SETTING-UP INSTRUCTIONS
MAINTENANCE MANUAL
REPAIR INSTRUCTIONS AND PARTS LIST FOR

MOTOR CYCLES

MODEL NUMBERS 810.94010

This is the Model Number of your Allstate light weight motor cycle. It will be found on a plate fastened to the frame. Always mention this number when communicating with us regarding the motor cycle, or when ordering parts.

HOW TO ORDER REPAIR PARTS

All parts listed herein may be ordered through Sears, Roebuck and Co. or Simpsons-Sears Limited. When ordering parts by mail from the mail order house which serves the territory in which you live, selling prices will be furnished on request or parts will be shipped at prevailing prices and you will be billed accordingly.

WHEN ORDERING REPAIR PARTS: ALWAYS GIVE THE FOLLOWING INFORMATION AS SHOWN IN THIS LIST.

1. The PART NUMBER
2. The PART NAME
3. The MODEL and SERIAL NUMBER
4. The NAME of item

This list is valuable. It will assure your being able to obtain proper parts service at all times. We suggest that you keep it with your other valuable papers.

SEARS, ROEBUCK AND CO. U.S.A.
SIMPSONS-SEARS, LTD. CANADA

SETTING-UP INSTRUCTIONS

Instructions for unpacking, assembling and final operations. Carefully follow the procedure explained below to get your Mo-Ped ready to start!

Opening the Crate or the Cardboard Box respectively:

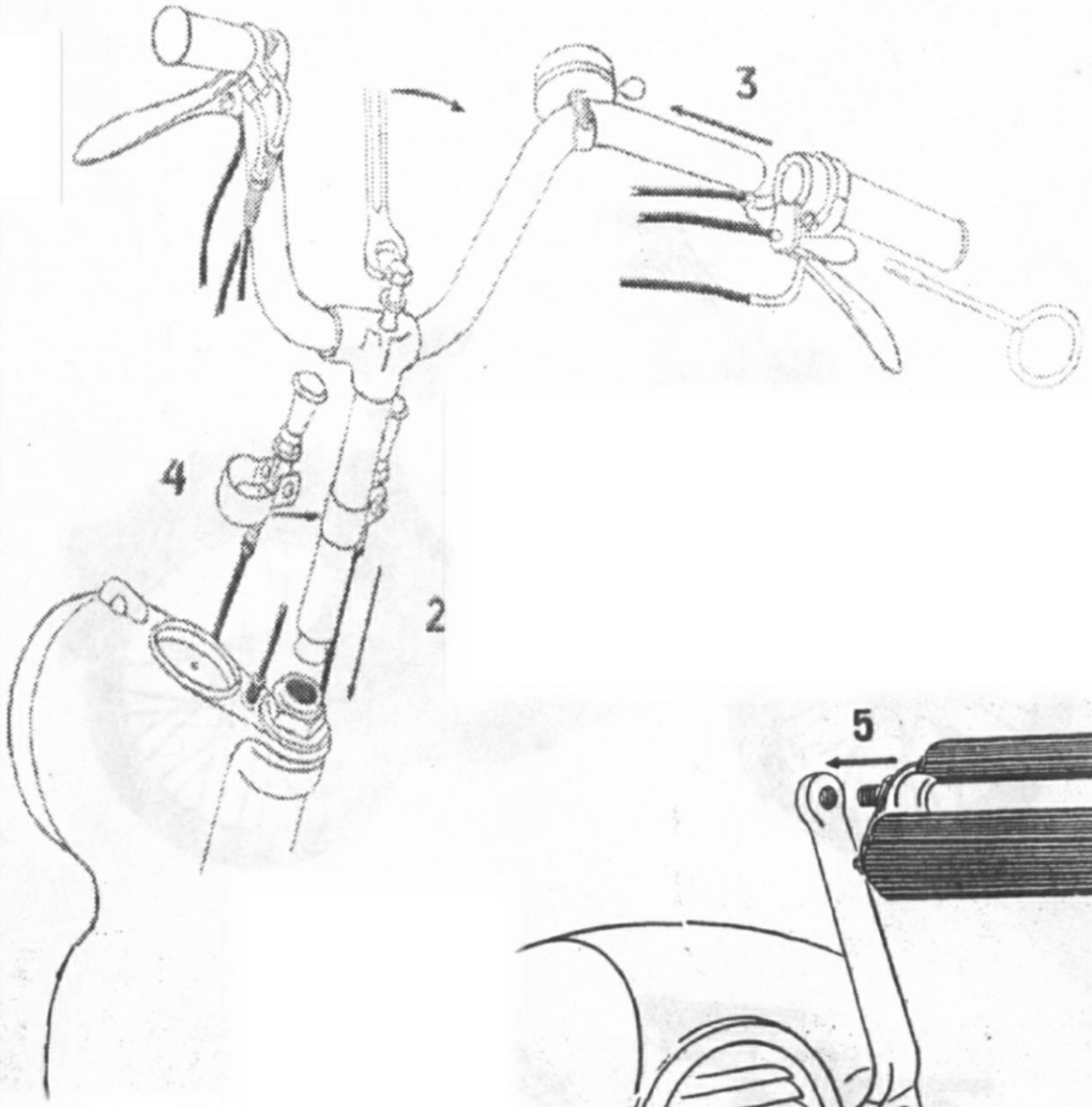
1. Set up crate (note the inscription TOP!) and remove "Statement of Origin" and "Manual" (Point 1).
2. Remove the nails securing the lid to the crate and take off the lid.
3. Lift the Mo-Ped out of the crate.

Final Assembly Work:

1. Untie the handlebar and remove the packing material.
2. Fit the handlebar into the fork shaft tube and tighten the clamping spindle (Point 2).
3. Push the throttle twist grip complete with control cables on to the right-hand end of the handlebar and clamp it tight (Point 3).
4. Fix the shackle of the choke control cable to the handlebar shaft (Point 4).
5. Untie the pedals from the luggage grid and screw them to the tread cranks.
   The left pedal has a left-hand thread, the right pedal has a right-hand thread. (Point 5).
6. Loosen clamping shackle on the frame and move the saddle to a position offering a comfortable seat.

Help the "ALLSTATE" Mo-Ped to work for you efficiently! We trust it will afford you great satisfaction.

USE ORIGINAL SPARE PARTS ONLY!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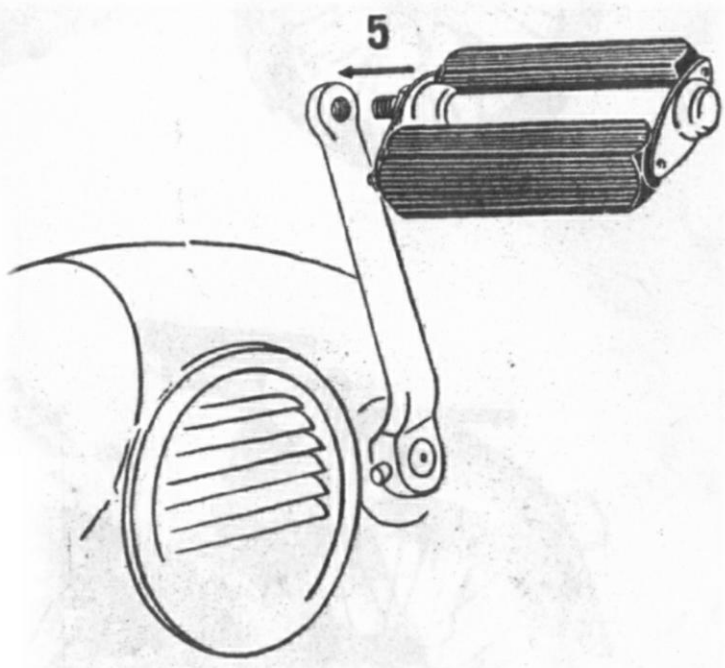
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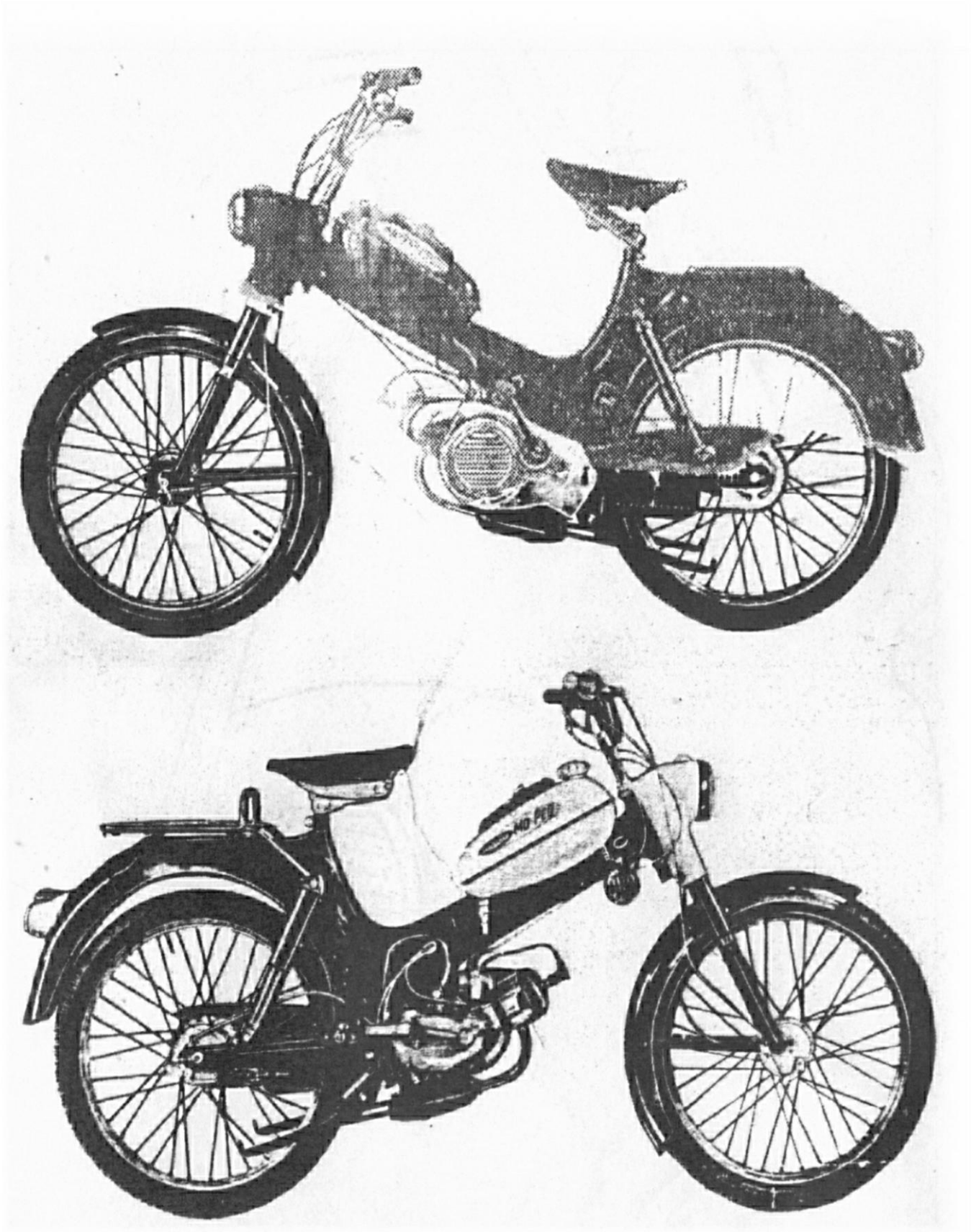


OPERATING AND MAINTENANCE MANUAL

We are glad to learn that you have become owner of an

ALLSTATE MO-PED

We can only compensate your confidence in our product by offering you all the experience gathered in half a century of bycycle and motorcycle production.
In spite of the graceful appearance the Allstate Mo-Ped is just as rigid and reliable as the world-famous Allstate motorcycles.
Riding this Mo-Ped is a child's play: on you get and off you go!
Nevertheless, we must ask you to read this booklet first of all, so you know how to handle your new Mo-Ped to ensure long years of faithful service. We won't keep you long. We just want to tell you the most important things about your Mo-Ped in brief. You yourself will reap the benefit.

"BREAK-IN" INSTRUCTIONS

The way of riding the vehicle and its treatment during the "Break-in" period are very important for the duration of life and the ecoromical fuel consumption.
For the first 400 miles drive your vehicle while changing the speed and the number of revolutions and also change the gears frequently. In any case, however, avoid to overstrain or torture your engine at low revolutions, i. e. change in time.
First 300 miles not over 30 mph
300—500 miles only for a short period at full load
Close the throttle once in a while for a moment in order to cool down the engine.

LUBRICATION

Always use a good grade oil. Use only nondetergent oil for fuel mixture. Mix in clean container before filling gas tank. Use correct oil mixture (see page 9). Incorrect oil/gas mixture will affect carburetion and cause engine damage.

Summer and winter SAE 40 or SAE 50

MAINTENANCE

Like all other precision machines your Mo-Ped requires allways to be carefully maintained.
The "first" lubrication and maintenance as discribed on page 11 is of great importance with regard to the duration of life of the engine as well as to a reliable vehicle.

TECHNICAL DATA

Engine

Type of engine: Single-piston engine with blower (fan) cooling.

Bore: 38 mm (1.5 in.).
Stroke: 43 mm (1.7 in.).
Cubic capacity: 49 c.c. (3 cu. in.).
Operation: Two-stroke cycle.

Performance

2.3 HP. (DIN)

Lubrication

Engine: Mixture lubrication, ratio 1 in 25 (= 4%).
Gearbox: Oil filled into gearbox.

Ignition

Flywheel magneto for ignition and lighting (6 Volt, 27 Watt), ignition coil outside.

Spark plug

Allst. No. 60410.

Carburettor

Bing carburettor with 12 mm passage diameter and choke. Needle position second notch from the top end. Main jet 62.

Air filter

Self-wetting air filter, directly mounted to the carburettor.

Clutch

Disk clutch running in oil bath.

Gearbox

Two-speed.
Transmission (reduction)

Engine — gearbox	i	= 3.63 : 1
Gear ratios	i_1	= 3.3 : 1
	i_2	= 1.44 : 1
Gearbox — rear wheel	i	= 2.83 : 1 (34 : 12)

Power Transmission

Engine — gearbox: Precision-made helical gears running in oil bath.

Gearbox — rear wheel: Roller chain 1/2 in. × 3/16 in.

Speed

57 km.p.h. (34 m.p.h.).

Hill-climbing capacity

22%.

Finish

Frame: All-enclosed pressed-steel frame of box section design.

Springing:

Front wheel: Telescopic fork with hydraulic damping, total amount of spring movement 50 mm.

Rear wheel: Pivoted swing fork with telescopic shock absorbers, total amount of spring movement 35 mm.

Fuel tank capacity: 1,45 gal. (5,5 litres) including reserve.

Stand: Spring-up prop stand.
Tires: 23 in. — 2.25 in.
Foot-rests: Pedals.
Brakes: Internal expanding brake of 90 mm diameter, 20 mm wide.

Brake operation:
Front wheel brake: By hand lever.
Rear wheel brake: By back-pedaling.
Saddle: With front hinge and two-ply rubber cover.

Head lamp: Aperture 85 mm diameter. Bulb for headlamp Philips type 6612 W 6 V 25/25 W.

Stop light: 6 V/5 W.

Tail light: 6 V, 3 W.

Equipment: Toolkit, luggage carrier, rattle.

Dimensions and Weights

Height: 990 mm (38.9 in.).

Width: 625 mm (24.6 in.).

Length: 1790 mm (70.5 in.).

Weight, without fuel: 48 kg (104 lbs.).

Weight, with fuel etc.: 52 kg (115 lbs.).

Maximum permissible weight: 145 kg (322 lbs.).

We reserve the right to alter design and finish without previous notice.

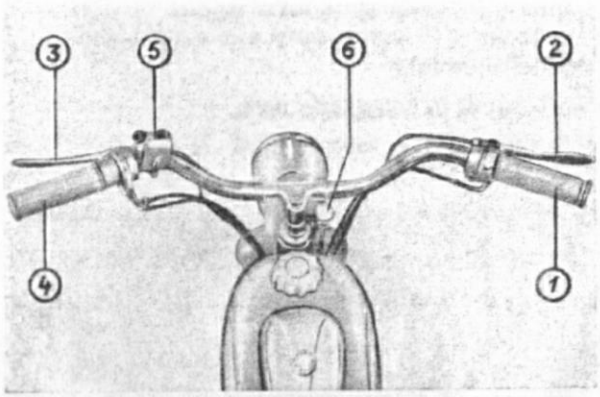


Fig. 1: Operating levers on the handlebar

1 Throttle twist grip
2 Hand brake lever
3 Clutch lever
4 Gearshift twist grip
5 Dimmer switch with horn button and short circuit button
6 Choke button

OPERATING LEVERS

1. Throttle twist grip (Fig. 1, No. 1)
On the right-hand side of the handlebar, it actuates (Fig. 2) the carburettor (adjustable bowden cable).

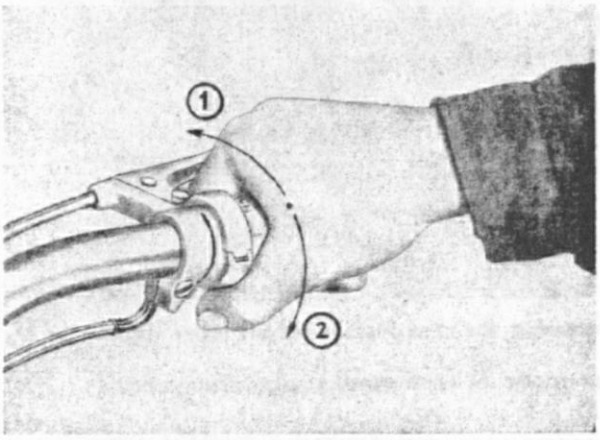


Fig. 2: Operating the throttle twist grip
1 Shutting throttle 2 Opening throttle

2. Hand brake lever (Fig. 1, No. 2)
On the right-hand side of the handlebar, it actuates the front wheel brake (adjustable bowden cable).

3. Clutch lever (Fig. 1, No. 3)
On the left-hand side of the handlebar, it engages the clutch (adjustable bowden wire).

4. Gearshift twist grip (Fig. 1, No. 4)
On the left-hand side of the handlebar, it serves to change speed (two adjustable bowden cables). Positions: 1st speed ("1"), Neutral ("0"), 2nd speed ("2"), can be engaged only when clutch lever is operated. Speed should be changed only while the engine is running or the Mo-Ped moving.

5. Dimmer switch (Fig. 1, No. 5)
On the left-hand side of the handlebar, it serves to switch on and off bright light and passing light.

