OPERATING MANUAL

FOR

ZÜNDAPP MOTORCYCLES

DB 200 K 500 KS 600 K 800

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Enclosed:
1 special booklet on battery-ignition system.
1 special booklet on carburetor.

1. Edition W

ZÜNDAPP - WORKS Ltd in NUREMBERG

OPERATING MANUAL
FOR
ZÜNDAPP MOTORCYCLES
DB 200 K 500 KS 600 K 800

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WORK IN NUREMBERG – SCHWEINAU

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PRIVATE SERVICE STATION IN BERLIN – SCHÖNEBERG

Feurigstrasse 29 - Phone 717444 - Telegraphic address: Zündapp - Berlin

Service stations at many important locations

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Design and engineering are subject to change

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Preface

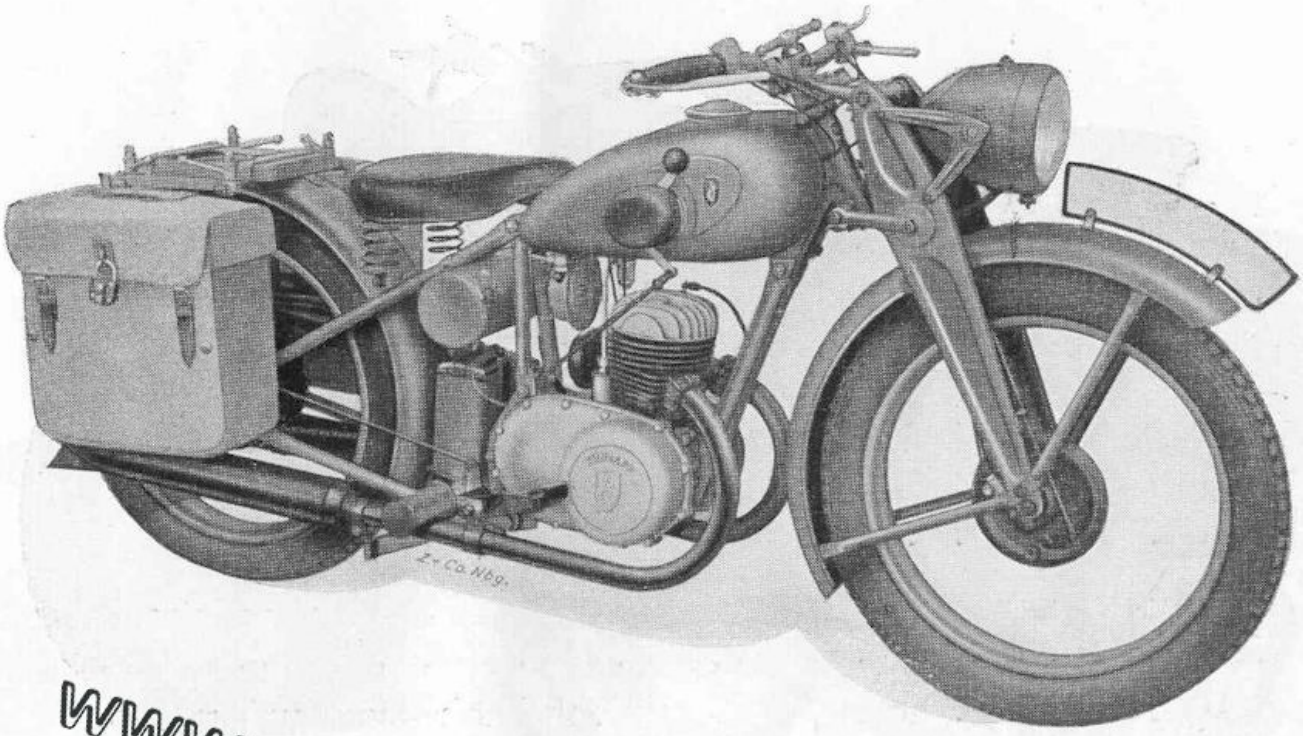
Zündapp motorcycles are designed on practical, state-of-the-art principles of the highest accuracy and made from the best materials. A well treated vehicle will keep its value longer than a badly treated one. So it is in your own interest not to avoid the small effort and the minimal costs that will arise when maintaining and treating the bike properly. This will save you from higher costs and losses.

The following manual will facilitate becoming acquainted with your motorcycle. It contains everything you need to know about the proper maintenance and the remedy of basic malfunctions with which every rider will have to deal with once.

More extensive inspections and repairs should be left to diligent professionals. You will find them at Zündapp service stations which are constantly advised by us. The Zündapp dealers will be available to answer any question and to give you the information you need. So before contacting the manufacturer turn to the responsible Zündapp dealer. Only by doing this, fast handling is ensured. If the damage is covered by the warranty the works or the responsible Zündapp-dealer workshop is to be informed **in writing immediately**. Furthermore, the warranty terms that came into effect on August 15th, 1938 are decisive for dealing with warranties.

We discourage you from doing any repairs on your own.

You have to pay special attention to the guidelines of breaking-in because the lifespan of the vehicle depends on it. It is very important to use **Zündapp's original spare parts** because only they will completely ensure the durability and sound operation. Zündapp doesn't avoid any costs to put their materials and manufacturing methods to stringent tests.



DB 200

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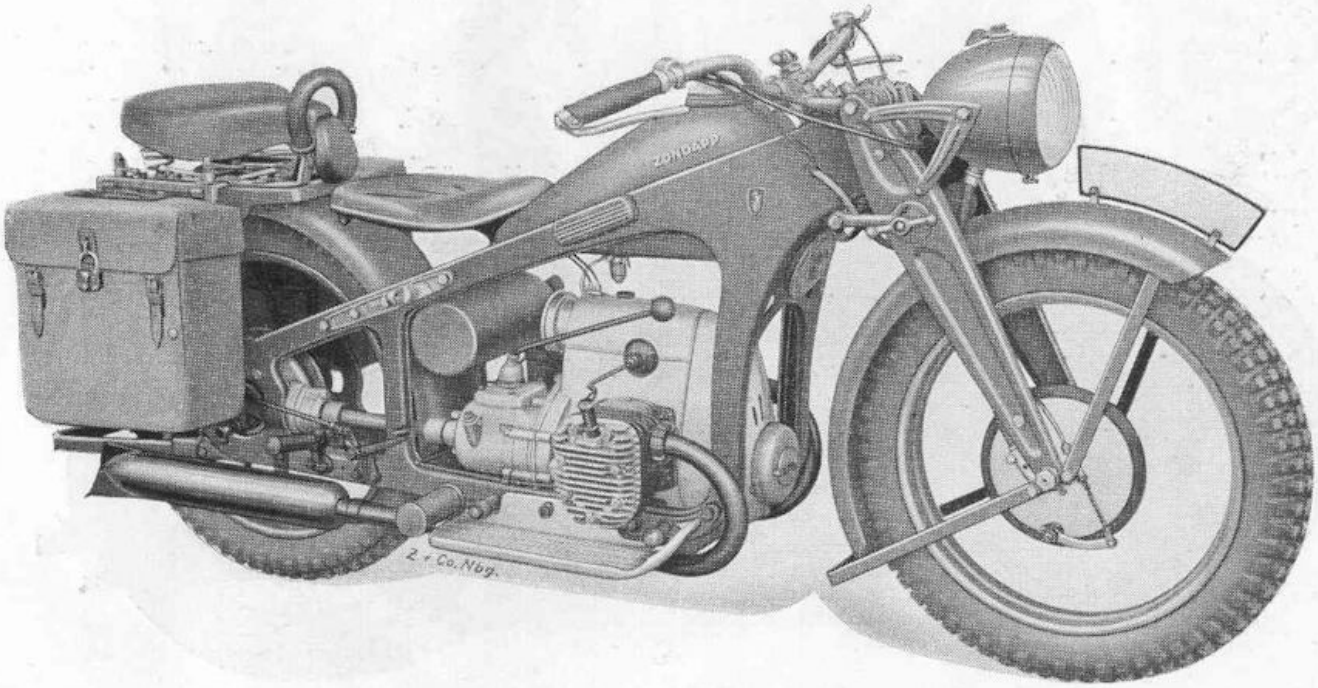
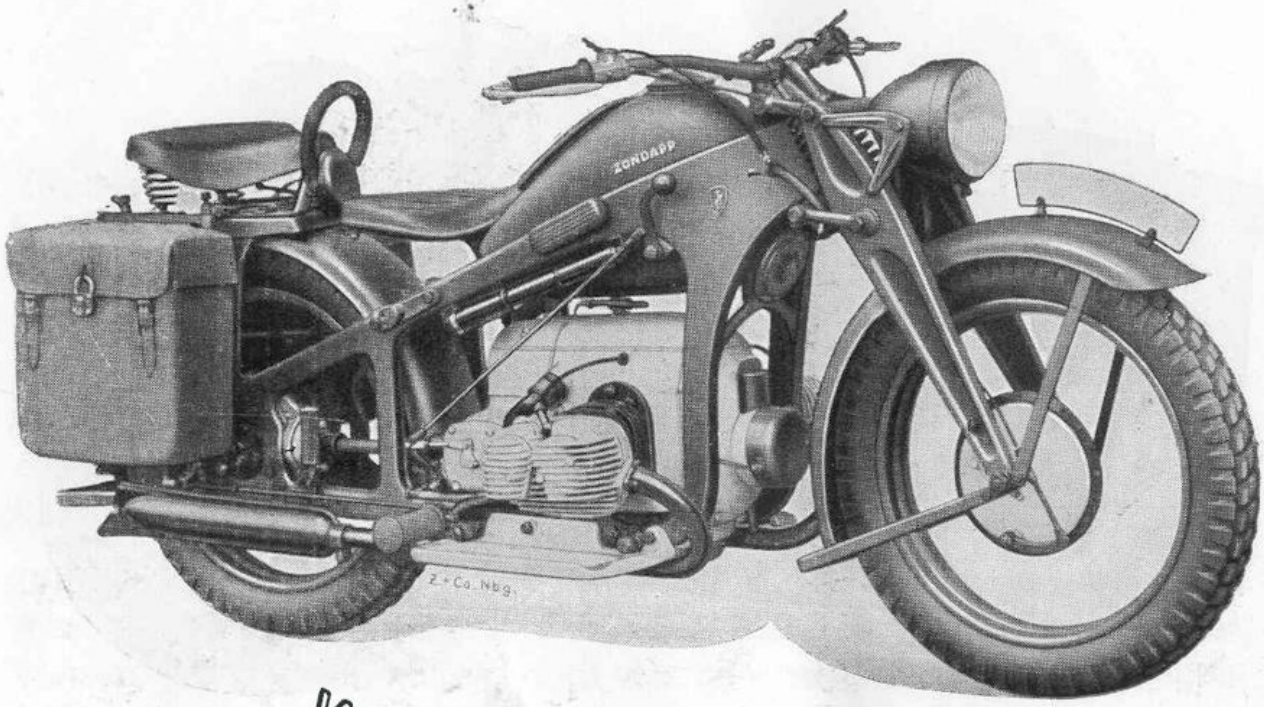


