DUCATI

Over Head cam-shaft
MOTORCYCLE 196
160 Monza Junior

Distributor for USA
BERLINER MOTOR CORPORATION

Instructions for use and maintenance

PRINTED IN ITALY

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Over Head cam - shaft

DUCATI

MOTORCYCLE 196

160 Monza Junior

SPECIFICATIONS - USE - MAINTENANCE

1st. ISSUE - PRINTED DM - Mod. 754/E July 1965 - 10.000

Every Motorcycle receives one copy of the present booklet.

GUARANTEE CARD

Every DUCATI MOTORCYCLE is supplied with a « Guarantee Card » which will be found in the sealed tool box.
The seal may broken only by the purchaser.

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.

Dear Sir,

We are very glad to welcome you among our clients, and feel sure that you will not fail to appreciate the magnificent performance of the ***DUCATI Motorcycle 160 Monza Junior.***

The magnificent performance 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 should 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 for your patronage and congratulate you on your wise choice of such a fine machine with its unequalled performance.

DUCATI MECCANICA S.p.A.

MOTORCYCLE DUCATI 160 Monza Junior

Colours: in 2 versions:
Black - Aluminium
Black - Aluminium - Red

A FOREWORD

Then main goal of the present instruction booklet is to enable the owner of an over Head camshaft 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.

DUCATI SERVICING GARAGE

It is advisable when taking the machine to a garage for repairs to ensure 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. They will also carry a full stock of genuine Ducati spares.

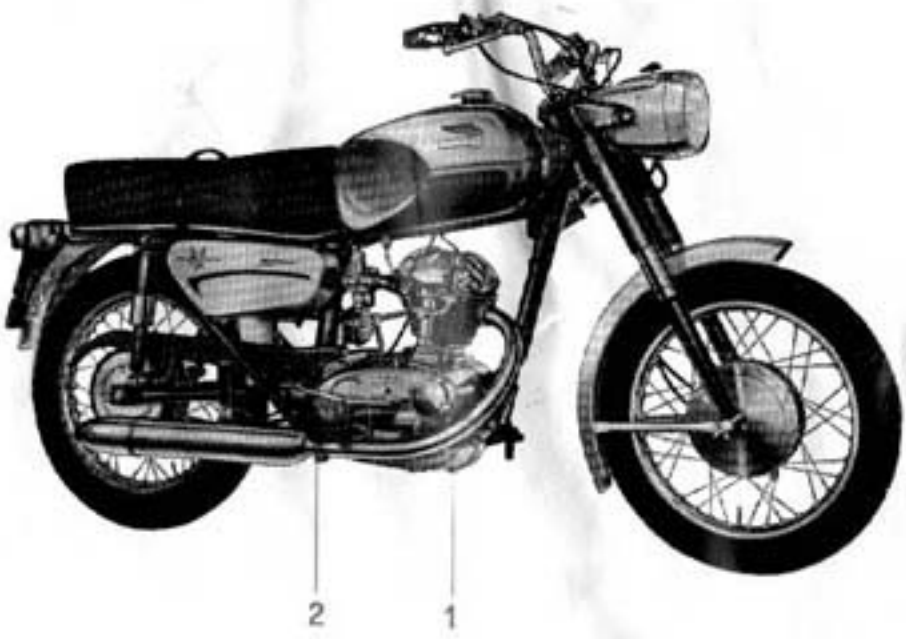
SPARE PARTS

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 Parts Catalogue).
2) Serial number of the engine (when ordering spare parts for the engine).
3) Serial number of the frame (when ordering spare parts for the frame).

IDENTIFICATION NUMBERS

Every DUCATI over head cam-shaft motorcycle can be identified by its frame and engine serial number.
The same serial number is stamped on the central girder near the battery.
The engine serial number is stamped on the crankcase near the front connection between the engine and the frame.



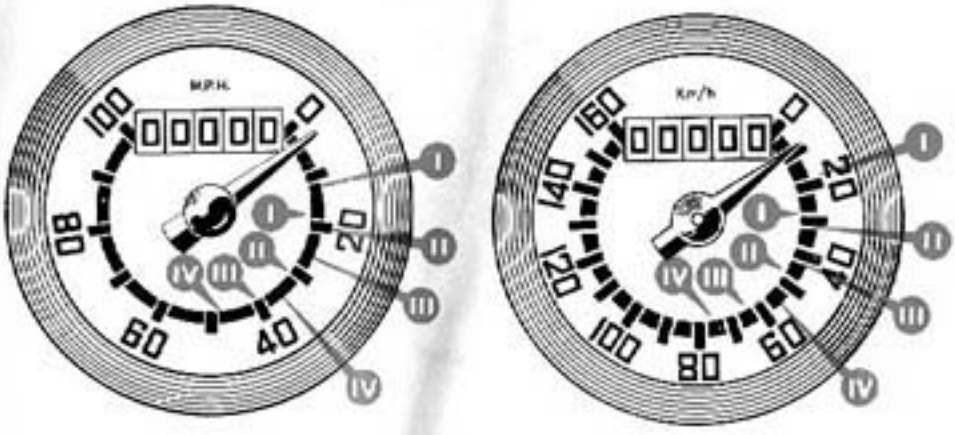
1 - Engine serial number

2 - Frame serial number

PRECAUTIONS

to be followed during the initial running-in period

The modern engine construction calls for very close tolerances between moving parts. It is essential that care is exercised during the running-in period a process which has already been started by the factory. The engine should never be over-revved or allowed to « slog » during this time and recommended maximum speed in gears should be strictly observed.



DISTANCE TRAVELLED	MAXIMUM SPEED IN MILES AND KMS PER HOUR			
	in bottom gear	in 2nd speed	in 3rd speed	in 4th speed
Up to 300 miles Up to 500 Km.	12 19	20 32	26 42	34 55
From 300 to 600 miles From 500 to 1000 km.	18 29	30 48	39 63	47 75

It is advisable to change the oil first at 300 miles and then at 600 miles (with the engine warm). Re-adjust the tappets, regulating the adjusting screw; tighten cylinder head and holding nuts, crankcase nuts and screws. Do not overtighten as damage may result in thread stripping or bolts breaking. Readjust contact breaker.

In order to ensure careful running-in the carburetor has been fitted with a distance piece which restricts the full use of the accelerator. After 600 miles this should be removed by your Ducati dealer.

Failure to comply with the above recommendations absolves the manufacturer from all liability of guarantee and any damage that may result.

MAIN SPECIFICATIONS

ENGINE

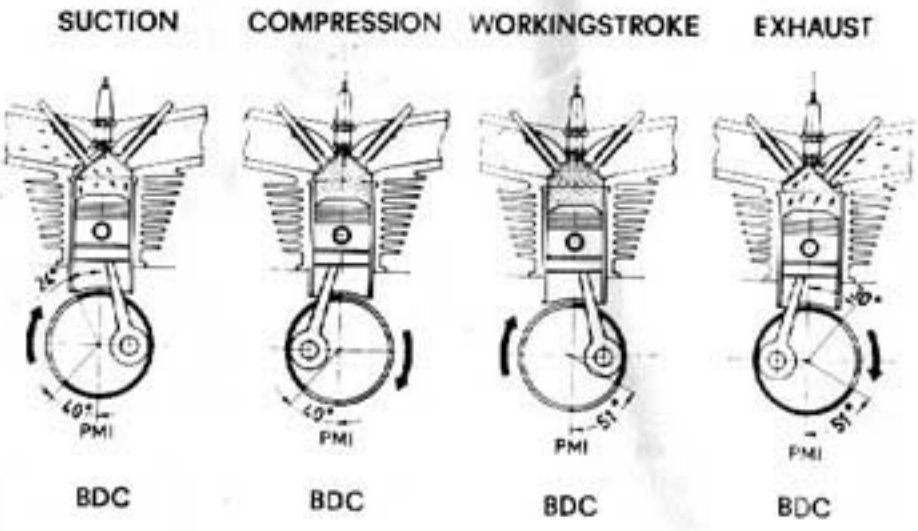
Single cylinder, four stroke, with cylinder inclined forward 10° from the vertical. The engine is supported by a cradle formed frame.

— bore: 61 mm. (2.4016")
— stroke: 52 mm. (2.0472")
— cylinder capacity: 156 c.c. (cu.in. 9.5198)
— compression ratio: 8,2 : 1

— combustion chamber with hemispherical ceiling;
— cylinder barrel of light alloy, deeply finned and with inserted special cast-iron liner;
— connecting rod of special steel with big-end assembled on a cage roller bearing and little-end bushed to take the gudgeon pin;
— pistons of light alloy, convex topped and in one piece, with four piston rings, two of which are slotted oil scrapers;
— cylinder head 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.

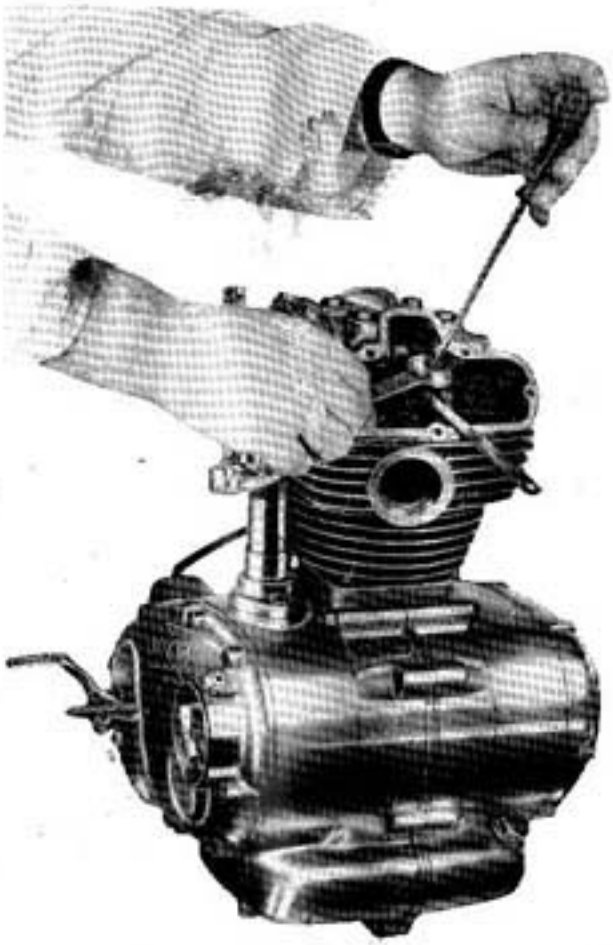


Specifications

The timing values, with clearance of 0.20 mm. (0.0079") between the valve and the rocker are the following:

Valve	Opening ± 5°	Closing ± 5°
Suction	24° before TDC	40° after BDC *
Exhaust	51° before BDC	33° after TDC **

* BDC = Bottom dead center.
** TDC = Top dead center.



Adjustment

The tappets are adjusted by means of the adjustment screws on the rockers.

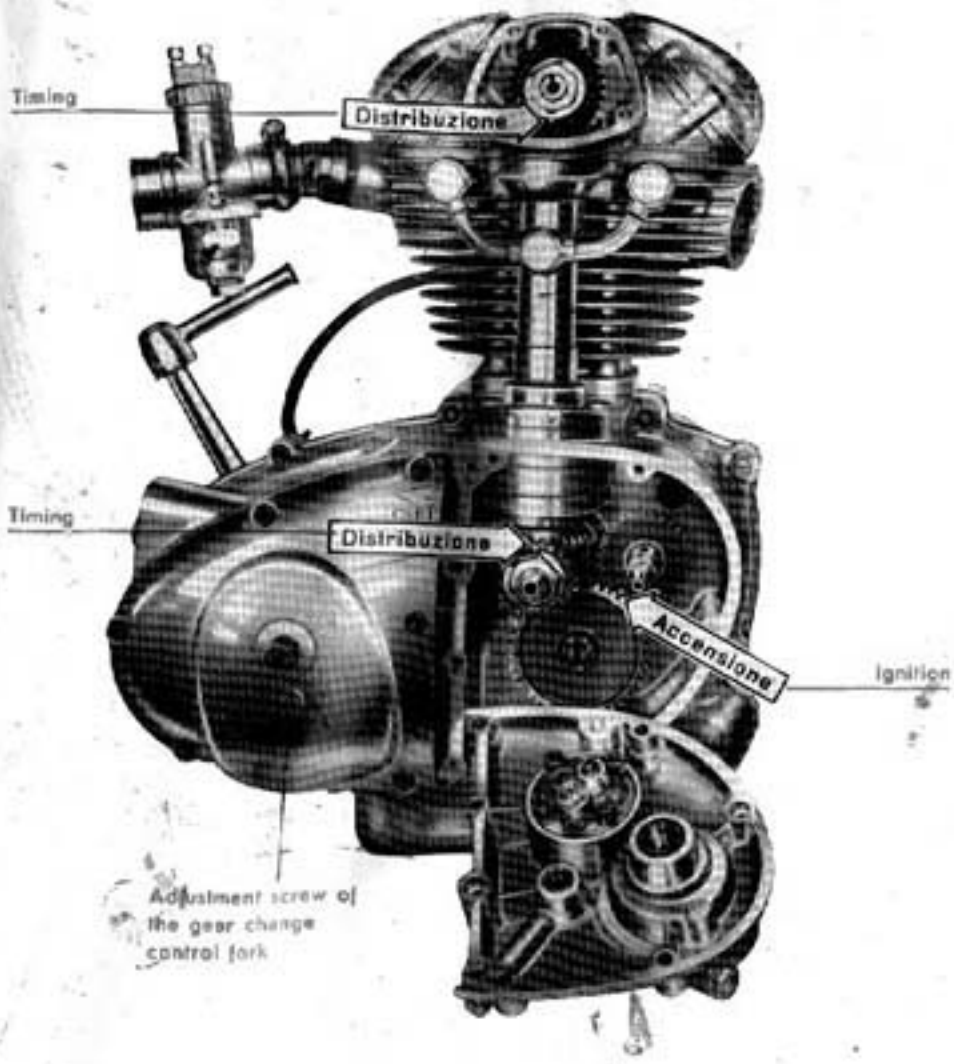
Clearance

The working clearance between valves and rockers, when the engine is cold, is of 0.05 (0.0020") to 0.07 mm. (0.0028"). The clearance has to be adjusted and checked with a feeler gauge, after the said timing datum has been controlled.

Engine Timinig

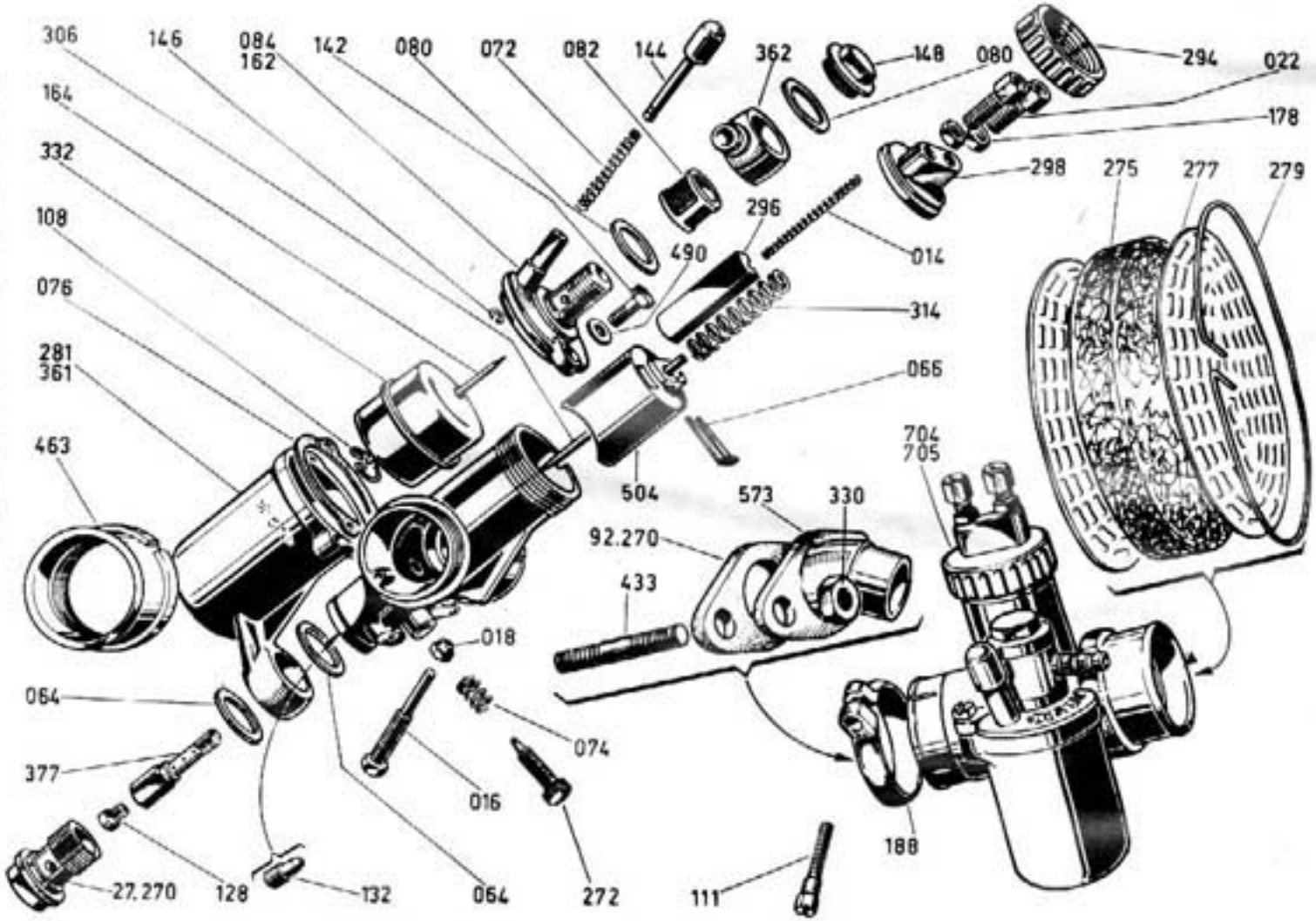
The timing gears in the crankshaft and on the camshaft, are provided with reference marks engraved on the toothed periphery.

