

INSTRUCTION MANUAL

for

DKW Motor Cycles

Edition:

MG	7048	3390,8
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Types:

NZ 250 and NZ 350

AUTO UNION A.G. • CHEMNITZ
(GERMANY)
BIRND-ROSEMEYER-STRASSE

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Stamp of B.K.W. Dealer.

Dealer responsible for controlling the initial records
of great machines.

Manufacturer
Factory Risk
Insured:

Name of my B.K.W. Motor Cycle:

.....

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A) Arrangement of Controls

Before starting out on your first ride, you should make yourself thoroughly familiar with the position and function of the various control devices. It is essential that right from the start you should know how they operate.

A 1) Petrol-tap



Fig. 1.
Petrol-tap
and filter on an
NZ 250

Before starting, turn on the petrol. The normal driving position is with the tap pointing down. With the tap in this position, the engine will run until the fuel supply is exhausted. Then turn the tap further to the right (horizontal position). This connects the reserve fuel supply, sufficient to cover about 12 miles.

At the end of a run or when stopping for any length of time, the petrol-tap should be closed by turning it to left into its horizontal position.

After filling petrol into the tank do not forget to turn the tap from its reserve-position (right) into the normal driving position (down), to be sure to have a fuel reserve supply, when required.

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A 2 Ticker on carburettor float chamber

To start up a cold engine, depress the tickler



Fig. 2 Petrol tap and filter on an NZ 350.

- 1 = Reset. Ya = off. Jb = on.
- 2 = To increase filter screen, turn to the left.
- 3 a To unscrew filter cap, turn to the left.

on the top of the float chamber: until petrol overflows through the air jet in the centre of the chamber cover. This is not necessary when the engine is warm.

A 3 Twist grip throttle control

To open the throttle, turn the twist grip to the left; to close, turn to the right. The more the



Fig. 3. Ticker.

grip is turned to the left, the more fully the throttle is opened, thereby increasing the supply of gas to the cylinder and accelerating the speed in proportion. When starting up the

engine, the grip should be given a turn of about one-fifth.

Use of throttle

As the machine gathers speed the throttle should be opened gradually by means of the twist grip. A hill should be taken with the throttle fully open and, as the engine begins to slow down, the throttle should be shut off slightly, it will then be found that the engine will pull better. When changing down to 3rd or 2nd speeds, more gas can be given. For normal travelling it is recommended that the twist grip be given

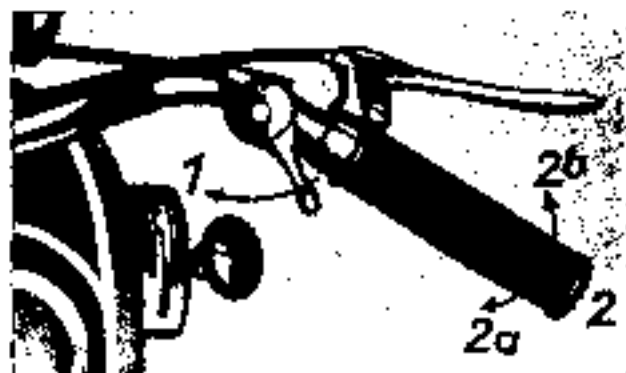


Fig. 4. Twist grip and air control lever.

1 = Air control open 2 = Gas 2a = Gas on 2b = Gas off

a turn of between two-thirds and three-quarters; the most favourable adjustment can be ascertained by "feeling". A speed almost equal to that obtainable with a fully open throttle can be attained by proper adjustment, with a result and economy of fuel.

A 4 Air Control

The mixture of petrol and air supplied to the cylinder of the engine is controlled by means of the air control lever.

Important!

When starting up a cold engine

the control lever should be closed.

When starting up a warm engine

the control lever should be fully opened.

Shortly after the engine has started running, the lever should be put into the normal position, i. e. fully open. In case of a short, but heavy, call being made upon the engine, as, for example, at the top of a hill climb, or when accelerating after slowing down at a corner, the air control lever should be closed for a short space in order to enrich the mixture; otherwise the lever should always be fully open when travelling.

Should it be found that the results are better when the lever is half open, this is a sign

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Fig 5. Ignition and lighting switches on tank.

either that the jet is too small or that the feed pipe or carburettor is dirty

A 5 Ignition and lighting switches

To switch on the ignition, remove cover, insert key crosswise and turn to the right. The lighting of the red signal lamp indicates that the ignition is switched on.

Operation of lighting switch:

- Position 0 Daylight
- Position 1 - Parking lights
- Position 2 = Main head light.

In **Position 1** the key can be removed. When the key is withdrawn, the switch is locked and cannot be operated until the key is again inserted.

In **Position 2** the key cannot be withdrawn. It is therefore impossible to leave the machine with the main head lamp burning by mistake.

Dimming is effected by means of Control A 15.

A 6 Kick-starter

The engine is started up by stepping sharply on the kick-starter. It is advisable to push the engine over by depressing the starter slowly once or twice and the third time more sharply. If the starter does not move, the machine

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Fig. 6. Kick-starter.

- 1 = Swing kick pedal outwards
- 2 = Step on starter

should be pushed forward or backward in gear and then placed in neutral again. If the engine does not start up, refer to the Chapter "Practical Advice".

A 7 Exhaust, or decompression

By operating the exhaust or compression release lever, a valve in the cylinder head is opened; this reduces the pressure in the cylinder and facilitates the starting-up of the engine. The lever should, of course, not be moved during the operation of the kick-starter, otherwise the engine will not start-up; it should be allowed to drop halfway. The lever should not be operated when the engine is running.

A 8 Clutch

The clutch should only be used for starting and for gear changing. By pulling the lever towards the driver the power transmission between engine and gear box is disconnected.

Operation of Clutch: When the engine is running the clutch lever should be pulled right back towards the rider and the change speed lever placed into first gear position. The clutch should then be released gently and the throttle opened gradually at the same time by means of the twist grip; contact will then be

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established between the engine and the back wheel and the machine will begin to move slowly. The lever should not be released suddenly otherwise the start will be a jerky one, or, if insufficient gas has been given, the engine will choke. After travelling for about 5-10 yards the clutch lever should again be drawn back after closing the throttle, and the change speed lever placed in second gear; then gradually let in the clutch once more and open the throttle. The operation is repeated when changing to third and top gears.

Do not attempt to avoid changing down when negotiating the top of a hill climb by allowing the clutch to slip, as this wears out the clutch. Change down as soon as the engine shows signs of overstrain. The clutch hand lever should have a play of about one-tenth of an inch. Paragraph C. 9 deals with the adjustment of the clutch.

A 9 Foot control gear change

Gears are changed by operating this control pedal.

To change from

Neutral into 1st gear	=	step on pedal
1st to 2nd gear	=	raise pedal
2nd to 3rd gear	=	raise pedal
3rd to 4th gear	=	raise pedal

4th to 3rd gear	=	step on pedal
3rd to 2nd gear	=	step on pedal
2nd to 1st gear	=	step on pedal

Thus: To change up	=	raise pedal
To change down	=	step on pedal.

Hints on correct gear-changing

Starting

When the engine has started-up and is running in neutral, the clutch lever (A B) should be drawn right back and the clutch foot control pressed down with the ball of the foot. 1st gear can then be easily engaged. If there is any difficulty, do not use force; just push the machine backward or forward about a foot and it will then be found that the gear will engage noiselessly and with ease.

The clutch lever should then be released and, as the machine gathers speed, the gears changed successively up to top — the normal speed for touring in open country — as described in A 8.

Changing down

A hill should be approached with a burst of speed; the throttle should then be closed gradually. It is bad riding to attempt to take a hill on top speed or to delay changing down until



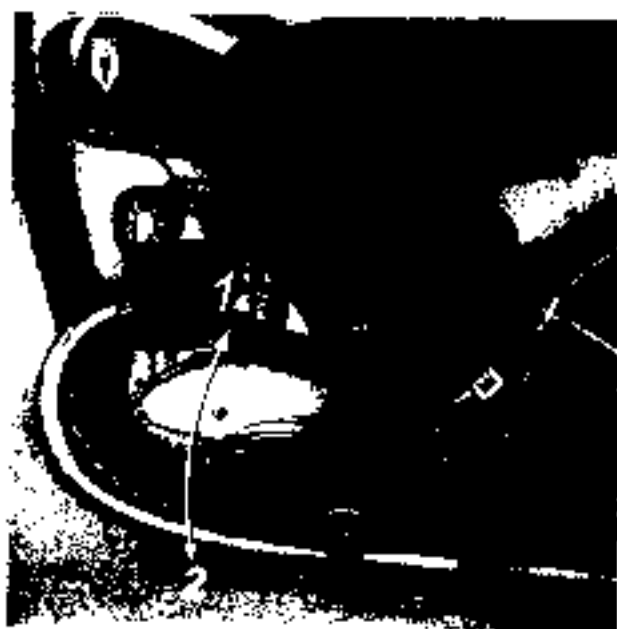


Fig 7 Foot control gear change.

- 1 = In order to change up, raise pedal
 2 = In order to change down, step on pedal.

the last moment. The good rider changes down in ample time and saves his machine from unnecessary wear, at the same time economizing fuel.

Important!

To change down, for example, from top to 3rd speed, the correct procedure is as follows; close throttle slightly, dechitch and depress foot lever till the next lower gear engages, slip in clutch and accelerate. The difference between changing up to a higher speed and changing down to a lower speed lies in the fact that in the former case (changing up) the throttle is completely closed whereas in the latter case (changing down) it is not quite closed owing to the fact that the engine is travelling at a higher speed and must therefore be accelerated during the change.

