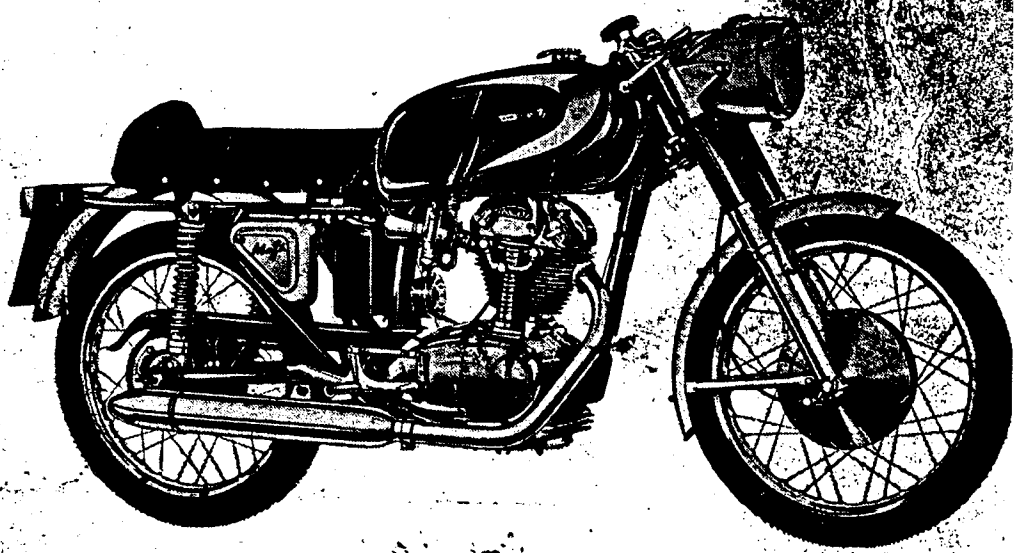
DUCATI

5 - speed

250 cc. over head cam-shaft

MOTORCYCLES 196

Distributor for USA
BERLINER MOTOR CORPORATION



DUCATI
MECCANICA
BOLOGNA

Instructions for use and maintenance

PRINTED IN ITALY

MK III TUNING SPECS

Valve Clearances: .006" intake (.15 mm
.012" exhaust (.30 mm.

Ignition:
Breaker points .012-.016" (.3-.4 mm)
Advance 21°-23° static
18° automatic
39°-41° total @ 3000 r.p.m.
spark plug gap .020" (.5 mm)

5 - speed over head cam-shaft

DUCATI MOTORCYCLES 196

250 GT
250 monza
250 mach 1
250 mark III
250 motocross

SPECIFICATIONS - USE - MAINTENANCE

DUCATI MECCANICA BOLOGNA

1 st. ISSUE - PRINTED DM - Mod. 751/E December 1964 - 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 be 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 Motorcycles.

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

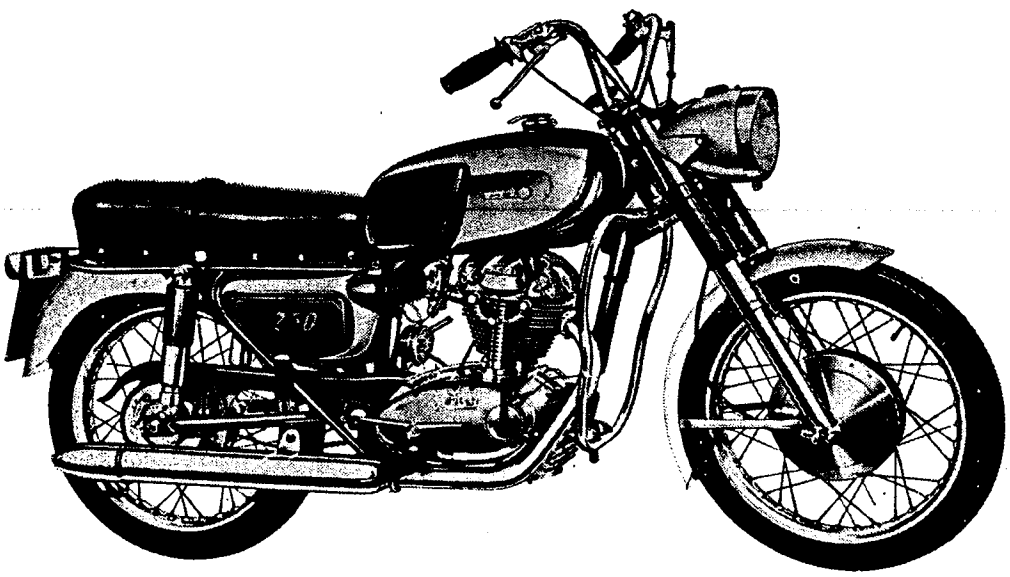
In order to obtain the fine service that the Ducati machine is capable of giving, it is essential that the instructions contained in this book be religiously adhered to.

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

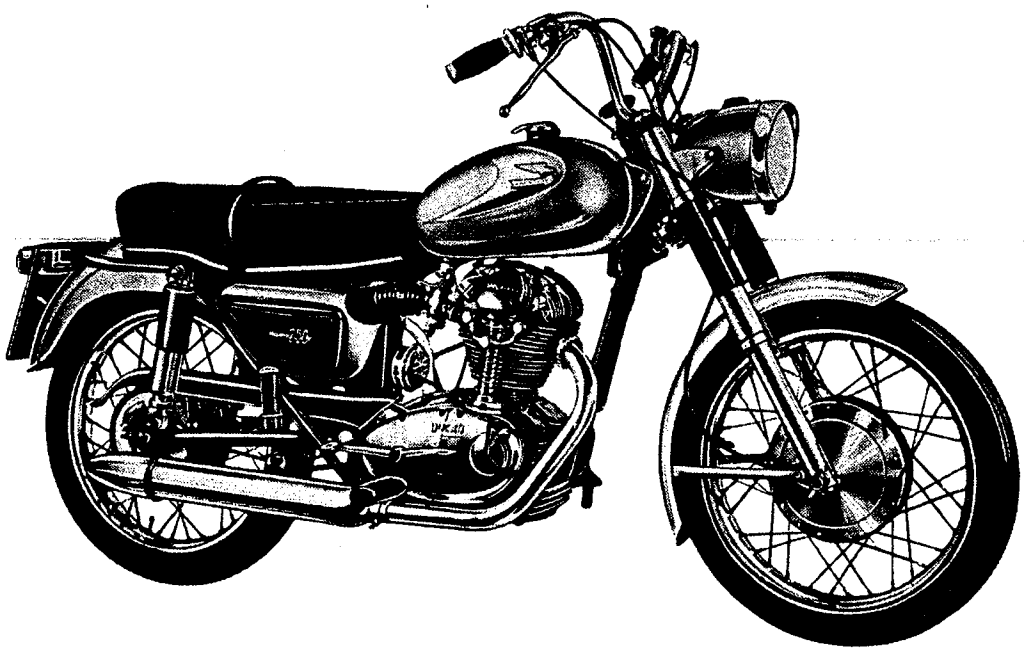
DUCATI MECCANICA S.p.A.

MOTORCYCLE DUCATI 250 GT



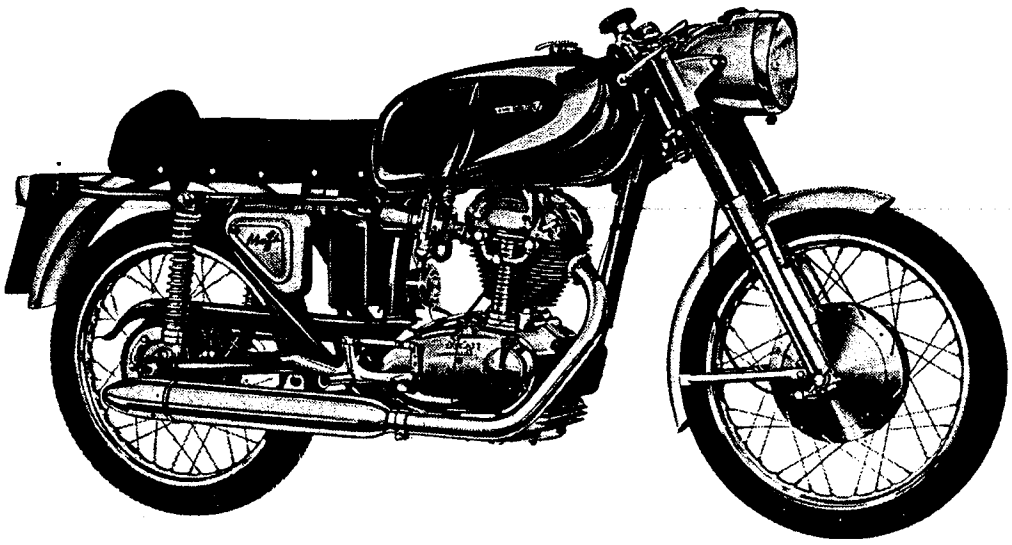
Colours: bright black and metallized aluminium

MOTORCYCLE DUCATI 250 MONZA



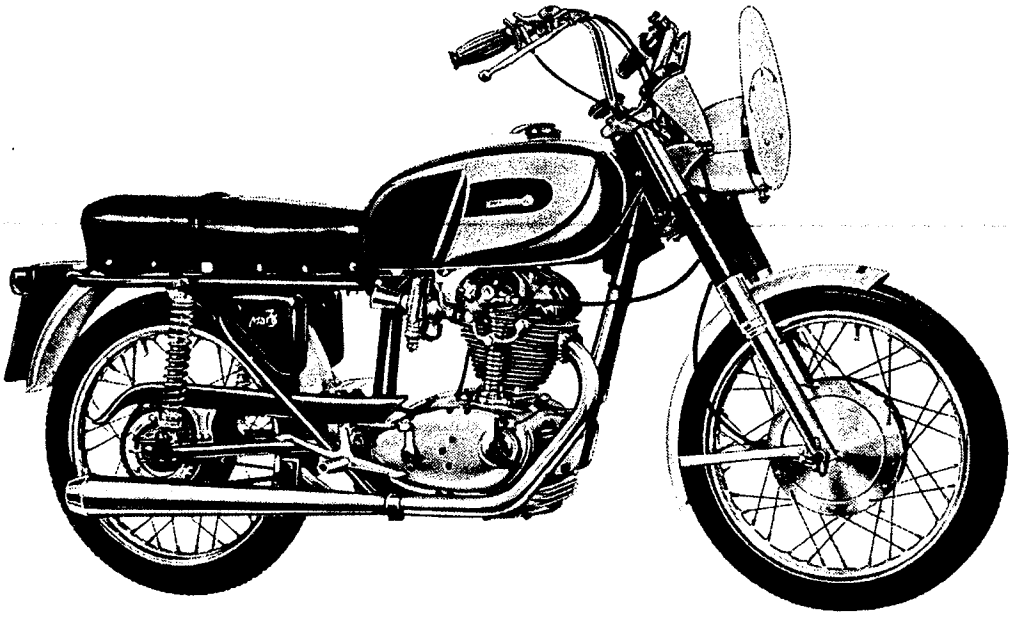
Colours: bright black and metallized aluminium