K 500



KS 600

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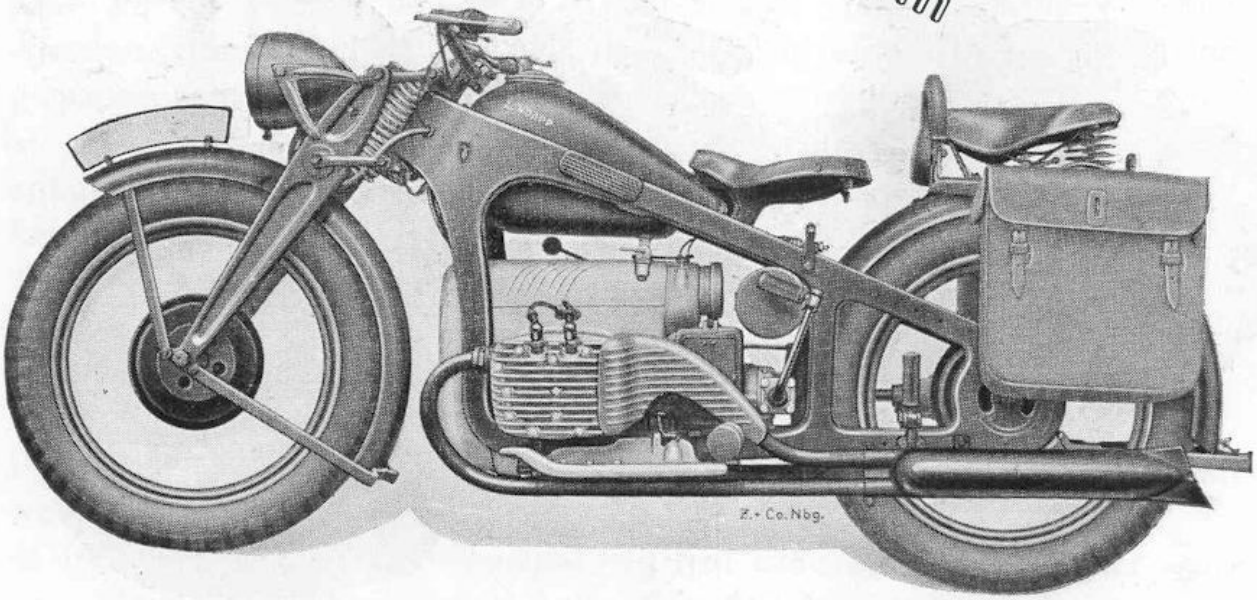
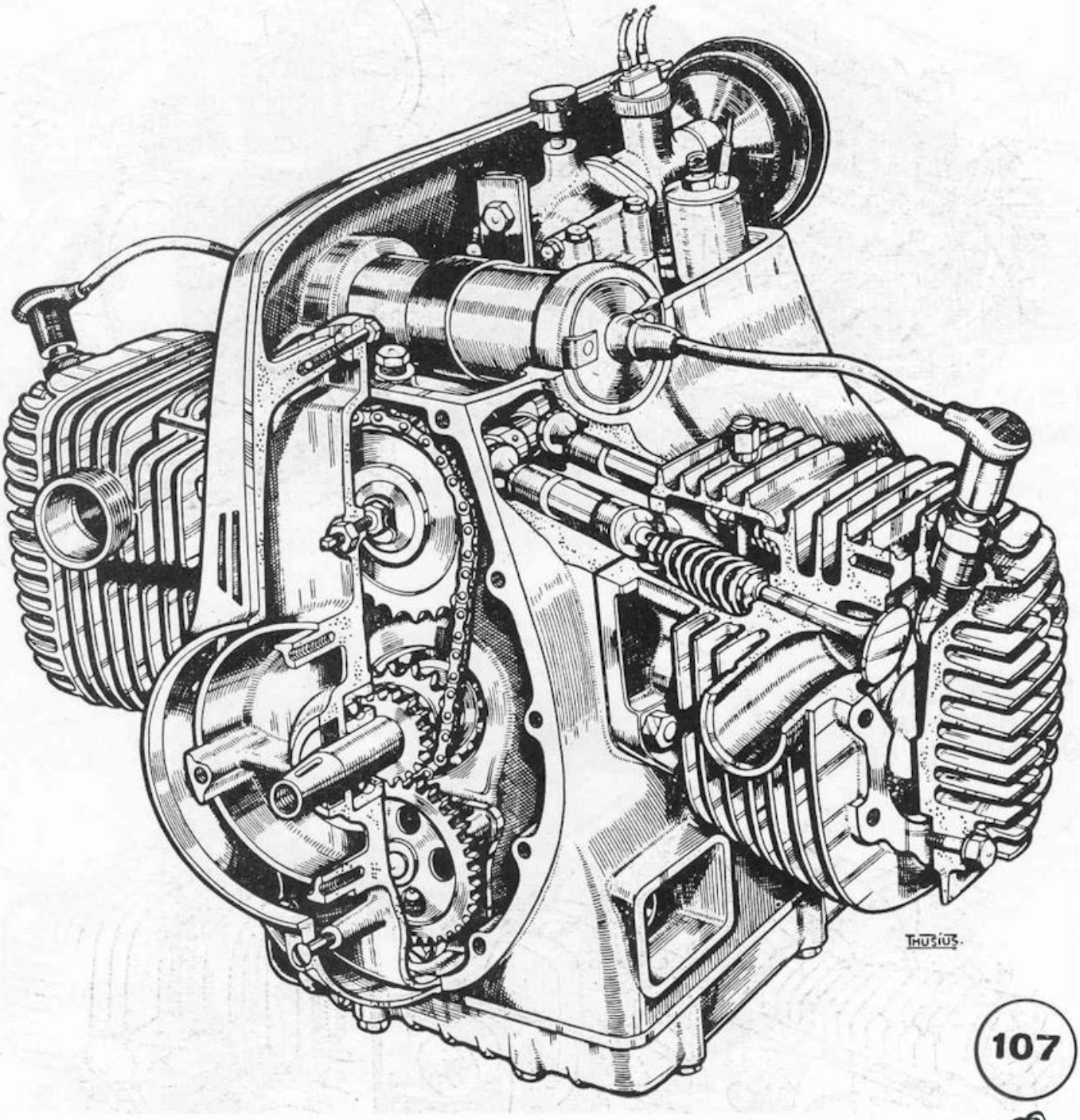


K 800



107

107: Zündapp K 500 two-cylinder, four-stroke block engine, side valve.
Open: front with camshaft and oil-pump drive.
Easy to adjust valves, built-in carburetor and spark coil.

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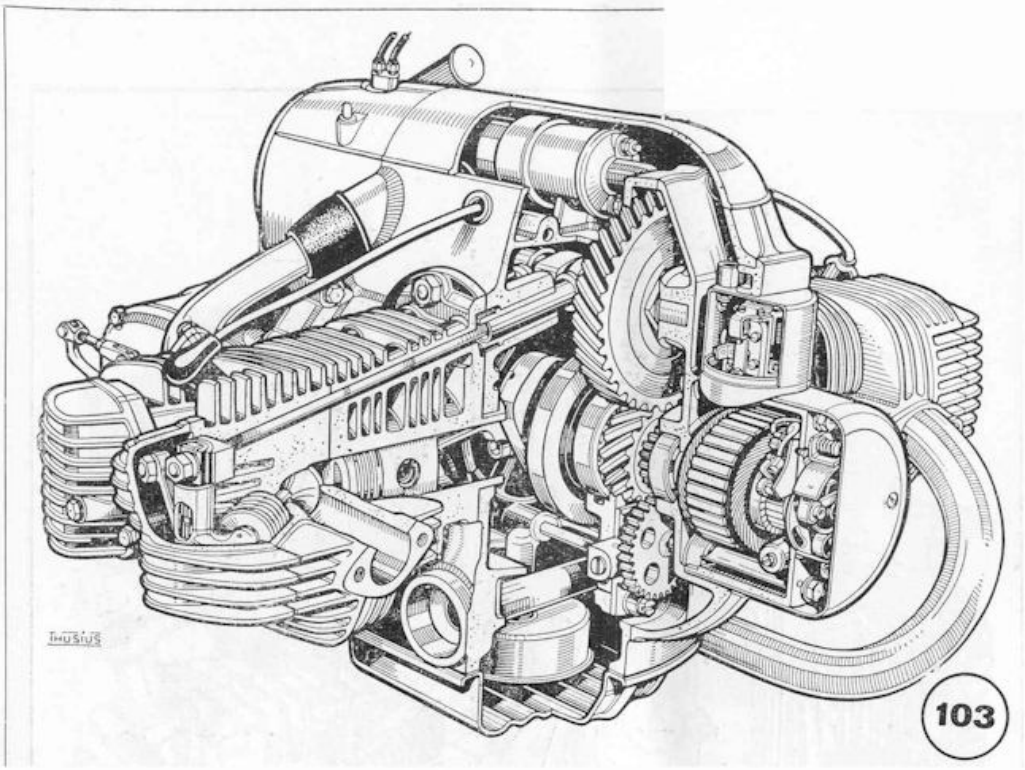

103: Two- cylinder, Zündapp four-stroke engine, overhead valve 597 ccm, 28 PS sectional view.