A 10 Hand control gear change

The DKW Motor Cycle is also fitted with a hand control lever for gear changing. When using the foot lever, it is always possible to see which gear is engaged, or whether the machine is in neutral from the position of the hand lever. The advantage of a duplication of gear changes is that there is a choice of methods available to the rider according to circumstances; he can change gears either with hand or

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foot. As the throttle must be operated by hand when changing, it is in itself an advantage to be able to change gears with the foot; after short practice the rider will quickly appreciate the fact that gear changing with the foot is the correct and most practical method.

When using the hand lever, care should be taken to see that the lever is pushed inwards towards the tank so as to avoid missing the desired gear and ensure connecting with the next highest speed.



Fig. 6 Foot brake.

- Brake pedal adjusting screw
- 7 - Lubricating nipple



A 11 Foot brake

This is located on the right hand side of the machine and can easily be reached with the ball of the foot without it being necessary for the foot to leave the rest. The position of the foot brake can be adjusted to suit the rider by means of a screw.

A 12 Hand brake

This brake operates on the front wheel. When descending a long incline it should be used to assist and relieve the foot brake by alternate application. If it is necessary to pull up suddenly, both brakes may be applied simultaneously, but not too sharply, as the wheels are liable to jam if the lever is pulled back suddenly the full distance. A locked wheel is likely to result in skidding. The best braking effect is obtained by a firm but gradual application and not by a sudden jerk.

A 13 Steering damper

Wobbling of the front wheel, particularly in travelling over bad roads, may be counteracted by appropriate adjustment to the steering damper device. After a little experience the rider will be able to make the most favourable adjustment



to suit himself. Rigid adjustment is obtained by turning the knob to the right; to slacken off turn in the opposite direction.

A 14 Shock absorbers for front fork

The front wheel fork is fitted with shock absorbers to counteract excessive springing when taking a succession of humps. The shock absorber is regulated by turning the screw forward to tighten up, or backward, to slacken off, as desired. Tight screwing should be avoided as this unnecessarily retards the function of the springs.

A 15 Dimmer switch for head lamp and horn operation

In order to dim or switch on the head lamp, operate the switch lever to its full extent in the desired direction. The horn is operated by means of a press stud conveniently placed for use.

A 16 Stand

The machine can be placed on the stand without difficulty and bodily exertion if the rider does not attempt to lift the full weight on to the stand. The stand should be pressed down on to the ground with the left foot and the machine pulled backwards (not upwards) by

means of the luggage carrier, the foot being pushed against the cross-bar of the rest. A lubricating nipple will be found on the axis of the stand.

A 17 Speedometer and mileage indicator

These are installed in the direct line of sight of the rider. The face, which is large and easily read, is indirectly illuminated for night riding.

A 18 Adjustable knee grips

The rubber knee grips on the side of the fuel tank are adjustable to the comfort of the rider by means of two nuts.

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A few practical hints

Running-in a new machine

A careful study of this section will save you trouble and expense!

As in the case of all motor vehicles, speed limits must be observed during the first 1,200 miles.

	Speed limits
250 and 350 cc	
1st. gear	from 0 to 9 miles per hour
2nd. gear	from 9 to 15 miles per hour
3rd. gear	from 15 to 30 miles per hour
250 cc. top gear	from 30 to 40 miles per hour
350 cc top gear	from 30 to 43 miles per hour.

In the early stages of running-in a new engine slow travelling on top gear should be avoided, for town riding the 3rd speed should be used. To help the rider in keeping the speed within the prescribed limits, the carburetter is throttled down by means of a pin which is removed by the DKW dealer when the running-in mileage has been completed. You should ask your DKW dealer for a DKW Servicing Card and take your cycle to him for inspection when the specified mileage has been completed.



A) Controls

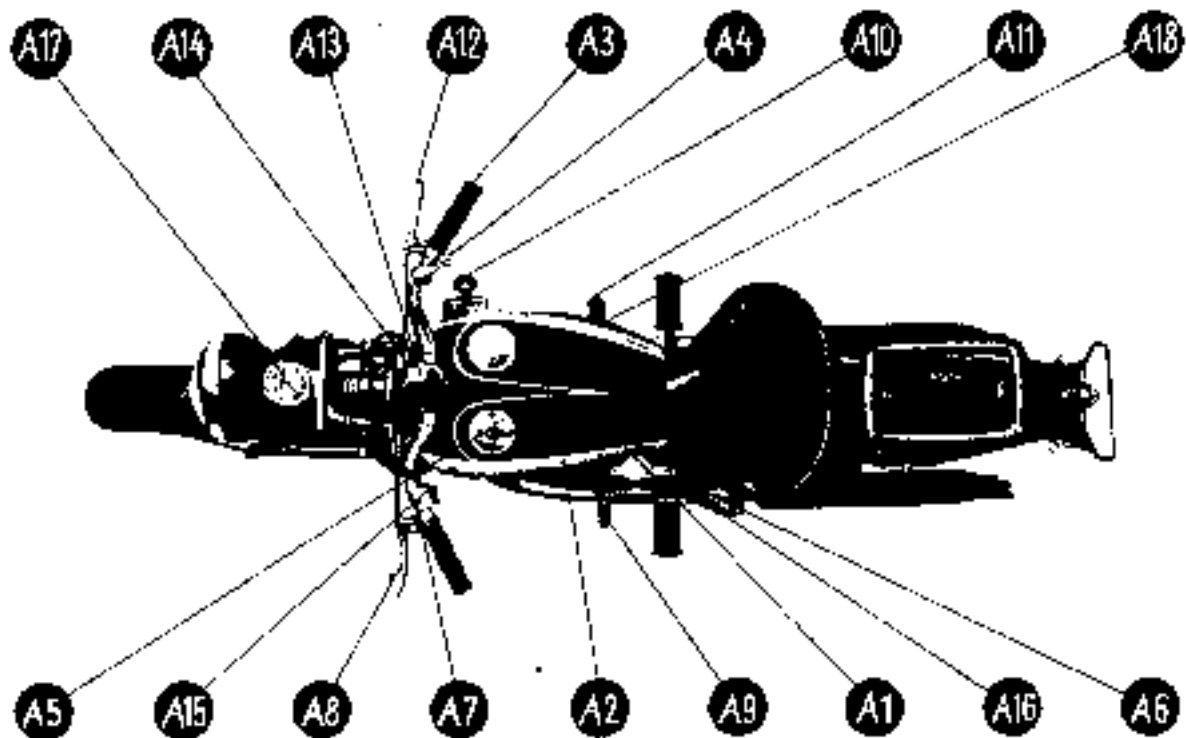


Fig 9. Plan View.

Starting

1. Turn on petrol-tap A 1
2. Flood float-chamber by operating the tickler A 2
3. Set the throttle by means of the twist grip and the air control lever in the starting-up position A 3, A 4
4. Switch on ignition A 5
5. Operate the kickstarter A 6.

If after operating the kickstarter several times the engine fails to start-up, refer to the chapter "Practical Advice" on page 90.

Then proceed to operate gears and clutch as described in A 8, 9 and 10.

Stopping

To save the engine from unnecessary wear, close the throttle and put the gear in neutral before the machine comes to a standstill. Switch off the ignition and turn off the petrol supply. Before leaving the machine on the stand, look to see that it is standing on a firm surface.

You should get into the habit of removing the ignition key when leaving your motor cycle. This is not only a police regulation but also automatically ensures that the ignition is switched



means of the 22 mm spanner which will be found in the tool bag. The wheel is then free and can then be lifted out without difficulty.

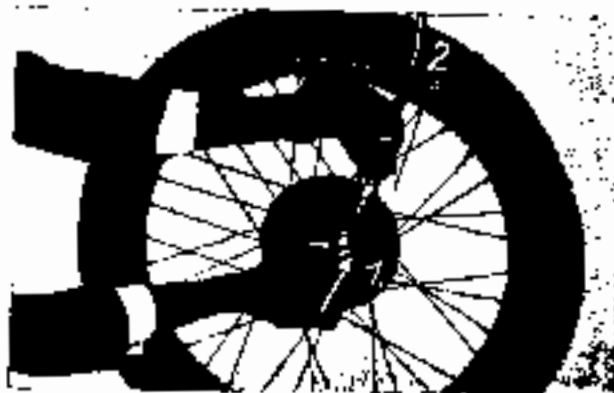


Fig. 11. Removing the front wheel; disconnecting the mileage indicator cable.

1 = Press button. 2 = Withdraw cable from seating.

Removing the back wheel

Loosen the two screws which hold the end section of the mud guard in position. Raise mud guard as shown in illustration (Fig. 12).



Unscrew the axle nut on the left side (looking towards the front of the machine) with the 22 mm spanner provided. After about 5 or 7 turns the axle spindle will become free and



Fig. 12. Removing the back wheel.

1 = To loosen turn screw to left
2 = Raise end of mudguard and support with strut.
3 = Unscrew spindle with left hand tool





Fig. 13. Dismounting back wheel; withdrawing the spindle.

- 1 - Unscrew spindle nut with a left hand tool.
- 2 - Withdraw spindle with a left hand tool.
- 3 - Remove distance piece.



Fig. 14. Removing the back wheel.

- - Slip wheel off seat post to left and then withdraw backwards.



can be easily withdrawn. Remove the distance piece, which will be found between the wheel and the frame, and the washer, between the nut and the frame. Do not lose these parts or forget to replace them when remounting the wheel.

When replacing the back wheel take care to see that the nut on the spindle is in the correct position in relation to the chain adjusting



Fig. 15 Spindle parts.

1 = Distance piece. 2 = Washer. 3 = Spindle

screw, the otherwise wheel will not run true and unnecessary wear of the tyre and chain will result.

It is also important to see that the mud guard is replaced correctly in its grooved seating.

