

DUCATI
860 cc.

**instructions for use
and maintenance**

MOTORCYCLE 860 cc.
TWO CYLINDERS
SINGLE SHAFT

DUCATI

Dear Sir,

We are very glad to welcome you among our clients, and feel sure that you will not fail to appreciate the magnificent performances of the DUCATI Motorcycles.

The magnificent performances and reliability of our machines reflect the experience gained throughout many years of successful racing both on track and road.

In order to obtain the fine service that the Ducati machine is capable of giving, it is essential that the instructions contained in this book be religiously adhered to.

If these instructions are followed closely, particularly during the running-in period of the machine, then you will be assured of many years trouble-free enjoyable riding.

We thank you and congratulate you on your wise choice of such a fine machine with unequalled performances.

DUCATI MECCANICA S.p.A.

SPECIFICATIONS - USE - MAINTENANCE

1st ISSUE - PRINTED DM - Mod. 783/E - February 1975 - 10.000

Every Motorcycle receives one copy of the present booklet.

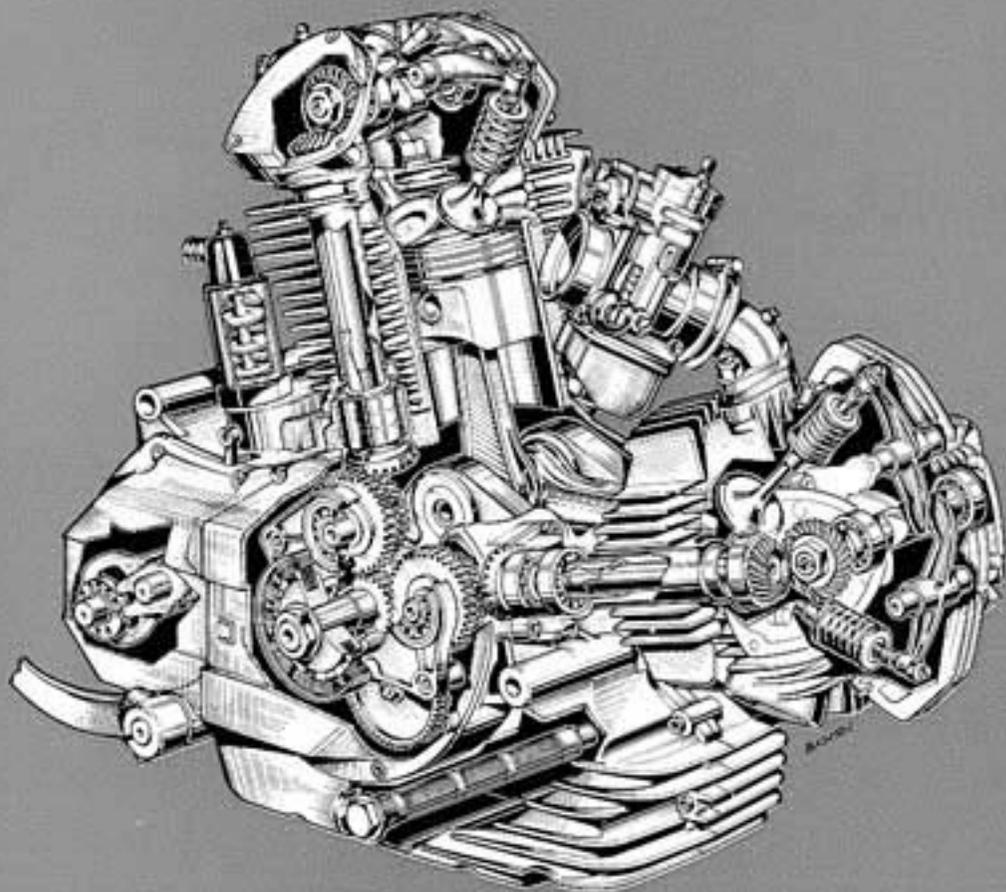
GUARANTEE CARD

Every **DUCATI MOTORCYCLE** is supplied with a « Guarantee Card ».

The contents of this booklet are not binding and though the main specifications of the motorcycle described and illustrated in this booklet remain unchanged, the **DUCATI MECCANICA S.p.A.** will be free to introduce modifications of some details, or of some accessories, if these modifications will be judged necessary, or if they can improve the motorcycle, or finally for some technical-economical exigencies, but without being obliged to bring this booklet up-to-date.

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THE ENGINE IN SECTION VIEW



A FOREWORD

The main goal of the present instruction booklet is to enable the owner of a DUCATI Motorcycle to use his vehicle in the best possible way.

The following notices are therefore only simple recommendations, suggestions, advices, and terms of reference, sufficient to enable anyone, having no experience or ignoring any special technical knowledge, to use his vehicle and to maintain it for a long time in perfect working condition.

In this booklet you will find the specifications of the new model of the precious series of motorcycles produced by DUCATI.



DUCATI SERVICING GARAGES

It is advisable, when taking the machine to a garage for repairs, to be sure that the garage is a Ducati agent as the staff will have been specially trained and the garage will have been equipped with the necessary tools to carry out any repair required (see pictures at page 57 and following).

This way you will be sure that the possible replacement of groups or parts will be made with genuine Ducati spares, in order to avoid unforeseeable troubles and to ensure interchangeability, good operation, and long life.

ORDERS FOR SPARE PARTS

It is absolutely necessary that each order for spare parts clearly states the following data:

- 1) The catalogue code of the spare part obtained from the Spare Part Catalogue;
- 2) Serial number of the engine (when ordering spare parts of the engine);
- 3) Serial number of the frame (when ordering spare parts of the frame).
- 4) The reason why the spare part is required.

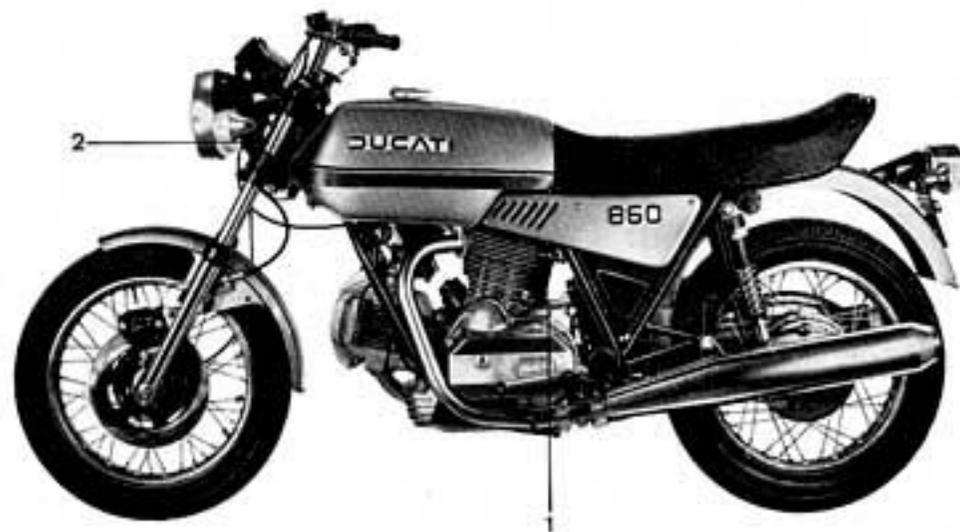
For the requests of spare parts under the warranty, the Dealer has to fill in the special application form (in 2 copies) and send it together with the defective parts to Ducati Meccanica, for technical examination and the eventual replacement free of charge.

IDENTIFICATION NUMBERS

Every DUCATI 860 can be identified by its frame and engine serial number.

For the frame, the number is printed in the steering tube.

The engine serial number is stamped on the crankcase near the vertical cylinder base.



1 - Engine serial number

2 - Frame serial number

PRECAUTIONS

TO BE FOLLOWED DURING THE INITIAL RUNNING-IN PERIOD

During the first 1000 Km. (620 miles), the rev. counter must not exceed 4500 ÷ 5000 r.p.m.

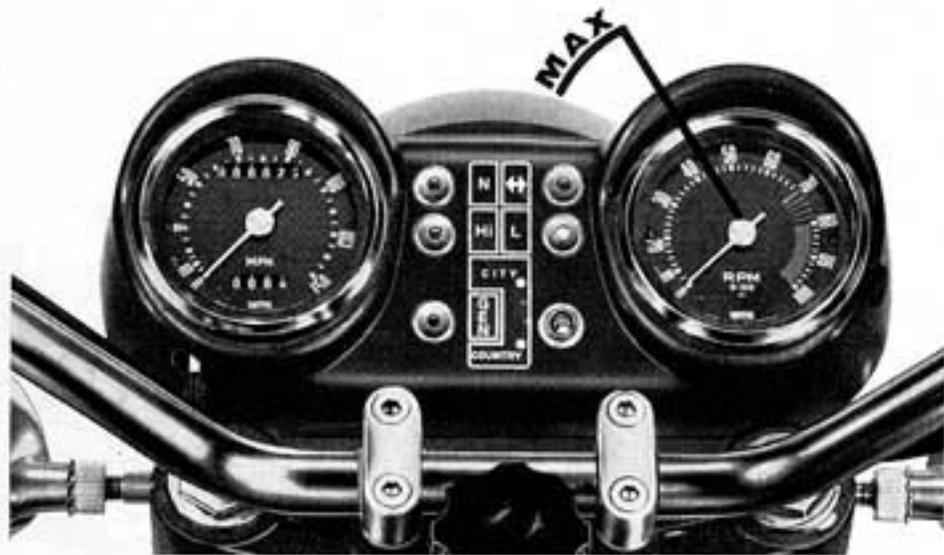


Fig. 1

Moreover, it is advisable to ride as follows:

During the first 1000 Km. (620 Miles)

- Do not force the engine, keeping it for a long time at a high number of revolutions, especially while going uphill;
- Keep the chain well lubricated and in the correct tension.
For adjustment, follow the instructions of pages 28 and 29.
- Check if the wheel spokes are loose: if so, go to your local Servicing Garage who can adjust them to the correct tension.

At 1000 Km. (620 Miles)

- Replace the oil in the engine crankcase and the correspondent filter.
- Check if the nuts securing the head and cylinder to the crankcase are tight, as well as nuts and bolts in general.

From 1000 to 3000 Km. (620 Miles to 1860 Miles)

The owner can expect better performance from his machine if he does not exceed 5000-5500 rpm for the first 3000 Km. (1860 Miles).

The more strictly and accurately you follow the aforesaid recommendations, the longer the engine life and the less the need for overhauling and tune-up.

MAIN SPECIFICATIONS

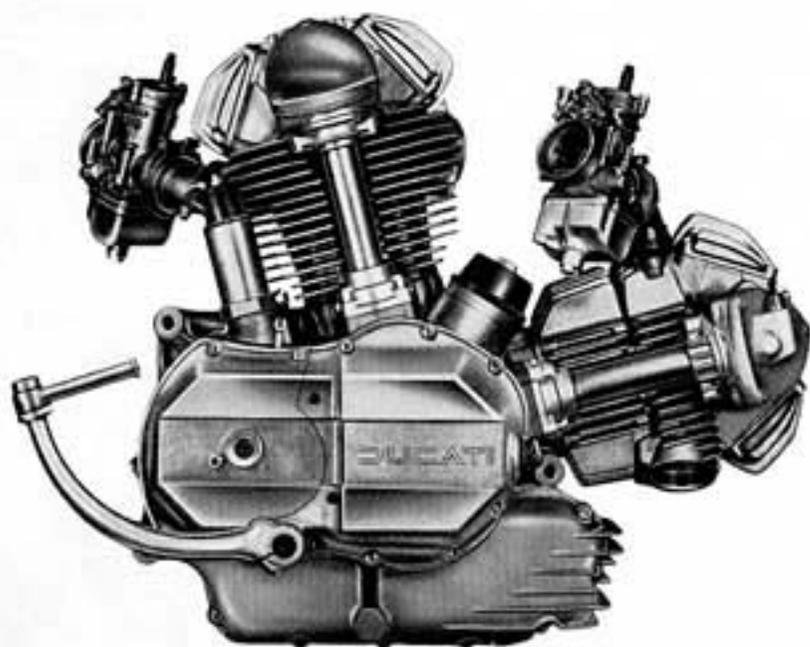


Fig. 2

ENGINE

- two cylinders, 4 strokes, « L » longitudinal-type of 90° - supported by a cradle formed frame;
- bore: 86 mm (3.38583");
- stroke: 74,4 mm (2.9291");
- cylinder capacity: 863,9 cc. (52,699 cu. in.);
- compression ratio: 9.5 : 1;
- combustion chamber with hemispherical ceiling;

- deeply finned cylinders in light alloy, with special cast iron liners inserted;
- connecting rods in special steel, with roller cage at the big end (crank pin) and little end bushed to take the gudgeon pin;
- pistons in light alloy, pressforged with skirt in one piece, and 3 piston rings, 1 of which is a slotted oil scraper;
- cylinder heads cast in light alloy and closely finned, with inserted valve seats.