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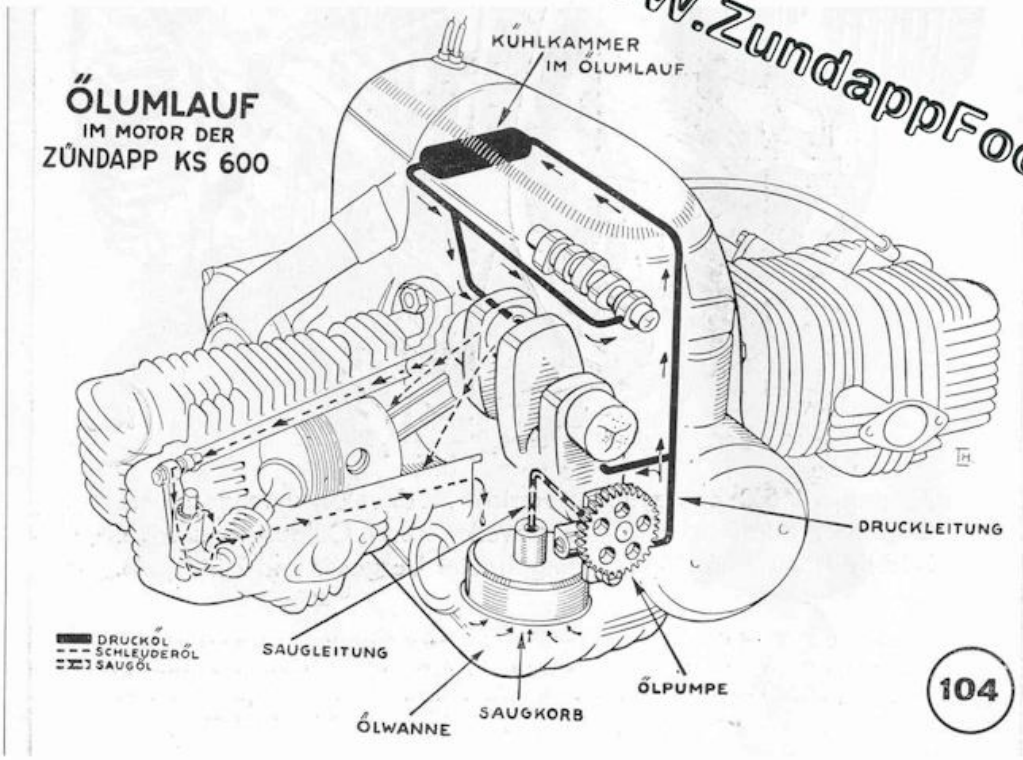
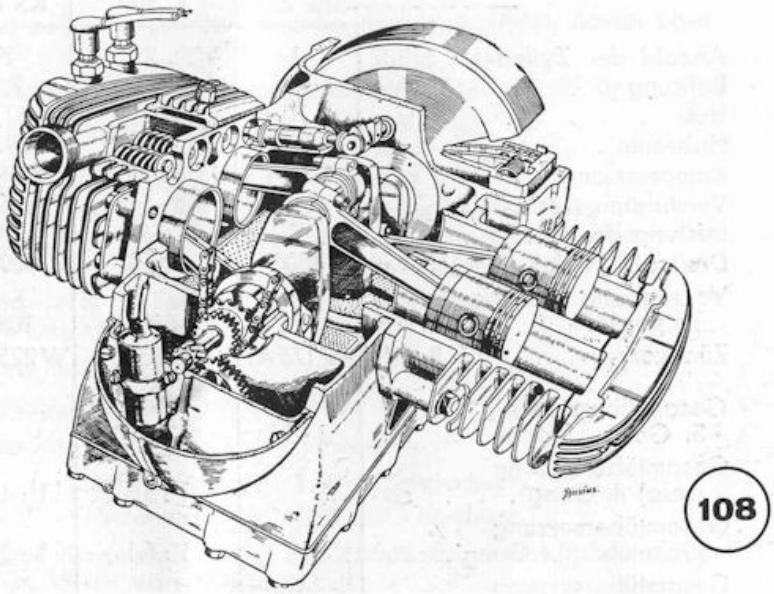


104: Oil circuit in Zündapp KS 600 engine

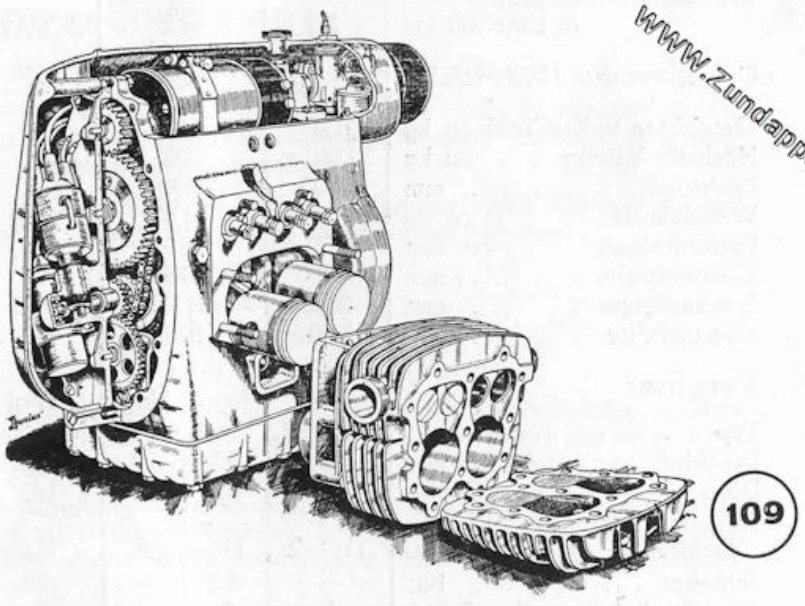
Cooling chamber in oil circuit

Below drawing:
Suction line
Oil sump
Strainer
Oil pump
Delivery line

Key:
Oil, high pressure
Splash lubrication
Suction oil



108: Sectional view of a Zündapp K 800 four-cylinder, four-stroke block engine, side valve.



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109: Zündapp K 800 four-cylinder, four-stroke block engine, side valve.
Open: front with camshaft and oil-pump drive, Spark coil, distributor and alternator drive.
Removed cylinder and cylinder head. Enclosed carburetor.

2 Technical specifications

	DB 200	K 500		KS 600	K 800
Number of cylinders.....apiece	1	2		2	4
Bore.....mm	60	69		75	62
Stroke.....mm	70	66.6		67.6	66.6
Displacement... ccm	198	498		597	804
Compression space.....ccm	39+/-1	54+/-1		53+/-1	45+/-1
Compression ratio	1:6	1:5.8		1:6.5	1:5.8
Output of engine...PS	7	16		28	22
RPM.....n	4000	4550		4800	4300
Spark advance before top dead centre*).....mm	4,5	8 *)		10 *)	10
Sparkplug.....Bosch	W 175 A1	W 175 A1		W 225 T1	W 175 A1
Overall ratio 3rd gear.....approx.	1:5.8				
Overall ratio (solo) 4th gear.....approx.		1:5.3		1:4.65	1:4.35
Overall ration (sidecar) 4th gear.....approx.		1:6.1		1:5.26	1:5.3
Overall ratio (W-sidecar) 4th gear.....approx.				1:5.58	1:5.65
Fuel consumption under standard in litre/100 km	2.5	4.2		5.5 (sidecar)	5.5
Oil consumption on 100km approx. litre		0.1		0.1	0.15
Weight with full tank .....approx. kg	120	188		210	212
Maximum load .....approx. kg	160	200		200	200
Wheelbase.....mm	1300	1390		1410	1405
Turn radius approx. m	5	4.6		4.6	4.6
Ground clearance .....approx. mm	130	130		135	120
Total width.....mm	750	815		885	815
Total length.....mm	2000	2150		2165	2165
Total height.....mm	900	900		960	900
Carburetor	Bing	Amal	Bing	Amal	Amal
Type.....	AJ 2/20	5/416	AJF 2/22	M76/446	M74/431P
Passage.....mm	20	22	22	25.4	18.2
Nozzle.....size	80	85	85	140	105
Airscrew revolutions open.....approx.	1 ½ -2	1 ½	2	1 ½	1
Slide valve... No.	-	5/2	-	6/3	4/4
Needle position from top.....detent	1	3	4	2	2
Mixing chamber insert	4	-	4	-	-

*) The ignition timing can be manually adjusted in the K 500 and the KS 600. In the K800 the ignition timing is adjusted automatically.

