



**MOTO GUZZI**

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**850** **Le Mans**

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**OWNER'S MANUAL**



*Dear rider,*

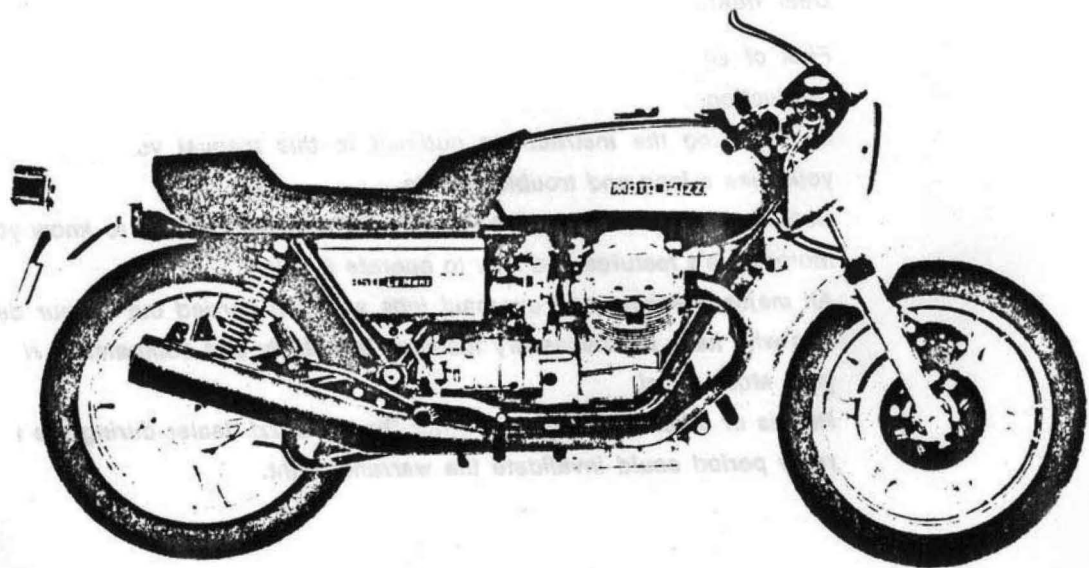
*First of all we wish to thank you for choosing this motorcycle of our production.*

*By following the instructions outlined in this manual you will ensure your bike a long and troublefree life.*

*Before riding, please read thoroughly this manual in order to know your motorcycle's features and how to operate it safely.*

*All major checking and overhaul jobs are best carried out by our dealers who have the necessary facilities to quickly and competently repair your Moto Guzzi.*

*Repairs or adjustments by any other than a Guzzi dealer during the warranty period could invalidate the warranty right.*



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## 4 MAIN FEATURES

<b>Engine</b>	2-cylinder 4-stroke Cylinder disposition «V» 90° Bore mm 83 Stroke mm 78 Displacement cc 844 Compression ratio 10,2 Output HP 80 SAE at 7.300 r.p.m.
<b>Valve gear</b>	O.H.V. push rod operated.
<b>Carburetion</b>	2 Dell'Orto carburettors type PHF 36 B (D) (right), PHF 36 B (S) (left).
<b>Lubrication</b>	Pressure, by gear pump. Normal lubrication pressure $3,8 \div 4,2$ Kp/cm <sup>2</sup> (controlled by relief-valve). Electrically controlled oil pressure gauge. Wire gauze and cartridge oil filters.
<b>Generator</b>	Front (14 V - 20 A) on the crankshaft.
<b>Ignition</b>	By battery, with double contact breaker and automatic advance.

**Ignition data:**

Initial advance (fixed) 8°

Automatic advance 26°

Full advance 34°

2 Ignition coils, on the left side of frame

**Starting**

Electric starter with electromagnetic ratchet control. Ring gear bolted on flywheel.

Starter button, (START) right on the handlebar.

**Transmission****Clutch**

Dry type, multiplates, flywheel driven. Lever controlled from handlebar (left).

**Primary drive**

via the gearbox.

Ratio: 1 : 1,235 (Z = 17/21).

**Gear box**

Five speeds, frontal engagement, constant mesh gears. Cush drive incorporated.

Pedal controlled from left side of the motorcycle

Ratio:

low gear 1 : 2 (Z = 14/28)

2nd gear 1 : 1,388 (Z = 18/25)

3rd gear 1 : 1,047 (Z = 21/22)

4th. gear 1 : 0,869 (Z = 23/20)

top gear 1 : 0,750 (Z = 28/21)

<b>Secondary drive</b>	cardan shaft (bevel gear set). Ratio: 1 : 4,714 ( $Z = 7/33$ ). Overall gear ratio (engine/wheel): low gear 1 : 11,643 2nd gear 1 : 8,080 3rd. gear 1 : 6,095 4th gear 1 : 5,059 top gear 1 : 4,366
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## Cycle

<b>Frame</b>	Duplex cradle, tubular structure.
<b>Suspension</b>	Telescopic front fork incorporating sealed hydraulic dampers. Rear swinging fork with externally adjustable springs.
<b>Wheels</b>	In light alloy, with rims, WM 3/2,15-8 front and rear.
<b>Tires</b>	Front 3,50 H - 18" or 100/90 H - 18" Rear 4,00 H - 18" or 110/90 H - 18" or 4,10 V - 18"



**Brakes****Front:**

Hydraulic disc brake, twin braking cylinder caliper. Hand lever controlled from the handlebar (R/H). Hydraulic transmission, free from rear braking system.

Disc  $\varnothing$  300 mm

Braking cylinder  $\varnothing$  38 mm

Master cylinder  $\varnothing$  12,7 mm

**Rear:**

Hydraulic disc brake, twin braking cylinder caliper. Pedal lever controlled from the motorcycle (R/H).

Disc  $\varnothing$  242 mm

Braking cylinder  $\varnothing$  38 mm

Master cylinder  $\varnothing$  15,875 mm

**Hydraulic transmission:**

The rear brake is bound by a hydraulic transmission to a twin front brake featured and dimensioned like the hand controlled front brake.

**Dimensions and weights**

Wheelbase m 1,470

Max. width m 2,190

Max. length m 0,720

Max. height	m	1,030
Min. ground clearance	m	0,150
Dry Weight	kg	198

## Performances

Maximum speed,  
solo riding: 210 km/h.  
Fuel consumption: lt 8 x 100 km.

