

Le Mans

1000



MOTO GUZZI

OWNER'S MANUAL

The illustrations and descriptions in this booklet are indicative only and the manufacturer reserves itself the right to introduce any modification it may deem necessary for better performance or for constructive or commercial reasons without prior notice.

Dear rider

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

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

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

All major inspections and overhauls should be carried out by our dealers who have the facilities necessary to guarantee an efficient and competent service.

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



RIDING TECHNIQUE

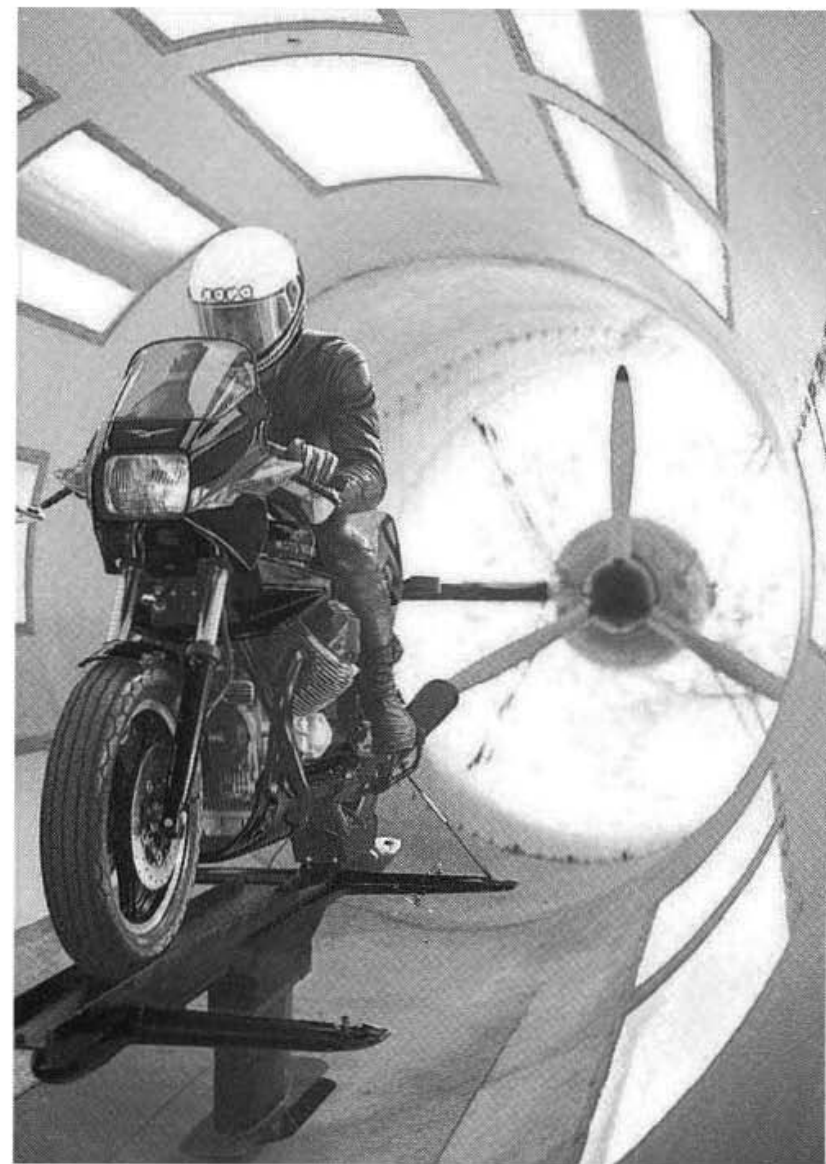
Due to its exceptional features, this motorcycle can be considered as in the same class as racing machines, and should be ridden as such.

For this very reason it is enjoyed by many enthusiasts, but as with racing motorcycles, the riding technique must be appropriate.

Above all else, given that the carburetors are fitted with accelerator pumps, if the throttle isn't used correctly in relation to

the engine speed, any excess fuel expelled by the carburetors will end up in the carburetor air intake filter.

When travelling at low speeds, or more correctly at low engine speeds, the throttle must be used carefully, since the excess fuel might not be fully burned by the engine; at high engine speeds, even with abrupt accelerations, the fuel is completely burned, producing that exhilarating and distinguishing "pick-up".



AERODYNAMIC DEVELOPMENT

Reproducing ideal driving conditions in a free flow wind tunnel, the aerodynamics has been optimised by designing an integral cockpit fairing, to create an air flow that envelopes the rider, enclosing him in an isolated air pocket, and with special profiling, producing negative lift and hence stable road-holding, with an increase in stability proportional to the increase in speed.

Low drag coefficient and low total weight make for higher speeds and lower fuel consumption than obtained on any other motorcycle of similar engine capacity.

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6 GENERAL FEATURES

Engine

Twin cylinder - 4-stroke
Cylinder arrangement V 90°
Bore 88 mm
Stroke 78 mm
Displacement 948.8 cc
Compression ratio 10 : 1
Max torque 8.43 kgm at 6250 rpm

Valve gearing

O.H.V., push rod operated.

Carburation

2 carburettors, "Dell'Orto" type PHM 40 ND (right), PHM 40 NS (left).

Lubrication

Pressurised by geared oil pump.
Wire gauze and cartridge filters in oil sump.
Normal lubrication pressure 3.8-4.2 kg/cm² (54-60 p.s.i.).
Pressure relief valve in sump.
Low oil pressure indicator sending unit in crankcase.

Alternator

On front end of crankshaft (14 V - 20 A).

Ignition

Coil-battery ignition with double contact breaker and centrifugal automatic advance.

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Ignition data:

– ignition advance (static) $8^{\circ} \pm 1^{\circ}$

– automatic advance $26^{\circ} \pm 2^{\circ}$

– full advance (s. + a.) $34^{\circ} \pm 2^{\circ}$

Contact breaker points gap: 0.37-0.43 mm (0.015-0.017").

Spark plugs: Bosch W 5 DC.

Spark plug gap: 0.6 mm (0.024").

2 ignition coils fitted on frame.

Starting

Electric starter (12 V - 0.7 KW) with solenoid engagement. Ring gear bolted on flywheel. Starter button (start) on right of handlebars.

Transmission data

Clutch

Twin driven plates, dry type, on flywheel. Hand controlled by lever on left of handlebars.

Primary drive

By gears. Ratio: 1 to 1.235 (tooth ratio 17/21).

Transmission

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

Pedal operated on the left side of the motorcycle.

Gear ratios:

Low gear = 1 to 2 (tooth ratio = 14/28)

2nd gear = 1 to 1.388 (tooth ratio = 18/25)

3rd gear = 1 to 1.047 (tooth ratio = 21/22)

4th gear = 1 to 0.869 (tooth ratio = 23/20)

High gear = 1 to 0.750 (tooth ratio = 28/21)

Final drive

By shaft with universal joint and gear set.

Ratio: 1 to 4.714 (tooth ratio = 7/33).

Overall gear ratios (Engine-wheel):

Low gear = 1 to 11.647

2nd gear = 1 to 8.088

3rd gear = 1 to 6.100

4th gear = 1 to 5.063

High gear = 1 to 4.367

Frame

Cradle, tubular structure.

Suspension

Front: telescopic fork "Moto Guzzi patented" with air-hydraulic shock absorbers.

Rear: swing fork with adjustable coil springs concentric with hydraulic dampers.

Wheels

Light alloy casting rim dimensions:

– front: 16 MT 2.50 H2

– rear: 18 MT 3.00 H2

Tires

Front: 120/80 V16

Rear: 130/80 V18

Type: Tubeless or tube-type.

Brakes

Front: two-piston fixed calliper, floating disc brake, controlled by hand lever on the right side of handle-bars. Hydraulic operation independent of the rear brake;

- disc Ø 270 mm (10.63");
- braking cylinder Ø 38 mm (1.50");
- master cylinder Ø 12.7 mm (0.50").

Rear: two-piston fixed calliper, floating disc brake. Pedal control located in the center of the right side of the motorcycle;

- disc Ø 270 mm (10.63");
- braking cylinder Ø 38 mm (1.50");
- master cylinder Ø 15.875 mm (0.625").

The rear brake is connected via a hydraulic hose to the front left side brake, which has one set of components of the same dimensions as the hand controlled front right side brake.

Dimensions and weights

Wheelbase (loaded)	1.514 m (59.6")
Length	2.160 m (85.0")
Width	0.680 m (26.8")
Height	1.220 m (48.0")
Ground clearance	0.120 m (4.7")
Dry weight	215 kg (474 lbs)

Performance

Top speed, solo riding: 230 km/h (143 mph).
 Fuel consumption: 5.4 l/100 km (44 miles/US gal).

Recommended fuel and lubricants

Description	Quantity	Recommended products
Fuel tank Reserve	24 l (6.3 US gls) 4 l approx. (1 US gl)	Supergrade petrol (97 NO-RM/min.)
Oil sump	3 l (6.3 pints)	«Agip Sint 2000 SAE 10W/50» oil
Transmission	0.75 l (1½ pints)	«Agip Rotra MP SAE 80W/90» oil
Secondary drive box (bevel set lubrication)	0.23 l (½ pint) 0.02 l (1¼ pint)	«Agip Rotra MP SAE 80W/90» oil «Agip Rocol ASO/R» oil
Front fork (each leg)	0.15 l (⅓ pint)	«Agip F.1 ATF Dexron» fluid
Braking circuits (front and rear)		«Agip F.1 Brake fluid - SAE J 1703»

IDENTIFICATION DATA

(fig. 2)

Every motorcycle is stamped with identification numbers on the tubular frame and on the crankcase.

The frame number is written in the motorcycle log-book and is the vehicle's legal identification.

Spare Parts

Only «**ORIGINAL MOTO GUZZI SPARE PARTS**» should be used.

The use of non-original parts invalidates the warranty.

Warranty

The warranty is valid for a period of six months and is limited to 10.000 km (6000 miles) from the date of purchase.

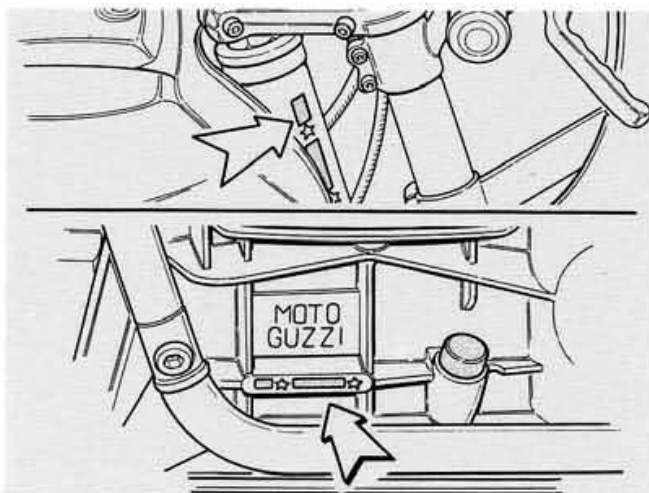
It is terminated by any modifications, participation in racing events or the use of non-original accessories or original accessories not fitted according to SEIMM-MOTO GUZZI instructions.

Tires and accessories or parts not manufactured

by SEIMM - Moto Guzzi are excluded from this warranty.

Every new motorcycle is accompanied by a «service coupons booklet». This booklet must follow the motorcycle and be kept at all times with the other legal documents.

Only this document is valid for presentation to SEIMM - Moto Guzzi for recognition of the warranty, according to the general sales conditions.



12 INSTRUMENTS AND CONTROLS

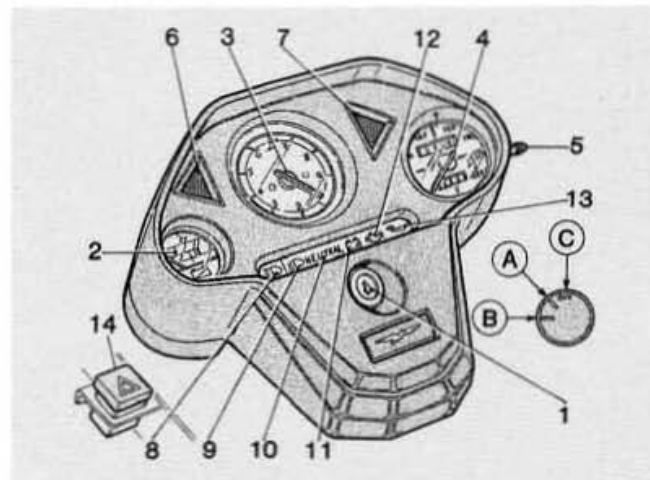
Instrument panel (fig. 3)

1 Ignition key switch:

«OFF» in line with mark «C»: machine stationary, key removable (no contacts).

