



SERVICE STATION MANUAL

633793 ÷ 633800



SMT RCR



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SERVICE STATION MANUAL

SMT RCR

This service station manual has been drawn up by Piaggio & C. S.p.A. to be used by the workshops of Piaggio-Gilera dealers. It is assumed that the user of this manual for maintaining and repairing Piaggio vehicles has a basic knowledge of mechanical principles and vehicle repair technique procedures. Any significant changes to vehicle characteristics or to specific repair operations will be communicated by updates to this manual. Nevertheless, no mounting work can be satisfactory if the necessary equipment and tools are unavailable. It is therefore advisable to read the sections of this manual concerning special tools, along with the special tool catalogue.

N.B. Provides key information to make the procedure easier to understand and carry out.

CAUTION Refers to specific procedures to carry out for preventing damages to the vehicle.

WARNING Refers to specific procedures to carry out to prevent injuries to the repairer.



Personal safety Failure to completely observe these instructions will result in serious risk of personal injury.



Safeguarding the environment Sections marked with this symbol indicate the correct use of the vehicle to prevent damaging the environment.



Vehicle intactness The incomplete or non-observance of these regulations leads to the risk of serious damage to the vehicle and sometimes even the invalidity of the guarantee.



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CHARACTERISTICS

CHAR

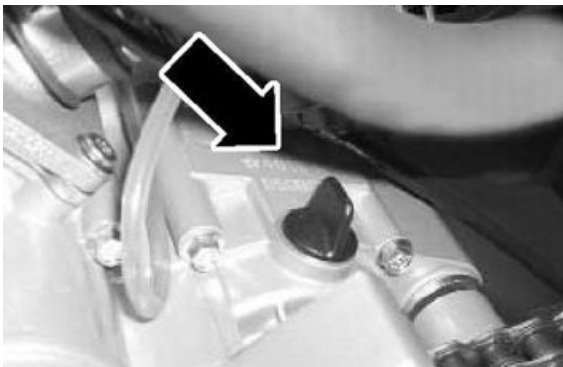
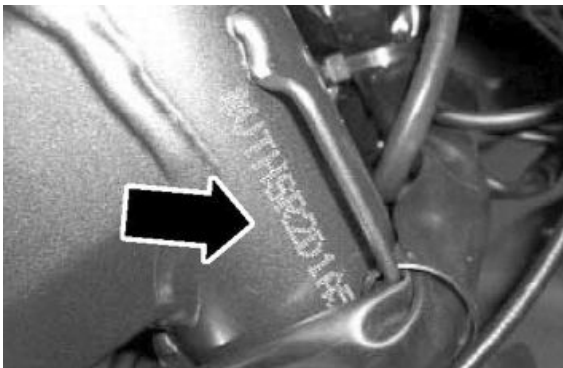
Vehicle identification

Chassis prefix

The chassis registration number is stamped on the right side of the headstock.

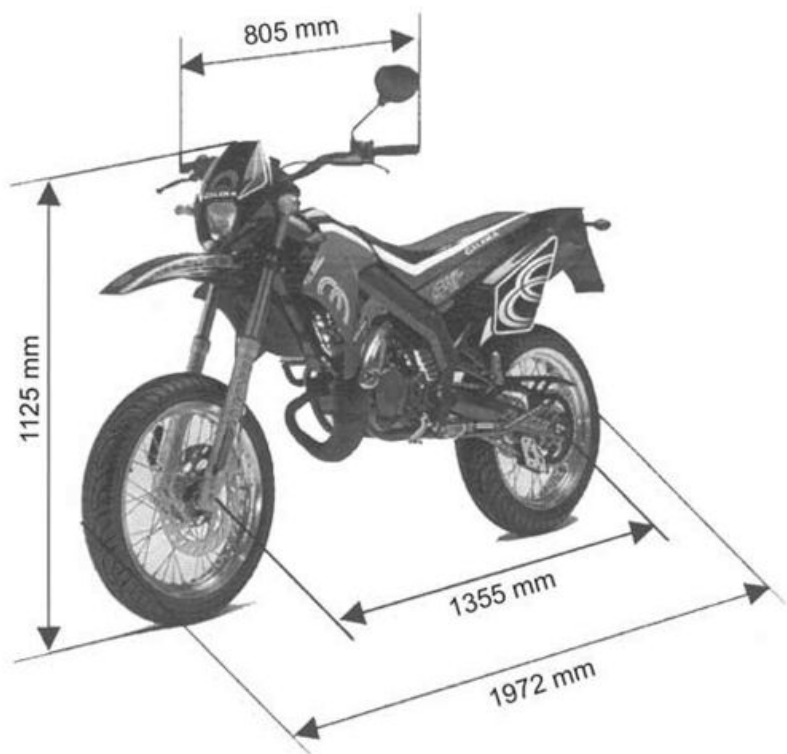
RCR: ZAPG11D1A

SMT: ZAPG12D1A



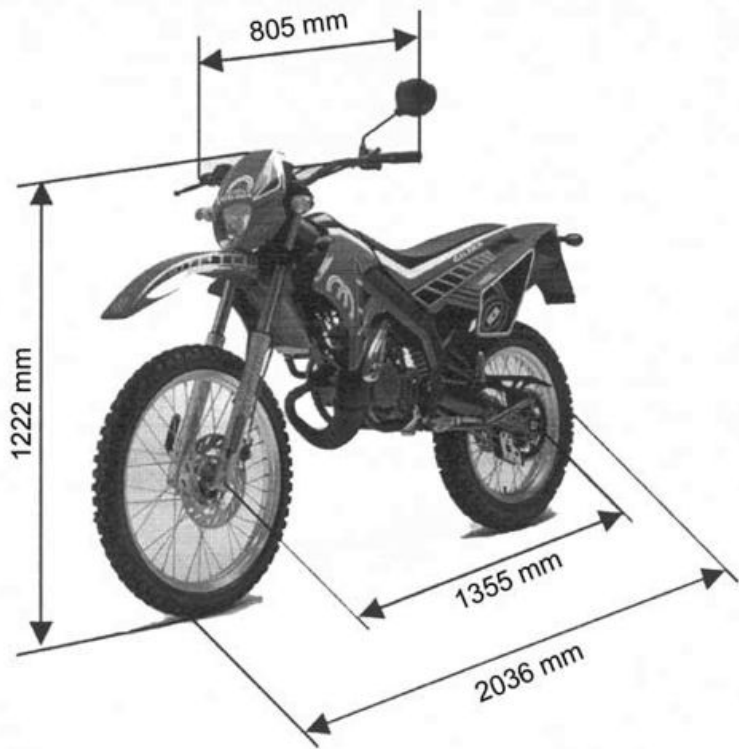
Dimensions and mass

SMT SIZES	
Specification	Desc./Quantity
Width	805 mm
Length	1972 mm
Max. height	1125 mm
Wheelbase	1,355 mm



RCR SIZES

Specification	Desc./Quantity
Width	805 mm
Length	2036 mm
Max. height	1222 mm
Wheelbase	1,355 mm



Engine

ENGINE

Specification	Desc./Quantity
Type	single-cylinder, two-stroke
Bore	40 mm
Stroke	39.88 mm
Cubic capacity	49 cm ³
Compression ratio	11.5 :1
Carburettor	Dell'Orto PHVA-17.5 with manual starter
Engine idle speed	1900 ± 100 rpm
Air filter	sponge impregnated with a mixture 50% oil (Selenia Air Filter Oil) and 50% unleaded petrol.
Start-up	With pedal
Transmission	Chain
	Main ratio: 3.7 (78/21)
	RCR final ratio: 4.7 (53/13)
	SMT final ratio: 3.78 (53/14)
Gearbox	At 6 speeds with selector, fork and distribution drum operated by external control
Speeds	First Speed 11/34 Second Speed 15/30 Third Speed 18/27 Fourth Speed 20/24 Fifth Speed 22/23 Sixth Speed 23/22
Lubrication	Separate oiling, mixture oil.
Fuel supply	Petrol-oil mixture by carburettor, automatic mixer (variable flow according to engine speed and throttle valve opening)
Inlet	By means of a compression valve on the casing
Cooling system	forced coolant circulation system

Capacities

CAPACITY

Specification	Desc./Quantity
Fuel Tank	Capacity 7 l / Reserve 1.3 l
Oil mixer tank	Capacity 1 l / Reserve 0.25 l
cooling circuit	~ 0.850 l
Transmission oil	0.65 l

Electrical system

ELECTRICAL SYSTEM

	Specification	Desc./Quantity
1	Ignition type	Capacitive discharge electronic ignition, with incorporated HV coil
2	Ignition advance (at TDC)	1.2 mm
3	Spark plug	NGK B8 ES
4	Headlight	12 ÷ 35/35 W
5	Rear lights	12V ÷ 21/5W
6	Turn indicators	12V ÷ 10W
7	Battery	12V - 4Ah
8	Fuse	4A
9	Generator	Magneto flywheel in alternating current

Frame and suspensions

CHASSIS AND SUSPENSIONS

Specification	Desc./Quantity
Chassis	diagonal twin spar frame.
Front suspension:	Hydraulic fork and centred axle.
Rear suspension:	Swinging with hydraulic progressive shock absorber.

Brakes

BRAKES

Specification	Desc./Quantity
Front wheel brake:	Hydraulic disc Ø 240 mm (RCR) Ø 260 mm (SMT)
Rear wheel brake:	Hydraulic Ø 180 mm disc.

Wheels and tyres

WHEELS AND TYRES

Specification	Desc./Quantity
Front tyre:	80/90 x 21" (RCR) 100/80 x 17" (SMT)
Rear tyre:	110/80 x 18" (RCR) 130/70 x 17" (SMT)

Tightening Torques

Standard tightening torques

TORQUE IN N_m BY TYPE OF TIGHTENED MATERIAL

Name	Torque in Nm
M4 Ø 8.8 steel screw on plastic with metallic spacers	2
M4 Ø 8.8 steel screw on brass, copper, aluminium and their alloys	2
M4 Ø 8.8 steel screw Iron, steel	3
M5 Ø 8.8 steel screw on plastic with metallic spacers	4
M5 Ø 8.8 steel screw on brass, copper, aluminium and their alloys	4
M5 Ø 8.8 steel screw Iron, steel	6
M6 Ø 8.8 steel screw on plastic with metallic spacers	6.5
M6 Ø 8.8 steel screw on brass, copper, aluminium and their alloys	6.5
M6 Ø 8.8 steel screw Iron, steel	10.5
M7 Ø 8.8 steel screw on brass, copper, aluminium and their alloys	10.5
M7 Ø 8.8 steel screw Iron, steel	17
M8 Ø 8.8 steel screw on brass, copper, aluminium and their alloys	16
M8 Ø 8.8 steel screw Iron, steel	26
M10 Ø 8.8 steel screw Iron, steel	52
M12 Ø 8.8 steel screw Iron, steel	100
M14 Ø 8.8 steel screw Iron, steel	145

ENGINE-VEHICLE

Name	Torque in Nm
Shock absorber to chassis upper attachment	30-40
Shock absorber to chassis lower attachment	55-65
Lower arm to shock absorber chassis clamp	55-65
Arm to chassis clamp	55-65
Arm to suspension clamp	55-65
Oscillating fork	70-80
Engine to chassis front attachment	35-40
Engine to chassis lower attachment	25-28
Fork to steering tube clamping	90-130
Fork leg cap	17-19
Muffler to cylinder	9-12
muffler to chassis clamp	17-19
Muffler silencer to chassis	17-19
Steering arm - fork bar clamp	20-24
Handlebar to steering arm	20-24
Front wheel shaft	70-80
Front brake calliper	17-19
Rear wheel axle	70-80
Rear brake calliper	17-19
Rear brake disc	17-19
Front brake disc	11-12
Rear wheel gear	17-19
Head-cylinder stud bolts	10-12
Head-cylinder fixing nuts	19-22
Flywheel to shaft	35-45
Stator to crankcase	8-10
Clutch cover	8-10
Crankshaft pinion	8-10
Crankcase halves fixing screws	8-10
Starter motor to crankcase	32-38
Cylinder head thermistor	32-38
Cylinder head thermostat nut	25-40
Clutch seat	35-45
Crankcase oil drainage cap	10-15
Pinion counterweight	3.5-4.5
Main shaft bearing unit	3.5-4.5
Gearbox sprocket tightening	3.5-4.5

Products**RECOMMENDED PRODUCTS TABLE**

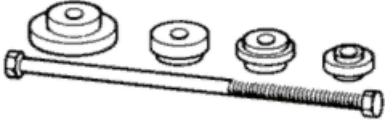
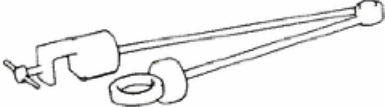
Product	Description	Specifications
AGIP CITY HI TEC 4T	Oil to lubricate flexible transmissions (brake, throttle control and mixer, odometer)	Oil for 2-stroke engines: SAE 5W-40, API SL, ACEA A3, JASO MA
AGIP FILTER OIL	Oil for air filter sponge	Mineral oil with specific additives for increased adhesiveness
AGIP CITY TEC 2T	Mixer oil	synthetic oil for 2-stroke engines: JASO FC, ISO-L-EGD
AGIP GP 330	Grease for brake levers, throttle	White calcium complex soap-based spray grease with NLGI 2; ISO-L-XBCIB2
AGIP BRAKE 4	Brake fluid	FMVSS DOT 4 Synthetic fluid
AGIP GREASE PV2	Grease for the steering bearings, pin seats and swinging arm	White anhydrous-calcium based grease to protect roller bearings; temperature range between -20 C and +120 C; NLGI 2; ISO-L-XBCIB2.
AGIP GREASE SM 2	Grease for odometer transmission gear case	Lithium grease with NLGI 2 Molybdenum disulphide; ISO-L-XBCHB2, DIN KF2K-20

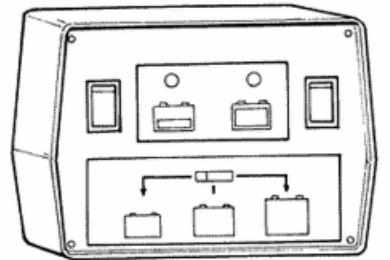
Product	Description	Specifications
PARAFLU MOTO RIDER	coolant	Ready to use monoethylene glycol anti-freeze fluid, CUNA NC 956-16
AGIP GEAR 80W-90	gearbox oil	SAE 80W-90 oil complying with API GL4 specifications

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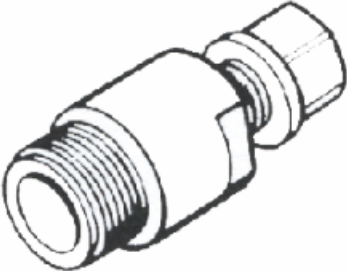
TOOLING

TOOL

TOOLS		
Stores code	Description	
00H0530004.1	Clutch locking tool	
00H0530015.1	Engine opening tool	
00H0560032.1	Crankshaft gear extractor	
001330Y	Tool for fitting steering seats	
002465Y	Pliers for circlips	
020004Y	Punch for removing fifth wheels from headstock	
020074Y	Support base for checking crankshaft alignment	
020150Y	Air heater support	
020151Y	Air heater	
020329Y	MityVac vacuum-operated pump	

Stores code	Description	
020330Y	Stroboscopic light to check timing	
020331Y	Digital multimeter	
020332Y	Digital rev counter	
020333Y	Single battery charger	
020334Y	Multiple battery charger	
020357Y	32 x 35 mm adaptor	
020358Y	37x40-mm adaptor	

Stores code	Description	
020363Y	20 mm guide	
020376Y	Adaptor handle	
020412Y	15 mm guide	
020425Y	Punch for flywheel-side oil seal	
020439Y	17 mm guide	
020441Y	26 x 28 mm adaptor	

Stores code	Description	
020455Y	10-mm guide	
020456Y	Ø 24 mm adaptor	
020544y	Pliers for clamps	
020565Y	Flywheel lock calliper spanner	
020581Y	Flywheel extractor	

INDEX OF TOPICS

MAINTENANCE

MAIN

Maintenance chart

AFTER 1000 KM

Action
Coolant- Change
Air filter - cleaning
Odometer gear - greasing
Steering - Check
Brake control levers - greasing
Brake pads - check
Transmission chain - greasing
Tension transmission chain - check
Safety locks - check
Front fork- Check
Electrical system and battery - check
Wheel - Check
Tyres pressure - Check
Fuel and oil hoses - Check
Vehicle and brake test - road test
Engine oil - change
Spark plug / electrode gap - check
Carburettor - Adjustment
Clutch control lever - Adjustment

At 5,000; 25,000; 35,000; 55,000 KM

Action
Coolant level - check
Air filter - cleaning
Brake control levers - greasing
Brake pads - check
Brake fluid level - check
Transmission chain - greasing
Tension transmission chain - check
Front fork- Check
Electrical system and battery - check
Tyre condition and wear - Check
Tyres pressure - Check
Fuel and oil hoses - Check
Vehicle and brake test - road test
Engine oil - Check
Spark plug/electrode gap - replacement
Carburettor - Adjustment
Clutch control lever - Adjustment

At 10,000; 20,000; 40,000; 50,000 KM

Action
Coolant- Change
Air filter - cleaning
Radiator - Cleaning
Odometer gear - greasing
Steering - Check
Brake control levers - greasing
Brake pads - check
Brakes hoses- Check
Transmission chain - greasing
Tension transmission chain - Replacement
Safety locks - check
Front fork - Replacement
Rear shock absorber - Check
Electrical system and battery - check
Headlight - adjustment
Tyre condition and wear - Check
Wheel - Check

Action

Tyres pressure - Check
Oil filter -Replacement
Fuel and oil hoses - Replacement
Vehicle and brake test - road test
Engine oil - change
Spark plug/electrode gap - replacement
Carburettor - Adjustment
Clutch control lever - Adjustment