## Fuel and oil capacities

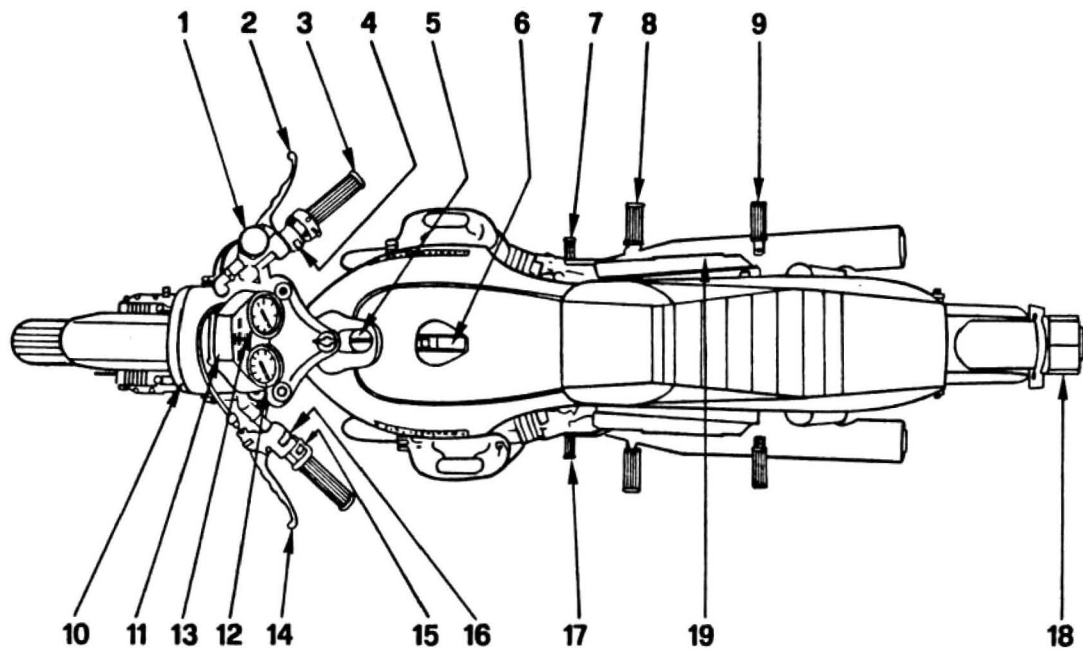
<b>Group or part</b>	<b>Quantities lt</b>	<b>Recommendation</b>
Fuel tank (Reserve 3 lt):	22,5	Petrol 98/100 NO-RM
Sump:	3	Agip SINT 2000 SAE 10 W/50
Gearbox:	0,750	Agip F. 1 Rotra MP SAE 90
Rear drive box: (bevel set lubrication)	} 0,230 { 0,020	Agip F. 1 Rotra MP SAE 90 Molyklote type A
Front fork (p. leg):	0,120	Agip F. 1 ATF Dexron
Front and rear brakes:		Agip F. 1 Brake fluid

## 10 CONTROLS AND ACCESSORIES

(fig. 2)

- |    |   |    |  |
|----|---|----|--|
| 1  | Master cylinder (front right brake)             | 12 | Km or mile counter   |
| 2  | Control lever (front right brake)               | 13 | Rev. counter   |
| 3  | Throttle control grip                           | 14 | Clutch control lever                                       |
| 4  | Engine starting and emergency stopping button   | 15 | Buttons controlling: horn, flashing light and turn signals |
| 5  | Key switch                                      | 16 | Lighting switch  |
| 6  | Fuel tank filler cap                            | 17 | Gear change control lever                                  |
| 7  | Brake control pedal (front left and rear brake) | 18 | Tail light   |
| 8  | Foot-rest, front                                | 19 | Master cylinder (left front and rear brake)                |
| 9  | Foot-rest, rear                                 |    |  |
| 10 | Headlight                                       |    |  |
| 11 | Instrument panel                                |    |  |

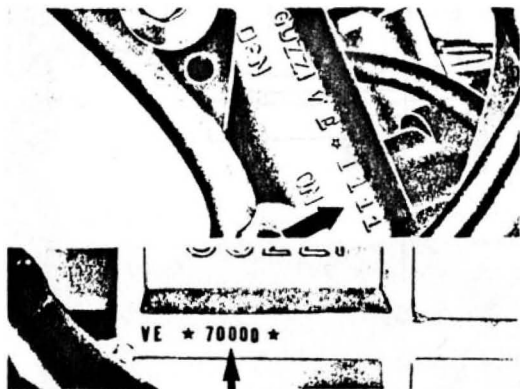
*Right and left hand as seen in riding position.*



## 12 IDENTIFICATION DATA

Every motorcycle is identified by a serial number which is stamped on the frame downtube and on the crankcase.

The number on the frame downtube appears also in the certificate of conformity and is valid to legal effects for the identification of the motorcycle.



## Spare parts

In case of parts replacement, make it sure that «Original Moto Guzzi Spare Parts» only are used. The use of non-genuine parts invalidates the warranty right.

## WARRANTY

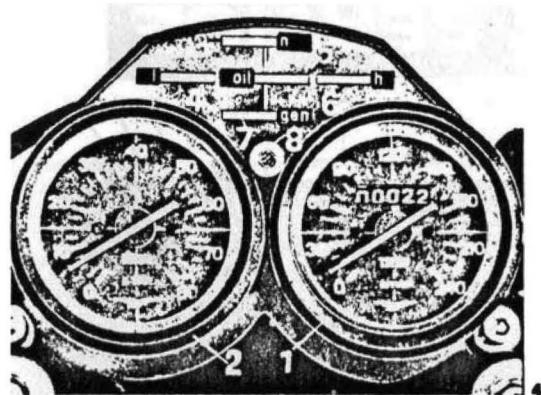
The warranty is valid for a period of 6 months with a limitation to 10000 km from the selling date and expires in case of modifications to the motorcycle or participation to racing competitions.

Tyres as well as parts or accessories which are not manufactured in the «Seimm - Moto Guzzi Factories» are out of warranty.

Each new motorcycle is supplied with a «coupon-book». It has to be carefully kept with all other circulation papers as this is the only document entitling the owner of the motorcycle to be recognized of the warranty right from «Seimm Moto Guzzi» according the general sale conditions.

### Instrument panel (fig. 4)

- 1 Km counter.
- 2 Rev.-counter.
- 3 Orange neutral indicator. It lights when the gearbox is in neutral position.
- 4 Green light indicating parking light on.



5 Red warning light. Oil pressure gauge. It goes out when the pressure is sufficient for normal engine lubrication. Should it not go out, the pressure is not correct; in this case the engine has to be stopped and suitable checkings are to be carried out.

6 High beam warning light, blue.

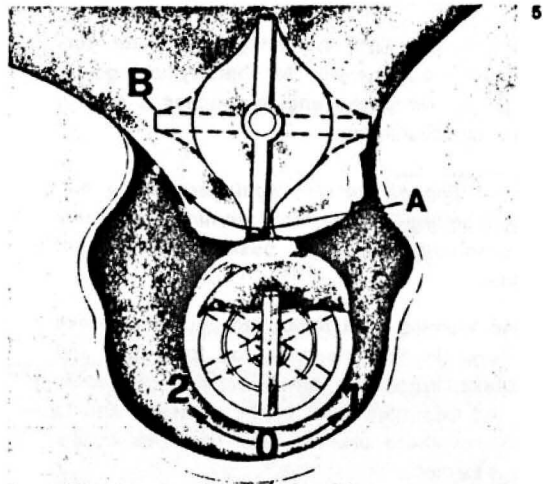
7 Red warning light indicating insufficient current from the generator for battery charge. It must go out when the engine reaches a certain number of revolutions.

*By day riding all warning lights are to be out. By night riding the parking warning light only and eventually the high beam warning light are on.*

8. Red warning light indicating uncorrect brake fluid level in the reservoir for front left and rear brake. When this light is lit, it is necessary to top at maximum level in the reservoir and to check that there are no fluid leakages in the braking circuit.

## 14 Steering damper control (fig. 5)

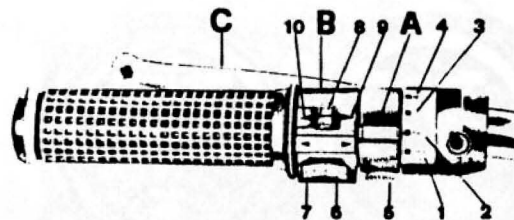
- Knob Position A: damper rests.
- Knob Position B: damper works.



## Key Switch (fig. 5)

The key has three positions.