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



Adjustment
of minimum
air intake

Adjustment
of the throttle



Instance: Carburetor Dell'Orto UB 22 BS - Spare parts

PETROL FEED

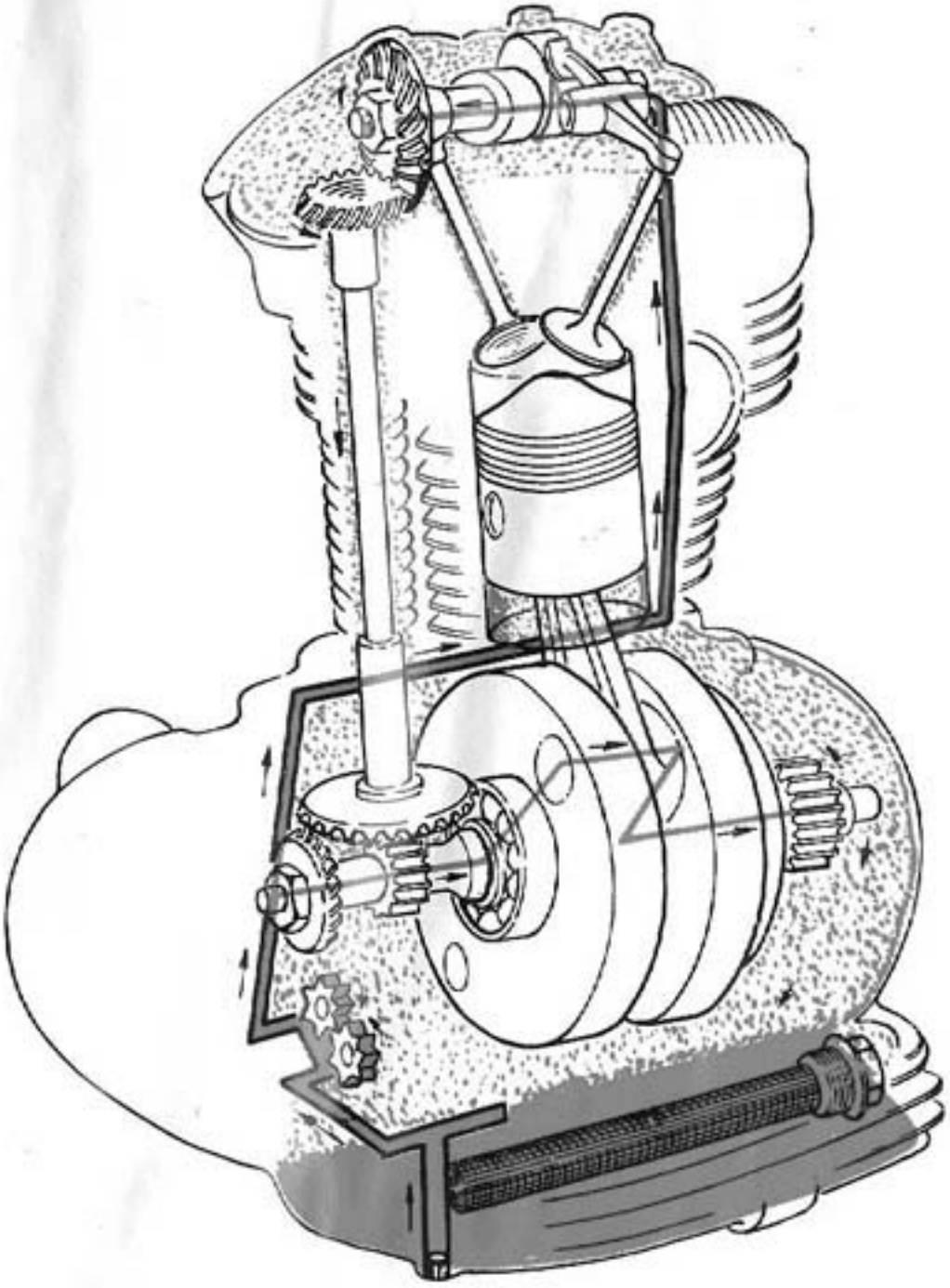
The petrol is fed to the carburetor by gravity.
The carburetor is Dell'Orto UB 22 BS with quiet air intake on the tool-box.

Atomizer	260 A
Choke	22
Main jet	95
Idling jet	35

The petrol tank is provided with a three position 2 taps: closed - open - reserve and has a capacity of lts. 13 approx. (imp. gall. 2.8597 - USA gall. 3.4342), and a reserve of lt. 1.6 (imp. gall. 0.35196 - USA gall. 0.4227).

LUBRICATION

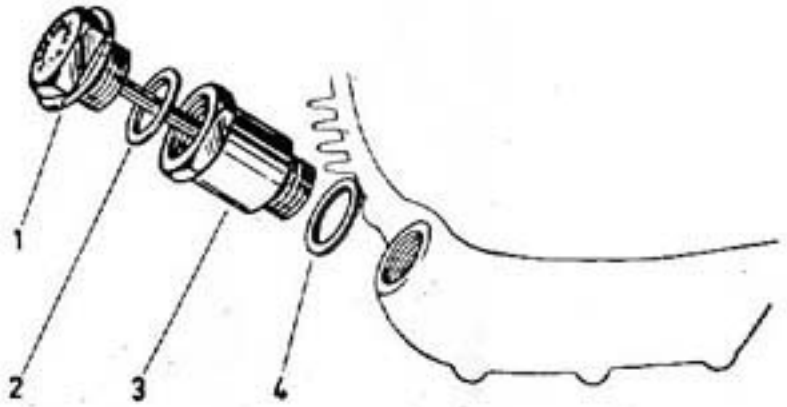
The engine is pressure lubricated, by means of a gear pump driven by the shaft; this pump takes the oil through a filter, from the lowest point of the crank-case which acts as an oil sump, and forces it through proper oil-ways, to all parts of the engine which have to be lubricated. The oil returns by gravity.
The sump capacity is of about 1.750 Kg. (lb. 3.858) = lt. 2.100 (USA gall. 0.5548 = imp. gall. 0.4620).



An Oil-filler with stick consisting of:

1) Stick-provided filler plug;
2) Sealing gasket;
3) Filler;
4) Sealing gasket;

allows the oil level measurement.

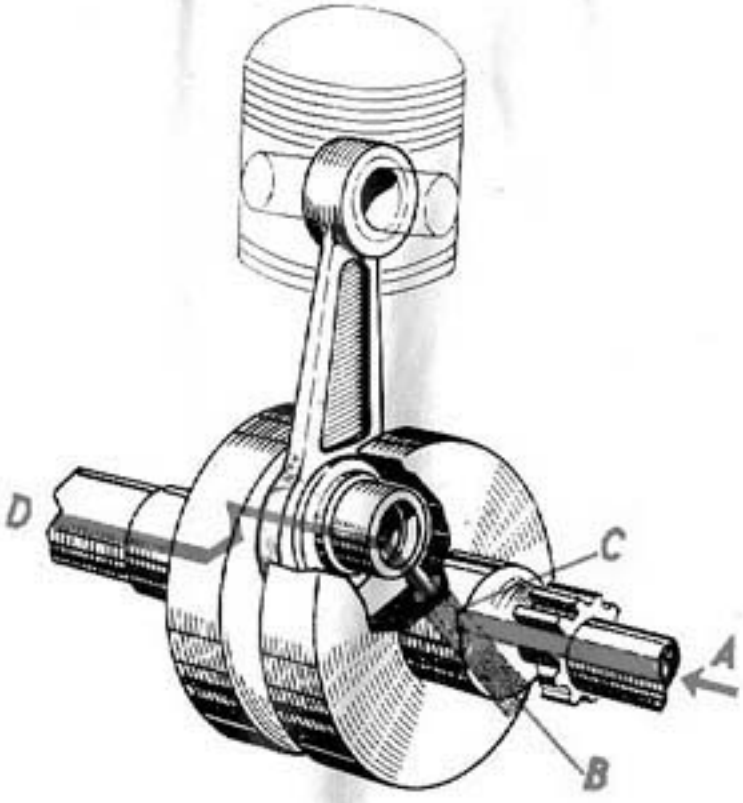


The filler plug stick is marked by two notches in the spots where the oil level is respectively at its lowest and at its highest point.

The oil level is measured by just resting the plug on the filler.

— The lubricating system of the DUCATI 160 Monza Junior with over head cam shaft engine is of the simplest and requires no special maintenance except the renewal of the oil level (AGIP F. 1 MULTIGRADE or AGIP F.1 RACING SAE 40) each 500 Km. (about 310 miles) and the total change of the oil, including the cleaning of the filter every about 2000 Km. (about 1240 miles).

CENTRIFUGAL OIL FILTER INSERTED IN THE MAIN-SHAFT



How it works

The oil which is to be filtered, is brought to the filter through the pipe A; from here, the centrifugal force eliminates all the impurities (which are heavier than the oil), which accumulate all around the threaded plug B of the main shaft.
The filtered oil, goes through the tube C to lubricate the big end, and through the duct D, to lubricate the engine-clutch housing gear.

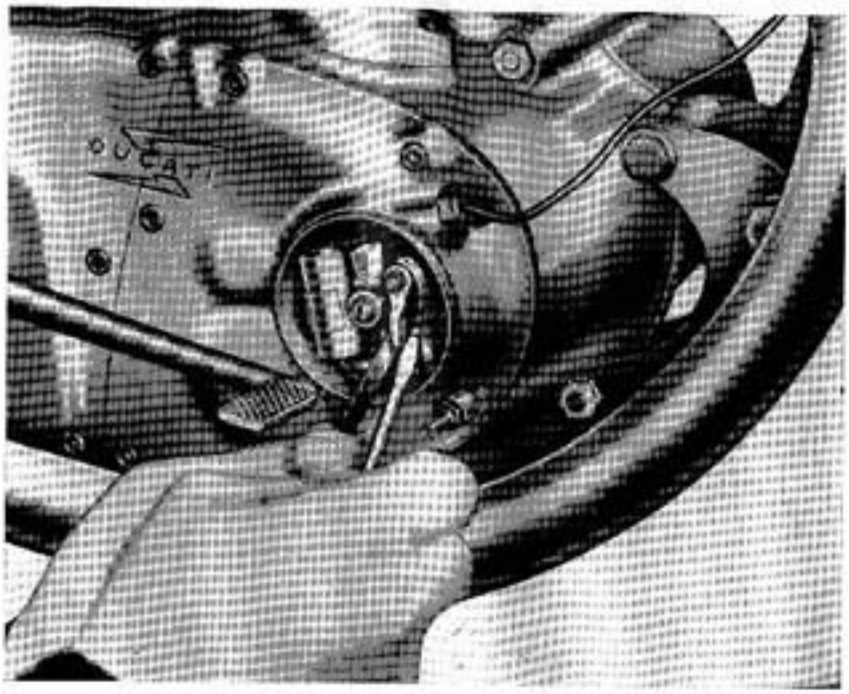
COOLING

Cooling of the engine is achieved by close finning of both the cylinder and cylinder head.

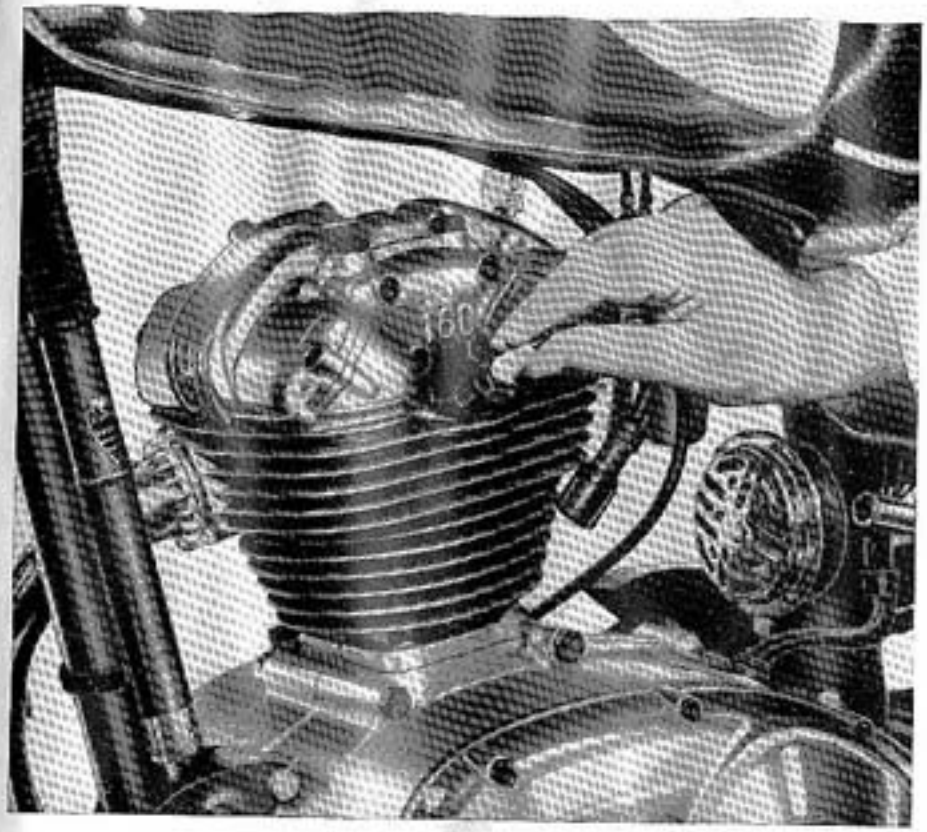
IGNITION

The ignition is battery-coil.
The partial automatic advance ignition is:

Advance with stopped engine	21° to 23°
Amplitude of automatic advance . . .	18°
Total advance with engine running at 3.000 r.p.m.	39° to 41°



For setting up the ignition, see figure on page 15.
The clearance between the platinum plated contacts is of 0.3 to 0.4 mm. (0.0118" to 0.0157") and has to be checked by means of the feeler gauge (see figure hereupon).
The ignition plug is a Marelli CW 260 N, or a similar model and is located on the leftside of the top of the cylinder head.
When replacing the sparking plug make sure the angle of the plug, relative to the plughole, is correct otherwise there is a risk of stripping the thread in the cylinder head. Screw the plug lightly at first then tighten it.



HOW TO CHECK IGNITION SPARK ADVANCE

Check periodically the ignition spark advance (after the first 600 and, after, every 1200 miles); be sure that the automatic device works properly, that it is well lubricated and that the springs are neither *out of shape* nor *out of place.*

The rotary amplitude of the automatic advance must be 9° equal to 18° on the driving shaft. If you have any doubt, get it checked by a specialized workshop.

