Operating Manual for

STADTROLLER

BERLIN

SR59

Edition 1960

VEB INDUSTRIEWERKE LUDWIGSFELDE

The Stadtroller „SR 59-Berlin“ is a Product of VEB Industriewerke Ludwigsfelde.

Scooterstation offers full parts support for the SR59 Berlin scooter within the US. If you need parts you can contact us at: (503)-231-2768 or e-mail us at sales@scooterstation.com

This operating manual was was written by a collective of Authors of the VEB Industriewerke Ludwigsfelde.

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KG 12/3/60

A lot of unnecessary frustration

will be avoided if you don´t put this operating manual aside carelessly, but instead briefly familiarize yourself with the directions and suggestions this manual provides. All sections of this manual have been compiled by skilled personell and serve the purpose of imparting knowledge about this vehicle to you without which the operation of a modern motorvehicle would just be impossible. We want to give you the maintenance and care advice necessary for you to be able to enjoy your vehicle, instead of having to spend your valuable free time at an authorized dealers shop, that you should better use for your own recreation.
It´s a simple fact that any new motorvehicle should be treated with a lot of care and attention. This is why you will save lots of money, frustration and potential anger if you apply the knowledge gained from this operating manual. Not only should you consider the given advice for a single ride, but for the entire time in which you drive your motorscooter.
Please consider that the observance of our advice essentially contributes to the preservation of your property and thus to the peoples property.
If you don´t find the information on the following pages sufficient or if you need additional advice, you can always trustfully contact one of our authorized dealers. They will always help and advise you, because our authorized dealers ought to avoid repairs before they happen by making qualified suggestions and giving helpful advice.

VEB Industriewerke Ludwigsfelde

LEGAL DISCLAIMER:
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Table of contents

Illustration 1: Berlin SR59 as viewed from the left

Illustration 2: Berlin SR59 as viewed from the right

1 Technical data

1.01 Engine

Mode of operation	Two-stroke
Process	Loop scavenging
Piston stroke	58mm
Cylinder bore	56mm
No. Of cylinders and Orientation	1 cylinder, standing, leaning 15º forward
	Piston displacement 143ccm
Compression ratio	7.75:1:8.1
Room for compression	20,4ccm
Continous output at 4000rpm	6.5hp
Maximum output at 5100rpm	7.5hp
Max. torque at 3500rpm	1.15kgm
Coolant	Forced air (axial load supercharger)
Lubrication	4%

Carburetor

Design	Round slidegate valve carburetor
Type	24 KN 1-1
Passage	24mm
Main jet	90
Needle jet	67
Idle jet	40
Needle setting	3
slidegate valve-cut out4mm	
Idle air screw	2,5 to 3 revolutions, open
Weight of float	10,6grams
Airfilter	Baffle wet air filter with intake silencer

Ignition	Battery Ignition
Spark plug	Isolator M 14-240
Length of thread	10mm
Elektrodenabstand	0,6mm
Unterbrecherkontaktabstand	0,4mm
Vorzündung	4mm of OT (28% crankangle), fixed setting

Piston

Material	Si 20
Piston rings	2 Compression rings
Oversizes	for cylinder-diameter 56.25; 56.50; 56.75; 57.00mm

Crankshaft bearings

Amount	3
Type	Ball bearings
Connecting rod bearings	Doublerowed roller bearings, cageless, with friction disc
Dimension of rolls	5x5 in compliance to DIN 5402

1.02 Transmission and power transmission

Clutch	Multiple disc clutch in oilbath, adjustable at motor and handlebar
Coating	Frictionlambals „Original Cosid“
Number of compression springs	6
Transmission	Docked to engine, hand controlled
Number of gears	4
Idle motion display	electronic pilot lamp on lefthandside of controlpanel
Gearshift	by footswitch and circuit breaker
Gears	
1. gear	3.05 :1
2. gear	1.805 :1
3. gear	1.285 :1
4. gear	1 :1
Ratio	
Engine/Transmission	2.75 :1
Transm./Rear wheel	2.19 :1
Gear ratio	
1. Gear	18.4 :1
2. Gear	10.8 :1
3. Gear	7.73 :1
4. Gear	6.02 :1
Kickstart ratio	3.76 :1
Power transmission	
Engine/Transmission	Sleeve chain 3/8“ x 7.7 x 5Dmr. 44 links
Transm./Rear wheel	Chain ½“ x ¼ “ x 8.51 Dmr. 94 rollers

1.03 Brakes

Foot brake	Drum brake
Effective to	Rear wheel
Operates through	Bowden cable
Handbrake	Drum brake
Effective to	Front wheel
Operates through	Bowden cable, adjustable at hub and handle bar
Diameter of brake drums	
rear/front	150mm
Brake lining	
width	24mm
Material	„Original Cosid“, glued on

1.04 Wheels

Type	Full disc wheels, light alloy
Axles	
Front wheel	Normal axle
Rear wheel	Knockout spindle
Rims	Drop base rims 2.50 C x 12
Tires	
Dimensions	3.50-12
Type	Block profile
Air Pressure	
Front	1.2atü (17.64psi) single driver
Rear	1.5atü (22.05psi) single driver
Front	1.4atü (20.58psi) with buddy
Rear	2.0atü (29.40psi) with buddy

1.05 Suspension

Front wheel suspension	Balance beam fork, Pressure spring with friction damping
Effect	Proportional
Displacement	110mm
Rear wheel suspension	Trapezoid swing, torsion spring (patented), hydraulically absorbed
Effect	Proportional
Displacement	70mm

1.06 Steering

Lenkkopfwinkel	25º
Vorderradnachlauf	75mm
Lenkanschlag	At Steering shaft
Lenkwinkel	90º

1.07 Electrical System

alternator	Voltage regulating
Type	GMR 6/60
Manufacturer	FEK (Fahrzeugelektrik Karl-Marx-Stadt)
Performance	60W
Propulsion	Anchored directly on crankshaft tap
Controller	RSC 60/6 on Blowercasing
Charging control lamp	on the lefthandside of the controlpanel
Fuse	15A
Ignition coil	TJ 6/1 at crankshaft tap
Battery	
Voltage	6V
Capacity	8Ah
Negative pole	to ground
Headlight	130mm face
Main light	35/35W Bilux

1.08 Frame

Type	Central frame
Seams	Electrical and autogenic welding seams
Stand	Sidestand on left side of floorboard

1.09 Body

Front	Fender, Legshield, headlight with casing, instrument panel
Floor and Rear	Floorboard made from GA1-alloy, Rear hood with removable toolbox and tippable seats, that can be locked
Number of seats	2

1.10 Equipment

Speedometer	Installed on instrumentpanel with nightlight
Propulsion	through the front wheel
Tools	Under the seats in the rear hood

1.11 Measurements and weights

Maximum length	2080mm
Maximum width	650mm
Maximum height	950mm
Wheelbase	1430mm
Ground clearance	110mm (loaded)
Wading capability	240mm
Turning circle	4.0 Meters
Weight	140Kg (309lbs.)
Dry curb weight	131Kg (289lbs.)
Maximum weight	300Kg (662lbs.)
Pressure on front axle	
unloaded	51Kg (112lbs.)
loaded	100Kg (221lbs)
Pressure on rear axle	
unloaded	84Kg (185lbs.)
loaded	200Kg (442lbs.)
Avg. Fuel consumption	2.8liters/100Km (85mpg)
Fuel consumption at speeds	
of 40Km/h (25mph)	2.1l/100Km (112mpg)
of 50Km/h (31mph)	2.4l/100Km (99mpg)
of 60Km/h (37.5mph)	2.9l/100Km (82mpg)
Top speed	82Km/h (51mph)
Continous top speed	75Km/h (47mph)
climbing ability (single driver)	1st gear 33% (30º) at 15Km/h (9.5mph)
	2nd gear 18% (16º) at 30Km/h (19mph)
	3rd gear 12% (11º) at 50Km/h (31mph)
	4th gear 5% (4.5º) at 60Km/h (37.5mph)

1.12 Filling amounts

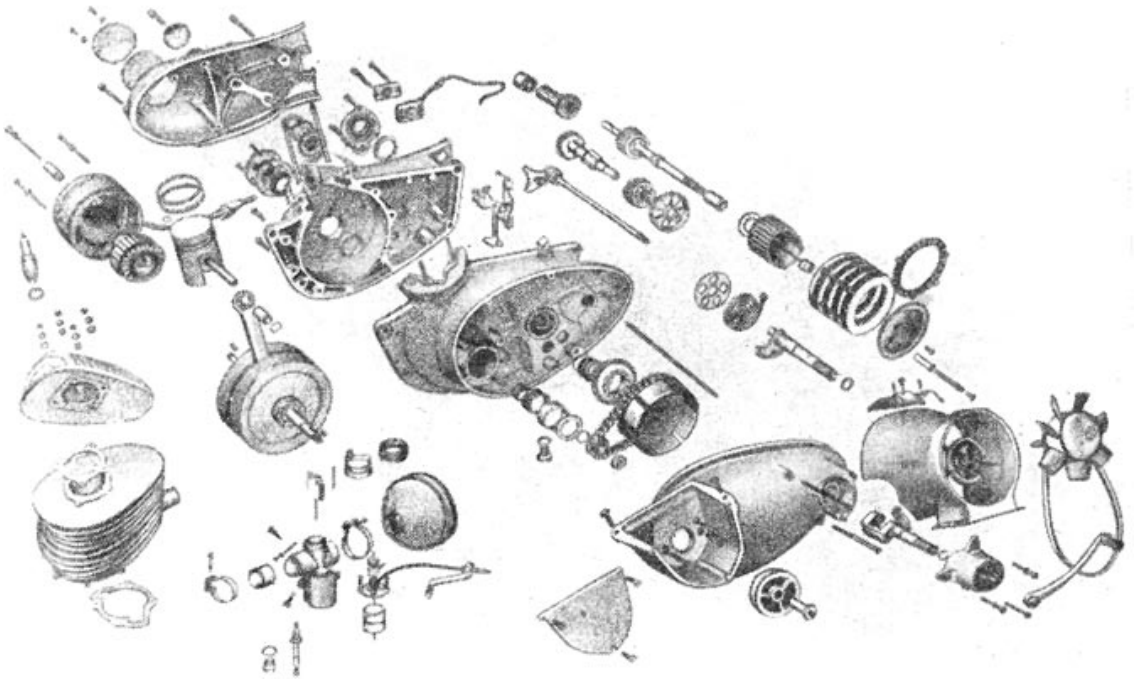
Fuel tank	12 liters (3.2 US gallons)
Reserve in fuel tank	1.5 liters (1.6 US liquid quarts)
Transmission oil	0.4 – 0.45 liters (0.84-0.95 US liquid pints)
Radius with one tank filling	appx. 350Km (219miles)

2 Description

2.1 Engine

2.11 Mode of operation

The aircooled supercharged single cylinder two-stroke engine of the SR59 Cityscooter operates as a loop-scavenging-triple-port-Engine. This engine is an advanced version of the reliable and successful 125cc two-stroke motor of the MZ-125-2 Motorbike. The following section describes the mode of operation of the RM150 engine:
As the piston moves upward (from bottom dead center (BDC) to top dead center(TDC)), a vacuum is created beneath the piston in the enclosed volume of the crankcase. The piston uncovers a little air inlet just before reaching the top dead center. This little air inlet is the end of the intake port, through which fresh air enters the crank case due to the vacuum created before. Because this very same air had to pass through the carburetor prior to entering the crank case, it is mixed with just the right amount of fuel and oil (the oil being necessary for the lubrication of the engine) When the piston is on a downward move after passing TDC it relocks the intake port and thus compresses the air/fuel mix. By now, the oil has dropped out of the mix and attached itself to bearings and other parts within the engine. Just before reaching BDC two openings called transfer ports are uncovered in the cylinder.
The *scavenging* phase has begun. Meaning that the unburned mixture gasses are flowing out of the transfers and merging together to form a loop. The gasses travel up the backside of the cylinder and loops around in the cylinder head to *scavenge* out the burnt mixture gasses from the previous power stroke. It is critical that the burnt gasses are scavenged from the combustion chamber, to make room for as much unburned gasses as possible. Now the loop of unburned mixture gasses have traveled into the exhaust pipe's header section. Most of the gasses aren't lost because a compression pressure wave has reflected from the baffle cone of the exhaust pipe, to pack the unburned gasses back into the cylinder before the piston closes off the exhaust port. Now the crankshaft has rotated past bottom dead center (BDC 180 degrees) and the piston is on the upstroke. The compression wave reflected from the exhaust pipe is packing the unburned gasses



back in through the exhaust port as the piston closes off the port to start the compression phase.
Image 3. Explosion drawing of engine

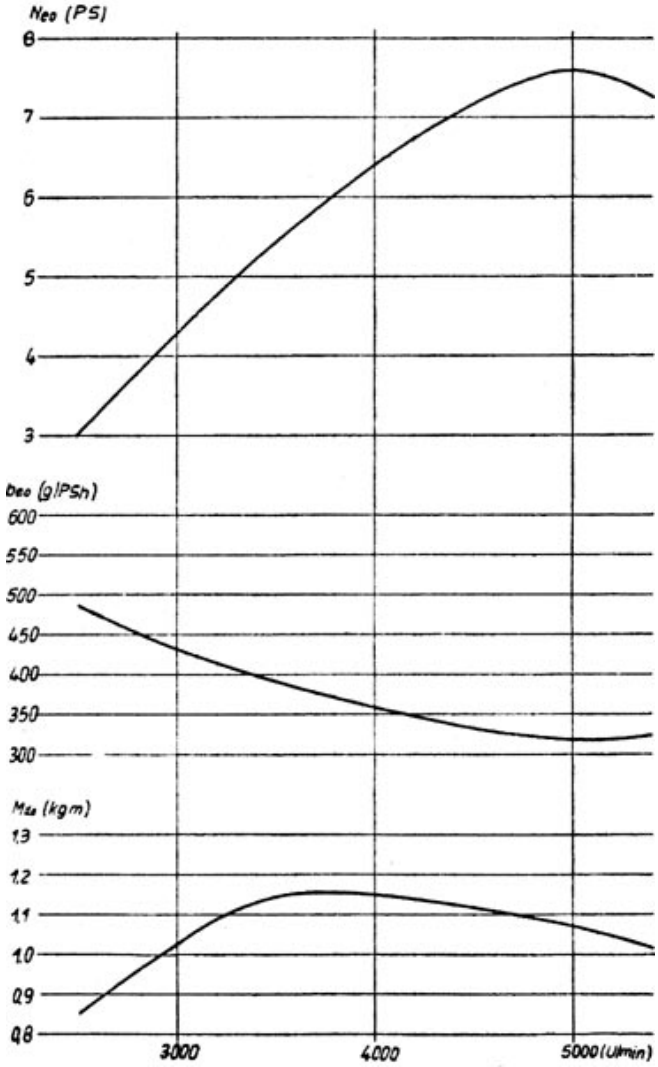


Image 4. Power curve chart

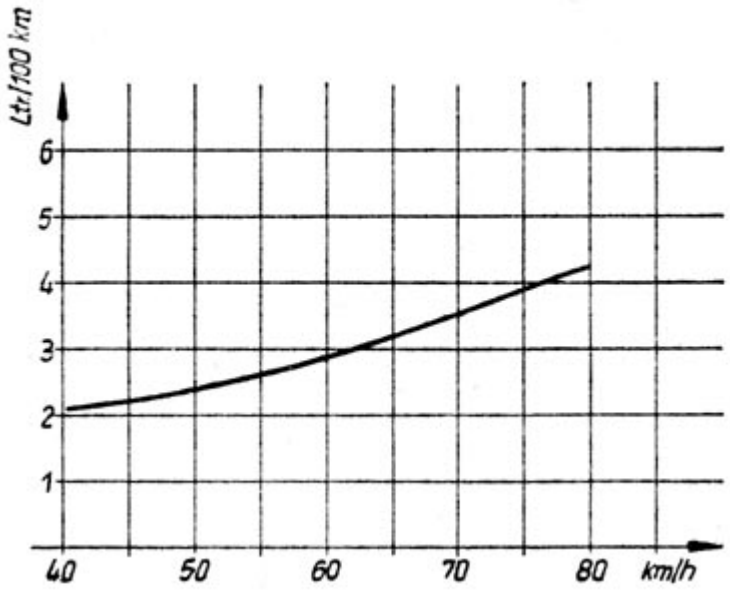


Image 5. Gas consumption curve

In the crankcase the pressure is below atmospheric producing a vacuum and a fresh charge of unburned mixture gasses is flowing through the intake into the crankcase. The unburned mixture gasses are compressed and just before the piston reaches TDC, the ignition system discharges a spark causing the gasses to ignite and start the process all over again.

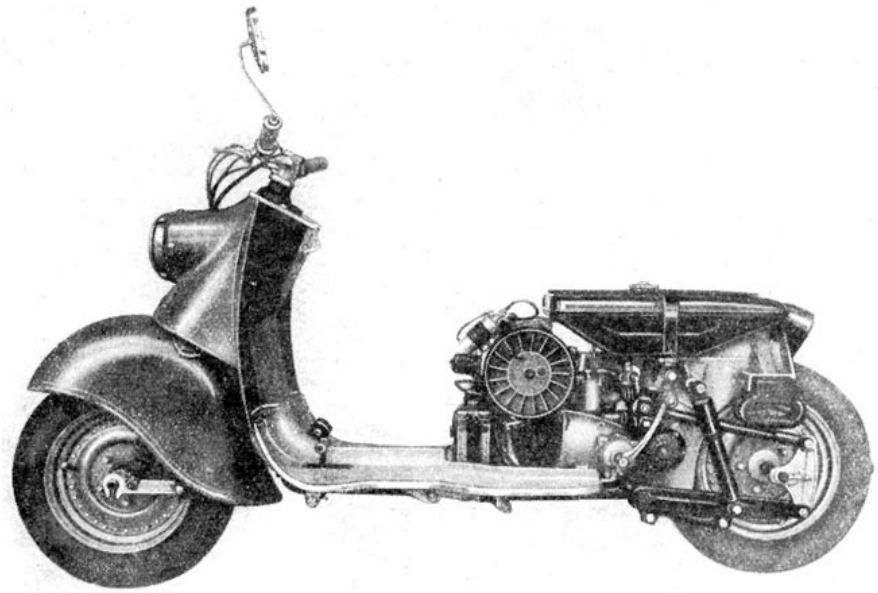


Image 6. Motor viewed from left side

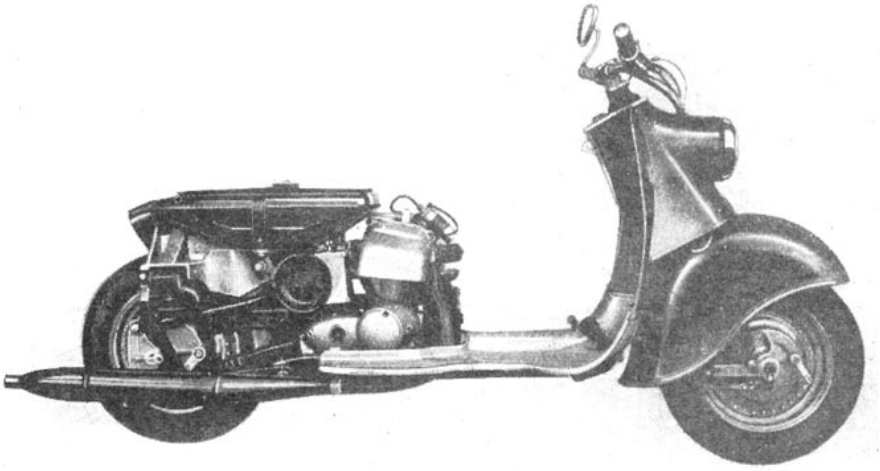


Image 7. Motor viewed from right side

2.12 Crankshaft

The crank is made from several metal parts, that were manufactured hydraullically under several tons of pressure. These parts consist of the two strokediscs, the two crank pivots and the strokepivot on which the connecting rod is installed on a doublerowed rollerbearing. A polished seperator disc seperates the two rows of rollers and thus keeps an ideal tracking and also insures sufficient lubrication even at high revolutions. At the top end of the connecting rod there is a bronze bushing into which the piston bolt is installed.
The crank is installed into the crankcase by one ball bearing on the right and two ballbearings on the left. The necessary pressuretightness of the crankendings at the bearings is achieved by spring pressured crank seals on each side.

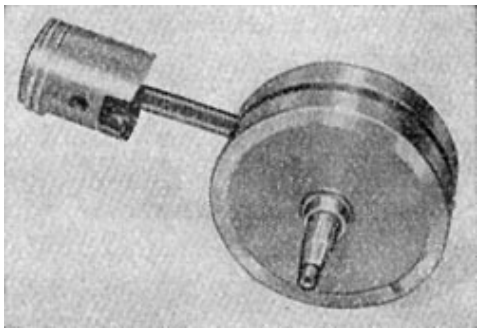


Image 8. Crank with connecting rod and piston

2.13 Crankcase

The enginecase is sliced vertically through the middle. The front section contains the crankcase and the rear section the transmissioncase.The crankcase picks up the crank and carries the cylinder. The two halfes of the engine case are held together by screws . The seperation surfaces of both halfes of the engine case should have minor amounts of a fluid sealer applied to them prior to closing the enginecase. Two lightmetal cast lids close the exposed areas around the sides of the enginecase.

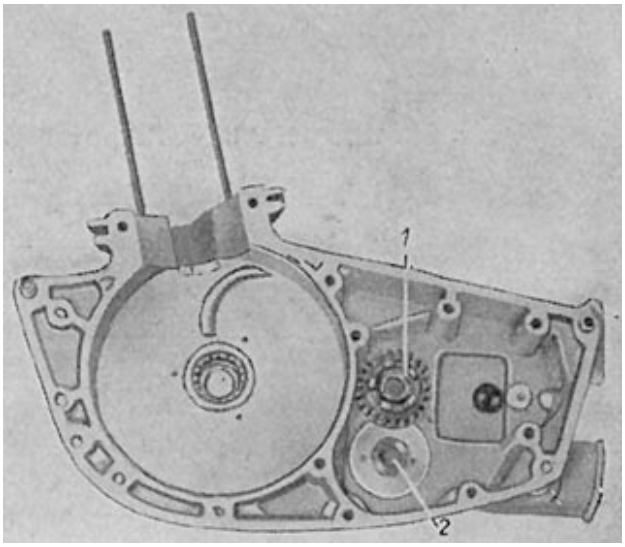


Image 9. Crankcase section
(1)Ratchet
(2)Bushing for countershaft

The main transmission of power including the clutch can be found in the left area while the alternator and the clutch access are installed in right side, well protected from dirt.

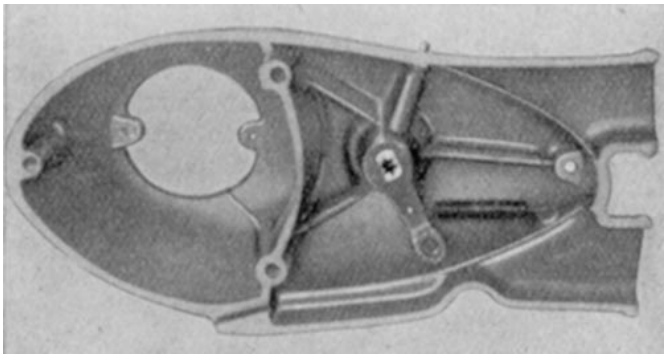


Image 10. Lightmetal lid, right side

2.14 Cylinder and Cylinderhead

The cylinder is made of special grey cast iron and is covered with large scaled cooling fins. Together with the cylinderhead which is also equipped with cooling fins, it is frimly screwed onto the crankcase using four long special screws. At the foot of the cylinder a paper seal supplies the necessary sealing.

