

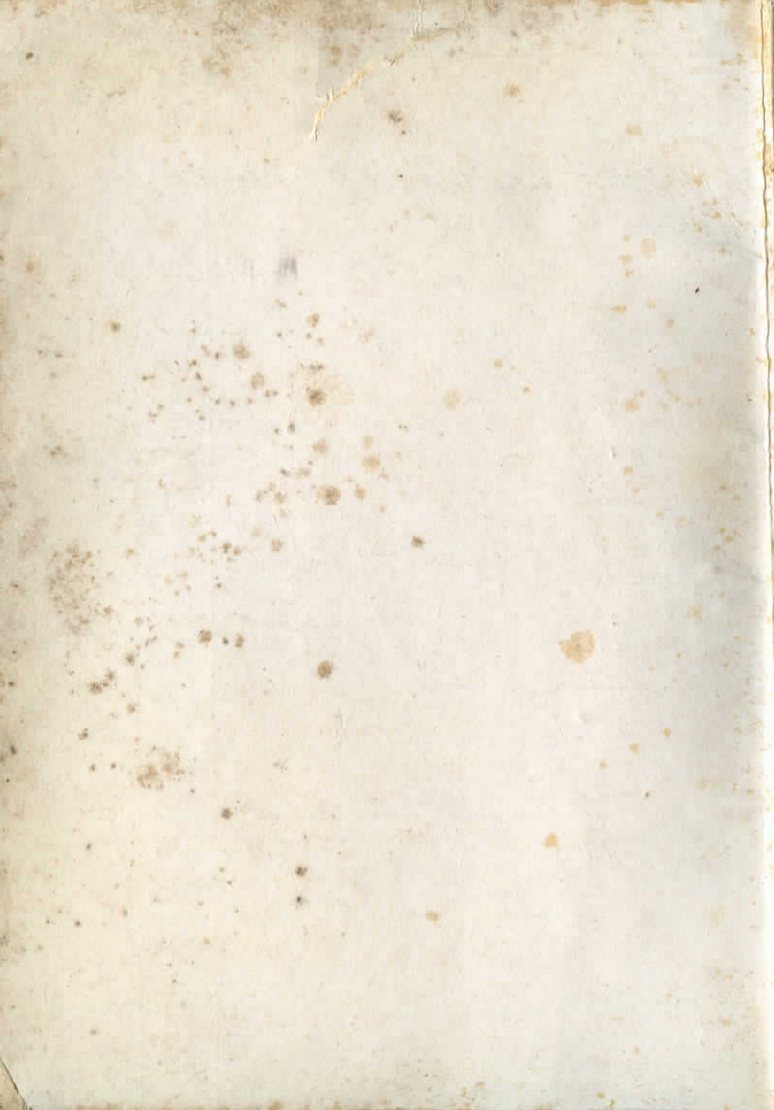
ZUNDAPP

*Combinette S*

Model 423



**OPERATION AND MAINTENANCE**



## Dear ZÜNDAPP Friends,

Operation and maintenance of the ZÜNDAPP Combinette are very simple, indeed. When selling you this efficient autocytle your ZÜNDAPP dealer certainly extended the essential features to you. As an additional aid we have compiled this booklet in order to give you the principal points of operation, maintenance and trouble shooting in a nutshell and so allow you to study them at your leisure.

There is just one thing we want to ask of you: Please do read this booklet before you start the engine for the first time.

Your ZÜNDAPP dealer and we shall, of course, be only too glad to help you whenever any problems should arise.

And now, good luck to you and a lot of fun on all your trips.

Yours faithfully,

**ZÜNDAPP-WERKE GMBH**  
**NÜRNBERG - MÜNCHEN**  
**Werk München**

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## Specifications

### Engine:

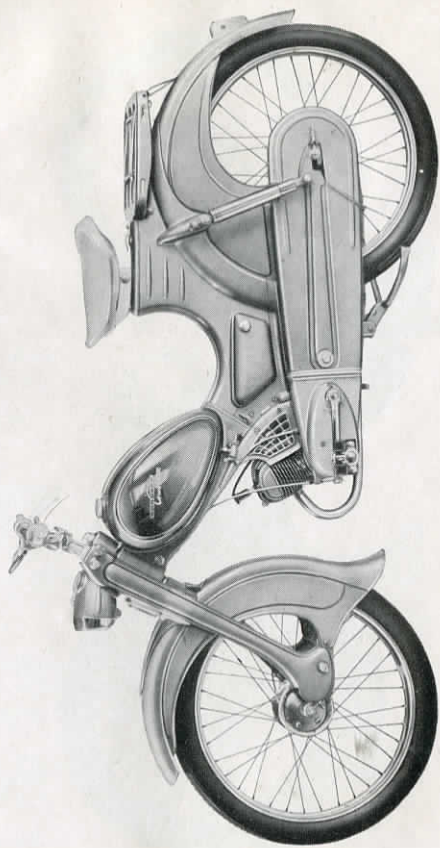
Identification . . .	Model 258
Piston Displacement	50 cc
Bore and Stroke . . .	39 × 41.8 mm
Compression Ratio	1 : 6.5
Horsepower . . . . .	1.5 h.p. at 4,200 r.p.m.
Cycle . . . . .	2-stroke
Transmission Oil . . .	Branded transmission oil SAE 80
Transmission Oil Quantity . . . . .	About 200 cc
Fuel . . . . .	Gasoline-oil mixture, mixing ratio 20:1 for running-in period, later 25:1
Type of Oil . . . . .	Branded 2-stroke cycle engine oils or SAE 30—40 engine oil.
Rated Fuel Consumption . . . . .	About 1.8 liters per 100 kilometers
Carburetor . . . . .	BING 1/9.5/53
Main Nozzle . . . . .	50
Pintle Nozzle . . . . .	2.17
Pintle Adjustment . . .	Second notch from top
Exhaust . . . . .	Arranged laterally
<b>Electrical System</b> . . .	BOSCH flywheel magneto, 6 volts, 17 watts
Ignition Timing . . . . .	2.9 mm before top dead center
Spark Plug . . . . .	BOSCH W 175 T 1 or BERU 175/14 u 2
Spark Gap . . . . .	0.7 mm