Removing tyre

DKW motor cycles are fitted with deep-bedded rims. Expert knowledge is not necessary to remove a tyre, but the method differs from that necessary for an ordinary bicycle tyre. It is useless to attempt to force the tyre rim over the rim of the wheel by means of a lever, screw driver or similar tool. This will only result in damage to the wire beading and outer cover. The secret of easily and quickly removing a tyre lies in following these directions. First release all air from the inner tube, using the reverse end of the valve dust cap as a key. Then, commencing at the valve, press the tyre into the base of the rim. This may be done by treading on the tyre.

By pressing the edge of the tyre into the base of the rim, the tyre on the opposite side expands and the wired edge can, with the help of the levers supplied, easily be pressed over

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the edge of the rim. Having made a start, the rest of the rim of the outer cover can easily be loosened and after removing the valve nut the inner tube can be taken out.



Fig. 16. Press the outer cover into the base of the wheel rim with the foot and press the tyre over the rim on the opposite side.

Mending a punctured tyre

The surface of the inner tube surrounding the puncture — usually resulting from a nail



Fig. 17. Press the outer cover over the rim of the wheel.



should be cleaned with a little petrol and slightly roughed by means of the file supplied with the puncture outfit. Then spread a little solution evenly over the surface. While the solution is drying, cut out a piece of rubber of the required size and shape — oval or round if possible — and after removing the gauze protection, press it firmly on the punctured area. Before replacing the inner tube, feel inside the outer cover to make sure that the cause of the puncture (e.g. a nail without a head) is no longer there.

A faulty valve

A slow leakage of air from the tyre is generally the result of a faulty valve. This can be located by removing the dust cap and covering the end of the valve with a little spittle. In the event of there being a leakage, bubbles will form. If there is found to be a leak, the valve should be screwed tight by means of the dust cap which also serves as a key. Leakage may also result from a faulty joint between the valve and the inner tube. This can also be stopped by removing the outer cover and tightening up the valve nut adjoining to the inner tube.

Replacing a Tyre

After repairing a puncture, the inner tube should be pumped up slightly and then replaced inside the outer cover. The valve is then fitted into the port in the wheel rim and lightly secured by means of the nut. One rim of the outer cover having been placed in position inside the wheel rim, the other edge should then be pressed over the edge of the wheel with the aid of the tyre levers, commencing at the valve. The foot should be used to keep the tyre in place once it has been pressed over the rim. The last piece can be easily pressed over the rim by depressing the section of the tyre immediately opposite. As when removing the tyre, force should not be used in replacing it. When the tyre has been finally closed over the wheel rim, care should be taken to see that the valve is in an upright and not in a slanting position otherwise a leakage in the valve is liable to result later. The tyre should now be pumped up about one-third full and any kinks removed by bouncing the tyre a few times on the floor. Finally, look to see that the narrow rubber line on the side of the tyre is parallel to the wheel rim all round. If it is not, the outer cover is not seated properly in the wheel rim. The tyre should be punched and kneaded until

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Fig. 18. Replace inner tube pumped up slightly.



it slips into position. The tyre may then be pumped up to the correct pressure (see page 45).

After a little time the rider will be able to judge the correct pressure, but it is advisable at the

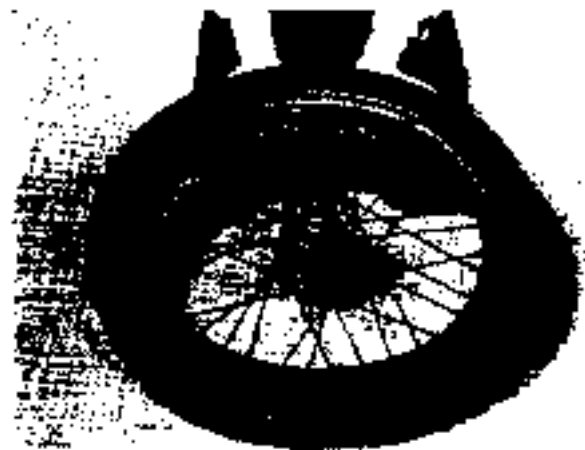


Fig. 19. The valve must be upright.



outlet to have the air pressure tested at the first Service Station after repairing a puncture on the road.



Fig. 20. Press the outer cover into the base of the wheel rim with the feet and commencing at the valve, press it over the rim.



Fig. 21. The last section can be easily pressed over the rim with the help of tyre levers.

Special measures to be taken in Winter

When starting in the dark do not switch on the lights until the engine is running.

Step on the self-starter twice to loosen the engine before switching on the ignition; then switch on the ignition. Also declutch twice before starting to loosen the clutch and facilitate the operation of the gears.



Do not start immediately after the engine has been set running; allow the engine to run for about a minute with the machine at a standstill.

Before the cold weather sets in, test the battery to see that the acid does not leak and that the acid is up to the correct level. It is also advisable to have the battery charged at a garage.

If the machine is not to be used during the winter months, it should be jacked up so that the wheels are clear of the ground. Both tyres should be deflated and the battery dismantled and stored in a warm room. It should be sent to be charged every six or eight weeks.



B) Working parts requiring attention

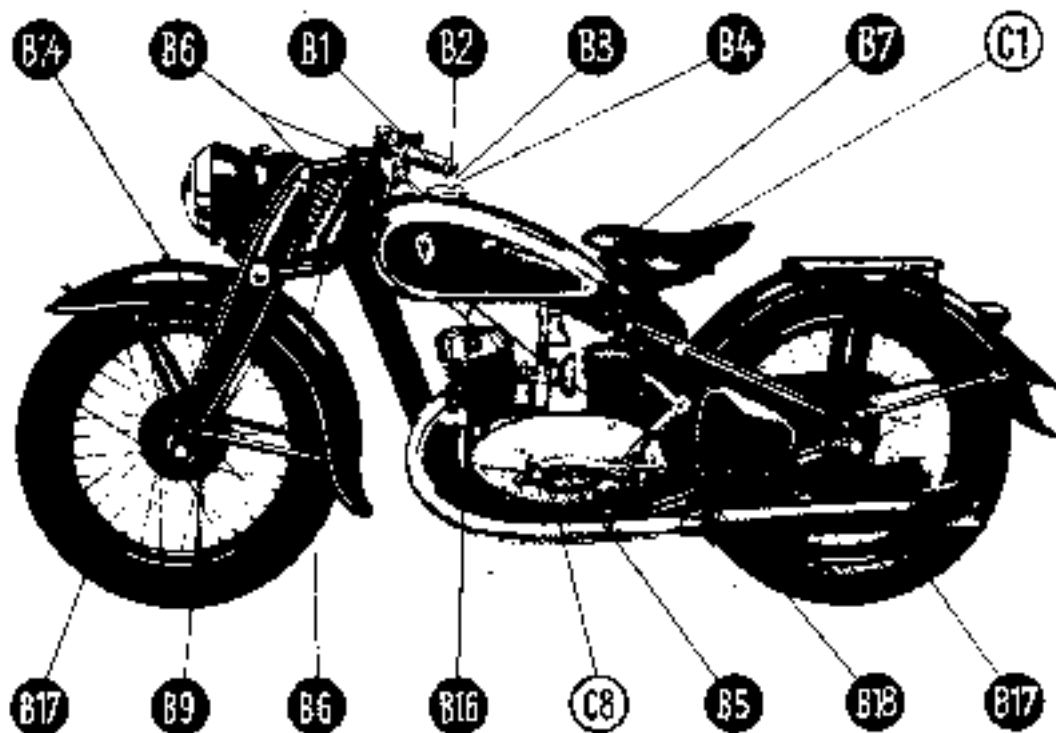


Fig. 22. Side View

B) Fuel, lubrication, electrical equipment, etc.

B 1 Petrol

We recommend the use of only well-known fuel products. If a petrol-benzol mixture — which is not necessary for normal running — is used, no adjustments should be made to the carburettor or the ignition timing. It is not advisable to make frequent changes in the kind of fuel used.

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B 2 Fuel admixture

We suggest that during the running-in period — i.e. for the first 2,000 miles — Auto-Kullag should be mixed with the petrol in a proportion of 0.3 cu. in. to a full tank of 3 gallons.

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B 3 Lubricating Oil

For engine lubrication use only best-known brands of motor oil, having the following approximate specifications:

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Specific weight at 68°F approx. 0.908
Viscosity at 122°F approx. 12° E
Viscosity at 212°F approx. 2.15° E
Flash point (open) approx. 428°F
Low cold test maximum approx. - 4°F
SAE rating SAE 40

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For summer and winter lubrication, we recommend **Triple Shell** meeting the above specifications, which we have tested thoroughly in our own plants and found especially suitable for engine lubrication.

B 4 Mixture proportions — Oil and Petrol

Oil and petrol should be mixed in certain fixed proportions. A mixture sometimes known as "Petrol", in a proportion of 25:1, i. e. 5½ gallons of petrol to 1¾ pints of oil should be used, also for the running-in period. For a normal fill up of 2¼ gallons, an addition of 25 cubic inches is required.

B 9 - G 14

Lubrication of transmission parts and frame

Like the engine, gears, transmission chain, front fork, brake and speedometer drive, must be lubricated periodically in accordance with instructions. Lubrication points, lubricating material and lubricating periods are clearly indicated in the lubricating chart at the end of this section. Details will also be found under paragraphs C 8, C 10, C 12 and C 14.

B 16 Sparking plugs

The most suitable sparking plugs for DKW motor cycles, Type NZ, are Bosch plugs W 225 T 1, or Beru 225/b 16. Plugs with a low sparking value should not be used.

B 17 Tyre pressure

The air pressure in the tyres should be checked at least twice a month. For types NZ 250 and NZ 350 the pressures should be maintained as follows:

<i>Important!</i>	Front wheel	Back wheel	
Soil	17	20 lbs per sq. in.	47
With pillion or side-car	17	27 lbs. per sq. in.	
With pillion and side-car	17	33 lbs per sq. in.	