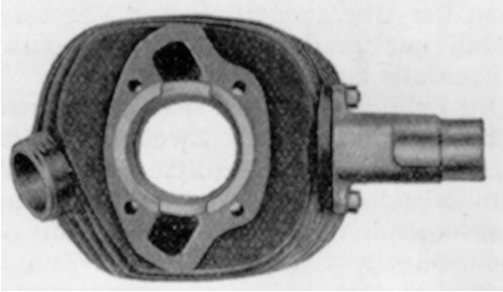


Image 11. Cylinder

Where the cylinder and the crankcaes meet, the crankcase is also equipped with some cooling fins, to harmonize the optical impression of the engine.
Precisely carved, you will find the previously decribed (sect. 2.11, mode of operation) transfer ports in the cylinder. The two port openings located on the sides at the foot of the cylinder are corresponding with the adjacent ports in the crankcase. When the cylinder is worn out, it can be rebored and fitted with the next larger size of piston. The measurements for reboring the cylinder are as follows: 56,25; 56,50; 56,75 and 57mm.

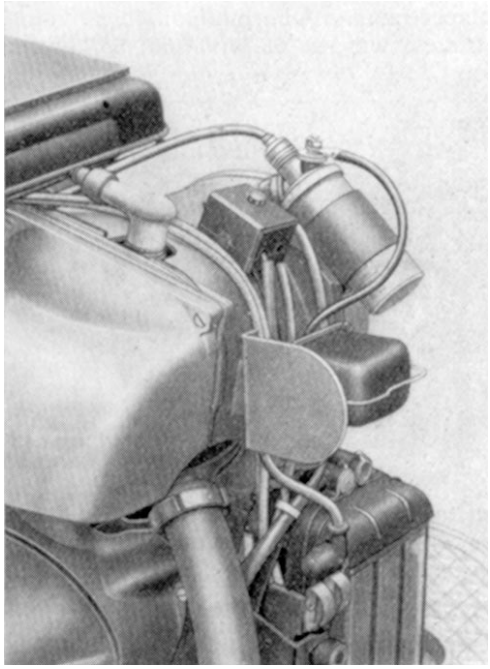


Image 12. Cylinder and Exhaust connectors

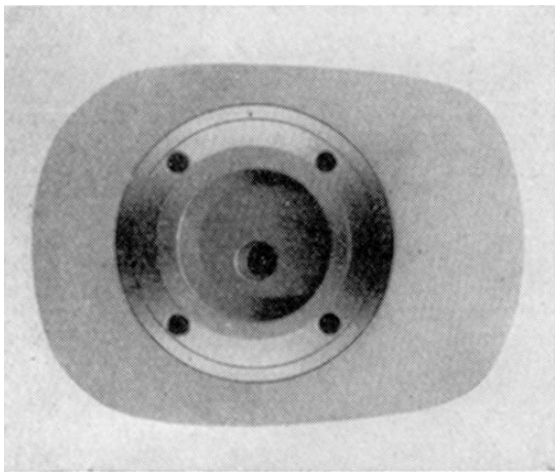


Image 13. Cylinder head

A sparkplug that is necessary for the ignition of the gas/air mix, sits in the center of the cylinder head. The cooling fins are oriented in direction of the supercharger blower.

2.15 Piston and piston bolt

The purpose of the silicon bearing cast lightmetall alloy piston is to pick up the pressure from the burnig fuel. The oscillation of the piston caused by the work cycles is transformed into the necessary rotational movement by the crank. The sealing of the piston toward the cylinder walls is achieved by the presence of two 2,5mm wide piston rings which are secured against rotating by safety lock pins, to protect them from getting into the transfer ports, which could otherwise do harm to the engine. The piston is connected to the crank by a specially hardened lapped piston bolt that is secured against shifting by circlips.

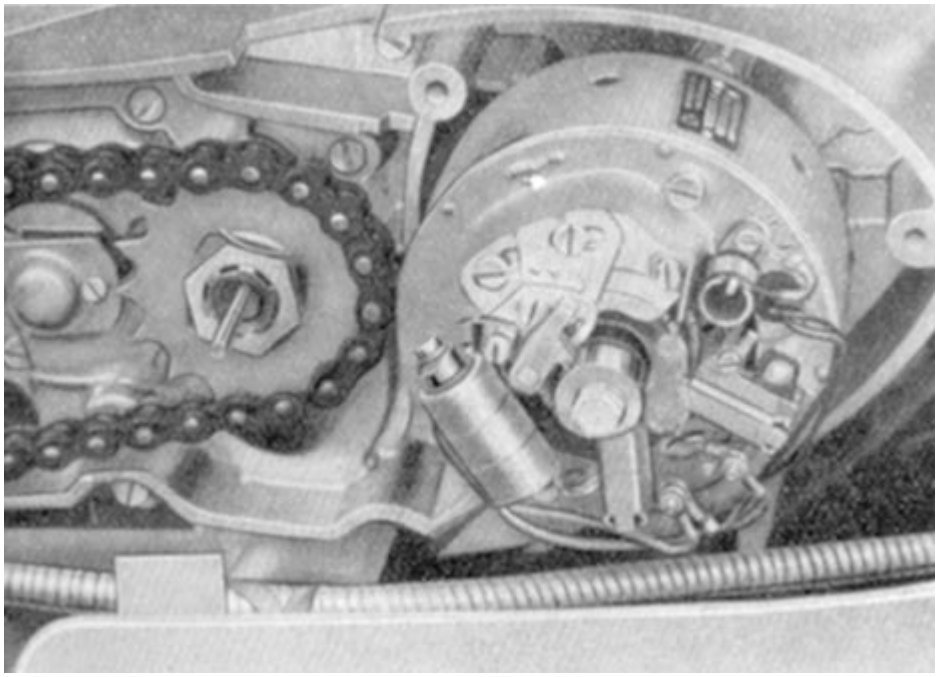


Image 14. Orientation of aggregate, right side

2.16 Fan

An axial load supercharger forces fresh cool air onto the cooling fins of the cylinder to cool the warm air that is being produced by the cycle process of the running engine. The axial load supercharger is made from two components: a light metal fan casing and an air guiding cover that directs the air.
The flywheel is driven by a 8x5x474 drivebelt. The drivebelt is hooked onto the left crank pivot secured by a beltdisc. A supercharger alarm system consisting of a contact and an orange pilot lamp on the right hand side of the instrument panel, supplies the appropriate control and security incase of possible blockage or snapping of the belt.

2.161 Inspection of the blower beltdrive

The belt for the flywheel should be loosly streched. It should also easily put the flywheel into motion. If fitted too loose, it will lead to the belt „throbbing“, bearing the danger that the belt will make contact to the housing and thus be subjected to premature wear. Also when the belt is installed too tight, it will show signs of premature wear, because the tension that occurs during operation adds to the initial tension of the belt. This leads to excessive friction on the belt´s profile, which will cause the belt to eventually snap.
It is hard to give an exact value for the tension necessary for the belt but it´s safe to say, that when you can push the installed drivebelt in by about 1/3 of an inch, that the tension set is just about right to achieve the longest endurance of your belt. By using distancing strips between the blowercase and the clutch lid the right tension of the belt can be set.

2.162 Changing the drivebelt

a) Removal of engine housing

b) Removal of alloy lid on the left half of the enginecase underneath the blower by unscrewing the two upper and loosening the lower cylinderscrew.

c) Remove lower drivebelt disc (right-hand-thread) using a 19mm socket and remove disc.

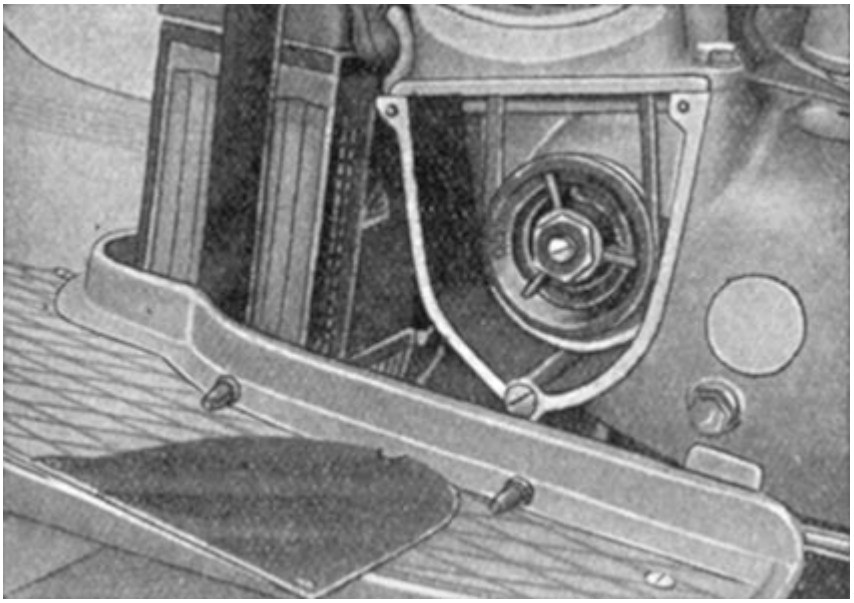


Image 15. Belt drive

d) Unscrew the three screws of the guide rim and remove the guide rim. On the extenstion of the guide rim you you have the flywheel and the drivebelt disc. Now you can install the new drive belt. (A reserve belt is in the toolbox).

e) Repeat steps a) through d) in reverse order.

2.17 Electrical System

The electrical system consists of the following:

a) alternator 6V, 60W
b) Led-battery 6V, 8Ah (K20)
c) Ignition coil
d) Cntroller switch
e) Ignition and lightswitch
f) Circuit breaker and condenser (mounted on the holding cap of the alternator)
g) Sparkplug (in Cylinder head)
h) Headlight (Hi beam, low beam and parking light)
i) Charging control lamp (red, on the lefthandside of the controlpanel)
j) Neutral gear control lamp (green, on the lefthandside of the controlpanel)
k) Control lamp for Supercharger (orange, on the righthandside of the controlpanel)
l) Signal horn
m) Brake-, tail- and licenseplate lamp
n) Wiring harness
o) Control lamp (unused. Can be used for Hi-beam display for instance)

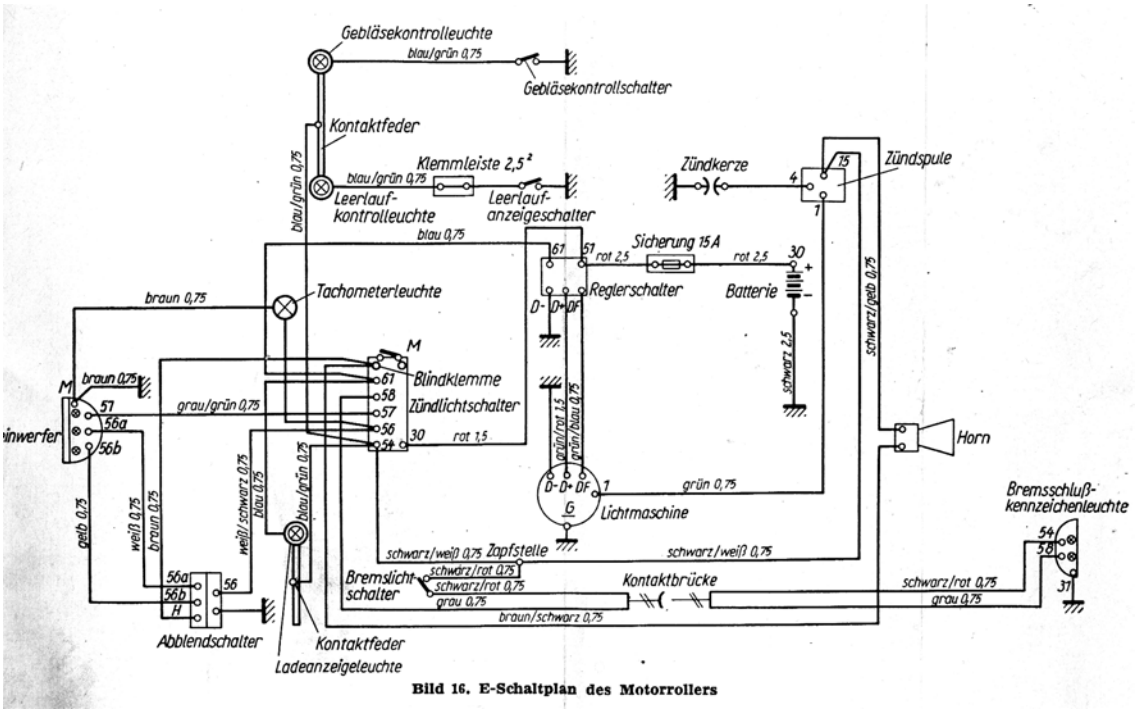


Bild 16. E-Schaltplan des Motorrollers

Image 16. Wiring diagram

Suggestion: A more detailed and colored version of the wiring diagram can be downloaded from our website at
www.scooterstation.com

2.171 alternator

The genereator generates the electricity necessary for ignition, lights and signal horn. Also the alternator charges the battery through a controller switch.

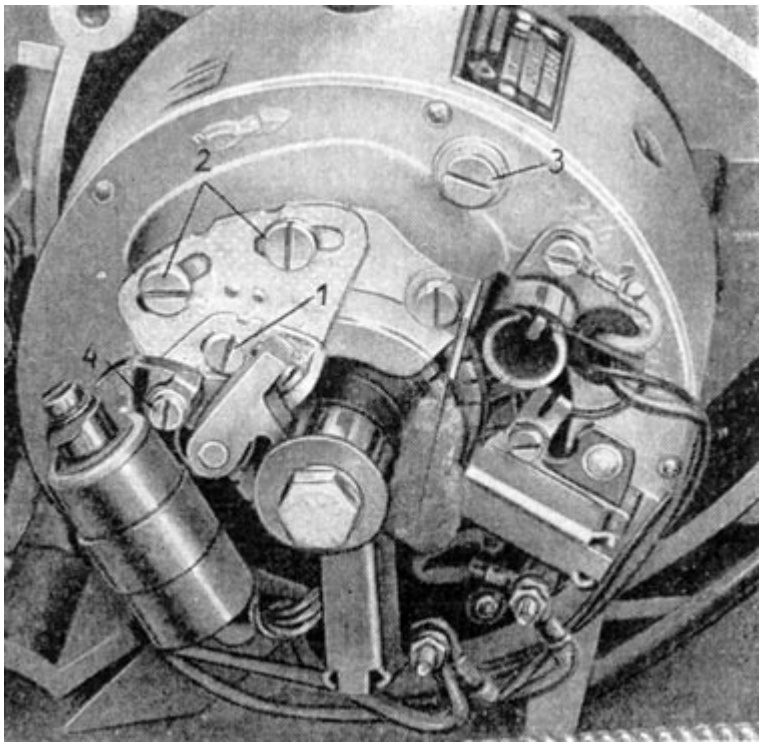


Image 17. alternator

The battery functions as a direct current shunt link alternator. The alternator is made from two main parts. The anchor and the holding cap.

The controller switch is installed on the blowerhousing and keeps the alternators voltage steady, regardless of the number of revolutions the engine is doing or how many of the lights are currently turned on.
Also the controller switch automatically switches the battery off, when reaching a high enough number of revolutions as well as switching battery support on when the revolutions fall under a certain amount. When the red controll lamp on the controlpanel expires, the battery is being charged by the alternator. When the red control lamp is on, it shows that the battery is currently feeding the electrical system.
The anchor that carries the commutator, sits directly on the cone of the right crank pivot. It gets screwed together with the circuit breaker cam using a long hexagonal nut. The holding cap contains the pole housing with poles and field coils on the inside. The front face carries the circuit breaker and the condenser as well as the brushes that are forced onto the commutator by springs and supply the current. A three wired cable connects the alternator with the regulator-aggregate and the circuit breaker with the ignition coil. The aeration of the of the alternator housing, wich is enclosed by a housing lid, is achieved by a sufficiently large breakout in the partition wall of the housing. The housing lid itself carries a little detachable plate, which if taken off the housing lid, enables easy monitoring of brushes, condenser and commutator.

2.171.1 Monitoring the electrical system

During regular operation the electrical system doesn´t need any extra attention. However it is necessary to have the electrical system inspected and serviced by special personnell (IKA dealers workshop) every 6.000 miles. Merely the breaker points should be inspected for abrasion every 1.000 miles.

When the cam is in it´s highest position, the contact gap should be 0,4mm. Less or more gap will result in bad starting behaviour, unsteady running, less performance and higher gas consumption of the engine. Adjustment of the points is done with detached circuit breaker cover (see image 18) and loosened clamping screw (C), by pivoting the smaller statorplate around the bolt (D). The pan head screws (A and B) are not to be loosened during this procedure.
The clamping screws (C) and (B) are to be tightened again after adjustment. If the breaker points have burned spots, they are to be smoothed out using a contact file. More vigorous signs of conflagration on the points indicate a defecticve condensor. The advice of a professional electric technician is now essential to have the defective part replaced.

2.171.2 Electrical tuneup (every 6000 miles)

The regular 6000mile inspection of the electrical system consists of a check up on proper positioning and insulation of the wiring and faultless seating of all clamping screws and connectors. All contacts are checked for cleanness and are polished if needed. (This covers ignition coil contacts, ground contact of the battery, regulator contacts, alternator contacts, tail- and stoplight connecting contacts in the front of the rear housing and on the frame).

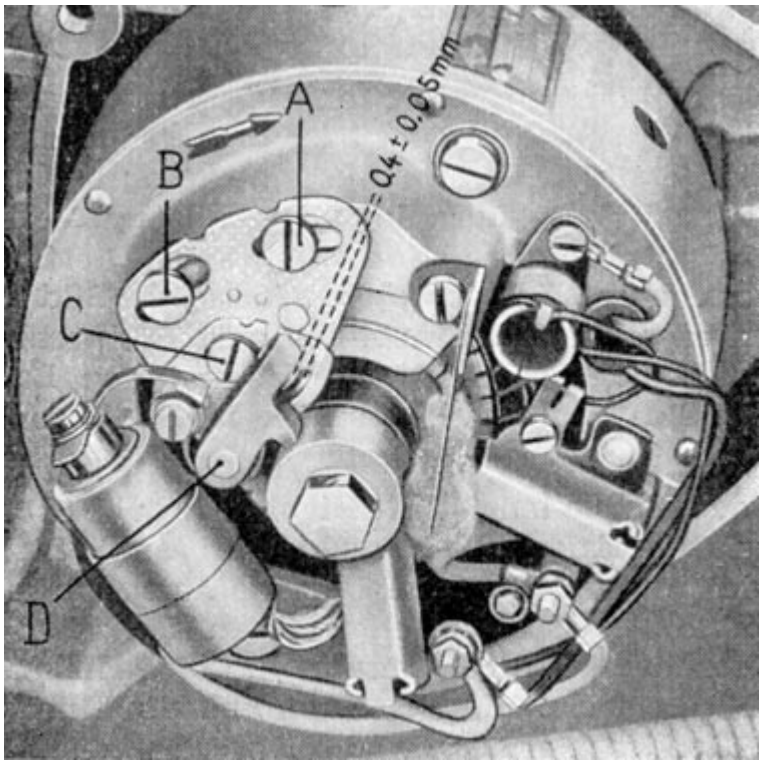


Image 18, Statorplate

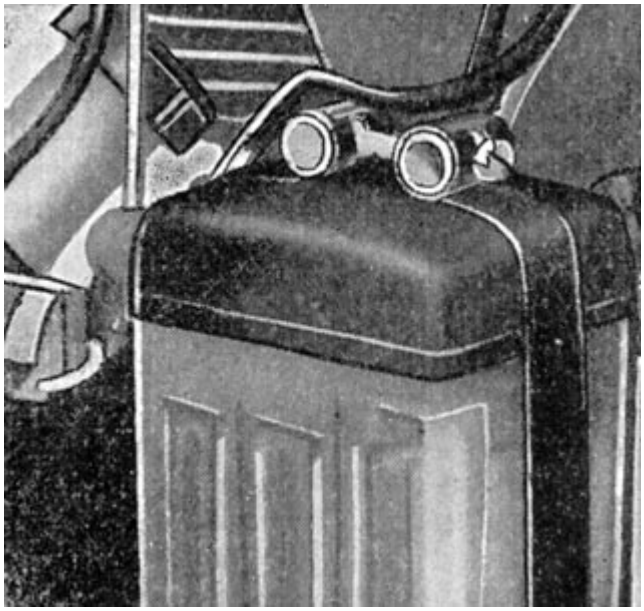
The condition of the commutator and the carbon as well as the tension of the carbon springs will be inspected. The positive (+) carbon´s wear is heavier compared to the negative carbon (-). The lowest height of the carbon may not exceed 11mm. After reaching this height, the carbon should be

replaced. Grind in a new carbon should be done by a professional mechanic. Letting the carbons wear out too much, will braze out the coil connectors in the commutator. The generotr´s correct power emission will be tested using high precision equipment. Also, the

condition of the circuit breaker (spring tension, lever bedding, breaker cam) will be inspected. The grease cloth for the breaker cam should receive 2-3 drops of oil every 1000miles.
Further more, given the opportunity, the ignition timing will be adjusted, because it changes itself in operation due to wear of the points. The correct position should be 4mm before TDC (Top Dead Center of the piston).
This timing value has been identified as optimal during the extensive test phase and should not be changed, because only this setting will ensure best performance and best gas mileage.

2.172 Battery

It is the battery´s task to supply any operational electrical equipment with energy, while the engine is turned off. When the engine is running, it is being charged by the alternator. The amount of charge adjusts itself depending on the battery´s energy level.



Picture 19, Battery

The Lead-battery has a maximum capacity of 8Ah (Ampere hours), assumed that the battery is discharged at a rate of 20 hours with 5% of the nominal capacity, equaling 0,4 A.

With the outside temperature falling, the capacity of the battery secedes rapidly. This is why you should always pay attention to the actual charging state of the battery especially in winter. Where a battery on low charge freezes at about -15 degrees celsius (5 degrees farenheit) and possibly breaks the battery case, there is no need to worry about freezing battery acid in a well charged battery.

2.172.1 Battery maintenance

The battery is very important for the proper functionality of of the ignition and the lighting system. The operative condition of your motor scooter and it´s engine is highly depending upon the condition of the battery. Due to that fact it requiresregular attention.
In it´s first two weeks of operation, it should be recharged at an external battery charger twice, because a new battery reaches it´s maximum capacity by and by. When in permanent operation, it

is usually not necessary to recharge the battery at an external battery charger. It is however, necessary to recheck the battery´s acid level every two months (or every 1200 miles) and, if necessary refill the evaporated battery fluid with distilled water untill the plates in each cell are sunk about a half an inch under fluid level. The battery contacts are to be kept clean, checked for good contact and afterwards lubricated with Vaseline. About twice a year or once every 3000 miles – one should have the acid concentration checked and possibly supplemented by a battery shop or a local IKA-electric service station.

