

Servicing

DUCA TI

Motor Cycles

**750 SPORT/GT
860**

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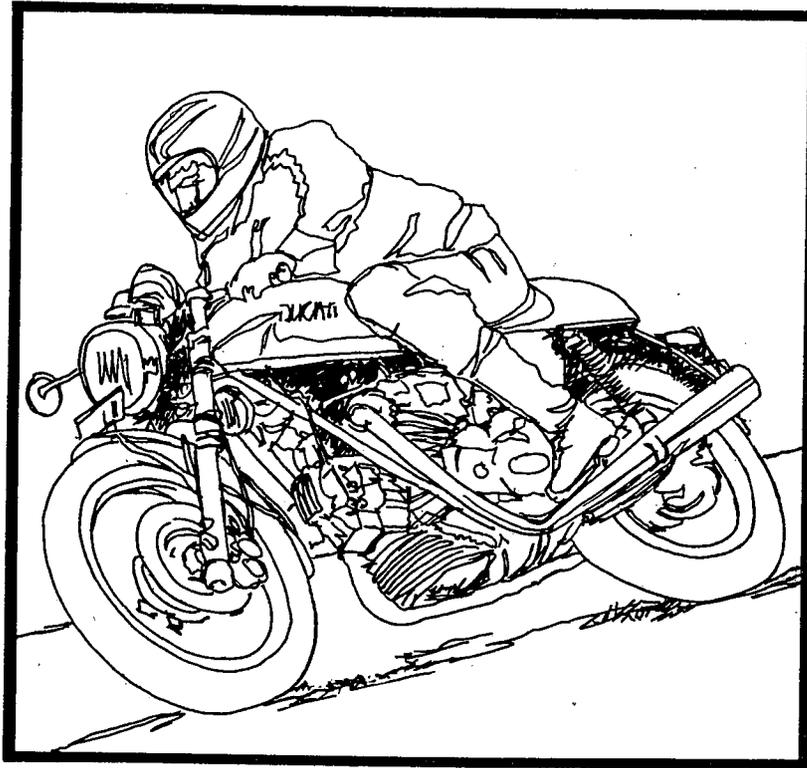
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SPECIFICATIONS—750

Engine

Two cylinder four stroke "L" configuration

Four stroke twin cylinder 90 degree longitudinal "L" configuration, supported in a cradle frame.

Bore: 80 mm (3.1496")

Stroke: 74.4 mm (2.9291")

Cylinder capacity: 748cc (45.629 cu. in.)

Compression ratio: 8.5:1

Deeply finned cylinders in light alloy with special cast iron liners inserted. Connecting rods in special steel, with roller cage at the big end and the small end bushed to take the gudgeon pin; Light alloy pistons, press forged with the skirt in one piece and three piston rings, one of which is an oil scraper. Cast light alloy cylinder head, 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.

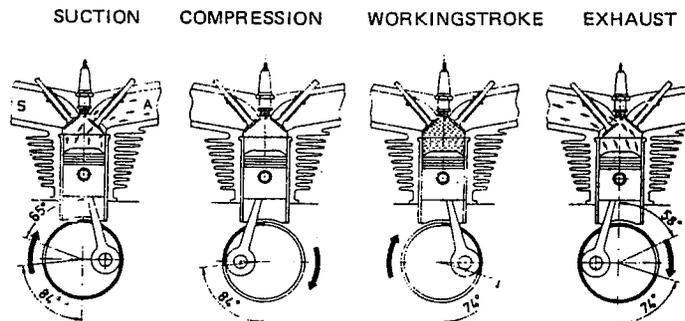


Fig. 1

With a valve/rocker clearance of 0.10 mm (0.0039") for both inlet and exhaust the timing is as follows: Inlet opens 65° before T.D.C. and closes 84° after B.D.C.; Exhaust opens 74° before B.D.C. and closes 58° after T.D.C.

The tappets are adjusted by means shims on the end of the valve stems, and the clearance should be checked after the timing has been set and with the engine cold.

The timing gears in the crankshaft and on the cam shaft are provided with reference marks and care should be taken to re-align these when assembling the engine after repair or maintenance.

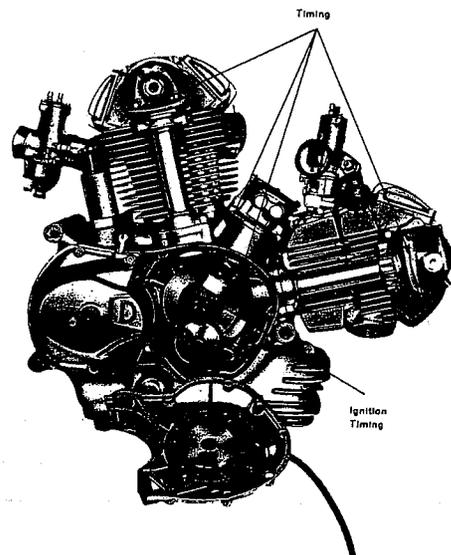


Fig. 2

IDLING ADJUSTMENT

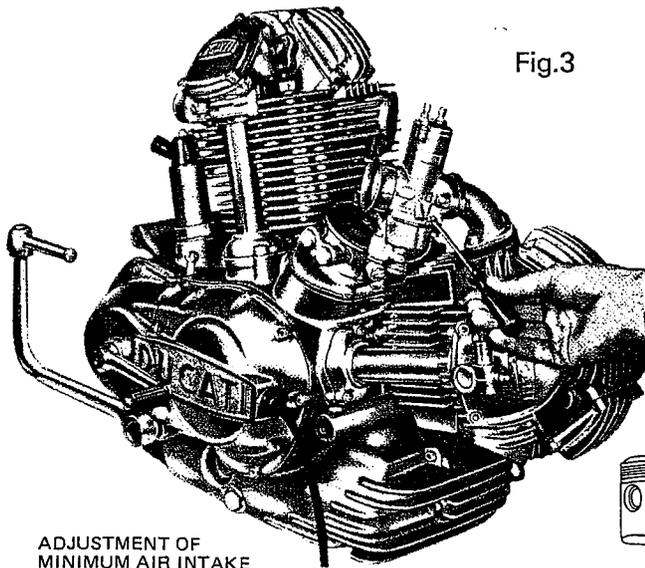


Fig. 3

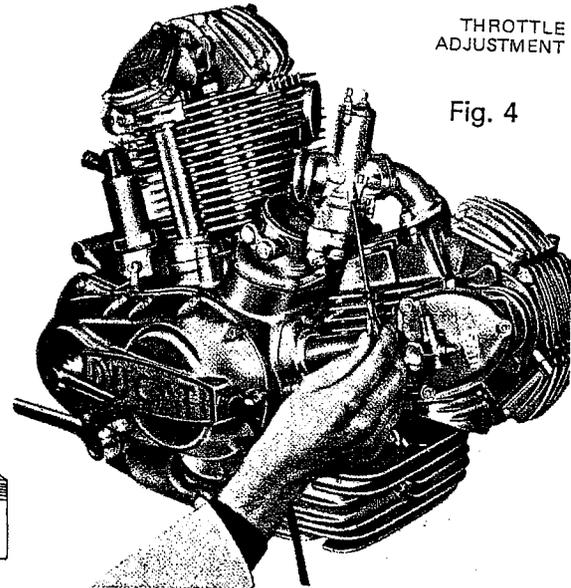
ADJUSTMENT OF
MINIMUM AIR INTAKETHROTTLE
ADJUSTMENT

Fig. 4

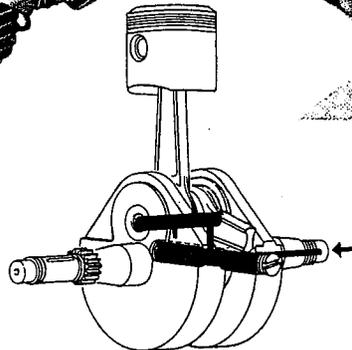


Fig. 5

Fuel

Petrol is gravity fed to the engine through two Amal carburetors with air filters. The tank holds 17 litres (3.74 gallons) and has two three-position cocks: close-open-reserve. The reserve is about 1.6 litres (0.35 gallons)

Lubrication

The engine is pressure lubricated by means of a gear pump driven by the crankshaft. This pump takes the oil from the lowest point in the crankcase, through a filter and forces it through a series of oilways to all parts of the engine requiring lubrication. The oil return is by gravity.

The sump capacity is about 4.5 Kg (1.10 gallons) and an oil filter with dipstick and sealing gasket allows easy oil level measurement.

The filler plug dipstick is marked with two notches to indicate lowest and highest permissible levels and the level is checked by resting the plug on the filler.

The system is quite simple and requires no special maintenance other than topping up the oil every 500 Km (300 miles) and changing the oil and cleaning the filter every 2,000 Km (1,200 miles).

Cooling

The engine is air cooled by means of fins on both the cylinder barrel and cylinder head.

Ignition

Ignition is by battery and coil with 10° advance when the engine is stopped and 29° automatic advance at over 1,200 r.p.m., a total of 38°.

To time the ignition see the figure on page 6. The clearance between the platinum plated contacts should be 0.3 to 0.4 mm (0.0118" to 0.0157") and should be checked with a feeler gauge.

The spark plugs are Lodge 3 HN or a similar model and are located on the left side of the cylinder head.

When replacing the plugs make sure the plug is aligned correctly in the thread so as to avoid cross threading. Screw the plug in lightly at first, then tighten it.

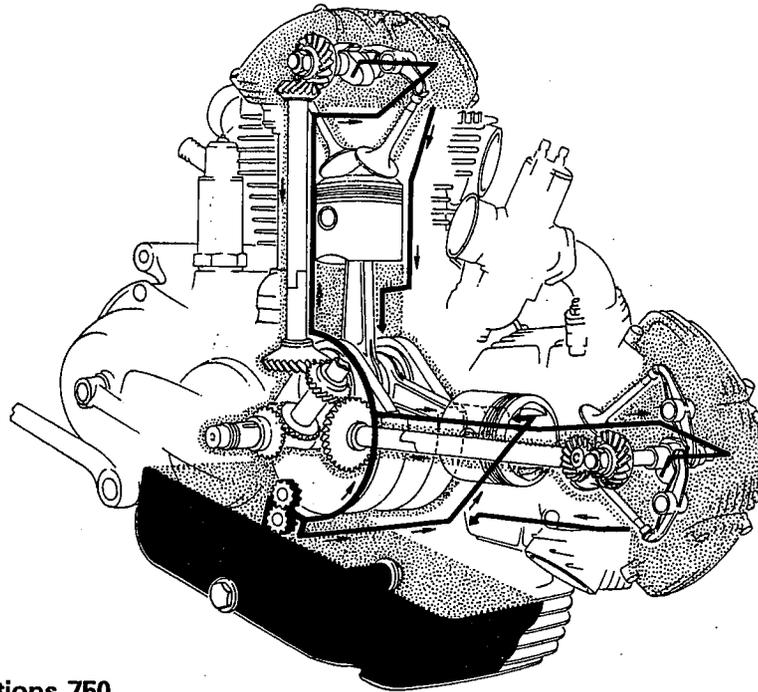


Fig. 6

Running-in Precautions 750

During the first 1000 Km (620 miles) the rev counter should not exceed 4,500—5,000 r.p.m. and do not maintain the maximum allowed speed through the gears for long periods.

After the first 500 Km (300 miles) and after the first 1,000 Km (600 miles) with the engine still warm, change the crankcase oil, adjust the tappets, fitting the appropriate rocker shim and check the cylinder-head tie-rods as well as nuts and bolts generally. Adjust the platinum contact breaker points in accordance with the data shown under Specifications, and check the chain tension and lubrication.

Transmission

The transmission components consist of a clutch and gearbox. The clutch is of the multiple plate type, with steel and phenolic resin discs, turning in an oil bath. It is mounted on the primary shaft of the gear box. The clutch housing, which is made of special hardened steel, turns on two internal bearings and is lubricated with the engine sprocket.

The clutch is operated by a hand lever on the left hand side of the handlebar.

The transmission between the engine and the primary shaft of the gear box is through gears with a reduction ratio of 2.448:1.

The constant mesh, 5-speed gearbox is mounted in the crankcase and is operated by a foot pedal.

Bottom gear	— 2.236:1
Second gear	— 1.562:1
Third gear	— 1.203:1
Fourth gear	— 1.000:1
Fifth gear	— 0.887:1

Transmission between the gearbox and rear wheel is effected by a chain drive with a ratio of 2.250:1.

Frame

The frame of the Ducati 750 GT is made of high tensile steel in a stylish modern design and is of the central girder type.

Suspension

The front suspension consists of Ducati double action, long stroke hydraulic forks.

The rear suspension is effected by a strong hinged fork with double action hydraulic shock

absorbers which can be adjusted to three different loads.

In the Ducati 750 GT the fork fulcrum spindle is fixed to the frame while the fork rotates around it through a bronze bush, giving the machine greater solidity and stability. On the left hand side bush there is a grease nipple for the spindle.

Wheels

The wheels are of the spoke rim type in light alloy, the front being 19" x 2" and the rear, 18" x 3" at the rim. Both wheels have a detachable spindle. The rear wheel has a special cushion drive and can be dismantled without removing the chain.

Brakes

The front brake is a disc brake with a telehydraulic control on the handlebar, while the rear brake is of the drum type, pedal controlled.

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

ELECTRICAL SYSTEM

General specifications

The electrical system consists of the following main parts:

Headlamp — A powerful, two filament 12 Volt, 40/45W headlamp is fitted, together with a 12 Volt, 3W parking light. Inside the headlamp there is a relay for the emergency lights as well as a circuit for the fitting of direction indicators.

Dashboard — This is mounted on the handlebars and contains the speedometer and tachometer as well as three warning lights for ignition key, high beam and parking light. The instruments are lit by two independent lights.

Coils — The two 12 Volt high tension coils are fitted under the tank and become live only when the ignition key is inserted. When replacing them be sure not to reverse the connections.

Horn — The 12 Volt horn is mounted under the handlebars.

Stop lamp switch — A new type of switch is mounted on the left and rear of the frame and is operated by the brake pedal. **IMPORTANT:** The two wires must be inserted in such a way as to avoid contact with the central sheath and they must be properly insulated.

Key switch — This is positioned under the saddle on the left hand side, on models fitted with an electric starter there is an additional starting position.

Fuse box — There are four fuses located under the saddle, inside the tool box. The fuses are F.1 15A to protect the parking light, F.2 25A to protect the headlight, F.3 15A to protect the horn and stop light and F.4 15A to protect the emergency light and direction indicator circuit. **IMPORTANT** When replacing a fuse, flex the contact springs so that they hold the fuse firmly in position.

Battery — The battery is a Yuasa 12N-12A-4A-12V, with 6 cells and Volt — 12Ah capacity. It has a transparent case to allow easy checking of the electrolyte level and is cushioned by a special rubber mounting. When checking the battery level with an ammeter always ensure that the engine is STOPPED.

Regulator — A standard 12 Volt regulator is fitted. Please note that the negative cable from the battery must be connected to the regulator frame.

Alternator — The alternator has an output of 150 Watts and is mounted within the engine on the clutch side. The three wires from the alternator connect directly to the regulator and it is important not to confuse them. When opening the engine take care not to damage the alternator windings.

Plate holder — The rear number plate is lit by a two filament 5/21 Watt bulb.

Handlebar controls — Left hand side: light switch and horn button.
Right hand side: Switch for emergency lights and indicators.

Fitting of Direction Indicators

The four lamps must be mounted on the supports already designed on the motorcycle. Using cable with a 1 mm square cross section connect the front indicators to the terminals inside the headlamp and the rear ones from the fuse box terminals under the saddle, ensuring that 12 Volt, 15 Watt bulbs are used.

The handlebar control is already connected.

IMPORTANT

The engine cannot be run without a battery as there would be no current to the rectifier. In fact the engine can only be started if the battery voltage exceeds 8 volts.

The battery cables must not be detached while the engine is running as this would damage the rectifier.

Advantages of the Electrical System

The electrical system employed in the Ducati 750 GT offers several advantages over previous systems. The four fused circuits in particular simplify the tracing of electrical failures, while allowing the unaffected circuits to continue functioning.

Operation of the Electrical System

1. Key inserted:

The engine can be started and the white ignition light in the centre of the dashboard remains alight until the engine is stopped. The battery is recharged while the engine is Running.

Light Switch: Centre position — Lights off

Left position — The rear and front parking lights come on as well as the green warning light on the dashboard.

Right position — The headlight comes on and can be switched to low or high beam, the red warning light on the dashboard indicates high beam.

In all positions the battery charge remains balanced. When the headlight is switched on the small parking light is also on, giving the rider a safety light in the event of the main bulb burning out.

The horn operates.

The stop light operates.

2. Key not inserted:

The engine cannot be started.

Light Switch: All positions remain as above.

The connection between the battery and the electronic current regulator is cut.

The horn does not operate.

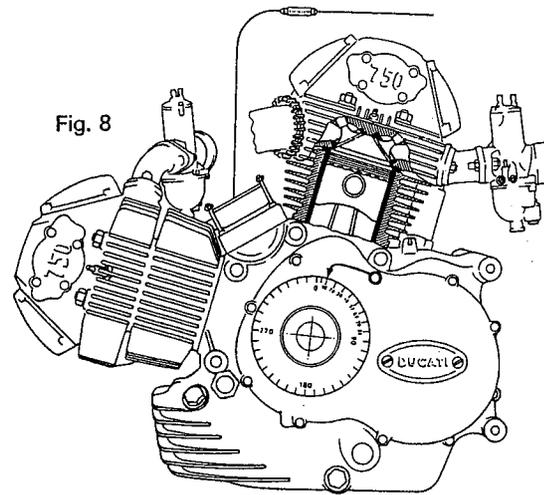
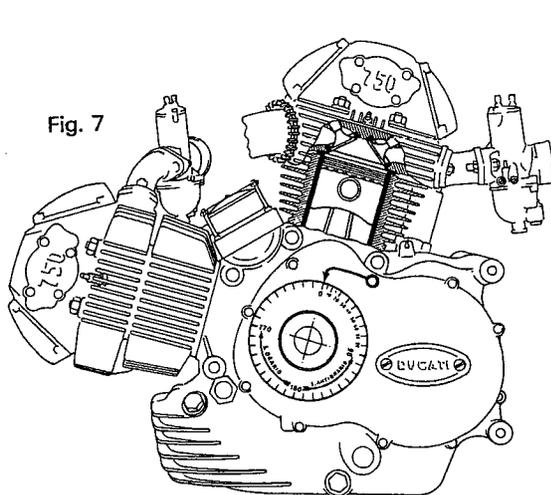
The stop light does not operate.

HOW TO CHECK IGNITION ADVANCE

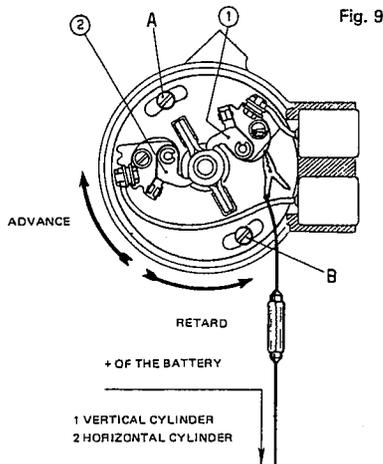
Periodically check the ignition spark advance (after the first 600 and later every 1,200 miles); ensure that the automatic advance works properly, that it is lubricated and that the springs are neither out of shape nor out of place.

The rotary movement of the automatic advance must be 14°, equal to 28° on the driving shaft. If you have any doubt get it checked by a specialist workshop. To check the spark advance, proceed as follows:

1. Remove the threaded plug which is at the driving shaft level and fit a suitable timing chart. (Fig. 7).



2. Fit an indicator on one of the screws that secure the cover.
3. Bring the piston of the vertical cylinder to T.D.C. of the compression stroke and set the indicator at "0" on the timing chart.
4. Rotate the driving shaft anti clockwise for about a quarter of a turn.
5. Connect a 12V-3W lamp to the spring of the contact breaker in series with the positive pole of the battery (Fig. 9). The lamp should light up.



6. Rotate the driving shaft slowly, clockwise, until the light goes out or its intensity is lowered. At that precise moment the indicator should show an advance of 10° . (Fig. 8).

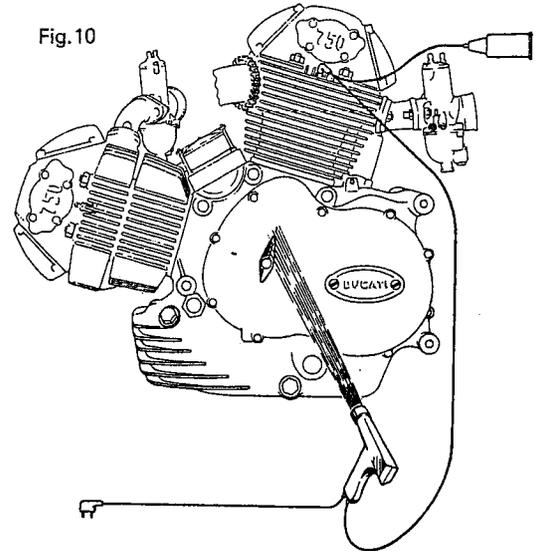
7. Repeat the above test for the sake of accuracy.
8. Repeat the test for the horizontal cylinder, taking care to set the indicator at "0" on the timing chart.
9. If the reading does not tally with the required figure, loosen the two screws (A and B) which secure the plate, and rotate it, advancing or retarding the ignition until the correct reading of 10° is obtained.
10. Bear in mind that, if the felt which lubricates the cam is allowed to dry out, the fibrous slipping block, which opens the moving part of the contact breaker arm, will tend to wear, reducing the size of the gap.

Checking the total advance with a stroboscope

Carry out the following:

1. Mount the advance checking indicator 88713.0109 on the driving shaft centre line, flywheel side, after removing the plug 0400.49.090.
2. Connect the stroboscope light cable to the spark plug in question.
3. Start the engine and run at about 2,500—3,000 r.p.m. then shine the stroboscope on the reference mark for the cylinder being tested, placed on the clutch side cover.
4. The phasing indicator must align with the reference mark, and the ignition coil should be turned clockwise to advance and anti clockwise to retard until the two coincide.

Fig.10



SPECIFICATIONS—860

Engine

Four stroke twin cylinder, 90° longitudinal "L" configuration, supported in a cradle frame.

Bore: 86 mm (3.387")

Stroke: 74.4 mm (2.93")

Total Capacity: 863.9cc. (52.700 cu. in.)

Compression ratio: 9:1

The engine is basically similar in construction to the Ducati 750, with the exception of the electronic ignition system.

Ignition

The electronic ignition system consists of the following components:

- a) Generator — with the magnetic flywheel attached to the axle on the left hand side. Access to the generator is via the left hand cover and clutch.

To time the ignition:

1. Fit the protractor wheel to the engine axle.
 2. Bring the vertical cylinder to T.D.C. and set the protractor wheel at "0"
 3. Rotate the engine anti-clockwise and position it at 38° in advance.
 4. Turn the magnetic flywheel using a pin inserted into the hole, rotating it until the pin slips into the corresponding hole on the stator plate.
 5. Tighten the three screws which fasten the stator plate.
- b) Transducers — mounted under the fuel tank.
 - c) Spark plugs — Champion L 88 type.

Data 860

With a valve/rocker clearance of 0.05-0.08 mm (0.002"-0.0031"), inlet and 0.01-0.12 mm (0.0039"-0.0047"), exhaust, the valve timing is as follows: Inlet opens at 48° before T.D.C. and closes at 83° after B.D.C. Exhaust opens at 83° before B.D.C. and closes at 48° after B.D.C.

Clearances should be set with the engine cold and after the timing has been adjusted.

Fuel

Petrol is gravity fed to two Dellorto carburettors, type PHF 32 AD for the front cylinder and type PHF 32 AS for the rear. The main jet is set at 122, and the idle jet at 60. The taper needle equals K/6 at the second notch and the diffuser measures 32 mm.

The inlet filters are FISPA 062459 reference number 0960.91.715 for the front cylinder, and 0960.91.815 for the rear.

Lubrication

The engine is pressure lubricated (see 750 for details of oil capacity and replacement).

Transmission

The transmission system is essentially similar to that of the Ducati 750 with the following gear ratios utilised:

Primary reduction	2.187:1
Bottom gear	2.237:1
Second gear	1.562:1
Third gear	1.204:1
Fourth gear	1:1 (direct drive)
Secondary ratios	2.467:1
	2.533:1
	2.5:1

Suspension

The front suspension consists of Ceriani type forks and the rear suspension of Marzocchi, hydraulic shock absorbers.

Wheels

The wheels are similar to those fitted to the Ducati 750. Recommended tyres are front — 3.50 H18Pirelli Supersport, inflated to 31.3lb/sq. in. rear — 120/90-4.70 H18 Pirelli Supersport, inflated to 35.5lb/sq. in.

Electrical System — 860

The system is essentially similar to that installed in the Ducati 750, with the exception of the electronic ignition circuitry. Five fuses protect the components: F1,25A, General: F2,8A, Parking Lights: F3,8A, Lights and emergency lights: F4,8A, Stop light and horn: F5, 8A, Direction indicators. The headlight is a 50/55 Watt, 12 Volt quartz iodine bulb and the dashboard warning lights are as follows:

- GEN — Red — Key inserted
- L — White — Lights on
- Hi — Blue — Main beam
- N — Green — Gears in neutral
- Yellow flash — Turn indicator

The horn has two settings, for town and country.

Battery

Kick start models — YUASA type 12N-12A-4A, 12 Volt and 12Ah.

Electric start models — YUASA type B68, 12 Volt and 32Ah.

The battery is recharged by the alternator through an electronic voltage regulator. The alternator produces 150 Watts at 12 Volts and is installed on the right hand side of the engine.

Emergency Switch

The emergency earthing switch on the right handlebar is required by American law. It operates by earthing out the two transducers, thus stopping the engine immediately.

Make sure the switch is returned to the RUN position after the engine has stopped.

MAINTENANCE [750 and 860]

The continuing good condition of the motorcycle depends on proper maintenance. By following the fundamental procedures below you can avoid most serious trouble and continue to enjoy excellent performance and reliability from your motorcycle. The operations to be carried out are subdivided according to the mileage covered by the motorcycle, and the

recommendations which follow are, of course, only indicative, because lubrication, checking and adjustment depend also on the nature of the road travelled, seasonal temperatures and the length of the intervening period.

Every 500 Km (300 miles)

- Top up the oil level in the crankcase.
- Check the tyre pressure.
- Tighten the cylinder head bolts.
- Adjust the brakes.
- Check the clearance between valves and rockers, placing the appropriate shim on the valve stem or adjusting to restore the specified clearances.

Every 1,000 Km (600 miles)

- Check and adjust the distance between the spark plug electrodes to about 0.8mm (0.0315") 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 them, the gap should be 0.3 to 0.4mm (750 only).
- Check the valve clearances as mentioned above.

Every 1,500 Km (900 miles)

- Check the speedometer drive and lubricate with grease.

Every 2,000 Km (about 1,200 miles)

- Change the crankcase oil, draining it while the engine is hot, and making sure that the oil drains off completely.
- Remove the carburettor air filters and clean with compressed air.
- Clean out the carburettor float chamber, the main jet and the idle jet.
- Readjust the clutch to take up any wear on the plates.
- Lubricate the hinge of the rear fork.
- Dampen the lubricating wick of the contact breaker cam with thin mineral oil.
- Uniformly tighten the nipples of the spokes and check that the wheel nuts are secure.

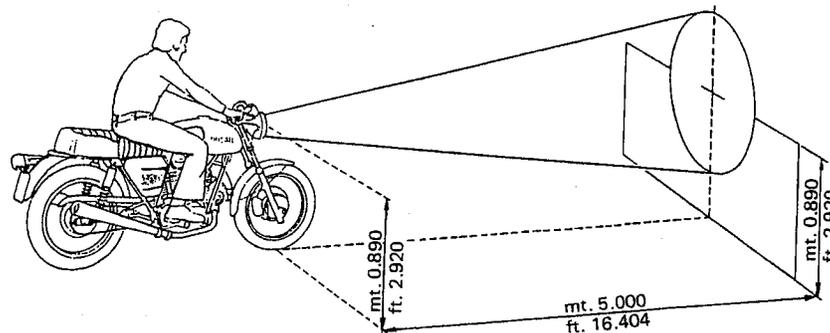
Every 20,000 Km (about 12,400 miles)

- Dismantle the exhaust pipes and cylinders, in order to remove the carbon deposit from the cylinder heads and pistons. This should preferably be carried out by a Ducati servicing garage.

Headlamp alignment — 750

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

- Place the motorcycle at a distance of 5 meters (16.404 ft) from a vertical wall.
- Make sure that the ground is even and that the axis of the headlamp is perpendicular to the wall.
- The motorcycle must be held upright by the rider and not rest on the centre stand.
- Draw a cross on the wall at a height of 0.890 meters (2.920 ft).
- When the high beam is switched on, the cross should be in the centre of the beam.
- To adjust the alignment of the headlamp use the two fixing screws on the front fork or the three screws on the headlamp ring.