«A» in line with mark «C» (turned clockwise): machine ready to be started. All circuits «ON». Key not removable.

«B» in line with mark «C» (turned clockwise) machine stationary. With switch «A» of fig. 4 in «PARK» posi-



tion, parking light «ON». Key removable.

2 Voltmeter.

3 Tachometer.

4 Speedometer-odometer.

5 Zero reset for trip odometer.

6 Indicator light (green) for left turn signal.

7 Indicator light (green) for right turn signal.

8 Indicator light (blue) for high beam ON.

9 Indicator light (green) for parking lights ON.

10 Indicator light (green «NEUTRAL»). On when transmission is in neutral.

11 Indicator light (red) for generator output. Should go off upon increasing engine speed.

12 Indicator light (red) for oil pressure. Goes off when oil pressure is sufficient to assure engine lubrication. If it does not, then the oil pressure is incorrect: if this happens the engine should be stopped immediately and checked.

13 Indicator light (red) shows low level of fluid in the front left and rear brake fluid master cylinder-reservoir. If it comes ON then top up the fluid reservoir. At the same time check that there are no leaks in the hydraulic circuit.

14 Hazard warning lights switch (located on the bracket to left of headlight).

Light and Turn Signal Switches, Horn Button (fig. 4)

These are located on the left side of the handlebars.

Switch «A»

«PARK» parking lights.

«ON» dual beam headlight ON.

«OFF» lights off.

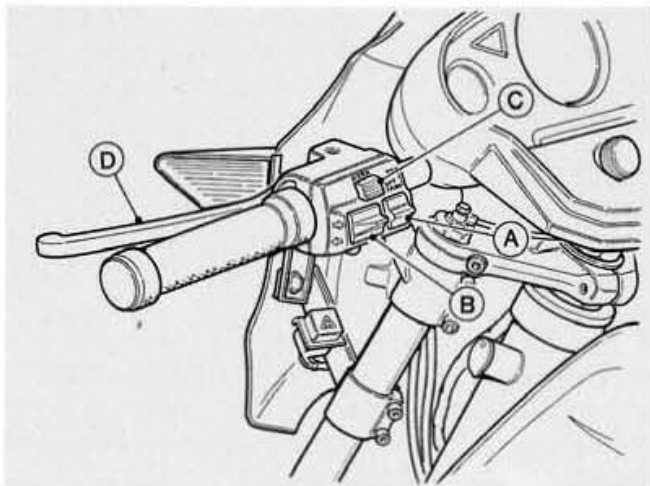
Switch «B»

➡ Right turn signal.

➡ Left turn signal.

Button «C»

Horn.



Engine Start Button, Light Control and Engine Shut-Off Switches (fig. 5)

13

These are located on the right side of the handlebars.

With key mark «A» in line with mark «C» (fig. 3) the vehicle is ready to be started. To start the engine proceed as follows:

- ensure that switch «B» is central;
- disengage the clutch fully (lever «D» in fig. 4);
- if the engine is cold, turn the «starter» lever to start position «A» (see fig. 30);
- press start button «A» (fig. 5).

To stop the engine in an emergency move switch «B» up-ward or downward.

When the engine has stopped turn the ignition key (fig. 3) counterclockwise until mark «OFF» is in line with mark «C», and remove the key from the switch.

Switch «E»

With switch «A» (fig. 4) in position «ON»:

«LO» low beam.

«HI» high beam.

«Flash» flash.

Throttle Twist Grip Control («G» in fig. 5)

The throttle control is located on the right side of the handlebars: rotating it toward the rider opens the

throttle; the opposite closes it.

Adjustment of the twist grip travel is by means of screw «D».

To retard the twist grip return adjust screw «C».

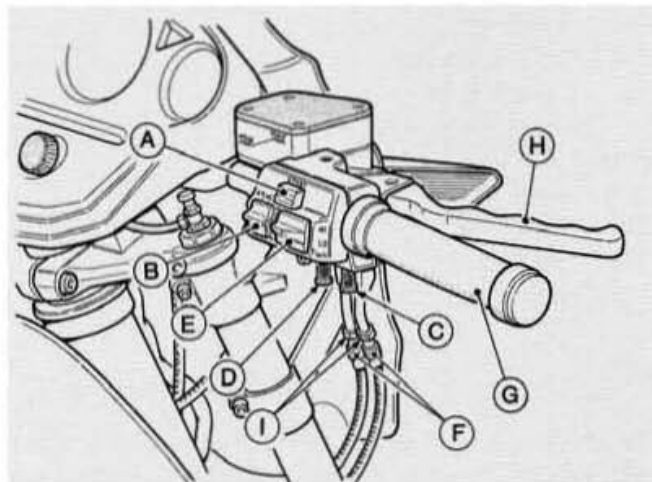
Clutch Control Lever («D» in fig. 4)

The lever is located on the left side of the handlebars; it should be used only during move off and to change gears.

Right Front Brake Control Lever

(«H» in fig. 5)

The lever is located on the right side of the handle-



bars; it actuates the masters cylinder for the front right hydraulic brake.

Choke Lever (fig. 30)

The choke (cold start) lever is located on the left side of the vehicle.

- «A» starting position.
- «B» normal position.

Front Left and Rear Brake Pedal

(«B» in fig. 18)

The pedal is located in the centre of the right side of the vehicle, and is link connected to the master cylinder. It actuates the front left and rear brakes simultaneously.

Gearshift Pedal (fig. 6)

This is located in the centre of the left side of the vehicle:

- low gear, lever downward;
- 2nd - 3rd - 4th - high gears, lever upward;
- neutral, between low and 2nd gears.

Before moving this pedal, the clutch must be disengaged.

Fuel Filler Cap (fig. 7)

To access the fuel filler cap «B» turn key «A» clockwise, then lift cover «C».

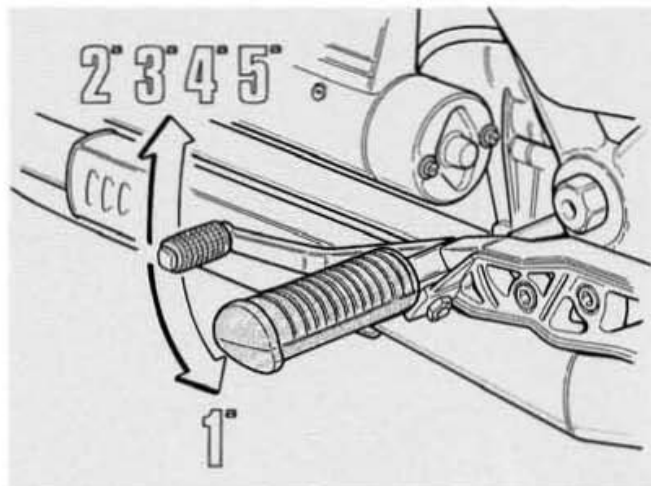
NOTE - Any fuel spilt should be wiped off immediately to prevent permanent damage to the tank's paint.

Fuel Cocks (fig. 8)

These are fitted under the rear of the tank.

The «FUEL» cocks have three positions:

«ON» - open, arrow upward;



«RES» - reserve, arrow downward;

«OFF» - closed, arrow horizontal.

Fuse unit (fig. 9)

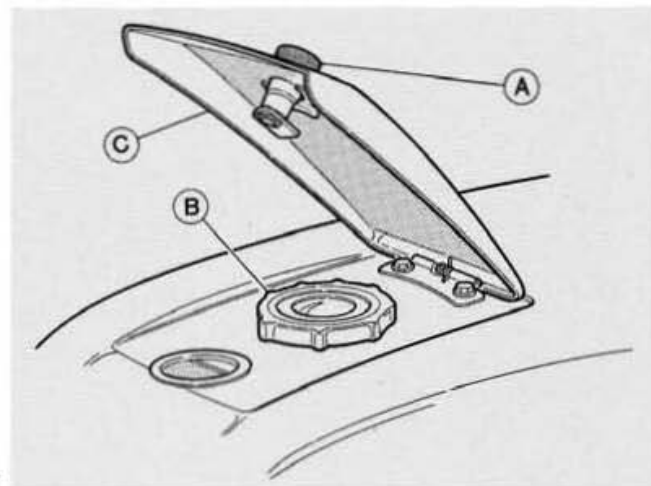
This is located centrally on the motorcycle; the saddle must be removed to access it.

Six fuses of 15 A are fitted.

Prior to replacing any blown fuses the fault must be found and rectified (see "Wiring Diagram Legend").

1 Hazard warning lights.

2 Turn signal lights - Parking lights - Panel lights - Parking lights indicator.



3 High and low beam lights - Front brake "stop" light pressure switch - Voltmeter - Indicator lights for neutral, generator, engine oil pressure, brake fluid level.

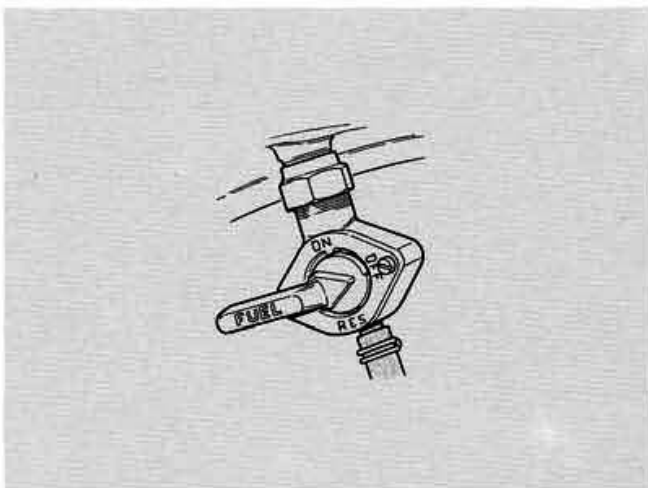
4 Horn solenoid switch.

5 Starter solenoid switch, rear brake "stop" light pressure switch.

Saddle Lock (fig. 10)

The saddle lock «A» is located on the rear left side of the motorcycle.

To unlock it, turn the key 90° counterclockwise and depress. The saddle will rise automatically, allowing its removal.



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To lock it, press the saddle in its frame location and push home.

Steering Lock («A» in fig. 11)

To lock and unlock the steering, proceed as follows:

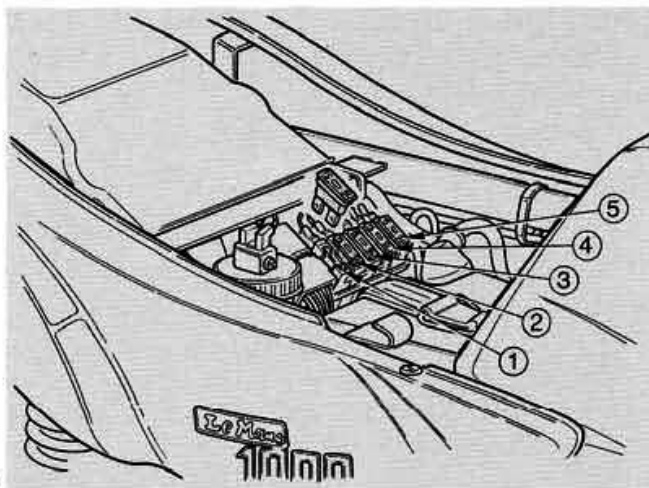
Locking

Turn the handlebars fully to the right.

Insert the key in the lock, turn counterclockwise and depress, turn it clockwise, then release and remove the key.

Unlocking

Insert the key in the lock, turn counterclockwise, then release and remove the key.