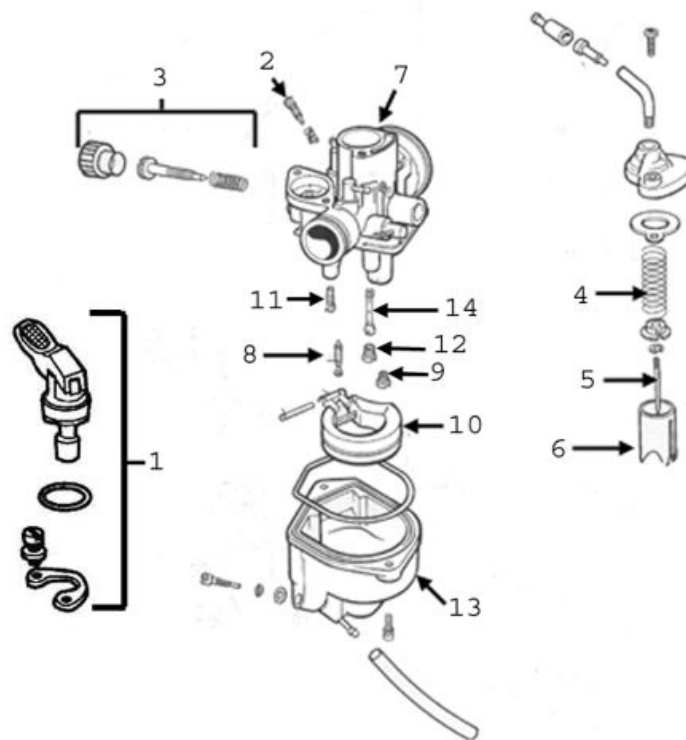
At 15,000; 30,000; 45,000; 60,000 Km**Action**

Coolant level - check
Air filter - cleaning
Brake control levers - greasing
Brake pads - check
Brake fluid level - check
Transmission chain - greasing
Tension transmission chain - check
Front fork- Check
Electrical system and battery - check
Tyre condition and wear - Check
Tyres pressure - Check
Fuel and oil hoses - Check
Vehicle and brake test - road test
Engine oil - Check
Spark plug/electrode gap - replacement
Carburettor - Adjustment
Clutch control lever - Adjustment
Cylinder head and cylinder - Cleaning
Complete piston - Replacement

EVERY 2 YEARS**Action**

Brake fluid - Change

Carburettor

**KEY:**

1. Starter
2. Idle air set screw
3. Idle speed set screw
4. Throttle valve spring
5. Throttle valve tapered pin
6. Throttle valve
7. Carburettor body
8. Pin
9. Minimum nozzle
10. Float
11. Starter nozzle
12. Maximum nozzle
13. Float chamber
14. Diffuser

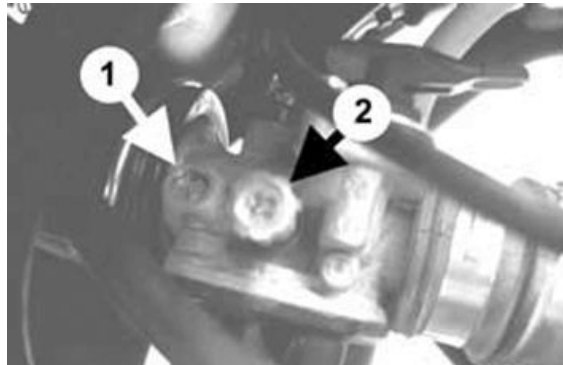
Carburettor

- Disassemble the carburettor in its parts, wash all of them with solvent, dry all body grooves with compressed air to ensure adequate cleaning.
- Check carefully that the parts are in good condition.

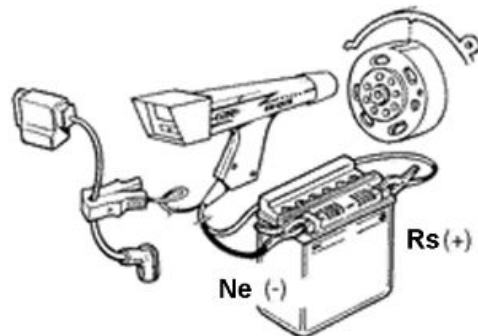
- The throttle valve should slide freely in the mixture chamber. Replace it in case of excessive clearance due to wear.
- If there are wear marks in the mixer chamber causing inadequate tightness or a free valve slide (even if it is new), replace the carburettor.
- It is advisable to replace the gasket at every refit

WARNING**PETROL IS HIGHLY EXPLOSIVE ALWAYS REPLACE THE GASKETS TO AVOID PETROL LEAKS****Idle speed check**

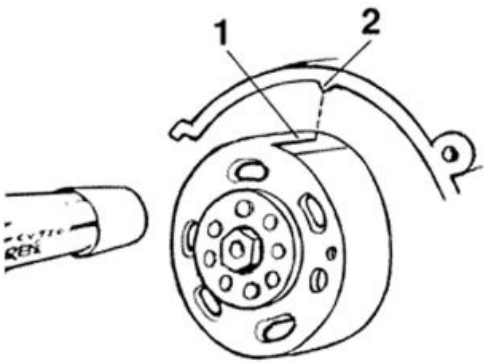
- Before adjusting idle speed, set the flow set screw as described below.
- Tighten the flow set screw (1) until it stops and then undo the screw as many turns as recommended ($1 + 1/4$) so as to obtain a first adjustment.
- Warm up the engine and rest the vehicle on a flat surface.
- Tighten the idle speed set screw until the ideal engine idle speed is obtained.
- Engine idle speed: $1,900 \pm 100$ rpm.
- Turn the flow set screw (1) slowly until the maximum rotation rpm possible is obtained.

**Checking the spark advance****Engine timing check**

- Remove the crankcase left cover.
- Connect the corresponding specific tool, the red gripper to the battery positive (+) terminal, and the black gripper to the battery negative (-) terminal. Connect the synchroniser to the high voltage conductor (the wire connecting the high voltage coil to the spark plug).

**Specific tooling****020330Y Stroboscopic light to check timing**

- With the engine at 3000 rpm, check that the line (1) on the magneto flywheel is aligned with the notch on the crankcase (2).



TECHNICAL SPECIFICATIONS

Specification	Desc./Quantity
Timing	22° at 3000 rpm
Advance	1.8° at 3000 rpm

Spark plug

- Clean the deposits between the two electrodes.
- Clean off mud and dirt that may accumulate around the spark plug base.
- Remove the spark plug and make sure the electrodes are not worn. The central electrode must have clean corners and the external electrode must have a regular thickness.
- Replace the spark plug if signs of wear are detected or the insulator is cracked or chipped.
- Check the electrode gap with a thickness gauges.
- The gap must be 0.6÷0.7 mm.

Electric characteristic

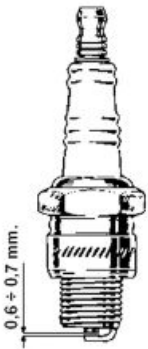
Spark plug

NGK B8 ES

- Fit the spark plug manually to avoid damaging the thread, and tighten it slightly with the appropriate wrench.

Locking torques (N*m)

Spark plug 20 ÷ 24



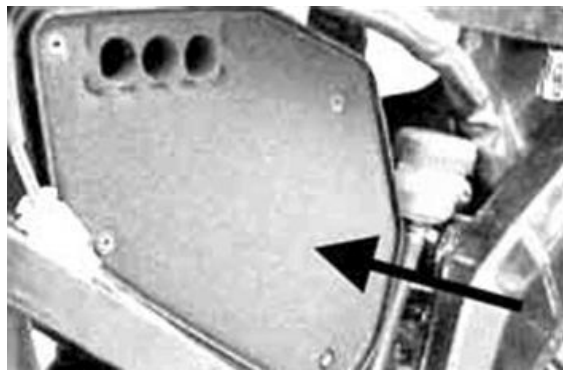
Air filter

- To reach the filtering element, remove the saddle and the right side fairing.
- Afterwards, remove the 4 screws on the air filter cover shown in the photograph.



Cleaning

- Wash the sponge with water and mild soap.
- Dry it with a clean cloth and short blasts of compressed air.
- Soak the sponge in a solution of 50% petrol and 50% SELENIA AIR FILTER OIL.
- Gently squeeze the filtering element with your hands without wringing it; let it drip dry and then refit.



CAUTION

NEVER RUN THE ENGINE WITHOUT THE AIR FILTER, THIS WOULD RESULT IN AN EXCESSIVE WEAR OF THE PISTON AND CYLINDER.

transmissions

Transmission adjustment

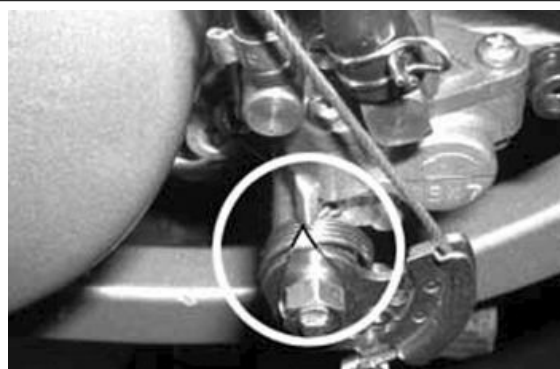
- Adjust the control cables:
- Mix cable: see "Mixer timing" section.
- Throttle cable: adjust it in such a way that the sheath does not have any clearance.
- Splitter control cable: Adjust it in such a way that there is no clearance on the throttle grip.
- Adjust all transmissions in such a way that their sheaths do not have any clearance.

Mixer Timing

- To adjust the mixer, operate on the corresponding set screw shown in the figure.



- The correct oil flow rate is obtained by aligning the two references shown in the figure.



Drive chain adjustment

It is convenient to check chain tension every 1000 km and, if required, adjust and lubricate the chain. The chain is properly adjusted when, with the scooter upright and without load, it looks as indicated in the figure. Chain backlash should be between 30 and 45 mm.



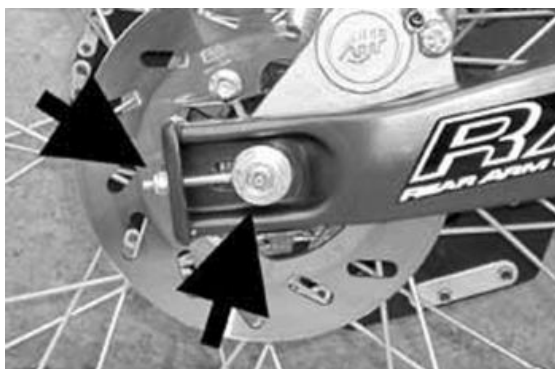
To restore the proper chain tension, operate as follows:

- Loosen the wheel pin nut.
- Operate on the set screws until the correct tension is obtained.
- Check alignment by means of the notches indicated on the chain tightener inside the slot on the fork, on both sides.
- Tighten the screws.



Locking torques (N*m)

Rear wheel axle 70-80 Set screw 17 ÷ 19



Braking system

Rear brake fluid

Front brake oil level check

Proceed as follows:

- Place the scooter upright.
- Check the fluid level through the references on the brake oil reservoir body.



Topping up brake fluid

Proceed as follows:

- Unscrew the reservoir cap, remove the gasket and top-up using only the specified fluid but never exceed the maximum level.



CAUTION



AVOID CONTACT OF BRAKE FLUID WITH EYES, SKIN, AND CLOTHING. IN CASE OF CONTACT, RINSE WITH WATER. THE BRAKING CIRCUIT FLUID IS HYGROSCOPIC, THAT IS, IT ABSORBS HUMIDITY FROM THE SURROUNDING AIR. IF THE HUMIDITY IN THE BRAKING FLUID EXCEEDS A CERTAIN VALUE, IT WILL LEAD TO INEFFICIENT BRAKING. NEVER USE BRAKING FLUID KEPT IN CONTAINERS THAT HAVE ALREADY BEEN OPENED, OR PARTIALLY USED.

WARNING

BRAKE CIRCUIT FLUID IS VERY CORROSIVE; DO NOT LET IT COME INTO CONTACT WITH PAINTED PARTS.

N.B.

SEE THE BRAKING SYSTEM CHAPTER WITH REGARD TO THE CHANGING OF BRAKE FLUID AND THE BLEEDING OF AIR FROM THE CIRCUITS.

CAUTION

ONLY USE DOT 4-CLASSIFIED BRAKE FLUID.



IN NORMAL CLIMATIC CONDITIONS IT IS ADVISABLE TO REPLACE THE ABOVE MENTIONED FLUID EVERY 2 YEAR.

Recommended products

AGIP GP 330 Grease for brake levers, throttle

White calcium complex soap-based spray grease with NLGI 2; ISO-L-XBCIB2

Braking system fluid

Front brake oil level check

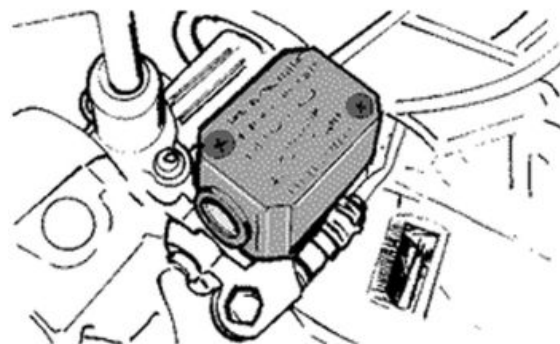
Proceed as follows:

- Park the scooter upright with the handlebar centred.
- Check fluid level through the corresponding warning light (A).

**Topping up brake fluid**

Proceed as follows:

- Remove the reservoir cap by loosening the two screws, remove the gasket and top-up using only the fluid specified without exceeding the maximum level.

**CAUTION**

AVOID CONTACT OF BRAKE FLUID WITH EYES, SKIN, AND CLOTHING. IN CASE OF CONTACT, RINSE WITH WATER. THE BRAKING CIRCUIT FLUID IS HYGROSCOPIC, THAT IS, IT ABSORBS HUMIDITY FROM THE SURROUNDING AIR. IF THE HUMIDITY IN THE BRAKING FLUID EXCEEDS A CERTAIN VALUE, IT WILL LEAD TO INEFFICIENT BRAKING. NEVER USE BRAKING FLUID KEPT IN CONTAINERS THAT HAVE ALREADY BEEN OPENED, OR PARTIALLY USED.

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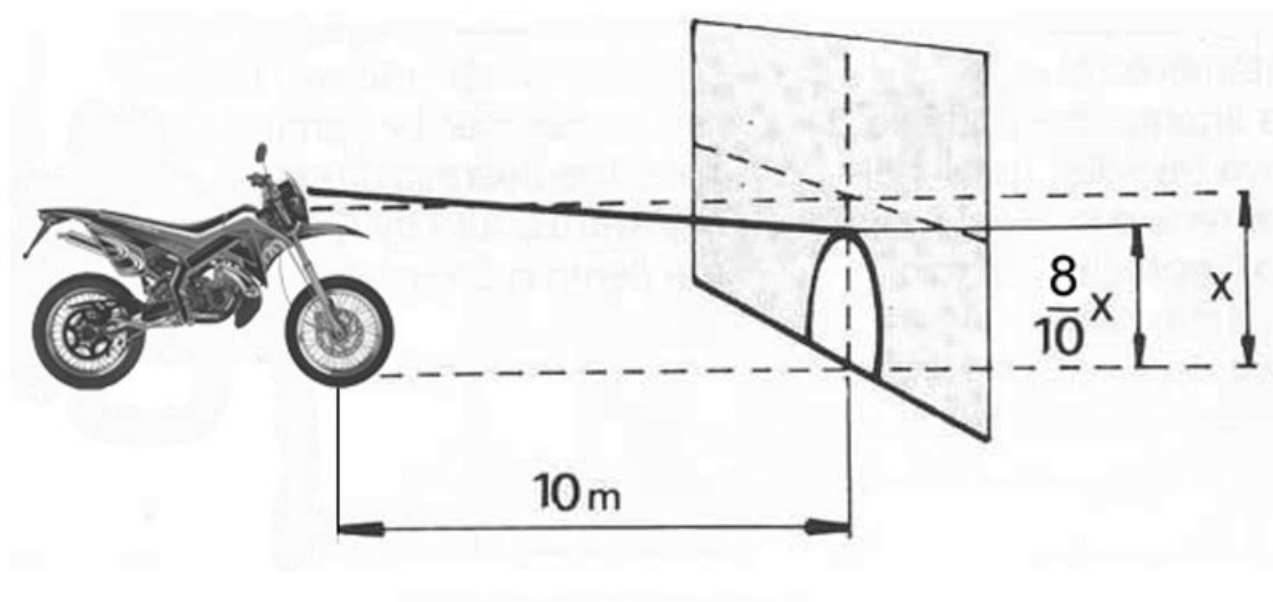


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Recommended products

AGIP GP 330 Grease for brake levers, throttle

White calcium complex soap-based spray grease
with NLGI 2; ISO-L-XBCIB2

Headlight adjustment

- Position the scooter with rider on a flat ground, 10 m away from a half-lit white screen.
- Make sure that the scooter axle is perpendicular to the screen.
- Measure the height from the centre of the headlight to the ground and then mark a cross on the wall at the same height measured.
- Start the engine and lock the throttle at 1/3 of its stroke.
- Turn on the low-beam light, the maximum demarcation limit between the dark and the light area must be at a height not exceeding 8/10 of the height from the ground to the centre of the headlight.

Direct the front headlight by operating on the screw indicated in the photograph.



Gearbox Oil

- Warm the engine up to the regular operating temperature
- Remove the oil filler cap (3)
- Remove the oil drainage plug from the right crankcase cover (1)
- Remove the oil drainage plug from the central section of the crankcase (2)
- Clean the drainage plug and its seat, and refit the plug

WARNING

Make sure that the drainage plug gasket is in good conditions

Locking torques (N*m)

Oil cap 10 Nm



- Pour oil in the main transmission gearbox through the filler cap (3)

Characteristic

Capacity:

0.65 l



INDEX OF TOPICS

TROUBLESHOOTING

TROUBL

Engine

Poor performance

POOR PERFORMANCE

Possible Cause	Operation
Fuel nozzles or cock clogged or dirty.	Remove, wash with solvent and dry with compressed air.
Excess of deposits on the cylinder ports and in the combustion chamber.	Descale the thermal group.
Muffler obstructed	Replace
Air filter clogged or dirty.	Clean according to the procedure.
Starter inefficient. (Remains on)	Check the mechanical movement of the Starter control transmission.