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Acceptance of the motorcycle 3

When accepting the motorcycle every driver should satisfy oneself that

1. the motorcycle is in good order and condition,
2. the toolkit is complete according to the list,
3. the carburetor is throttled and sealed,
4. in the case of two-stroke engines, the gearbox is filled with oil according to the regulations and that a good brand oil is mixed to the fuel in the proper ratio,
5. in the case of four-stroke engines, the engine, gearbox and bevel gear contain the required amount of oil,
6. the battery is charged,
7. the engine is thoroughly greased,
8. the tires have the right pressure:

   Front wheel: approx. 1.50 atmospheric excess pressure
   Rear wheel: approx. 1.75 atmospheric excess pressure

Without oil the destruction of all engine components is only a matter of minutes.

Attention – break-in! 4

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If you love your motorcycle you have to do a proper break-in!

The carburettor seal and throttle may only be removed by Zündapp dealers after a run of approx 2000km or any warranty claims will be rejected.

In this break-in time none of the following speeds shall be exceeded in the according gears:

1st gear 20km/h
2nd gear 30 km/h
3rd gear 50 km/h
4th gear 65 km/h (cruising gear)

We do not say that these speeds have to be held constantly. Changing the speed frequently is beneficial for the break-in.

Exceeding the prescribed maximum speeds can easily lead to damages on the pistons, the connecting rod bearings etc. which the works cannot be held responsible for.

After the brake-in phase it is necessary to raise the speed gradually and include short distances at full throttle to ensure an additional break-in of the pistons and the individual engine components. It is important to avoid high engines speeds in lower gears by changing gears early.

Control levers DB 200

1. Ignition key.
2. Charging control lamp.
3. Safety fuse (only for Bosch-Headlights)
4. Speedometer.
5. Shock absorber.
6. Clutch lever.
7. Handbrake.
8. Air lever.
9. Throttle twist grip.
10. Dimmer switch.
11. Signal button.
12. Filler cap.
13. Kick starter.
14. Foot-brake lever.
15. Gear lever.
16. Shifting scheme (I = 1st Gear, 0 = Neutral, II = 2nd Gear, III = 3rd Gear).

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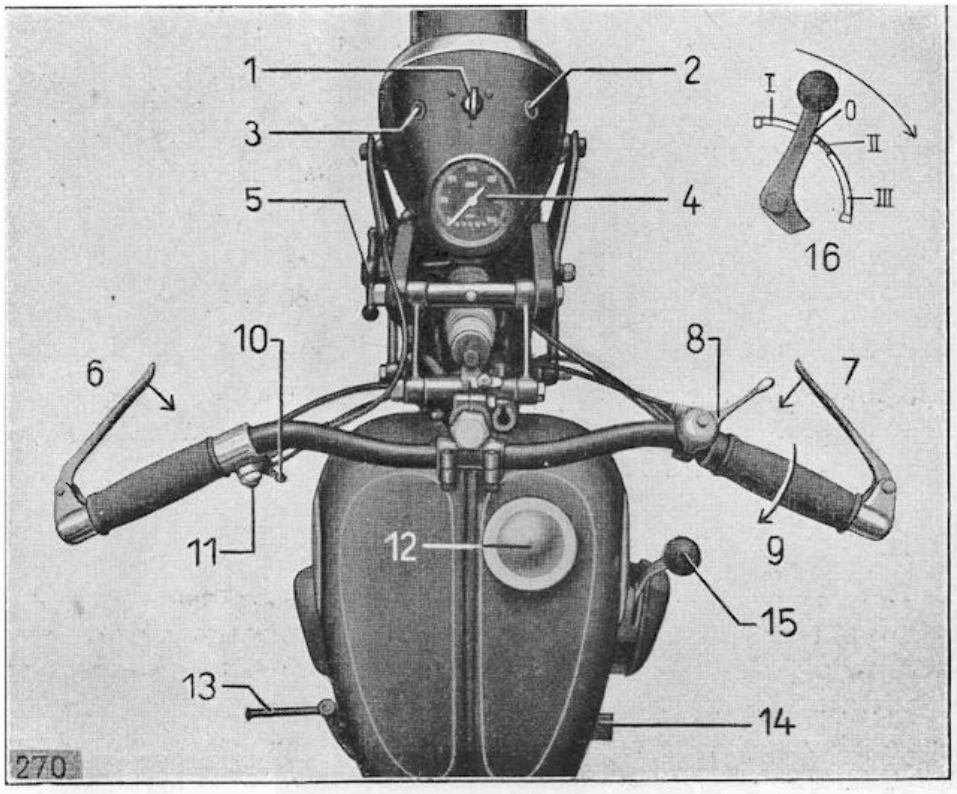

Control levers K 500, K 800

1. Ignition key.
2. Charging control lamp.
3. Safety fuse (only for Bosch-Headlights)
4. Speedometer.
5. Shock absorber.
6. Clutch lever.
7. Handbrake.
8. Air lever.
9. Throttle twist grip.
10. Dimmer switch.
11. Signal button.
12. Ignition lever for K 500
13. Shock absorber of steering
14. Filler cap.
15. Gear lever.
16. Foot-brake lever.
17. Kick starter.
18. Shifting scheme for hand gear shift (K 500 and K 800)
    0=Neutral, I=1st Gear, II=2nd Gear, III=3rd Gear, IV=4th Gear.

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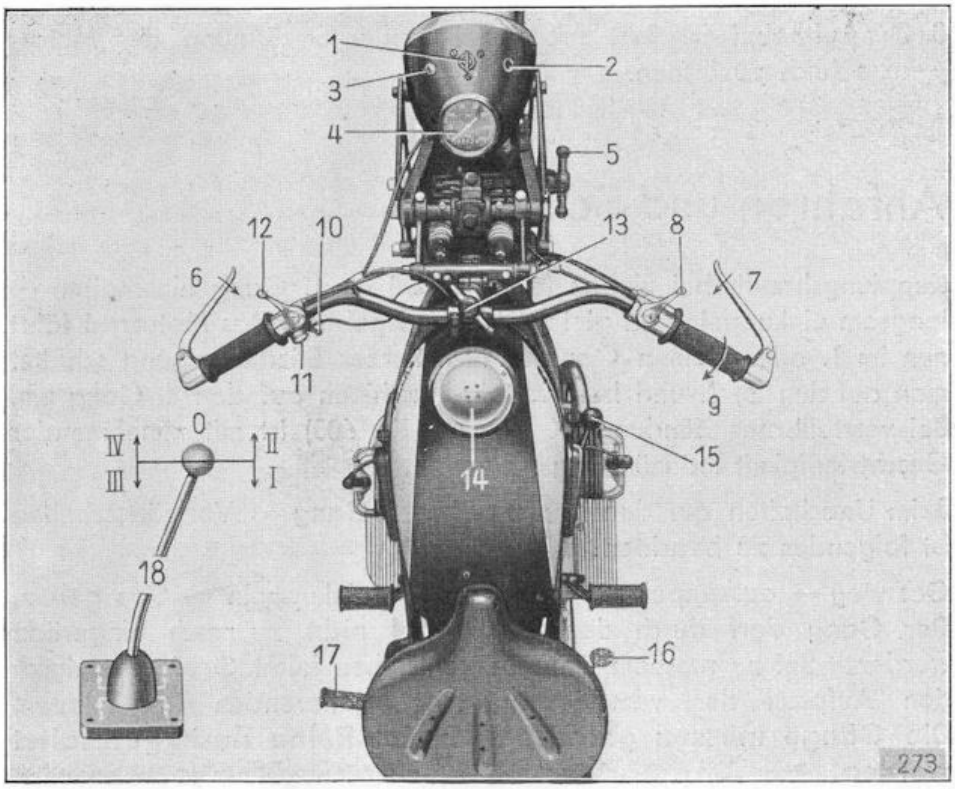

7 Starting up the engine

1. Put gear level in Neutral.
2. Open fuel cock and overflow carburetor by using the pad. The model K 800 features a pump carburetor, the fuel pump is activated by twisting the throttle twist grip repeatedly to full throttle (in the case of sealed bikes as far as it will go).
3. The clutch which immersed in an oil bath in all models, is released by pulling the clutch lever and pressing down the kick starter crank at the same time.
4. Close the air lever, open the throttle twist grip a little and press the kick starter crank repeatedly: The engine will now suck in the ignitable mixture.
5. Switch on ignition using the ignition key. In the case of adjustable ignitions (K 500 and KS 600) set to retarded ignition.
6. Press down kick starter crank with force until the engine starts up.
7. The engine speed is to be held as low as possible. It is recommended to let the engine run in place until the operating temperature is reached. But not for too long because without an air stream the cooling is not sufficient.
8. The air lever is to open only when the heat of the engine increases.

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8 Starting and shifting

Pull clutch lever (disengage) - shift into 1st gear - slowly engage and accelerate at the same time. The motorcycle now runs in 1st gear. After short acceleration shift onto 2nd, 3rd and in the case of four-stroke engines into 4th gear. In the case of adjustable ignition (K 500 and KS 800) set to advance ignition with increasing speed.

When shifting to the next higher gear you should mind the following:

Release the accelerator – disengage – shift – engage – accelerate. Do not engage the gear too quickly with the lever. When putting the gear in too quickly noises can be generated as the result of jaw clutches colliding at different speeds. **The gears have to be strictly shifted in sequence.**

While driving 9

Acceleration, speed and deceleration of the motorcycle are adjusted using the throttle twist grip as well as the front and rear wheel brakes. Operate the brakes carefully. **Braking slowly helps driving well and saves tires and fuel.**

It is of importance how to operate the clutch lever and the foot and hand gear levers when shifting.

When shifting to a lower gear it is about getting the right moment, it is a matter of feeling and experience.

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Note: shift well timed. It is better to shift often then too little!

When shifting down the throttle twist grip is not closed completely as in the case of shifting up because the engine has to be accelerated proportionally to the gear change. So it is not necessary to rev up. The engine speed may not be kept so low that the engine is running jerky. This will cause damage.

