

ZUNDAPP

Combinette



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**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 autocyce, 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.

There is one thing we ask for: read this booklet **before** the first start.

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

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

ZÜNDAPP-WERKE GMBH
NÜRNBERG - MÜNCHEN
W e r k M ü n c h e n

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SPECIFICATIONS:

Motor	model 255
Piston Displacement in cc	50
Bore/Stroke in mm	39/41,8
Power in HP	1,5 at 4200 r. p. m.
Compression Ratio	1 : 6,5
Cycle of Operation	two-stroke cycle
Lubrication of Gearbox	Mobiloil C 80 and other equals oils
Lubrication of Cylinder	mixture lubricating
Quantity of Gearbox Oil	approx. 200 cc
Fuel	gasoline-oil mixture, ratio 25 : 1
Oil	two-stroke oils of 1st quality
Fuel Consumption per 100 kilomtrs . . .	1,5 ltrs
Carburetor	1/12/51
Main Jet	54
Needle Jet	2,12
Needle Adjustment	4th noth from top
Exhaust	side-mount
Electrical system	NORIS flywheel magneto 17 Watts reduced to 3 Watts
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

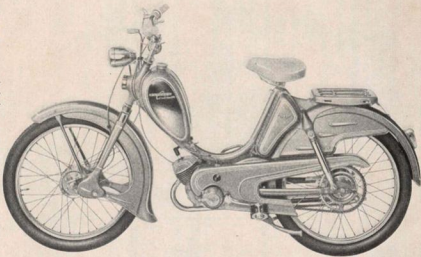
Headlight Bulb	6 Volts, 3 Watts
Taillight Bulb	6 Volts, 2 Watts
Clutch	3-plate dry clutch
Transmission	planetary gear with 2 speeds and idling (1 : 3,72 and 1 : 5,38) total reduction 1 : 22,5 and 1 : 15,5
Gearshift	twist grip control indicating 1st and 2nd speed
Drive	chain $\frac{1}{2}$ " x $\frac{3}{16}$ "

Frame

Colour	light blue
Wheel Suspension	front wheel rocker arm suspension adjustable to weight of driver rear wheel damper
Brakes	full-size internal expanding brake $3\frac{1}{2}$ inch diam. hub in front and rear wheel
Wheels	23"
Tires	23" x 2,25" with counter pressure valve
Fuel Tank	5,3 ltrs, reserve 250 cc
Control Devices	throttle twist grip, clutch lever and gearshift with adj. screw, brake operating lever and decompression lever

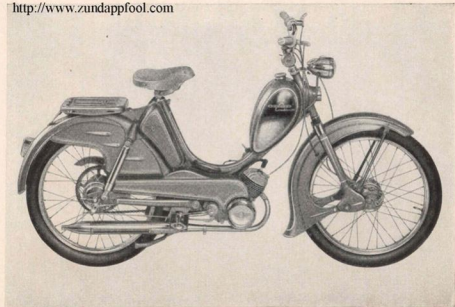
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Type 422 Two-Speed-Engine

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Type 422 Two-Speed-Engine

Operation

For this paragraph and the control devices mentioned therein see figs. 1 to 5!

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

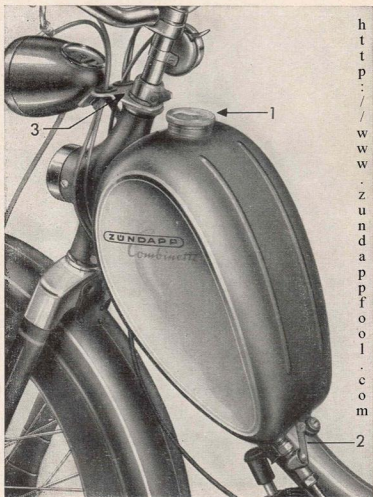
- a) Turn fuel tank filler cap to the left and remove it. Fill in the ready-mixed fuel. Also so-called self-mixing 2-stroke oils should be mixed in a separate can before filling in. This is the only way to assure sufficient lubricating of the piston. Ratio gasoline : oil = 25 : 1.
- b) The gearbox has to be filled with oil (filler neck on right motor side). Total oil quantity 200 cc (transmission oil according to specification). Watch the 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 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).

e) **Adjustment of the Saddle**

Procedure (see fig. 3):

The adjustment of suspension to weight of driver: right turn of the adjusting screw will reduce smoothness, left turn will increase it. It is not necessary to remove saddle for adjustment.