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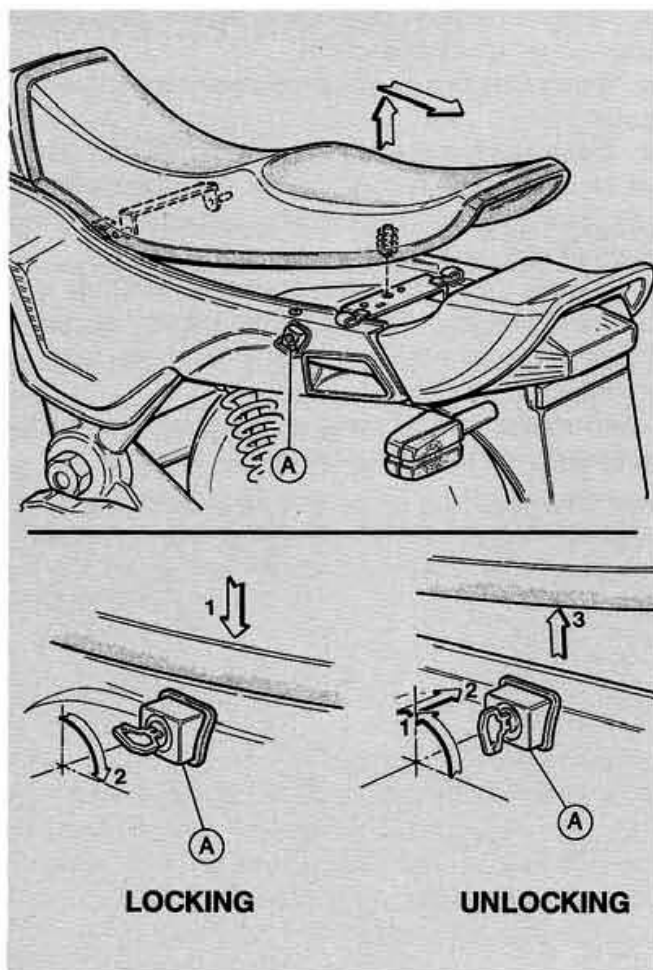
Side Stand («A» in fig. 12)

The motorcycle has a sidestand for use during brief stops; since this stand retracts automatically, it is recommended that the center stand be used for long stops, giving greater stability.

Steering Damper (fig. 13)

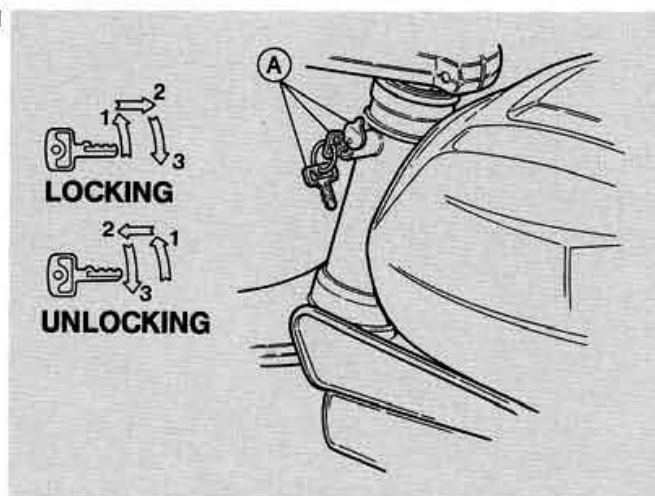
This is fitted on the right side of the motorcycle, between the frame and the steering head.

To harden or reduce damping, screw nut «A» in or out respectively.



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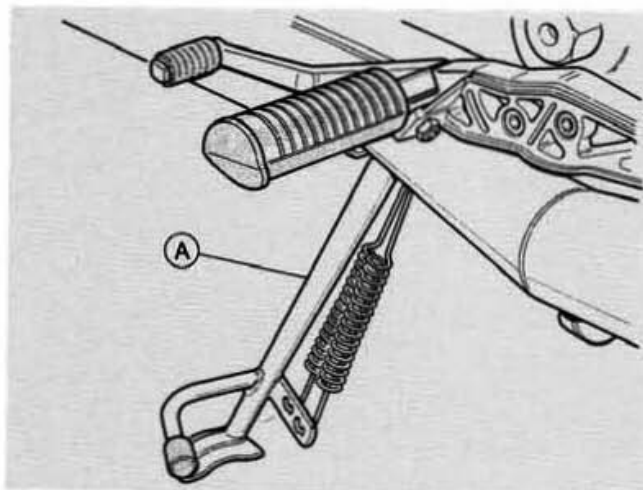
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18 Cleaning the windshield

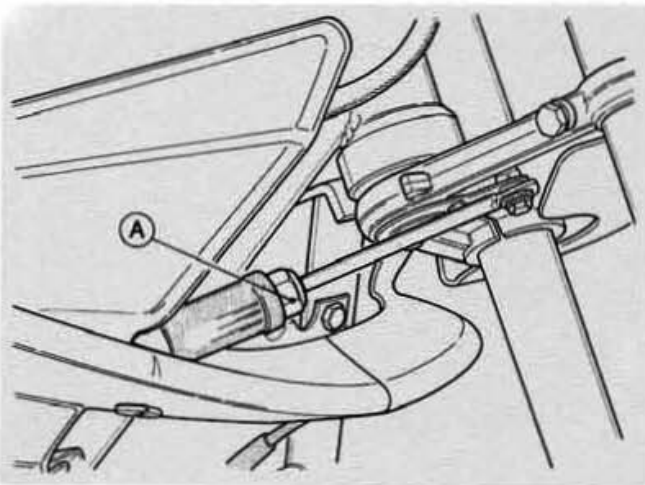
Most soaps, detergents, waxes and polishes used for plastics or glass, can be used to clean the windshield. However, the following precautions should be taken:

- **never wash or clean the windshield when the air temperature is very high, or under strong sunlight;**
- under no circumstances should solvents, caustic solutions, or similar products be used;
- do not use liquids containing abrasive materials, or pumice, glass paper, scrapers, etc.;



- apply polishes only after having thoroughly washed off all dust and dirt;
 - light scratches can be smoothed over with a soft polish;
 - fresh paint and sealing compounds can easily be removed before they harden, by rubbing lightly with gasoline, isopropyl alcohol or butyl cellosolve (do not use methylated spirits);
 - always use soft cloths, sponges, chamois leather or cotton wool rubbing gently. Do not use paper towels or synthetic fiber cloths as these tend to scratch the windshield.
- Deep scratches or abrasions cannot be removed by vigorous rubbing or by the use of solvents.

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Prior to starting

Check that:

- the ignition key is in the start-up position (mark «A» on the key must be in line with mark «C», see fig. 3);
- there is sufficient fuel in the tank;
- the red panel indicator light (front left and rear brake master cylinder-reservoir fluid level) is not ON;
- engine sump oil level is correct;
- the following indicator lights are ON: **red** low oil pressure, **red** low generator output, **green** for transmission in neutral;
- the choke «starter» lever is in the start-up position («A» in fig. 30).

Cold Starting

After the above checks, turn the throttle twist grip (toward the rider) by 25% of full travel, disengage the clutch and press the «START» button («A» in fig. 5). Once the engine has started, and before returning the choke to its normal position («B» in fig. 30), *allow the engine to idle for a few seconds in summer or a few minutes in winter.*

If the «starter» choke is left in the start-up position («A» in fig. 30) carburation problems ensue, with a considerable increase in fuel consumption, and in the worst case the risk of seizure due to the removal of the cylinder wall oil film by the excess fuel.

Caution - If the green «NEUTRAL» panel indicator does not light up when mark «A» on the ignition key is in line with mark «C» (see fig. 3), this indicates that a transmission gear is engaged; shift into the «neutral» position.

Starting a Warm Engine

Proceed as for cold starting, except that the «starter» choke should **not** be moved to position «A» (see fig. 30), since this would enrich the mixture excessively.

Driving

To shift gears, close the throttle, disengage the clutch and select the next gear; gently reengage the clutch, accelerating at the same time.

20 The gear shift pedal has to be operated firmly and followed through by the foot.

When shifting down to lower gears, gradually brake whilst closing the throttle and reengaging the clutch, to **avoid overrevving the engine.**

Stopping

Close the throttle, brake, and, when almost stationary, disengage the clutch. This action has to be well coordinated to maintain good control of the motorcycle.

For normal deceleration, brake with the engine by shifting through the gears, taking care not to **over-rev the engine.**

On wet or slippery roads, take care when braking, and especially with the front right brake.

To stop the engine, turn the ignition key to align the mark «OFF» with the mark «C» (see fig. 3). **Do not forget always to close the fuel cocks when the motorcycle is parked.**

Parking

When parking at night in poorly lit roads, leave the parking light on. To do this, turn the ignition key until mark «B» (on the key) is aligned with mark «C» (see fig. 3) and move the light switch (see fig. 4) to «PARK»; then remove the key and lock the steering (see «Steering Lock» and fig. 11).

BREAK-IN

During the break-in period follow the rules below:

- before moving off, allow the engine to warm up by idling for a while, the time depending upon the temperature;
- avoid exceeding the break-in speeds shown in the table below, bearing in mind that whilst observing these limits, it is good practice not to ride at a constant speed, but to vary it often;
- before stopping, decelerate gradually, to avoid

subjecting the engine components to abrupt temperature changes;

- carry out the service as specified in the service coupons booklet;
- bear in mind that complete bedding-in of the components, which will allow full and longlasting enjoyment of the motorcycle, is achieved only after several thousands of miles.

Maximum break-in speeds

Distance covered	Maximum permissible speeds				
	Low gear	2nd gear	3rd gear	4th gear	High gear
Up to 1000 km (600 miles)	45 km (28 mph)	65 km (40 mph)	85 km (53 mph)	100 km (62 mph)	115 km (71 mph)
From 1000 km (600 miles) to 2000 km (1200 miles)	55 km (34 mph)	80 km (50 mph)	105 km (65 mph)	120 km (75 mph)	140 km (87 mph)
From 2000 km (1200 miles) to 4000 km (2400 miles)	Gradually increase the above limits up to the maximum permissible speed.				

After the first 500 km (300 miles) – 1500 km (900 miles)

- Change the engine oil.

Should the level fall below the minimum mark before the engine has covered 500–1500 km (300–900 miles), it will be necessary to change

the oil instead of topping up.

Recommended oil: Agip Sint 2000 SAE 10W/50.

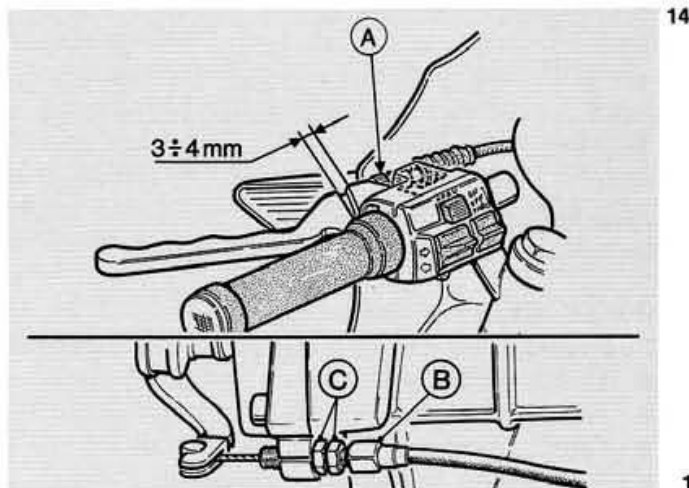
- Check tightness of all nuts and bolts.
- Adjust valve clearance.
- Check contact breaker gaps.
- Check the tire inflation pressure.

22 MAINTENANCE AND ADJUSTMENTS

Clutch lever adjustment (fig. 14)

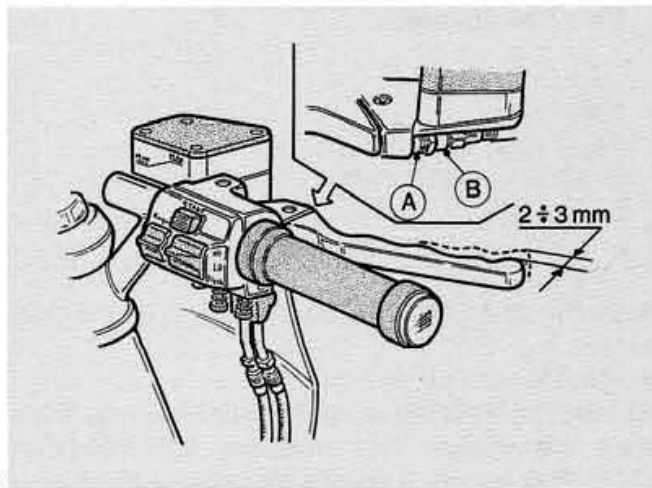
The free play between the clutch control lever and its mounting bracket should be 3 to 4 mm. If not then reset it by pulling back the rubber boot and adjusting knurled nut «A».

The setting can also be done thru'adjuster «B», by slackening locknuts «C» located on the right side of the transmission.



Front right brake lever adjustment (fig. 15)

A certain amount of free play is expected between the master cylinder-reservoir float and the actuating end of the control lever. This is adjusted by changing the number of washers «B» on the «STOP» pressure switch «A», located beneath the transparent master cylinder reservoir.