- Headlamp Bulb . . . 6 volts, 15 watts
- Taillamp Bulb . . . 6 volts, 2 watts
- Clutch . . . . . 3-plate dry-disk clutch
- Transmission . . . Planetary gear with 2 speeds (1 : 7.4 and 1 : 4.32) and neutral. Total reduction 1 : 27.5 and 1 : 16.1
- Gearshift . . . . . Twist-grip control with visual indication of neutral, first and second gears
- Drive . . . . . Sprocket chain  $1\frac{1}{2}'' \times \frac{3}{16}''$

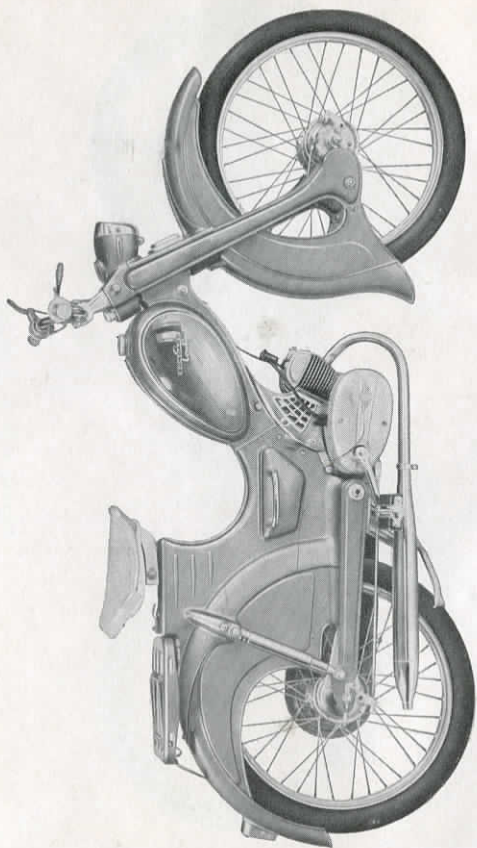
**Frame:**

- Colour . . . . . Light blue
- Wheel Suspension . Cantilever-type front-wheel suspension, adjustable to weight of driver; Cantilever-type rear-wheel suspension, elastic swing limiter
- Brakes . . . . . Expanding hub brakes, 90 mm diam., in front and rear wheel, enlarged braking area
- Wheels . . . . . 23"
- Tires . . . . . 23"  $\times$  2.25", with Schrader valves
- Tire Inflation . . . Front 17 psi, rear 25 psi at a driver's weight of about 165 lbs
- Fuel Tank . . . . . 7.3 liters, reserve 0.5 liters
- Controls . . . . . Twist-grip throttle control, clutch lever and gearshift control with adjusting screw, brake lever

Designs, text and illustrations subject to change.



Model 423 S 2-Speed



Model 423 S 2-Speed



## Preparations to Riding and Description of the Combinette

Riding the Combinette is very simple if you observe the following hints:

- a) Remove the **Tank Filler Cap 1** by turning it counter-clockwise and fill in the prepared gasoline-oil mixture. It is always wise to mix also so-called self-mixing two-stroke engine oils thoroughly in a mixing can since only this precaution will warrant a proper intermixing of the oil and gasoline and thus ensure a satisfactory lubrication of the engine. The best gasoline-oil mixing ratio is 25:1. During the running-in period (about 200 miles), however, the mixing ratio should be 20 : 1.
- b) The setting of the two-arm three-way **Fuel Cock 2** is indicated by the markings „A” and „R”. „A” stands for „Open”, „R” for „Reserve”. When the letter „A” shows on top, the fuel cock is open; in vertical position it is closed.

If with the fuel cock open no fuel reaches the carburetor (engine stops), the fuel is running low. In this event turn the fuel-cock lever to the left (as seen from the driving direction) and the reserve tank will deliver fuel to the carburetor. When the fuel-cock lever is thus turned to the left, the letter „R” appears. This is an indication that the fuel will last for about 18 miles more, and you should get another fill at the nearest filling station.

- c) The **Transmission** should always be kept properly supplied with oil. The oil level, which should be about 200 cc, can be read on the dipstick which is arranged at the stem of the upper screw marked red and located underneath the magneto cover 44 (right-hand side of transmission case). Please observe the indi-

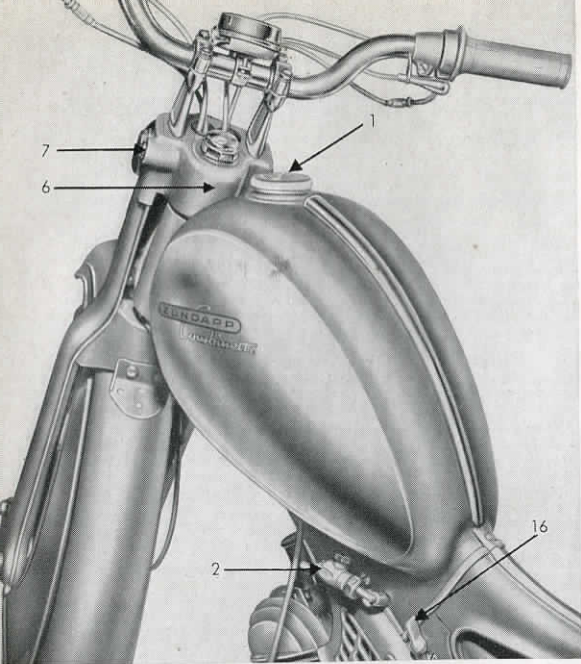


Fig. 1

### Fuel Tank

- 1 = Filler cap
- 2 = Fuel cock
- 6 = Headlamp shell
- 7 = Handlebar lock
- 16 = Starting linkage lever

cation on the left-hand crankcase cover regarding the removal of the wire so as to warrant a proper ventilation of the crankcase.

To remove the magneto cover proceed as follows: Loosen the nut on the right-hand end of the crank axle 43 until it projects somewhat over the key held down by it. Knock out the key, holding some solid object against the axle end, and remove the nut entirely. The pedal can now be taken off. Then unscrew the two slotted screws on the magneto cover 44 and lift off the cover. The hexagonal head screw marked red will show the oil level when it is turned out. The lower hexagonal head screw also marked red seals off the oil drain hole. The oil change should preferably be performed by a service shop.