2.172.2 Battery is not being charged sufficiently

a) Acid concentration incorrect (volume weight at full charge: 1.285)
b) Acid level too low (refill the evaporated battery fluid with distilled water untill the plates in each cell are sunk about a half an inch under fluid level.)
c) Plates are damaged
d) Supply lines are loose or oxidized
e) Short circuit in the wires, mechanical defect in the stator plate, dirty commutator,carbons disaligned, bad grounding of battery, regulator or statorplate.
f) Main cable between statorplate and regulator or ignition coil defective.
g) Regulator or reverse current switch defective.

Since we have often had to discover, that the battery was not installed correctly, we have to point out explicitly, that the stator and/or the regulator will break if the wrong connector is attached due to non-observance. (Positive pole points to the blower and is connected to the red cable, negative pole points to the exhaust and is connected with the black cable.)

2.173 Light and signal system

The headlight is equipped with a 35/35W Bilux lamp for hi and low beam and a 1.5W lamp for parking light. The lights can be switched on by turning the ignition switch on the left hand side of the instrument panel.
The switch on the left hand side of the handlebar is used to switch from hi beam to low beam. Since it is a combined switch, the signal horn is activated by pushing down that very same switch.
The signal horn can be found on the left side of the rear rocker and is maintenance free. The clarity of the horn sound can be adjusted by turning the screw located on the back of the horn.

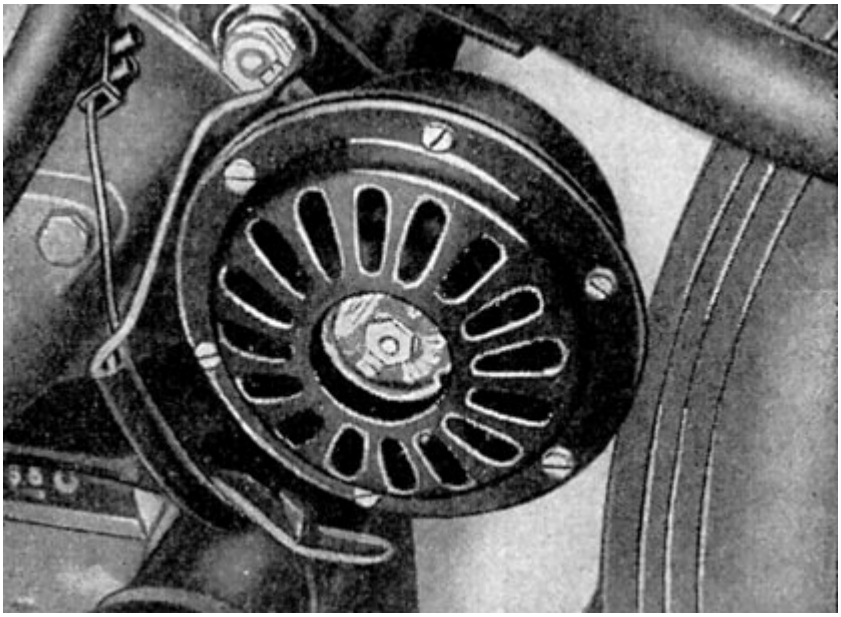


Image 20, signal horn

A purposeful and yet shapely developed cap contains the lamps for brake light, taillight and licenseplate light and is located at the rear end of the hood.

2.173.1 Signal horn failure

a) Defective horn
b) Broken contact (bad wire)
c) Defective signal switch
d) Battery empty

2.174 Voltage regulator

It is the regulators task, to keep the voltage on a constant level regardless of the engine speed or the amount of operative consumers. The voltage regulator also contains the reverse current switch.

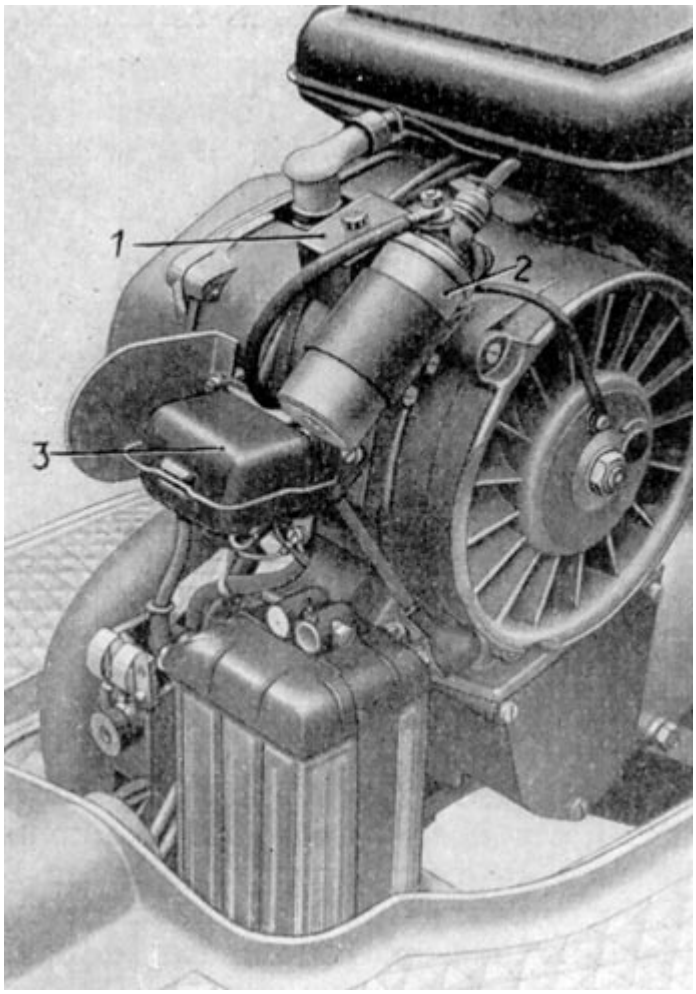


Image 21. voltage regulator and ignition coil

It switches the battery supply for the electric circuit off, when the engine produces enough power to maintain all the consumers and back on, when the number of revolutions are not sufficient to supply all needed power.

2.175 Ignition

The ignition consists of the ignition coil, which is connected to the flywheel housing, the ignition line, the spark plug and the circuit breaker with parallel switched condensor that are mounted on the geneartor´s holding cap. The breaker cam wich rotates along with the crank causes the breaker lever, that carries one of the circuit breaker contacts, to be raised against the pressure of the breaker spring and thus causes the primary current to be interrupted while the contacts are seperated. Just in this moment, the voltage that has been generated while the contacts were closed,

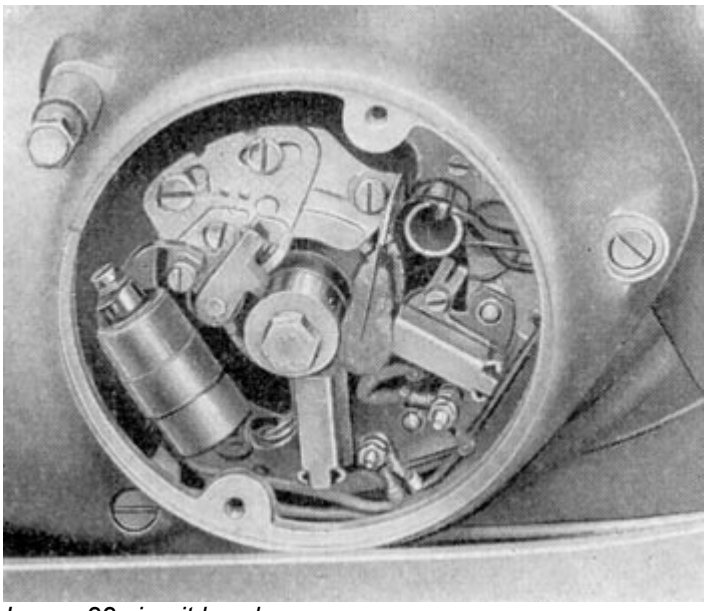


Image 22 circuit breaker

breaks down and inducts a high voltage of 10.000 to 15.000 volts. This high voltage flows through the high voltage cable directly to the spark plug.
To prevent any damaging spark from bridging the points, a condenser is switched parallel to the breaker points. To achieve the the right contact distance, which is at the highest point of the breaker cam (0.4mm) and to set the best ignition timing (4.0mm before TDC), the two-pieced stator plate is kept adjustable. A little lube-cloth, that is kept under spring tension keeps the cam´s slideway slightly greased and thus reduces wear of the breaker lever to a bare minimum.

2.18 Carburetor and filter

Processing and conditioning the right mixture of fuel and air for combustion is maintained by the BVF (Berliner Vergaser Fabrik, engl.: Berlin Carburetor Plant) 24 KN 1-1 Round slidegate valve carburetor.
The fuel level inside the floater housing is maintained on an optimal balanced level of about one to two mm under the discharge opening. This is achieved by the floater and the float needle valve. By actuating the dabber on the floater housing, the floater is being pushed down and thus keeps the float needle valve open. By doing this, the fuel floods at the needle valve opening and over enriches the air / fuel mix that is needed for starting a cold motor. The fuel travels from the floater housing through the main jet into the needle jet, who´s output opening can be adjusted as a result of it´s conical design. The needle jet is installed in the gate valve (Actually a round slidegate valve in this carburetor). It so has to follow the same movement as the slidegate, which is operated through the throttle control on the right hand side of the handlebar. By opening the slidegate, air and fuel are now equally and evenly distributed. Thereby always the correct combustible ratio of air and fuel,which is necessary for

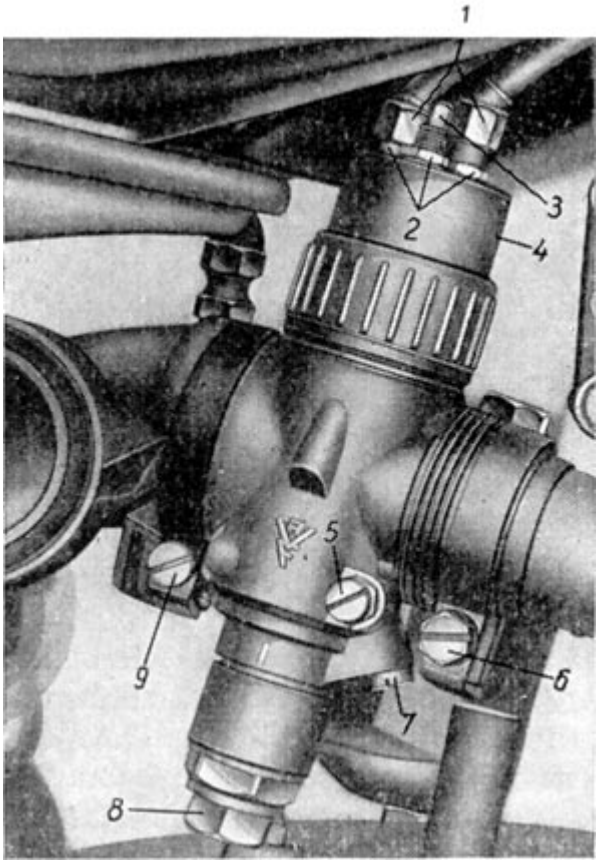


Image 23. Carburetor

(1)Cable adjusting screw
(2)Hexagonical screw
(3)Striker pin for idle adjustment
(4)Slidegate housing cap
(5)Idle regulation screw
(6)Hexagonical screw for retainer
(7)Idle jet
(8)Screw plug
(9)Hexagonical screw filter retainer

immaculate combustion, is getting distributed to the cylinder. The main jet also sets the maximum tolerance for the amount of fuel, while the needle jet controls the fuel output up to appx. ¾ of the slidegate opening. By manipulating the needle setting in the slidegate (notches in the needle jet), additional influence can be taken towards the fuel/air mix consistency within the scope of the jet needle (until appx. ¾ slidegate opening). If the needle is placed higher, the ratio will be richer and if the needle is placed lower, the ratio will be leaner.
Incase of having to start a cold engine, the carburetor has an air slidegate installed, that can be operated by using the air lever on the right hand side of the handlebar.
The fuel-air-ratio is set by an idle-fuel-jet (7) and an adjustable idle-air-jet that let fuel-air-foam pass through a bore to the outside. Adjusting the idle speed is done by adjusting the striker pin (3), which is located at the slidegate housing cap (4).

2.181 maintenance of the carburetor

The main jet can be cleaned without having to take the carburetor apart. All that needs to be removed for that purpose is the screw plug of the mixing chamber. The main jet sits in the needle jet. Loosen the clamping screw and turn the carburetor so, that the screw plug can be unsrewed from the mixing chamber. Now the main jet can be removed using a screwdriver. The jets are cleand by simply blowing through them or using a horses hair. Never use wire or needles for cleaning attempts, because it might damage or break the jets alltogether.
The carburetor should be dismounted and disassembled once every 1200 miles. In order to do this, the silencer needs to be removed along with the fuel line. Afterwards the cap of the mixing chamber needs to be unscrewed and taken off with the throttle cable and connected throttle slide gate. Next the carburetor´s clamping screw needs to be loosened and the carburetor pulled off from it´s socket. After loosening the two screws that are attached to the floater housing, the lid can then be taken off and the floater with needle removed.
To gain access to the needle jet and the main jet, the screw underneath the mixing chamber needs to be loosened, using a hexagonical wrench. The needle jet is screwed into the body of the mixing chamber and should, if possible, not be removed, because this might cause malfunctioning of the carburetor.
All parts are to be cleansed thoroughly with fuel and then checked for mechanical defects (wear). Wear and tear of things like loose parts of the carb, worn out floater needle or jet needle, defective floater, damaged gaskets, bent jet needle or a loose or inclined intake socket are responsible for poor function of the carburetor. Because one or the other of the above mentioned faults might occur during regular operation of the scooter, it is advisory to have the carburetor thoroughly checked by a dealer´s workshop every once in a while.
When assebling the carburetor, it is to be seen, that all the parts are tightened well, that no gaskets are being damaged and that the needle jet isn´t being bent during installation. The standard setting of the carburetor must not be changed under any circumstances, because the factory setting is already optimal regarding gas consumption and performance. Before mounting however, one must not forget that is is essential to lube the clutch spindle. (Nr. 9 of the lubechart, illustrations 59 and 60).
Adjusting idle speed is done by adjusting the idle airflow screw after first cleansing the idle fuel jet. Unscewing the idle airflow screw in a counterclockwise rotation, leads to more air (a leaner ratio) and screwing it in results in more fuel being provided, and thus a thicker ratio. Normally, the air/fuel ratio is correct, when the idle airflow

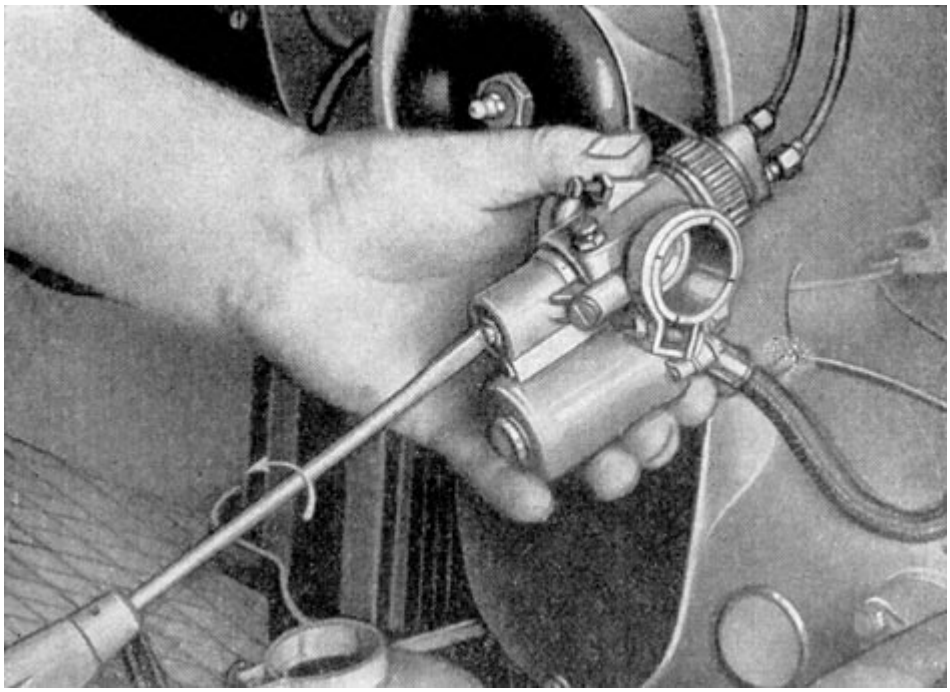


Illustration 24, Removal of main jet

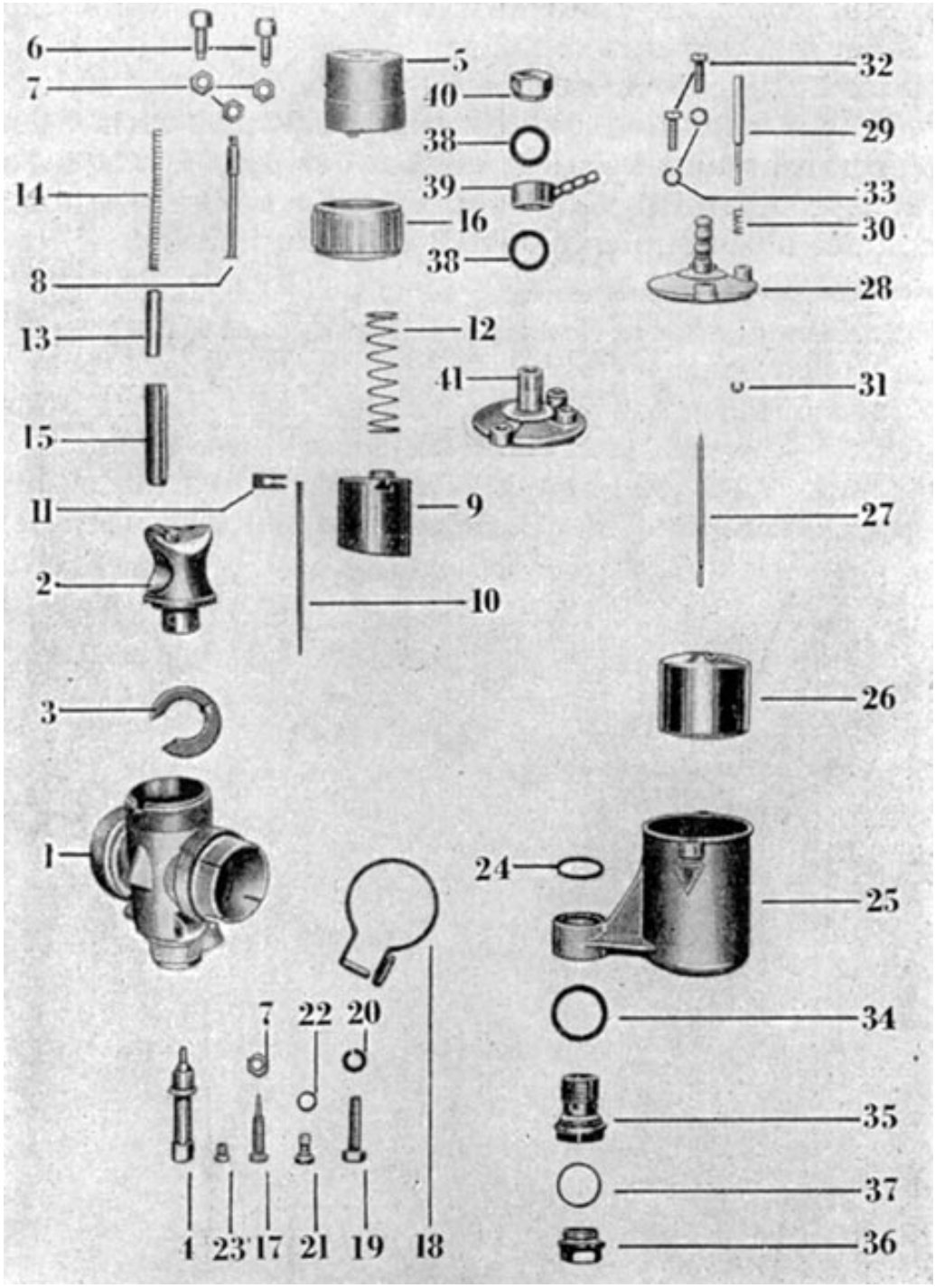


Illustration 25, Explosion diagram of carburetor

Parts list for carburetor type 24KN1-1

(1) Carburetor housing, pre assembled

(2) Thrust piece

(3) Seal for thrust piece

(4) Needle jet

(5) Slidegate housing cap

(6) Cable adjustment screw

(7) Hexagonal nut
1x for regulator screw
2x for cable adjustment screw
1x for stop pin

(8) Stop pin

(9) Slide gate

(10) Needle

(11) Clamping yoke

(12) Pressure spring for slide gate

(13) Guide jacket

(14) Pressure spring for choke

(15) Air slide gate

(16) Screw joint

(17) Adjusting screw

(18) locking ring

(19) Hexagonal screw for locking ring

(20) Lock washer for hexagonal screw

(21) Idle jet

(22) Seal for idle jet

(23) Main jet

(24) Upper Gasket for floater housing

(25) Floater housing

(26) Floater

(27) Floater needle

(28) Floater housing cap

(29) Dabber

(30) Pressure spring for dabber

(31) Lock washer

(32) Cheese head screw for floater housing cap

(33) Spring ring for cylinder screw

(34) Lower gasket for floater housing

(35) Hollow screw

(36) Locking screw

(37) gasket

(38) gasket

(39) nipple

(40) Locking nut

screw is screwed out by about 2½ rotations. After adjusting, it´s position is to be secured with the counter nut.
The idle speed is adjusted through a stop screw which can be found on the housing cap. This screw is also secured with a counter nut. Screwing the stop screw in, reduces the intake opening that is left open, when the throttle is fully closed reulting in reduced idle speed. Acordingly, the idle speed is raised, by screweing the stop screw out.
To insure that only clean air gets into the carb, an intake silencer wet air filter is installed before the intake opening. The wet air filter´s baffle is coated with oil which causes fine dust particles to stick to the many little filter channels, resulting in throttleling the carburetor and thus reducing power output of the entire engine. This is why regular cleansing of the wet air filter is essential as well as re-coating the filter with motoroil, which is mandatory to achieve full effect.

2.182 Cleansing the airfilter

After having removed the three hexagonal nuts from the intake silencer, it´s lid can be removed. The rubber seating inside the lid (filter seating) holds the wet air filter. It can be pushed out easily without the use of any tools. Using benzine and a little help of an old clean paintbrush the airfilter is now to be cleansed thoroughly. (Attention: Never use benzine as fuel)
Afterwards the air filter is coated with a little motor oil. Leave enough time to let excess oil drip off. When done, press the air filter back into it´s seating and screw the lid back onto the intake silencer, after also having cleansed it. (The intake silencer is made from aluminum pressure die cast)

To clean the intake silencer, it must be removed from the rubber connection nozzle, which itself is clamped onto the carburetor socket and can only be removed, once the two tightning screws (wich carry the fastening angles) on the clutch housing are losened. The intake silencer can be ground off, although the screws are only losened and don´t need to be entirely unscrewed, because the fastening angles have trenches embedded.