Cleaning

The motorcycle should be washed and cleaned periodically, according to the length of time it has been in use and the nature of the roads covered.

- Clean the engine with paraffin 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 chamois leather for drying.
- Never use solvents, petrol, spirit or paraffin on the paintwork as they will dull the finish.
- Grease the chromium plated parts with vaseline and polish with a chamois leather.

Laying the motorcycle up for long periods

If the motorcycle has to be stored for a long period it is advisable to adopt the following procedure:

- Clean the motorcycle thoroughly.
- Empty the fuel tank.
- Take out the battery and keep it charged.
- Squirt some oil into the cylinders through the spark plug holes and turn the engine several times by hand, to distribute a thin film of oil on the cylinder walls.
- Lift the machine so that the motor rests on a block of wood and deflate the tyres.
- Cover the machine with a canvass or other waterproof cover.

Running-in Precautions 860

During the first 2,500 (1,500 miles) do not exceed 4,000 r.p.m. After the first 1,000 Km (600 miles) replace the crankcase oil and filter. Subsequent oil changes should be carried out every 5,000 Km (3,000 miles) and the filter replaced every 10,000 Km (6,000 miles).

Periodic Disc Brake Maintenance (750 and 860)

Clean the hydraulic pump and calipers clean but NEVER use petrol or oil. When necessary use brake fluid, taking care not to touch paintwork which could be damaged.

Maintain the level of fluid in the reservoir at about 8-10 mm below the rim. Always replace the rubber casing and tighten the cover.

Check that the hydraulic line is not damaged in any way and that there are no fluid leaks.

When the brake pads are worn to about 1.5mm of the shoulder plate they should be renewed.

Replacement of brake pads

Remove the securing cotter pins and extract the pads. Clean the visible parts of the pistons with a clean rag moistened with brake fluid, NEVER with petrol or oil, when they are clean, replace the pistons in the calipers. When remounting the pistons it is advisable to release some fluid from the caliper drain screw, to avoid fluid spilling from the reservoir. Ensure that the screw is closed securely after replacing the pistons.

Clean the inner parts of the pad mountings, insert the new pads and fit new cotter pins, bending the ends with pliers to secure them.

Operate the brake lever several times to allow the new pads to settle into position and, if necessary, restore the fluid level in the reservoir.

Avoid sudden braking immediately after fitting new pads.

CARE OF THE BATTERY

How to prepare the battery for filling

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

If the battery is provided with a long drain pipe, cut the seal about 3cm from the end. If the battery has a short sealed tube and comes with a separate long pipe, fit the long pipe.

Filling the battery

The electrolyte (Dilute sulphuric acid) must have a specific gravity of 1.240 in tropical climates where the average temperature exceeds 25°C (77°F) and 1.260 in mild climates.

Fill to the level of the anti-splash gauze, as indicated on the side of the battery.

The electrolyte should be cooler than 30°C (86°F) before filling.

After the battery has been filled, allow it to stand for half an hour; during this period some of the electrolyte will probably be absorbed and if so, the level must be restored by adding more dilute sulphuric acid as above.

Charging the Battery

It is preferable to charge the battery fully before installing it in the motorcycle, applying a current of 1.2A for between 15 and 20 hours. Charge until the battery electrolyte reaches the density referred to above.

Mounting

- Secure the battery firmly in position on the motorcycle.
- Make sure that the terminals are correctly connected, damage to electrical parts can result from current of the wrong polarity being applied.

Maintenance

- Check the electrolyte level once a month and top up with DISTILLED WATER. Never top up with sulphuric acid.
- Always keep the battery clean and ensure that the drain tube is unobstructed.
- Recharge the battery when the horn and lights indicate that the current is low.

Maintenance of the Electrical System

It is extremely important to refer to the wiring diagram on page 63 when carrying out inspection or repairs to the electrical system. To avoid demagnetizing the alternator take care never to reverse the polarity of current passing through it. Always use the appropriate meters when testing.

If the electronic regulator fails to function, do not tamper with it, send it to a Ducati agent for servicing, or replacement.

NEVER detach the battery cables when the engine is running or damage to the electronic regulator will result.

Refer to page 57 for further information.

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 this is in order, the fault may be one or more of the following:

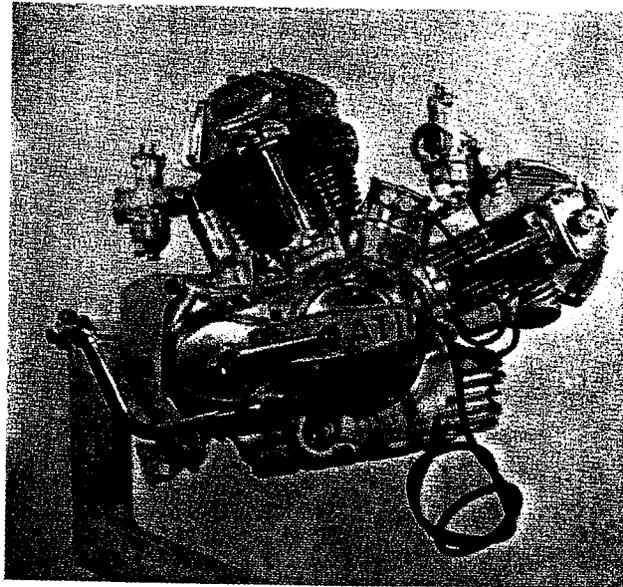
CAUSE	REMEDY
<p>Petrol pipe is clogged.</p> <p>Petrol filter dirty.</p> <p>Petrol cock filter is dirty.</p> <p>Carburettor float stuck.</p> <p>Carburettor float leaking.</p> <p>Jet is clogged.</p> <p>The cable of the ignition coil is broken or sparking externally.</p> <p>Defective sparking plug.</p> <p>The contact breaker points do not open.</p> <p>The contact breaker arm is seized on its pivot.</p> <p>The contact breaker points are dirty.</p> <p>The capacitor has broken down or is short circuited.</p>	<p>Blow through it until the obstacle is removed.</p> <p>Dismantle the filter and clean the gauze by air blast.</p> <p>Dismantle the filter and clean it by a blast of air through the gauze.</p> <p>Remove the float and clean out the float chamber.</p> <p>Change the float.</p> <p>Remove the obstacle by a strong blast of air.</p> <p>Inspect the cable insulation for faults and if necessary change the cable.</p> <p>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 0.8mm (0.0315").</p> <p>Check the position to the fixed contact point.</p> <p>Check movement between rocker arm and pivot if necessary.</p> <p>Clean the contact breaker points with a rag damped in petrol</p> <p>Change the capacitor</p>

CAUSE	REMEDY
<p>Compression low.</p> <p>A valve spring is broken. Valve sticking.</p> <p>The rocker adjuster is worn out.</p> <p>The battery is discharged.</p> <p>The battery quickly discharges because of a fault or break in the recharging circuit.</p> <p>With key not inserted battery discharges.</p>	<p>Check if the sparking plug has been tightly screwed in, check the valves for gas-tightness and the tightness of the piston rings.</p> <p>Change the broken spring.</p> <p>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 0.8mm (0.0032").</p> <p>Recheck the clearance by fitting the rocker shim on the valve stem end.</p> <p>Recharge the battery according to the instructions on page 11.</p> <p>Disconnect the wire from the + terminal block of the battery.</p> <ul style="list-style-type: none"> — Insert an ammeter in between the terminal clamp and the wire. — Insert the ignition key and let the engine turn, till attaining 6,000 r.p.m. The ammeter should show: <ul style="list-style-type: none"> a) maximum current about 10A, with completely discharged battery. b) minimum current about 1A, with completely charged battery. <p>According to the battery load condition, you will obtain intermediate figures. These tests must be carried out with switched off headlight.</p> <p>Checking the Electrical System. Make sure that all the bulbs are efficient.</p> <ol style="list-style-type: none"> 1) With the lights switched off, the ammeter should read 0 at 1,100 r.p.m. approx. 2) With town lights switched on (during the night) the ammeter should read 0 at 1,400 r.p.m. approx. 3) With the antidazzle lights switched on the ammeter should read 0 at 2,300 r.p.m. approx. <p>Check if there are earthed contacts in the system.</p>

CAUSE	REMEDY
<p>Irregular feed of petrol to the carburettor.</p> <p>Main jet partly clogged.</p> <p>Carburettor butterfly valve does not open completely.</p> <p>The float needle does not close properly.</p> <p>Petrol of bad quality.</p> <p>The spark plug is not of the right type.</p> <p>The plug is loose.</p> <p>The sparking plug cable sparks externally.</p> <p>The spark gap between the electrodes of the sparking plug is too wide.</p> <p>The sparking plug electrodes are dirty.</p> <p>The contact breaker opening is excessive. (750)</p> <p>The secondary winding of the coil is short-circuited or broken (750)</p> <p>The silencer is almost completely clogged-up.</p>	<p>Clean the carburettor filter, the petrol cock filter and the petrol pipe.</p> <p>Clean the main jet by means of an air blast.</p> <p>Readjust the valve travel by means of the adjustment screw of the carburettor Bowden cable.</p> <p>Clean out the carburettor and especially the needle seat.</p> <p>Empty the petrol tank and refill at a reliable garage.</p> <p>If the sparking plug overheats, you will have preignition, knocking, and missing, 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>Tighten the plug down well. A washer should always be placed between the sparking plug and its seating in the cylinder head.</p> <p>Change the cable or repair the insulation</p> <p>Adjust the gap to the proper width of about 0.8 mm (0.0315").</p> <p>Clean the electrodes with a wire brush.</p> <p>Readjust the exact opening of the contact which is 0.3-0.4 mm = 0.0118" to 0.0157".</p> <p>Change the coil (at a Ducati Servicing Garage).</p> <p>Clean the silencer, to ensure free discharge of the spent gases.</p>

**DISASSEMBLING
and
REASSEMBLING**

**DUCATI
750 & 860
ENGINES**





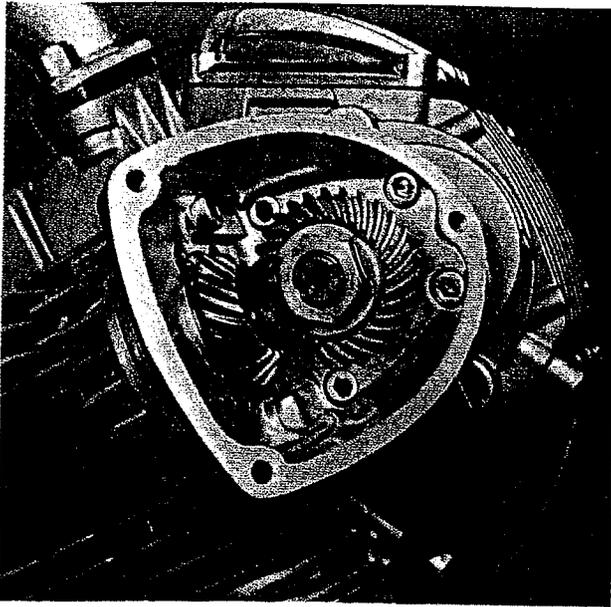
SERVICING DUCATI MOTORCYCLES 750 & 860

Because of the basic similarity between the Ducati 750 and 860 models, many of the operations described in the following pages are identical for each model. To avoid repetition, most procedures are described in connection with only one model, however, the 860 owner should have no difficulty in interpreting information on the 750 and applying it to his own machine.

Identification Numbers

Both the 750 and 860 models can be identified by two numbers, one for the frame and one for the engine. The frame number is printed on the steering tube and engine number appears on the crankcase near the cylinder base.

The metal plate attached to the rear right hand side of the frame carries data referring to the international classification of silencers and is not a means of identification.

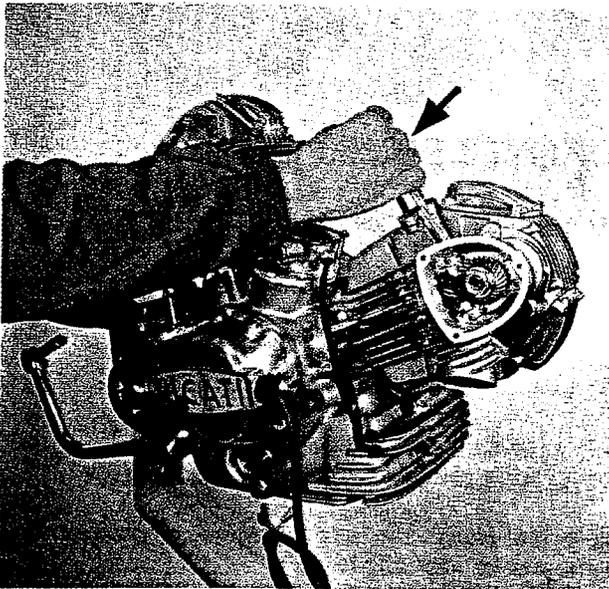


DISASSEMBLING THE ENGINE

The two timing marks on the upper two taper gears.

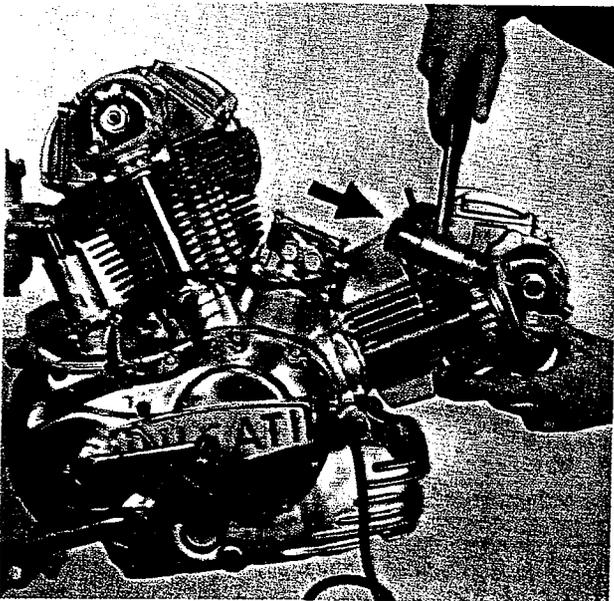
Before removing the cylinder head, remove the cover and rotate the engine until the two timing marks coincide.

During disassembly, be careful not to turn the engine since the engine will be automatically timed after you refit the head.



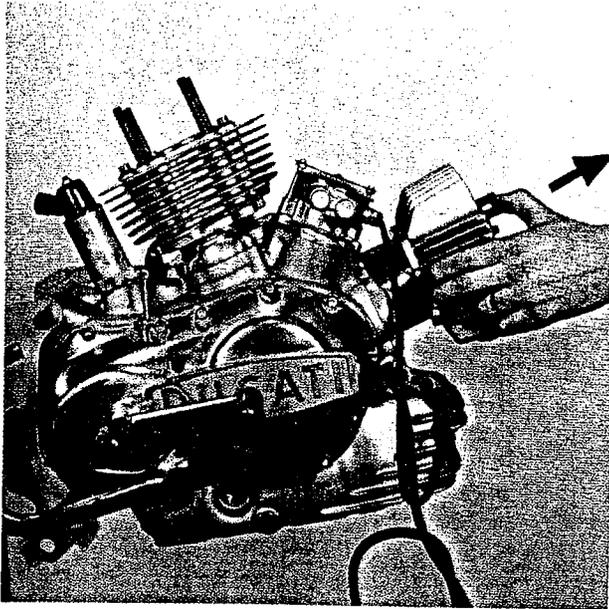
Removing the head

By means of a 17mm polygon wrench (860—16mm) slightly loosen the four nuts in a crossed sequence. This is necessary to avoid damage to the holding head face.

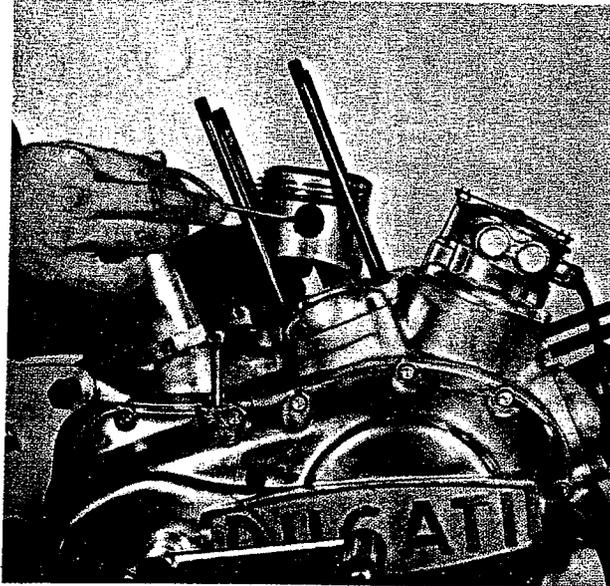


Removing the head

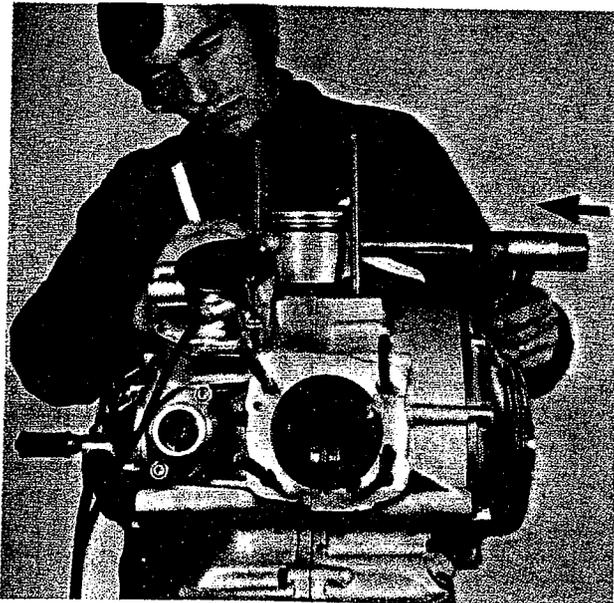
After loosening the four nuts, begin to remove the head, using a plastic hammer. Be very careful to avoid hitting the fins. Then lift the head and screw off the four nuts.



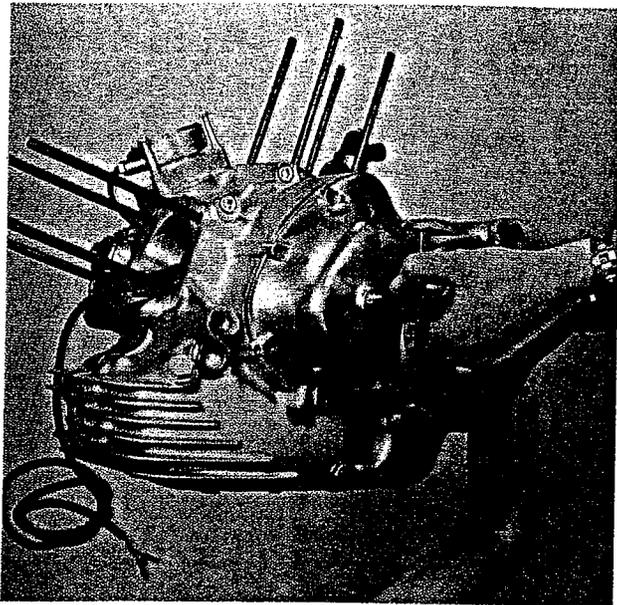
Removing the cylinder
Remove the cylinder from its seat by lifting it slowly and carefully.



Removing the circlip from the gudgeon pin
Remove the circlip with a pair of pointed pliers. It is important to cover the crankshaft opening with a clean cloth to prevent the circlip from falling into the engine.

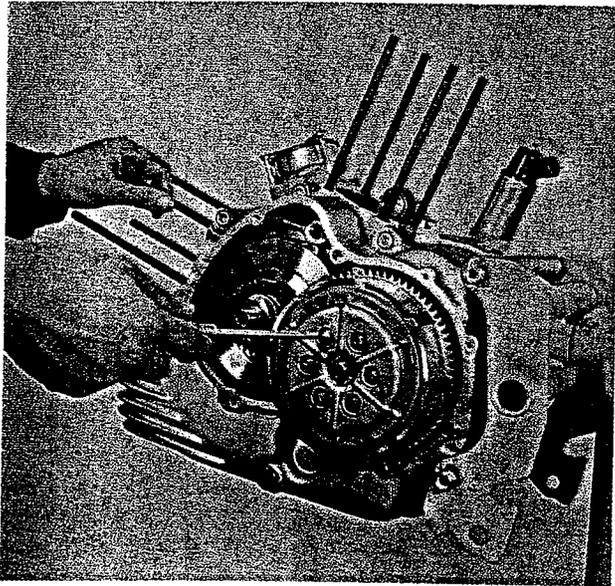


Removing the piston
Tap out the gudgeon pin while holding the piston in one hand to avoid damage to the connecting rod.



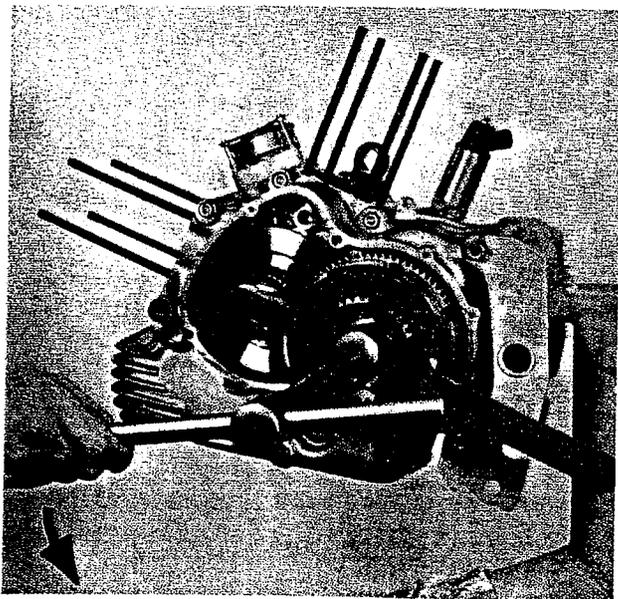
Removing the clutch side cover

Remove the screws holding the cover, then remove the cover by inserting extractor # 88713.0258 in place of the plug and turning the extractor until the cover comes off. Continue rotating the extractor while tapping on the cover with a plastic hammer to allow the cover to come off evenly. Never insert a screwdriver between the sealing surfaces.



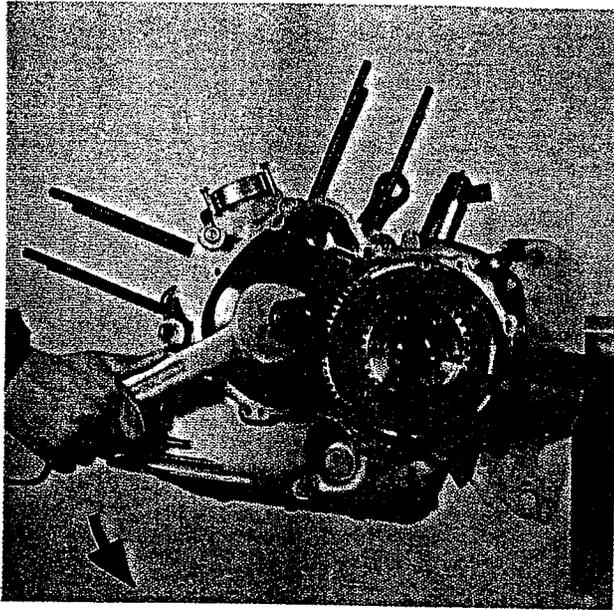
Removing the clutch

Remove the six screws, the springs and the cups and pull out the clutch plates.



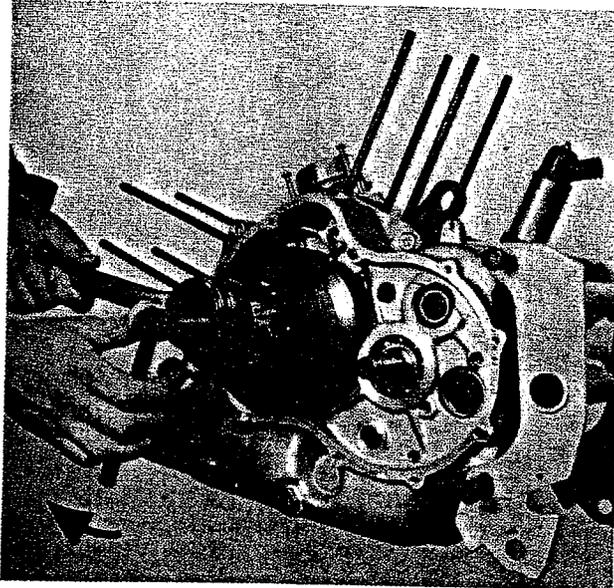
Removing the drum and clutch housing

In order to prevent the engine from rotating, insert the special tool # 88713.0101 as shown. Then open the lock washer and unscrew the nut, using a 30 mm wrench. Now remove the drum and the clutch housing.



Removing the fixing nut on the flywheel gear

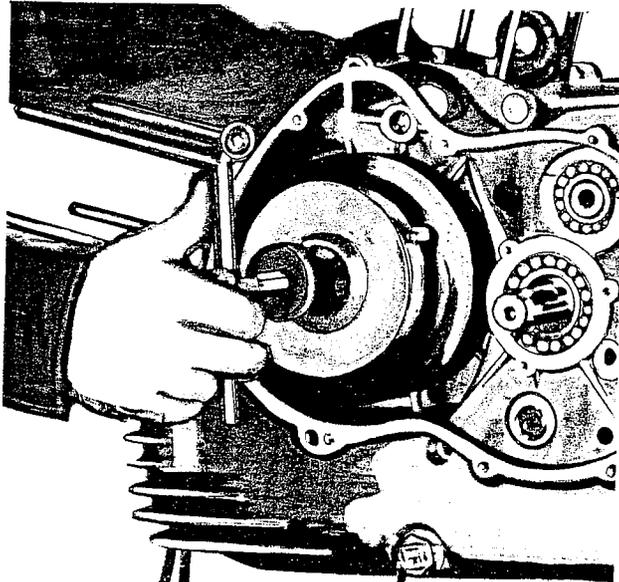
With the special tool still in position, open the lock washer and unscrew the holding nut, using a 36mm wrench.



Removing the flywheel-gear assembly — 750

Fit puller # 88713.0110 on the gear and allow the outer tool ring to slide until you can grip the back of the gear with a pair of pliers. Then use the puller to remove the assembly from the shaft cone.

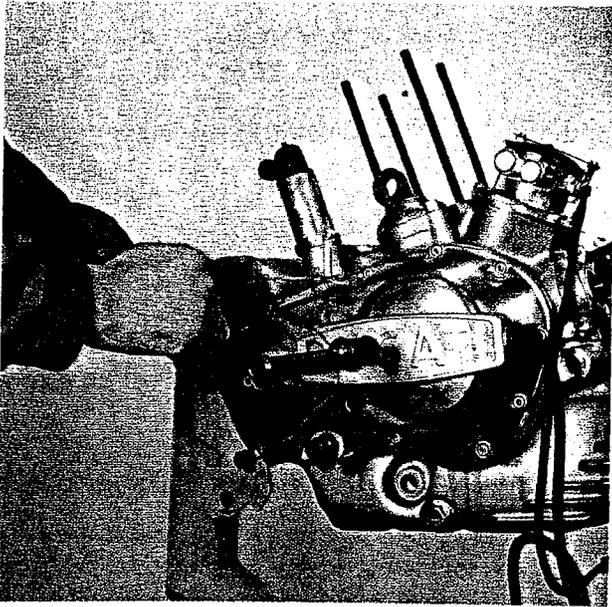
While performing this operation, use a 30mm wrench as shown to prevent the engine from rotating.



Removing the flywheel gear — 860

Insert the three pins of the 88713.0117 tool in the three flywheel holes and rotate tool clockwise, so that three teeth hook the flywheel.

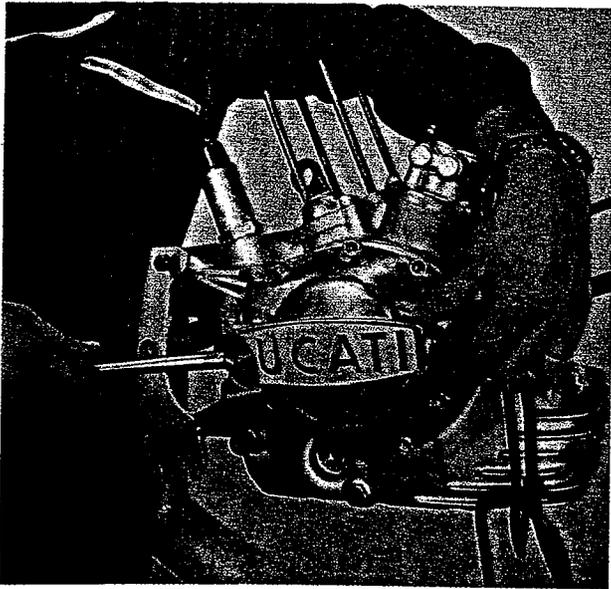
Put the tool handgrip in drawing position, then—using a plastic hammer—beat the handgrip centre until the unit comes out of the crankshaft.