- d) The **Handlebars** 3 are attached to two supports by means of two clamps 4 and, after loosening the four hexagonal head screws 5, can be swung forward or back, which will widen or reduce the distance between the handlebar grips and the saddle. (This is service shop work). Pull the screws tight simultaneously on both sides — not one after the other.

Left of the headlamp shell 6 a handlebar lock 7 is arranged, which when turned by a key arrests the handlebars so that they cannot be moved. For locking the handlebars must be swung over to the right.

- e) The **Tool Box** 8 is located in the center of the frame. Its cover can be removed by loosening the knurled nut 9.
- f) The **Saddle** (Fig. 3) is adjustable. It can be adjusted to both the size and the weight of the rider.

Adjusting the saddle to the weight of the rider:

By turning the slotted-head screw 10 underneath the saddle nose clockwise the saddle springs become

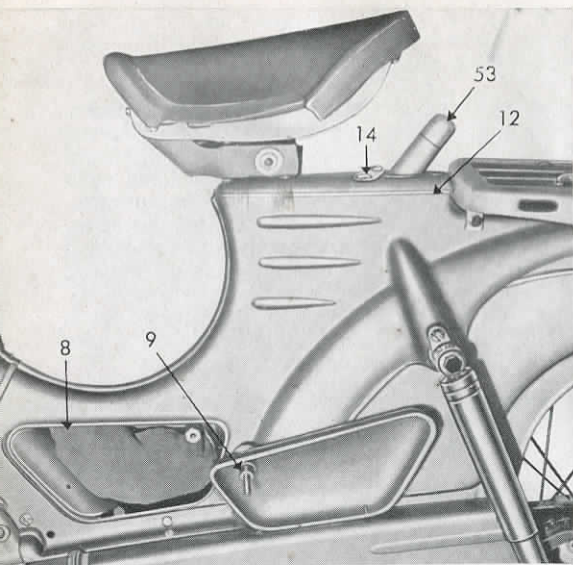


Fig. 2

### Tool Box

- 8 = Tool box
- 9 = Knurled nut holding the tool box cover in place
- 12 = Saddle support cover
- 14 = Pivoted cover
- 53 = Inflator

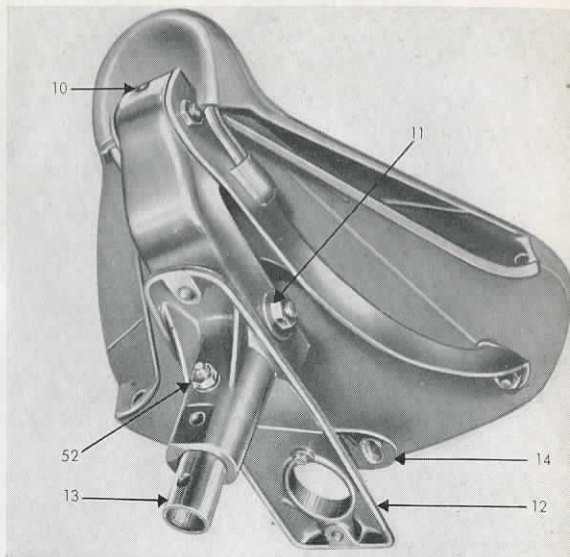


Fig. 3

### Saddle Adjustments

- 10 = Adjusting screw underneath the saddle nose
- 11 = Fastening nut on the saddle pillar
- 12 = Saddle support cover
- 13 = Saddle tube
- 14 = Pivoted cover
- 52 = Nut and bolt in the saddle tube for adjusting the height of the saddle

harder, by turning it counter-clockwise they become softer. This adjustment can be made without removing the saddle.

Adjusting the saddle to the size of the rider:

Loosen the fastening nuts 11 and move the saddle forward or back thus changing its distance from the handlebars. The saddle need not be removed for this adjustment either. After completing this adjustment the nuts 11 must, of course, be tightened again. For the adjustment in height, however, the saddle must be removed. To do this unscrew the saddle support cover 12 and, after removing the hexagonal nut, pull out the bolt 52. The saddle can then be pushed up or down until the bolt 52 can be inserted in one of the three holes in the saddle tube 13. The bolt 52 may also be inserted in the hole nearest to the in the bushing accommodating the saddle tube 13 so that a total of five vertical positions is available.

Instead of the saddle a seat cushion (Item No. 9304) designed to fit the cycle can be mounted.

#### g) **Tire Inflation:**

The tires of the Combinette are provided with Schrader valves to which the inflator 53, stored in the frame underneath the saddle or seat cushion, can easily be attached. The Schrader valves are so designed as to allow the tires to be inflated also from a compressed-air line. The inflator 53 is protected by a cover 14 which pivots on the cover 12, and can be taken out from its housing after the cover 14 has been turned aside. After using the inflator do not forget to replace the rubber cap on the inflator connection as this cap protects the check valve located there. After putting the inflator in its housing again, close the pivoted cover 14 which keeps the inflator securely in its place.

Since the tire pressure is most important for shock-free riding, your attention is called to the fact that overinflation will cause the tires to wear rapidly. The recommended tire pressure is 17 psi in the front wheel and 25 psi in the rear wheel if your weight is about 165 pounds. If you are much heavier than that, you may increase the tire pressure somewhat, while a somewhat lower pressure will do for a rider lighter in weight.

- h) To use the **Luggage Carrier** lift up the spring clamp at its forward end.

## Driving

Starting the engine:

Before starting **from the cold** push the lever 16 on the left-hand carburetor casing 24 forward to its stop while keeping the twist-grip throttle control 15 (on the right handlebar) closed. With a warm engine this lever 16 need not be operated.

After taking the cycle from the park stand 17 start the engine proceeding as follows:

Pull the clutch handle 18 towards the twist-grip 19 on the left handlebar 3, thus disengaging the clutch, shift to second gear (the correct position is indicated by the gear indicator 20) and push the cycle forward. Simultaneously, open the twist-grip throttle control 15 by turning it backwards until a slight resistance is felt (do not open more). Then bring the forward pedal into kicking position and kick it down.