While refitting the intake silencer, it must be carefully monitored, that the breather rubber of the alternator is properly embedded into the bottom part of the housing, otherwise the alternators ventilation is jeopardized.
When driving in snow, ice, sandy or very dusty areas, **the airfilter is to be cleansed more often.** A dirty air filter results in an irregular running engine, smothering exhaust, higher fuel consumption, and bad performance.
The engine must never be used without air filter, because the carburetor setting is precisely tuned to the throttleing effect of the air filter. Missing air filter results in a ratio, that is too lean and results in loss of performance. Also fine particles of dust and sand will get into the engine, corroding the contact surface of the cylinder and possibly breaking the engine´s bearings. With every airfilter cleansing (every 1250 miles) one shouldn´t forget to lube the clutch.

2.2 Power train

2.21 Primary transmission and clutch

The power train between engine and transmission is achieved by a chain which sitting on the chain pinion on the lefthand side of the crank extension on one side and on the sprocket wheel of the clutch barrel on the other.
Chain transmission and clutch are operated in a constant oil bath, because the clutch

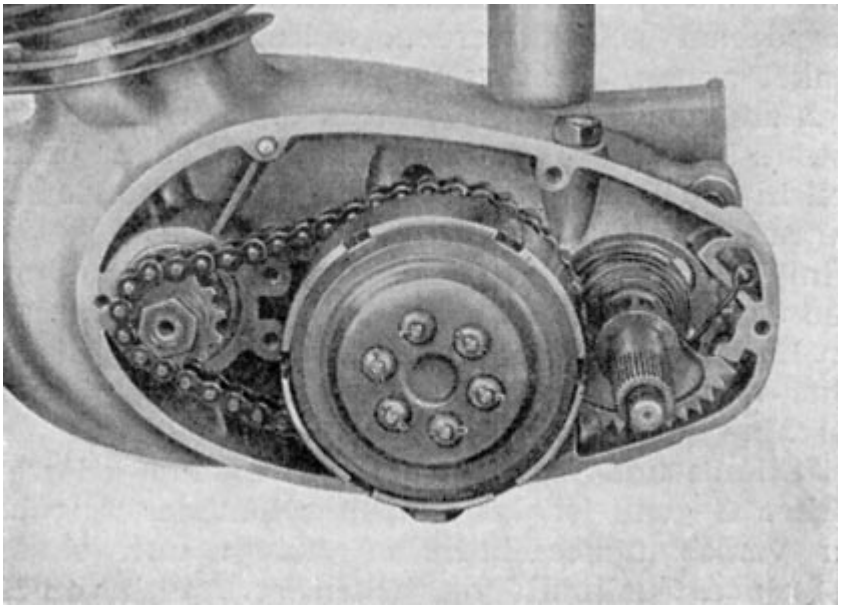


Image 26. Primary drive train

compartment is connected to the lube chamber of the of the transmission. Adjusting the primary chain is not necessary.
A designated pressure screw (3) , which is secured by a counter nut (2) is used for adjusting the clutch actuation. (See image 27).

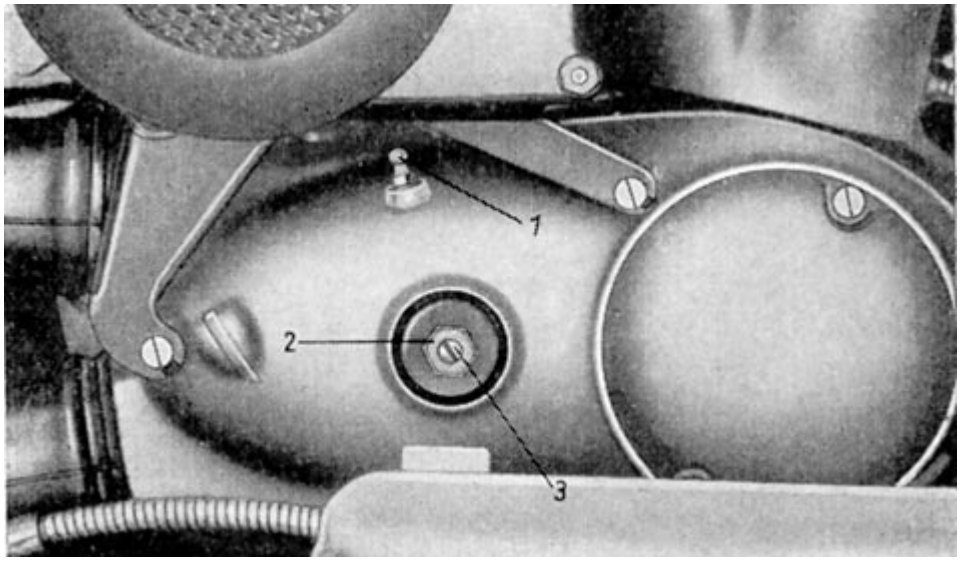


Image 27. Clutch adjustment

(1) grease nipple
(2) Counter nut
(3) Pressure screw

2.211 Adjusting the clutch

There always has to be a „dead gear“ of appx. 2-3mm near the clutch lever bowden cable seat.
If there happens to be too much play, the clutch can not be released entirely. If, on the other hand, there is too little play, the clutch springs will be too loose, causing in the clutch to slip and in extreme cases even to burn. The adjustment of the right play is done by turning the adjusting screw on the right hand side engine housing. Before adjusting, the counter nut has to be losened applying a 14mm wrench in a counterclockwise rotation. Then the play can be adjusted using a screwdriver. Clockwise rotation reduces the play, counterclockwise expands.

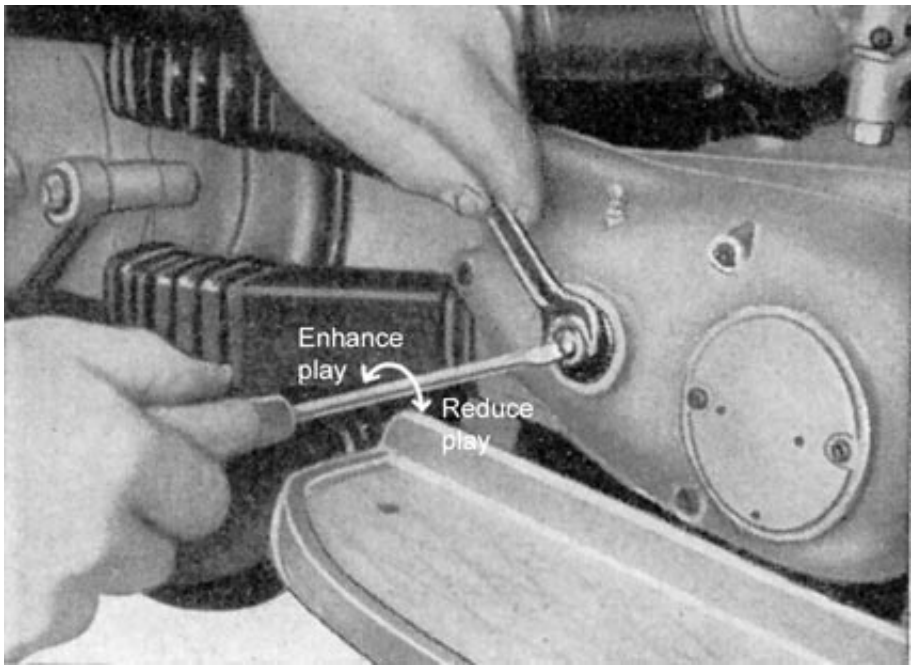


Image 28. Clutch adjustment.

After adjusting, the counter nut has to be tightened while the screwdriver holds the adjustment screw in place, to avoid it from turning along with the counter nut. However, since the introduction of the new adjustment option located at the clutch lever on the handlebar, clutch play can now be adjusted much easier making it more convenient too. (Also see handbreak adjustment)

2.22 Gearbox

The for pairs of cogwheels that are sitting on the main gearshaft (clutch shaft) and the layshaftare constantly engaged. All the gears as well as neutral (inbetween the 1st and 2nd gear)

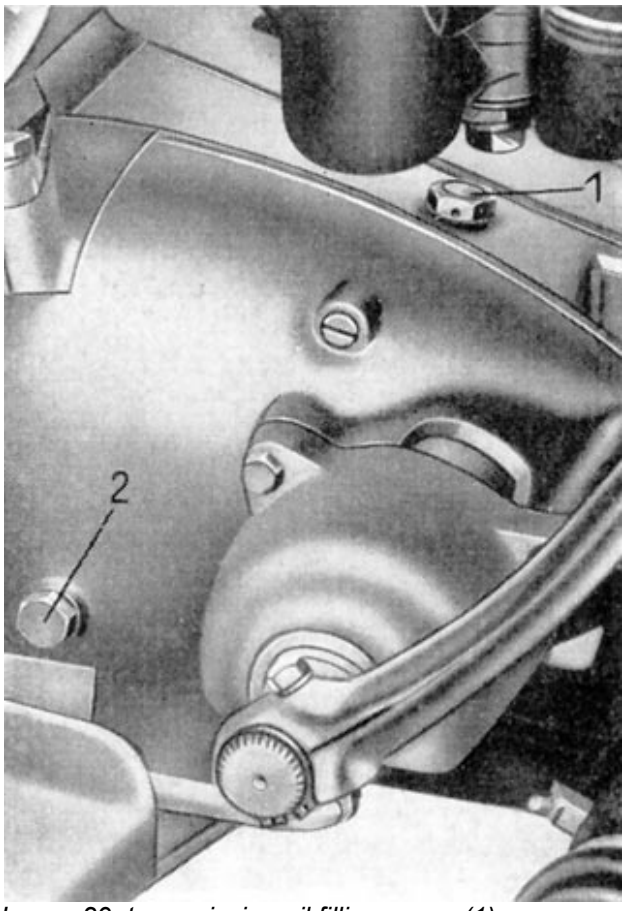


Image 29. transmission oil filling screw (1)
Level check screw (2)

are engaged through use of the hand controlled clutch.
The bearing of the main gearshaft is handled by ball bearings, and the layshaft´s bearing by bronze bushings. A shaft gasket is placed on the shaftwheel (cogwheel on the right hand side of the transmission, which´s hub is carrying the chain pinion gear on it´s outside.), to avoid oil leaks.
The switch for the neutral gear control lamp is installed on the wall of the gearbox housing next to the cogwheel. In neutral the contact is closed, so that the green control lamp on the instrument panel lights up. Lubrication of the gear box and the primary drive train is maintained by first opening the transmission oil filling screw and then filling the gearbox with transmission oil.
To check the filling level of the gear box oil, a level chaeck screw is installed. When unscrewed, oil starts to leak out of the opening, as soon as the oil level is correct.
The oil should be changed and flushed after the first 300 miles. After that chganging and flushing of oil should be done every 6000 miles. Use summer motoroil as lubricant for the gear box. (Total filling 450cm³)

2.23 Rear power train

The power train from the transmission to the rear wheel is achieved by a roller chain which is installed on the chain pinion gear at the gear box on one side and on the rear wheel´s sprocket wheel on the other. A specially designed full encapsulation is provided, to enhance the durability of these parts. The cycle of the roller chain from pinion gear to sprocket wheel is kept oil- and dustfree by a special hose shaped two piece rubber housing.

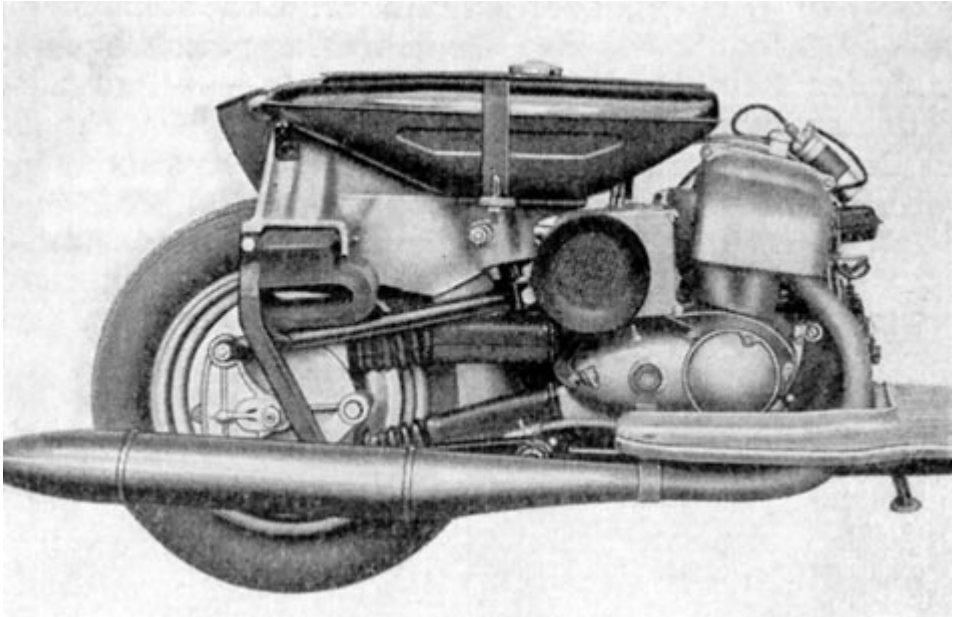


Image 30. Secondary drive train (transmission / rear wheel)

The tension of the roller chain and the rear wheel alignment is adjusted by commonly known chain tighteners that are attached to the rear fork.

2.231 Chain maintenance

The chain should be lubed once every 600 miles, using viscous motor oil which can be applied through the little drilling in the rear end of the chain housing, after the cap screw has been removed. For this task, the rear wheel should be rotated slowly.
However, a thorough cleansing of the roller chain especially of the inner joints, is necessary every 3000 miles. To do this, the chain is to be taken off and thoroughly washed in fuel. (chain links should be bent to extricate the the gunk from the joints). After washing the chain, it should be bathed in heated, fluid grease. The chain must be removed from the cooled off bath in time, so that a little excess grease clings to the chain, making it slide nicely within the rubber

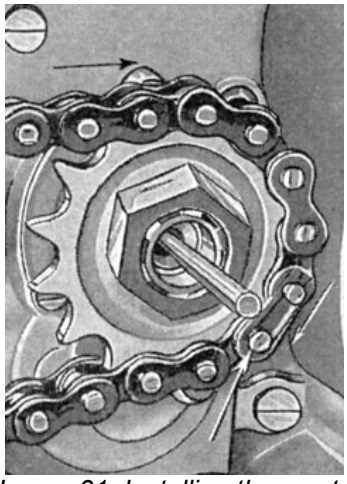


Image 31. Installing the master link

housing. After having removed the engine cover and the master link, it is advisable to leave the rubber housing on the chain to not complicate the refitting process. Rather, the entire chainbox should be removed and disassembled from the rear wheel hub, so that the chain can be refitted nicely and fed through the rubber housing. Make sure, that the rubber flaps, which are attached to the rubber housing are facing the vehicle.
When closing the chain, it is to be made sure, that the master link´s closed end is facing running direction.

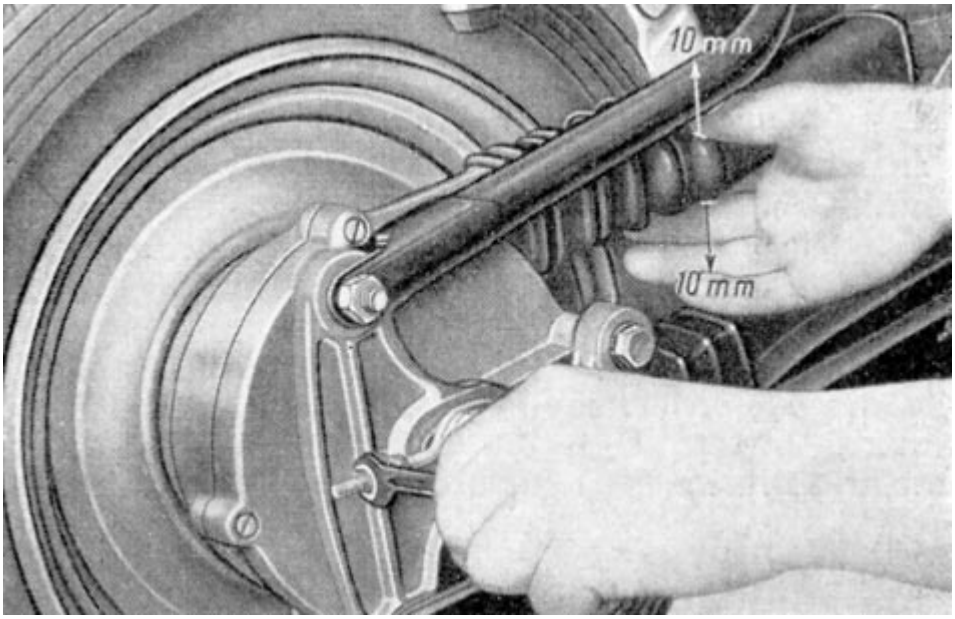


Image 32. Testing chain tension

The correct slack span is to be checked regularly. When measured in the middel of the chain, it should sag by appx. 20mm. That means, it should shuttle 10mm up and down. If the slack span should have more or less play than recommended, the chain, the rubber housing and the attached sprockets and bearings will wear out early. Also an unnecessary loss of performance is caused by improper slack span. Therefore it is recommended, to losen the axle nut and rod by two rotations.
Both of the front nuts of the chain adjuster are also losened by a few threads and threaded forward.
Now the two rear nuts of the chain adjuster are also to be threaded forward, until the slack span is right.

CAUTION: To prevent disalignment, the amount of threading must be equal on both nuts.

Subsequently the chain adjusters are arrested by the front nuts and the axle nut and rod are also to be tightened again.

It is extremely important to ensure exact wheel alignment, because not only does it assure good road holding and thus the driver´s safety, but also it determines the life span of the chain, wheel bearings and tires.

2.3 Chassis

2.31 Frame

the main part of the chassis consists of the central frame, that is made from electrowelded steel pipes.
The rear end of the frame bears the rear axle and the hood mounts for fuel tank- and rear hood. The engine is installed in the bracket and secured with **three threaded bolts**, nuts and locking plates keeping it in place.

2.32 Front wheel balance beam fork

An improved edition of the balance beam fork retains the front wheel and carries the suspension. Street impacts are conveyed through the swinging arm, the suspension pickups and the spiral springs, which are guided by sliding bushings in the fork pipes. Sleeves located between the sliding bushings and fork pipes seal the suspension mechanism against dust. The steering column is held by two ballbearings that are sitting in the steering shaft and can be adjusted by counter nuts. A steering clamp, that consists of two shells, that are kept toghether by clamping bolts

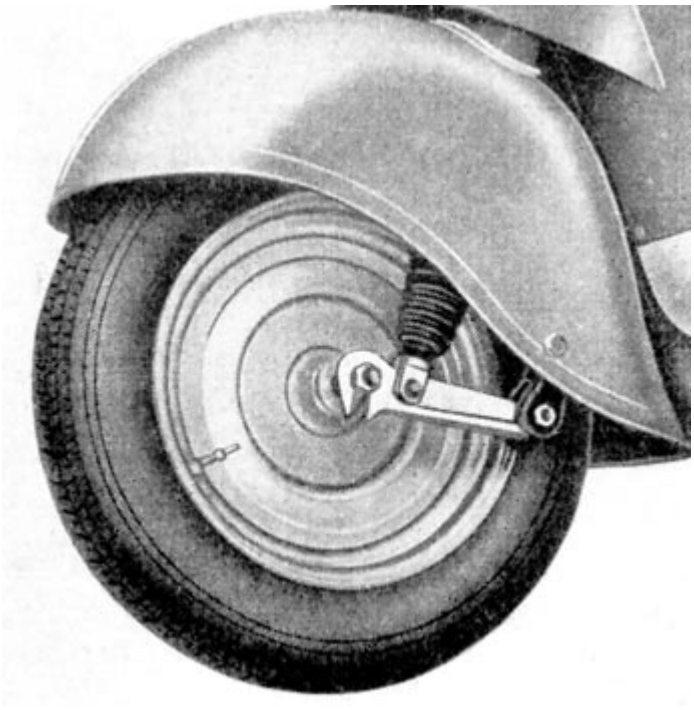


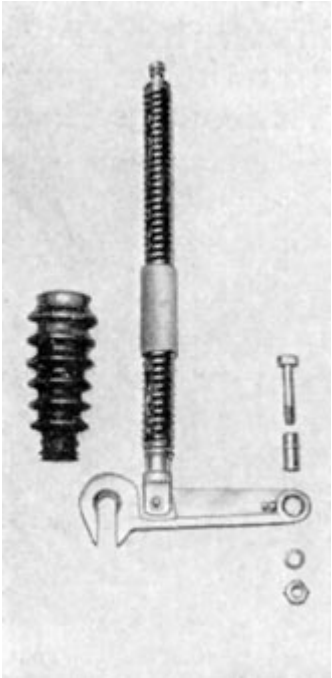
Image 33. Front wheel balance beam fork

that are secured against contortion, are the link between handlebar and steering column. The handlebar can be put into tha most convenient position for the driver, by simply loosening the upper clamping bolt.

2.321 Disassembling the balance beam fork

1. Remove speedometer spring and brake cable.

2. Remove axle nuts and take out front wheel.



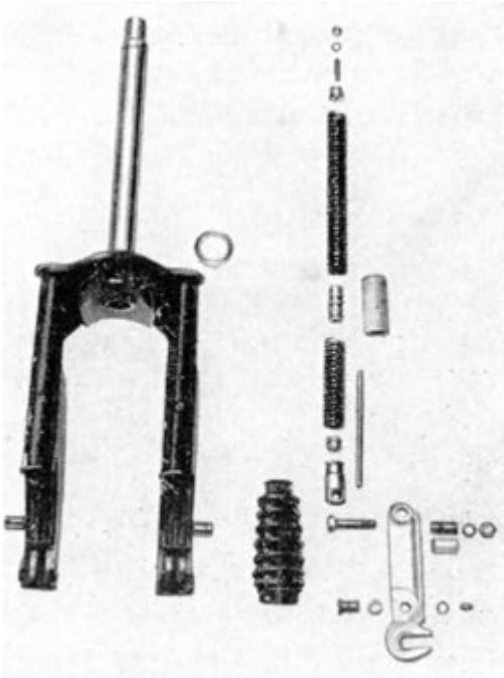


Image 34 and 35. Disassembled front suspenion

3. Loosen steering clamp and remove handlebar from steering column.

4. Remove sleeve from steering column and unscrew counter nuts.

5. Remove front fork including front fender from steering shaft.

6. The fender can be removed, by unscrewing the two fender screws on the sides of the fender.

7. Push sleeves out of fork pipes.

8. Unscrew both screws fom the fork bridge.

9. After having removed the swinging arm bolts, the entire suspension including swinging arm can be pulled out.

10. Swinging ar can be seperated from suspension pickup and connecting rod by first removing the connecting rod´s bolt.

2.322 Adjusting the Steering column bearings

1. Bend rubber sleeve (4) back and open counter nuts (1 & 3) with hook spanner.

2. Tighten lower nut (1) until the bearing has just enough room to maneuver without play.

   Test: The fork should fall from it´s center position to the left and the right as far as it will go without any interference.