TIMING

The timing system is provided with overhead valves, inclined at 80°, timed by an overhead camshaft. The valves are made of special steel, with hardened upper end.

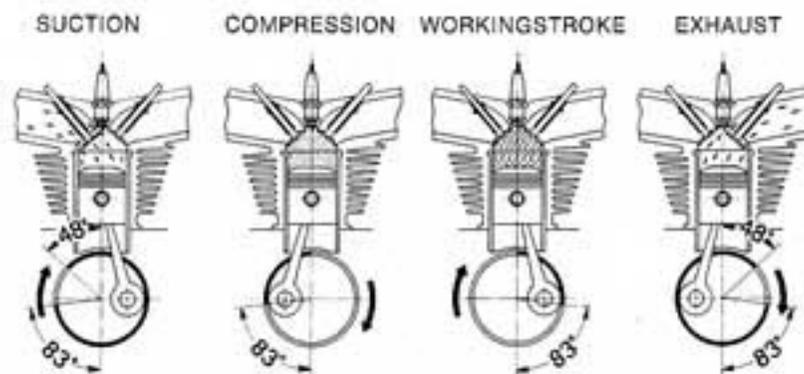


Fig. 3

Data

The timing data, with a clearance between valve and rocker of 0.10 mm (0.0039") for inlet and exhaust, between valve and rocker, are the following:

Valve	Opening $\pm 5^\circ$	Closing $\pm 5^\circ$
Suction	48° before TDC	83° before BDC
Exhaust	83° before BDC	48° before TDC

Adjustment

The tappets are adjusted by means of the appropriate rocker shim (see Fig. 4).

Clearance

The working clearance between valves and rockers, when the engine is cold, is of about 0.08 mm. (0.00315") for the suction, and 0.12 mm. (0.00472") for the exhaust. The clearance has to be adjusted and checked with a feeler gauge, after the said timing data have been controlled.

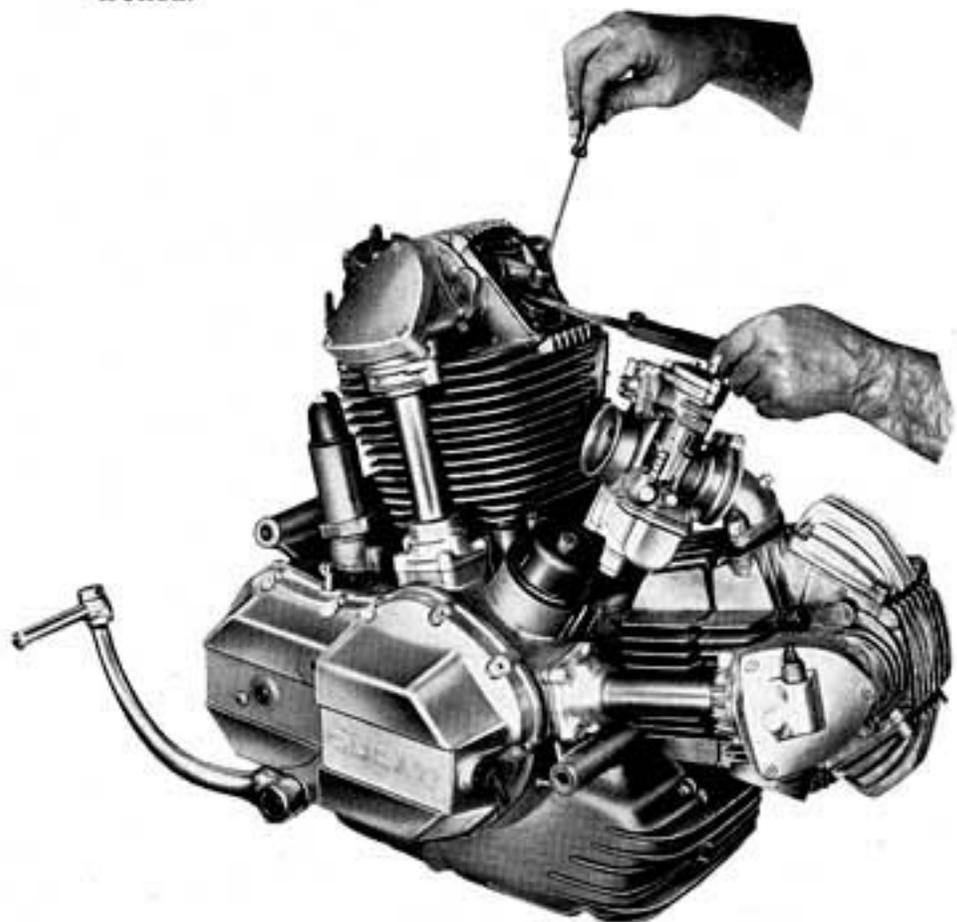


Fig. 4

ADJUSTMENT OF THE IDLING

When the engine is hot, adjust the 2 throttle stop screws (see Fig. 5) until each cylinder has an equal tickover. Then adjust the mixture screws to the position where you obtain the fastest tickover (see Fig. 6) approx 1½ turns out. Then make equal turns on the 2 throttle stop screws until the tickover settles at 800/1000 r.p.m.



Fig. 5

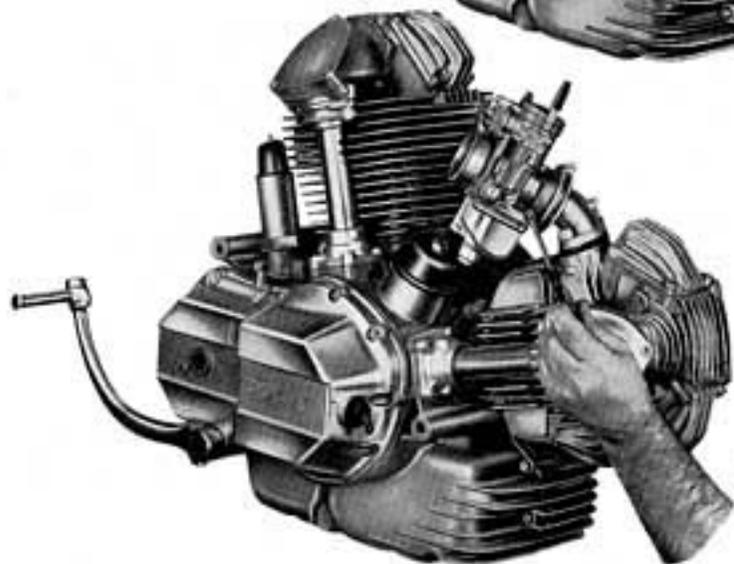


Fig. 6

Note: The mixture screws should be turned in to weaken the mixture and out to richen the mixture.

Engine timing

The timing gears in the crankshaft and on the camshaft, are provided with reference marks engraved on the toothed periphery.

The engine is timed when the above mentioned marks are disposed as indicated by the arrows in the following illustration (Fig. 7).

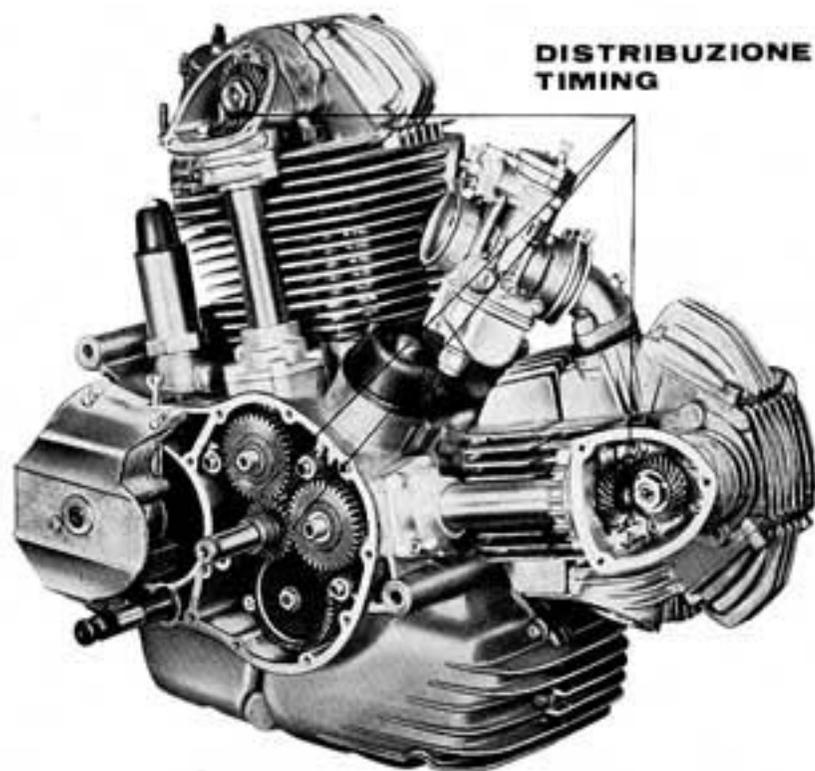


Fig. 7

PETROL FEED

The petrol feed of the engine is by gravity, by means of 2 Dellorto carburetors, with air filter.

Model	Carburat.	Atomizer	Diffuser	Main Jet	Idling Jet	Pin Position
FRONT	PHF32AD	106	32	122	60	K6 2nd notch
REAR	PHF32AS	106	32	122	60	K6 2nd notch

The tank has a capacity of 17 liters (3.74 Imp. gal. = 4.49 U.S. gal.) with two 3-position cocks: closed - open - reserve.

The reserve is about 2 litres (0.44 Imp. gal. = 0.53 U.S. gal.).

SILENCER TYPE APPROVAL

On the rear R.H. plate supporting the engine, there is an indication plate with the wording E₃-9R-13716 regarding the silencer type approval (see Fig. 8).