When driving fast it is essential:

a) in the case of two-stroke engines to close the air lever temporarily in short intervals to obtain better lubrication and avoid overheating of the engine,
b) in the case of four-stroke engines to close the throttle twist grip temporarily in short intervals because by this the oil film in the cylinder is renewed by the vacuum created in the combustion chamber and overheating of th engine is avoided.

The driving characteristics of the motorcycle can be influenced by operating the shock absorbers. This is done by loosening or tightening the shock absorber toggle on the side of the front fork. In the case of the KS 600 it is done by adjusting the hand lever at the oil shock absorber.

After stopping put gear lever into Neutral. Important for an easy start up and little wear is the right stopping of the engine. This is done as follows:

Two-stroke engines: Close air lever, bring engine to high speeds, take out ignition key, let engine slow down with the throttle twist grip opened and then close the latter.
Four-stroke engines: close air lever, bring engine to high speeds, take out ignition key and shut throttle twist grip at the same time.

If the ignition key is not taken out the battery will discharge itself through the ignition coil and control light. **After turning off the engine close the fuel cock**.

The fuel reserve will be available when turning the hand lever into reserve position.

10 Removing the wheels K500, KS 600, K 800

Figure 1: Put motorcycle on the stand, flip up fenders after loosening 2 nuts, insert socket wrench or jack (in tool) through a recess in the frame and the spokes on the hub behind it and put it in on one of the four square-head bolts (wheel bolt) that have a left-handed thread and an "L" on it. Insert tool and loosen bolt [1]). Then, with the wheel in the same position, loosen opposite bolt [1]). Turn wheel a quadrant and loosen the two other bolts [1]).

1) Do not screw the bolts out.

Figure 2: Loosen axle nut (on the other side of the frame), insert tool into the head of the axle and screw it out.

Figure 3: Removing the front wheel is the same procedure using the front-wheel stand. Only the fender cannot be flipped up. The speedometer drive built into the brake cover is not to be removed. Front and rear wheel are interchangeable.

When reassembling the wheels well tightened wheel bolts have to be attached special importance to.

After riding approx. 50km the bolts have to be retightened.

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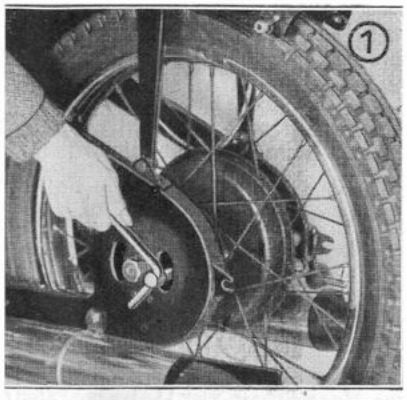

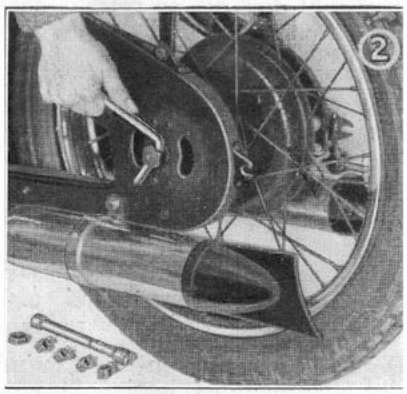

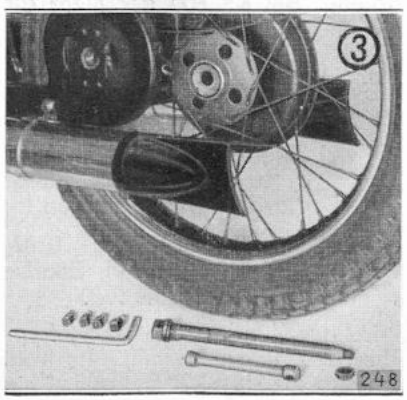

Removing the wheels DB 200

Front wheel:
But motorcycle on the stand. After pulling up the rubber hose and lifting the brake lever, unhinge the brake cable from the fork piece. Now (only if speedometer is present) loosen clamping bolt 1 of the speedometer and pull out helical end. Screw out axle nut and remove axle.

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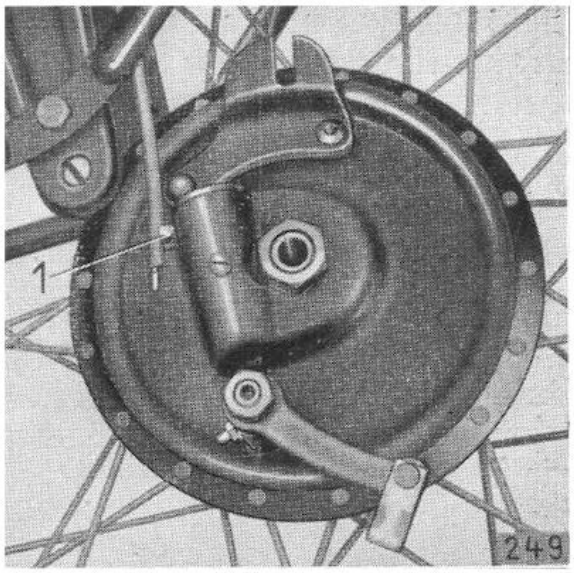
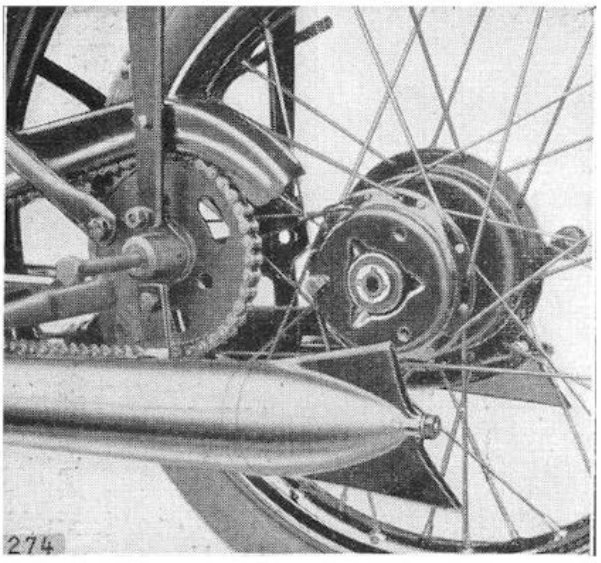


Rear wheel:
Loosen toggle nut of the brake leverage and put it on the inside of the luggage-rack elbow. Screw out the three square-head bolts in the sprocket located on the chain side, screw out the axle nut and remove the axle.



11 Maintaining the breaks

The play that results from gradual wear at the rear-wheel brake is removed by the toggle screw (Figure 1 and 2) and at the front-wheel brake by the setscrew (Figure 3 and 4).

In released state the brake must not grind. There has to be a little play or lost motion in the hand and foot brake levers.

For the automatic return of the brake lever into idle state the retaining springs in the brake have to have good tension, also low joint friction is important. Therefore lubricate in time. Brake lining contaminated with oil or grease cannot brake and have to be cleaned with fuel.

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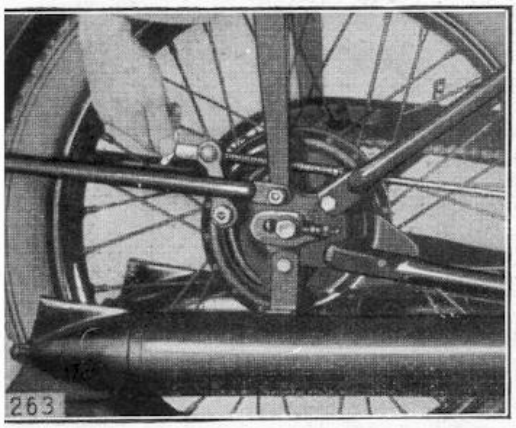
1



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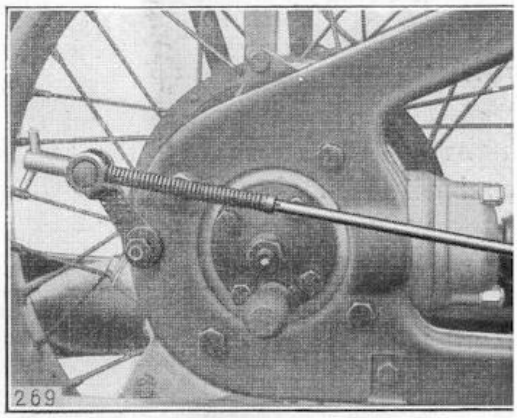

K 500, KS 600, K 800

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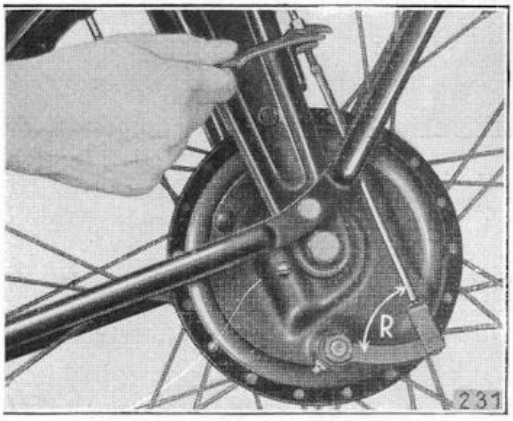

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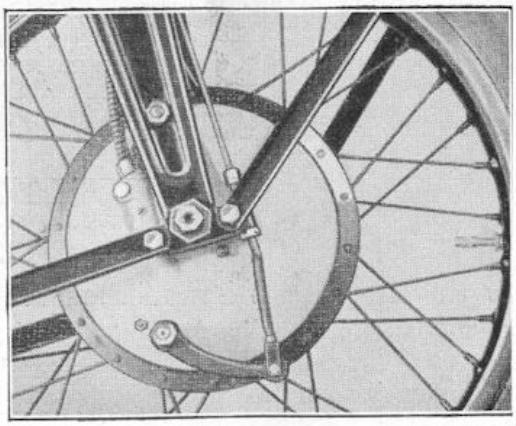
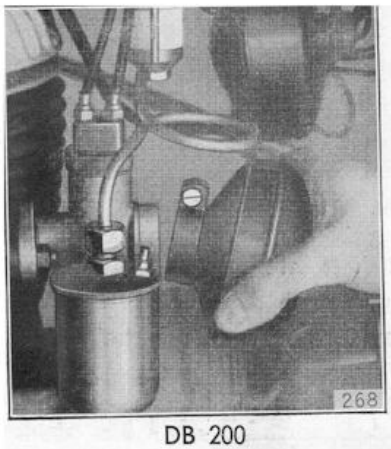


K 500, KS 600, K 800

Carburetor 12

The carburetor is described in detail in the enclosed special booklet. The standard values of the settings are given in chapter 2 (Technical specifications).



