WORKSHOP MANUAL

Additions to the Workshop manual for the models V1000 G5 e 1000 SP - Cod. 17 92 01 61
The illustrations and description 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.
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### ENGINE
- Cylinder configuration: 90° V-twin
- Bore: 88 mm
- Stroke: 78 mm
- Capacity: 948.8 cc
- Compression ratio: 9.2:1
- Max. torque: 7.7 kgm at 5200 rpm

### VALVE GEAR
O.H.V. push rod operated rocker arms

### CARBURETTORS
2 Dell’Orto carburettors PHF 30 DD (right) and PHF 30 DS (left)

### LUBRICATION
Pressure feed by gear pump
Wire mesh and cartridge filters on oil sump
Normal lubrication pressure 3.8-4.2 kg/cm² (pressure valve on oil sump)
Low oil pressure sensor (electrical) on oil crankcase

### GENERATOR ALTERNATOR
On front of crankshaft (14V-20A)

### IGNITION
Battery-coil ignition, double contact breaker with automatic advance.
- Ignition timing
  - Ignition advance (fixed) 2° ± 1°
  - Full advance (static and automatic) 33° ± 1°
- Contact breaker points gap: 0.37-0.43 mm
- Spark plugs: Marelli CW 7 LP; Bosch W 7 D; Bosch W 7 DC; Champion N9 Y; Lodge HLNY.
- Spark plug gap: 0.6 mm
- Ignition coils 2 mounted on frame.

### STARTER
Electric starter motor (12 V - 0.7KW) with electromagnetic ratchet control. Pinion fixed to flywheel. START push-button on right handlebar.

### TRANSMISSION

#### CLUTCH
Dry, twin driven plates. Located on engine flywheel. Clutch lever on left handlebar.

#### PRIMARY DRIVE
By gears, 1:1.235 (Z = 17/21)

#### GEARBOX
5-speed, front engaging, constant mesh. Incorporated Cush drive. Control pedal on left side of machine.

<table>
<thead>
<tr>
<th>Gear</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>1 : 2 (Z = 14/28)</td>
</tr>
<tr>
<td>2nd</td>
<td>1 : 1.368 (Z = 18/25)</td>
</tr>
<tr>
<td>3rd</td>
<td>1 : 1.047 (Z = 21/22)</td>
</tr>
<tr>
<td>4th</td>
<td>1 : 0.869 (Z = 23/20)</td>
</tr>
<tr>
<td>5th</td>
<td>1 : 0.750 (Z = 28/21)</td>
</tr>
</tbody>
</table>

#### FINAL DRIVE
Cardan shaft with gears

<table>
<thead>
<tr>
<th>Gear</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>1 : 11,643</td>
</tr>
<tr>
<td>2nd</td>
<td>1 : 8,080</td>
</tr>
<tr>
<td>3rd</td>
<td>1 : 6,095</td>
</tr>
<tr>
<td>4th</td>
<td>1 : 5,059</td>
</tr>
<tr>
<td>5th</td>
<td>1 : 4,366</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overall ratios (engine-wheel)</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st gear</td>
<td>1 : 11,643</td>
</tr>
<tr>
<td>2nd gear</td>
<td>1 : 8,080</td>
</tr>
<tr>
<td>3rd gear</td>
<td>1 : 6,095</td>
</tr>
<tr>
<td>4th gear</td>
<td>1 : 5,059</td>
</tr>
<tr>
<td>5th gear</td>
<td>1 : 4,366</td>
</tr>
<tr>
<td>1 : 5.333 (Z = 6/32)</td>
<td></td>
</tr>
</tbody>
</table>
FRAME

Modular duplex tubular cradle

SUSPENSION

- Front: «MOTO-GUZZI patented» hydraulically damped telescopic forks.
- Rear: swinging arm with adjustable helical springs around adjustable hydraulic damper.

WHEELS

- Front: 18 MT 2.50 H2
- Rear: 18 MT 3.00 H2

TYRES

- Front: 110/90 V18
- Rear: 120/90 V18
Type: TUBELESS or TUBE-TYPE

BRAKES

  - Φ disc 300 mm;
  - Φ brake cylinder 38 mm;
  - Φ master cylinder 13 mm.
- Rear: floating disc with fixed caliper, twin brake cylinder. Brake pedal on centre-right of motorbike;
  - Φ disc 270 mm;
  - Φ brake cylinder 38 mm;
  - Φ master cylinder 15.875 mm.
The rear brake is connected by a hydraulic circuit to the left front brake; the left front brake has the same dimensions as the right front brake controlled by the brake lever.