MOTORCYCLE DUCATI 250 MACH 1



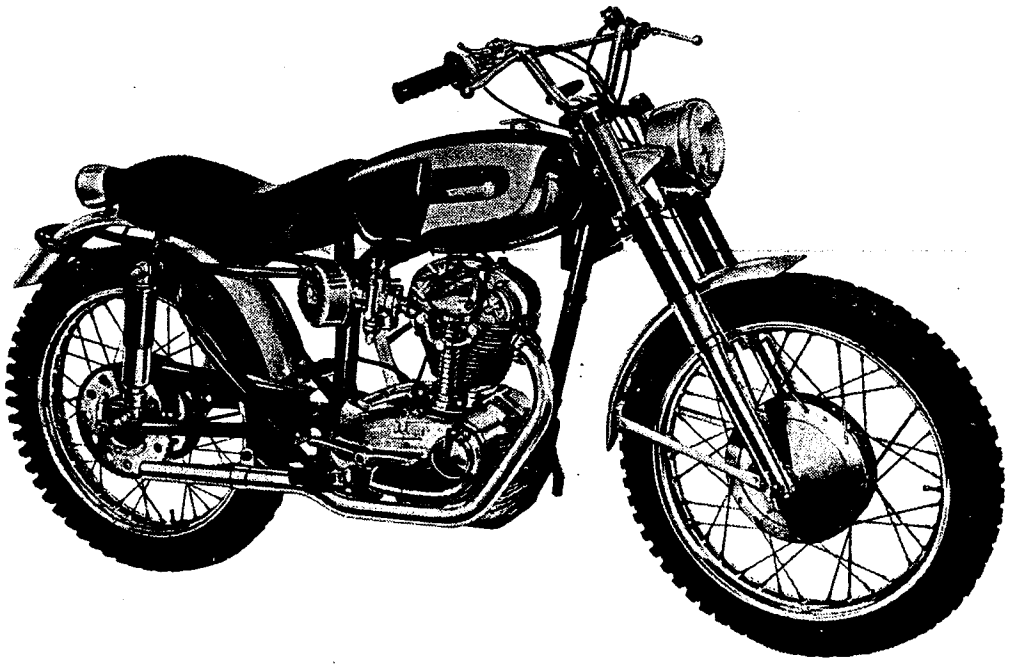
Colours: Triumph red and metallized aluminium

MOTORCYCLE DUCATI 250 MARK III



Colours: bright black and metallized aluminium

MOTORCYCLE DUCATI 250 SCRAMBLER



Colours: bright black and metallized aluminium

A FOREWORD

The main goal of the present instruction booklet is to enable the owner of an over head cam-shaft 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 vechicle 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.

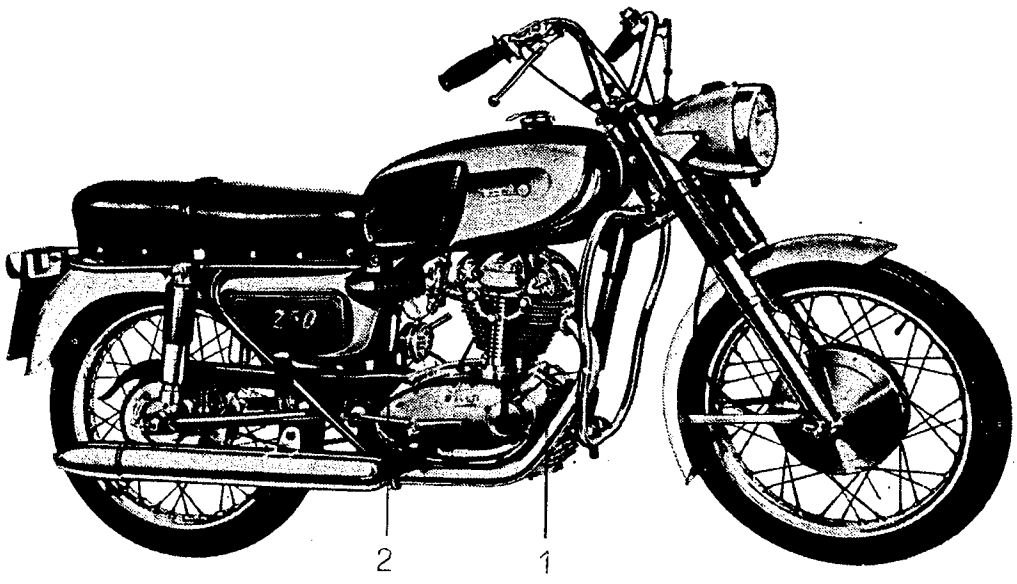
SPARE PARTS

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 of the model wanted).
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).

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.



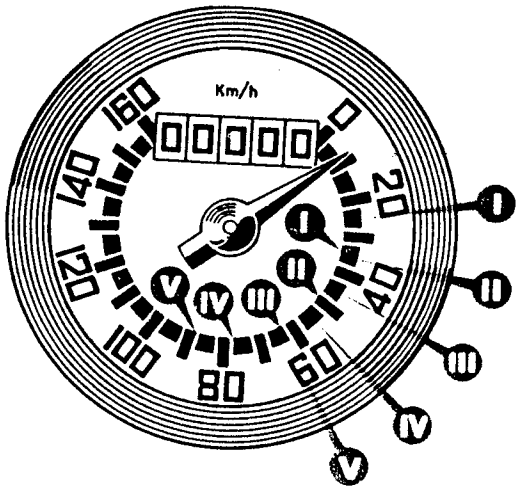
1 - Engine serial number

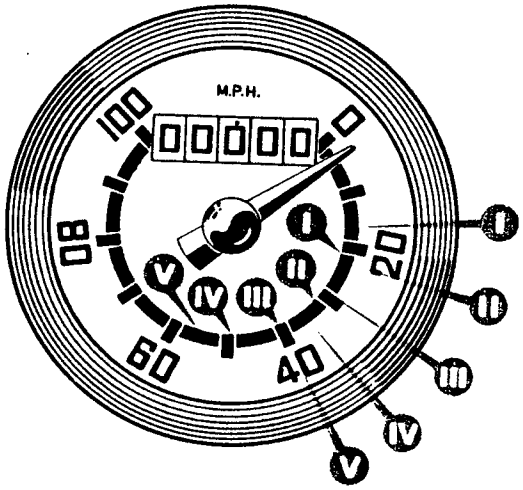
2 - Frame serial number

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 speeds in gears should be strictly observed.





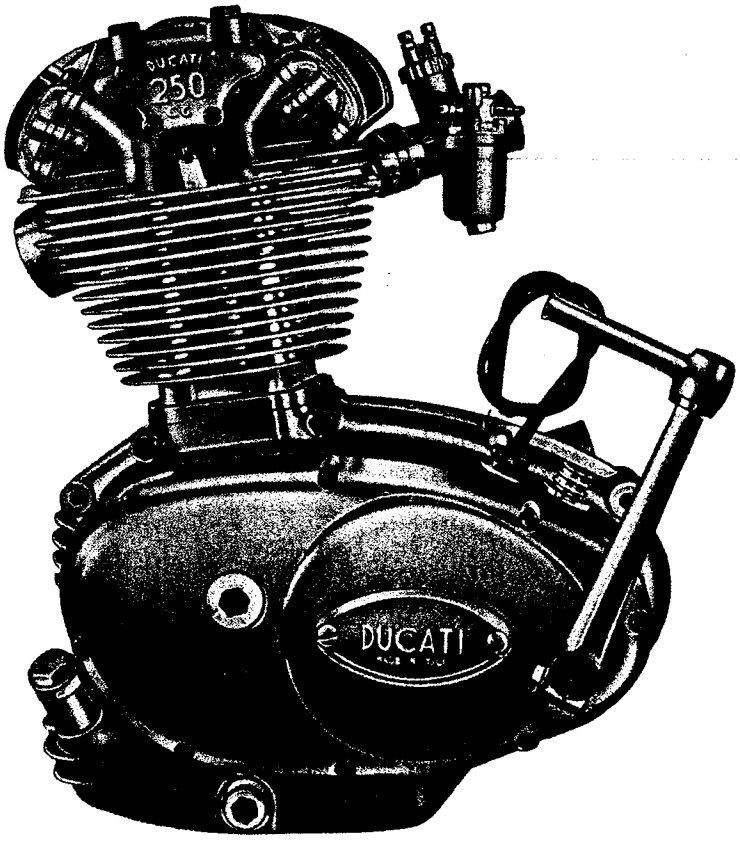
DISTANCE TRAVELLED	MAXIMUM SPEED IN MILES AND KMS. PER HOUR				
	in bottom gear	in 2nd speed	in 3rd Speed	in 4th speed	in top speed
Up to 300 miles Up to 500 Km.	16 25	22 36	29 46	36 56	40 64
From 300 to 600 miles From 500 to 1000 Km.	21 34	31 50	40 64	49 79	56 90

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 in the 250 GT and MONZA, fitting the rocker appropriate shim in the other 3 models; 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