Starting difficulties

DIFFICULT STARTING

Possible Cause	Operation
Carburettor nozzles clogged or dirty.	Remove, wash with solvent and dry with compressed air.
Air filter clogged or dirty.	Wash with water and soap and soak again in a mixture of 50% petrol and 50% oil.
Starter inefficient.	Check the mechanical movement.
Engine flooded.	Start the vehicle keeping the throttle fully open alternately making the engine run for approx. five seconds and stopping for other five seconds. If the engine fails to start, remove the spark plug and make the engine run with open throttle so as to expel fuel in excess. Refit a dry spark plug and repeat the procedure. If the fuel tank is empty, refuel and start up.
Spark plug faulty or dirty.	Remove the spark plug and make sure it is clean and in good conditions. Adjust the electrodes at 0.6÷0.7 mm. Replace the spark plug, if required.
Ignition system faulty.	Check (see the ELECTRICAL SYSTEM chapter).

Engine tends to cut-off at full throttle

LOSS OF BLOWS

Possible Cause	Operation
Air filter dirty	Clean according to the procedure.
Excess of deposits on the cylinder ports and in the combustion chamber	Descale the thermal group.
Spark plug faulty or dirty	Remove the spark plug and make sure it is clean and in good conditions. Adjust the electrodes at 0.6÷0.7 mm. Replace the spark plug, if required. Bear in mind that many problems engines have derive from the use of the wrong spark plug.

ENGINE TENDS TO STOP AT TOP SPEED

Possible Cause	Operation
Maximum nozzle dirty - lean mixture	Wash the nozzle with solvent and dry with compressed air
Dirty carburettor	Wash the carburettor with solvent and dry with compressed air
Spark plug faulty or dirty.	Remove the spark plug and make sure it is clean and in good conditions. Adjust the electrodes at 0.6÷0.7 mm. Replace the spark plug, if required.
Fuel tank breather clogged.	With a jet of compressed air, check that the breather pipe is in good conditions (without crushings) and that it is not clogged.
Water in the carburettor.	Drain out the float chamber.

Engine tends to cut-off at idle**THE MOTOR TENDS TO STOP AT IDLE SPEED**

Possible Cause	Operation
Minimum nozzle dirty	Wash the nozzle with solvent and dry with compressed air
Starter that stays open	Check the mechanical movement.
Reed valve does not close	Check / replace the reed pack

High fuel consumption**HIGH FUEL CONSUMPTION**

Possible Cause	Operation
Air filter blocked or dirty.	Clean according to the procedure
Carburettor nozzles loose and/or float pin faulty	Make sure the nozzles are correctly tightened and that the float pin is correctly tightened and in good conditions.
Starter inefficient	Check the mechanical movement.

Engine overheating**ENGINE OVERHEATING**

Possible Cause	Operation
No coolant in the cooling circuit	Restore the level
Incorrect air bleeding	Repeat the operation
Thermostat remains closed	Replace
Fluid leak in the radiator	Replace the radiator
Coolant leaking from the cooling system	Inspect the whole circuit to spot the leak.

Transmission and brakes**Insufficient braking****BRAKE SYSTEM**

Possible Cause	Operation
Poor braking	The braking action should begin as soon as the brake controls are operated.

Possible Cause	Operation
Brake noise	Check the pads and the front brake disc. If excessive wear or scoring is found, replace when necessary.
Pads worn	Check the brake pads for wear.

Electrical system

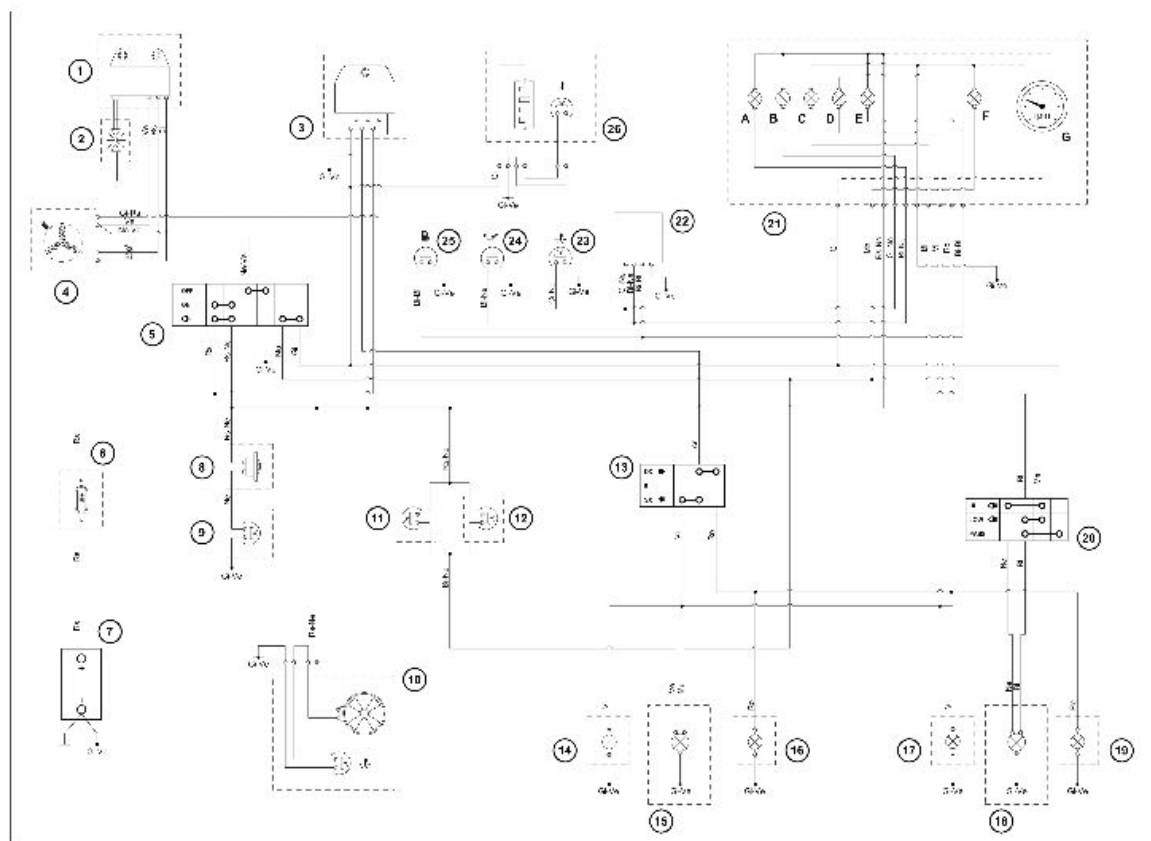
Battery

BATTERY	
Possible Cause	Operation
Battery	The battery is the electrical device in the system that requires the most frequent inspections and thorough maintenance. Frequently check that the fluid level fully covers the plates; otherwise, restore the level adding distilled water (never use natural water, even if it is drinking water) and check fluid density at the same time. If the vehicle is not used for some time (1 month or more) the battery needs to be recharged periodically. The battery tends to discharge completely within three months. If the battery is fitted on a motorcycle, be careful not to invert the connections, keeping in mind that the black ground wire is connected to the negative terminal while the red wire is connected to the terminal marked+.

INDEX OF TOPICS

ELECTRICAL SYSTEM

ELE SYS

**KEY**

1. Electronic ignition device
2. Spark plug
3. Voltage regulator
4. Magneto flywheel
5. Key switch
6. Main fuse
7. Battery
8. Horn
9. Horn button
10. Electric fan pre-installation
11. Rear brake STOP button
12. Front brake STOP button
13. Turn indicator switch
14. Left turn rear indicator bulb
15. Tail lights/stop light bulbs
16. Right turn rear indicator bulb
17. Left turn front indicator bulb
18. High-beam/low-beam bulb
19. Right turn front indicator bulb

20. Light switch

21. Instrument panel

A. Oil warning light

B. Temperature warning light

C. High-beam warning light

D. Turn indicator warning light

E. Low fuel warning light

F. Instrument panel bulb

22. Timer

23. Engine temperature warning light control

24. Low oil warning light control

25. Fuel level warning light control

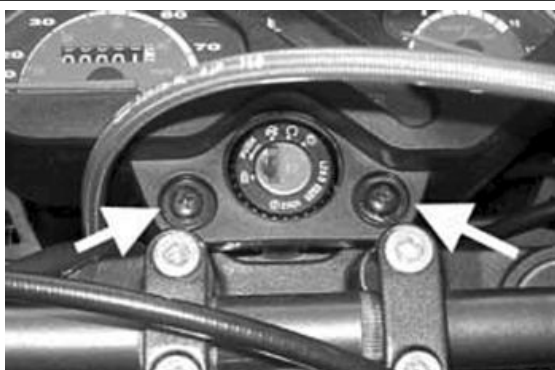
26. Automatic starter pre-installation

Ar = Orange, **Az** = Sky Blue, **Bi** = White, **Bl** = Blue, **Gi** = Yellow, **Gr** = Grey, **Ma** = Brown, **Ne** = Black, **Ro** = Pink, **Rs** = Red, **Ve** = Green, **Vi** = Purple

Electrical system installation

Antitheft

- Remove the headlamp front cowl.
- Operating on the 2 screws shown in the photograph, remove the instrument panel.



- To remove the switch/lock unit, remove the two screws fixing the unit to the fork upper plate shown in the photograph.

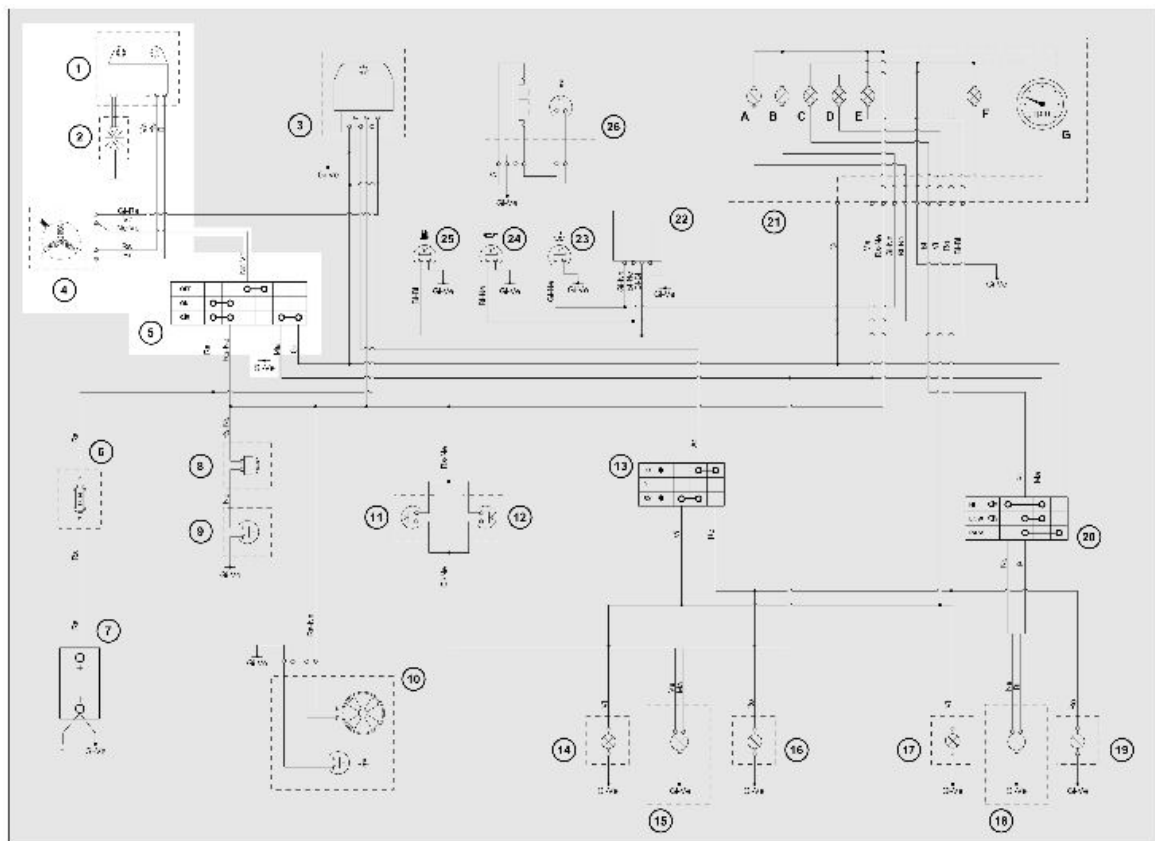


- Disconnect the electrical connections and remove the switch/lock unit.



Conceptual diagrams

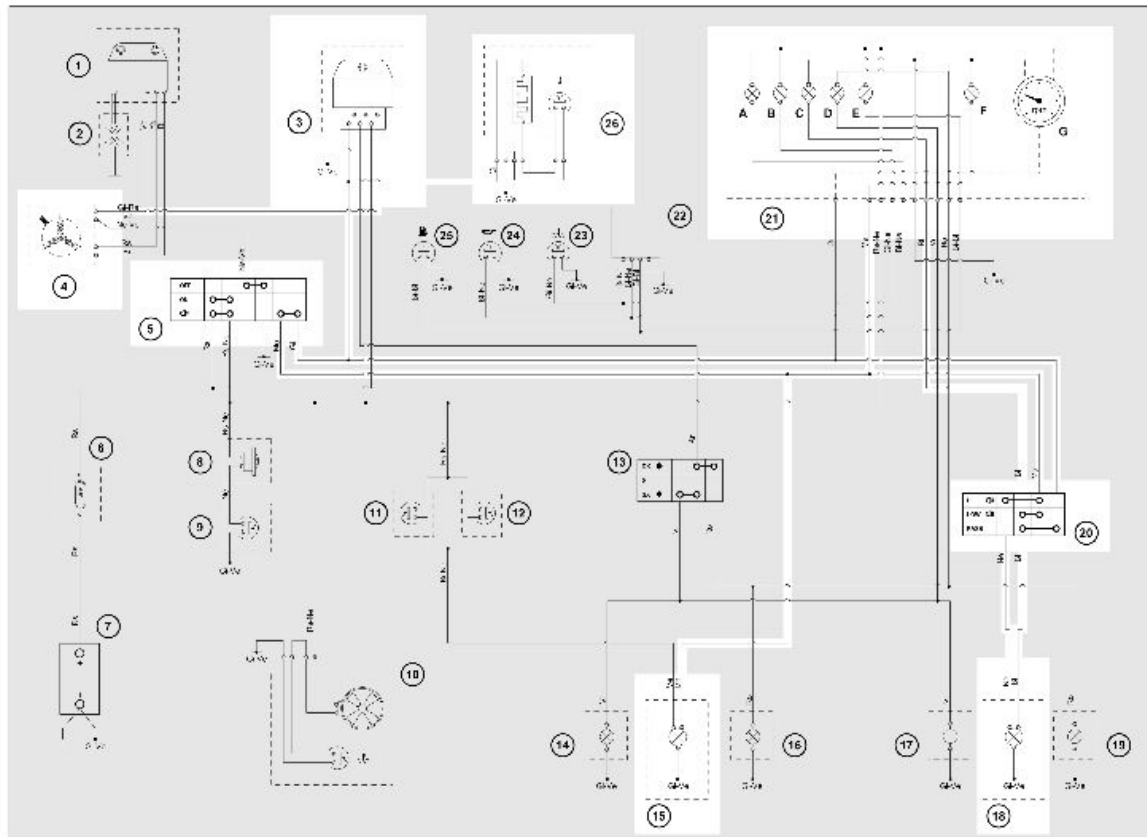
Ignition



KEY

1. Electronic ignition device
2. Spark plug
4. Magneto flywheel
5. Key switch

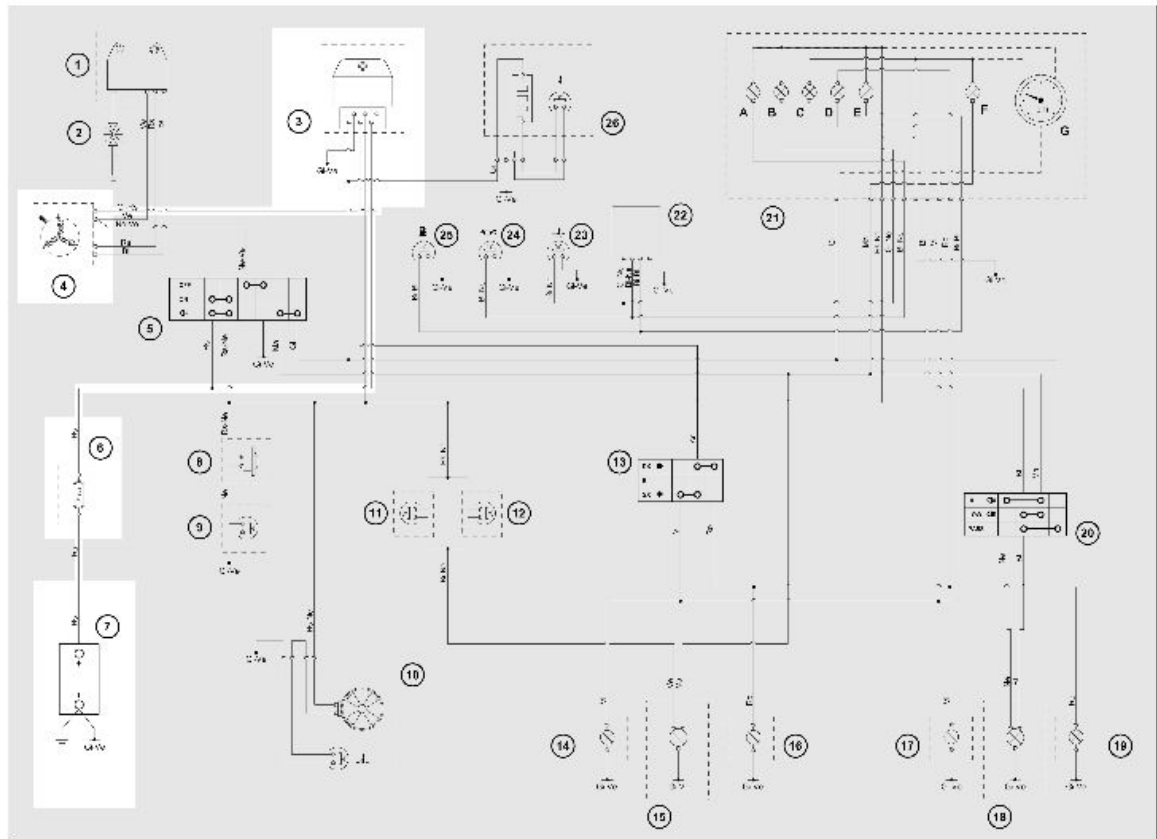
Headlights and automatic starter section



