means of a pedal fitted in an easily accessible manner by the right foot rest.

To Support

the scooter, the **prop stand** fitted on the left-hand side of the machine is hinged down. The **centre stand** is used only to support the machine when removing a wheel, or to take the weight off the tyres when the machine is laid up for the winter.

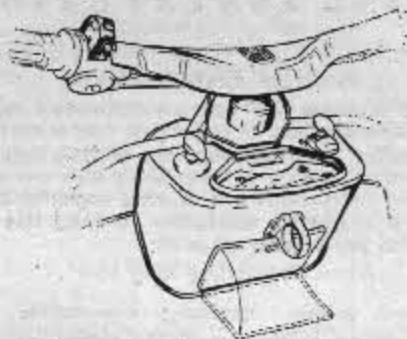


The Body Side Panels

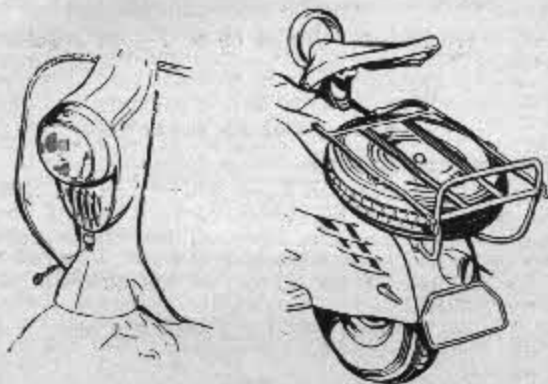
are fitted to either side of the rear of the machine, and are held by means of clips fitted with rubber pads. These panels not only give the scooter a most attractive appearance, but also keep dirt and dust away from the engine, the fuel tank, and the tool compartment. Ports at front and rear of these side panels permit the air necessary for cooling the engine to enter. To remove a side panel, push down the locking lever, raise the rear of the panel, and then lift it off.

The Instrument Panel

On this are mounted the speedometer, complete with fuel-supply warning light and ignition warning light, the knob for actuating the combined tickler and choke-slide linkage, and the starting, lighting, and ignition switch. To enable the instrument-panel bulbs to be replaced, and to check the various connections, the instrument panel is fitted with a lid. This is kept closed by means of a lock, the key for which is the same as for the thief-proof steering-head lock.



The equipment also includes: The safety hook for a hand bag or similar item; the **thief-proof lock** on the steering head, which is fitted at the front in the fork cowling, between the headlamp and the horn; the spare wheel; the luggage carrier; and finally the tool kit in its box.



RIDING INSTRUCTIONS

1 Engine Lubrication

Even if you consider that you are absolutely conversant with the proper method of running-in a new motor vehicle, it is possible that the following section may contain something which is new to you. But if you are a novice, the following instructions are of vital importance. In our experience it is always advisable to read this through first. See also the section on p. 30.

„When descending long hills“.

Important when Filling Up with Petrol

If no oil is added to the petrol, the piston will seize in the cylinder, and this then has to be repaired. Always therefore add engine oil to the petrol* in the following proportions:

While running-in, or if the engine is heavily loaded, e. g. if it is used in mountainous country	1 : 20
otherwise	1 : 25

In other words use 1 pint of oil to 2½ or 3 gallons of petrol.

2 Changing Oil in Gearbox*

After the first 300 miles

Unscrew the upper and lower plugs** on the gearbox and drain off the oil, which contains sludge formed from the metal particles worn off the various parts as they bed down, while the engine is warm. Then add fresh oil to the level of the bottom of the oil check plug** on the gearbox.

Capacity of gearbox about 0.3 litres (0,5 pint).

* See p. 62

** See p. 56

Running-In Speeds

Do not run at full throttle for the first 600 miles

On the other hand, do not err too much on the side of caution by keeping down to too low a speed. So far as possible keep to a level road, or at least one with only moderate gradients, and make full use of your gears and throttle. Change down in **good time** when going up hill, to prevent the engine speed dropping too much, otherwise the engine may suffer damage. Let the engine rev freely, but don't cane it. Don't carry a pillion passenger during the running-in period.

The following speeds should be taken as a guide:

In bottom gear alternate between	15 and 20 km/hr (10 and 15 m.p.h.)
In 2nd gear alternate between	25 and 35 km/hr (20 and 25 m.p.h.)
In top gear alternate between	40 and 55 km/hr (30 and 37 m.p.h.)

After the first few hundred miles have been covered, 2/3 full speed can occasionally be exceeded for short periods to check the engine power.

After the running-in period lower the jet needle one groove to reduce fuel consumption.

And One More Point

After the first 300 miles and 600 miles

Make sure that all the nuts and bolts are tight, tightening up where necessary. The principal items are the wheel nuts, the handlebar and silencer connections, the cylinder-head bolts and the terminals in the headlamp.

Every 1 200 miles

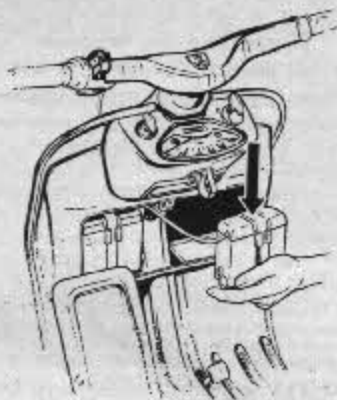
Have the 4 bolts holding the engine to the frame (2 at the top in back and 1 each at the top and bottom in front) inspected by your service agent and retightened if necessary.

Preparing the Scooter for Use

Charge the Batteries*

The batteries are normally supplied uncharged. Since special instructions have to be followed when charging batteries, especially starter batteries, it is best to entrust this work to your NSU Dealer, or to a battery service station where there is the necessary special equipment.

* See also instructions on page 43



The two batteries, which are connected in series, should be removed in the following manner:

Unscrew the knurled bolt recessed into the top of the battery case lid, open the lid, and lift it clear. Disconnect the earth lead from the frame. Lift up the clip on one of the batteries, and lift it out of the case complete with its carrier. Push down the top of the metal strap and unhook its lower end. Take off the battery lid, and disconnect both leads. Then take out the other battery in the same way.

Note: When removing the battery, disconnect the — lead first. When replacing the battery, fit the + lead first.

Check the Tyre Pressures

Do not run with the tyres either too hard or too soft. It is best to keep the tyres at the pressures which experience has shown to be the most suitable, namely:

Front: 0.8 to 0.9 atm

Rear: 1.4 atm for one person,
2—2.25 atm for two persons

Check the Fuel Supply

The fuel tank has a capacity of 7 litres (1½ gallons). The filler cap is situated under the hinged lid placed on the right-hand side of the panelling between the rider's saddle and the pillion seat.