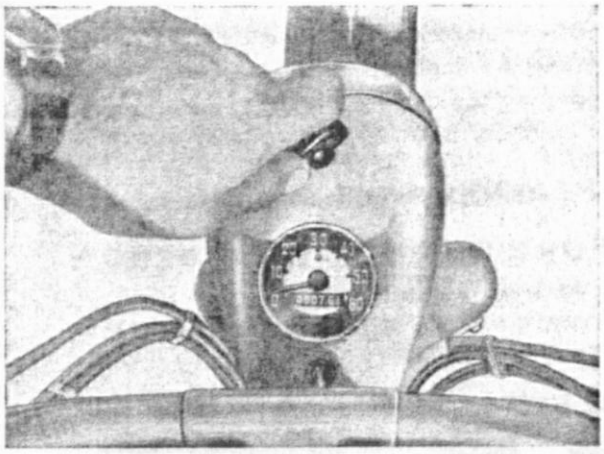


Fig. 3: Operating the head lamp switch

6. Choke button (Fig. 1, No. 6)
In the middle of the handlebar, it operates the choke (bowden wire).

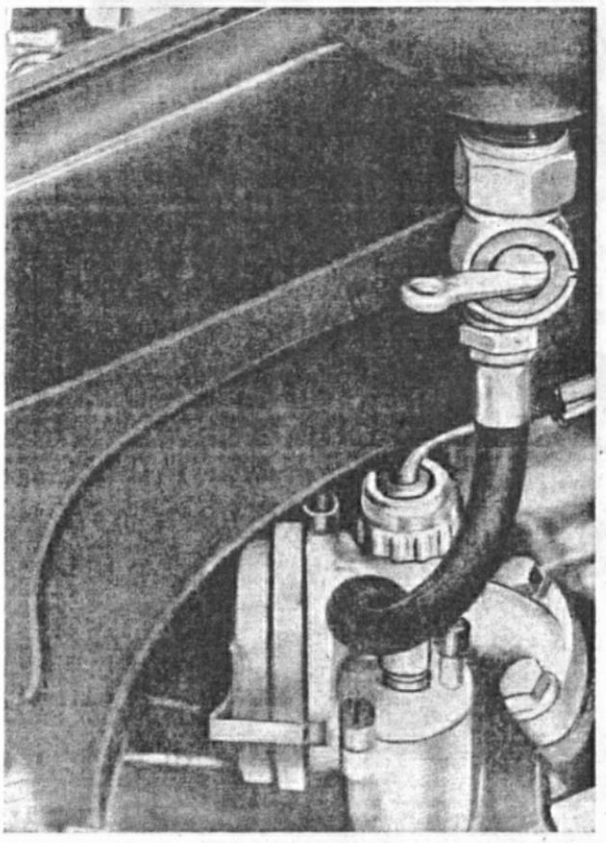


Fig. 4: Fuel cock in "Reserve" position

7. Head lamp switch (Fig. 3)
On the head lamp, for switching it on and off.

8. Fuel cock (Fig. 4)

In the right-hand bottom of the fuel tank. Positions: "Off" (Fig. 16), "On" (Fig. 12), and "Reserve" (Fig. 4). You can go 8—10 km (5—6 miles) on the fuel reserve.

9. Pedals

Situated on crankcase. Their functions are:

(a) Starting the engine

(b) Operating the coaster brake

(c) For auxiliary treading on upgrades above 20%

(d) For pedaling without the engine.

BEFORE RIDING THE MO-PED

A. Check oil level in gearbox:

1. Unscrew dipstick (Fig. 5), wipe it dry, screw it in and out repeatedly.

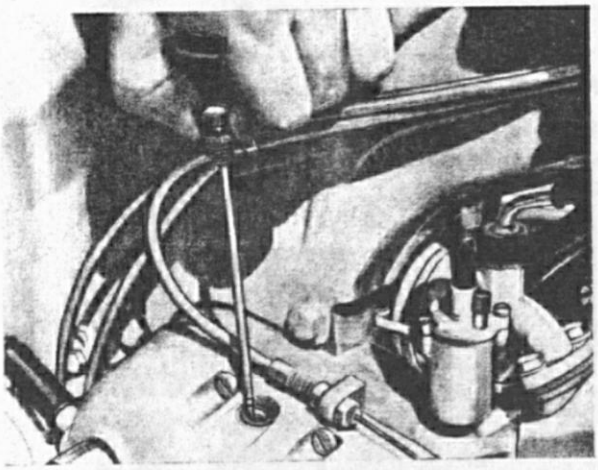


Fig. 5: Measuring oil level with dipstick

2. Oil quantity is correct when oil level is between the marks.

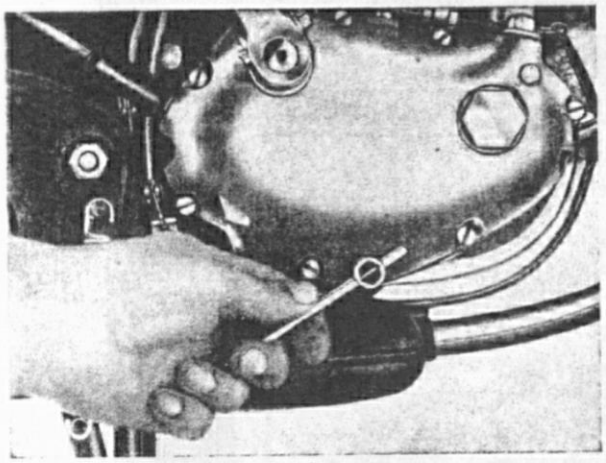


Fig. 6: Drain plug for transmission oil

3. If the oil level is below the bottom mark, fill up with Allstate oil or equivalent:
SAE 40—50 in summer; SAE 20—30 in winter.

4. If the oil level is above the top mark, loosen drain plug (Fig. 6), drain a little oil, wipe dipstick before measuring oil level again.
Screw up dipstick completely every time you measure the oil level.

B. Check oil level in telescope fork:

1. Loosen both clamp screws (Fig. 7) by 2—3 turns.

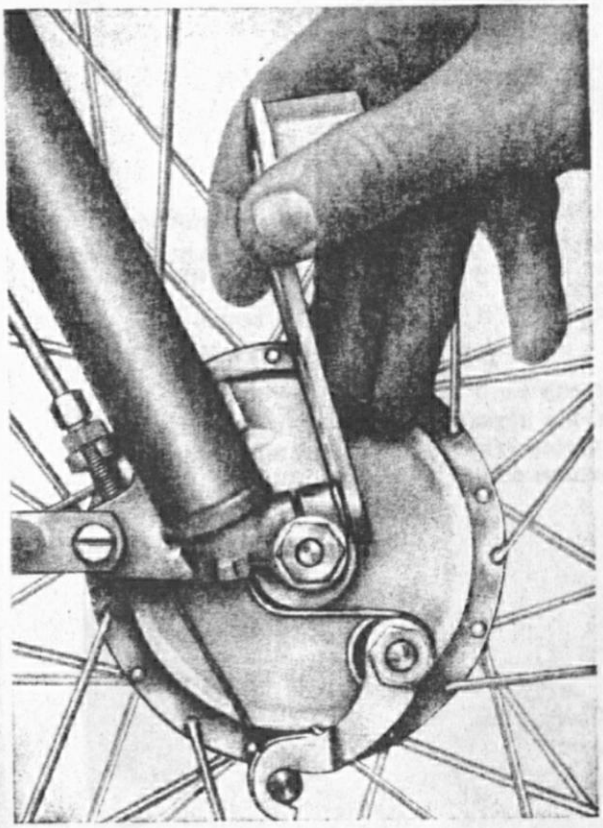


Fig. 7: Loosening the clamp screw of the front wheel

2. Loosen nuts of the spring supporting bolts (Fig. 8).

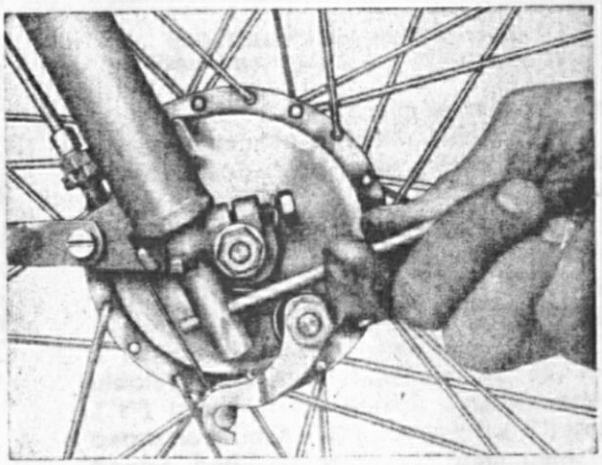


Fig. 8: Loosening the spring supporting bolt in the telescope front fork

3. Press spring supporting bolts upwards.
4. If oil issues, tighten nuts immediately.
5. If no oil issues:

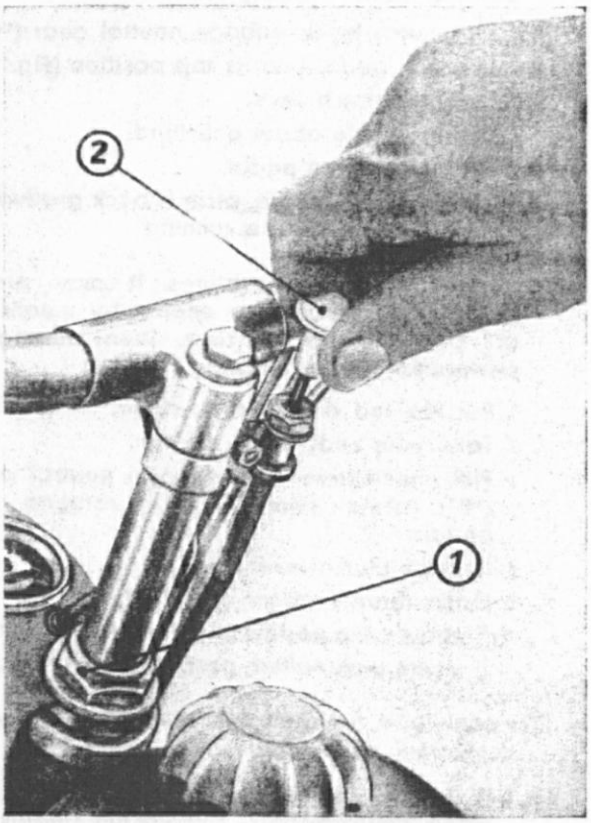


Fig. 9: Handlebar tube
1 Fork tube nut 2 Choke button

(a) Unscrew fork tube nut (Fig. 9, No. 1).
(b) Remove holding screws (Fig. 10).

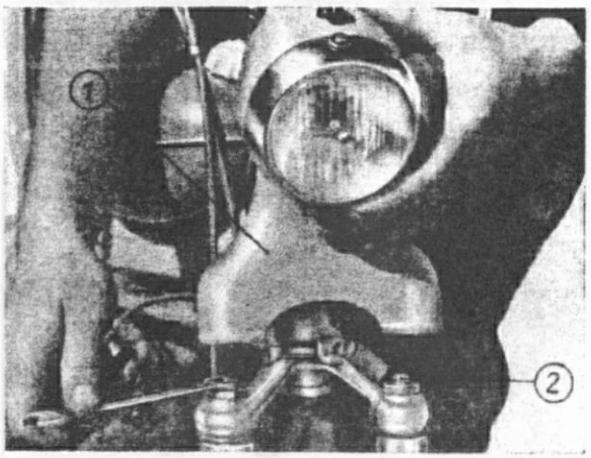


Fig. 11: Unscrewing the oil screws of the telescope front fork
1 Head lamp bracket 2 Oil screws

(c) Pull head lamp bracket upwards (Fig. 11, No. 1).
(d) Unscrew oil screws (Fig. 11, No. 2).
(e) Fill 40 c.c. of engine oil into each fork leg, using SAE 30 oil in summer, SAE 20 oil in winter.

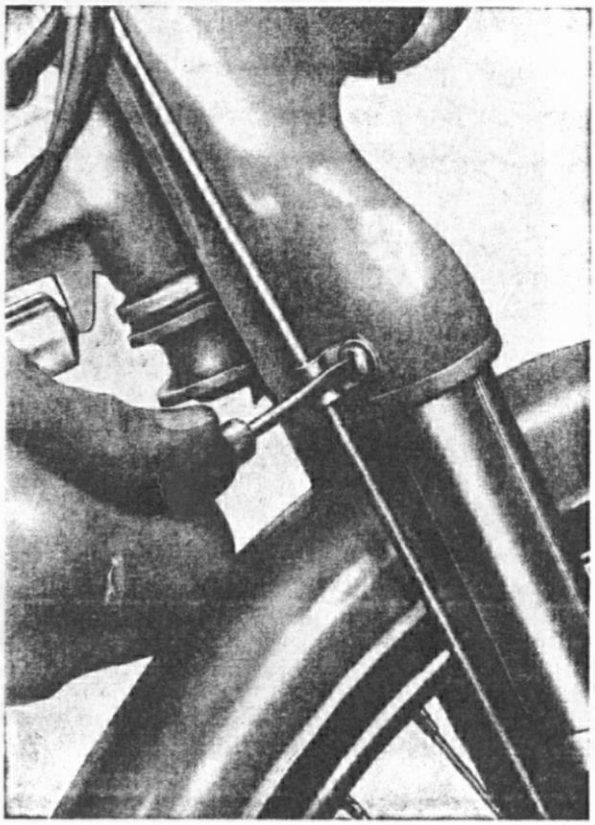


Fig 10: Unscrewing the retaining screws of the head lamp bracket

C. Check tire pressure:

Front wheel 1.75 atü (= 25 lbs./squ. in.).
Rear wheel 2.25 atü (= 32 lbs./squ. in.).

D. Fill fuel tank with mixture

For the break-in period of 200 miles, add 1/2 pint of outboard motor oil, two cycle engine oil, or a good grade non-detergent SAE 40—50 motor oil to each U.S. Standard gallon of gasoline. For each Imperial gallon of gasoline, add 10 ounces of motor oil. These ratios are 1 to 16. After break-in period the mixture may be reduced to 1/3 pint of oil per U. S. Standard gallon or 7 ounces of oil for an Imperial gallon of gasoline. This ratio is 1 to 24. It is very important to observe the increased quantities of oil to be used in the gas-oil mixture during the break-in period.

Attention! Never fill up with pure gasoline!

OPERATING INSTRUCTIONS

A. Open fuel cock (Fig. 12).

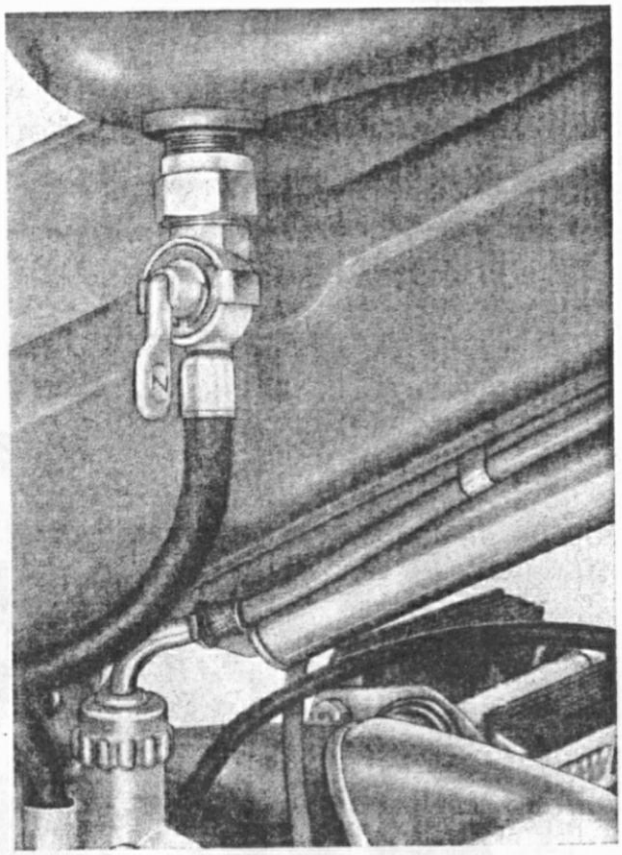


Fig. 12: Fuel cock in "On" position

B. Pull choke button (only when starting from cold) (Fig. 9, No. 2).

On very cold days depress tickler — situated on float chamber cover — for a short period.

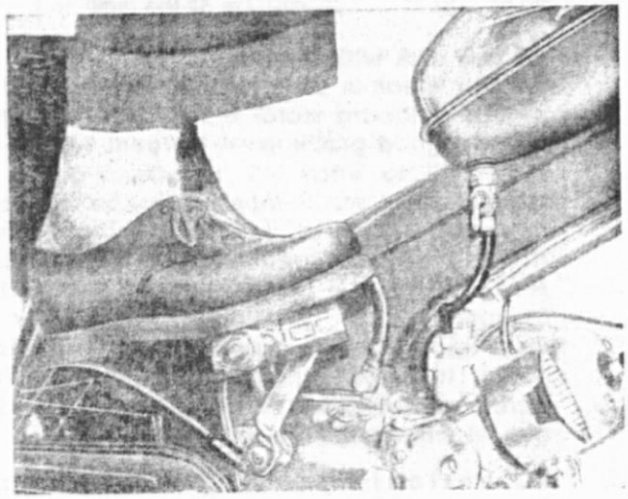


Fig. 13: Pedals in starting position

C. Starting the engine

I. On the stationary Mo-Ped the easiest way of starting is the following one:

1. Pull clutch lever, engage neutral gear ("0").
2. Get one pedal into its top position (Fig. 13).
3. Release clutch lever.
4. Open throttle about one third.
5. Step smartly on pedal.
6. If choke was pulled, push it back gradually, as soon as engine is running.

II. At very low temperatures it may prove necessary to crank the engine by means of the pedals for some time. Then starting is performed in the following manner:

1. Put Mo-Ped on the prop-stand.
2. Take your seat in the saddle.
3. Pull clutch lever and engage neutral gear ("0") while simultaneously rotating the pedals.
4. Release clutch lever.
5. Open throttle about one third.
6. Tread on the pedals until the engine starts.
7. If choke was pulled, push it back gradually.

III. Finally, you can start your Mo-Ped in the way customary with other makes of Mo-Peds:

1. Pull clutch lever, engage 2nd speed ("2"), while simultaneously turning the pedals.
2. Get on and begin to pedal as on a bicycle, while pulling the clutch lever, then slowly release clutch lever.
3. If choke was pulled, push it back gradually.

D. Moving off (This does not apply, if engine was started according to method III, above).

1. Declutch, engage 1st speed (Fig. 14).

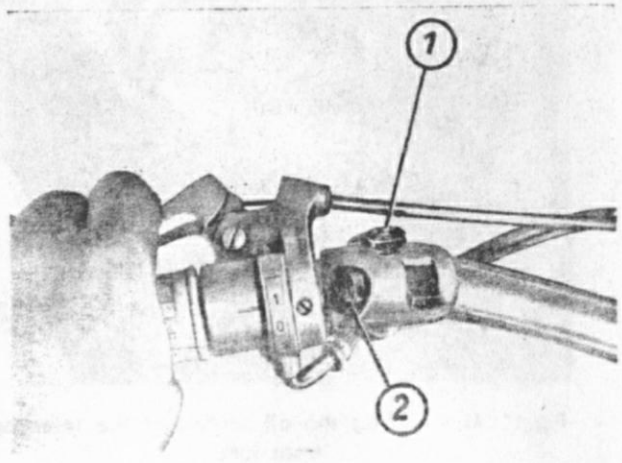


Fig. 14: Engaging the 1st speed

2. Slowly release clutch lever, open throttle at the same time.
3. Put feet on pedals, do not pedal backwards!
4. Open throttle still wider, until normal cycling speed (about 15 km.p.h. = 9 m.p.h.) is reached. The 1st speed, which you are using now, serves for starting and going uphill. For riding in the normal way the 2nd speed is used.