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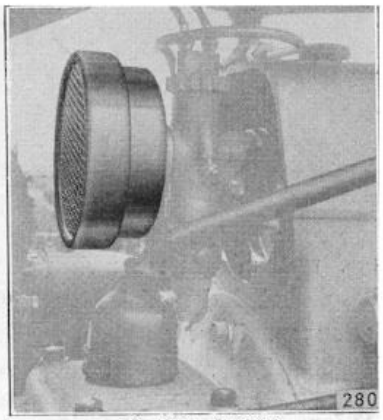

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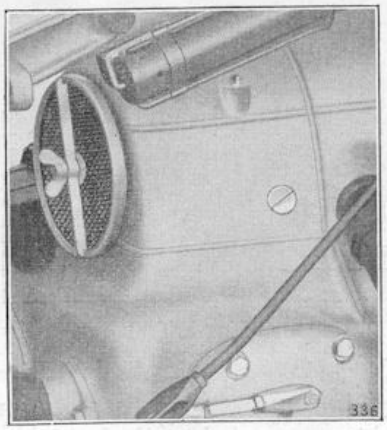

KS 600

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Air Filter 13

The air filter has to be cleaned everytime you refuel or at least after a run of 500km. The dirt is to be removed from the filter with fuel, dried and blown out and then dipped into thin oil which has to drip off. The anti-dust effect is mainly based on the thin oil coating of the inserts in the filter. Badly or not at all cleaned air filters show a poor performance and high consumption.

14 Readjusting the valves K500, KS 600, K 800

The play of the valves has to be checked frequently. Especially during the warranty period the play has to be checked between the individual inspections. The play is to be measured when the engine in cold and in the ignition dead centre. The play between valve stem and cam follower screw, alternatively rocker arm, has to be at least 0.20mm at the inlet valve and 0.25 at the exhaust valve. In the case of motorcycles for cross-country purposes both valve have to have a play of 0.25mm.

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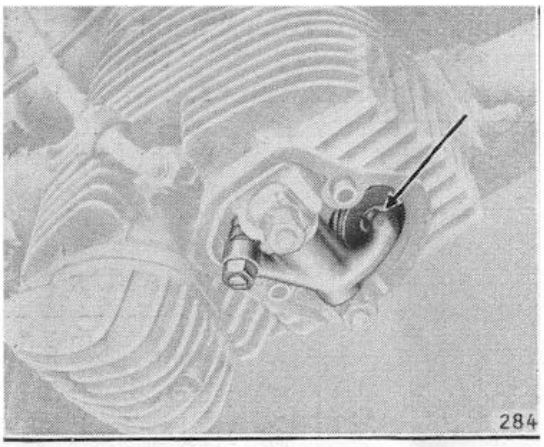
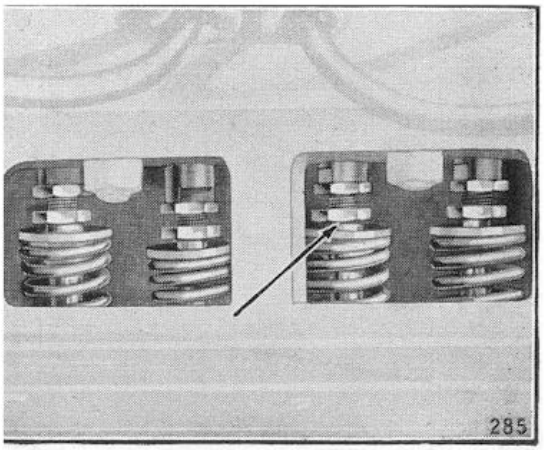


KS 600

Improper valve play will cause difficulties when starting up, burned valves, bad performance and high fuel consumption.
No oil is to be filled into the valve chamber additionally (K 500 and K 800). Only the ground of the chamber may be covered.



K 500, K 800

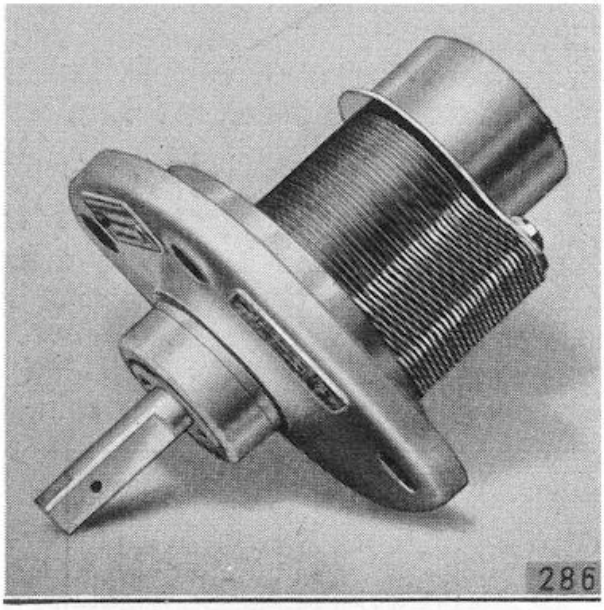
Oil filter KS 600 15

The engine oil is cleaning by the built in disk filter. Everytime you refuel the square bolt of the disk filter that sticks out below the cylinder on the left-hand side of the crankcase (in direction of travel) is to be twisted one and a half times clockwise. If the disk filter is operated inevitably through a Bowden cable in the foot brake, as in some motorcycles, it is necessary to twist the square bolt mentioned above by hand additionally after a run of 500km one and a half times clockwise.

Disk filter KS 600

Empty disk filter sump every 1000km by removing the screw located below the disk filter on the left side of the crankcase.

From the vehicle identification number 501474 on the disk filter is left out. The oil is merely cleaned by the strainer mounted to the intake manifold. Therefore operating or cleaning the oil filter is no longer necessary in these bikes. For learning how to treat the oil filters of the other models, see chapter 21 (Lubrication and maintenance).



Spaltfilter KS 600

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Ignition 16

The gap between the contact breaker points has to be around 0.4mm. Crank engine until the contact breaker points are completely opened. A suitable thick, calibrated metal strip has to be able to be moved between the contacts without a problem.

17 Checking the spark plug

Screw out the spark plug, connect it to the ignition cable and put it with its body on the cylinder. Switch on the ignition and activate the kick starter. Between the electrodes of the spark plug which should have a gap of 0.7mm should now jump a spark if the ignition system, the ignition cable, the contact breaker and the spark plug itself is ok. Sooted and oiled spark plugs are cleaned best with a wire scratch brush or with fuel.

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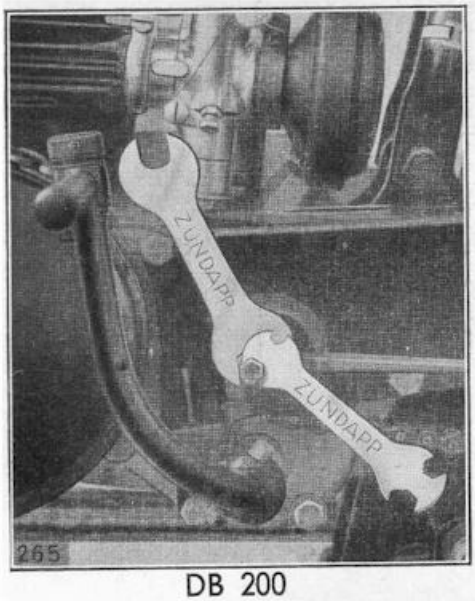
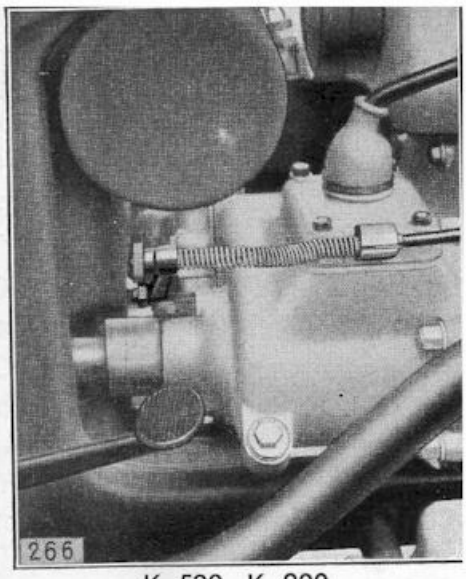
18 Readjusting the clutch

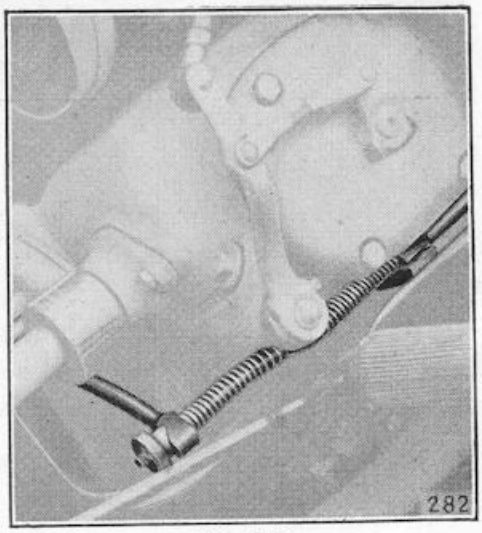
The clutch is adjusted at the nut on the clutch lever or at the pressure screw which is located in the clutch lever and secured with a locknut. Between pressure screw and pressure pin has to be a play of approx. 0.2mm when engaged.