Never Fill Up with Petrol only

If there is no oil added to the fuel, the piston will seize in the cylinder, and straight away you are landed with your first repair bill. Always, therefore, add a good engine oil* to the fuel.

Always Mix the Petrol and Oil in the Right Proportions

See „Important when filling up with petrol“ on page 20. If the scooter has been standing idle for some hours or has been left overnight, the petrol-oil mixture in the tank should be well shaken up by taking hold of the handlebars and saddle and pushing the scooter to and fro for a number of times **before the fuel tap is opened.**

* See page 62

Preparing to Start

Open the Fuel Tap

The ignition key is used for opening and shutting the fuel tap. The tap has two positions: "Open" and "Closed". When the amount of fuel remaining in the tank drops to 1 litre (1 $\frac{3}{4}$ pints) the fuel-supply warning lamp on the instrument panel lights up.



Fuel tap opened



Fuel tap closed

Now study carefully and note the effect the various **positions of the starter knob** have on the choke slide and the carburettor: —

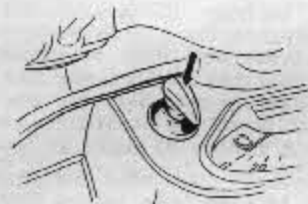


Starter knob pulled right out: The choke slide closes first, and then the tickler is depressed.



Starter knob $\frac{3}{4}$ out: The tickler is released, but the choke slide remains closed (starting position).

Starter knob $\frac{1}{4}$ out: The choke slide is half opened (Starting position in cold weather and with engine cold).



Starter knob pushed in: The choke slide is opened.

Make certain that the gearbox is in neutral. If necessary pull in the clutch lever and turn the gear-change twistgrip to "O", rocking the Scooter to and fro to release the gears.



enable the lower gear to be engaged without a jerk. Change down in good time when about to climb a steep hill, — to let the clutch slip instead of changing down and so avoid stalling the engine when climbing a hill, is absolutely wrong, and will lead to clutch trouble.

When Braking

apply the brakes carefully, and not too violently. At the same time close the throttle twistgrip. Do not use the front brake on wet or slippery bends (fallen leaves). Down hills either use both brakes together, or the front and rear brakes alternately, depending on the steepness.

When Descending Long Hills

don't keep the throttle closed all the time, but rev up every now and again. The reason for this is as follows:

It will be remembered that when the throttle of a two-stroke engine is opened the mixture drawn into the engine includes oil for lubricating the piston and the bearings. But this is no longer the case when the engine is used as a brake down hills with the throttle closed. In this case the engine is to all intents and purposes supplied with **no oil at all**. The inevitable result is that the piston will seize in the cylinder and the cylinder will be damaged; this can also result in a serious accident.

Never, therefore, descend a long hill with the throttle closed all the time, but rev the engine up every few hundred yards to supply lubricating oil to the moving parts. Use the brakes and clutch as necessary to keep your speed down when you do this. It is of course possible to increase the braking effect of the engine by changing down to a lower gear, but special care is needed when this is done with a two-stroke engine, since the engine then runs at a much higher speed, and so requires more oil. In this case, the engine will therefore have to be speeded up more frequently than when running in top gear. **The lower gears should therefore be used to assist the brakes only when descending very steep hills.**

Stopping

During temporary stops, such as at road junctions or other traffic obstacles, don't keep the engine running in gear with the clutch out, but engage neutral, and then start off again in bottom gear.

At the End of the Journey

don't try to stop with the engine in gear, stalling the engine by means of the brakes. Instead throttle down, engage neutral, and then use the brakes as necessary to stop the machine.

Switching Off the Ignition

Withdraw the ignition key, or the electrical system will be damaged. Close the cap to keep rain out of the switch.



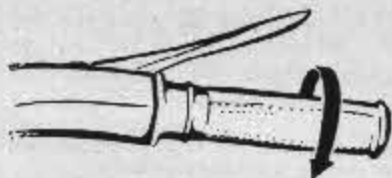
Always close the fuel tap at the end of each journey and when parking.

To Park

hinge down the prop stand, and lean the scooter over to the left. To lock it, turn the handlebars fully to the left.

If the scooter is not to be used for any length of time, it is advisable to use up the petrol and oil supply in the carburettor by running the engine in neutral gear in order to prevent the jet becoming oiled up. Before using the scooter again, mix the petrol and oil in the tank thoroughly by swaying the scooter to and fro as described earlier.

The Throttle Twistgrip
should be about $\frac{1}{4}$ to $\frac{1}{3}$ open.



Start the Engine

Pull out the starter knob, and in warm weather, push it back immediately into the $\frac{1}{4}$ -open position in order not to flood the carburettor. **Push the ignition key right down in the switch and hold it there. The ignition warning lamp will light up as a sign that the batteries are supplying current. Never try to start the engine by jabbing the starter a number of times in quick succession.**

If the engine fails to start after the starter has been turning it for 4 to 5 seconds, release the ignition key, and pause for a short while. In winter, extend this pause to about 30 seconds, since the battery cannot supply an unlimited amount of current.

The amount of current available is reduced considerably in cold weather, and so it is advisable not to keep the scooter in too cold a place.

If the engine starts (the ignition warning lamp goes out) **but stops again,** close the choke slide, and keep it closed until the engine has reached its proper operating temperature and is running normally.

If the tickler has been depressed too much, try to start the engine with the throttle twistgrip fully open. This will introduce extra air into the excess of fuel, and so produce a suitable mixture.

If the sparking plug is wet, take it out and dry it. Close the fuel tap. Turn the engine over a few times, and then replace the sparking plug. Do not open the fuel tap again until the engine has started.

If the batteries are run down, start the engine by pushing the scooter with 2nd gear engaged.

If, however, the batteries have been removed, connect the charging lead 51 (red) to the black lead attached to terminal 30.

If the engine still fails to start after 5 or 6 attempts have been made, find and rectify the fault before trying again.

Riding

Starting Off

Pull back the clutch lever and engage bottom gear (gear indicator shows "1"). Open the throttle (turn the twistgrip slowly, not violently), and **at the same time** release the clutch lever, slowly and evenly so that the scooter moves off without a jerk.

When Riding

Adjust the speed by altering the position of the throttle twistgrip.

Changing Up

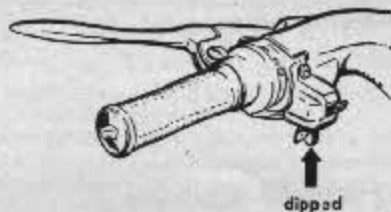
At a speed of about 20 km/hr (12 m.p.h.), close the throttle, declutch, change into 2nd gear, open the throttle, and at the same time let the clutch in carefully and steadily. At a speed of about 35 km/hr (22 m.p.h.) change up into top gear in the same way.

