ZÜNDAPP

Combinette

OPERATION AND MAINTENANCE

Dear Zündapp friends:

Operation and maintenance of the COMBINETTE are very simple. Certainly our agent has already informed you about the most important details when selling you this powerful autocycle, but we thought it advisable to outline in this booklet the essentials of operation, maintenance and trouble shooting so that you may be able to study it at home.

Of course, our agent as well as our Service Department are always quite at your disposal if any question should arise.

As you know, different models of COMBINETTE are available. This booklet is applicable to all models, modifications of different types being described and illustrated, so that you may easily find out all which concerns the model you are owner of.

Good luck and a lot of fun on all your trips!

ZÜNDAPP-WERKE GMBH
NÜRNBERG - MÜNCHEN
Werk München

Contents

Specifications of One-Speed Engine

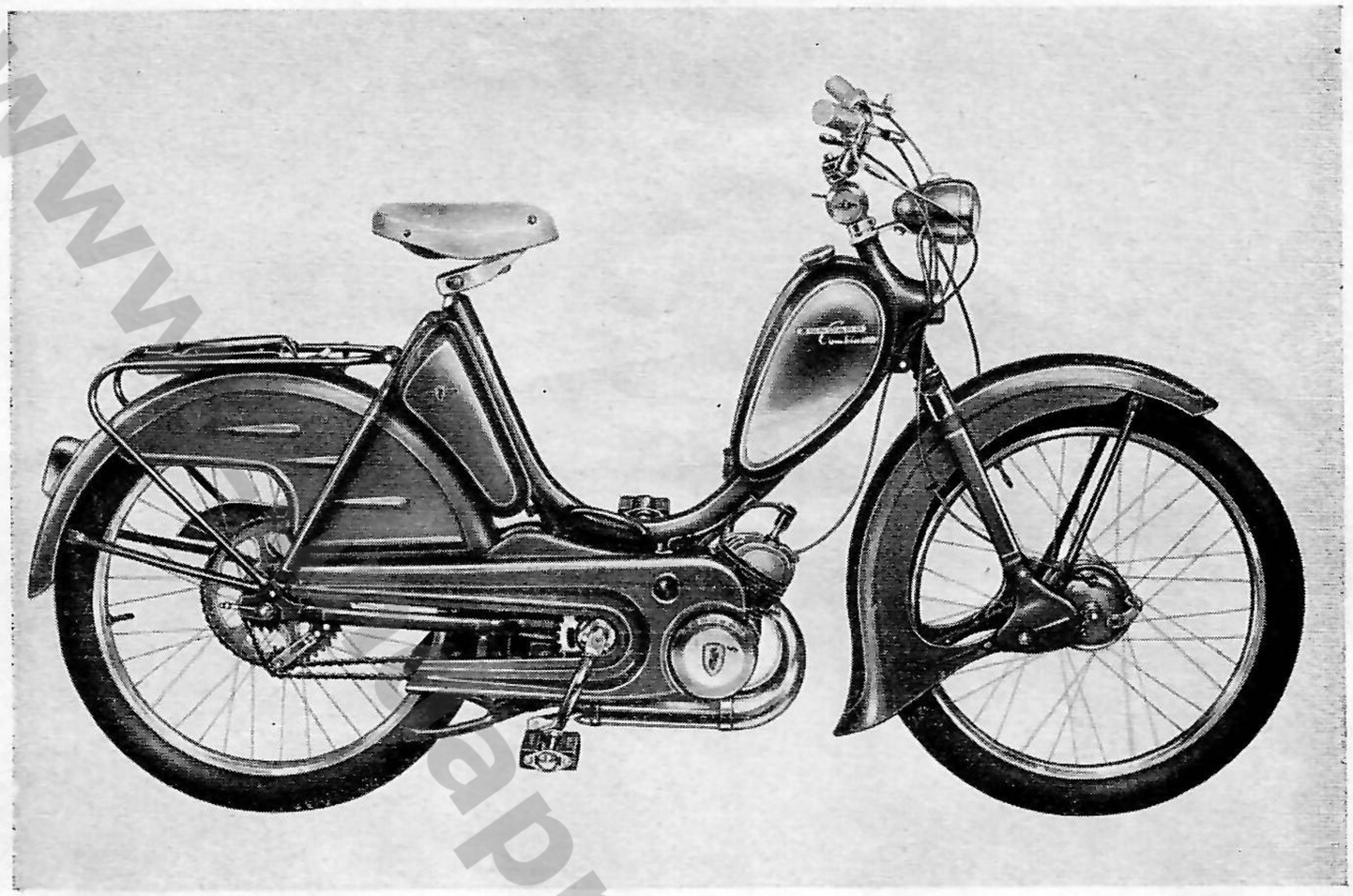
Piston Displacement in cc	50
Bore/Stroke in mm	39/41,8
Compression Ratio	1 : 6,5
Cycle of Operation	two-stroke-cycle
Lubrication	mixture lubrication, ratio 25 : 1 gasoline-oil
Carburetor	Bing 1/12.52
Main Jet	54
Needle Jet	2,12
Needle Adjustment	4th notch from top
Fuel	gasoline-oil-mixture ratio 25 : 1
Oil	selfmixing two-stroke oil of first quality
Fuel Tank Capacity	5,3 ltrs, reserve 250 cc
Fuel Consumption per 100 kms	1,5 ltrs
Electrical System	Noris-flywheel-magneto with two 6 Volts-lighting-coils
Ignition Timing.	2,6 mm before u.d.c.
Spark Plug	Bosch W 175 T 1, 14 mm Beru 175/14 n 2
Spark Plug Gap	0,7 mm
Head Light Bulb	6 Volts, 2,7 Watts
Tail Light Bulb	6 Volts, 2 Watts
Clutch	three-plate dry clutch
Transmission	1 : 4,08 total reduction 1 : 17,30
Drive	chain $^1/_2" \times ^3/_{16}"$
Wheels	23"

Tires	23"×2,25" with counter pression valve
Rims	drop-base rims for steel cable tires
Brake	front: internal expanding hub rear: internal expanding hub
Tire Pressure	front: 1,6 atü = 23,5 lbs rear: 2 atü = 29 lbs