- «0» (vertical) Standstill, key removable.
- «1» (turned counterclockwise) Standstill, key not removable. Parking light is on with button «A» (LIGHTS) in line with «Park».
- «2» (turned clockwise) Ready to start, all controls are in. Key not removable.





## Lighting switch (LIGHTS) (fig. 6 -A-)

Left, on the handlebar, 4 positions.

- «1» OFF Lights off.
- «2» PARK Parking light.
- «3» L Low beam.
- «4» H High beam.
- «5» Stop button. To come back to position OFF press it towards the left.

## Horn, flashing light and turn signal controls (fig. 6 -B-)

Left, on the handlebar.

- «6» HORN Horn button.
- «7» FLASH Flashing light button.
- «8» OFF Turn signals button.

## Engine starting and emergency stopping (fig. 7 -F)

Right, on the handlebar.

With the Ignition key in position «2» (fig. 5) the motorcycle is ready to be started. To start the engine press the button «1» START.

To stop the engine (In case of emergency) turn the lever to position «3» or «4» OFF.

After engine stopping, reset key in position «0» fig. 5.

## Starter control (fig. 27)

The control lever for starting a cold engine is fixed to one of screws securing rocker box cover to left cylinder head.

- «A» Starting position.
- «B» Riding position.

## Steering damper

It is screwed to its control plate and welded to the frame.



## Gearshift control pedal (fig. 8)

On the left side of the motorcycle.

Low gear: pedal down.

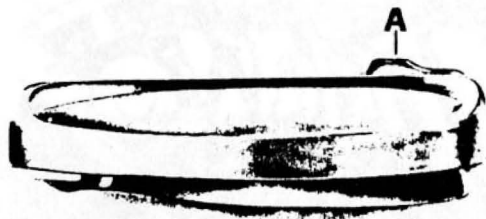
2. 3. 4. and top gear: pedal up.

Neutral position: between low and 2nd gear.

*Before operating the gearshift pedal, the clutch lever has to be fully pulled in.*

## Fuel filler cap (fig. 9)

To open it, press the control button «A».



## Fuel taps (fig. 10)

They are located under the fuel tank, rear side.

Positions:

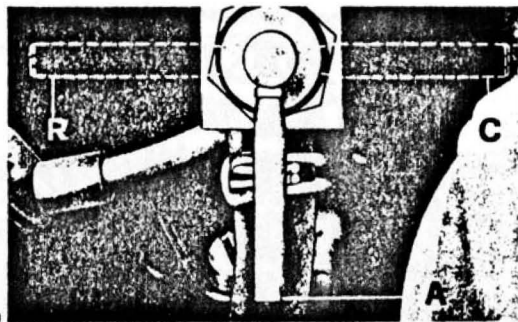
«A» Open (vertical).

«R» Reserve (horizontal) see «R» on the taps.

«C» Closed (horizontal) see «C» on the taps.

## Terminal block with fuses (fig. 11)

It is located on the right side of the bike and holds n. 6 16 A fuses. Access is made possible by taking off the right motorcycle cover.



## 20 On the way

To change to another gear, close the throttle, pull the clutch lever fully in and shift into the new gear; release gently the clutch lever and open the throttle at the same time. The gearshift pedal has to be firmly actuated and foot accompanied.

When shifting down to a lower gear, gradually operate brakes and throttle control not to cause **the engine to go over revs**, when releasing the clutch lever.

### Stopping the motorcycle

Close the throttle control, operate the brake control levers, the clutch lever will be pulled in when the motorcycle comes almost to stopping.

This manoeuvre has to be very co-ordinately carried out not to let the motorcycle going beyond control.

To normally reduce speed, use the engine braking power by correctly gearshifting and paying attention that **the engine does not go over revs**.

On wet or slippery roads, the brakes, especially the front one, (right) have to be carefully operated. To stop the engine turn the ignition key to position «0» (see fig. 5).

**When the engine is stopped, remember to close the taps by turning them to position «C» in fig. 10.**

### Parking

By parking on insufficiently lighted roads, it is necessary to let the parking lights on, by turning the ignition key to position «1» in fig. 5 and the light switch A (LIGHTS) to position «2» (PARK) (see fig. 6). Take off the key.

To lock the steering see fig. 12 and proper instructions.

## RUNNING IN

During the running in, a new motorcycle has to be used very carefully as efficiency, performance and life of the engine are largely dependant on how the motorcycle is run in this period.

**The engine should never be allowed to reach a high number of revolutions before having a chance to warm up sufficiently.**

Never exceed the following speeds and do not force the engine long time.

### Running in speeds

	Max. permissible speeds km/h				
	low gear	2nd gear	3rd gear	4th gear	top gear
Up to 800 km	45	65	85	100	115
From 800 up to 1600 km	55	80	105	120	140
From 1600 up to 3000 km	Gradually increase speed to max. permissible limits.				

#### After the first 500 ÷ 1000 km

Change the engine lubricating oil. Should the oil level be under the minimum mark before the engine has reached 500 ÷ 1000 km, it is necessary to change the oil instead of topping up. Recommended oil: Agip Sint 2000 SAE 10 W/50".

Tighten all nuts and bolts.

Adjust valve rocker clearance.

Check double contact breaker points gap.

#### Every 500 km

Check oil level; correct level nearly at the max. mark (see the marks on the oil filler cap dipstick).

Screw the cap fully in for this checking.

## 22 MAINTENANCE

### Adjusting the clutch lever (fig. 13)

If the free play at the handlebar is higher or lower than mm 4, screw in or out adjuster «A» to obtain the correct play.

This adjustment can also be carried out by slackening nuts «C» and acting on adjuster «B» that is located right on the gear box.

### Adjusting the front right brake control lever (fig. 14)

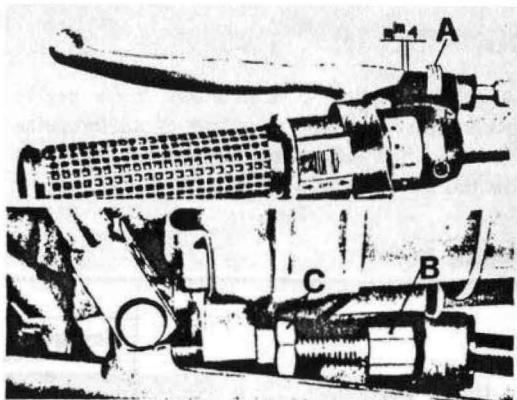
After fitting a feeler gauge «A» between floater in master cylinder and the end of the control lever get the correct play of  $mm\ 0,05 \div 0,15$  by acting on screw «B».

### Checking brake pads wearing

Every 5000 km check brake pad thickness:

- new pad: mm 9
- wear limit: mm 6 a.

13



14



If thick. is under the wear limit, it is necessary to replace the pads. After this operation has been carried out, do not draw the pistons. They operate the control lever on the handlebar «B» fig. 15 several times until the caliper pistons reach their normal position.

By the replacement of the pads check the condition of the fluid pipes, should they be damaged, replace them immediately.