When on the move, the process of changing gear, including declutching and adjusting the throttle, must be carried out rapidly. You will soon be able to do this without difficulty.

When Changing Down

Again declutch first, but do not close the throttle completely, to enable the engine speed to increase; this will

Positions of the Lighting Switch when Riding and Parking at Night



Lights switched off



Parking and rear light switched on

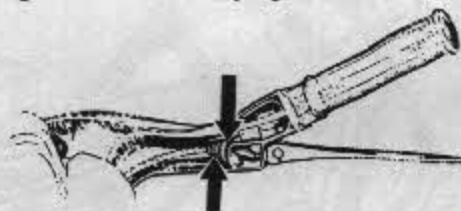


Headlamp and rear light switched on

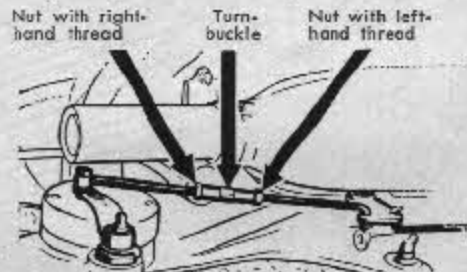
MAINTENANCE FRAME

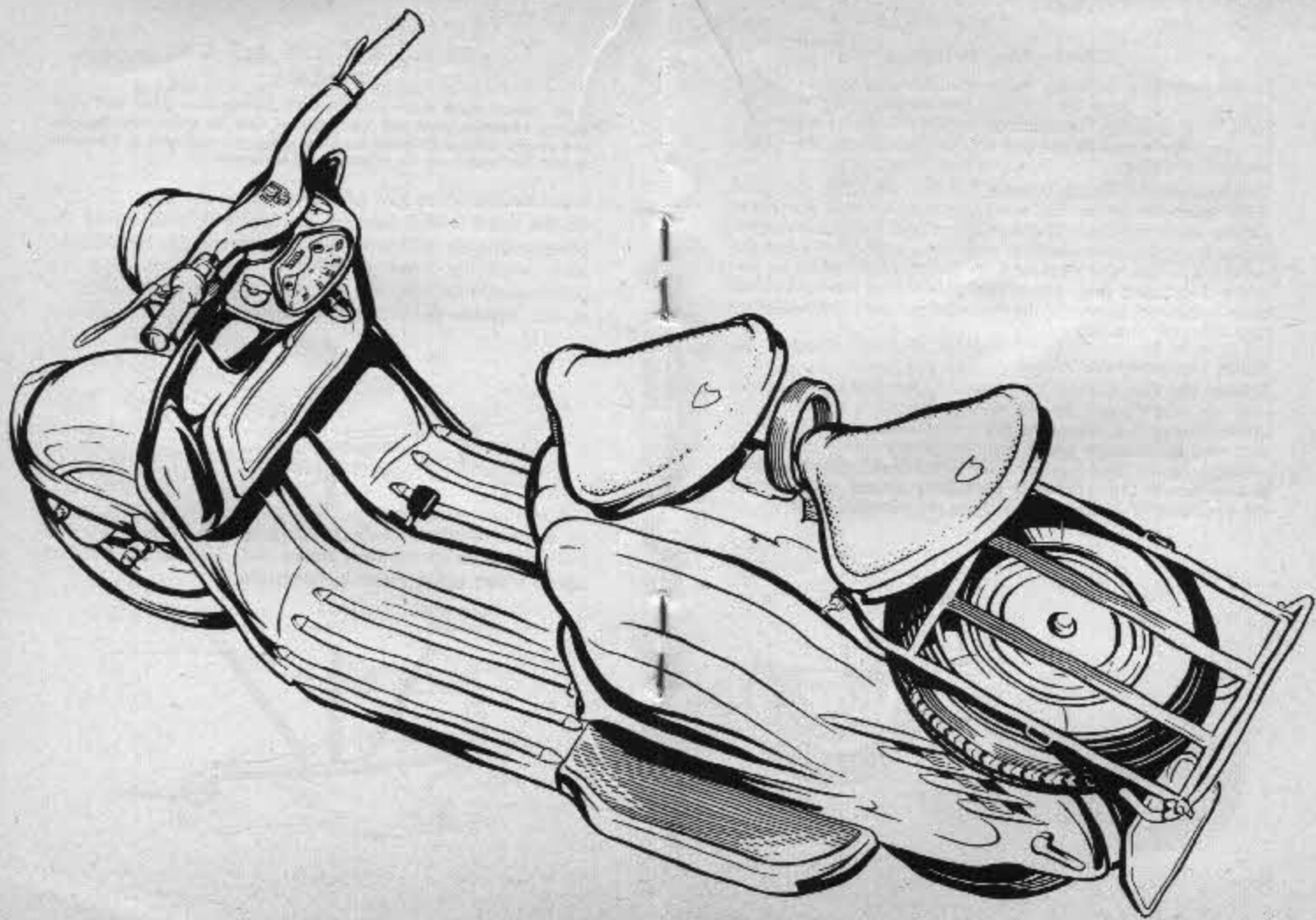
Every conscientious rider will keep his scooter in a good and road-worthy condition, and will take special care to make sure that the brakes are always in good working order. We consider it advisable to test the brakes at the beginning of each run.

If the brakes no longer grip properly, on the front wheel: Loosen the lock nut, and adjust the brake cable by means of the adjuster on the hand-brake lever until the front wheel just spins freely, but the brake starts to operate as soon as the brake lever is pulled. **Tighten the lock nut up again.**



on the back wheel: Adjustment is effected by means of the turnbuckle in the rear brake rod. **Tighten the nuts up again when adjustment is complete.**





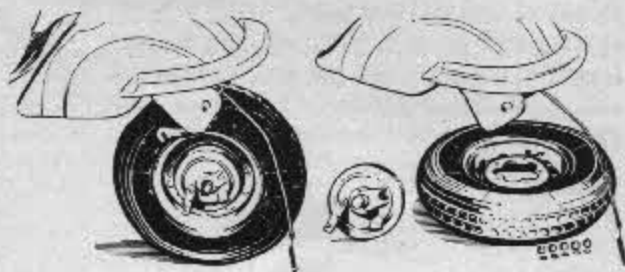
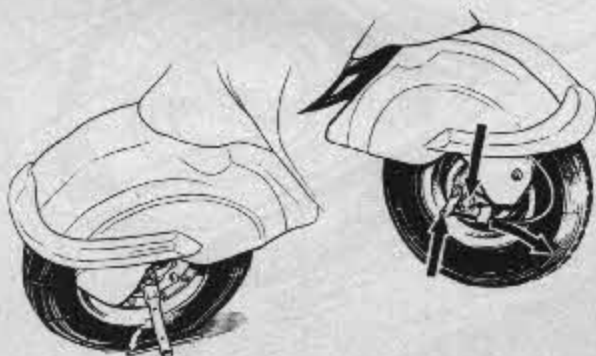
Changing Wheels

To change the wheels, raise the scooter on its centre stand. This is done by holding the stand down with the foot, and pulling the scooter upwards and backwards by the rider's saddle — not by the handle on the pillion seat.