Removing the gear selector cover

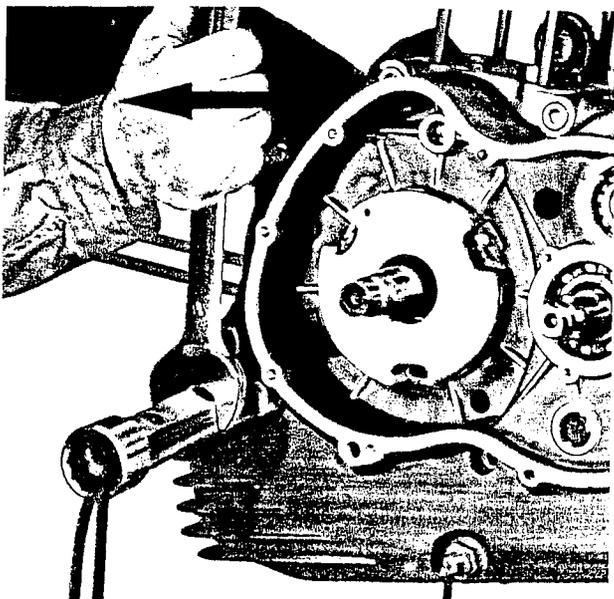
First remove the starter lever and unscrew the four cover screws.

This operation must always be performed before removing the engine from the frame.



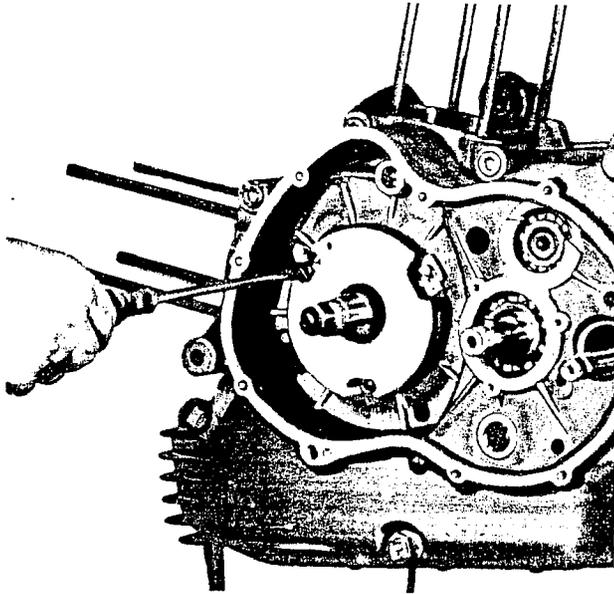
Removing the timing side cover

Remove the nine screws and gently tap on the cover with a plastic hammer until it can be easily removed.



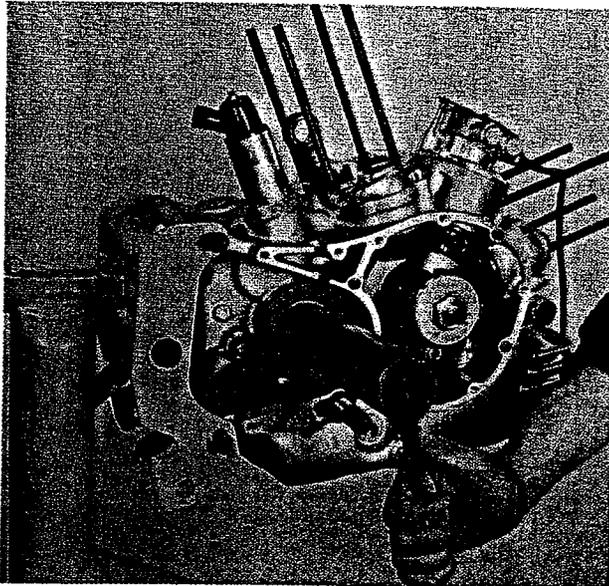
Removing the cable seal ring

First remove the exterior rubber cap, paying attention to slip it out entirely. Put the cables into a box spanner (30 mm) undo the ring and remove the inner rubber.



Removing the stator-plate, electronic ignition generator—860

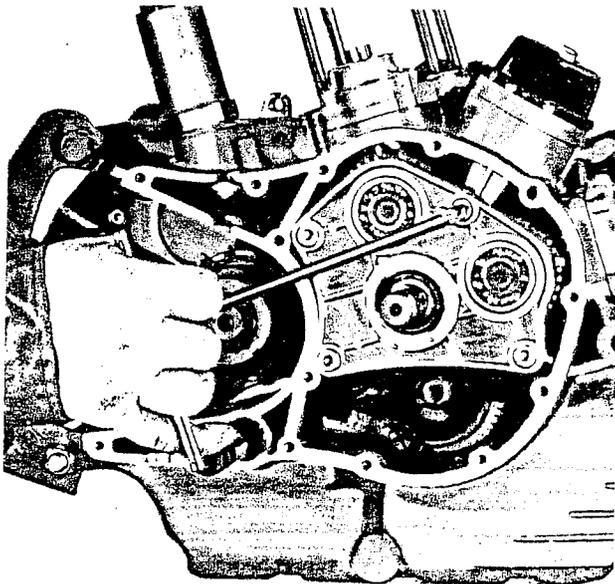
Using a screwdriver, undo the three screws fixing the stator plate to the crankcase; then gently slip the two cables from the crankcase.



Removing the chain pinion—750

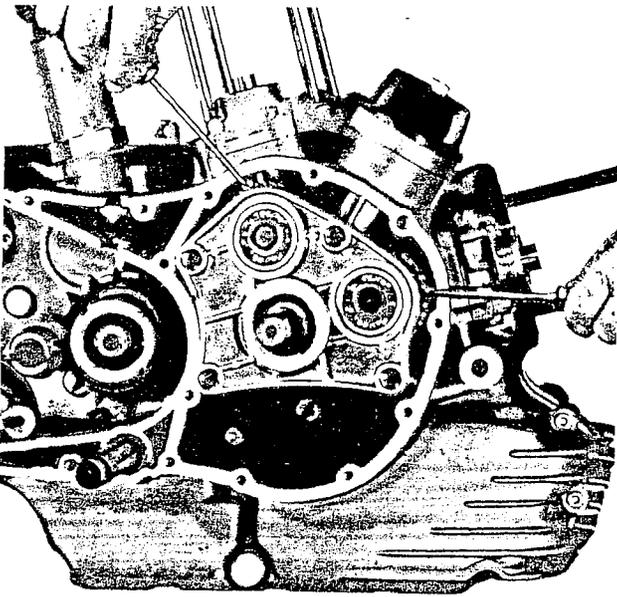
Insert tool # 88713.0107 between the teeth of the chain pinion and position it against the crankcase. Then open the lock washer and remove the fixing ring, using tool # 88713.0104.

This operation is not necessary unless you are repairing or replacing parts.



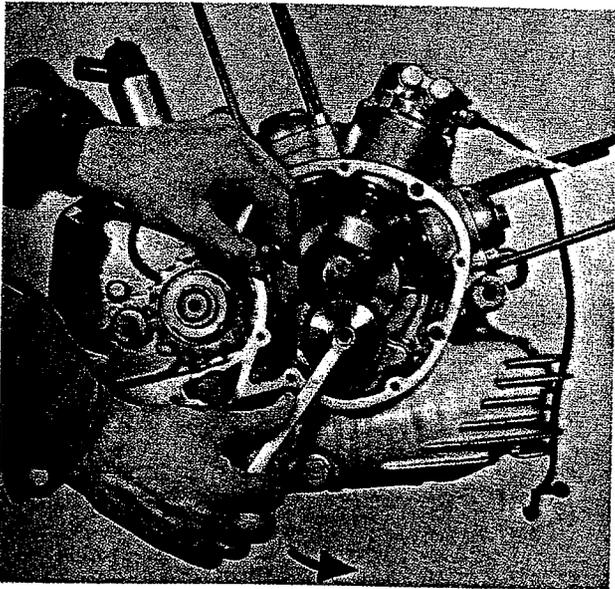
Removing the timing block—860

With a 6mm hexagonal wrench unscrew the four screws fixing this block to the crankcase.



Removing the timing block—860

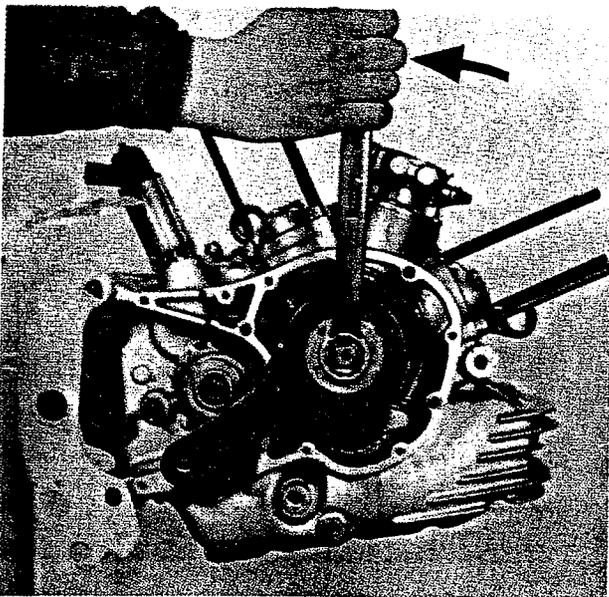
After the four screws and the distance piece have been removed, insert two screwdrivers as shown in the illustration and lever so that the block may come out. Then slip the two gears and their shafts, take off the bearing housing and the distance piece from the crankshaft. Pay attention to the distance washers under and over the shafts.



Removing the pump control gear

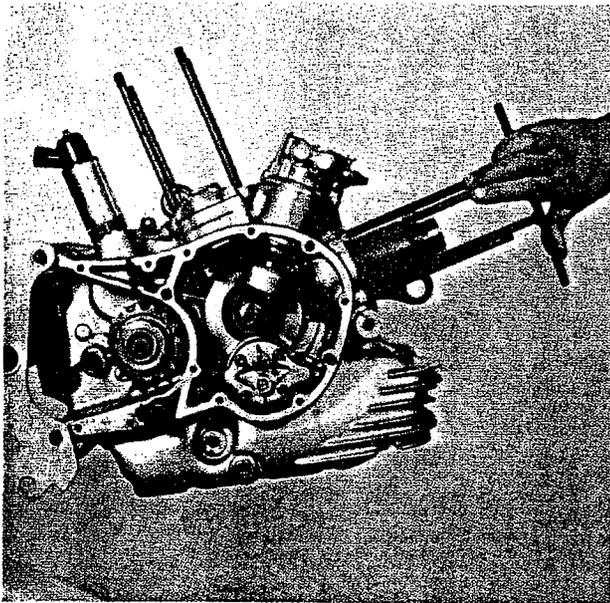
Open the lock washer and insert a pin of about 14mm in diameter in the crankcase hole, as shown, until it enters the crankshaft opening. This will prevent the engine from rotating.

With a 13mm spanner, undo the nut fixing the gear to the shaft cone and remove the gear.



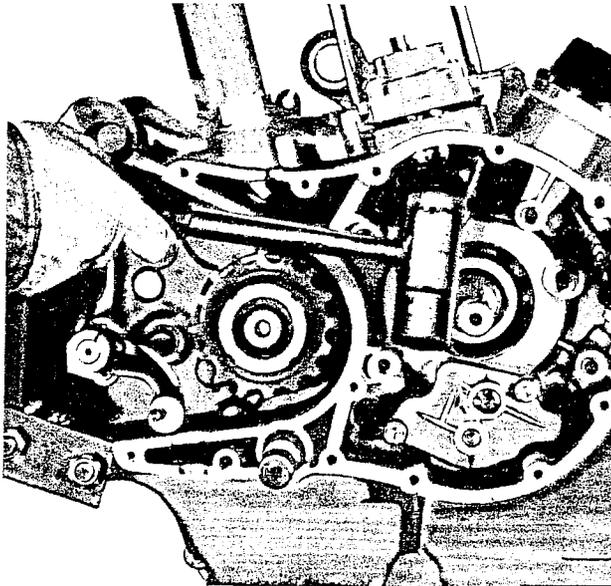
Removing the alternator rotor

Insert tool # 88713.0108 in the alternator rotor poles and position it against the starter shaft. Open the lock washer, unscrew the nut with a 30 mm wrench and remove the rotor. Then remove the distance piece and the driving gear. Pay special attention to the shims that must be fitted together with the conical gear.



Removing the bearing holding bushes and conical gears—750

First remove the flange and the Seeger ring on the conical gear shank with a pair of pliers. With puller # 88713.0111 you can then remove the bush and the bearings.

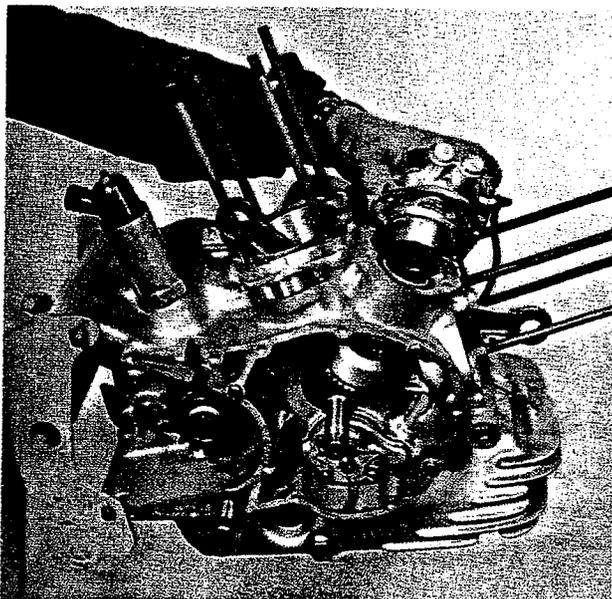


Removing the bearing holding bushes and conical gears—860

Remove the four screws fixing the bush to the crankcase, then tap with a plastic hammer until the block comes out.

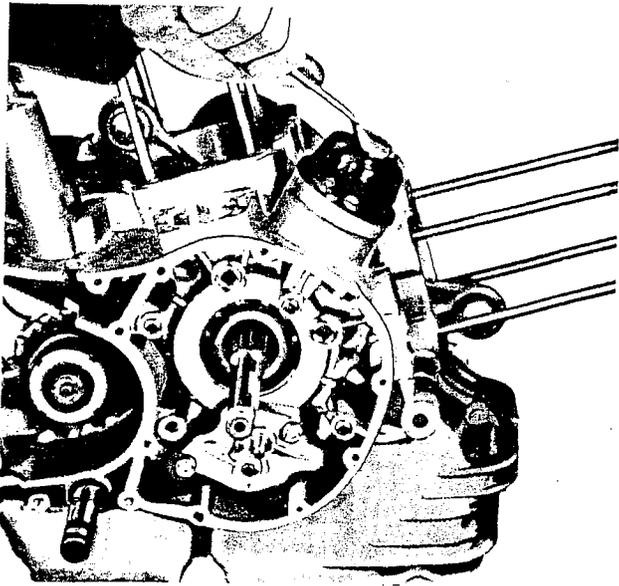
IMPORTANT:

The distance gaskets under the bush must be kept apart, since they must be put in the original place at the engine re-assembling.



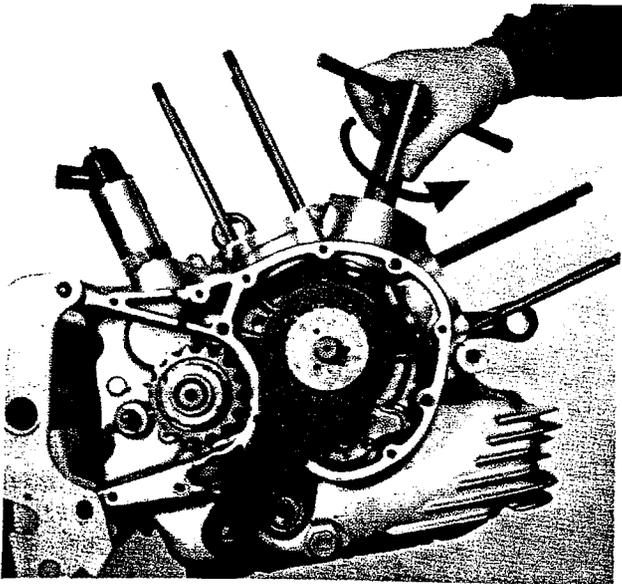
Removing the ignition distributor—750

Set one piston at top dead centre and fit the dial gauge, setting it at zero. Remove the distributor and, after repairing it, refit it, making sure it is timed correctly. Check the advance in both cylinders and ensure that the point gap is set at 4mm. If no repairs are being made to the ignition distributor, it is not necessary to remove it. When repairing the distributor, however, be careful not to remove the half-bush under it which retains the central conical gear and shims.



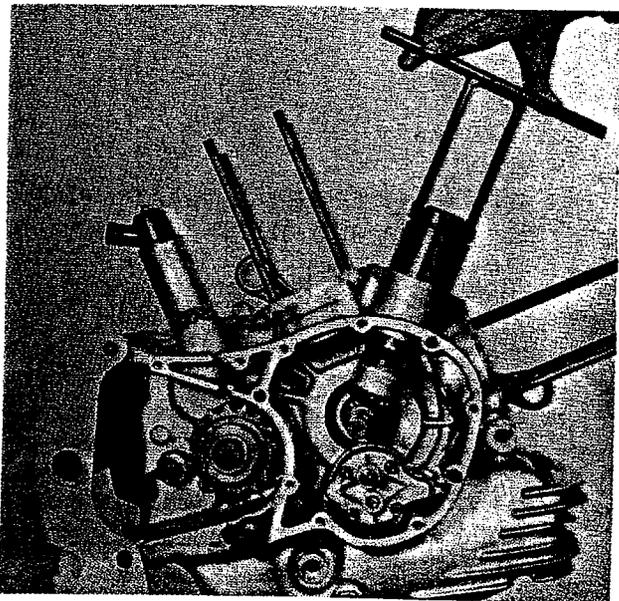
Removing the oil filter (cartridge replacement) — 860

With a 17 mm wrench first undo the nut, then the cover and the cartridge.



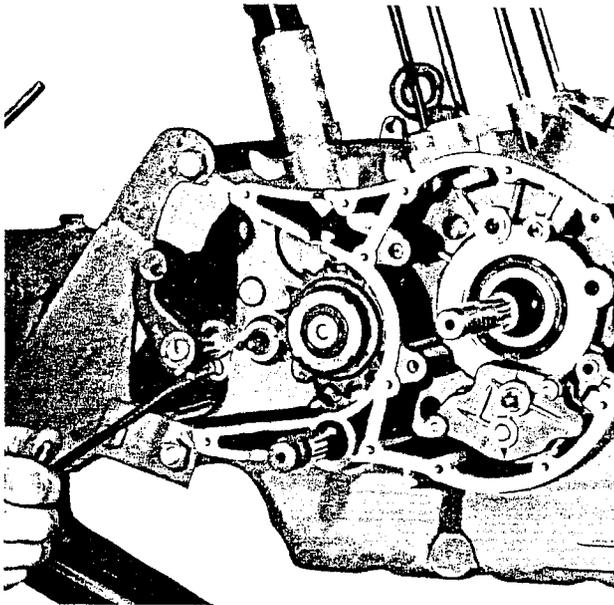
Removing the lock ring and ignition distributor control gear

Provisionally fit the taper gear and the alternator rotor on the driving shaft. Then fit tool # 88713.0108 on the shaft to prevent the engine from rotating. Then remove the half-bush and Seeger ring which retain the control gear. Open the lock washer and remove the lockring and gear, using the special box wrench # 88713.0105.

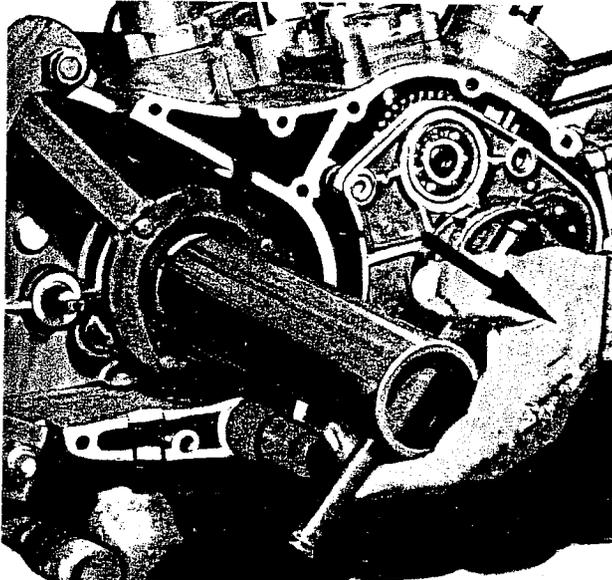


Removing the bearing holding bush for the ignition distributor axle

Remove the bush and bearing, using puller # 88713.0111. This operation is necessary when correcting bevel gear play.

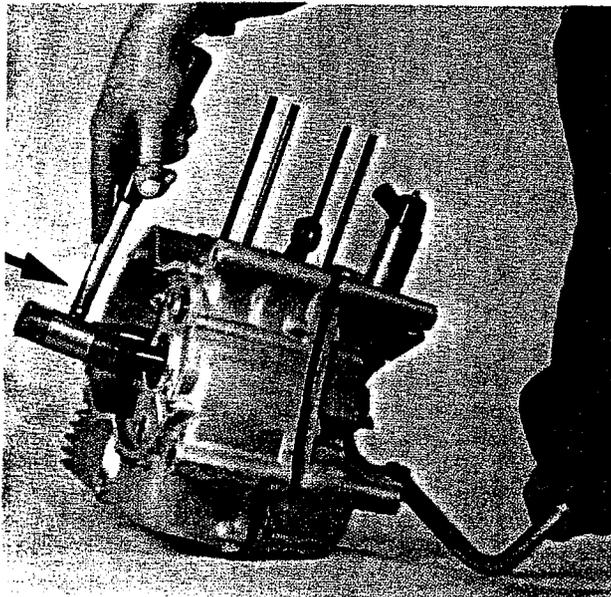


Removing the gear selector lever and rod
With a 5 mm hexagonal wrench unscrew the screw fixing the plate, then remove the rod and its lever.



This illustration refers to caption "Fitting the chain pinion" which appears on page 38.

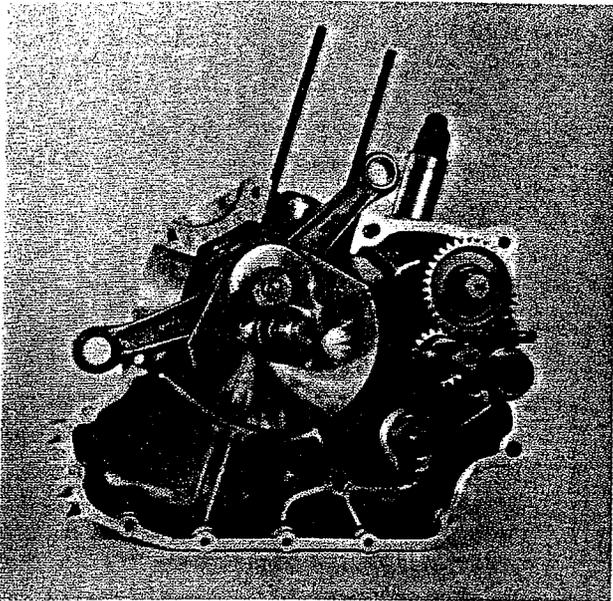
Removing the oil pump block
With a 6 mm hexagonal wrench undo the two screws fixing the pump block to the crankcase.
Pay attention that the ball and the spring are both fitted to the crankcase when the block is removed, they can fall and be lost.



Opening the crankcase

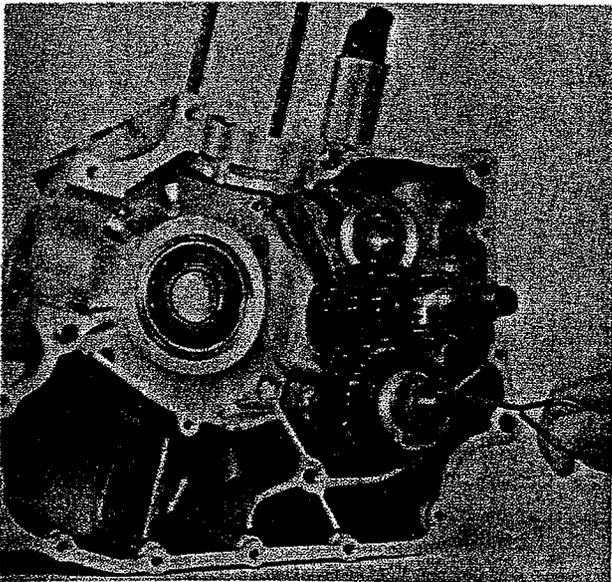
- With a 5 mm hexagonal wrench undo the eight screws fixing the half crankcase (timing side).
- With a 8 mm hexagonal wrench undo the four screws fixing the half crankcase (clutch side).

Tap on the driving shaft to allow the crankcase halves to separate. Never insert a screwdriver between the sealing surfaces. During this operation, keep the starter lever beyond half travel, allowing the inner stop to release.



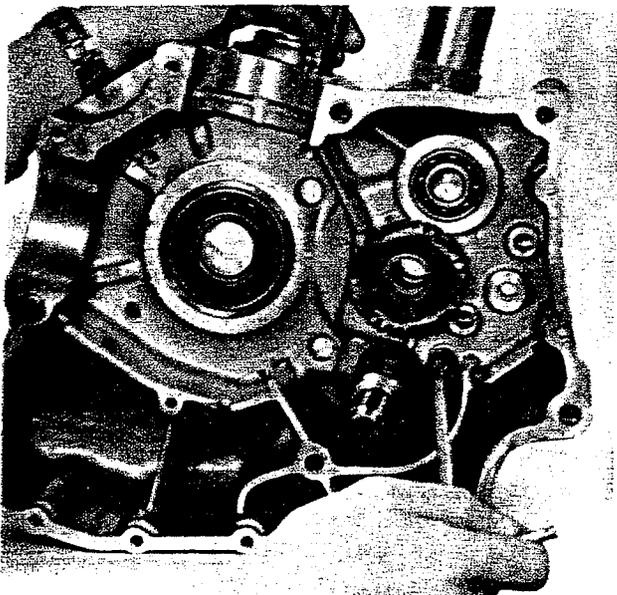
The open engine

This figure shows the half crankcase timing side with all of the inner engine components. Clearly visible are all of the thrust washers, painted in red, which are needed to eliminate end float in the various shafts. When removing these shafts, take special care to avoid mixing the thrust washers, since they must be refitted exactly when assembling the engine.



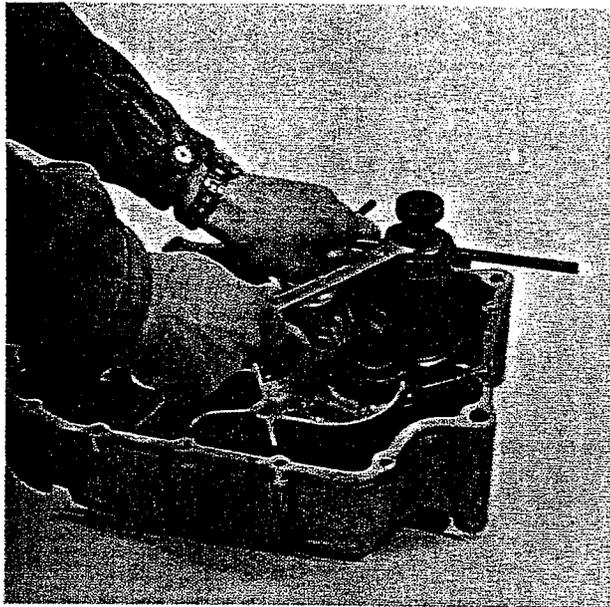
Removing the transmission shaft

With a hardened steel nail remove the stop ring, washer, spring and slide coupling; remove the Seeger ring and take out the starter gear with a pair of pliers. Then remove the transmission shaft from its seat.



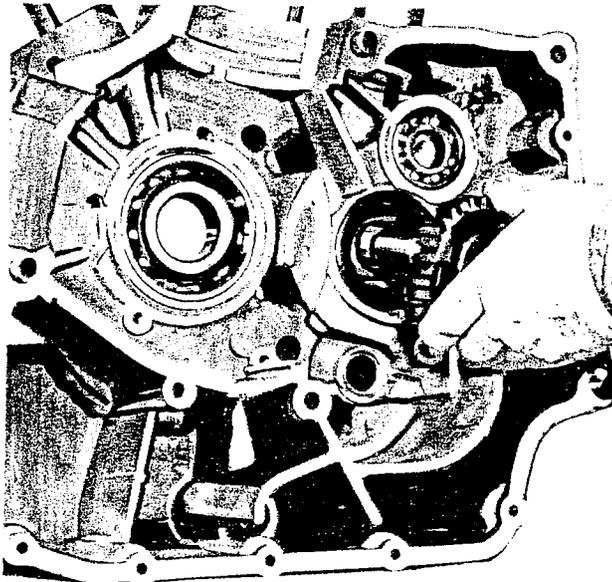
Removing the starter shaft

To remove the starter shaft, remove the screw that holds the pedal return spring.