Should the engine not start immediately, bring back the pedal into starting position and keep kicking it down until the engine starts. Then open the throttle somewhat wider and shift to neutral („O“ on the gear indicator). The engine is now idling.

To drive off pull the clutch handle 18, shift into first gear and, opening the throttle, slowly release the clutch handle. Upon reaching a speed of about 12 m. p. h. close the throttle and disengage the clutch, shift to second gear and throw in the clutch again. After shifting it helps to wait a bit before you release the clutch handle so that the transmission gears can properly enmesh.



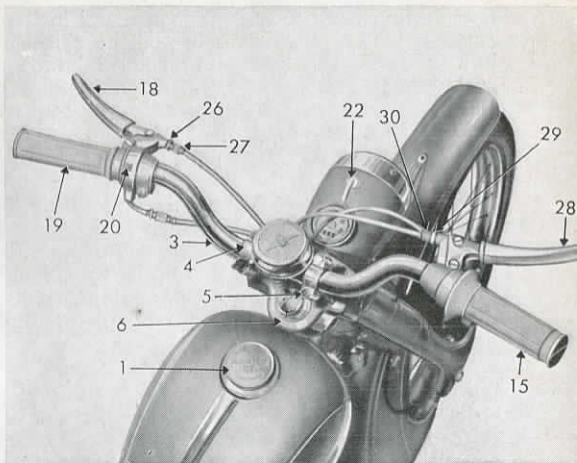


Fig. 4

### Handlebars and Controls

- 1 = Tank filler cap
- 3 = Handlebars
- 4 = Handlebar supports and clamps
- 5 = Hexagonal head screws
- 6 = Headlamp shell
- 15 = Twist-grip throttle control
- 18 = Clutch handle
- 19 = Twist-grip gearshift control
- 20 = Gear indicator
- 22 = Light and cut-out switch
- 26 = Knurled nut on the clutch handle
- 27 = Knurled screw collar on the clutch handle
- 28 = Hand brake control
- 29 = Knurled nut on the hand brake control
- 30 = Knurled screw collar

For Shifting back to first gear proceed in the same way. Another way of starting is to pull the clutch handle, shift into second gear, release the clutch handle, sit on the cycle and step on the pedals. After the engine has started, shift into first gear and proceed as described above. In cold weather do not open the throttle wide too early or else the engine will be stalled.

To stop the engine turn the light and cut-out switch 22 on the headlamp to the right. When letting go of the switch it returns to its starting position. Stalling the engine by applying the brake while driving is a practice that should be avoided as it will do the engine no good. Always disengage the clutch first, shift to neutral and then stop the engine.

Shifted to neutral and with engine stopped the Combiette can be pedaled like a regular bicycle. When wheeling it backward pull the clutch handle 18 or else the rear wheel brake will come into action.

After reaching top speed do not leave the throttle control grip 15 in its position but throttle down gently until the engine just keeps the attained speed. This will keep down fuel consumption.

On long downhill rides open the throttle from time to time so as to ensure proper lubrication of all moving parts. When the cycle is not in use, the fuel cock should be closed.

Regarding running-in you need not be overly cautious but may drive at a good cruising speed right away. The only things you should avoid, however, during the first 400 miles or so are continuous drives with the throttle wide open and long rides in hilly country. After these first 400 miles you may put the engine to its full performance.

## Lighting

The light switch 22 is located on the headlamp shell 6. With the switch in center position the lights are off; when the switch points to the left, they are on.

The taillight, which is combined with a rear reflector, is simultaneously switched on or off when the switch on the headlamp is operated. The lights work only with the engine running.

## Maintenance

The three inspections demanded by the manufacturers under their guarantee conditions should in no case be neglected.

The first inspection is to be made by the dealer after 200 miles of driving, while the second, after 750 miles, and the third, after 1000 miles, should be performed by one of our service shops.

The following instructions are intended to show you how to proceed when checking your autocycle.

The air cleaner 23 (Fig. 6) should always be clean. Keeping it so will raise the efficiency, extend the life and keep down the fuel consumption of the engine. The air cleaner is located on the carburetor 51.

1. **To clean the air cleaner** take off the carburetor casing 24 (Fig. 5) on the left side of the cycle and also the frame panel 25 next to the tool box 8 after removing four slotted head screws. The air cleaner can then easily be lifted out. It should be washed in gasoline, dried and dipped in thin motor oil. Excessive oil is removed by vigorous shaking.

### 2. Clutch

The clutch should engage and disengage properly and without slipping. Proper adjustment is indicated by the clutch handle 18 having a free movement of about  $\frac{3}{8}$  inch at its end with the clutch engaged. The clutch should be checked every 600 miles. A misaligned or worn clutch shows by conveying motion to the rear wheel even after being disengaged.

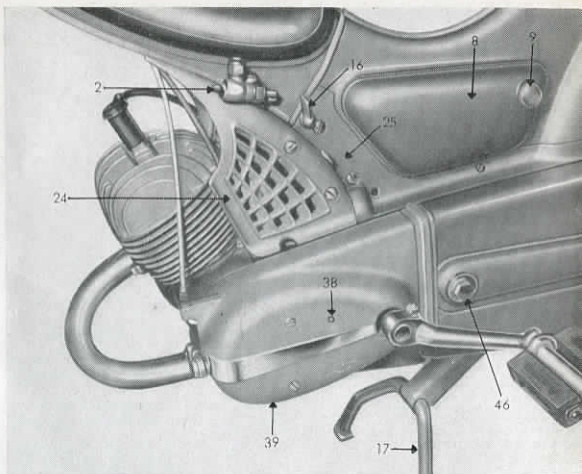


Fig. 5

### Clutch Side of Cycle

- 2 = Fuel cock
- 8 = Tool box
- 9 = Knurled screw keeping tool box cover  
in place
- 16 = Starting linkage lever
- 17 = Park stand
- 24 = Carburetor casing, left
- 25 = Frame panel, left
- 38 = Oil nipple
- 39 = Clutch case cover
- 46 = Hexagonal head bolt for rear fork