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Figure 1 **Fuel Tank**

- 1 = filler cap
- 2 = fuel tap (outward-closed,
upward-open, inward-reserve)
- 3 = cable support

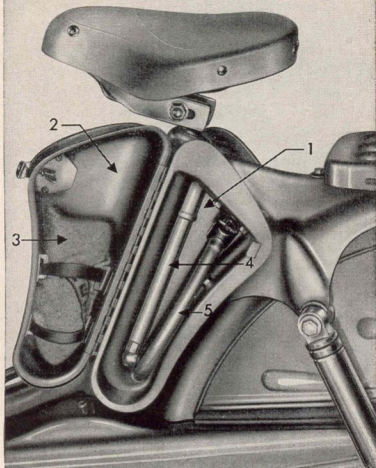


Figure 2

Tool Box

- 1 = tool box
- 2 = cover
- 3 = tools
- 4 = tire pump
- 5 = cable lock

Adjustment of saddle to bodily conditions of driver: loosen fastening screws of the saddle and displace the same accordingly. To obtain longest possible distance from handlebar, turn saddle pillar by one half turn. The rubber seat of saddle requires a special treatment. Oil, grease, fuel and acid are enemies of rubber desolving it and rendering its surface poor-looking. Furthermore congestions of clothing are not to be

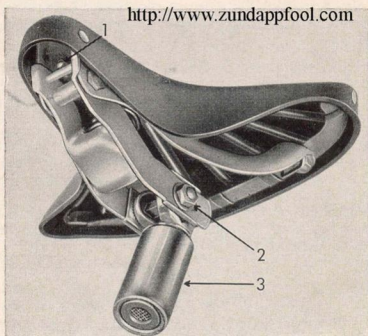


Figure 3

Adjustment of Saddle

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

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 should 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 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 the one-way valve and permits inflating of the inner tube without any trouble. The pump is placed in the toolbox absolutely safe. The key of the toolbox lock fits also the cable lock which is supplied too.

Since tire pressure is of utmost importance we draw your attention to the fact that high pressure causes consussions of the COMBINETTE, while a rapid wear is the result of too low tire pressure. We recommend at a driver's weight of 150 lbs

front wheel: 17 lbs

rear wheel: 22 lbs

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

g) **Luggage Carrier**

The luggage carrier is solidly built, similar to the one on a motorcycle. A cavity on the rear end facilitates lifting of the Combinette when transported. When using the spring arm take care that the same will be lifted on its free front end only.

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h) Starting the Engine

Take autocycle back from stand.

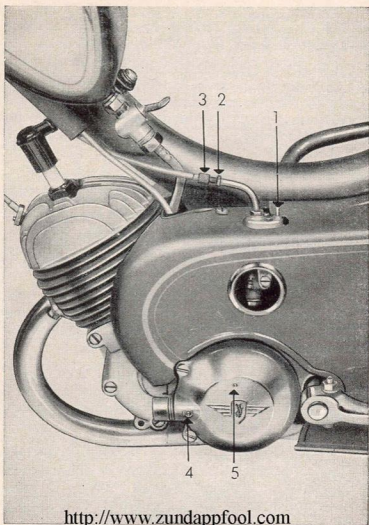
Pedal kickstart: disengage clutch, shift into second speed release clutch lever and move the cycle a little to and fro until a significant resistance will become evident, then disengage clutch and push the pedals. The downward pushed pedal may be returned into horizontal position by the toe tip if a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

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 of 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.

Throttle control will be opened $\frac{1}{3}$ to $\frac{1}{2}$ when engine is warm. At cold engine slightly only till a resistance is felt. At low temperature do not give full throttle too early as thus starting device will be pushed 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.
- i) With the engine shut off the COMBINETTE may be operated like any standard bicycle (Shift to neutral)



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Figure 4

Carburetor Side

- 1 = starter pin
- 2 = lock nut
- 3 = adjusting screw for throttle cable
- 4 = lubricator
- 5 = lubricator

When moving autocycle reverse, clutch ought to be dis-engaged anyway.

- k) Do not leave the twist grip in its position when having gained to desired speed, but shut down to a degree so that the engine is just keeping the acquired speed. You will save fuel!
- l) With driving downhill with closed throttle (engine brake) only a very small quantity of oil reaches the sliding surfaces of the engine due to the admixture of lubricant to the fuel. It is therefore recommended to open throttle for just a moment on long downhill rides.
- m) Do not fail to close the fuel tap after each ride.
- n) When running-in the engine, no particular caution is necessary, as you may immediately up to speeds of 18 m.p.h. During the first 360 miles, however, we recommend to avoid driving at full throttle over long distances and overworking the engine when going uphill. After approx. 360 miles you may safely operate the vehicle at full throttle, provided, of course, you observe traffic regulations.
- o) Lighting switch setting on head light:
 - center: lighting switched off,
 - left: lighting switched on,
 - right: cut-out of engine.