Removing the countershaft bearing from the half-crankcase timing side

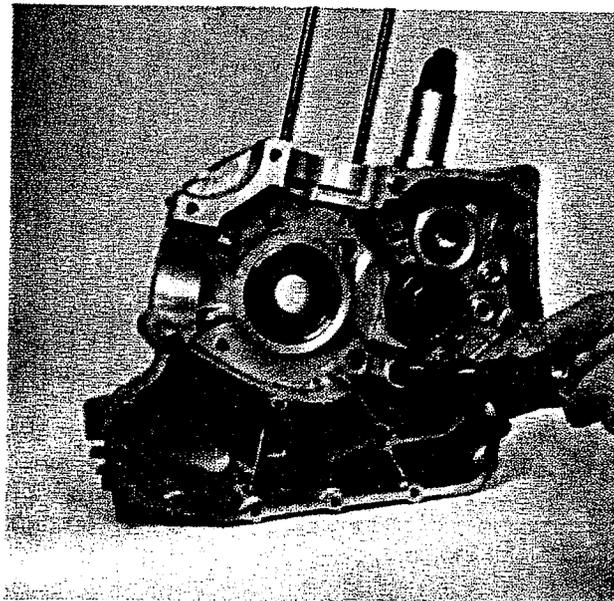
This bearing is placed in a blind seat and cannot be tapped out. Therefore it is necessary to grip the bearing from the bottom and remove it, using the special puller # 88713.0270.



REASSEMBLING THE ENGINE

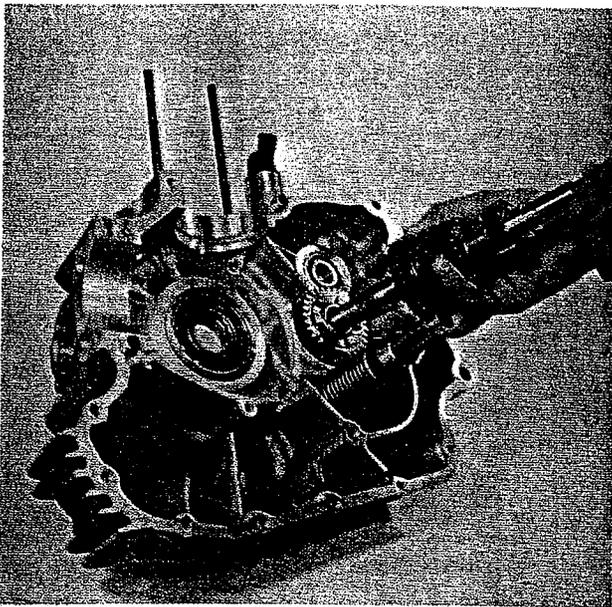
Refitting crankshaft gear

Before re-fitting the gear check the wear of the two oil seals; one inside the gear and the second fitted to the outside crankcase, under the chain pinion.



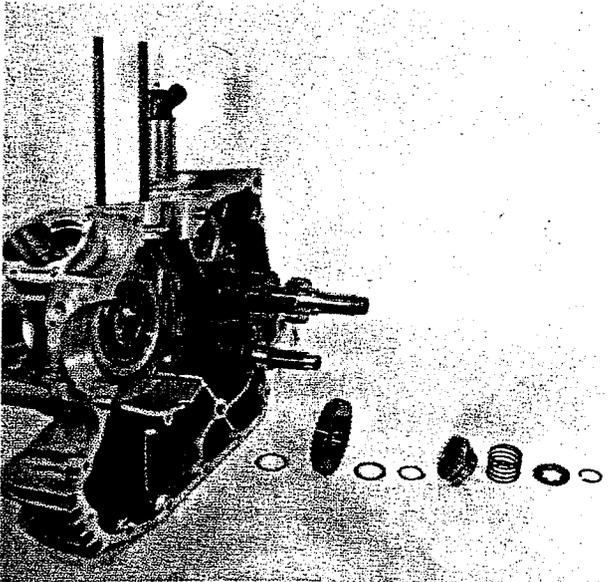
Refitting the starter shaft

First, check the condition of the rubber seal ring inside the shaft seat and replace if necessary. Then fit the starter shaft, being careful to insert the thrust washer in its proper place. Then fit the screw holding the pedal return spring.



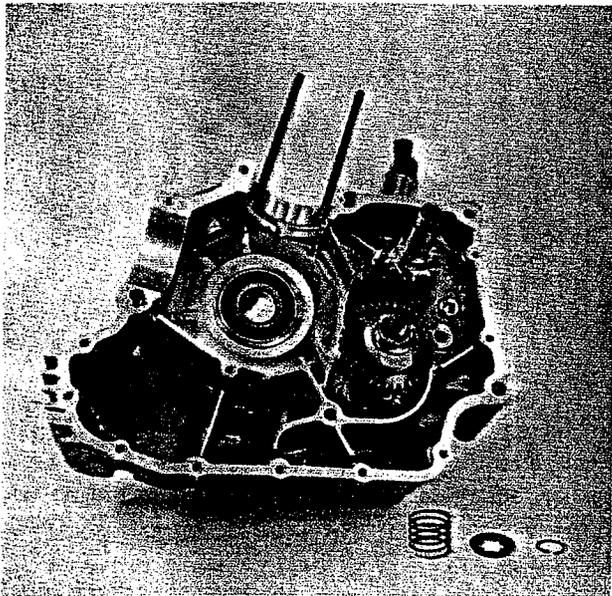
Refitting the transmission shaft

Fit the transmission shaft, complete with its gears, being careful to position the thrust washer against the fourth speed meshing gear fixed on the chain pinion shaft. Another thrust washer must then be placed in the upper part of the shaft. This will act as a shim against the bearing on the clutch side half-crankcase.



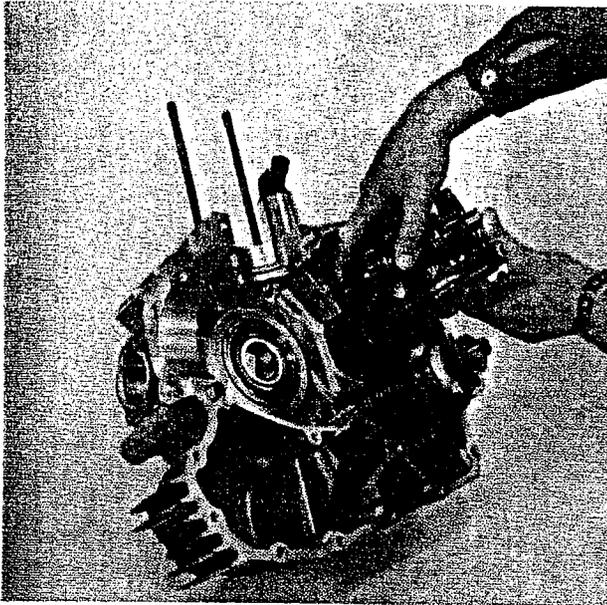
Starter assembly

This figure shows the various components of the starter assembly, exactly as they are fitted: the thrust washer, the gear, the second thrust washer, the Seeger ring, slide coupling, spring, special washer and outer stop ring.



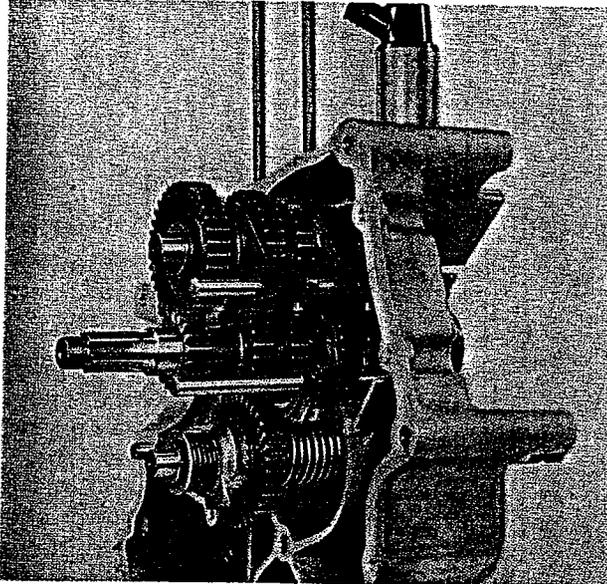
Fitting the slide coupling in the starter shaft

The slide coupling must be fitted with the cam positioned towards the bottom, since it has to enter the proper seat of the clutch side half-crankcase in order to disengage the starter.



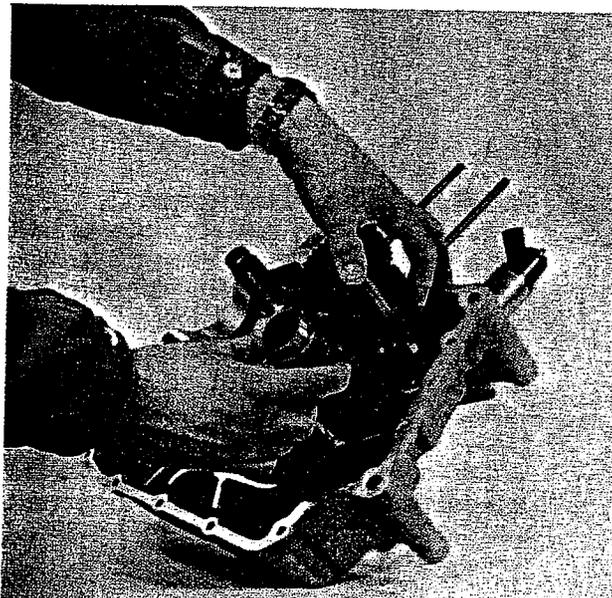
Fitting the countershaft

The countershaft must be fitted in its seat taking care to position the thrust washer between the bearing and fourth speed gear. Another thrust washer must be placed in the upper portion of the shaft to act as a shim against the bearing of the clutch side half-crankcase and the first gear.



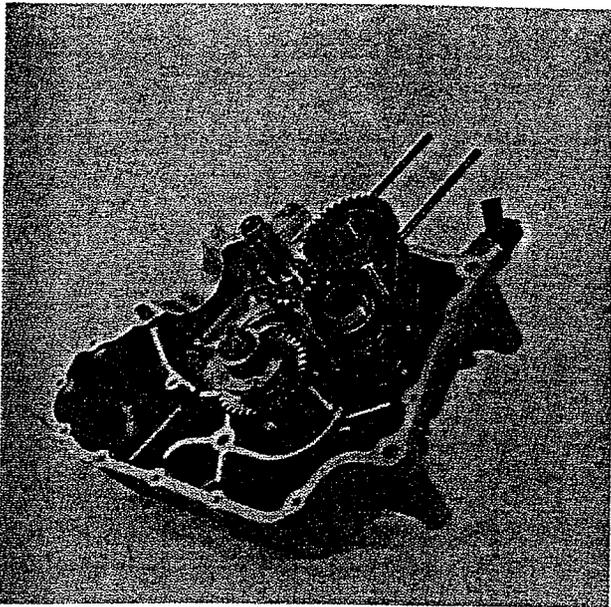
Fitting the speed control forks

This figure illustrates how the forks are fitted. These forks must be fitted before the gear control drum.



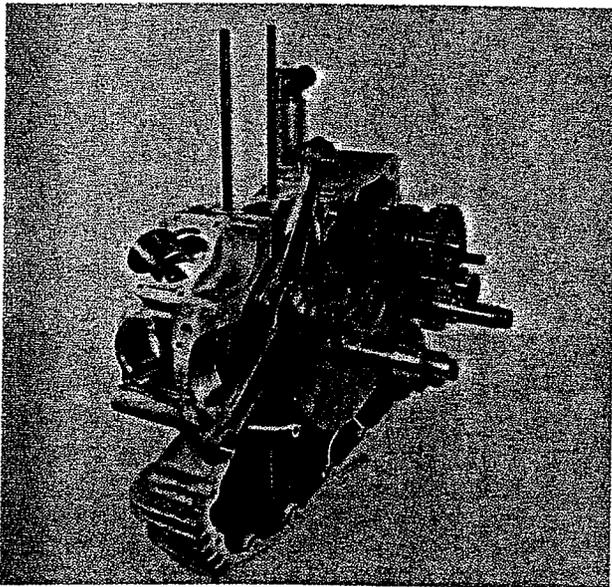
Fitting the gear drum

The gear drum must be fitted in its seat, taking care to position the thrust washer in the stem. Another thrust washer must then be placed in the upper portion of the drum and will rest against the clutch side half-crankcase. Before positioning the drum stem in its seat make sure that the rubber seal ring is in good condition. After fitting the drum, make sure that the fork guidepins are in the proper drum cams.



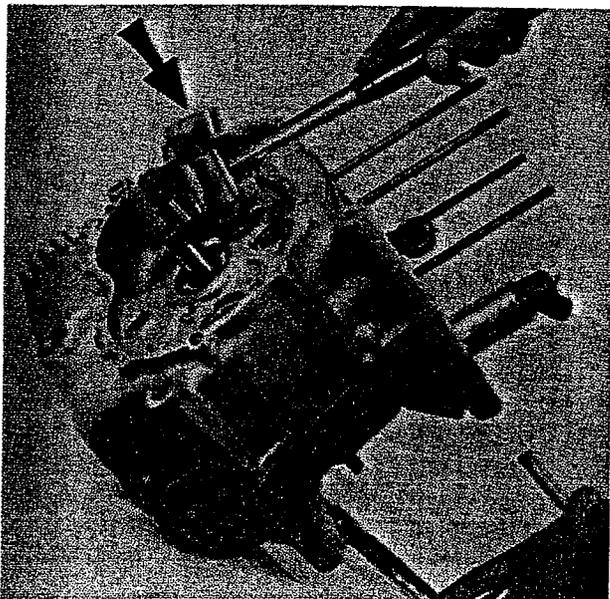
The complete gearbox

This figure shows the complete gearbox. All of the thrust washers and speed control forks are painted red.



Fitting the driving shaft

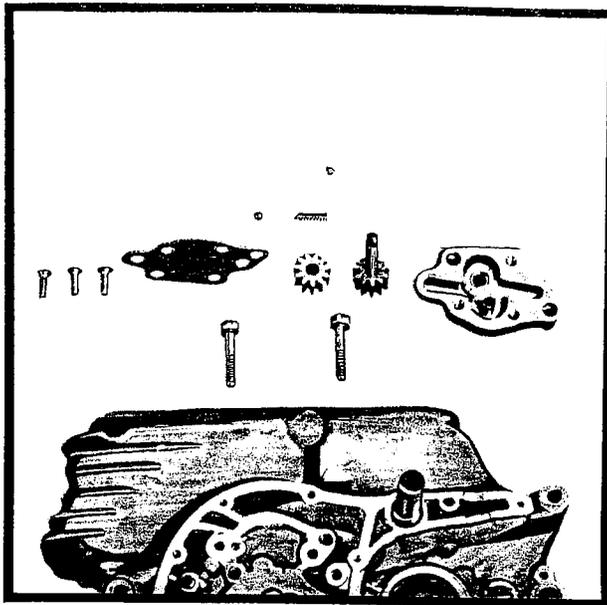
The driving shaft must be fitted in its main bearing with a very slight pressure. It may be necessary to tap the shaft with a plastic hammer. Before fitting the driving shaft, position the central conical timing gear, painted red in the figure. When the crankcase is completely assembled, there should be no end float in the drive shaft.



Fitting the two half-crankcases

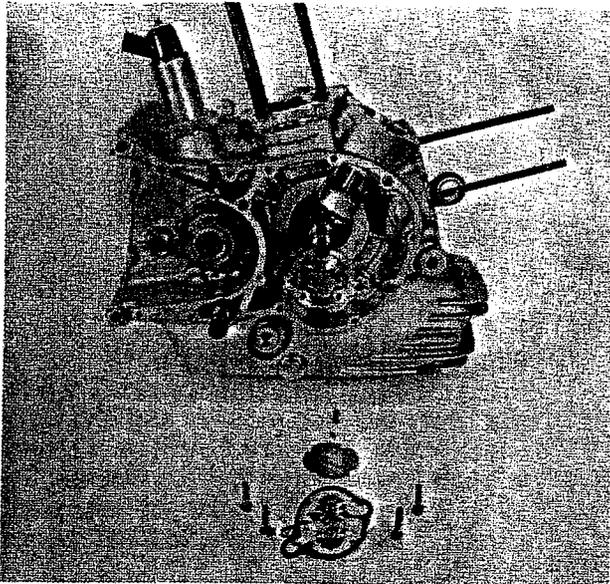
Carefully clean the contact surfaces and make sure that the three reference dowels are in the right place. Carefully position the gasket and the clutch side half-crankcase. When the engine is assembled, tap with a plastic hammer in order to match the surfaces properly. Then screw in the twelve fastening screws.

When the engine is completely assembled there should be no play in the driving shaft axle and .2 or .3mm play in the gearbox axles.



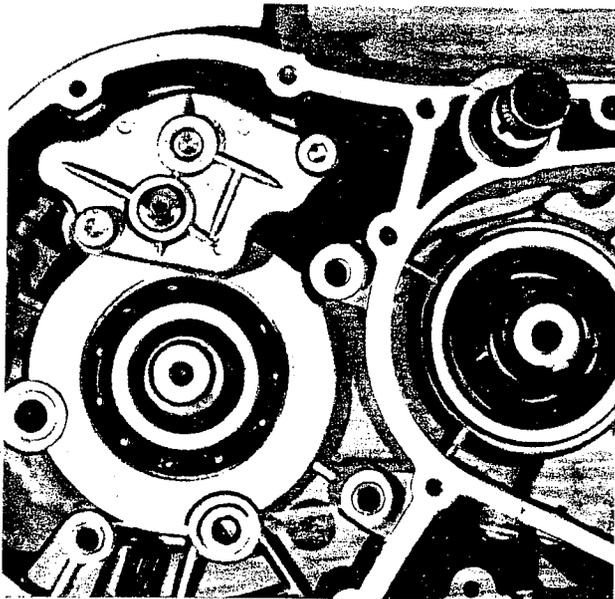
Fitting the oil pump — 860

Before starting fitting it is necessary to check all details, so that no faulty gears or dented matching surfaces remain. Then fit the pump assembly and after having tightened the two screws fixing the cover, check that the gears can rotate freely. Fit the spring and the ball in the housing and securely fit the pump assembly on the crankcase fixing it with two screws, to be tightened with a 8mm wrench. The figure shows the different components.



Fitting the oil pump — 750

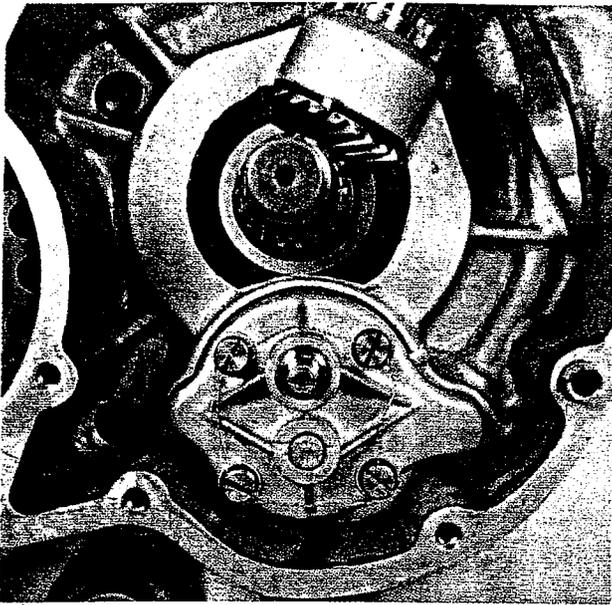
First fit the spring, then the ball and the pump assembly previously assembled with the gears, the cover and the gasket. Screw in the four screws and secure them with the safety wire. Once the pump is fitted, rotate it to ensure it is working properly.



The fitted oil pump — 860

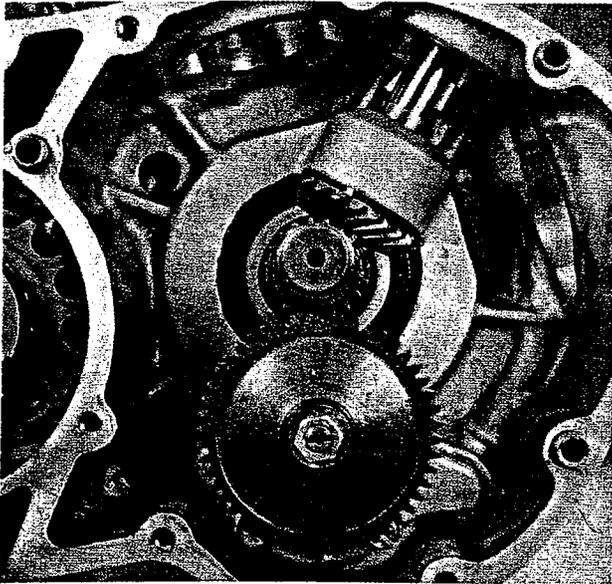
The figure shows the oil pump fitted in the proper position.

Important: When the two screws are tightened, rotate the pump to ensure it is working properly. Even a small dent or foreign matter between the matching surfaces can cause malfunction.



The fitted oil pump—750

This figure shows the oil pump fitted in the proper position. Note the safety wire to prevent the screws from loosening.



Fitting the pump control gear

Insert the key in the pump spindle. Then fit the gear, the stop washer and the nut, which must be locked with a 13 mm wrench. Then tighten the stop washer. To avoid any irregular rotation of this gear, carefully clean the hole and the pump spindle.

Fitting the side bevel gear bushes

Fitting must be carried out as follows:

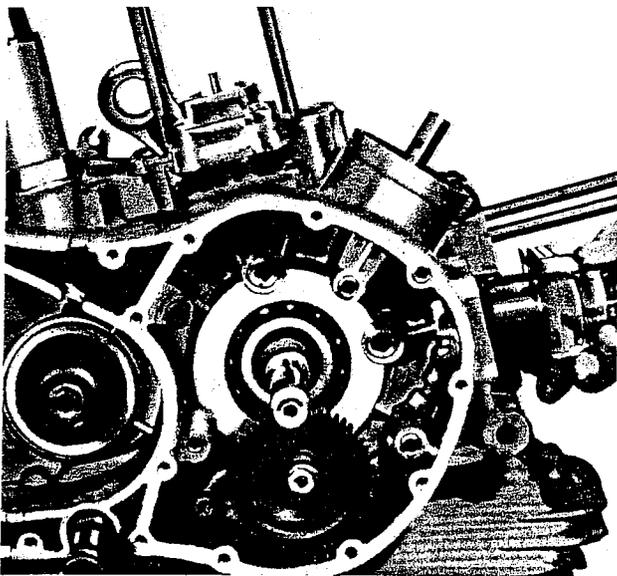
- Fit the rubber ring in the bush.
- Fit the bearings with their distance piece.

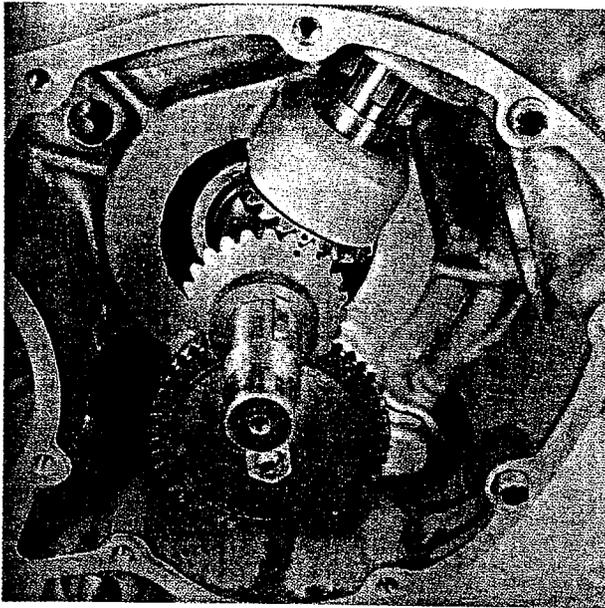
Bearings must be placed with the greater roller diameter outside.

Then fit the thrust washers and their Seeger ring, taking care to check that no end play remains.

— Fit the conical gear with its thrust washers (under and over) and close with the Seeger ring; it is important that no end play remains here (if necessary use new thrust washers).

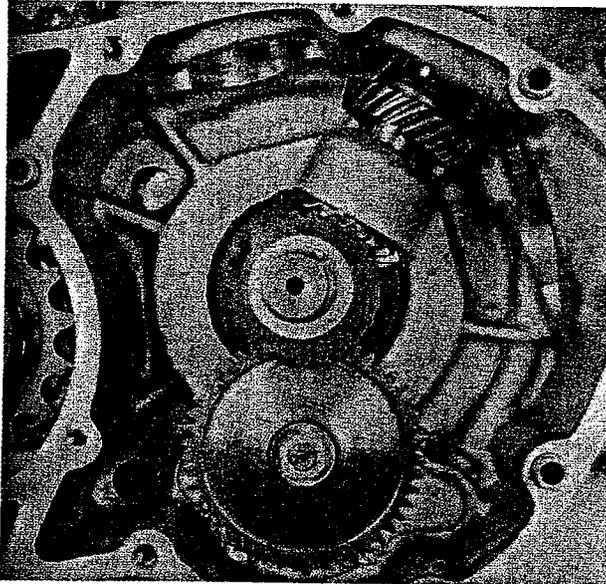
— Fit the bushes on the crankcase taking care to place underneath the shims which serve to determine the exact meshing height.





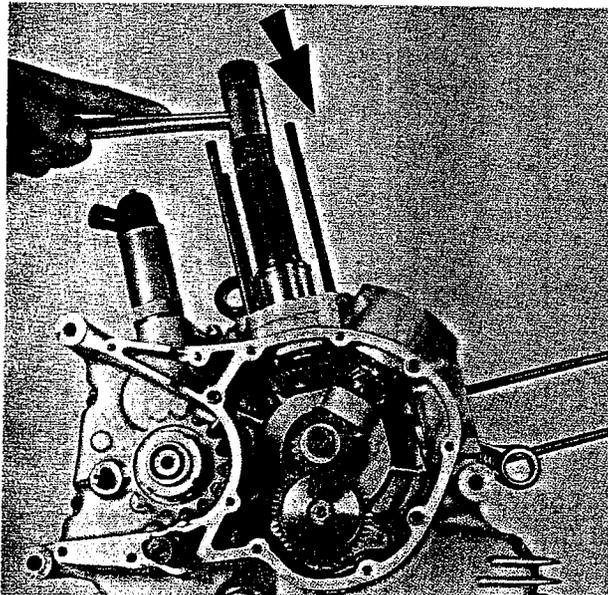
Fitting the driving gear

The conical driving gear is fitted on the driving shaft. Make sure that the reference mark coincides perfectly with the mark on the driven gear. It is important to check the meshing surfaces of these gears for proper alignment. It may be necessary to insert shims until the proper alignment is obtained. This alignment must be checked again when fitting the bush and the ignition distributor.



Fitting the conical driving gear of the upper bevel gears

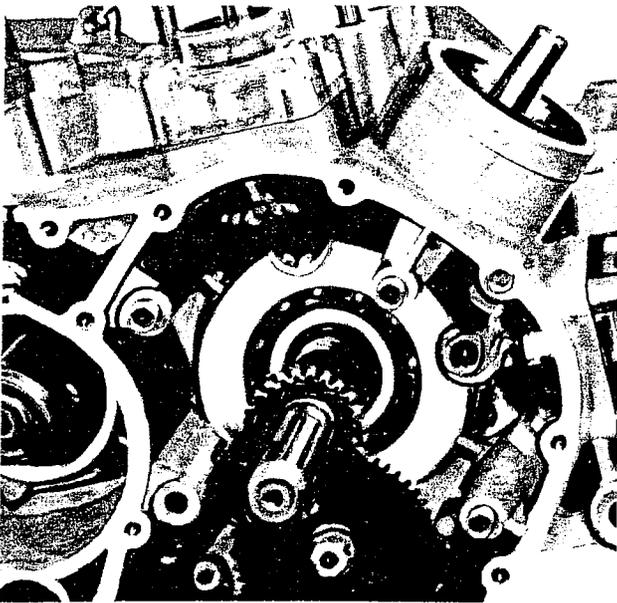
Fit the thickness washers, insert the keys, position the conical gear and fit the other thickness washers. Then fit the bearing holding bush as outlined in the next illustration.