E. Changing into second gear (This does not apply, if the engine was started according to method III, above.)

1. Throttle down.
2. Pull clutch lever at once, bring 2nd gear into engagement.
3. Release clutch lever.
4. Open throttle.

Continue to open throttle until top speed has been attained. Then turn back twist grip to about 3/4 of full throttle. The loss of speed will be hardly perceptible, whilst there will be a considerable drop in fuel consumption. Regulate speed by means of the throttle, opening it only very gradually. Jerky opening of throttle increases fuel consumption. Slow down by closing throttle never by pulling decompressor lever.

Braking: The Mo-Ped has two brakes of ample dimensions. Normally the rear wheel brake is used. This is done by pedaling backwards. In an emergency, or when going downhill, simultaneously apply the front wheel brake, but with caution! While riding downhill, keep 2nd speed engaged and do not declutch!

F. Changing down

1. Throttle down.
2. Pull clutch lever, engage 1st speed.
3. Release clutch lever.
4. Open throttle quickly.

When to change down:

1. When the speed drops perceptibly on upgrades.
2. When you have to ride slowly, e. g. in town traffic.

G. Stopping

1. Throttle down.
2. Apply brake.
3. Shortly before stopping pull clutch lever, change into neutral.
4. Release clutch lever.

If you wish to stop the engine:

5. Press down short circuit button (Fig. 14/1).
6. Shut fuel cock (Fig. 15).

H. Riding by pedaling, without using the engine

1. Declutch, engage 2nd speed, while stepping on the pedals.
2. Get on and ride Mo-Ped like a bicycle, while pulling the clutch lever.
3. Before stopping change back into neutral gear.

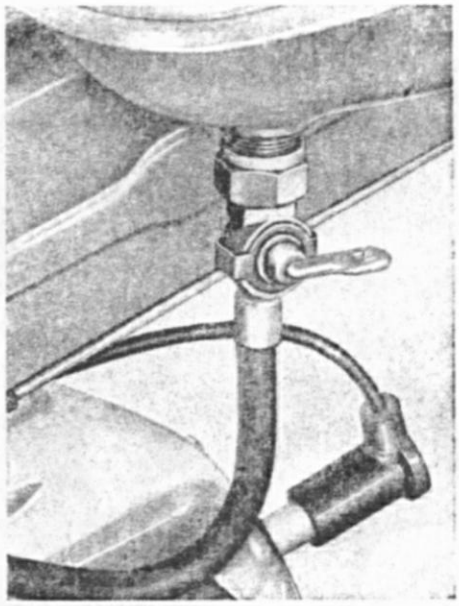


Fig. 15: Shutting the fuel cock

CARE AND MAINTENANCE

If there is any work to be done that you feel you cannot carry out yourself, turn to your Allstate agent for advice. He will only be too glad to help you.

After the initial 1000 km (600 miles)

Change oil in gearbox

1. Ride Mo-Ped until engine gets warm.
2. Remove dipstick (Fig. 5).
3. Remove oil drain screw plug (Fig. 6).
4. Drain oil.
5. Screw in oil drain screw plug.
6. Fill up with 250 c. c. of rinsing oil.
7. Screw in dipstick.
8. Start engine, let it run for a short while, and stop it.
9. Remove oil drain screw plug.
10. Drain off rinsing oil.
11. Screw in oil drain screw plug.
12. Fill gearbox with gear oil (in summer use SAE 40—50 oil, in winter SAE 20—30 oil) until notch on dipstick is reached. (Screw up dipstick completely every time you measure the oil level!)
13. Screw in dipstick.

After every 500—1000 km (300—600 miles), depending on whether the machine has been subjected great strain

Clean and oil chain

This work should be done whenever the chain is dirty or dry. The life of the chain depends on its maintenance.

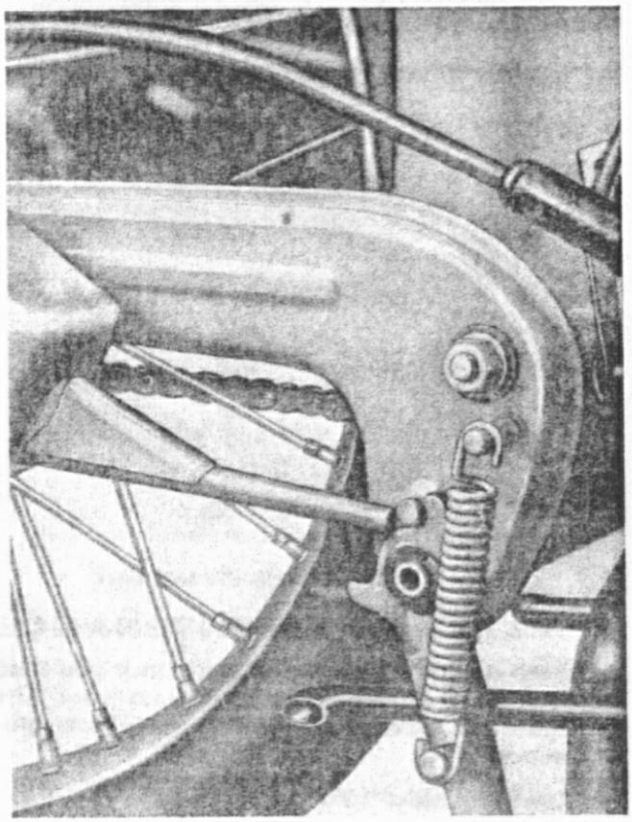


Fig. 16: Oiling the prop stand bearings

Lubricate bearings

1. Prop stand: see Fig. 16.
2. Brake and clutch levers, oil sliding surfaces of levers.
3. Throttle twist grip and throttle cable:

   Raise cover of hand lever bracket (Fig. 17), oil sliding surface of twist grip and cable ferrule opening, turn twist grip both ways several times, and replace cover.
4. Gearshift twist grip: Turn handlebar to the left, tilt Mo-Ped to the right, oil sliding surfaces.
5. Clutch operating cable: oil wire, pull clutch lever several times.
6. Choke operating cable: Pull choke, grease bolt, operate wire several times.
7. Front brake cable: oil wire.

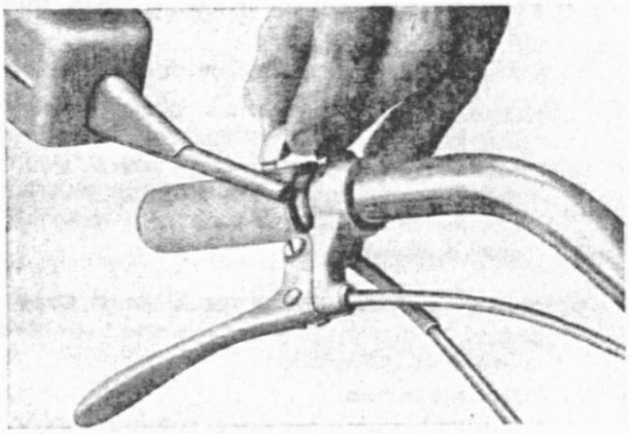


Fig. 17: Oiling the throttle twist grip

Clean air filter:

1. Remove clamp spring (Fig. 25/3).
2. Take out filter inset (Fig. 25/6).
3. Wash filter inset in pure gasoline used for cleaning.
4. Dip filter inset in engine oil for a short time and allow oil to drip off.
5. Fix filter inset by means of clamp spring.

After every 3000—4000 km (1900—2500 miles)

Check oil level in gearbox

Grease stub-axles and chain tensioning screws:

1. Stub-axles: Dismantle and oil stub-axles.
2. Chain tensioning screws: Oil their threads.

In addition to this routine maintenance these jobs have to be performed every time the wheels have been removed.

Grease hinges of swinging saddle.

Remove oily deposits from the end pipes of muffler.

Grease brake shafts.

Decarbonize exhaust port:

1. Loosen nut (Fig. 18) at bottom of engine case.

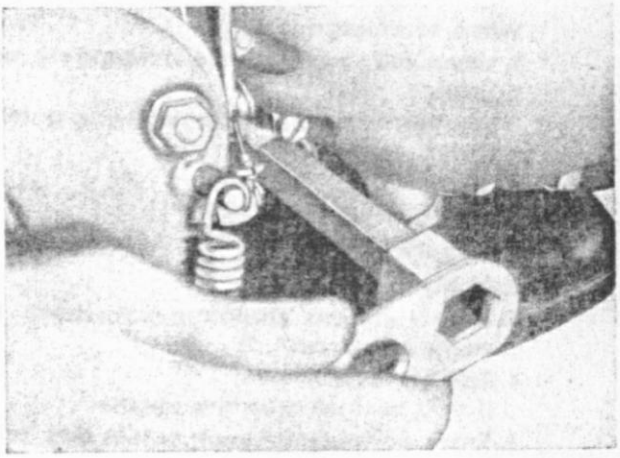


Fig. 18: Loosening the exhaust muffler

2. Unscrew exhaust pipe.
3. Turn exhaust pipe and muffler downwards.
4. Engage 2nd gear, rotate engine via rear wheel until the piston reaches its bottom dead center.
5. Cautiously remove oil carbon deposit from exhaust port, taking care not to damage piston and cylinder wall.
6. Assemble exhaust in reversed order of dismantling.

Have the lubricator felt pad of the contact breaker greased by an Allstate service station.

After the initial 6000—8000 km (3700—5000 miles)

Change oil in gear-box.
Change oil in telescope fork.

After every 12.000 km (7500 miles)

Grease bearings of road wheels.
This job should be done by a service station only.
Change oil in gearbox.

Cleaning

Cleaning is the fundamental element of all maintenance. The large, smooth surfaces of the Allstate Mo-Ped make it very easy indeed. A sharp jet of water should be avoided, as it is detrimental to the paint and involves the danger of water getting into brakes and bearings or penetrating into carburettor and ignition, thus causing trouble. The best method of exterior cleaning is to use a big, soft sponge. The dirt should first be washed off with plenty of water, since rubbing the paint with a half-dry sponge would cause tiny grains of sand to scratch the finish and destroy its lustre. The surface should be wiped dry with chamois-leather. The application of some mild paint wax after the washing is very much to be recommended, as it will preserve the attractive appearance of the vehicle for a long time.
Even the bright parts will be grateful for a modest measure of maintenance. It is advisable to clean them from time to time, especially before the Mo-Ped is laid up for the winter. After the cycle has been operated for some time, the engine case will be dirty. The simplest way of cleaning it is washing with a tepid solution of some soap flakes or washing lotion.

Changing (cleaning) the spark plug

1. Remove spark plug cable from spark plug.
2. Unscrew spark plug by means of spark plug spanner (Fig. 19).

(3. Clean electrodes.)

Test spark plug (4.—7.)

4. Put spark plug socket on new (cleaned) spark plug.
5. Place plug thread against a bright engine part ("ground it").

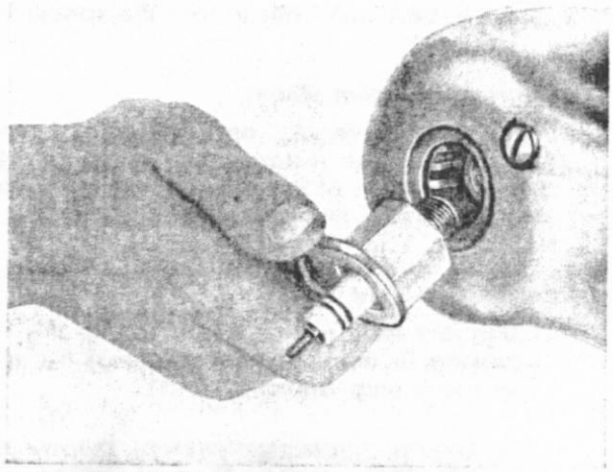


Fig. 19: Unscrewing the spark plug

6. Rotate engine by means of pedals. Powerful sparks must now jump from electrode to electrode. If this is not the case, the electrodes must be cleaned, or their gap corrected.
7. Take off spark plug cable.
8. Screw in spark plug 2—3 turns by hand.
9. Tighten spark plug with spark plug spanner.
10. Put on spark plug cable socket.

Removal of Front Wheel

1. Unscrew lock nut of stub-axle (on the right, looking in the direction of riding) by means of spark plug wrench (Fig. 20).
2. Loosen both clamp screws at the fork lugs (Fig. 7) with spark plug wrench.

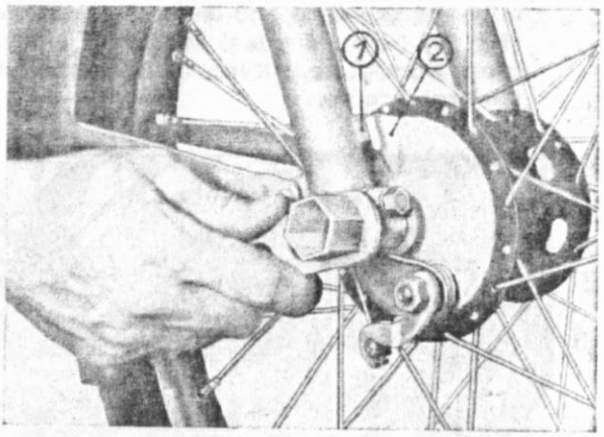


Fig. 20: Unfastening the stub-axle lock nut of the front wheel

1 Brake stop nose
2 Recess in the brake back plate (for brake stop nose)

3. Insert mandrel in the cross-bore hole of the left-hand stub-axle end, pull out axle, and raise Mo-Ped, so that front wheel drops out. Detach brake back plate, but leave it hanging from brake cable. If there is no speedometer

drive, be careful not to lose the spacer bushing (left).

Inserting the Front Wheel

Proceed in reversed order. Before installing brake back plate restore brake return spring. Fit brake stop nose of right fork tube (Fig. 20, No. 1) into recess on the brake back plate (Fig. 20, No. 2).

Removal of Rear Wheel

1. Unscrew lock nut of stub-axle (on the right, looking in the direction of riding) by means of spark plug wrench (Fig. 21).

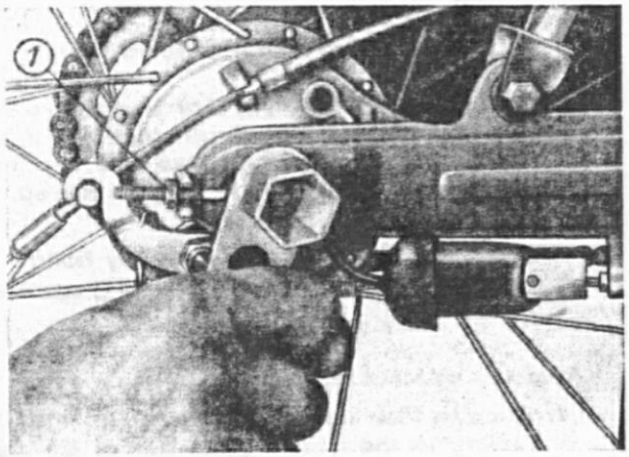


Fig. 21: Unscrewing the stub-axle lock nut of rear wheel
1 Nut of chain tensioning screw

2. Insert mandrel in the cross-bore hole of the left-hand stub-axle end and pull out stub-axle (Fig. 22). Now the wheel will drop out. Detach brake back plate, but leave it suspended from the brake cable.

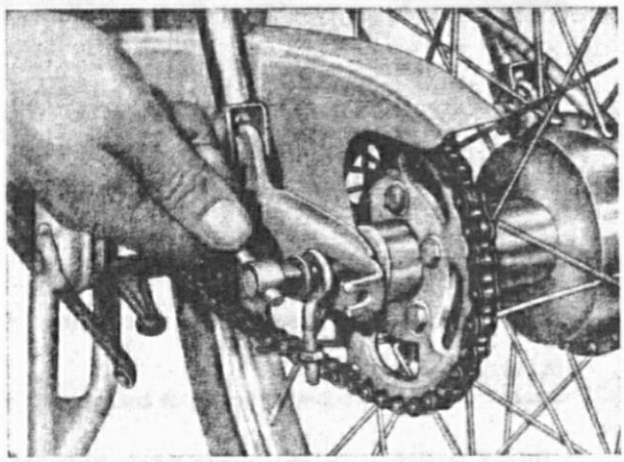


Fig. 22: Removal of rear wheel

3. Put chain over the end of the swing fork arm (Fig. 23), do not allow it to drop to the ground.

Inserting the Rear Wheel

Proceed in reversed order of dismantling. When installing the stub-axle do not forget to pass it through the eyes of the chain tensioning screws. Fit brake stop bolt on the right-hand fork arm into recess on the brake back plate (Fig. 23, No. 1).

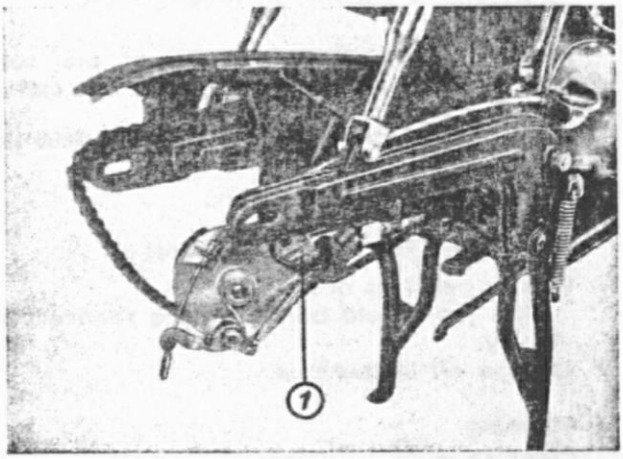


Fig. 23: Chain and brake back plate after removal of rear wheel
1 Recess in the brake back plate (for brake stop bolt)

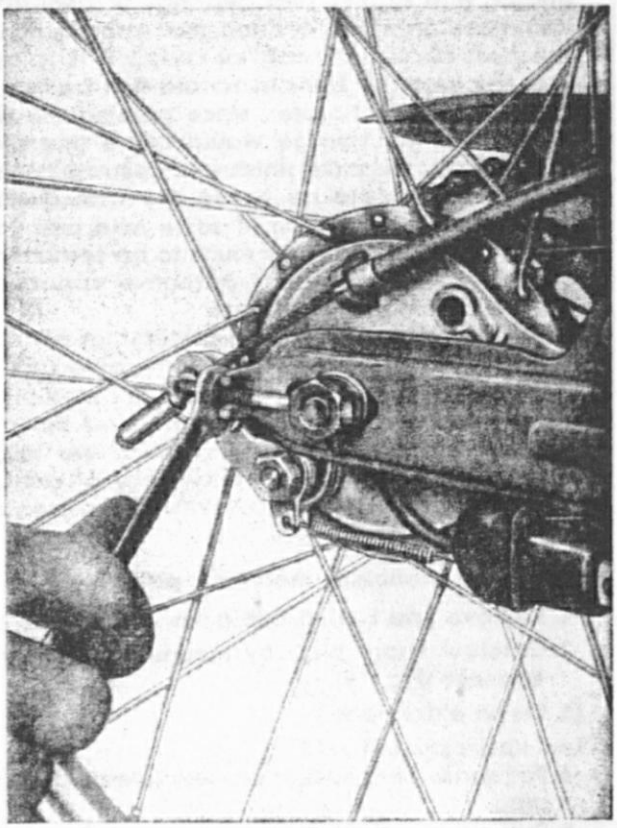


Fig. 24: Chain tensioning

Chain Tension

You must be able to move the chain up and down easily for 10—15 mm (0.4—0.6 in.) half-way between front and rear chain sprockets.