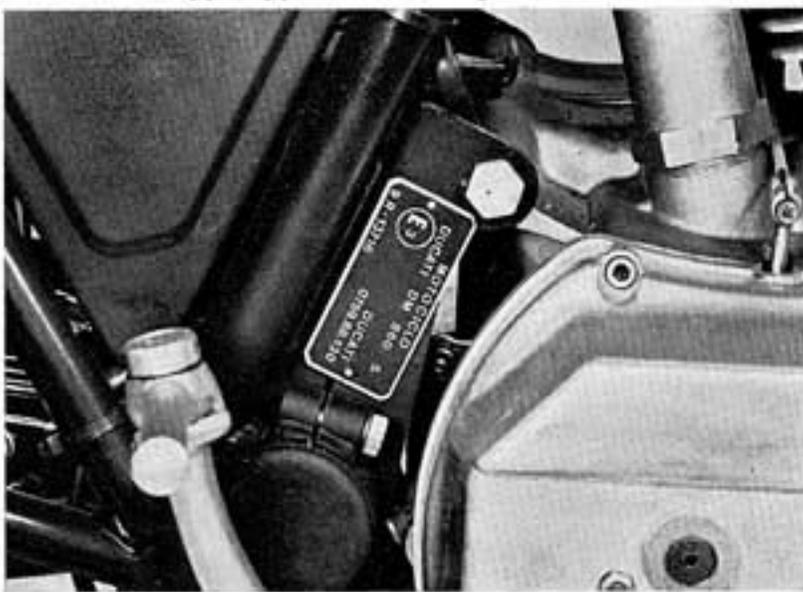


Fig. 8

LUBRICATION SYSTEM

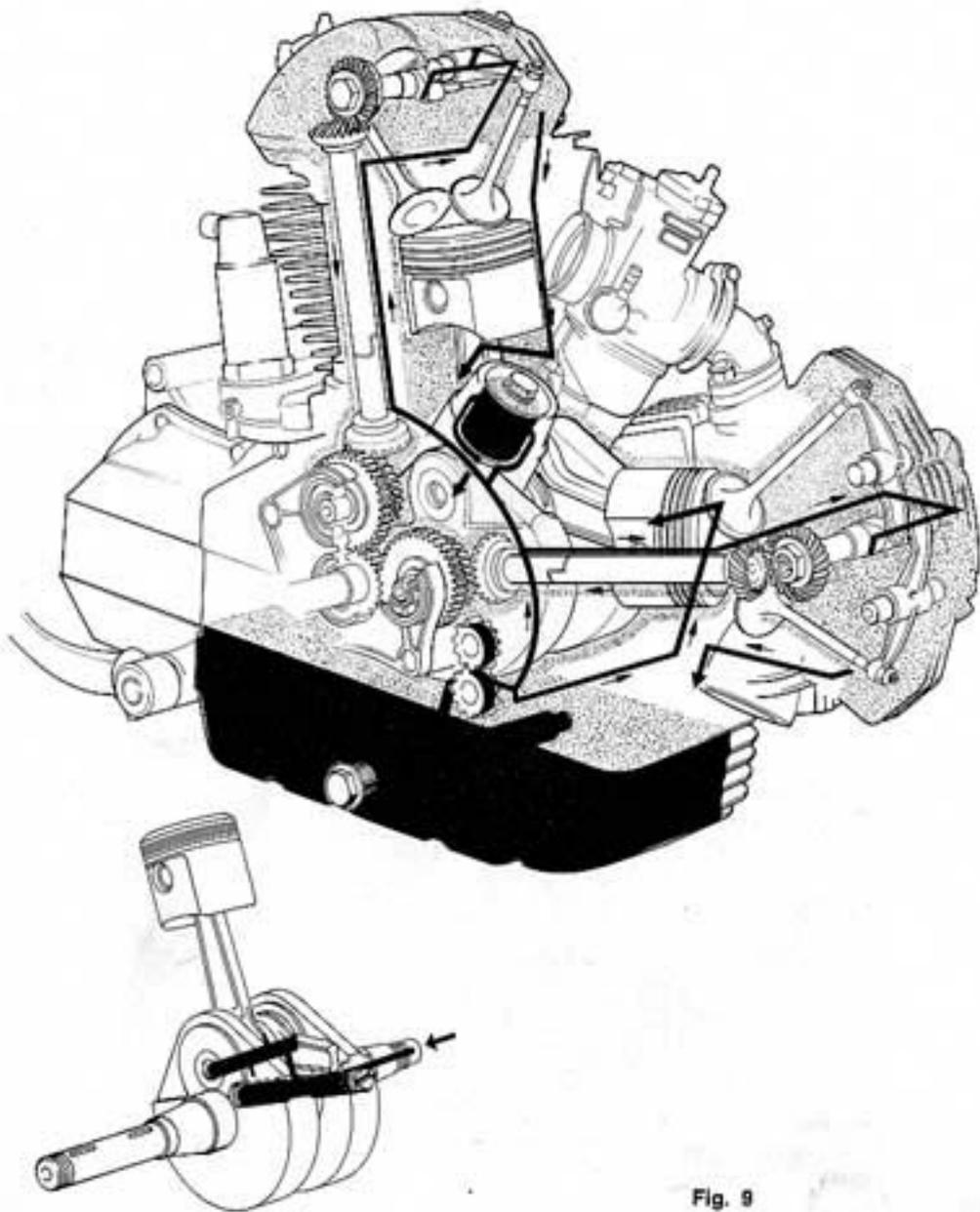


Fig. 9

LUBRICATION (see Fig. 9)

The engine is pressure lubricated, by means of a gear pump driven by the shaft; this pump takes the oil through a first filter, from the lowest point of the crank-case which acts as an oil sump, and forces it through proper oil-ways, to all parts of the engine which have to be lubricated. The oil returns by gravity.

The sump capacity is of about 4.5 Kg. (10 lbs) = lt. 5 (1.10 imp. gal. = 1.32 US gal.).

The filler plug stick is marked by two notches in the spots where the oil level is respectively at its lowest and at its highest point.

The oil level is measured by just resting the plug on the filler (see Fig. 10).

— The lubricating system of the DUCATI 860 GT motorcycles with single-shaft engine is quite simple and requires no special maintenance except the renewal of the oil level every 500 Km. (about 310 miles) and the total change of the oil, including the cleaning of the filter every 5000 Km. (about 3100 miles).

An oil-filler with stick consisting of:

- 1) Stick-provided filler plug;
 - 2) Sealing gasket;
- allows the oil level measurement.

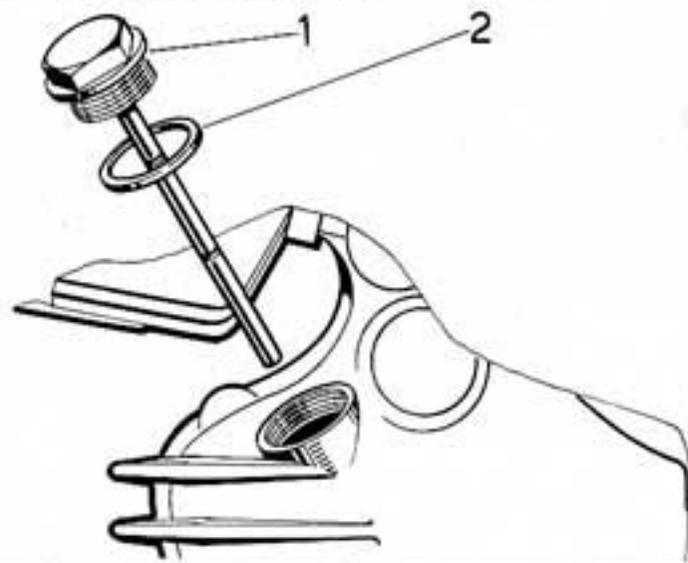


Fig. 10

FILTER CARTRIDGE (see Fig. 11)

The oil filter is placed in the center of the engine (see photograph) between the twin cylinders and it is necessary to replace it with the first oil replacement at 1000 Kms (620 Miles) and at 5000 Kms (3100 Miles); after that mileage it is sufficient to replace it only every two oil changes, i.e. 15.000 Kms (9300 Miles) and 25.000 Kms (15.500 Miles).



Fig. 11

AIR COOLING

The close finning of both cylinders and heads facilitates the natural loss of heat, by air.

ELECTRONIC IGNITION SYSTEM

This works by CAPACITOR DISCHARGE. The capacitor is charged by the generator and discharged through the high-tension coil when triggered by the MAGNETIC PICK-UP.

The system consists of the following parts:

a) Ignition generator (Fig. 12)

This can be reached by removing the clutch cover on the L.H. side of the engine. This incorporates the lighting and ignition coils and also the magnetic trigger.

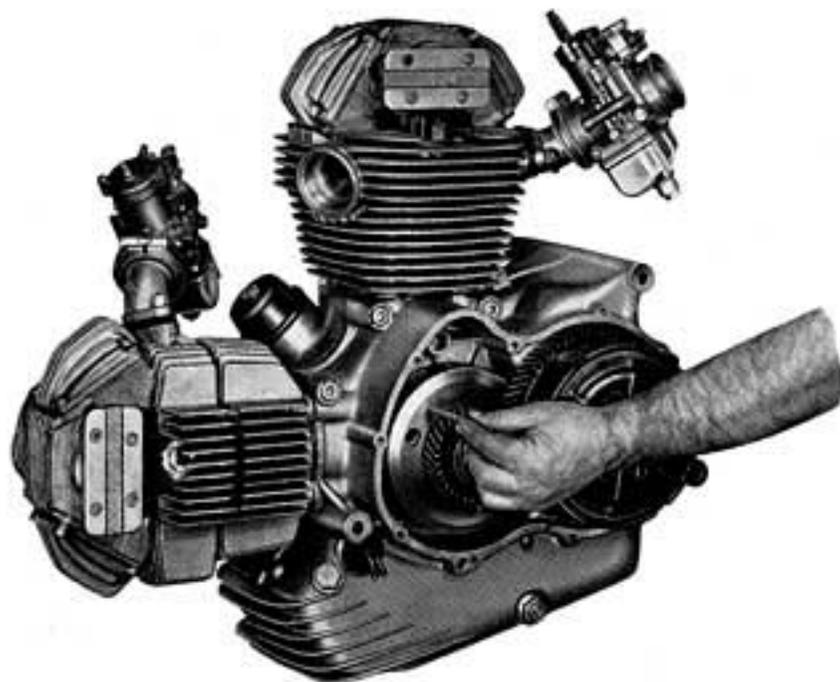
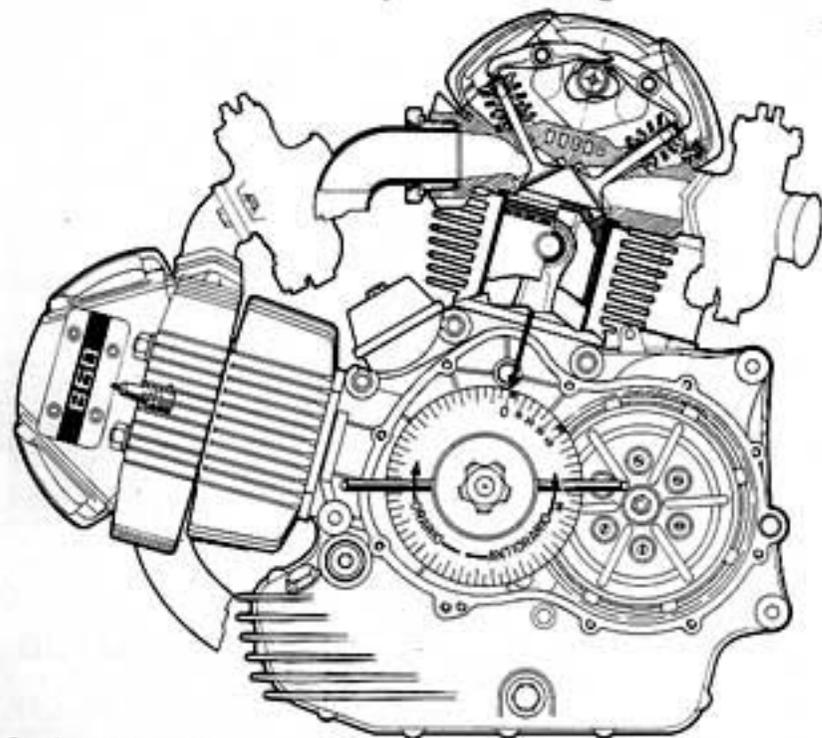


Fig. 12

- 1- By means of a screwdriver, loosen the three screws that secure the plate.
- 2- Fit the protractor wheel on the engine axis (see Fig. 13).
- 3- Bring the piston of the vertical cylinder to TDC of compression stroke and set the indicator at « 0 » of the timing wheel.
- 4- Rotate the driving shaft clockwise for about a quarter of a turn.
- 5- Rotate the engine slowly in the direction of its movement stopping it at 38° of advance (reading it on the wheel) (see Fig. 14).
- 6- Insert a pin in the small hole on the flywheel magnet of the electronic generator and displace the plate till the pin enters in the corresponding back-plate hole (see Fig. 12).
- 7- By means of the screwdriver fasten the three screws that secure the stator plate to the engine crankcase.



Orario = clockwise
Antiorario = anticlockwise

Fig. 13

ATTENTION: The spark advance: at about 2000 rpm it is released with an amplitude of about 28° in a single stage.

Note: To remove the rotor from the generator, use the appropriate puller (see pages 57 and 58, item 11); never and for no reason tap on the rotor with a hammer.

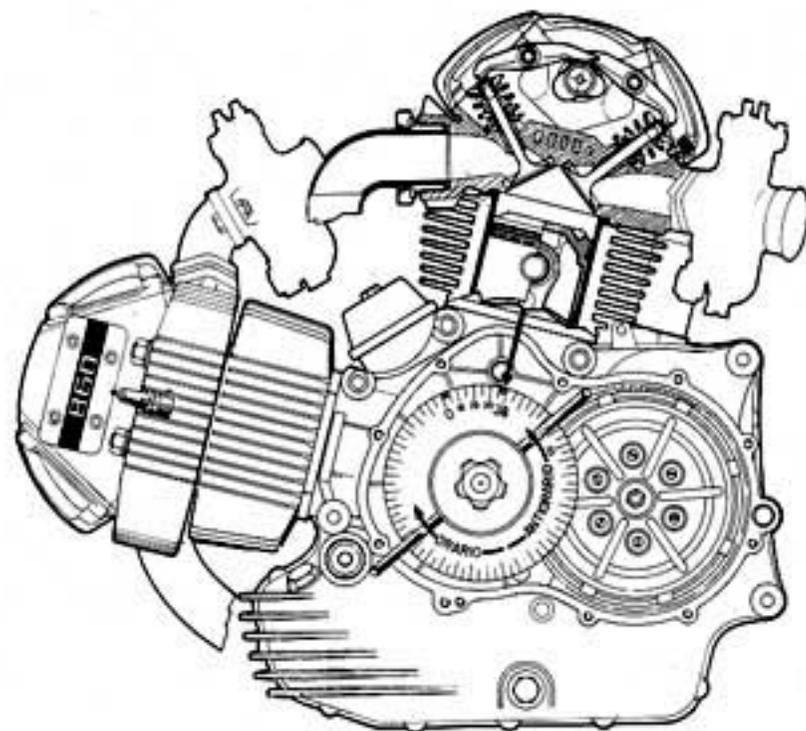


Fig. 14

b) Transducers

These are special coils working electronically, placed under the fuel tank and sheltered by special rubber caps for the electrical contacts.

c) Spark plugs

The spark plugs are CHAMPION L 88 A of the normal type or a similar model, and are located on the left side of the top of the cylinder heads.

The clearance between the electrodes must be 0.8 mm. (0.0315").

