

Fig. 21. Dynamo-Coil-Ignition-Unit B 245, distributor disc removed

- | | | |
|---|-------------------------|-----------------------------------|
| 103 a = Distributor disc holding spring | 108 c = Pull off spring | 113 b = Pointed screw |
| 107 a = Adjustable contact | 109 a = Timing lever | 113 e = Carbon brush |
| 107 b = Breaker lever contact | 112 = Distributor rotor | 133 a = Contact breaker cam |
| 107 c = Contact breaker lever | 112 a = Electrode | 139 b = Contact locking screw |
| 107 d = Insulating block in contact breaker lever | 113 = Distributor disc | 139 c = Eccentric adjusting screw |
| | 113 a = Distributor | 217 = Regulator cover |

Cable connections

Connect the vertical high-tension terminal marked "1" on the distributor to the sparking plug of the cylinder which has been used for timing; the other vertical H.T. terminal should be connected to the sparking plug of the other cylinder. Run a cable from the (horizontal) terminal 4 of the distributor disc

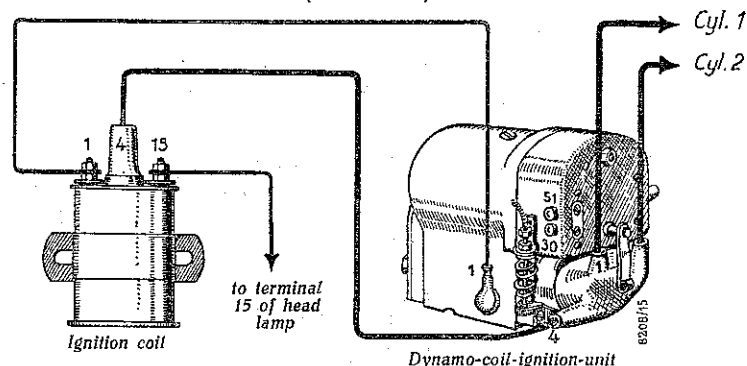
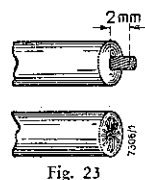


Fig. 22. Wiring diagram for dynamo-coil-ignition unit B 245
(all other cable connections as on wiring diagram page 23)



to terminal 4 (high-tension terminal) of the ignition coil. The cables are secured to the distributor head by means of pointed screws 113 b (Fig. 21). If a cable is to be replaced, unscrew the corresponding pointed screw 113 a, and detach the cable end from the distributor disc. Bare the new cable for about 2 millimetres ($\frac{3}{32}$ "), and splay the wires of the core against the rubber insulation (Fig. 23). Push the cable hard home into the terminal until it touches the bottom of the hole, then tighten the pointed screw until its head is firmly seated. Make sure by a gentle pull that the cable is properly fastened. The cables are attached to the ignition coil as described page 8.

ROBERT BOSCH G.M.B.H., STUTTGART

VTD-B 9868-3 (8. 38)

Bosch

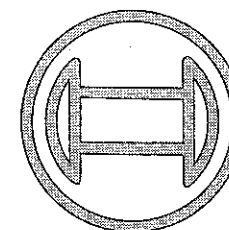
LIGHTING and IGNITION SET for MOTOR CYCLES

with

Dynamo-Ignition-Units
B142, BK142, B145



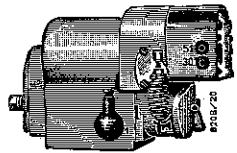
Appendix:
Dynamo-Ignition Unit B245



FEG - Archiv

BOSCH-Lighting Set for Motor Cycles

Component parts:



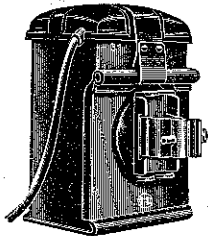
The Dynamo-Coil-Ignition-Unit

The dynamo and contact breaker for the ignition current in one housing, with only one common drive, requires but little space.



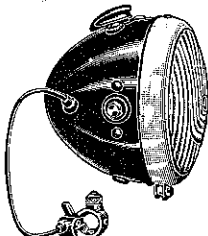
The Ignition Coil

which serves as a transformer is of a suitable construction. The coil can be fitted in an easy manner.



The Battery

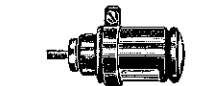
has moderate dimensions and may easily be fixed to the motor cycle by its carrier. It is in every way adapted to meet the exacting requirements of motor cycles, because of its strong construction.



The Headlamp

provides a distance light of great range, and an excellent anti-dazzle light that satisfies all demands required by law.

The alternate switching on of the distance light or the anti-dazzle light is done by means of a Bowden wire without letting go of the handle bar, an advantage that every motor cyclist will appreciate.



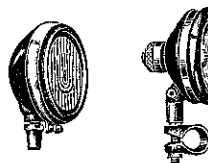
The Number Plate Lamp

illuminates the registration mark at the rear and may also be used as a hand lamp for carrying out repairs on the road by night.



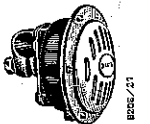
The Side Lamp

completes the set, if a sidecar is attached to the motor cycle.



The Spot Light

can easily be fitted on the handle bar and serves as an excellent auxiliary instrument for lighting up signposts and house-numbers.



The Horn

prevents accidents, gives warning signals without startling, and generally increases driving safety.

The Dynamo-Coil-Ignition-Unit

Construction

The dynamo is situated in the upper portion of the housing. Its armature is driven by a shaft in the lower part. The rear portion of this shaft is formed into a cam, by means of which the contact breaker for the ignition is operated. Armature and contact breaker shaft are both carried in ball bearings.

The regulator and automatic switch (see below) are mounted on the commutator side; a metal cap protects them and the interior of the dynamo against dust and water. The commutator and the brushes are accessible for overhaul, after removal of the cover plates 203 f (in the case of dynamo-coil-ignition-units B 142 and BK 142) or after removal of the regulator cover 217 (in the case of B 145).

The terminals (30, 51 and 61) are enclosed in the commutator cover; the cables, however, can be connected from the outside.

The dynamo-coil-ignition-units B 142 and B 145 must be driven at camshaft speed, BK 142 at crankshaft speed.

The Dynamo

The dynamo is a two pole shunt wound 6 volt machine having a rated output of 30 watts (B 142, BK 142) or 45 watts (B 145). As long as the engine is running, a constant flow of current is supplied by it to the headlamp, the hand or tail lamp, also to the side lamp, the horn and ignition coil. Besides this it charges the battery, which, when the engine is not running supplies the current-consumers.

Voltage regulator

The voltage of the dynamo is kept practically constant by the voltage regulator, irrespective of the speed of the dynamo and the number of current consuming details in circuit. The lamps always burn with uniform brightness and give long service. The battery is charged quite automatically, and quickly, because high initial charging current is admissible.

Automatic switch

In order to prevent the battery discharging through the dynamo when the engine is running at low speed and when the voltage of the dynamo is lower than that of the battery, an automatic switch is fitted. It only connects the dynamo in parallel to the battery, when the dynamo attains sufficient speed so that the battery and dynamo voltage are the same.

Working of the dynamo without battery

The voltage regulation offers the following important advantage:

In case of battery trouble the engine can be started and run with the dynamo alone.