KEY

- 3. Voltage regulator
- 4. Magneto flywheel
- 5. Key switch
- 15. Tail lights/stop light bulbs
- 18. High-beam/low-beam bulb
- 20. Light switch
- 21. Instrument panel
- A. Oil warning light
- B. Temperature warning light
- C. High-beam warning light
- D. Turn indicator warning light
- E. Low fuel warning light
- F. Instrument panel bulb
- 26. Automatic starter pre-installation

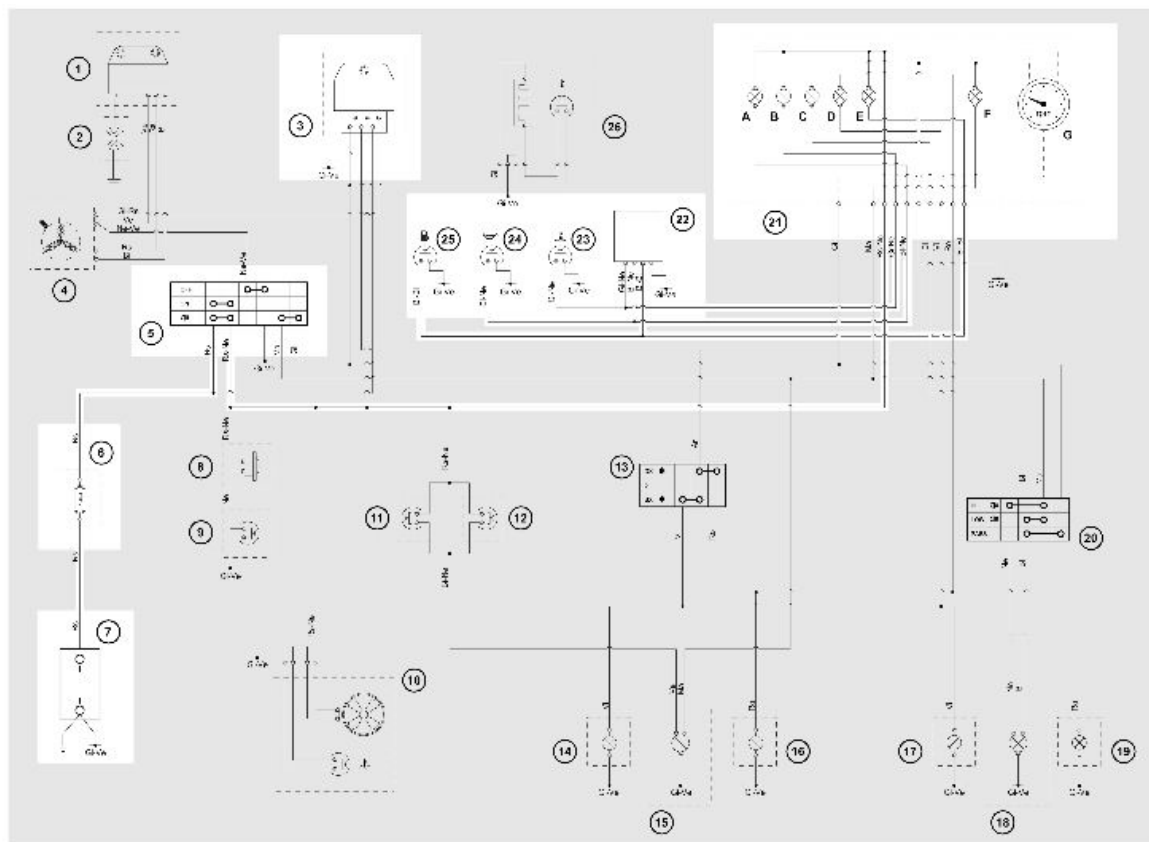
Battery recharge and starting



KEY

- 3. Voltage regulator
- 4. Magneto flywheel
- 6. Main fuse
- 7. Battery

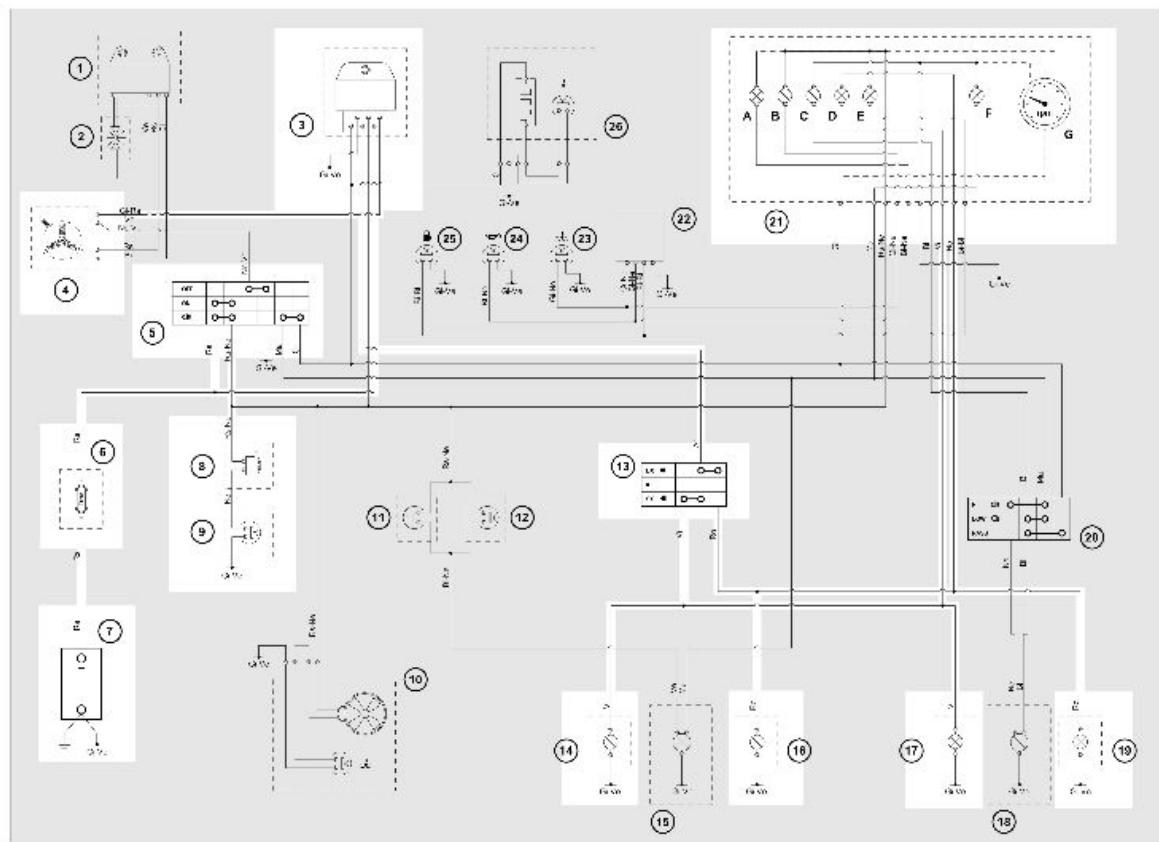
Level indicators and enable signals section



KEY

- 3. Voltage regulator
- 5. Key switch
- 6. Main fuse
- 7. Battery
- 21. Instrument panel
 - A. Oil warning light
 - B. Temperature warning light
 - C. High-beam warning light
 - D. Turn indicator warning light
 - E. Low fuel warning light
 - F. Instrument panel bulb
- 22. Timer
- 23. Engine temperature warning light control
- 24. Low oil warning light control
- 25. Fuel level warning light control

Turn signal lights

**KEY**

- 3.** Voltage regulator
- 4.** Magneto flywheel
- 5.** Key switch
- 6.** Main fuse
- 7.** Battery
- 8.** Horn
- 9.** Horn button
- 13.** Turn indicator switch
- 14.** Left turn rear indicator bulb
- 16.** Right turn rear indicator bulb
- 17.** Left turn front indicator bulb
- 19.** Right turn front indicator bulb
- 21.** Instrument panel
- A.** Oil warning light
- B.** Temperature warning light
- C.** High-beam warning light
- D.** Turn indicator warning light

E. Low fuel warning light

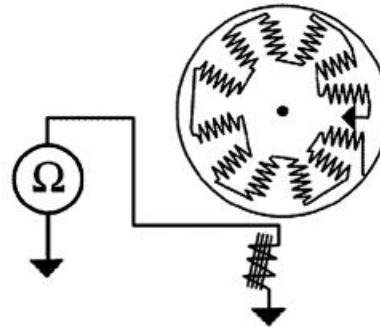
F. Instrument panel bulb

Checks and inspections

In case the cause of ignition failure or malfunction cannot be easily identified at sight, first of all replace the control unit by another one in operating conditions.

Remember that the engine must be off to disconnect and replace the control unit.

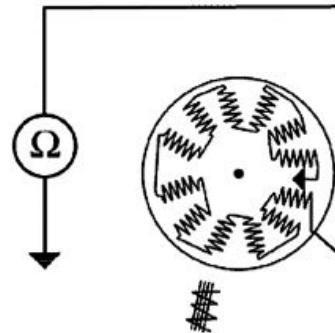
If after replacement the vehicle starts properly, the control unit is failing and must be replaced.



If the failure persists, check the generator and the stator components as follows:

After a sight control of the electrical connections, use a specific tester to measure the stator winding and the pick-up.

If checks on the loading coil, pick-up detect irregularities, **replace the stator and the failing components.**



Disconnect the connector on the flywheel cover and measure the resistance between either contact and the earthing.

Specific tooling

020331Y Digital multimeter

Ignition circuit

Coil removal

- Remove the front left fairing
- Detach the clamps of the magneto flywheel cable
- Remove the two screws fixing the control unit
- Remove the tube from the spark plug
- Remove the control unit



- Check the resistance of the secondary winding of the high voltage coil (resistance between points A and B)

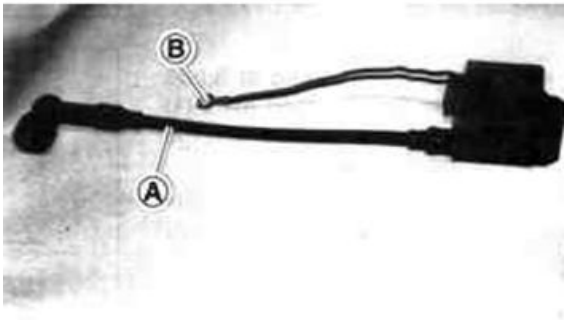
WARNING

IF THE READINGS OF THE SECONDARY WINDING AND THE MAGNETO FLYWHEEL ARE RIGHT, REPLACE THE COIL.

Electric characteristic

Resistance

5 - 6 kOhm



Tube check

- Check the resistance value in the hole

Electric characteristic

Resistance

4 - 6 kOhm



Stator check

WARNING

IF VALUES NON CONFORMING TO THE TABLE ARE DETECTED, CHECK ALL THE ELECTRICAL CONNECTIONS BEFORE REPLACING THE MAGNETO FLYWHEEL



RESISTANCE VALUES

	Specification	Desc./Quantity
1	White - Red	100 (Ohm)
2	White - Green	700 (Ohm)
3	White - Yellow	0.5 (Ohm)
4	Earth - Red	100 (Ohm)
5	Earth - Green	820 (Ohm)
6	Earth - Yellow	0.7 (Ohm)

RESISTANCE VALUES

- Remove the front left fairing
- Disconnect the high voltage coil terminals, the stop lights and the light fittings

- Check that the resistance between the terminals and the earth complies with the values indicated in the table.

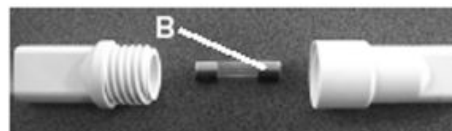
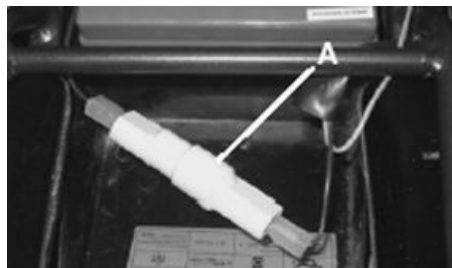
Lights list

BULBS

	Specification	Desc./Quantity
1	Front headlamp bulbs	12V. 35/35 W. Type: Twin filament
2	light/stop bulb:	12 V, 21/5 W Type: Twin filament
3	Turn indicators bulb:	12 V, 10 W

Fuses

The electrical system is protected by a 4 ampere fuse «B» located on the fuse box «A» on the battery positive cable. Before replacing a blown fuse, find and solve the problem that caused it to blow. Do not substitute the fuse with any alternative form of conductor



Sealed battery

Sealed battery start-up operations

INSTRUCTIONS FOR REFRESHING THE STOCK CHARGE OF AN OPEN CIRCUIT

1) Voltage check

Before installing the battery on the vehicle, check the open circuit voltage with a normal tester.

- If the voltage exceeds 12.60 V, the battery may be installed without any renewal recharge.
- If voltage is below 12.60 V, a renewal recharge is required as explained in 2).

2) Constant voltage battery charge mode

- Constant voltage equal to 14.40÷14.70V
- Initial charge voltage equal to 0.3÷0.5 for nominal capacity
- Duration of the charge: 10 to 12 h recommended

Minimum 6 h

Maximum 24 h

3) Constant current battery charge mode

-Charge current equal to 1/10 of the nominal capacity of the battery

-Duration of the charge: 5 h

WARNING

-WHEN THE BATTERY IS REALLY FLAT (WELL BELOW 12.6V) IT MIGHT BE THAT 5 HOURS OF RECHARGING ARE NOT ENOUGH TO ACHIEVE OPTIMAL PERFORMANCE. IN THESE CONDITIONS IT IS HOWEVER ESSENTIAL NOT TO EXCEED EIGHT HOURS OF CONTINUOUS RECHARGING SO AS NOT TO DAMAGE THE BATTERY ITSELF.

Dry-charge battery

WARNING

THE BATTERY ELECTROLYTE IS POISONOUS AS IT MAY CAUSE SERIOUS BURNS. IT CONTAINS SULPHURIC ACID. AVOID CONTACT WITH THE EYES, THE SKIN AND CLOTHING. IF COMING INTO CONTACT WITH EYES OR SKIN, WASH ABUNDANTLY WITH WATER FOR APPROX. 15 MIN. AND SEEK IMMEDIATE MEDICAL ATTENTION.

IN THE EVENT OF ACCIDENTAL INGESTION OF THE LIQUID, IMMEDIATELY DRINK LARGE QUANTITIES OF WATER OR MILK, MAGNESIUM MILK, BATTERED EGG OR VEGETABLE OIL. SEEK IMMEDIATE MEDICAL ATTENTION.

THE BATTERIES PRODUCE EXPLOSIVE GAS; KEEP CLEAR OF NAKED FLAMES, SPARKS OR CIGARETTES; VENTILATE THE AREA WHEN RECHARGING INDOORS.

ALWAYS WEAR EYE PROTECTION WHEN WORKING IN THE PROXIMITY OF BATTERIES. KEEP OUT OF REACH OF CHILDREN

Use of dry-cell batteries :

1. Having removed the short, closed tube and removed the caps, put into the elements sulphuric acid of the type for specific weight 1.26 accumulators corresponding to 30° Bé at a temperature of no less than 15°, until you reach the upper level.
2. Leave to stand for at least 2 hours; afterwards top-up to the level with sulphuric acid.
3. Within twenty four hours, recharge with the special (single or multiple) battery charger that recharges at an intensity the same as approximately 1/10 the rated capacity of the said battery. At the end of the charge, make sure that the density of the acid is around 1.27, corresponding to 31° Bé and that these values are stabilised.
4. Once the charge is over, level the acid (by adding distilled water). Close and clean carefully.
5. Once the above operations have been performed, install the battery in the vehicle ensuring that it is wired up properly..

WARNING

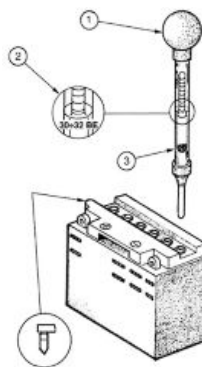
- ONCE THE BATTERY HAS BEEN INSTALLED IN THE VEHICLE IT IS NECESSARY TO REPLACE THE SHORT TUBE (WITH CLOSED END) NEAR THE + POSITIVE TERMINAL WITH THE CORRESPONDING LONG TUBE (WITH OPEN END), THAT YOU FIND FITTED TO THE VEHICLE, TO ENSURE THAT THE GASES THAT FORM CAN ESCAPE PROPERLY.

Specific tooling

020333Y Single battery charger

020334Y Multiple battery charger

- 1 Hold the vertical tube
- 2 Look at the level
- 3 The float must be freed



Battery maintenance

The battery is an electrical device which requires careful monitoring and diligent maintenance. The maintenance rules are:

1) Check the level of the electrolyte

The electrolyte level must be checked frequently and must reach the upper level. Only use distilled water, to restore this level. If it is necessary to add water too frequently, check the vehicle's electrical system: the battery works overcharged and is subject to quick wear.