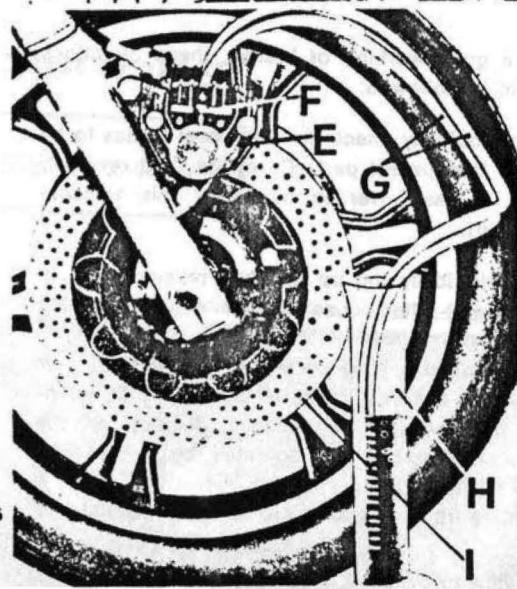
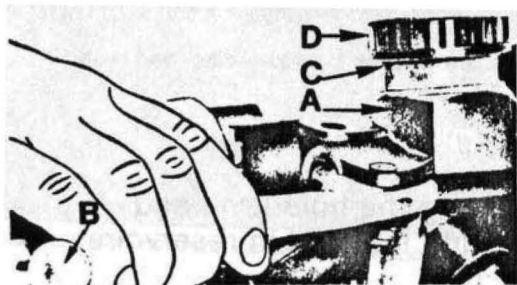
## Checking the brake discs

(«I» fig. 15-16)

The brake disc must be accurately clean, without oil, fat or other dirt and must not show any deep scoring.

In case of replacement or overhauling of the brake disc, it is necessary to check its wobbling. This checking is carried out by means of a proper gauge that must never read more than 0,2 mm.

Should wobbling be higher, carefully check the mounting of the disc on the hub and the play of the hub bearings.



24 Connection torque between disc and hub is  $2,2 \div 2,4$  Kpm.

## Checking the fluid level and changing the fluid in reservoirs (fig. 15-16)

For a good working of brakes, these directions are to be followed:

- periodically check the fluid level (it has to be in the transparent part «C» of the fluid reservoir «A»). It has never to be under this transparent part.

- periodically top up the fluid reservoir «A» (if necessary) after loosening the cap and taking off the gaiter (see fig. 15).

The minimum fluid level in the reservoir for front left and rear brake is warned by its warning light «8» fig. 4, which is located on the instrument panel and actuated by cutout «C» (see fig. 16).

Topping up in this reservoir is made possible by

unscrewing cap «D» of pump «A» fig. 16 after disconnecting the electric wiring.

**For topping up use fresh fluid taken from sealed containers to be opened in this case only.**

- completely renew the brake fluid every 15.000 km or at least once a year.

The fluid pipes have to be always full and without air; a long and elastic movement of the control lever «B» evidences the presence of air inside them.

Use only fresh fluid in case of washing.

**No alcohol is to be used for washing and no compressed air for drying up; use Trichloroethylene for metallic parts.**

Fluid to be used «Agip F.1 brake fluid SAE J 1703».

## Air bleeding (fig. 15-16)

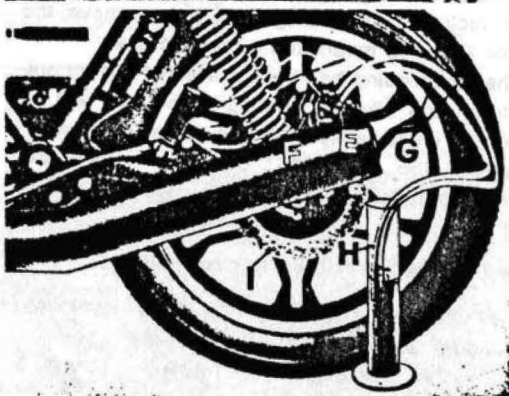
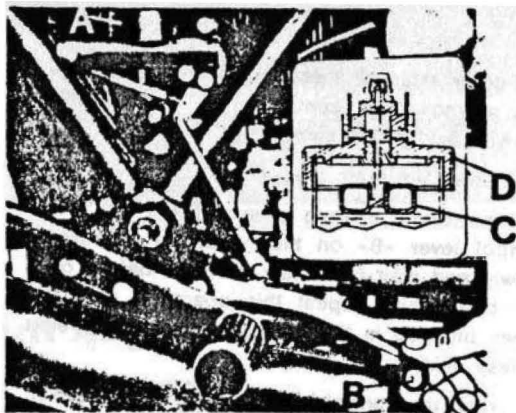
This operation is required when the movement of the control lever on the handlebar is long and elastic because of the presence of air inside the braking circuits.

Operations are as follows:



### Front braking circuit, right (fig. 15)

- turn the handlebar until master cylinder (fluid reservoir) «A» reaches the horizontal position;
- if necessary, top up the fluid reservoir «A» (take care that during the air bleeding the fluid level does not go under the transparent part);
- act on a caliper body «E» at a time:
  - 1) take out the rubber covers then fit the transparent flexible pipes «G» on the drain plugs «E»;



the other ends of these pipes will be plunged into a transparent container «H» partially filled up with fluid of the same type;

2) loosen the drain plug «E»;

3) completely operate several times the brake control lever «B» on the handlebar, release it slowly and wait for a few seconds before operating it again. Repeat this operation until the pipes plunged in the transparent container emit airless fluid;

4) keep the control lever «B» completely drawn and lock the drain plug «E», then remove the pipes «G» and mount the rubber covers.

If the air bleeding has been correctly carried out, a direct and efficient working of the fluid will be realized immediately after the initial idle movement of the lever «B»; otherwise repeat the whole operation.

#### **Rear and left front braking circuits (fig. 16)**

See chapters «Checking the fluid level and changing the fluid in reservoirs» — point 1. and «Front braking circuit right» — points 3. and 4.

#### *Fluid level*

1. It is warned by the warning light «8» in fig. 4 which is located on the instrument panel. When the warning light is lit, it is necessary to top up.

#### *Air bleeding*

3. Operate several times the control pedal «B» a.s.o. ...

4. Keep the control pedal «B» fully pushed down a.s.o. ...

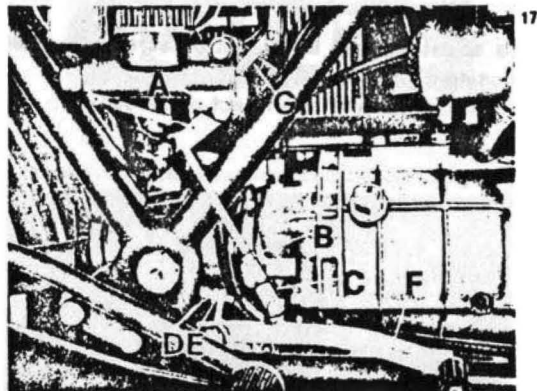
### **Adjusting the control pedal for rear and left front brake (fig. 17)**

— fit a feeler gauge «G» between floater in master cylinder and lever end, then get the correct play of mm 0,05 0,15 by acting on adjuster «A»;

— remove circlip, slip out pin and loosen counternut «B»; now screw in or out fork «C» until the ideal position of control pedal «F» is reached.

— re-fit pin and circlip.

After adjusting, loosen counternut «E» and adjust lever return stop screw «D».



## Adjusting the rear suspensions (fig. 18)

The external springs of rear suspensions can be adjusted on three position by means of a proper lever «A».

In case of faulty damper operation, have them checked by our dealers.