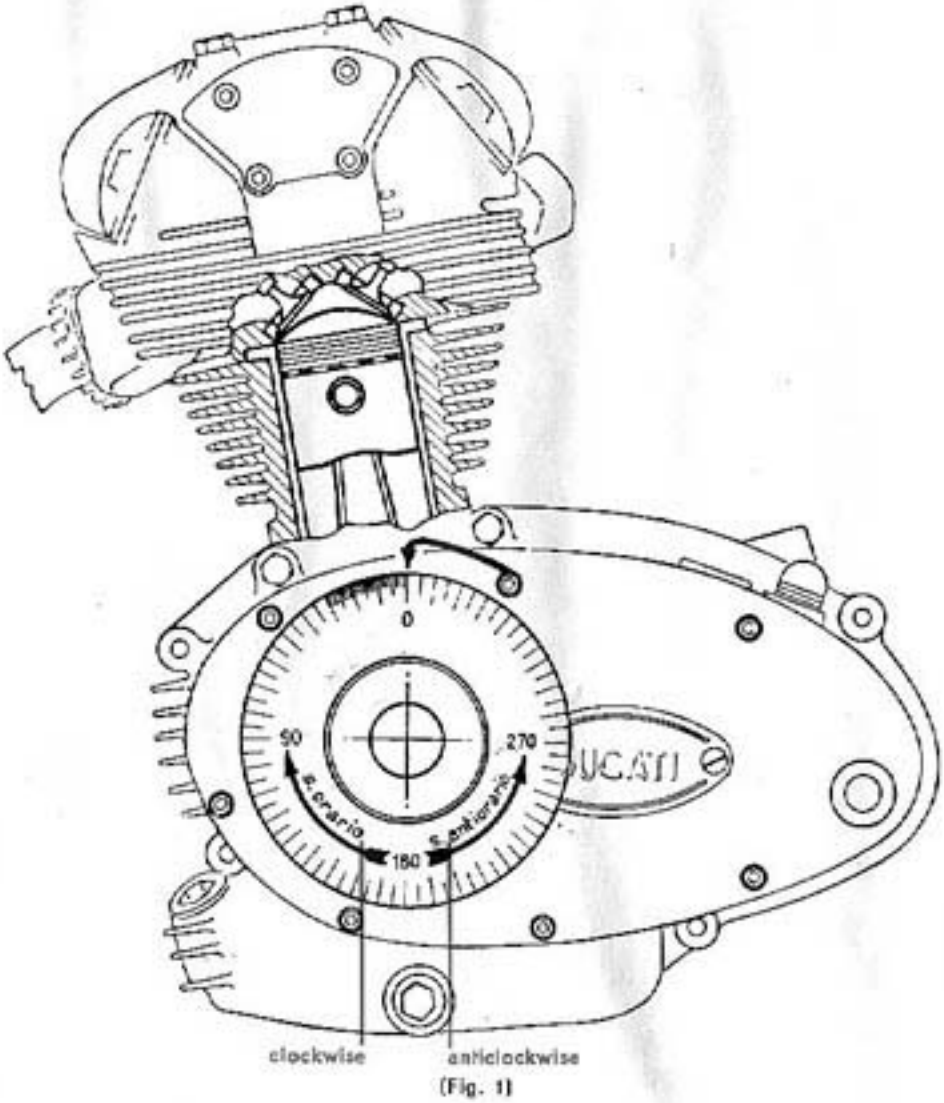
To check the spark advance, proceed as follows:

1st. - Remove the threaded plug which is at the driving shaft level, and fit a suitable timing chart (Fig. 1).

2nd. - Fit an indicator on one of the screws that secure the cover (Fig. 1).

3rd. - Bring engine to TDC of compression stage and set the indicator at « O » of the timing chart.

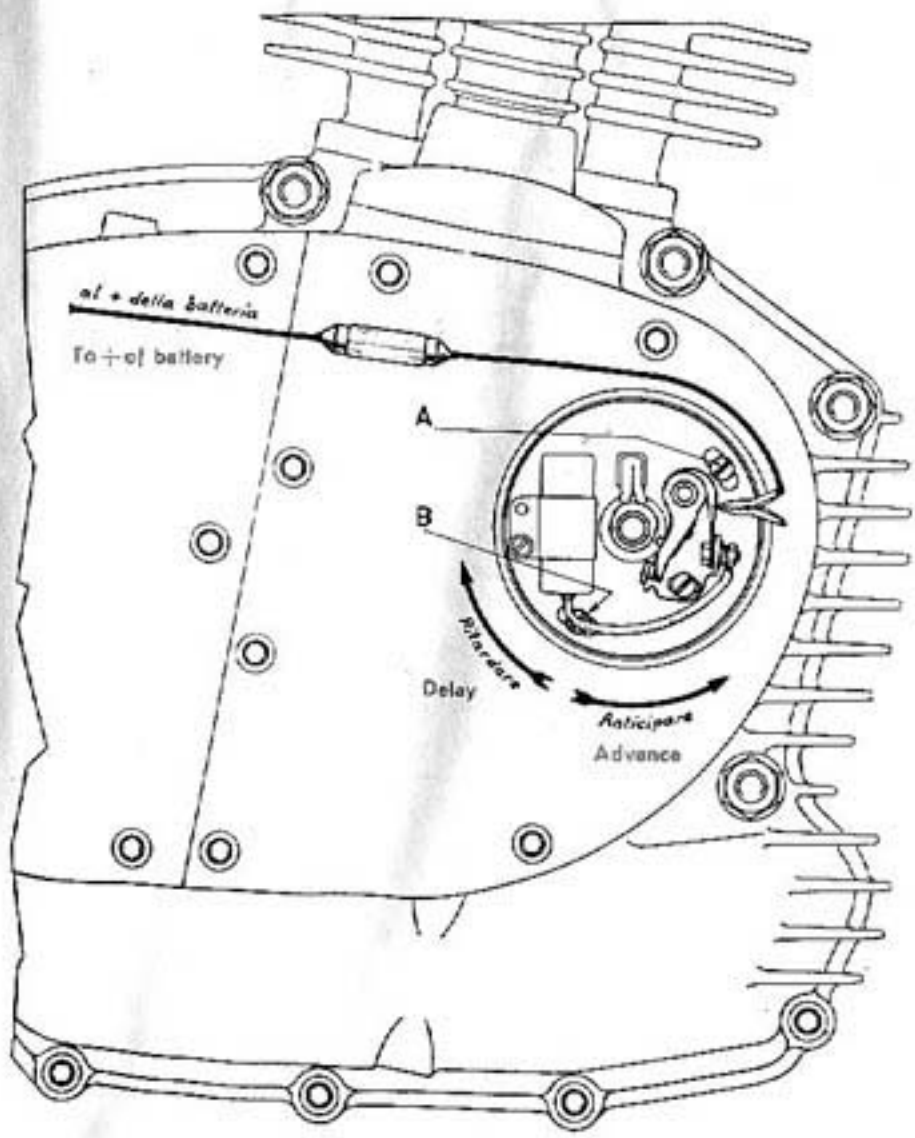
4th. - Rotate the driving shaft clockwise for about a quarter of a turn.



(Fig. 1)

5th. - To the spring of the mobile part of the contact breaker connect a 6V. - 3W. lamp in series with the + of the battery (Fig. 2). The lamp should light up.

6th. - Rotate the driving shaft slowly, anticlockwise, till the light goes out or its intensity is lowered. At that very moment, the indicator should give on the goniometer the advance degrees you will find on page 22.



(Fig. 2)

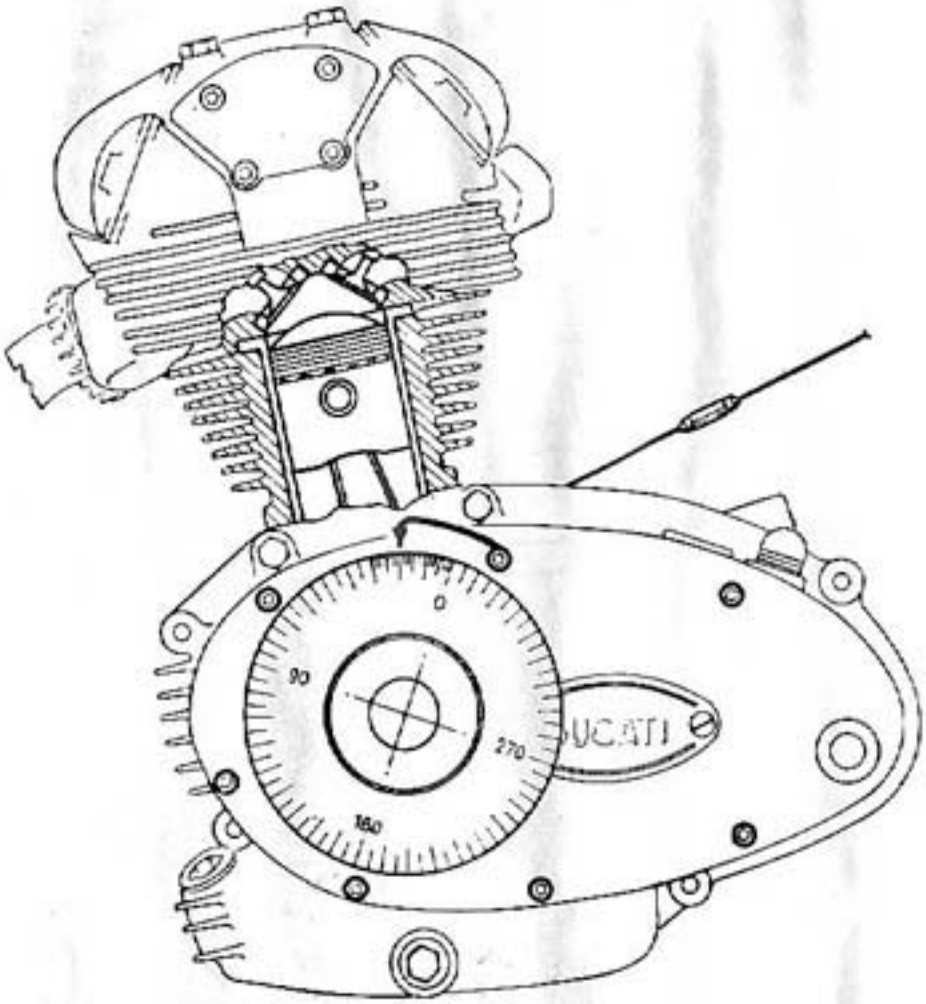


Fig. 3

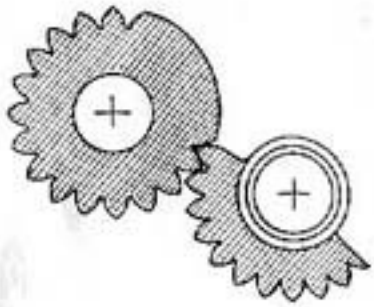
7th. - To be on the safe side, it is advisable to repeat the test.

8th. - If the reading should not tally with the requested numbers, then loosen the two screws (A and B) which secure the plate, and rotate it, advancing or delaying ignition until the right number found at page 22 is obtained.

9th. - Bear in mind that if you let go dry the felt which lubricates the cam, the fibrous slipping block (that operates the opening of the moving part of the contact breaker arm), will tend to wear out, lowering thus, the value of the gap.

STARTING

The kick-starter is located on the left hand side of the engine. In the case the starter unit is refit, it is indispensable to carry it out as shown in the figure aside.



TRANSMISSION

The transmission components comprise a clutch and a gear box. The clutch is of the multiple plate type with steel and phenol resin disks. It turns in an oil bath and is mounted on the primary shaft on the gear box.

The clutch housing, made of special wear resisting cast iron turns on two inner bearings which are set at an adequate distance. It is lubricated together with the engine sprocket as already explained in the paragraph of the centrifugal filter.
This system ensures smooth movement, solidity and long wearing; it has been fitted and tested on the 200 cc. motorcycles, since 1960.
The clutch is operated by a handlever placed on the left hand side of the handlebar.
The transmission between the engine and the primary shaft of the gearbox is obtained by means of gears and the reduction ratio is:
3.000 to 1.
The gearbox is mounted in the crankcase; the gears for the 4 speed gearbox are constantly meshed and are operated by a foot pedal.
The transmission ratios of the gears are the following:

— in bottom gear	1 to 2.75
— in second gear	1 to 1.65
— in third gear	1 to 1.18
— in fourth gear	1 to 0.97

The transmission between the gearbox and the rear wheel is made by means of a chain and the speed ratio is 2.875 : 1.

FRAME

The frame of the DUCATI 160 Monza Junior is of a very smart and modern design, is manufactured with high tensile steel and is of the central girder type.

SUSPENSION

The front suspension is the MARZOCCHI telescopic-hydraulic long-stroke fork, with steering rod.
Each fork leg contains 150 cm^3 (cu. inch. 9.1540) of AGIP F.1 MOTOR HD SAE 20 oil.
The rear suspension consists of a robust hinged fork with double action hydraulic dampers, (shock-absorbers).
On these machines the fork fulcrum-spindle is fixed to the frame while the fork with bronze bush rotates on it. This gives the machines greater solidity and stability.

WHEELS

The wheels are of the spoke type with chrome plated rims, normal profile 16" x 2¼" the front one and 16" x 1.85" the rear one.
The front wheel has a detachable spindle.
The rear wheel has a special cushion drive.
Tyres: 2.75 - 16", the front one; 3.25 - 16" the rear one.
Tyre pressures: 2,25 Kg/cm² (32.01 lb/sq inc.) for both wheels.

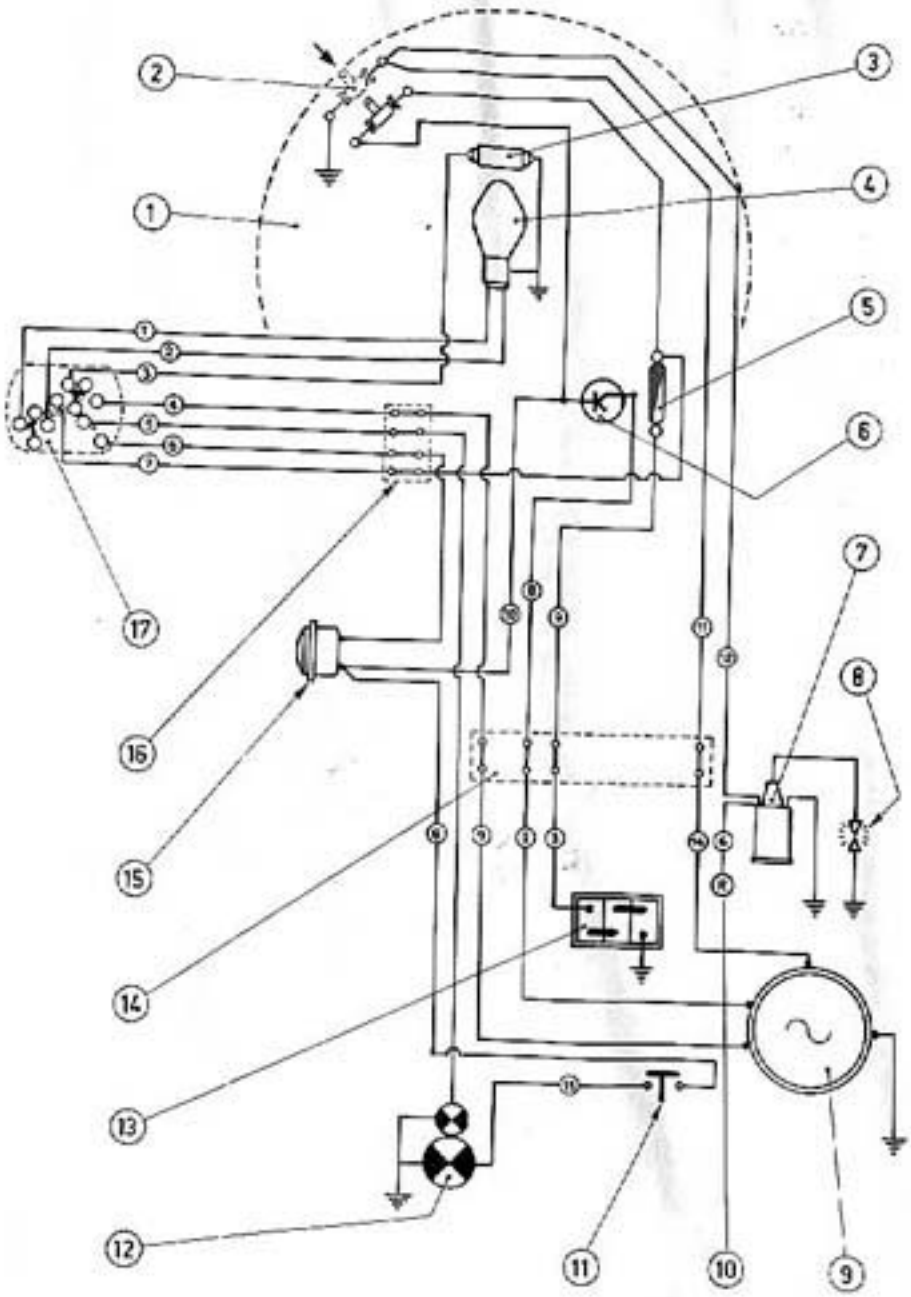
BRAKES

The brakes are of the expanding type with two brake-shoes, — hand operated the front and pedal operated the rear — with finned brake drums of large diameter width, and with non fade brake linings.
The diameter of the front brake drum is 158 mm (6.2205") the diameter of the rear drum is 136 mm (5.3543").