2) Load status check

After restoring the electrolyte level, check its density using an appropriate densitometer (see the figure). When the battery is charged, you should detect a density of 30 to 32 Bé corresponding to a specific weight of 1.26 to 1.28 at a temperature of no lower than 15° C.

A density reading of less than 20° Bé indicates that the battery is completely flat and it must therefore be recharged.

If the scooter is not used for a given time (1 month or more) it will be necessary to periodically recharge the battery.

The battery runs down completely in the course of three months. If it is necessary to refit the battery in the vehicle, be careful not to reverse the connections, remembering that the ground wire (**black**) marked (-) must be connected to the **-negative** clamp while the other two **red** wires marked (+) must be connected to the clamp marked with the **+positive** sign.

3) Recharging the battery

Remove the battery from the vehicle removing the negative clamp first.

The normal bench charging must be carried out with the specific (single or multiple) battery charger, placing the battery charger selector on the type of battery to be recharged. The connections to the power supply must be made by connecting to the corresponding poles (+ with+ and -with -).

4) Battery cleaning

The battery should always be kept clean, especially on its top side, and the terminals should be coated with Vaseline.

WARNING

BEFORE RECHARGING THE BATTERY, REMOVE THE PLUGS OF EACH CELL. KEEP SPARKS AND NAKED FLAMES AWAY FROM THE BATTERY WHILE RECHARGING.

CAUTION

NEVER USE FUSES WITH A CAPACITY HIGHER THAN THE RECOMMENDED CAPACITY. USING A FUSE OF UNSUITABLE RATING MAY SERIOUSLY DAMAGE THE VEHICLE OR EVEN CAUSE A FIRE.

CAUTION

ORDINARY AND DRINKING WATER CONTAINS MINERAL SALTS THAT ARE HARMFUL FOR THE BATTERY. FOR THIS REASON, YOU MUST ONLY USE DISTILLED WATER.

CAUTION

CHARGE THE BATTERY BEFORE USE TO ENSURE OPTIMUM PERFORMANCE. INADEQUATE CHARGING OF THE BATTERY WITH A LOW LEVEL OF ELECTROLYTE BEFORE IT IS FIRST USED SHORTENS THE LIFE OF THE BATTERY.

Specific tooling

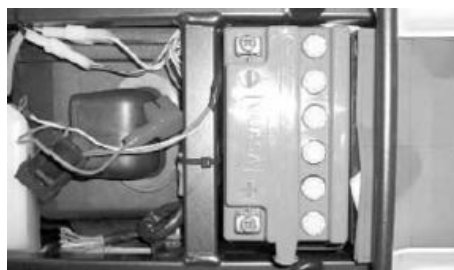
020334Y Multiple battery charger

020333Y Single battery charger

Battery installation

Battery

For battery access, it is necessary to insert the key on the tank cover lock, turn the key rightwards and lift the cover. Dismantle the two fixing wing nuts of the saddle and extract them, the battery compartment is under the saddle. The battery is the electrical device that requires the most frequent inspections and diligent maintenance. The main points of maintenance to be observed are as follows: Check the electrolyte level, this must be checked frequently and it must reach the maximum level. To maintain such level, use distilled water only. If necessary add water frequently, check the vehicle electric system: the battery is working in overcharge and is easily impaired.



Battery maintenance

- Keep the tank caps perfectly closed. It is important.
- Keep the upper part perfectly clean, dry and away from corrosive materials. The battery terminals must be cleaned and greased to avoid corrosion.
- Check the battery disposal capacity with a densitometer. 1.265 or most, it is considered a good capacity: if less, the battery must be charged. The

advisable recharge tension is $0.5 \div 1$ A maximum, or until the advisable density is obtained.

- The battery, if not used, discharges between 0.5% and 1% every day. This measure increases with temperature. To compensate, a recharge must be done once a month.
- Batteries contain sulphuric acid. Avoid contact with skin, eyes and clothing.



WHEN RECHARGING THE BATTERY, MAXIMUM INTENSITY MUST NOT EXCEED $0.5 \div 1$ A. OTHERWISE, THE BATTERY WOULD BE SERIOUSLY DAMAGED.



BATTERIES CONTAIN VERY ENVIRONMENTAL DANGEROUS SUBSTANCES. FOR BATTERY REPLACEMENT, CONTACT AN AUTHORISED PIAGGIO-GILERA SERVICE CENTRE, AS THEY ARE EQUIPPED FOR THE DISPOSAL IN AN ENVIRONMENTALLY FRIENDLY AND LEGAL WAY.

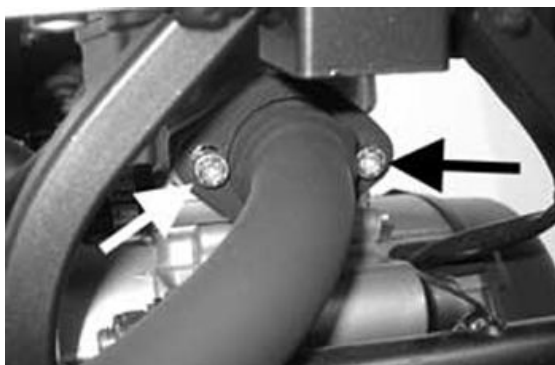
INDEX OF TOPICS

ENGINE FROM VEHICLE

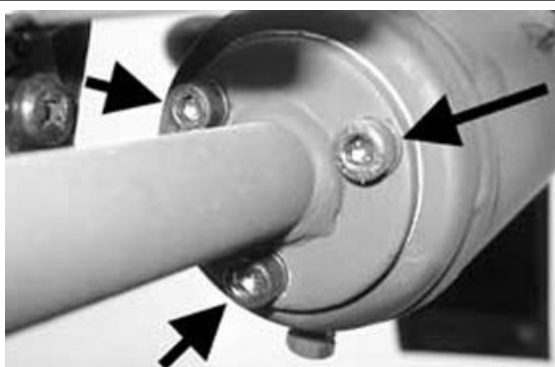
ENG VE

Exhaust assy. Removal

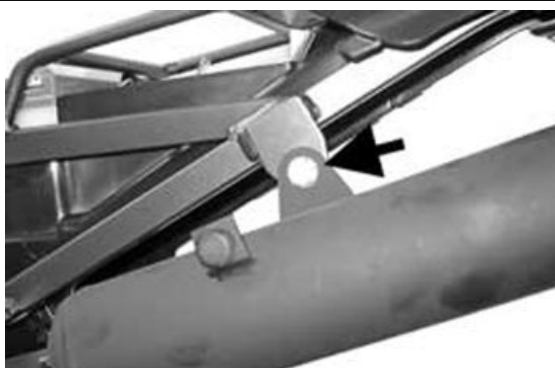
- Remove the left side fairing
- Remove the screws fixing the muffler to the cylinder



- Remove the screws fixing the silencer to the muffler



- Remove the retainer fixing the silencer to the chassis
- Slide off the muffler



Removal of the engine from the vehicle

- Remove all the plastic parts around the fuel tank.
- Pay attention to the couplings between the plastic parts, the fuel tank and the radiator protection grille.



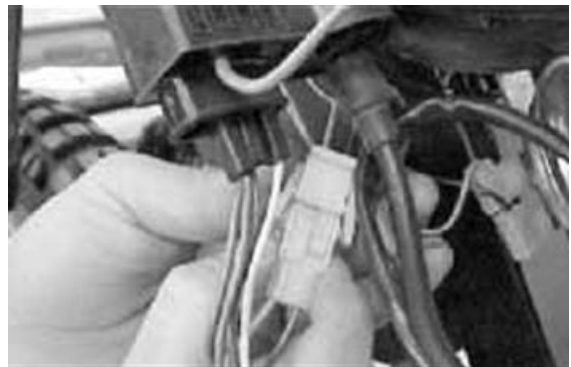
- Remove the exhaust pipe and the silencer.



- Remove the cooling rubber pipe connecting the water pump to the radiator.
- Get a container to collect the coolant.



- Remove the following electric wires:
 - the cable harness connecting the fly-wheel to the coil
 - the cable harness of the coolant sensor
 - the HV cable



- Remove the carburettor:
 - Remove the low-pressure pipe controlling the fuel pump
 - Remove the fuel hose
 - Remove the mixer oil hose



- Remove the cable from the clutch lever.
- Before removing the cable, fully loosen the set screw of the lever-hand grip unit.



- Remove the oil pump cover and disconnect the metal cable and the hose connecting the oil reservoir to the mixer.



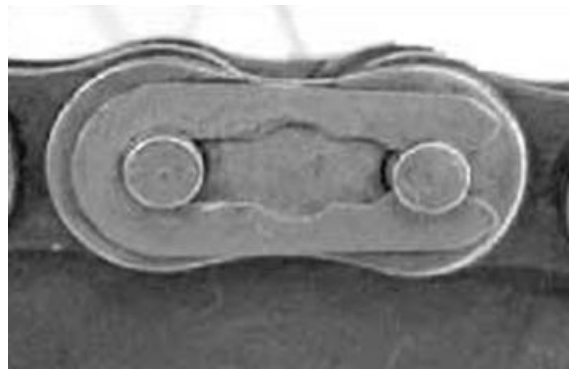
- Remove the protective platen from the gearbox and the kick start pedal.



- Drain the oil out of the gearbox. The oil drainage plug is located in the lower section of the crank-case.



- Remove the drive chain operating on the false mesh shown in the photograph.
- Note the correct position of the drive chain upon refitting.



- Remove the clamps fixing the engine to the chassis, indicated in the photograph.



-
- Remove the engine from the chassis by pulling and rotating it slightly.



INDEX OF TOPICS

ENGINE

ENG

Flywheel and starting

Removing the flywheel magneto

- Remove the left rear cover
- Detach the gear pedal
- Undo the three fixing screws and remove the crankcase left cover



- Lock the magneto flywheel with the aid of the specific calliper spanner and remove the flywheel fixing nut

Specific tooling

020565Y Flywheel lock calliper spanner



- Remove the rotor unit from the flywheel with the aid of the specific flywheel extractor

Specific tooling

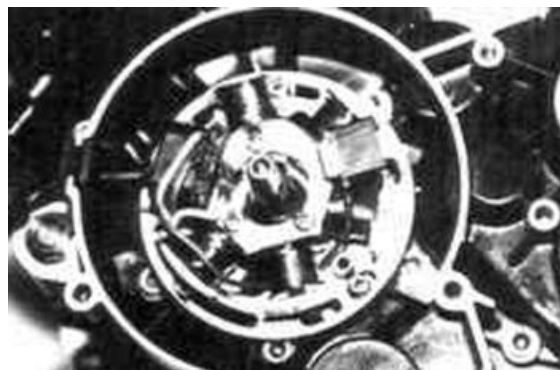
020581Y Flywheel extractor



- Detach the fittings of the flywheel cable and the brackets fixing the cables to the chassis

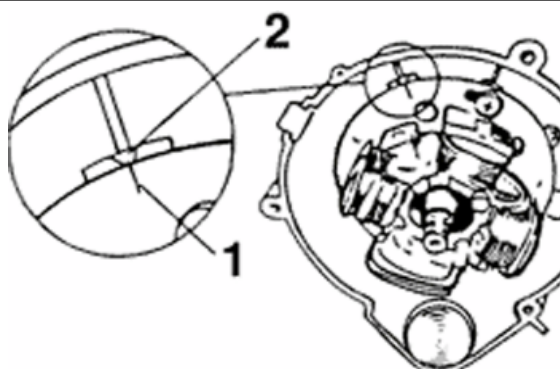


- Undo the three fixing screws and remove the stator from the crankcase

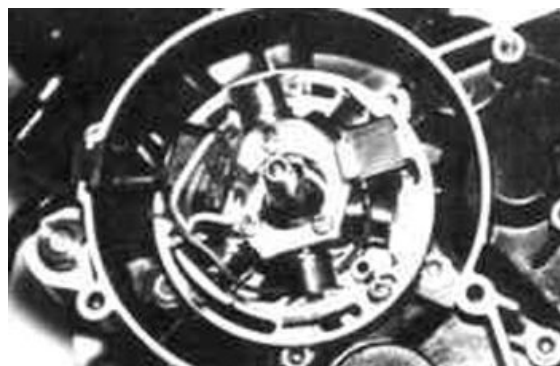


Refitting the flywheel magneto

- Align the symbol (1) on the stator with the centre of the arrow (2) on the crankcase and fix it with 3 screws



- Connect the stator cables with the high voltage coil and fix them to the chassis with the brackets
- Make sure the cable support inside the crankcase is correctly positioned so that the cables do not get into contact with the flywheel rotor



- Fit the flywheel rotor making sure that the wrench is aligned with its guide
- Lock the flywheel using the specific calliper spanner and tighten the flywheel fixing nut
- Fit the other parts following the removal steps but in reverse order



Specific tooling

020565Y Flywheel lock calliper spanner

Locking torques (N*m)

Flywheel 35 ÷ 45 Nm

Cylinder assy. and timing system

Removing the cylinder head

Head fitting

- To refit it, carry out the removal operations but in reverse order
- Fit a new gasket between the head and the cylinder
- Make sure the coupling surfaces are perfectly clean
- Place the head on the cylinder and tighten the four stud bolts in two or three stages, tightening one stud bolt and afterwards the one that is diametrically opposite
- Refit the thermoswitch and fit an adhesive gasket on the thread
- Fit the thermostat and its fixing nut
- Connect the thermoswitch connector and the spark plug tube - Connect the radiator coupling to the cylinder head
- Connect the coupling from the radiator to the hydraulic pump
- Fill the cooling system reservoir with coolant
- Purge the system by operating on the coolant pump cap

Locking torques (N*m)

Stud bolts: 19 Nm Screws 6 Nm Thermoswitch 10 Nm

- Remove the coolant hose connecting the cylinder to the water pump
- Use a container to collect the coolant
- Remove the hose from the head to the radiator
- Disconnect the temperature sensor electrical connector.
- Remove the two M6 screws first and then the four M7 stud bolts fixing nuts
- Remove the head and its gasket
- Remove any carbon deposits present on the head being careful not to scratch the coupling surfaces
- Use a trued bar to check whether the head coupling surface is flat. Maximum run-out allowed: 0.05 mm





Removing the cylinder - piston assy.

- Drain the coolant out of the system
- Remove the cylinder head
- Remove the cooling circuit rubber pipe between the cylinder and the water pump
- Move the cylinder slowly upwards
- Remove the base gasket
- Put a piece of old cloth in the cylinder housing hole on the crankcase so that no object can fall in
- Remove the seeger ring retaining the pin
- The pin
- The Piston
- The piston sealing circlips (piston rings)
- When pulling the pin, be careful to fasten the connecting rod properly to avoid distortions
- Check and clean the components
- Clean the piston crown by carefully removing any possible carbon deposits
- Visually check the piston sealing circlips. Replace the piston if it is damaged or distorted

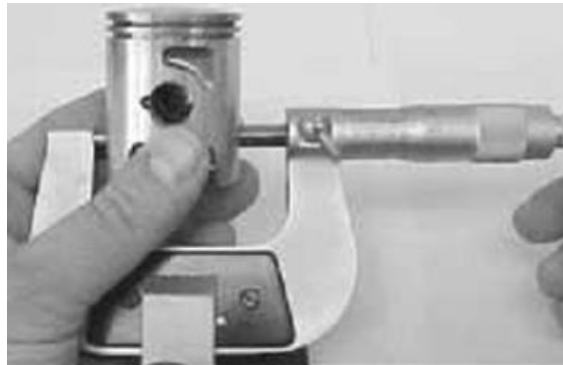


Inspecting the piston

- Check the piston diameter following the perpendicular axis to the pin seat. Carry out measurements 15 mm away from the lowest circlip seat

Characteristic**Serviceability limit:**

0.05 mm



Inspecting the cylinder

- Measure the gaps of the piston sealing circlips by placing a thickness gauge in the cylinder

Characteristic**Maximum piston ring gap allowed:**

0.5 mm



- Check cylinder for wear with a bore meter
- Calibrate the bore meter according to the measurements indicated in the table for the piston - cylinder group
- Measure following the perpendicular axis and at the three different cylinder heights

Characteristic**Serviceability limit:**

0.35 mm



Removing the piston

- Refit the piston sealing circlips
- Fit a new base gasket
- Refit the ball retainer at the rod small end being careful to lubricate the components with recommended oil
- Refit the piston paying attention to the direction of the arrow indicated on the piston crown. This arrow should be facing the outlet
- Fit the pin all the way down and fit the two new pin retaining seeger rings being careful to fit them in their corresponding positions
- Lubricate both the cylinder and the piston faying surfaces and the sealing circlips
- Carefully fit the piston in the cylinder being careful to press the sealing circlips in their seats
- Fit a new head gasket and refit the head on the cylinder
- Fit a new spark plug
- Reconnect the temperature sensor connectors and the spark plug cap
- Fill the cooling circuit being careful to bleed it

Recommended products

AGIP CITY TEC 2T Mixer oil

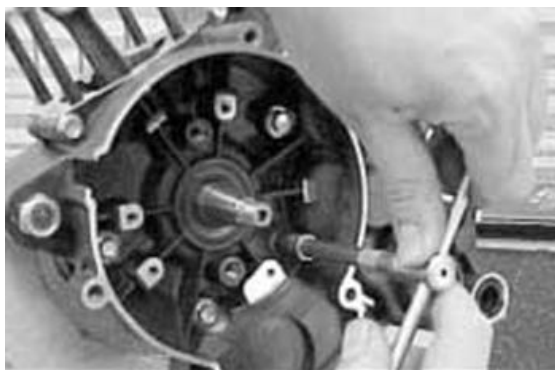
synthetic oil for 2-stroke engines: JASO FC, ISO-L-EGD



Crankcase - crankshaft

Crankshaft removal

- Remove the engine from the chassis and rest it on the engine support
- Remove the thermodynamic unit (cylinder head and piston)
- Remove the magneto flywheel
- Remove the main gear, the kick start and the gear selector lever
- Remove the fixings screws of both crankcase halves located to the left of the engine



- Remove the intermediate gear located at the end of the gearbox
- Remove the gearbox star



- Warm up the seats of the crankshaft, the main shaft, and the secondary shaft on both sides at about 60°



- Place the crankcase on a wooden support as shown in the photograph
- Separate the two crankcase halves with the specific tool

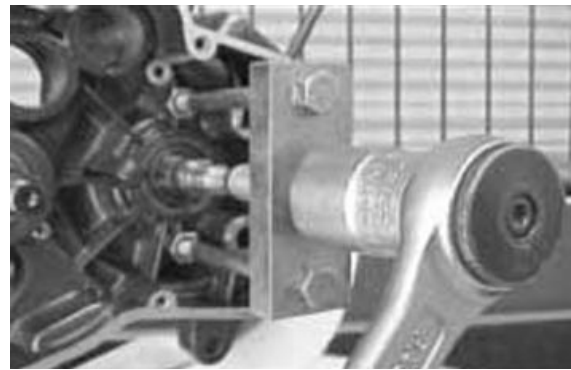
Never use a lever or a screwdriver to separate the crankcase halves. Replace the crankcase halves if the coupling surfaces get damaged.