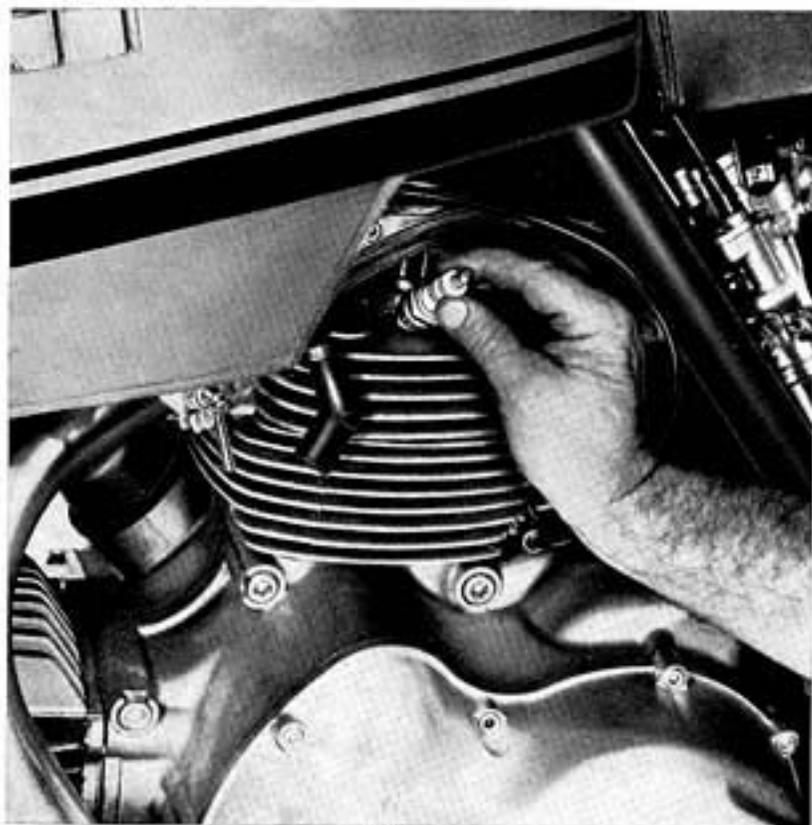


Fig. 15

When refitting the spark plug make sure to fit it with the same angle of the head base; screw the plug lightly at first, then tighten it. This will avoid eventual risks of stripping the thread in the cylinder head (see Fig. 15).

Advance checking through stroboscopic light

Carry out the following operations:

- 1) Mount the advance checking indicator 88713.0116 on the driving shaft center line, clutch side, after removing the plug.

- 2) Insert the stroboscopic light cable into the spark plug of the cylinder under check.
- 3) Start the engine until attaining about 3,000 rpm. and direct the stroboscopic light on the reference mark (I) of the cylinder in question, placed on the cover, clutch side.
- 4) The stroboscopic light must light up the phasing indicator perfectly aligned with the reference mark (I). If it is not, adjust the coil ignition rotating the stator base of the ignition generator: **to advance rotate anti-clockwise; to retard rotate clockwise** (see Fig. 16).

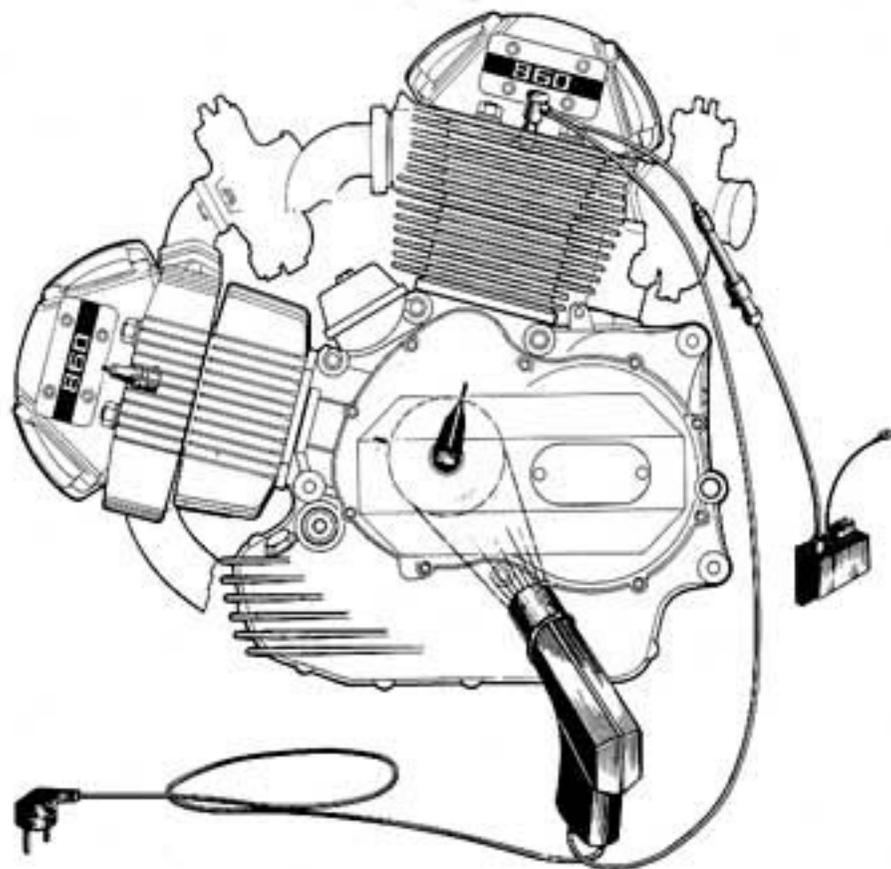


Fig. 16

TRANSMISSION

The transmission consists of the primary transmission, the clutch, gearbox and secondary transmission. The clutch is of the multiple plate type with steel discs and friction material. It turns in an oil bath and is mounted on the primary shaft of the gear box.

The clutch housing, made of special wear resisting steel, rotates on two inner bearings which are set at an adequate distance.

It is conveniently lubricated together with the engine sprocket.

The clutch is operated by a handlever placed on the left side of the handlebar.

The transmission between engine and primary shaft of the gearbox, is obtained by means of helical gears and the reduction ratio is 2.187 to 1.

The gearbox is in the crankcase; the gears for the 5 speeds are constantly meshed and operated by a foot pedal.

The transmission ratios of the gears are the following:

- in bottom gear 2.237 to 1
- in second gear 1.562 to 1
- in third gear 1.204 to 1
- in fourth gear 1.000 to 1
- in top gear 0.887 to 1.

The transmission between the gearbox and rear wheel is obtained by a chain and the speed ratios are:

- $15/37 = 1/2.467$ or
- $15/38 = 1/2.533$ or
- $16/40 = 1/2.5$.

FRAME

The frame of the DUCATI 860 cc. is of the open double cradle type, made of high tensile steel and very sturdy structure.

FRONT SUSPENSION

The front suspension consists of a telescopic-hydraulic long-stroke, double action fork, with steering stop. Each fork leg contains 180 to 185 c.c. (11.132 to 11.450 cu.in.) of oil AGIP OSO-25 or equivalent.

REAR SUSPENSION

The rear suspension consists of a swinging fork with double action, hydraulic adjustable load dampers (shock-absorbers) which can be adjusted for three different loads: Minimum - Medium - Maximum (see Fig. 17).



Fig. 17

FORK FULCRUM-SPINDLE

In this motorcycle the fork fulcrum-spindle is fixed to the frame, while the fork provided with bronze bush, rotates on it.

This system gives the machine greater sturdiness. The spindle is fitted on a special eccentric chain adjuster (see Fig. 18).

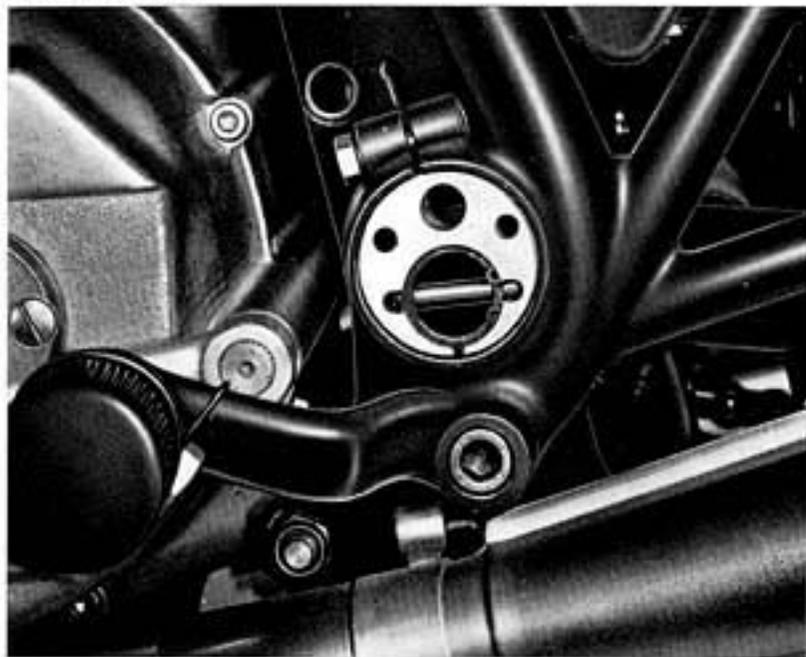


Fig. 18

CHAIN TENSION ADJUSTMENT

For the correct chain adjustment, up and down movements should be no more $15 \div 20$ mm. ($0.59'' \div 0.79''$), with grounded machine and one person sitting on the rear part of the saddle, or with rear suspensions at half-stroke (see Fig. 19).

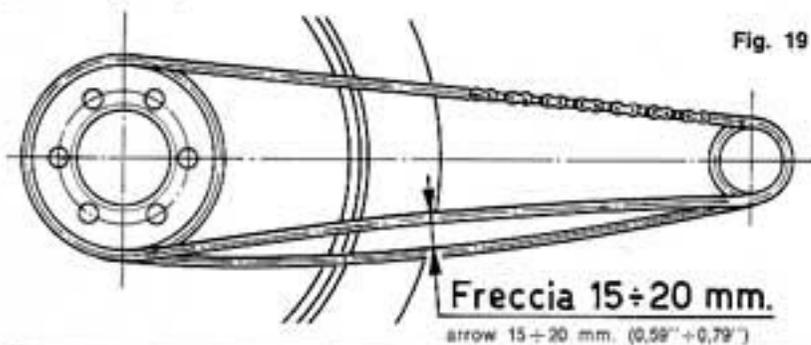


Fig. 19

To increase the chain tension, follow the instructions hereunder (see Fig. 20):

- 1) Remove the plastic covers protecting the rear fork spindle.
- 2) With the appropriate wrench loosen bolt B on both sides of the motorcycle.
- 3) With the help of a special wrench coupled with the eccentric pin P, rotate till obtaining the chain correct tension.
- 4) Tighten the two bolts B.
- 5) Refit the plastic protection covers.

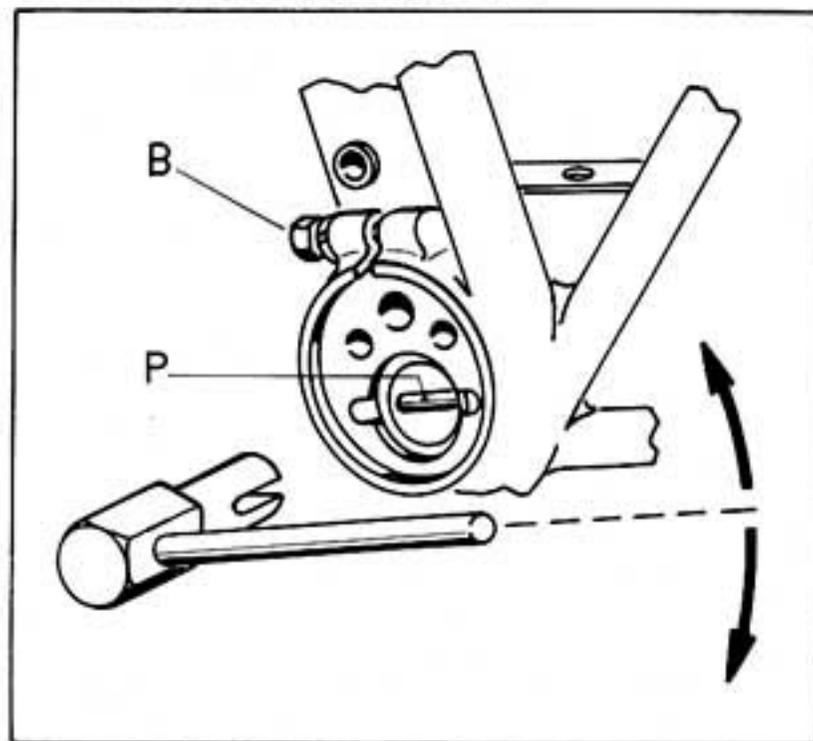


Fig. 20

SADDLE

The motorcycle is provided with hinged, and comfortable seat for two persons. For eventual checks of the electrical equipment, replacement of fuses and to have access to the toolkit, the seat has to be raised. To carry out this ope-



Fig. 21

ration, open the lock and press the lever in the direction of the arrow (see Fig. 22).



Fig. 22

WHEELS

The wheels are of the spoke type with rims as follows:

Material	Profile	Wheel rim size	
		Front	Rear
Steel	Normal	18" x 3"	18" x 3"

The wheels are with detachable spindle.

The rear wheel has a special cushion drive and can be dismantled without removing the chain.