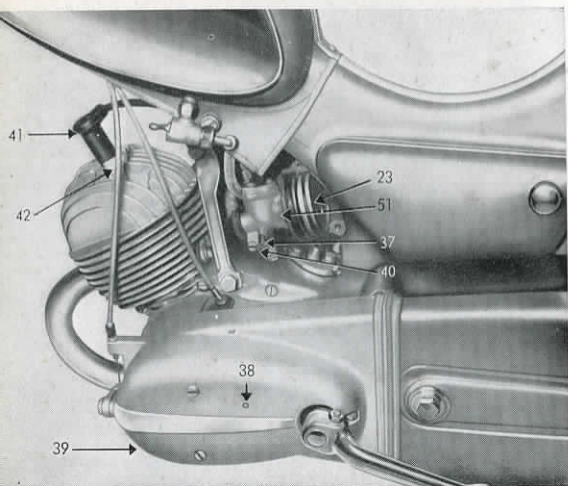


Fig. 6

### Carburetor and Clutch

(Carburetor casing and frame panel have been removed)

- 23 = Air cleaner
- 37 = Idling adjustment screw
- 38 = Oil nipple
- 39 = Clutch case cover
- 40 = Main nozzle
- 41 = Spark plug terminal
- 42 = Spark plug
- 51 = Carburetor

The play of the clutch control cable can be adjusted by loosening the knurled nut 26 next to the clutch handle 19 (Fig. 4) and then turning the knurled screw collar 27 in or out. Turning the collar in will increase the play, turning it out will decrease it. After adjustment the knurled nut 26 should be tightened again. If no further adjustment is possible, the clutch should be checked and readjusted at a **service shop**.

### 3. Front Wheel Brake

The free play of the brake control handle 28 should be about  $\frac{3}{8}$  inch at its end. Wear of the brake linings makes readjustment of the brake necessary from time to time. Check and, if necessary, readjust the brake at least every 600 miles.

To do this proceed as follows (Fig. 4):

Loosen the knurled nut 29 on the brake handle 28 and turn out the knurled screw collar 30 until the free play is  $\frac{3}{8}$  inch. Hold the collar in place and tighten the knurled nut 29 by turning the twist grip — **not** the knurled collar 30. Another adjustment can be made at the front wheel hub.

To do this proceed as follows (Fig. 7):

Loosen the nut 58, turn out the screw collar 59 until the play of the brake handle 28 is  $\frac{3}{8}$  inch, and then, holding the collar 59 in place, retighten the nut 58 against the strap 60.

### 4. Rear Wheel Brake

The rear wheel brake is actuated by back-pedaling. It, too, should be checked for proper action from time to time. It is adjusted by means of the hexagonal nut 31 on the brake rod 32 (right-hand side of cycle). Turning the nut 31 to the right will decrease the play, turning it to the left will increase it.

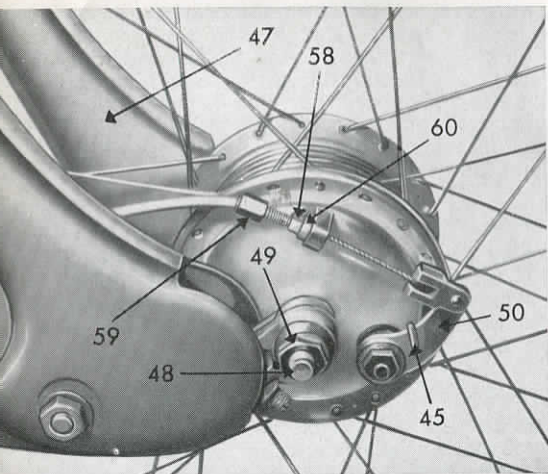


Fig. 7

### Front Wheel

- 45 = Return spring
- 47 = Front fork
- 48 = Front axle
- 49 = Axle nut
- 50 = Brake lever
- 58 = Nut
- 59 = Screw collar
- 60 = Strap



## 5. Front and Rear Wheel Suspension (Figs. 7 and 9)

In the Combinette 423 both the front and rear wheel has cantilever suspension. The rear wheel is also provided with a pair of telescopic shock absorbers the upper ends of which have each an oil nipple 34 into which a few drops of oil should be injected from time to time.

The cantilever suspension units do not require any maintenance. They have been supplied, at the factory, with an amount of grease that will last a long time.

## 6. Retightening the Chain (Fig. 8)

The chain is housed in a chaincase and so protected, to a high degree, from dust and dirt. It should be cleaned in a bath of gasoline or Diesel oil after every 600 miles of driving and lubricated with ZÜNDAPP Semifluid Chain Grease (**Service shop work**).

For retightening the chain loosen the nuts 35 provided on the two sides of the rear axle 36. Then turn the axle 36 at its right end by means of a wrench in the direction indicated by an arrow until the proper chain tension has been obtained. Do not make the chain too tight, but let it slack somewhat and retighten it once more if necessary. After tightening the chain the two nuts 35 **must be screwed down** again.

## 7. Idling of the Engine

Quiet idling with the engine running at low speed and without sputtering enhances driving comfort and fuel economy. Should the engine change its idling speed, it should be readjusted.

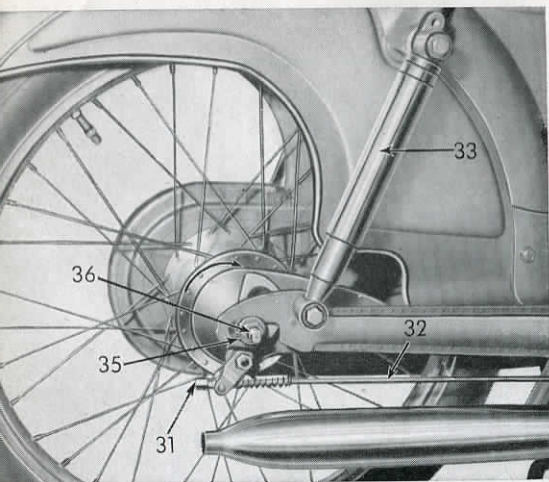


Fig. 8

### Adjustments of Rear Wheel Brake and Chain

- 31 = Brake adjusting nut
- 32 = Brake rod
- 33 = Shock absorber
- 35 = Axle nut
- 36 = Rear axle