For this purpose the battery must be disconnected by loosening the cable bet-

ween battery terminal 30 and terminal 30 of the dynamo. Furthermore put the bridge connector 217 g (Fig. 3) in the position "Dynamo" by means of a screw driver or a coin (see Fig. 1). When starting, all consumers — except the ignition coil — must be switched off.

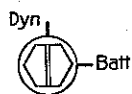


Fig. 1. Bridge connector in position "Dynamo"

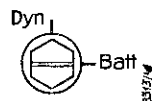


Fig. 2. Bridge connector in position "Battery"

All the driver has to do is to increase the speed of the dynamo to such an extent that the voltage it produces suffices to close the automatic switch. If he unable to attain that speed with the aid of the kickstarter, the motor cycle must be pushed a distance with the engine switched on.

Before refitting the repaired and charged battery put bridge connector 217 g back in position "Batt" (Fig. 2). If not the battery gets discharged through the dynamo when the vehicle stands still.

Contact breaker

The stationary contact breaker is situated in the contact breaker housing on the rear bearing plate, below the regulator cover 217 (Fig. 3). It is accessible after removing the contact breaker cover 110.

The contact breaker lever 107 c mounted on an insulating base, touches with its insulating block the cam 133 a, and is diverted by it. The stationary contact breaker point 107 a is earthed. A cable connection runs from the contact breaker lever to the lateral terminal 1, which is connected with the ignition coil. Parallel to the contact breaker points a condenser is connected, which is seated in the lower part of the common housing. The contact breaker housing 108 is movable in the bearing plate. A pull-off spring 108 c presses it into the retarded ignition position of the contact breaker.* In order to regulate the timing, the timing lever arm 109 a on the contact breaker housing has to be connected by a Bowden wire with a notched hand lever on the handle bar of the motor cycle. A timing range of 20° is provided, measured on the driving spindle.

Timing to the engine

The dynamo-ignition-unit is correctly timed by the engine manufacturer and the following instructions are given for use when the dynamo-ignition-unit

* In the case of some special models into the advanced ignition position.

has been removed for some reason. When replacing the dynamo-ignition-unit the following should be noted:

At first the piston of the cylinder must be timed in accordance with the directions laid down in the handbook supplied with the motor cycle.

Now the dynamo-ignition-unit is adjusted. At the same time the hand-timing lever for ignition on the motor cycle must be in the "advanced ignition" position. Should the Bowden wire connection not yet be established, then it is advisable to take out the spring 108 c, and turn the contact breaker housing contrary to the direction of rotation of the dynamo-ignition-unit, till the advanced ignition position is reached. After turning the spring 103 a, holding the contact breaker cover 110, the latter is taken off. The contact breaker shaft is then turned so long at the driving spindle in the direction of rotation (see arrow on housing), till the insulating block 107 d is diverted by the cam 133 a, and the contacts 107 a and 107 b are just opening.

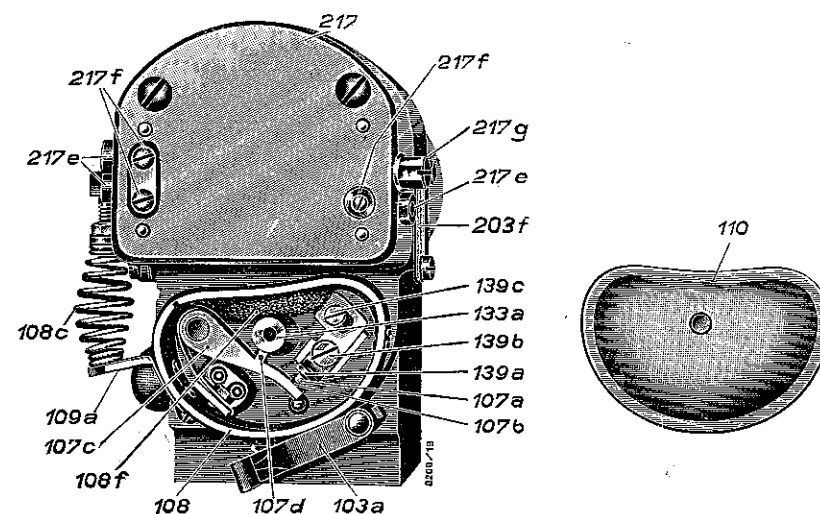


Fig. 3. Dynamo-ignition-unit, with contact breaker cover removed

- | | |
|--|--------------------------|
| 103 a = Holding spring | 133 a = Cam |
| 107 a = Adjustable contact | 139 a = Contact plate |
| 107 b = Contact of contact breaker lever | 139 b = Fixing screw |
| 107 c = Contact breaker lever | 139 c = Adjusting screw |
| 107 d = Sliding piece | 203 f = Cover plate |
| 108 = Contact breaker housing | 217 = Regulator cover |
| 108 c = Pull-off spring | 217 e = Rubber sockets |
| 108 f = Felt wick for cam lubrication | 217 f = Terminal screws |
| 109 a = Timing arm | 217 g = Bridge connector |
| 110 = Contact breaker cover | |

Now, by moving the dynamo-ignition-unit, the driving component fastened on the driving spindle is engaged with the driving component of the already timed engine; in this position the dynamo-ignition-unit must be fixed.

When coupling the dynamo-ignition-unit with the engine, great care must always be taken that the position of the driving spindle does not get displaced relatively to the driving engine shaft, as otherwise the ignition would not take place at the right moment.

If the dynamo-ignition-unit is gear driven there is no need for re-setting the dynamo-ignition-unit. All that is needed is to re-assemble the gears according to the markings.

Note. For timing, a steel strip about 0.03 mm in thickness, which can be inserted between the contacts, should be used. The moment the steel strip can be easily withdrawn, indicates the commencement of the opening of the contacts. It is not advisable to use paper strips for this purpose as particles of paper may adhere to the contacts and cause ignition failure, if the contacts are not carefully cleaned.

The dynamo-ignition-unit is fixed on its base by screws or by dowel pins and fixing strap. When using the latter method the fixing screw on the strap and also its lock-nut must be tightened up well to prevent the strap working loose.

Any differences in height which may occur between driving spindle and dynamo-ignition-unit shaft, may be corrected by placing shims of proper thickness under the dynamo-magneto-unit. These must be made of non-magnetic metal such as brass, aluminium etc. (Strips of paper or pasteboard must not be used.)

Fixing the lighting cable to the dynamo-ignition-unit

The cables running from the dynamo-ignition-unit to the terminals 30/51 and 61 of the headlamp and to the + terminal 30 of the battery are stripped of their insulation for about 8 mm., and the terminal screws 217f (Fig. 3) are loosened (but not entirely unscrewed). The cables are inserted into the openings of the rubber sockets 217e and pushed well home; they are then fastened tightly by the screws 217f. (Test by a gentle pull whether the cables are firmly held). The cable issuing from the terminal 30 of the battery must be connected last of all. (See also page 18 and wiring diagram page 23).

Fixing the ignition cable to the contact breaker terminal

The low tension cable is fixed to the terminal 1 of the dynamo-ignition-unit by the cable shoe supplied with it. The cable end, first stripped of its insulation for about 5 mm, is inserted from above through the smaller opening of the rubber protecting cap, then pushed into the cable shoe, fastened and soldered (Fig. 4 and 5). After the cable shoe has been fastened by screw and spring

washer to the terminal (Fig. 4), the rubber protecting cap is again drawn over the insulating disc of the terminal, as indicated in Fig. 4 by the dotted lines.