DIMENSIONS AND WEIGHT

- Wheelbase 1.550 m
- Overall length 2.330 m
- Overall width 0.970 m
- Height (with screen) 1.445 m
- Weight (dry) 272 kg

PERFORMANCE

- Max. speed: with one rider approx. 190 kph
- Fuel consumption: 6.5 lt/100 km

REFUELINGS

- Fuel tank approx. 25 l. Super petrol (97 NO-RM/min.)
  (reserve approx 6 lt.)
- Oil sump 3 l. «Agip Sint 2000 SAE 10W/40» oil
- Gearbox 0.750 l. «Agip Rotra MP SAE 80W/90» oil
- Rear drive 0.250 l. of which: 0.230 l. «Agip Rotra MP SAE 80W/90» oil
  (bevel set lub.) and 0.020 l. «Agip Rocol ASO/R» or «type A Molykote»
- Front forks (per leg) 0.150 l. «Agip ATF Dexron» fluid
- Front and rear brake circuits «Agip Brake Fluid - SUPER HD»
# TABLE OF MAINTENANCE AND LUBRICATION OPERATIONS

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>1500 Km</th>
<th>3000 Km</th>
<th>6000 Km</th>
<th>9000 Km</th>
<th>12,000 Km</th>
<th>15,000 Km</th>
<th>18,000 Km</th>
<th>21,000 Km</th>
<th>24,000 Km</th>
<th>27,000 Km</th>
<th>30,000 Km</th>
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<tbody>
<tr>
<td>Engine oil</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
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<tr>
<td>Oil filter cartridge</td>
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<tr>
<td>Wire gauze oil filter</td>
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<td></td>
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<tr>
<td>Air filter</td>
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<td>R</td>
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<td>R</td>
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<td>Ignition timing</td>
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<td>A</td>
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<td>A</td>
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<td>Spark plugs</td>
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<td>R</td>
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<tr>
<td>Rocker clearance</td>
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<td>A</td>
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<td>Carburation</td>
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<td>Nuts and bolts</td>
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<tr>
<td>Fuel tank, filters and pipes</td>
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<td></td>
<td>C</td>
<td>C</td>
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<td>R</td>
<td>A</td>
<td>A</td>
<td>R</td>
<td>A</td>
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<tr>
<td>Rear drive box oil</td>
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<td>A</td>
<td>A</td>
<td>R</td>
<td>A</td>
<td>A</td>
<td>R</td>
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<td>R</td>
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<tr>
<td>Fork legs oil</td>
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<tr>
<td>Starter motor and generator</td>
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<tr>
<td>Brake system fluid</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>R</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>R</td>
</tr>
<tr>
<td>Brake pads</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
</tbody>
</table>

A = Inspections - Adjustments - Possible replacements - Servicing / C = Cleanings. R = Replacements.

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, renew this oil at least once a year.
### CYLINDERS

Cylinders range (mm)

<table>
<thead>
<tr>
<th>GRADE A</th>
<th>GRADE B</th>
<th>GRADE C</th>
</tr>
</thead>
<tbody>
<tr>
<td>88,000 ± 88,006</td>
<td>88,006 ± 88,012</td>
<td>88,012 ± 88,018</td>
</tr>
</tbody>
</table>

### PISTONS

Pistons range (mm)

<table>
<thead>
<tr>
<th>GRADE A</th>
<th>GRADE B</th>
<th>GRADE C</th>
</tr>
</thead>
<tbody>
<tr>
<td>87,968 ± 87,974</td>
<td>87,974 ± 87,980</td>
<td>87,980 ± 87,986</td>
</tr>
</tbody>
</table>

Pistons of an engine have to be balanced; only a difference of 1.5 gr. in weight is admissible.

When fitting a piston, make sure that the «SCA» (exhaust) mark is facing towards the exhaust hole of the cylinder.