DB 200



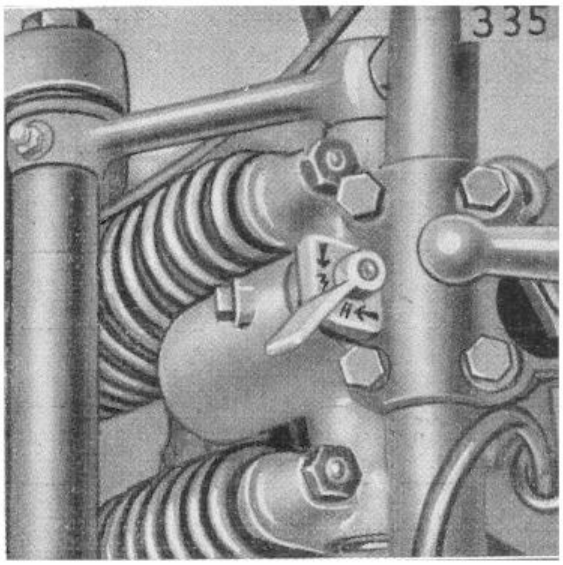
K 500, K 800



KS 600

Oil shock absorber KS 600 19

The oil level in the oil shock absorbers has to be checked every 1000km and if necessary Gargoyle-Mobiloel Arctic or and equivalent brand oil has to be refilled. This is done by removing the screwing and the toggle from the top of the sock absorber together and refilling oil **while constantly moving the handlebar up and down** until oil is leaking out of the feed opening. This means that the shock absorber is completely filled with oil. Now replace the screwing and the toggle.



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The suspension can be adapted to particular terrain conditions by turning the toggle to the right (in direction of movement) for a harder suspension and turning it to the left for a softer suspension.

20 Cause of malfunction

Engine does not start	Engine starts poorly	Engine splashes into carburetor	Exhaust bangs when starting	Engine interrupts jerkily	Two-stroke engine does four strokes	Heavy oil fumes	Black exhaust smoke	Engine pings	Poor compression	Engine output is insufficient	High fuel consumption	Carburetor drips	Spark plug interrupts	Spark plug is gray from inside	Spark plug is incrusted	Spark plug is moist
X	X	X						X		X				X		
	X	X		X				X		X				X		
					X		X			X	X				X	X
	X				X		X				X	X			X	X

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Remedy
Engine is getting too much auxiliary air. Check sealing. Tighten spark plug.
Carburetor contaminated, clean and check according to special booklet.
Wrong carburetor setting. See Chapter 2 and special booklet about carburetor.
Needle valve or float does not seal. Renew needle or float.
Needle valve gets stuck. Activate pad shortly or clean float chamber.
Open air lever completely.
Fuel or oil is improper. Only use brand products.
Wrong mixing ratio, see chapter 5.
Spark plug contaminated, improper or damaged. Clean or renew spark plug.
Gap between electrodes too big. Bend ground electrode to 0.7mm
Spark plug isolation loose or cracked. Renew spark plug.
Contact breaker point contaminated or oiled. Clean point.
Contact breaker arm rotates poorly or fibre block is worn out. Make arm passable. Set contacts to 0.4mm, if necessary renew arm.
Ignition cable strikes through. Renew cable.
Ignition system defective. Check according to special booklet. Let electrical engineer correct malfunctions.
Engine is flooded with fuel. Remove spark plug and clean it. Close fuel cock and switch off ignition. Open throttle and air lever completely and activate kick starter repeatedly. Screw in spark plug, open fuel cock and start up as usual.
Heavy oil-carbon deposit in combustion chamber. Let engine be cleared of soot and use proper fuel.
Wrong valve play. Let professional readjust it. (see page 22)
Valve or valve seat burned. Valve gets stuck. Let professional repair or renew it.
Piston ring is burned to ashes. Let professional check it.
Too much oil. Check oil level. Drain excessive oil.

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21 Lubrication and maintenance DB 200

Figure 1 Rear wheel drive chain.
Figure 2 Oil filler plug for gearbox.
Figure 3 1 pressure-lubrication nipple at throttle twist grip.
Figure 4 6 pressure-lubrication nipples at fork joints.
Figure 5 1 pressure-lubrication nipple each at hubs and brake keys.
Figure 6 1 pressure-lubrication nipple at foot-brake lever.
Figure 7 Joints of the gear lever.
Figure 8 1 pressure-lubrication nipple at the front-wheel brake cover.

The pressure-lubrication nipples have to be greased every 300 to 500km.
The oil level in the gearbox has to be checked every 300km.
The oil in the gear box has to be changed every 5000km.
The rear-wheel chain has to be oiled after every cleaning and at least every 300 to 500km.
All joints like the ones of the gear shift have to be oiled after cleaning the engine.
Greasing the lubrication nipple of the Bowden **may only be done with oil**.

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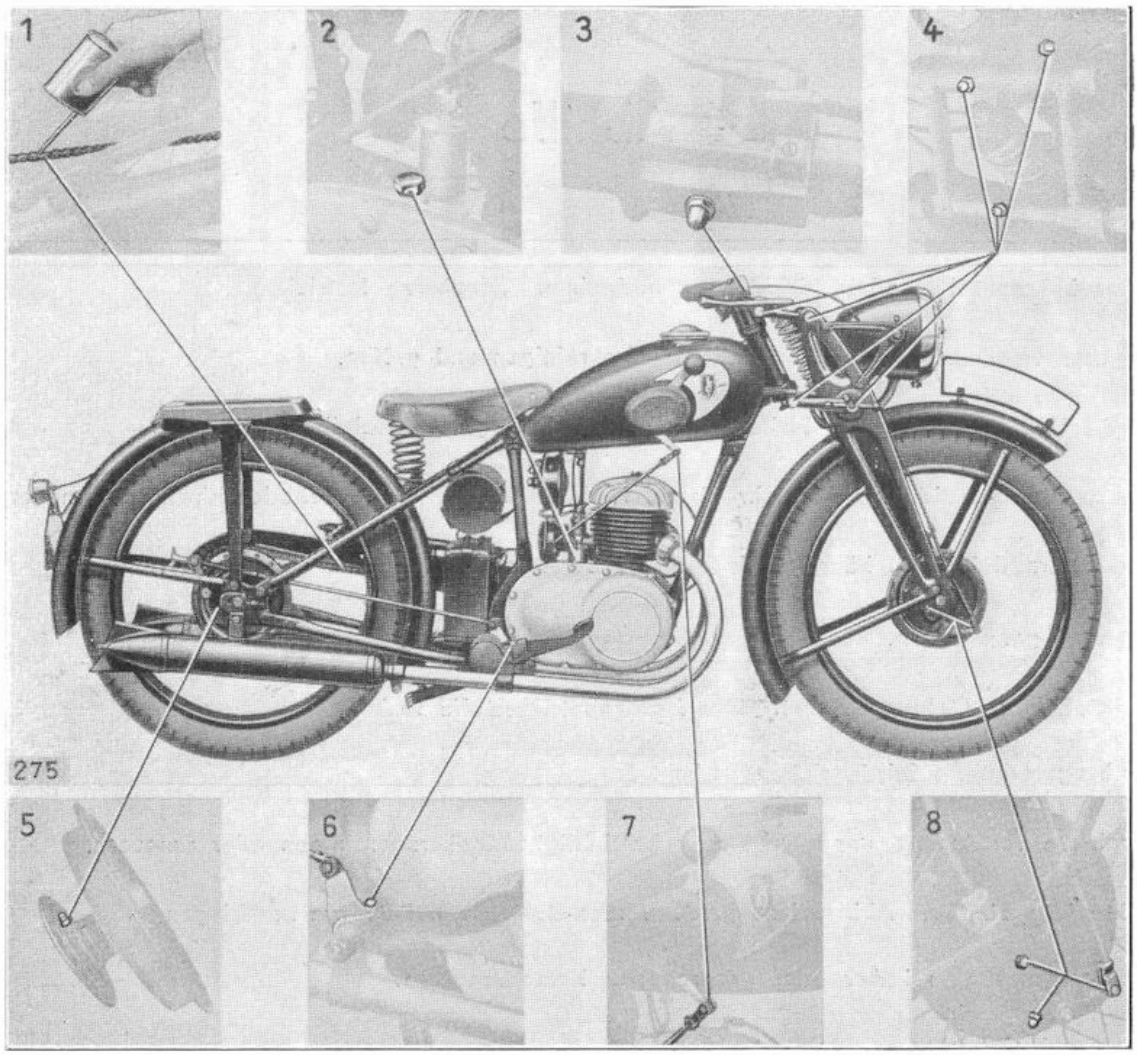

Lubrication and maintenance KS 600

Figure 1 2 pressure-lubrication nipples at kick starter cover.
Figure 2 Oil filler plug for engine.
Figure 3 1 pressure-lubrication nipple at throttle twist grip.
Figure 4 7 pressure-lubrication nipples at fork joints.
Figure 5 1 pressure-lubrication nipple at the bevel-gear drive cover and the oil filler plug.
Figure 6 1 pressure-lubrication nipple each at foot-brake lever, gear shaft bearing and oil filler plug for the gearbox.
Figure 7 2 pressure-lubrication nipples at front-wheel brake cover.
Figure 8 1 pressure-lubrication nipple each at hubs.