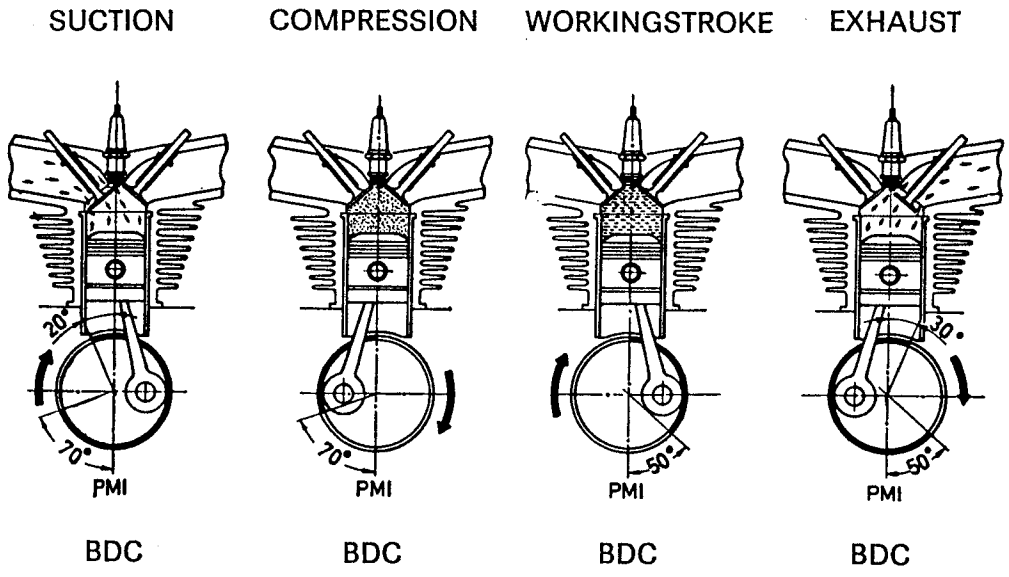
— Single cylinder, four stroke, with cylinder inclined forward 10° from the vertical. The engine is supported by a cradle formed frame.
— bore: 74 mm. (2.9134")
— stroke: 57,8 mm. (2.27559")
— cylinder capacity: 248,589 c.c. (15.1698 cu.in.)
— compression ratio: 8 : 1 for the 250 GT and Monza, 10 : 1 for 250 MACH 1 and Mark III, and 9.2 : 1 for 250 SCRAMBLER;

— 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 oils 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.

250 GT and MONZA



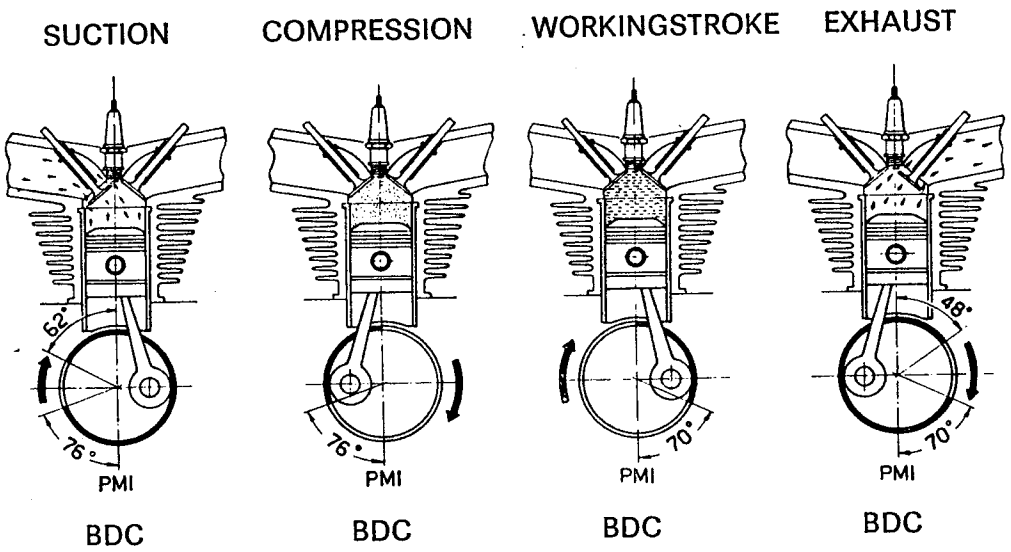
Specifications

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

Valve	Opening ± 5°	Closing ± 5°
Suction	20° before TDC	70° after BDC *
Exhaust	50° before BDC	30° after TDC **

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

250 MACH 1 and MARK III

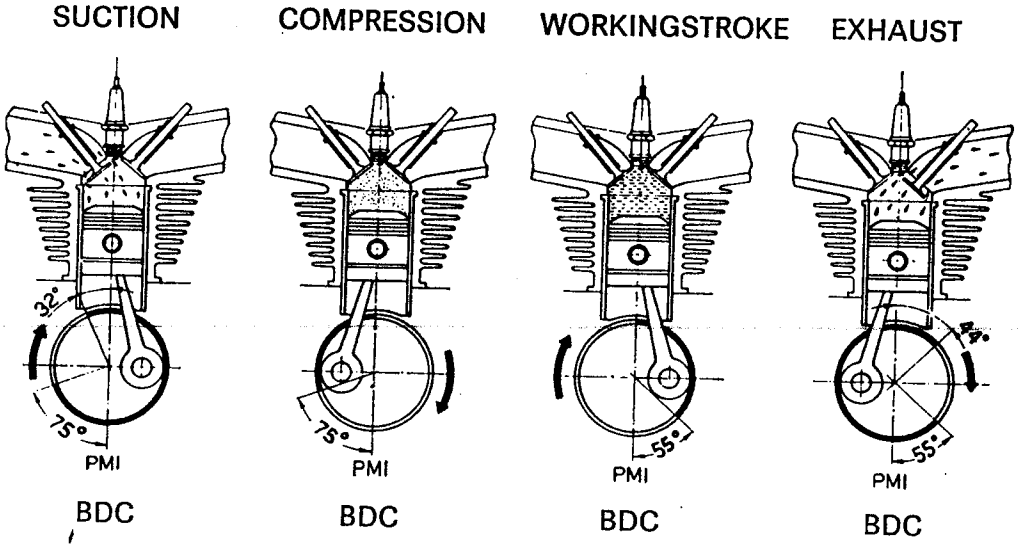


Timing, with a clearance of 0.15 mm. (0.0059 in.) between the valve and the suction rocker and 0.30 mm. (0.0118 in.) between the valve and the exhaust rocker, are as follows:

Valve	Opening ± 5°	Closing ± 5°
Suction	62° before TDC	76° after BDC *
Exhaust	70° before BDC	48° after TDC **

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

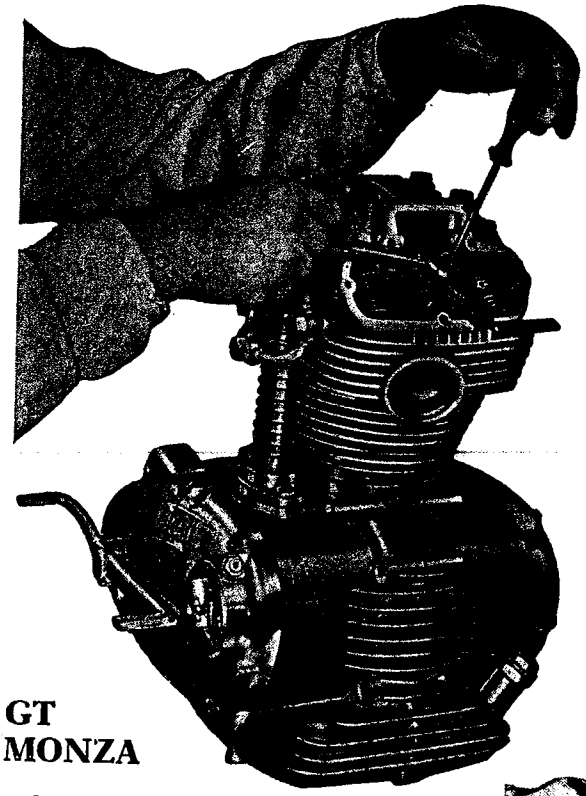
250 SCRAMBLER



Timing with a clearance of 0.15 mm. (0.0059 in.) between the valve and the suction rocker, and 0.20 (0.0079 in.) between the valve and the exhaust rocker are as follows:

Valve	Opening ± 5°	Closing ± 5°
Suction	32° before TDC	75° after BDC*
Exhaust	55° before BDC	44° after TDC**

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



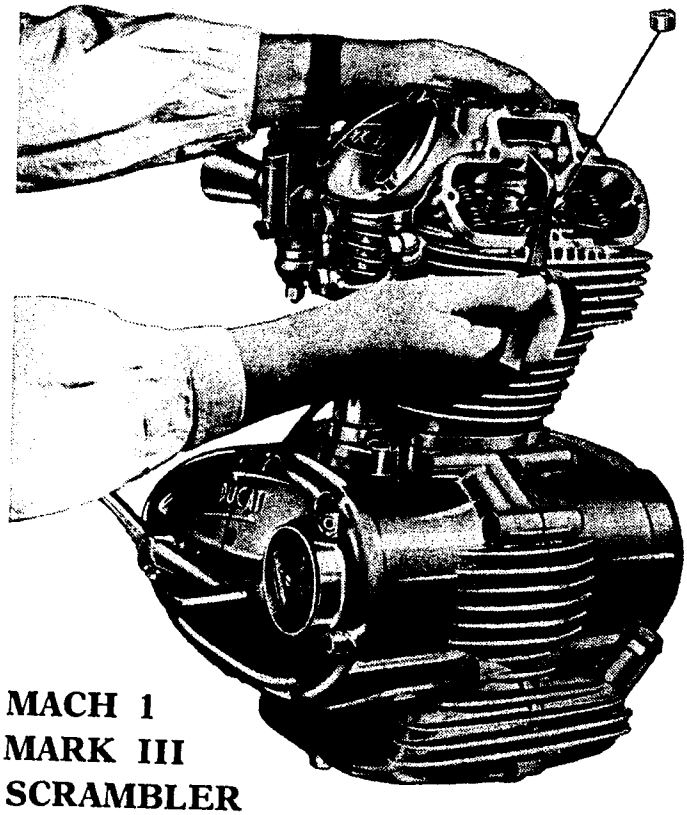
GT
MONZA

Adjustment

The tappets are adjusted by means of the adjustment screws on the rockers in the 250 GT and Monza and the appropriate rockers shim on the end of the valve stem on the other models.