B 18 Battery

Details concerning the maintenance of the Battery are contained in paragraph C 7.

B 19 Fuses

The fuses for the electrical installation are to be found in the coil box. The main (dynamo) fuse is situated on the underside of the coil box in a screw cap, and the battery fuse is visible when the coil box cover is removed. For further particulars see paragraph E 5.



Lubricating chart for NZ 150 and NZ 150

No.	Lubricating part	Lubricating material	When to lubricate in miles	No. of points.
B 1-B 5	Engine (Tank)	Shell-Auto oil Triple Shell	—	3
B 5	Gear box and clutch	Shell E. P. Spirax Light in winter under 0° C (32° F). In Triple Shell or Shell E. P. Spirax Light	1,800	1
R 6	Front wheel fork	Shell High Pressure Grease	600	2
R 7	Saddle nose	Shell High Pressure Grease	600	1
B 8	Clutch worm	Shell High Pressure Grease	600	1
B 9	Speedometer drive	Shell High Pressure Grease	600	1
B 10	Brake key, front	Shell High Pressure Grease	600	1
B 11	Brake key, rear	Shell High Pressure Grease	600	1
B 12	Foot brake lever	Shell High Pressure Grease	600	1
	Stand	Shell High Pressure Grease	600	1
R 13	Chain	Shell Chain Grease	600	1
B 14	Speedometer spiral	Golden Shell	3,000	1
B 15	Lubricating felt to coast breaker	Shell Ambrolium	3,000	1

We recommend the use of only good quality oils and greases as given above. These have been thoroughly tested in our works and found to be the most suitable for lubricating purposes.



C) Care and maintenance

You will find in this section all you require to know about the necessary care and maintenance work which you yourself will be able to carry out without special expert knowledge. Many owners will take a personal pride and pleasure in looking after their machines or willingly undertake the work to save time and money. But whether you do the work yourself or not, it is essential that it should be carried out. We cannot too strongly emphasize the fact that the reliable running and value of your machine depends to a large extent upon the work of care and maintenance. There is also, of course, certain work, particularly after the machine has been in use for a certain length of time, which can only be carried out in recognised DKW workshops by experienced mechanics. The eye and ear of a DKW expert sees and hears more than the ordinary rider. When your machine has completed, at the outside, 6,000 miles, you should take it to a DKW workshop to be overhauled. You will receive willing advice as to any work necessary.

C1 Petrol Filter

The gauze filter to the petrol tap must be cleaned after every 1,800 miles. In the case of



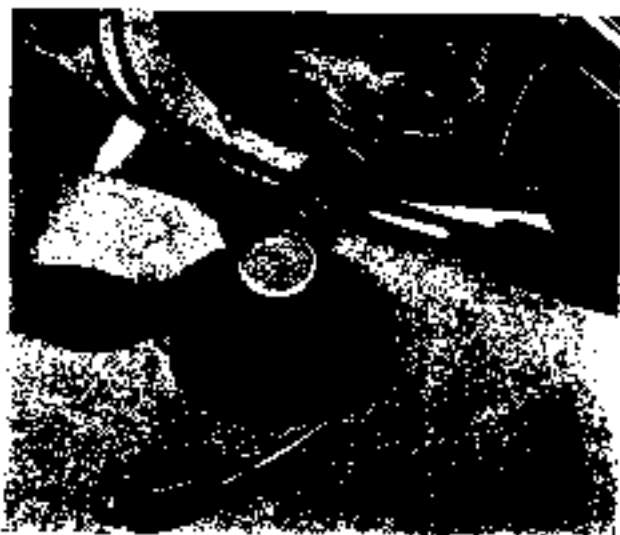


Fig. 23. Cleaning the Air Filter.

- 1 - Wash filter with petrol
- 2 - Take oil.

the NZ 350, remove the guard cap with a 17 mm key and unscrew the nut holding the filter in position (See Fig. 2). Wash the filter gauze thoroughly with petrol and replace, taking care to see that all parts are screwed firmly in position. In the case of the NZ 250, the petrol feed pipe should be detached from the petrol tap; it can be unscrewed from the tank and the filter washed out. The machine should be tilted over to the right to prevent the petrol in the tank from running out.

G2 Air filter

The carburettor air filter must be cleaned after every 1,200 miles. It is removed by unscrewing the retaining screw with a screw driver and withdrawing the filter to the rear. It should then be thoroughly washed with petrol and dipped in a bath of lubricating oil which is not too thick; then allow it to drain well. A dirty air filter causes the engine to run irregularly, and give off fumes; it also increases the fuel consumption.

Do not attempt to ride without an air filter.

G3 Sparking plug

The sparking plug should be examined after every 1,800 miles and the spark gap between



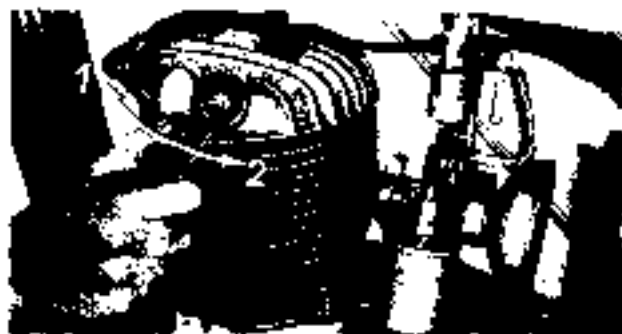


Fig. 24 Unscrewing the sparking plug.

- 1 = To screw in the sparking plug
2 = To unscrew the sparking plug

the electrodes checked. This should be 0.023 in. or approximately the thickness of 3 postcards laid one on top of the other. If the gap is too big, the two outer electrodes should be carefully pressed together until the right clearance has been set. The centre electrode must not be bent. The sparking plug should always be firmly screwed in position. A packing ring must always be fixed under the plug. The plug should be replaced by a new one of equal sparking value after every 6,200 miles. The irregular

working of the engine may be due to a faulty plug. The section "Practical Hints" will tell you what to look for.

C4 Decarbonising the Engine

With every internal combustion engine, the formation of carbon deposits of combustion residue from oil and petrol in the combustion chamber, the gas channels and the exhaust box (silencer) must be contended with. After about six months of normal running the machine should be taken to one of our recognised workshops and examined and cleaned (decarbonised) if necessary.

Deposits may be considerably reduced if the following points are observed:

1. Do not drive too slow when in top gear;
2. Always use the same kind of fuel and lubricating oil.
3. Carry out all maintenance work recommended in this manual.

C5 Cleaning the exhaust box (silencer)

Cleaning presents no difficulty as the exhaust box can be taken apart if the machine is extensively used for town work, the exhaust box should be examined every two months, as deposits





Fig. 25. Cleaning the Exhaust Box (Silencer) Leistritz Type.

➔ — Remove end section and withdraw silencer.



Fig. 26. Cleaning the Exhaust Box (Silencer) Eberspächle Type.

➔ — Withdraw end section together with silencer in the case.



are liable to accumulate quickly. No adjustments should be made to the inside of the exhaust chamber otherwise the working of the engine may be adversely affected.

C6 Ignition and Lighting Installation

The cable laid alongside the frame of the machine should be examined from time to time as to its condition. If it has got out of position there is a possibility of its becoming bent or damaged and causing a short circuit. Slightly damaged cables may be repaired with insulating tape; badly damaged cables must be replaced. The maintenance of the lighting installation is a matter for our DKW workshops and DKW electrical Service Stations.

The periodical inspection and control of the contact breaker, the stroke action, the tension of the damper spring, the condition of the lever bearings and the lubrication of the contact breaker cam should not be neglected. This is the matter of a few moments but is very essential to the efficient running of your machine. Under no circumstances should the ignition timing be readjusted by the owner himself. The adjustment made at the works has been found, after long tests, to be the best. The adjustment of the ignition timing need only be



Fig. 27. The battery uncovered.

→ = Correct acid level (1 cm (1 1/2") above the plates)

72

82

90



checked from time to time and then only by means of the special apparatus to be found only at our DKW service workshops. The section "Practical Hints" will tell you what to do in the event of a breakdown on the road.

C7 Battery

Regular attention to the battery is essential for the perfect functioning of the ignition and lighting system. When new, it must be taken to a service station and charged slowly at least twice. Later, it should be topped twice a month with distilled water. If this is neglected and the top plates are allowed to become uncovered, the performance will be impaired and the battery suffer. The acid solution should be tested at least twice a year. The cable connections should be examined occasionally to see that they are in position and a little vaseline applied to keep them from becoming dry and cracking.

C8 Clutch and gear box

The clutch runs in an oil bath. The lubricating material is fed through the filling opening on the left side of the gear box casing and simultaneously serves the power transmis-

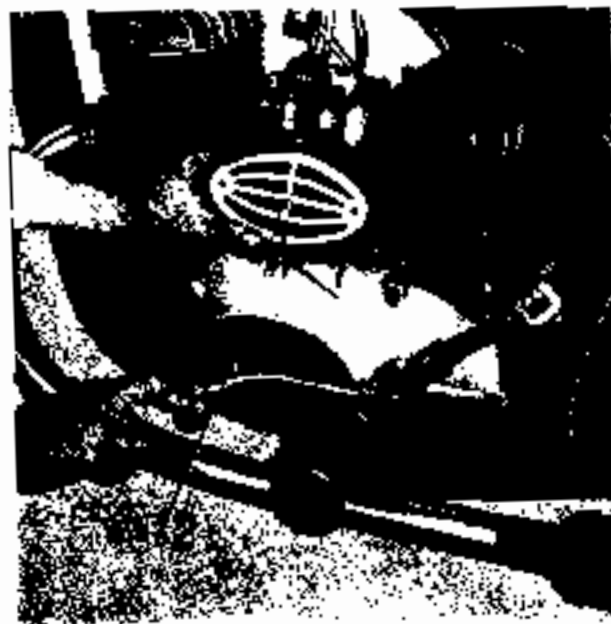


Fig. 28. Filling up with gear oil.