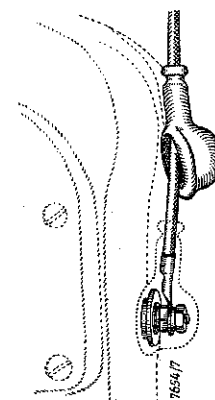


Fig. 4.

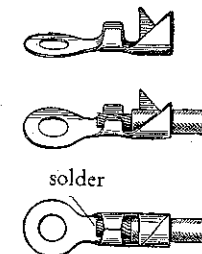


Fig. 5.

The other end of the cable is connected with the terminal 1 of the ignition coil.

The ignition coil

serves as a transformer for the low tension dynamo or battery current into high tension ignition current. It has a primary winding, consisting of a few turns of thick wire, through which the low tension current is flowing, and a secondary winding consisting of a large number of turns of thin wire, which is connected with the sparking plug, and through which the high tension current is flowing.

In the primary circuit the contact breaker interrupts the current in the moment of ignition, with the result that in the secondary winding a high tension is induced, giving rise to a spark at the plug. The beginning of the primary winding (terminal 15) is connected across the ignition switch of the headlamp with the terminal 51 of the dynamo, and thus at the same time with the + terminal 30 of the battery as shown in wiring diagram, page 23. A cable runs from the end of the winding (terminal 1) to terminal 1 (contact breaker) on the dynamo-ignition-unit.

The secondary winding forms the continuation of the primary one; the end of the primary winding and the commencement of the secondary winding are joined together. The end of the secondary winding (terminal 4) is connected to the sparking plug by a high tension cable.

When fitting the ignition coil, care must be taken that its housing has metallic connection with the frame of the motor cycle.

Fixing the cables to the ignition coil

The low tension cables are fixed on the terminals 1 and 15 of the ignition coil by means of cable shoes. The connection is done in the same way as described on page 6 under the heading "Fixing the ignition cable to the contact breaker terminal" (Fig. 5). It will be found of advantage to cover the cable shoe with a piece of rubber tubing, as shown in figure 6.

The high tension cable leading to the sparking plug, leaves the ignition coil through the high tension outlet (terminal 4). The connecting up of this cable is done as follows:

1. Pull cap nut 156 d, bushing 156 e and rubber packing 156 f over the cable end (cable end must project at least 20 mm, Fig. 7).
2. Insert cable end firmly into the high tension outlet of the ignition coil, until it strikes against the bottom of the hole.



Fig. 6.

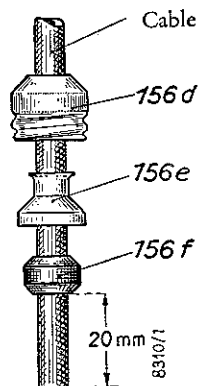


Fig. 7.



Fig. 8.

3. Push the rubber packing and the bushing down until they are firmly seated and tighten them with the cap nut (Fig. 8).
4. Examine by a gentle pull whether the cable is well fixed.

The Battery

has a nominal potential of 6 volts. Its capacity is 7 ampere hours at a 10 hour rating; the battery when fully charged is able to supply a current of 0.7 amperes without interruption for 10 hours.

On the lid of the battery box, brief instructions for treatment are given. Detailed instructions see next page.

Fixing the cables

1. Battery BGD 312 (Fig. 9).

The battery has no special terminals; the rubber insulated battery cables are directly soldered to the pole heads and pass out of the lid of the box, through side slots. The earth cable running from the negative pole (31) of the battery must be connected up to the frame terminal plate S 21 (see wiring diagram, page 23).

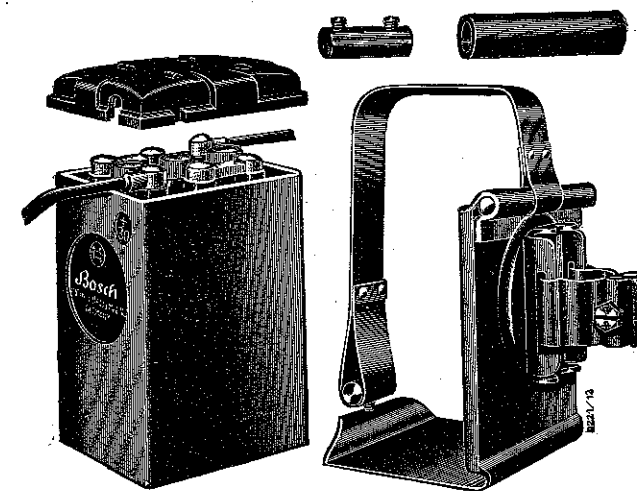


Fig. 9. Battery BGD 312 with battery carrier and cable connector

The positive cable (30) is connected by a socket (Fig. 9) with the cable running from terminal 30 on the dynamo-ignition-unit. This socket is protected against earthing by a rubber sleeve. When drawing over the rubber sleeve, care must be taken that the socket is completely covered by it.

2. Battery BGD 312 A (Fig. 10).

In the case of this battery the lacquered cables are fixed by clamping screws to the laterally projecting bars of lead. The cable connector mentioned under 1. is not required.

The cable running from the negative pole (31) of the battery must be connected up to the frame terminal plate S 21 (see wiring diagram page 23). The positive terminal (30) is connected with terminal 30 on the dynamo-ignition-unit.

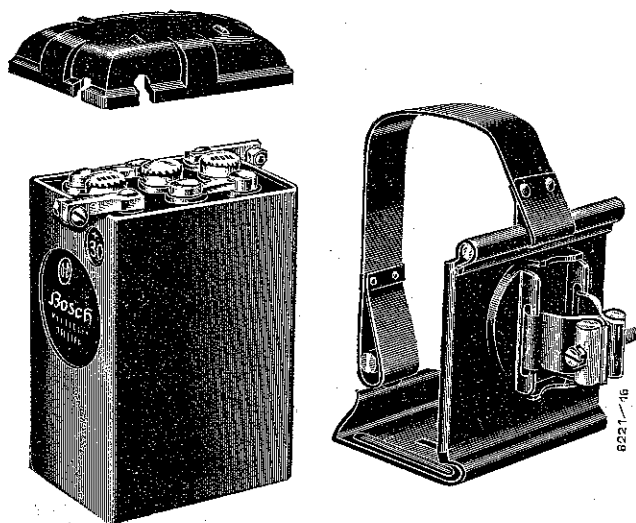


Fig. 10. Battery BGD 312 A with battery carrier

Instructions for treatment of battery

A. Treatment of fully charged battery

1. Keep battery clean and dry.
2. Do not put any objects on the open battery (risk of short-circuit).
3. Inspect as often as possible (at least every 4 weeks) to see whether the electrolyte is 8 mm above the top of plates.
If this is not the case, add distilled water.
4. Replace electrolyte lost by spilling and leakage, with solution of chemically pure accumulator acid and distilled water only. The density of the refilling electrolyte must be approximately the same as that of the electrolyte in the cell to be refilled. Measure density of electrolyte beforehand.
5. Replace evaporated electrolyte with distilled water only.
6. The battery is fully charged when all cells gas freely and steadily (the battery boils), the terminal voltage of each cell has risen to 2.6—2.7 volts, and the specific gravity of the acid is $1.285 = 32^{\circ} \text{ Bé}$ (in tropical climate $1.230 = 27^{\circ} \text{ Bé}$).