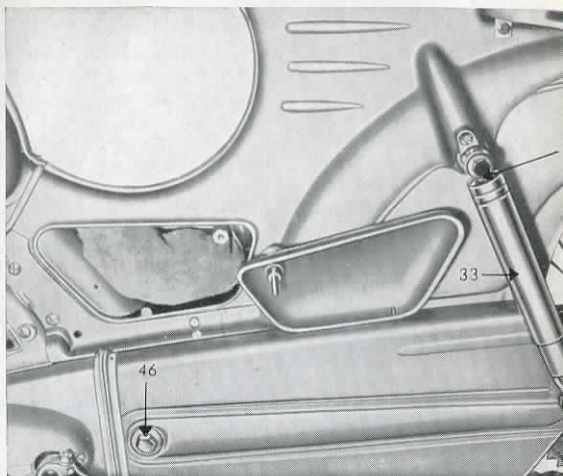


Fig. 9

### Rear Wheel Cantilever Suspension

- 33 = Shock absorber
- 34 = Shock absorber oil nipple
- 46 = Rear fork hexagonal head bolt

To do this proceed as follows (Fig. 6):

The idling adjustment should be performed when the engine is warm. Turn the coil-spring loaded idling adjustment screw 37, located on the carburetor 51, into the latter's casing as far as it will go, and start the engine. Then turn the screw 37 slowly out again until the engine runs properly at low speed without sputtering. Normally, the adjustment screw should be turned out three half-turns.

#### 8. **Checking the Transmission Oil Level** (Fig. 5)

The oil level should be checked every 600 miles and replenished if necessary. (For the procedure see Page 7) The dipstick attached to the oil filler plug shows the lowest and highest admissible oil level. To obtain an exact reading of the oil level take the cycle from the park stand 17, putting it on both wheels so that it assumes a perfectly horizontal position.

The oil nipple 38 on the left-hand side of the clutch case cover 39 should receive a few drops of oil about every 600 miles.

#### 9. **The Carburetor** (Figs. 5 and 6)

The Carburetor becomes accessible when the left-hand louvered carburetor casing 24 and the frame panel 25 are removed. Should the main nozzle 40 require cleaning, take it out and clean it by blowing through it **only**.

#### 10. **Spark Plug** (Fig. 6)

Lift off the spark plug terminal 41 from the spark plug 42, remove the latter and clean it thoroughly, preferably with a brush, from all carbon deposits. If necessary, readjust the spark gap, which should be 0.7 mm, by bending the electrode. The spark gap may be checked by means of a gauge available with automotive parts dealers.

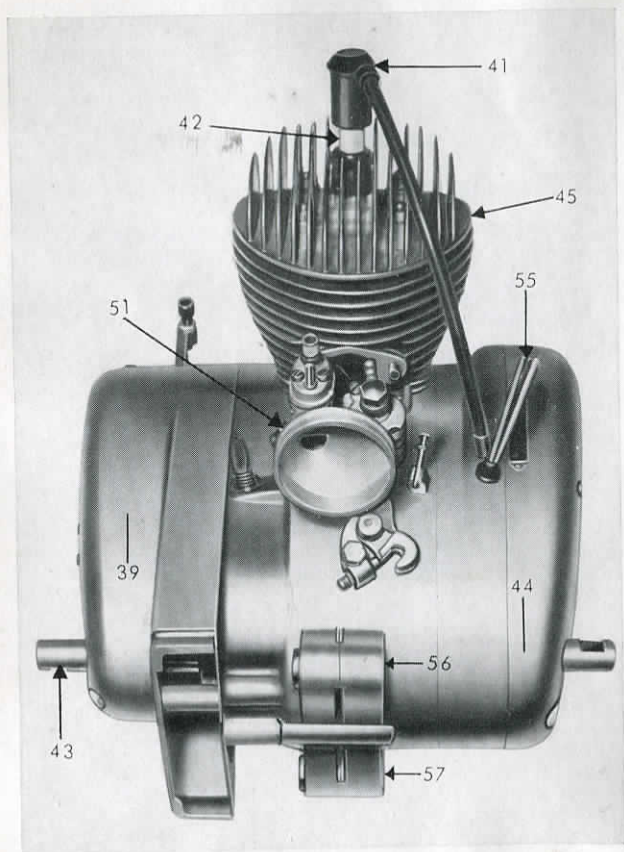
### 11. **Cable Controls** (Fig. 4)

The carburetor, clutch, gearshift and brake control cables should move easily in their sheaths; to this end they should be lubricated after the three inspections have been performed or, at least, every 1200 miles. To do this detach the cables at the handles and pour thin oil between the cable and sheath until the oil runs out at the other end (**Service shop work**).

### 12. **Cleaning the Exhaust System**

Performance and fuel consumption of the auticycle depend, to a high degree, on the back-pressure of the waste gases in the exhaust system. For this reason, the exhaust system should be cleaned about every 2000 miles (**service shop work**).

Fig. 10 The 2-Speed Transmission Engine (Model 258)



To Fig. 10 **The 2-Speed Transmission Engine (Model 258)**

- 39 = Clutch case cover
- 41 = Spark plug terminal
- 42 = Spark plug
- 43 = Crank axle
- 44 = Magneto cover
- 45 = Cylinder
- 51 = Carburetor
- 55 = Light cable
- 56 = Engine suspension lugs
- 57 = Engine suspension lugs

# Engine Troubles and Their Causes

## 1. Engine fails to start.

Causes :

Fuel tank is empty.

Fuel cock has not been opened.

Strainer in the fuel cock is clogged.

Float needle sticks.

Carburetor nozzle is clogged.

Starter pin has not been operated when the engine was too cold.

Spark plug is dirty.

Spark gap is too wide (should be 0.7 mm).

Ignition cable is defective.

Short circuit in the headlamp switch.

Contact-breaker points are oily or charred.

## 2. Engine starts but misses.

Causes :

Fuel cock is closed.

Spark plug is fouled up.

## 3. Engine starts but misses on acceleration.

Cause :

Engine is still too cold.

## 4. Engine starts but "pops" in the carburetor on acceleration.

Causes :

Engine is too cold.

Nozzle is clogged.

Fuel line is clogged by dirt.

Intake line leaks.

Ignition timing is retarded.

Condenser or ignition coil is defective.