1 = Oil level indicator

2 = Filling opening for gear oil



sion, clutch and gears. The lubricant recommended is Shell-Getriebeöl HDL (in Winter - unter 0° - ½ Shell „E. P. Spirax Light“ + ½ Shell Auto Oil „Single Shell“.

The use of any other lubricant is liable to result in a sticking, slipping or breakdown of the clutch. A complete fill is 1,76 pints (1 litre). At the outset the lubricating oil should be changed after 1,800 miles; later, every 6,000 miles. The oil is drained out by removing the screw which will be found underneath the casing; it should be run off when warm and the gears washed with „Shell Flushing Oil“. Fresh gear oil can then be run in with the engine running slowly until the top level shown on the indicator is reached (see Fig. 28).

C9 Adjustment of Clutch

The adjustment of the clutch is simple and can be made without the aid of tools. If the amount of play in the clutch hand lever is greater than that given under paragraph A 8 (about $\frac{1}{16}$ "), resulting in the clutch not fully disengaging, this can be immediately remedied by giving the adjusting cap, shown in Fig. 29, a turn of about one revolution to the right. If the clutch slips, thus indicating that the adjustment is too fine, turn the nut to the left.



Fig. 29. Adjusting the Clutch.

➔ - To reduce the clutch play turn to the right.

C10 Lubricating the driving chain

The chain should be greased with Shell-Kettenfett every 600 miles by being laid in warmed liquid chain grease. It should first be washed in paraffin oil. After being dipped in chain grease it should be allowed to drain well before being replaced.

C11 Care of the driving chain

The chain should neither be too tight nor too loose. In either case the chain and tooth crown





Fig 30 Checking the chain tension.

wheels will be overstrained and the performance of your machine be adversely affected. The tension is correct if the chain can be moved about $\frac{1}{4}$ " midway between the two crown wheels. When the machine has been running for a longer period, it will be found that the chain has become stretched, but this can be compensated by setting back the rear wheel. For this purpose the two axle nuts securing the back wheel should be loosened as well as the counter-nut of the adjusting screw; the necessary adjustment to the back wheel can then be made by operating the adjusting screw. The



Fig 31 Adjusting the chain.

- 1 = Loosen the axle nut
- 2 = Loosen the locking nut
- 3 = To lighten chain turn to right
- 3a = To loosen chain turn to left.



number of turns given to the nut should be counted, as a corresponding adjustment must be made on the other side and the same number of turns must be given to avoid irregular adjustment which would result in the wheel not running true and unnecessary wear of the tyre. A test as to whether the chain is running true can be made by standing the machine upright and then from a distance of about 2 yards behind the back wheel, taking a sight over the rear crown wheel to the front crown wheel. The chain should then run exactly parallel along the line of sight over the two crown wheels. Sooner or later, according to the work the machine has been called upon to do, the chain will begin to show signs of wear and a new driving chain will become necessary. If the chain can be lifted two-thirds of the height of a tooth on the rear crown wheel it is time to have a new chain.

C12 Care of Cycle

The regular lubrication of the cycle is absolutely essential. It is the cheapest way of keeping down the running costs. The lubricating points of the front fork and on other parts of the frame are shown on the lubricating chart. As the various lubricating points on the motor-

cycle are everywhere easily accessible, the work can be carried out by the owner. It scarcely takes ten minutes to thoroughly lubricate the machine. A grease gun is included among the tools supplied.

To fill the grease gun

1. Remove cover.
2. Remove protection cap.
3. Withdraw piston by means of chain.
4. Fill the gun with the prescribed light pressure grease leaving sufficient room for the piston. Shake the gun vigorously with the nozzle pointing downwards in order to expell all air and allow the grease to settle.
5. Replace piston by pressing firmly.
6. Replace cover.

In the event of a foreign body having entered the gun and preventing the return valve in the pressure cylinder from functioning, it should be removed by unscrewing the nozzle and lifting out the valve spring and ball.

C13 Brakes

The adjustment of the front and rear wheel brakes can be made in a minute by hand by



Fig. 32. Adjusting the front wheel brake.

→ = To adjust brake turn to left



Fig. 43. Adjusting the back wheel brake.

→ = To adjust brake work out to right.



means of wing nuts. The regular greasing of the foot brake lever and the brake key connections to both wheels is absolutely essential for the reliable operation of the brakes. After completing about 3,000 miles, the machine should be taken to a DKW service station for the brake drum to be opened and cleaned and the release springs and bearings lightly greased with "Shell High Pressure Grease".

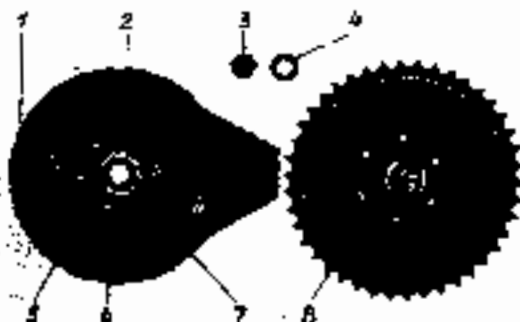


Fig. 34. View of Brake drum opened.

1 = Brake key connection. 2 = Brake pin-rod. 3 = Right hand side nut.
4 = Washer. 5 = Brake shoe. 6 = Release springs. 7 = Brake rim.
8 = Brake drum with tooth crown wheel.



C14 Fork joint, Wheel and steering bearings

The amount of play in the wheel and steering bearings is important in connection with the machine's road holding qualities and its reliability. The bearings should therefore be inspected every six months at a DRW Service Station and renewed whenever necessary.

C15 Rear wheel shock absorber

A shock absorber is mounted in the back wheel to take hard jolts imparted by the power transmission. Shock lugs on the brake drum

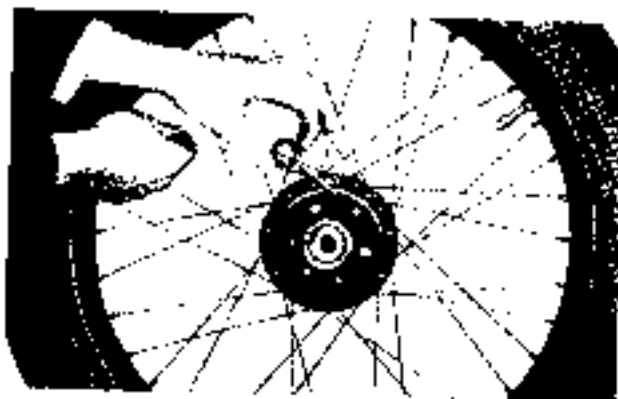


Fig. 35. Changing a sprocket wheel shock absorber.



are mounted on rubber rings and should be renewed after every 5—6,000 miles. They can be removed and replaced without difficulty.

C16 Bowden connections and control levers

The Bowden connections should be examined after every 3,000 miles to see that they have no sharp bends or have not come out of their seatings or are otherwise damaged. They are also liable in time to fray at the ends. It is better to renew them in good time than to risk a breakdown on the road. All Bowden connections should be slightly greased at points where they join with control levers.

C17 Tyres

The regular control of air pressure and of the condition of the tyres is important not only for the life of the tyres but also for the running of the motor cycle. Damage to surface of tyres can either be repaired with cold vulcanised filling solution, or (if the damage is extensive) by being sent to a good vulcanising workshop for repair. Uneven treads (bumps or depressions) should be repaired by an expert if further damage to tyres is to be avoided.



CM Cleaning

It is recommended that the motor-cycle should be washed down thoroughly with luke warm water at least twice a month, and then rubbed immediately with a soft cloth. It should then be sprayed with DKW-Nebelwäsche and given a final polish.

Side Cars

If a machine is to be ridden with a side car it will be necessary to install a smaller driving pinion in the gear box having two teeth less.

As the comfort of a side-car depends upon it being perfectly fitted, the work should be entrusted to an accredited DKW workshop.

Racing machines

If a machine is required for taking part in sporting competitions, a special racing type, constructed by us from the practical experience gained in such events over a number of years, can be delivered.



Customers' Servicing Stations

You are invited to apply to any of the recognised DKW agents if you have difficulties in regard to repairs or any other questions in connection with your DKW machine. Our agents are in constant touch with us; they are experienced, have at their disposal mechanics who have been trained in our works schools, have special tools and testing instruments and use only original DKW spare parts. You can always rely upon quick and expert attention to all your requirements.



Technical Enquiries

Written enquiries should also be addressed to our recognised agents. In order to save time and ensure personal attention, the following details should be given:

1. Type of machine.
2. Frame and engine number.
3. Purchase date.
4. Total mileage completed.
5. Adjustment of carburetter used.
6. Condition and adjustment of ignition.
7. Fuel used (Brand-Petrol or mixture).
8. Lubricating material used (brand and quality).
9. "Petrol" admixture (proportions).
10. Sparking plug-type and make.
11. Description of face of plug.
12. Date when engine last cleaned.
13. Nature of road used (town or country).
14. Load (No's. pillion, or with side car).
15. Method of riding.
16. Business.
17. Mechanical condition of engine.
18. Condition of machine. Wheel bearings, brakes, clutch.
19. Exact fuel consumption.
20. Transmission: Gear Pinion.