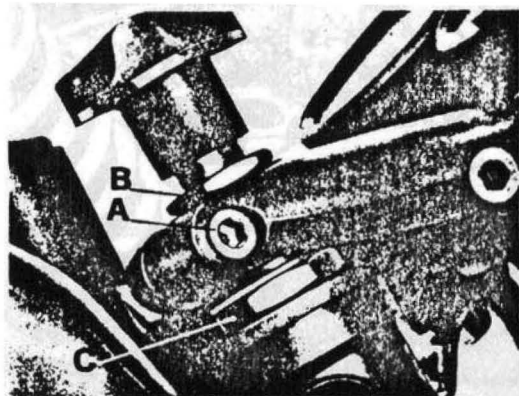


- 28 *Do not forget that the two springs have to be adjusted at the same position, to ensure a good stability of the motorcycle.*

## Adjusting the steering (fig. 19)

For a safe riding, the steering has to be so adjusted to allow a free movement of the handlebar but without excessive play.

Operate as follows:



- slacken the steering head fixing bolt «A» loosen the nut «B» and screw in or out the adjuster «C» to take up excessive play. After this adjustment has been made, lock nut «B» and the steering head fixing bolt «A».

*It is recommended to have this operation carried out by our dealers.*

## Adjusting the throttle control grip (fig. 7)

To adjust the grip travel, act on screw «C» after loosening counternut «D».

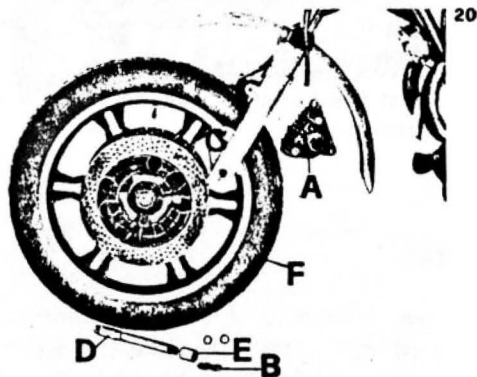
To adjust the grip return, act on screw «E».

## REMOVAL OF WHEELS

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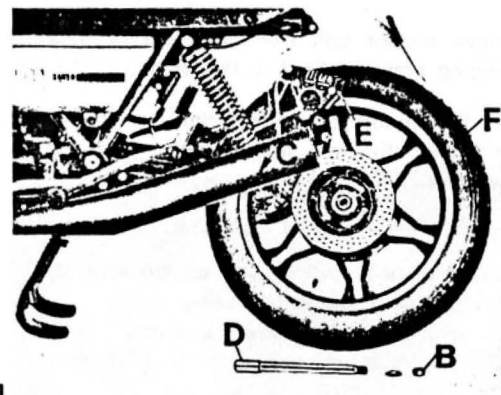
### Front wheel (fig. 20)

- set the vehicle on the central stand, place a block under the engine crankcase to free the wheel from the ground.
- undo caliper «A» securing screws and remove caliper «A» with pipe from right fork cover.
- undo wheel spindle lock nut «B» (left side).



- undo screws «C» securing fork covers to wheel spindle.
- slip off spindle «D»; care the position of spacer «E».
- disengage the braking disc (wheel right side) from caliper and slip the wheel out of fork rods.

To re-fit the wheel operate viceversa.



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## 30 Rear wheel (fig. 21)

- place the bike on its central stand.
- loosen nut «B» on the spindle, drive box side.
- undo spindle securing screw «C», on rear swinging arm.
- slip spindle «D» out of drive box, wheel hub and rear swinging arm.
- slip braking disc out of caliper «E».
- remove caliper unit from stop pin on rear swinging arm and fix it to the frame.
- lean the motorcycle to the right so to free the wheel «F» from rear swinging arm and drive box.

To re-fit the wheel operate viceversa.

**Remember to re-fit caliper unit on the stop pin on the rear swinging arm (left side)**

and to check clearance between pad and braking disc. (See proper chapter in section «Maintenance»).

## Wheel balance

To improve stability and decrease vibrations at high speeds, the wheels have to be kept balanced. Operations are as follows:

- after removing the wheel, suspend it on a fork.
- spin the wheel lightly several times and see if it stops always in various positions, thus indicating a correct balance.
- if one point of the wheel always stops at the bottom, put a proper balance weight opposite that point.
- repeat this operation until the wheel is correctly balanced.

## Tyres

The tyre condition is of main importance as stability of motorcycle, riding comfort and even rider safety are depending on this factor.

It is therefore quite advisable not to use tyres with tread lower than 2 mm.

A wrong tyre pressure can also affect stability of motorcycle and shorten tyre life.

Correct pressure is:

- front wheel: solo or with pillion: 2 Kp/cm<sup>2</sup>
- rear wheel: solo: 2,3 Kp/cm<sup>2</sup>
- with pillion: 2,5 Kp/cm<sup>2</sup>

**These data are for normal riding (touring). In case of constant high speed or motorway riding increase tyre pressure 0,2 kp/cm<sup>2</sup>.**

## 32 LUBRICATION AND MAINTENANCE CHART

### Monthly (or every 3000 km)

- Check electrolyte level in battery (see chapter **Electrical Equipment «Battery»**).

### Periodically

- Check tyre pressure (see chapter **Removal of Wheels «Tyres»**).

### Every 500 km

- Check oil level in the crankcase (see chapter **Lubrifications**).

### After the first 500 ÷ 1000 km

- Replace the crankcase oil (see chapter **Lubrifications**).
- Tighten all nuts and bolts.
- Check rocker clearance (see chapter **Valve gearing «Tappet clearance»**).

### Every 3000 km

- Replace the crankcase oil (see chapter **Lubrifications**).
- Check rocker clearance (see chapter **Valve gearing «Tappet clearance»**).
- Check the oil level in the gear box (see chapter **Lubrifications**).
- Check oil level in the rear drive box (see chapter **Lubrifications**).

### Every 5000 km

- Check the fluid level in brake fluid reservoirs (see chapter **Maintenance «Brakes»**).

### Every 10.000 km

- Clean the fuel tank, the fuel taps, the filters and the fuel lines (see chapter **Maintenance «Cleaning the fuel tank, filters, tape and fuel lines»**).



- Replace the oil in the gear box (see chapter **Lubrications**).
- Replace the oil in the rear drive box (see chapter **Lubrications**).
- Clean and smear all battery connections (see chapter **Electrical equipment «Battery»**).

## Every 15.000 km

- Replace the fluid level in brake fluid reservoirs (see chapter **Maintenance «Brakes»**).

## After the first 20.000 km

All checkings hereunder described must be carried out by our dealers:

- Check there is sufficient grease in the wheel bearings.
- Check there is sufficient grease in the steering bearings «Agip F. 1 Grease 30».
- Replace the oil in the fork covers (see chapter **Lubrications**).
- Clean starter motor and generator commutators using a clean rag slightly moistened with petrol.

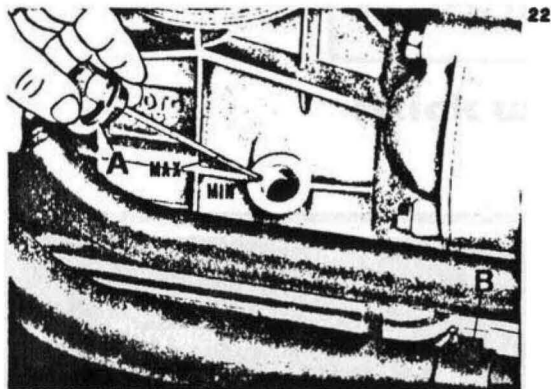
## 34 LUBRICATIONS

### Engine lubrication (fig. 22)

#### Engine oil

Using the oil filler dipstick «A» check the sump level every 500 Km.