Tyres and pressures are as follows:

Model	Tyre	Front wheel		Rear wheel	
		Tyre size	Pressure Kg/cm ² (lb/sq.in.)	Tyre size	Pressure Kg/cm ² (lb/sq.in.)
U.S.A.	Metzeler	3.50 H 18 - C 66	2.4 (34.14)	4.00 H 18 - C 66	2.7 (38.407)
STANDARD	Pirelli	3.50 H 18 -	2.2 (31.295)	120/90-4.70 H 18	2.5 (36.985)

BRAKES

The front brake is of the disc type with telehydraulic control by hand on the handlebar; the rear brake is of the drum type with pedal control.

The diameter of the front disc is 280 mm. (11.02"), the diameter of the rear drum with double cam is 200 mm. (7.87").

ELECTRICAL EQUIPMENT - LIGHTS AND CONTROLS (see WIRING DIAGRAM)

General Information

In this system most of the parts can be removed by means of special connectors, which allow the widest accessibility for repairs and replacements of damaged parts.

For the case the wires have to be disconnected from the connector pins, use a small tool (our drawing 88713.0114) that we can supply at request (see Fig. 23). Practically

it consists of 2 small tubes which have to be inserted in the connector pins, with a certain pressure and cause the straightening of the two stop tangs and the removal of the pin itself from the plastic body.

The tube with an « M » is for the male pin while that with an « F » is for the female pins. Before refitting the pins in their seats, open the stop tangs by means of a small screwdriver.

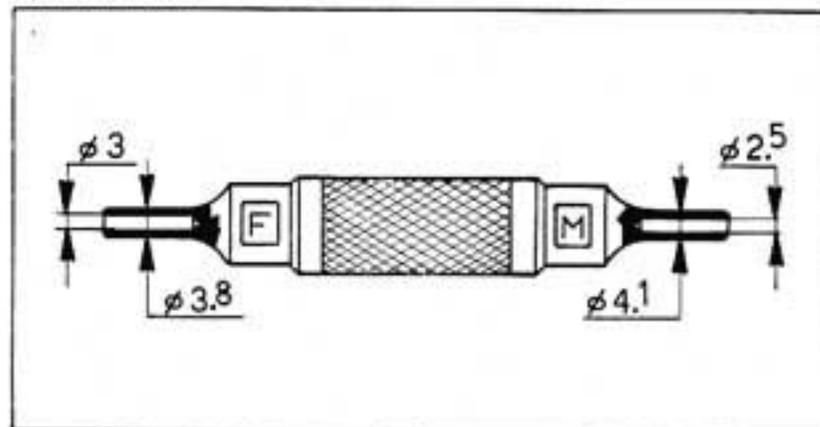


Fig. 23

The electrical system consists of the following main parts:

- 1) Headlamp
- 2) Dashboard
- 3) Horn
- 4) Stop switch
- 5) Key switch
- 6) Fuse box
- 7) Battery
- 8) Regulator
- 9) Alternator
- 10) Plate holder
- 11) Controls
- 12) Direction indicators (trafficators)
- 13) Electric starter

1) **Headlamp**

The headlamp has a large diameter (\varnothing 170 mm. = 6.69") and supplies a powerful light beam by means of a twin-light, 12 Volt 55/60 W - H 4, iodine bulb.

The headlamp is also provided with a 12 V - 3 Watt parking light.

In the USA version, it contains a Sealed Beam, \varnothing 6.69", 12 Volt bulb, without parking light. Inside the headlamp there are: a relay for headlamp, a flasher unit for the direction indicators and two special devices, one consisting of 2 diodes and 1 resistor for the engine cut off, and the other consisting of an impedance and a condenser (capacitor) for the two-tone horn.

2) **Dashboard**

On the two sides of the dashboard, are arranged the two instruments: Rev. and Km. counters (see Fig. 1).

In the middle there are the following warning lights:

- | | | |
|-------------------|------------|-----------------------------|
| GEN - red colour | indicating | Inserted key |
| L - white colour | " | Lights |
| Hi - blue colour | " | Main beam |
| ↔ - yellow colour | " | Flashers |
| N - green colour | " | Gearbox in neutral position |

A switch controls the two-tone horn: low tone for town; higher tone for country.

3) **Horn**

The 12 Volt horn is placed under the fuel tank in an adequate position to have the highest efficiency. As already said, it is of the two-tone type.

4) **Stop lamp switches**

That for the front brake is inserted in the hydraulic circuit of the disc brake, while that for the rear brake, of the conventional type, is fitted on the rear left side of the motorcycle. Both switches control the same device as they switch on the stop red light when braking.

Attention! As the rear stop switch is crossed by the brake wire, ensure that the two lucars are well protected by their sheath, in order to avoid any short circuit at earth with the central sheath body.

5) **Key switch**

It is placed under the fuel tank on the left side and works in three positions:

Parking lights, Stop, Running (see Fig. 25).

6) Fuse box

It is placed under the saddle and for access to it, lift the toolbox. **There are 5 fuses:**

F of 15 Amp. general fuse (of 25 Amp. in the motor cycles with electric starter);

F₁ of 8 Amp. protects the parking lights;

F₂ of 8 Amp. protects the headlamp lights;

F₃ of 8 Amp. protects the horn and Stop light;

F₄ of 8 Amp. protects the direction signal lamps.

Attention! While replacing a fuse, load the contact springs to allow to fit the fuse well tight.

If a fuse blew out, check to find the cause of the blowout before replacing it, otherwise the fuse will continue to blow.

7) Battery

The battery is a YUASA 12 N - 12 A - 4 A, of 12 Volts - 12 Ah. It is provided with a transparent case allowing to check the level of the electrolyte, and is placed in a special rubber box; it is elastically fixed.

In the motorcycles with electrical starter, is fitted a battery of the YUASA B 68 - 12 Volt - 36 Ah type.

Attention: the motorcycle can run, in an emergency case, also without battery, but in these conditions the lights must not be utilized, as well as all the other devices, horn, stop light, flashers etc.

To check the recharge current, always insert the ammeter with still engine.

8) Regulator

The regulator consists of an alum box placed under the saddle, containing the diodes to rectify the alternator current converting it into direct current for the recharge of the battery. Moreover it contains a special electronic set working in connection with the battery tension: if the battery is down (low tension) the recharge current will be high; if the battery is charged (normal tension 12 to 14 Volt), the current will be 4 to 2 Amp.

During the long runs on highways, especially with

switched out headlamp, the battery tension could exceed 14 Volts; in this case the regulator will stop the recharge current.

It is very important that the regulator be clamped on the frame in order to dissipate the heat produced by the diodes.

9) Alternator

Its power is more than 150 Watts. It is placed within the engine, clutch side. Three wires come out from it, and have to be directly connected to the regulator according to their colour.

Important! When removing the clutch side cover, take care not to damage the alternator windings.

10) Plate-holder

It is placed together with the tail light, on the rear mudguard and contains a 12 Volt - 5/21 Watt twin-light bulb.

11) Controls on the handlebar (see Fig. 24)

New model controls have been adopted which meet

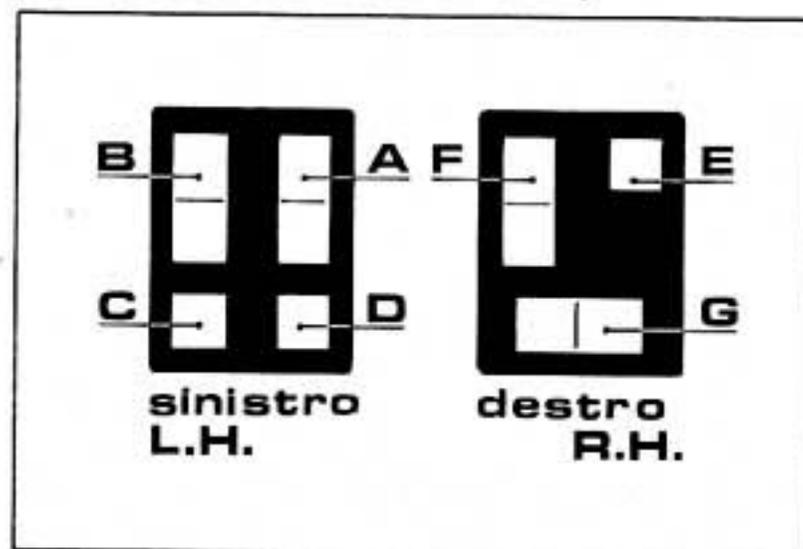


Fig. 24

all the requirements of the Traffic Regulations.

Left side:

Light switch . . . A) in BLUE colour (US edition:
BLACK colour)

Main beam switch,
low beam and parking
lights . . . B) BLACK colour (US edition:
BLUE colour without PAR-
KING position)

Horn press button C) in BLACK colour

Headlamp flasher
button . . . D) in BLUE colour

Right side:

Electrical starter
push button . . . E) in RED colour

Emergency
kill-switch . . . F) in BLACK colour

Direction
signal switch . . . G) in BLACK colour

Attention! The push button for the Emergency switch cuts off the engine, quickly, in case of emergency and acts earthing the two H.T. coils (transducers); **after the engine stop, displace it in position « RUN ».**

For normal use, employ the key switch which takes the current out of the entire equipment.

If after several attempts the engine does not start, check if the emergency switch is still on the « OFF » position.

12) **Direction flashers**

They are already fitted on the standard produced motorcycle and are controlled by the switch on the R.H. of the handlebar. In any device there is a 15 W - 12 V bulb. (In the US edition there is a 21 W - 12 V bulb).

13) **Electrical starter**

The electric starter is supplied on request; this mechanical device is placed at the engine left side. On the device there is a small motor of adequate size, helping to carry out a quick engine starting without difficulties.

The necessary current is supplied by a large YUASA B 68, 36 Ah - 12 Volt battery.

To carry out the starting, press the red button at the right side of the handlebar: the engine will start to regularly rotate.

During winter, if the motorcycle had a prolonged rest in a low temperature, it is advisable to « help » the engine with a kick on the pedal facilitating its rotation, as it would hardly start when cold.

SOME ADVANTAGES OF THE ELECTRIC EQUIPMENT WITH ELECTRONIC REGULATOR

The electrical system with electronic regulation of current offers real advantages in comparison with the recharge installation adopted on the other motorcycles.

The advantages can be summarized as follows:

- 1) Adjustment of the automatic charge.
- 2) No electrical contacts in the regulator and consequently there is a greater safety in the working.

Anyway great care should be taken not to disconnect the battery cables when the engine is running, because the regulator would surely remain damaged.

WIRING SYSTEM OPERATION

- 1) **Key in position A means parking** (see Fig. 25)
— The warning light is lit together with the parking lights. The key can be removed, if so desired.

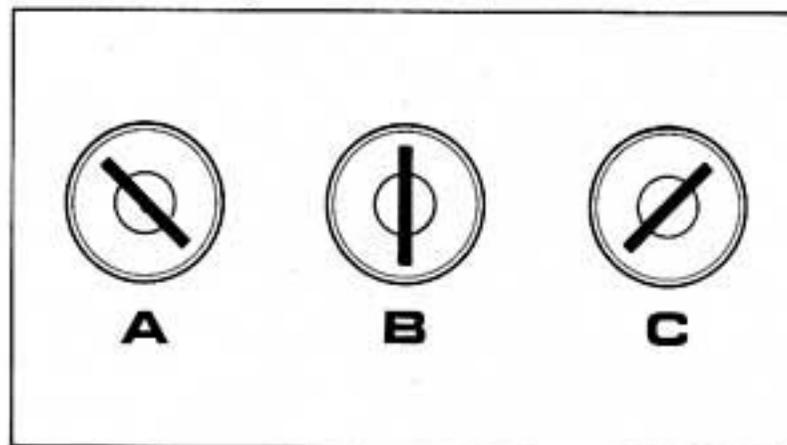


Fig. 25

- It is impossible to let the engine start.
- In the US edition, only the number plate bulb is lit.

2) **Key inserted in C position « Marcia = Running »** (see Fig. 25)

- The warning light GEN is lit.
- It is possible to start the engine and the battery is conveniently recharged.
- By means of the controls placed on the handlebar, Left and Right hands, it is possible to switch on the headlight, the parking lights, the flashers, horn etc.

During the working of all these electrical parts the battery is recharged all the same and the number of revs. for a balanced charge-rate will of course, rise:

Revs. for balanced charge-rate with switched out headlights = 1,000 rpm.

Revs. for balanced charge-rate with switched on headlights = 2,400 rpm.

By revs. for balanced charge-rate, we mean the engine revs. at which the battery begins to be recharged. Of course, if we fit on the motorcycle additional lights and horns the number of revs. for a balanced charge-rate will overload the alternator windings too.

The alternator can, of course, stand a certain additional load at condition however it will not exceed 25 to 30 Watts of absorption. Under these conditions however, there is the risk to be compelled to sometimes recharge the battery, unless the engine revs. have been kept beyond 3,200 rpm.