3. Counter upper nut against lower nut. The locking plate (2) must be in place between the two nuts.

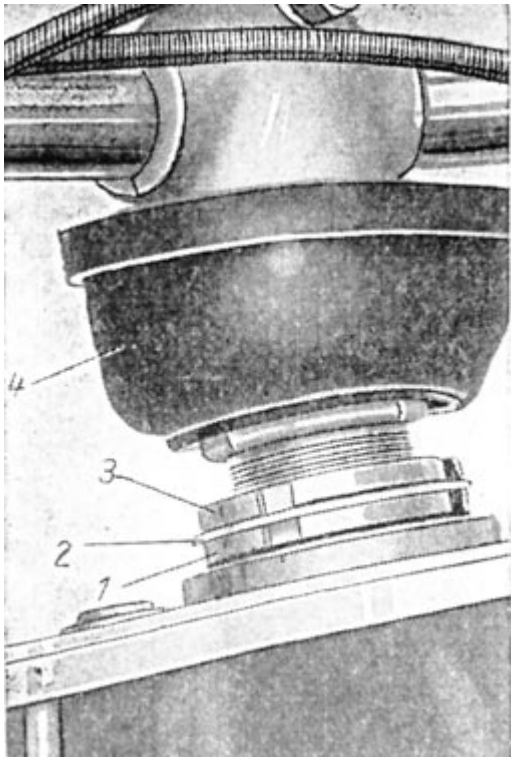


Image 36. Adjusting the steering columns

2.33 Rear wheel suspension

The rear wheel suspension is realized by a torsion spring, hydraulic shock and a trapezoid rocker. The stability of the trapezoid rocker system is achieved by a stabilizer which is installed just behind the torsion spring and is screwable into the swinging arm. The two pressure casted aluminum axle holders that are each connecting each sides upper and lower rocker also carry the axle bearings for the rear wheel. The axleholders are beared springy by rubber bushings and thus are maintenance free.Rubber buffers are installed on both sides of the hood brackets, to prevent the suspension from striking through.

2.331 Disassembling the rear wheel suspension

1. Remove rear wheel (see section 2.351)

2. Remove rear hub with chain drive (see section 2.341)

3. Remove axle retainer by unscrewing the rear swinging bolts

4. The upper swinging arms can be removed by removing the long hexagonal at the rubber bushing.

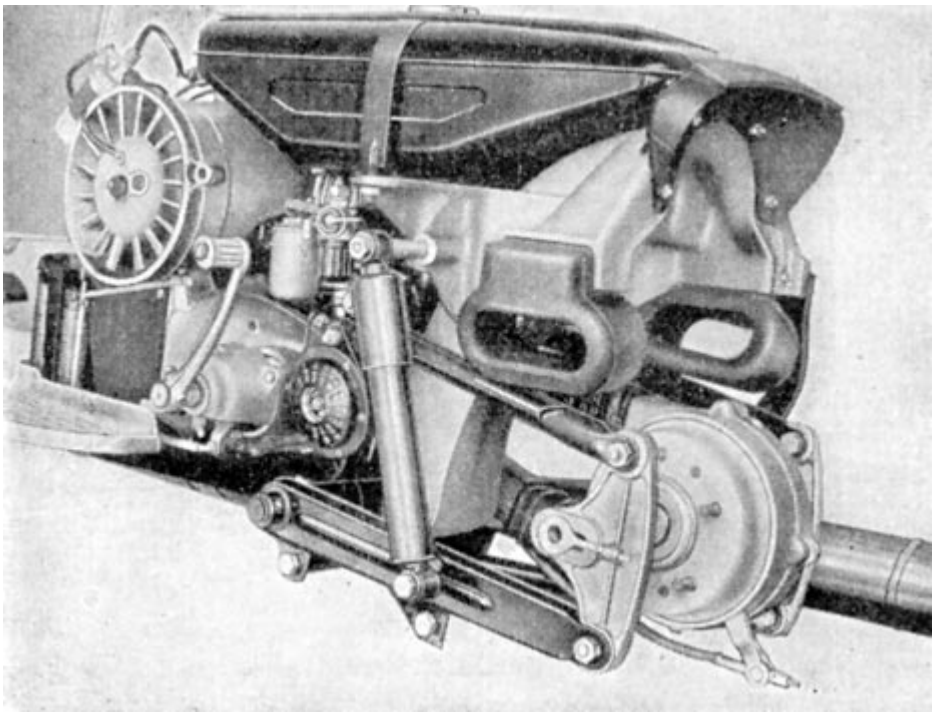


Image 37. Rear wheel rocker

5. Remove hydraulic shock.

6. Losen stabilizer by removing hexagonal nuts.

7. Remove lock rings from torsion spring

8. Using a hammer and a mandrel, the torsion spring can now be hammered out of its sprocket seat. Caution: This task needs to be performed with great care, to avoid damaging of the sprockets.

2.34 Brakes

Mechanical brakes are installed in the front and the rear wheels.

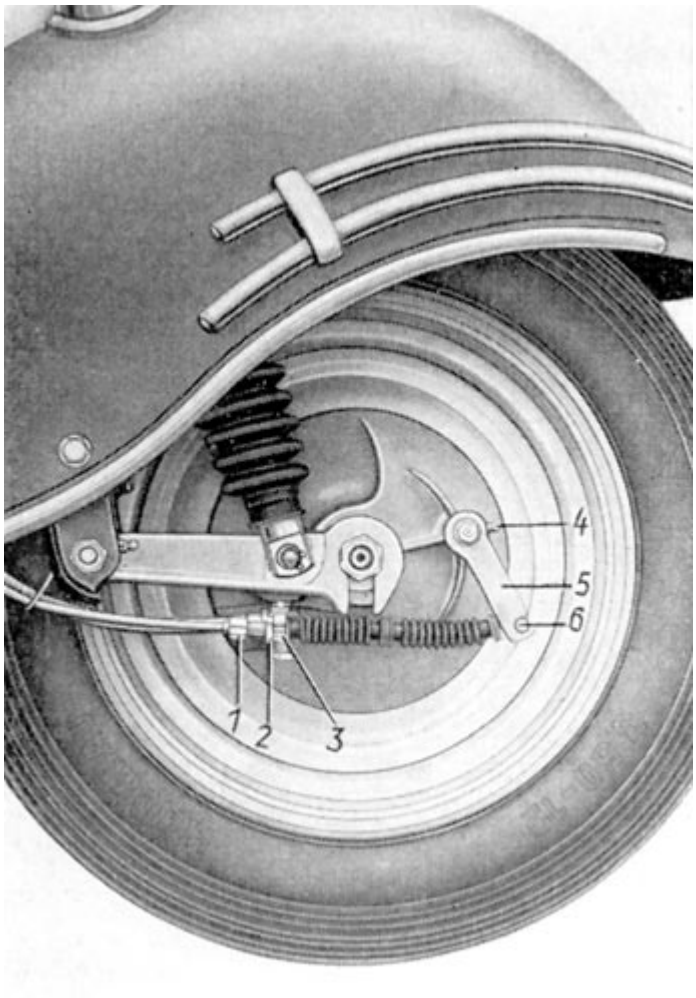


Image 38. Front brake

(1) Adjusting screw	*(4) Lubrication nipple*
(2) Counter nut	*(5) Brake lever*
(3) Break anchor cam	*(6) Brake cable nipple*

The front wheel can be adjusted, at the cable jacket on the handlebar or at the hub. The rear wheel brake is adjusted by turning a hexagonal nut, that is sitting on the thread at the end of the brake cable.
The bearings for the brake key shafts are equipped with lubricating elements to ensure smooth running of the brakes, by keeping the bearings constantly lubricated.

2.341 Brake maintenance

There are adjustment devices installed at the end of the rear brake cable and at the thrust bearing

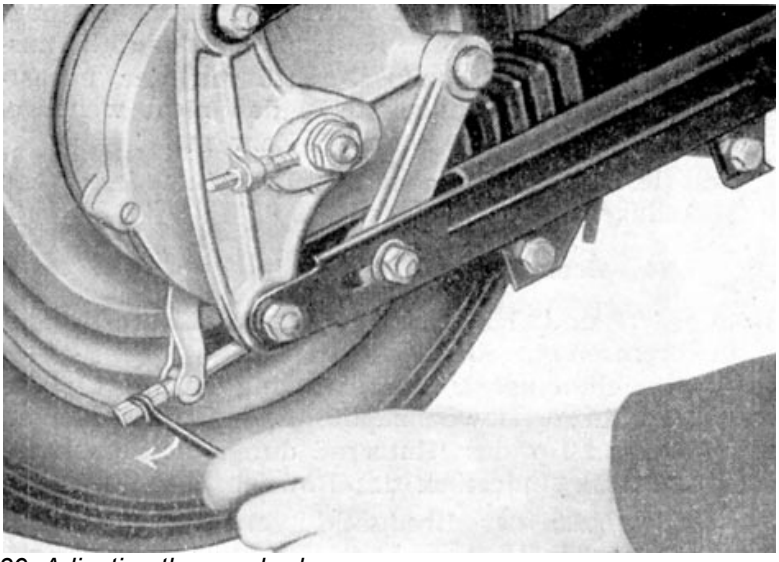


Image 39. Adjusting the rear brake

of the jacket of the front brake for the necessary adjustments that need to be done due to the wear of the brake shoes.
The rear brake is adjusted merely by clockwise rotation (½ rotation at a time until snap) of the adjustment nut.To adjust the front brake, first the hexagonal counter nut needs to be loosened counterclockwise. Then the adjustment nut also needs to be turned counterclockwise. Afterwards the counter nut needs to be tightened again. The same procedure should now be done at the brake lever.

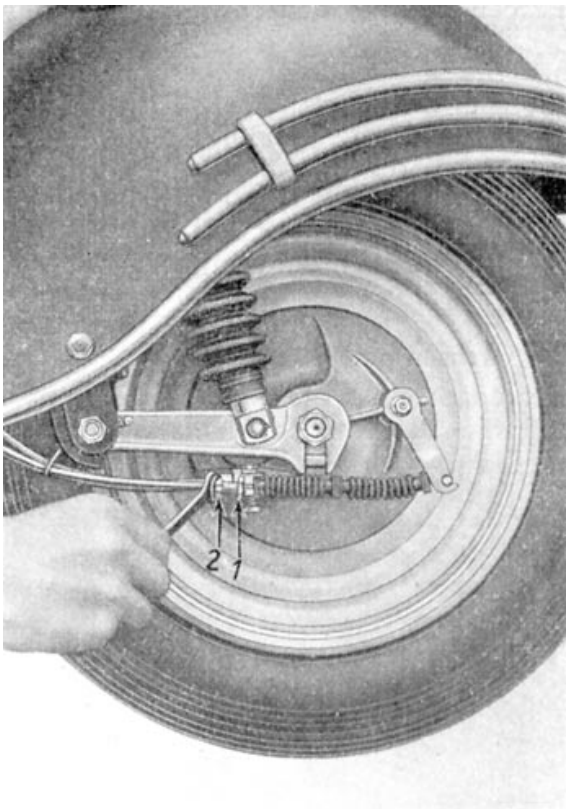


Image 40. Adjusting the front wheel brake

Do not over adjust. Make sure that the wheels turn without the brakes grinding after adjustment. Brake drums should be opened every 3000 miles, to clean the inner parts of the brakes. The armature plate with brake pads and straddle mechanism can be pulled out after first having removed the front wheel. This task is a little more difficult for the rear brake. After having taken out the rear wheel, rubber housings of the chain need to be removed from the cover plate and taken off. Then the master link of the chain is to be opened (Make sure to leave the chain in the rubber housings). After loosening the axle nut and the brake retainer screw, the entire rear wheel hub including chain and rubber housings can be removed. The three screws of the chain housing are taken out and the housing lid removed. The sprocket wheel is pulled out after the three nuts have been taken out. Afterwards the armature plate can be pulled out, revealing the brake mechanism. By removing the three countersinks, the brake drum can be removed.
All inner parts are to be thoroughly cleansed, the brake pads checked for wear and immaculate adhesive sealing as well as the right bevel on their ends. All pivot points and spring loops are to be lubricated **ever so slightly**.
Simultaneously the hub´s ball bearings are to be washed out in fuel and regreased afterwards.

2.35 Axles and wheels

The front axle is a regular axle with „drop out“ ends. The rear axle is a simple rod axle. The front and rear axles are equipped with two ball bearings each. The speedometer is actuated from the front hub through a helical gear and a shaft drive. The rims are designed as full disc

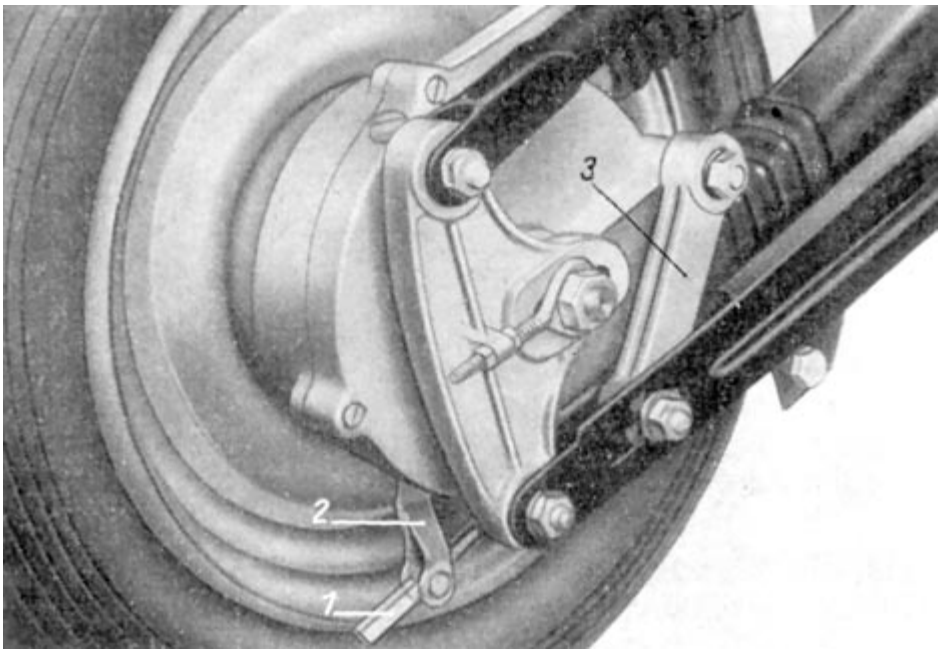


Image 41. rear wheel brake

wheels and are made from light alloy. The 2.50 Cx12“ drop base rims are mounted with 3.50-12“ tires. The five hole wheels are exchangeable from back to front, meaning that the rear wheel can also be used as front wheel and vice versa.

2.351 Flat tire

Removing the front wheel:

a) Tilt the scooter sideways and let it rest on the edge of the florboard.

b) Remove speedo cable and brake cable from the armature plate

c) Loosen axle nuts

d) Remove wheel

e) The wheel will be ready for tire installation, after having removed the five wheel nuts.

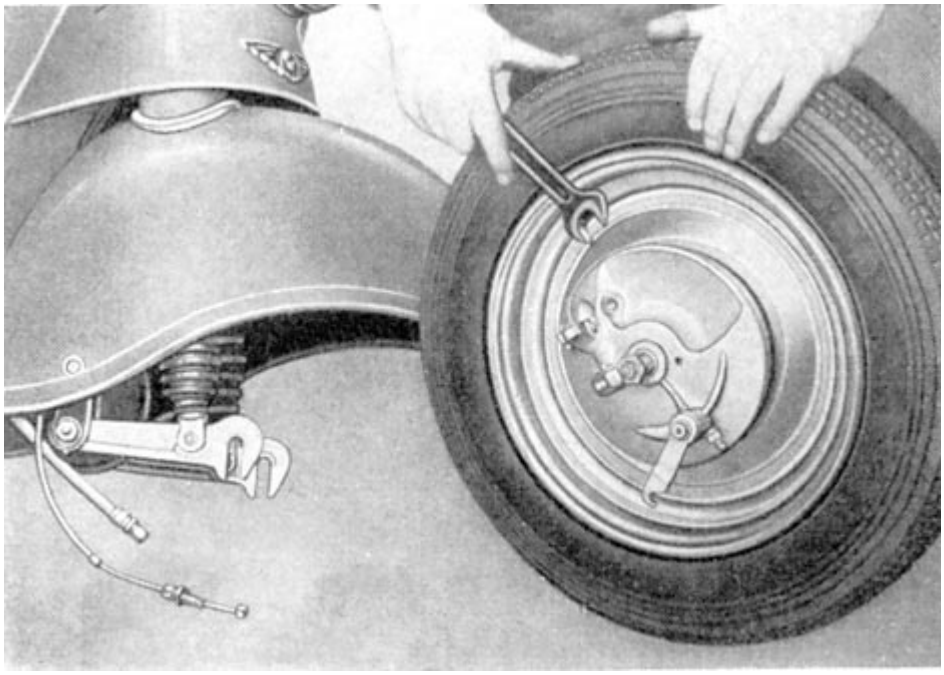


Image 42. Removing the front tire

Removing the rear wheel:

a) Remove hood. (Screw of knurled screw and the two nuts)

b) loosen wheel nuts and rod axle

c) Tilt the scooter sideways and let it rest on the edge of the florboard.

d) Unscrew rod axle.

e) Remove bushing and unscrew wheel nuts

f) Remove rear wheel

Dismantling a tire

1. Remove valve from tire and let all the air out

2. Remove nut from valve seat

3. Lay wheel down flat on the ground

4. Using both feet, step on the tire on the opposite side of the valve, until the tire is pushed into the drop base of the rim.

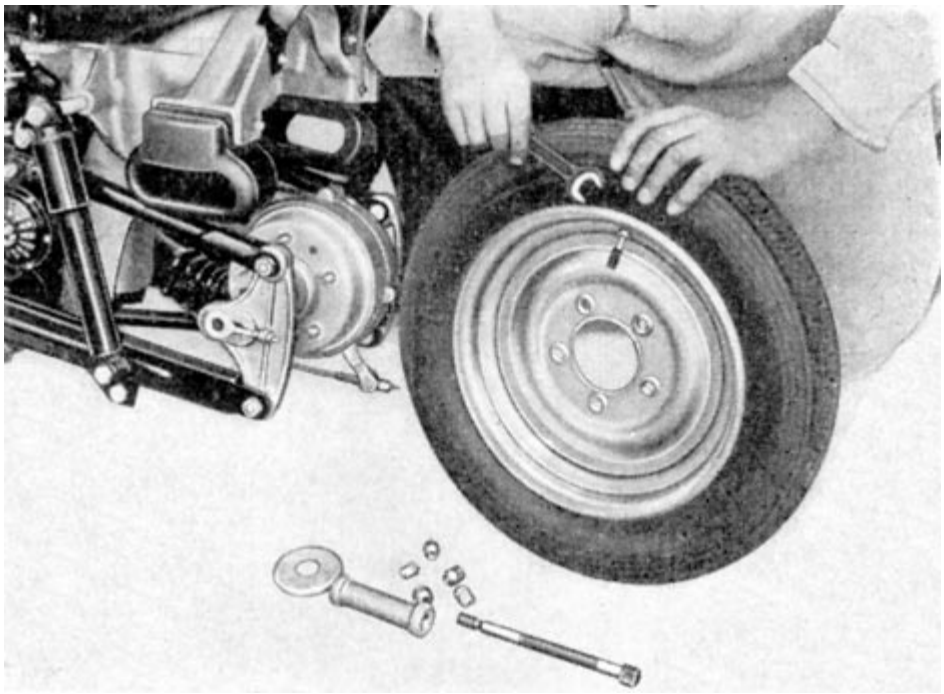


Image 43. Dismantling the rear wheel

5. Lift the tire over the edge of the rim where the valve is located, using the provided mounting levers (included in tool kit).

6. By moving the two mounting levers towards both sides, start lifting the rest of the tire over the rim. Never apply brute force or use an oversize mounting lever without making sure that the opposite side of the tire is completely pushed into the drop base. Otherwise, the cable inside the tire might burst, resulting in a broken tire.

7. Remove tube

Mounting a tire

1. Perform a thorough check of the tire, to insure that there is no glass or other objects driven into the tire. Also remove all dirt or sand from within the tire.

2. Disperse a little talc into the tire and spread by turning the tire.

3. Check canvas for proper positioning withing the rim.

4. Fill the rim with a little airand place it into the tire so that the valve seat can be pushed through the valve opening in the rim. Be careful to not twist the tube and make sure that the valve sits straight. Loosely fit the valve nut onto the valve, so that it won´t slip back into the rim throughout the mounting process.

5. Slip the tire over the rim´s edge on the opposite side of the valve. This can be done without tools for over half of the rims diameter.

6. The last piece of the tire is hoisted applying the mounting levers from the left and the right side of the valve, whilst using your feet to press the other side of the tire into the rim´s drop base.

   Caution !! Do not damage tube with mounting lever.

7. Inflate the tire a little and bounce the tire on the ground in a circular motion, until the tire´s checkmark has the same distance to the rim all around. (Wobbeling, bad road holding and high wear and tear of the tire will occur, if this procedure is not followed)

8. Now inflate tire to it´s correct pressure. (See section 1.04) Reinstalling the wheel into the scooter, is done in reverse order of removal instructions.

2.36 Tank

The tank has a capacity of appx. 3.1 us gallons, of which 1.32 quarts are accessible through

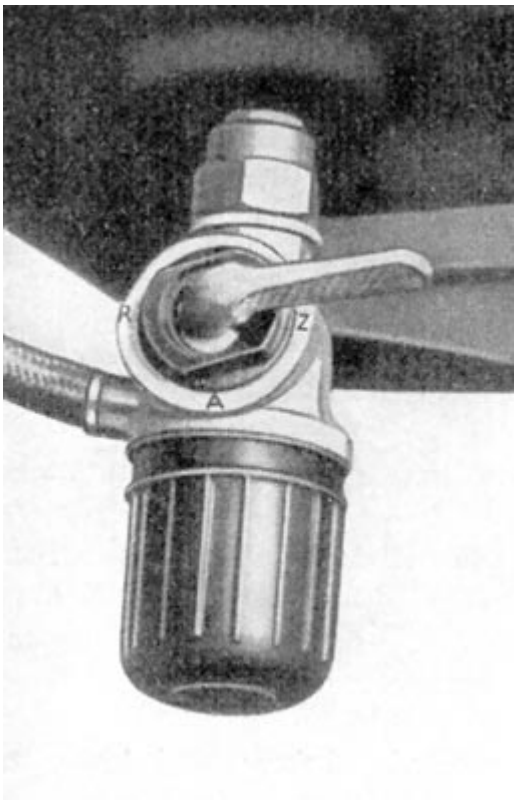


Image 44. Fuel tap

Fuel tap positions:
Z=closed
A=open
R=reserve

the fuel tap´s reserve setting. The fuel tank is installed on the hood mount and affixed with a tensioning belt. The fuel tap is installed on the left hand under side of the tank.