Note: Measure the cell voltage during charging.
Measure electrolyte density not before the required level of 8 mm. is reached.

The state of charge of the battery can be ascertained by the density of electrolyte provided that the battery has always been properly treated.

The relationship between density of electrolyte and state of charge is as follows:

1.285 spec. grav. (32° Bé): battery fully charged	} in tropical climate	1.23 (27° Bé)
1.250 spec. grav. (29° Bé): battery half charged		1.21 (25° Bé)
1.21-1.23 spec. grav. ($25^{\circ}-27^{\circ} \text{ Bé}$): battery discharged		1.17 (21° Bé)

7. After adding water or acid, the density must only be measured after the liquid has been thoroughly mixed in the cells; this is best done by recharging ($\frac{1}{2}$ hour).

B. Treatment of the insufficiently charged and discharged battery

1. Charge the battery on the motor cycle, or by a separate source of current until it "boils" for half an hour and the voltage of each cell is 2.6—2.7 volts.
2. Switch off the charging current.
3. Let battery stand for half an hour.
4. Measure density of acid. The spec. grav. must be $1.285 = 32^{\circ} \text{ Bé}$ (in tropical climate $1.230 = 27^{\circ} \text{ Bé}$).

If density of acid is too high: dilute liquid in the cells with distilled water.
If density of acid is too low: add acid of higher density. In both cases take care that the liquid is not too high above the plates (see A 3).

C. Treatment of defective battery

1. Charge sulphated battery for 40 hours with charging rate of 0.25 amperes. Afterwards complete charge with charging rate of 1 ampere.
2. Other defects, such as short-circuiting of a cell, loose pole head connections or cracked ebonite boxes, must only be repaired in a special workshop.

D. Treatment when not in use

Treat battery as stated under A; charge at least every 4 weeks at 1 ampere, if necessary from a separate source of constant current. It is advisable to discharge the battery beforehand, with at most 1 ampere discharge rate until the voltage drops to 1.8 volts per cell.

The headlamp

The headlamp is so constructed that dust and water cannot reach the reflector. Therefore, the cleaning of the reflector is quite unnecessary, and must on no account be attempted, because all contact with the surface of the reflector decreases its reflecting power.

The headlamp is provided with two bulbs, a Bilux bulb for full and anti-dazzle light and an auxiliary bulb for stationary illumination. The auxiliary bulb is placed beneath the Bilux bulb.

When inserting the Bilux bulb into the headlamp, the distance light filament comes exactly in the focus of the reflector.

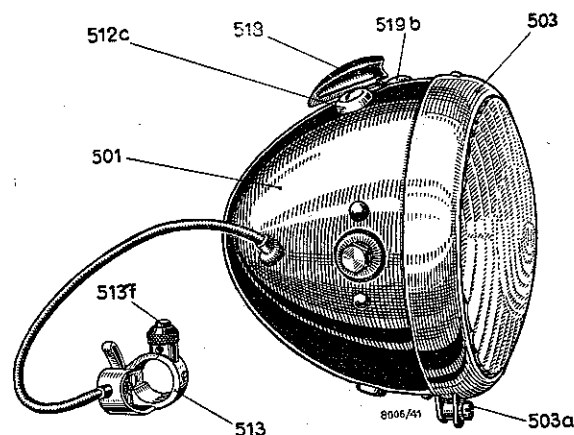


Fig. 11. Headlamp EAS 150x2

- | | |
|---------------------|---|
| 501 = Casing | 513 = Bowden wire switch |
| 503 = Glass frame | 513f = Press button for the horn |
| 503a = Fixing screw | 518 = Switch lever |
| 512c = Fuse holder | 519b = Inspection window of charging lamp indicator |

For the alternate switching on of the distance light or the anti-dazzle light, an anti-dazzle switch is fitted inside the headlamp, which is operated by a Bowden wire from the handle bar.

On the casing of the headlamp, a switch lever 518 is attached. It is provided with three positions for switching the various lamps (such as headlamp, number plate and side lamps) on and off. The ignition is switched off by either pushing the switch lever upwards or withdrawing it completely. The switch lever can be withdrawn in any of the three positions, thus preventing its being tampered with by unauthorised persons.

In order to have a substitute handy in the event of the switch lever (of insulating material) getting lost, it is advisable to carry an emergency key on your key-ring (supplied to special order).

For the supervision of the charging of the battery, a charging indicator lamp 519b is placed by the side of the switch. As soon as the battery is switched in parallel with the dynamo by the automatic switch, the lamp goes out, thus indicating the commencement of the charging. The lighting up of the lamp after stopping, reminds the driver to switch off the ignition by partly or entirely withdrawing the switch lever. The lamp goes out, when the ignition is switched off.

The battery ignition should be switched off immediately the engine stops running. If the crankshaft of the engine, when stationary, is in such a position that the contact breaker contacts are touching one another, than the battery will discharge itself over the ignition coil, if the battery ignition has not been switched off.

The headlamps can also be supplied with an opening to fit a speedometer.

Switching Combinations

Left	Centre	Right
T own driving at night Auxiliary lamp, number plate lamp and side lamp as well as ignition are switched on Switch lever pushed upwards or withdrawn Light for stationary use Auxiliary lamp, number plate lamp and side lamp switched on; ignition switched off	Day driving Ignition switched on, all other consumers (except horn) switched off Switch lever pushed upwards or withdrawn Zero position Ignition and all other consumers (except horn) switched off	Night driving Ignition, Bilux lamp*), number plate lamp and side lamp switched on

The positions of the lever are understood as viewed in the direction of driving.

*) Driving light, i.e., distance and anti-dazzle light, in accordance with the position of the Bowden wire switch. The horn is always switched on irrespective of the position of the switch lever (also when switch lever is pushed upwards or withdrawn).

Fixing the cables

When connecting the cables the wiring diagram (see page 23) should be used. To enable the cables being connected to the terminals, the headlamp must first be opened. This is done by loosening the fixing screw 503a (Fig. 11); then the glass frame 503 is swung upwards and the guide clip 503c (Fig. 12) lifted out of the slit in the holding lobe 501b. The cable ends are stripped for a length of about 7 mm of their insulation and passed through the cable insert sockets 501a.

The openings in the cable rubber sockets are sealed by means of thin coverings. Before inserting the cable, the covering is pierced with a pointed object. The various cables are then connected to the corresponding terminals, as shown in the wiring diagram.

Note: Do not pierce the coverings of cable insert sockets that are not yet in use, as otherwise dust and water get into the headlamp.

The cables inside the headlamp are guided through cable thimbles 509c.

A two-core cable is used for number plate lamp JN 5 if it is used as a hand lamp; the black cable is connected to terminal 58, the white cable (earth) to terminal 31.