Checking brake pad wear

Every 5000 km (3000 miles) check that the brake pad thicknesses are:

- new pad 9 mm (0.35");
- minimum pad thickness 6 mm (1/4").

If a pad is below minimum thickness it must be replaced. The brake system does not need to be bled after pad replacement; it is sufficient to operate the brake lever («B» in fig. 16) several times, until the brake calliper pistons reach their correct positions. When replacing brake pads, check the condition of the brake lines, and replace them immediately if damaged.

NOTE - After pad replacement, it is advisable to use the brakes gently for the first 100 km (60 miles), to allow them to bed in correctly.

Brake fluid level check and change

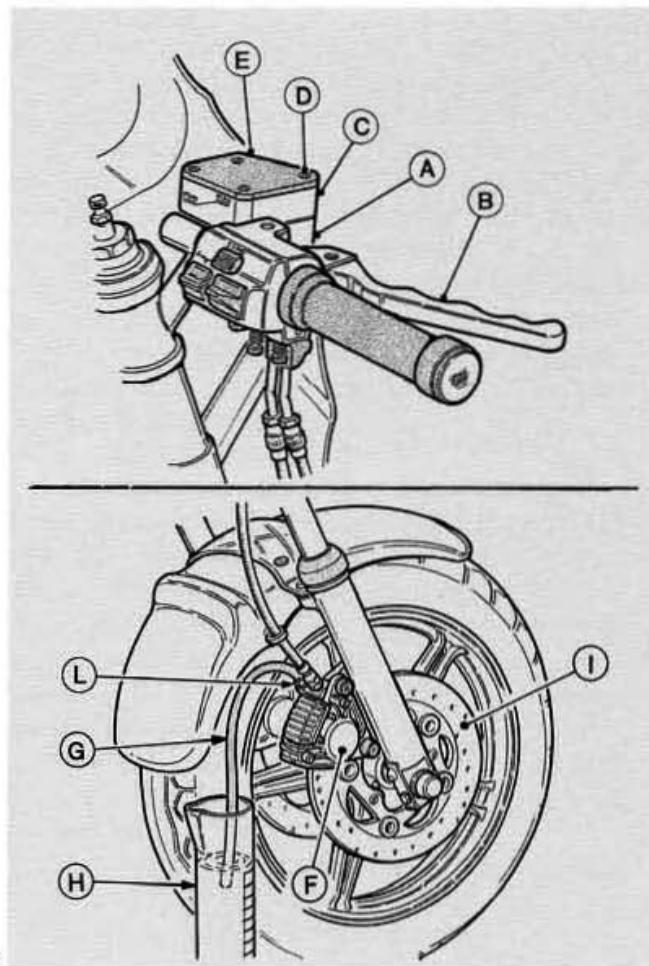
(figs. 16 and 17)

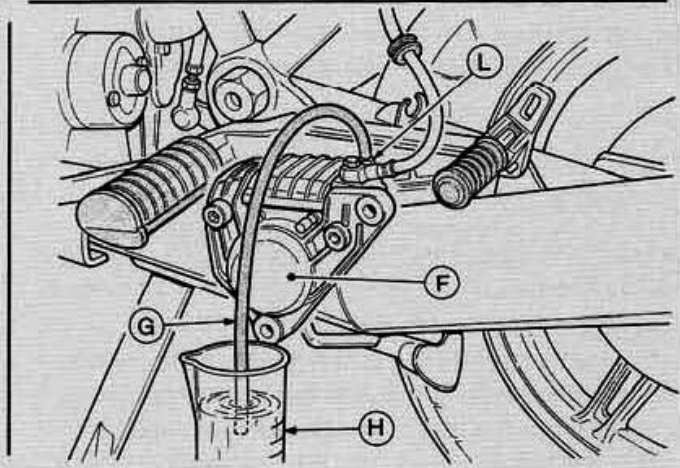
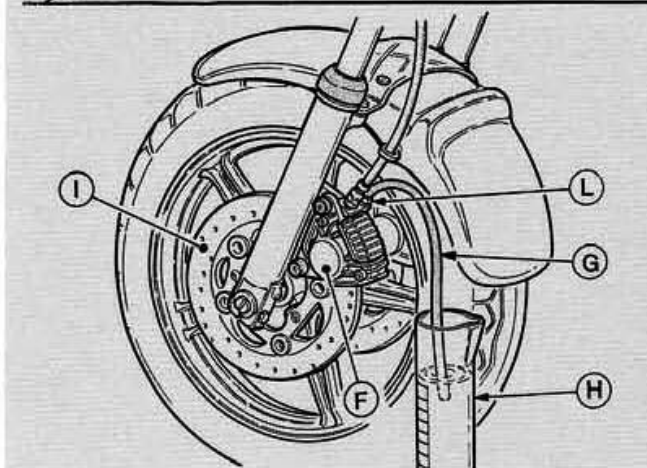
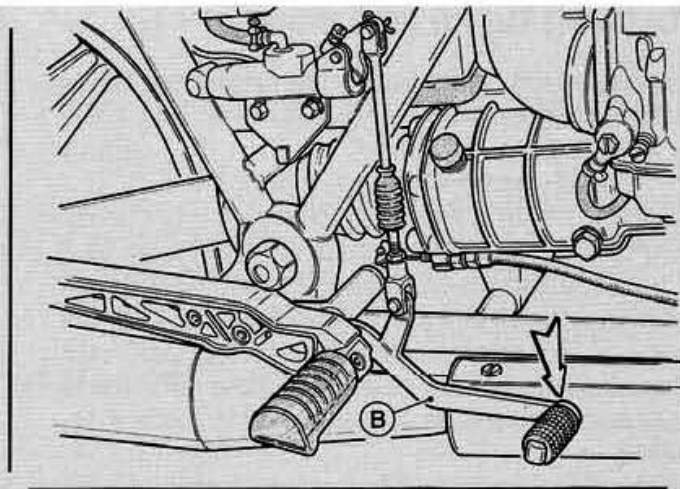
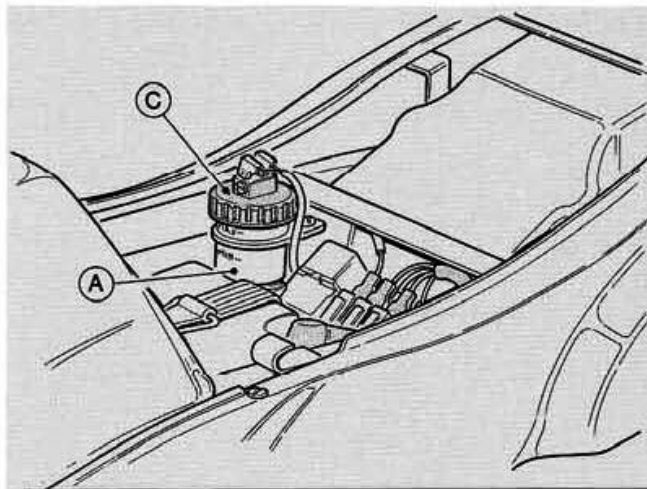
For max. brake efficiency, the following procedures should be carried out:

Front right side braking system (fig. 16)

1 Check frequently the brake fluid reservoir level, which should never fall below the transparent section «C» of the master cylinder reservoir «A».

2 Periodically or as necessary, top up the brake





fluid in reservoir «A», by undoing screws «D» of cap «E», and removing the diaphragm.

Top up only with brake fluid from well sealed containers that should be opened only when needed.

3 Every 15.000 km (9000 miles), or at least once a year, change the brake fluid.

For efficient brake operation, the system must always be full of fluid, with no entrapped air; if the travel of brake lever «B» is long and feels spongy, then suspect entrapped air.

To flush the brake system, use only new fluid.

Never dry out the system with spirit or compressed air; for metal parts trichloroethylene is recommended.

Fluid to be used: Agip F.1 Brake Fluid - SAE J 1703.

Rear and front left braking system (fig. 17)

As for the front right brake, except for paras. 1 and 2.

1 Low fluid level is shown by a panel indicator light (13 of fig. 3). Top up when illuminated.

2 Periodically or as necessary, top up the brake fluid of reservoir «A» by unscrewing cap «C» and disconnecting the wiring.

Bleeding the brake system (figs. 16 and 17)

The brake system must be bled if air is entrapped, as noted by the brake lever's or pedal's travel being long and feeling spongy.

Bleed as follows:

Front right braking system (fig. 16)

1 Put the motorcycle on its center stand.

2 Turn the handlebars until reservoir «A», which is integral with the master cylinder, is horizontal.

3 Top up reservoir «A», as necessary, taking care that its level remains above minimum during bleeding.

4 Bleed via calliper «F», as follows.

5 Remove the dust cap from bleed screw nipple «L», and fit to the nipple a suitable flexible transparent tube «G» which has its other end submerged in the same type of brake fluid, partially filling a transparent container «H».

6 Loosen bleed screw «L».

7 Pump brake lever «B» on the handlebars, several times, pausing between each pump. Continue this until the brake fluid pumped into container «H» via tube «G» is completely free from air bubbles.

8 Hold brake lever «B» in its depressed position, whilst tightening bleed screw «L»; then remove plastic tube «G» and replace the dust cap on the bleed nipple.

If the bleeding has been done correctly, after the initial travel of brake lever «B», a firm action without sponginess will be felt.

If this is not so, then repeat the above procedure.

Rear and front left braking system (fig. 17)

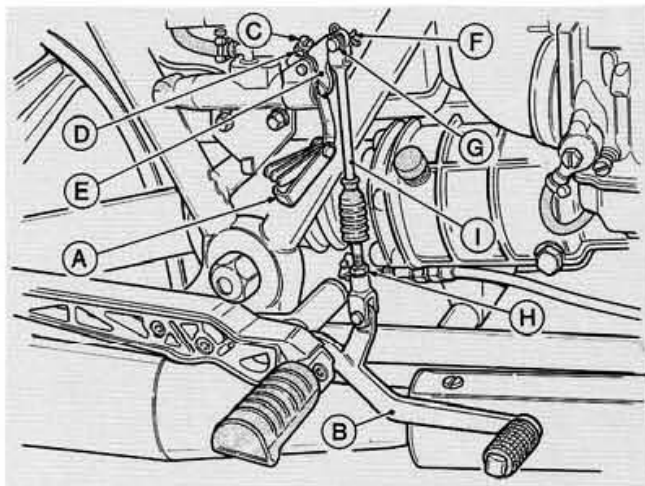
As for «front right hand braking system», except for paras. 2, 7 and 8:

- 26
- 7 operate brake pedal «B» etc.;
 - 8 keep brake pedal «B» depressed etc..

Rear and front left brake pedal adjustment (fig. 18)

Check the clearance between the master cylinder and lever «E» as follows:

- insert a feeler gauge «A» between master cylinder piston and lever end;
- correct clearance is 0.05 to 0.15 mm (0.002" to 0.006");



- to reset the clearance, loosen locknut «D» and adjust screw «C» as necessary.

To alter the height of the brake pedal «B»:

- remove split pin «F», slide out pin «G», loosen locknut «H», and screw tie rod «I» in or out as required;
- install pin «G» and its split pin «F»;
- then adjust screw «C» to reset the clearance between master cylinder and lever «E».

Rear suspension adjustment (figs. 19 and 20)

The stiffness of the rear suspension springs can be adjusted to three different settings with special wrench «A» (fig. 19).

The damping can also be adjusted, by turning disc «A» of fig. 20.

Depending on the need and on the weight carried by the bike, there are four different settings:

- position 1 - very soft for light loads;
- position 2 - for solo or two riders, on good roads (e.g. highways);
- position 3 - for solo sports riding, or for two riders plus baggage;
- position 4 - very hard, for two riders under heavy load conditions.

18 To compensate for aging of the dampers, which

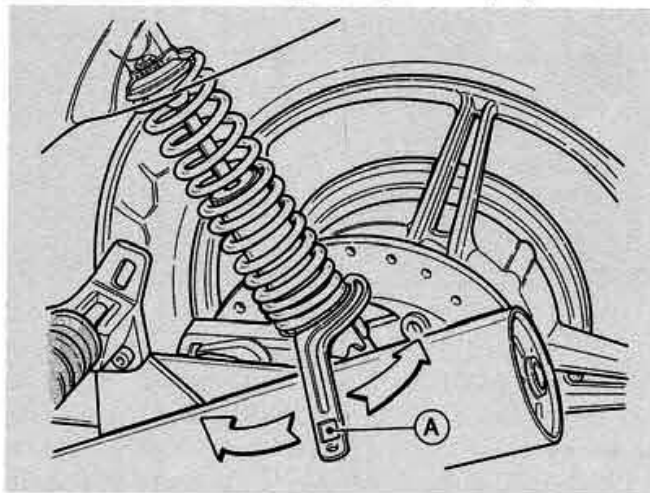
takes a considerable amount of usage, the setting may have to be one higher than those shown previously.