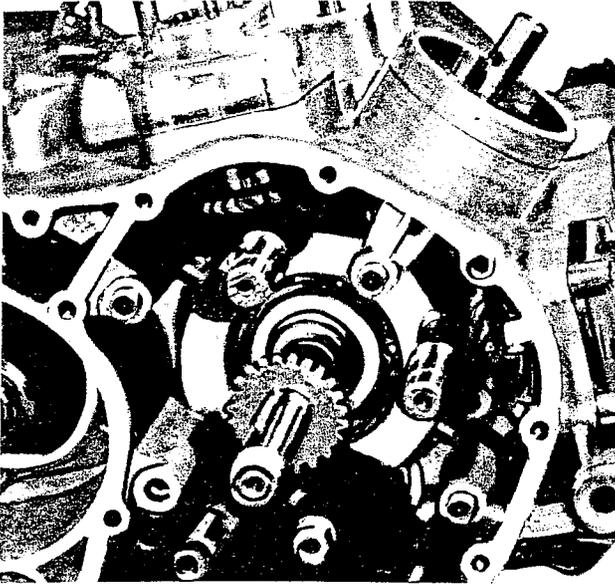
Fitting the side bevel gears

First insert the conical gear from the lower side, being careful that the reference mark coincides with one of the two marks on the central conical gear. The other mark on the central gear is used to fit the conical gear on the opposite side.

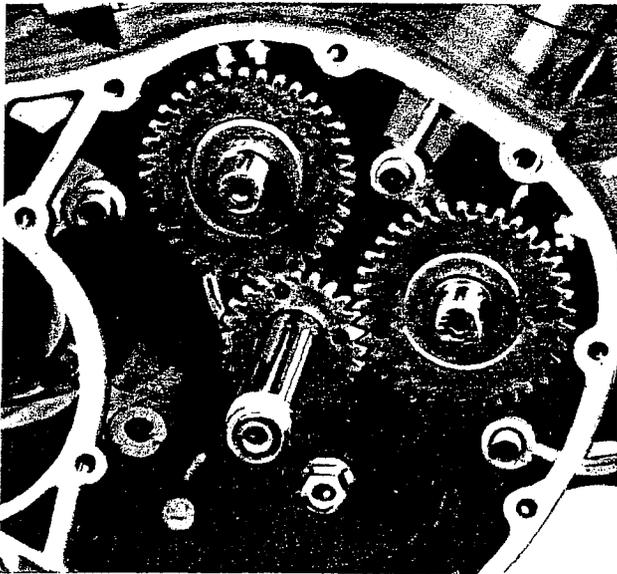
Next, the thickness washers are fitted. Then fit the bearing holding bush. To do this, tool # 88713.0111 should be screwed on the bush itself. Then tap on the bush with a plastic hammer until it seats properly. Then fit the thickness washers and the Seeger ring. The conical gear on the opposite side is fitted in the same manner.



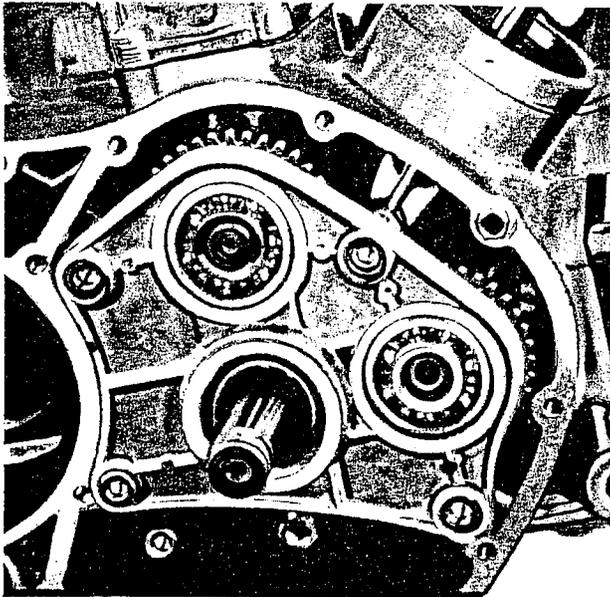
Fitting the timing control gear and pump
The figure shows the double gear fitted to the crankshaft. Before fitting the gear it is advisable to check the key and its seat condition.



Fitting the two gear holding spindles
The figure shows the two spindles holding the gears already fitted in their seats. Before fitting, remember to put the thrust washers under the spindles.

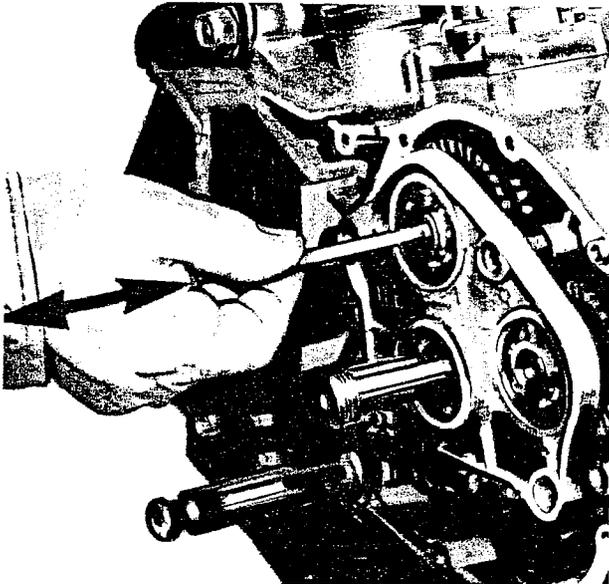


Fitting the two timing gears
The figure shows the two timing gears already fitted with reference marks towards the central gear. Place the thrust washers on the two gears. They will be the support for the bearings.



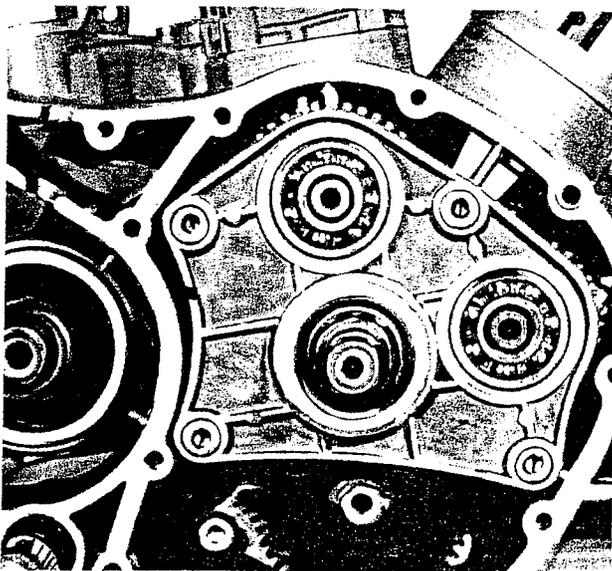
Fitting the timing block – 860

The figure shows the timing block already fitted and fixed with four screws, to be tightened with a 6mm hexagonal wrench.



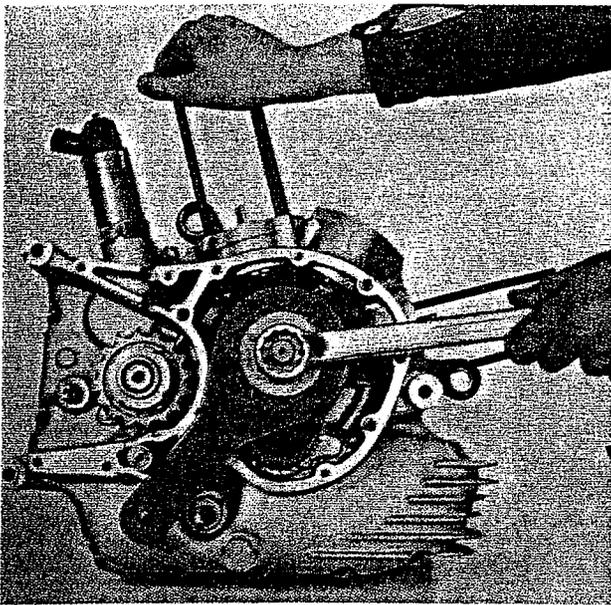
Checking the end play of the two spindles

Drive a 6mm screw in the spindle centre, then push and pull to check if there is end play, which could be eliminated by placing thrust washers under the two spindles. Such end play does not cause any malfunction and limited end play may be allowed. However it is very important to check that there is no play under the two conical gears fitted to the above spindles and the mesh is regular and not worn. The meshing surfaces must be properly aligned. A correct fitting of the bevel gears means quiet running and long engine life.



Fitting the central bearing ring

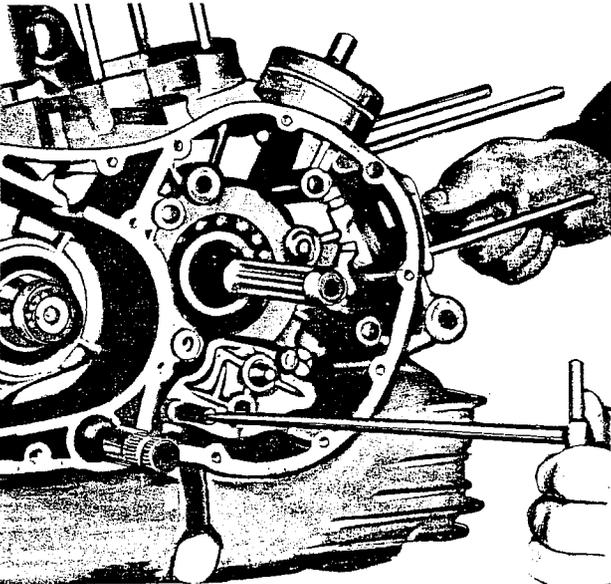
The figure shows the central ring of the bearing already fitted. Before fitting this ring it is necessary to fit the distance piece as a support against the central gear.



Fitting the alternator rotor

First fit the distance piece on the shaft and fit the rotor and the stop washer. Then fit tool # 88713.0108 on the rotor poles and lean it on the starter shaft as shown in the figure. Then fit the nut and tighten it with a 30mm wrench. Then tighten the stop washer.

860 Long distance piece.

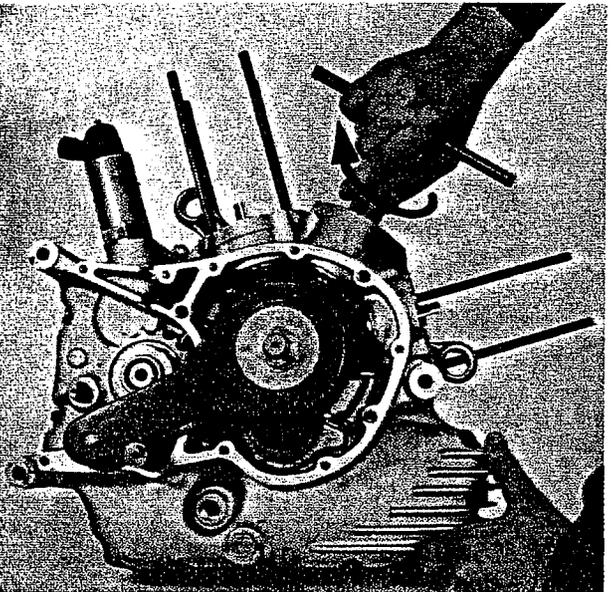


This illustration refers to caption "Removing the oil pump block" which appears on page 27.

Fitting the chain pinion

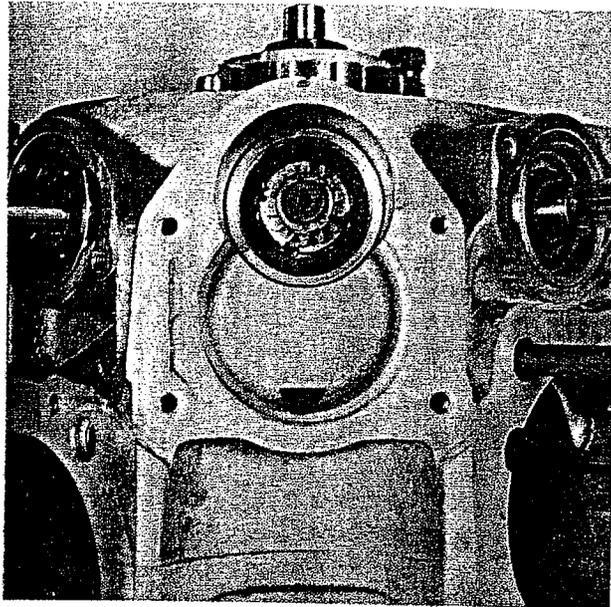
This fitting must be carried out as follows:

- Fit the distance ring.
- Fit the chain pinion taking care to place the higher hub towards outside.
- Fit the stop washer.
- Fit the threaded rim.
- Insert tool # 88713.0107 between the pinion teeth.
- With the special wrench # 88713.0104 tighten the rim.
- Tighten the stop washer.

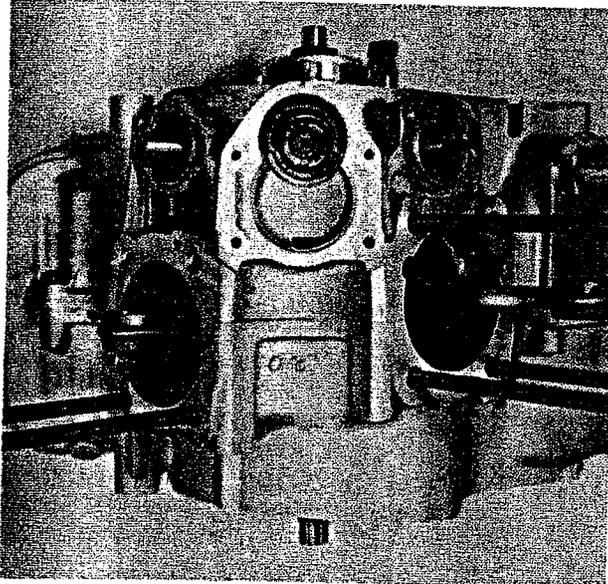


Fastening the threaded rim of the central group

Fit tool # 88713.0108 on the rotor poles and lean it on the starter shaft as shown in the figure. Next, position the stop washer. Screw in the rim and tighten it down with box wrench # 88713.0105. Then fasten the stop washer by bending one of the teeth in one of the rim grooves.

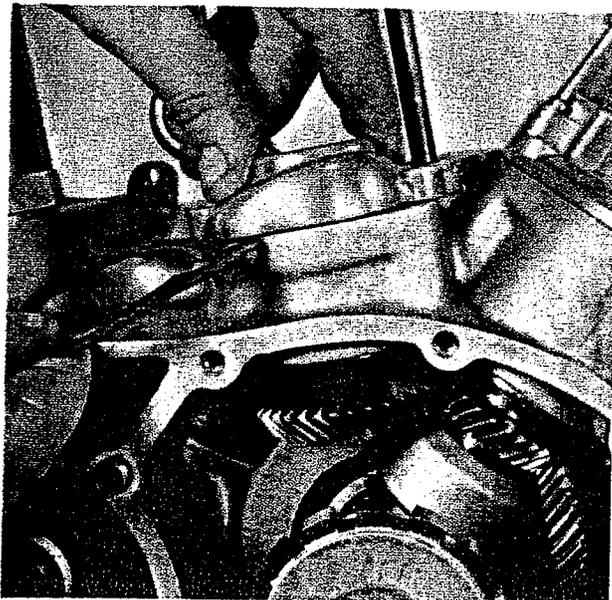


Fitting the ignition distributor control gear
 Insert the key and position the ignition distributor control gear and the Seeger ring.



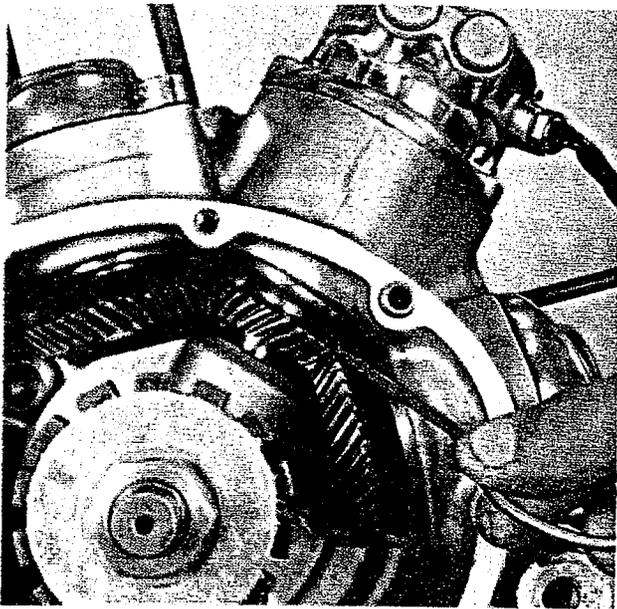
Fitting the half bushing

Fit the thickness washers and the half bushing, positioning it as shown in the figure. The thickness washers must be positioned so that the half bushing upper face is 100mm higher than the ignition distributor face. This is necessary to allow the distributor to block the central gear group and apply pressure against the distributor gasket. After this is done, the ignition distributor can be fitted. Once the distributor is fitted, check the play in the bevel gears to ensure that there is no play, but they should not be tight.



Fitting the seal flanges of the side conical gears

Fit the spacers and the flange as shown in the illustration. With the gasket try to eliminate the clearance between the crankcase and flange so, at the same time, the flange blocks the bevel gear housing.

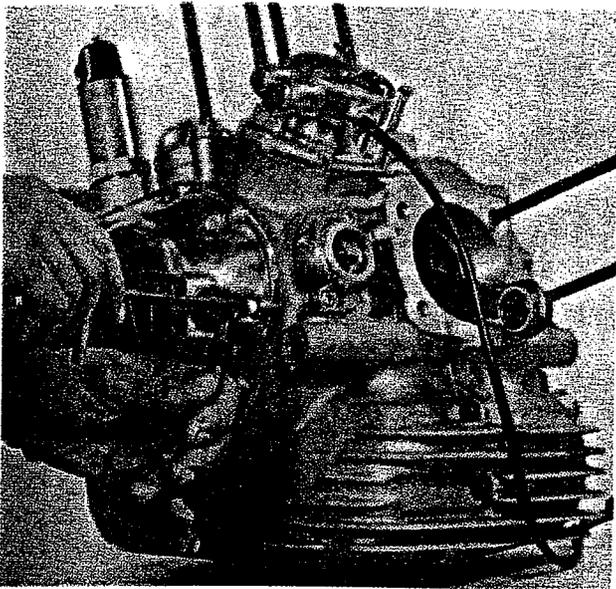


Checking the bevel gear mesh

Once the two outer flanges and the distributor have been fitted, check the gear mesh carefully as follows: With a sharp pin, check the outer gear surface as shown in the figure, to ensure the surfaces are at the same level in the lapping zone.

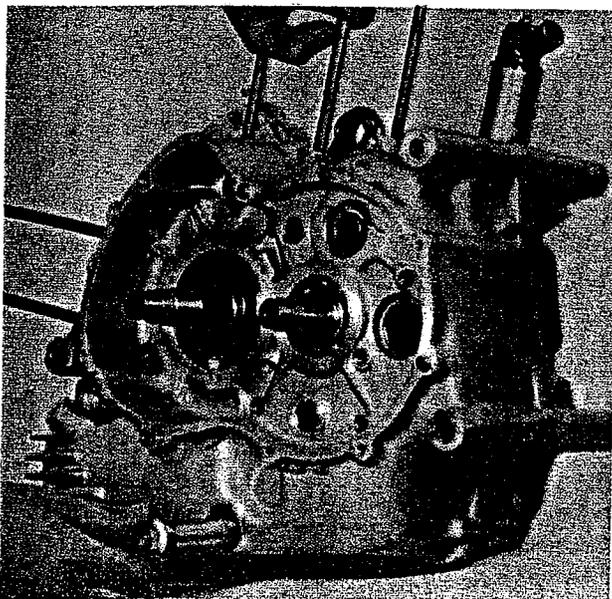
To check mesh, rotate the gears to see if there is any play or interference. For the most efficient operation, there should be no play or interference.

If play or interference is evident, adjust the thickness washers above and below the central upper conical gear. In this manner, you can correct the mesh of the three gears in the upper group.



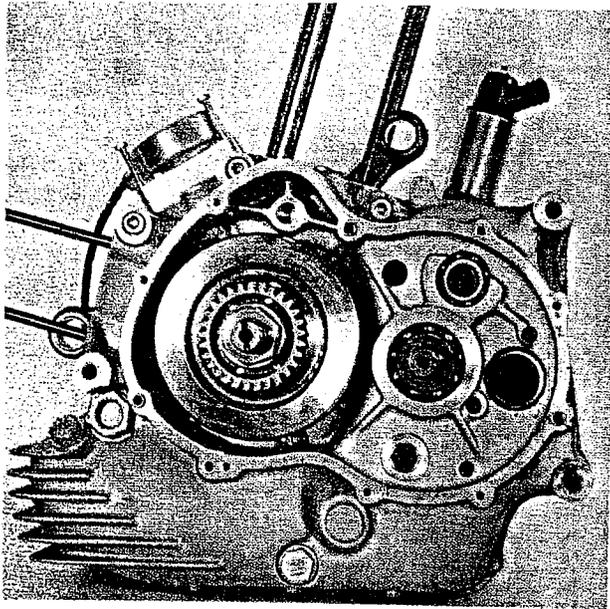
Fitting the timing side cover

Before fitting the cover, ensure that the three dowels are in good condition and in the correct position. Then place the gasket on the matching surface and fit the cover with the nine screws. When positioning the cover near the matching surface, be careful to avoid damaging the alternator coils contained inside the cover. Also, to fit the screw where the cable comes out of the cover, first remove the bakelite rim as shown in the figure.



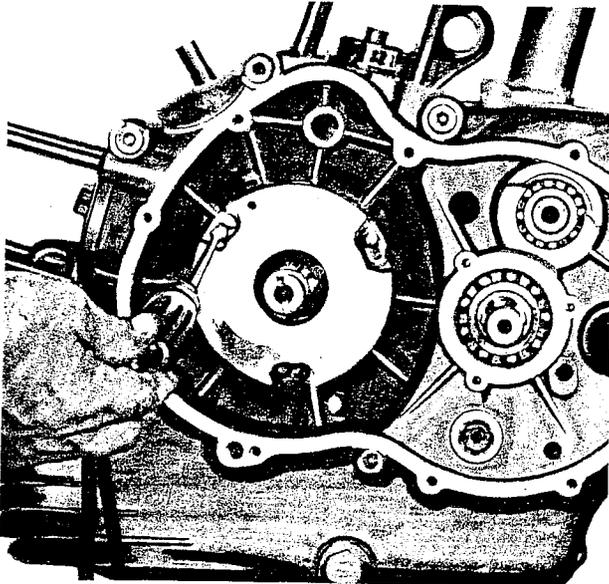
Fitting the oil filter

Insert the filter by hand in its respective hole and screw it in, making sure it is positioned properly in the chain-side half-crankcase. Then tighten with a 21mm wrench.



Fitting the flywheel-gear assembly

Carefully clean the shaft and gear cones and check for any irregular surface or dents. Check the condition of the key and its seat. Then fit the assembly, the stop washer and the fastening nut.

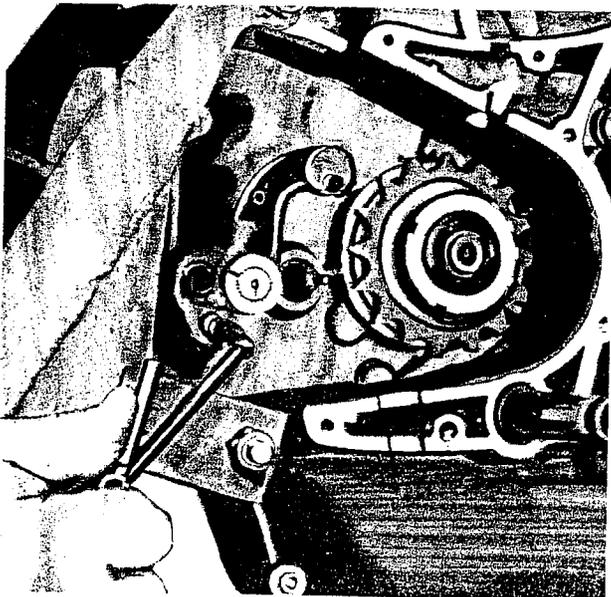


Fitting of stator-plate (electronic ignition generator)—860

Carefully clean the plate seat, then pass the two cables through the opening until they come out of the crankcase hole. Then fit the plate in its seat and fix it with the three screws which have to be tightened in a way that the stator-plate may rotate. The stator-plate will be finally fixed later, after the ignition-advance has been adjusted.

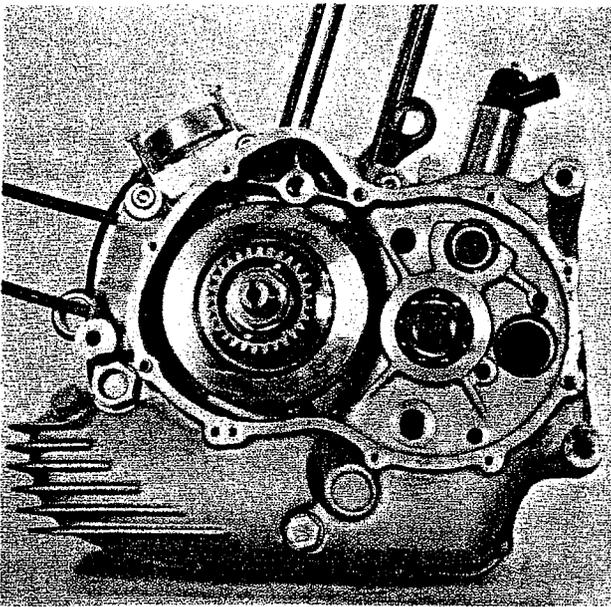
Then the two cables will be fitted to the crankcase by means of a threaded rim, under which must be positioned a thrust washer and its rubber gasket.

The rim will later be tightened with a 30 mm box wrench, the two cables passing through the wrench.



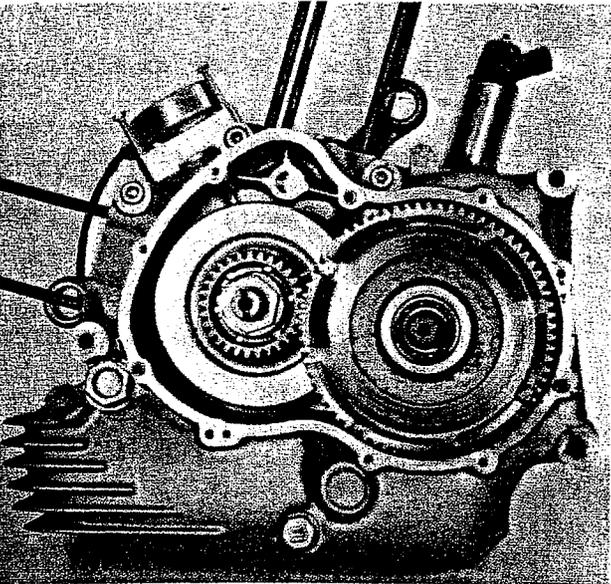
Fitting the gear selector lever and rod

Insert the stop plate in the notch of the rod and fit the block to be fixed with one screw only, using a 5 mm hexagonal wrench.



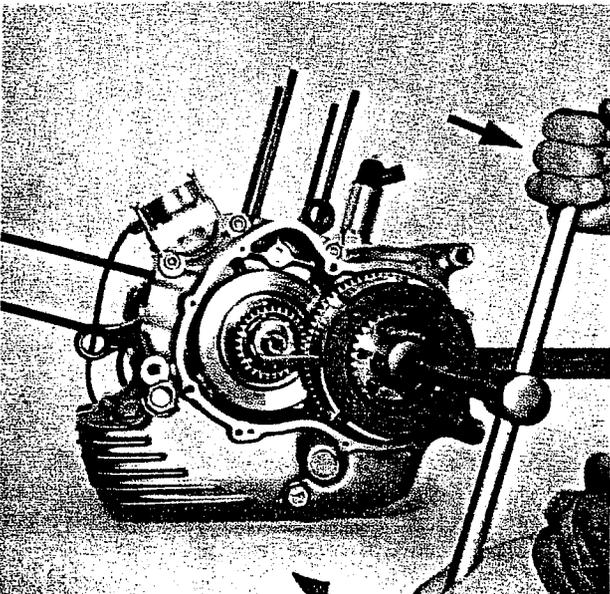
Fitting the thickness washer under the clutch housing

Remember to place the 1.5mm thickness washer, which appears in red, under the clutch housing (3mm 860)



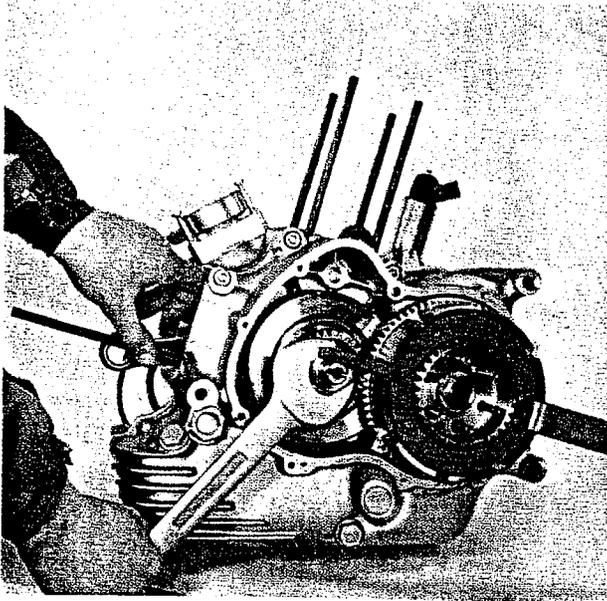
Fitting the clutch housing

The clutch housing is fitted on its shaft, being careful that it is well centered in respect to the driving gear fitted on the flywheel. Make sure there is no play or tightness between these two gears.