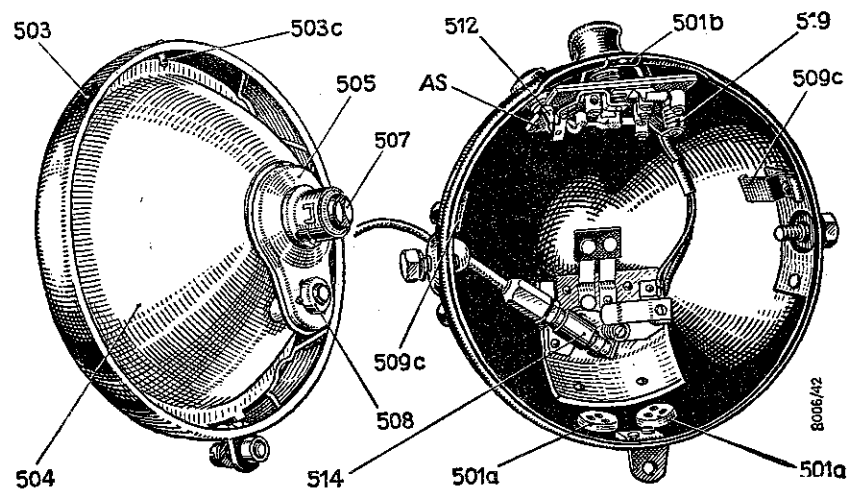


Fig. 12. Headlamp EAS 150x2, opened

- | | | |
|------------------------------|----------------------|-----------------------------|
| 501 a = Cable insert sockets | 504 = Reflector | 509 c = Cable thimble |
| 501 b = Holding lobe | 505 = Bulb holder | 512 = Fuse |
| 503 = Glass frame | 507 = Bilux bulb | 514 = Anti-dazzle switch |
| 503 c = Guide clip | 508 = Auxiliary bulb | 519 = Charging control lamp |
| | | AS = Connection plate |

Adjustment of the headlamp

The headlamp must be adjusted when the motor cycle is loaded, in such a manner that at a distance of 5 metres (16 ft), the centre of the distance beam is 2 cm. ($\frac{3}{4}$ ") lower. (Machine should not be placed on its stand). The sharp

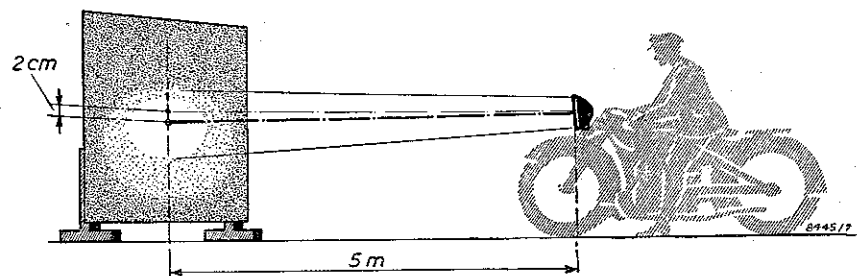


Fig. 13. Adjustment of the headlamp

limit between the lower (bright) zone and the upper (dim) zone of the anti-dazzle beam should lie at least 5 cm (2") lower than the centre of the lamp at 16 ft. distance; otherwise the adjustment must be altered in order to preclude dazzling under all circumstances.

Replacing the bulbs

For the purpose of replacing a burnt out bulb, the headlamp must be opened as described in paragraph "fixing the cables".

Detach the bulb holder 505 (Fig. 12) from the reflector. To remove the damaged bulb, press it back and turn it to the left until it can be pulled out. Insert the new Bilux bulb, making sure that the words "oben-top" stamped on the base, point upwards and that the two flaps on the base may slide in the corresponding slots of the holder. Then turn the bulb to the right as far as it will go and pull it forward. Insert the new auxiliary bulb so that the two pins on the base may slide in the corresponding slots of the holder, turn it to the right, then pull it forward until the pins rest in the two notches.

The bulbs to be inserted must be entirely free from oil and grease, otherwise the reflector will be tarnished by their fumes in the course of time. New bulbs are best handled and inserted with aid of tissue paper or a clean cloth. Dirty bulbs should be wiped with a cloth and some alcohol — not with petrol.

Changing charging indicator lamp

For the purpose of changing a burnt out charging indicator lamp, the headlamp must be opened. Charging indicator lamp 519 (Fig. 12) is held in position by a spring clip. After pressing back this clip, the charging indicator lamp can be taken out and replaced by a new one (Order number: BOSCH NGL 692/1 Z = Osram 3765).

Changing fuse

In order to change fuse, only fuse holder 512 c (Fig. 11) need be screwed out of the headlamp housing. When a new fuse (Order number WSG 501/1 Z)

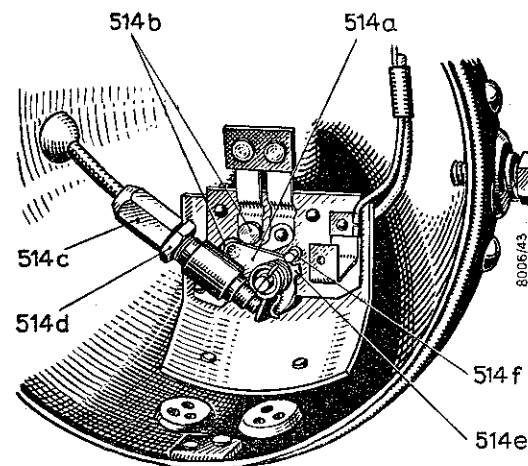


Fig. 14. Anti-dazzle switch

- | |
|-------------------------|
| 514 a = Contact lever |
| 514 b = Contact buttons |
| 514 c = Adjusting nut |
| 514 d = Fuse nut |
| 514 e = Base flap |
| 514 f = Base pin |

has been inserted, the fuse holder is screwed in again. If a screwdriver does not happen to be at hand, the fuse holder may be screwed out and in with the aid of a coin.

Adjusting the Bowden wire

The Bowden wire should be adjusted in such a manner that there is a gap of about 0.5 mm (between base flap 514 e of the contact lever and base pin 514 f (Fig. 14). If this is not the case, adjusting nut 514 c, after loosening fuse nut 514 d must be turned until the contact lever is in its correct position.

Attendance

Chromium-plated parts should be given a filmy greasing from time to time with vaseline or sewing machine oil; if wet, first rub dry with a clean cloth. If very dirty, rinse with water. Do not use polish.

The number plate and tail lamp

serves to illuminate the rear distinction mark and at the same time as a tail lamp. The housing is therefore provided with two light apertures, one with a clear glass for illuminating the distinction mark and one with a red glass for a tail lamp.

a) Number plate lamp JN 5 (Fig. 15).

This lamp is of cylindrical shape. After loosening fastening nut 551 e and removing the lamp from the slot of the carrier, it can also be used as a hand lamp. In that case, a two-core cable (order No. NKA 30/0.75) is used which, running from the headlamp to the number plate lamp, is held by cable clips, and where easy removal is required by spring clips.

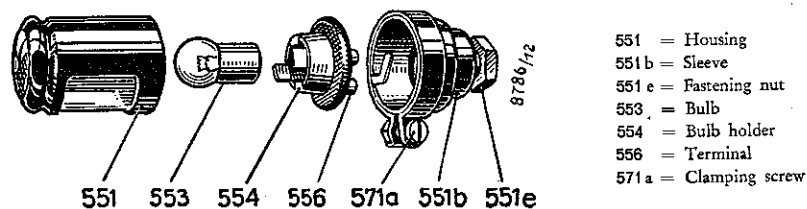


Fig. 15. Number-plate lamp JN 5, dismantled

If a longer cable is used to allow a greater freedom of movement, the extra length of cable can be carried in a holder on the motor cycle.