If the damping seems irregular, have them checked by one of our dealers.

NOTE - To retain stability it is always advisable to have both suspension units set the same, as regards both the damper setting disc and the spring stiffness setting.

Air-hydraulic shock absorbers (fig. 21)

The operating load pressure of the front shock absorbers is 1.5 to 2.5 kg/cm² (21 - 36 psi).

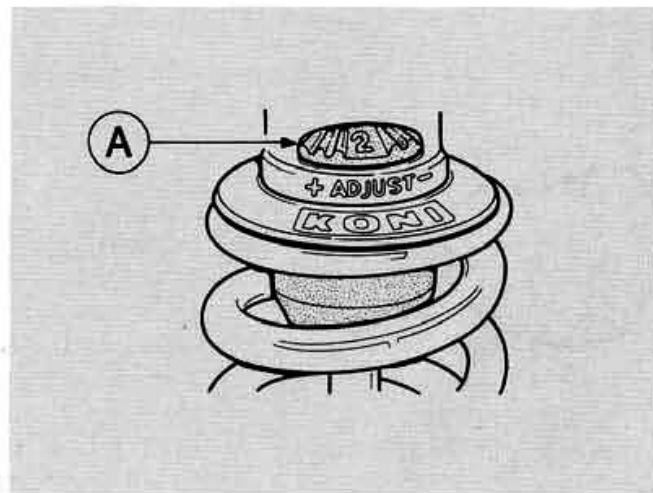


19

To check the pressure, the use of an accurate pressure gauge is recommended, with the connection tube as short as possible (ideally without a tube), since the internal volume of the tube itself affects the true pressure in the shock absorbers.

To ascertain by how much the tube reduces the shock absorber's internal pressure from that measured, simply take two successive readings; the difference between them shows accurately enough the pressure loss caused by every measurement. The measurement should be made with the motorcycle on its centre stand, and with cold shock absorbers; pressurise the shock absorbers only with de-humidified air.

27



20

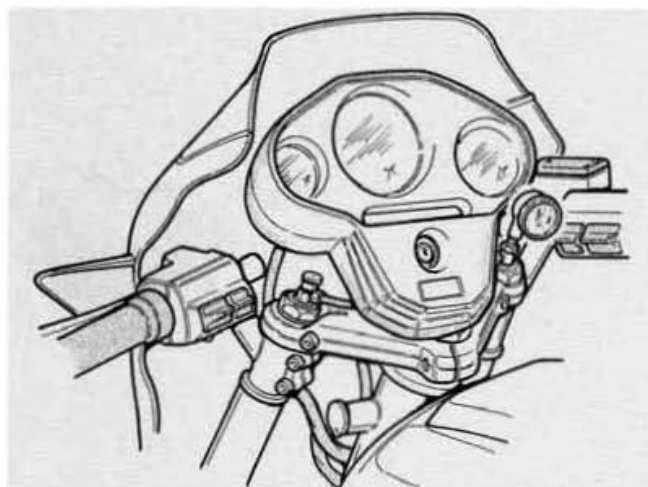
28 *NOTE - Our dealers have the necessary pressure gauges to check shock absorber pressures.*

Adjusting the steering (fig. 22)

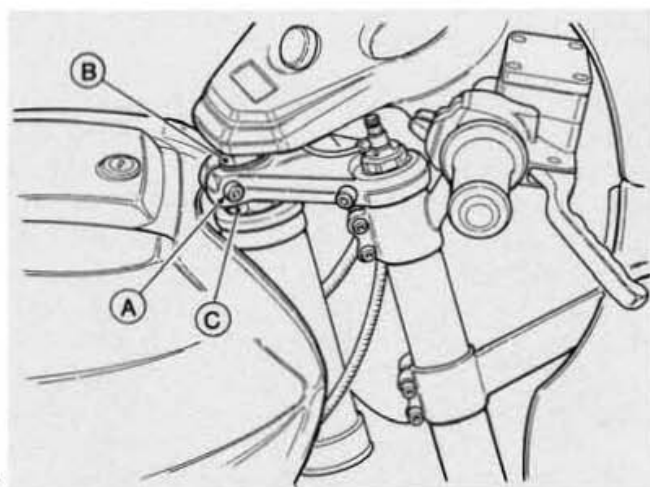
For safe riding, the steering must be adjusted so as to allow the handlebars to move freely, but without play. Adjust as follows:

- loosen steering head pinch screw «A»;
- undo steering head locknut «B»;
- rotate the adjustment nut «C» so that there is no play and the handlebars move freely.

Tighten nut «B» and the steering head pinch screw «A».
This adjustment is best done by our dealers.



21



22

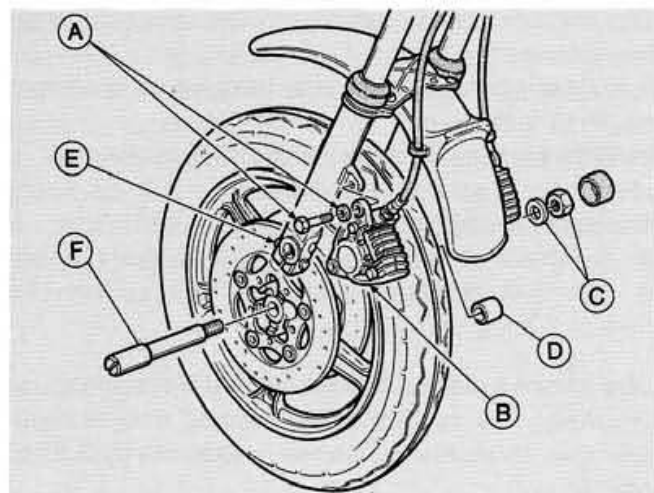
WHEEL REMOVAL

29

Front wheel (fig. 23)

To remove the wheel proceed as follows:

- place the vehicle on its center stand and keep the front wheel raised from the ground (by suitable method);
- undo screws «A» that secure the brake callipers to the fork, and remove the callipers «B» together with their hoses;
- undo spindle nut «C» on the right side;
- loosen fork spindle pinch screws «E»;



- withdraw spindle «F», noting how spacer «D» is fitted;
- remove the front wheel from the front fork legs;
- reassembly is the reverse of removal, taking care to position the spacer correctly; then repeatedly pump the brakes (lever and pedal) to reposition the calliper cylinder pistons.

NOTE - Depending on the type of tire used, it may be necessary to deflate it to remove the wheel.

Rear wheel (fig. 24)

To remove the rear wheel from the swing arm and final drive proceed as follows:

- place the vehicle on its center stand;
- undo nut «A» with washer «B» on the spindle, final drive side;
- loosen spindle pinch screw «D» on swing arm;
- withdraw spindle «C» from final drive, hub, and swing arm;
- undo screw «F» that secure brake calliper «G» to bracket «E» and remove the bracket;
- temporarily secure the calliper to the frame;
- incline the wheel and withdraw it from the swing arm and final drive.

- 30 *Reassembly is the reserve of removal, taking care to insert the calliper bracket assembly in the lug on the left member of the swing arm assembly.*

Wheel balancing

To improve stability and reduce vibration when at high speeds, the wheels must be balanced properly. To balance a wheel proceed as follow:

- mount the wheel, removed from vehicle, in a fork;
- rotate the wheel slowly several times, noting if it

always stops in different positions: this shows good balancing;

- if a certain point on the wheel often ends up at the bottom, then attach a suitable counterweight diametrically opposite to it;
- repeat this procedure until the wheel is correctly balanced.

Tires

Tires are one of the most important parts of the motorcycle to check.

The stability, riding comfort and even the rider's safety depend on them.

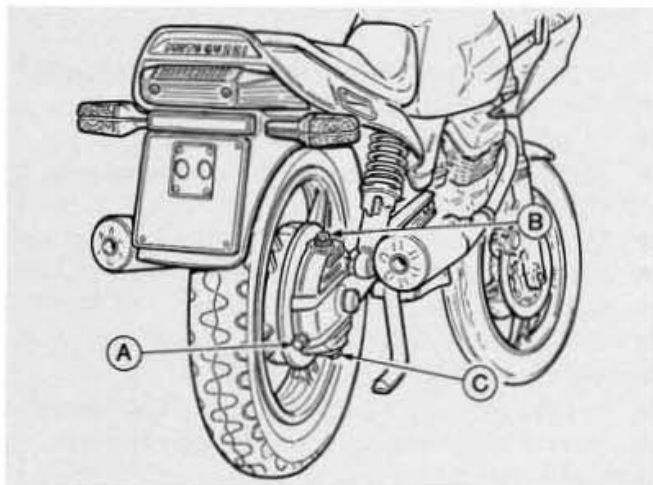
It is thus inadvisable to use tires when the tread depth is less than 2 mm (0.08").

Incorrect tire inflation pressure can also cause poor stability and excessive tire wear.

The recommended tire inflation pressures are:

- front: with one or two riders: 2.2 kg/cm² (31 psi);
- rear: with one rider: 2.4 kg/cm² (34 psi); with two riders: 2.7 kg/cm² (38 psi).

The above inflation pressures are for normal use (touring). For continual high speed use, or highway use, increase the above pressures by 0.2 kg/cm² (3 psi).



Removing and installing tires

The motorcycle has light alloy rims, which whilst being considerably strong mechanically, can be damaged by the use of incorrect tooling when removing or installing the tires. For this reason never use tools that have ribs or sharp corners where they are to touch the rim edges; the contact surface should be wide, smooth and with rounded edges. Using commercially available lubricants for this purpose, eases the manipulation and bedding in of the tires on the rims during removal and replacement, whilst reducing the leverage needed on the tools. It is also very important for the tire beads to be properly bedded into the rim center groove.

During tire replacement, it is important to take care that tires marked with an arrow on their side wall must be mounted:

- with the arrow facing in the direction of forward travel, for the rear wheel;
- with the arrow facing opposite to the direction of forward travel, for the front wheel.

32 SERVICE SCHEDULE

ITEMS ▼	MILEAGE COVERED ▶	900 mi. (1500 km)	1800 mi. (3000 km)	3700 mi. (6000 km)	5600 mi. (9000 km)
● Engine oil		R	R	R	R
● Oil filter cartridge		R			
● Gauze oil filter		C			
● Air cleaner				C	R
● Ignition timing		A	A	A	A
● Spark plugs		A	A	A	R
● Valve clearance		A	A	A	A
● Carburettor settings		A	A	A	A
● Nut and bolt tightness		A			
● Fuel tank, filters and pipes					C
Transmission oil		A	A	A	R
Final drive oil		A	A	A	R
Wheel and steering bearings					
Front fork oil					
Starter and generator					
Brake fluid		A	A	A	A
Brake pads		A	A	A	A

A = Maintenance - Inspection - Adjustment - Possible replacement - Servicing / C = Cleaning / R = Replacement.

● Operation required for maintaining the vehicle according to emission regulations (USA).

Occasionally, check the electrolyte level in battery, lubricate joints and cables; every 500 km (300 miles) check the engine oil level. In any case, replace this oil at least once a year.

7500 mi. (12.000 km)	9400 mi. (15.000 km)	11.300 mi. (18.000 km)	13.200 mi. (21.000 km)	15.100 mi. (24.000 km)	17.000 mi. (27.000 km)	18.900 mi. (30.000 km)
R	R	R	R	R	R	R
	R					R
	C					C
	C	R			R	
A	A	A	A	A	A	A
A	A	R	A	A	R	A
A	A	A	A	A	A	A
A	A	A	A	A	A	A
	A					A
		C			C	
A	A	R	A	A	R	A
A	A	R	A	A	R	A
			A			
			R			
			A			
A	R	A	A	A	A	R
A	A	A	A	A	A	A

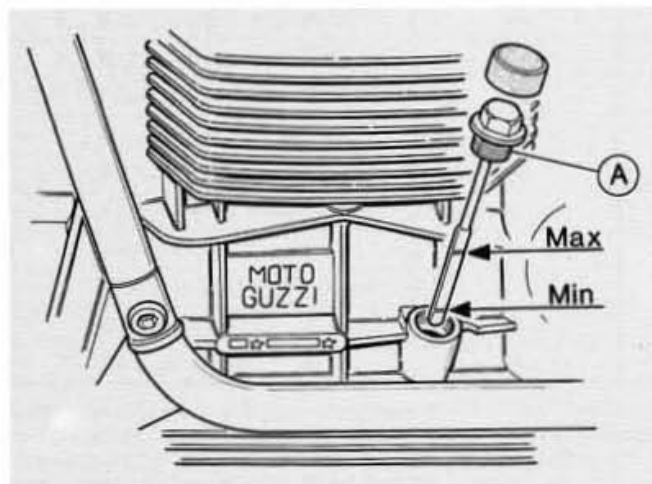
34 LUBRICATION

Engine lubrication (fig. 25)

Oil level check

Every 500 km (300 miles) check the engine oil level in the crankcase: the correct oil level is indicated by the upper mark on the dipstick attached to plug «A». If lower than this level, top up with oil of the recommended quality and grade.