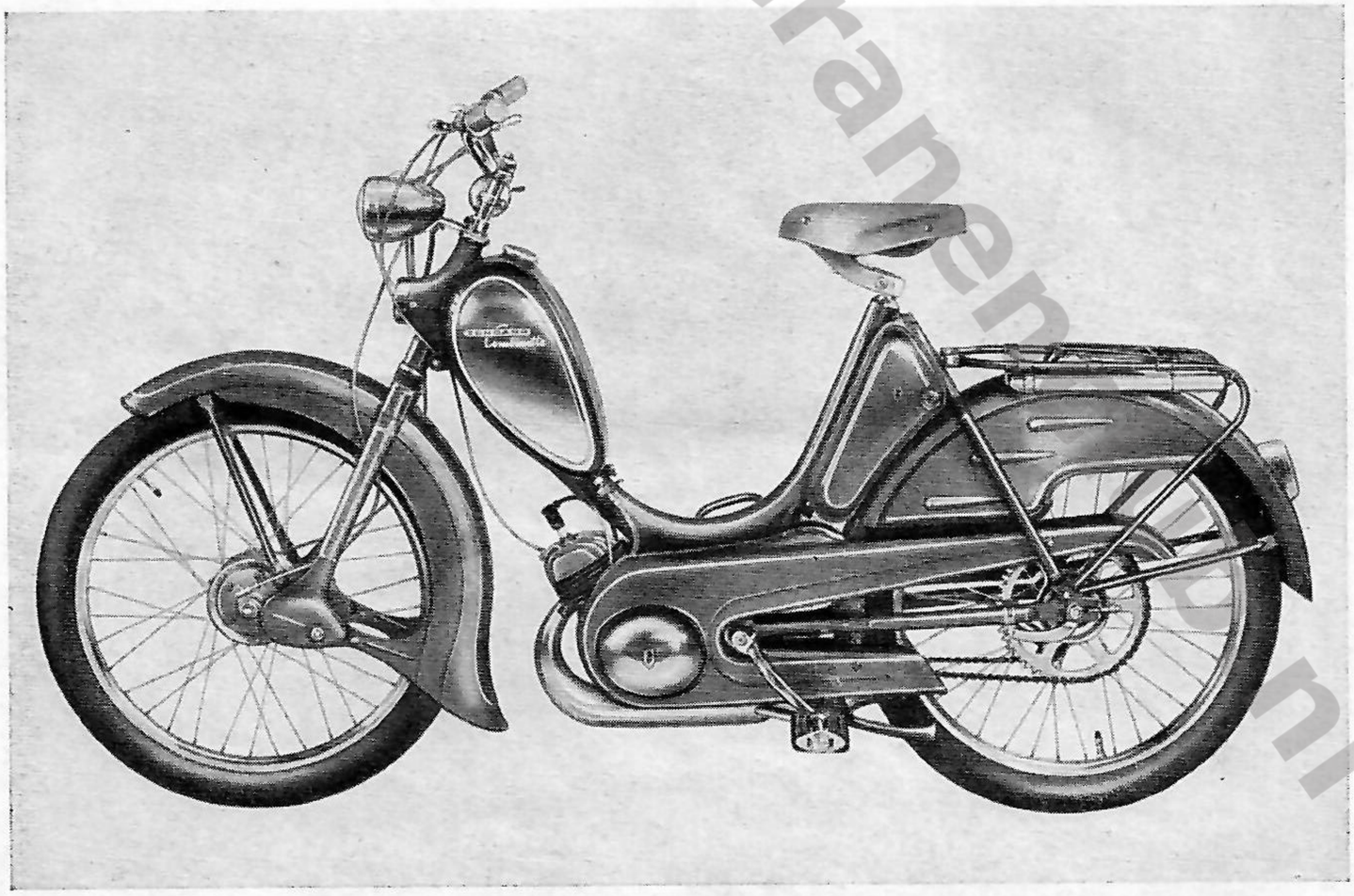
Specification of Two-Speed Engine

Piston Displacement in cc	50
Bore/Stroke in mm	39/41,8
Compression Ratio	1 : 6,5
Cycle of Operation	two-stroke-cycle
Lubrication	mixture lubrication
Carburetor	Bing 1/12.51
Main Jet	54
Needle Jet	2,12
Needle Adjustment	4th notch from top
Fuel	gasoline-oil-mixture ratio 25 : 1
Oil	selfmixing two-stroke oil of first quality
Fuel Tank Capacity	5,3 ltrs
Fuel Consumption per 100 kms	1,5 ltrs
Electrical System	Noris-flywheel-magneto with two 6 Volts-lighting-coils
Ignition Timing	2,6 mm before u.d.c.
Spark Plug	Bosch W 175 T 1, 14 mm Beru 175/14 n 2

Spark Plug Gap	0,7 mm
Head Light Bulb	6 Volts, 2,7 Watts
Tail Light Bulb	6 Volts, 2 Watts
Clutch	three-plate dry clutch
Transmission	planetary gear with 2 speeds and idling (1 : 5,38 and 1 : 3,72) total reduction 1 : 23,8 and 1 : 16,55
Transmission Oil Quantity	approx. 200 cc
Oil	first quality oils like Mobil-Oil C 80, Esso 80, Shell 80, BP Energol SAE 80, Aral BV Transmission-Oil 80
Speed Change	twist grip operating with dial on handlebar
Drive	chain $^1/_2$"×$^3/_{16}$"
Wheels	23"
Tires	23"×2,25" with counter pressure valve
Rims	drop-base rims for steel cable tires
Brake	front: internal expanding hub rear: internal expanding hub
Tire Pressure	front: 1,6 atü = 23,5 lbs rear: 2 atü = 29 lbs



Type 412 / One-Speed Engine



Type 412 / One-Speed Engine

Type 405 / Two-Speed Engine

Type 405 / Two-Speed Engine

Operation

For this paragraph and the control devices mentioned therein see Figure 1 to 6.

Operation of the ZÜNDAPP-COMBINETTE is very simple if you will remember a few directions:

a) Turn fuel tank filler cap to the left and remove it. Fill in first gasoline and then a selfmixing oil of first quality. When using oils which do not mix automatically with gasoline, mixture has to be prepared in a mixing can before filling. Ratio gasoline : oil = 25 : 1.

b) The transmission case has to be filled with transmission oil (filler neck on right motor side). Total oil quantity 200 cc (transmission oil according to specification of 2-speed engine). Watch oil level gauge.

c) Open fuel tap. Fuel flows to the carburetor.

d) When engine is cold, depress starter pin entirely, after having closed twist grip. Thus the choke valve reduces air intake and the engine receives the overrich mixture required for starting. (The more you accelerate, the more the starter pin will be pushed out automatically.) **When the engine is warm** do not depress the starter When the engine is warm do not depress the starter pin. It is recommended to give full throttle before starting. This will ensure that the starter pin is in top position. (The more you accelerate, the more the starter pin will be pushed out automatically).

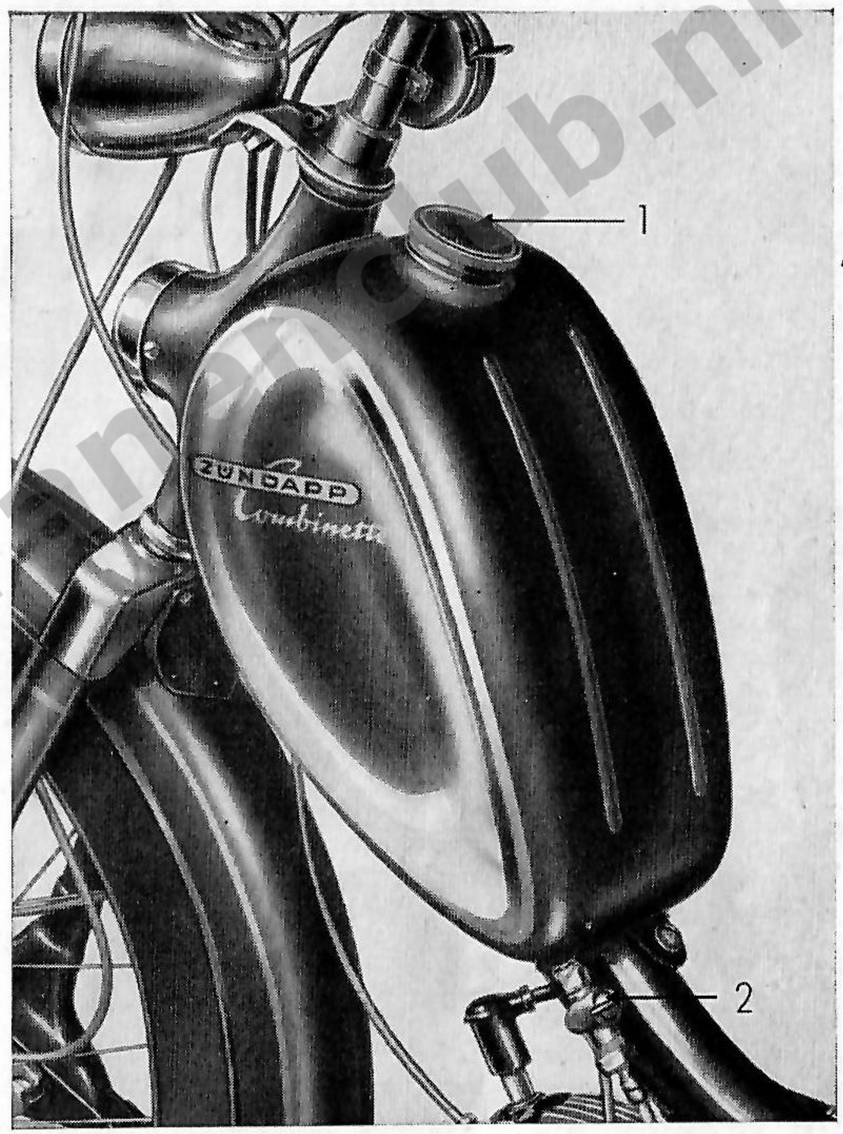


Figure 1 **Fuel Tank**

1 = filler cap
2 = fuel tap (outward—closed, upward—open, inward—reserve)