1. Loosen lock nut of stub-axle (Fig. 21).
2. Tighten both chain tensioning nuts (Fig. 24) by an equal number of turns until chain tension is correct. If the chain is too tightly stretched, both chain tensioning nuts have to be loosened slightly, but always by an equal number of turns. Before tightening the stub-axle lock nut, make sure that the distance between wheel and fender part of the frame is the same on both sides.

Clutch Adjustment

The clutch release lever (Fig. 25, No. 1) attached to the crankcase cover must have a play of 2—3 mm (0.08—0.12 in.) measured on the outside.

1. Hold clutch cable adjusting sleeve (Fig. 25, No. 2) at the eye of the crankcase cover.
   If the clutch has excessive play, proceed as follows (2a—4a):
   2a) Loosen forward check nut (Fig. 25, No. 3) by a few turns.
   3a) Turn rear check nut (Fig. 25) in the same direction until play is correct.
   4a) Retighten forward check nut.
   If the clutch has too little play, proceed as follows (2b—4b):
   2b) Loosen rear check nut (Fig. 25, No. 4) by a few turns.
   3b) Turn forward check nut (Fig. 25, No. 3) in the same direction until play is correct.
   4b) Retighten rear check nut.

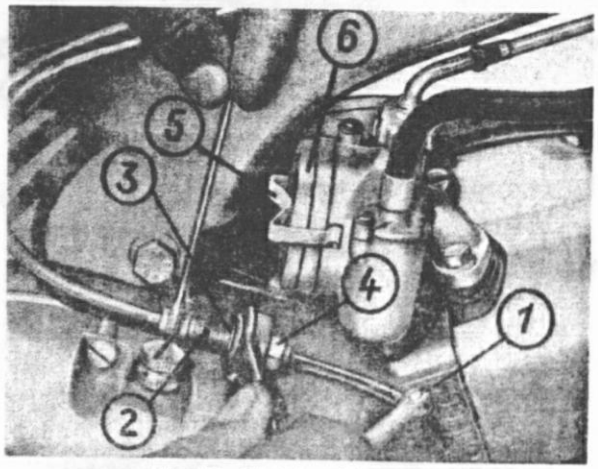


Fig. 25: Clutch adjustment

1 Clutch operating lever
2 Clutch adjusting sleeve
3 Forward check nut
4 Rear check nut
5 Springshackle
6 Air-Filter

Brake Adjustment

a) Front wheel brake
   You should not be able to pull the brake hand lever so far that it touches the grip.
   1. Loosen the check nut (Fig. 26, No. 1) of the brake adjusting sleeve near the brake back plate.
   2. Go on unscrewing brake adjusting sleeve (Fig. 26, No. 2) until brake has correct grip. If the adjusting sleeve has been unscrewed too far so that the brake catches, it should be screwed up a little again.
   3. Hold adjusting sleeve and retighten check nut.

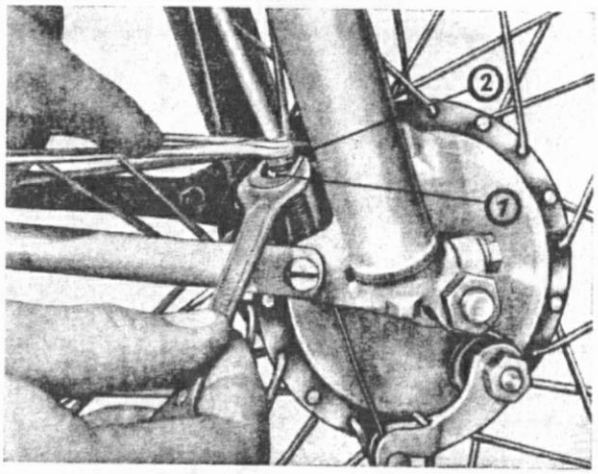


Fig. 26: Adjustment of front wheel brake
1 Check nut 2 Brake adjusting sleeve

b) Rear wheel brake
   Adjustment to increase braking effect is unnecessary. Only if the brake catches, it should be adjusted in the following way:
   1. Slip back rubber collar (Fig. 27, No. 1).
   2. Loosen check nut (Fig. 27, No. 2) of the brake adjusting sleeve by means of 11 mm wrench.
   3. Unscrew adjusting sleeve (Fig. 27, No. 3) until brake stops catching.
   4. Hold brake adjusting sleeve with spanner and retighten check nut.
   5. Pull rubber collar over adjusting sleeve.

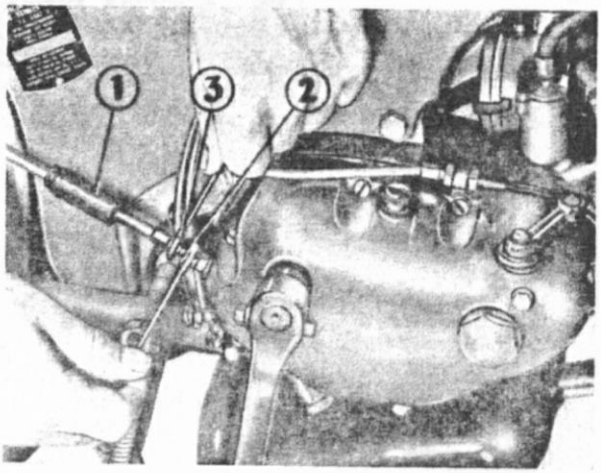


Fig. 27: Adjustment of rear wheel brake
1 Rubber collar 2 Check nut 3 Brake adjusting sleeve

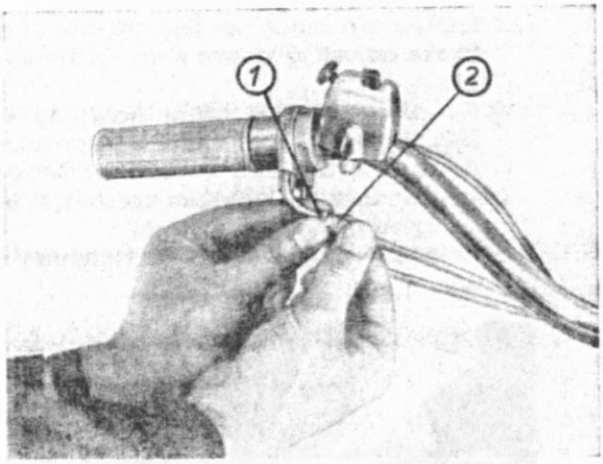
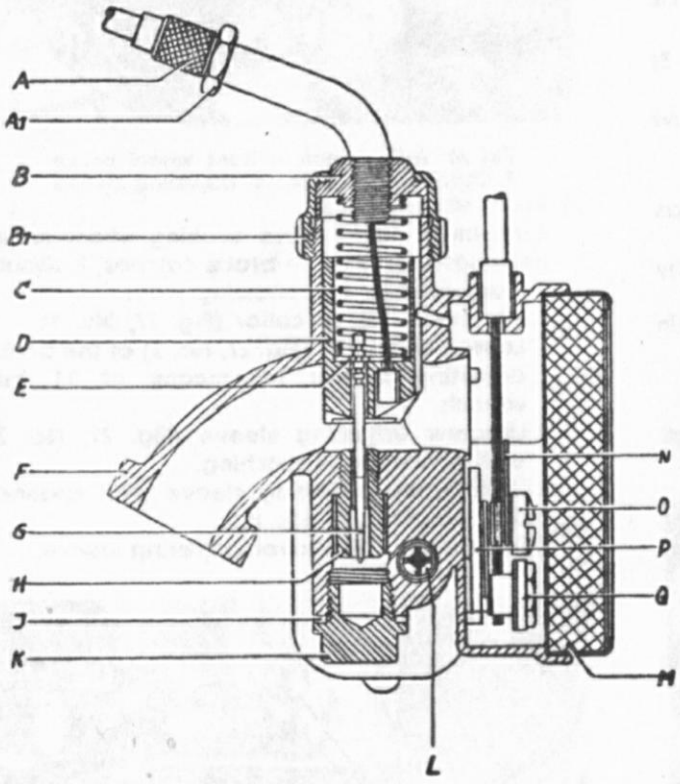


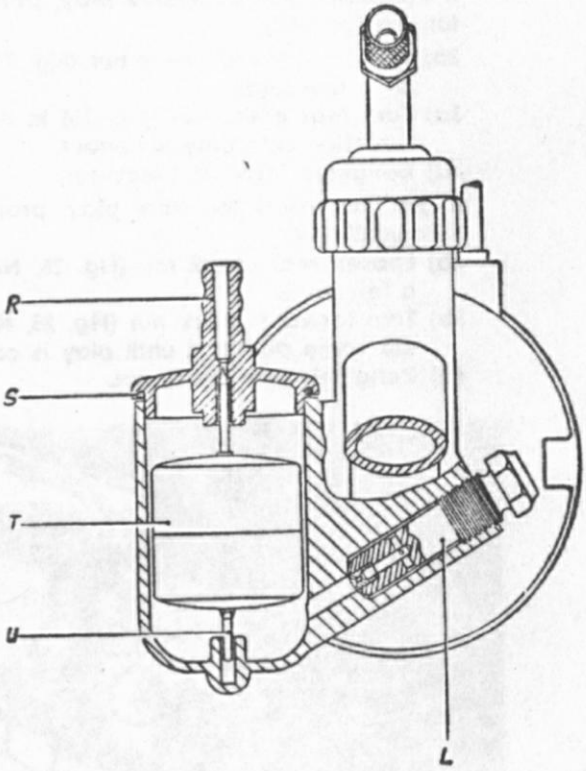
Fig. 28: Adjustment of gearshift device
1 Check nut; 2 Cable adjusting screw

Gearshift Adjustment

1. Put machine on stand.
2. Bring gearshift twist grip into "0" position. You must be able to turn the rear wheel freely, without any grating noise in the gearbox.
3. Now operate clutch lever, turn gearshift twist grip about 2 mm backwards and forwards and see if, within this range, the rear wheel can be moved freely, and without any grating noise in the gearbox.
4. To adjust the gearshift, i. e. to eliminate any grating noise, use the two cable adjusting screws (Fig. 28).

CARBURETTOR





A Set screw
A1 Nut
B Top piece
B1 Screw cover
C Throttle slide spring
D Throttle slide
E Spring disc
F Carburettor housing
G Valve needle
H Needle valve
J Seal ring
K Screw plug
L Nozzle
M Filter inset
N Torsion spring
O Connecting screw
P Choke
Q Nipple
R Float chamber cover
S Rubber gasket
T Float
U Float needle

Cleaning the Main Jet

1. Unscrew main jet (Fig. 29).
2. Clean main jet either by blowing through it or by means of a bristle. Never use a piece of wire!
3. Install main jet and tighten it with feeling.

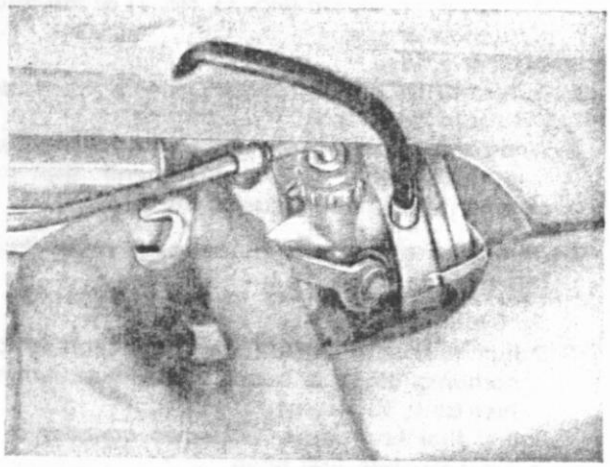


Fig. 29: Unscrewing the main jet

Control of Carburettor Float

1. Loosen holding-down screws of float chamber cover (Fig. 30, No. 1).
2. Cautiously lift off float chamber cover, taking care not to damage the needle point. If necessary, clean valve seat in the cover.
3. Take out float with needle.
   If the needle is not in its notch, shift it until it registers. Test needle point for perfect condition. Exchange float if it leaks.
   Assemble in reversed order of dismantling. When putting on the float chamber cover, first fit the valve seat on the needle point.

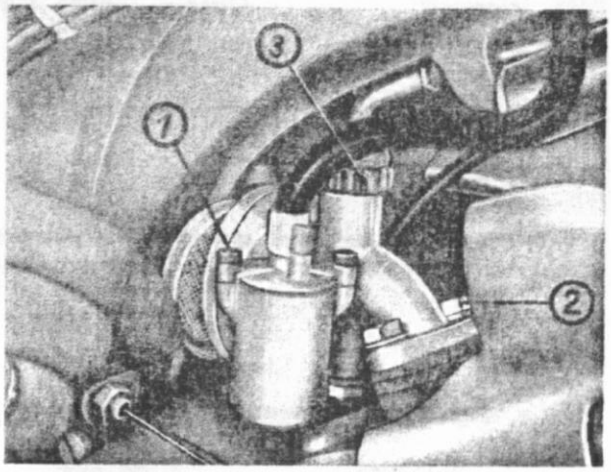


Fig. 30: Dismantling the carburettor

1 Holding-down screw of the float chamber cover
2 Fastening screw of carburettor
3 Screw cover

Cleaning the Carburettor

1. Unscrew fastening screws (Fig. 30, No. 2) of carburettor.
2. Remove carburettor to the right. Take care not to lose the two intermediate flanges and the two gaskets.
3. Unscrew screw cover (Fig. 30, No. 3).
4. Pull out throttle slide (Fig. 31, No. 1) together with valve needle and compression spring.

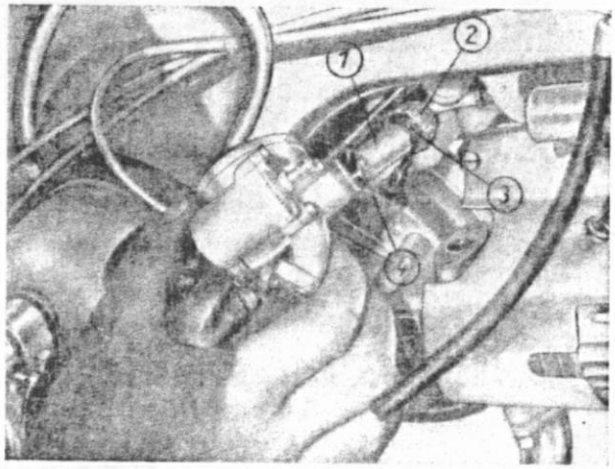


Fig. 31: Further dismantling of the carburettor

1 Throttle slide
2 Screw cover
3 Compression spring
4 Valve needle

5. Press together screw cover (Fig. 31, No. 2) and throttle slide (Fig. 31, No. 1), push cable into the bore'-hole (Fig. 32, No. 1) of the throttle slide, and pull out cable with spring (Fig. 31, No. 3) and screw cover.
6. Remove valve needle (Fig. 31, No. 4) together with clamp spring. Clean all parts; if necessary, change clamp spring, clamp needle into second notch from the top and fit it into the needle hole of the throttle slide (Fig. 32, No. 2). Assemble carburettor in reversed order of dismantling.

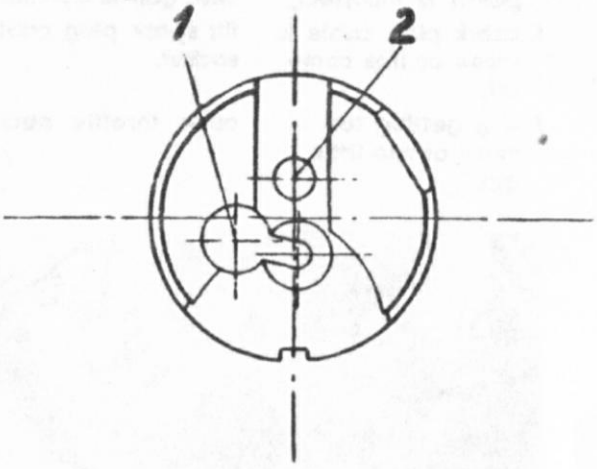


Fig. 32: End view of throttle slide

1 Bore'-hole
2 Bore for needle

Adjusting Gas for Idling

It is important that the engine, when in neutral gear, goes on running regulary.

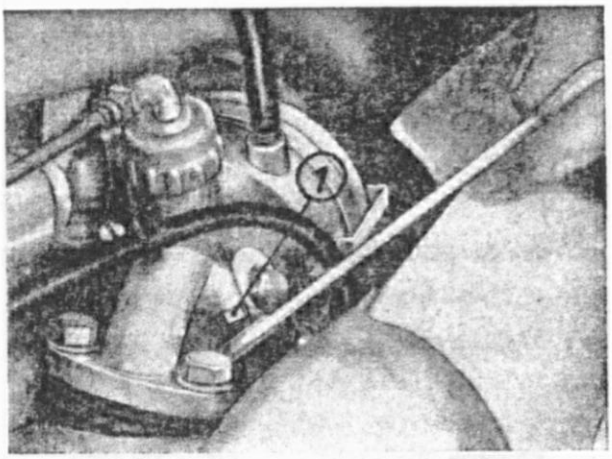


Fig. 33: Adjusting gas for idling
1 Check nut

1. Loosen check nut (Fig. 33, No. 1) of the throttle slide stop screw.
2. Start engine.
3. Turn throttle control twist grip right down ("Throttle down").
4. When the engine threatens to stall, screw up throttle slide stop screw until the warm engine "ticks over" regulary (Fig. 33).

Cleaning the fuel hose (fuel tank may be drained fort this purpose).

1. Shut fuel cock.
2. Pull fuel hose from its top connection, drain contents of hose into a clean vessel; empty fuel tank, if necessary.
3. Pull fuel hose from its bottom connection.
4. Blow through fuel hose.

WHEN IN DIFFICULTIES...

The engine fails to start; the running engine stalls...

because	do this:
1. the fuel cock is shut,	open fuel cock (Fig. 12), or switch it over to "Reserve" (Fig. 4).
2. the fuel tank is almost or completely empty,	switch fuel cock over to "Reserve" (Fig. 4), or fill up with mixture.
3. spark plug has become dirty,	clean spark plug.
4. spark plug is defective,	change spark plug.
5. gap of breaker points is incorrect,	bend ground electrode until gap is 0.5 mm.
6. spark plug cable is loose or has come off,	fix spark plug cable socket.
7. it is getting too much or too little gas,	open throttle about 1/8.
8. (a) the Mo-Ped was leaning against some object and has fallen down, or (b) the choke was pulled although the engine was warm,	start engine according to method III. If the engine is badly flooded, drain fuel mixture from crankcase by loosening oil drain plug (Fig. 34).
9. the fuel pipe is clogged,	blow through the fuel pipe.
10. the fuel cock is clogged,	have it cleaned by an Allstate service station.
11. the main jet is clogged,	clean main jet.
12. there are foreign bodies in the valve seat of the float needle,	clean valve seat.
13. the float needle is not in the notch,	dismantle float move needle until it registers in the notch.