The taillight which is equipped with a reflector is being operated simultaneously with the headlight switch.

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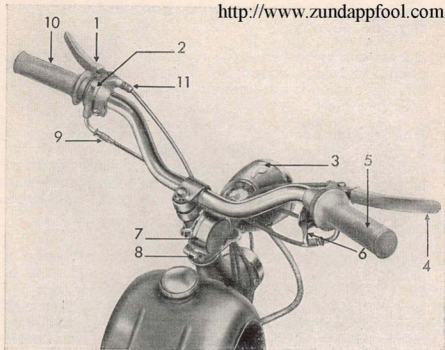


Figure 5

Control Devices

- 1 = clutch operating lever
- 2 = speed dial
- 3 = light and cut-out switch
- 4 = front brake operating lever
- 5 = twist grip for throttle control
- 6 = decompression lever
- 7 = bell
- 8 = extension stem nut and clamp
- 9 = adjusting screw for gearshift cable
- 10 = twist grip of gearshift
- 11 = adjusting screw for clutch cable

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. Nevertheless you will have to give your ZUNDAPP-COMBINETTE a certain minimum of routine maintenance.

(Please use your service and inspection card, as otherwise guarantee claims can not be advanced). The preventive maintenance should be performed according to the following schedule:

First inspection at 180 miles

1. Tighten all bolts and nuts, also those inside and below toolbox, as well as air-intake elbow and motor suspension.
2. Tighten expander bolt of handlebar.
3. Check front brake and adjust, if necessary.
4. Check rear brake and adjust, if necessary.
5. Check chain tension and adjust, if necessary.
6. Check clutch clearance and adjust, if necessary.
7. Check carburetor and air filter and clean, if necessary.
8. Tighten slotted hex. nut of rear wheel suspension (behind treadle axle) and secure with cotter pin.
9. Check control devices of gearshift and adjust, if necessary (workshop).
10. Change gearbox oil (f. i. Mobiloil C 80, Esso 80, Shell 80, BP Energol SAE 80, Aral BV 80 Transmission Oil).
11. Tighten cylinder head nuts (when engine is cold only).

12. Check front and rear cones and adjust, if necessary.
13. Lubricate bowden control cables.
14. Grease speedometer gear and oil speedometer cable.

Second inspection at 750 miles

1. Tighten all bolts and nuts, also those inside and below toolbox, as well as air-intake elbow and motor suspension.
2. Tighten expander bolt of handlebar.
3. Check front brake and adjust, if necessary.
4. Check rear brake and adjust, if necessary.
5. Check chain tension and adjust, if necessary.
6. Check clutch clearance and adjust, if necessary.
7. Check carburetor and air cleaner and clean, if necessary.
8. Tighten slotted hex. nut of rear wheel suspension (behind treadle axle) and secure with cotter pin.
9. Check control devices of gearshift and adjust, if necessary (workshop).
10. Change gearbox oil (f. i. Mobiloil C 80, Esso 80, Shell 80, BP Energol SAE 80, Aral BV 80 Transmission Oil).
11. Tighten cylinder head nuts (when engine is cold only).
12. Check front and rear wheel cones and adjust, if necessary.
13. Check front fork.
14. Check handlebar bearings and grease, if necessary.
15. Lubricate bowden control cables.
16. Grease speedometer gear and oil speedometer cable.

Third inspection at 1500 miles

1. Tighten all bolts and nuts, also those inside and below toolbox, as well as air-intake elbow and motor suspension.
 2. Check front brake and adjust, if necessary.
 3. Check rear brake and adjust, if necessary.
 4. Check chain tension and adjust, if necessary.
 5. Check clutch clearance and adjust, if necessary.
 6. Check carburetor and air cleaner and clean, if necessary.
 7. Tighten slotted hex. nut of rear wheel suspension (behind treadle axle) and secure with cotter pin.
 8. Check control devices of gearshift and adjust, if necessary (workshop).
 9. Change gearbox oil (f. i. Mobiloil C 80, Esso 80, Shell 80, BP Energol SAE 80, Aral BV 80 Transmission Oil).
 10. Check front and rear cones and adjust, if necessary.
 11. Check handlebar bearings and grease, if necessary.
 12. Lubricate bowden control cables.
 13. Remove cylinder head and clean intake and exhaust ports.
 14. Dismantle exhaust and clean.
 15. Grease speedometer gear and oil speedometer cable.
- Even after these above mentioned 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 figs. 6 and 7):

The carburetor is located on the left side.

Therefore remove the left chainguard, 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. Re-assemble chainguard.