This check should be done after the engine has been run for a few minutes: dipstick plug «A» should be screwed in fully for the check.



Oil change

After the first 500 - 1000 km (300 - 600 miles) and then every 3000 km (2000 miles) approx., change the engine oil. This is done with the engine warm, allowing the oil to drain thoroughly, before refilling with new oil.

«A» oil filler plug and dipstick (fig. 25).

«B» oil drain plug (fig. 26).

Quantity required: 3 liters (6.3 pints) of «Agip SINT 2000 SAE 10W/50».

Changing oil filter cartridge and cleaning the gauze filter (fig. 26)

Every 15.000 km (9000 miles or 5 oil changes) change the filter cartridge as follows:

- undo plug «B» and allow the oil to drain fully from the sump;
- undo the sump securing screws and remove sump «C» from the crankcase, complete with cartridge filter «A», gauze filter «D» and oil pressure relief valve «E»;
- unscrew cartridge filter «A» and replace with an original Moto Guzzi filter.

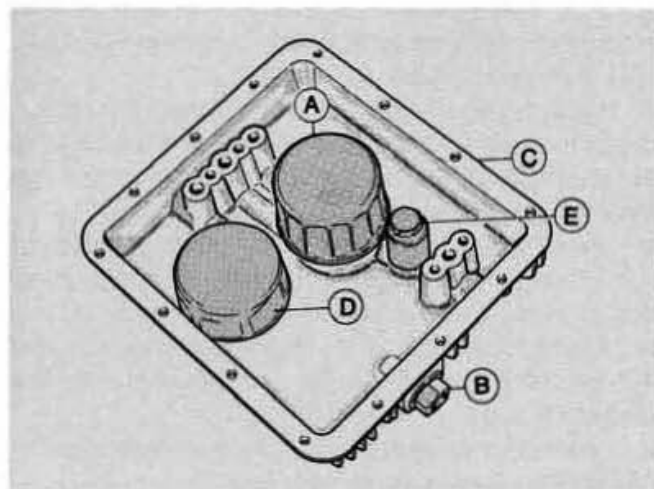
25 At the same time as changing cartridge «A», it is con-

venient to remove the gauze filter «D», wash it in a bath of gasoline and dry it with compressed air. Before installing it, blow through the sump oil ducts with compressed air. Use a new sump gasket when installing the sump. *These jobs are best done by our dealers.*

Transmission lubrication (fig. 27)

Oil level check

Every 3000 km (2000 miles), check that the oil is just level with plug hole «B». If below, top up with oil of the recommended quality and grade.



26

Oil change

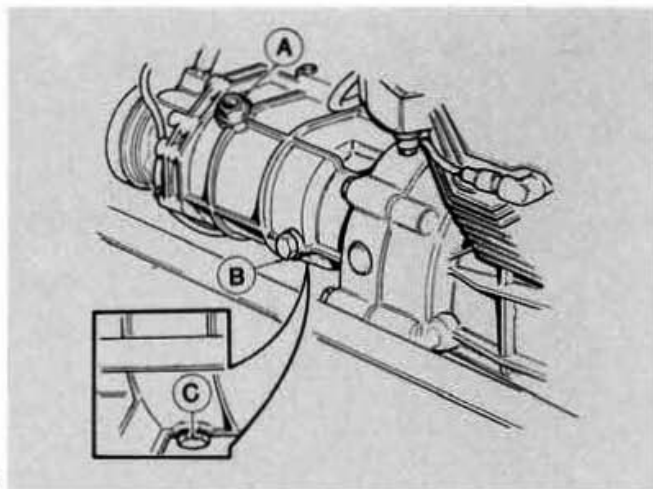
Every 10.000 km (6000 miles) change the transmission oil. This should be done with the engine warm, when the oil is less viscous and so drains better. Allow the transmission oil to drain completely before refilling.

«A» Oil filler plug.

«B» Oil level plug.

«C» Oil drain plug.

Quantity required: 0.75 l (1½ pints) of «Agip Rotra MP SAE 80W/90».



27

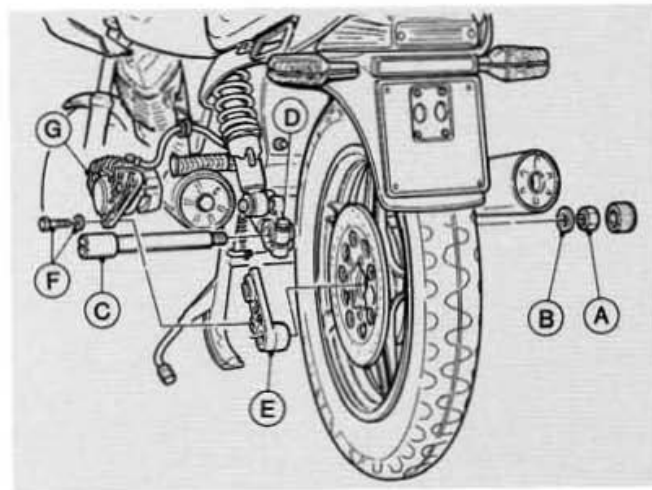
36 Final drive lubrication (fig. 28)

Oil level check

Every 3000 km (2000 miles) check that the oil is just level with plug hole «A». If it is below, top up with oil of the recommended quality and grade.

Oil change

Every 10.000 km (6000 miles) change the final drive oil. This should be done with the engine warm, when the oil is less viscous and so drains better. Allow the final drive oil to drain completely before re-filling.



«A» Oil level plug.

«B» Oil filler plug.

«C» Oil drain plug.

Quantity required: mixture of:

0.23 l (½ pint) of «Agip Rotra MP SAE 80W/90» and
0.02 l (0.05 pint) of «Agip Rocol ASO/R».

Front fork lubrication (fig. 29)

Change the fluid in the front fork legs as follows:

- with the motorcycle on its center stand, loosen steering head pinch screw «C»; disconnect the equalizer tube and completely unscrew head cap «B»; then remove drain plug «A»;

- lightly press downward on the front of the motorcycle, to push out head cap «B» which is attached to the shock absorber body. Be careful not to damage the instrument panel;

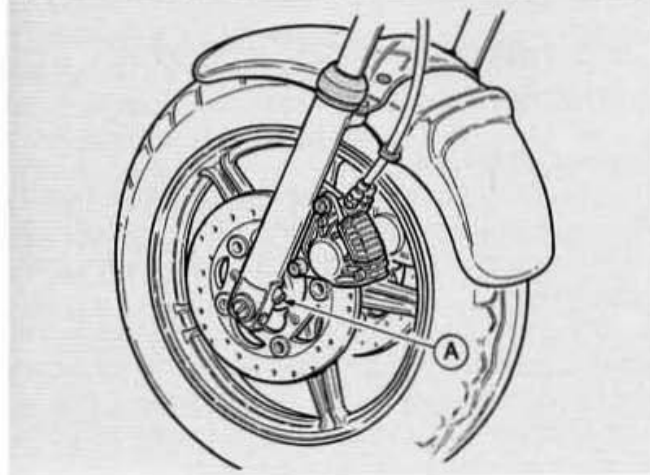
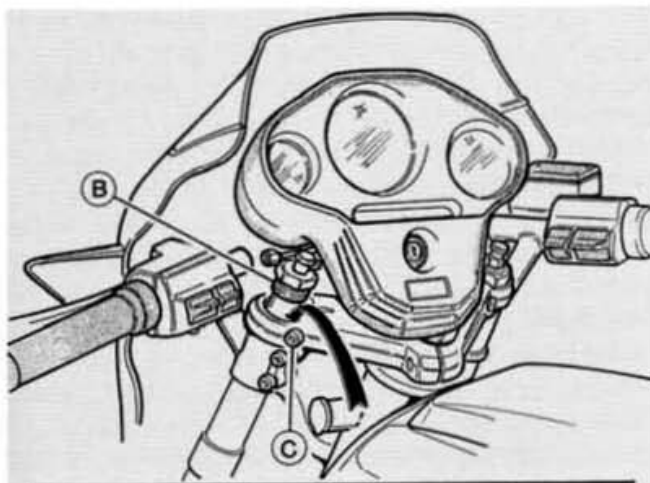
- install plug «A» and refill with 150 cc of «Agip F.1 ATF Dexron» via the space between the fork arm inner cylinder and the shock absorber body;

- release the front of the bike, refit cap «B» and tighten the pinch screw. Repeat the above for the other fork leg;

- reconnect the equalizer tube and repressurise the shock absorbers as required.

Lubrication of Steering Head and Swing Arm Bearings

These operations are best done by our dealers.



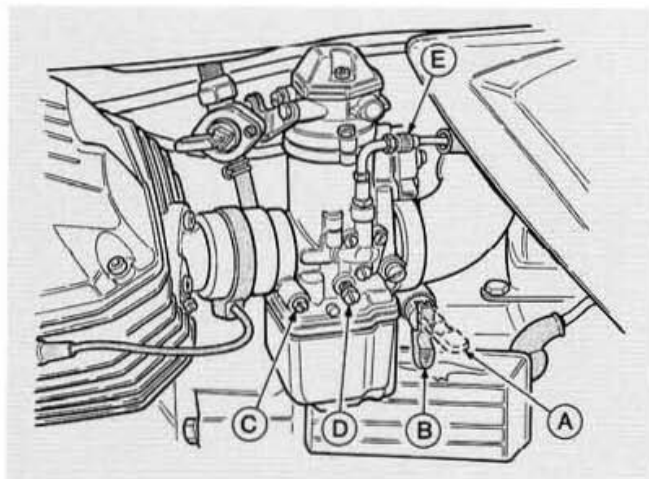
38 FUEL SYSTEM

Carburetors (fig. 30)

There are two Dell'Orto type «PHM 40 ND» (right) and «PHM 40 NS» (left) carburetors.

Controls

Throttle grip control on right side of handlebars.
«Starter» choke lever for cold starts on left side of crankcase;
«A» cold start position;
«B» normal position.



Carburetor Data

Venturi	40 mm dia. (1.57")
Throttle valve	60.5
Atomizer	268 AB
Main jet	145
Idle jet	57
Starter jet	60
Pump jet	35
Needle	K 19 (3rd notch)
Float	10 gr (0.35 oz)
Idling screw adjustment:	open 1½ turns.

Carburetor and idling speed adjustment (fig. 30)

Proceed as follows:

1 Check that the choke lever is in normal position «B», and that there is about 3 mm ($\frac{1}{8}$ ") play between cable terminals and adjuster screws «E» on both carburetors.

2 With the throttle closed, check that there is 1 to 1.5 mm (0.04 to 0.06") play between cable terminals and adjuster screws «F» (fig. 5), handlebars end, on both carburetor cables, to adjust loosen locknuts «I» and turn screws «F» as necessary.

Then tighten locknuts «I»;

3 run the engine to warm-up temperature. Screw in fully idle mixture control screws «C» and back off through 1½ turns;

4 using both hands, check that the exhaust pressures are equal. If there is a noticeable difference, adjust screw «D» on one carburettor until equal pressure is obtained (idling speed should be 1000 - 1100 rpm, therefore it may be necessary to either screw in the carburettor screw of the cylinder with the lower pressure, or back off the carburettor screw of the cylinder with the higher pressure);

5 adjust screws «C» to obtain optimum carburation for each cylinder (shown by an increase in speed) and then reset the idling speed as per para. 4;

6 disconnect each spark plug lead in turn, checking that the engine turns over a similar number of times in each case, prior to stalling.