ELECTRICAL SYSTEM

The lighting is provided by a flywheel alternator which is fixedly and partially recharged.
A SAFA 3 IL 3 - 6V - 7Ah battery feeds the stop, horn and parking lights.
The head-lamp APRILIA carries 3 lights.
A Kms-speedometer VEGLIA with dial of 120 or a mile speedometer, scale 80 is incorporated in the same head-lamp.
A removable key, placed on the headlamp provides the contact for the ignition. By removing the key the engine is stopped.
Alongside the lefthand grip of the handlebar is the 3-light switch for the diplight, the antidazzle light, and the button for the horn.
In the normal position on the rear mudguard are placed the number-plate carrier, the rear light, the reflector, the numberplate lighting and the Stop-light.

ELECTRICAL SCHEME OF THE 160 MONZA JUNIOR



KEY TO PARTS OF THE ELECTRICAL SCHEME

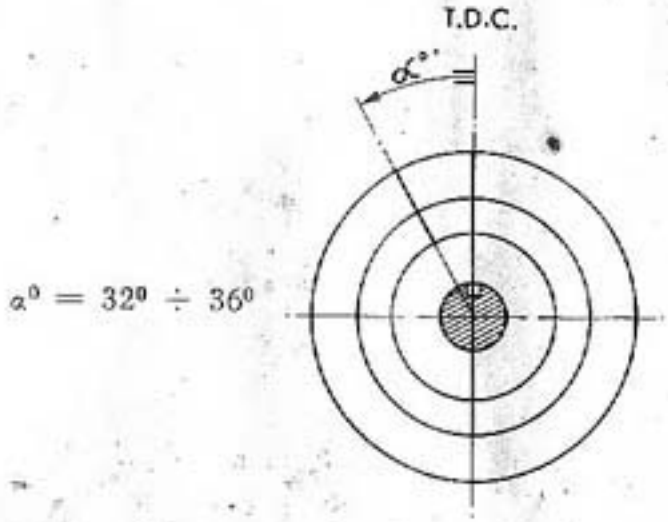
1 - Headlamp APRILIA 130 RCGN/t (App. T.G.M. 1408 PMx)
2 - 4-contact key
3 - Parking light 6V-3W
4 - Headlamp bulb 6V-25/25W
5 - Fuse 15A
6 - Diode
7 - H.T. coil in a.c. 6V
8 - Ignition spark plug
9 - Generator 6V - 28W
10 - Contact breaker - Condenser
11 - Switch stop
12 - Number plate bulb and stop light 6V-3/15W
13 - Battery 7Ah - 6V - SAFA 3 IL 3
14 - Frame terminal block
15 - Horn 6V
16 - Derivation terminal block
17 - Lights control device LD 57/8SM.

COLOUR OF THE CABLES

1 - 2 White
3 - 8 Blue
4 - Brown
5 - Black with yellow collar
6-13 - Black
7-11-12 - Green
9 - Red
10 - Black with blue collar
14 - Yellow

NOTE!

When the flywheel is to be fitted on the driving shaft, be careful it is in perfect phase. To carry it out, proceed as follows: Having the piston at the Top Dead Center (T.D.C.) and the driving shaft key and flywheel mark in the position shown in the figure, let the flywheel rotate anticlockwise, for the angle α, till it attains the new position.

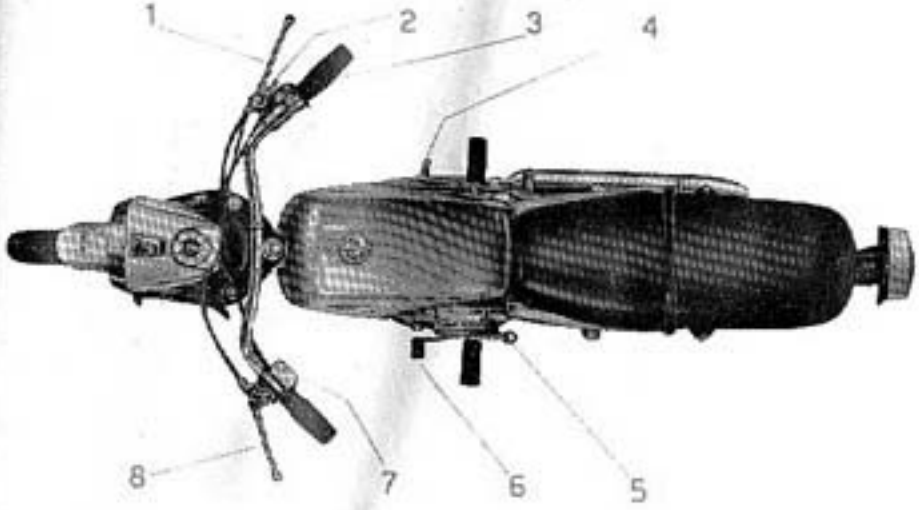


CONTROLS

As mentioned in the foregoing paragraph, alongside the left hand fixed handlebar grip, will be found the light switch and that for the dip light and the antidazzle light, the button for the horn, the hand operated clutch lever; and above grip is located the little air-regulating lever.

The righthand handlebar grip rotates for accelerating and decelerating the engine. In front of the grip is placed the operating lever for the front brake and the air control lever.

Near the left hand footrest is placed the rear wheel brake lever which also operates the stoplight and the kickstart. Alongside the right hand footrest is the double lever for the gear change.



LEGEND

1 - Front brake control lever

2 - Air regulating control lever

3 - Rotating throttle control grip

4 - Change double lever

5 - Kickstarter

6 - Rear brake control lever

7 - Light switch and that for dip and antidazzle lights, and button for horn

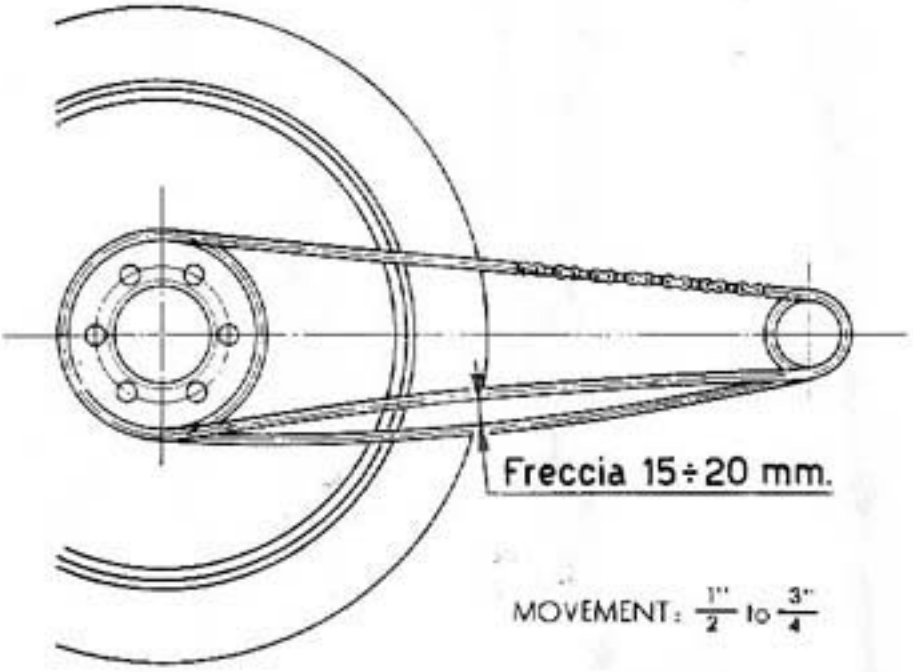
8 - Clutch control lever

SADDLE

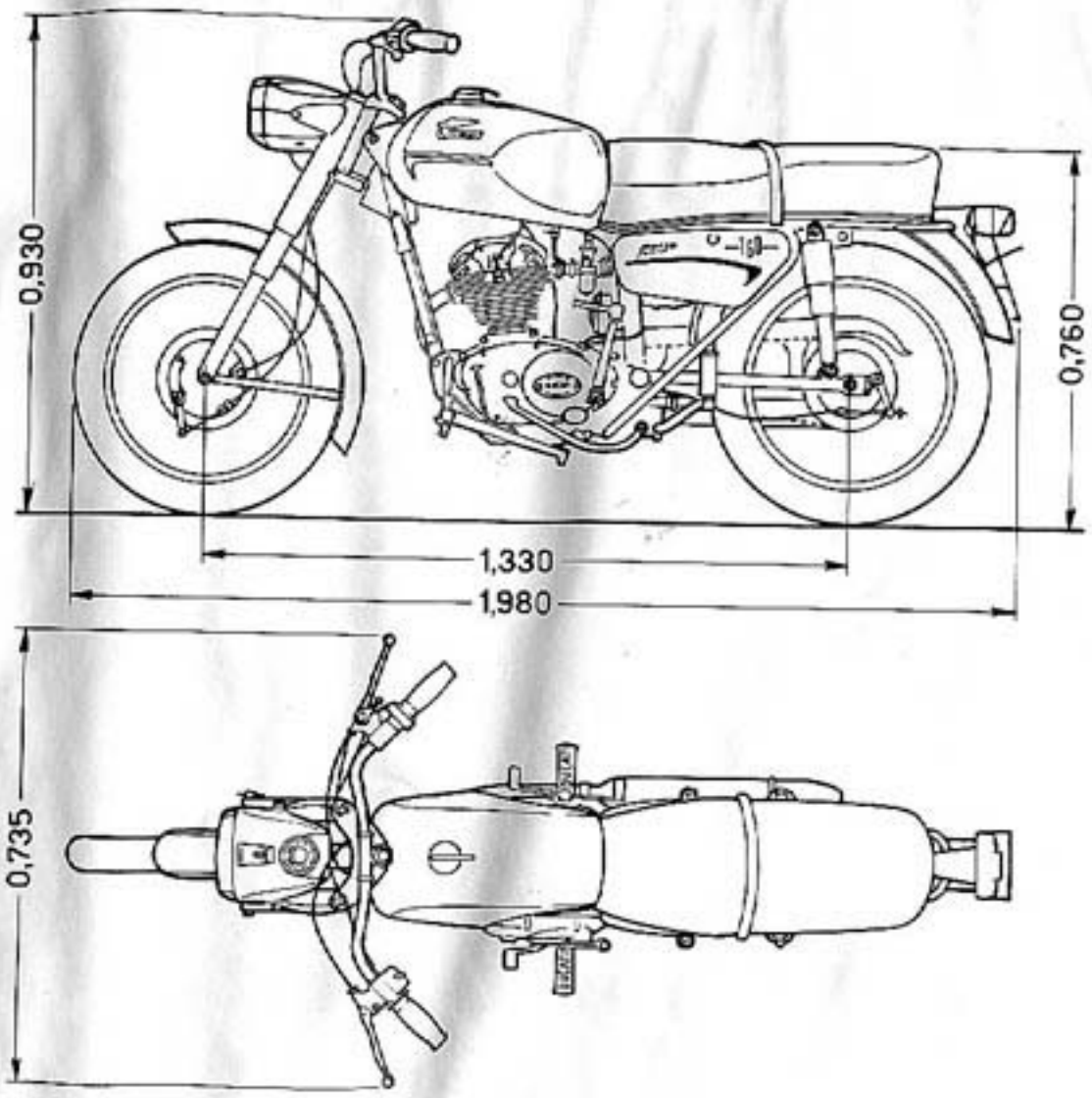
The motorcycle is provided with a dual-seat, wide and comfortable, a hand grip and footrest for pillion.

ADJUSTING OF THE CHAIN TENSION

For the correct chain adjustment up and down movement should be no more than ½" to ¾".



OVERALL DIMENSIONS IN METERS AND WEIGHT

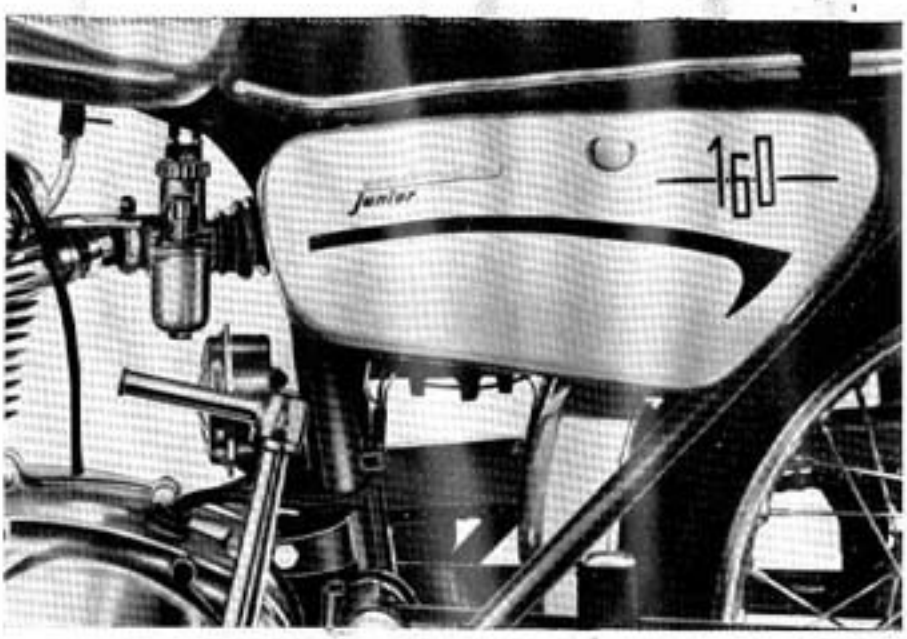


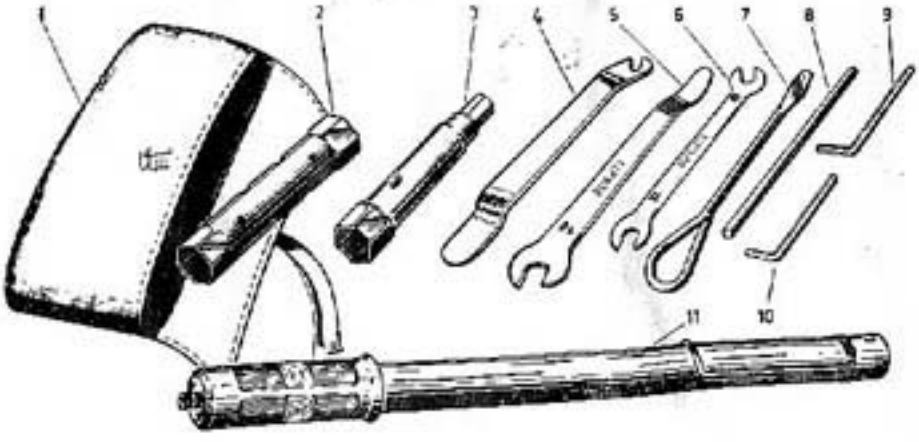
Weight (unladen) kg. 108 (lb. 238.100)

mts.	0.735 =	inch.	28.9369
»	0.760 =	»	29.9212
»	0.930 =	»	36.6141
»	1.330 =	»	52.3621
»	1.980 =	»	77.9526

TOOL BOX

A large tool box of ample capacity is placed under the saddle at the left side of the rider and contains the spanners and the tools supplied with the motorcycle for the normal inspections of the engine, which can be executed by the rider himself.