2. Checking and Re-adjusting of Clutch Clearance

The clutch has to engage and disengage properly without dragging. When correctly adjusted, the clutch lever at the handlebar should have a free clearance of approx. $\frac{3}{8}$ inch at its end. Check this clearance every 600 miles and adjust, if necessary (workshop).

Procedure (see fig. 6):

Remove left chainguard, loosen lock nut of adjusting screw — turning in of adjusting screw increases, turning out reduces clutch clearance. If the thread of the adjusting screw does not permit any further withdrawal, shorten the bowden cable.

Quite obviously, the clutch must have a certain clearance between clutch tongue and thrust pin (about $\frac{1}{2}$ m/m). Remove clutch case and adjust by installing spacers between thrust pin and thrust plate. With the growing wear of the clutch linings the full clearance

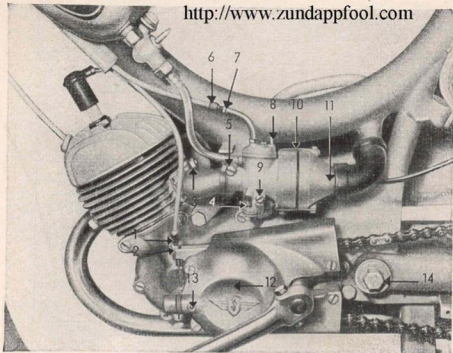


Figure 6 Carburetor and Clutch

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

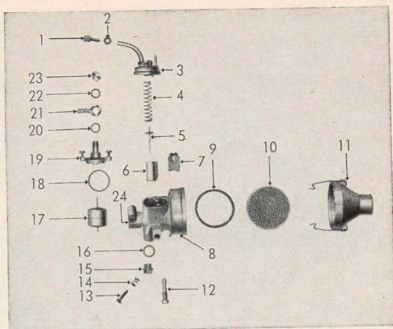


Figure 7 Carburetor in Disassembled State

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

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tends to decrease and ought to be adjusted by removing one or two spacers. The clearance is to be checked at the clutch lever fitted on the clutch case. With correctly adjusted clearance the clutch lever can easily be raised by approx. 3/16" until a resistance is felt. (Shop Work).

3. Checking and Re-adjusting of Front Wheel Brake

Increasing clearance on the operating lever indicates that the brake needs re-adjustment. Generally the clearance should not exceed approx. 3/8 inch at the end of the operating lever. Re-adjustment should be made in such a way that when the brake lever has travelled through this clearance the brake shoes begin to drag. Check brake every 600 miles and re-adjust, if necessary.

Procedure (see fig. 8):

Loosen lock nut of cable adjusting screw and unscrew the latter until the specified clearance has been attained. Then hold adjusting screw firmly and re-tighten lock nut.

4. Lubricating Speedometer Gear

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

5. Checking and Re-adjusting the Rear Wheel Brake

Check brake clearance every 600 miles and re-adjust, if necessary.

Procedure (see fig. 9):

Adjust clearance by means of the cable adjusting screw.

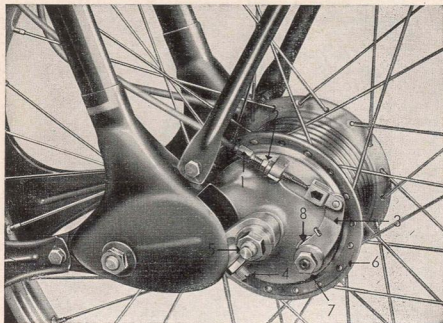


Figure 8 Adjustment of Front Wheel Brake

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

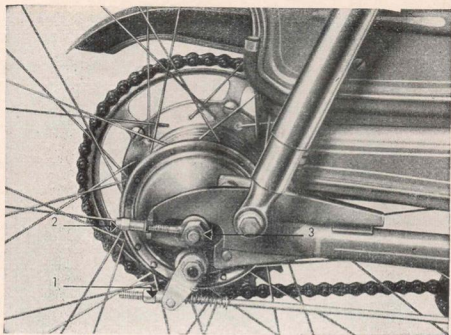


Figure 9 Adjustment of Rear Wheel Brake and Chain

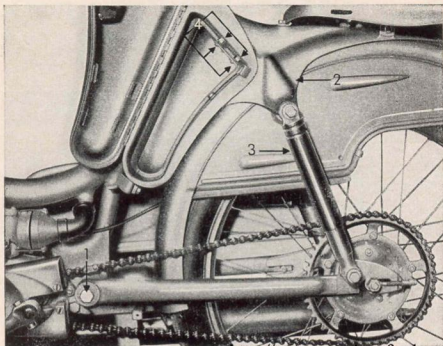
- 1 = brake linkage adjusting screw
- 2 = adjusting screw for chain
- 3 = axle nut

6. Front and Rear Wheel Suspension (figs. 8 and 10)

The Combinette disposes now beside the free rocker arm front wheel suspension also of a solidly built rear wheel suspension equipped with 2 dampers.