To Remove the Front Wheel: Loosen the lock nut, and slack back the brake-cable adjuster until the brake cable can be removed from the cam lever and the cable anchorage. Then unscrew the two axle nuts sufficiently for the washers which are recessed in the pivoted links to become clear, and drop the wheel out. When the wheel has been removed, unscrew the five domed nuts and washers and take off the hub.

When Replacing the Wheel

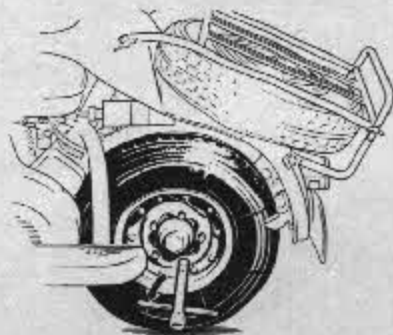
Tighten the five domed nuts securing the hub to the wheel and do not forget to fit spring washers under them. When fitting the wheel in the front forks, make certain that the anchorage plate for the brake back plate fits properly over the pin of the right-hand pivoted link. **Finally screw the axle nuts up tightly.** Make certain that the washers fit in the recesses on the pivoted links.



To Remove the Rear Wheel: Press down the locking pin holding the left-hand side panel; raise the rear of the panel, and lift it off. To remove the wheel, unscrew the five domed nuts and remove the washers.

When Replacing the Wheel

Tighten the five domed nuts securely, and do not forget to fit the spring washers under them.



To Remove the Spare Wheel

First unscrew the front of the luggage carrier and hinge it back. The spare wheel can then be removed after unscrewing the upper domed nut holding the wheel disc and the three domed nuts holding the wheel to its bracket.



Changing Tyres

To remove a tyre from the rim, **first let all the air out of the tyre**, and then remove the ten hexagonal nuts and their washers.



MAINTENANCE ENGINE

Adjusting the Clutch

Operating the clutch also releases the locking device on the gear-change segment. To make certain that both cables can be adjusted as necessary, the clutch lever must be 10 mm (0.4 in) clear of the clutch cover plate, — if necessary adjust by means of the adjuster screw.

Tighten the lock nut up well.

The clutch lever must have a play of 1 to 1.5 mm (0.04 to 0.06 in) measured at the point of attachment of the clutch cable.

If there is too much play the clutch will not disengage properly.

If there is not enough play the clutch will slip.

The adjuster for the clutch cable is situated underneath the right-hand foot board. **Tighten the lock nut up well.**



Adjust the cable for the gear-change segment locking device so that it has a play of about 1 mm (0.04 in) when the clutch lever is pulled back. Take off gearchange mechanism housing cover. **Tighten the lock nut up well.**

Gearbox

To adjust the gearchange mechanism it may be necessary to alter the cable adjusters which are situated on the gearbox. **Tighten the lock nuts up well.** It is advisable to have this work carried out by your NSU Dealer.



The Carburettor

is a Bing single-lever carburettor.

It is not advisable to modify the standard carburettor settings in any way. The cable adjuster is situated on the carburettor.



Fuel Tap and Filter

A dirty filter gauze in the tap or a blocked petrol pipe have the same effect as does **too small a jet** (blow through the petrol pipe with the fuel tap open and the scooter leaning over to the left). At the first opportunity flush out the tank and the tap complete with filter gauze with petrol, and also the main filter and its gauze. **The highest standard of cleanliness should be maintained when filling up the tank with fuel.**

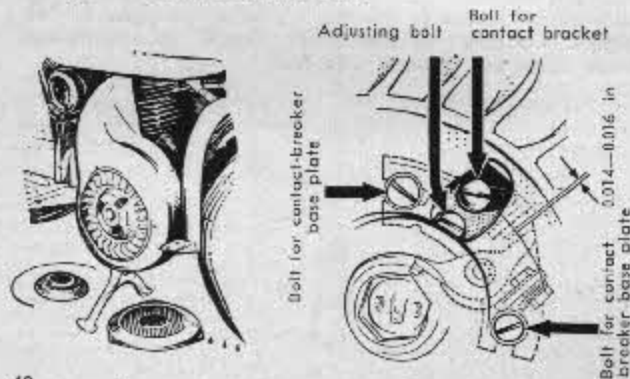


Electrical Equipment

Apart from checking that all leads are making good contact, that all the items are properly earthed, and replacing any defective bulbs or leads, it is advisable not to attempt to undertake any repairs to the electrical system. Instead entrust this work to your NSU Dealer, since the expert with his specialised knowledge can often find in a few minutes a fault for which a layman may search for hours - in vain. We are nevertheless giving a few details here, primarily for the benefit of the rider who takes an interest in the way in which his machine functions.

The gap at the contact-breaker points should be between 0.35 and 0.4 mm (0.014 and 0.016 in) when the contacts are fully open, i. e. when the arm is on the highest point of the cam. Check this gap by means of a clean feeler gauge which is free from grease.

If adjustment is necessary (worn contacts) loosen the bolt holding the contact bracket, and turn the adjusting bolt carefully in the required direction until the correct gap is obtained. Then tighten up bolt holding the bracket again. The adjustment can be carried out by working through the oval hole in the fan.



Ignition takes place 4.25 mm (0.17 in) before TDC, and must be set with the flyweight of the advance and retard mechanism fully extended. To check or adjust the ignition timing it is advisable to remove the cylinder head. If however measurements are made through the sparking-plug hole, a normal commercial type of gauge will be required.

When the ignition is correctly timed, the cam will be just on the point of separating the points when the piston is in the position specified. (Flyweight fully extended). A test lamp of the same voltage as the batteries, connected between terminal 1 on the ignition coil and earth, will light up at the instant the contact-breaker points open. If the points are in good condition, it is also possible to determine the point of ignition with the aid of a clean and grease-free strip of metal, 0.03 mm (0.0012 in) thick, which can just be drawn out from between the contacts as they open. Do not use paper. If the ignition timing is not correct, the contact-breaker base plate will have to be displaced in the required direction. To do this slacken off both the bolts holding it by $\frac{1}{2}$ to 1 turn, and move the base plate by tapping lightly a screwdriver held against it.