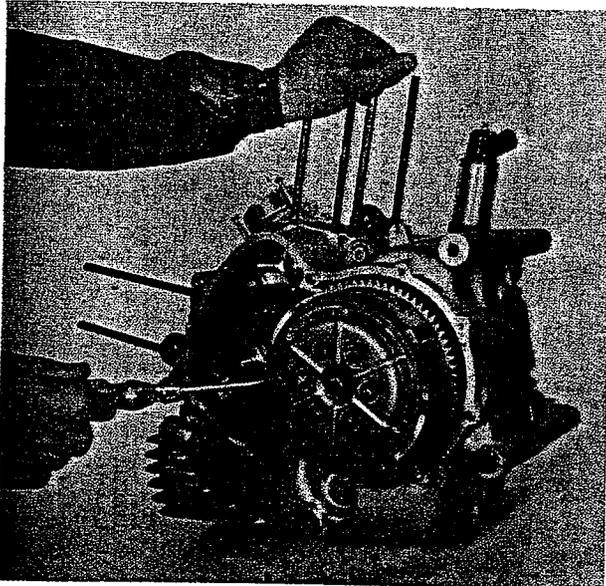
Fitting the clutch drum

Fit the clutch drum on the same shaft as the clutch housing and position the lock washer. With special tool # 88713.0101, placed as shown in the figure, fit the nut and tighten it with a 30mm box wrench. Then tighten the lock washer.



Fastening the nut fixing the flywheel-gear assembly

With the same tool # 88713.0101 placed as shown in the figure, tighten the nut with a 36mm wrench. Then tighten the lock washer.



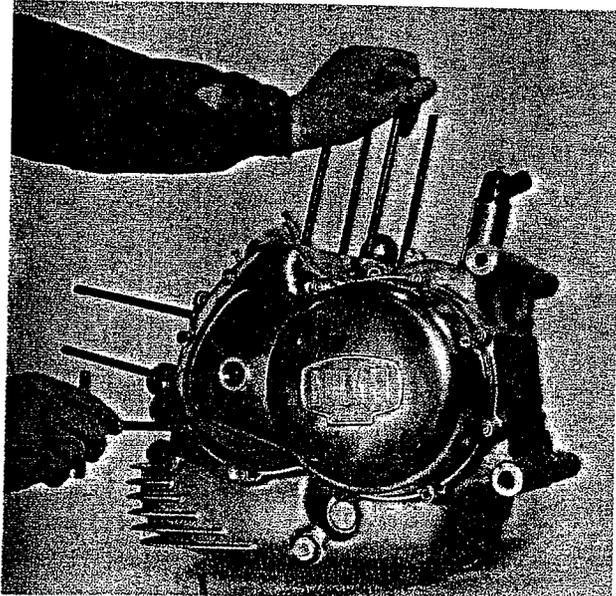
Fitting the clutch

In the hole of the main shaft fit: a rod, a 6 x 6 mm bearing, another rod, and another 6 x 6 mm bearing.

Then fit the set of clutch plates in the following order: alternate one driving plate and one driven plate until all 16 plates have been installed, with the last driving plate having the outer teeth towards interior. Then fit the pressure plate and the shim with its counternut.

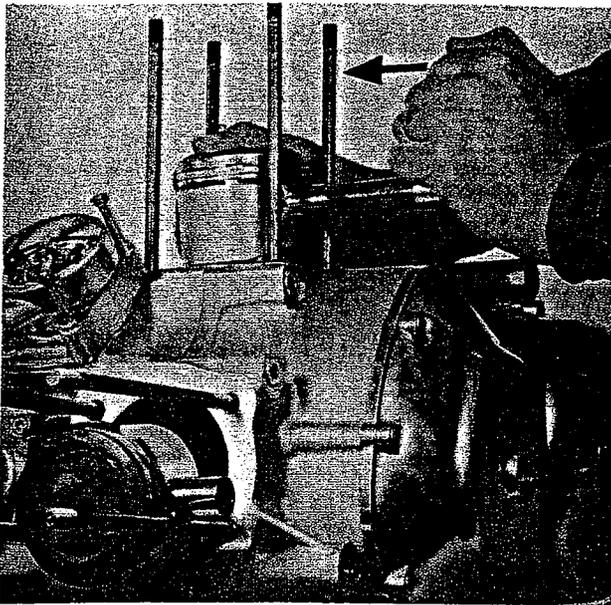
IMPORTANT:

Before fitting the gear selector cover, install the following parts in the transmission shaft hole from the selector cover side: A 5/16 x 5/16 bearing, a 5/16 ball; another 5/16 x 5/16 bearing; and a rod with the ball part towards the clutch lever.



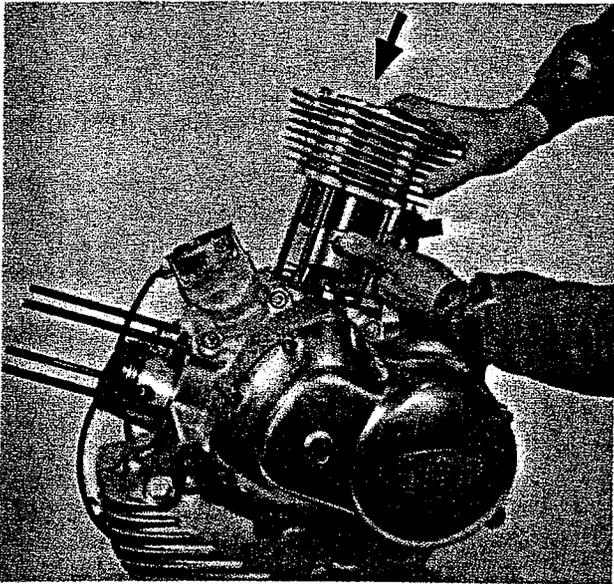
Fitting the clutch side cover

Fit the gasket and the cover and install the ten screws. You will notice that all of the screws are not the same size and the longer ones should be installed where the three reference dowels appear. Also, when fitting the gasket, make sure that the oil delivery hole is open.



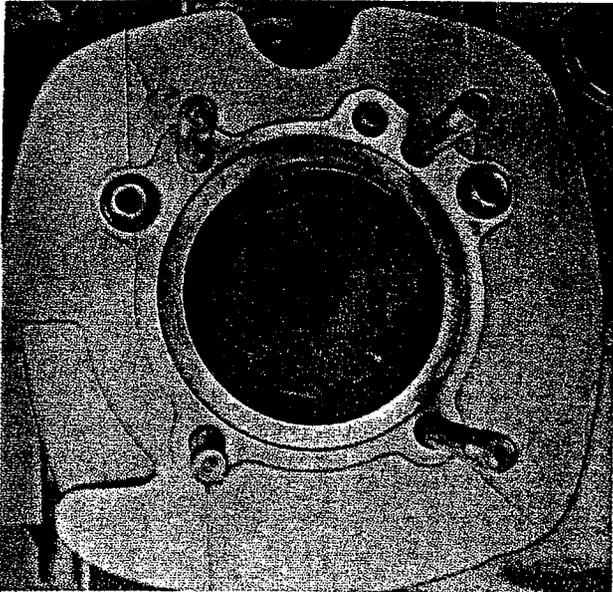
Fitting the pistons and gudgeon pins

First heat the pistons to 120° to 140°F. Using a pin, fit the gudgeon pin. Once the gudgeon pin has been fitted, tighten the two stop rings. Take care to fit the pistons in the correct position, with the one for the vertical cylinder with the exhaust valve in front.



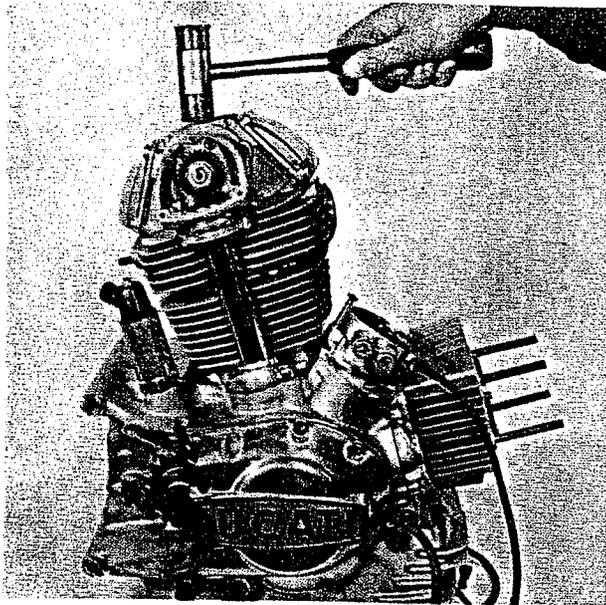
Fitting the cylinders

Position the gasket at the cylinder base. Place the piston rings so that the union slits are at about 120° between each other. Slowly insert the piston in the cylinder, keeping the rings closed with your hand, being careful not to damage the rings. The figure shows the method for fitting the vertical cylinder. The same system applies to the horizontal cylinder.



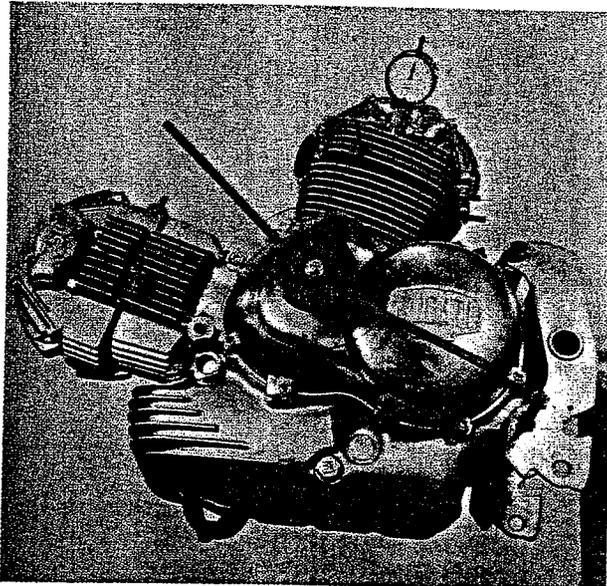
Fitting the rubbers for oil flow in the head

This figure illustrates the method of installing the rubbers in the oil ducts. The smallest is placed in the delivery hole and the others in the recovery holes. It is best to fit new rubbers every time the head is assembled.



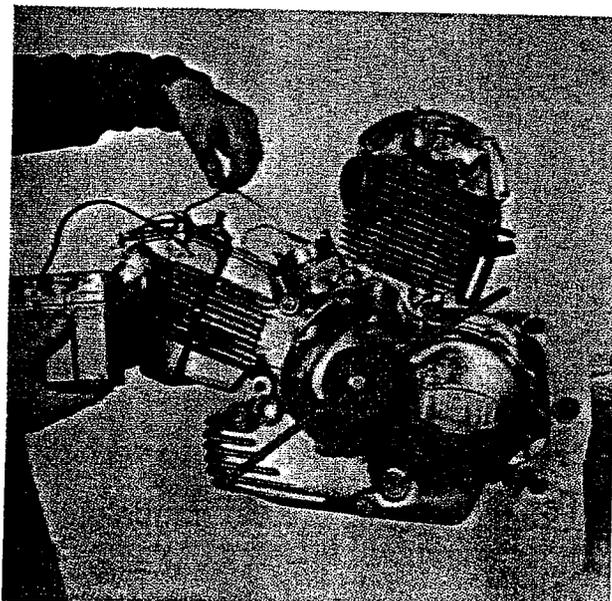
Fitting the heads

First, line up the two reference marks in the bevel gears. Place the head on the four studs and make sure that the engagement in the vertical shaft corresponds with the crankcase. When the studs appear from the upper supporting surface of the nuts, install the washers and tighten the nuts. Then tap the head carefully until it seats properly. Tighten the nuts with a 17 mm polygon wrench. Before the assembly is completed, make sure that there is a Seeger ring near the coupling in the stem of the vertical conical gear.



Checking the ignition timing—750

Find Top Dead Centre of the rear cylinder on the compression stroke. Fit the degree wheel on the crankshaft in zero position. Turn the degree wheel in a clockwise direction until the points are fully open, and set the points gap at .015" or 0.4 mm.

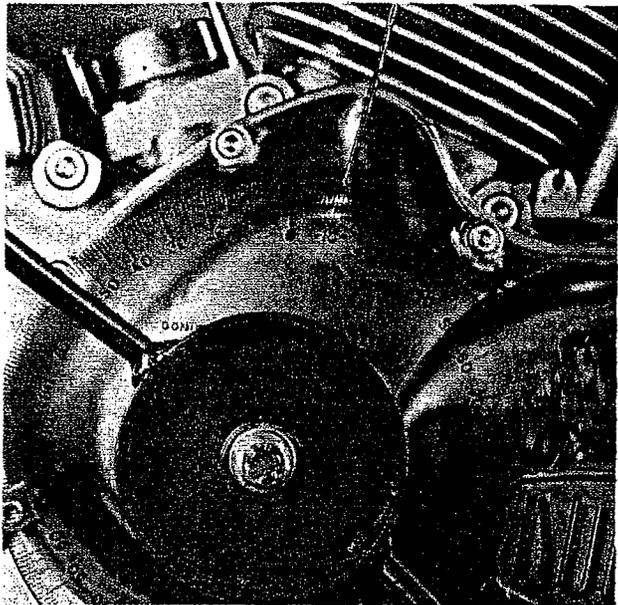


Setting ignition timing by means of a battery and bulb—750

Insert a battery and bulb between the engine and the moveable contact of the vertical cylinder. Rotate the engine in the direction of the movement and set the contact so that it opens exactly 10° before top dead centre. When the contact opens, the bulb will go off, allowing you to check the advance and make any necessary corrections.

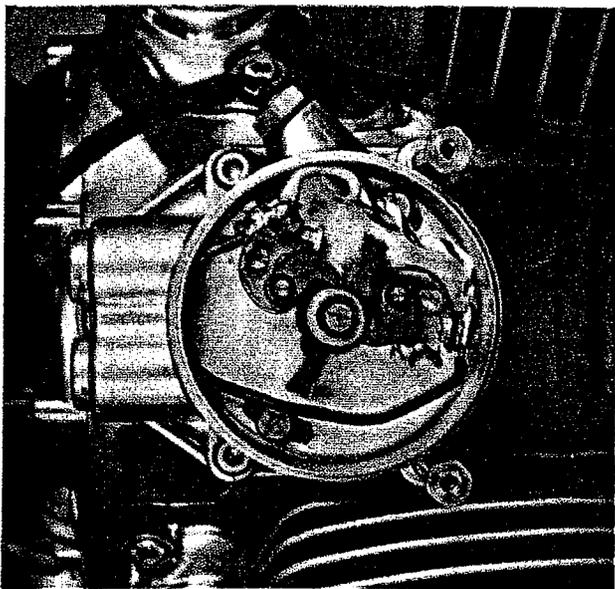
For the other cylinder, follow the same procedure but rotate the engine 270° after top dead centre.

During this entire operation, remember to set the contact gaps at 4 mm.



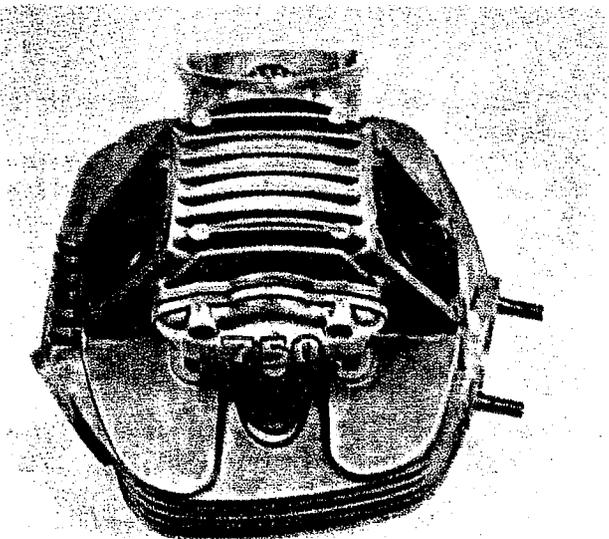
The engine adjusted at 10° advance

This figure shows the dial gauge indicating an exact 10° ignition advance. The automatic advance is 28° and the total advance is 38°.



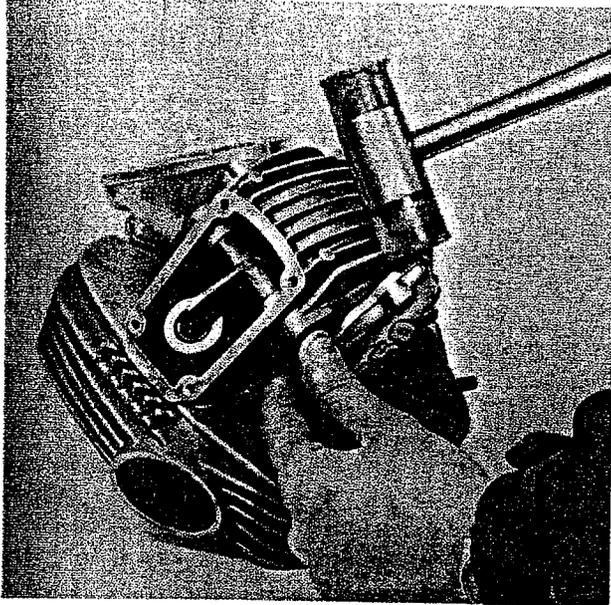
The ignition distributor— 750

This figure shows the distributor plate. The cam with one lobe and the two sets of points can be seen in particular.



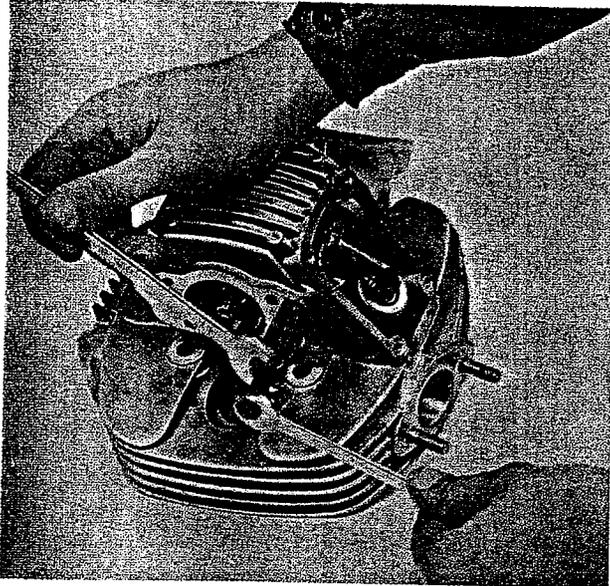
The dismantled cylinder head

This figure shows the vertical cylinder head with the two covers removed.



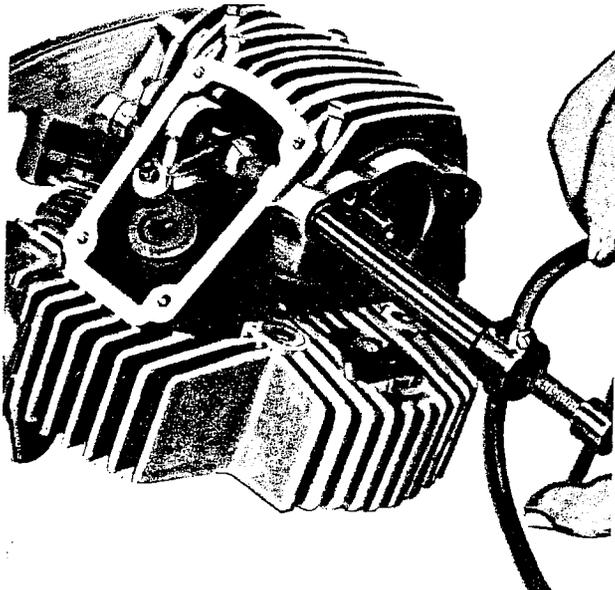
Removing the bearing flange

Remove the four screws and tap the flange with a plastic hammer until it rotates. Then tap until it can be removed as shown in the figure.



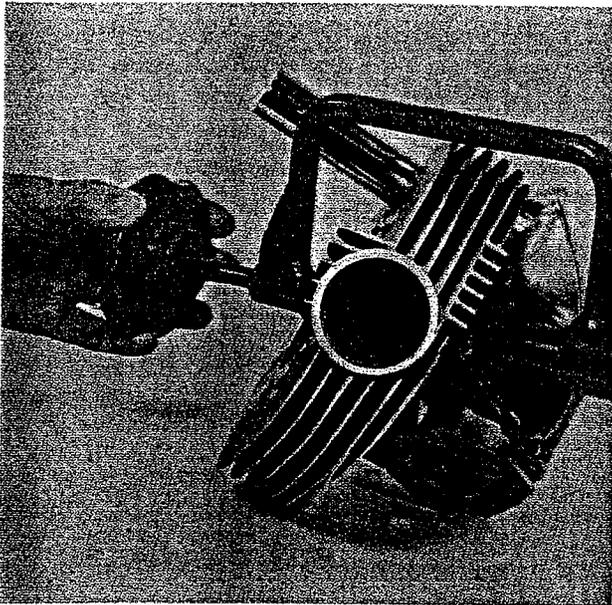
Removing the rocker pin—750

Screw tool # 88713.0260 in the threaded hole of the rocker pin. With an 11mm wrench hold the central screw. With a 17mm wrench, rotate the puller until the pin can be removed from the head.



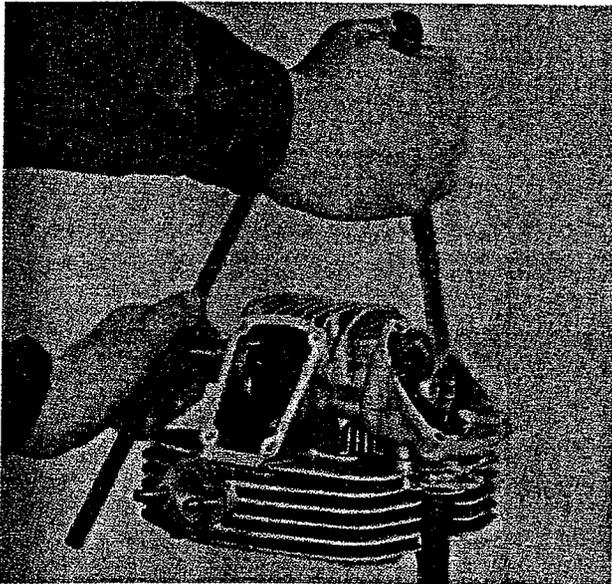
Removing the rocker pin—860

Screw tool # 88713.0120 in the threaded hole of the rocker pin. Rotate the tool as shown in the figure until the pin is removed from the head.



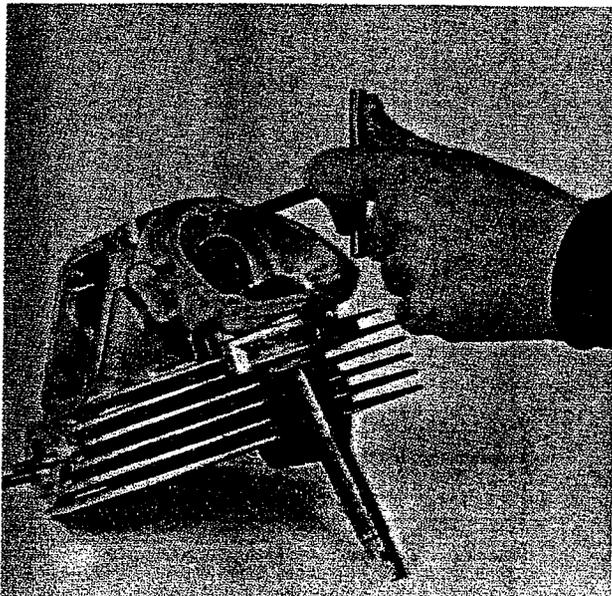
Removing the valves and springs

With tool # 88713.0102 positioned between the valve head and upper plate, remove the two half-cones. Remove the tool and take out the spring and valve from their guide.



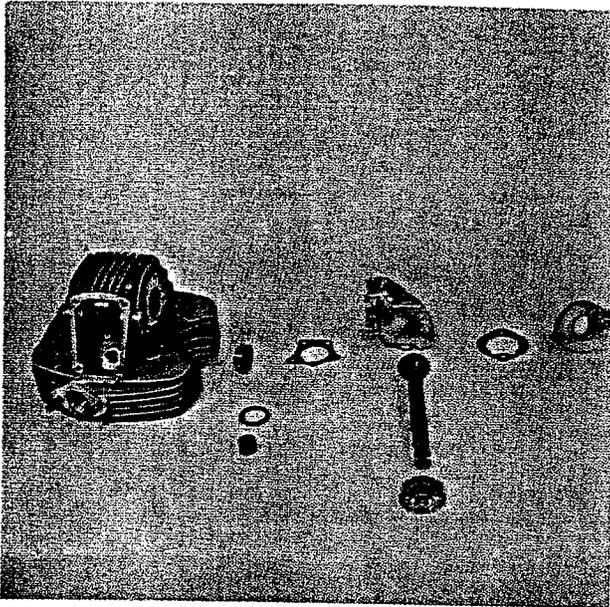
Removing the camshaft

Open the lock washer which holds the hex nut. With tool # 88713.0263 attached to a cam lobe, hold the shaft to prevent it from rotating. Then remove the nut with a 22mm wrench.



Removing the conical gear with the transmission shank

Remove the timing support from the head as shown in the figure. Remove the flange from the support and take out the bearing and conical gear. To remove the same gear from the horizontal cylinder, it is not necessary to remove the timing support.

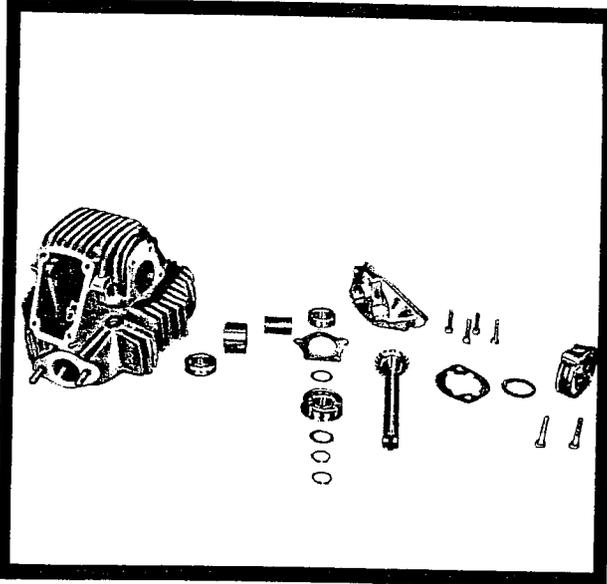


Fitting the head — 750

This figure shows the various components of the head and timing group assembly:

- The bare head.
- The ball bearing.
- The two distance pieces.
- The gasket.
- The timing support, in which the bearing and conical gear with transmission shank must be fitted.
- The gasket.
- The flange.

Before fitting the timing support in the head, the conical gear and appropriate bearing must be fitted.



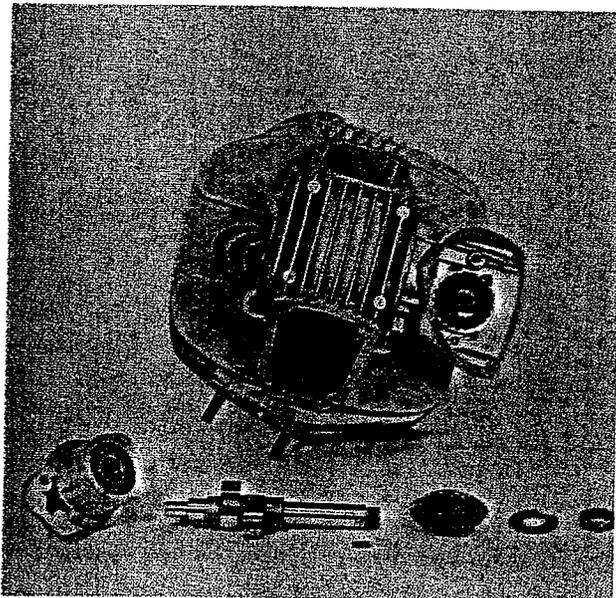
Fitting the head — 860

This figure shows the various components of the head and timing group assembly, in the fitting order:

- The head.
- The ball bearing.
- The two distance pieces
- The timing support, in which the bearings, the gasket, the shim rings and the two seegers must be fitted.
- The conical gear.
- The fixing screws, the flange, the rubber and the gasket.