The front wheel spring rocker arm, the super-sized balloon tires 23" x 2,25", the spring saddle adjustable to weight of driver and the additional rear wheel dampers render a comfort not to be surpassed.

The suspension devices do not require any maintenance. The grease supply is sufficient for a long time.



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Figure 10

Rear Wheel Suspension

- 1 = hex. head bolt for fastening the rear wheel suspension arm, slotted hex. nut and cotter pin are located on the other side
- 2 = damper support
- 3 = damper
- 4 = bolts for fastening damper support to toolbox

7. 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 chainge, re-adjust immediately. Check every 600 miles and re-adjust, if necessary.

Procedure (see figs. 6 and 7):

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 adjusting screw has to be turned out 3 half turns.

8. Adjustment of Chain <http://www.zundappfool.com>

(see fig. 9)

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 tension screws accordingly. Corresponding to this a re-adjustment of the brake linkage should be made.

9. Lubricators on Clutch Case

(see fig. 4):

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

10. Checking of Oil Level in Gearbox

Check oil level every 1200 miles. Refill oil according to inspection chart, if necessary. The filler neck is located on the right rear side of the engine. The oil gauge on

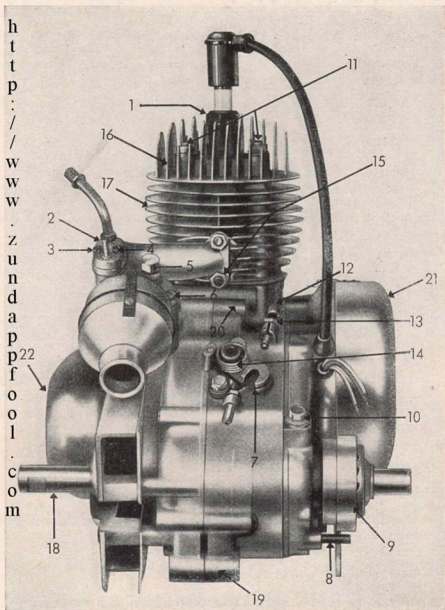


Figure 11

The Two-Speed Engine

Figure 11

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 = gearshift selector
- 8 = stop pin
- 9 = brake catch
- 10 = oil filter plug with oil level gauge
- 11 = cylinder head nuts
- 12 = adjusting screw of shifting cable
- 13 = lock nut
- 14 = spring of gearshift selector
- 15 = fastening bolt of air intake
- 16 = cylinder head
- 17 = cylinder
- 18 = treadle axle
- 19 = motor suspension
- 20 = motor suspension
- 21 = magneto
- 22 = clutch

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the plug indicates the minimum and maximum oil levels (see fig. 11). When checking oil level take cycle back from stand.

11. **Cleaning of Carburetor**

It is mandatory to clean the carburetor when necessary at least every 1200 miles.

Procedure (see figs. 6 and 7):

Shut off fuel supply to the carburetor and remove left chainguard. 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 throttle cable. Figure 7, 1 to 7, 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. Re-install all parts. When turning in the fastening bolt of fuel hose coupling, in which strainer has to be inserted before, watch that one gasket is above and one below the coupling. Also take care of the gaskets for cover plate and float bowl.

Choke valve, throttle valve and jet needle should be removed from the throttle cable when replacing one of these parts only. When re-assembling watch the spring retainer plate which has to catch the prescribed notch.

Check for vertical position of the carburetor.

12. 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 gap will be adjusted on the lateral electrode.

13. Cleaning of Exhaust Port, Pipe and Muffler

Efficiency and consumption of a two-stroke engine depend mainly on pressure conditions in the exhaust system. The provided cleaning at every 2000 miles should be therefore performed anyway.

The procedure itself (dismantling, cleaning of exhaust, cleaning of the exhaust ports in the cylinder) is a workshop task.

14. Lubricating Control Cables

Throttle, clutch, gearshift and decompression cable should move easily in their sheaths. Therefore lubricated them every 2000 miles.

Procedure:

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

The subsequent adjustment of idle as well as the clutch and brake cable have been described already. Gearshift cable will be adjusted by means of the screw shown in fig. 5 number 9: loosen lock nut, adjust screw and tighten lock nut again. Throttle and clutch cable will be adjusted in the same way.

Subject to changes without prior notice

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