### **5. Engine lopes.**

Causes:

Air cleaner is clogged.

Spark plug is dirty.

Ignition is out of order.

Ignition cable is loose.

Spark plug terminal is loosely connected to spark plug.

Carburetor is clogged.

### **6. Engine knocks.**

Causes:

Carbon deposit on the piston head.

Poor fuel.

### **7. Engine overheats.**

Causes:

Unsuitable oil.

Not enough oil in the gasoline-oil mixture.

Exhaust port, exhaust pipe or exhaust muffler are clogged by carbon deposits.

Radiator fins are too dirty.

### **8. Engine speeds up and slows down at rapid intervals.**

Cause:

Clutch drags because of insufficient play at the clutch handle or excessive wear of the clutch disks.

### **9. Engine does not deliver full power.**

Causes:

Ignition timing is not advanced far enough.

Dirty air cleaner.

Exhaust port, exhaust pipe or exhaust muffler are clogged by carbon deposits.

Sticking piston rings.

Defective cylinder-head gasket.

Loose cylinder head, exhaust flange or intake flange.

Rubber sleeve at the carburetor leaks or has come off.

**10. Engine operates on four-stroke cycle.**

Causes :

Wrong fuel mixture (too much oil).

Carburetor nozzle is too large.

Nozzle pintle sticks.

Float or seat of float needle is not tight.

Air cleaner is dirty.

Ignition timing is wrong.

**11. Excessive fuel consumption.**

Causes :

Leaks in the fuel tank or fuel lines.

Carburetor nozzle is too large.

Ignition timing is set too far retarded.

Exhaust is clogged.

# ZÜNDAPP

MUNICH WORKS

ZÜNDAPP products are distinguished by their progressive, wellmatured designs. Elegant styling, high quality and first-class workmanship and finish are their characteristic features. Their intrinsic value shall strike the human eye at first glance. This aim cannot be gained by mere chance but only by a production that goes through a fine-meshed network of special machinery and equipment, checks and tests. To us the name of ZÜNDAPP has always been an obligation. Every product that carries this name is a true branded article. The consumer who buys a ZÜNDAPP product does not only get his money's worth but also enjoys satisfaction for many years.

ZÜNDAPP deliberately refuses to operate with big numbers. Placed before the choice between producing in greater numbers or better quality the factory's decision will always be for higher quality. So, in all its lines of production, ZÜNDAPP's first and foremost aim has always been Top Quality.

## Production Line of Small Engines

### **ZUNDAPP** - Delphin BM 70

Powerful sideboard motor, 70 cc, 2.3 h.p., with light-alloy cylinder, combined pressure-head air and spray-water cooling. A sturdy skeg protects the propeller from striking underwater objects. Check valve in the exhaust automatically seals off the engine against the inrush of water when the engine is stopped. Automatic rewind starter with emergency starting feature. Highly resistant to sea water. ZUNDAPP Delphin boat motors may be used with all types of water craft such as collapsible, wood, sailing, rubber and inflatable boats.



## **ZUNDAPP** - Combimot SM 70 Stationary Engine

The Combimot SM 70 is a fan-cooled stationary engine that is the ideal power plant wherever light weight for easy transport and high output from a small unit for great economy is wanted. The overall weight of the unit is not more than 26 lbs. Its rated continuous output at 4,800 r.p.m. is about 2.5 h.p. Fuel consumption is very low at 0.5 to one liter per hour, depending on the load.

Drive is optional, either direct at 1:1 or at a reduction ratio of 1:2 or 1:3.

The SM 70 is particularly suited for use with water pumps, outdoor milking machines, lawnmowers, power saws, deep-well pumps, etc.

## **ZUNDAPP** - Generator Set SE 70

This is a "pocket size" power station with an output of 800 to 1000 watts of direct or alternating current at  $\pm 2.5\%$  accuracy of control. Wherever a portable electric power source of high output is required, the ZUNDAPP Generator Set is the ideal unit. Thus it became the steady companion of the successful explorer and camera man, Hans Ertl. On his expedition into the "History of the Pre-Inca Civilizations", to the temple of Paititi, this portable generator proved a most valuable and always reliable aid even under the most adverse conditions.

## Production Line of Sewing Machines

**ZUNDAPP** - Elcona 1 B

Portable electric straight-stitch sewing machine, convertible into a zig-zag and automatic machine.

**ZUNDAPP** - Elcona 2 B

Portable electric zig-zag sewing machine, convertible into an automatic machine.

**ZUNDAPP** - Elconamatic 3 B

Portable electric automatic sewing machine.



**ZUNDAPP - ZR 18 B**

Household straight-stitch sewing Machine, convertible into a zig-zag and automatic machine.

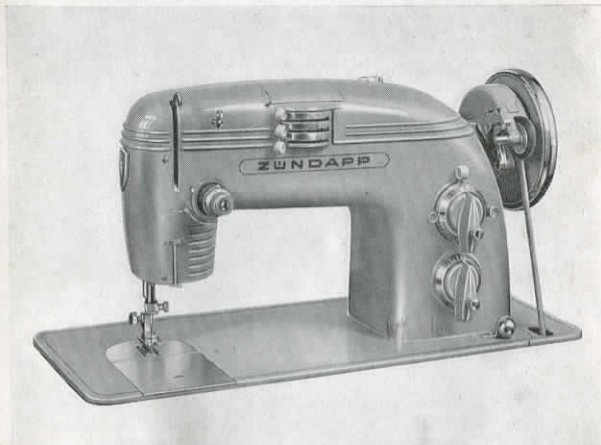
**ZUNDAPP - ZR 118 B**

Household zig-zag sewing machine, convertible into an automatic machine.

**ZUNDAPP - ZR 128 B**

Automatic household sewing machine.

For its sewing machines ZUNDAPP offers a wide range of furniture, from the simple space-saver console to the luxurious cabinet. ZUNDAPP sewing machine furniture is made from selected wood and precious veneers and built with superior workmanship by highly experienced specialists.