Clearance

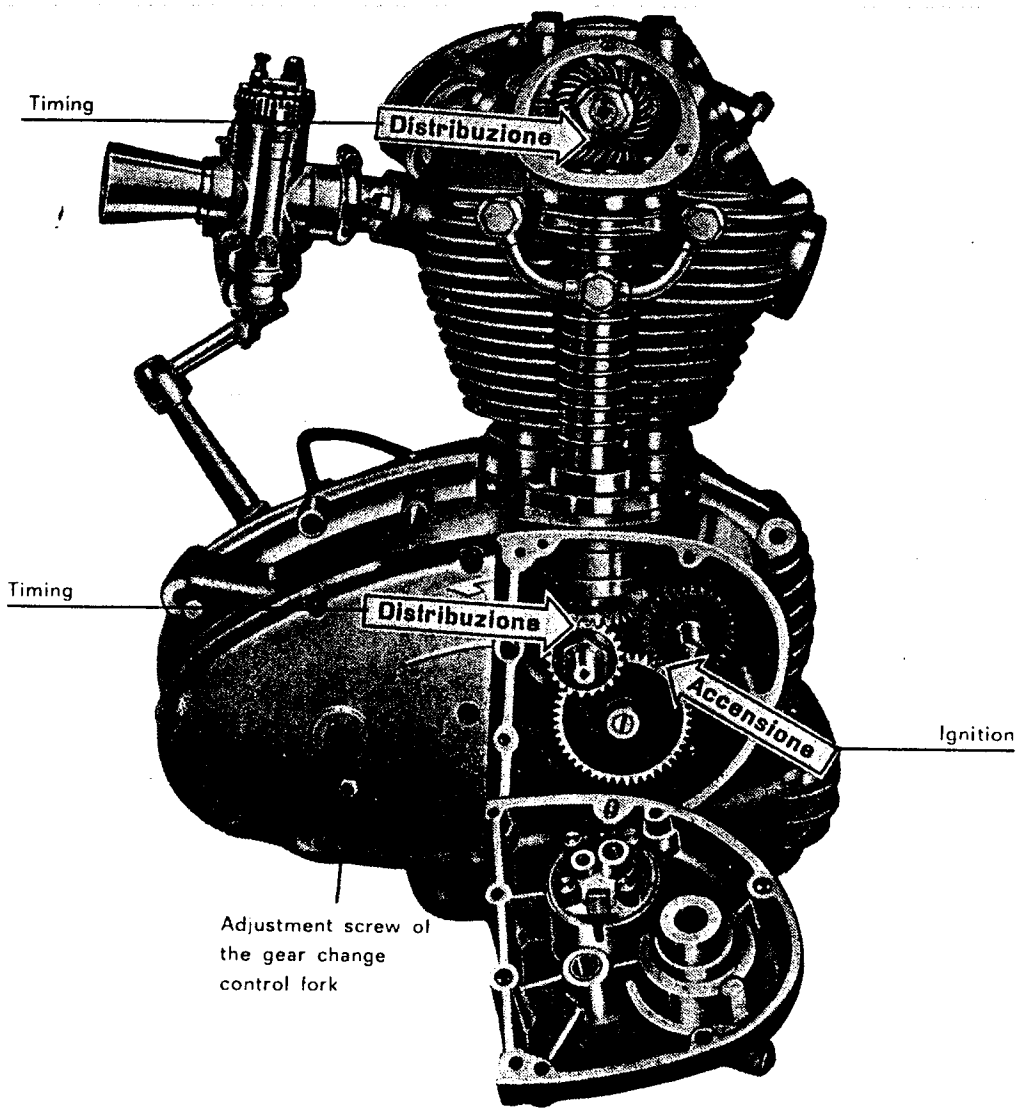
The working clearance between valves and rockers, when the engine is cold, is of 0.05 (0.0020") to 0.07 mm. (0.0028") for the 250 GT and Monza; 0.15 mm. (0.0059") respectively 0.30 mm. (0.0118") between valve and suction and exhaust valve, for the 250 MACH 1 and Mark III; respectively 0.15 mm. (0.0059") and 0.20 mm. (0.0079") for the SCRAMBLER. The clearance has to be adjusted and checked with a feeler gauge, after the said timing data have been controlled.



MACH 1
MARK III
SCRAMBLER

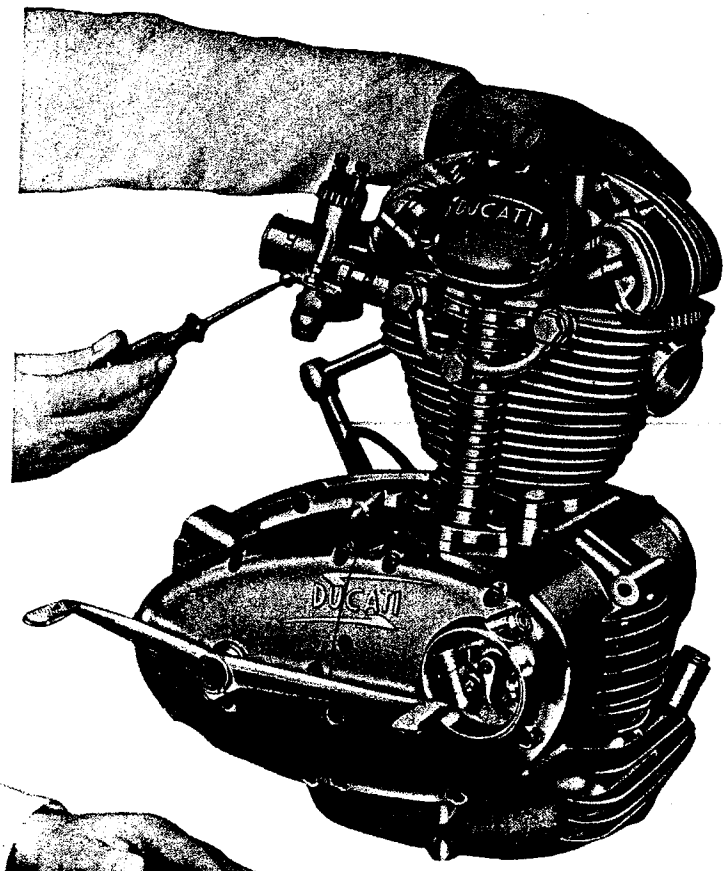
Engine timing

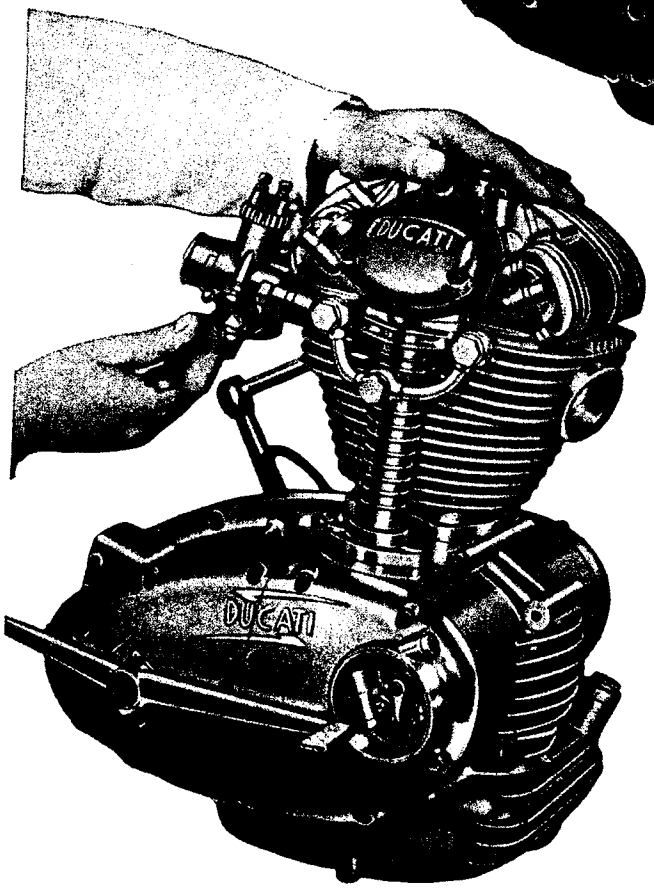
The timing gears in the crankshaft and on the camshaft, are provided with reference marks engraved on the toothed periphery.
The engine is timed when the above mentioned marks are disposed as indicated by the arrows in the following illustration.