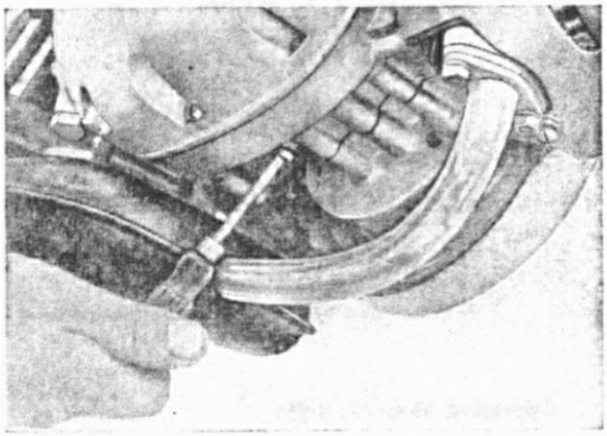


Fig. 34: Oil drain screw plug in crankcase

The engine runs irregularly or intermittently...

because	do this:
1. there is too little fuel in the tank,	turn fuel cock to "Reserve" (Fig. 4), fill up with fuel mixture.
2. the carburettor is loose,	tighten carburettor holding screws.
3. the float leaks,	exchange the float.
4. the spark plug cable is loose,	fix spark plug cable socket.
5. the spark plug is defective,	change spark plug.

6. the jet needle is loose,	clamp needle into second notch from the top.
7. the mixture is faulty,	empty fuel tank, fill up with correct mixture, ratio 1 to 24 (= 4%).

Poor Performance

because	do this:
1. chocke is perpetually pulled out,	push back choke.
2. exhaust is clogged,	remove oily deposits from exhaust.
3. the carburettor is loose,	tighten holding screws of carburettor.
4. the spark plug is defective,	change spark plug.
5. the brakes catch,	adjust the brakes.
6. the clutch slips,	adjust clutch.
7. the exhaust port is clogged,	decarbonize exhaust port.
8. the float leaks, the float needle is deformed (jams),	check, and if necessary, exchange parts of the float chamber.
9. the jet needle is loose,	clamp needle into second notch from the top.
10. the air filter is clogged,	clean air filter.
11. the fuel mixture is faulty,	empty fuel tank, fill up with correct mixture, ratio 1 to 25 (= 4%).

An useful word of advice

Unless you are an expert yourself, you will not be able to detect certain defects at once. But the trained mechanic will save you unnecessary expense by some small repair work. So bring your machine overhauled thoroughly after every 2000 miles or so. Our mechanics will go over it, and if necessary, decarbonize the engine. Have your machine overhauled thoroughly after every 6000 miles.

Lubrication Table

1. Fuel tank	Mix engine oil with fuel at a ratio of 1 in 25 (= 4%), using SAE 50 oil in summer and winter.
2. Gearbox	Change oil after the initial 1000 km (600 miles), check oil level every 3000—5000 km (2000 bis 3000 miles). Change oil after the initial 6000—8000 km (4000—5400 miles). Change oil every 1200 km (7500 miles).
3. Chain	To be cleaned and greased every 500—1000 km (300—600 miles).
4. Center stand	Every 500—1000 km (300—600 miles).
5. Brake-, clutch- and throttle-cable	Every 500—1000 km (300—600 miles) with engine oil.
6. Hand levers	Grease sliding surfaces every 500—1000 km (300—600 miles).
7. Speedometer drive	Every 1000 km (600 miles) with grease gun.
8. Brake shafts	Every 3000—5000 km (2000—3000 miles).
9. Contact breaker	Every 3000—5000 km (2000—3000 miles) have the lubricator felt pad greased by an authorized workshop.
10. Linchpins	Every 3000—5000 km (2000—3400 miles) lubricate threads.
11. Chain tighteners	Every 3000—5000 km (2000—3400 miles) lubricate threads.
12. Air filter	Every 3000 km (2000 miles) clean and lubricate filter element.
13. Telescopic shock absorber	Grease them with a grease gun after every 3000 km (1800 miles).

Spark plug

Use Allstate-spark plugs only (No. 60410).
The most suitable electrode gap is 0.5 mm (0.02 in.)I

We hope that in this booklet we have given you all the advice you need to get real enjoyment out of riding your new machine. And now we wish you a

HAPPY JOURNEY!

REPAIR INSTRUCTIONS

PREFACE

This repair manual is not supposed to be a text-book for beginners, but a book of reference for the workshop and the experienced rider of a Mo-Ped. We have therefore omitted all those explanations which are obvious to the expert. In the first place we want to show how to go about repairs in a professional way. This will save the repair shop time and money.

THE ENGINE

I. Removing the Engine from the Frame:

1. Detaching the control cables:

a) Clutch cable: Loosen cable by pressing the declutching lever (Fig. 5/1) at the engine case against the cable end, detach cable, unscrew nut of adjusting screw, and pull out the latter.

b) Gearshift control cable: Loosen adjusting nuts on handlebar as well as lower adjusting angle (Fig. 19/1), whereupon both wire ends can be detached.

c) Brake cable: Unhitch cable covering at lug of brake back plate (Fig. 26/1).

2. Removal of Carburettor:
Unscrew both fastening screws, pull carburettor out of connecting sleeve and either leave carburettor hanging from the cables or detach choke control cable after unscrewing the clamping screw (Fig. 1/1), pull out throttle slide, and detach carburettor after shutting the fuel cock and pulling off the fuel pipe.

3. Exhaust pipe:
Unscrew the two nuts at the cylinder, pull pipe from the two studs, and turn pipe downward.

4. Remove both pedals:
Unscrew screw from cotter, knock out cotter (by means of a copper mallet). Mark pedals to avoid confusing them.

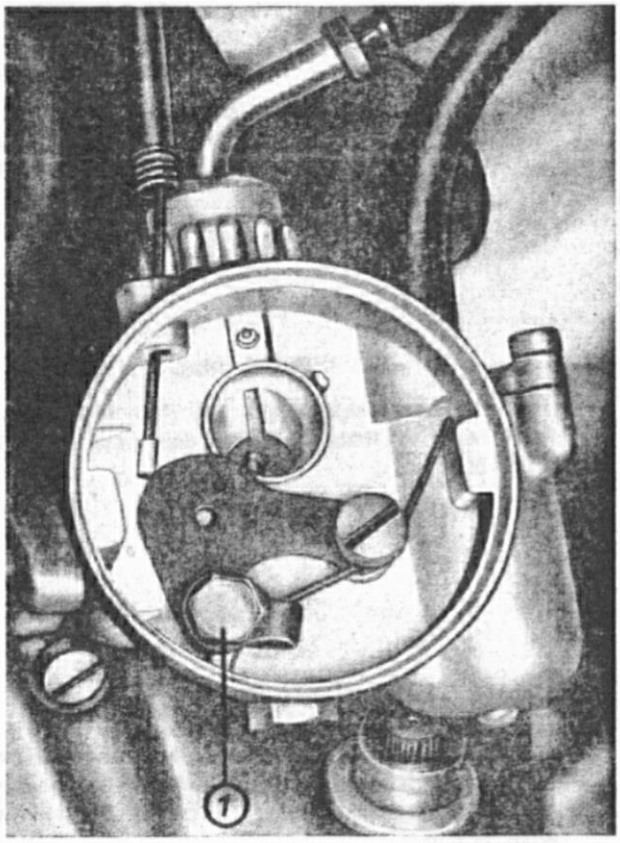


Fig. 1: Removing the carburettor
1 Clamping screw of choke control cable

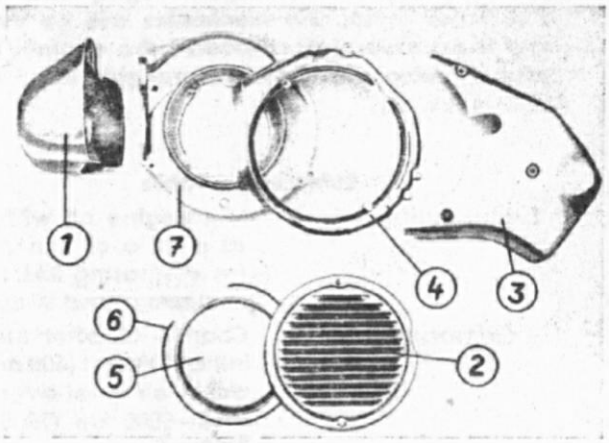


Fig. 2: Exploded view of engine cowling and blower housing

1 Blower hood
2 Blower louver cover
3 Fairing plate
4 Blower housing
5 Cover plate
6 Wire ring
7 Base plate

5. Removal of blower hood (Fig. 2/1):
Unscrew the four fixing bolts and take off hood.
6. Removal of blower louver cover (Fig. 2/2):
Unscrew two screws and lift off cover.
7. Removal of fairing plate (Fig. 2/3):
Unscrew three screws and lift off fairing plate.
8. Removal of chain:
Unscrew chain connecting link and pull off chain (gears must be in neutral position!).
9. Disconnect light cable.
10. Unscrew engine fixing bolts:
Unscrew three nuts, pull out bolts, detach exhaust.
11. Detach engine from frame.

II. Dismantling the Engine:

Blower and Flywheel Magneto

Place engine on work bench, its left side up.

1. Remove blower housing (Fig. 2/4) by unscrewing four screws.
2. Remove the cover plate (Fig. 2/5). Detach wire ring (Fig. 2/6), turn and take off cover plate.
3. Detach the flywheel magneto (Fig. 3). Unscrew nut screw on extractor (spezial tool

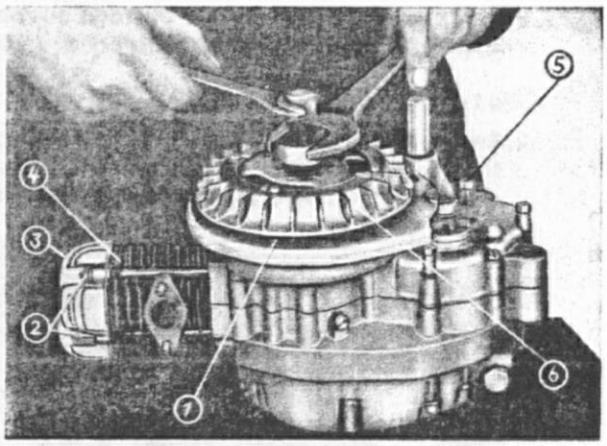


Fig. 3: Extracting the flywheel magneto

1 Base plate
2 Cylinder-head cap screws
3 Cylinder-head
4 Cylinder
5 Hexagon head screws
6 Flywheel magneto with blower fan

No. 050.7012), and extract flywheel, taking care of the roller.

4. Unscrew the base plate (Figs. 2/7 and 3/1). Unscrew four screws and take off base plate.
5. Remove spark plug cable socket.
6. Remove the armature plate.
Mark relative position of armature plate and engine case, unscrew three screws (Fig. 17/1) and remove armature plate.

Cylinder and Piston

1. Unfasten cylinder-head cap screws (Fig. 3/2), lift cylinder-head (Fig. 3/3).
2. Detach cylinder (Fig. 3/4). (Do not allow the piston to knock against the crankcase, as this may damage the piston!)
3. Remove circlip from piston (Fig. 4) by a rotary movement, using flat-nose pliers (Fig. 4/1), push out gudgeon pin, and detach piston. (Do not knock out the gudgeon pin forcefully!)

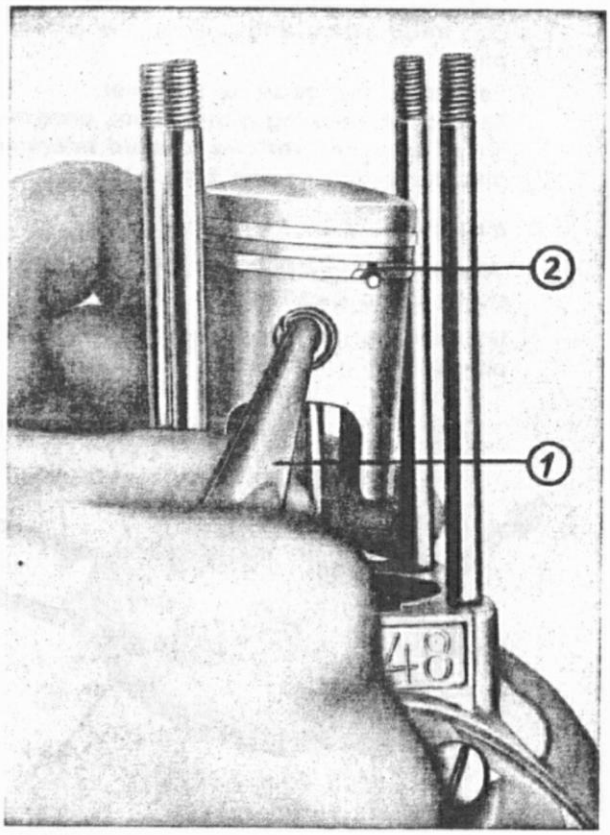


Fig. 4: Removing the circlip securing the gudgeon pin
1 Flat-nose pliers
2 Piston ring

Visual inspection:

On no account should the skirt of the piston be decarbonized, even if it has become quite black. The piston rings must move perfectly freely in their respective grooves. Never remove piston rings without good reason! Rings gummed up with burnt oil, and their grooves, must be thoroughly cleaned. When removing such rings take care not to damage or stretch them unduly. Do not interchange them and put them back in their correct position. If any ring is blackened along the greater part of its circumference, this indicates that gas is leaking past it, and it should be replaced. If a ring was removed, it should be rolled around the groove into which it is to be fitted to ascertain that is it quite free. On the

other hand, its axial play (up-and-down movement) should not amount to more than 0.15 mm, to avoid excessive noise.
Then push the rings into the cylinder bore by means of the piston, so that the ring gaps become visible. Minimum possible ring gap is 0.1 mm, maximum permissible gap, without power loss, is 0.8 mm. (The increase is due to wear of the rings after a long period of operation.)

Chain guide plate and gearbox sprocket

1. Removing the chain guide plate:
   Unscrew two lens head screws and one hexagon head screw and remove the chain guide plate.
2. Removing the gearbox sprocket:
   Bend back securing plate of nut, unscrew nut, lift off sprocket, remove toothed intermediate disc. Now turn engine bloc over.

Crankcase cover

1. Unscrew centering screw (Fig. 5/2) (guide for clutch thrust bearing nut).
2. Unscrew catch guide (Fig. 5/3) and oil level plug (Fig. 5/4).

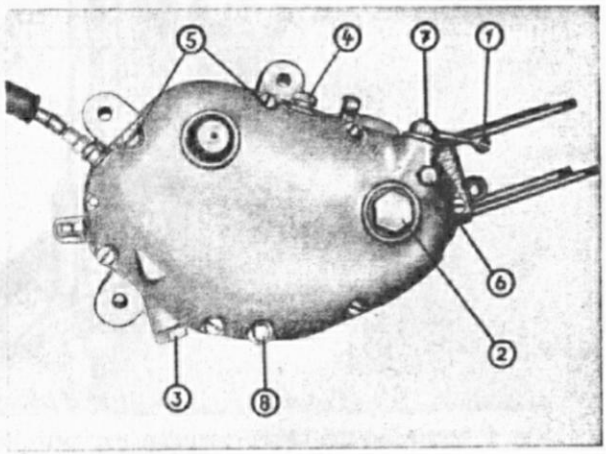


Fig. 5: Engine, right-side view

1 Declutching lever
2 Centering screw
3 Catch
4 Oil level plug
5 Retaining screws of crankcase cover
6 Fixing bolt
7 Declutching shaft
8 Oil drain plug

3. Unscrew retaining screws of crankcase cover (Fig. 5/5) — seven screws —, loosen cover by means of a rubber mallet, and raise cover until brake lever (Fig. 6/1) of coaster brake becomes visible (Fig. 6).
   The brake lever is fastened to the claw collar by means of a spring ring. This spring ring must first be removed.
   Then slide the brake lever from its claw collar (Figs. 6/2 and 7/2), turn declutching lever until the shaft passes the ball nut (Fig. 7/1), the big thrust washer at the same time slipping from the shaft, and lift cover clear.

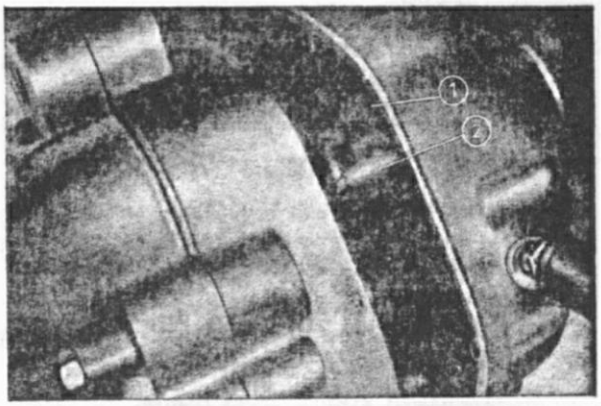


Fig. 6: Removing the crankcase cover

1 Brake lever
2 Claw collar

4. The declutching shaft cannot be pulled off before the crankcase cover has been lifted. Unscrew fixing bolt (Fig. 5/6) of declutching shaft, pull out declutching shaft (Fig. 5/7) together with declutching lever (Fig. 5/1).

Brake Spring for Driver and Fixation of Gearshift Lever

1. Remove brake spring (Fig. 7/6) from driver (Fig. 7/5).
2. Remove lock washer (Fig. 7/8) and supporting disc (Fig. 7/9) from gearshift rail (Fig. 7/10).

Clutch and Primary Drive

1. Remove large circlip (Fig. 7/11) from clutch thrust bearing (Fig. 7/12), remove set bolt together with thrust bearing (Fig. 7/12). Bend up

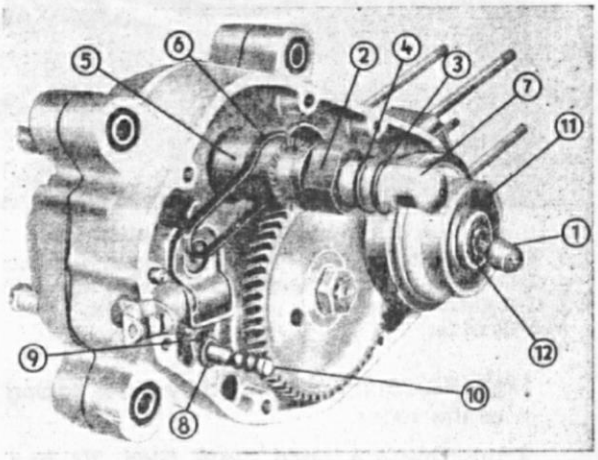


Fig. 7: Starter mechanism

1 Ball nut of set bolt
2 Claw collar
3 Circlip (pedal pin bearing)
4 Thrust washer
5 Driver
6 Brake spring
7 Pedal shaft
8 Lock washer
9 Supporting disc
10 Gearshift rail
11 Circlip
12 Clutch thrust bearing

securing plates of nuts on countershaft and crankshaft journals, fit sprocket holder (special tool No. 050.7014) (Fig. 8/1) on large driving pinion (Figs. 8/2 and 9/9), and loosen nuts (Fig. 8), first the nut of the large driving pinion, then the nut of the clutch), remove securing

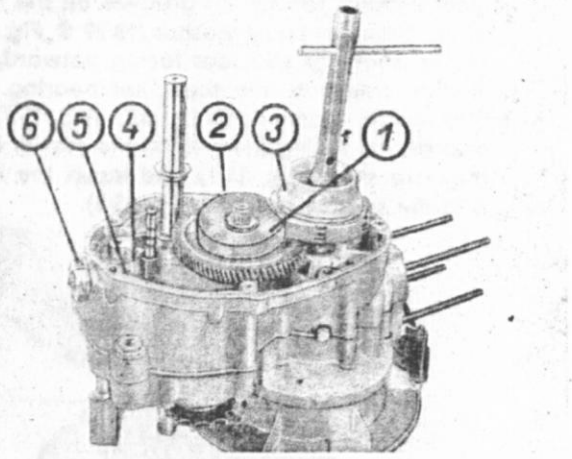


Fig. 8: Primary drive

1 Gear bracket
2 Large driving gear
3 Spring cage
4 Interior gearshift lever
5 Gearshift shaft
6 Exterior gearshift lever

plates spring collar (Fig. 9/1) of clutch spring (Fig. 9/2), spring, and spring cage (Figs. 8/3, and 9/3) as well as clutch hub (Fig. 9/4) with discs (Fig. 9/5), thrust washer, clutch housing (Fig. 9/6) with bushing (Fig. 9/7), and thrust washer (Fig. 9/8).