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**Values in mm.**

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**Piston-pin and bushing mating data.**

<table>
<thead>
<tr>
<th>Inserted and machined bush inner dia. mm</th>
<th>Piston-pin dia. mm</th>
<th>Bushing to piston-pin mating clearance mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.015</td>
<td>21.994</td>
<td>0.017 ± 0.036</td>
</tr>
<tr>
<td>22.030</td>
<td>21.998</td>
<td></td>
</tr>
</tbody>
</table>

**CRANKSHAFT BALANCE CHECKING**

To statically balance the crankshaft it is necessary to apply to the crankpin a load of 1,650 ± 1,652 Kg.
15 FUEL FEEDING

15.1 CARBURETORS (fig. 344).

No. 2 Dell'Orto «PHF 30 DD» (R.H.) «PHF 30 DS» (L.H.) type.

Carburetters controls
- throttle twist grip on the R.H. handlebar;
- «CHOKE», cold start control, on left handlebar.

Carburettor setting

<table>
<thead>
<tr>
<th>Component</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diffuser</td>
<td>Ø mm 30</td>
</tr>
<tr>
<td>Throttle valve</td>
<td>50/3</td>
</tr>
<tr>
<td>Spray nozzle</td>
<td>264 AB</td>
</tr>
<tr>
<td>Main jet</td>
<td>125</td>
</tr>
<tr>
<td>Idle jet</td>
<td>50</td>
</tr>
<tr>
<td>Starting jet</td>
<td>75</td>
</tr>
<tr>
<td>Tapered needle</td>
<td>K23 (3rd notch)</td>
</tr>
<tr>
<td>Float</td>
<td>gr 10</td>
</tr>
</tbody>
</table>

Idling screw: open by 1½ turns.

15.6 CHANGING THE AIR FILTER (figs. 345-346).

Every 6000 km. check the filtering unit condition and eventually clean it with compressed air; every 9000 km. replacement is prescribed.

To replace the air filter lift the saddle, remove fuel tank and side covers. Take out R/H carburettor and undo the screw fixing the air intake to the bike frame; remove the two side screws and take out from the R/H side the container «A» complete with air filter.
Rear suspension spring features.

A free spring has the length of 235 mm.
A spring under 36.5 Kg. load must have a 215 mm length.
A spring under 118 Kg. load must have a 170 mm length.
A spring under 197 Kg. load must have a 138 mm length.

A spring under 288.5 Kg. load must have a 108 mm length.
A fully loaded spring must have a 94 mm length.

Note: If springs have not the above features or prove warped, they must be replaced.
21 FRONT SUSPENSION

21.1 FRONT FORK (fig. 351).
- Stroke 140 mm.
- Sleeve inner diameter: 40.010 ± 40.050 mm.
- Fork legs outer diameter: 39.975 ± 39.950 mm.

**UPPER SPRING**
Active coils N = 36
Total coils 37.25

![Diagram of Upper Spring]

Check the spring after having applied a load up to 167 mm, many times

**LOWER SPRING**
Active coils N = 25
Total coils 26.75

![Diagram of Lower Spring]

Check the spring after having applied a load up to 120 mm, many times

<table>
<thead>
<tr>
<th>HYDRAULIC BRAKING TABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>STROKE</td>
</tr>
<tr>
<td>CYCLES</td>
</tr>
<tr>
<td>EXTENSION</td>
</tr>
<tr>
<td>COMPRESSION</td>
</tr>
<tr>
<td>66.7/1</td>
</tr>
<tr>
<td>mm 4</td>
</tr>
<tr>
<td>Kg 10</td>
</tr>
<tr>
<td>Testing temperature 18°~30°C</td>
</tr>
<tr>
<td>Load in Kg ±10%</td>
</tr>
</tbody>
</table>

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![Diagram of Hydraulic Braking Table]
21.2 FRONT FORK LEGS LUBRICATION
(fig. 350).