C) Care and maintenance

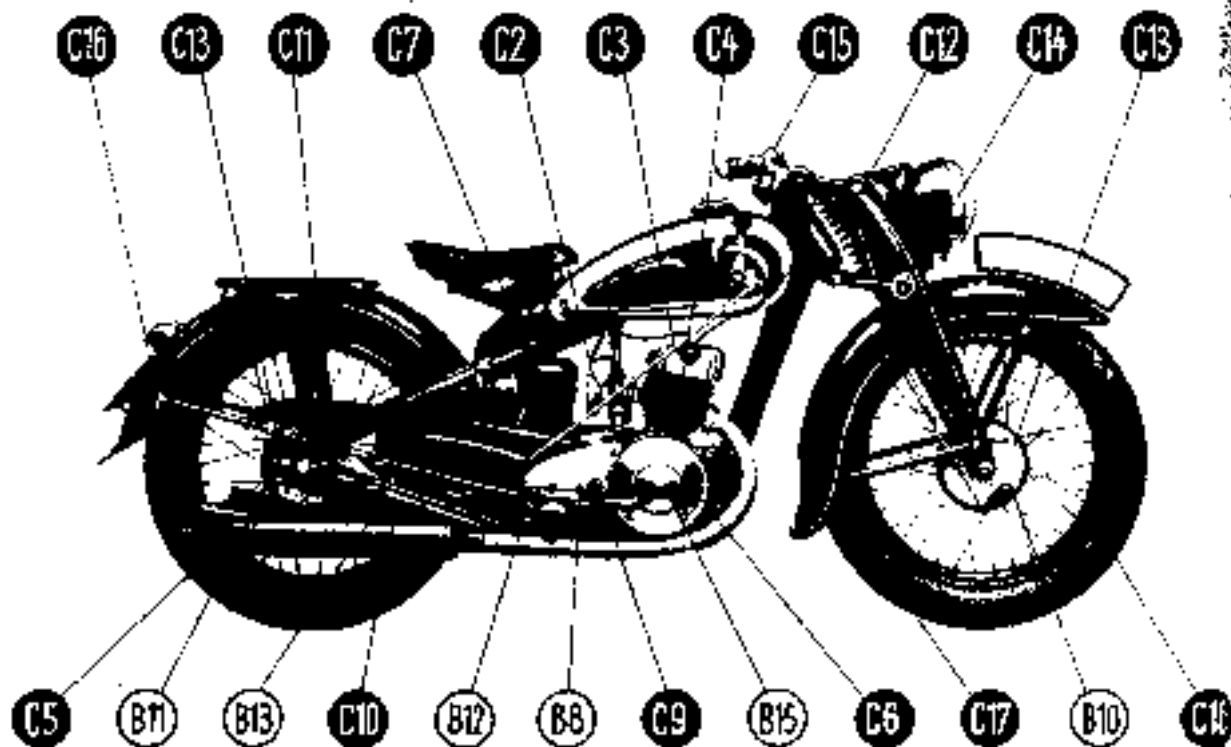


Fig. 30. Side View.

What must I do!

Attention necessary after	600 miles	1200 miles	1800 miles	2400 miles	3000 miles	6000 Miles	For details refer to
Front fork lubricate	○	○	○	○	○	○	Lubrication chart
Front, lubricate	○	○	○	○	○	○	Lubrication chart
Chain, grease	○	○	○	○	○	○	Lubrication chart
Clutch, adjust: lubricate	○	○	○	○	○	○	Lubrication chart
Speedometer, connect	○	○	○	○	○	○	Lubrication chart
Brake lever front	○	○	○	○	○	○	Lubrication chart
rear	○	○	○	○	○	○	Lubrication chart
Handle nuts	○	○	○	○	○	○	Lubrication chart
Front brake lever stand	○	○	○	○	○	○	Lubrication chart
Tyre pressure check	○	○	○	○	○	○	Page 49 and 51
Spark plug — examine/electrode	—	○	—	○	—	○	Page 41
Pistol filter, clean	—	—	○	—	—	—	Page 41
Air filter, clean	—	○	—	○	—	—	Page 45
Clutch, adjust	—	—	○	—	—	—	Page 53
Blowers — test	—	—	○	—	—	—	Page 51
Caliper, examine	—	—	—	—	○	○	Page 51
Brackets, connect examine	—	—	—	—	○	○	Page 57
Speedometer, connections, grease	—	—	—	—	○	○	Lubrication chart
Spark plug — examine	—	—	—	—	—	○	Page 59
Gear box — examine grease	—	—	—	—	—	○	Lubrication chart and page 55
Contact breaker: lubricating oil grease	—	—	—	—	○	○	Lubrication chart



D) The carburetter

DI Important points

On DKW motor-cycles of the NZ Type, needle jet carburetters of the three makes, Amal, Graetzin or Bing, are used. These are similar as regards construction, operation and attention required. Details as to the operation of the carburetter will be found in Section A. The attention required is mainly confined to cleaning at lengthy intervals. Cleaning is simple, but the carburetter must be taken to pieces for the purpose. It must be carefully reassembled after cleaning.

The proper working of the carburetter may be affected by mechanical defects such as dirty leads, air leaks at suction joint, carburetter not mounted correctly (crooked), loose ring nut to mixing chamber, loose jet housing, valve needle not in its proper seating, defective float, defective packing rings, gas slide valve out of position and dirty air filter. It is therefore necessary to take great care in reassembling, as any of the foregoing points will lead to the failure of the carburetter sooner or later. It is advisable to have the work done at a DKW service station. It is desirable to have the carburetter controlled twice a year. Your attention

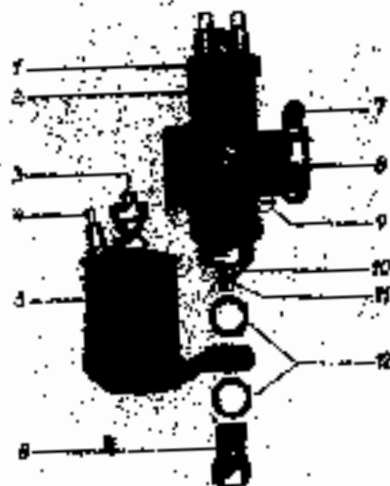


Fig. 37. Component parts of the Amal Carburetter.

- 1 = Screw-on cover. 2 = Mixing chamber. 3 = Petrol supply feed.
4 = Tickle. 5 = Float chamber. 6 = Screw cap. 7 = Clamp screw.
8 = Jet ring. 9 = Slide valve stop screw. 10 = Jet housing.
11 = Main jet. 12 = Packing rings.



is drawn to the fact that it has now been found possible to introduce a standard adjustment for the carburetter which produces the best results under almost any condition, both as regards consumption and performance. You should, therefore, not attempt to make "special adjustments" of your own as these can seldom be satisfactory. As a result of experience we have limited the adjustment margin to the main jet to one stage either way. A larger margin of



Fig. 38. Gas and air slide as well as float needle of Amal Carburetter.

- 1 - Clamp spring 2 - Position 3 - Float needle
4 - Gas slide valve 5 - Air slide valve

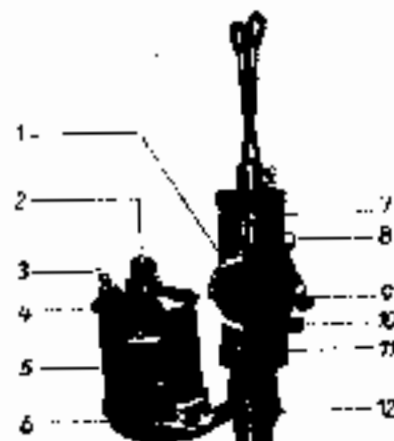


Fig. 39. Section of Amal Carburetter

- 1 - Gas slide valve 2 - Detail supply feed 3 - Tickler 4 - Float needle 5 - Float 6 - Float chamber 7 - Mixing chamber 8 - Clamp screw 9 - Throttle check valve 10 - Idling adjustment screw 11 - Float needle 12 - Main jet



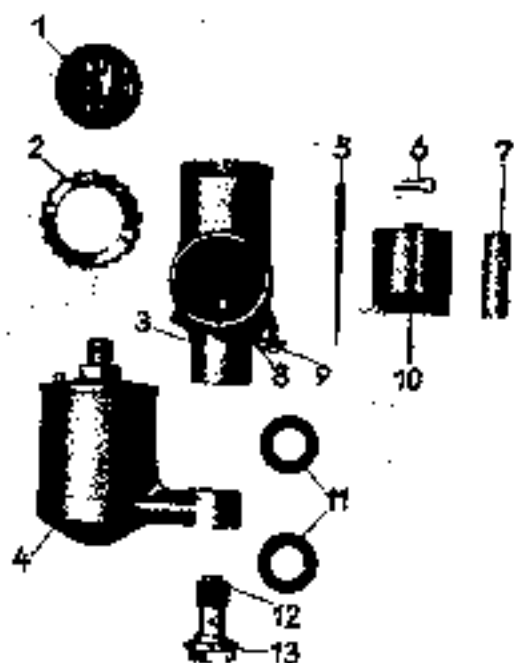


Fig 40 Components of Bing Carburettor.

1 = Mixing chamber head 2 = Fuel chamber 3 = Jet 4 = Fuel chamber 5 = Jet needle 6 = Fuel needle 7 = Fuel needle 8 = Fuel needle 9 = Fuel chamber 10 = Jet 11 = Throttle valve 12 = Needle jet 13 = Jet carrier

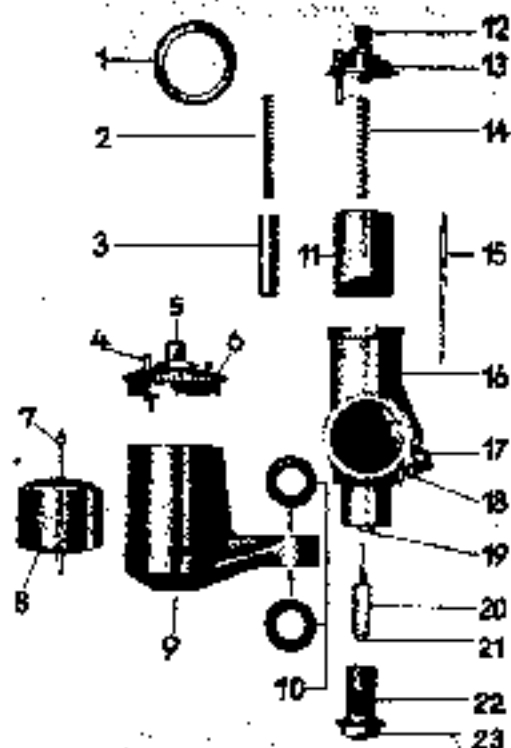


Fig 41. Components of Graetz Carburettor.