If this is not so, then back off carburettor screw «D» of the cylinder that makes the engine turn over more times or screw in the carburettor screw of the cylinder that makes the engine turn over fewer times;

7 set the idling speed to 1000 - 1100 rpm by adjusting both screws «D» by an equal amount;

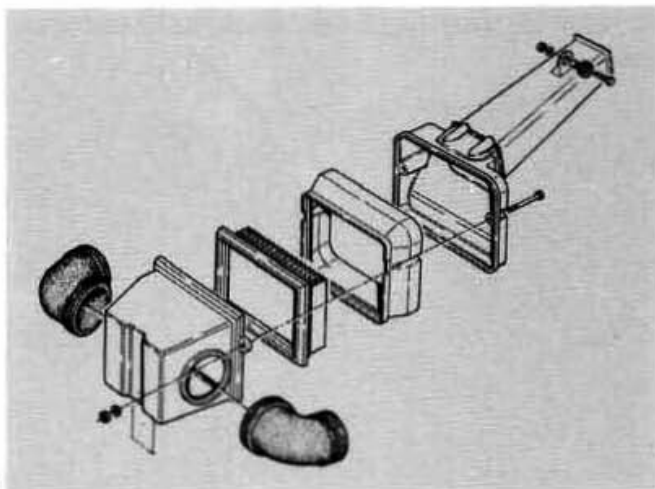
8 ensure that the throttle valves are balanced as follows: have an assistant accelerate gently and progressively whilst checking with both hands that the exhaust pressures increase simultaneously.

If the pressure in one cylinder increases in advance (of the other), adjust its throttle cable setting by loosening locknut «I» (fig. 5) and screwing in cable adjuster nut «F» until synchronization is achieved.

NOTE - For precise tuning, our dealers use a vacuum gauge.

Cleaning Fuel Tank, Fuel Cocks, Fuel Filters and Lines

Every 10.000 km (6000 miles) or when irregular fuel



- 40 supply is suspected, clean the fuel tank, cocks, carburetor filters, and fuel lines.
Filters are best cleaned with gasoline and compressed air.

Changing the Air Cleaner (fig. 31)

Every 6000 km (3700 miles) check and if necessary clean the air cleaner with compressed air.

Every 9000 km (5600 miles) the cleaner should be changed.

The cleaner is housed together with an oil breather, on top of the engine.

The cleaner cartridge is best changed by our dealers.

VALVE GEAR

41

Valve clearance (fig. 30)

After the first 500 - 1500 km (300 - 900 miles) and then after every 3000 km (1800 miles), or when the valves are noisy, check the clearance between valves and rockers.

This check is done on a cold engine, with the piston at top dead centre (T.D.C.) at the end of the compression stroke (valves fully closed).

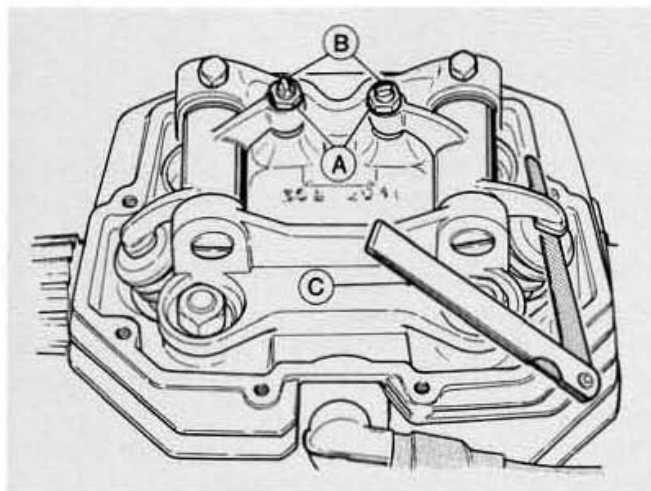
Remove the rocker cover and proceed as follows:

- 1 loosen nut «A»;
- 2 adjust screw «B» to set the following clearances, using a feeler gauge «C».

- Intake valve 0.20 mm (0.008").
- Exhaust valve 0.25 mm (0.010").

Note that excessive clearance causes noise, whereas with insufficient clearance the valves do not close fully causing:

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

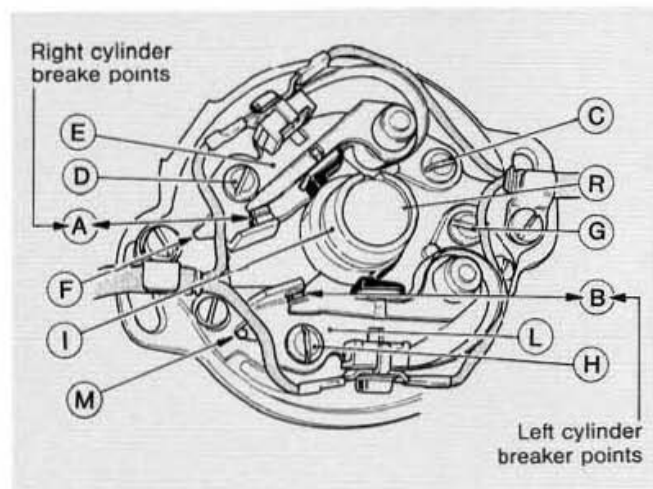


42 IGNITION SYSTEM

Servicing, Checking and Adjusting Double Contact Breaker (fig. 33)

Servicing

Every 3000 km (2000 miles), wet cam felt pad «R» with a few drops of engine oil.



Checking

- Undo the contact breaker cover securing screws and remove the cover.
- If points «A» (right cylinder) or «B» (left cylinder) are dirty or oily, clean them with a rag moistened with gasoline.
- If the points are worn, they must be replaced.
- Check the point gaps of both contact breakers «A» (right cylinder-red wire) and «B» (left cylinder-green wire): the gaps must be 0.37-0.43 mm (0.014-0.017").

Setting the gaps

Points «A» - right cylinder

Bring cam «I» to its maximum lift, loosen screws «C» and «D», and by levering against lug «F», move plate «E» as necessary.

When the gap is correct, tighten screws «C» and «D».

Points «B» - left cylinder

Bring cam «I» to its maximum lift, loosen screws «G» and «H», and by levering against lug «M», move plate «L» as necessary.

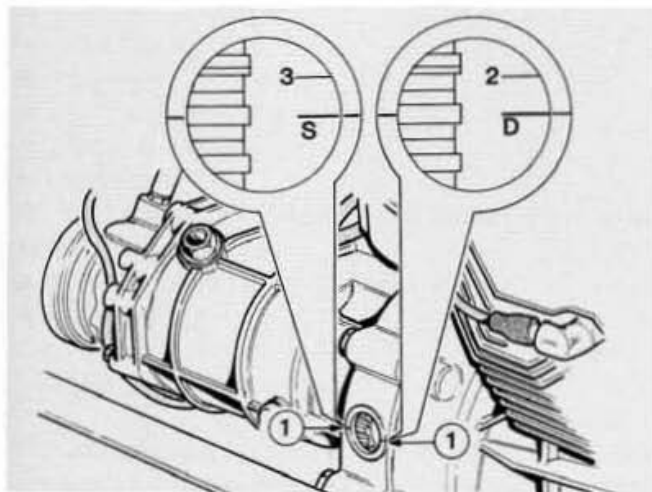
When the gap is correct, tighten screws «G» and «H».

33 Subsequently, check ignition timing.

Checking and Adjusting Static Ignition Advance (fig. 34)

Checking

- Remove the rubber plug from the inspection hole on the right side of the transmission housing, over the flywheel.
- It is best to use a timing light to find the precise moment when points «A» and «B» fig. 33) begin to open; connect the light across the supply terminal of the contact breaker being checked and ground.



34

Timing the right cylinder (fig. 34)

- Rotate the flywheel in the direction of engine rotation (counterclockwise) until the piston is at the end of its compression stroke (valves closed). In this position, mark «D» stamped on the flywheel (T.D.C. of the right cylinder) should coincide with mark «1» on the inspection hole rim.
 - Rotate the flywheel clockwise until mark «2» (static advance) coincides with mark «1» on the inspection hole rim.
- At this point, contact breaker points «A» should start to open (fig. 33).

Timing the left cylinder (fig. 34)

- Rotate the flywheel in the direction of engine rotation (counterclockwise) until the piston is at the end of its compression stroke (valves closed). In this position, mark «S» stamped on the flywheel (T.D.C. of the left cylinder) should coincide with mark «1» on the inspection hole rim.
 - Rotate the flywheel clockwise until mark «3» (static advance) coincides with mark «1» on the inspection hole rim.
- At this point, contact breaker points «B» should start to open (fig. 33).

Ignition advance setting

- Initial (static) advance
- Automatic advance

$8 \pm 1^\circ$
 $26 \pm 2^\circ$

- 44 ■ Full advance (static + automatic) $34 \pm 2^\circ$
Contact breaker points gap: 0.37 - 0.43 mm (0.014 - 0.017").
Contact breaker point gap setting and ignition timing are best done by our dealers.

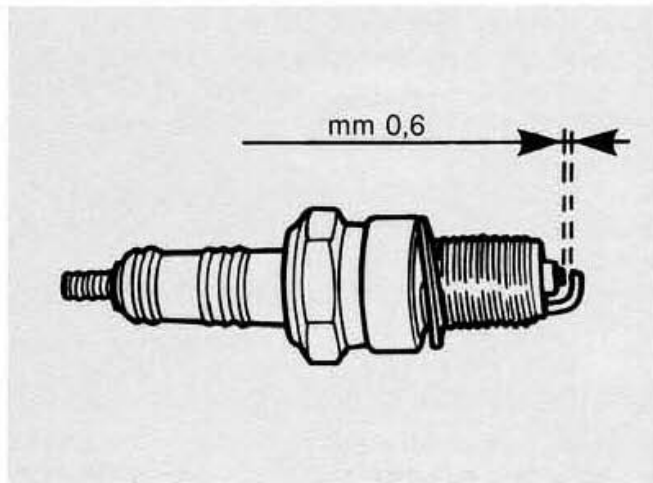
Spark plugs (fig. 35)

The type of spark plugs to be used is Bosch W5 DC.
Points gap: 0.6 mm (0.020").
Cleaning: use gasoline, wire brush, and a needle to clean internally.

When installing the spark plugs, start them correctly by hand through a few turns, and then tighten with the plug wrench supplied. If badly inserted, the plugs will cause the cylinder head thread to be stripped.

Do not overtighten plugs.

Every 9000 km (6000 miles) change the spark plugs, even if they appear to be in good condition.



The electrical system consists of:

- battery;
- starter with solenoid engagement;
- alternator, fitted on front end of crankshaft;
- double contact breaker with centrifugal automatic advance;
- ignition coils;
- rectifier;
- voltage regulator;
- fuse unit (6 fuses 15 A);
- turn signal relay;
- starter solenoid;
- headlight;
- tail light;
- turn signal lights;
- ignition switch;
- light switch;
- turn signal light switch, horn button, and hazard warning light switch;
- engine start and stop button;
- electric horn.

Battery

The battery is a 12 V type with 24 Ah capacity. It is charged by the alternator.

Access to the battery is obtained by:

- unlocking and lifting the saddle;
- releasing the rubber straps and disconnecting the wiring.

Activation of dry charged batteries

Dry charged batteries retain their charge for a long time if kept with their filler plugs tight, in a dry environment at 20° to 30° C. They are put into service as follows:

1 fill the cells with sulphuric acid of specific gravity 1.27, at 25° C, to 5 mm above the plates, or to the level indicated;

2 leave for 1 hour, then top up with the same acid. The battery is now ready for use.

For a longer battery life, it is best to check the acid specific gravity in all of the cells.

If any reading is below 1.26 then the battery should be given a booster charge at $\frac{1}{5}$ of the rated current as shown in the catalogue. 5 hours are recommended, and normally sufficient. The battery temperature should not exceed 45° C; if this happens, then reduce the current, and increase the charging time. Stop charging when the specific gravity has reached 1.27 - 1.28 at 25° C and has remained steady for 3 readings taken at half-hour intervals.

Maintenance of batteries in service

Dry charged batteries, once given a booster charge or received wet, are maintained as follows:

- at least once a month, top up with **distilled water** (never acid) to 5 mm above the plates, with the battery horizontal and at rest;
- keep the terminals clean and tight, and smeared with petroleum jelly;
- keep the top of the battery dry, avoiding acid spillage, which would damage the insulation and corrode the battery brackets and housing;
- make sure that the motorcycle battery charging circuit does not give excessive or insufficient current, bearing in mind that the acid specific gravity should be between 1.24 and 1.27. If it isn't, then check the insulation and efficiency of the charging and starter system;
- wet batteries, in store should be periodically recharged at $\frac{1}{10}$ the rated current; moreover the acid level should be kept topped up, and the specific gravity should be 1.27 (at 25° C) at all times;
- when in use, the battery should be positively strapped ensuring that the anti-vibration mounts are efficient.