After re-tightening the bolts holding the base plate check the timing in the manner described above.

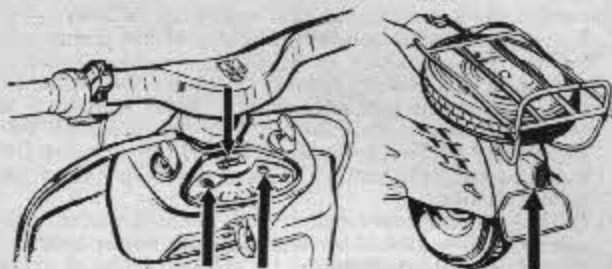
To prevent the **fibre cam on the contact breaker running dry**, smear a 1-mm (0.04-in) thick layer of high melting point grease (pour point 150-160° C = 300-320° F) on the **felt pad**, every 10,000 km (6000 miles) and rub it in well. After this distance has been covered it is also necessary to have the **commutator and the carbon brushes** inspected, and this work should be entrusted to your dealer.



Spark plug: Gap at electrodes should be 0.6 to 0.7 mm (0.024 to 0.028 in). Check with a feeler gauge. Use a Bosch W 240 T 11 or a similar suitable plug made by a well-known manufacturer when fitting a new plug. Screw the sparking plug in a few turns by hand first, and then tighten up with the spanner. **Do not forget the sealing washer.**



In the headlamp are fitted a **12-volt 35/35-watt** twin-filament bulb and a **12-volt 2-watt** bulb for the parking light. When fitting a new bulb make absolutely certain that it is completely free from oil and grease, since otherwise the reflector will become dimmed by the oil vapours that condense on it. A piece of paper or a clean rag should therefore be used for holding the bulb. It is not possible to clean the reflector.



The **rear lamp** bulb is rated at **12 volts, 3 watts**, and that for the **stop light** at **15 watts**, while the **ignition warning light** and the **speedometer illumination** bulbs are each rated at **2 watts**. The **fuel warning light** is fitted with a **12-volt 1.2-watt** bulb.

Before starting out on each run, make certain that all the lights are working properly. A failure of the twin-filament bulb in the headlamp or of the rear light or stop light is a danger both to yourself and to others.

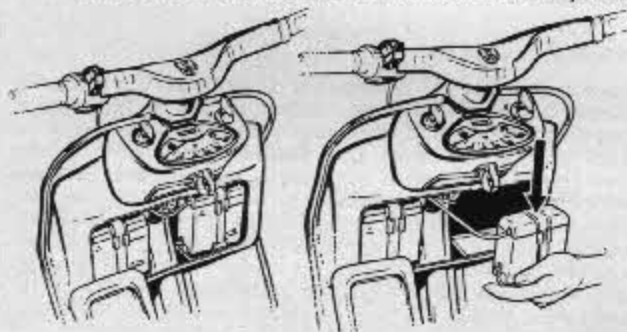
The Batteries

have a capacity of 10 amp. hr. at **12 volts**. Certain rules should be observed if the batteries are to be kept in good condition.* It is important that a constant check be kept on the acid level. Use **distilled water** only. Water that has been boiled is not satisfactory, since it contains metallic and chloride residues which may harm the battery. See that there is a good earth connection. The terminals must be kept clean and bright, and it is also advisable to treat them with an acid-free grease, preferably a special battery grease, in order to prevent corrosion. Also apply this grease to the thread of the knurled bolt recessed into the lid of the battery case.

* See also battery manufacturer's instructions.

The most important points are briefly as follows: —

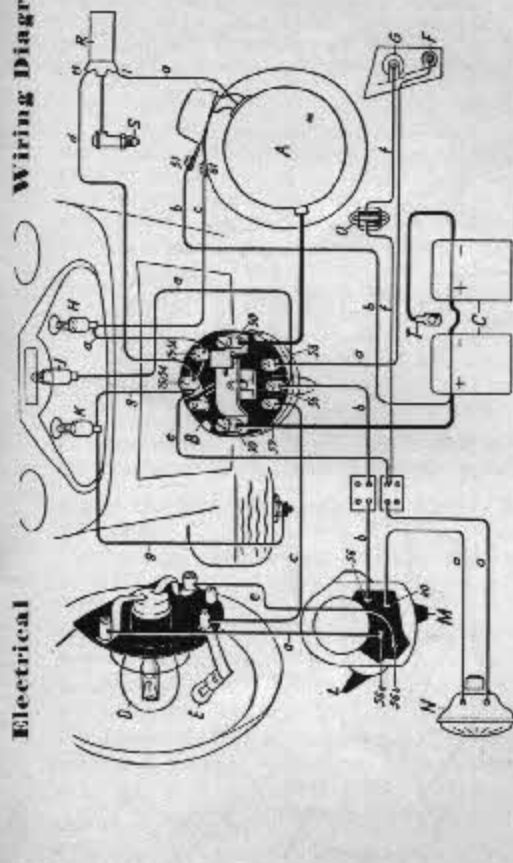
1. **If the acid level is too low**, the top of the plates will be ineffective, which is especially disadvantageous when starting. The dry portion of the plates sulphates, and becomes permanently useless. **If the acid level is too high** there is the danger that the acid will be thrown out of the vent openings, and will damage the metal forming the battery case, and possibly even the rider's clothing.
2. Protect the **batteries** against oil, grease, petrol, and paraffin. **They should be washed with water only.**
3. **More frequent attention** will be required if the machine is used a lot after dark or in fog, and if additional current consumers to those provided as standard are kept switched on all the time. The same applies if the machine is used for frequent short runs at low speeds, and hence is started frequently, especially when the lights are also used.
4. **If the machine is not used for any length of time or is laid up for the winter**, check the acid level and state of charge of the batteries, have them fully charged, and then put them on charge again every 6—8 weeks. It is advisable to store the batteries in a cool place.



For instructions on the removal of the batteries from the machine, see page 22.

Electrical

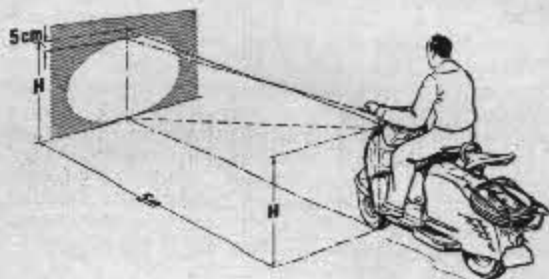
Wiring Diagram



- | | | |
|--|--------------------------|----------|
| A Flywheel, Dynamo | M Horn Button | a black |
| B Starting, Ignition and Lighting Switch | N Stop Light Switch | b red |
| C Battery | R Ignition Coil | c brown |
| D Headlamp Bulb (double-filament) | S Sparking Plug | d yellow |
| E Parking Lamp Bulb | T Earth Cable Connection | e white |
| | | f blue |
| | | g green |

Adjusting the Headlamp

For road-safety reasons, the boundary between the lower illuminated zone and the upper dark zone must be at least 5 cm (2 in) beneath the centre of the headlamp at a distance of 5 metres (16 ft) when the headlamp beam is dipped.