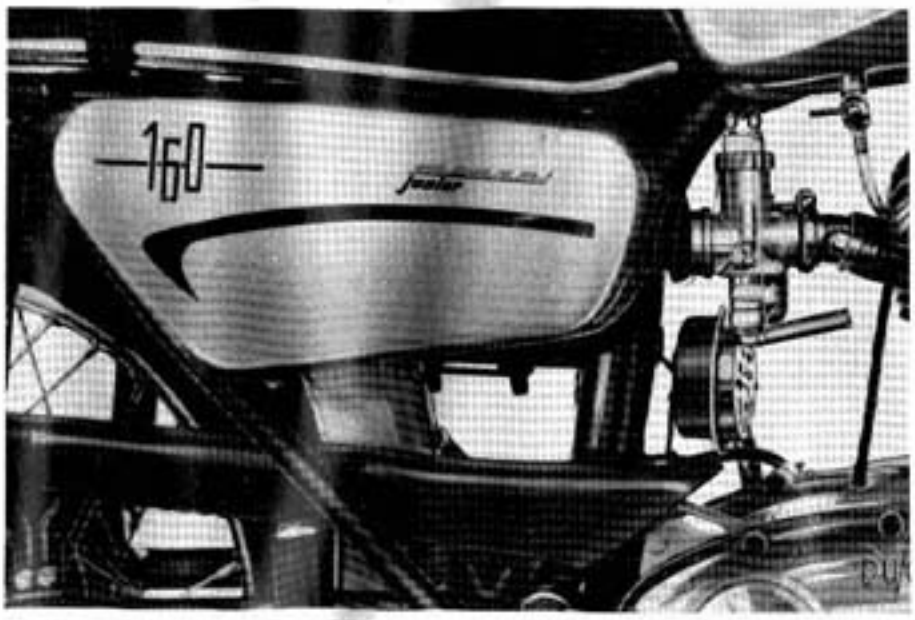




1 - Tool bag
2 - Double box spanner 19-22 (0.7480 — 0.8661")

3 - Double box spanner 21 for hexagon 14 (0.8268" — 0.5512")
4 - Tyre lever
5 - Hexagon spanner 14 with tyre puller (=0.5512")
6 - Double hexagon spanner 10-11 (=0.3937" — 0.4331")
7 - Screw driver
8 - Tommy-bar for box spanner 21-22 (=0.8268" — 0.8661")
9 - Spanner for hollow hexagon 6 (=0.2362")
10 - Spanner for hollow hexagon 5 (=0.1968")
11 - Tyre inflator.

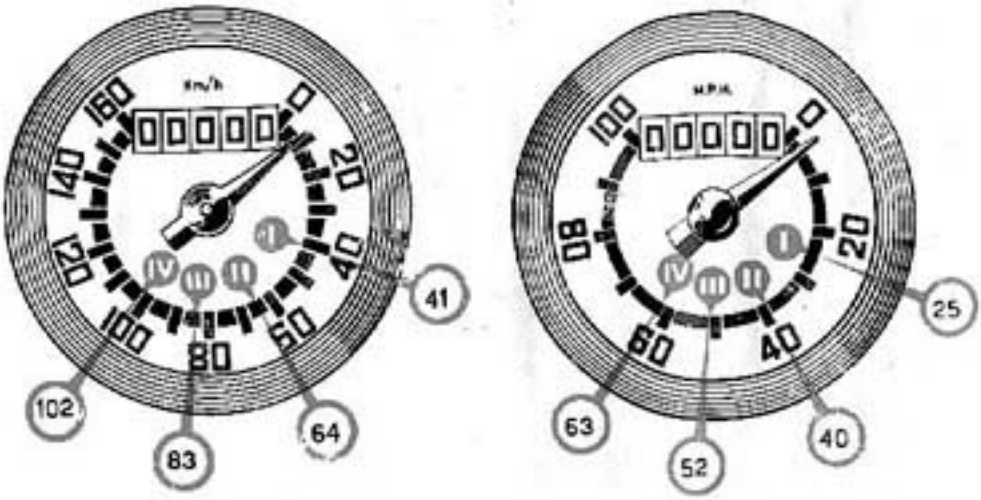
On the right of a toolbox similar to the previous one, is the air cleaner for the carburetor for the quiet air inlet. The battery is located between the two boxes.



PERFORMANCE

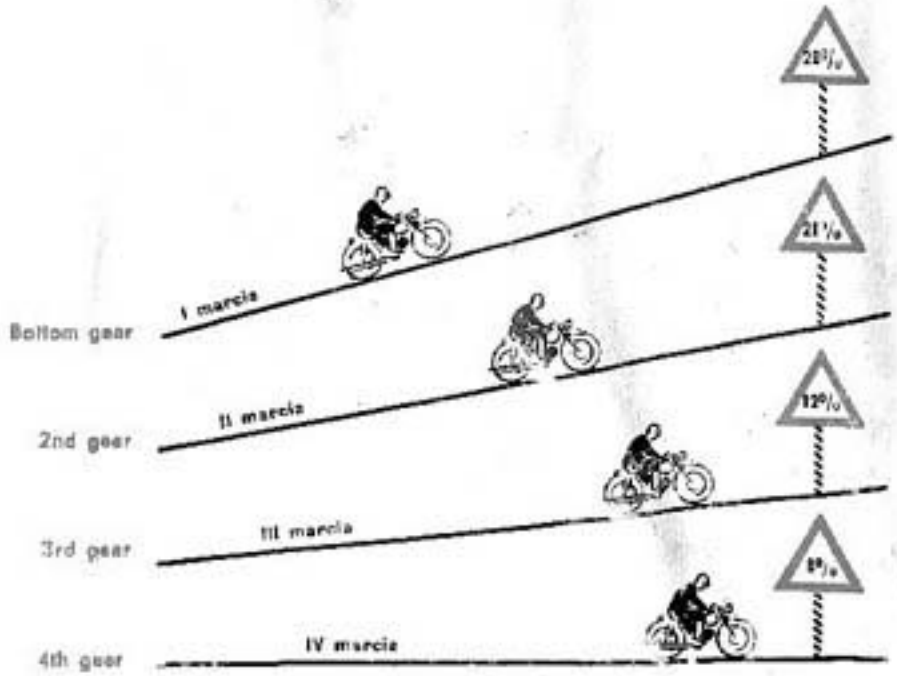
The maximum speeds allowed for each of the gears, correspond to the figures recorded in the red circles of the speedometer reproduced overleaf.

These speeds are obtainable only strictly following the recommendations for the tuning up, mentioned at pages 9 and 10 and periodically carrying out the maintenances described at pages 43 to 48.



(In lowered position race type)

Maximum gradient which can be overcome with rider only, in the various (gears) speeds.



CONSUMPTION AND DISTANCE

The consumption at an economical speed of 70 ÷ 75 Km/h (43 to 47 m.p.h.) about 1 liter = (imp. gall. 0.220 = USA gall. 0.2642) of petrol AGIP SUPERCORTEMAGGIORE per 36 Km. (ml. 22).

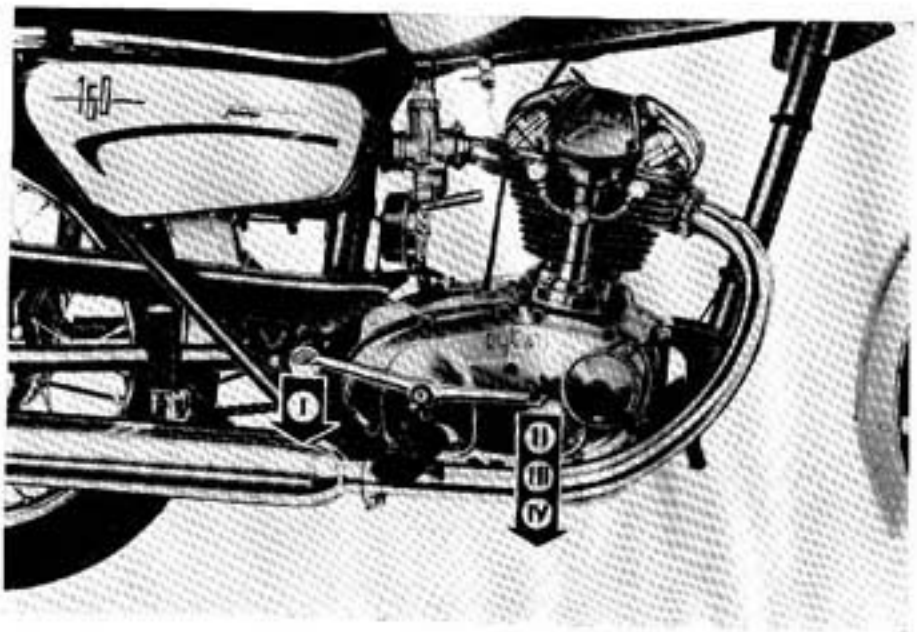
Maximum distance of cruising with one tankful, 468 Km. (ml. 291).

HOW TO USE THE OVER HEAD CAM-SHAFT MOTORCYCLE

FILLING UP AND STARTING THE ENGINE

Before starting the engine make sure that there is sufficient petrol in the tank, for the distance you wish to travel. See that the petrol tap is on and that the engine lubricating oil is at the right level.

For the lubrication it is advisable to use AGIP F.1 MULTIGRADE or AGIP F. 1 RACING SAE 40.
Having refueled and checked the oil, see that gear lever is in neutral position and press down the carburetor tickler to ensure the correct level of petrol in the float chamber. Now, after having inserted the contact-key into its place on the headlamp, turn the righthand handlebar grip (accelerator) for about one-eighth if its travel



and thrust the kickstarter energically downward.
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, do not race it 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.**

RIDING AWAY AND RUNNING OF THE MOTORCYCLE

With the engine running, disengage the clutch and using your heel, push down the rear 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 righthand 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 until about 15/20 Km/h (9-12 m.p.h.). To pass now from bottom gear in second gear, turn back righthand grip fully and quickly; and after having disengaged the clutch follow up at once by pressing down the front arm of the gearchange lever, with the toe of your shoe. Now turn forward the righthand 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. To change down from a high gear to a lower one, operate as follows: close the throttle, disengage the clutch, accelerate the engine momentarily, thus synchronizing the gear about to be engaged, engage the lower gear and then let go off the clutch control.
A good motorcyclist will make use of the controls intelligently 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 its turning at once: thus you avoid any oversupply 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.

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.

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

STOPPING THE MOTORCYCLE

To stop the engine, 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 pull out the contact key of the switch placed on the headlamp.

MAINTENANCE

On good maintenance depends the good condition of the motorcycle.

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

The operations to be carried out are subdivided in accordance with the order on which depends 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.

EVERY 500 Km (about 310 miles)

— Restore the oil-level in the crankase;

— 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, adjusting it from 0.002" to 0.0028" (0.05 to 0.07 mm.) by means of the screws and nuts placed on the rockers.

EVERY 1000 Km. (about 620 miles)

— Check and adjust the distance between the sparking plug electrodes to about 0.5 mm (0.02") and clean them with a small wire brush and some petrol;

— Clean the contact breaker platinum plates with a rag damped in petrol and check the distance between the platinum plates, which opening should be 0.3 to 0.4 mm. (0.0118" to 0.0157");

— Check the clearance between valves and rockers as mentioned in the above paragraph.

EVERY 1500 Km (about 930 miles)

— Lubricate the speedometer drive with AGIP F.1 GREASE 30.

EVERY 2000 Km (about 1240 miles)

— Change the oil in the crankcase draining it while the cingine is hot, make sure that the oil drains off completely.

— Remove the carburetor oil filter and wash it in petrol or paraffin oil, in order to remove all impurities from the gauze.

— 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.

— Dampen with 2 drops (not more) of thin mineral oil the lubricating wick of the contact breaker cam.

— Tighten uniformly the nipples of the spokes and check whether the screws and the nuts of the wheels have been firmly tightened.

EVERY 10.000 Km (about 6200 miles)

— Unscrew the B plug of the engine shaft and clean the hollow (see page 21).

— Tighten the plug again in its seat, and then smear with some polish to avoid the plug unscrews during motion. To allow the cleaning, it is only sufficient to remove the engine cylinder.

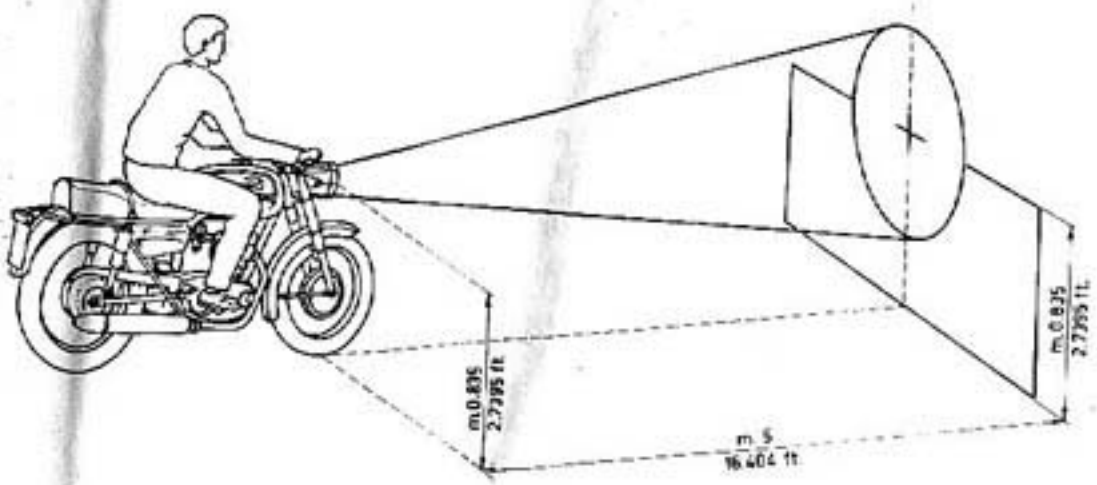
EVERY 20.000 Km (about 12400 miles)

— Dismantle the exhaust pipe and the cylinder, in order to remove the carbon deposits on the cylinder head and on the piston (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;



— trace a cross in the intersections between the optic axis and the wall, that is at a height of 0.835 meter (ft. 2.7395) from the ground;
— when the depthlight is lighted up, the cross must be in the center of the circular light-beam hitting the wall;
— to rectify, in case, the alignment of the headlamp, operate by means of the two screws fixing the headlamp on the front fork.

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 road.

— Clean the engine with parafin 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 parafin, otherwise the paint will look flat;

— grease the chromium plated parts with vaseline and polish with a shammy leather.

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 efficient, as per instructions at page 47;

— squirt through the hole of the sparking plug, 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 motorcycle upon two pieces of wood, lifting the machine from the ground and empty the air out of the inner tube;

— cover the machine with a canvas, or water-proof cover.

INSTRUCTIONS

ON HOW TO PROCEED THE FIRST TIME YOU CHARGE THE BATTERY

Battery Type 3 IL 3 - Capacity: 7 Ah in 20 hrs.

1) Fill each cell with sulphuric acid (specific weight 1280) till level is 1 cm. (0.3937 in.) above top edge of the plates.

2) Let battery rest for about 6 hours, to allow plates to soak and cool down; then re-establish the right level by adding more sulphuric acid.

3) Charge battery for at least 48 hours running, at an intensity equal to 1/10th its capacity, **until electrolyte thickness has recovered its initial value.**
(While charging the battery be careful electrolyte temperature does not exceed 50°C. (122°F.)).

   At this stage there will be an intense ebullition in all the cells. Voltage of each cell must reach at least 2.7 volts while charge is being made; that is, 8.1 volts for a 3-cell battery, and 16,2 volts for a 6-cell battery.
If necessary, restore right level by adding distilled water. The battery is now ready for use.

INSTRUCTIONS

ON MAINTENANCE OF BATTERY.

During idle periods, and before using battery, make sure electrolyte level is at least 6 mm. (0.2362") above top edge of plates if battery is for a car, and 2 mm. (0.0787") if battery is for a motor cycle.

See that the above mentioned level is always maintained. Add distilled water only; NEVER sulphuric acid.

If the battery is not used at once, it must be charged for a short time a least once a month, or every time it has to be used. *Take great care* that especially the upper part of the battery is kept clean and dry. Make sure the vert

plugs are well screwed down; if they are damaged, change them. Protect terminals and connections from possible oxidation by coating with pure vaseline.
The characteristics of the battery should correspond perfectly to those of the electric equipment assembled on the motor cycle.