NOTE - For use in tropical climates (average temperature higher than 33° C) it is advisable to reduce the acid specific gravity to 1.23.

Light bulb replacement

Headlight (figs. 36 and 37)

To replace the headlight bulbs, disconnect the wiring from behind the lamp unit, remove protective rubber boot «G», and take out bulb «D» by turning spring «E».

After installation, check that no other wires have been accidentally disconnected (especially the parking light wires).

The parking light and holder «F» are push fitted.

Tail Light (fig. 38)

Undo reflector screw «A», then push, turn and withdraw the bulb from its holder.

Front Turn Signal Lights (fig. 37)

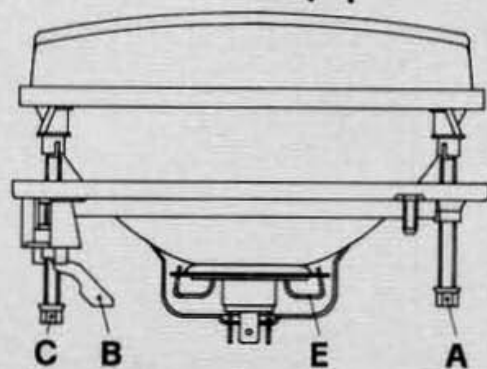
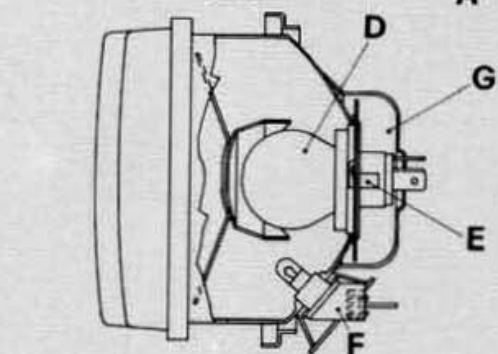
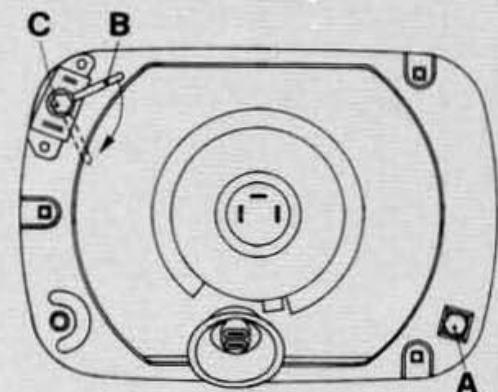
Undo screws «A» securing the turn signal lens to the front cowling, and remove the lens. The bulbs are push fits.

Rear Turn Signal Lights (fig. 38)

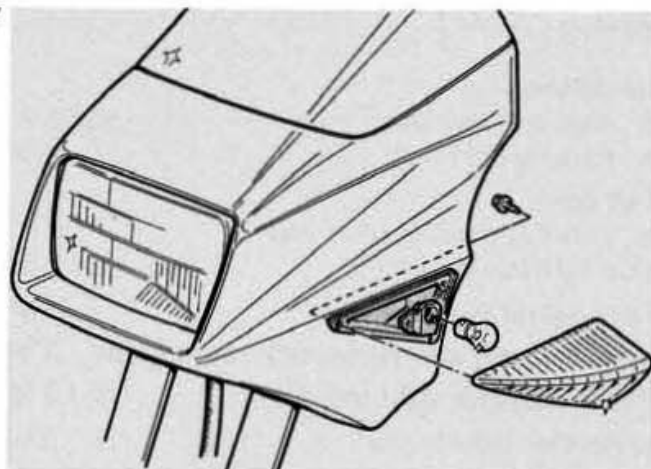
The turn signal lenses are snap fits. They can be removed by levering a screwdriver in the recesses indicated by arrows. The bulbs can then be replaced.

Speedometer, Odometer, Tachometer, Voltmeter, and Panel Indicator Lights

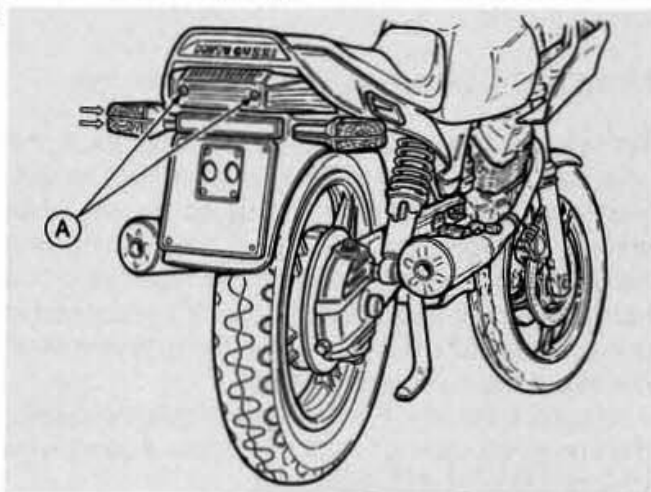
Pull out the bulb holders to replace the bulbs.



37



38



36

47

48 Bulbs

Headlight:

- high and low beam bulb 55/60 W
- parking light bulb 4 W

Tail light:

- parking, number plate and stop light bulbs 5/21 W

Turn signal light bulbs 21 W

Speedometer and tachometer light bulbs 3 W

Panel indicator light bulbs 1.2 W

Voltmeter light bulbs 3 W

Headlight beam adjustment (fig. 36)

For safe riding and not to trouble crossing riders, the headlight has always to be kept at correct height. Horizontal setting is adjusted by screw «A» while vertical setting is adjusted by «C» until the correct height is reached. The center of the high beam has not to be higher than 0.833 m (32.79") measured at 3 m distance (abt. 3.3 yards) with the motorcycle off the stand the rider in the saddle.

Acting on lever «B», it is possible to quickly change the horizontal setting to suit it to the load conditions (1 or 2 persons on the saddle).

WIRING DIAGRAM

50 Wiring diagram legend

- 1 Headlight.
- 2 High and low beams (55/60 W bulbs).
- 3 Parking light (4 W bulb).
- 4 Connector block, 15 way (Molex).
- 5 Connector block, 9 way (Molex).
- 6 Connector block, 9 way (Molex).
- 7 Ignition switch, 3 positions.
- 8 Voltmeter (3 W bulb).
- 9 Speedometer (3 W bulb).
- 10 Tachometer (3 W bulb).
- 11 Indicator light, right turn signal (1.2 W bulb).
- 12 Indicator light, brake fluid level (1.2 W bulb).
- 13 Indicator light, oil pressure (1.2 W bulb).
- 14 Indicator light, alternator (1.2 W bulb).
- 15 Indicator light, neutral (1.2 W bulb).
- 16 Indicator light, parking lights (1.2 W bulb).
- 17 Indicator light, headlight (1.2 W bulb).
- 18 Indicator light, left turn signal (1.2 W bulb).
- 19 Hazard warning light switch.
- 20 Turn signal light, front right (21 W bulb).
- 21 Turn signal light, front left (21 W bulb).
- 22 Turn signal light, rear right (21 W bulb).
- 23 Turn signal light, rear left (21 W bulb).
- 24 High beam, low beam, flash, engine start switch unit.
- 25 Horn, lighting and turn signal switch unit.
- 26 Two-tone horn.
- 27 Front brake stop light pressure switch.
- 28 Rear brake stop light pressure switch.
- 29 Rectifier.
- 30 Alternator (14 V 20A21).

- 31 Voltage regulator.
- 32 Battery.
- 33 Starter relay.
- 34 Starter.
- 35 Fuse unit.
- 36 Rear stop light.
- 37 Number plate/rear parking light.
- 38 Tail light.
- 39 Flasher unit (12 V 42/92 W).
- 40 Brake fluid level indicator sending unit.
- 41 Neutral indicator sending unit.
- 42 Oil pressure indicator sending unit.
- 43 Ignition coils.
- 44 Spark plugs.
- 45 Contact breaker.
- 46 Horn relay.
- 47 Resistor (80 Ω - 2 W).

Fuse 1: hazard warning lights.

Fuse 2: turn signal lights, parking lights, panel lights, parking lights indicator.

Fuse 3: high and low beam, front brake stop light pressure switch, voltmeter, indicator lights for neutral, generator, engine oil pressure, brake fluid level.

Fuse 4: horn relay.

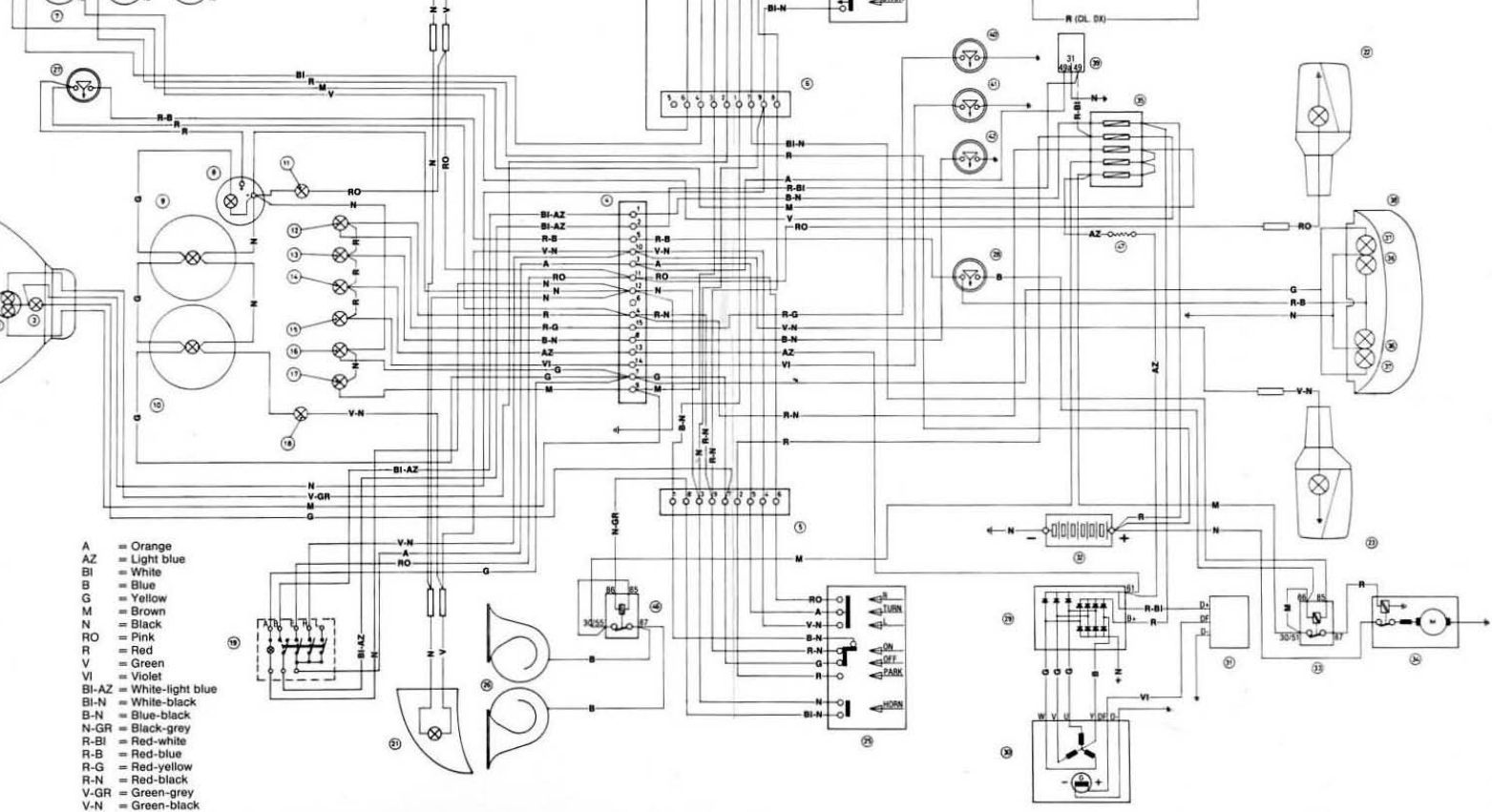
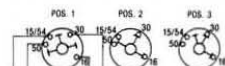
Fuse 5: starter relay, rear brake stop light pressure switch.

IGNITION SWITCH POSITIONS

Position 1: No contact (off)

Position 2: Contact on all terminals (on)

Position 3: Contact on terminals 16 and 30



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