To adjust the position of the headlamp, loosen both the upper and the lower slotted screws on the headlamp rim.



CARE OF THE MACHINE

Cleaning the Machine

Only if you look after your "PRIMA" properly, i. e. if you use it correctly, clean it regularly, and lubricate it in accordance with these instructions, can you rely on your machine being always ready for instant use.

To protect the polished and cellulosed parts, always use a soft oily cloth for wiping the machine down, even if it is only dusty. Any dried mud should first be softened, and large lumps of dirt cleaned out of the corners with a wooden stick; finally wash the machine down. But be careful when using a hose, and keep the stream of water away from the hubs and the carburettor. If water penetrates into the hubs, the bearings will rust, while water in the carburettor (or the fuel tank) will make the engine difficult to start or will cause it to stop while under way. Any very greasy spots should be cleaned down with paraffin or a washing solvent, and not with petrol, which attacks the cellulose. Also always wipe off at once any petrol spilled when filling the tank.

Routine Lubrication

Clean the lubrication points or nipples before oiling or greasing.

During bad weather lubricate the running gear and the controls (front springing, brake levers, pivot pins in rear springing, foot-brake linkage etc.) more frequently than specified. If a squeak develops, grease at once, of course.

Engine Lubrication

is with engine oil*, which should be well mixed with the petrol before this is poured into the tank.

The proportion of oil to petrol while running in, or if the engine is heavily loaded, e. g. in mountainous country, should be 1 : 20;
otherwise 1 : 25

* See page 62

Routine Lubrication

miles	600	1200	1800	2400	3000	3600	4200	4800
	5400	6000	6600	7200	7800	8400	9000	9600
	10200	10800	11400	12000	12600	13200	13800	14400
	15000	15600	16200	16800	17400	18000	18600	19200
	×	×	×	×	×	×	×	×
	×	×	×	×	×	×	×	×
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miles 6 000

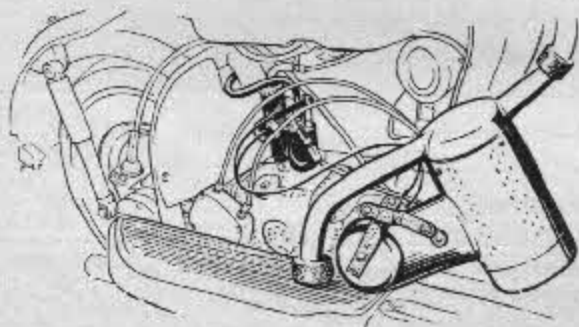
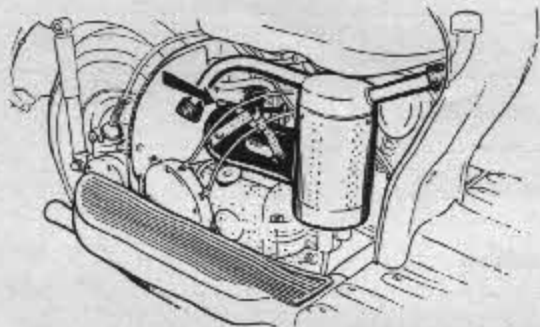
and Inspection

	Page No. in the Instruction Book
Air Filter	50
Control cable for the tickler operating on the choke slide	51
Levers and joints	52
Front wheel springing	54
Rear wheel springing	55
Control cables	55
Oil-change in the gearbox	56
Rear wheel swinging arm	57
Rear wheel Transmission	57
Front wheel Hub	58
Gear-change and throttle twist grips, steering-head Bearings, Lubricating Pad	59

Every 600 miles

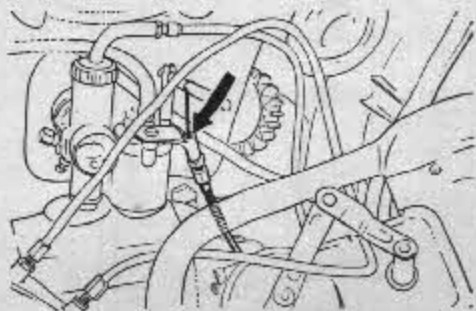
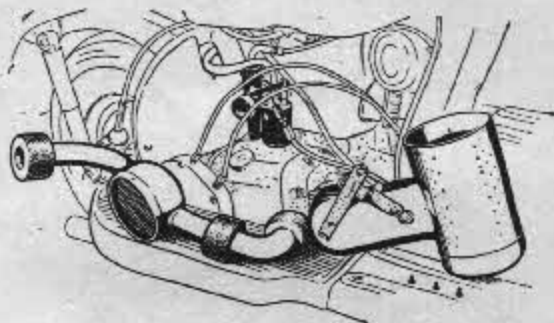
Air Filter

If the air filter is very dirty, it will increase the fuel consumption considerably. This should therefore be thoroughly washed in petrol, blown through with compressed air, dipped in thin oil, and allowed to drain. Clean it more frequently than specified if this seems desirable, if necessary each time the tank is filled.



Every 600 miles

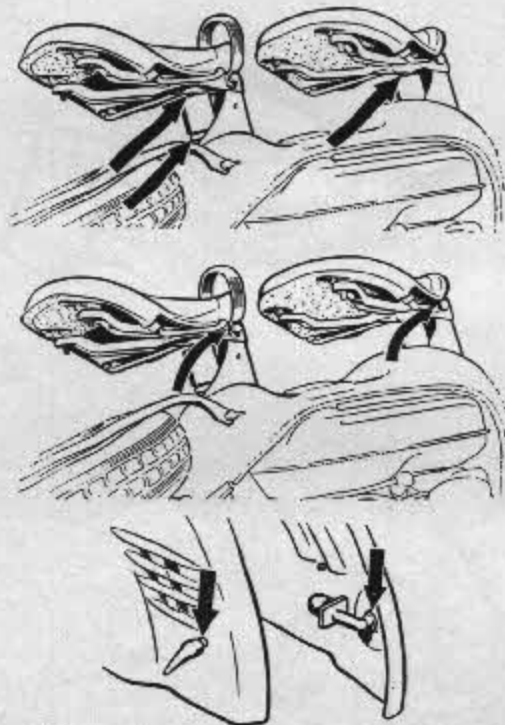
To clean the filter, the inlet-air silencer should be removed from the carburettor, and the air filter taken out of the silencer chamber after the three bolts that hold it have been unscrewed.