Fixing the cable

1. Loosen clamping screw 571 a.
 2. Pull housing 551 out of sleeve 551 b by turning on the left.
 3. Insert cable end through fastening nut 551 e and sleeve 551 b.
 4. When using the number plate lamp as a hand lamp (see above), connect black cable to + terminal, white cable to the other terminal 556 of bulb holder 554. The other ends of the cable are conducted to the headlamp; the black cable is connected to terminal 58, the white cable (earth connection) to terminal 31 of the headlamp.
- If the number plate lamp is not intended for use as a hand lamp, plus-terminal 556 of the number plate lamp is connected to terminal 58 of the

headlamp. From the other terminal 556 of the number plate lamp a cable leads to the frame terminal plate S 21, or to the earth connection of the motor cycle.

5. Withdraw cable until lamp holder 554 seats firmly in the sleeve 551 b.
6. Push housing 551 into sleeve 551 b by turning to the right and tighten it by means of tension screw 571 a.

The other ends of cables are conducted to the headlamp; the black cable is connected to terminal 57/58, the white cable (earth connection) to terminal 31 of the headlamp.

Replacing the bulb

1. Loosen tension screw (Fig. 15).
2. Pull out housing 551 out of sleeve 551 b by turning on the left.
3. To remove the damaged bulb, press it back and turn it to the left until it can be pulled out.
4. Insert the new bulb so that the two pins on the base may slide in the corresponding slots of the holder. Turn the bulb to the right, then pull it forward until the pins rest in the two notches.
5. Push housing 551 into sleeve 551 b by turning to the right and tighten it by means of tension screw 571 a.

b) Number plate lamp JN 7 K 1 (Fig. 16).

This lamp has a shell-shaped housing. It is firmly fixed to the indicator plate and can therefore not be used as a hand lamp.

Fixing the cable

The single core cable (order number NKA 14/1.5), running from the number plate lamp to the headlamp, is held by cable clips (Fig. 20).

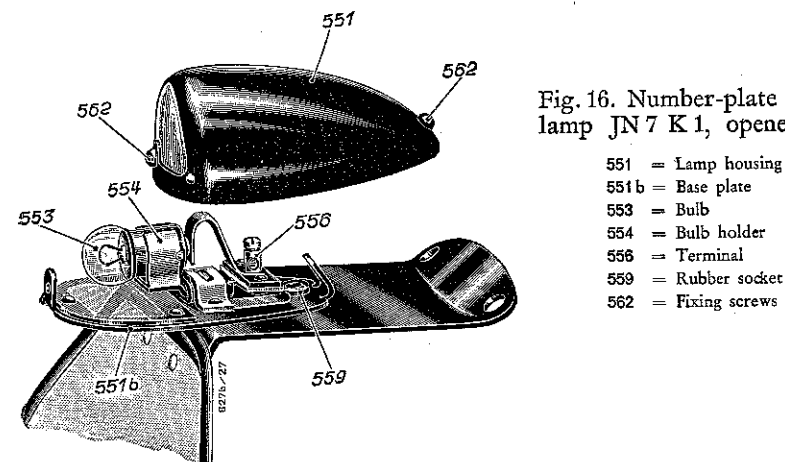


Fig. 16. Number-plate lamp JN 7 K 1, opened

- 551 = Lamp housing
- 551b = Base plate
- 553 = Bulb
- 554 = Bulb holder
- 556 = Terminal
- 559 = Rubber socket
- 562 = Fixing screws

1. Remove the two screws 562 and lift lamp housing 551 off base plate 551 b.
2. Insert cable end through rubber socket 559 and clamp underneath screw 556. The other end of the cable is fixed to terminal 58 of the headlamp.

- Lamp housing 551 is then put on base plate 551b again and fastened by means of the two screws 562.

Replacing the bulb

- Remove the two screws 562 and lift lamp housing 551 off base plate 551b.
- Remove worn bulb (to begin with, press bulb back in holder 554, then turn bulb by 90° and pull out). Insert new bulb in such a manner that one of the two pins in the base of the bulb points upwards. Insert bulb in holder 554 and then turn by 90° until the two base pins fit into the hollows provided for that purpose.
- Lamp housing 551 is then put on base plate 551b again and fastened by means of the two screws 562.

The side lamp

is intended for motor cycles with side-cars; it must be fixed to the off-side of the side-car.

a) Side lamp L 75 (Fig. 17).

Fixing the cable

- After the loosening of the screw 572a the glass rim 572 is removed from the housing of the side lamp.

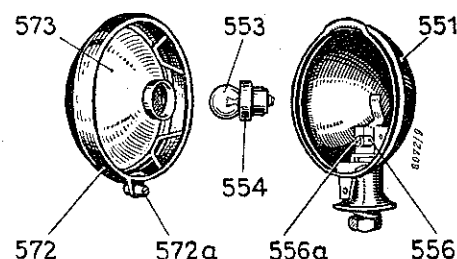


Fig. 17. Side lamp L 75, dismounted

- 551 = Housing
- 553 = Bulb
- 554 = Bulb holder
- 556 = Cable terminal
- 556a = Terminal screw
- 572 = Glass rim
- 572a = Fixing screw
- 573 = Reflector

- The cable from the terminal 58 of the headlamp (ordering number NKA 14/1.5) must be pushed through the post of the housing and tightened by the terminal screw 556.
- The rim 572 is then put on again and fastened by means of the fixing screw 572a.

Replacing the bulb

The bulb is replaced in the same manner as that of the headlamp (see page 15).

b) Side lamp JK 50 (Fig. 18).

Fixing the cable and replacing the bulb is done in the same manner as on number plate lamp JN 7 K 1 (Fig. 16).

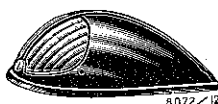


Fig. 18. Side lamp JK 50

The Horn

The sound of the Bosch Horn is produced by the vibrations of a diaphragm caused by means of an electro-magnet and a contact breaker.

The horn requires no special attention. If the tone loses its purity, the horn should be examined at a Bosch Service Station.

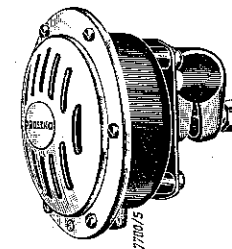


Fig. 19. Horn

Wiring

To avoid short-circuits and breakdowns, great care must be taken when laying and connecting the cables. For this purpose lacquer cables having a strand section of 1-5 sq. mm. are used; these are impervious to water, petrol or oil. For the purpose of fixing the cables to the frame of the motor cycle cable clips are used (Fig. 20).

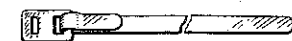


Fig. 20. Cable clip

The metal parts of the cycle frame or the engine (earth) are used for the return of the current.

When mounting parts marked * in the wiring diagram, care should be taken that there is a good metallic connection to the frame or the engine.

The terminals 31 of the battery and the headlamp are connected to the frame terminal plate S 21 by special cables (see wiring diagram page 23).

When connecting the cables the wiring diagram should be used. On principle, terminals, bearing the same number should always be connected with each other, for instance terminal 30 of the dynamo ignition unit with terminal 30 of the battery, terminal 15 of the ignition coil with terminal 15 of the headlamp etc. The cables must first be connected to the dynamo-ignition-unit, then to the headlamp and the other current consumers, and last of all to battery, as otherwise there is the risk of a short-circuit.