## DESIGN AND ENGINEERING FEATURES

### ZUNDAPP Sewing Machines

**Standard Features:** Precision adjustment of stitch length up to 4.5 mm ( $\frac{3}{16}$  inch) with forward and reverse stitch regulation during sewing. Easy return to a once-selected width of stitch. Precision adjustment of upper thread tension. Dropping-type material feed. Automatic bobbin filling control (Elcona models only). Reliable, doubly rotating heavy-duty looper with or without spring catch. Because of the transversal looper tucking is possible without any special attachment. The spring-catch type looper prevents snarling or fouling of the thread. Sewing speed range up to 1,200 stitches per minute. Needle system 705. Split-type presser foot allows the sewing of materials with a max. thickness of 8 mm ( $\frac{5}{16}$  inch). Built-in, non-heating sewing light with swing-away reflector. Free arm space  $190 \times 110$  mm ( $7\frac{1}{2} \times 4\frac{3}{8}$  inch). Full set of accessories. Colour: Non-glaring light green.

**Zig-Zag:** Sturdy zig-zag mechanism. Needle bar suspended to swing between point supports. Wide zig-zag overstretch of 4.5 mm ( $\frac{3}{16}$  inch). Stitch position adjustment permits of setting the stitches right or left of the center line. Limit control of the zig-zag swing.

**Automatic:** Automatic control by means of three centrally arranged levers. Fully automatic control of all sewing operations. No following hand lever. All patterns may be sewn with 36 and 72 stitches, and with half or full width of stitch. Control cams interchangeable. The automatic machines can sew patterns which could never be done by hand.



**Accessories:** Special sewing feet. Low-priced tucking and eyelet embroidery attachments. Button-hole attachment for the automatic machines. With every ZÜNDAPP sewing machine detailed instructions for straight-stitch, zig-zag and automatic sewing and a colourful sewing pattern book are supplied.

### **Complete ZÜNDAPP System:**

Appreciable economical advantages are afforded the customers by ZÜNDAPP's "build-up" system incorporated in the design of all ZÜNDAPP sewing machines. This special feature meets the desires of many homemakers to whom the purchase of a zig-zag or automatic sewing machine has been impossible.

The straight-stitch sewing machines ZÜNDAPP Elcona 1 B and ZR 18 B can, by a later inclusion of the zig-zag or automatic devices, be built up into the Universal Zig-Zag Sewing Machine Elcona 2 B and ZR 118 B or the Universal Automatic Sewing Machines Elconomatic 3 B and ZR 128 B.

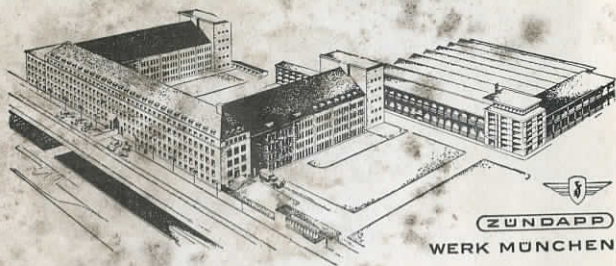
A progressive system designed for progressive sewing machines.

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Please ask for illustrated descriptive literature from

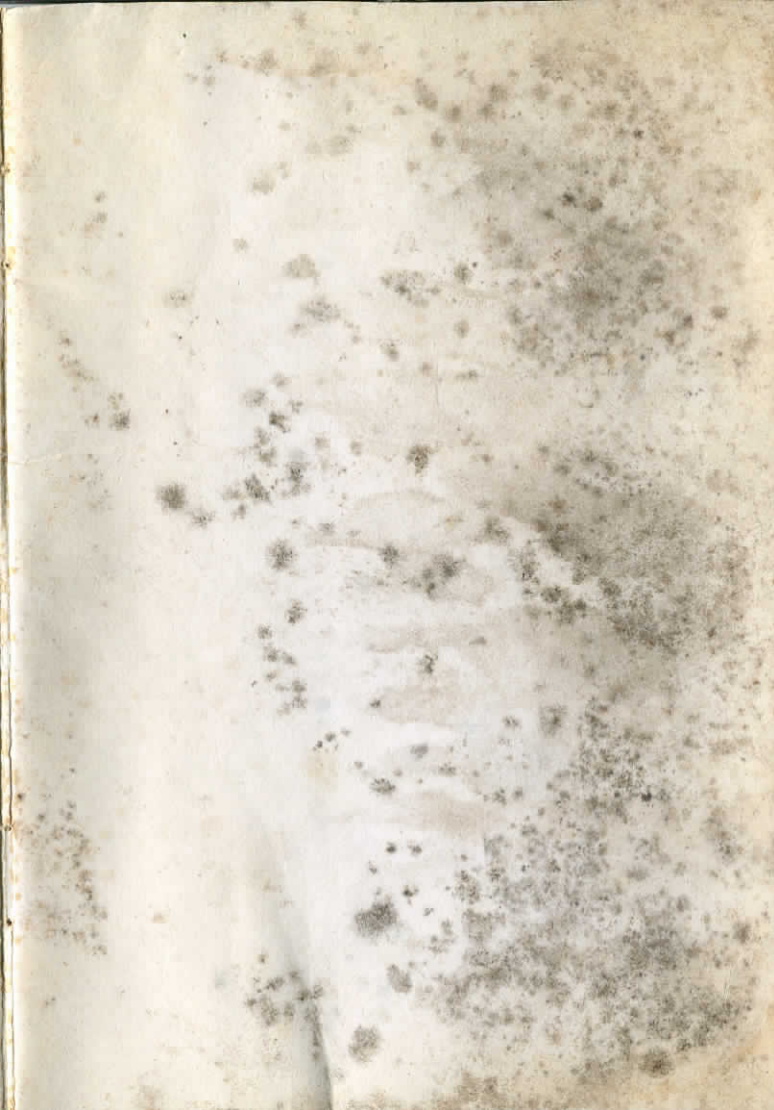
**ZÜNDAPP - WERKE GMBH NURNBERG - MÜNCHEN**

**Werk München Abt. Co, München 8, Anzinger Str. 1**



**ZUNDAPP**  
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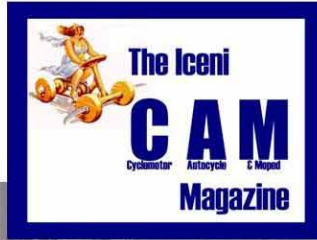


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