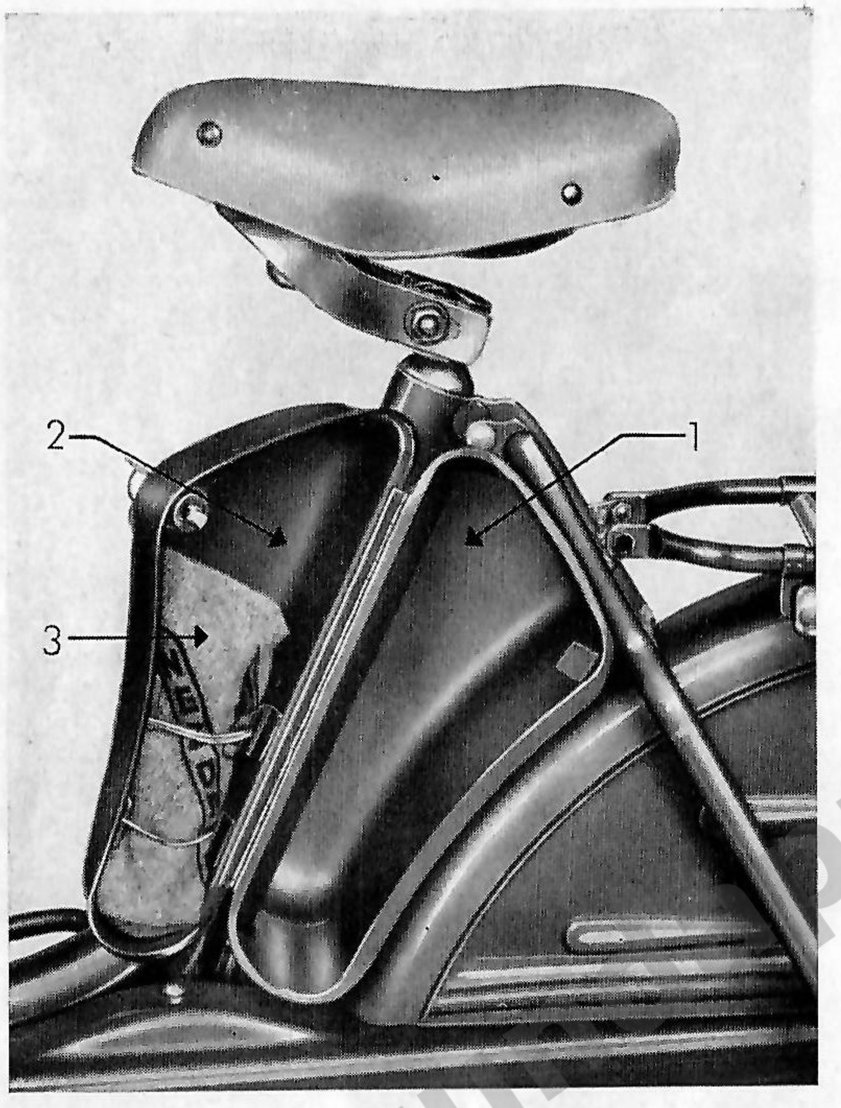


Figure 2 **Tool Box**

1 = tool box
2 = cover
3 = tools

e) **The Adjustment of the Saddle**

The swing saddle may be adjusted to size and weight of the driver.

Procedure (see Fig. 3):

The adjustment of suspension to weight: right turn of the adjusting screw will reduce smoothness, left turn will increase it.

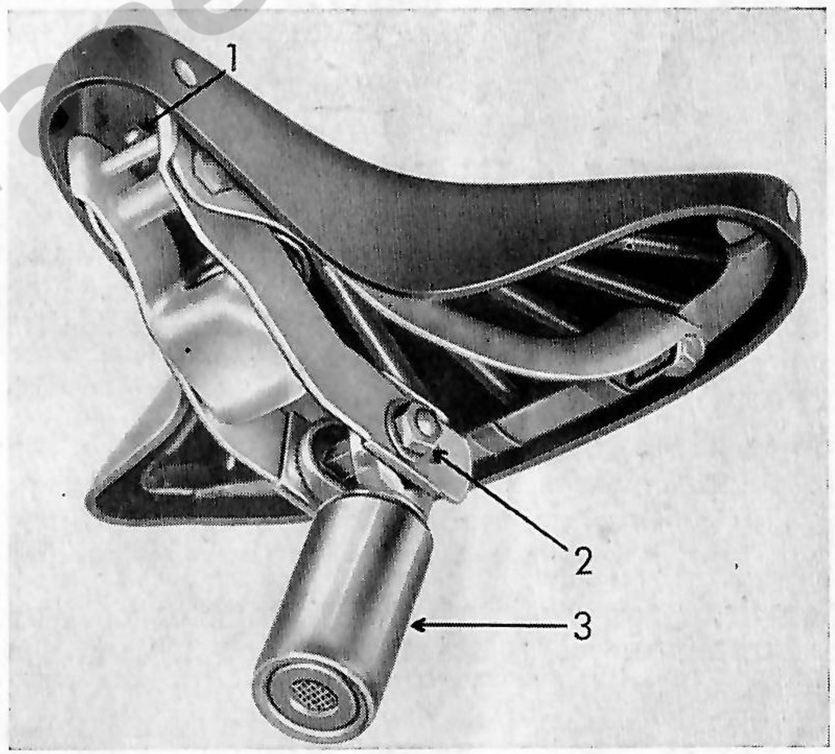


Figure 3 **Adjustment of Saddle**

1 = suspension adjusting screw
2 = nut (right and left) for saddle displacement
3 = saddle pillar

Adjustment of saddle to size of driver: loosen fastening screws of saddle and displace saddle accordingly. To obtain longest distance from handlebar, turn saddle pillar by one half turn. The rubber seat of saddle requires special treatment. Oil, grease, fuel and acid are enimies of rubber desolving it and rendering its surface poor-looking. Furthermore congestions of clothing are not to be avoided in this case. It is therefore recommended to clean the saddle with smooth lotions such as lukewarm soap-suds and to rinse with pure water afterwards. This service is to be performed every 4 to 6 weeks.

f) **Tire Pressure**

The ZÜNDAPP-COMBINETTE is equipped with one-way tire valves. Standard bicycle air-pumps can therefore not be used. The advantage of the one-way valve consists in the fact that the correct air pressure can be established at any filling station by means of an air compressor.

The tire pump supplied with the autocycle is a real motorcycle pump which fits one-way valve and permits inflating of the inner tube without any trouble.

Since tire pressure is of utmost importance we draw your attention to the fact that high pressure causes concussions of the COMBINETTE, while a rapid wear is the result of too low tire pressure. We recommend therefore at a driver's weight of 75 kg

front wheel	1,6 atü	=	23,5 lbs
rear wheel	2 atü	=	29 lbs

Do not forget to put the rubber cap on the pump, it protects the valve against dust and water.

g) **Starting the One-Speed Engine**

Take autocycle back from stand.

Pull back clutch lever until it engages into notch, mount vehicle and push the pedals. With low temperature and cold engine open twist grip only a little (until you feel a slight resistance which indicates that starter pin is being lifted); with warm weather and hot engine open about 1/3 to 1/2 of the way. Slowly release clutch lever. The engine will start after a few revolutions. If the starter pin has been pushed in, give full throttle just for a moment after engine has started and vehicle has run a short distance. Do not fail to perform this operation as otherwise the engine will receive an overrich mixture.

Another possibility is the starting by means of the decompression lever. Procedure is the same as outlined in point a, c, d. Clutch remains engaged and at starting the decompression lever will be pulled back. As soon as vehicle is in motion release decompression lever and the engine will start. The speed is regulated exclusively by the twist grip. Never let the clutch drag.

During short stops (crossings, traffic jams) disengage clutch and wait with idling engine. To start again, open twist grip and engage clutch slowly.

At disengaged clutch and inoperative engine you may ride in the conventional manner of a standard bicycle. The catch on the clutch lever keeps the clutch disengaged automatically.

h) **Starting the Two-Speed Engine**

Take autocycle back from stand.

Pedal kickstart: disengage clutch, shift into second speed release clutch lever and move the cycle a little to and fro until a significant resistance will become evident, then disengage clutch and push the pedals. The downward pushed pedal may be returned into horizontal position by the toe tip if a second push should be neccessary.

The engine runs at standing cycle. For moving shift into first speed (watch dial on twist grip) at shut-down throttle and entirely disengaged clutch. Open throttle a little bit and engage clutch slowly. After having gained a sufficient speed, disengage clutch at shut-down throttle, shift into second speed and engage again. After the shifting operation itself wait quite a moment before engaging in order to grant proper engagement. Shifting from second into first speed will be performed in the same way.

You may also start in the following way: shift into second speed, engage clutch, pull decompression lever, move cycle by pedalling and then release decompression lever.

Accelerator control will be opened just as on the one-speed engine about 1/3 to 1/2 of the way when engine is warm. With cold motor give a little throttle after depressing starter pin (until slight resistance will become evident). At low temperature do not give full throttle too early, as thus starting device will be blocked out automatically.

i) The engine is shut off by the cut-out switch on the head lamp as well as by means of the decompression lever. Never stall engine but disengage clutch, shift to neutral, apply brake and shut the engine off.