Correct oil level is nearly at the maximum mark. Should the level be lower than recommended, top up with oil of the same type and features.

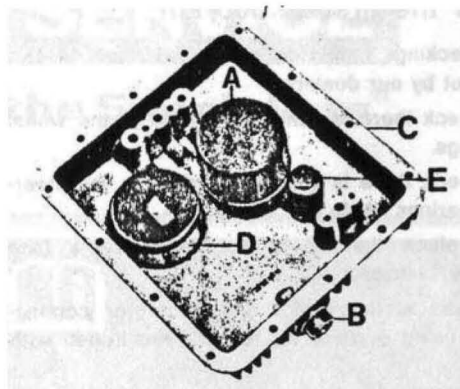


Let the engine turn for a few minutes before checking; oil filler dipstick «A» fully screwed.

#### Replacing the engine oil

After the first 500 ÷ 1000 km and later on every 3000 km change the engine oil.

The oil has to be replaced when the engine is



**warm.** Remember to allow all the old oil to drain before introducing fresh oil.

- A» oil filler cap.
- B» oil drain plug.

Quantity required:

lt 3 «Agip Sint 2000 SAE 10 W/50».

#### Replacement of filter cartridge and cleaning the wire gauze filter (fig. 23)

Every 15.000 km (5 oil changes) replace filter cartridge «A» by proceeding as follows:

- undo plug «B» and let the oil fully drain.
- undo securing screws and remove sump «C» from crakcase. The sump fits filter cartridge «A» wire gauze filter «D», oil pressure relief valve «E».
- undo filter cartridge «A» and replace It by an original one.

It is advisable to remove also wire gauze filter «D», to wash it in petrol bath and dry it by means of compressed air jet. Before re-fitting blow the sump with compressed air.

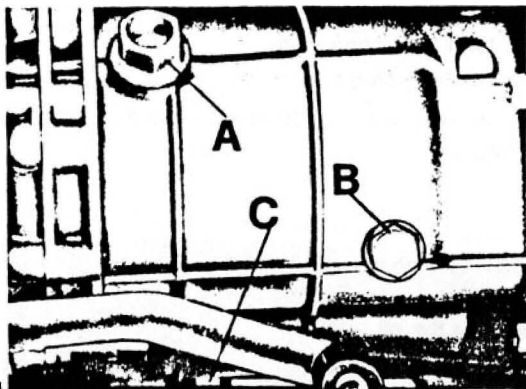
Replace the gasket between sump and crankcase before mounting the sump.

*This maintenance is best done by our dealers.*

#### Gear box (fig. 24)

##### Checking the oil level

Every 3000 km check that the oil level is nearly at the inspection hole «B».



36 If this level is not correct, top up with oil of the same type and features.

### Changing the oil

Every 10.000 km or so, change the oil in the gear box.

This operation should be carried out when the oil is still warm and easy to drain.

Remember to drain all the old oil before introducing fresh oil.

«A» oil filler cap.

«B» level inspection plug.

«C» oil drain plug.

Quantity required: lt 0,750 of oil «Agip F.1 Rotra MP SAE 90».

### Rear drive box (fig. 25)

#### Checking the oil level

Every 300 km check that the oil level is nearly at the inspection hole «A».

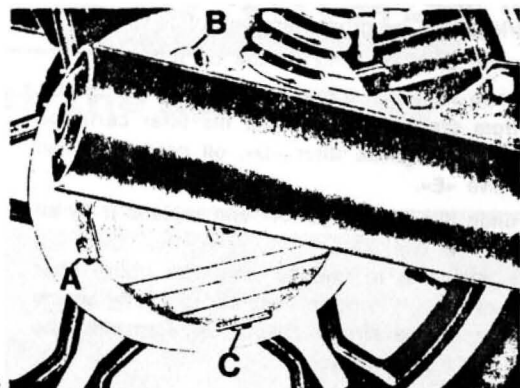
If the level is not correct, top up with oil of the same type and features.

### Changing the oil

Every 10.000 km change the oil in the rear drive box.

This operation should be carried out when the oil is still warm and easy to drain.

Remember to drain all the old oil before introducing fresh oil.



- «A» inspection level plug.
- «B» oil filler cap.
- «C» oil drain plug.

Quantity required:

lit 0,230 of oil «Agip F. 1 Rotra MP SAE 90»

lit 0,020 of oil «Molykote A».

### Front fork (fig. 26)

To replace the lubricating oil in fork covers proceed as follows.

- undo the drain plug «A» with gasket.
- undo screw «B».

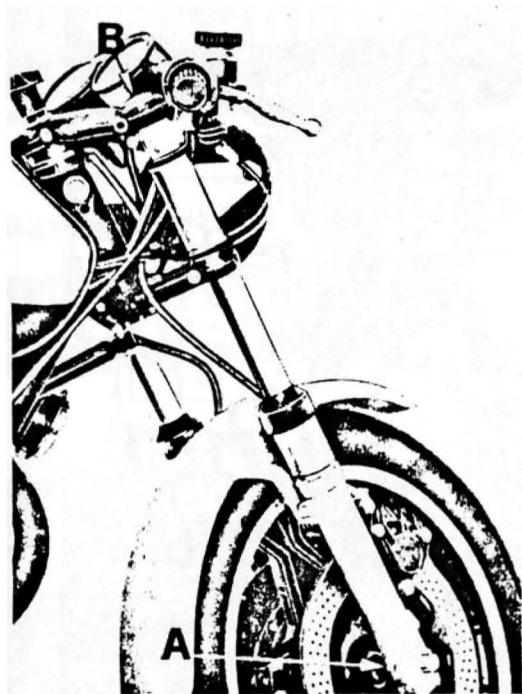
Remember to let the fork covers fully drain, before filling with fresh oil.

- «A» oil drain plug.
- «B» oil filling screw.

Q.ty required lit 0,120 for each cover «Agip F. 1 ATF Dexron».

### Steering, wheel bearings, and rear suspension

For these lubrications it is suggested to apply to our dealers.



## 38 CARBURETION

### Carburetors (fig. 27)

N. 2 Dell'Orto Carburetors PHF 36 B (D) (right)  
PHF 36 B (S) (left).

#### Controls:

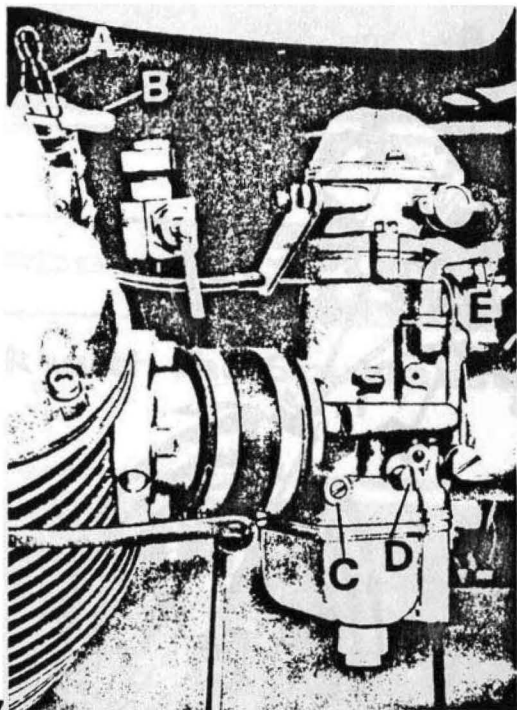
- throttle control grip, right on the handlebar;
- starter control lever for starting a cold engine, located on left cylinder head cover.

«A» Starting position for a cold engine.