GT
MONZA

Adjustment of minimum air intake

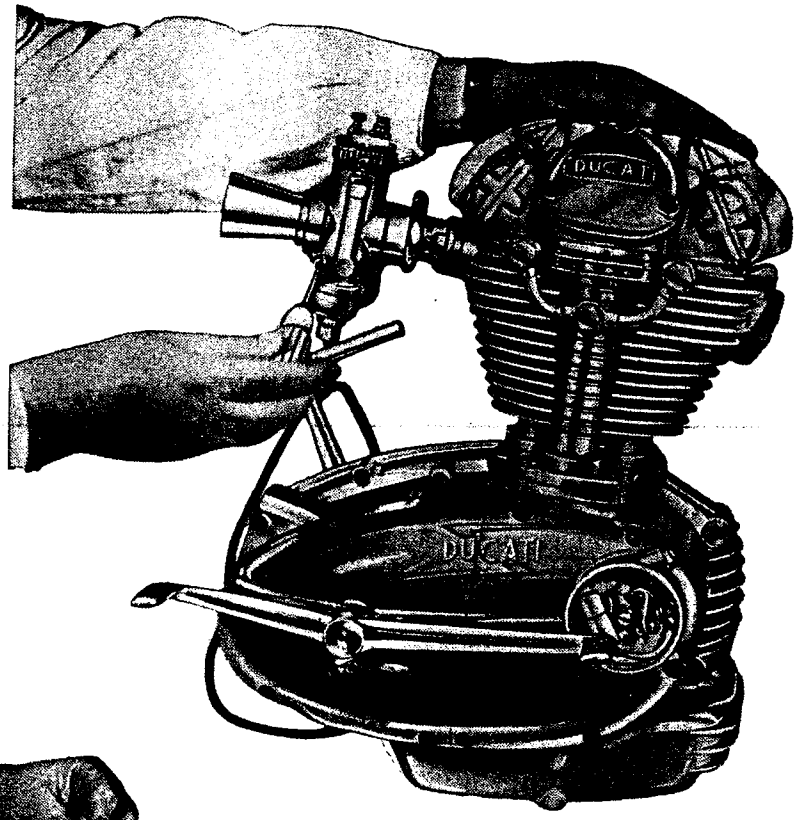


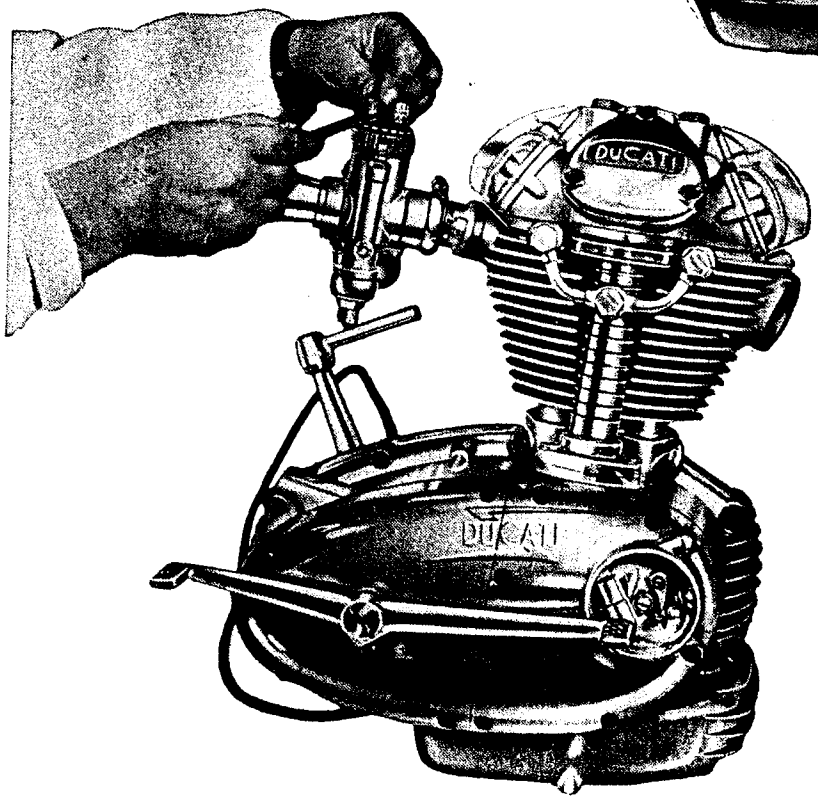


Adjustment of the throttle

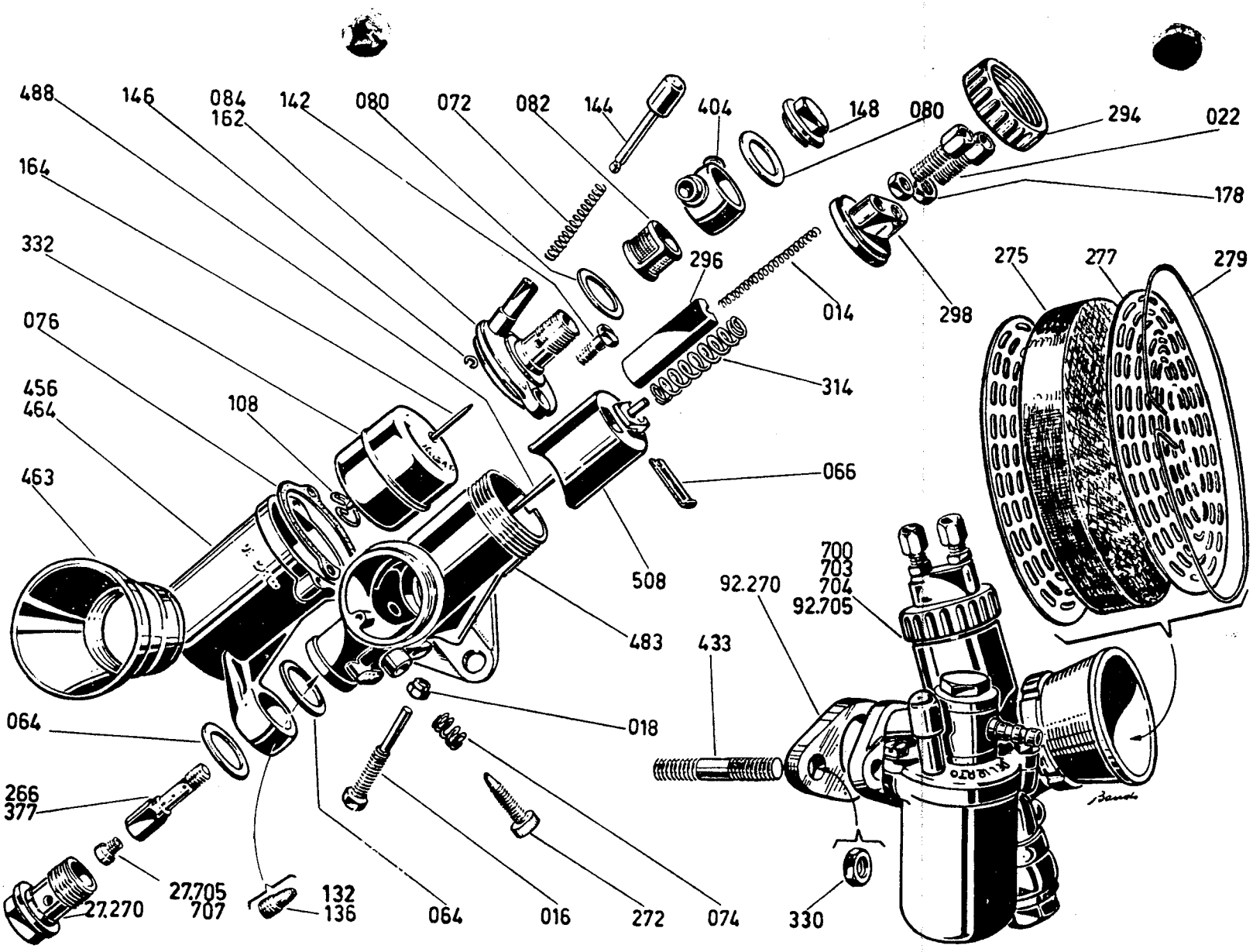
MACH 1
MARK III
SCRAMBLER

Adjustment of minimum air intake





Adjustment of the throttle



Instance: Carburetor Dell'Orto UBF 24 BS - Spare parts in the 250 GT and MONZA

PETROL FEED

The petrol is fed to the carburetor by gravity.
The carburetor is Dell'Orto with quiet air intake on the tool-box, for the 250 GT and Monza, with normal intake in the other models.

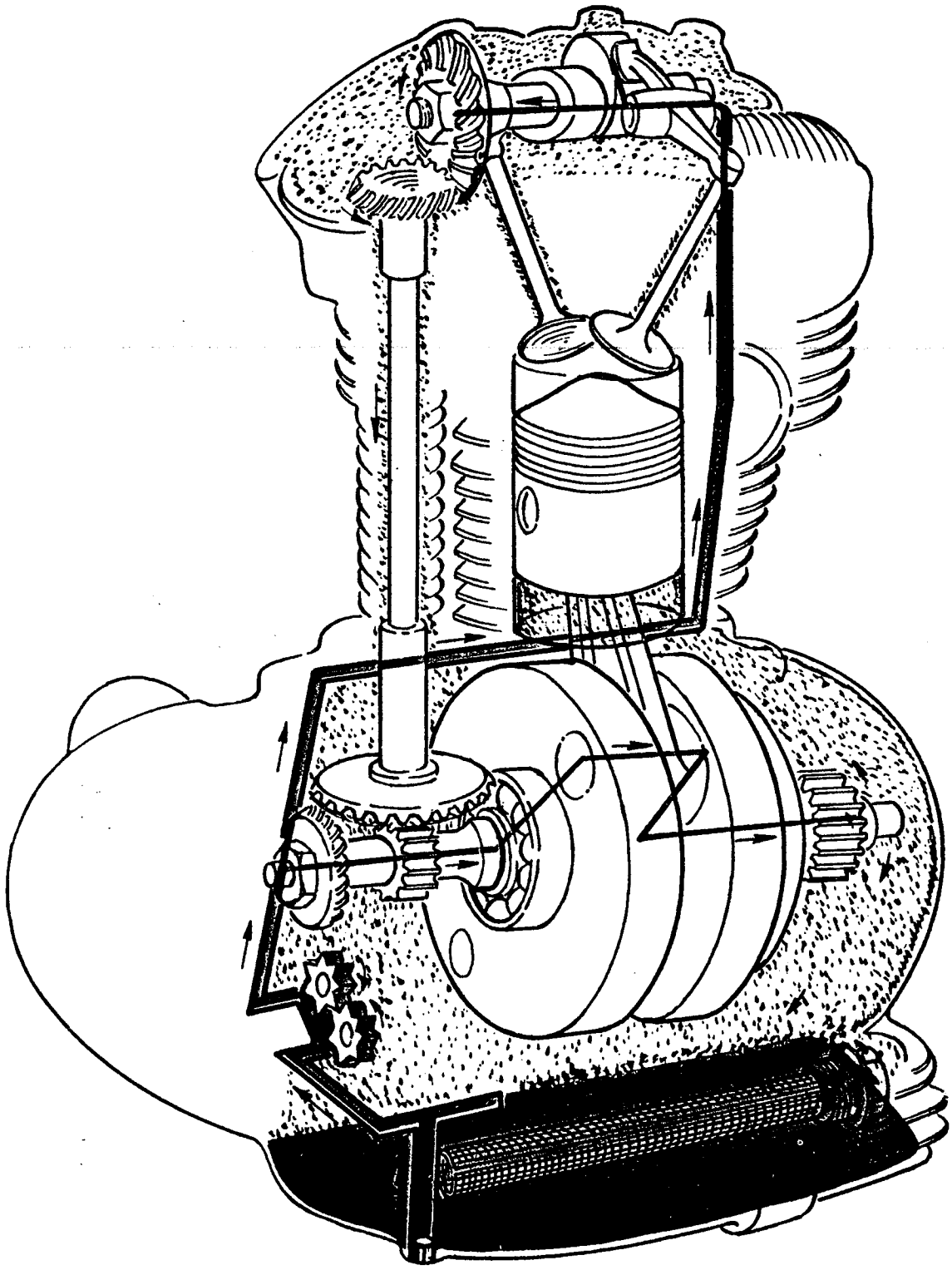
Models	Carburetor	Atomizer	Choke	Main jet	Idling jet
GT	UBF 24 BS	260 B	24	108	40
MONZA	UBF 24 BS	260 B	24	108	40
MACH 1	SSI 29 D	265	29	118	50
MARK III	SSI 29 D	265	29	125	50
SCRAMBLER	SSI 27 A	265	27	112	50

The petrol tank (for capacities and numbers of taps see the list) is provided with a three position tap: closed - open - reserve.