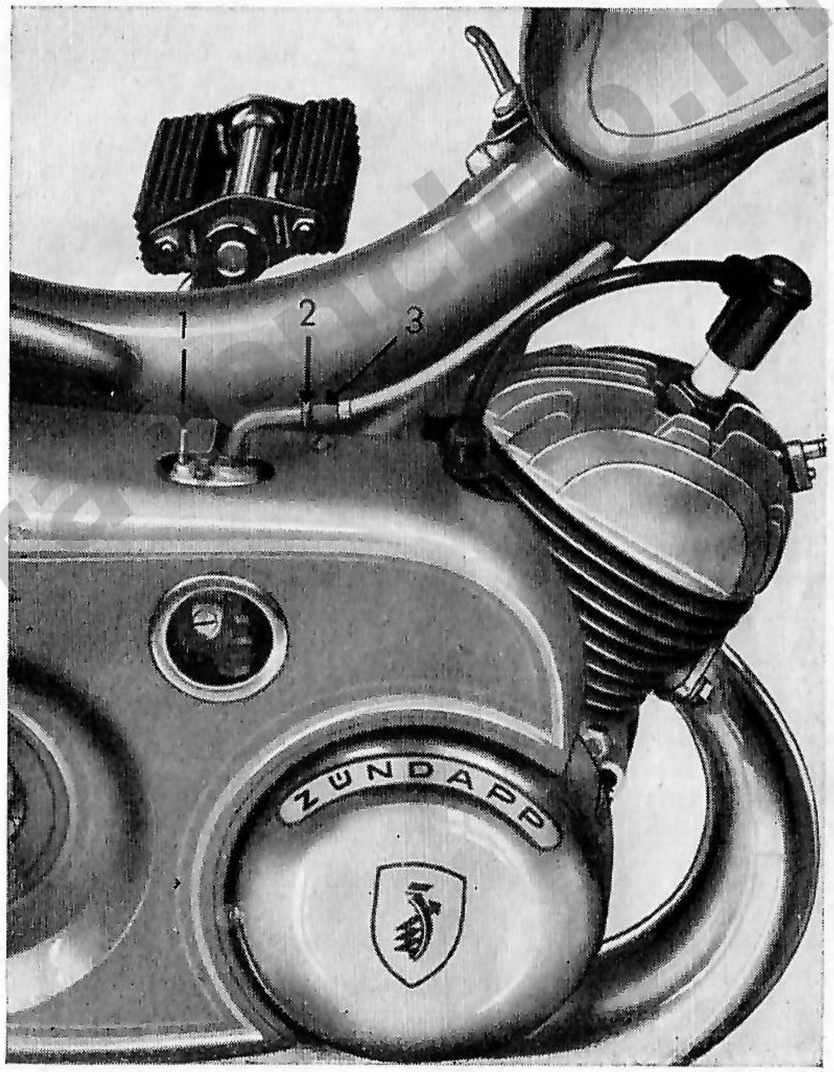


Figure **4** **Carburetor Side of One-Speed Engine**

1 = starter pin
2 = lock nut
3 = adjusting screw for accelerator bowden cable

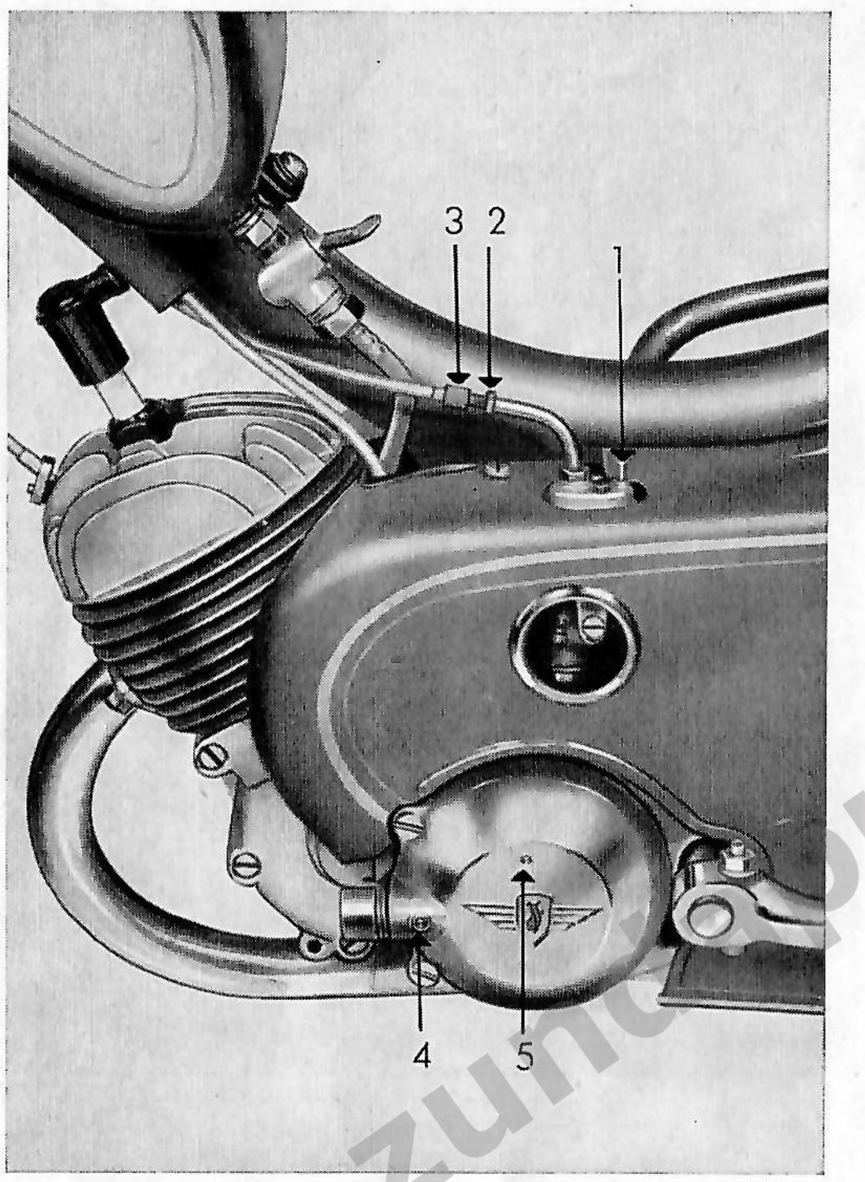


Figure 5 **Carburetor Side of Two-Speed Engine**

1 = starter pin
2 = lock nut
3 = adjusting screw for accelerator bowden cable
4 = lubricator
5 = lubricator

With the engine shut off the COMBINETTE may be operated like any standard bicycle (on 2-speed engines shift into neutral). When moving autocycle reverse, clutch ought to be disengaged in any case.

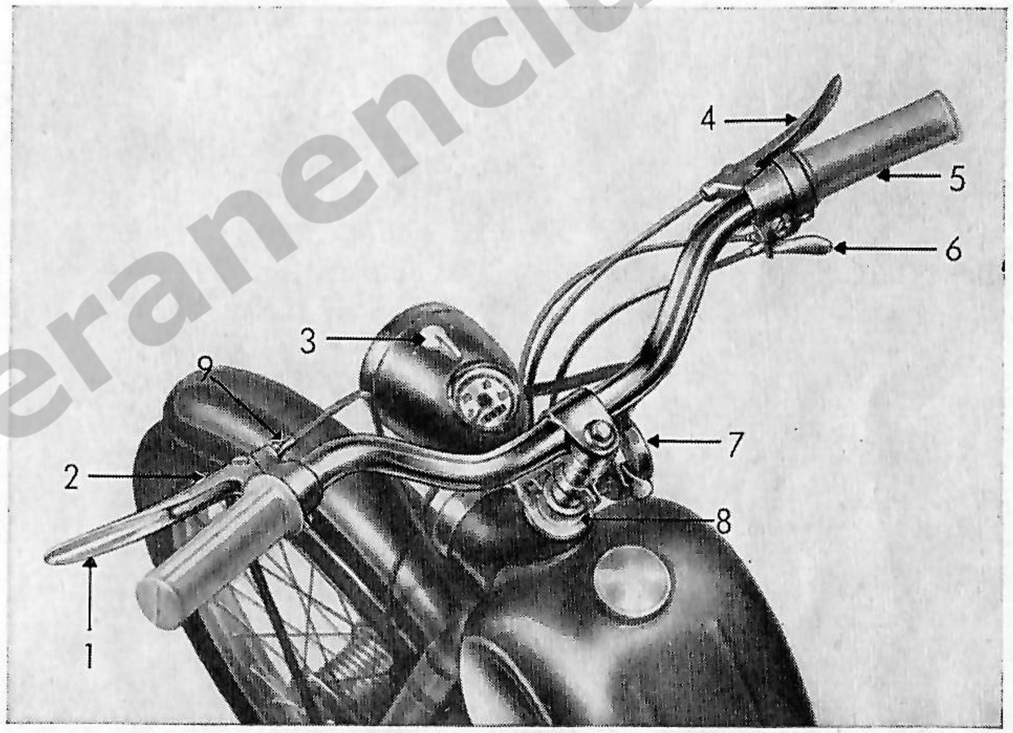


Figure 6 **Control Devices of One-Speed Engine**

1 = clutch operating lever
2 = catch for clutch operating lever
3 = light and cut-out switch
4 = operating lever for front brake
5 = twist grip accelerator control
6 = decompression lever
7 = bell
8 = extension stem nut and clamp

Maintenance

When you follow the aforementioned suggestions, you have rendered your engine a good service already, for expert operation will increase its performance and life. Neverthless you will have to give your ZÜNDAPP-COMBINETTE a certain minimum of routine maintenance. (Please use your service and inspection card, as otherwise guarantee claims can not be advanced). The preventine maintenance should be performed according to the following schedule:

1. 180 miles Check

1. Tighten all bolts and nuts (do not forget air intake and motor suspension).
2. Tighten expander bolt of handlebar.
3. Check front brake and adjust, if neccessary.
4. Check rear brake and adjust, if neccessary.
5. Check chain tension and adjust, if neccessary.
6. Check clutch clearance and adjust, if neccessary.
7. Check carburetor and air filter and clean, if neccessary.
8. Clean spark plug and readjust gap, if neccessary.
9. Check gear shift control and adjust, if neccessary. (Shop Service).
10. Replace transmission oil (Mobil Oil C 80, Esso 80, BP Energol SAE 80, Aral BV Transmission Oil 80).
11. Tighten engine suspension.
12. Tighten nuts of cylinder head (when engine is cold only).
13. Check front and rear wheel cones and adjust, if neccessary.