1 = Fuel chamber head 2 = Fuel chamber 3 = Jet 4 = Fuel chamber 5 = Fuel needle 6 = Fuel needle 7 = Fuel needle 8 = Fuel needle 9 = Fuel chamber 10 = Jet 11 = Throttle valve 12 = Needle jet 13 = Jet carrier 14 = Fuel needle 15 = Fuel needle 16 = Fuel needle 17 = Fuel needle 18 = Fuel needle 19 = Fuel needle 20 = Fuel needle 21 = Fuel needle 22 = Fuel needle 23 = Fuel needle



adjustment is unnecessary and would only result in breakdowns. Should you not be satisfied with the working of the jet, i. e. if it functions listlessly or tends to spill back in the carburettor, you should immediately seek the advice of a DKW workshop.

D 2 How to clean the main jet

1. Turn off the petrol tap.
2. Using a screw driver, release the air filter fastening and remove the air filter by withdrawing it to the rear.
3. Using a 14 mm spanner, loosen the screw and disconnect the fuel feed from the float chamber.
4. Loosen the nut on the carburettor flange with a screw driver, or 9 mm spanner.
5. Give the carburettor a slight turn to the side and, using a 17 mm Amal, 14 mm Graetzin or 19 mm Bing spanner (as the case may be) unscrew the nut connecting the mixing and float chambers.
6. Care should be taken not to damage or lose the two packing rings.



7. The main jet can now be removed with a 6,5 mm spanner in the case of an Amal, or an 8 mm spanner in the case of Bing and Graetzin carburettors.

8. The main jet should be cleaned by blowing air through it, not, however, by using a wire or other sharp object. Under no circumstance should an attempt be made to increase the size of the jet bore. Every jet bears the maker's name and it is advisable always to use original spare parts.

9. In the case of an Amal carburettor, it is also recommended that the jet housing be cleaned at the same time by forcing air through with the tyre pump.

10. The jet can now be replaced in its housing and the float chamber screwed on. Do not forget the two packing rings.



E] Electrical equipment

E 1 Lighting system

The lighting equipment consists of a 12 pole direct current dynamo. The armature is of the bell design and also acts as a flywheel. A special device must be employed to remove the armature from its seating. The pole system is mounted on an aluminium base plate which is screwed to the engine casing. The pole system consists of two star shaped magnets between which the magnet coil is housed.

The main cable connection (white cable = 1; black cable = 20) is also attached to the base plate. These two cables should not be confused, otherwise the correct functioning of the lighting set will be impaired and the regulator destroyed.

The lighting installation on all NZ motor-cycles can take a total full load of 75 watts; the nominal tension is 6 volts.

The lighting set is protected by a light metal cover secured with two screws to the base plate.

E 2 Contact Breaker

The contact breaker is mounted on a U-shaped bridge and is attached to two fittings on the

aluminium base plate. The contact breaker is centred in this bridge and the fixing screws pass through two slots, so that the position of the contact breaker can be adjusted within certain limits. The gap on the contact breaker should not exceed 0,02". The cam which operates the contact breaker is connected to a centrifugal governor which prevents back firing when the engine is started up.

E 3 Ignition adjustment

The performance and wear and tear of the engine depend to a large extent upon the correct adjustment of the ignition timing. The adjustment must be made to the fraction of a millimeter and for this purpose a suitable device is necessary and should be used in conjunction with the adjustment indicator installed above the contact breaker. It is absolutely useless to attempt to obtain better results by means of advanced ignition; the experience of the makers should be relied upon. As precision in the ignition timing, viz-

Type NZ 250 4,5 mm (0.177") from upper dead centre with centrifugal weights in their controlling position;



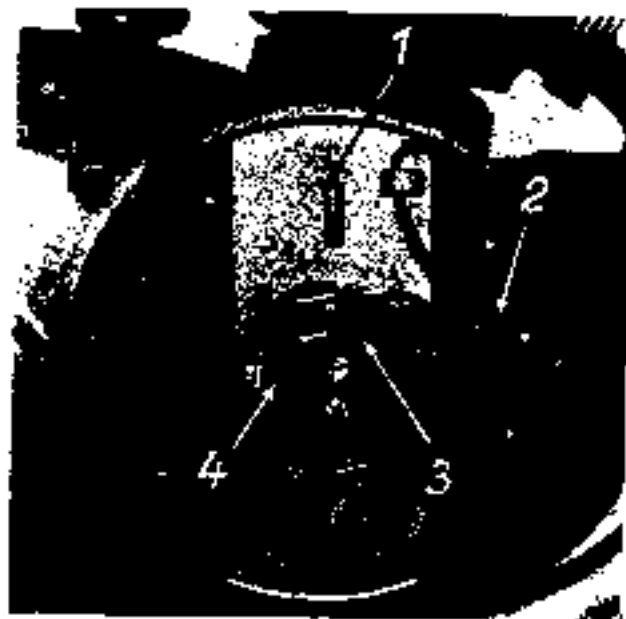


Fig. 13. Contact Breaker.

- 1 = Adjustment gauge 2 = Contacts.
3 = Lubricating felt 4 = Contacts.

Type NZ 350 6,5 mm (0,256"), from upper dead centre with centrifugal weights in their controlling position;

Depends upon the perfect working condition of the contact-breaker, centrifugal governor device and the condenser, it is advisable to have the adjustment tested twice a year at a recognised DKW workshop, or at a DKW electrical Service Station.

E4 Coil Box

The coil box is installed on the side of the battery. It houses the following:

1. right: voltage regulator;
2. left: cut-out armature;
3. ignition coil;
4. battery fuse;
5. dynamo fuse;
6. the connection clip

The coil box always must be kept clean. This applies to all connections and particularly to the earth connections and is absolutely essential for the reliable working of the set. The presence of dirt in the coil box will at once lead to a defect.



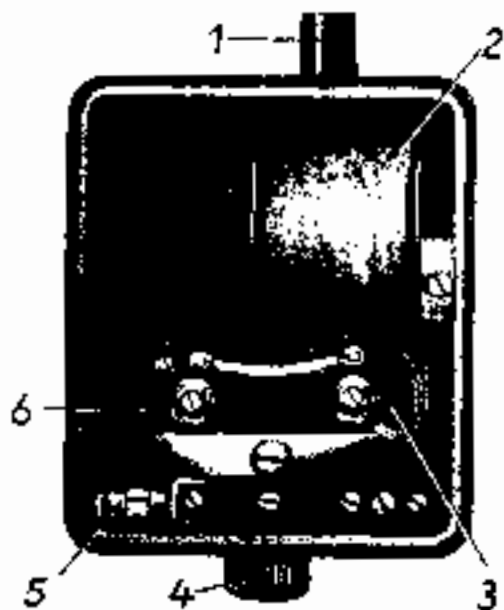


Fig. 44. Coil Box.

1 = Ignition cable connection. 2 = Ignition coil. 3 = Regulator.
4 = Dynamo fuse. 5 = Battery fuse. 6 = Cut-out switch.

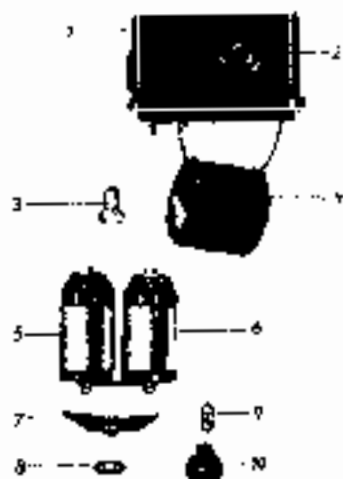


Fig. 45. Component parts of the Coil Box.

1 = Coil box (seen from above). 2 = Ignition cable connection.
3 = Pilot Light. 4 = Ignition coil. 5 = Switch. 6 = Regulator.
7 = Contact spring. 8 = Dynamo fuse. 9 = Battery fuse.
IN A Plug



E 5 Fuses

Two 40 Amp. fuses are installed. The battery fuse is to be found below the cut-out switch; the dynamo fuse is to be found under the coil box and is screwed on with an insulated cap. Care should be taken to see that the fuses are always securely in position, as a loose fuse gives a bad contact and results in an overheating of the adjoining parts. The spring will become soft and the soldered parts on the fuse become disconnected without it being possible to see from the outside that there is a break at the contact.

E 6 Head Lamp

The head light comprises a 25/35 watt, 6 volts Bilux Lamp and a parking light of 3 watts and 6 volts. The rear light is also 3 watts and 6 volts. The correct mounting of the head lamp so as to give the maximum lighting effect is important. A simple test is to place the motorcycle on a level surface with the head lamp 16 feet distant from a white wall. The centre of the reflection on the wall should then be 1" below a line taken from the centre of the head lamp. The rear light shows signal red.



E 7 Electric Horn

The strength of the signal horn should be tested from time to time. The tone can change through the loosening of the horn itself or of the membrane adjusting screw. It is in the rider's own interest to have a properly tuned horn. The adjustment of the membrane requires experience and should therefore be left to a DKW workshop to carry out.