2.361 Cleansing the fuel filter

The fuel filter is part of the fuel tap.
The fuel filter filters dirt particles before they can get into the floater housing of the carburetor. To avoid reduced flow rate, the filter should be cleased regularly.
To cleanse the filter, it needs to be removed from the fuel tap by unscrewing it. After removing the screen from the filter housing, both parts are washed out in benzine. When reinstalling the filter into the fuel tap, insure that the filter housing seal is in place and undamaged.

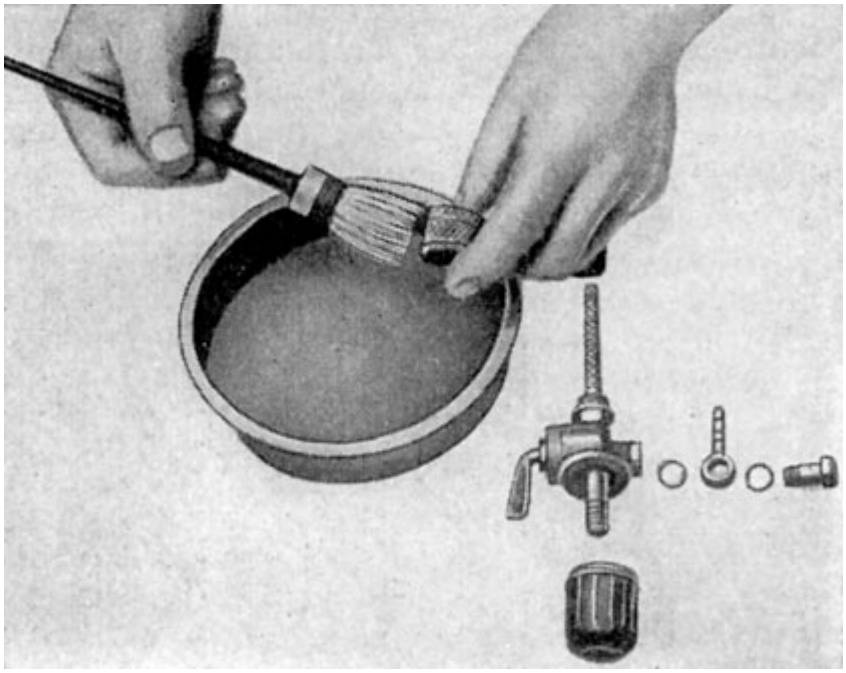


Image 45. Cleansing the fuel filter

2.37 Driver and buddyseat

The coil spring cage based driver- and buddyseat are mounted on a mutual base frame and are made from foam rubber.

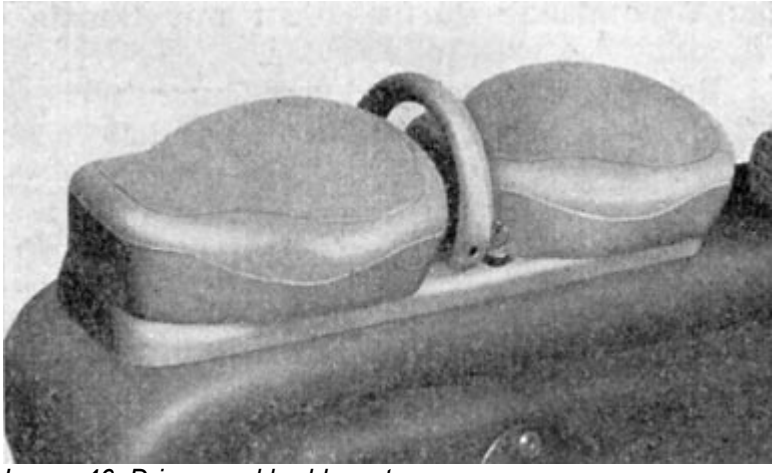


Image 46. Driver- and buddyseat

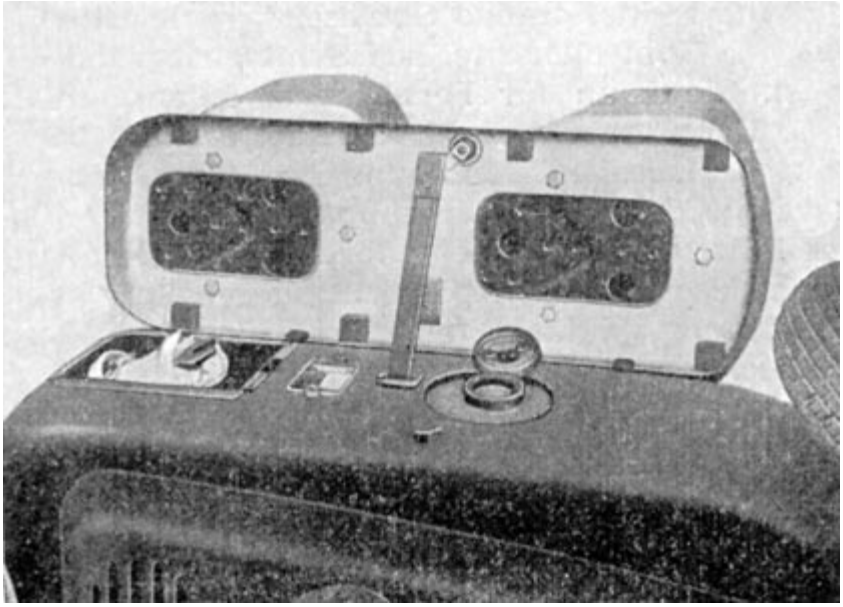


Image 47. Opened base frame

The base frame is opened sideways to refuel the scooter. The opened base frame also enables access to the tool kit, which after being removed, can be used to work on the spark plug that can be accessed easily by opneing the little round door in the hood. A security lock prevents unauthorized access to the toolbox.
Caution: Never clean seats with fuel, bezine or thinner.

2.38 Instrumentpanel and theft protection

The necessary pilot lights for the scooter as well as the electronic switches are mounted evidently on the instrument panel.
The following lights, switches and instruments are to be found on the instrument panel:
left hand side: red pilot light and green neutral indicator light. Right hand side: orange supercharger pilot light and a blind light which is mounted for the purpose of symmetry. It could be connected to serve as a hi beam indicator for example. The speedometer is mounted on the right hand side of the instrument panel, ignition and lightswitch on the left.
The theft protection is mounted in the center of the instrument panel and equipped with a cover plate to protect it from water.
Operating the instrument panel:

1. Open cover plate

2. Insert key (also fits for opening base frame) and turn right

3. Turn handlebar to the left until the locking pin engages noticeably

4. Once the locking pin is engaged, the key can be turned by 180º and pulled out. Now the scooter´s handlebar is arrested.

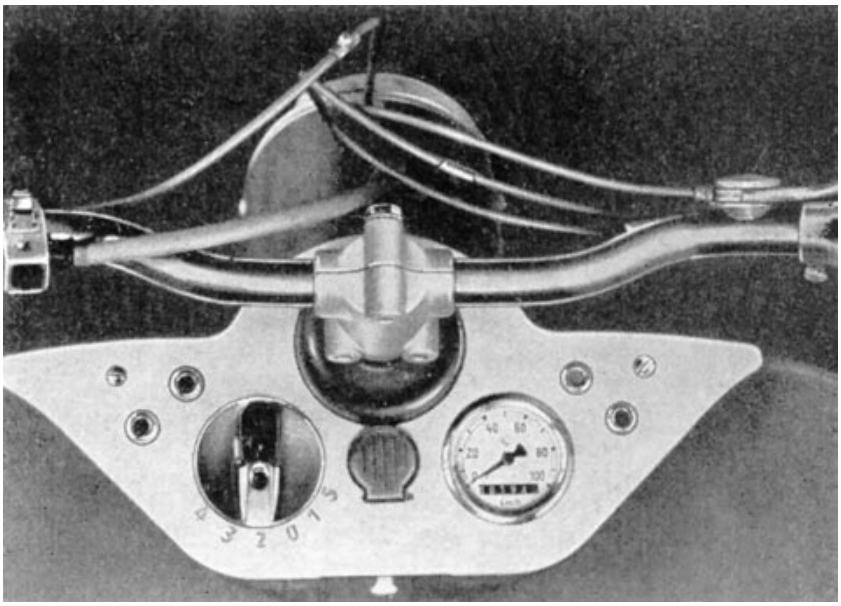


Image 48. Instrumentpanel

2.39 Tools

For the necessary maintenance work and little repairs incase of breakdown, which can possibly surprise any motorcyclist once, a complete set of emergency tools is provided in the toolbox under the base frame of the seats. This tool kit consists of the following:

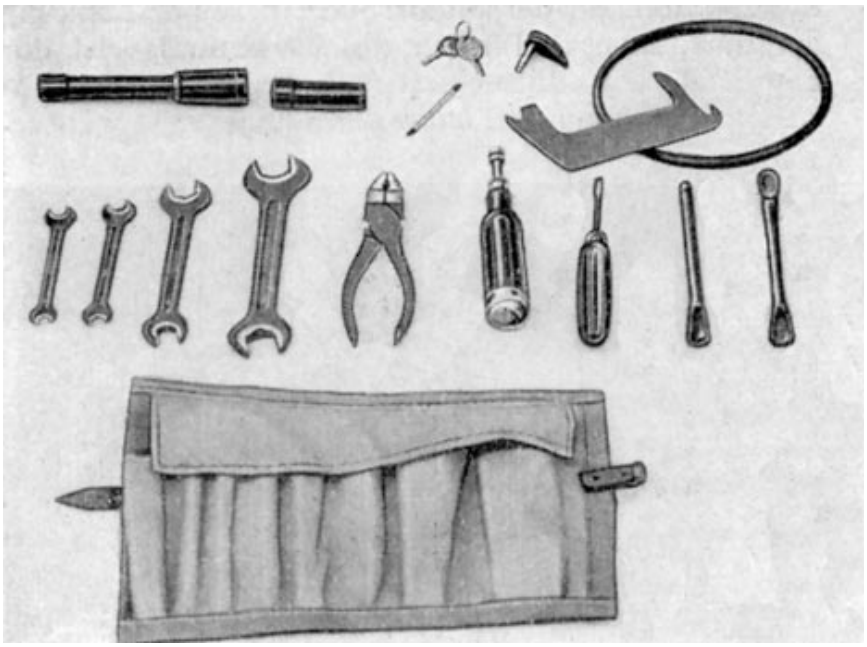


Image 49. Tool kit

2 mounting levers
1 spark plug spanner
1 screwdriver
4 wrenches, sizes 8-10mm, 9-11mm, 14-17mm and 19-22mm
1 pair of universal pliers
1 grease gun
1 sensing gauge
1 extension for socket wrench (for tire exchange)
Also included in the toolkit is spare v-belt for the supercharger 8x5x475.

3 Operating instructions

3.1 Orientation and intention of the control elements

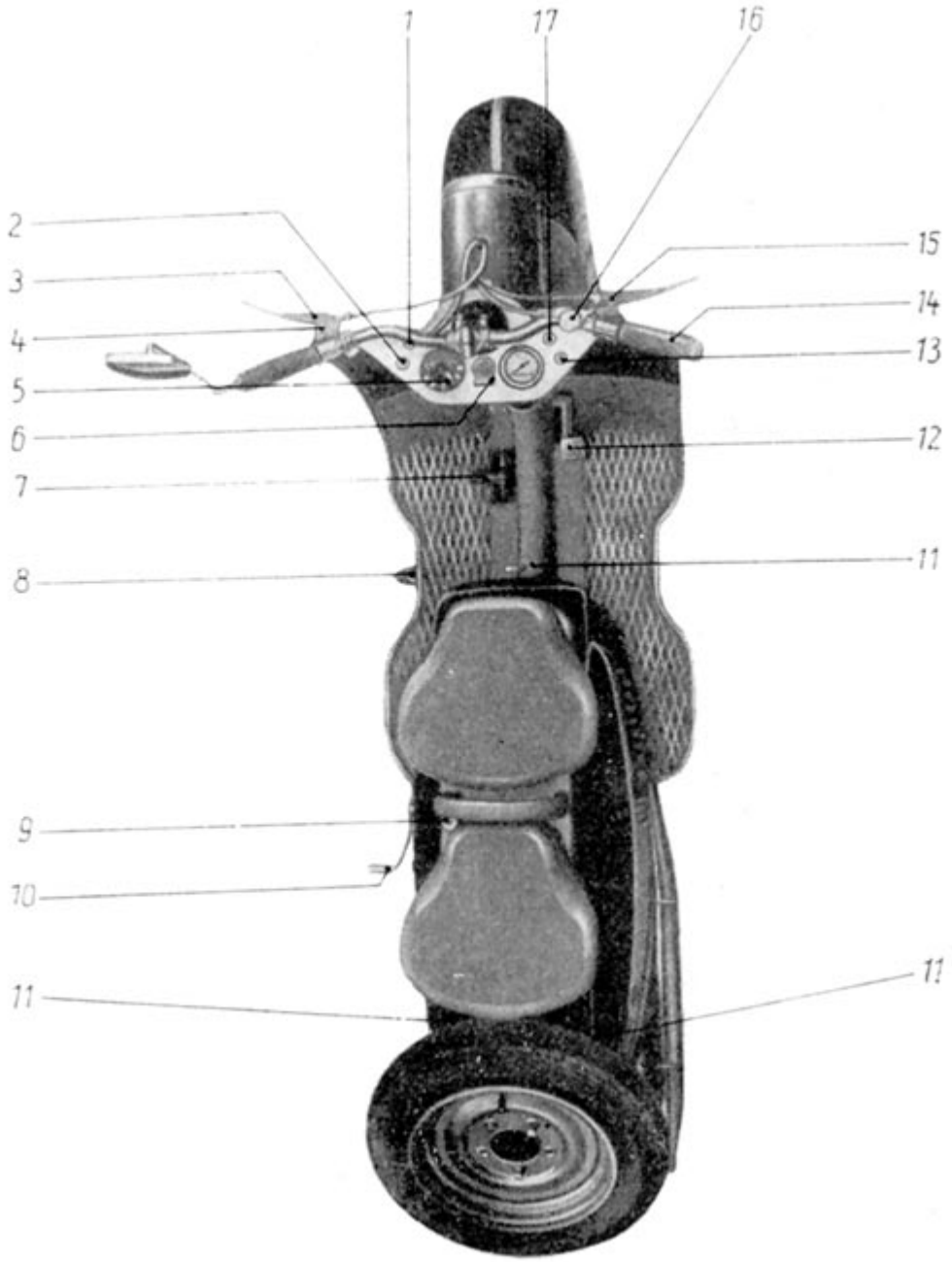


Image 50. Orientation of the control elements

(1) Neutral gear pilot light, (2) Charging status light, (3) Clutch lever, (4) low beam switch and signal switch, (5) Ignition and light switch, (6) Theft protection, (7) foot gear switch , (8) Sidestand, (9) Security lock, (10) Kickstart, (11) hood mount (12) foot brake lever (13) Supercharger pilot light (14) Throttle (15) Hand controlled brake (16) Choke lever (17) Blind pilot light

3.101 Choke lever

The choke lever is mounted on the handlebar and controls the air slide gate of the carburetor. If the lever is pushed forward (in driving direction), it closes the carburetor´s intake manifold partially resulting in a thicker ratio necessary for cold start.
After startup, the lever should slowly be pulled back to avoid unwanted oversaturation of the ratio. If the engine is still warm from previous use, the choked needn´t be closed (pushed forward) because it tends to stall the engine. Applying the dabber also stalls an already warm engine.

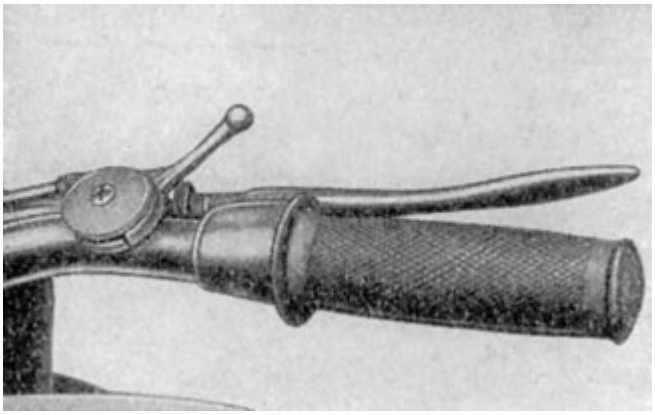


Image 51. Handlebar with choke

3.102 Throttle

The position of the carburetor´s round slidegate and thus the engines rpm´s are determined by the throttle control on the right hand side of the handle bar.

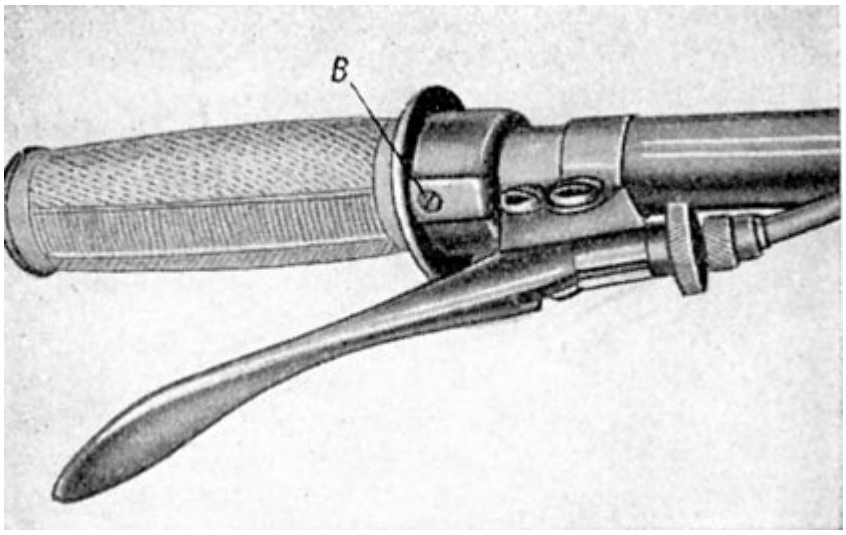


Image 52. Throttle setting
(B) Adjusting screw for stoppage in the handle

An adjustment screw labled „Bremse“ (engl. Brake) is installed in the turning handle and can be used to set the smooth running of the throttle according to the personal prefernce of the driver.

3.103 Ignition and lightswitch

The combined ignition and lightswitch unit is found on the left hand side of the instrument panel like already described in section 2.38. The ignition key can be pulled out in positions 0 and 1.

Relevance of the key settings:

Position 0: Ignition and lights switched off – key removable (Parking during daylight)

Position 1: Ignition switched off, parking lights (rear and front) on – key removable (Parking at night)

Position 2: Ignition switched on, light switched off, - key not removable (For kickstarting engine and driving during daylight)

Position 3: Ignition switched on, parking lights (rear and front) switched on – key not removable (For city driving at night with city lights)

Position 4: Ignition switched on, head light and taillight switched on – key not removable (For driving at night)

Position 5: Ignition switched on (however, no red pilot light), lights switched off – key not removable. (This is the setting for push starting the scooter in 1st or 2nd gear due to empty or missing battery)

When switching on the ignition, the red pilot light goes on (except when in position 5) to acknowledge contact between the ignition coil and the battery. When the engine is being accelerated, the red pilot light must go out. If the red pilot light does not go on when the ignition is switched on, or if the pilot light does not go out when accelerating, it means that the equipment is malfunctioning. An immediate search and repair of the error is necessary. (See section 4.32).

Also the green neutral gear pilot light on the left hand side of the instrument panel must light up when the ignition is switched on. If this is not the case, disengage gear and bring it into neutral using the foot gear switch before kickstarting the scooter. Neutral can be found inbetween 1st and 2nd gear.

When parking the scooter with parking lights on, leave the ignition on position 1. It is also advantageous to not have the headlight on, while kickstarting the scooter to avoid unnecessary weakening of the spark. Only turn the headlight on, when the scooter is running.

The horn is only active on ignition positions 2, 3, 4 and 5, to prevent unauthorized access when the scooter is parked.

3.104 Dipswitch (Low beam switch)

Th dipswitch on the left hand side of the handlebar is mounted for convenient access by the left hand´s thumb. It can be switched up and down to toggle between hi and low beam.

3.105 Clutch lever

The clutch lever is also found on the left hand side of the handlebar. When actuated (pulled in) the clutch separates the power train between motor and gear box. The clutch lever must always have a „dead gear“ of 2-3mm.

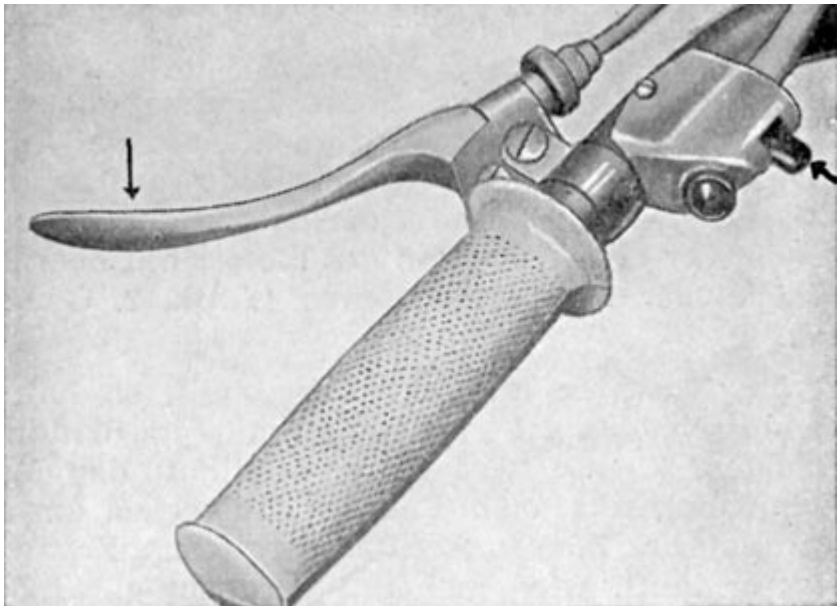


Image 54. dipswitch and clutch lever

By applying force to the lever with your hand, the transition from „dead gear“ to active gear can be felt. Adjusting the „dead gear“ is done by either a little little pressure screw that is located at the right hand side of the engine housing or the ring nut located at the clutch lever. (See section 2.211). The clutch lever must never be released at once, but instead gradually and efficiently, because otherwise engine and power train would be unecessarily strained. Also when starting up, the scooter would propably stall.

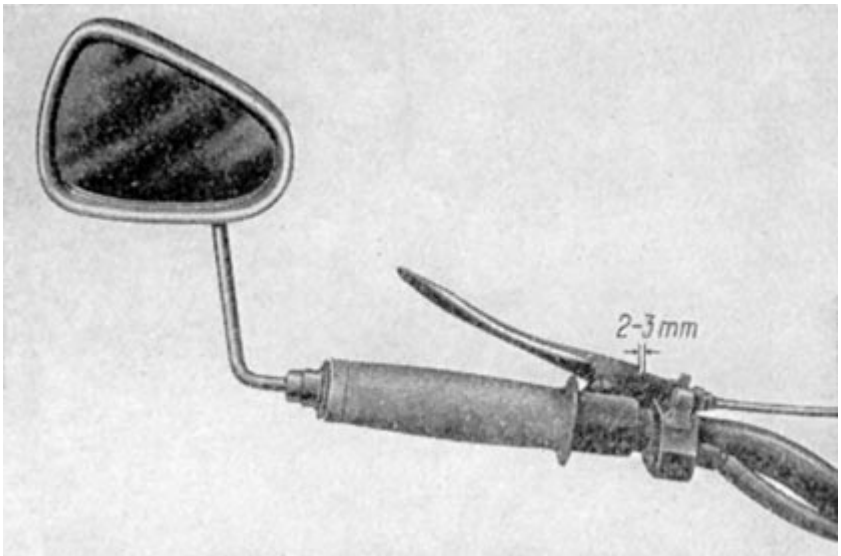


Image 55. Play of clutch lever

3.106 Kickstart

The prominent kickstart on the left hand side of the hood is provided for kickstarting the engine. If the kickstart can´t be kicked down because the mechanism is locked in sprocket on sprocket, the scooter needs to first be pushed back and forth a little to switch it back into neutral gear.