The recharge current intensity is rectified (according to the battery condition) by the electronic rectifier, which automatically stops the recharge when the tension exceeds 14 to 14.2 Volts (see point 12 - Rectifier).

Note! The GEN warning light remains lit also when the motorcycle is running.

3) **Key in still position B** (see Fig. 25)

The GEN warning light is switched out.

It is impossible to let the engine start because the two transducers are earthed; moreover the entire equipment is totally insulated and the lights cannot be switched on, as well as the other electric parts. The key can be removed, if so desired.

HANDLEBAR CONTROLS

As it has been seen in the previous paragraph, on the Left side of the handlebar, is placed near the fixed handgrip, the electrical control: main beam, low beam, horn button and headlamp flasher button. In front of the handgrip there is the clutch lever and above, the starter lever (see Fig. 26).

On the Right Side, there is the throttle handgrip and in front of it, the front brake lever. The electric control consists of the switch for the side flashers, the emergency kill-switch and the electric starter button.

At the Left Hand of the motorcycle, near the footrest, there is the 5 speed gear lever.

At the Right Hand there is the foot brake lever and the kickstarter pedal.

Note! The Stop light is controlled by both brakes, by means of two separate switches connected with their corresponding control levers.

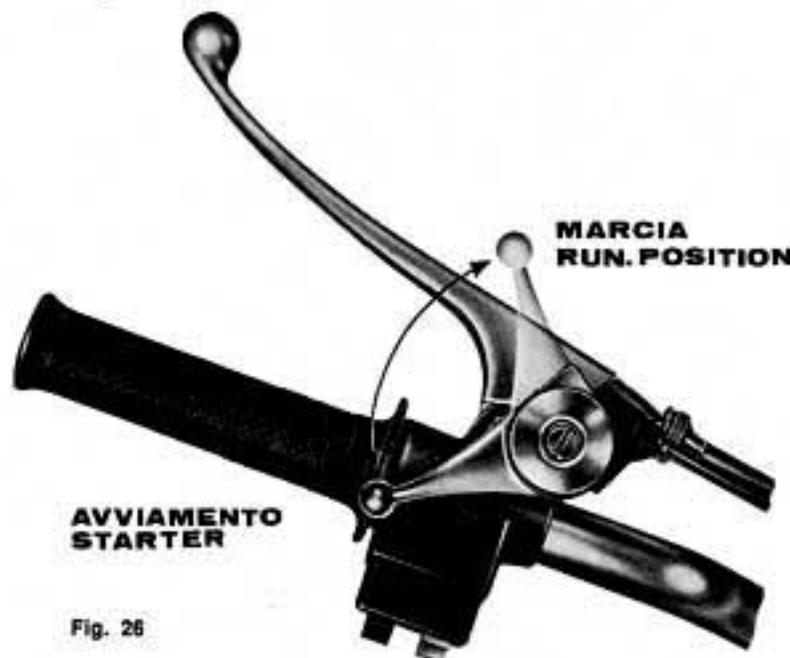
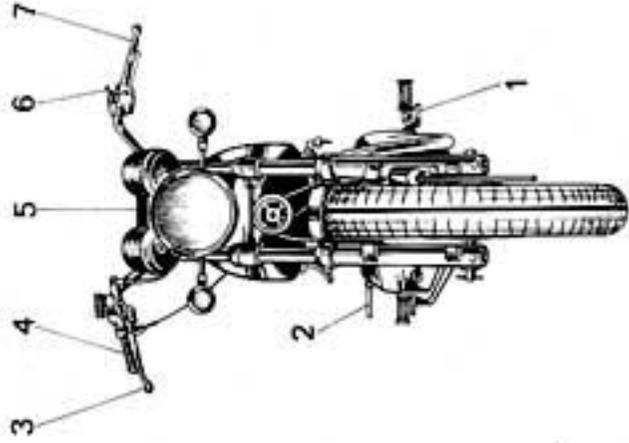


Fig. 26

CONTROLS



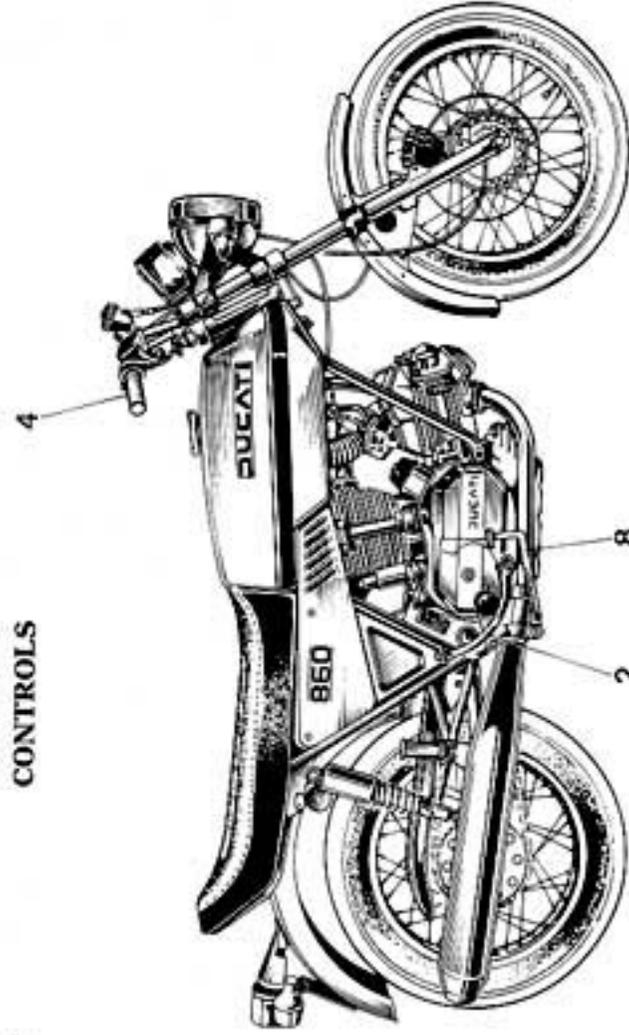
- 1 - Change gear lever
- 2 - Starting articulated lever
- 3 - Front brake control lever
- 4 - Accelerator hand grip

40

LEGEND

- 5 - Dashboard
- 6 - Starter
- 7 - Clutch lever
- 8 - Rear brake lever

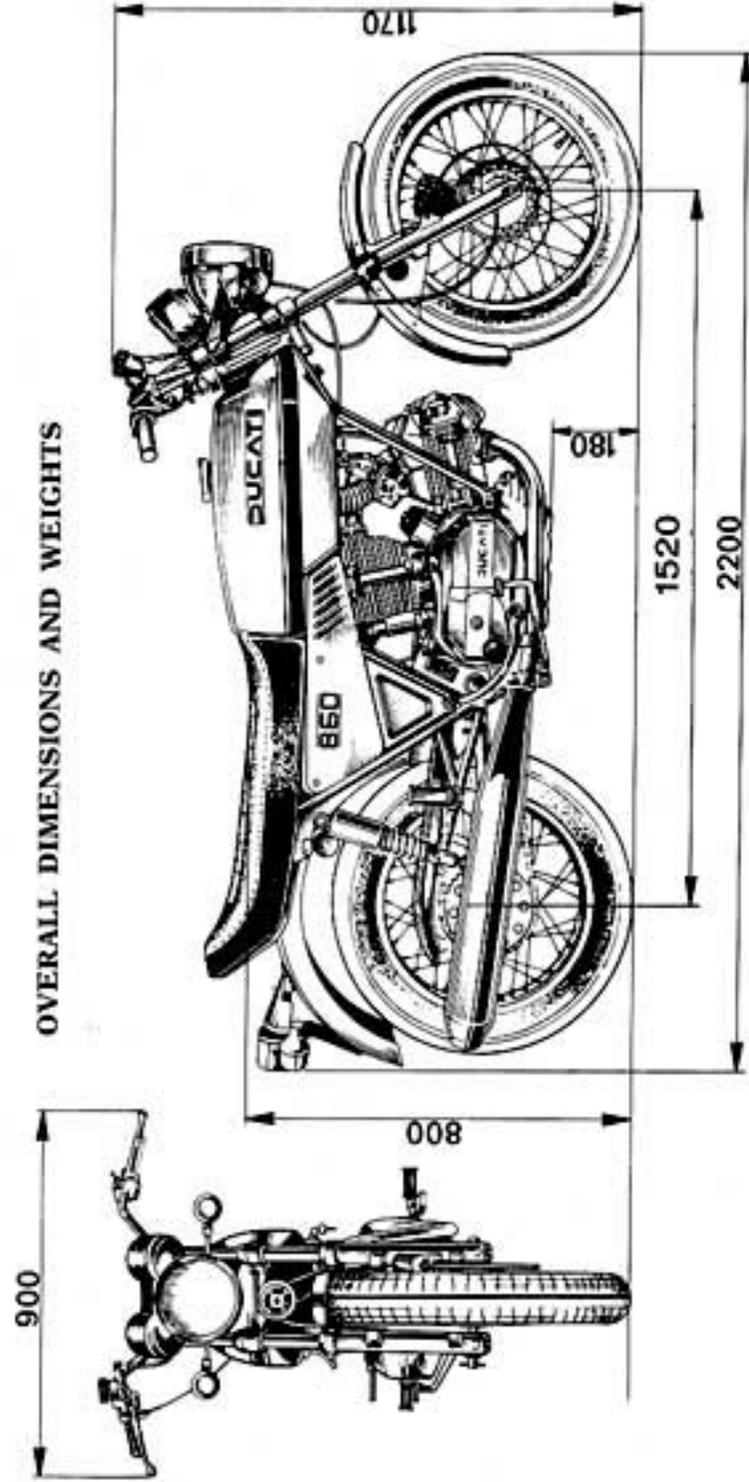
Fig. 27



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008

OVERALL DIMENSIONS AND WEIGHTS



Weights:

Motorcycle with Kickstarter
Weight empty (but with petrol and oil)
Kg. 220/484 lbs.

Motorcycle with electric starter
Weight empty (but with petrol and oil)
Kg. 230/506 lbs.

41

Fig. 28

TOOL-KIT

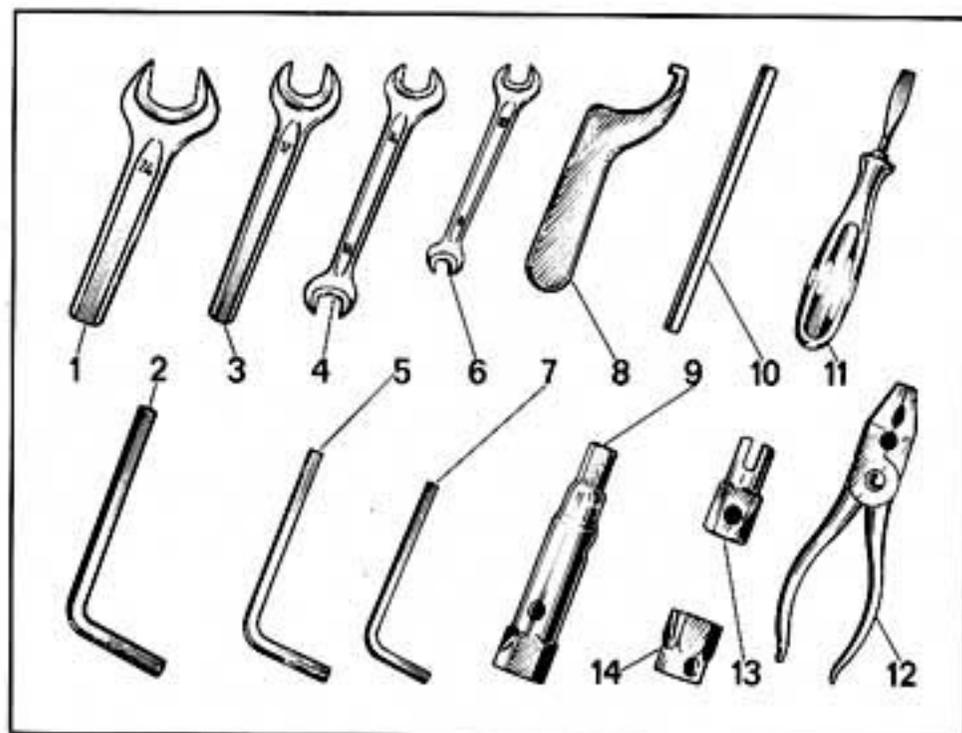


Fig. 29

TOOLBOX

A large toolbox of ample capacity is placed under the saddle and contains the spanners and tools needed for normal inspections or repairs that the rider himself can carry out (see Fig. 29).

- 1 - Normal spanner of 24 mm.
- 2 - Inner hexagon spanner 10 mm.
- 3 - Normal spanner 17 mm.
- 4 - Double box spanner 13 - 14 mm.
- 5 - Inner hexagon spanner 8 mm.