Every 1200 miles

Levers and joints

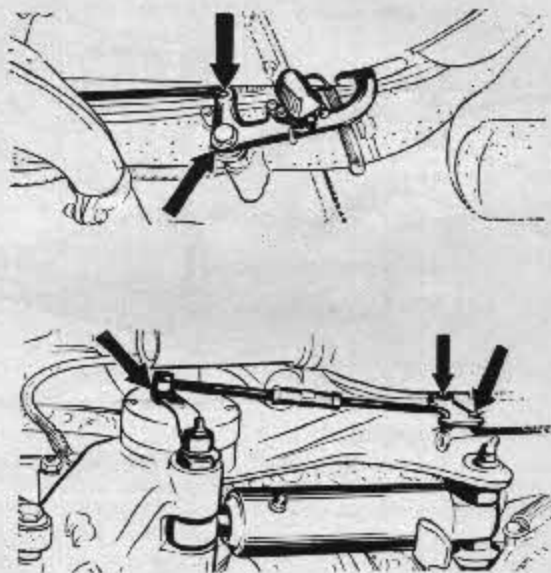
Apply grease*, to the saddle springs and saddle ball joints and oil to the front saddle bearing and locking pins for the side panelling.



* See page 62

Every 1200 miles

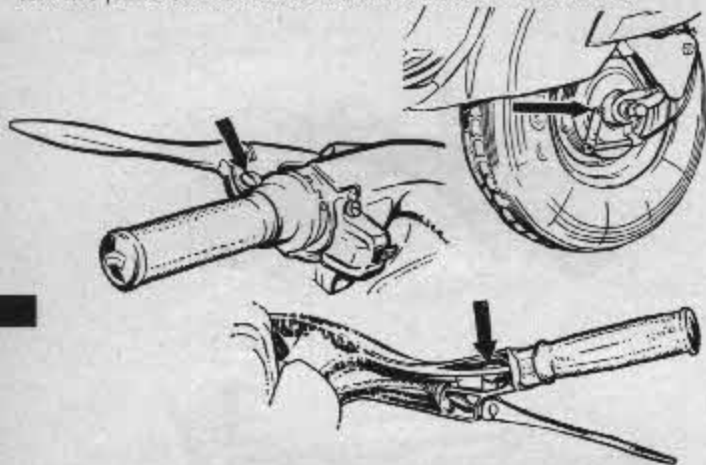
Lubricate foot-brake pedal and linkage fork with oil*.



* See page 62

Every 1200 miles

Apply a few drops of oil* to the front-brake camlever and the joints on the hand-brake and clutch control levers.



Front wheel springing

Apply 2 or 3 shots of grease* to the grease nipples on the bearings for both front fork pivots, including the front springs bearings.

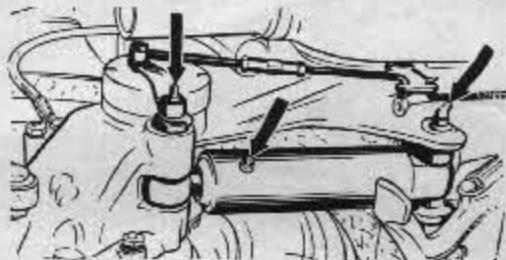


* See page 62

Every 1200 miles

Rear wheel Springing

Force grease* into both the front and the rear bearings (also the rear-brake lever bearing), and also into the nipple on the spring casing; grease the latter point as soon as any noise is heard.



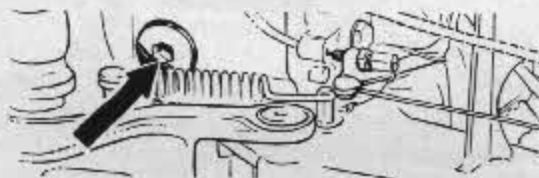
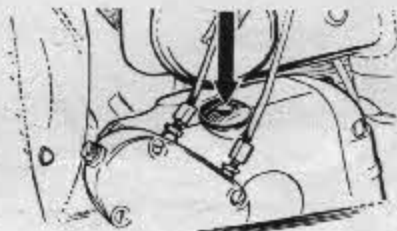
Control cables

Disconnect the cables, and allow a mixture of oil and petrol to drip into the upper end of the casing until it emerges at the bottom. Also grease the ends of the cables where they slide in and out of the casing, to prevent water penetrating. Pay special attention to the clutch cable and the choke-slide cable. This job can be simplified by using a cable lubricator, obtainable from any accessories dealer.

* See page 62

Every 2400 miles

when the gearbox is warm drain off the oil. To do this unscrew the filler plug, the drain plug, and the oil-level control plug. Replace the drain plug, and pour in oil* until it emerges out of the control opening (0,3 litres). Finally replace the oil-level control plug and the filler plug.

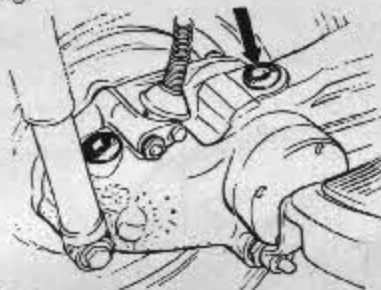


* See page 62

Every 2400 miles

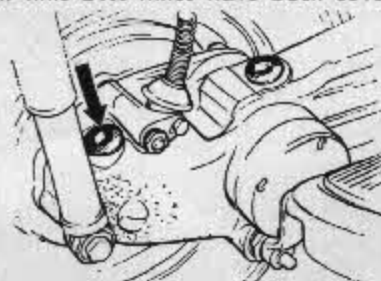
Rear wheel Swinging Arm

Force grease* into the bearing until it is level with the inlet opening.



Rear wheel Transmission**

Remove the inlet plug and force in 50 grams (1 3/4 oz) of grease* on **every second occasion**. When a further 2400 miles have been covered, take off the cover plate complete with the drive shaft, and remove all traces of old grease. Then insert 140 grams (5 oz) of grease* **and no more**. Continue topping up and replacing grease alternately each time 2400 miles have been covered.