3.107 Foot gear switch

The foot gear switch is located on the left hand side of the floor board. Actuating the gear switch will cause the switch shaft, which is beared within sleeve shaft of the kickstart to change

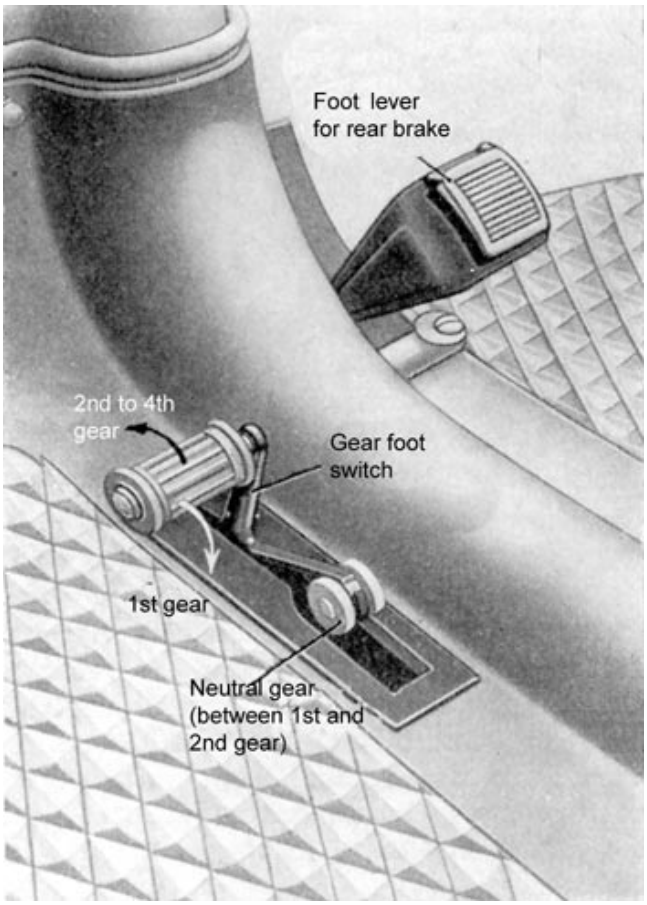


Image 56. Actuation of foot gear switch

the different gear ratios within the gear box. The gearbox has an automatic switch installed, that returns the footswitch back into it´s original position after each switching operation. The foot gear switch must be pushed forward to move the gears up into 2nd ,3rd and 4th gear and down to switch down again. To switch from neutral into 1st gear, the switch must also be pushed back.

To switch from:

Neutral to 1st gear	push foot switch back
1st gear to 2nd gear	push forward
2nd to 3rd gear	push forward
3rd to 4th gear	push forward
4th to 3rd gear	push back
3rd to 2nd gear	push back
2nd to 1st gear	push back

Neutral is found inbetween 1st and 2nd gear. It can be located by applying slight pressure to the foot switch (push back when coming down from 2nd gear and push forward when coming from 1st gear). When neutral is found, the green pilot light on the left hand side of the instrument panel will also light up.

3.108 Rear brake foot lever

The rear brake foot lever is found on the right hand side of the floor board. Pushing it down will result in actuating the rear brake. The rear brake can be adjusted by using the adjustment screw at the rear end of the break cable.

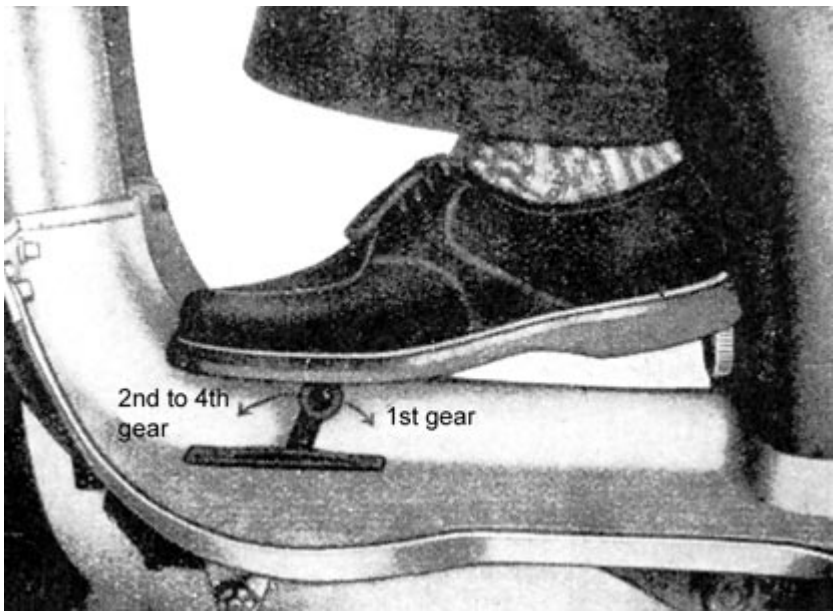


Image 57. Foot gear switch and rear brake foot lever

(1) Foot gear switch
(2) Rear brake foot lever

3.109 Front brake lever

The lever provided on the right hand side of the handle bar activates the front brake. It should be used to support the rear brake, when slowing down. In conjunction with the rear brake, the front brake is especially valuable on longer downhill rides due to the relocation of the center of gravity. Using the front brake only occasionally bears the danger, that it will not function as well as it should when it´s needed for emergency situations for instance.

3.110 Sidestand

The sidestand is found on the left hand side of the floor panel. It is used to park the vehicle. By slightly tilting the scooter into the opposite direction, the sidestand can be accessed easily. CAUTION: Before sitting on the scooter the sidestand has to be retracted. Otherwise the floorboard may be damaged.

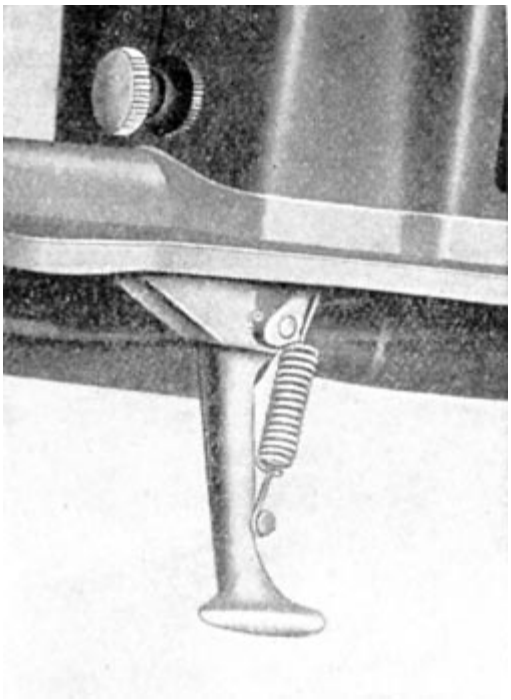


Image 58. Sidestand

3.111 Tip up hook

A tip up hook can be found on the instrument panel´s housing and used for convenience purposes like hanging up a purse or a brief case while on then road. Pushing down the button, opens the hook for use.

3.2 Proper operation

3.21 Before your first ride

The following things need to be done, before starting the engine for the first time:

1. Check battery for correct charge. This can be done by turning the headlight on and honking the horn. (The first time charge of the battery should be done by an IFA customer care center.)

2. Fill the fuel tank with fuel (ratio of 5% oil). Only use mineral oil for mixing if possible ! Mixing oil with fuel is done in a container outside of the fuel tank, to insure proper blending of oil and fuel. Never try blending oil and fuel in the tank, relying on the oil to mix itself with the fuel.

   We strongly recommend the new 2-stroke oil „Hyzet 43 Mot. SM“ for use with the SR59 Berlin scooter. It runs smoother but the ratio stays at 5%.

3. Check transmission fluid level

4. Check tire pressure

   Tires must be checked for correct tire pressure on a regular basis.

   The correct tire pressure for the SR59 Berlin is:

Single driver:	front	17.6 psi
	rear	22.0 psi
Driver & buddyfront	22.0 psi	
	rear	29.4 psi

   The pressures should not fall bellow the the suggested rates, because it might lead to unsound tires.

5. Check for function of front and rear lights as well as function of the pilot lights on thje instrument panel.

6. Check braking action of front and rear wheel (See section 2.34).

3.22 Running in

All movable parts of a new scooter must be run in. Especially Power trains and and engine must be run in although they were manufactured to highest technical standards. This makes it important to not overstress the engine throughout the first 900miles.

The driver and owner of a new motorscooter must know that the durability and reliability of the scooter will be better, the more diligence is applied especially during the running in period of the scooter. For this purpose, the following speed suggestions should not be exceeded while running in the scooter:

1st gear	appx. 9mph
2nd gear	appx. 18mph
3rd gear	appx. 28mph
4th gear	appx. 37.5mph

As much as excessive speeds are to be avoided, driving too slow also damages the power train and the engine while driving in the scooter. In result it should be taken great care, to switch gears in

the appropriate moment on the way up to 4th as well as down again. Don´t accelerate to the highest possible speed in each gear after the 900miles of running in are up. Only after 1800 miles are all parts ready to be strained without running into the danger of being damaged.

3.23 Starting up

To start the cold angine, folle these steps:

1. Position the gears into neutral, by using the foot gear switch (Green pilot light lights up when in neutral).

2. Open the round door on the hood and switch the fuel tap lever to „A“, open (lever pointing down). Also see image 44 in section 2.36 for details.

3. Push down carburetor´s dabber until fuel overflows (appx. four to seven seconds)

4. Close choke (Also see section 3.101) and close round hood door.

5. Open thottle by about ¼ to ½ .

6. Efficiently kickstart the engine twice.

7. Switch ignition to position 2 (Charging light, Supercharger pilot light and Neutral gear light light up)

8. Start engine by powerful kickstart.

9. Open choke slowly

10. Close throttle almost fully and keep engine idleing.

Once the engine is running, the red and orange pilot light should extinguish (If they don´t, see sections 4.32 and 4.33). The green neutral light will first go out, when a gear is engaged. If these lights fail to light up with the ignition switched on, the battery is most liekely empty. With the battery removed from the scooter, it can still be started by setting the ignition to position 5 and push starting the scooter with 1st or 2nd gear engaged. If one of these lights fails to light up with activated ignition, one of the systems is propably malfunctioning (See section 4.31 accordingly).

3.24 Running up and shiffting gears

Running the scooter up is done as follows:

1. Engage clutch by pulling clutch lever.

2. Push foot gear switch back (engages 1st gear and green pilot light goes out)

3. Release the clutch efficiently and at the same time accelerate the thottle. (Motoscooter starts to moving)

4. After about 6 yards or reaching a speed of about 9mph, pull clutch lever and reduce throttle. Now push foot gear switch all the way forward, until it reaches limit stop. (switching into 2nd gear) Release clutch efficiently and at the same time accelerate throttle.

5. A soon as a speed of 18mph is reached, follow step 4. to switch into third gear.

6. Repeat step 4. for switching into 4th gear as soon as a speed of about 37.5mph is reached.

3.25 Shifting down on a slope

If the motor doesn´t seem to make an ascending slope with the current gear engaged and the speed goes under the recommended amount, it is necessary to downshift accordingly.

Therefore:

1. Engage clutch and reduce throttle by about ½ .
2. Push foot gear switch back (engage next lower gear)
3. Disengage clutch and accelerate throttle.

This description needs to be followed in a speedy and efficient fashion, so that the speed of the scooter doesn´t drop too fast.
If the motor doesn´t make the slope with one gear already shifted down, or if the speed get´s below specifications in city traffic, repeat steps 1. through 3. accordingly.

CAUTION !!
It is not adavantageous to use the engine break with a 2-stroke engine. A two-stroke engine should always be kept on revolutions. The engine will work more efficient and, although in higher revolutions, the engine won´t be strained as much as if it were used with the engine break.
A lot of drivers tend to go downhill in top gear and have the throttle closed in the same time. We would like to remind you, that even in driving school it is advised to use the same gear uphill as you should going downhill. This is extremely important with a two-stroke engine, because the engine is lubricated by the fuel. When you are using the engine break, (high gear with closed throttle) you are denying the engine it´s lubricant and thus run into the risk of severely damaging your engine (piston seizure or serious damage of the bearings might occur as a result of that). So always make sure, that the engine is supplied with some fuel (open throttle to an extent.

3.26 Brakes

regulation of the scooter´s speed should be possibly be maintained by the throttle. The brakes are sufficient to bring the scooter to a safe halt coming from any speed. Braking is usually conducted by first using the foot brake and then gradually adding the front brake as a support to the rear brake. Even when sudden obstacles appear in the way, that require sudden heavy braking, the brakes should not jam. The brake performance of a jammed wheel is not as good as if the wheel were just heavily decelerated. Also never use the „engine break“ with a two-stroke engine (See section 3.25).

3.27 Stopping

Follow these guidlines to bring the scooter to a full stop:

1. Close throttle

2. Engage clutch, accelerate throttle for a short moment (open throttle and close it again) and maneuver the gear box into neutral gear using the foot gear switch (green pilot light on the instrument panel will light up) and disengage the clutch.

3. Bring the scooter to a full stop by applying the brakes

Incase the scooter should be parked:

4. Turn off ignition

5. Close fuel tap.

3.28 Mothballing the bike for storage

If the scooter should be mothballed during winter or for any other reason, the following things apply:

1. Jack up the scooter by placing logs under traverses and underbody (three point storage) and clean scooter thoroughly.

2. Empty fuel tank and carburetor.

3. Lube all lube points (see supplied lube chart for reference)

4. Reduce air pressure in all tires to appx. 8Psi. At this point ensure, that the scooter is jacked up properly so that the tires are disencumbered.

5. Remove battery and have it serviced at a professional battery shop.

6. Spray body with paint protection and coat blank parts with vaseline.

7. Cover scooter with canvas to protect it against dust.

4 Protection and maintenance work

4.1 General information

The supplied maintenance booklet gives information on when the scooter should be inspected by an authorized dealer and what should be taken care of at which mileage (The speed´s mileage counter is used as reference).
Non observance of the maintenance booklet results in loss of possible warranty.
We do however want to point out, that additional care can´t hurt.
When lubing the scooter, never forget the front and rear suspension, especially when driving a lot on bad roads or through wet conditions.
So spare no effort or dirty hands for the little trouble. Your scooter will certainly appreciate it !!

4.2 What to do

4.21 Daily

4.211 Before leaving the driveway

1. Check tank for sufficient fuel

2. Check functionality of lights and horn

3. Check for sufficient play on the clutch (two to three millimeters). (Also see image 55).

4. Check air pressure. (See section 3.21)

5. Check brakes

4.212 During stays in transit

1. During short stops after a longer drive, it is advisable to check the tire temparature. Unusually warm tires leave to conclude, that the air pressure is too low (great thermal stress caused by excessive friction).

2. Check tires for nails or other objects that might stick in the tires, especially after driving on dirt roads or low quality streets.

4.213 After returning

1. Check tires as described in section 4.211

2. **After long drives over dirty or sandy roads, (summertime), clean air filter and coat it with oil (Also see section 2.182).**

3. After driving in bad weather: spray scooter off with water while the dirt is still moist.

4. Close fuel tap after parking the scooter.

4.22 Lubricating the engine

This engine works with an oil-fuel ration of 5%. This means, that the engine is lubricated by the oil additive in the fuel. Never fill scooter up with unmixed fuel !! Operating the engine without oil additive, would destroy the crank, big end bearings and the cylinder track, because they would run dry. To ensure proper lubrication of the engine at all times (winter or summer) therefore is 5%.

4.23 Lubricating the chassis

Lubrication of the chassis at the lube nipples (see lube chart for details) is just as important as the lubrication of the engine and gear box. Lubrication is applied with the supplied grease gun. With exception of the cable nipples, every nipple is lubed with grease. The cables are to be lubed with thick engine oil (NO grease !!).
The joints of the handlebar levers are lubed with a few drops of motor oil.

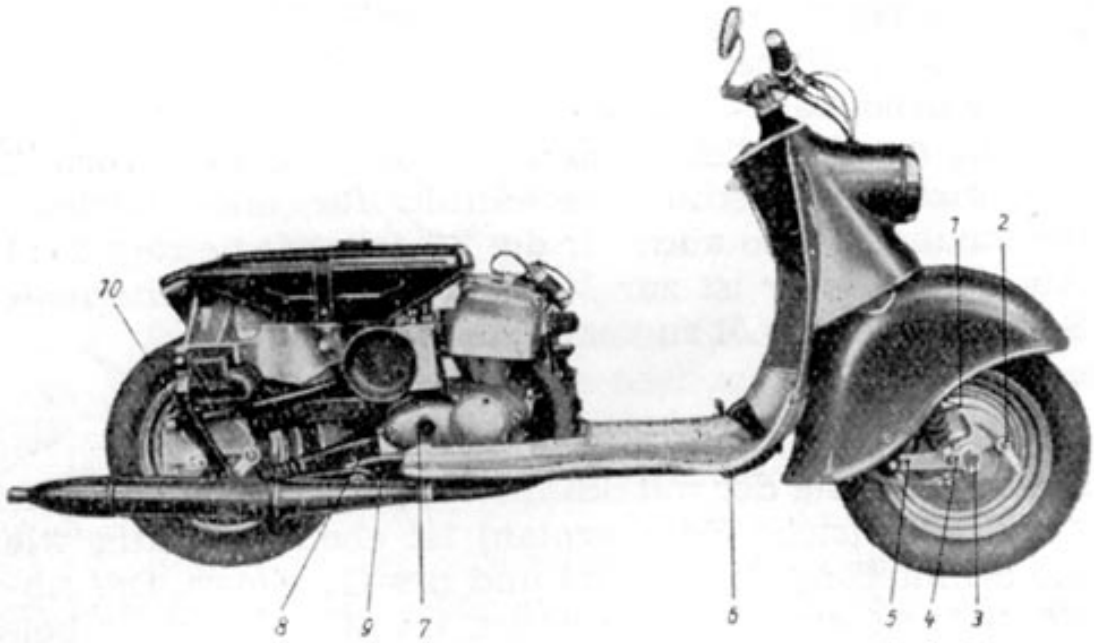
Malfunction of the grease gun:
Incase of contamination of the lubricant inside the grease gun, which may cause the grease gun do not operate, remove the mouthpiece and take out the valve spring with ball. Afterwards clean parts from contaminated lubricant and reassemble grease gun.

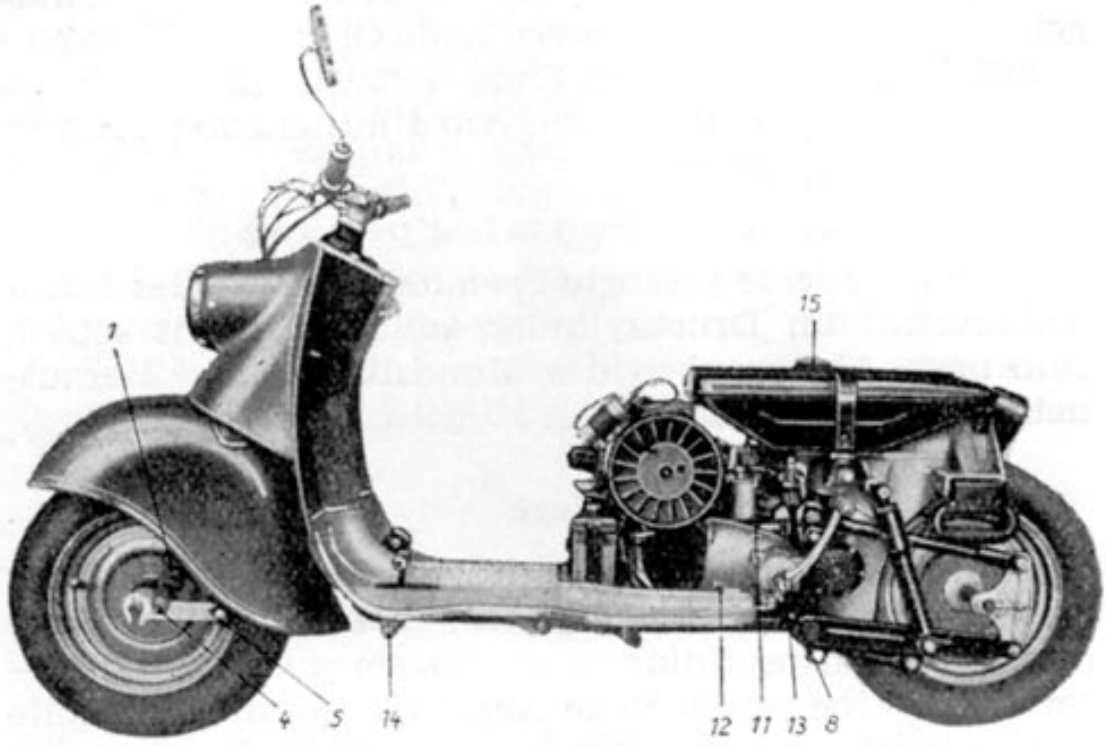
Lube chart

No.	Lube point	No. Of Lube points	Lubricant
1	Front fork (under fender)	2	Grease
2	Brake lever, front	1	Grease
3	Speedometer	1	Grease
4	Spring retainer	2	Grease
5	Rocker bolt	2	Grease
6	Foot brake lever	1	Grease
7	Clutch spring	1	Grease
8	Rear wheel rocker arm	2	Grease
9	Foot brake cable	1	Motoroil
10	Chainlubrication	1	Motoroil
11	Gear box filling screw	1	Motoroil
12	Inspection screw for gear box	1	Motoroil
13	Kickstarter	1	Grease
14	Foot gear switch	1	Grease
15	Engine lubricant	Mixture	Fuel-Oil 5%

The Bowden cables do not carry lube points anymore, due to more advanced methods of production. They are bathed in graphite before assembly. Just disassemble every 3000 miles and oil as described in section 4.23

Supercharger: Both Ballbearings are factory assembled with hotgrease. This lasts for appx. 21000 miles.