F) Practical advice

F 1 The engine fails to start-up

1. Upon depressing the tickler, petrol fails to flow:
 - a) petrol tank is empty,
 - b) petrol not turned on, or
 - c) if tap is in position A and there is only a small supply of petrol in the bottom of the main tank, switch over to R (reserve supply),
 - d) filter gauze to petrol tap is dirty and is stopping flow of petrol.
 - e) air vent in tank cover is blocked with dirt.
2. Petrol flows after operating tickler, but engine still refuses to start-up:
 - a) dirty jet,
 - b) twist grip and air control lever not set in accordance with instructions (warm or cold engine),
 - c) ignition not switched on.
3. The ignition is switched on but the charging control lamp signal does not burn:
 - a) defective signal lamp,

- b) battery fuse blown,
- c) battery empty or not fully charged,
- d) bad contact in coil box,
- e) broken or damaged cable.

4. Signal lamp burns, but sparking plug does not spark (Simple test: disconnect cable from plug and hold it by rubber insulation about 3 mm from the plug, operating kickstarter at the same time):
 - a) contact breaker rocker arm does not lift,
 - b) rocker arm seating over-oiled or burnt out,
 - c) rocker arm sticks,
 - d) bad ignition coil contact,
 - e) defective ignition coil,
 - f) condenser burnt,
 - g) bad cable connection in coil box.
5. Ignition sparks on plug:
 - a) gap between plug electrodes incorrect (correct gap 0,024"),
 - b) plug oily, old or unsuitable,
 - c) engine has choked ("drowned") through too frequent flooding of float chamber or continuous operation of kickstarter. In this case remove plug and turn en-



gine over several times by means of kick-starter until cylinder has been "aired".

d) too much oil in mixture.

C. Battery weak:

a) incorrect acid solution (electrolyte),

b) plates not covered with solution (top with distilled water),

c) plates damaged,

d) loose, or oxidised connections,

e) short circuit somewhere in connections, mechanical defect in lighting set, dirty commutator, brushes do not connect, bad earth connections from battery, coils or lighting set,

f) main cables, 1 or 20, defective,

g) defective regulator,

h) cut-out switch defective,

i) make-shift or wrong fuse.

I 2 The Engine does not run smoothly

I. Four-stroking

a) jet too large,

b) incorrect jet needle adjustment,

c) defective float needle or float,

d) too much oil in "petrol" mixture,

e) ignition too far advanced,

f) accumulation of carbon deposits in engine or exhaust box,

g) dirty air filter,

h) mechanical adjustments to exhaust box

II. Spitting back in the carburetter:

a) jet too small,

b) incorrect jet needle adjustment,

c) dirty petrol filter impeding flow of fuel,

d) dirty carburetter,

e) carburetter improperly mounted (cracked),

f) carburetter loose,

g) ring nut on mixture chamber loose,

h) defective packing on engine,

i) retarded ignition adjustment,

k) old or loose plugs, incorrect gap adjustment to electrodes,

l) low sparking value of plugs,

m) too high sparking value of plugs,

n) riding without air filter,

o) defective condenser,

p) contact breaker rocker arm sticks,



- h) plug in case or old, packing ring not replaced,
- i) defective packing of engine.

F 4 The engine stops suddenly

- a) empty petrol tank,
- b) petrol tap not switched over to reserve supply (R),
- c) jet blocked,
- d) ignition cable to coil disconnected or loose,
- e) insulation to sparking plug broken,
- f) main fuse blown,
- g) contact breaker rocker arm broken or other defect to make-and-break parts,
- h) broken or loose main cable of battery,
- i) burnt condenser

F 5 A few words on Fuel Consumption

As in the case of all motor-vehicles, fuel consumption figures are based upon an average speed of 30 1/2 miles per hour on a level road and for an uninterrupted journey. Under other conditions the consumption is naturally increased.

If, under normal running conditions, the consumption is higher than it should be, the following points should be checked:

- a. Adjustment of carburetter, its correct functioning, uninterrupted feed, cleanliness of air filter
- b) Suitability of kind of fuel used, which is of the utmost importance; in this connection the advice given in this manual should be followed.
- c) Correct adjustment of ignition and perfect condition of all mechanical parts connected therewith.
- d) Are the controls (thrust-grips, air control lever and clutch) being correctly operated? If not, the consumption will be increased!
- e) The cleanliness and packing of the engine.

F 6 The charging control light does not switch off after starting-up

- a) cut-out switch defective or bad earthing connections,
- b) loose contacts, interrupted battery contacts,
- c) dynamo fuse blown,
- d) defective regulator,



- e) defective lighting battery resulting from dirty commutator, or short circuit in excited winding.

F 7 Main fuse blows

- a) defective regulator, too high regulation,
b) bad earth connection on coil box,
c) short circuit in cables,
d) cable connections 1 and 20 to lighting battery wrongly connected up.

F 8 The head lamp does not burn

- a) faulty cable connection to lamp,
b) fuse blown,
c) loose fittings inside lamp,
d) loose or defective bulbs,
e) defective battery.



Precautions against theft:

In addition to precaution against theft by removing the ignition key, the NZ types are equipped with an additional measure of security. A lock is installed on the steering column of the handle bars to take a safety locking device which can be obtained from our Spare Parts Department.

Method of Use:

A) To lock the wheel and secure machine against theft.

- 1) Turn handle bars to left
- 2) Slide the metal disc cover protecting the lock to one side
- 3) Insert the locking device attached to the key into the lock until the brass part disappears into screw and raised pin on the brass device should be in lock
- 4) Turn key to turn to right and withdraw. (The brass locking device will remain in the lock)

B) To unlock wheel.

Insert key, gear to turn to left and withdraw. The locking device will become attached to the key and can be carried on a key ring as part of the key. The lock cover should be kept closed to prevent the lock from dust and water.

C) Other tips.

- 1) Take a note of the number of your key
- 2) Keep a spare key in your pocket or purse.
- 3) Do not oil a DEW safety key
- 4) Wash a dirty lock out with petrol (particularly the screw groove) as a spare key may be obtained by giving the number of your key.



DKW-spare parts

You should always use DKW spare parts for a DKW motor cycle. These can be purchased at reasonable prices from DKW dealers. If for any reason you are unable to obtain what you require please communicate with our DKW special Spare Parts Department which will be only too glad to give you advice.

DKW spare parts are reliable and low-priced.

We recommend

DKW-Polish

for polishing all enamel parts. It cleans and preserves the surface and is economical in use. Original tins supplied in

½ litre Order No. 0830

1 litre Order No. 0318

Motor cycle driving chains of all the best makes are stocked. We invite your inquiries.

Luggage carriers can be supplied in various designs. We recommend underlays in felt or rubber to protect your luggage. Prices on application.



Pillion Seats with rubber or imitation leather covers. Adjustable foot rests can be adapted to any luggage carrier. A number of different types stocked. Inquiries invited.

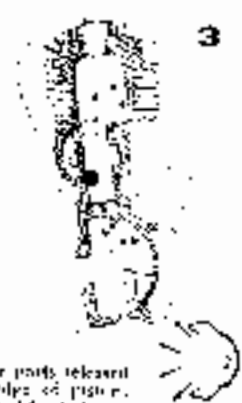




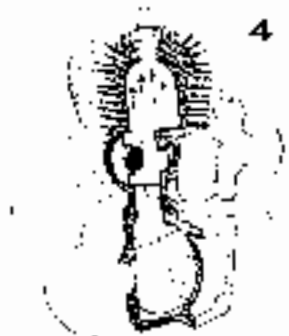
1 Induction of charge in crank case. Movement of the piston from bottom dead centre to top.



2 Pre-compression of fresh charge in crank case. Movement of piston downwards to bottom dead centre.



3 The fresh air ports released by upper edge of piston. Lower edge of piston charge to combustion chamber.



4 Compression of mixture in combustion chamber. Piston moved up.



5 Ignition starts before top dead centre is reached; combustion and expansion of gases resulting in power, and descent of piston.



6 Release of exhaust ports by piston before the opening of the exhaust ports. Escape of burnt charge through exhaust pipe.

Fig. 10. Cycle of action of DKW-two-stroke engine with inverted scavenging.

Working of the DKW-two-stroke engine with inverted scavenging

The piston operates from the bottom upwards, thereby creating a partial vacuum in the crank case; as the inlet port opens and communicates with the supply of petrol-gas and air, a charge rushes in to fill the vacuum. When the piston descends the mixture is placed under compression in the crank case at a pressure of about 5.7 $\frac{\text{lb.}}{\text{sq. in.}}$. The pre-compressed fuel mixture then enters the combustion chamber through two lateral transfer ports, being deflected backwards to the rear cylinder wall by the oblique arrangement of the ports. The two currents of combustion mixture meet at the rear of the combustion chamber and rise upwards forcing the spent gas before them and arrive scavenging in the upper part of the combustion chamber. The piston then rises and again compresses the fresh charge in the cylinder head. Shortly before the piston reaches the top of its stroke (top lead centre) ignition takes place from the sparking of the plug and combustion is started. By the time the piston has passed top dead centre, the charge is completely burnt and the piston is forced on its downward stroke. The exhaust ports first become uncovered by the

piston and the burnt gases pass out through the exhaust pipes. The transfer ports again open and the cycle of action already described is repeated. It will be seen that the working of a two-stroke engine is in principle the same as that of a four-stroke engine except that the four phases of operation (induction of fresh gas, compression, combustion and expulsion of burnt gases) are reduced to two phases by operations taking place simultaneously both above and below the piston. The two phases, or strokes, may be therefore summarised as follows:

1st Stroke:

Below the piston: Induction of charge in the crank case.
Above the piston: Compression and ignition of the fuel mixture.

2nd Stroke:

Below the piston: Pre-compression of the fresh charge in the crank case.
Above the piston: Combustion of the fuel mixture (power stroke), expulsion of burnt gases and transfer of fresh fuel mixture.