Models	Petrol tank capacity lt.	Taps number	Reserve lt.
GT	17 (imp. gal. 3.7396 = USA gal. 4,4909)	2	1.6 (imp. gal. 0.35196 = USA 0.4227)
MONZA	13 (imp. gal. 2,8597 = USA gal. 3,4342)	2	1.6 (imp. gal. 0.35196 = USA 0.4227)
MACH 1	16 (imp. gal 3.5196 = USA gal. 4,227)	2	1.6 (imp. gal. 0.35196 = USA 0.4227)
MARK III	16 (imp. gal. 3.5196 = USA gal. 4,227)	2	1.6 (imp. gal. 0.35196 = USA 0.4227)
SCRAMBLER	11 (imp. gal. 2.4197 = USA gal. 2,9059)	2	1.6 (imp. gal. 0.35196 = USA 0.4227)

LUBRICATION

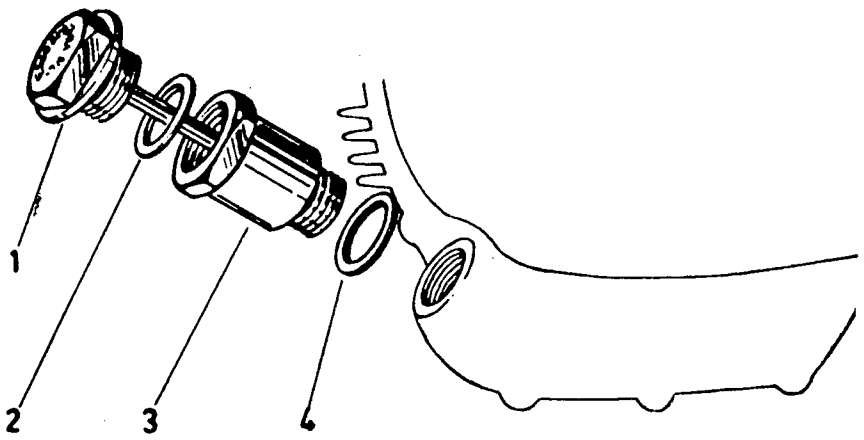
The engine is pressure lubricated, by means of a gear pump driven by the shaft; this pump takes the oil through a filter, from the lowest point of the crank-case which acts as an oil sump, and forces it through proper oil-ways, to all parts of the engine which have to be lubricated. The oil returns by gravity.
The sump capacity is of about 2 Kg. (4,409 lb) = lt. 2.400 (0.634 gall. USA = 0.5279 imp. gall.).



An Oil-filler with stick consisting of:

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

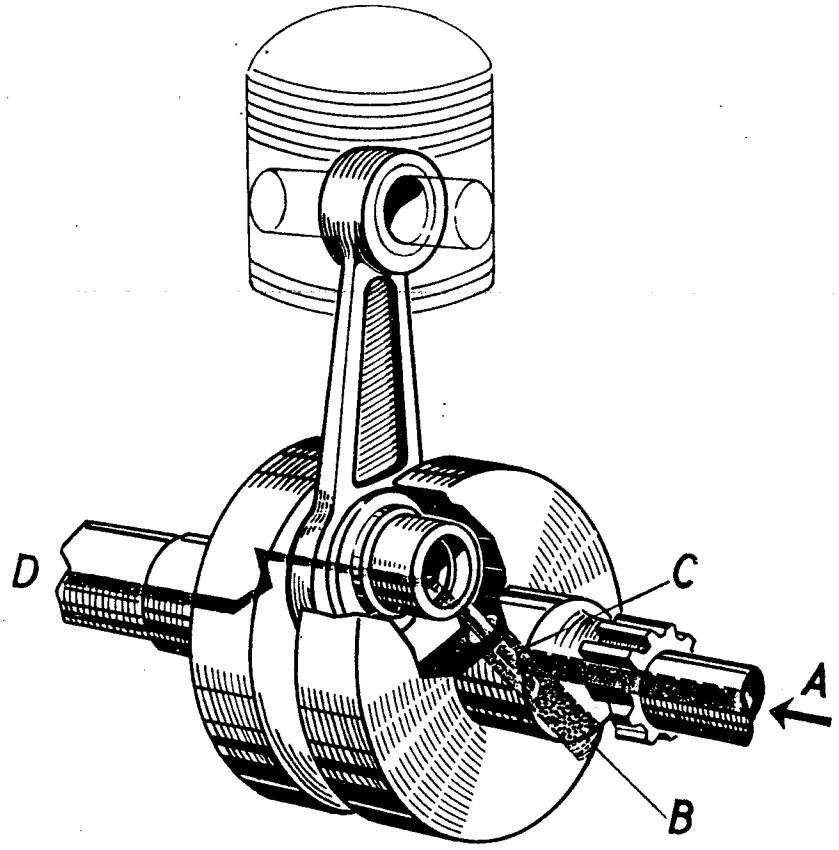
allows the oil level measurement.



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 motorcycles with single over head cam-shaft engine is of the simplest and requires no special maintenance except the renewal of the oil level (Esso ESSO EXTRA MOTOR OIL 20 W - 30-40 or RACER 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.

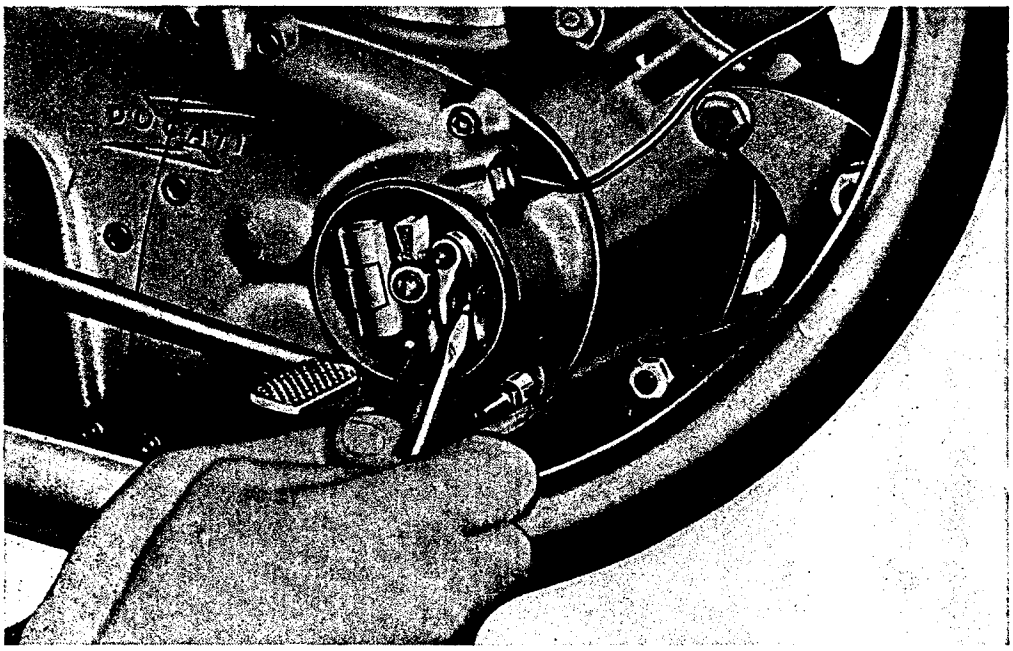
COOLING

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

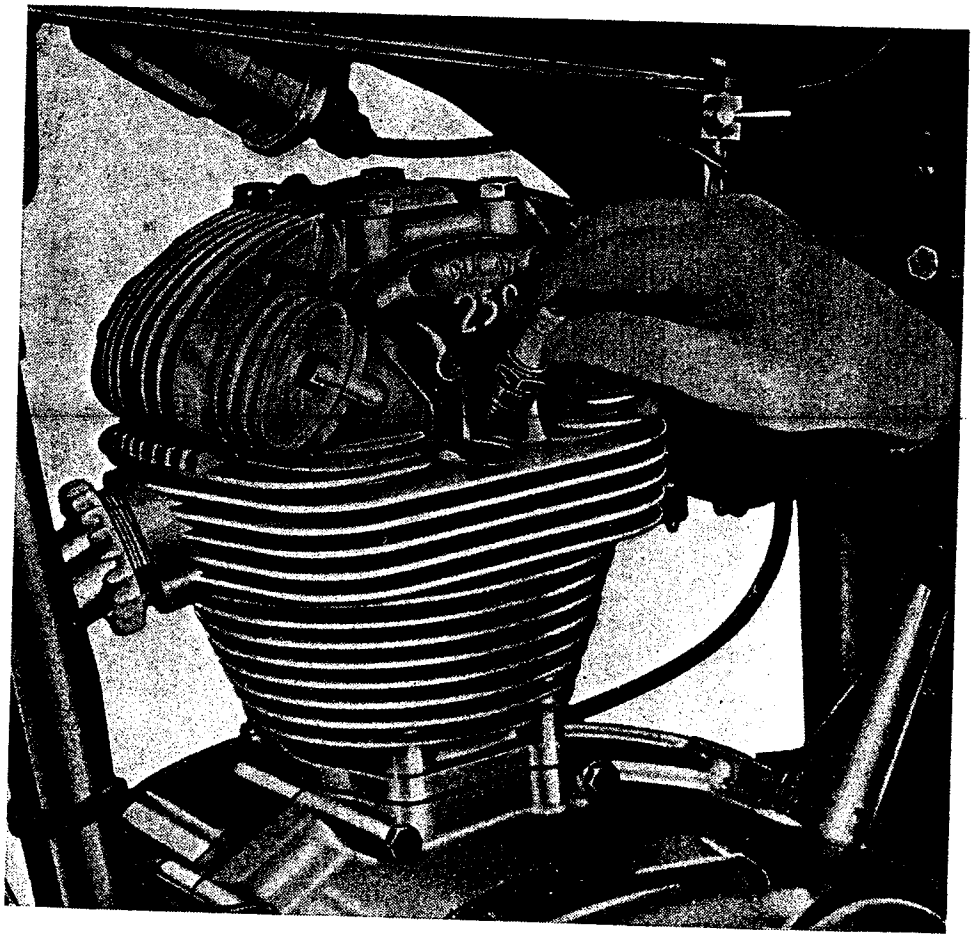
IGNITION

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

Model	Advance with stopped engine	Amplitude of automatic advance	Total advance with engine running at 3.000 r.p.m.
GT	5° to 8°	28°	33° to 36°
MONZA	5° to 8°	28°	33° to 36°
MACH 1	5° to 8°	28°	33° to 36°
MARK III	21° to 23°	18°	33° to 41°
SCRAMBLER	21° to 23°	18°	39° to 41°



For setting up the ignition, see figure on page 20.
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 14° equal to 28° on the driving shaft in the models GT, Monza, Mach 1, and must be 9° equal to 18° on the driving shaft in the models Mark III and SCRAMBLER. If you have any doubt, get it checked by a specialized workshop.