Specific tooling

00H0530015.1 Engine opening tool

- Fit the specific tool from the flywheel side wall
- Remove the crankshaft after warming up the shaft seat at about 60°

Specific tooling**00H0530015.1 Engine opening tool**

- Take out the selector guiding fork and the selector



- Take out the two gear shafts at the same time



- Thoroughly clean and degrease the crankshaft and then inspect it
- Use a thickness gauge to check the clearance between the connecting rod head and the half shaft

Characteristic**Serviceability limit:**

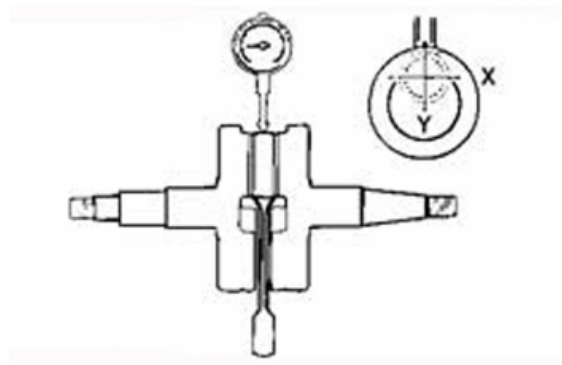
0.8 mm



- Use a dial gauge to check the clearance between the connecting rod and the crankpin on the X and Y axes as indicated in the photograph

Characteristic**Serviceability limit:**

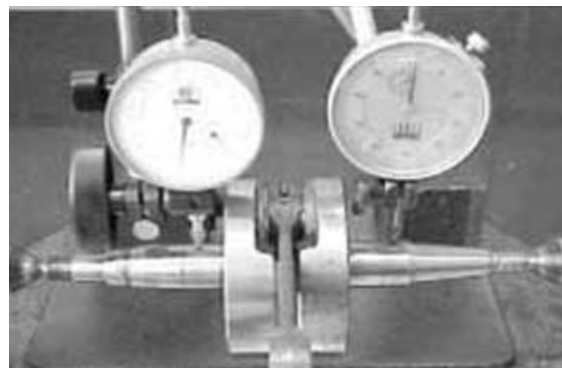
0.35 mm



- Make sure that both half shafts are not scratched or abnormally worn
- Use two dial gauges and a support as indicated in the photograph to check the deviation of both half shafts

Characteristic**Serviceability limit:**

0.05 mm

**Selector unit removal**

- Remove the clutch unit
- Remove the gear pedal (1)



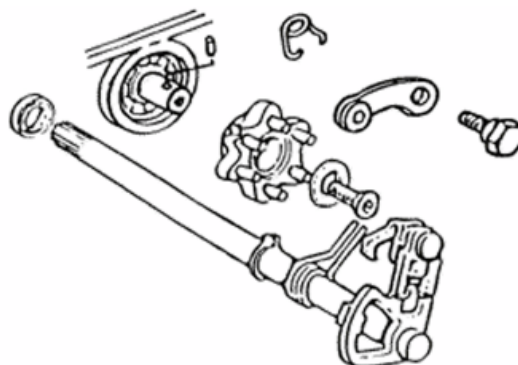
- Remove the shaft/selector unit (2) by pulling it outwards



- Undo the screw of the gear selector lever (1)
- Undo the screw of the drum control head (2)
- Unscrew the drum control pin



- Make sure that the selector shaft springs and the gear selector lever spring have been correctly fitted
- Check that the selector shaft is not worn or damaged
- Fit the parts following the removal procedures but in reverse order
- Apply one drop of Loctite 270 on the thread of the screw of the drum control head



Crankcase fitting

- Fit the new gaskets on the hydraulic pump shaft with the aid of the specific tools
- Fit the first gasket with its rim facing inside and the second gasket with the rim facing outside



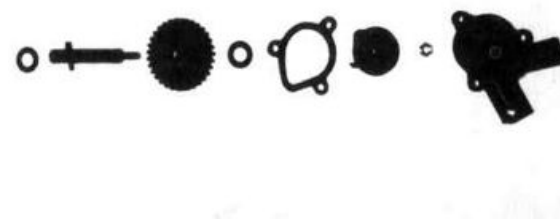
Specific tooling

020376Y Adaptor handle

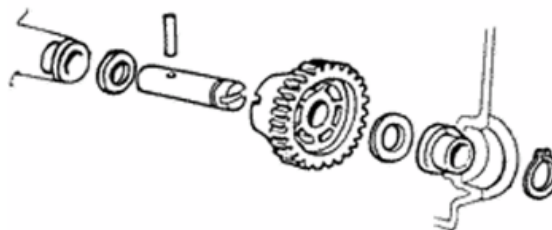
020441Y 26 x 28 mm adaptor

020455Y 10-mm guide

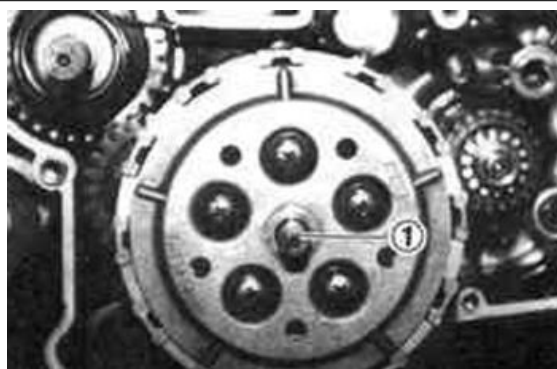
- Fit the hydraulic pump shaft
- It is crucial to make sure that the washer is correctly fitted
- Fit the pump rotor and fix it with its nut
- Fit a new gasket on the pump cover and then fit the pump cover



- Fit the oil pump shaft following the removal operations but in reverse order
- It is crucial to make sure that the washers are correctly fitted



- Fit the bolts on the clutch cover
- Fit a new gasket on the crankcase right cover
- Make sure the faying surfaces of the crankcase and cover are clean and in good conditions
- Align the tappet (1) with the clutch shaft on the cover



- Place the crankcase right cover and, with the aid of a screwdriver, rotate the clutch shaft until it is aligned with the tappet
- Using a screwdriver, rotate the oil pump shaft and the crankshaft so as to engage the oil pump pinions and those of the hydraulic pump
- Tighten the screws on the crankcase cover in two or three stages, tighten one screw first and then the one that is diametrically opposite

Locking torques (N*m)

Crankcase right cover 8 ÷ 10 Nm

- Fit the oil pump and the hose support
- Fit the oil pump cable (1). Level the buffer (2) with the aid of a screwdriver in order to fix the cable end. Using the specific nuts (3), align the symbols (4) stamped on the oil pump retainer to the throttle control in neutral
- Fit the oil pump cover



- Fit the clutch control (only if it has been previously removed)



- Fit the new gasket on the clutch shaft using the specific tools

Specific tooling

020376Y Adaptor handle

020441Y 26 x 28 mm adaptor

020412Y 15 mm guide



- Fit the clutch cables, the clamp and the lever
- Using a screwdriver, rotate the clutch shaft anti-clockwise and then fit the clutch lever with its screws
- Adjust the clutch lever clearance to a value between 2 and 4 mm (handlebar left side)



- Fit the connecting coupling between the hydraulic pump and the radiator and between the hydraulic pump and the cylinder
- Fit the rear brake pump and the brake fluid reservoir
- Pour recommended oil in the crankcase
- Fill the cooling system with the recommended coolant

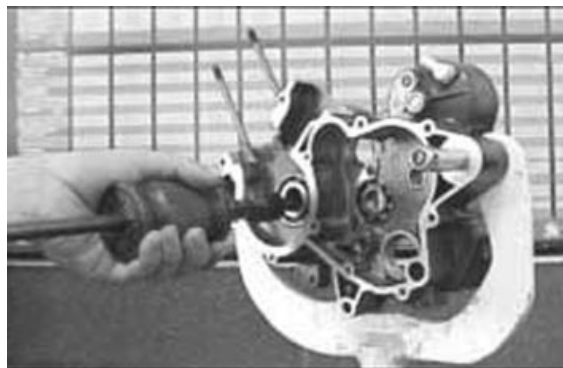


Crankshaft and gearbox fitting

- Clean and lubricate the main bearings
- Replace them if there are signs of abnormal wear, distortions or friction



- To remove the main bearing, use the specific tool as shown in the photograph after warming up the crankcase at about 90°



- To fit the new bearing, warm up the seat at about 90°
- Using a punch, push the bearing until it stops



- Thoroughly clean and degrease the gear shaft and then inspect it
- Carry out a visual inspection of the gears. Replace the gears if they show signs of overheating or surface softening or abnormal wear of gears teeth
- Replace the whole shaft if it is damaged or abnormally worn



- Take out the gears and the shim washers from the secondary shaft once the locks have been removed



- Check the gear studs and clefts are not rounded or show signs of abnormal use



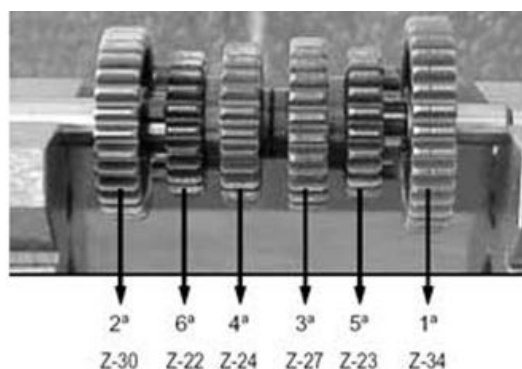
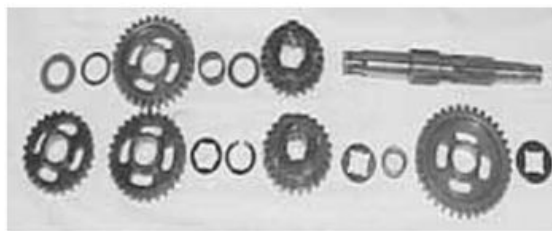
- Check the secondary shaft rings for wear
- Replace them if 25% of their surface is worn



- Make sure that the secondary shaft roller bearing show no signs of wear. Replace it if worn.



- Thoroughly clean and degrease all the gearbox components, the selector and the shaft with a degreasing agent
- Refit the secondary shaft making sure all components are fitted correctly
- Refit the gearbox unit in the crankcase (the main and the secondary shafts must be fitted at the same time)
- First check the overall size of the secondary shaft including shim washers. Overall size of the secondary shaft: Max. 87,700 mm. MIN. 87.350 mm
- Fit the selector. Lubricate the surfaces with specific oil
- Make sure that the gearbox works properly by selecting different speed ratios and turning the gear selector drum to both sides
- Select neutral gear and check that the system rotates freely
- Refit the crankcase by warming up the shaft seats at about 60°
- Tighten the screws to the prescribed torque
- Make sure the crankshaft and the gear rotate freely after refitting the crankcase



Recommended products

AGIP CITY HI TEC 4T oil to lubricate flexible transmissions (throttle control)

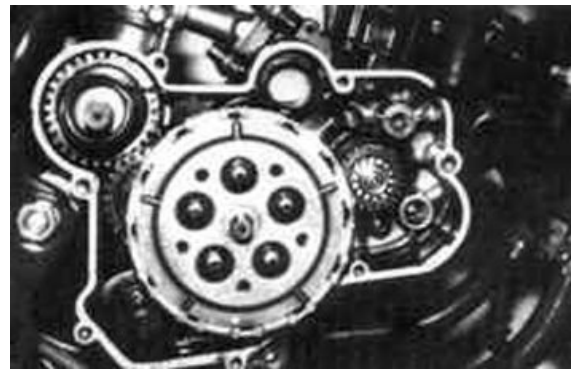
Oil for 4-stroke engines

Locking torques (N*m)

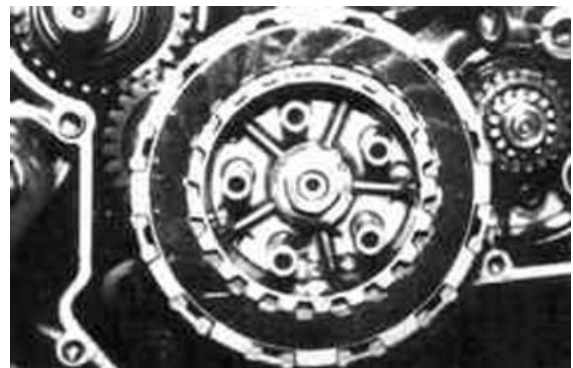
Tightening torque: 6 Nm

Removing the clutch

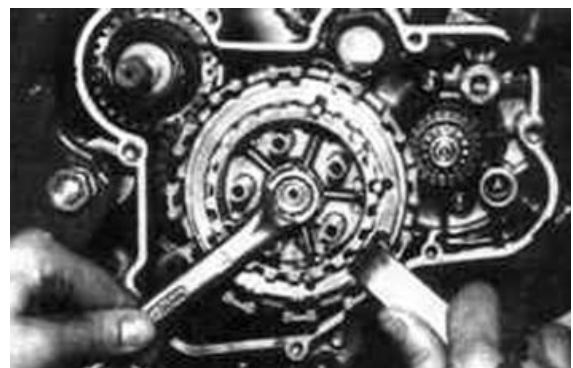
- Remove the crankcase right cover
- Undo the 5 screws fixing the clutch spring and lift the clutch internal cover



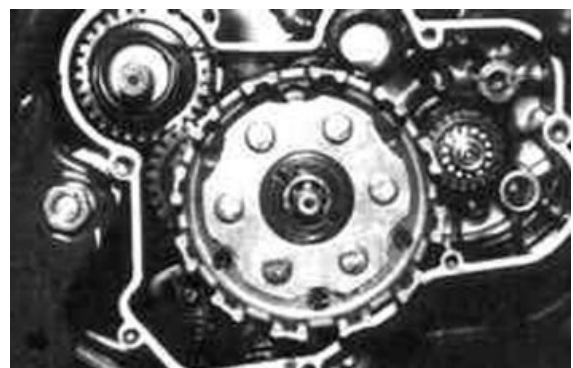
- Remove the 3 clutch plates and the two steel discs
- Straighten the bevelled washer



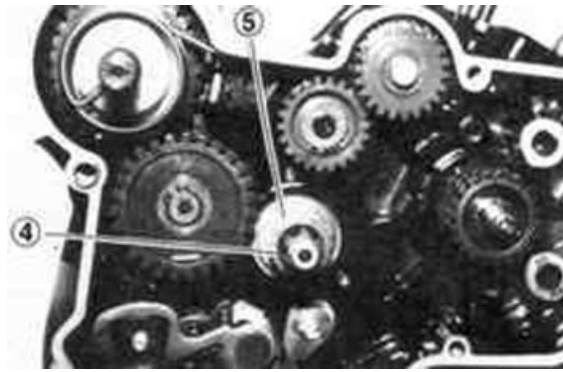
- Lock the hub with the specific tool and unscrew the nut with a M17 wrench - Detach the locking washer and the star washer



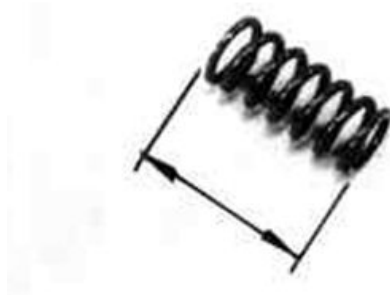
- Remove the clutch hub



- Remove the clutch bushing shell (4) and the bushing washer (5)



- Check the clutch spring
- Measure the length of each spring when extended

Characteristic**Spring serviceability limit:****31 mm**

- Check the clutch plate
- Measure the thickness of each plate

Characteristic**Serviceability limit:****3.8 mm**

- Check the steel disc
- Use thickness gauges to check that the plates are not distorted

Characteristic**Serviceability limit:****0.15 mm**

Visually inspect in between the teeth. Replace the component if there are signs of thermal fatigue, reduced surface hardness or teeth irregular wear. Check the components of the clutch bell are in good conditions:

- Clutch disc seats
- Rivets and connecting plugs with crown gears
- Main shaft lever coupling

CAUTION

REPLACE THE PART IN CASE OF EXCESSIVE DAMAGE.



Check that the coupling between the surface and the plate is not eroded or grooved. Replace the part if any defect is found.

CAUTION

REPLACE THE PART IN CASE OF EXCESSIVE DAMAGE.



Check the pressure disc and its axial bearing.

CAUTION

REPLACE THE PART IN CASE OF EXCESSIVE DAMAGE.