14. Lubricate bowden control cables.
15. Grease speedometer gear and oil speedometer cable.

2. 750 miles Check

1. Tighten all bolts and nuts (do not forget air intake and motor suspension).
2. Tighten expander bolt of handlebar.
3. Check front brake and adjust, if neccessary.
4. Check rear brake and adjust, if neccessary.
5. Check chain tension and adjust, if neccessary.
6. Check clutch clearance and adjust, if neccessary.
7. Check carburetor and air cleaner and clean, if neccessary.
8. Clean spark plug and readjust gap, if neccessary.
9. Check gear shift control and adjust, if neccessary.
10. Check level of transmission oil and refill, if neccessary. (Mobil Oil C 80, Esso 80, BP Energol SAE 80, Aral BV Transmission Oil 80).
11. Tighten engine suspension.
12. Tighten nuts of cylinder head (When engine is cold only).
13. Check front and rear wheel cones and adjust, if neccessary.
14. Check front fork.
15. Check handlebar bearings and grease, if neccessary.
16. Lubricate bowden control cables.
17. Grease speedometer gear and oil speedometer cable.

3. 1 500 miles Check

1. Tighten all bolts and nuts (do not forget air intake and motor suspension).

2. Check front brake and adjust, if neccessary.
3. Check rear brake and adjust, if neccessary.
4. Check chain tension and adjust, if neccessary.
5. Check clutch clearance and adjust, if neccessary.
6. Check carburetor and air cleaner and clean, if neccessary. Tighten float bowl.
7. Clean spark plug and readjust gap, if neccessary.
8. Check gear shift control and adjust (Shop Service).
9. Replace transmission oil (Mobil Oil C 80, Esso 80, Shell 80, BP Energol SAE 80, Aral BV Transmission Oil 80).
10. Tighten motor suspension.
11. Check front and rear wheel cones and adjust, if neccessary.
12. Check handlebar bearings, and grease, if neccessary.
13. Lubricate bowden control cables.
14. Remove cylinder head and clean intake and exhaust ports.
15. Dismantle exhaust and clean.
16. Grease speedometer gear and oil speedometer cable.

Even after these abovementioned checks, all specified preventive maintenance should be performed periodically. This will preserve efficiency of the engine.

If you have mechanical skill you may do most of these maintenance jobs yourself, otherwise and in those cases particularly mentioned in this manual, remit your COMBINETTE to a competent maintenance shop or service station.

1. Servicing the Air Cleaner

A serviceable air cleaner will not only reflect favorably on the performance and the fuel consumption of the engine but will also increase its life.

Procedure (see Fig. 7., 8. and 9.):

With one-speed engine the carburetor is fitted on the right side and with two-speed engine on the left side of the frame. Remove therefore right or left chain guard respectively. Take off spring brackets and push back air cleaner union. Remove air cleaner from carburetor housing, wash out in gasoline, let dry and dip in thin engine oil. Let metal gauze inset become thoroughly soaked, drain off excess oil by vigorous shaking and re-install. Make sure that both spring brackets engage in their notches on carburetor housing and that rubber sleeves are fitted properly as otherwise engine efficiency will decrease. Assemble chain guard.

2. Checking and Readjusting Clutch Clearance

The clutch must engage and disengage properly without dragging. When correctly adjusted, the clutch lever at the handlebar must have some clearance when clutch is engaged (approx. 1/4 inch at the end of the lever). Check clutch clearance every 600 miles and adjust, if neccessary. (Shop Service).

Procedure (see Fig. 9 and 11):

Remove chain guard, loosen lock nut of adjusting screw, turning in of adjusting screw increases, turning out reduces clutch clearance. If thread of the adjusting screw does not permit further withdrawal, shorten clutch cable.

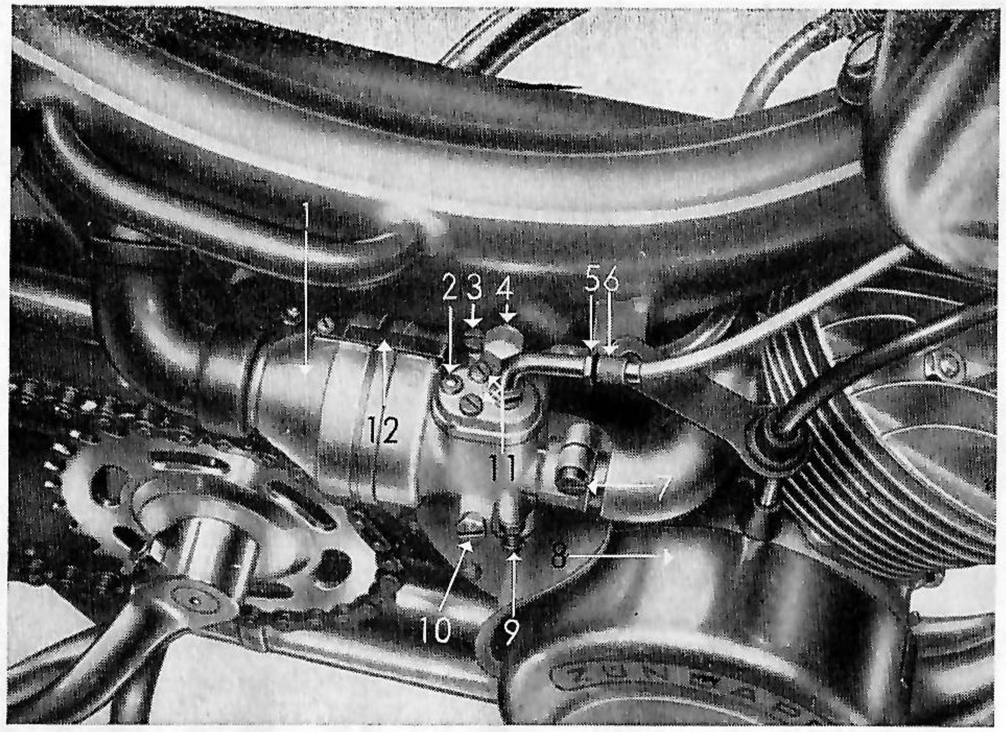


Figure 8 **Carburetor on One-Speed Engine**

1 = air cleaner union
2 = starter pin
3 = fastening screw for float bowl
4 = bolt for fuel hose coupling
5 = lock nut for adjusting screw of bowden cable
6 = adjusting screw of accelerator bowden cable
7 = clamping screw
8 = cover of magneto
9 = idle adjustment screw
10 = main jet
11 = cover plate screw
12 = spring bracket

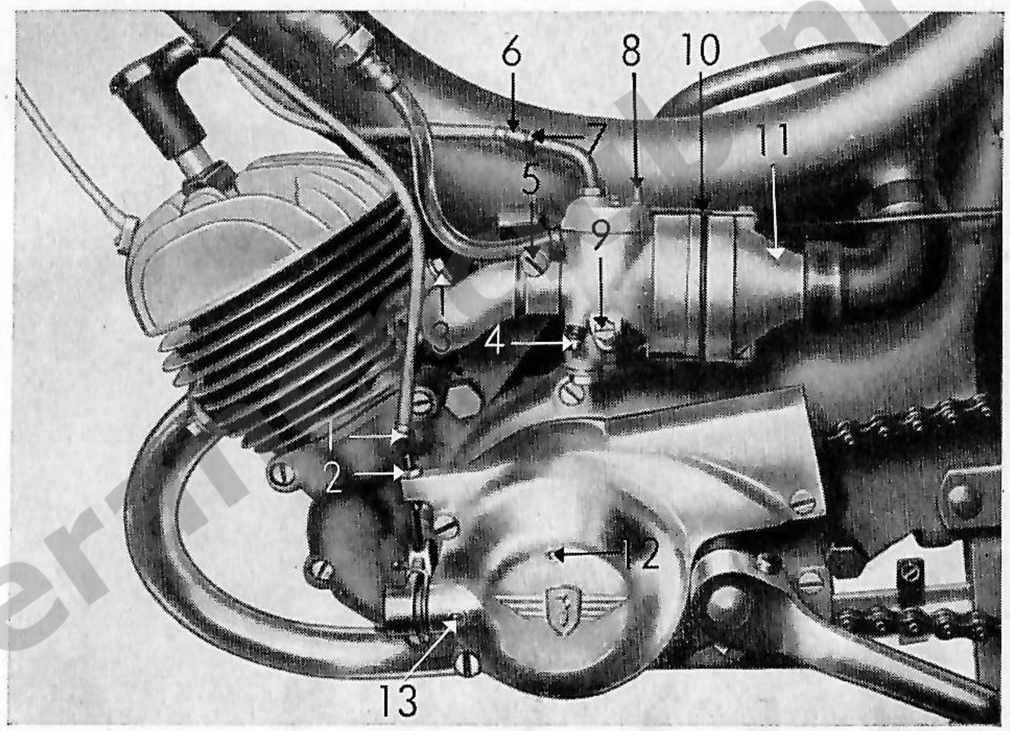


Figure 9 **Carburetor on Two-Speed Engine**

1 = adjusting screw for clutch bowden cable
2 = lock nut for adjusting screw of bowden cable
3 = fastening nut of air intake elbow
4 = idle adjustment screw
5 = clamping screw of accelerator cable
6 = adjusting screw of accelerator cable
7 = lock nut of adjusting screw
8 = starter pin
9 = main jet
10 = spring braket
11 = air cleaner union
12 = lubricator on clutch housing
13 = lubricator of clutch lever shaft