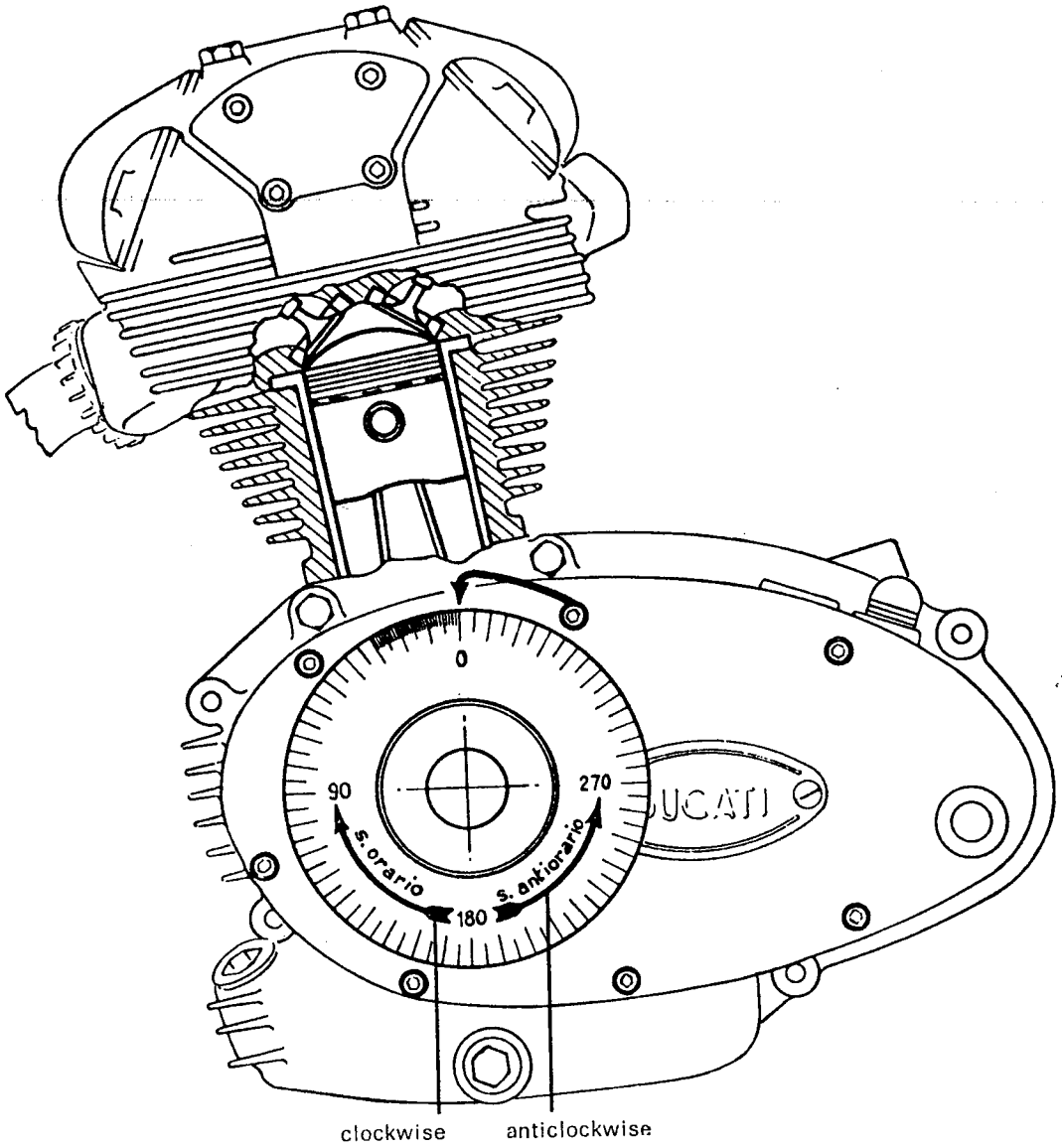
To check the spark advance, proceed as follows:

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 screw that secure the cover (Fig. 1).

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

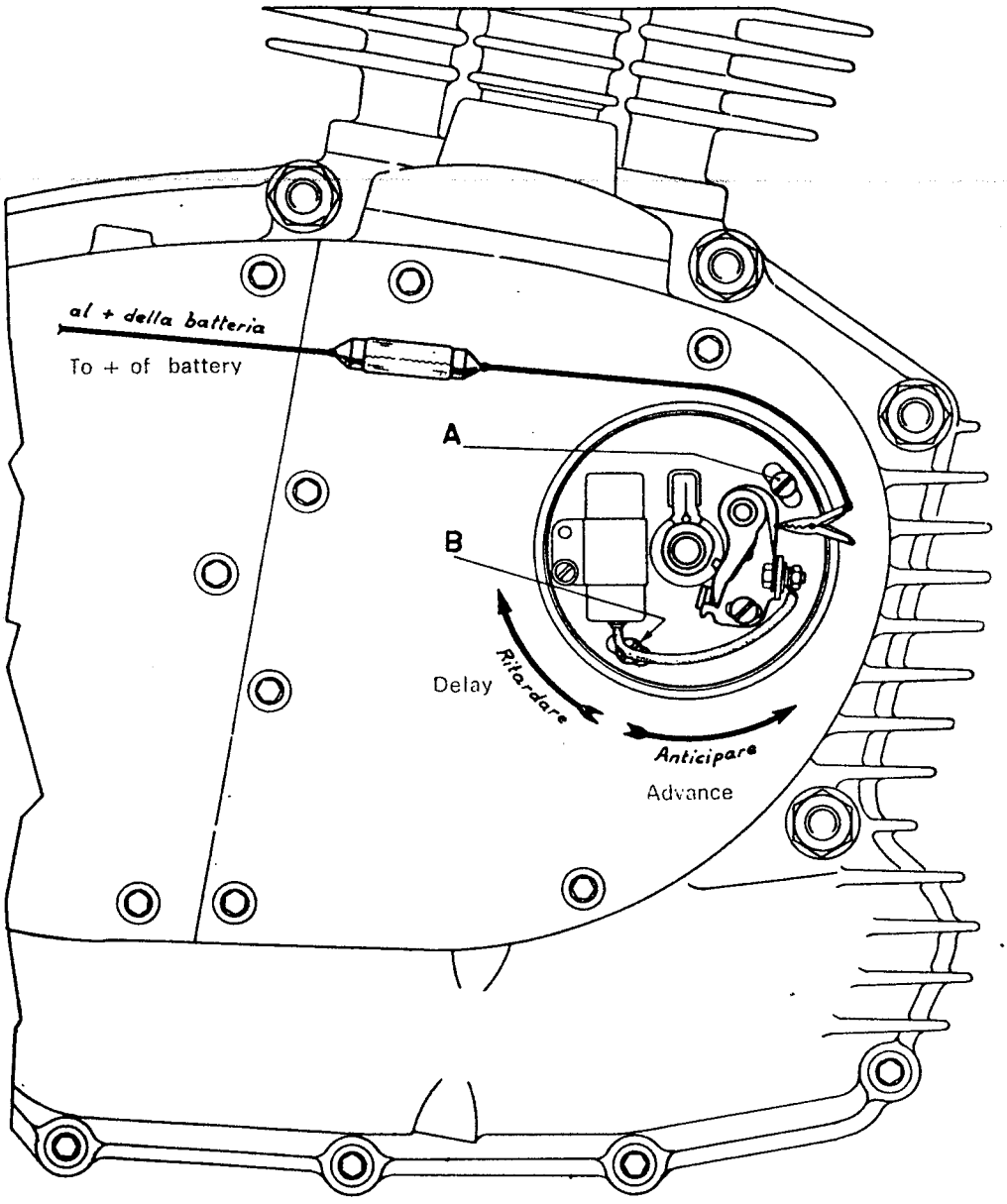
4th. - Rotate the driving shaft clockwise for about a quarter of a turn.