Important:

Before fitting the timing support in the head, the conical gear and appropriate bearing must be fitted.

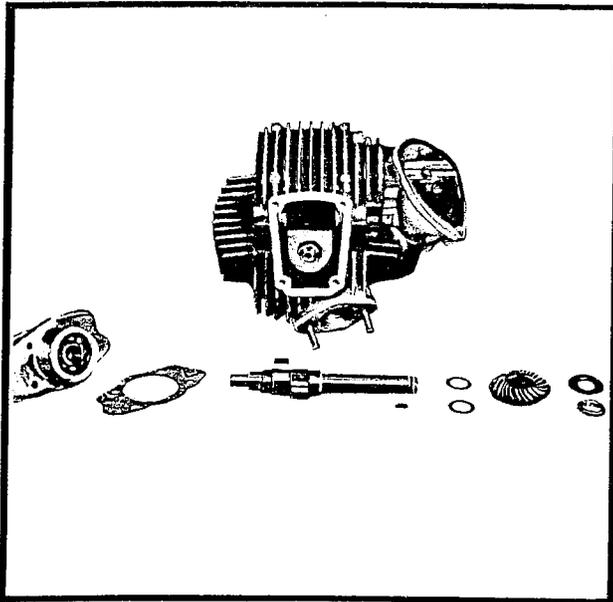


The head and corresponding camshaft group — 750

This figure shows the various components of this assembly, which are fitted in the following order:

- The bearing holding cap.
- The camshaft and key.
- The conical gear.
- The lock washer.
- The fastening nut.

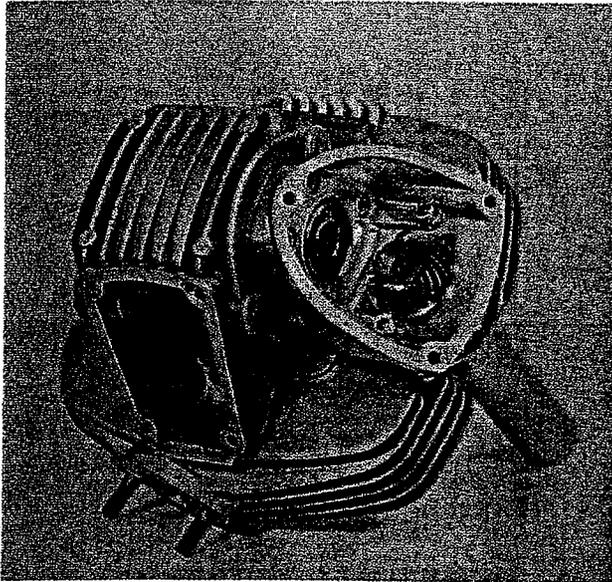
For this assembly, tool # 88713.0263 should be used. Tighten the lock washer after the nut has been fastened.



The head and corresponding camshaft group—860

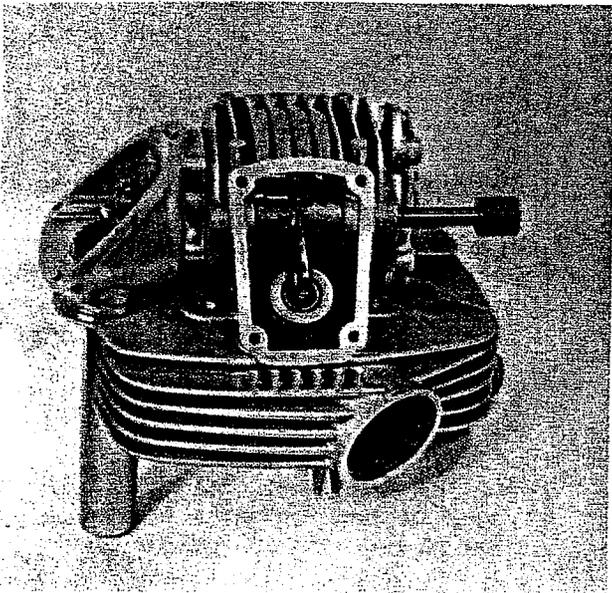
This figure shows the various components of this assembly:

- The bearing holding cap.
- The gasket.
- The camshaft and its key.
- The shim rings
- The conical gear
- The lock washer
- The fastening nut.



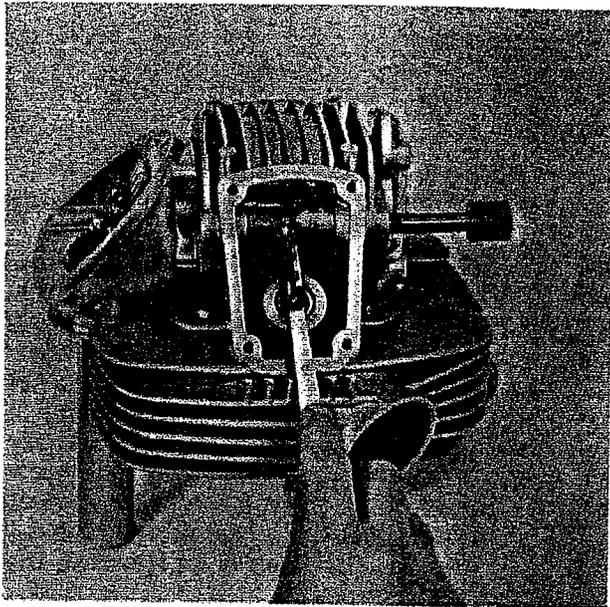
The complete head and timing group

When fitting the flange, make sure to position it in the proper direction, with the fins corresponding to those of the appropriate head.



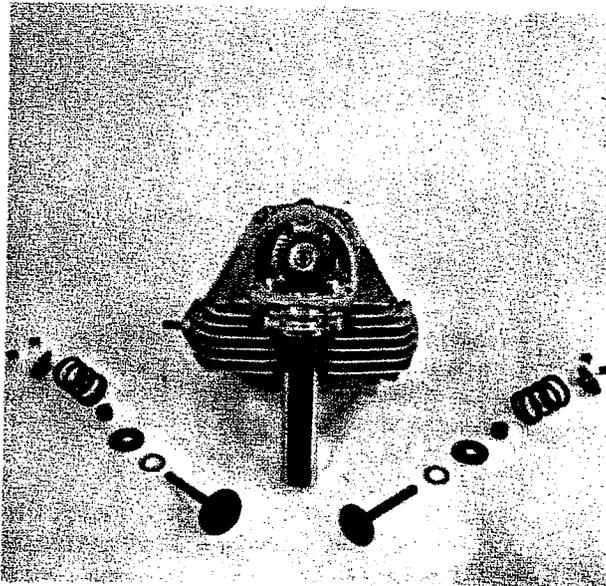
Fitting the rocker

First, fit the adjusting cap on the valve stem. Fit the rocker and appropriate washers, using the special pin tool # 88713.0262 in place of the regular pin. Check the alignment of the rocker slippers on the axis of the valve and cam. If the alignment is not perfect, use the thrust washers to ensure there is no end play in the rocker.



Checking the rocker clearance—750

Before fitting the regular pin, check the play under the rockers with a feeler gauge. The clearance for the inlet valve should be 10mm and 15mm for the exhaust valve. If the clearance is not correct, install the correct size shim to achieve the correct clearance. After this has been done, fit the normal rocker pin.



The head and valve group

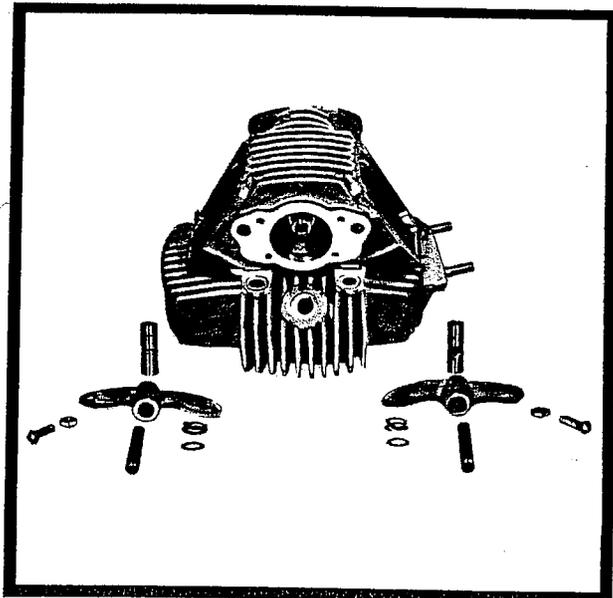
This figure shows the various components of this group, which are fitted in the following order:

- The valve.
- The brass washer.
- The lower plate.
- The oil seal rubber.
- The spring.
- The upper plate.
- The two half-cones.

When assembling this group, special tool # 88713.0102 should be used.

Note

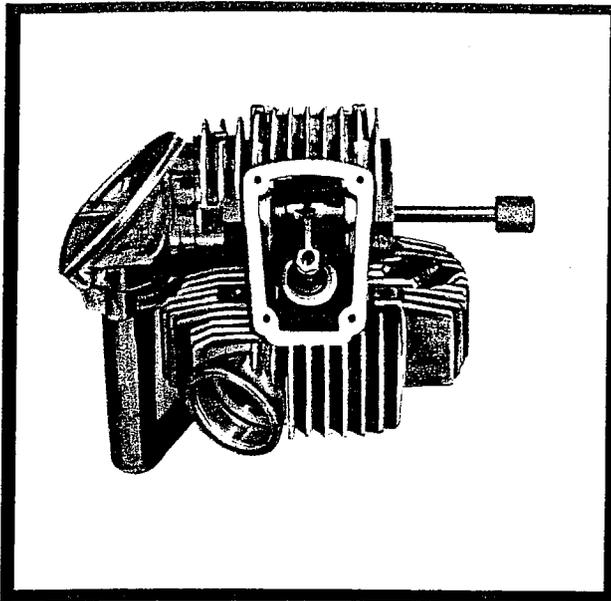
The brass washer has been fitted on the first 50 engines only, i.e. no. 750.001 to 750.050.



The horizontal head and the rocker group — 860

This figure shows the horizontal head with dismantled rockers, bushes, pins, shims and adjusting caps.

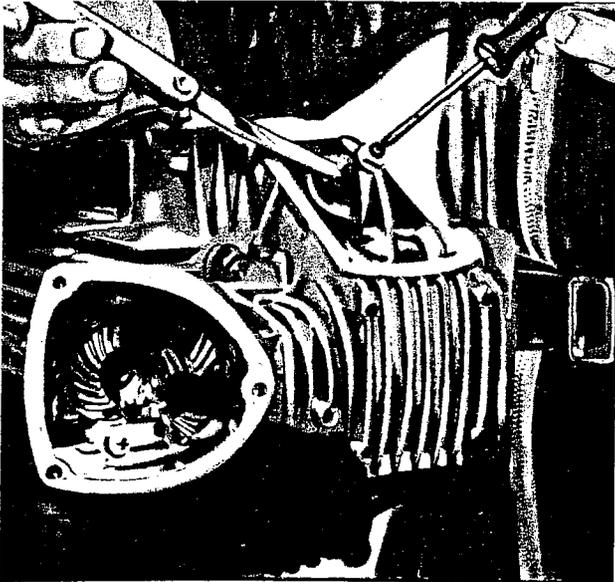
To assemble fit the bushes in the rockers, then check that pins enter without too much end play, then fit the adjusting caps with their counter-nuts.



Fitting the rocker—860

Fitting must be carried out in the following order;

- Fit the rocker using the special pin tool # 88713.0262 in place of the regular pin. Use the thrust washers to ensure there is no end play in the rocker (on both sides).
- Check the alignment of the rocker slippers on the axis of the valve and cam; in case the alignment is not regular, axially move the rocker, positioning the thrust washers differently. At end fitting there must not be any end play in the rocker.
- Remove the special tool and fit the regular pin.

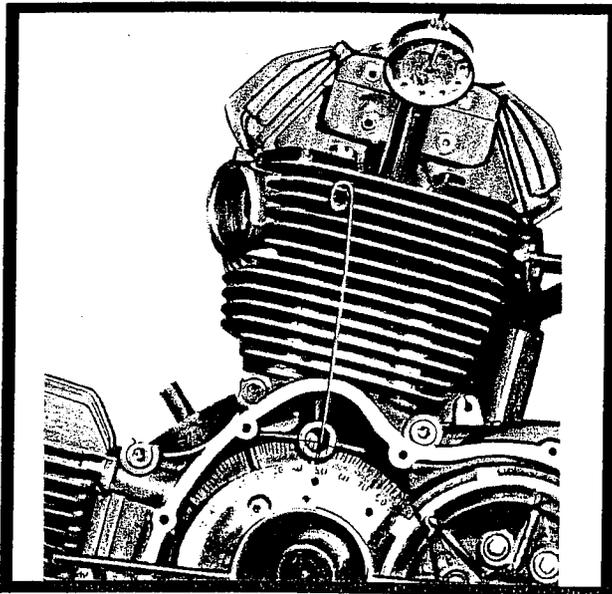


Checking rocker clearance—860

Check the play under the rockers with a feeler gauge, with "cold engine". The clearance must be:

- 0.08mm for the inlet valve
- 0.12mm for the exhaust valve.

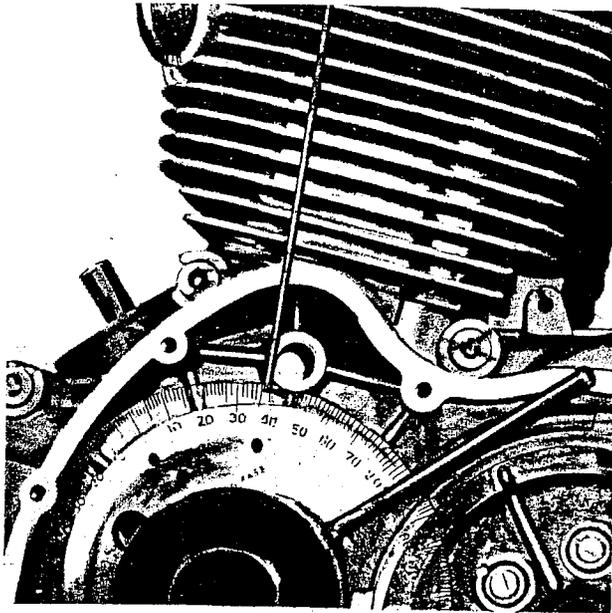
If the clearance is not correct, install the correct size shims using a 12mm wrench and a screwdriver.



Checking the ignition timing and top dead centre—860

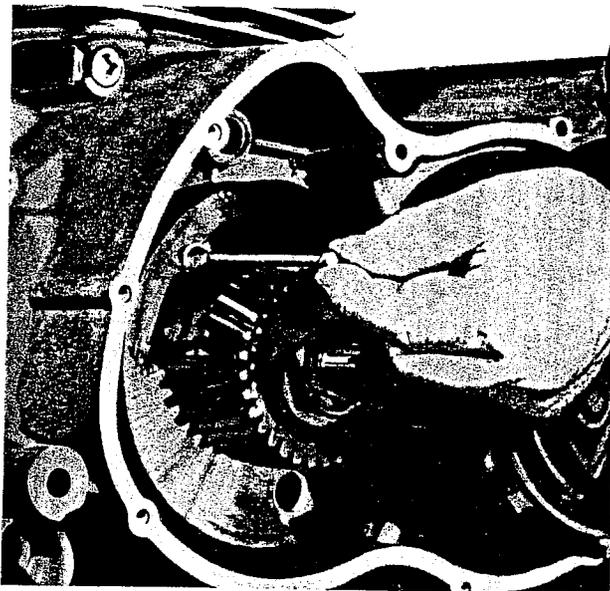
Find Top Dead Centre of the rear cylinder on the compression stroke.

Fit the degree wheel on the crankshaft in zero position (special tool # 88713.0112 and degree wheel no. 98112.0002). Then fix a point as shown in the figure, in zero position when piston reaches the Top Dead Centre.



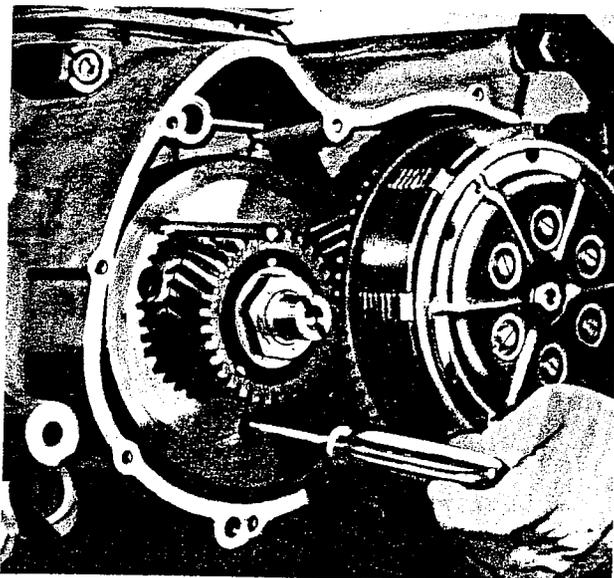
Setting the ignition timing—860

The figure shows the dial gauge indicating 38° advance. To obtain this setting, rotate the engine backwards from the Top Dead Centre position for a quarter turn, then forwards gradually until the wheel indicator shows a reading of exactly 38°.



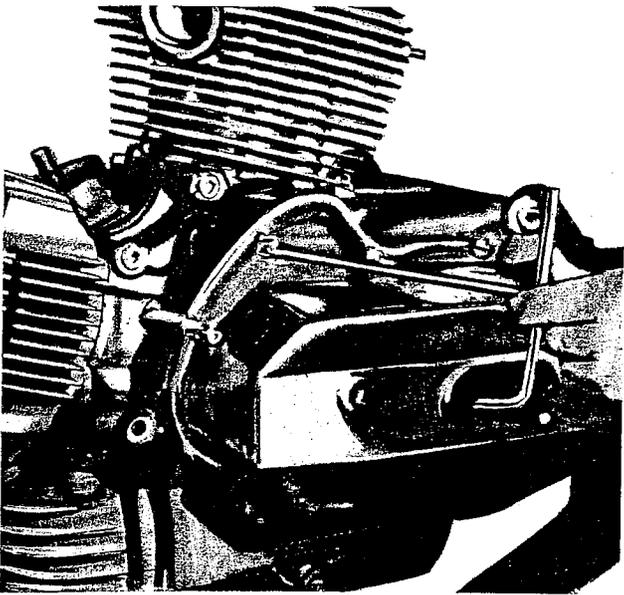
Ignition timing, stator plate orientation—860

Remove the dial gauge, taking care not to turn the engine. Fit the pin # 88713.0119 in the appropriate hole on the generator rotor and turn the stator plate until the pin slips into the corresponding stator plate hole.



Ignition timing, securing the stator plate—860

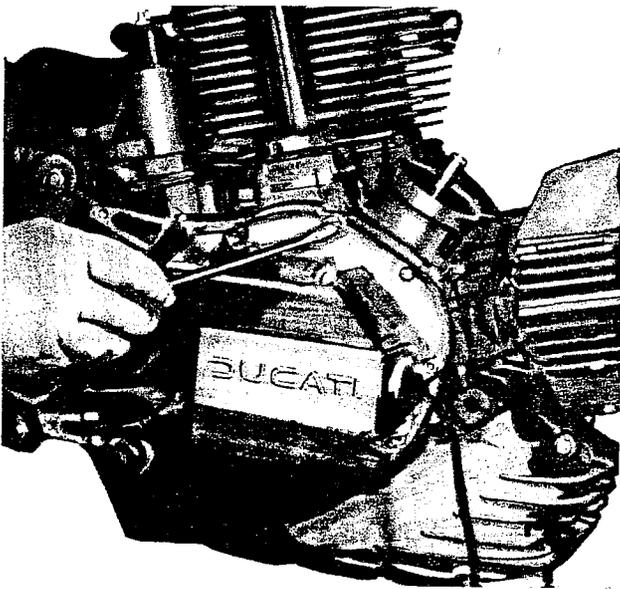
Keeping the pin inserted as in the previous figure, and without turning the engine, gently insert a screwdriver in the three holes and tighten the screws securing the plate to the crankcase. The engine should then be set at exactly 38° ignition advance. For accuracy use the dial gauge again to check. When the engine is re-mounted in the motorcycle it is advisable to check the ignition advance with a stroboscope.



Fitting the clutch side cover—860

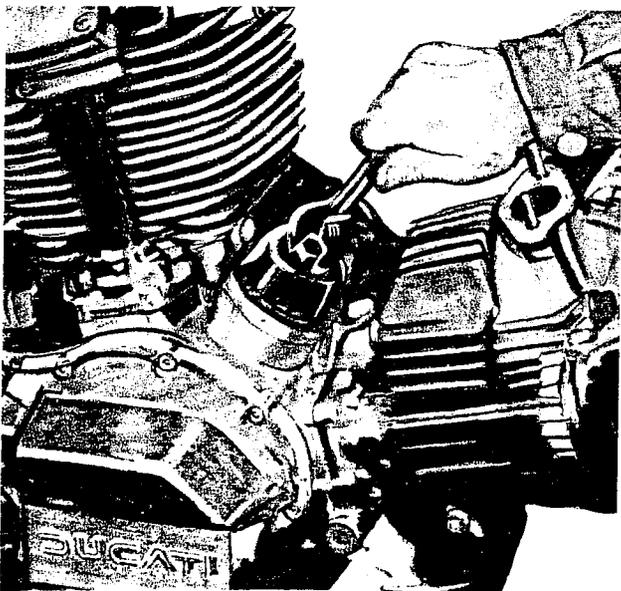
Carefully check the surfaces for dents and gasket residue, which must be removed with a smooth file.

Then fit the new gasket and the cover, tighten the 10 screws using a 5mm hexagonal wrench.



Fitting the distribution side cover—860

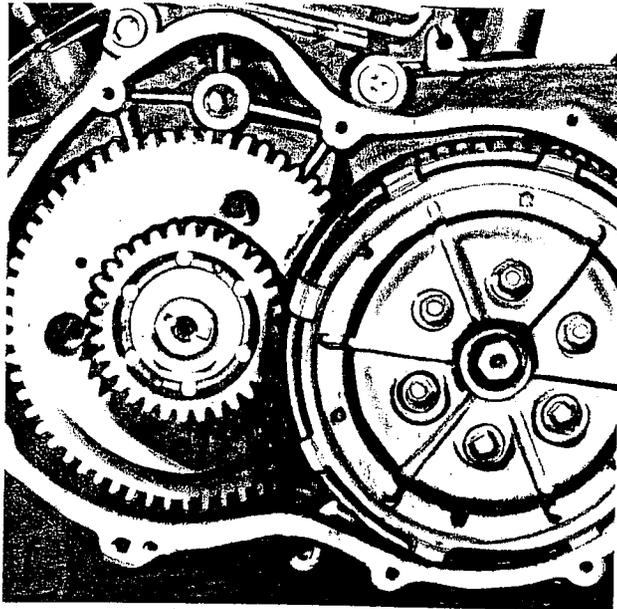
Carefully follow the instructions already given with the previous figure and check that the magnet rotor is clean and without metallic splits. Place the gasket and fit the cover, taking care not to damage the alternator winding. Tighten the 10 screws using a 5mm hexagonal wrench.



Replacing the oil filter cartridge—860

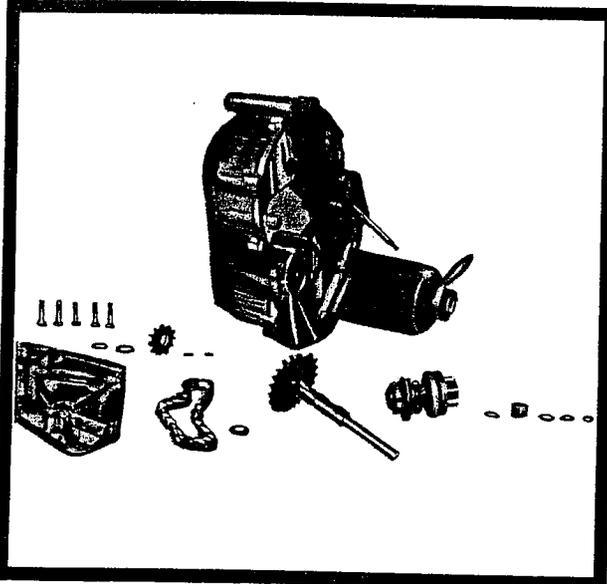
Using a 17mm wrench remove the bolt, the cover and the filter cartridge.

The oil filter cartridge must be replaced after the first 1000 Km; then after 5000 Km and later every two oil changes, viz. at 15000, 25000 etc. Km.



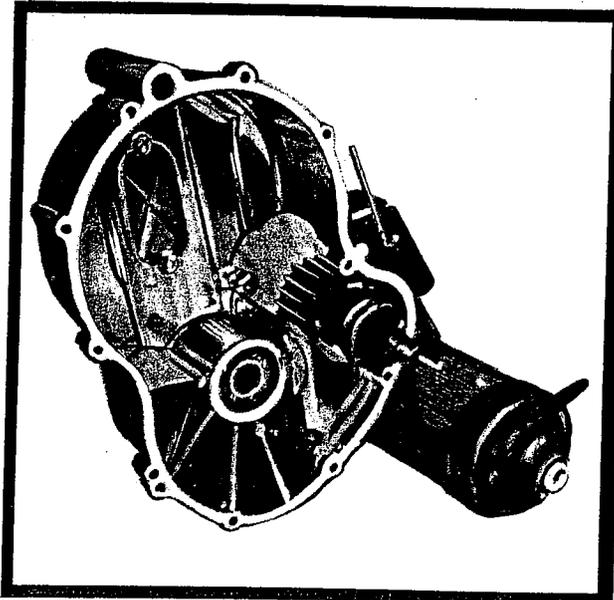
Electric starter — 860

The figure shows the engine with the clutch cover removed and the external teeth of the electronic ignition rotor visible.



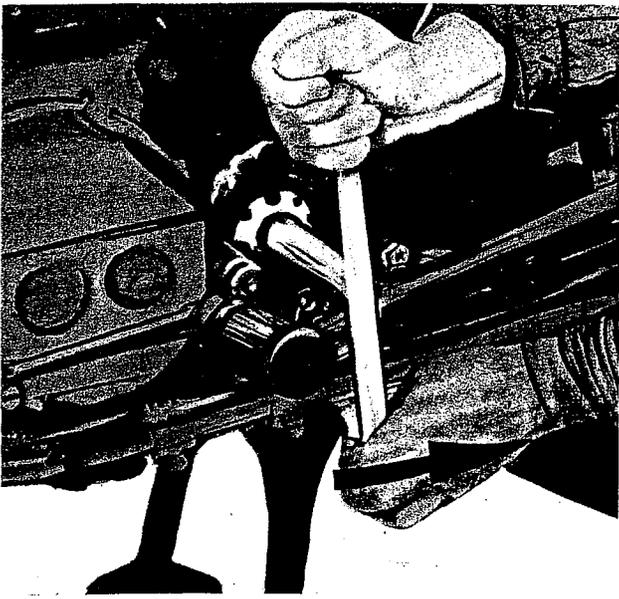
Electric starter — 860

The figure shows the components of the electric starter group, fully dismantled. From the left these are: the cover, two gears with their chain, the starter motor crankcase, the float gear, etc.



Electric starter — 860

The figure shows the crankcase with the shaft, its chain-driven gear and the float gear.



Chain adjustment

With a special wrench # 88713.0115 inserted in the pin as shown in the figure, rotate the eccentric to get the right adjustment of the chain.

With a 13mm wrench tighten the above two bolts. Then refit the two plastic caps.

The chain must have 15-20 mm play with the motorcycle on the ground and the driver on the rear part of the saddle.