RECHARGING

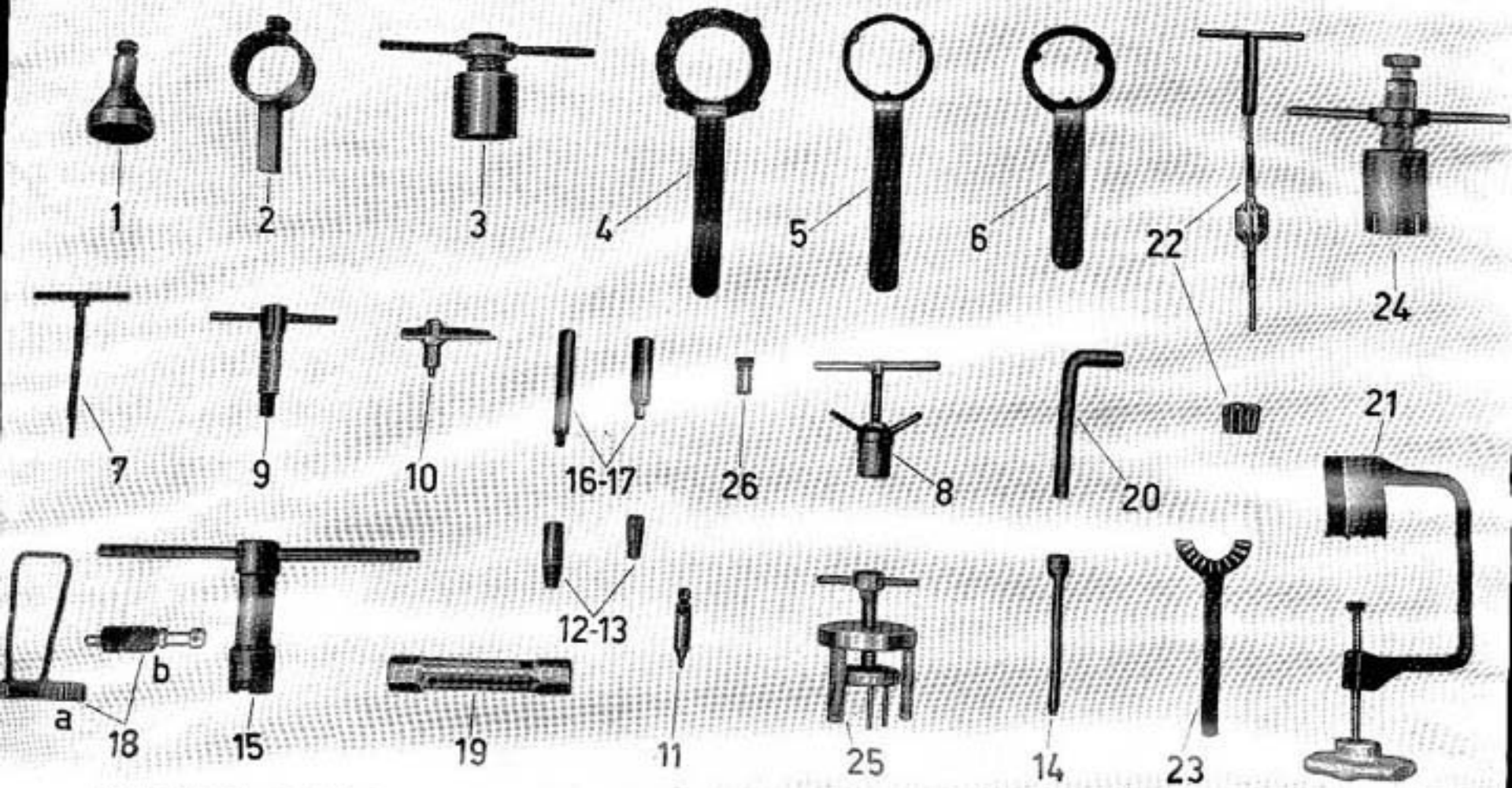
Before recharging the battery, which has been removed from the machine, make sure it is quite clean.
Put into circuit and recharge preferably at a normal intensity in amperes equal to and not exceeding 1/10th of the battery capacity rating in 10 hours (see tables and other data in SAFA Catalogue).
If, while recharging, the temperature (measured by means of an appropriate thermometre dipped in the electrolyte) reaches 50°C. (122°F.) reduce or stop the charge till the temperature has gone down to at least less than 40°C. (104°F.). Charging must continue until reading of the electrolyte density is the same 3 times running and is equal to 31° Bè (specific weight 1275) or until voltage has reached the value or 2.7V. per cell.
NEVER add sulphuric acid. Maintain level by adding chemically pure distilled water ONLY.

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 on page 30.
To avoid demagnetizing the rectifier, be careful never to send electrical current (direct or alternate current) in the opposite direction.
Every inspection should be made with a convenient Ohmmeter.

SERVICE STATION

TOOLS FOR SERVICE STATION



Attention: the tool n. 25 is deleted.

TOOL EQUIPMENT
LEGEND

1) Flywheel puller

2) Piston cleaning tool

3) Puller for journal bearing bushing

4) Housing-holding key for tightening the engine shaft gear

5) Drum-holding key for tightening the drum nut

6) Gear holding key for tightening the pinion nut

7) Spanner for nuts with hollow hexagon - ch. 5 (0.1968") or ch. 6 - (0.2362")

8) Valve seats grinding tool

9) Puller for clutch side cover

10) Piston position indicator

11) Rocker pin puller

12-13 Cones for fitting circlips with round and square sections

14) Line-up pin for rocker bushing or washer assembly

15) Timing camshaft holding key for tightening of the bevel gear Z = 28

16-17) Pin for assembling and dismantling of gudgeon pin

18) Engine shaft holding tool for tightening of the bevel gear Z = 21
a) with assembled cylinder head b) with dismantled cylinder head

19) Spanner for bevel gear Z = 28 (see 15)

20) Plug assembly spanner for plugs with hollow hexagon ch. 12 (0.4724") or ch. 14 (0.5512")

21) Valve assembling and dismantling tool

22) Grinder for valve seats (one for the inlet and one for the exhaust)

23) Key for threaded ring of exhaust pipe

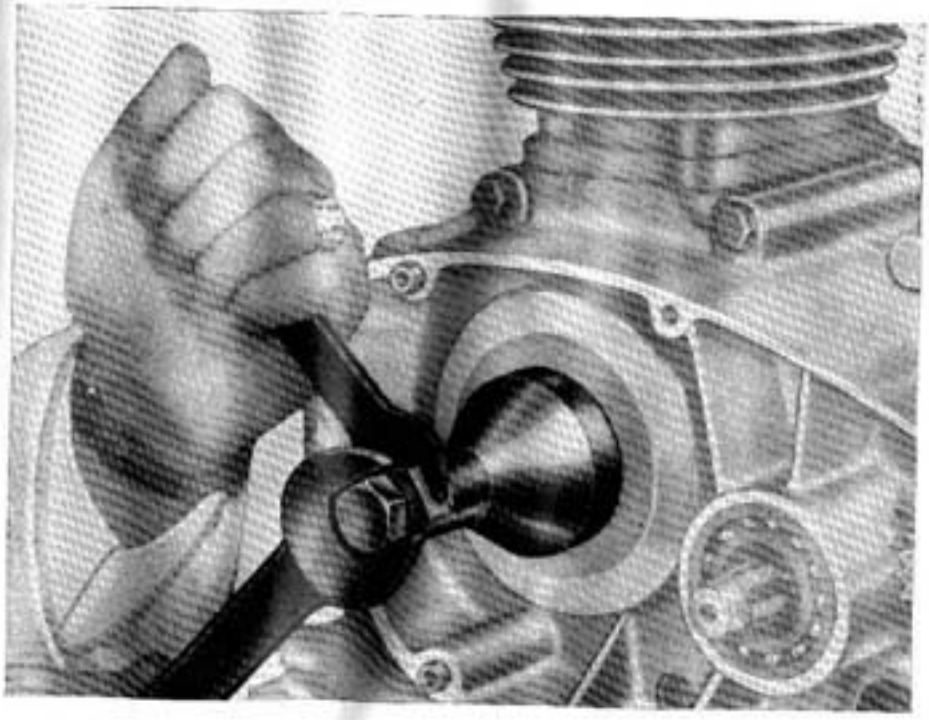
24) Ball bearing puller (3 types)

26) Bush for the assembly of the advance ignition cover

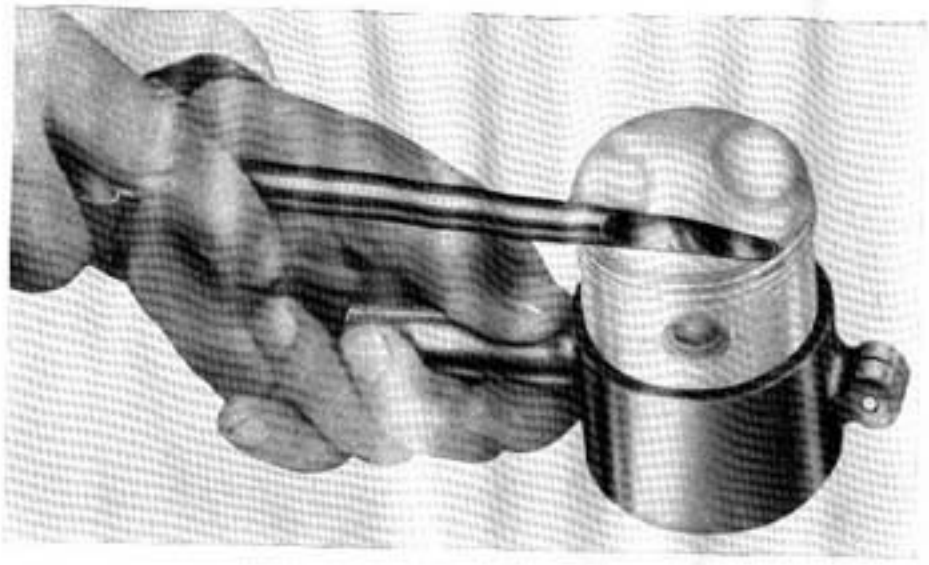
SERVICE STATION

TOOL EQUIPMENT

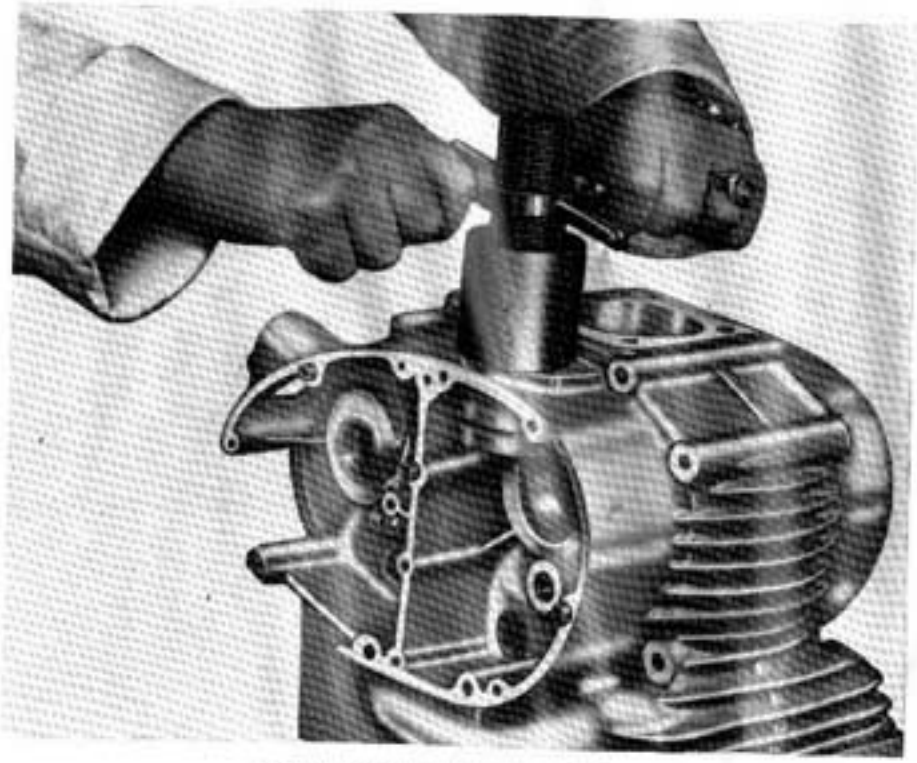
DIRECTION FOR USE



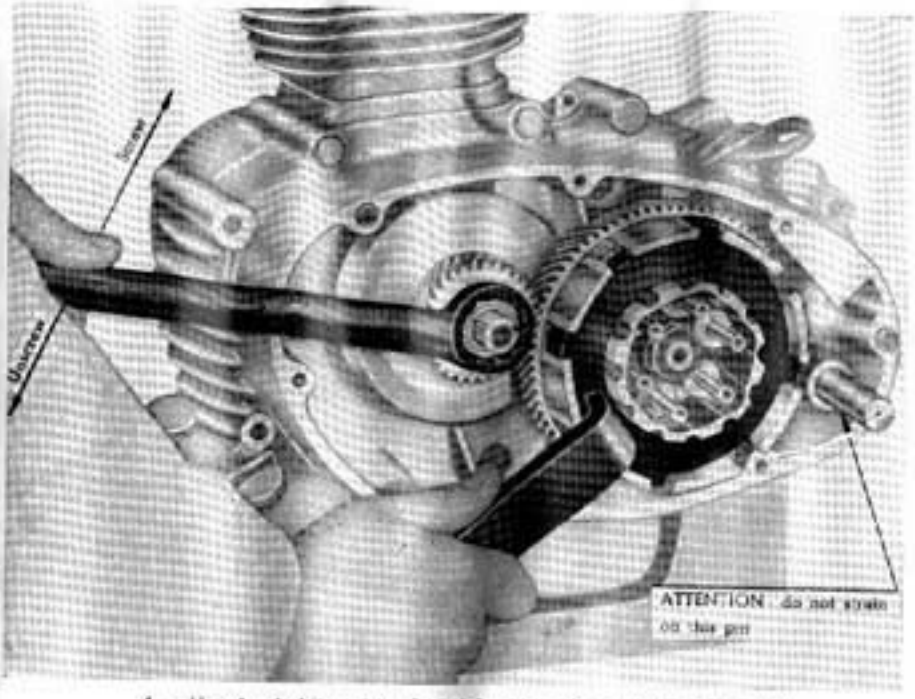
1 - Flywheel puller



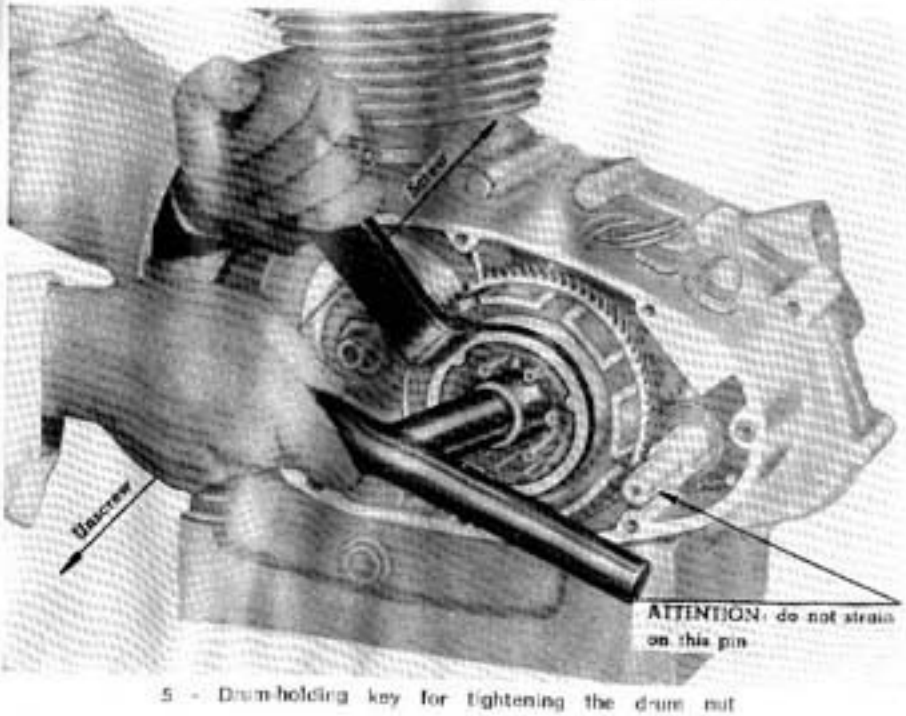
2 - Piston cleaning tool



3 Puller for journal bearing bushing



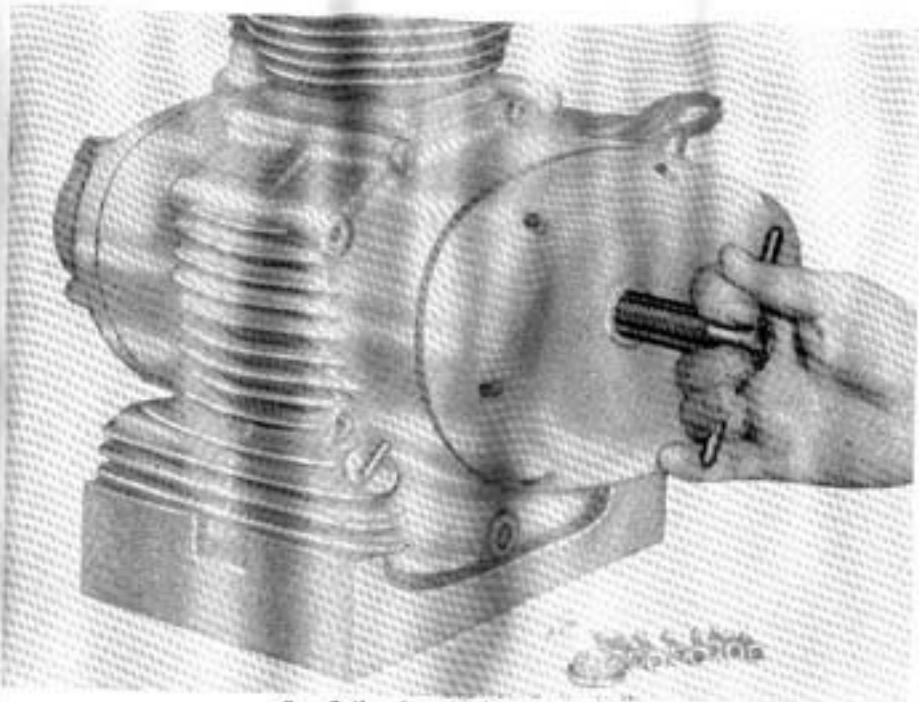
4 - Housing-holding key for tightening the engine shaft gear