The pressure-lubrication nipples have to be greased every 300 to 500 km.
The oil level in the engine, gearbox and bevel-gear drive have to be checked every 300km.
The oil in the engine has to be changed after 500km, 1000km and 2000km during break-in and then every 2000km.
The oil in the gearbox and the bevel-gear drive has to be changed every 5000km.
Greasing the lubrication nipple of the Bowden **may only be done with oil**.

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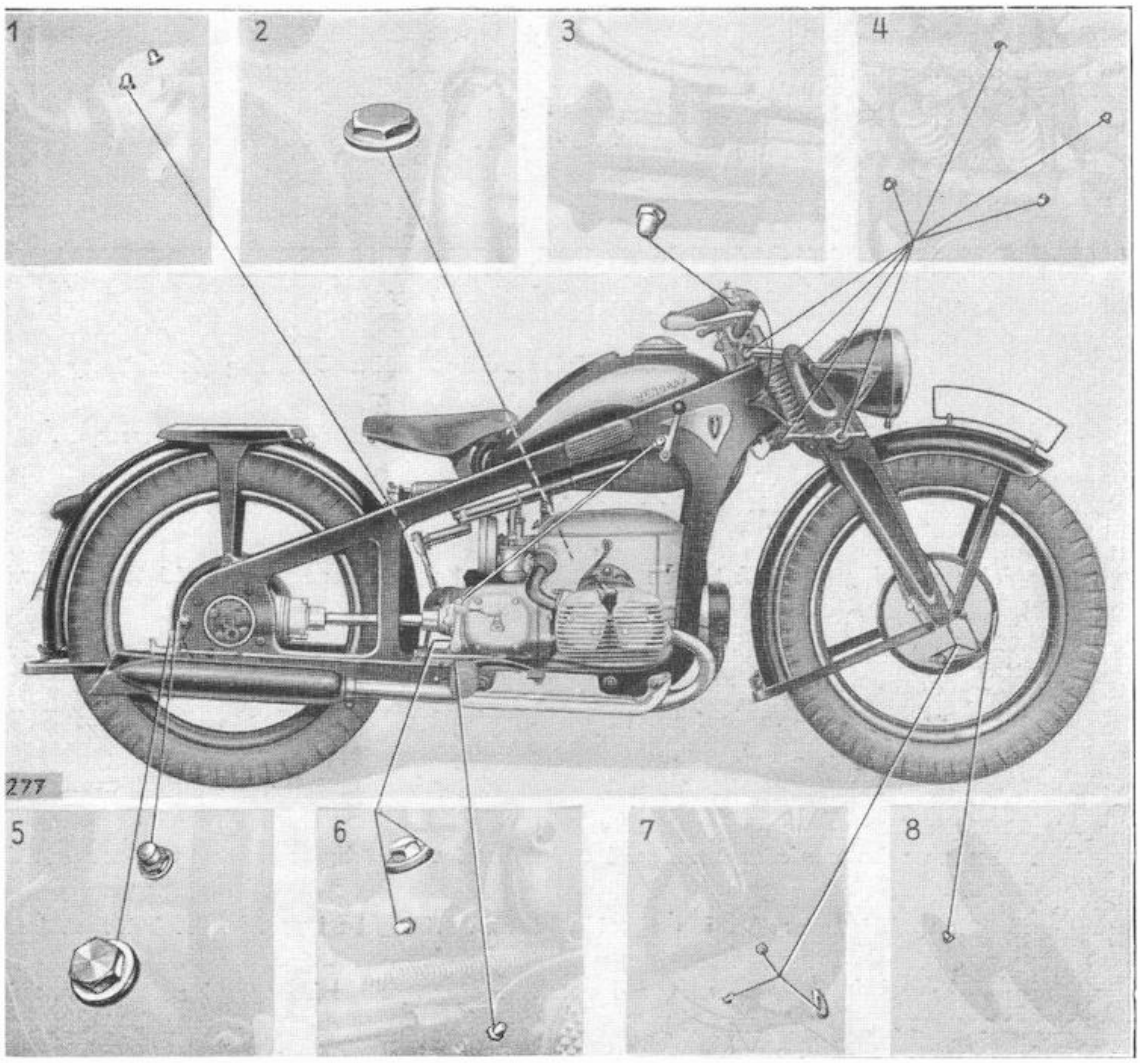
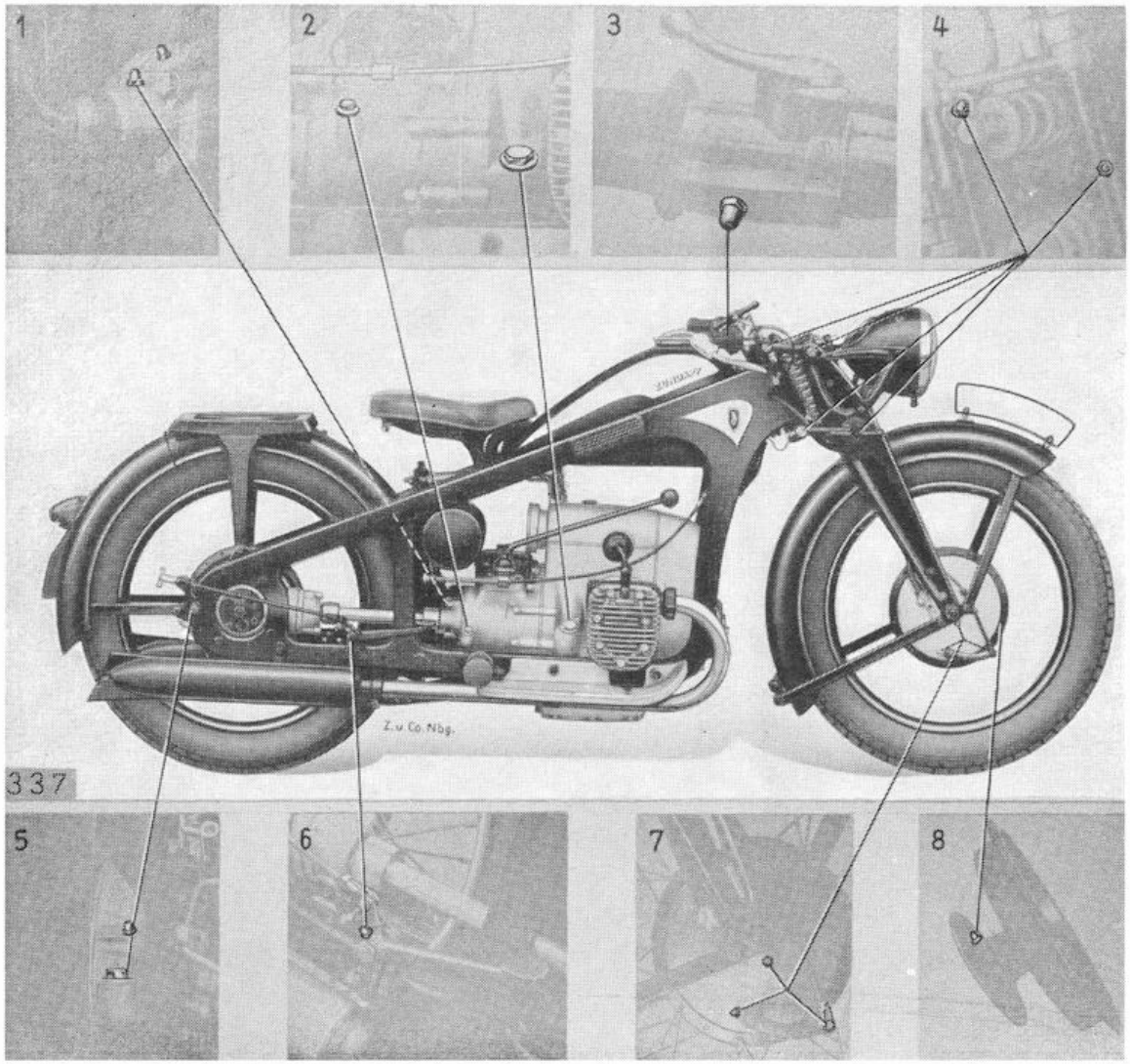


Lubrication and maintenance K 500, K800

Figure 1 2 pressure-lubrication nipples at kick starter cover.
Figure 2 Oil filler plug for gearbox and engine.
Figure 3 1 pressure-lubrication nipple at throttle twist grip.
Figure 4 8 pressure-lubrication nipples at fork joints.
Figure 5 1 pressure-lubrication nipple at bevel-gear drive cover and oil filler plug.
Figure 6 1 pressure-lubrication nipple at foot-brake lever.
Figure 7 2 pressure-lubrication nipples at front-wheel brake cover.
Figure 8 1 pressure-lubrication nipple each at hubs.

The pressure-lubrication nipples have to be greased every 300 to 500 km.
The oil level in the engine, gearbox and bevel-gear drive have to be checked every 300km.
The oil in the engine has to be changed after 500km, 1000km and 2000km during break-in and then every 2000km.
With every 3rd oil change the oil filter has to be replaced.
The oil in the gearbox and the bevel-gear drive has to be changed every 5000km.
Greasing the lubrication nipple of the Bowden **may only be done with oil**.

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