**Pinion fitting**

- Insert the wrench in the crankshaft and then fit the main transmission gear
- Fit the hydraulic pump and the oil pump driving gear
- Lock the magneto flywheel with the aid of the specific tool and tighten the main transmission gear fixing nut and the pump driving gear fixing nut

Specific tooling

020565Y Flywheel lock calliper spanner**Locking torques (N*m)****Flywheel 35 ÷ 45 Nm****Right cover**

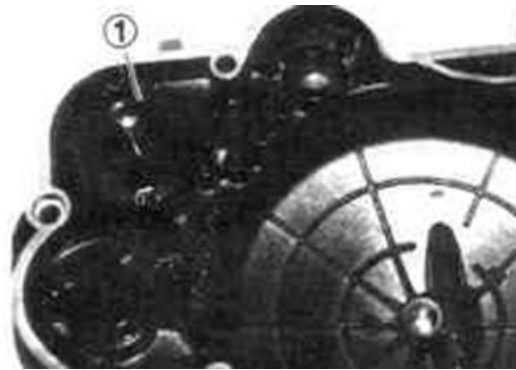
- Remove the engine protective cover
- Remove the rear brake pump
- Detach the coupling connecting the radiator to the hydraulic pump and drain the coolant out of the cooling system
- Detach the coupling connecting the hydraulic pump to the cylinder
- Remove the clutch lever and detach the cable clamps from the clutch
- Drain the oil out of the gearbox and the clutch
- Remove the oil pump cap
- Partially lift the lockscrew fixing the oil cable with the aid of a small screwdriver
- Rotate the pump valve control anticlockwise and detach the oil pump cable
- Remove the hose support
- Undo the two screws fixing the oil pump
- Move the whole oil pump unit and its hoses towards one side of the carburettor but do not detach them
- Remove the clutch cover
- Remove the clutch cover bolts



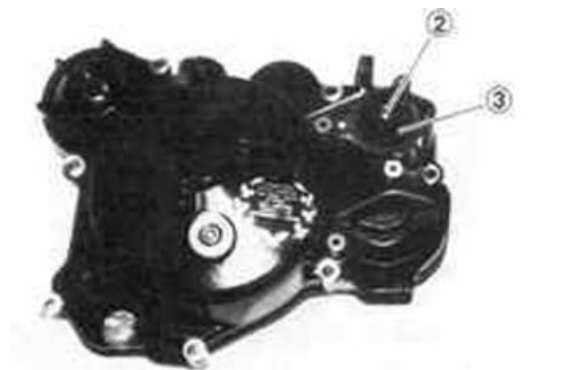
- Remove the crankcase cover gasket and clean off any rest of old gaskets that may remain on the crankcase or the cover



- Loosen the screws fixing the clutch shaft and remove it
- Undo the three screws fixing the hydraulic pump and remove it
- Detach the gasket and clean off any rests of old gaskets that may be left on the coupling surfaces of the hydraulic pump
- Lock the driving gear (1)



- Unscrew the fixing nut (2) first and then the rotor (3). Push the driving gear, remove the hydraulic pump and the gaskets



- Remove the seeger ring (4)
- Remove the oil pump (5)



Main transmission pinion

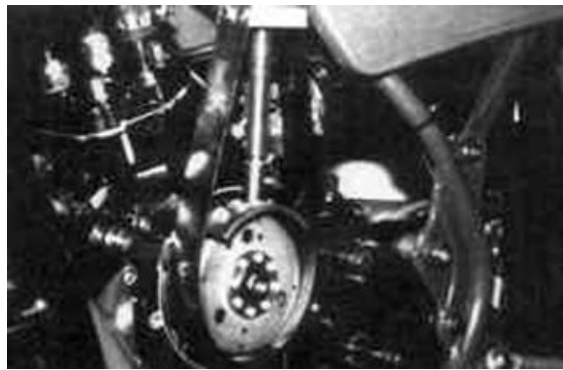
- Remove the crankcase right cover and the clutch hub



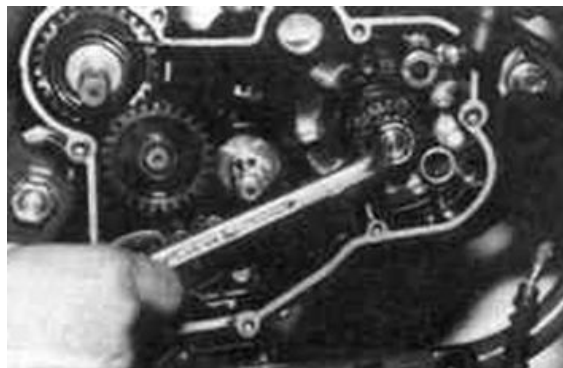
- Remove the crankcase left cover
- Lock the magneto flywheel with the specific tool

Specific tooling

020565Y Flywheel lock calliper spanner



- Lock the magneto flywheel and then loosen the main transmission gear fixing nut and the pump driving gear
- Remove the hydraulic pump and the oil pump driving gear



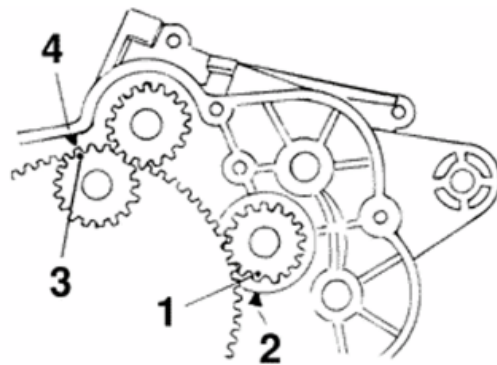
- Remove the main transmission gear using the specific tool

Specific tooling

0.0H.056.0.032.1 Crankshaft gear extractor

**Clutch fitting**

- Fit the clutch bushing washer and its shell



- Fit the hub (1) without interfering with the main transmission gear. The hub should be aligned with the main transmission gear (2), and then, after manually turning the intermediate gear of the kick starter (4), it should be aligned with the clutch hub gear



- Fit the clutch hub washer
- Fit the hub, the star washer, the locking washer and the fixing nut
- Lock the hub using the specific tool and tighten the locking nut using the appropriate M17 wrench
- Fold the locking washer to secure the nut



- Lubricate the clutch plates with new oil
- Fit the transmission discs with the visible circle on one of the clutch surfaces facing out



- Fit the clutch internal cover with the Gilera logo in line with the visible notch on one of the clutch hub teeth
- Fit the clutch springs and their fixing screws



Lubrication

Oil pump

Removal

Oil pump removal

- Remove the oil pump cover located on the engine crankcase
- Remove the oil feed and delivery hoses from the pump by operating on the flexible clamps
- Be careful to close the oil feed hose connected to the pump so that the oil reservoir does not get empty



- Remove the pump opening control cable by operating first on the set screw retainer indicated in the photograph and then on the pump cam retainer



- Remove the two screws fixing the pump to the crankcase
- Remove the pump
- Make sure the pump drive rotates freely
- Make sure the sealing rings are in good conditions. Replace them if they are damaged or distorted
- The oil pump is a safety element for proper engine operation. Replace it in case of faults; do not repair it



Refitting

- Fit the oil pump following the removal procedure but in reverse order
- Operate on the set screw to align the reference notches on the pump control lever (2) with those on the pump body, without accelerating with the throttle control
- Purge the oil system after fitting the oil pump



Oil pump purging

- Check oil level in the reservoir and, if necessary, top up with oil recommended for this type of engine
- Place a suitable container under the pump to collect the oil purged from the pump
- Loosen the oil pump bleed screw (1), located at the front of the pump between the feed and the delivery hoses, to facilitate drainage until the oil flow is constant and no air bubbles are formed. Tighten the bleed screw (1)



Pipe purging

- Fill up the fuel tank with a mixture of oil and petrol at 2.5% using the oil recommended for this type of engine
- Start the engine and let it run for about 10 minutes with the oil pump control lever (2) fully open in order to send out all the air in the pipe together with the oil
- DO NOT fully rev up the engine while purging
- Carry out this operation in a well-ventilated area



Fuel supply

WARNING

IF THE SCOOTER IS NOT USED FOR OVER 1 MONTH, DRAIN ALL THE FUEL OF THE CARBURETTOR FLOAT CHAMBER. OTHERWISE, THE NOZZLES CAN GET PARTIALLY OR FULLY CLOGGED

WARNING

THE CARBURETTOR CAN BE REMOVED OR REPLACED WITH THE ENGINE FITTED ON THE SCOOTER

Removing the carburettor

Reed valve

- Remove the carburettor from the engine
- Remove the reed valve and its gasket from the crankcase



- Check that the valve petals are not damaged or distorted. Replace them if they are.



- Remove the plate limiting reed opening by undoing the three screws fixing the reed support



- Fit the valve following the removal procedure but in reverse order; make sure the plate limiting reed opening has been correctly positioned
- Absence of the plate limiting reed opening compromises the engine performance and reliability
- Check the O-ring of the reed support. Replace it if damaged or distorted



(TYPE: PHVA 14)

- Remove the carburettor by releasing the clamps on the inlet manifold and the bellows connected to the air cleaner housing
- Remove the fuel pipe from the carburettor, the mixer oil intake pipe and the fuel valve low-pressure pipe



- Operating on the screw indicated in the photograph, remove the throttle valve and its tapered pin



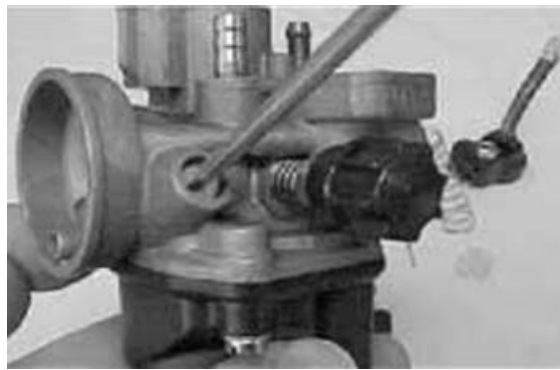
- Compress the throttle valve return spring
- Remove the safety cap in the throttle valve and remove the throttle control cable from the valve



- Remove the starter fixing cotter by undoing the screws indicated in the photograph
- Remove the starter control



- Remove the air flow set screw as indicated in the photograph



- Remove the carburettor float chamber
- Remove the float by operating the stem fixing it to the carburettor with a very thin pin
- Remove the maximum nozzle, the minimum nozzle and the starter nozzle

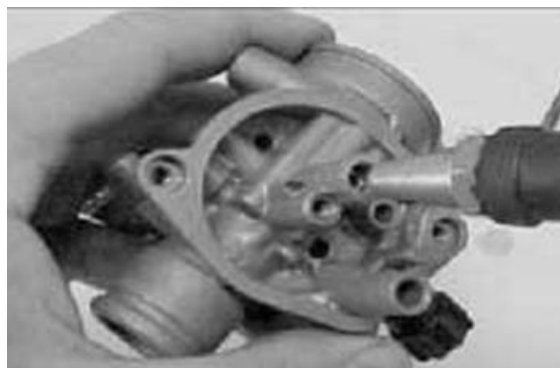


Refitting the carburettor

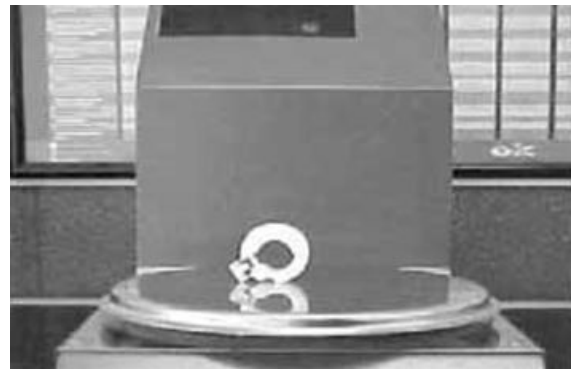
- Thoroughly clean all the carburettor components with solvent
- Be careful not to damage the carburettor gasket and the starter control O-ring



- Blow short blasts of compressed air through all the carburettor nozzles, including the oil and petrol intake nozzles



- Use scales to check the float weight. Weight: 3.5 g
- Replace the float if higher weight values are found



- Make sure the tapered pin is in good conditions. Replace it if damaged or distorted



- Make sure the starter control piston is in good conditions
- Replace it if it shows signs of abnormal wear



- Check that the calibration of the nozzles is adequate (refer to the carburettor calibration table)
- Failure to observe these values compromises engine performance



- Check that the lock is correctly positioned on the tapered pin notch
 - The lock must be on the third notch from the top
 - Move the lock up to obtain a leaner mixture
 - Move the lock down to obtain a richer mixture.
- Thus, carburetion can be adapted to different weather conditions



- Replace the tapered pin if it shows signs of wear as shown in the photograph



- Check that idle set screw shows no signs of abnormal wear. This is detrimental to correctly adjust idle speed



- Make sure the throttle valve does not show scratches comprising 25% of its overall surface. Replace if it does.



- If the throttle valve is replaced, fit another one with the standard settings indicated on the upper part as shown in the photograph
- Refit the complete the carburettor
- Refit the carburettor to the engine, connect the fuel pipes again, the mixer oil intake pipes and the low-pressure pipe for the fuel cock control



Adjusting the idle

- Tighten the flow set screw slowly until it stops and then unscrew it as many turns as specified for this type of engine (1+1/4)
- Remember this is the first adjustment
- Warm the engine up to the regular operating temperature
- Adjust the idle speed at 1600 ± 200 rpm by operating on the idle speed set screw (2)
- Turn the flow set screw (1) to both directions until the maximum rpm possible is obtained



INDEX OF TOPICS

SUSPENSIONS	SUSP
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Front

Front suspension removal

- Remove the stem and the fork leg from the fork plate.
- Secure the stem adequately in the vice with aluminium clamps to avoid scratching the stem.
- Loosen the upper screw.



- Remove the stem upper lock together with the preloading bushing.
- Remove the spring.



- Prepare a container to collect the oil present in each stem.
- Measure the amount.



-
- Remove the dust guard with the aid of a screwdriver.



-
- Remove the lower screw located on the fork leg in order to release the stem from the fork leg.



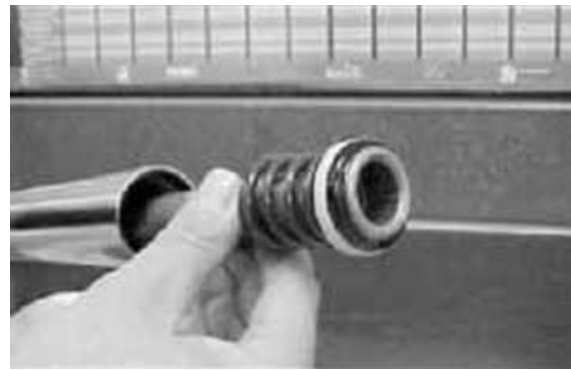
-
- Remove the stem from the fork leg.



-
- Remove the aluminium bushing that guides the stem into the fork leg.



- Take out the hydraulic cartridge from the stem upper part.



- Lock the fork leg in the vice being careful to use two aluminium clamps to avoid scratching the fork leg.
- Place a protection cloth on the fork leg edge and remove the oil seal as indicated in the photograph.
- Always replace the oil seal upon refitting.



- Clean and degrease all the components of the front suspension.
- Check all the parts related to the suspension.
- Check the guide bushings for wear. Replace them if there are signs of wear on the surface.



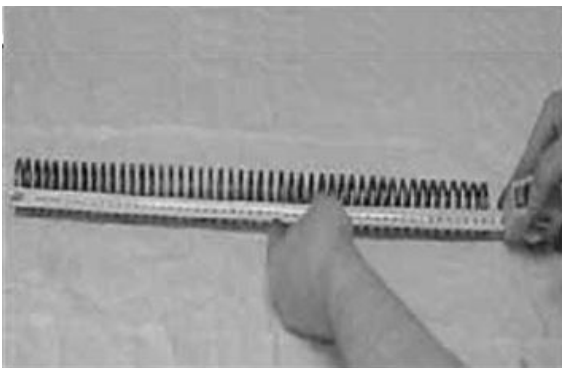
- Check the guide bushings on the fork leg for wear. Replace them if they show signs of abnormal wear.



- Prepare a support with two gauging blocks in X.
 - Position the stem as shown in the photograph and use a dial gauge check alignment.
- Serviceability limit: 0.2 mm



- Check the fork spring length.
- Make sure the spring does not show any signs of abnormal wear or distortions. Replace it if it does.



- Check if the return spring and the guide nylon ring are in good conditions. Replace them if damaged or distorted.



- Thoroughly clean all the components.



Refitting

Carry out removal operations in reverse order being careful to observe the following tightening torques:

REFITTING	
Name	Torque in Nm
Fork stem cap	17 ÷ 19 Nm
Fork plate upper clamp	8 ÷ 10 Nm

Name	Torque in Nm
Fork plate lower clamp	8 ÷ 10 Nm
Front wheel shaft	70-80
Front brake calliper clamps	17 ÷ 19 Nm *

Rear

- The rear shock absorber unit does not require maintenance. Replace it if there are any signs of malfunctioning.



- In RCR version, rear suspension maintenance operations must be carried out frequently, especially, every time the scooter is used in dusty or muddy areas. Afterwards, clean and lubricate the connecting arms in the areas where they are linked to the chassis and the shock absorber.



INDEX OF TOPICS

BRAKING SYSTEM

BRAK SYS

Rear brake calliper

Rear brake calliper replacement

- Support the scooter rear carriage axle adequately so that the rear wheel does not touch the ground.
- Detach the oil brake hose from the calliper, pouring the fluid inside a container.
- Remove the wheel axle operating on the nut indicated in the photograph.
- Upon refitting, tighten the wheel axle nut to the specified torque.
- Purge the system.

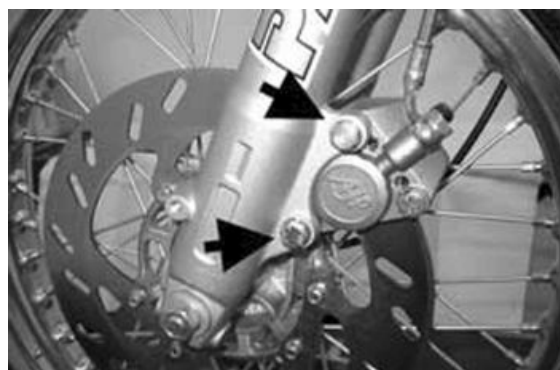


Locking torques (N*m)

Wheel axle nut 70 ÷ 80 Nm

Front brake calliper

- Detach the oil brake pipe from the calliper; pour the fluid inside a container.
- Remove the mountings indicated in the figure.
- When refitting, tighten the nuts to the prescribed torque.
- Purge the system.