- 6 - Double spanner 8 - 10 mm.
- 7 - Inner hexagon spanner 6 mm.
- 8 - Spanner for shock-absorber adjustment
- 9 - Hexagon spanner for spark plugs and cover plug
- 10 - Pin for box spanner
- 11 - Screwdriver
- 12 - Universal pliers
- 13 - Spanner for chain adjustment
- 14 - Box spanner 21 mm. for oil plug.

PERFORMANCES

The max. speed can be obtained only by scrupulously following the running-in rules described at the pages 10 and 11, and periodically executing the maintenance operations listed at the pages 48 to 56.

Fuel: petrol AGIP SUPERCORTEMAGGIORE (or equivalent).

Max speed: about 190 Km/h (118 m.p.h.).

Consumption at 56 mph equals 46 mpg. - 6,25 liters per 100 Km. CUNA rules) = 20 Km./1 liter = (56 mi./Imp. gal. = 46 mi./U.S. gal.). Fuel distance approx. 190 miles per tank.

IMPORTANT

At any speed, do not exceed the max. number of revolutions of the engine, that is 7000/min.

Failure to comply with the above recommendations absolves the manufacturer from all liability as to possible troubles occurring in the engine.

HOW TO USE THE 860

FILLING UP AND STARTING THE ENGINE

Before starting the engine, make sure that in the tank there is sufficient fuel for the distance you wish to travel, that the fuel taps are open and that the engine lubricating oil is at the right level.

We advise to use AGIP F. 1 RACING S 50 or equivalent. To start the engine, follow these instructions:

- 1) Place the motorcycle on the central stand.
- 2) Engage neutral gear.
- 3) Give the throttle handgrip two turns just to enrich the carburation.
- 4) Bring the choke lever in starting position (see Fig. 26 at page 39).
- 5) Insert the key in « Marcia = Run » position.
- 6) Firmly kick the starter pedal.

(In the bikes with electric starter, press the push button on the handlebar, Right Hand).

If the engine does not start, repeat this operation, varying at the same time more or less the opening of the throttle by means of the handlebar grip. **Once the engine is started, bring air control lever to the running position, do not race immediately, especially when the engine is cold, but before accelerating the engine let the lubricating oil warm up to facilitate its circulation throughout the engine, so as to reach all moving parts.**

Note: do not continually rotate the twist-grip whilst kick-starting the engine, as this will operate the accelerator pumps and flood the cylinders.

RIDING AWAY AND RUNNING OF THE MOTORCYCLE

With the engine running, disengage the clutch and, using your toe (see Fig. 30), push down the arm of the gearchange lever. When this lever is left to itself, it returns to its original position. With this move the bottom gear is now engaged. Now turn the throttle hand grip little

by little and release gradually your hold on the clutch lever; the motorcycle begins slowly to go under way. With the clutch lever completely released, let the motorcycle increase its speed. To pass now from bottom gear into second gear, turn back throttle hand grip fully and quickly; and after having disengaged the clutch press upwards the gearchange lever. Now turn forward the throttle hand grip again, releasing at the same time the clutch lever. Similar operations are carried out in order to change from second gear into third gear, from third gear into fourth gear and from the fourth to the top gear.

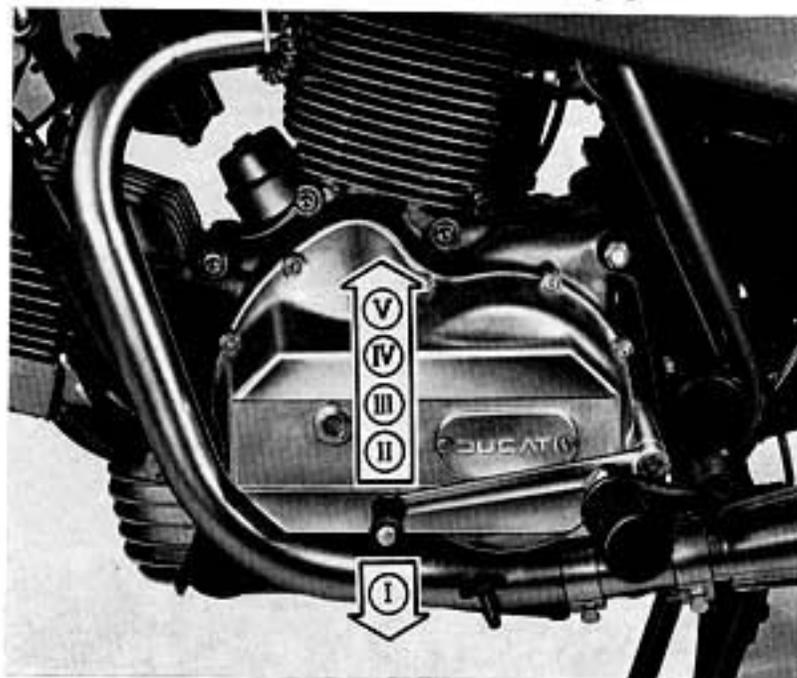


Fig. 30

To change down from a high gear to a lower one, operate as follows: close the throttle, pull the clutch lever, accelerate the engine momentarily, thus synchronizing the gears about to be engaged, engage the lower gear and then let go off the clutch lever.

A good motorcyclist will make use of the controls intelli-

gently and at the right time. When riding uphill and the engine tends to slow down, change to a lower gear at once; do not "hang on" to a higher gear when the effort required from the engine advises to use a lower gear.

When the engine turns at a low number of revolutions, do not accelerate low quickly: thus you avoid any over-supply of fuel and too harsh drive to the transmission.

The clutch should not be held long disengaged with a gear engaged, because the clutch plates will become overheated, causing rapid wear by friction.

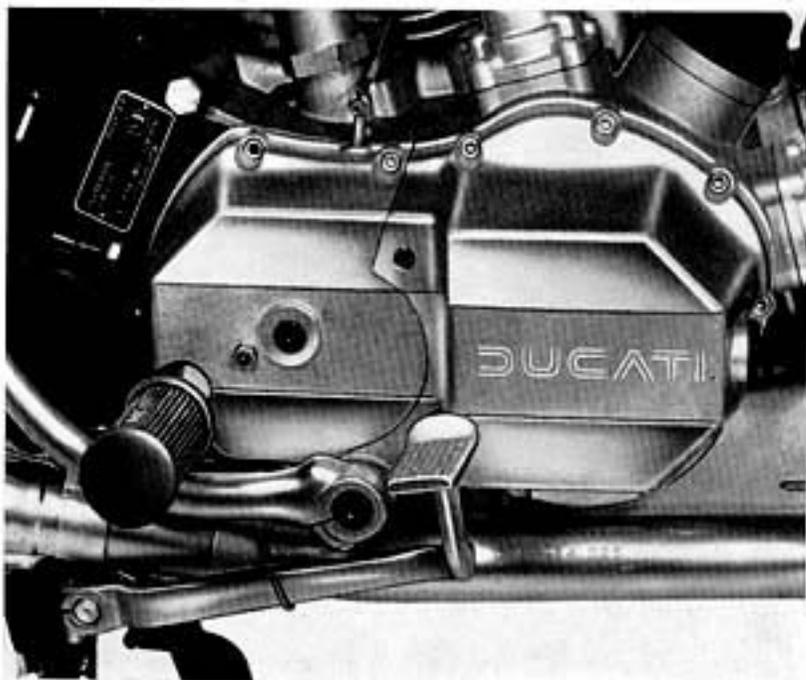


Fig. 31

Except in case of emergency, never use the brakes brutally when you are already near behind the obstacle, but throttle down the engine in right time and then make use of the brakes.

Attention! Differently from the other DUCATI motorcycles, the rear brake lever is at the RIGHT HAND (see Fig. 31).

Bear in mind that insufficiently inflated tyres are detrimental to the roadholding qualities of the motorcycle, and cause a greater tyre wear and lower efficiency.

STOPPING THE MOTORCYCLE

To stop the vehicle, close the throttle completely (the engine will then act as a gentle brake), disengage the clutch and put the gear pedal in neutral. A slight use of the brakes will then stop the motorcycle.

To stop the engine, turn the contact key on the position "Arresto = Stop".

In case of emergency, use also the switch placed on the control on the handlebar, at R.H.

MAINTENANCE

On good maintenance depends the good condition of the motorcycle.

By following these fundamental rules you can avoid serious troubles and obtain an excellent performance from your motorcycle.

The operations to be carried out are subdivided in accordance with the mileage run by the motorcycle. The recommendations which follow are, of course, merely indicative, because lubricating, checking and adjustments depend also on the nature of the road, the seasonal temperature, the length of the intervening period, etc.

AT FIRST 500 Km. (about 310 Miles)

- Restore the oil-level in the crankcase;
- Check the tyre pressure with a pressure-gauge;
- Tighten the cylinder head holding down bolts;
- Readjust the brakes;
- Check the clearance between valves and rockers for its correct value (see page 14);
- Adjust the chain and lubricate it.

AT FIRST 1000 Km. (about 620 Miles)

- **Totally replace the oil contained in the engine crankcase and the filter cartridge;**
- Check the correct tension of the chain and lubricate it;
- Check the clearance between valves and rockers as already explained.

EVERY 1000 Km. (about 620 Miles)

- Check the level of the oil contained in the engine crankcase;
- Check the correct tension of the chain and lubricate it.

EVERY 3000 Km. (about 1800 Miles)

- Change the oil in the crankcase draining it while the engine is hot, make sure that the oil drains off completely;
- Remove the carburetor oil filters and wash them by blast of compressed air, in order to remove all impurities from the cloth.
- Clean out the carburetor float chamber, the main jet and the idle jet;
- Readjust the clutch because the wear on its linings might otherwise cause slip.
- Lubricate the hinge of the rear fork and the cam;
- Tighten uniformly the nipples of the spokes and check whether the screws and the nuts of the wheels have been firmly tightened.

EVERY 20000 Km. (about 12400 Miles)

- Dismantle the exhaust pipes and the cylinders, in order to remove the carbon deposits on the cylinder heads and on the pistons (this should be done by a Ducati Servicing Garage).

HEADLAMP ALIGNMENT

It is advisable to check periodically the alignment of the headlight as follows:

- place the motorcycle at a distance of 5 meters (ft. 16.404) from a bright wall;
- make sure that the ground be even and that the optic axis of the headlamp be perpendicular to the wall;
- the motorcycle with its rider must rest on the wheels, not on the central stand;

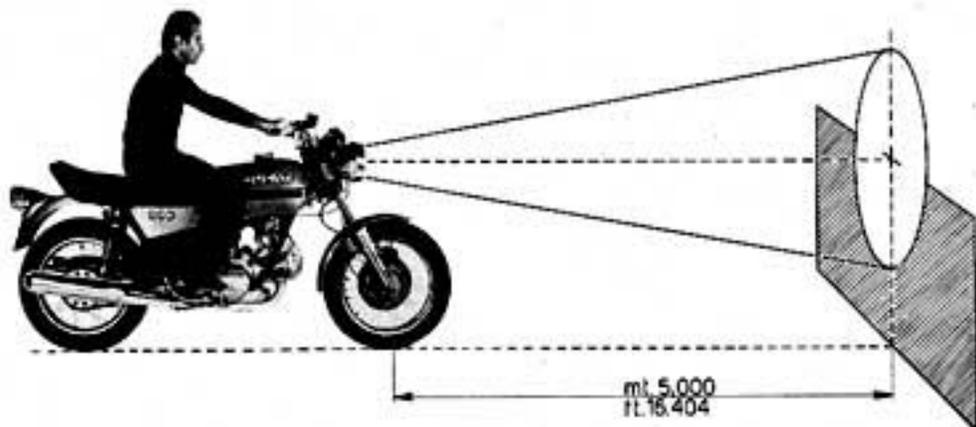


Fig. 32

- measure the height of the headlamp from the ground and trace a cross on the wall at the same height;
- when the headlight is switched on the cross must be in the center of the circular light-beam hitting the wall;
- to rectify the alignment of the headlamp, operate by means of the two fixing screws of the headlamp on the front fork, or the screw of the head lamp ring.

OVERALL CLEANING

The motorcycle should be washed and cleaned periodically, according to the length of time it has been used and the state of the roads.

- Clean the engine with kerosene and wipe it dry with a clean rag;
- wash down the painted parts of the frame with water, using a sponge for washing and a shammy leather for drying;
- never use solvents, petrol, spirit or kerosene, otherwise the paint will look flat;
- grease the chromium plated parts with vaseline and polish with shammy leather;
- be careful not to wet the two transducers placed under the fuel tank and the emergency switch on the handlebar, R.H.

PROLONGED REST OF THE MOTORCYCLE

If the motorcycle has to be put at rest for several months, it is advisable to proceed as follows:

- clean the motorcycle thoroughly;
- empty the petrol tank;
- take out the battery and keep it charged and efficient, as per instructions at page 53;
- squirt through the holes of the sparking plugs several drops of oil into the cylinder and turn the engine by hand for several revolutions, distributing a thin oil film on the walls;
- put the motor upon a piece of wood, lifting the machine from the ground and empty the air out of the inner tubes;
- cover the machine with a canvas, or water-proof cover.