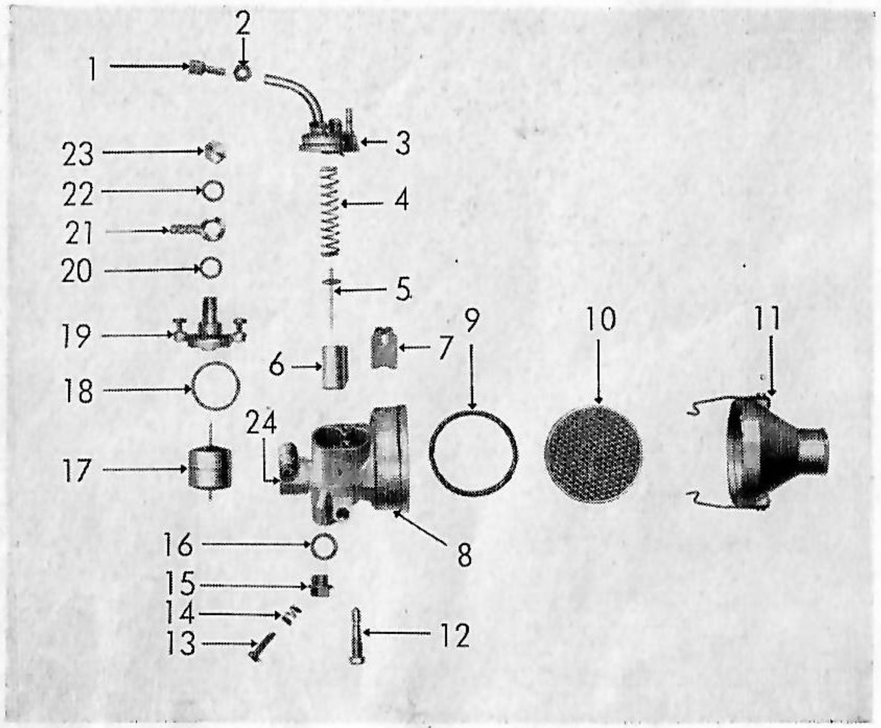


Figure 10 **Carburetor in Disassembled State**

1 = adjusting screw
2 = lock nut
3 = cover plate
4 = spring
5 = jet needle
6 = throttle valve
7 = choke valve
8 = carburetor housing
9 = gasket
10 = air cleaner
11 = air cleaner union
12 = main jet
13 = idle adjusting screw
14 = spring
15 = plug
16 = gasket
17 = float
18 = gasket
19 = float bowl cover
20 = gasket
21 = fuel hose coupling
22 = gasket
23 = bolt
24 = fastening screw

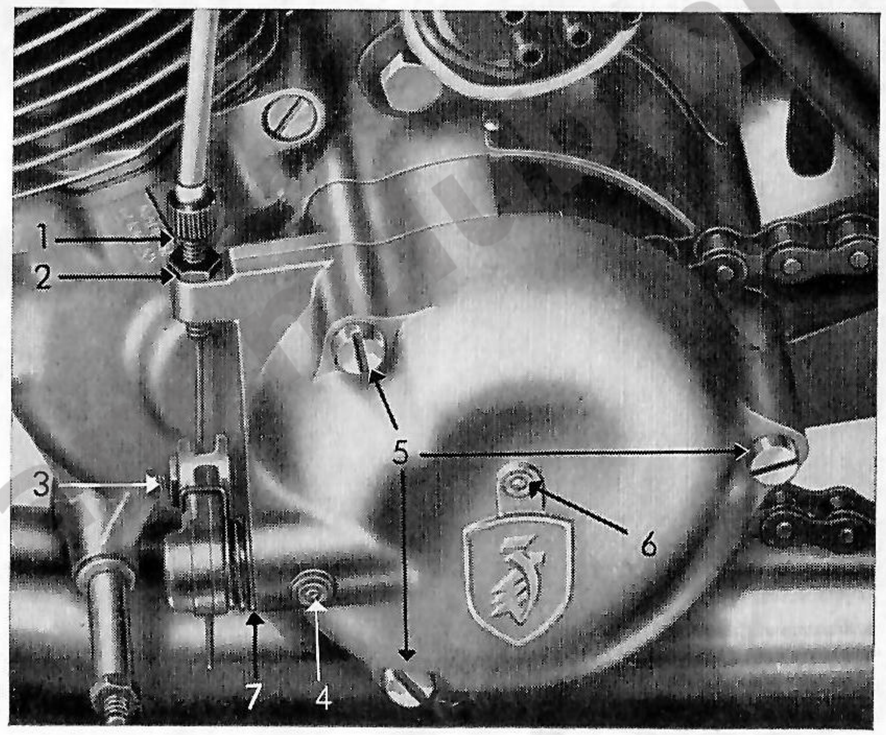


Figure 11 **Clutch Side of One-Speed Engine**

1 = adjusting screw of clutch cable
2 = lock nut for adjusting screw of clutch cable
3 = screw nipple
4 = lubricator of clutch lever shaft
5 = fastening bolt of clutch housing
6 = lubricator
7 = torsion spring

Quite obviously, the clutch must have a certain clearance between clutch tongue and thrust pin (about 1/2 mm). Remove clutch housing and adjust by installing spacers between thrust pin and thrust plate. With the growing wear of the clutch linings the full clearance tends to decrease and ought to be adjusted by removing one or two spacers. The clearance is checked at the clutch crank fitted on the clutch housing. With correctly adjusted clearance, the clutch crank can easily be raised by approx. 3/16" until a resistance is felt. (Shop Work).

3. **Checking and Readjusting of Front Wheel Brake**

Increasing clearance on the hand brake lever indicates that the brake needs readiustment. Generally the clearance should not exceed approx. 1/4 inch at the end of the brake lever. Readjustment should be made in such way that when the brake lever has travelled through this clearance the brake shoes begin to drag. Check brake every 600 miles and readjust, if neccessary.

Procedure (see Fig. 11):

Loosen lock nut of cable adjusting screw and unscrew the latter until the specefied clearance has been attained. Then hold adjusting screw firmly and retighten lock nut.

4. **Lubricating Speedometer Gear**

The hub gear speedometer is fitted with a lubricator. It has to be greased with first quality transmission or bearing grease.

5. **Checking and Readjusting the Rear Wheel Brake**

This operation concers only the COMBINETTE with 2-speed engine equipped with an internal expanding coaster brake hub. Check brake clearance every 600 miles and readjust, if neccessary.

Procedure (see Fig. 13):

Adjust clearance by means of cable adjusting screw.

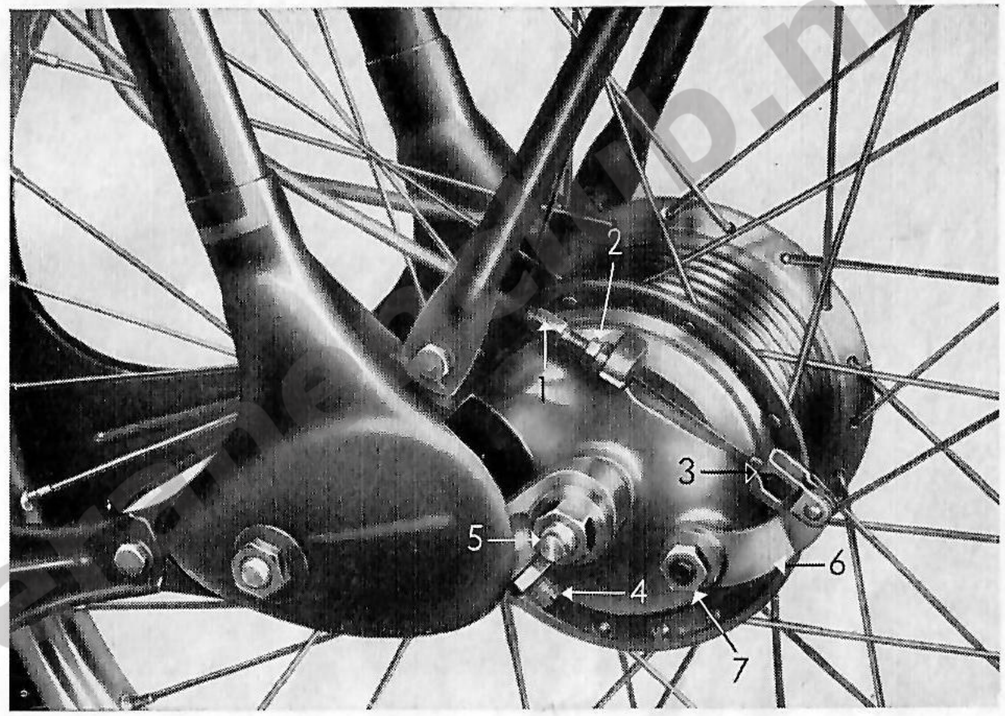


Figure 12 **Adjustment of Front Wheel Brake**

1 = adjusting screw of brake control bowden cable
2 = lock nut
3 = cable suspension
4 = adjusting screw of swing fork
5 = axle nut
6 = brake lever
7 = fastening nut