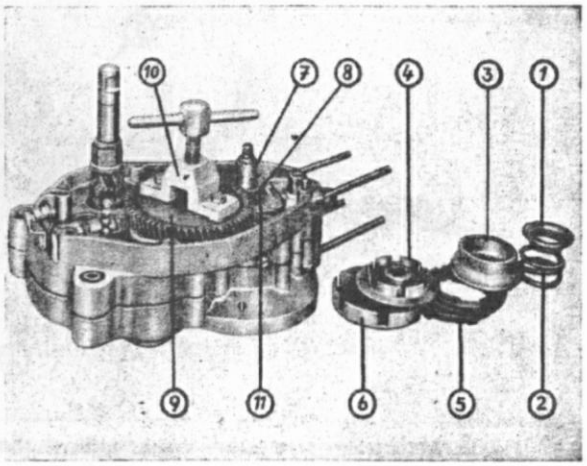


Fig. 9: Extracting the driving pinion and dismantling the clutch

1 Spring collar
2 Clutch spring
3 Spring cage
4 Clutch hub
5 Clutch discs
6 Clutch housing
7 Bushing
8 Thrust washer
9 Large driving pinion
10 Extractor tool
11 Seal ring

2. Extract large driving pinion (Fig. 9/9). For this purpose screw on extractor (Fig. 9/10 special tool part No. 050.7013 with screws 8 mm to be used with toothed wheel 050.1.1300 only, not necessary with toothed wheel 350.1.13.000.1). Turn engine bloc over!

Crankcase and Gearbox

1. Unscrew crankcase bolts (8 fillister-head screws and 2 hexagon-head screws). Now turn engine over once more and remove the right-hand half of the crankcase.
2. Take out the crankshaft (Fig. 10) as well as the mainshaft (Fig. 12/1) with gearshift assembly (Fig. 14), countershaft (Fig. 11/1), starter intermediate shaft (Fig. 13/1) and pedal pin (Fig. 15/1). Take care of the various thrust washers and rollers of the bearings. (The rollers of all three bearings have the same diameter.)
3. Press out shaft seal rings (Fig. 9/11), if they are defective (hard). Both seal rings are mounted with their caulking edges facing inward.
4. If a new crankcase is to be mounted, the bushings, rubber seal rings, the bearing of the countershaft and the bearing races of the crankshaft will have to be pressed out.
5. Dismantling the gearshift shaft:
   Remove lock washer (Fig. 8/4), disc, and cotter, and pull out the gearshift shaft. Remove the gearshift lever (Fig. 8/5).
6. The crankshaft races can be removed by means of the extractor (Fig. 10/1, special tool No. 350.1.70.011.0).

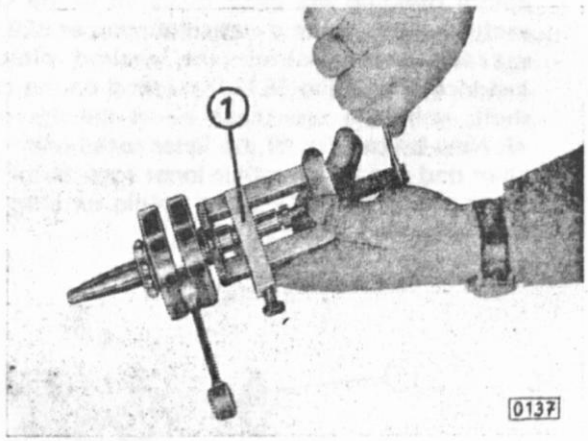


Fig. 10: Extracting the races of the crankshaft bearings
1 Extractor for crankshaft bearing races

III. Engine Reassembling

Before reassembling all engine parts should be washed in paraffin (kerosene) and dried with compressed air.

Crankcase and Crankshaft

If a new crankcase is to be mounted, heat it, so that you can just touch it, and press in silent blocs, bushings, rubber seal rings, and the ball

bearing of the countershaft. Then fit the circlip at the ball bearing. Then the crankshaft seal rings are pressed in, and after that the crankshaft main bearings are pressed in by means of a suitable mandrel. For easier balancing of the axial play of the crankshaft, the distances of the crankshaft bearings must be measured. For this purpose the inner races, together with the ball rows, must be fitted into the outer races (the inscription on the inner races must always face the exterior of the crankcase). Now in each crankcase half the distance from the centre flange of the crankcase to the inner ball race is measured by means of a depth gauge or an accurate vernier caliper. These measurements, to which the thickness of the gasket has to be added, are added up. The resulting sum (only the tenths and hundredths) are scratched into the inner crankcase wall, as in the original crankcase (compare also paragraph 2). Exchange only pairs of crankcase halves, for they are finished jointly!

1. When putting on the left crankcase half, spread grease on the roller bearing races of mainshaft and countershaft, and insert rollers (Fig. 11/2).
2. Oil crankshaft bearings and install crankshaft with its conical journal (generator end) facing downward (Fig. 11).

If new crankshaft main bearings are mounted, or if a new crankshaft is fitted, the axial play of the crankshaft must be readjusted. It should be 0.04—0.09 mm. Both crankshaft and crankcase were carefully measured by the works and the results marked on them (see preceding chapter!). Before pressing the inner races on to the crankshaft journals, insert a sufficient number of 0.1 mm spacer shims to obtain the desired play. For instance: the figure 36.10 is marked on the crankshaft, while the crankcase bears the figure (36) 47. Now below one of the inner races one 0.1 mm shim and below the other inner race two 0.1 mm shims are to be inserted to obtain an axial play of 0.08 mm.

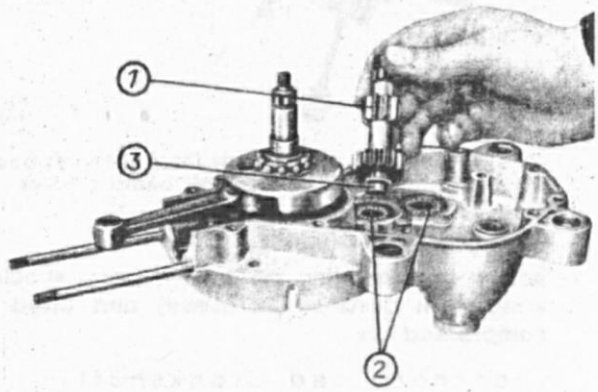


Fig. 11: Installing the countershaft
1 Countershaft 3 Thrust washer
2 Rollers in bearing races

Gearbox and Gearshift

1. Slip thrust washer 12,5/20 Ø (Fig. 11/3), its shoulder facing outward, on the countershaft (Fig. 11/1). Then fit the latter, its larger spur gear foremost, into the roller bearing.
2. Slip second-speed gear (Fig. 12/2) over the threaded end of the mainshaft (Fig. 12/1), the gear's claws facing the grooves on the mainshaft. Then put thrust washer (18/29 Ø, Fig. 12/4) on the shaft, its shoulder facing outward, and fit the mainshaft into the roller bearing.
3. Slip thrust washer (14/20; 5/2, Fig. 13/2), its depression facing inward, on the starter intermediate shaft (Fig. 13/1) and insert the latter into the bronze bushing (Fig. 13/3).

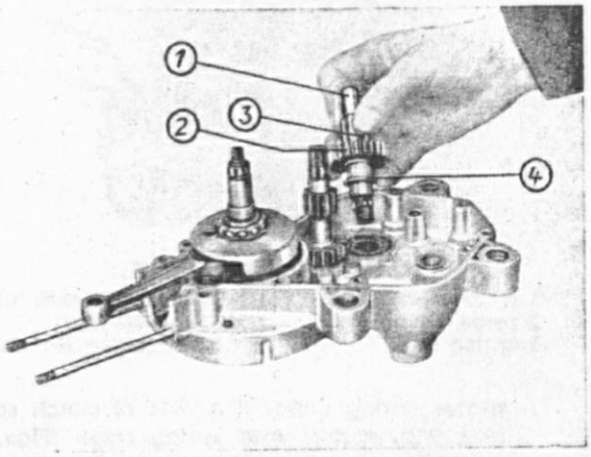


Fig. 12: Installing the mainshaft
1 Mainshaft 3 Claws of second-speed gear
2 Second-speed gear 4 Thrust washer

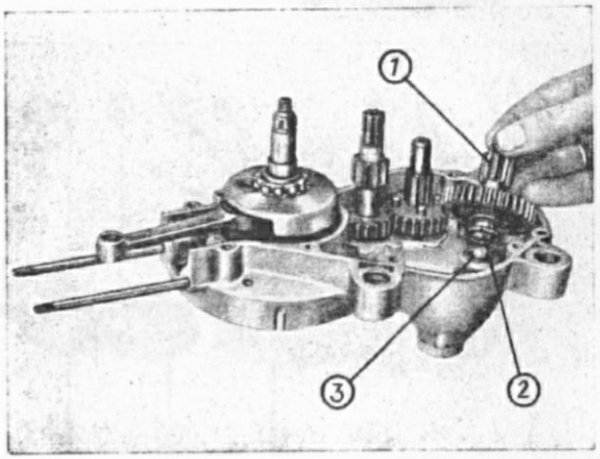


Fig. 13: Mounting the starter intermediate shaft
1 Starter intermediate shaft 3 Bronze bushing
2 Thrust washer

4. First put gearshift socket (Fig. 14/1) on top of gearshift fork (Fig. 14/2), then install fork together with socket, and fit first-speed gear (Fig. 14/3) with its claws (Fig. 14/4) facing inward. Upon the first-speed gear (Fig. 14/3) there is to mount a disc (see spare parts catalog page 46).
5. Place thrust washer (26/16/2), its depressed

side facing the interior of the gearbox, on bore of bearing, and install pedal shaft (Fig. 15/1) in such a way that the lateral gearing (Fig. 15/2) of the spur gear is turned towards the gearbox.

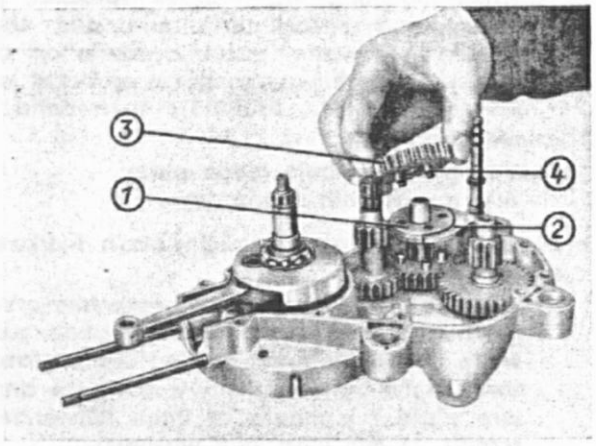


Fig. 14: Installing the gearshift device
1 Gearshift socket 3 First-speed gear
2 Gearshift fork 4 Claws of first-speed gear

6. Slide thrust washer (14/20 : 5/2, Fig. 15/3), its depressed side facing the gear wheel, on the starter intermediate shaft.
7. Put lock washer (Fig. 15/4) and supporting disc on gearshift rail.
8. Place gasket, soaked in oil, on crankcase.

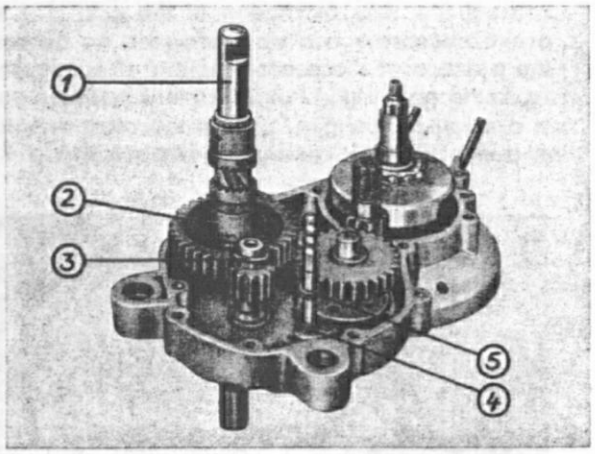


Fig. 15: Installing the pedal pin
1 Pedal pin 4 Lock washer, bottom
2 Lateral gearing of spur gear 5 Lock washer, top
3 Thrust washer

9. Spread grease in the roller race of the right-hand half of the crankcase and insert rollers. Unless already mounted, gearshift shaft and interior gearshift lever should now be installed at right angles.
10. Put on right half of crankcase (minding not to damage the seal ring), turn crankcase over, and screw up the two halves. The crankcase fixing bolts are all the same length. The hexagon-head screws (Fig. 3/5) are to be inserted between the rear engine fixing bolts.
11. Slide supporting disc on gearshift rail and fit lock washer (Fig. 15/5).

Primary Drive and Clutch

1. Fit large driving pinion (Fig. 8/2) on countershaft, assemble thrust washer (22/15/1.7) (Fig. 9/8), its sunk side facing downward, as well as greased busing (Fig. 9/7), cone up, on crankshaft journal.
2. Assemble clutch housing (Fig. 9/6), thrust washer (26/15/1), and clutch hub (Fig. 9/4) on crankshaft journal.
3. Clutch assembling
   Insert: one friction disc
   one steel disc
   one friction disc
   one steel disc (Fig. 9/5),
   and put on spring cage (Fig. 9/3), clutch spring (Fig. 9/2), and spring collar (Fig. 9/1).
4. Put securing plates of nuts on the ends of countershaft and crankshaft, screw nut on countershaft, lock large driving pinion by means of special tool No. 050.7014, and tighten nut (Fig. 8).
5. With large driving pinion locked, tighten nut on clutch spring cage until clutch spring cage and first steel clutch disc turn around together.
6. Bend up securing plates on countershaft and crankshaft (secure the nuts!).
7. Mount clutch thrust bearing (Fig. 7/12) and secure it with the circlip (Fig. 7/11).
   Care should be taken to press the set bolt together with the ball bearing into its bearing shell right up to its shoulder, because otherwise the declutching shaft will be unable to engage.

Piston and Cylinder

1. Lubricate the gudgeon pin bushing in the connecting-rod, mount heated (to ca. 60° C.) piston with piston ring gaps facing forward, oil and insert gudgeon pin. Fit gudgeon pin snap rings. (It is advisable to use new snap rings.)
2. If the gasket, glued to the cylinder base flange by means of jointing compound, has been damaged, it should be scraped off and replaced by a new one. After the new gasket has been stuck to the cylinder with jointing compound, oil it or lubricate it with some viscous grease.
3. Oil piston rings and turn them round in their grooves till the pegs securing the rings appear in the centre of the piston ring gaps.
4. Lubricate cylinder barrel and mount cylinder,

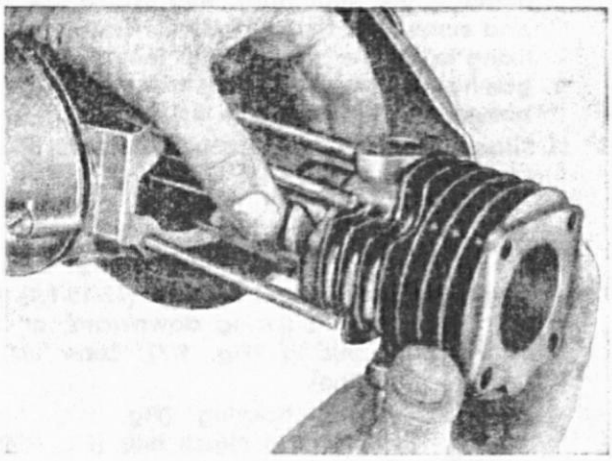


Fig. 16: Mounting the cylinder

taking care not to break the piston rings (Fig. 16).

5. Mount cylinder head (Fig. 3/3), place four spacer shims on studs, screw down hexagon nuts, collar nuts, and tighten them crosswise (Fig. 3/2).

Crankcase Cover

1. Mounting the crankcase cover:
   Scrape away damaged crankcase cover gasket and replace it by a new one. Spread jointing compound on joint surface of crankcase cover and put gasket on. The side of the gasket facing the crankcase must be painted with oil or grease.

2. Assemble the declutching shaft (Fig. 5/7) and screw up the fixing bolt (Fig. 5/6), pull brake lever (Fig. 6/1) with cable into crankcase cover, place brake lever, its shoulder first, on claw collar (Figs. 6/2 and 7/2) of pedal pin (Fig. 7/7), fix it with spring ring, slip thrust washer (26/16/2) on pedal pin and fit cover, taking care to insert the gearshift rail into its guiding bore without tilting it, and to turn the declutching lever around in such away that the declutching shaft will pass the ball nut (Fig. 7/1). Then pull at the brake cable until the crankcase cover can be fitted completely. Insert the seven fixing screws of the crankcase cover and tighten them crosswise, beginning from the centre and proceeding outwards. Screw in oil drain plug (Fig. 5/8).

3. Put fiber washer on catch locking screw, (Fig. 5/3), fit catch and catch spring into locking screw, and screw down the latter. Screw up centering screw (Fig. 5/2), taking care to turn the set bolt together with the ball nut until the latter arrives at the middle of the centering screw bore. The declutching lever (Fig. 5/1) must have at least 10 mm of lost motion. If it has not so much, remove locking wire from the ball nut (Fig. 7/1) and adjust it. Afterwards secure ball nut again.

Gearbox Sprocket and Chain Guide Plate

1. When mounting the gearbox sprocket, put on toothed intermediate disc and chain sprocket, fit securing plate, screw on and tighten nut (while holding the sprocket with special tool No. 050.7015). Then bend up securing plate.
2. Mounting the chain guide plate:
   Two screws with spring rings.

Flywheel Magneto, Ignition Adjustment, Blower

1. Insert roller of flywheel magneto into crankshaft stub, mount magneto armature plate while simultaneously pulling both cables through the plate, and screw down the armature plate (by means of three fillister-head screws, 15 mm long, and washers).
2. Screw on base plate (Fig. 2/7 and Fig. 3/1), using four 10 mm long fillister-head screws, washers and spring rings.
3. Mount magneto flywheel with blower fan (Fig. 3/6). Insert washer and tighten nut.
   Adjust ignition (Figs. 17, 18). Turn the magneto until the breaker points (Fig. 17/2), fully opened, become visible through the large aperture in the flywheel. Measure the contact gap, which should be 0.4 mm, with a feeler gauge.