Instructions for use

Note: The regulator is accurately adjusted at the factory and, under no circumstances may this adjustment be tampered with. Do not touch any high-tension carrying metal part of the ignition circuit (spark plug terminal nut, for instance) whilst the engine is running, for dangerous electric shocks might result under certain circumstances.

1. After running-in period of engine

(see data in motor cycle instruction book):

Check up contact breaker gap

During the break, i. e. when the sliding block 107 d (Fig. 3) of the contact breaker lever 107 c runs on to the steel cam 133 a, the contacts 107 a and 107 b of the contact breaker must be from 0.4 to 0.5 mm. distant from each other. This gap may be regulated by adjusting the contact plate 139 a. For this purpose loosen the fixing screw 139 b which fixes the contact plate, and after the gap has been correctly adjusted by moving the eccentric screw 139 c, the fixing screw 139 b is tightened.

2. Regularly, about every 4—6 weeks:

Examine the battery
(see page 10)

3. Regularly after about every 1000—1500 miles or after an interruption of several months:

Oil the gearing

For this purpose remove screw marked "Oel" (on driving side), fill opening with motor oil, and replace screw. On some models a flap covered lubricator is used instead of the screw.

4. Regularly after about 3000 miles:

Overhaul carbon brushes of the dynamo

For this purpose, the two cover plates 203 f (in the case of dynamo-ignition-units B142 and BK 142) or the regulator cover 217 (in the case of B145) are taken off. If the brushes are so worn that the brush spring threatens to bear on the recess of the brush-holder, then they must be changed in a Bosch workshop.

Examine cables

Examine cables to see whether worn through at any point (particularly the cables on the handle bar and battery cables). Replace damaged cables.

5. After 10 000 miles or when motor cycle is being overhauled:

Inspect breaker contacts

In the course of time the contact faces are liable to burn away and get pitted. Generally speaking these phenomena do not affect engine operation. We would therefore advise to refrain from unnecessary filing and dressing of the points or undertake other changes and alterations in the setting. When an engine overhaul is due, the breaker points should be seen to by an approved Bosch Service Station, who will dress the points on an oil stone or replace them in the event that they should be completely worn.

In the event of ignition failure in service due to corrosion of the breaker faces, these superficial layers of oxide should be removed with a perfectly clean, hard instrument, such as the Bosch contact file (supplied on request). On no account use emery paper or emery cloth, as this ravels. Ordinary commercial files or files that have been previously in use for other metals should also be avoided, as they are liable to damage the contact faces beyond repair.

After cleaning the contacts be sure to re-adjust the gap as indicated under 1.

Replenish the grease in the ball bearings

Renewing the hot bearing grease (fuse point 170° C) in the ball bearings is most advantageously done at a BOSCH Agency or a BOSCH Service Station.

Lubricate Bowden wire on headlamp

A few drops of oil should be given of the movable parts of the Bowden wire switch and also to the anti-dazzle switch 514 (Fig. 12).

Troubles, their Cause and Remedy

Ignition Troubles

I. The engine stops suddenly or does not start

Take cable off the sparking plug and hold cable end a distance of about 2—3 mm from the engine body, simultaneously turn the engine over by means of the kickstarter.

Sparks jump from the cable to earth

1. High tension cable between coil and sparking plug damaged (earthed) or broken. *Remedy:* Repair or replace cable.
2. Sparking plug sooted up or oily. *Remedy:* Clean plug or replace it.

No sparks jump from the cable to earth

First re-connect cable to the sparking plug.

1. When opening, no spark is to be seen between the contacts of the contact breaker: primary cable broken, damaged (earthed or loosened from the terminals). *Remedy:* Replace, repair or fasten cable. Battery almost discharged or quite empty. *Remedy:* Switch off without delay all current consuming details, and after a longer interval start engine. Inspect battery, and charge it as soon as possible during a longer day run, or by a separate source of current (see also under "Battery Troubles"). The fault may also be caused by the dynamo, or a cable has become loosened between the dynamo and the battery, or a cable is damaged (earthed).
2. When opening, distinct sparks are seen between the contacts. Coil damaged. *Remedy:* Have it examined at a Bosch repair shop.

II. The engine stops at high speed

1. Examine gap after contact breaker lever has been completely diverted; the contacts of the contact breaker must be from .016"—.020" (0.4-0.5 mm.) from each other.
2. Gap between the electrodes of the sparking plug is too great; it should be .028" = 0.7 mm. *Remedy:* Right gap may be obtained by bending the side electrodes.

III. The engine runs intermittently, or efficiency is impaired

1. Sparking plug sooted up or oily. *Remedy:* Clean plug or replace it; if necessary use plug with lower heat resistance.

2. Gap between the electrodes of the plug is too great. *Remedy:* Adjust gap by bending the side electrodes (.028" = 0.7 mm).
3. Sparking plug cable loosened or damaged (earthed). *Remedy:* fix cable, repair or replace it.
4. Contact breaker contacts oxidised. *Remedy:* Contacts must be inspected (see "Instructions for Use", paragraph 5).
5. Gap of contact breaker is too great or too small. *Remedy:* Regulate contact gap (see page 20).
6. Oil or petrol vapours in the contact breaker housing. *Remedy:* Clean contact breaker housing with a piece of cloth and then blow through.
7. Ignition coil damaged. *Remedy:* Have it examined at a Bosch repair shop. The cause of the engine coming to a standstill, may be a wrong timing. If the retarded ignition is too great, the engine gets too hot and does not accelerate; if the advanced ignition is too great the engine knocks. *Remedy:* Readjust dynamo-ignition-unit (see page 4). Examine driving component, and make sure that it has not worked loose.

IV. Explosions in the carburettor

Causes: Incandescent ignition by plug becoming incandescent, recognizable by the pale white colour of the insulator. *Remedy:* Select plug of higher heat resistance. Though the plug may be the right one for the engine, it gets too hot, because it is not screwed tight or the packing washer has been forgotten. Incandescent ignition may also be caused by a deposit of oily soot in the plug or cylinder. *Remedy:* Clean plug, prevent it becoming oily.

Breakdowns in the lighting set

Given proper attention breakdowns in the lighting set hardly ever occur.

If troubles nevertheless occur in the lighting set, the cables should first be examined. The cables with defective insulation must be repaired or replaced. The cables may have become detached from their terminals on the dynamo, in the headlamp or the battery, and must therefore be fastened. Burnt-out bulbs must be replaced.

If the cables, cable connections and bulbs are in good condition, the dynamo is tested by disconnecting the battery (loosen cable connection between dynamo and battery), switching on a current detail, and starting the engine. If the dynamo still supplies no current, the dynamo-ignition-unit must be forwarded to a Bosch repair shop.

In the event of troubles occurring when switching over from distance to anti-dazzle and vice versa, inspect the anti-dazzle switch (see paragraph "Adjusting the bowden wire", page 16).