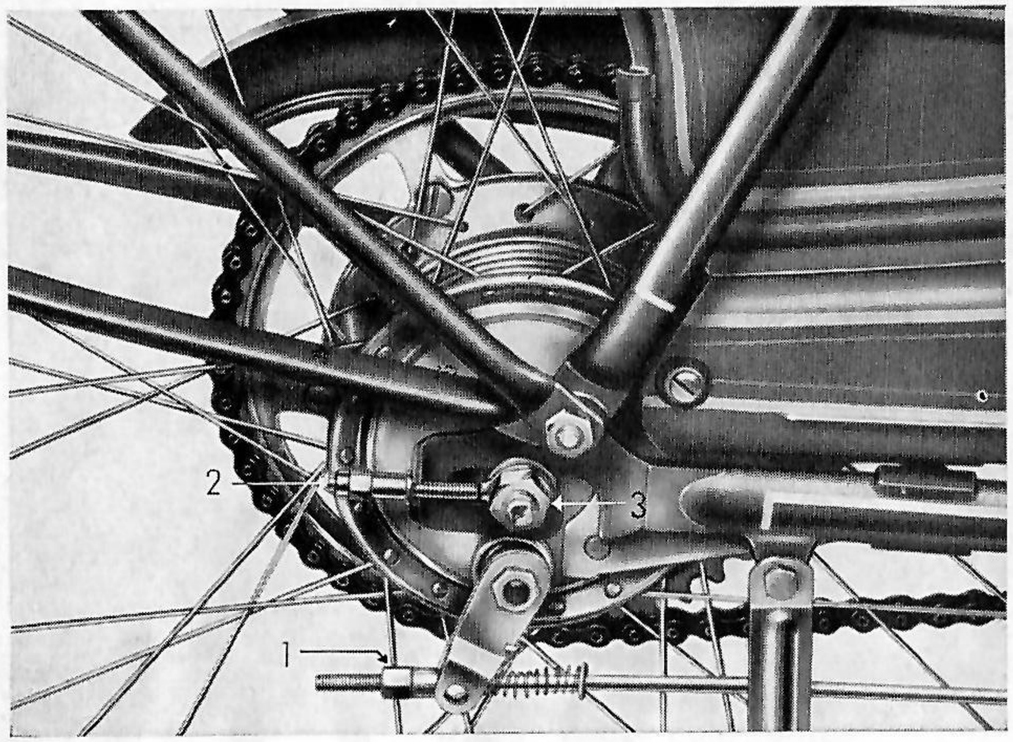


Figure 13 **Adjustment of Rear Wheel Brake and Chain on Two-Speed COMBINETTE**

1 = brake adjusting screw
2 = adjusting screw for chain
3 = axle nut

6. Idle Adjustment of Engine

Quiet idling which makes the engine just turn at low speed without knocking, spiting or misfiring, adds to the comfort of the driver and helps economize fuel. If the idling speed should suddenly change, readjust immediately. Check every 600 miles and readjust, if neccessary.

The adjustment should be made when engine is warm. Turn in lower adjusting screw and start engine. Close throttle entirely. Now turn out adjusting screw until engine runs at lowest possible revolutions but without stalling. Generally idle adjustment screw has to be turned out 3 half-turns.

7. Checking Chain Tension, Cleaning and Lubricating of Chain on One-Speed Engine

(see Fig. 14).

The wear of the chain is increased by the influence of dust and dirt. Proper servicing at 600 miles intervals will considerably reduce wear and tear.

Procedure:

a) Remove left chain guard.

b) Loosen chain lock and remove chain.

c) Dip chain in gasoline or kerosene bath for about an hour, brush off, rinse again and wipe clean. Then dip for about one half an hour into a closed can of ZÜNDAPP Chain Grease and let then drain off for 2 to 3 hours. Reinstall closed part of chain clip spring pointing in turning direction of the chain.

d) Adjust chain by adjusting screw (center sag: a total of $^1/_2$ inch up and down).

If you have no skill leave these aforementioned services to a workshop.

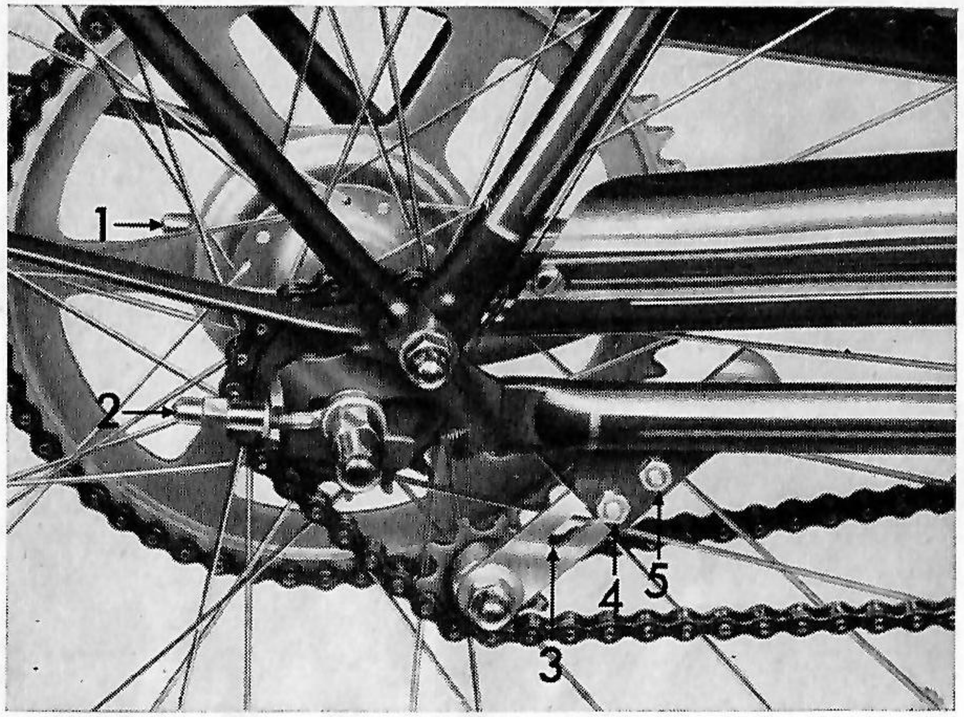


Figure 14 **Chain Adjustment and Pedal Chain Adjustment on One-Speed COMBINETTE**

1 = left adjusting screw
2 = right adjusting screw
3 = pedal chain tensioner
4 = fastening screw for pedal chain tensioner
5 = fastening screw for pedal chain tensioner

8. Adjusting of Pedal Chain on One-Speed Engine

(see Fig. 14).

Adjusting of common pedal chain is being performed by means of chain tensioner which will be tightened in the respective position.

9. Adjustment of Motor Chain on Two-Speed Engines

(see Fig. 13).

The tension of the chain is adjusted in the manner of a standard bicycle. Loosen fastening nuts of rear axle and displace rear wheel by adjusting the two chain adjusting screw accordingly.

10. Lubricator on Clutch Housing

(see Fig. 5).

In both lubricators a few drops of oil should be put in every 600 miles.

11. Cheking of Oil Level of Transmission Case on Two-Speed Engines

Check oil level every 1 200 miles. Refill, transmission oil if neccessary. The oil filler plug is situated on right rear side of the engine. The oil level gauge of the filler plug shows the minimum and maximum oil levels (see Fig. 15). When checking oil level the cycle has to be back from stand in ready-to-drive position.

12. Cleaning the Carburetor

It is mandatory to clean the carburetor if neccessity arises but at least every 1 200 miles.