Burnt contacts must be smoothed by means of a contact file. Any correction of the gap that may prove necessary can be performed by adjusting the position of the contact holder after loosening its fixing screw (Fig. 17/3). For this purpose there is a small recess (Fig. 17/4) in the contact holder, and opposite this recess are two stops (Fig. 17/5)

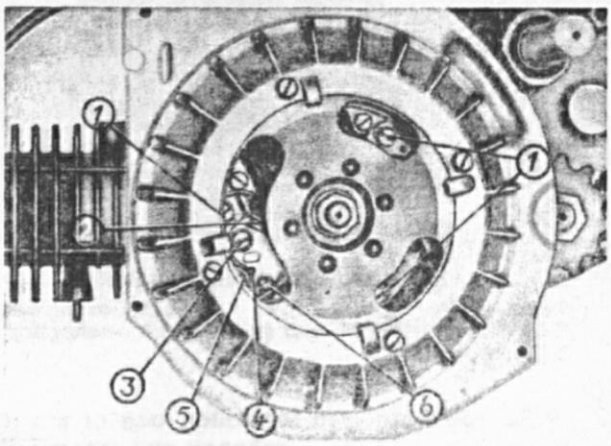


Fig. 17: Ignition and Lighting system

1 Fixing screws
2 Breaker points
3 Fixing screw of contact holder
4 Recess of contact holder
5 Stops
6 Nut of contact spring

on the armature plate. A screwdriver is inserted in the recess and between the two stops on the armature plate, whereupon the contact holder can be adjusted by turning the screwdriver either way (Fig. 18). Shifting the contact holder upwards widens the gap, shifting it downwards narrows it. Finally, tighten the fixing screw of the contact holder and check the width of the contact gap once again.

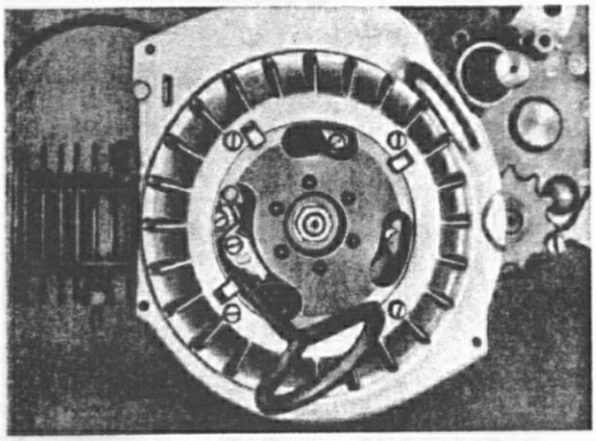


Fig: 18: Adjusting the contact gap

To find the exact moment of the breaker points opening, the following things are required: a motor-cycle battery (6 volt/4—6 amp.) and a bulb (6 volt/10 watt)*. Two 0.5 m (20 in.) long cables are soldered to the lamp, one to its socket (ground), the other to the positive contact. If a suitable lamp socket it used, there will be no need for soldering the cables to the lamp. It is advisable to attach crocodile clips to the cable ends. While the breaker points are closed, one cable of the control lamp is threaded through the large aperture of the flywheel and connected with the nut (Fig. 17/6) of the screw that clamps the breaker-lever spring. (This cable must not be brought into touch with ground.) The second cable is connected with the positive terminal of the battery. Another cable connected with the negative terminal of the battery is now brought into touch with ground (the engine), but not connected with it.

It should be stressed once more that the negative cable should touch the engine only when the breaker points are in contact. The control lamp is now burning brightly. Rotate the flywheel magneto slowly to the left (in the sense of engine rotation) until the lamp is perceptibly dimmed (to about half its former intensity). The moment at which the lamp's power is diminished is the instant of the breaker points opening, i. e. the ignition point. Therefore the flywheel must be held in this position. After establishing the ignition point the negative cable must be immediately removed from the engine, otherwise the magneto will be de-energized. Then the piston travel from the ignition point to T. D. C. (= sparking advance) has to be measured. For this purpose a thin measuring rod with millimetre graduation is introduced through the spark plug hole till it touches the piston crown. (Do not tilt the rod!) Now continue turning the flywheel to the left while watching the calibration of the rod to ascertain the distance the piston travels from the ignition point to T. D. C. (= sparking advance). This should be 1.8 mm. If the difference is less than 0.5 mm, it can be corrected by adjusting the gap of the breaker points. Widening the gap results in more, narrowing it in less, sparking advance.

If the difference exceeds 0.5 mm, the required amount of spark advance will be achieved by turning the armature plate. To do this the armature plate fixing screws (Fig. 17/1), which are accessible through the flywheel apertures, are loosened. Turning the armature plate to the left (in the sense of engine rotation) will cause more spark advance, turning it to the right (against engine rotation) will give less advance.

When the position of the breaker points or that of the armature plate has been altered, the measuring procedure must be repeated, as described above.

If a battery and a control lamp are not available, the moment of the breaker points opening can be ascertained by means of a piece of cigarette paper in the following manner: through the large flywheel aperture a narrow strip of cigarette paper is introduced and wedged between the closed breaker points. Then the flywheel is rotated to the left (in the sense of engine rotation) until the breaker points are just beginning to release the strip of paper, i. e. are beginning to open (= ignition point). Then the spark advance is measured in accordance with the rules given above. However, we would point out that the method involving the use of cigarette paper is not completely reliable, especially with engines that have been in operation for some time, owing to the wear of the contacts. We therefore recommend the first-mentioned method employing a 10-watt control lamp.

4. Insert and turn cover plate (Fig. 2/5), fit wire ring (Fig. 2/6).
5. Mount blower housing (Fig. 2/4), using four 8 mm fillister-head screws, washers, and spring rings.
6. Fill 180 c. c. oil into engine.

IV. Fixing the Engine to the Frame

1. Install engine and push the two short engine fixing bolts through the upper engine suspension plates from the right-hand side. Insert the long engine fixing bolts into the lower suspension plate form the left. This fixes the exhaust

* Only a 6 V/10 W bulb may be used to avoid weakening the magneto.

silencer, too. Fit spring rings and screw down the nuts.
Attention! The red cable leading to the generator must protrude on the left-hand side of the frame!

2. Connect light cable.
3. Mount the chain and close it by means of the connecting link.
4. Attach the fairing plate (Fig. 2/3) with three screws.
5. Screw on blower louver cover (Fig. 2/2) with two screws in such a way that the louvers face downward.
6. Mount blower hood (Fig. 2/1), using two lens head screws (10 mm long) with spring rings.
7. Mounting the pedals:
Fit pedals, insert cotter, put on washer and tighten cotter by means of the nut.
8. Mount exhaust pipe and fasten it with nuts and spring rings.
9. Mounting the carburettor:
Hitch throttle slide (Fig. 29/9) to throttle control cable, insert choke control cable (hold carburettor away from the frame on the right) and tie it up. Then put throttle slide into the carburettor housing (Fig. 29/1) and fix carburettor with two screws and washers. Then connect fuel pipe.
10. Connect control cables:

a) Clutch cable: hitch clutch cable on, first at the handlebar, then at the crankcase.

b) Gearshift cable: first slip the cable end fitted with a rimless ferrule (Fig. 19/2) throug the larger bore of the gearshift lever and hook its nipple to the lower adjusting angle (Fig. 19/1). Then put the second cable end into the upper adjusting angle (Fig. 19/3), pull the clutch lever, and turn the gearshift lever till the nipple can be hooked in.
Adjustment: both adjusting angles must be loose, both gearshift twist grip and gearshift lever must be in their neutral positions, the adjusting nuts must be loose. Then tension and tighten adjusting angles by means of the locking nuts (Fig. 19/4). Now, while rotating the rear wheel, try to shift gears from the various speeds to neutral. If, in doing so, it proves necessary to turn the twist grip b e y o n d its indicated neutral position to disengage the gears completely, this can be corrected by means of the adjusting nuts.

c) Brake cable:
Hitch nipple to rear wheel brake lever, pull at cable covering, and hitch covering to lug (Fig. 26/1) of brake back plate.

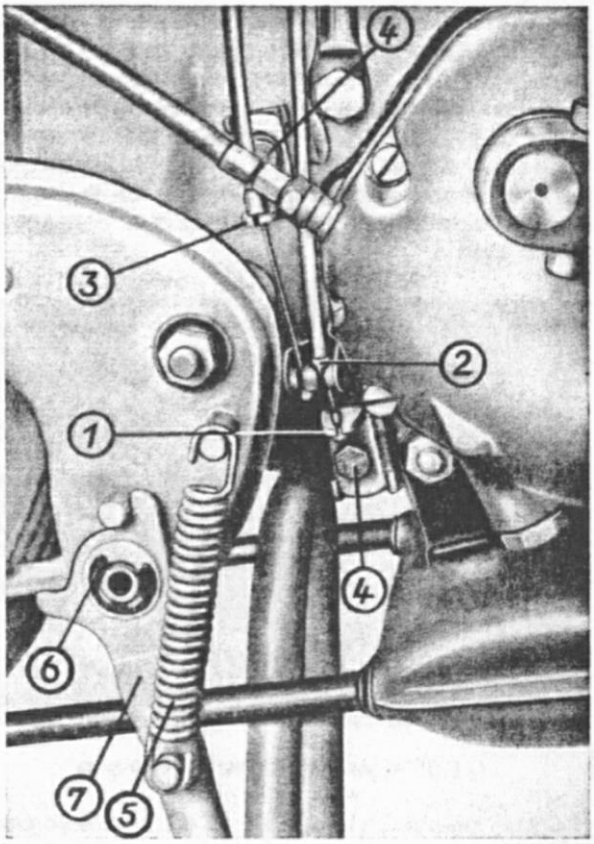


Fig. 19: Gearshift adjustment

1 Lower adjusting angle
2 Rimless ferrule
3 Upper adjusting angle
4 Fixing screw of adjusting angle
5 Prop-stand spring
6 Lock washer
7 Prop-stand

11. Screw on spark plug cable socket, screw in spark plug (giving it 3—4 turns by hand), fit cable socket on spark plug.

THE CHASSIS

Handlebar

a) Dismantling the handlebar:

1. Loosen clamping spindle (Fig. 20/1), knock clamping spindle and key downward, press handlebar into handlebar shaft, loosen the two cone screws (Fig. 22/1) of the twist grip housing (Fig. 22/2), pull the gearshift twist grip (Fig. 22/3) with cables from the handlebar.
2. Removal of right-hand twist grip:
Loosen clamping screw and pull throttle twist grip with cables from the handlebar.
3. Take out head lamp assembly with lamp socket (Fig. 21/1). Having marked head lamp cables 56a, 56b (blue and white, Fig. 21/2), and tail light cable 58 (black) and dimmer switch cable 56 (black) (Fig. 21/3) at their

connecting terminals, disconnect them, and pull cable assembly (Fig. 20/2) with protective rubber tube out of the head lamp body.

4. Unscrew fixing screw (Fig. 20/3) of choke cable shackle (Fig. 20/4), bend back shackle, and press it away from the fork tube.
5. Pull out handlebar.

b) Handlebar reassembling

Proceed in reversed order of dismantling. Pull cable assembly (Fig. 20/2) into head lamp body and connect cables. Connect white cable with one of the terminals of the lamp socket (Fig. 21/2). Connect blue cable with the other lamp socket terminal (Fig. 21/2). Connect both black cables with the right-hand terminal (looking in the direction of motion) of the light switch (Fig. 21/3).

Gearshift cable:

Dismantling: Remove twist grip from handlebar, disconnect gearshift cable from engine (see "Dismantling the Engine").

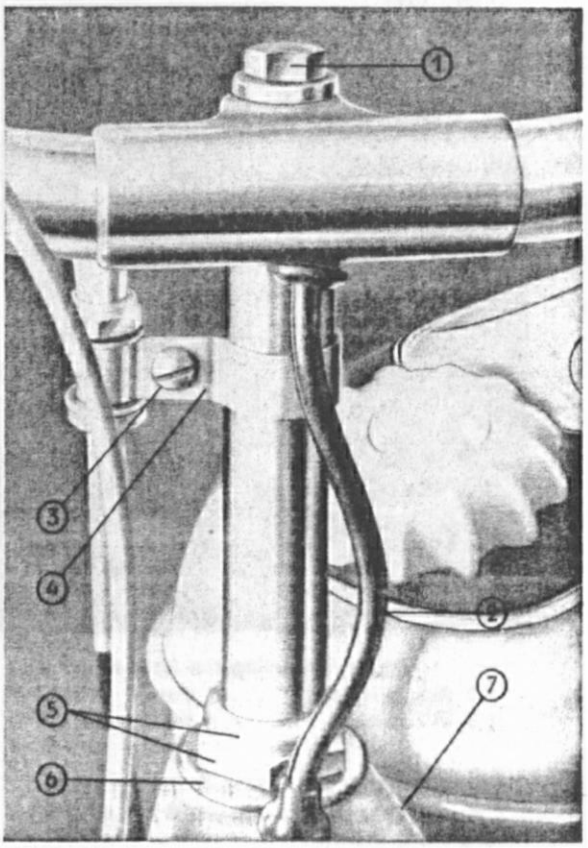


Fig. 20: Handlebar attachement

1 Hexagon-head of clamping spindle
2 Cable assembly
3 Fixing screw of shackle
4 Shackle of choke cable
5 Fork tube nut
6 Washer
7 Head lamp body

Pull off gearshift twist grip housing (Fig. 22/2), loosen clamping screw (Fig. 22/4) of clamping nipple, and take off cable complete with nipple.

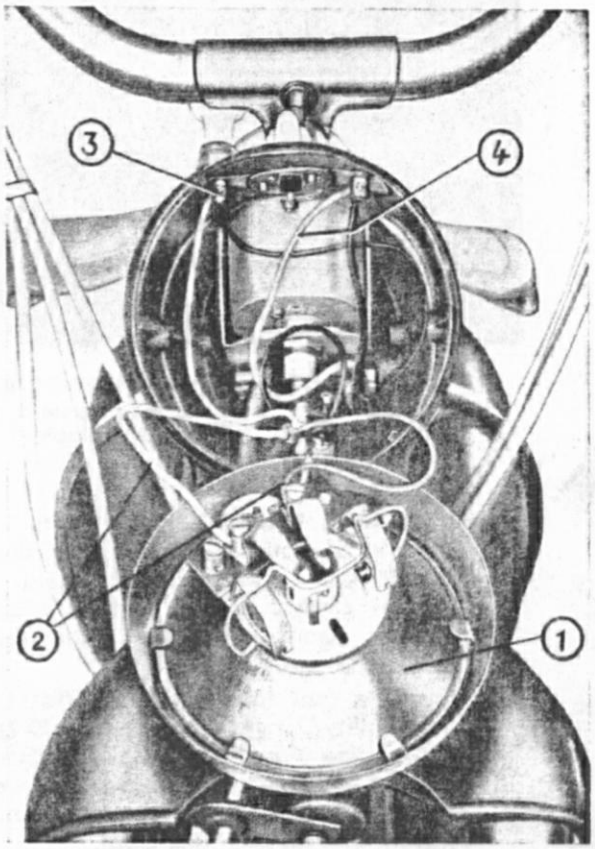


Fig. 21: Head lamp assembly

1 Head lamp assembly with lamp socket
2 Head lamp cables (56a, 56b)
3 Tail light cable (58) and dimmer switch cable (56)
4 Light cable (51)

Reassembling: Stretch wire at clamping nipple (Fig. 22/5) until the nipples of the wire ends touch the cable ends. Now the nipple of the twist grip is not in the middle of the free cable loop, dividing it into a shorter piece and a longer one. Hold twist grip in its normal position, insert the shorter piece of wire at the side of the rubber grip, place the nipple, the longer end first, into its recess and tighten it there, while simultaneously pulling the clutch lever.

Then wind the longer piece of wire once round the twist grip (fitting it into the groove), and mount twist grip housing. Then hook up wire ends at the engine case. Mount twist grip on handlebar.

Front Wheel Springing

a) Removing the telescope fork:

1. Dismantle handlebar.
2. Remove head lamp body:
   Disconnect light cable 51 (red) (Fig. 21/4) at

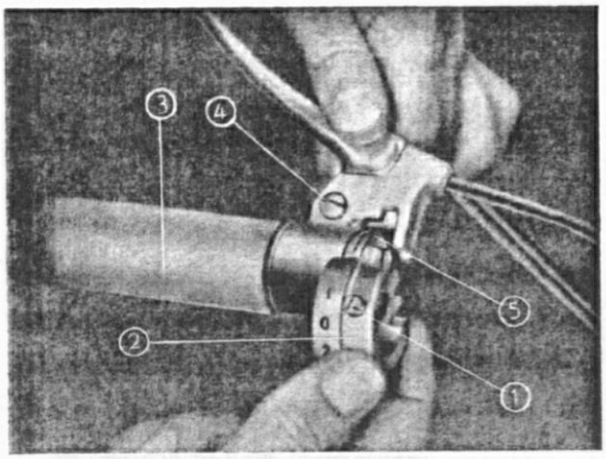


Fig. 22: Assembling the gearshift twist grip
1 Cone screw
2 Twist grip housing
3 Gearshift twist grip
4 Clamping screw
5 Clamping nipple

light switch, left-hand side (looking in the direction of motion); unscrew fork tube nut (Fig. 20/5) and remove washer (Fig. 20/6). Unscrew screws at left and right bottom ends of head lamp body, and remove head lamp body (Fig. 20/7).

3. Dismantle fuel tank (Fig. 23/1) (for better accessibility): shut fuel cock (Fig. 23/2) pull off fuel pipe (Fig. 23/3), remove toolbox lid, take out tools, unfasten nut, remove washer and pressure plate (Fig. 23/4) of the rubber support, and lift fuel tank clear.
4. Removal of front wheel (see Operating Instructions).

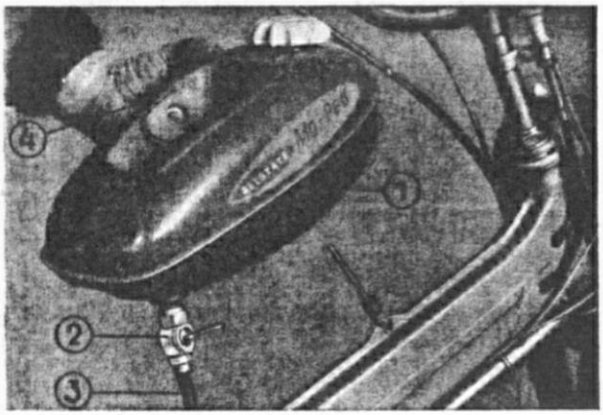


Fig. 23: Mounting the fuel tank
1 Fuel tank
2 Fuel cock
3 Fuel pipe
4 Pressure plate

5. Removal of mudguard (fender):
Unscrew mudguard fixing nuts and screws, press mudguard fixing clip away from one of the sliding tubes (Fig. 25/1), turn sliding tube through 90 degress, and remove mudguard.

6. Removing the fork from the steering head: Unscrew adjusting nut (Fig. 24/1) of the steering head, lift dust cap (Fig. 24/2), remove cone (Fig. 24/3), and pull out fork downward, taking care not to lose any of the balls of the bottom steering bearing.

b) Mounting the telescope fork:
This is done in reversed order of the removal. Worn steering bearing cups (seats) (Fig. 24/4) must be replaced, and new balls (21 each) should be put into the new bearings. Press the bearing cups right up to their shoulders into the frame tube, taking care not to cant them.