INSTRUCTIONS FOR FITTING THE BATTERY ON MOTORCYCLE

PRECAUTIONS BEFORE MOUNTING

— How to prepare the battery for the filling up:

Remove the gummed tape and the outlet plugs before filling up with electrolyte.

If the battery is provided with a long drain pipe, cut the sealed terminal at about 3 cm. (1.18") from the ends. If the battery has a short sealed tube and is provided with a long separate pipe, replace the short tube by the long one.

— Filling up with electrolyte

Fill up the battery; the electrolyte (diluted sulphuric acid) must have a density of 1.240 for tropical climates where the average temperature exceeds 25°C (77°F) and of 1.260 for mild climates.

Fill up to the UPPER LEVEL (level of the antisplash gauze) as it is indicated on the battery.

The electrolyte should have a temperature lower than 30°C (86°F) before the filling.

Leave the battery at rest for half an hour after having filled it up.

During this period, a part of the electrolyte can be absorbed: therefore it will be necessary to restore the level by adding more diluted sulphuric acid of the above specified densities.

— Charge

We recommend to charge the battery for the first time before making it operating, if time and installation make it possible.

Charge the battery with the current described in the Table, in a continuous manner, for 15 to 20 hours.

If the level of the electrolyte is lower after the charge, pour DISTILLED WATER until restoring it, that is up to the UPPER LEVEL.

At the end of the charge, firmly secure the outlet plugs, eliminate the acid and water that may have overflowed, and dry the battery.

FITTING

- Firmly secure the battery on the vehicle.
- Make sure that there is no error in the terminal connections (positive and negative) of the battery.
- Do not bend or compress the drain tube of the battery. If the tube is compressed, there is the risk of an explosion.

BATTERY MAINTENANCE INSTRUCTIONS

- Check the level of the electrolyte once a month. If it is lower than the average between the UPPER LEVEL and THE LOWER LEVEL, pour **distilled water** until restoring the level.

Never fill to the brim with sulphuric acid.

- Always keep the battery clean. Protect terminals with vaseline grease to avoid their corrosion.
- Avoid bending and obstructing the drain tube.

RECHARGE

Recharge is necessary when lights and horn grow faint, and when the battery has been inactivated for more than one month.

If the vehicle is regularly used, the battery should never remain discharged for no reason whatsoever. If this occurs, check the regulator, alternator and in case the complete installation, including of course, the battery which could be in bad condition.

To recharge the battery, follow the hereunder Table.

Charge until the battery starts boiling and the specific weight of the electrolyte exceeds 1.240 in tropical climates and 1.260 in the mild ones.

Type of battery	Tension (Volt.)	Capacity in 10h (Ah)	Recharge current (A)	Recharge hours
12N - 12A - 4A	12	12	1.2	10
B 68	12	32	3.2	10

INSTRUCTIONS FOR THE MAINTENANCE OF THE ELECTRICAL SYSTEM

In case of inspections or repairs, it is extremely important to know the working of the electrical system and to follow with care the scheme. To avoid demagnetizing the generator, be careful to never send electrical current (direct or alternate) in the opposite direction. **(Do not connect the battery with inverted poles).**

Every inspection should be made with convenient Ohmmeters and Voltmeters.

In case the electronic regulator does not work, do not tamper it for any reason, but send it to DUCATI MEC-CANICA S.p.A. for replacement.

PERIODICAL MAINTENANCE OF THE BREMBO DISC BRAKE SET

To have the brakes efficient, follow scrupulously these recommendations:

- frequently check the fluid level in the reservoir; it must never be more than 8 mm. (0.315") below the maximum level;
- periodically check (for instance every 5,000 Km. = 3,100 Miles) the fluid overflow; exclusively use the brake fluid (SAE J 1073 c) AGIP BRAKE FLUID SUPER HD or Equivalent taken from the original tin;
- every 20,000 Km. (12,400 Miles) it is advisable to completely replace the fluid;
- take care that the brake fluid does not get in touch with the motorcycle paint because it would be damaged;
- for a good working of the brake, take care that the tubes be always full with the fluid, and without air bubbles. The presence of air causes spongy and long travel in the hand lever.

ATTENTION!

For a good maintenance of the hydraulic disc brake unit, apply to a DUCATI Service Station.

REPLACEMENT OF THE FRICTION PADS

Every 5000 Km. (3100 Miles) it is advisable to check if the pads are worn out.

For this operation apply to a DUCATI Service Station.

Proceed in the following manner:

- take out the cover closing the pad slit, using a screwdriver as a lever;
- take out the central pin and its flat spring;
- pull out the two pad retaining pins;
- pull out the pads.

The thickness must be:

with new pad: mm. 9 (0.354");

at the wear limit: mm. 5.5 (0.217").

If the thickness is lower than the wear limit, the pads have to be replaced. The friction material must not be utilized till the metal plate appears, as this would heavily damage the disc and moreover the minimum coat of friction material assuring the thermic insulation between pads and brake fluid would be missing.

To replace the pads, act as follows:

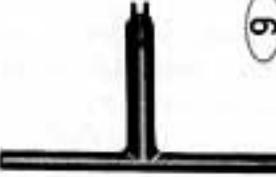
- push the small pistons inside the half-calipers, avoiding damage to the dust covers;
- fit the new pads in the caliper;
- fit the stop pins, the peg and position spring.

Acting as explained hereupon, it is not necessary, after the pads have been replaced, to drain the system, but only to press several times the brake lever till the small pistons revert to their normal position (pads at about 0,2 mm. (0.0079") from the disc).

ATTENTION! During the replacement of the pads, it is advisable to take some fluid out of the reservoir, because the piston backing in the cylinders, could let the fluid overflow from the reservoir.

IMPORTANT: for about 100 Km. (60 Miles) it is advisable to cautiously act on the new pads, allowing the friction material to correctly and entirely bed in.

SPECIAL TOOLS (860)

					
1	2	3	4	5	6
					
7	8	9	10	11	12
					
13	14	15	16	17	18

- 1) 98112.0002 Protractor wheel (X A).
 2) 88713.0101 Clutch bell and drum locking wrench (A).
 3) 88713.0102 Valve and spring disassembling and reassembling tool (A).
 4) 88713.0104 Tabular wrench for chain pinion locking ring (A).
 5) 88713.0107 Pinion retaining wrench for ring locking (For pinion Z = 16) (A).
 6) 88713.0108 Alternator retaining wrench for nut locking (A).
 7) 88713.0112 Graduated disc bearing tool for advance checking (A).
 8) 88713.0113 Spanner for removing exhaust pipe ring (A).
 9) 88713.0115 Spanner for chain tension.
 10) 88713.0116 Advance checking indicator with stroboscopic light.
 11) 88713.0117 Puller to remove ignition generator unit.
 12) 88713.0118 Pinion retaining wrench for locking rim (Pinion Z = 15).
 13) 88713.0119 Drift for electronic ignit. generator timing.
 14) *88713.0120 Rocker pin extractor.
 15) *88713.0258 Clutch cover extractor (X A).
 16) *88713.0262 Rocker assembling pin (X A).
 17) *88713.0263 Timing shaft removing wrench (X A).
 18) *88713.0270 Bearing extractor (X A).

(X) *Equal to those of the single shaft motorcycles.

(A) Equal to those for twincylinder 750 engine.

LEGEND

LOCATING AND REMEDYING FAULTS

The following list contains several of the most frequent faults which may arise and advice on remedying them.

ENGINE DOES NOT START EASILY

First of all, ascertain that there is enough petrol and that the cock is turned on. (A = open; R = reserve). If these are in order, the fault may be one or more of the following:

CAUSE	REMEDY
Petrol pipe is clogged.	Blow through it until the obstacle is removed.
Petrol filter dirty.	Dismantle the filter and clean the gauze by air blast.
Petrol cock filter is dirty.	Dismantle the filter and clean it by a blast of air through the gauze.
Carburetor float stuck.	Remove the float and clean out the float chamber (this should be done by a DUCATI Servicing Garage).
Carburetor float leaking.	Change the float (at a DUCATI Servicing Garage).
Jet is clogged.	Remove the obstacle by a strong blast of air.
The cable from the transducer to the spark plug is broken or sparking externally.	Inspect the cable insulation for faults and if necessary change the cable at a DUCATI Servicing Garage.

CAUSE	REMEDY
Defective sparking plugs.	Change or clean the plug, making sure that the insulating core is not damaged, that there are no carbon deposits on the electrodes and that the spark gap does not exceed 0.8 mm. (0.0315").
Compression lacking.	Check if the sparking plug has been tightly screwed in, check the valves for gas-tightness and the tightness of the piston rings (at a Ducati Servicing Garage).
A valve spring is broken.	Change the broken spring (at a Ducati Servicing Garage).
Valve sticking.	Dismantle the valve, clean the valve stem and the bore of the valve guide, and make sure that the clearance between stem and bore does not exceed 0.08 mm. (0.0032") (at a Ducati Servicing Garage).
No sparks in the sparking plugs.	Check the emergency switch placed on the handlebar at R.H. that it is not on the position OFF. In case it is on position RUN, it could be defective or imbued with damp keeping the coils also earthed. Also the main switch could be defective and keep earthed the transducer « center ». Check that the cables connecting the ignition generator with the two transducers be well connected and that there is no damp between them and among them and the earth.

CAUSE	REMEDY
One spark plug has no sparks.	Check that the device with 2 diodes within the headlamp is not earthed or that there are no insulation losses due to dampness inside the headlamp. If no faults will be found, replace the stator base and in case, the transducers (at a DUCATI Service Station). Check that the cables connecting the ignition generator with the relevant transducers, are well connected and that there is no moisture between them and between them and the earth. Check that the device with 2 diodes within the headlamp is not earthed and that there are no insulation losses due to moisture. If everything is correct, try to replace the relevant transducer and in case also the stator base of the generator (at a Ducati Service Station).

LIGHTS ARE NOT WORKING REGULARLY

CAUSE	REMEDY
The battery is discharged or discharges frequently.	Check the condition of the battery and the recharge circuit. Check the regulator. Once the fault has been found, let recharge the battery.

CAUSE	REMEDY
<p>With key not inserted, battery discharges quickly.</p>	<p>To check the recharge current, act as follows: Disjoin the wire from the + terminal block of the battery.</p> <ul style="list-style-type: none"> — Insert an amperemeter in continuous current between the terminal clamp and the wire (possibly with central « 0 »). — Let the engine turn, till attaining 6,000 r.p.m. The amperemeter should show: <ul style="list-style-type: none"> a) maximum current about 10 A, with completely discharged battery. b) minimum current about 1 A, with almost completely charged battery. <p>According to the battery load condition, you will obtain intermediate figures. These tests must be carried out with switched out headlight.</p> <p>Checking the Electrical System.</p> <p>Make sure that all the bulbs are efficient.</p> <ol style="list-style-type: none"> 1) With the lights switched out (during the day), the amperemeter should read 0 at 1,000 r.p.m. approx. 2) With town lights switched on (during the night) the amperemeter should read 0 at 1,400 r.p.m. approx. 3) With the antidazzle lights switched on (during the night) the amperemeter should read 0 at 2,400 r.p.m. approx. (in a Ducati Service Station). <p>Check if there are earthed contacts in the system.</p>

INEFFICIENT ENGINE

CAUSE	REMEDY
<p>Irregular feed of petrol to the carburetor.</p>	<p>Clean the carburetor filter, the petrol cock filter and the petrol pipe.</p>
<p>Main jet partly clogged.</p>	<p>Clean the main jet by means of an air blast.</p>
<p>Carburetor butterfly valve does not open completely.</p>	<p>Readjust the valve travel by means of the adjustment screw of the carburetor Bowden cable (at a Ducati Servicing Garage).</p>
<p>The float needle does not close properly.</p>	<p>Clean out the carburetor and especially the needle seat (at a Ducati Servicing Garage).</p>
<p>Petrol of bad quality.</p>	<p>Empty the petrol tank and refill at a reliable garage.</p>
<p>The spark plug is not of the right type.</p>	<p>If the sparking plug overheats, you will have preignition, knocking, and misses, especially at high revs. If the sparking plug remains too cold, you will have no ignition, because the electrodes will short-circuit. Use the right type of sparking plug; we advise the use of a plug having a thermal figure of 260 of the Bosch international scale.</p>
<p>The plug is loose in its adaptor.</p>	<p>Tighten the plug down well. A washer should always be placed between the sparking plug and its seating in the cylinder head.</p>
<p>One sparking plug cable sparks externally.</p>	<p>Change the cable or repair the insulation (at a Ducati Servicing Garage).</p>

CAUSE	REMEDY
The gap between the electrodes of the sparking plug is too wide.	Adjust the gap to the proper width of about 0.8 mm. (0.0315").
The spark plug electrodes are dirty.	Clean the electrodes with a wire brush.
One transducer is defective.	Replace it at a Ducati Service Station.
The stator base of the electronic generator is defective.	Replace it at a Ducati Service Station.
The silencers are almost completely clogged-up.	Clean the silencer, to ensure the free discharge of the spent gases.

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