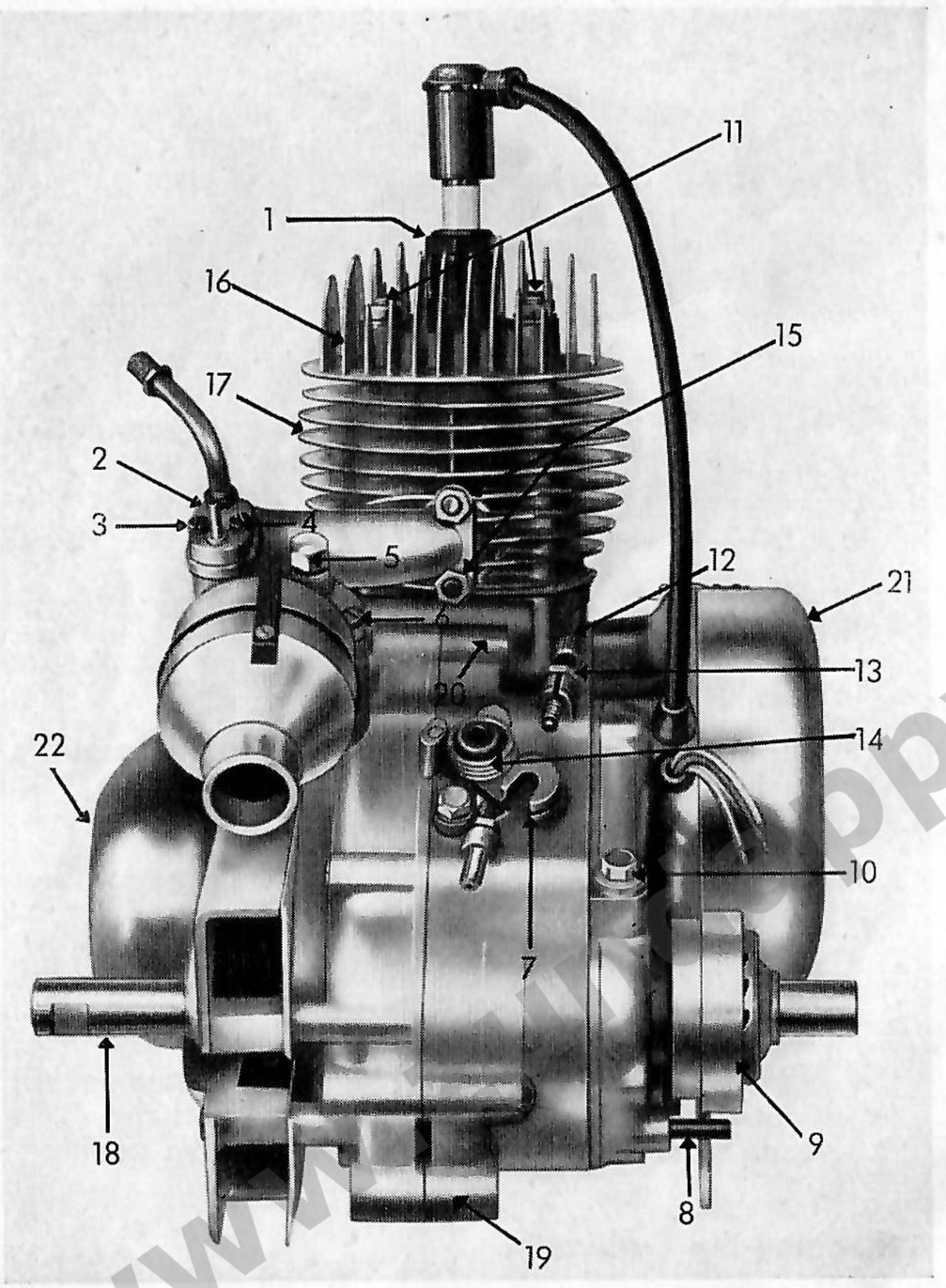


Figure 15 **The Two-Speed Engine**

To Figure 15 **The Two-Speed Engine**

1 = spark plug
2 = cover plate of carburetor
3 = cover plate screw
4 = cover plate screw
5 = fuel hose coupling
6 = fastening bolt of float bowl
7 = shifting lever
8 = stop pin
9 = brake catch
10 = oil filler plug with oil level gauge
11 = cylinder head nuts
12 = adjusting screw of shifting cable
13 = lock nut
14 = torsion spring of shifting lever
15 = fastening bolt of air intake
16 = cylinder head
17 = cylinder
18 = bottom bracket axle
19 = motor suspension
20 = motor suspension
21 = magneto
22 = clutch

Procedure (see Figs. 8, 9, 10).

Shut off fuel supply to the carburetor and remove right or left chain guard respectively. Take off spring brackets, push back air cleaner union and remove air cleaner. Loosen the two screws of the cover plate and take off cover plate together with throttle valve, valve spring, choke valve and jet needle with clip without disconnecting from accelerator control cable. Figure 10 shows these parts in disassembled state. Loosen clamping screw and remove carburetor from intake elbow of engine. Unscrew float bowl. The float lies loosely in the bowl.

Unscrew fastening bolt with fuel hose coupling and remove strainer. Take care of the two gaskets. Unscrew main. jet.

Clean all parts in gasoline. Never clean orifice of jets with a hard tool such as a needle or wire, but merely wash out and blow out vigorously. Reinstall all parts. At turning in of the fastening bolt for fuel hose coupling, in which strainer has to be inserted before, watch that one gasket is above and one below the fuel hose coupling. Also take care of the gaskets for cover plate and float bowl.

Choke valve, spring valve and jet needle with clip will be removed from cover plate only (by disconnecting accelerator cable from throttle valve) if one of those parts should be replaced. When assembling again take care that clip is in the required notch of jet needle.
Check for vertical position of the carburetor.

13. **Checking Spark Plug Gap**

Procedure:

Disconnect ignition cable from spark plug, remove spark plug and clean thoroughly. Adjust gap by means

of a spark plug gauge. Gap 0,7 mm. The correct gap will be established by a special device for this purpose.

14. **Cleaning the Exhaust**

Efficiency and consumption of a two-stroke engine depend mainly on pressure conditions in the exhaust system. The provided cleaning of every 2 000 miles should be therefore performed in any case.
The procedure itself (dismantling, cleaning of exhaust, cleaning of the exhaust ports in the cylinder) is a work shop task.

15. **Lubricating Bowden Control Cables**

Accelerator, clutch, shifting and decompression cable should move easily in their casings. They should therefore be lubricated every 2 000 miles.

Procedure:

Take cables out of operating levers and apply thin oil between cable and casing till the oil flows out at the other end.

The adjustment of idling and the different clearance to be effected afterwards have already been explained. The adjustment of gear shift control will be performed by means of the adjusting screw shown in Fig. 7: Loosen lock nut, adjust screw and tighten lock nut again. Adjust accelerator and clutch cable in the same way.

Engine Breakdowns

1. Engine does not start.

Causes:

Fuel tank empty.
Fuel tap closed.
Congested strainer.
Float needle jams.

Starter pin not operated when engine too cold.
Excessive spark plug gap.
Loose or worn out ignition cable.
Short circuit in head light switch.
Breaker point contaminated or burnt.

2. Engine starts and stalls afterwards.

Cause:

Carburetor empty, because of closed fuel tap.

3. Engine starts but stalls at acceleration.

Cause:

Engine still too cold.

4. Engine starts, but carburetor pops at acceleration.

Causes:

Engine too cold.
Jet plugged.
Congested fuel line.
Intake not tight.
Retarded ignition.
Defective condenser or ignition coil.

5. Engine operates irregularly.

Causes:

Air cleaner congested.
Spark plug dirty.
Intermittend ignition.
Ignition cable loose.
Ignition wire terminal loose on spark plug.
Carburetor congested.

6. Engine knocks.

Causes:

Excessive pre-ignition.
Glow ignition by carbon deposits.
Poor fuel.

7. Engine overheats.

Causes:

Incorrect ignition timing.
Unsuitable oil.
Exhaust port of cylinder or exhaust plugged by carbon deposits.
Insufficient cooling by dirty radiator fins.
Spark retard.

8. Intermittent racing of engine.

Cause:

Clutch drags due to insufficient clutch lever clearance or excessive wear of clutch linings.

9. Engine does not develop full power.

Causes:

Insufficient pre-ignition.
Defective carburetor.
Congested air cleaner.
Exhaust port of cylinder or exhaust plugged by carbon deposits.
Poor compression due to jammed piston rings caused by low grade lubricant.
Defective cylinder head gasket.
Loose cylinder head, exhaust and intake flange nuts.
Leaky decompression valve.
Rubber sleeve of intake untight or disjoint from carburetor or frame juntion.
Crepe rubber seal in the frame in wrong position ($^3/_8$ inch before orifice of rubber sleeve to steering).

10. Engine operates on four-stroke cycle.

Causes:

Incorrect mixture (too much oil).
Jet too large.
Jet needle jams.
Float or float needle leaky.
Air cleaner congested.
Incorrect ignition timing.

11. Excessive fuel consumption.

Causes:

Leaks in fuel line.
Float bowl loose.
Jet too large.
Incorrect ignition timing.
Exhaust plugged up.

Spark plug gap 0.028"

Ignition timing 0.104" B.T.D.C.

Carb. BING 1/12/51

Piston Ring gap 0.024"

Contact breaker gap 0.015"