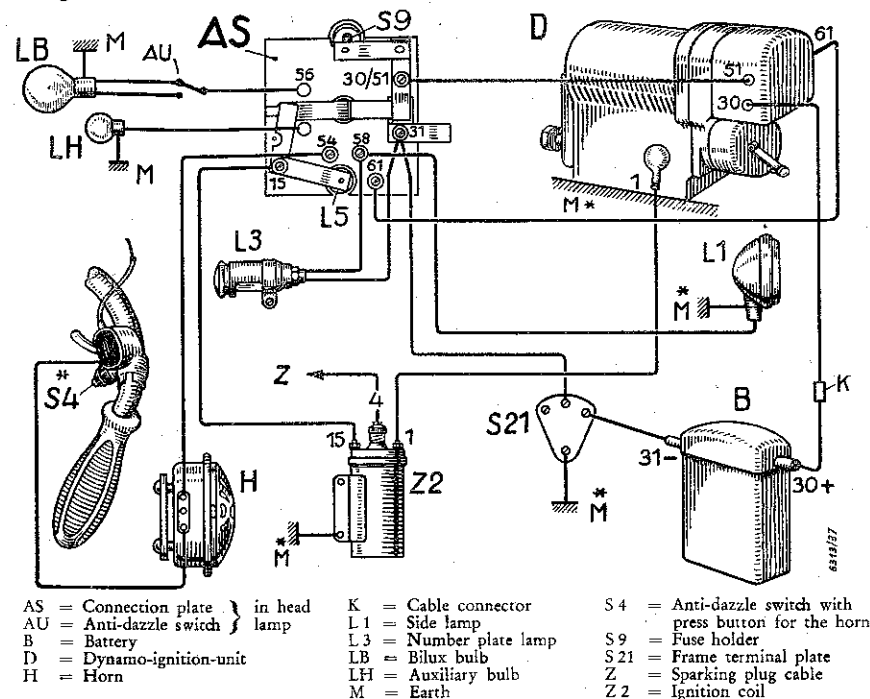
Battery troubles

Battery troubles need hardly be expected if the instructions are carefully followed. Trouble may arise owing to the fact that tools are placed on the open battery when the cover is off, thus shorting one or more cells. This not only causes an involuntary discharge, but also damages the cells, as the plates suffer. Spilled acid must at one be carefully wiped off. If other troubles occur, such as, shorting inside a cell, detached pole head connections, loosening of plates, cracking of the lead paste, cracking of the ebonite box, etc., then the battery must be forwarded to a repair shop.

In the event of a complete breakdown of the battery, put the bridge connector 217g (Fig. 3) in position "Dyn" and start with the dynamo alone, as described on page 3.

Wiring diagram

Current is returned through the frame. The parts marked * must therefore make good metallic connection with the frame or engine.



For all wiring purposes with the exception of plug cable, lacquer cable of 1.5 sq. mm are used (order number NKA 14/1.5). If the number plate lamp shall be used as a tail lamp, a two core cable (order number NKA 30/0.75) may be used.

Appendix

BOSCH Dynamo-Coil-Ignition-Unit B 245

This Dynamo-Coil-Ignition-Unit is similar to the devices B 142, BK 142 and B 145, with the difference that it is intended for two-cylinder engines, and as a consequence it has a distributor disc instead of the contact breaker cover. The lighting output is 45 watts, with 6 volts tension.

Timing to the engine:

Set the piston of one of the cylinders at the correct firing position as described in page 5; set the ignition control on the motor cycle at "full advance", and remove the distributor disc 113 (Fig. 21).

Rotate the driving shaft in the normal direction of rotation (see arrow on housing) until electrode 112 a on rotor 112 occupies the position shaded in Fig. 21 and the breaker contacts 107 a and 107 b are just opening. The dynamo-ignition-unit should be coupled with the engine in this position.

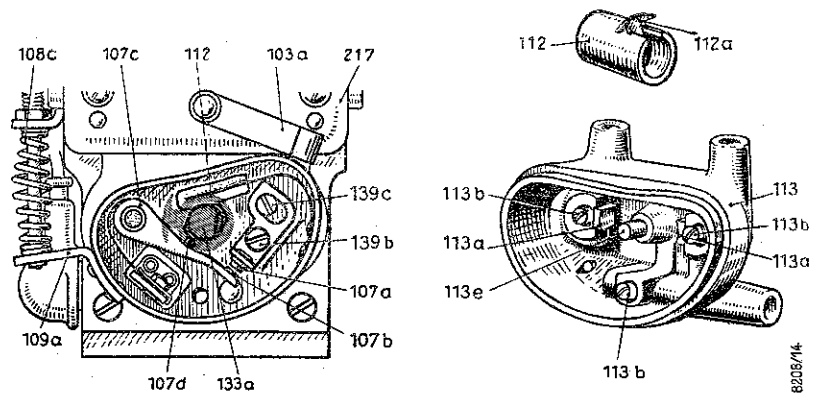


Fig. 21. Dynamo-Coil-Ignition-Unit B 245, distributor disc removed

- | | | |
|---|-------------------------|-----------------------------------|
| 103 a = Distributor disc holding spring | 108 c = Pull off spring | 113 b = Pointed screw |
| 107 a = Adjustable contact | 109 a = Timing lever | 113 c = Carbon brush |
| 107 b = Breaker lever contact | 112 = Distributor rotor | 133 a = Contact breaker cam |
| 107 c = Contact breaker lever | 112 a = Electrode | 139 b = Contact locking screw |
| 107 d = Insulating block in contact breaker lever | 113 = Distributor disc | 139 c = Eccentric adjusting screw |
| | 113 a = Distributor | 217 = Regulator cover |

Cable connections

Connect the vertical high-tension terminal marked "1" on the distributor to the sparking plug of the cylinder which has been used for timing; the other vertical H. T. terminal should be connected to the sparking plug of the other cylinder. Run a cable from the (horizontal) terminal 4 of the distributor disc

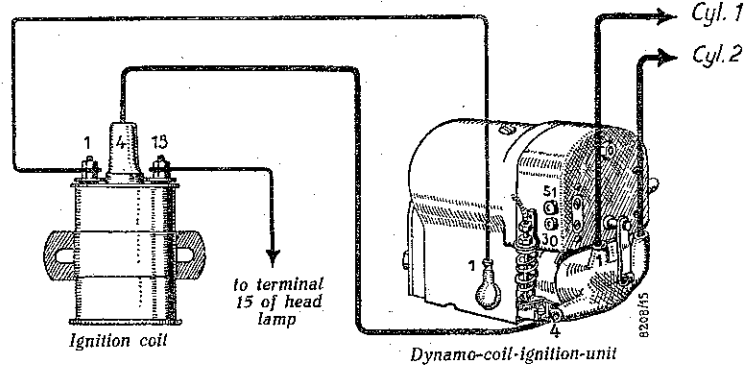


Fig. 22. Wiring diagram for dynamo-coil-ignition unit B 245
(all other cable connections as on wiring diagram page 23)

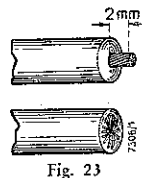


Fig. 23

to terminal 4 (high-tension terminal) of the ignition coil. The cables are secured to the distributor head by means of pointed screws 113 b (Fig. 21). If a cable is to be replaced, unscrew the corresponding pointed screw 113 a, and detach the cable end from the distributor disc. Bare the new cable for about 2 millimetres ($\frac{3}{32}$ "), and splay the wires of the core against the rubber insulation (Fig. 23). Push the cable hard home into the terminal until it touches the bottom of the hole, then tighten the pointed screw until its head is firmly seated. Make sure by a gentle pull that the cable is properly fastened. The cables are attached to the ignition coil as described page 8.

ROBERT BOSCH G.M.B.H., STUTTGART
VTD-B 9868-3 (8. 38)