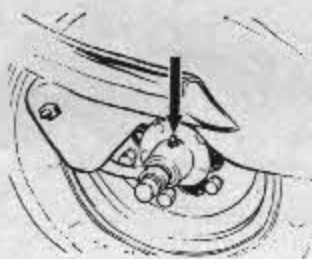
* See page 62

**let your NSU-Dealer carry out this work

Every 2400 miles

Front wheel Hub

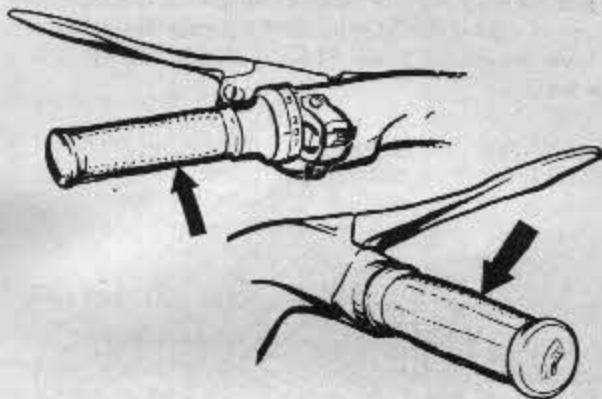
Force a small quantity of grease into the grease nipple.



* See page 62

Every 6000 miles

Remove throttle and gear-change twistgrips and grease* internal parts.



Steering-Head Bearings

Pack the balls in grease*. The bearing should first be cleaned. Adjust the bearing so that there is only a very small amount of axial play. (With the machine raised on its stand the front forks, when turned slightly from the central position, should swing right round to the left or right).

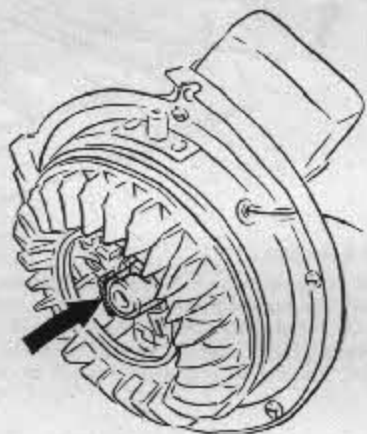


* See page 62

Every 6 000 miles

the Lubricating Pad on the Contact Breaker

should be greased with hot bearing grease having a pour point of 150—160°C (300—320°F). Smear the pad with a layer of grease 1 mm (0.04 in) thick, and rub it into the pad.



Overhauling the Engine

If the engine power drops off in course of time, decarbonisation of the cylinder and exhaust system will usually be necessary. It is advisable to entrust this work to your NSU Dealer. Make no alterations to the exhaust system.

For General Cleaning

Wash down the outside of the engine with paraffin or a washing solvent, and the cellulosed parts with water. Then rub down the engine with a rag, and the cellulosed parts with a chamolais leather or a viscose sponge.

Laying the Machine Up for the Winter

If the scooter is to be laid up for a lengthy period, during the winter months for instance, raise it on its centre stand to take the load off the tyres. Unscrew the sparking plug and pour in a small amount of anti-corrosive oil when the piston is in its uppermost position. With the carburettor empty and the fuel tap closed, push the scooter to and fro a few times with top gear engaged in order to turn the engine over, and finally bring the piston back to the top dead centre position. Repeat this procedure every four or five weeks. To prevent water condensing in the cylinder and the crankcase do not replace the sparking plug. Cover the sparking-plug hole with a clean cloth or a piece of fine-gauge filter mesh.

List of Recommended Lubricants

Application	see instruction book page	Lubricant
Engine	20	Branded oil SAE 50 for two-stroke engine
Gearbox	20/56	Branded oil SAE 30 or branded gear oil SAE 80
Control levers and joints control cables	52/54 55	Branded oil SAE 30
Saddle springs and saddle ball joints. Front and rear wheel springing and control cables, front wheel hub, gear change and throttle twistgrips and steering-head bearing.	58/59	High-pressure grease
Rear swinging arm and rear transmission	57	Grease e.g. Shell-Retinax G or Mobil Epix

Fault Tracing*

The engine fails to start. NO petrol floods out when the carburettor tickler is depressed.

Fuel tap closed or reserve supply used up.
Fuel tank empty.
Fuel tap or petrol pipe blocked up.
Float displaced on float needle (replace in groove).

The engine fails to start. Petrol floods out when the carburettor tickler is depressed.

Jet blocked. (Foreign bodies must be removed only with a bristle).
Water in the carburettor.

Throttle twistgrip incorrectly operated.

Choke slide wrongly operated (close only in cold weather).

High-tension lead disconnected or loose, or insulation defective. Tickler depressed too much so that sparking plug is wet. (Unscrew plug, close fuel tap. Open throttle fully. Turn engine over a number of times. Dry plug and screw it back in, and start engine with fuel tap closed. Do not open fuel tap until engine is running).

Sparking plug oiled up, sooted up, or electrodes bridged by a foreign body.

Wrong sparking plug.

Incorrect gap at sparking plug electrodes.

Faulty sparking plug (insulator cracked).

Contact breaker dirty or sticking.

Incorrect gap at contact-breaker points.

Contact-breaker points oiled up, dirty, or worn.

The engine stops suddenly or runs irregularly.

Fuel supply almost exhausted.

Water in carburettor.

Air supply incorrect (carburettor mounting loose).

Jet needle has become detached (replace).

Float displaced on float needle (replace in groove).

Float leaking (fit new float).

Too much oil in petrol (mixed in wrong proportions).

High-tension lead loose or insulation defective.

Sparking plug faulty or of wrong type.

Contact-breaker points oiled up, dirty, or worn.

*In case of doubt please seek the advice of your NSU-Dealer.

The engine does not pull properly or becomes unduly hot.

Clutch slipping (adjust).
Brakes adjusted too tightly (binding).
Choke slide incorrectly operated (open if it is closed).
Air filter dirty.
Air supply incorrect (carburettor mounting loose).
Jet needle has become detached (replace).
Carburettor flooding: Float chamber leaking, float needle bent.
Float needle or tickler sticking.
Petrol-oil mixture incorrect.
Wrong sparking plug.
Ignition timing incorrect.
Heavy carbon deposits in exhaust port.
Heavy carbon deposits blocking silencer.
Piston ring sticking in groove, worn, or broken.
Mechanical fault in power transmission or wheels and bearings.

The engine stops.

Reserve fuel used.
Fuel supply exhausted.
High-tension lead disconnected.
Sparking plug faulty or beads of metal deposited on plug electrodes.
Contact breaker sticking.

Lights fail to go on

Bulb burnt out.
Faulty earth contact.
Lead loose, disconnected, or oxidised.
Short circuit, insulation worn off lead.

Faults which cause an increase in fuel consumption include the following:

Incorrect fuels. Obstructed fuel supply. Incorrect carburettor settings. Carburettor generally in poor condition. Entry of excess air through leaky joints. Engine gaskets not sealing properly. Carbon deposits in gas ports and exhaust system. Ignition timing incorrect. Ignition system in poor condition mechanically or electrically. Faulty operation of the throttle twistgrip or the choke slide. Faulty use of gear. Defects in the power transmission. Brakes in poor condition (adjusted too tightly and therefore binding).