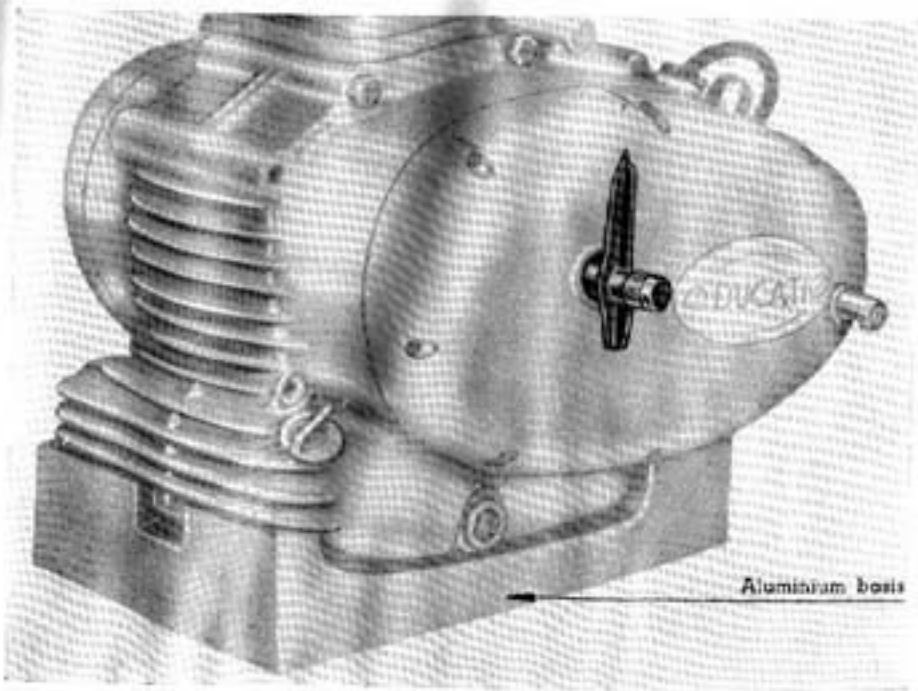
5 - Drum-holding key for tightening the drum nut

5 - Gear-holding key for tightening the pinion nut

8 - Valve seats grinding tool

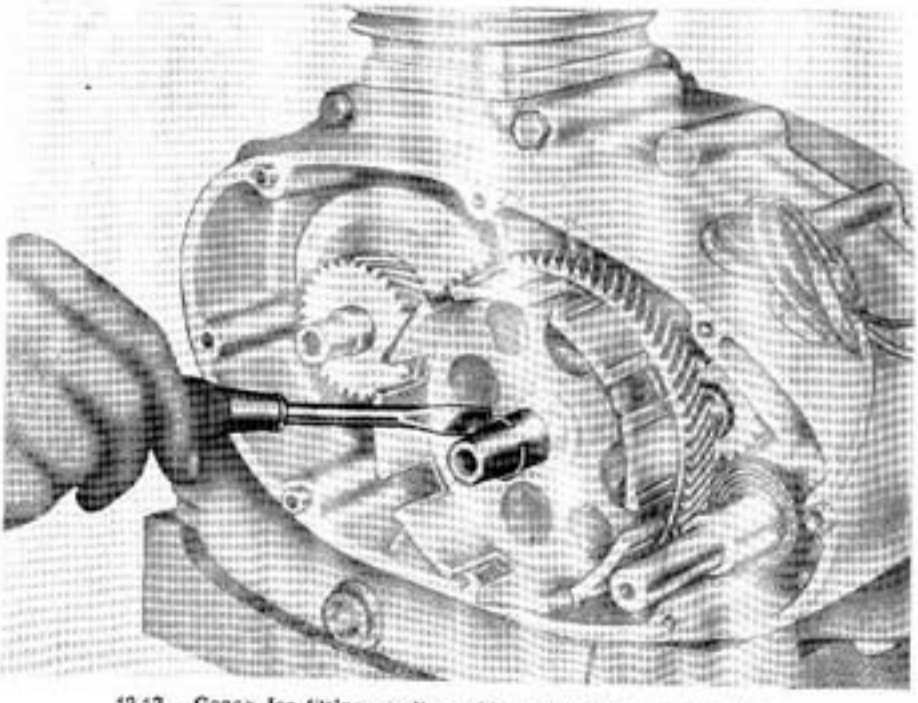


9 - Puller for clutch side cover

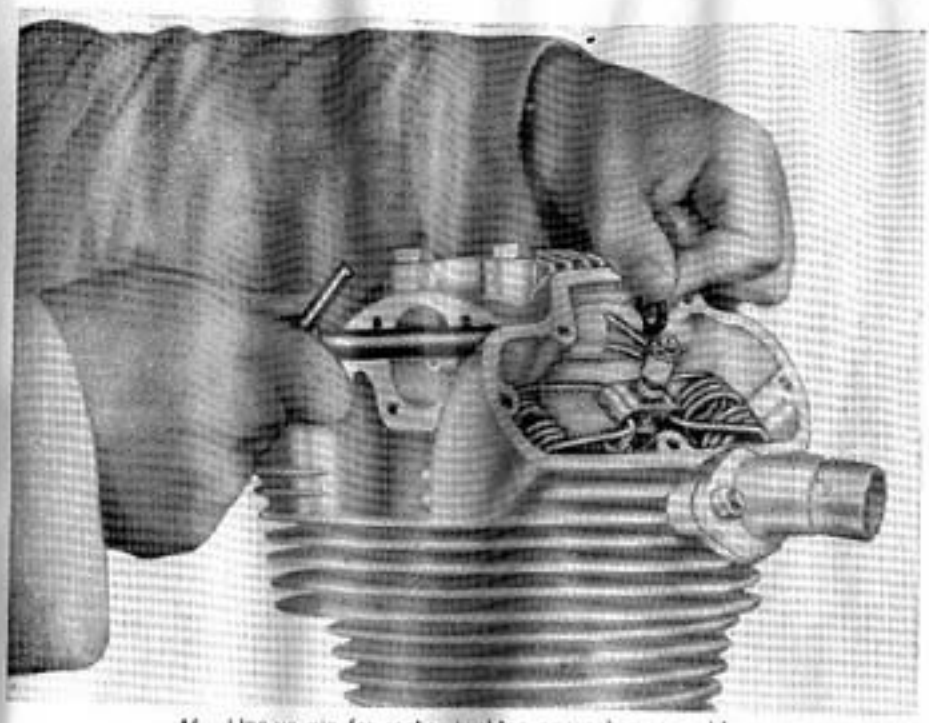


10 - Piston position indicator

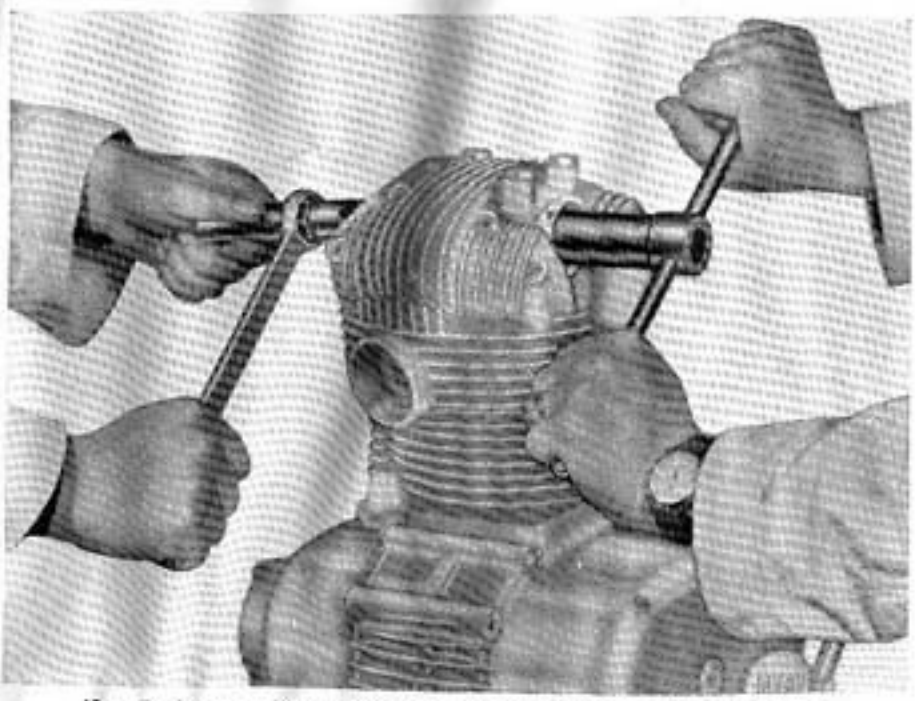
11 - Rocker pin puller



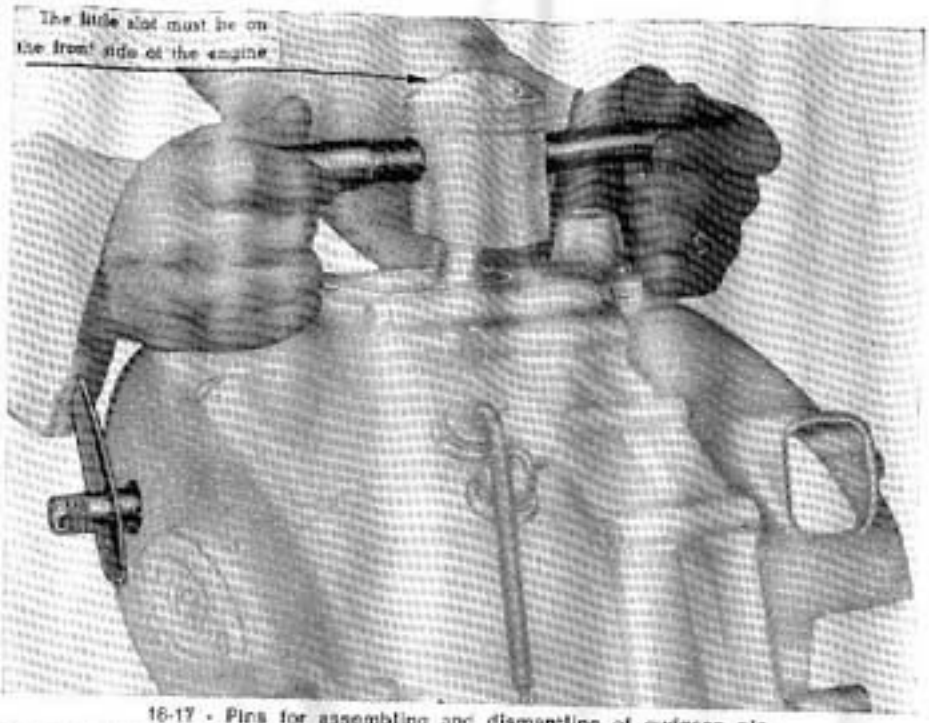
12-13 - Cones for fitting circlips with round and square section



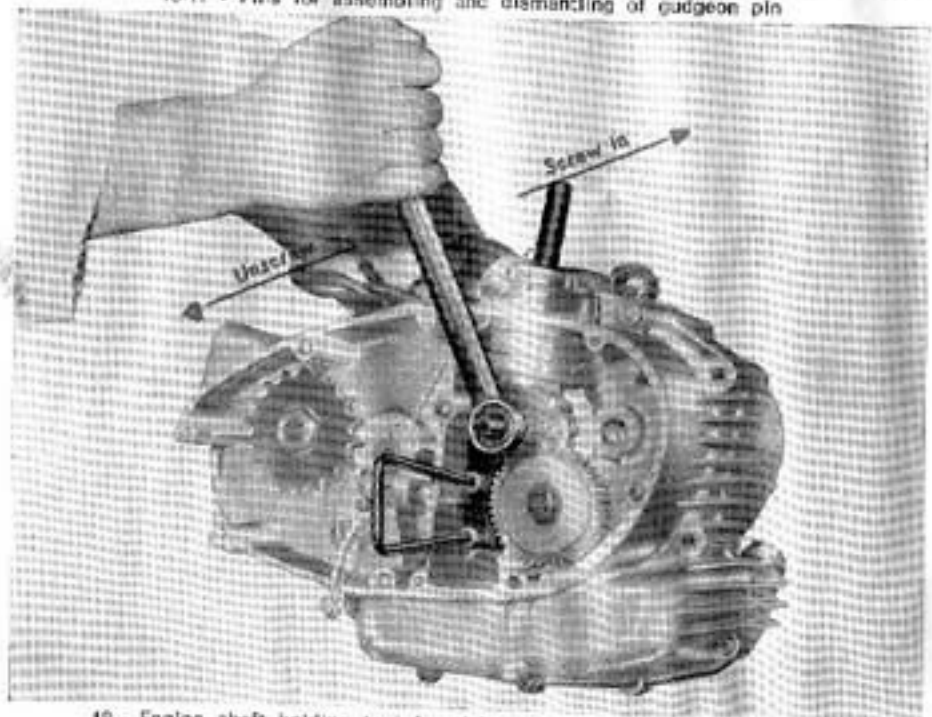
14 - Line-up pin for rocker bushing or washer assembly



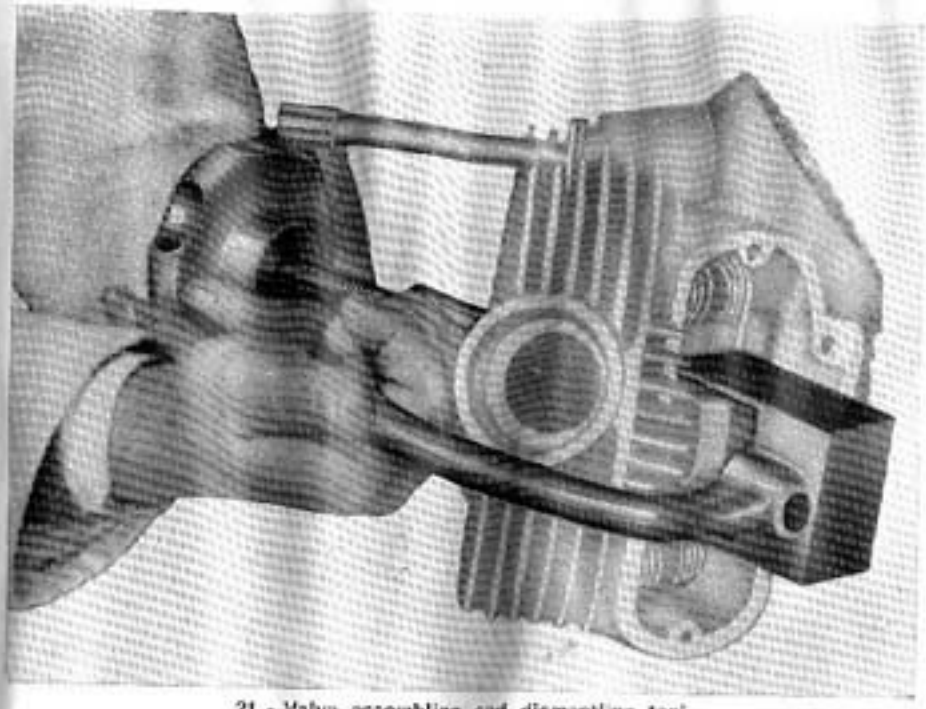
15 - Timing camshaft holding key for tightening of the bevel gear