To replace the oil in the front fork legs, proceed as follows:

- the vehicle placed on the central stand, remove the handlebar fixing plate and the instrument panel fixed to the same;
- loosen the side screw «C» locking the steering head to the fork leg;
- unscrew the upper plug «B»; then undo drain plug «A»;
- slightly press down the front side of the bike to force out the plug «B» which is solid to the shock absorber body;
- refit plug «A» and fill with the quantity of fluid prescribed (cc 150 «Agip ATF Dexron» type) through the space existing between the inner diameter of the fork leg and the shock absorber body;
- after having lifted the front side of the bike, refit plug «B» and lock the side screw again. Repeat the same operations for the other fork leg.
SWINGING FORK

Dimensions:
- 469.9 ± 470.1 mm
- 25.00 ± 25.050 mm
- 39.992 ± 39.967 mm
- 61.991 ± 61.961 mm
- 135.000 ± 134.900 mm
- 18.150 ± 18.050 mm
- 249.200 ± 248.800 mm
- 144.5 mm

Dimensions in millimeters.
23 WHEELS

23.1 FRONT WHEEL (fig. 353).

To remove the front wheel from the vehicle, proceed as follows:

- set the vehicle up on the central stand, place a support under the engine block to keep the front wheel up from the ground;
- undo screws «A» securing the calipers to the fork legs and remove calipers together with their pipes from same;
- undo spindle wheel securing nut «C» on the L.H. side;
- undo screws «E» securing the fork tubes to wheel spindle;
- withdraw spindle «F» paying attention to the mounting position of spacers «D» and remove the wheel;
- the reassembly operation is a reversal of the dismantling one. Pay attention to the correct position of spacers; then operate different times the brake controls to re-set caliper pistons in their normal position.
23.3 REAR WHEEL (fig. 355).
To remove the rear wheel from the swing arm and the drive box, proceed as follows:
- set up the bike on the central stand;
- remove the L.H. silencer;
- undo nut «A» with washer «B» on the spindle, rear drive box side;
- loosen spindle locking screw «D» on fork arm;
- withdraw spindle «C» from the drive box, the hub and the swing arm;
- withdraw the plate group with fitted the «E» caliper; from the stop spindle on the fork, fixing the same group to the frame;
- lean the vehicle to the right just enough to allow the wheel to be withdrawn from the rear fork arm and the rear drive box.
To reassemble the wheel, reverse the dismantling sequence paying attention to insert the plate complete with caliper on the stop of the swing fork left arm.

23.5 TYRES
Recommended pressures are:
- front wheel: with pilot only and with pillion too: 2.2 BAR;
- rear wheel: with pilot only: 2.4 BAR; with pillion too: 2.8 BAR.

Above figures are for normal riding (cruising speed). When using the motorcycle at constant high speed or on highways, it is recommended to increase the pressure by 0.1 BAR.
For the floating overhaul, in order to make reassembly of master cylinder easier, insert a pin «A» 2 mm dia. to lock the floating as shown in the drawing (fig. 358). Before filling the tank with fluid, remove the pin.
24 ELECTRICAL APPARATUS

24.2 ALTERNATOR-GENERATOR (SAPRISA)

Charge current intensity diagram

Battery = 12V
Room temperature = 20°C
25 ELECTRIC SYSTEM SCHEME

25.1 Key to wiring diagram.

1 Bulb, main/dipped beam 60/55 W
2 Bulb, front sidelights 4 W
3 Bulb, r/h direction indicator warning light.
4 Bulb, speedometer light
5 Bulb, rev. counter light
6 Bulb, l/h direction indicator warning light.
7 Connector, 4-way Molex
8 Bulb, fuel level warning light
9 Bulb, oil pressure warning light
10 Bulb, generator warning light
11 Bulb, neutral warning light
12 Bulb, sidelight warning light
13 Bulb, main beam warning light
14 Flasher switch
15 R/H front direction indicator
16 Front brake stop switch
17 Starter switch
18 L/H front direction indicator
19 Two-note horn
20 Control switch: start/stop engine, lights
21 Neutral switch
22 Oil pressure switch
23 Blinker unit (12 V - 46 W)
24 Control switch: lights-horn-direction indicators
25 Spark plugs
26 H.T. coil
27 Contact breaker
28 Rear brake stop switch
29 Fuse terminal board
30 Low fuel level warning sensor
31 Voltage regulator
32 Alternator 14 V - 20 A
33 Side stand microswitch
34 Battery 12 V - 24-Ah
35 Starter solenoid
36 Starter motor
37 R/H rear direction indicator
38 Bulb, number plate and stop light
39 L/H rear direction indicator
40 Two-note horn switch
41 Solenoid for side stand.
42 Connector, 6-way AMP
43 Connector, 6-way Molex