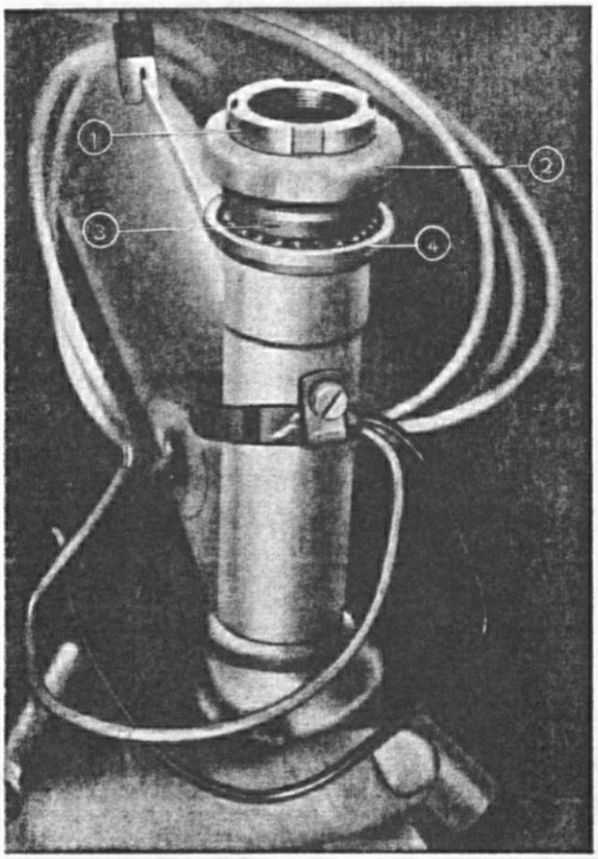


Fig. 24: Removing the front fork
1 Adjusting nut
2 Dust cap
3 Cone
4 Bearing seat

c) Dismantling the telescope fork (Fig. 25):
(To do this there is no need for removing the fork from the frame).

1. Unscrew the nut of the spring supporting bolt in the eye of the fork, and pull down sliding tube (Fig. 25/1) until the grooved shell (Fig. 25/2) becomes easily accessible. During this operation the oil will flow out.
2. Remove felt washer (Fig. 25/3) of grooved shell (Fig. 25/2) and unscrew grooved shell. Then pull out sliding tube downward.

3. Unscrew bottom joint of fork stanchion (Fig. 25/4) and remove bottom guide bushing (Fig. 25/5) as well as top guide bushing (Fig. 25/6) together with grooved shell.

4. Pull out exterior fork tube (Fig. 25/9) with rubber buffer (Fig. 25/8).

d) Reassembling the telescope fork:
Proceed in reversed order of dismantling. Insert top guide bushing with its chamfered edge facing downward. Replace worn guide bushings and likewise defective seal rings, and felt washers of the grooved shell.
After reassembling the fork fill 40 c.c. engine oil into each fork stanchion.

Rear Wheel Suspension

a) Removal of shock absorbers:

1. Loosen one of the two nuts of the top joint bolt (Fig. 26/2) and pull out bolt with the other nut.

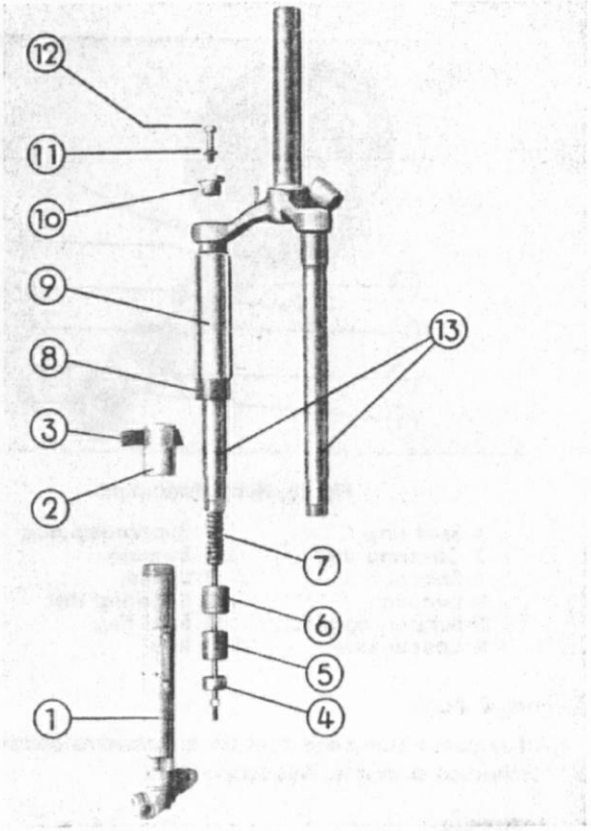


Fig. 25: Telescope fork, dismantled

1 Sliding tube
2 Grooved shell
3 Felt washer
4 Bottom joint of fork stanchion
5 Bottom guide bushing
6 Top guide bushing
7 Spring
8 Rubber buffer
9 Exterior fork tube
10 Top joint of fork stanchion
11 Spring ring
12 Screw of spring
13 Fork

2. Loosen nut of the bottom joint screw (Fig. 26/3), pull out screw, push spacer shell out of the silent block, and take off shock absorber (Fig. 26/4).

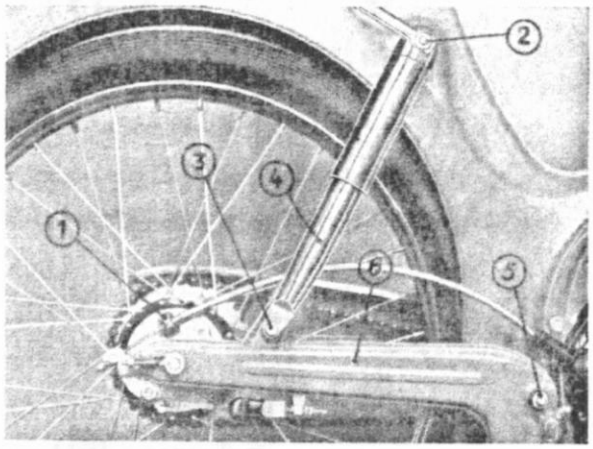


Fig. 26: Pivoted fork and shock absorber

1 Lug of brake back plate
2 Top joint bolt
3 Bottom joint screw
4 Shock absorber
5 Nut of pivoted fork spindle
6 Pivoted fork

b) Mount the shock absorber in reversed order.

c) Dismantling the shock absorber (Fig. 27):

1. Unscrew hexagon head nut from the lens head screw (Fig. 27/1) on the telescopic leg head (Fig. 27/2) and remove the lens head screw from the telescopic leg. Take off telescopic leg head; do not loose the sealing disc (Fig. 27/3).

2. Push the lower part of the telescopic leg (Fig. 27/4) through the sliding tube (Fig. 27/5) so the top rubber stop ring (buffer ring 43/29, 5/8) (Fig. 27/6) falls out. Remove pressure spring (Fig. 27/7) from the telescopic leg (Fig. 27/4). Remove bottom rubber stop ring 41/34/6 (Fig. 27/8) from telescopic leg.
Replace 2 plastic guide rings (Fig. 27/9), lubricator felt pad (Fig. 27/10) and oil scraper ring (Fig. 27/11) in case of excessive wear.

d) Reassembling the telescopic leg:
Assemble in reversed order of disassembling. Fit rubber buffer ring (Fig. 27/6) and sealing disc (Fig. 27/3) before mounting the telescopic leg head.

e) Removal of pivoted fork (Fig. 26):

1. Remove rear wheel (see Operating Instructions).

2. Open chain connecting link, but leave the chain resting on the gearbox sprocket.

3. Remove shock absorbers (Fig. 26/4).

4. Remove fairing plate (Fig. 2/3).

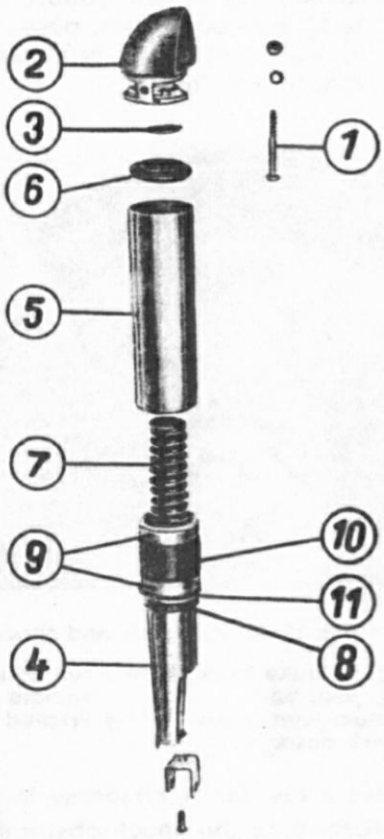


Fig. 27: Shock absorber, dismantled

1 Lens head screw
2 Telescopic leg head
3 Sealing disc
4 Lower part of leg
5 Sliding tube
6 Top rubber stop ring
7 Pressure spring
8 Bottom rubber stop ring
9 Plastic guide ring
10 Lubricator felt pad
11 Oil scraper ring

5. Loosen nut of pivoted fork spindle (Fig. 26/5) knock out spindle, and take off pivoted fork (Fig. 26/6) together with prop-stand.

6. Remove prop-stand: disconnect prop-stand spring (Fig. 19/5), remove lock washer (Fig. 19/6) from prop-stand shaft, pull out prop-stand tube from the other side, and remove prop-stand (Fig. 19/7).

f) Mounting the pivoted fork:

1. Mount prop-stand, attaching it to the pivoted fork, wich already contains silent blocs (to receive bearings and shock absorbers) and pressed-in bushings, and rubber buffers for the prop-stand.
When reassembling the prop-stand proceed in reversed order of dismantling.

2. Mount pivoted fork in reversed order of removal.

Hubs

a) Removal of bearings:

1. Extract both seal rings (Fig. 28/1/11) of the hub (Fig. 28/12) by means of a screw-driver.

2. The spacer shell (Fig. 28/6) between the bearings (Fig. 28/4/8) has two recesses at one end. Insert a prepared mandrel there and knock out the bearing on one side, but do not tilt it.

3. Take out supporting discs (Fig. 28/5/7) and spacer shell (Fig. 28/6), and press out the other bearing.

b) Installing the bearings:

1. Mount supporting disc (Fig. 28/5/7) either on the left or right side of the hub, the disc's crown facing the interior of the hub. and then press in the bearing.

2. Fit spacer shell (Fig. 28/6) from the other side, insert supporting disc with the crown facing the interior of the hub, and press in the second bearing.

3. Press in seal rings (Fig. 28/1/11), their inscription on the outside, together with inserted spacers (Fig. 28/3/9) and covering discs (Fig. 28/2/10). The spacers of the front wheel hub are of equal length (except when a speedometer is mounted). In the rear wheel hub the left-hand spacer is longer.

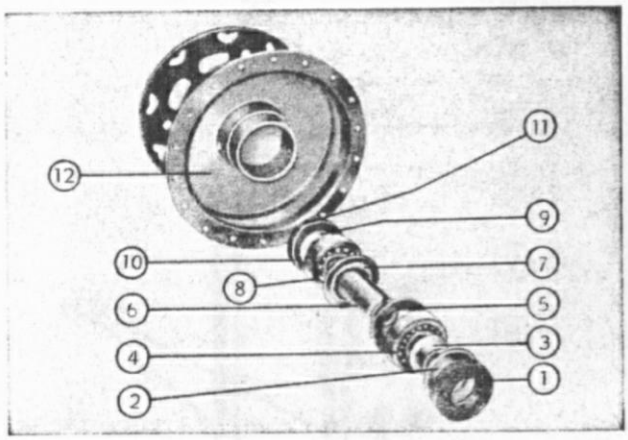


Fig. 28: Hub, dismantled

1 Seal ring
2 Covering disc
3 Spacer
4 Bearing
5 Supporting disc
6 Spacer shell
7 Supporting disc
8 Bearing
9 Spacer
10 Covering disc
11 Seal ring
12 Hub

Fuel Tank

For assembling the fuel tank compare chapter on "Removal of the Telescope Fork".

Saddle

a) Dismounting: Loosen nut of clamp dog and lift off saddle. After loosening the clamping screw of the frame the saddle bracket can be taken out.

b) Assembling: In reversed order of dismantling.

Central Prop-Stand

See chapter on "Removal of the Pivoted Fork".

WHAT TO DO WHEN IN DIFFICULTIES CARE AND MAINTENANCE, OVERHAULING, ADJUSTMENT

(For these chapters, please, compare the Operating Instructions)

Once again we wish to stress the importance of correctly adjusting the gearshift and the play of the clutch (compare the chapters "Engine Reassembling" and "Fixing the Engine to the Frame").

Carburettor Adjustment (for MO-PED equipped with intake silencer).

Carburettor Bing 1/12.

Main jet 62 (Fig. 29/10).

Needle position 2 (valve needle in second notch from top end, clamped) (Fig. 29/8).

Throttle slide 1, with milled recess 4.8 × 2 mm (Fig. 29/9).

After a running-in distance of about 500 km (300 m) main jet 60 (HD 60, Fig. 29/10) can be experimentally installed. It may remain, if acceleration from slow and average riding speeds is smooth and steady on opening the twist grip to full throttle, i. e. if get-away speed (or acceleration) and hill-climbing ability are not worse than with main jet 62. Main jet 62 should be reinstalled, if, with main jet 60, on opening up to full throttle the speed increases very slowly or fails to increase altogether, or if it increases while the twist grip is being turned back. This means that the engine accepts gas badly. At the same time the hill-climbing ability will diminish. In such a case there is no point in using main jet 62 to save fuel, as the exact opposite will result.

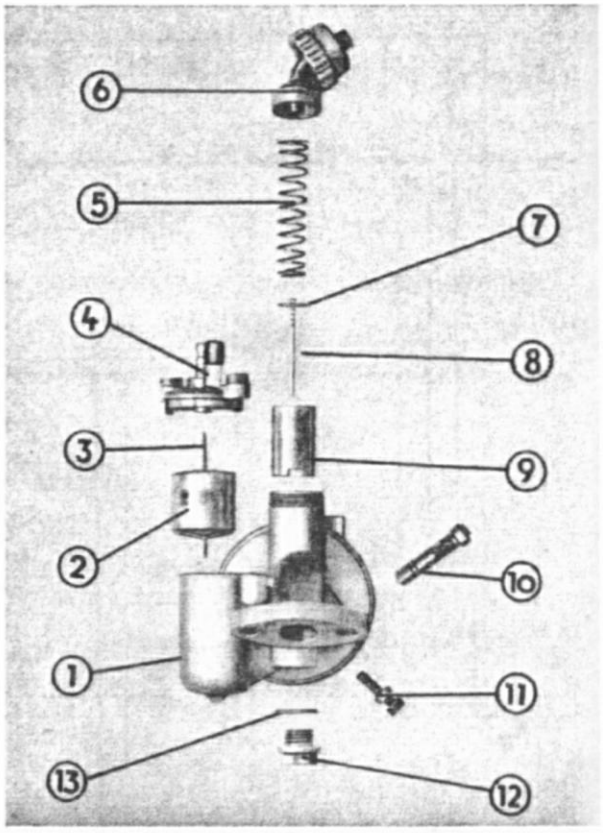
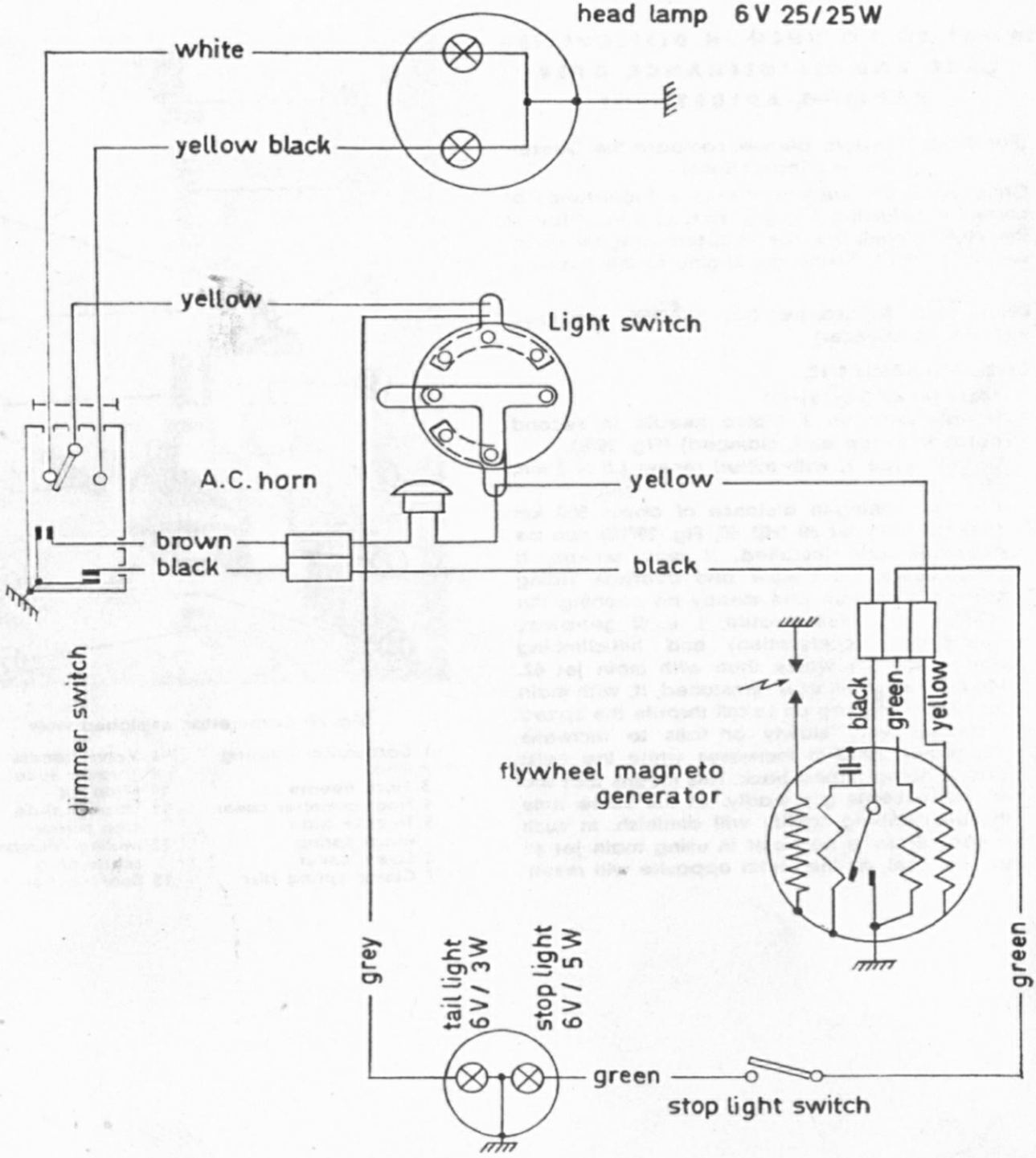


Fig. 29: Carburettor, exploded view

1 Carburettor housing
2 Float
3 Float needle
4 Float chamber cover
5 Throttle slide thrust spring
6 Screw cover
7 Clamp spring disc
8 Valve needle
9 Throttle slide
10 Main jet
11 Throttle slide stop screw
12 Mixing chamber screw plug
13 Seal washer



WIRING DIAGRAM

MS 50 STANDARD

Fig. 30