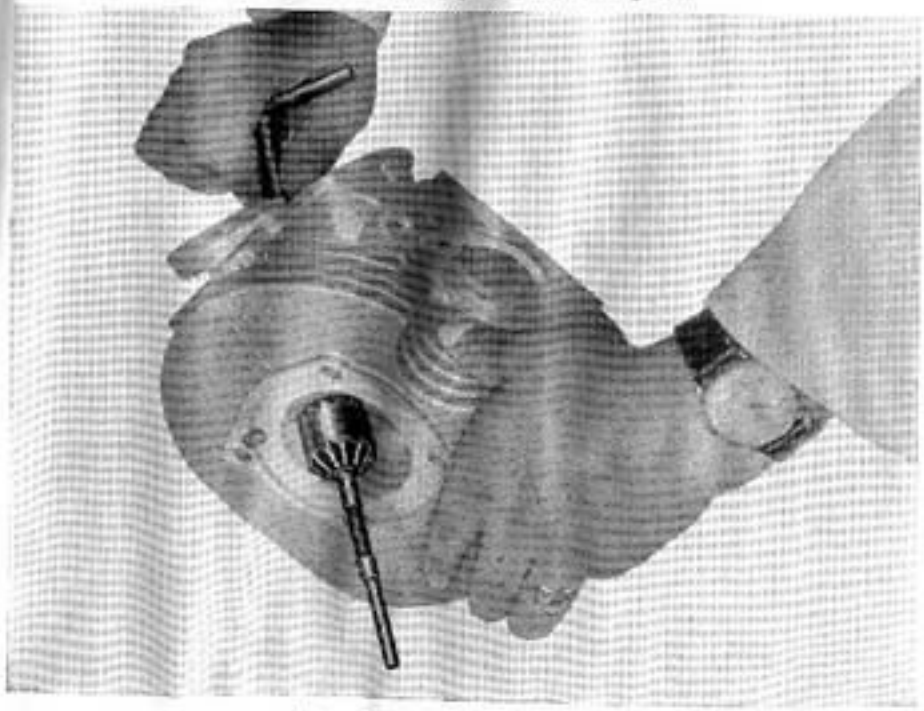
16-17 - Pins for assembling and dismantling of gudgeon pin



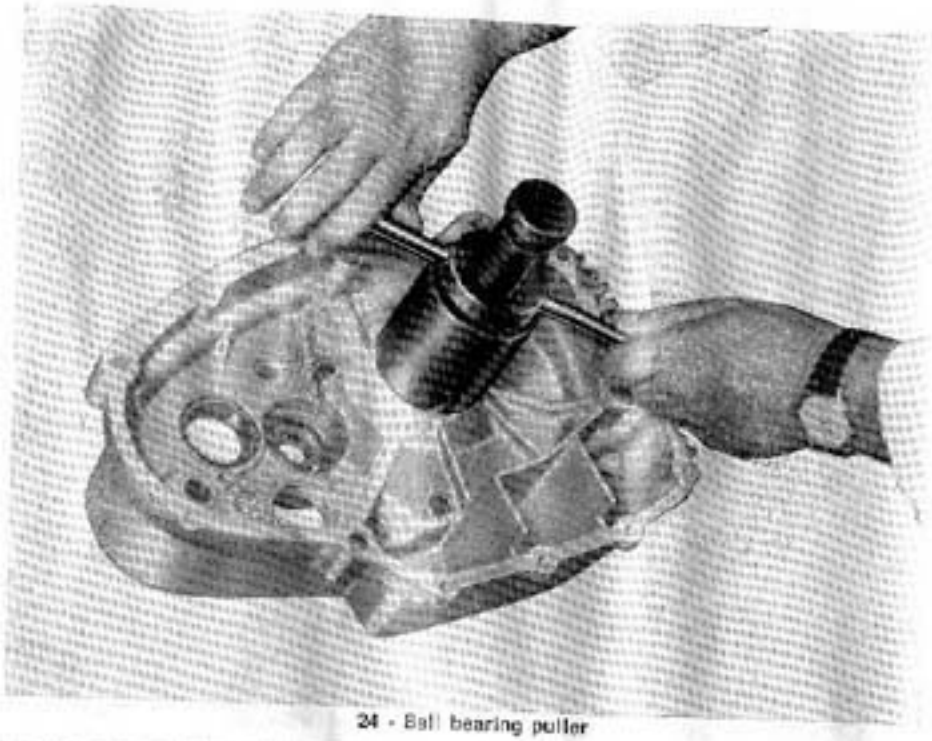
18 - Engine shaft holding tool for tightening of the bevel gear Z = 21
a) with assembled cylinder head b) with disassembled cylinder head.



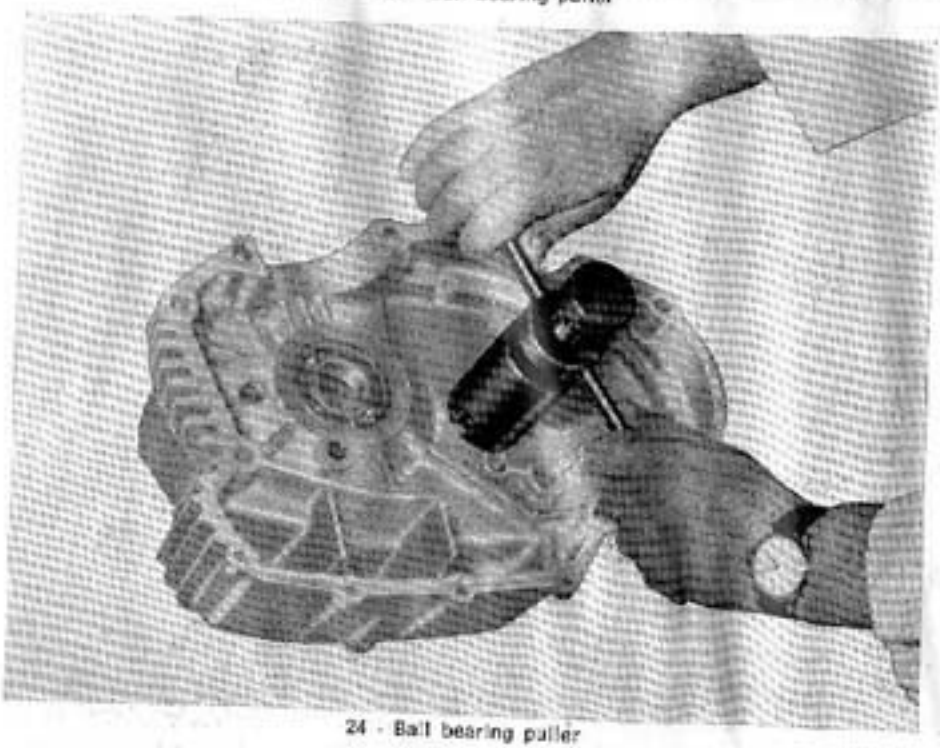
21 - Valve assembling and dismantling tool



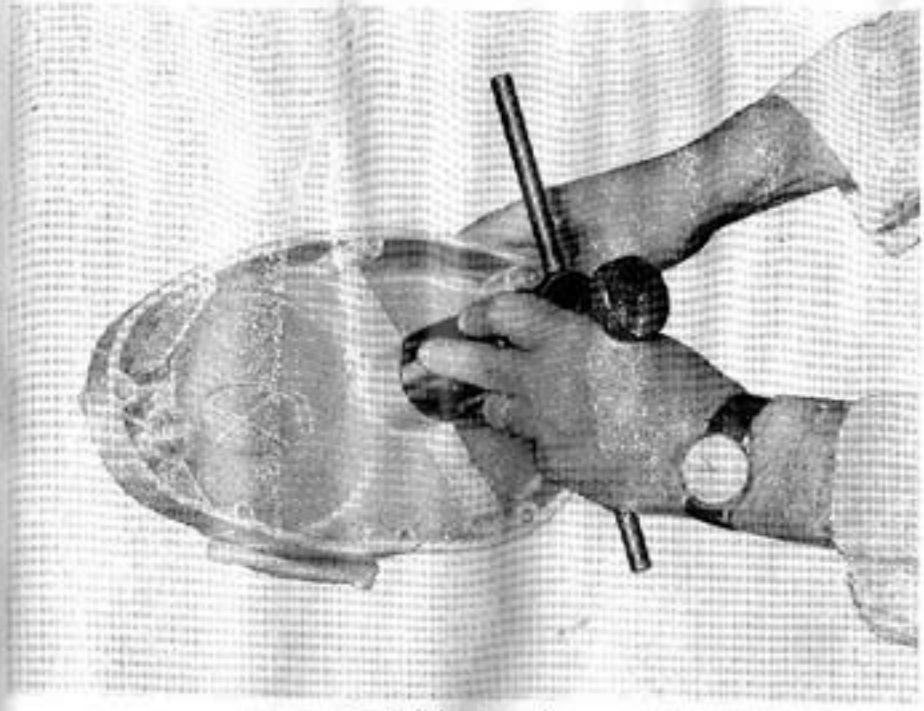
22 - Grinder for valve seat



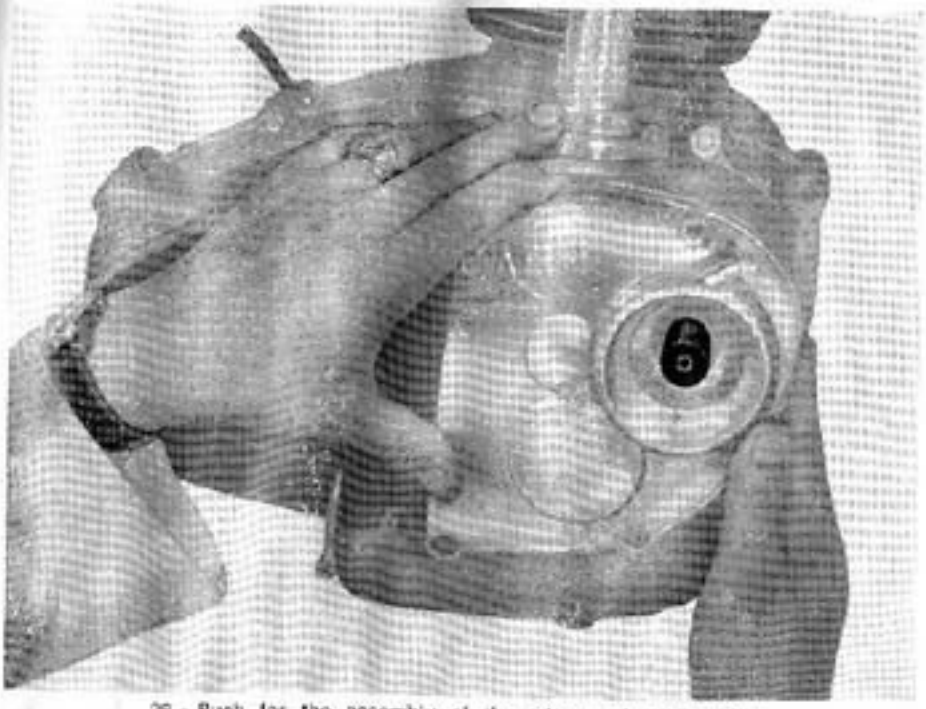
24 - Ball bearing puller



24 - Ball bearing puller



24 - Ball bearing puller



25 - Bush for the assembly of the advance ignition cover

LOCATING AND REMEDYING FAULTS

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

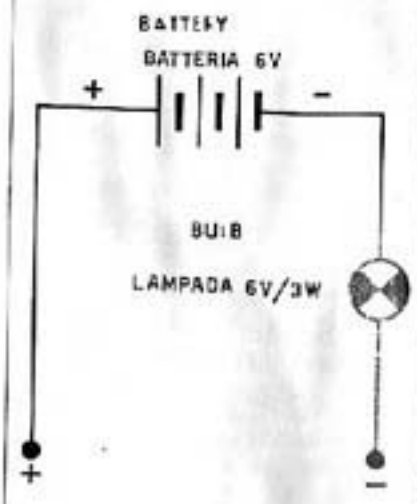
ENGINE DOES NOT START EASILY

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 of the ignition coil is broken or sparking externally.	Inspect the cable insulation for faults and if necessary change the cable at a DUCATI Servicing Garage).
Defective sparking plug.	Change or clean the plug, making sure that the insulation core is not damaged, that there are no carbon deposits on the electrodes and that the spark gap does not exceed 0.5 mm. (0.0197").

CAUSE	REMEDY
The contact breaker points do not open.	Check the position of the fixed contact point (at a Ducati Servicing Garage).
The contact breaker arm seized on its pivot.	Check movement between rocker arm and pivot and if necessary lubricate the pivot.
The contact breaker points are drity.	Clean the contact breaker points with a rag damped in petrol.
The capacitor has broken down or is short circuited.	Change the capacitor (at a Ducati Servicing Garage).
Compression lacking.	Check if the sparking plug has been tightly screwed in, check the valves for gas-tightness and the tightness of the piston (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 Station).
The adjustment screw for the tappet clearance is loose.	Readjust the clearance and tighten the set-nut properly.
The battery is discharged.	Recharge the battery according with the instructions of page 47 (at a Ducati Servicing Station).

CAUSE	REMEDY
The battery quickly discharges for a fault or an interruption in the recharging circuit.	Disjoin the wire from the + terminal post of the battery and insert the ammeter in continuous current between the terminal post and the wire. Insert the ignition key and let the engine turn. **CHECKING THE ELECTRICAL BALANCE** Make sure that all the bulbs and fuses are efficient. 1) With the lights switched out (during the day) the ammeter should mark the flowing of the current at about 1,500 revs. per minute. 2) With town lights switched on (during the night) the ammeter should read 0 at about 3,800 revs. per minute. 3) The country lights are fed in a.c. directly by the flywheel so they do not interest the circuit Diode-rectifier-battery. If these balances are reached with a superior number of revs. or if they are not reached, and if the country light does not light up, operate in the following manner:

CAUSE	REMEDY
Test of the circuits of the electrical diagram  	CHECKING THE ALTERNATOR a) Stator: Disjoin the wires from the terminal post and the frame and check by the ohmmeter or by the circuit tester (composed of a bulb of 6V/3W fed in series by a battery of 6V) so that between each cable and earth there is continuity (for a lighted lamp, in the opposite case remove the stator and check the connection and the weldings). b) Rotor: If the balance reaches a higher number of revs. the rotor may be partially demagnetized; replace it. CHECKING THE DIODE-RECTIFIER Having the ignition key inserted, connect the stylus terminals of the ohmmeter (or of a circuit tester) with the blue and red cables which arrive at the terminal post of the frame as follows: The + of the ohmmeter (or of the circuit tester) with the red and the — with the blue. Continuity (or bulb switched on) should be read, inverting the Stylo terminals there should be no continuity (bulb switched out). If this occurs, replace the Diode-rectifier.

CAUSE	REMEDY
	HORN AT EARTH If the horn is not working and is earthed, the battery is automatically in short circuit. Arrange for the replacement.

Dirt in the carburetor	Clean the carburetor filter, the petrol cock filter and the petrol pipe.
Main jet partly clogged.	Clean the main jet by means of an air blast.
Carburetor butterfly valve does not open completely.	Readjust the valve travel by means of the adjustment screws of the carburetor Bowden cable (at a Ducati Service Garage).
The float needle does not close porperly.	Clean out the carburetor and especially the needle seat (at a Ducati Servicing Garage).
Petrol of bad quality.	Empty the petrol tank and refill at a reliable garage.
The sparking plug is not the right type.	If the sparking plug overheats, you will have pre-ignition, 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.
The sparking plug works loose.	Tighten the plug down well. A copper washer should always be placed between the sparking plug and its seat, in the cylinder head.
The sparking plug cable sparks externally.	Change the cable or repair the insulation (at a Ducati Servicing Garage).

CAUSE	REMEDY
The spark gap between the electrodes of the sparking plug is too wide.	Adjust the gap to the proper width of about 0,5 mm. (0.0197").
The sparking plug electrodes are dirty.	Clean the electrodes with a wire brush.
The contact breaker opening is excessive.	Readjust the exact opening of the contact which is 0.3÷0.4 mm. = 0.0118" to 0.0157" (at a Ducati Servicing Garage).
The secondary winding of the coil is short circuited or b	Change the coil (at a Ducati Servicing Garage).
The silencer is almost completely clogged-up.	Clean the silencer, to ensure the free discharge of the spent gases.

STUDIO LUCY
TIP. RIGHI BOLOGNA

DUCATI MECCANICA S.p.A. - BOLOGNA
(BORGO PANIGALE) - POST BOX 313
PHONE 40.02.50 (four lines) - TELEGRAMS: «DUCATIMEC» - BOLOGNA (ITALY)