To adjust the chain it is necessary to follow the preliminary instructions hereunder:

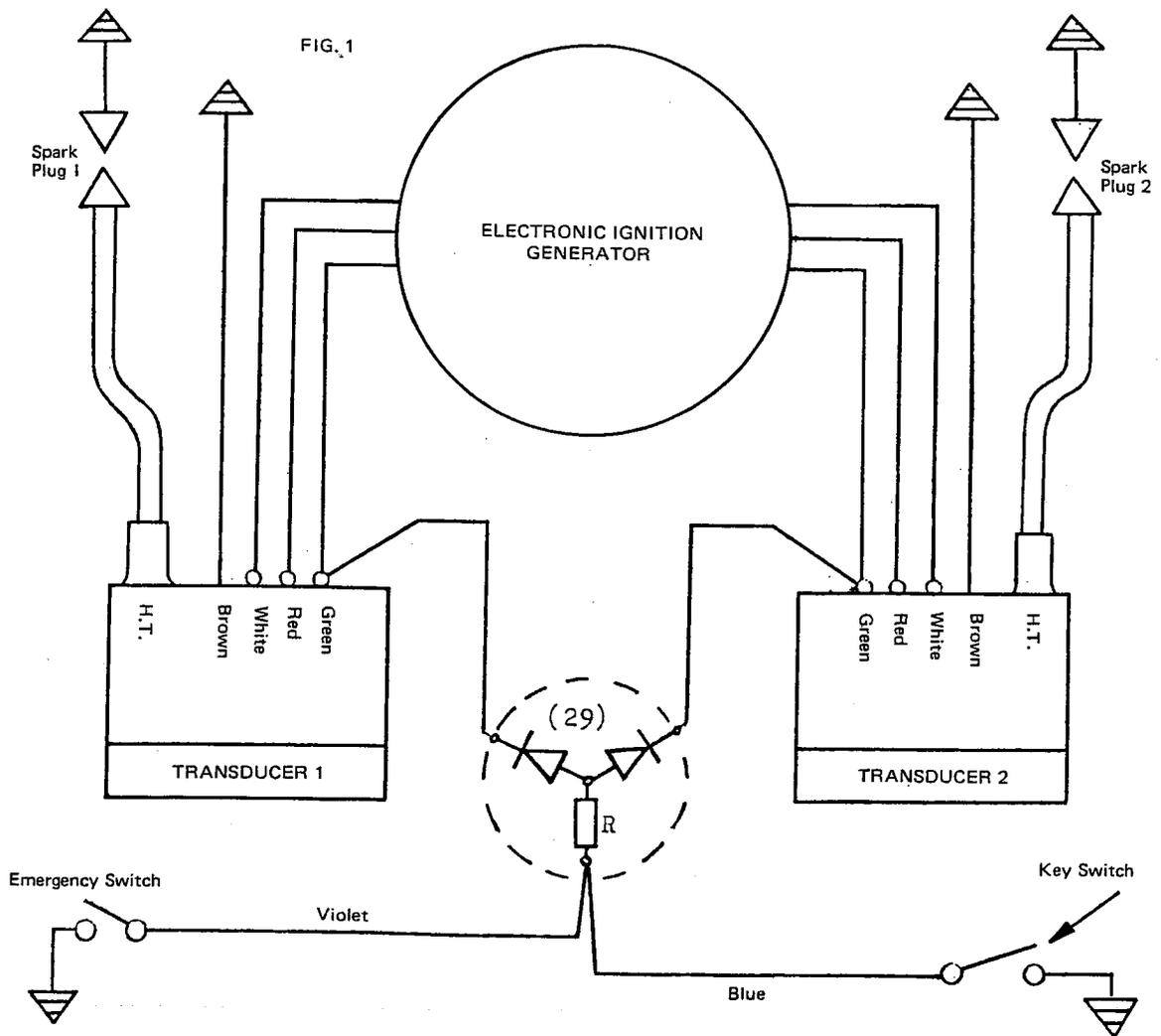
- Remove the two plastic caps of the fork spindle.
- With a 13 mm wrench undo the bolts on both sides of the motorcycle, as per the figure.

DUCATI 860 MOTORCYCLE ELECTRONIC IGNITION

1 GENERAL SPECIFICATIONS

The system consists of:

- GENERATOR — having permanent magnets, with the stator fixed to the crankcase and the rotor mounted on the crankshaft. Two three-core cables leave the stator and run to the transducers. **The red cable must be connected to the transducer serving the vertical cylinder.**
- TRANSDUCERS — Two high tension coils, connected to the spark plugs. The three wires from the generator are coloured white, red and green, as in Figure 1. The brown cable is earthed.



2 OPERATION

Ignition is by capacitor discharge. The current from the generator is fed through a capacitor which discharges through a static element controlled by the generator on the transducer's primary circuit.

The secondary circuit produces a high tension voltage which is fed to the spark plugs.

The transducer connected to the red cable (vertical head) produces a fully advanced spark as the rotor hole and corresponding stator plate hole coincide.

After a 270° clockwise rotation (looking at the generator) high tension current is produced in the transducer serving the horizontal cylinder. At engine speeds lower than 1,700 r.p.m. ± 300 , the high tension impulse produced by both transducers is retarded by 28°. The total advance available in the range 1,400 to 2,000 r.p.m. being $28^\circ \pm 2^\circ$.

To stop the engine it is necessary to ground the two transducers, either at the emergency switch on the right handle bar or by using the ignition key. The two transducer leads are linked to the one emergency switch lead through a device located inside the headlamp assembly, and consisting of a diode and two resistors. The stator plate is a single unit which includes two feeding coils, one for each cylinder, providing the current to charge the two capacitors, and two magnetic pick ups one for each cylinder, controlling the timing of the capacitor discharge. Each of these pick ups consists of two coils, positioned at a phase angle appropriate to the ignition timing for each cylinder.

The rotor is also a single unit fitting on to the crankshaft inside the permanent inductor magnets.

The high tension transducer includes the high tension coil and electronic components. The three connectors run to the generator and to earth, the earth wire being brown, the high tension outlet has a screw clip which connects on to the spark plug cable.

3 STATIONARY OR BENCH TESTING

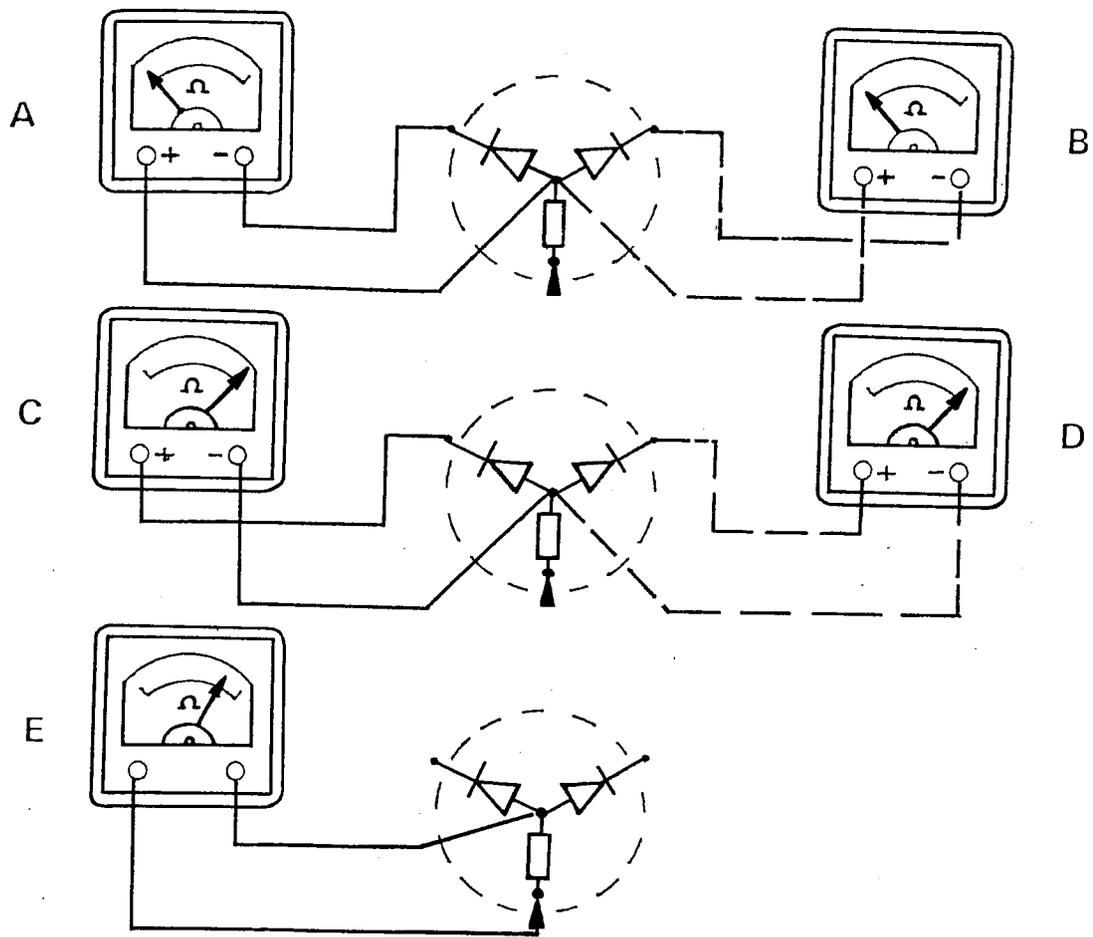
To check the system without using instruments simply ensure that the wiring and connections are in good order and replace any obviously worn or faulty parts. Thorough testing, however, does require the use of the following:

- a) Meter: to check the resistance.
- b) Stroboscope: pistol type for attachment to the spark plug leads.
- c) Test bench: to check the system dismantled from the motor cycle, and providing the following facilities:
 - Speed range: 0 to 8,000 r.p.m.
 - Speed indicator: to show r.p.m.
 - Three point spark gap: to check ignition phasing.
 - High tension peak voltmeter: to measure the H.T. voltage unloaded (range 1—4,000V).
 - Oscilloscope with H.T. cord (50KV): to check low tension and high tension values and wave shape regularity—green, red and white cables.

DEFECT: Engine will not start (plugs not sparking).

- a) Check transducer and generator connections.
- b) Check the operation of the two ignition switches (key and emergency); they may be faulty or damp, earthing the diodes of the linking device in the headlight assembly.
- c) Check whether the diodes mentioned above are shorted out using an Ohmmeter as shown in Figure 2.

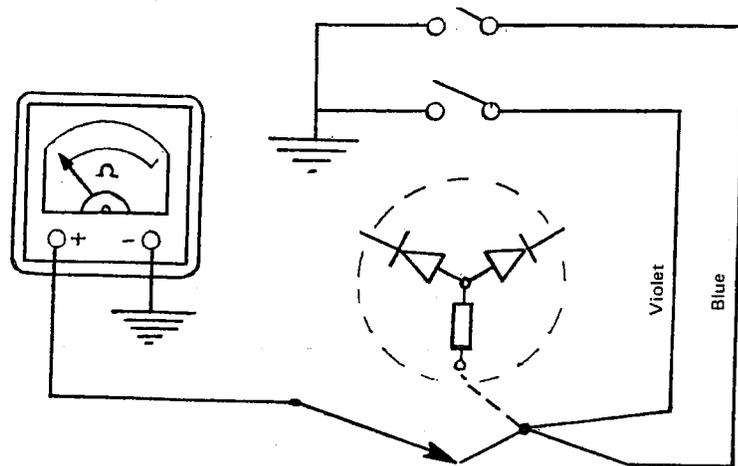
FIG. 2



- A The ohmmeter must indicate insulation.
- B The ohmmeter must indicate insulation.
- C The ohmmeter must indicate continuity.
- D The ohmmeter must indicate continuity.
- E The ohmmeter must indicate a resistance value of 150 Ω

If the linking device is shown to be functioning properly, all the circuit wiring must be carefully checked, especially the violet and blue cables connecting the device to the engine stop switches. To carry out this check, disconnect the clip attaching the cables to the device, and with both ignition control switches in the 'run' position, test between the clip and 'earth'. The instrument should indicate 'Insulation' (figure 3).

FIG. 3



Very rarely indeed could both transducers or both stator plate circuits be defective and this unlikely occurrence is not covered here.

DEFECT: Only one cylinder fires (no spark in one plug).

- a) Check the connection to the transducer of the cylinder not firing.
 - b) Disconnect the green cable between the transducer and linking device; if the engine then runs evenly the defect is in the device or cable.
 - c) If possible, substitute the transducer of the faulty cylinder with a replacement or test the transducer with a special instrument.
 - c) If none of the above tests reveals the fault the defect must be in the stator plate, in this case carry out the following tests:
 - i) disconnect the generator cable from appropriate transducer.
 - ii) Connect one Ohmmeter terminal to earth and the second to three cables successively: white, red and green. There should be perfect insulation (figure 4A).
 - iii) Connect the Ohmmeter terminals between the green and white cables. A reading of 285 Ohm resistance $\pm 10\%$ should be obtained (figure 4B).
 - iv) Connect the Ohmmeter terminals between the green and red cables. A reading of 1,000 Ohm resistance $\pm 30\%$ should be obtained (figure 4C).
- IMPORTANT:** During this test the Ohmmeter should be in the range 'X100'. With reversed terminals you can check insulation.

FIG. 4-A

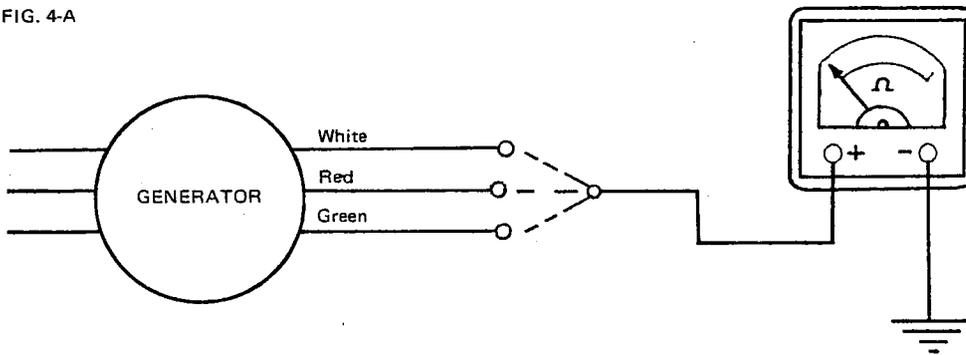


FIG. 4-B

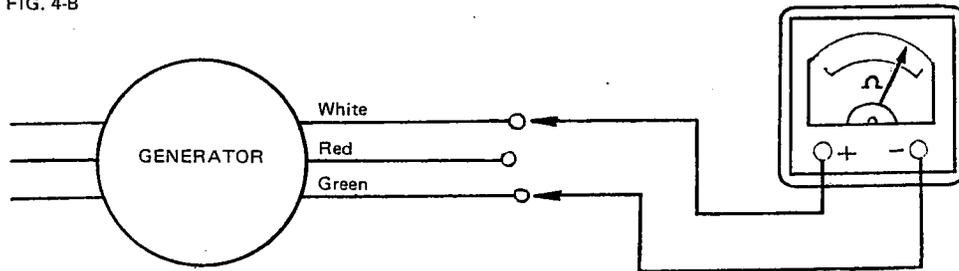
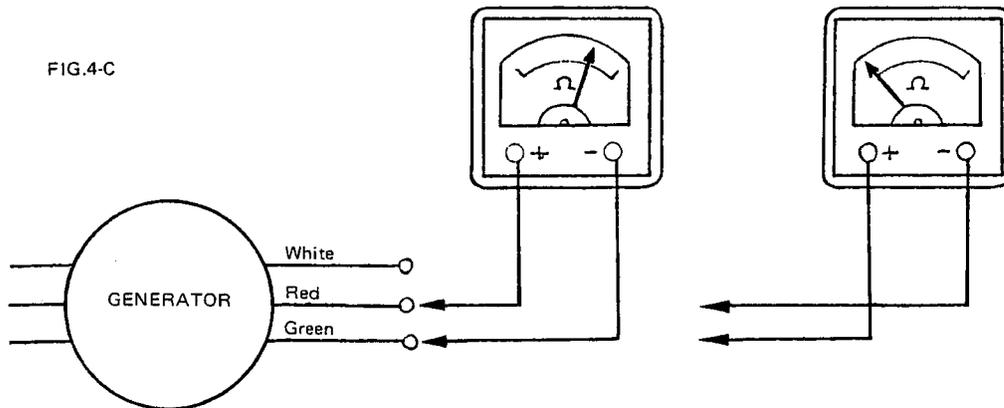


FIG. 4-C



If the values shown on the instrument correspond to those stated, check that the cables leaving the plate are not crushed inside the engine and short-circuiting or earthing.

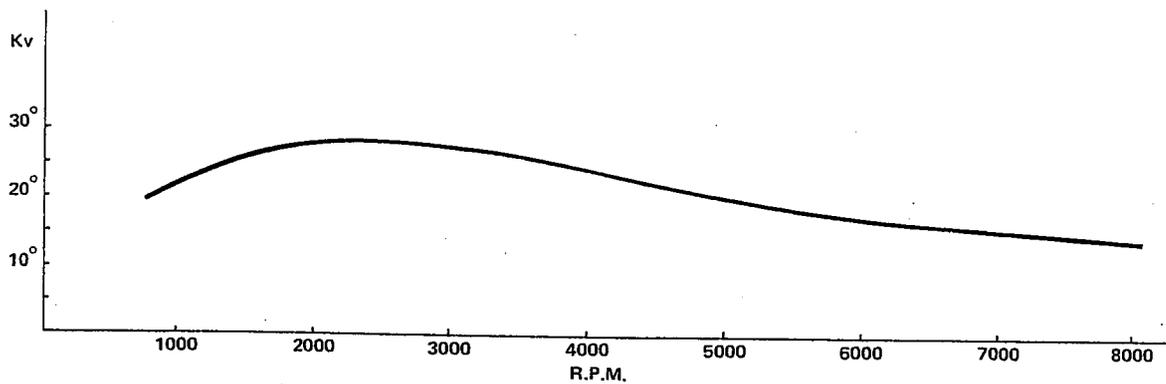
IMPORTANT

If none of the above tests have revealed the fault, replace the stator plate.

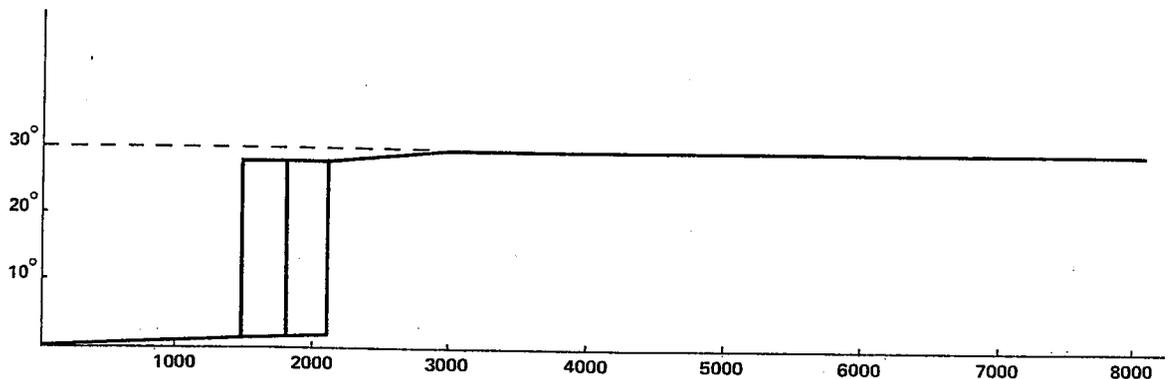
Stroboscopic light test: With a stroboscopic light pistol it is possible to test whether sparking does occur or not and also to check the ignition advance as described on page 7.

Bench test: On a test bench the system can be tested more conveniently and wiring and connections checked.

Performance curves:



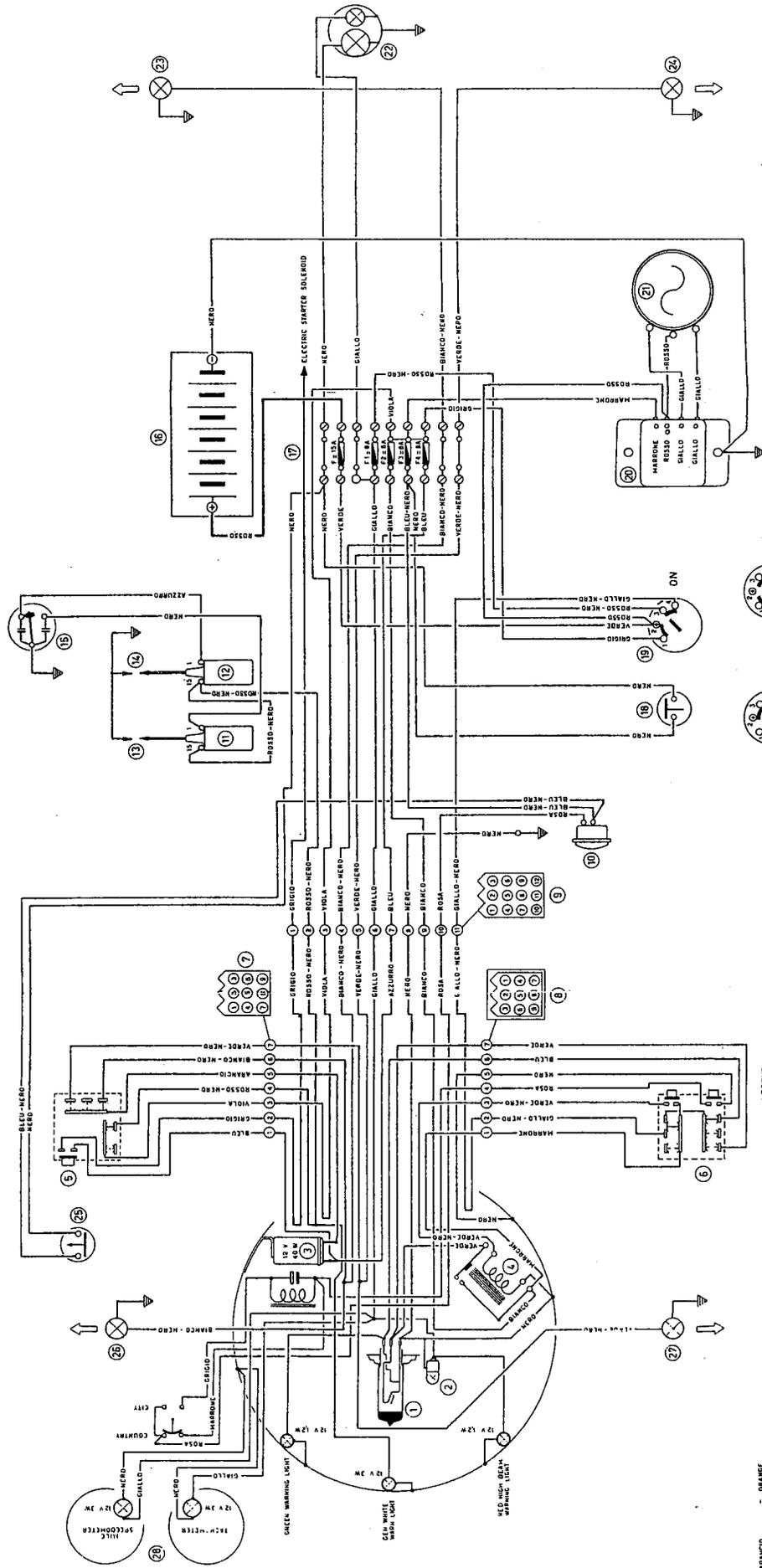
SPARKING POWER



FIXED AND AUTOMATIC ADVANCE

NOTES

DUCATI 750 SPORT

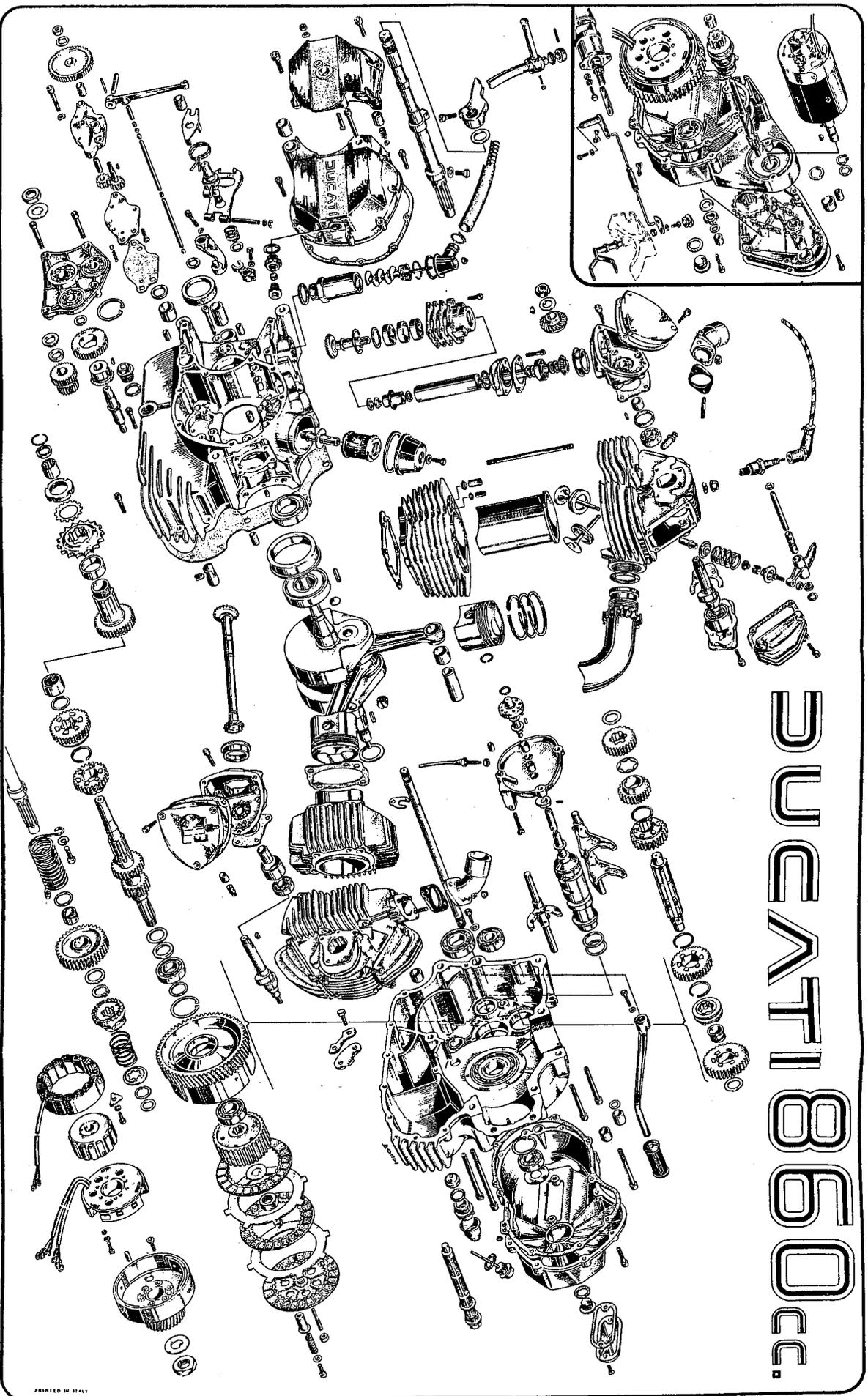


LEGEND

1	12V 35W HEAD LAMP	131	POWER DISTRIBUTOR
2	12V 35W SIDE LAMP	132	2000 RPM REAR LIGHT/STOP PLATE
3	12V 35W STOP LAMP	133	2000 RPM REAR FLASHER
4	12V 35W TURN SIGNAL LAMP	134	2000 RPM FRONT FLASHER
5	12V 35W HORN	135	2000 RPM FRONT STOP PLATE
6	12V 35W ELECTRIC STARTER	136	2000 RPM FRONT FLASHER
7	IGNITION SWITCH	137	2000 RPM FRONT STOP PLATE
8	SAFETY LOCK SWITCH	138	DUAL LIGHTS
9	ELECTRONIC REGULATOR		
10	2000 RPM REAR LIGHT/STOP PLATE		
11	2000 RPM REAR FLASHER		
12	2000 RPM FRONT FLASHER		
13	2000 RPM FRONT STOP PLATE		
14	2000 RPM FRONT FLASHER		
15	2000 RPM FRONT STOP PLATE		
16	BATTERY		
17	ELECTRIC STARTER SOLENOID		
18	IGNITION SWITCH		
19	SAFETY LOCK SWITCH		
20	ELECTRONIC REGULATOR		
21	2000 RPM REAR LIGHT/STOP PLATE		
22	2000 RPM REAR FLASHER		
23	2000 RPM FRONT FLASHER		
24	2000 RPM FRONT STOP PLATE		
25	2000 RPM FRONT FLASHER		
26	2000 RPM FRONT STOP PLATE		
27	DUAL LIGHTS		

ARANCIO	ORANGE
AZZURRO	BLUE
BIANCO-ROSSO	WHITE-RED
BIANCO-NERO	WHITE-BLACK
BLU	BLUE
BLU-NERO	BLUE-BLACK
GRIGIO	GRAY
GIALLO-NERO	YELLOW-BLACK
GIALLO-VERDE	YELLOW-GREEN
NERO	BLACK
ROSSO	RED
ROSSO-NERO	RED-BLACK
VERDE	GREEN
VERDE-NERO	GREEN-BLACK
VIOLA	VIOLET

MUCATI 1850 cc.



IL MOTORE SCOMPOSTO

EXPLODED VIEW OF THE ENGINE

VUE ECLATEE DU MOTEUR

MUCATI S. P. A. -
FABBRICAZIONE E COMMERCIALIZAZIONE DI
MOTOCICLISTI E ACCESSORI - VIA S. PIETRO, 10 - 20121 MILANO - ITALIA