4.24 Maintenance of spark plug

The state of the spark plug changes during operation as a consequence to the high mechanical, chemical and thermal strain it is exposed to – it ages. Regular maintenance and check up´s of the spark plug´s aging process is necessary in order to keep the engine reliable and safe.
For the beginning, it is important that the inner parts of the spark plug are clean. To maintain this, the spark plug should be removed every 600 miles and cleaned using a wire brush (Do not burn the spark plug out and don´t use any so called „spark plug cleaners“!). Also important is the right distance of the electrodes. Isolator spark plugs hav a distance of 0.6mm. Since this distance grows due to electrode burn up, the outer electrode needs to be bent in until it´s back to it´s original distance of 0.6mm. This can either be done by using the supplied sensing gauge (see image 61.) or by simply stacking 3 postcards on top of eachother and using them to measure the distance. The appearance of the spark plug´s inner parts, the so called „face“ concludes the burn-up of the engine and so gives the opportunity, to detect disturbances in the engine´s combustion processs timely and thus enables early troubleshooting (See section 4.241).
When reinstalling the spark plug, do not forget to also reinstall the spark plug gasket.
After about 6000 miles the spark plug has aged so far, that it can´t bear up against the thermal forces within the cylinder. To prevent possible damages to the engine, the spark plug has to be exchanged about every 6000 miles.

The right spark plug for the engine of the city scooter „SR59 Berlin“ must have a heat-count of 240. Never should spark plugs be used, that have a lower heat-count, because it might cause severe damage to the engine. Spark plugs with a higher heat-count are unnecessary and will cause complications.

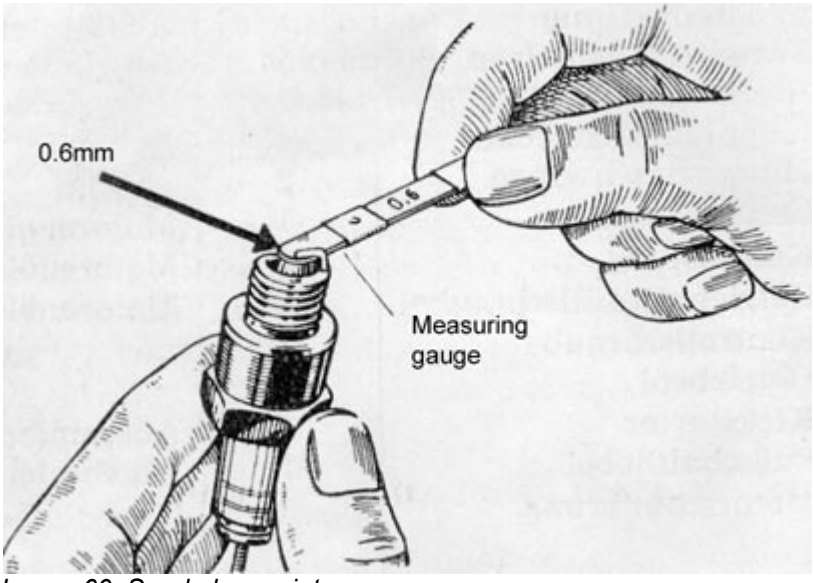


Image 60. Sparkplug maintenance

4.241 What does the spark plug´s face tell us ?

If the right sparkplug´s inner parts (the „face“) are black (meaning oily or grimy) one of the following problems could be responsible:

a) Distance of spark plug´s electrodes is too small

b) carburetor ratio is too thick

c) Mechanical defects of the carburetor that lead to an over enriched ratio like a worn out floater needle or a defective floater.

d) Dirty air filter

e) Too much oil or the wrong kind of oil in the fuel mix

f) Wrong ignition timing

g) Mechanical defects in the Ignition (dirty or stuck breaker lever, wrong points adjustment or condenser or ignition coil defective).

h) Significant build up of fuel residue within the engine compartment (burned in piston rings or dirty ports and exhaust).

i) Vehicle is being operated too slow

If the right sparkplug´s face is light colored (white-grey) and the electrodes show signs of little pearl like objects, the sparkplug was overheating. The following problems might be responsible:

a) Electrode distance too big.

b) carburetor ratio is too lean.

c) Mechanical defects of the carburetor that result in a ratio, that is too lean like fuel level in the floater chamber is too low, carburetor is slant or loose or the carburetor´s mixing chamber tightning nut is loose.

d) Obstructed fuel supply (Fuel filter dirty, fuel line clogged or dirty carburetor).

e) Defective engine gasket.

f) Missing air filter.

g) Not enough oil or oil of poor quality in the fuel mix.

h) Wrong ignition timing.

i) Sparkplug old or missing sparkplug gasket.

4.25 Cleansing the exhaust

The exhaust fumes are conveyed through the exhaust into the open. The exhaust collects all kinds of residue that, depending on operation mode and used fuels, need to be cleaned out after about 3000 miles. If ignored, the residues result in lacking performance and higher fuel consuption. The exhaust of the SR59 Berlin is demountable. After removing the nut, which is connected to the end of the exhaust, the end piece and the blind can easily be removed.

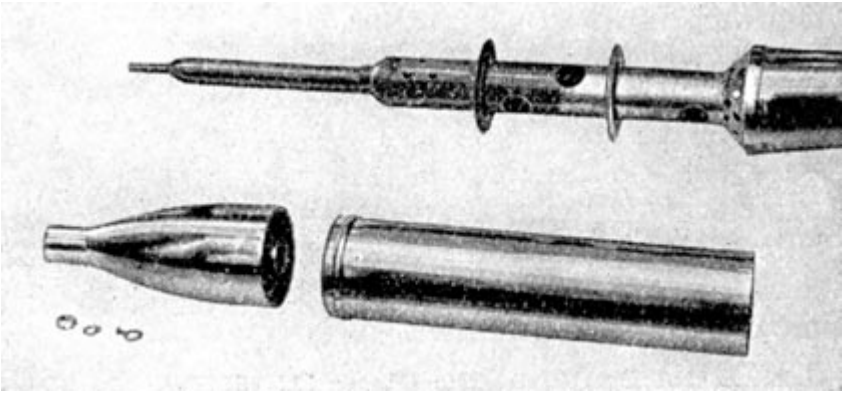


Image 62. Dismantled exhaust

4.3 Troubleshooting

4.31 Engine won´t start

No fuel overflowing while pushing down the dabber. This can have the following reasons:

a) No fuel in the tank

b) Fuel tap closed or not on reserve.

c) Dirty fuel filter.

d) Airhole in fuel tank lid clogged (The air hole is not visible from the outside).

e) Clogged fuel line.

Fuel does overflow while pushing down the dabber, but the engine still won´t start:

a) Clogged jet.

b) Throttle or choke are not in the according recommended positions for engine start (warm or cold motor).

c) Ignition is switched off.

Ignition is switched on but the red pilot light won´t go on.

a) Defective pilot light.

b) Discharged or insufficiently charged battery.

c) Bad contact within the ignition lock or the connecting cables.

d) Broken wires.

Red pilot light is on but there is no spark.

Simple inspection:

remove the sparkplug connector from the cable and hold it three to four millimeters close to the cylinder. When kickstarting, a spark should jump over. If no spark should occur even after repeating this procedure, one of the following problems might be responsible:

a) breaker lever doesn´t lift off.

b) Burned points.

c) Stuck breaker lever.

d) Connectors to the ignition coil have bad contact.

e) Ignition cable, condenser or resistor within the sparkplug connector defective.

f) Broken wire.

There is spark throughout the advised inspection but the engine won´t start:

a) Electrode distance too large or too small, due to the different atmospheric pressures within the combustion chamber. (More precise inspection of the sparkplug in a dry well).

b) Sparkplug oily or broken.

c) Engine flooded due to excessive dabber use.

d) Too much oil in the ratio.

e) Sparkplug connector defective.

4.32 Red pilot light does not go out after starting the engine

a) Defective reverse current switch or bad ground.

b) Loose contact at the cable connectors.

c) Defective regulator

d) Defective alternator due to dirty commutator, hanging brushes or short circuit within the coil.

4.33 Supercharger pilot light doesn´t go out or lights up while driving

a) Slipping v-belt fails to drive supercharger fly wheel.

b) Dodgy v-belt. (see section 2.162 for details)

4.34 Engine doesn´t run smooth

Four stroke motion (Regular failing of the ignition):

a) Closed choke

b) Dirty air filter

c) Crippled floater needle

d) Wrong carburetor adjustment, main jet too large, jetneedle too high.

e) Defective floater

f) Too much oil in the fuel.

g) False ignition timing

h) Excessive residue in the ports or in the exhaust

Carburetor „beat´s back“

a) Obstructed fuel flow or dirty fuel filter, clogged fuel lines or dirty carburetor bores.

b) Slanting carburetor.

c) Loose carburetor.

d) Carburetor´s tightening screws loose.

e) Defective engine gasket.

f) Missing air filter

g) Wrong carburetor setting, jet needle too low or fell into needle jet entirely due to broken clamping yoke.

h) Wrong ignition timing.

i) Old or defctive sparkplug, wrong electrode distance.

k) Breaker lever hangs or lifts off too far.

l) Points burned

m) Piston rings burned into the grooves (bad compression).

4.35 Engine stalls abruptly

a) Empty gas tank (Noticeble „stuttering“ of the engine prior to stalling).

b) Clogged tank, fuel lines or dirty carburetor.

c) Ignition cable loose or detached.

d) Defective sparkplug.

e) Broken breaker lever or fallen off contact material.

f) Defective condensor.

4.36 Excessive fuel consumption

As with all vehicles, the specifications on the fuel consumption are standard values. Of course the consumption changes when the engine and/or other parts of the vehicle are faulty. A higher fuel consumption can also have one of the following reasons: higher top speeds, permanent maximum load, off center load, bad roads and rough climate. If the fuel consumption is higher even under normal conditions, make sure that the following conditions are met:

a) Carburetor setting, immaculate carburetor condition, clear fuel lines, clean air filter

b) Immaculate sealing of the engine.

c) Use of the right fuel mixture.

d) Correct ignition timing and immaculate condition of the mechanical parts of the ignition.

e) Correct handling of throttle, gear switch and choke.

f) Immaculate condition of all other parts of the scooter (gear box, brakes, wheels, tires and frame).

If the fuel consuption still seems to high, it is strongly recommended, to stop by an authorized workshop and have them perform a test drive with the scooter so that they can determine, whether the it is the conditions or malfunctioning of the scooter that is responsible for the high fuel cnsumption. If the scooter is malfunctioning, the authorized dealer will gladly take care of the necessary repairs for you.

4.37 Headlight doesn´t work

a) Light bulb loose or broken

b) Cables within the headlight have bad contact.

c) Contact faces of the springs inside the headlight are oxidized.

d) Faulty battery.

e) Broken cable.

4.38 Adjusting the headlight

The following procedure should be attended in order to adjust the headlight:

a) Position the scooter perpendicular to and about five yards away from a white wall.

Image 63. Headlight bezel

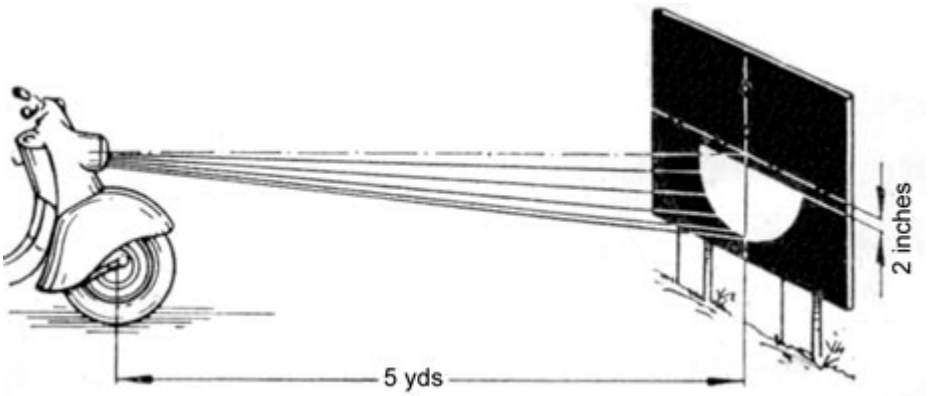


Image 64. Adjustment of headlight

b) Have one or two people sit on the scooter.

c) Loosen bezel screws and adjust headlight, where the boarderline between the bright bottom and dark upper area should be at least two inches under the center of the headlight.

d) Tighten bezel screws.

5 Repair instructions

5.1 Egine removal and instalation

1. Remove hood.
2. Loosen exhaust´s bolt and nut (located at right traverse) located at the bracket.
3. The tank can be removed, after loosening the carburetor´s tension belt and fuel line as well as the dabber bracket.
4. Remove carburetor´s slidegate cap and pull cables and slidegate out of carburetor.
5. Remove ignition coil and regulatorfrom blower housing without disconnecting cable connectors.
6. Remove Ground cable from battery and cable connector for neutral gear pilot light.
7. Loosen tightening screws from right cap and remove air intake damper.
8. Press chain protectors out of housing and open master link.
9. Loosen the three engine fixation screws that connect the engine to the frame.
10. Loosen connectores of the triple cored cable at the alternator´s cap (Mark connector ends and bend open cable fastener under the engine open).
11. Remove battery
12. Remove foot gear switch linkage from gear box lever.
13. Pull engine out upwards first and then take it out of the frame sideways.
14. Re-install correspondingly in reverse order.

5.2 Removal of cylinder head

1. Remove ignition cable.
2. Remove the four retainer screws from the stud bolts of the cylinder (Look out for circlips and washers).
3. Remove cylinder head.
4. Re-install correspondingly in reverse order after first cleaning the combustion area and the sealing surfaces of cylnder and cylinder head. Don´t forget the circlips and washers !! Tighten bolts „cross over“ and retighten some more, once the engine has warmed up after startup.

5.3 Removal of cylinder

1. Remove fuel tank.

2. Loosen exhaust´s bolt and nut (located at right traverse) located at the bracket and remove exhaust.

3. Remove cylinder head as described in 5.2.

4. Loosen clamping screw at the carburetor connector and remove carburetor from intake socket.

5. Pull cylinder out upwards (Neck of cylinder should be waggled out of dowel pin). Mind the gasket !

6. Use a clean cloth to cover up the crank case.

5.4 Removing the piston

1. Remove cylinder as described in 5.3.

2. Remove circlips from piston pin (make sure, that the circlips don´t spring off !)

3. Incase the piston pin is stuck in the piston, carefully heat up the piston (using a bunsen burner for example).

4. When the heat starts expanding towards the bottom end of the piston pin, press pin out with a spike.

5. Never hammer the piston pin out of the piston !!

5.5 Inspecting or exchanging piston rings

1. Remove cylinder as described in 5.3.

2. If the piston pin is still stuck in the piston, the necessary work can be done without removing the piston.

3. Remove piston rings using a pair of piston ring pliers or three narrow pieces of tin, to avoid breaking or overexpanding the rings. Mark the rings in such a way, that they can later be reinstalled in the same position in the same groove !!

4. Cleanse the piston rings and the grooves from any coal or residue. CAUTION !! do not damage rings with inappropriate tools !!

5. Insert the piston rings into the bore one by one with the help of a cylindric shaped piece of wood or an old piston. Push piston rings down into the bore by about half a stroke length.

6. Now check the piston rings gap using a measuring gauge. If the gap exceeds 0.5mm, the rings need to be exchanged.

7. Reinsert rings into piston grooves, using the tools and measures described for removal. Do not lubricate rings !!

5.6 Installing piston and cylinder

1. Lubricate rod head bushing.

2. Warm up piston to about 90ºFon a cooker.

3. Put the warm piston over the rod head in such a way, that the imprinted arrow in the piston is pointing forward.

4. Quickly push the cold piston pin through piston and connecting rod.

5. Reinstall circlips. Carefully verify the circlip´s correct seating. Lapsing circlips will destroy piston and cylinder !!

6. Apply bottom cylinder gasket.

7. Underlay crank case flange with a piece of wood so that the piston can rest.

8. Lubricate bore (not the piston !!)

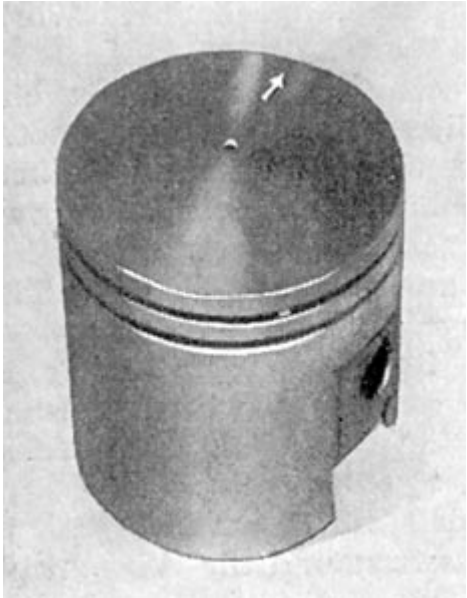


Image 65. Piston (arrow must point forward during installation!!)

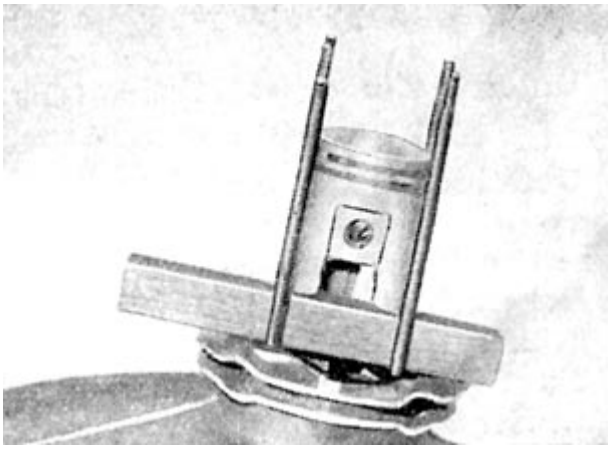


Image 66. Installing the piston

9. Slide cylinder onto stud bolts.

10. Press upper piston ring together firmly using your fingers, so that the ring ends are adjacent to the locking pin. Now slide cylinder over the piston and over the first piston ring.

11. Press lower piston ring together firmly using your fingers , so that the ring ends are adjacent to the locking pin.

12. Now slide the cylinder over the piston entirely. Remove underlying wood (Caution, do not damage gasket !!) Slide neck of cylinder into crankcase.

13. Cleanse sealing surface for cylinder head.

14. Attach cylinder head.

15. Put on circlips and washers and screw nuts on. Caution: tighten nuts cross-over !!

16. Install carburetor, fuel lines, exhaust and ignition cable.

5.7 Adjusting the ignition

1. Open breaker cap, incase the right side housing cover has not been removeed.

2. Cleanse breaker points and set the contact distance to 0.4mm at the highest possible position of the cam (Loosen screw C (image 18) for this purpose and adjust angle with a screwdriver. When the right distance is met, tighten screw again.)

3. Clamp a testing lamp to the contact spring to one wire and ground to the other wire.

4. Remove sparkplug, turn the ignition on, and turn the engine slowly using a socket wrench on the anchor screw.

5. If the test lamp light´s up earlier or later, the timing needs to be adjusted further.

6. For htis reason, the mounting bolts 2 and 3 (image 17) of the stator plate need to be loosened and the stator moved. (To the left, if the test lamp light´s up late and to the right if the lamp light´s up early.)

7. Tighten stator plate screws again.

8. To adjust the ignition timeng, follow these instructions: Loosen exhaust screw and remove exhaust pipe manifold. Move the piston to TDC. Mark the piston´s position with a pencil and measure 4mm off TDC for the right ignition timing. You can also measure through the opening of the spark plug using a gauge.

5.8 Exchanging a wheel bearing

Front wheel:

A DIN 6202 (DIN stands for Deutsche Industrie Norm) wheel bearing is installed on both sides of the hub. To remove them, follow these steps:

1. Remove wheel (see section 2.351)

2. Remove nuts from wheel.

3. Remove armature plate and remove axle seals.

4. Remove distance sleeves and axle seals.

5. Remove circlips using special pliers.

6. Hammer the axle out including the right wheel bearing.

7. Pull out left bearing, using a puller.

Rear wheel:

The rear wheel has a DIN6206 bearing in the left hand side of the hub and a DIN6204 in the right. A

distance sleeve sits inbetween these two bearings to prevent them from being pulled together when tightening the axle. When the distance sleeve doesn´t have the approved length anymore, the rings are pressed against the balls of the bearing, causing sluggish behaviour of the bearings which leads to their quick destruction. This concludes, that not only the wheel bearings need to be checked, but also the distance sleeve (Turning the wheel with loosened and tightened axle), because both can be responsible for sluggish behaviour of the wheel.

How to remove the bearings:

1. Remove wheel (see section 2.351).

2. Dismantle rear hub as described in section 2.341.

3. Hammer the axle out including the left hand side wheel bearing.

4. Pull out right bearing, using a puller. The new bearings need to be well lubed. Installation is done in reverse order.

6 Parts support – technical support

All spare parts for the city scooter „SR 59-Berlin“ can only be obtained through authorized dealers or specialized retail stores. This includes parts that are manufactured by IWL as well as third party parts excluding tires. It is pointless to order directly from the manufacturer.
There are enough authorized dealers within the GDR (German Democratic Republic) that monitor our vehicles throughout their warranty period, and are made available in the event of damage. For technical inqiuries that are directed directly to the manufacturer, make sure to add the part number of the regarding part and the frame number of the scooter as well as it´s current mileage.

Note: Scooterstation offers full parts support for the SR59 Berlin scooter within the US. If you need parts you can contact us at: (503)-231-2768 or e-mail us at sales@scooterstation.com

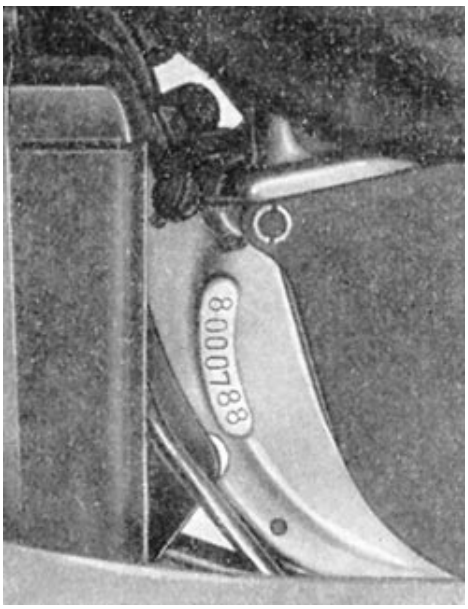


Image 67. engine nr. on the engine case

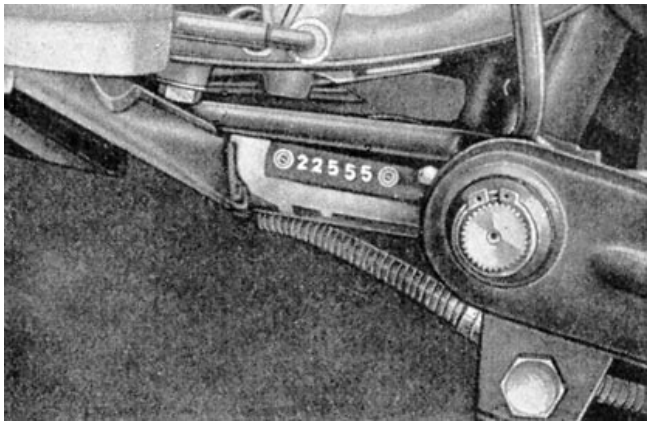


Image 68. VIN number on the frame

The frame number is found on the left hand side of the frame just behind the rear traverse. The engine number is found on the left hand side of the engine case on the bottom. The type plate is localized on the hood under the seats.