«B» Riding position.

#### Note:

*When the starter lever is in riding position «B» ensure that there is a clearance of about 3 mm. between starter control cable ends and adjuster screws «E» on both carburetors.*



**Standard carburettor setting**

Choke	Ø mm 36
Throttle (3)	60
Atomizer	265 AB
Main jet	135
Idling jet	60
Starter jet	70
Pump jet	38
Needle	K 5 (2nd notch)
Floater	10 grams
Idling adjuster screw opening	1 turn and a half.

**Adjusting carburetion and idling speed (fig. 27)**

Should a proper «Vacuum Meter» not be available, this adjustment is made as follows:

- 1 Get the engine at its running temperature.
- 2 Screw idling adjusting screws «C» fully in; then screw them out by one turn and a half.
- 3 By means of your hands feel if pressure at exhaust tubes is the same. In case of differences,

act on screw «D» of one carburettor until the pressure will be the same (idling speed will be kept at 1000 ÷ 1100 r.p.m. about; consequently it will be necessary to screw in the carburettor screw of the cylinder having a lower pressure or to screw out the carburettor screw of the cylinder having a higher pressure).

4 Get the best carburation for each cylinder by acting on screws «C» (this will be at the point where the r.p.m. increase slightly) then get idling speed according to point 3.

5 Disconnect one plug lead at a time and check that the engine stops after firing 5-6 strokes. If this does not occur, get it by proceeding as follows:

- screw out the carburettor screw «D» of the cylinder causing the engine firing more than 5-6 strokes.
  - screw in the carburettor screw «D» of the cylinder causing the engine firing less than 5-6 strokes.
- 6 Adjust idling speed to 1000 ÷ 1100 r.p.m. by screwing in or out in the same quantity screws «D».

- 40 **7** After closing the throttle control grip, check that there is a clearance of mm  $1 \pm 1,5$  between cable ends and adjuster screws «A» handlebar side; otherwise loosen nuts «B» and screw in or out adjuster «A».

Afterwards lock nuts «B» (see fig. 7).

- 8** Check that both gas valves open at the same time by proceeding as follows:

— turn slowly the throttle control grip and check by means of your hands that the pressure at exhaust pipes increases simultaneously. In case such increase is not simultaneous, adjust the carburation of the cylinder in advance by screwing adjuster «A» in (after loosening its counternut «B» fig. 7) until the pressure is the same for both pipes.

## Adjusting by means of a «Vacuum Meter»

To get a correct adjusting of carburation, it is advisable to apply to our dealers who can carry it out by means of a «Vacuum Meter».

## Cleaning the fuel tank, fuel tap, fuel filters and fuel pipes

Every 10.000 km or whenever there is an irregular fuel flow to carburettors, it is necessary to clean the fuel tank, the fuel taps, the fuel filters and the fuel pipes as well.

Ducts, filters on taps and carburettors, and pipes will be washed in petrol bath and dried with compressed air.



## VALVE GEARING

### Tappet clearance (fig. 28)

After the first 500 ÷ 1000 km and later on every 3000 km or any time valve operation is too noisy, tappet clearance should be checked.

This adjustment is made on a cold engine with the piston at TDC exactly at the end of its compression stroke.

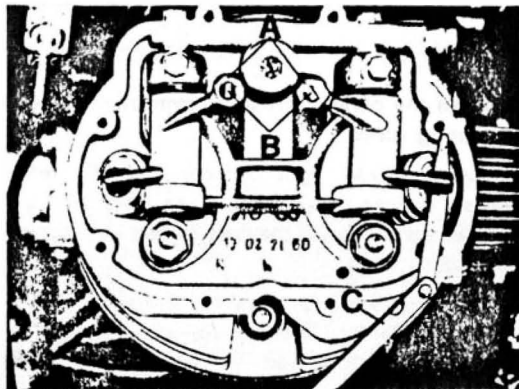
After removing the cylinder head cover, operate as follows:

- 1 slacken nut «A»;
- 2 screw in or out the adjuster screw «B» until the following clearances are obtained:

- inlet valve mm 0,22.
- exhaust valve mm 0,22.

Use a feeler gauge «C» to check this clearance. When this is excessive, there will be noisy valve operation: if it is less, the valves may not close fully, causing inconveniences such as:

- compression loss;
- engine overheating;
- valve burning.



## 42 IGNITION

### Checking and adjustment of double contact breaker

(fig. 29)

#### Maintenance

##### Every 3000 km

Lightly moisted the cam felt «O» with some engine oil drops.

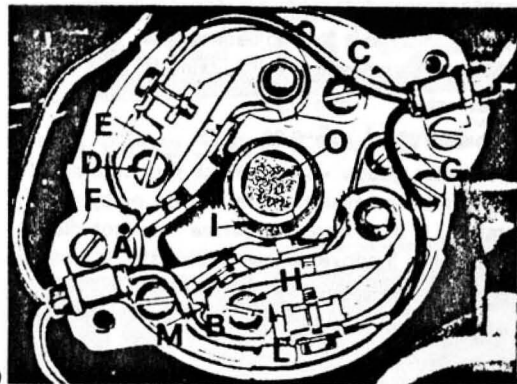
#### Inspection

- remove the contact breaker cover by undoing the securing screws.
- if contacts «A» right cylinder and «B» left cylinder are dirty and greasy, clean them with a petrol moistened rag. If they are in any way damaged replace them.
- check points gap of breaker «A» (right cylinder - red cable) and breaker «B» (left cylinder - green cable) wich should be between mm 0,37 ÷ 0,43.

#### Adjustrment of contact points

##### Contact points «A» - right cylinder

Bring cam «I» to maximum lift, loosen screws «C» and «D» and move plate «E» by acting on nocht «F».



After setting the correct distance, lock screws «C» and «D».

#### **Contact points «B» - left cylinder**

Bring cam «I» to maximum lift, loosen screws «G» and «H» and move plate «L» by acting on notch «M».

After setting the correct distance, lock screws «G» and «H».

*When adjusting the contact points, ignition timing should be checked as well (see chapter «Checking of ignition timing»).*

## 44 Checking and adjustment of ignition timing «fixed advance»

(fig. 30)

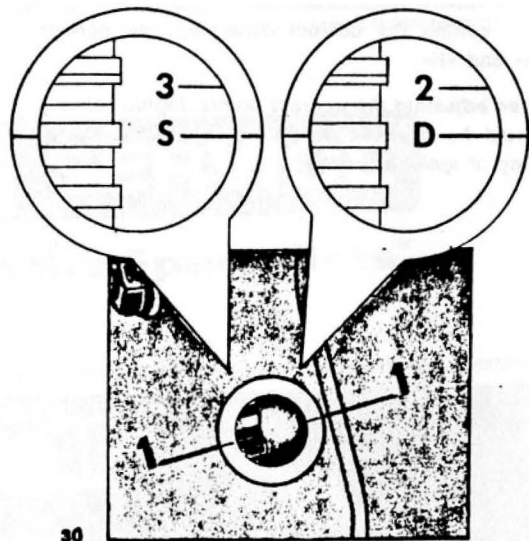
### Checking

- remove the rubber cap which seals the inspection hole on the right side of the gear box;
- to find the exact moment when the points «A» and «B» in fig. 29 start separating, it is advisable to use a suitable timing light device, mounted between the breaker feeding clamp and the ground.