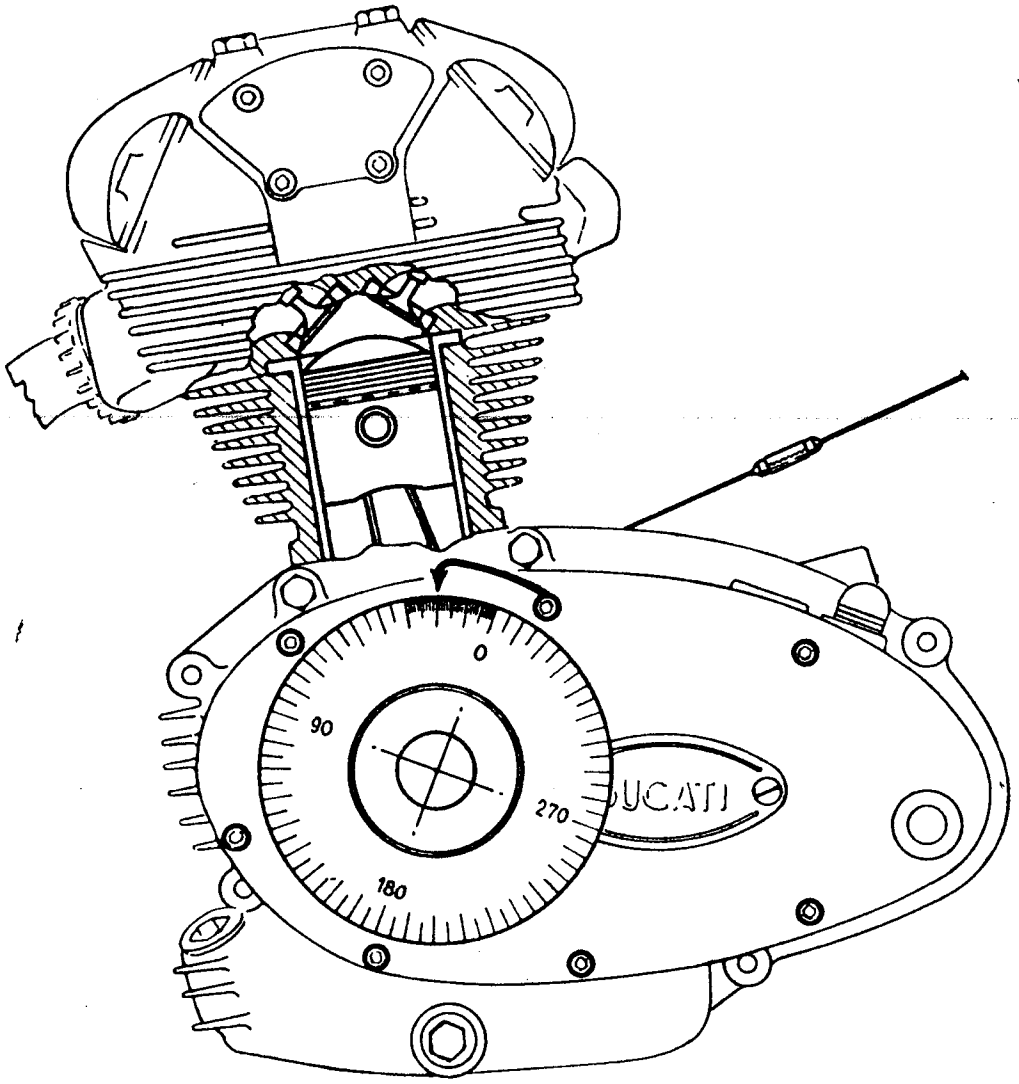
(Fig. 1)

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 28.



(Fig. 2)



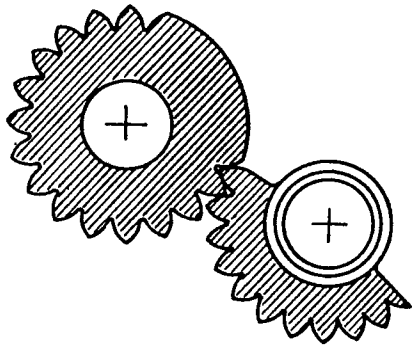
(Fig. 3)

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 28 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.

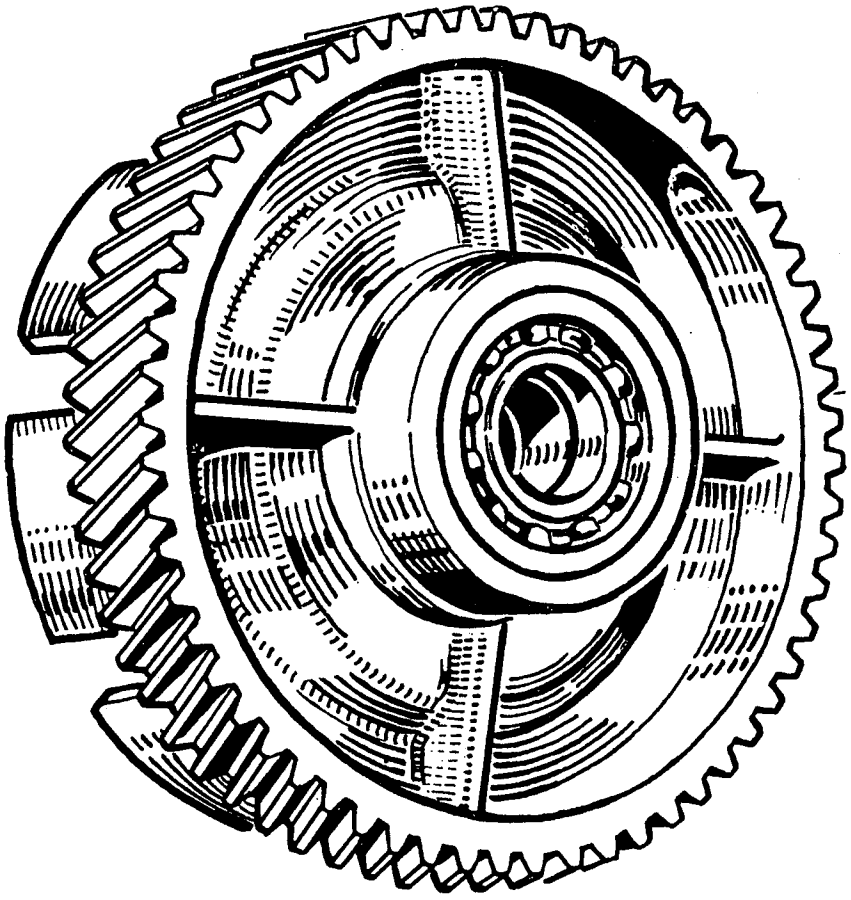
STARTING



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:
2.500 to 1.
The gearbox is mounted in the crankcase; the gears for the 5 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 2.53
— in second gear	1 to 1.73
— in third gear	1 to 1.35
— in fourth gear	1 to 1.10
— in top 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:
2.647 to 1 for the 250 GT and Monza.
2.222 to 1 for the 250 MACH 1 and Mark III,
3.929 to 1 for the 250 SCRAMBLER

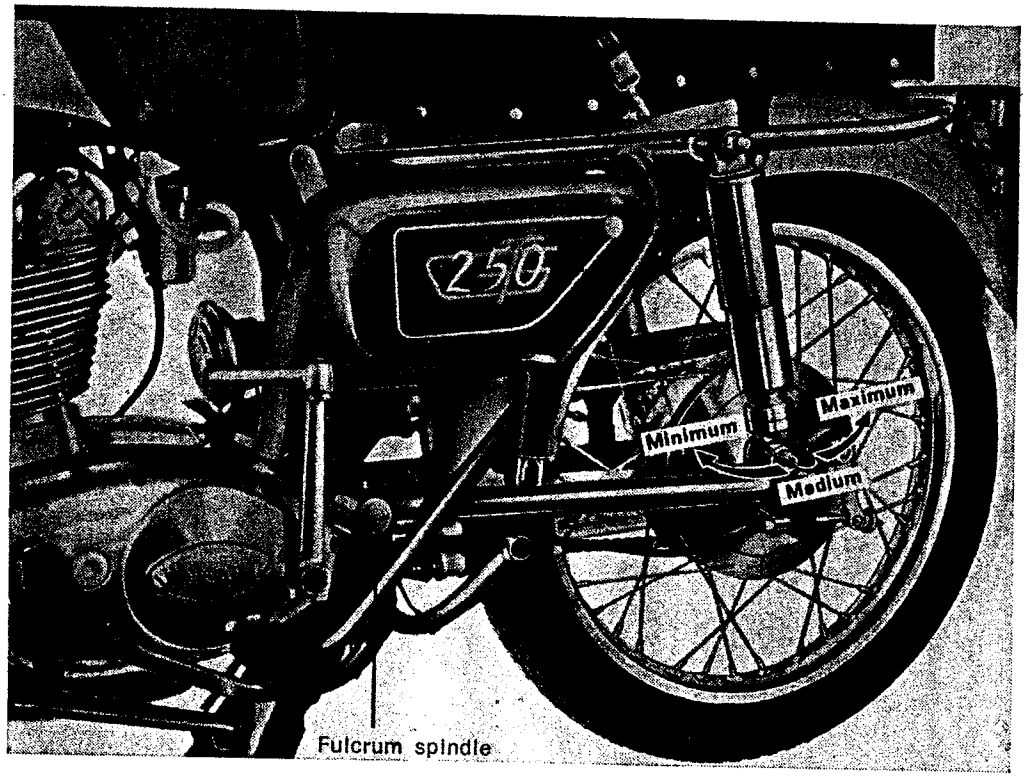
FRAME

The frame of the DUCATI motorcycles 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 composed by the DUCATI telescopic - hydraulic long-stroke fork, with steering rod. Each fork leg contains 100÷110 cu. cm. (cu. inch 6.1025 to 6.7127) of HYDRAULIC FLUID 5420 oil.

The rear suspension consists of a robust hinged fork with double action hydraulic dampers, (shock-absorbers), which can be adjusted for three differentt loads: Minimum - Medium - Maximum.
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 rims as follows:

Model 250	Wheel Rim		Wheel rim size	
	Material	Profile	Front	Rear
GT	Steel	Normal	18 x 2½	18 x 2½
MONZA	Steel	Normal	18 x 2½	18 x 2½
MACH 1	Steel	Normal	18 x 2¼	18 x 2¼
MARK III	Steel	Normal	18 x 2¼	18 x 2¼
SCRAMBLER	Steel	Normal	19 x 2½	19 x 2½

The front wheel has a detachable spindle.
The rear wheel has a special cushion drive.
Tyres and pressures are as follows:

Model 250	Front wheel		Rear wheel	
	Tyre	Pressure	Tyre	Pressure
GT and MONZA	2.75-18 ribbed	2,25 Kg/cm² (32,01 lb/sq. inc.)	3.00-18 grooved	2,25 Kg/cm² (32,01 lb/sq. inc.)
MARK III and MACH 1	2.50-18 ribbed	2,25 Kg/cm² (32,01 lb/sq. inc.)	2.75-18 grooved	2,25 Kg/cm² (32,01 lb/sq. inc.)
SCRAMBLER	3.00-19 grooved for Motocross	2,25 Kg/cm² (32,01 lb/sq. inc.)	3.50-19 grooved for Motocross	2,25 Kg/cm² (32,01 lb/sq. inc.)

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 180 mm (7.0866"), the diameter of the rear drum is 160 mm (6.2992").

NEW ELECTRICAL SYSTEM (250 GT - MONZA - MACH 1)

The lighting is provided by a storage battery which is recharged by the DUCATI flywheel alternator and rectifier. The head-lamp APRILIA of large diameter carries 3 lights. A mile speedometer VEGLIA with dial of 100 for the 250 GT and Monza, and of 150 for the 250 MACH 1, is incorporated in the same headlamp.

The 3-way switch for the light control is situated on the 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 switch for the diplight, the antidazzle light, and the button for the horn.