### Timing the right cylinder (see fig. 30)

- rotate the flywheel counterclockwise until the piston is at the end of its compression stroke (both valves closed). In this position, mark «D» on the flywheel (TDC of right cylinder) should coincide with mark «1» on the rim of the inspection hole;
- rotate the flywheel clockwise until the flywheel mark «2» (fixed advance) is in perfect

coincidence with mark «1» on the rim of the inspection hole. In this position the points «A» fig. 29 start separating.



### Timing the left cylinder (see fig. 30)

- rotate the flywheel counterclockwise until the piston is at the end of its compression stroke (both valves closed). In this position, mark «S» on the flywheel (TDC of left cylinder) should coincide with mark «1» on the rim of the inspection hole.
- rotate the flywheel clockwise until the flywheel mark «3» (fixed advance) is in perfect coincidence with mark «1» on the rim on the inspection hole. In this position the points «B» fig. 29 start separating.

*If the points («A» and «B» in fig. 29) do not start opening in the above positions, the ignition timing needs adjustment.*

### Ignition data

Initial advance (fixed)	8°
Automatic advance	26°
Total advance	34°
Breaker points gap:	mm 0,37 ÷ 0,43

*This checking is best carried out by our dealers.*

### Spark plugs

Points gap 0,5 mm.

The spark plugs are best cleaned with petrol and a wire brush using a needle for the inner part. In re-fitting the plugs, **ensure they are properly started by hand for a few turns** completing the operation by means of the plug wrench in the tool kit. If not properly started, the cylinder head thread may get stripped.

For all events, the plugs have to be replaced every 10000 km a. even if they still appear to be in good condition.

Recommended spark plugs are:

Bosch 230 T3

Champion N 9 Y

## 46 ELECTRIC EQUIPMENT

It includes the following:

- Battery.
- Starter motor with electro-magnetic relay.
- Generator-Alternator, located on the front side of crankshaft.
- Double contact breaker with automatic advance.
- Ignition coils.
- Rectifier.
- Regulator.
- Terminal block with fuses (n. 6 16 A fuses).
- Flashing relay.
- Starter relay.
- Headlight.
- Tail light.
- Lights for turning signals.
- Ignition switch.
- Lighting switch.
- Switch for turning signals, horn and flashing light.
- Engine starting and stopping switch.
- Horn.

### Battery

Battery is a 12 V type with a capacity of 20 Ah and direct charge from generator. Access to the battery is made possible by following operations:

- lift the saddle by means of lifting lever.
- remove the tool box.
- unhook the rubber bands and disconnect electric wires.

Every month, or every 3000 km a. check the electrolyte level and eventually top up in each cell, caring that the level is not more than 6 mm over the upper part of separators.

Remember to always add distilled water, chemically pure, and never add sulphuric acid.

The water must be added by a cold battery with at least 6 hours standstill.

Take care that the mixture (distilled water + sulphuric acid) does not overflow and get the upper part of the battery wet.

Every 10000 km check the battery connections and smear them with neuter vaseline to avoid oxidations.

With a charged battery, electrolyte density is 1,28 a. This rate comes down to 1,16 a. when battery is almost at discharge.

To put a new battery into service, apply to our dealers.

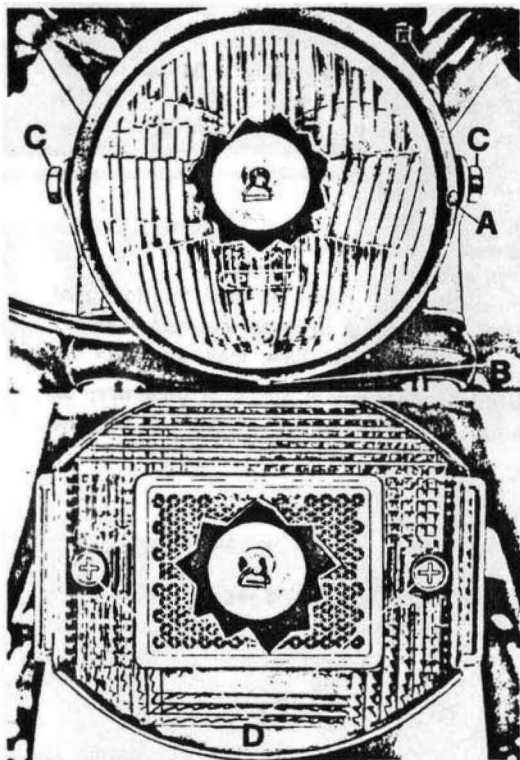
## Bulbs

- high and low beam: bulb 45/40 W - 12 V
- parking light: bulb 3 W - 12 V
- number plate lighting, parking light and stop light: bulb 5/21 W - 12 V.
- turn signals: bulb 21 W - 12 V
- instrument panel: bulbs 1,2 W - 12 V
- km and rev. counters: bulbs 3 W - 12 V.

## Replacement of light bulbs (fig. 31)

### Headlight

- Undo screw «B», disconnect beam insert, slip off sockets and replace bulbs.



## 48 Tail light

- Undo screws «D» securing reflector to tail light; push bulb inwards and turn it to the left at the same time, then slip it off.

### Turn signals

- Undo screws «D» securing reflectors to signal lights; push bulbs inwards and turn them to the left at the same time, then slip them off.

**By re-fitting of reflectors screw in uniformly, do not lock screws too much to prevent braking.**

### Instrument panel, km and rev. counters

- Slip off bulb sockets and replace bulbs.

## Headlight beam adjusting (fig. 31)

For a safe riding and not to trouble crossing ri-

ders, the headlight beam has always to be set at a correct height.

For horizontal setting act on screw «A».

For vertical setting undo screws «C» and shift the headlight by hand up or down in order to get the correct height.

The centre of the high beam must not be higher than 0,86 m, measured at 3 m distance with motorcycle not on stand and rider on saddle.



**WIRING DIAGRAM**

- 1 km counter - bulb 3 W
- 2 Rev. counter - bulb 3 W
- 3 High beam warning light - bulb 1,2 W
- 4 Oil pressure warning light - bulb 1,2 W
- 5 Neutral warning light - bulb 1,2 W
- 6 Town driving warning light - bulb 1,2 W
- 7 Generator charge warning light - bulb 1,2 W
- 8 Low beam - bulb 40/45 W
- 9 High beam - bulb 40/45 W
- 10 Right front turn signal light - bulb 21 W
- 11 Left front turn signal light - bulb 21 W
- 12 Engine starting and stopping switch
- 13 Lighting switch
- 14 Switch; turn signals, starting, horns, flashing light
- 15 Horn Absorption 3,5 A
- 16 Front brake stop light cutout
- 17 Flashing light relay
- 18 Rear brake stop light cutout
- 19 Battery (12 V - 20 Ah)
- 20 Regulator
- 21 Rectifier
- 22 Alternator (14 V - 20 A)
- 23 Starter motor relay
- 24 Starter motor (12 V - 0,6 HP)
- 25 Left rear turn signal - bulb 21 W
- 26 Rear brake stop light
- 27 Number plate and parking light - bulb 5/21 W
- 28 Right rear turn signal (bulb 21 W)
- 29 Flasher unit
- 30 Oil pressure cutout
- 31 Neutral position cutout
- 32 Terminal block with 16 A fuses
- 33 Contact breaker
- 34 Coils
- 35 Ignition switch (3 positions)
- 36 Spark plugs
- 37 Parking light, front - bulb 3 W
- 38 Brake fluid level warning light (Brake) - bulb 1,2 W.
- 39 Brake fluid level indicator (cutout) left front and rear brake circuits.



**Indicative data subject to change without prior notification**



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