Locking torques (N*m)

Fixing screws 17 ÷ 19 Nm

Rear brake disc

Rear brake disc replacement

- Support the scooter rear carriage axle adequately so that the rear wheel does not touch the ground.
- Remove the rear wheel operating on the axle nut indicated in the photograph.
- Undo the three disc clamps.
- Upon refitting, position the disc correctly making sure that it rotates in the right direction.



Locking torques (N*m)

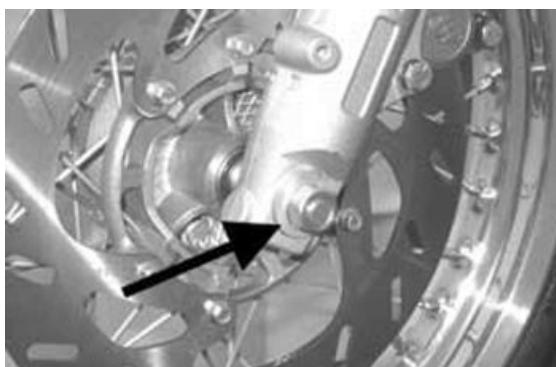
Wheel axle nut 70 ÷ 80 Nm Rear brake disc 17 ÷ 19 Nm *



Front brake disc

Brake disc replacement

- Remove the front wheel operating on the axle locking screw and on the wheel axle nut as shown in the photograph.



- Undo the six disc retainer.
- Upon refitting, position the disc correctly making sure that it rotates in the right direction.

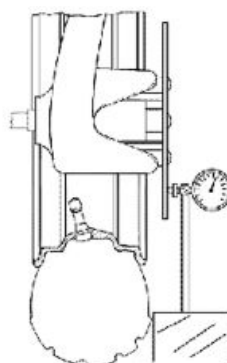
Locking torques (N*m)

Front brake disc 10 ÷ 12 Nm *



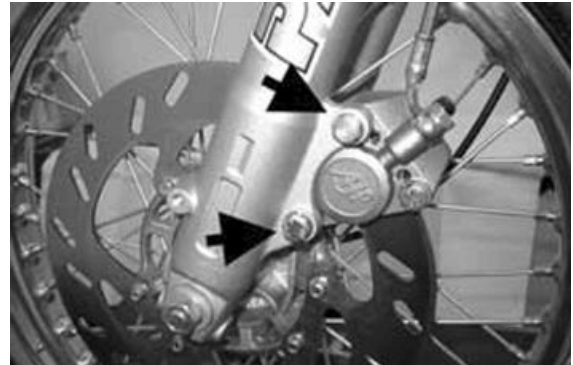
Disc Inspection

- Remove the wheel and check for unevenness of the disc. Maximum permissible out of true is 0.1 mm. If the value measured is greater, replace the disc and repeat the check.
- If the problem persists, check and replace the wheel rim if necessary.



Front brake pads

- To facilitate this operation, remove the two brake calliper clamps shown in the figure.



- With the calliper removed from the support but still connected to the oil pipe, remove the two pad locks.



- Pads must be replaced if the friction material thickness is less than 1.5 mm.



- Upon refitting, operate in reverse order bearing in mind that the arrow on the plate indicates the disc sense of rotation.



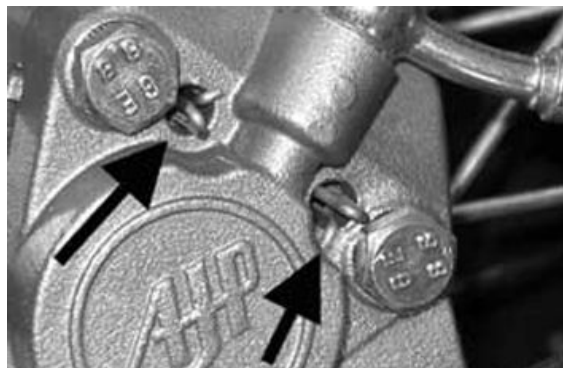
Rear brake pads

Brake pad replacement

- Support the scooter rear carriage axle adequately so that the rear wheel does not touch the ground.
- Remove the rear wheel axle operating on the nut indicated in the photograph.



- With the calliper removed but still connected to the oil pipe, remove the two pad locks.
- Remove the 2 pads and the two metal plates.



- Pads must be replaced if the friction material thickness is less than 1.5 mm.



- Upon refitting, operate in reverse order bearing in mind that the arrow on the plate indicates the disc sense of rotation.



Fill

Rear - combined

Oil refill and purging

- Once the bleed valve is closed, fill the system with TUTELA TOP 4 brake fluid to the maximum level.
- Undo the bleed screw.
- Apply the tube of the special tool to the bleed screws. When purging, it is necessary to refill the oil reservoir permanently while working with a Mi-tovac pump on the bleed screw until no more air comes out of the system. The operation is finished when just oil comes out of the bleed screws.
- Do up the bleed screw.



N.B.

IF AIR CONTINUES TO COME OUT DURING PURGING, EXAMINE ALL THE FITTINGS: IF SAID FITTINGS DO NOT SHOW SIGNS OF BEING FAULTY, LOOK FOR THE AIR INPUT AMONG THE VARIOUS SEALS ON THE PUMP AND CALLIPER PISTONS.

N.B.

DURING PURGING FREQUENTLY CHECK THE LEVEL TO PREVENT AIR GETTING INTO THE SYSTEM THROUGH THE PUMP.

CAUTION

WHILE CARRYING OUT THESE OPERATIONS, THE SCOOTER MUST BE UPRIGHT.

WARNING

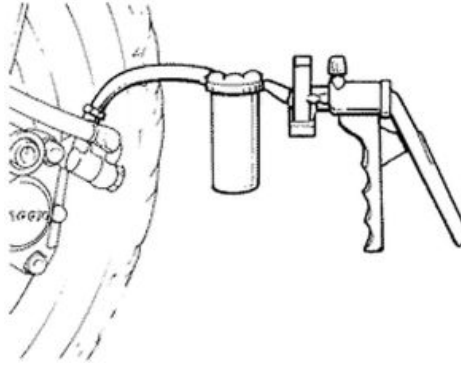
- BRAKING CIRCUIT FLUID IS HYGROSCOPIC. IT ABSORBS HUMIDITY FROM THE SURROUNDING AIR.

IF THE LEVEL OF HUMIDITY IN THE BRAKING FLUID EXCEEDS A GIVEN VALUE, BRAKING EFFICIENCY WILL BE REDUCED.

THEREFORE, ALWAYS USE FLUID FROM SEALED CONTAINERS.

UNDER NORMAL DRIVING AND CLIMATIC CONDITIONS YOU SHOULD CHANGE THIS LIQUID EVERY TWO YEARS.

IF THE BRAKES ARE USED INTENSELY AND/ OR IN HARSH CONDITIONS, CHANGE THE FLUID MORE FREQUENTLY.

**CAUTION**

WHEN CARRYING OUT THE OPERATION, BRAKE FLUID MAY LEAK FROM BETWEEN THE BLEED SCREW AND ITS SEAT ON THE CALLIPER. CAREFULLY DRY THE CALLIPER AND DEGREASE THE DISC SHOULD THERE BE OIL ON IT. WHEN THE OPERATION IS OVER, TIGHTEN THE OIL BLEED SCREW TO THE PRESCRIBED TORQUE.

CAUTION

AVOID CONTACT OF THE BRAKE FLUID WITH YOUR EYES, SKIN, AND CLOTHING. IN CASE OF ACCIDENTAL CONTACT, WASH WITH WATER.

WARNING

BRAKE CIRCUIT FLUID IS VERY CORROSIVE; DO NOT LET IT COME INTO CONTACT WITH PAINTED PARTS.

CAUTION

THE BRAKE FLUID IS HYGROSCOPIC, THAT IS, IT ABSORBS MOISTURE FROM THE SURROUNDING AIR. IF THE LEVEL OF HUMIDITY IN THE BRAKE FLUID EXCEEDS A GIVEN VALUE, BRAKING EFFICIENCY WILL BE REDUCED.

Specific tooling

020329Y MityVac vacuum-operated pump

Front

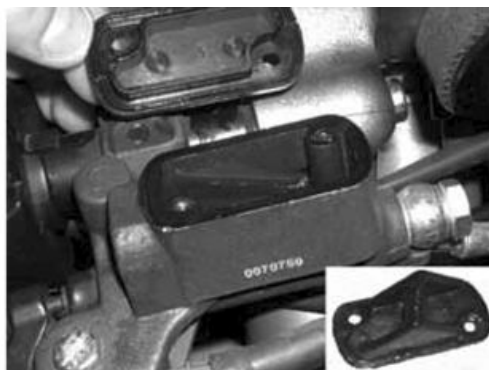
- Once the bleed valve is closed, fill the system with brake liquid to the maximum level.

Recommended products

AGIP BRAKE 4 Brake fluid

FMVSS DOT 4 Synthetic fluid

- Undo the bleed screw.
- Apply the tube of the special tool to the bleed screws. Upon purging, it is necessary to refill the oil reservoir permanently while working with a Mi-tovac pump on the bleed screw until no more air comes out of the system. The operation is finished when just oil comes out of the bleed screws.



- Do up the bleed screw.

N.B.

IF AIR CONTINUES TO COME OUT DURING PURGING, EXAMINE ALL THE FITTINGS: IF SAID FITTINGS DO NOT SHOW SIGNS OF BEING FAULTY, LOOK FOR THE AIR INPUT AMONG THE VARIOUS SEALS ON THE PUMP AND CALLIPER PISTONS.

N.B.

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CAUTION

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WARNING

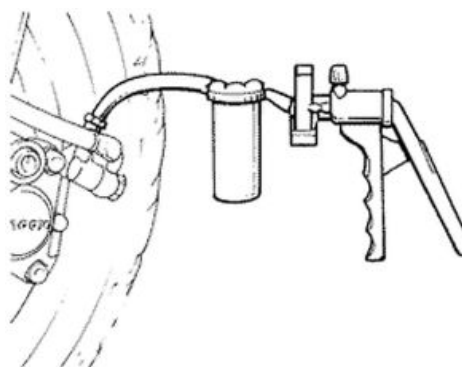
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UNDER NORMAL DRIVING AND CLIMATIC CONDITIONS YOU SHOULD CHANGE THIS LIQUID EVERY TWO YEARS.

IF THE BRAKES ARE USED INTENSELY AND/OR IN HARSH CONDITIONS, CHANGE THE FLUID MORE FREQUENTLY.

**CAUTION**

WHEN CARRYING OUT THE OPERATION, BRAKE FLUID MAY LEAK FROM BETWEEN THE BLEED SCREW AND ITS SEAT ON THE CALLIPER. CAREFULLY DRY THE CALLIPER AND DEGREASE THE DISC SHOULD THERE BE OIL ON IT. WHEN THE OPERATION IS OVER, TIGHTEN THE OIL BLEED SCREW TO THE PRESCRIBED TORQUE.

CAUTION

AVOID CONTACT OF THE BRAKE FLUID WITH YOUR EYES, SKIN, AND CLOTHING. IN CASE OF ACCIDENTAL CONTACT, WASH WITH WATER.

WARNING

BRAKE CIRCUIT FLUID IS VERY CORROSIVE; DO NOT LET IT COME INTO CONTACT WITH PAINTED PARTS.

CAUTION

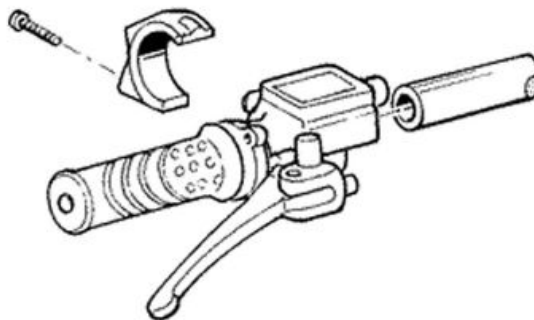
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Specific tooling

020329Y MityVac vacuum-operated pump

Front brake pump

- Operate on the two U bolt clamps (see figure).
- Disconnect the pipe and collect the brake oil in a container.
- Upon refitting, perform the operation but in reverse order.
- Tighten the hydraulic line to the prescribed torque and purge the system.



Rear brake pump - combined

Rear pump replacement

- Disconnect the pipe and collect the brake fluid in a container.
- Remove the pump by undoing the two clamps shown in the figure.
- Upon refitting, carry out the removal operations but in reverse order observing the tightening torques.



CAUTION



AVOID CONTACT OF THE BRAKE FLUID WITH YOUR EYES, SKIN, AND CLOTHING. IN CASE OF ACCIDENTAL CONTACT, WASH WITH WATER.

WARNING

BRAKE CIRCUIT FLUID IS VERY CORROSIVE; DO NOT LET IT COME INTO CONTACT WITH PAINTED PARTS.

CAUTION

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Locking torques (N*m)

Brake pump clamps 17 ÷ 19 Nm *

INDEX OF TOPICS

COOLING SYSTEM

COOL SYS

Coolant replacement

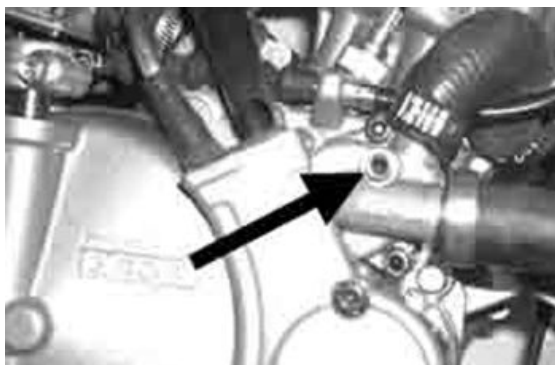
- Connect the sleeve to the hydraulic pump and the radiator
- Lift the reservoir cover, remove the cap and refill the reservoir with the recommended coolant
- Loosen the bleed screw on the pump cover and then tighten the screw again
- Start the engine and take it to normal running temperature. Make sure the coolant level is stable
- Shut off the engine and, if required, add coolant

**CAUTION**

Make sure there are no leaks in the system

System bleed

- Drain the coolant circuit by removing the screw shown in the figure and the expansion tank filler plug
- Detach the sleeve connecting the hydraulic pump to the radiator
- Collect the coolant in a clean container

**WARNING**

CARRY OUT THESE OPERATIONS WHEN THE ENGINE IS COLD. SCALDING COOLANT OR ITS VAPOURS CAN CAUSE SERIOUS BURNS. COLLECT THE COOLANT IN A CONTAINER. COOLANT IS HARMFUL. AVOID CONTACT WITH THE SKIN AND EYES.

Water pump - overhaul

Hydraulic pump removal

- Drain out the cooling system
- Remove the oil pump cover and the wire guiding support
- Remove the hydraulic pump cover

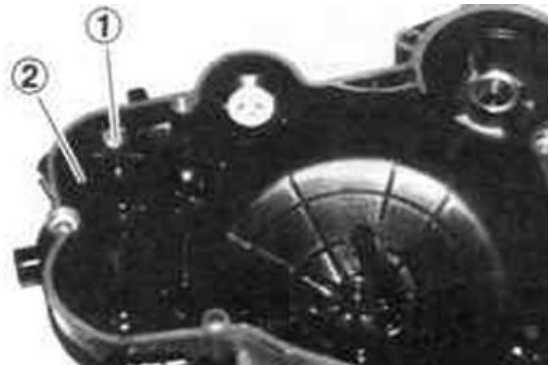




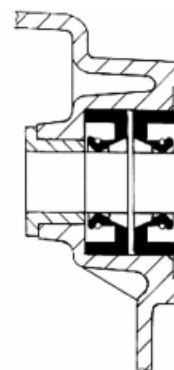
- Detach the gasket (1)
- Undo the rotor screw (2)
- Unscrew the hydraulic pump rotor (3)
- Drain out all the oil from the engine
- Remove the crankcase right cover



- Remove the hydraulic pump shaft (1) and the transmission pinion (2)



- As soon as there is the slightest indication of coolant or oil leaking from the breather, replace the gaskets of the hydraulic pump shaft
- Fit the new gaskets as shown in the next layout



Hydraulic pump fitting

- Fit the hydraulic pump shaft and the transmission pinion
- Insert the washer (3)
- Fit the crankcase cover
- Fit the pump rotor (1) and its screw



Locking torques (N*m)

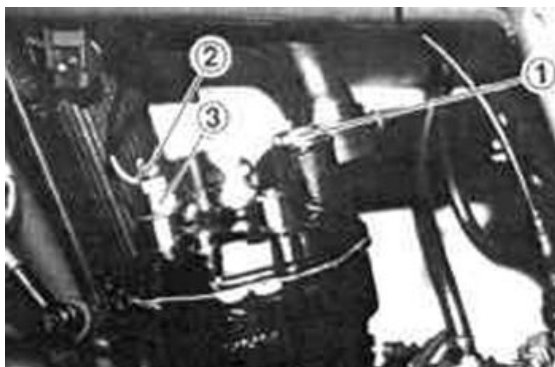
Pump rotor: 2 Nm

- Insert the gasket on the pump cover, the cover and the two sleeves
- Pour recommended oil in the transmission
- Fill up the cooling system
- Fit the other parts following the removal procedures but in reverse order

Thermostat

Removal

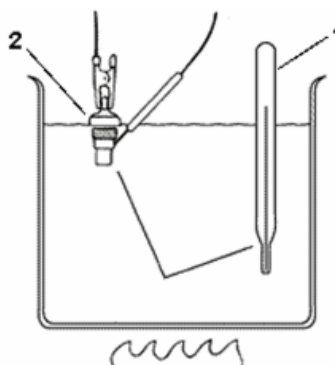
- Drain out the cooling system
- Detach the sleeve from the cylinder head
- Undo the thermostat screw (1) and the thermostat itself
- Take out the thermoswitch fitting (2)
- Detach the thermoswitch (3)



Check

Thermoswitch check

- Immerse the thermoswitch in hot water to check its resistance
 - The thermoswitch should not get into contact with the container walls or bottom; otherwise, the reading will not be accurate.
- 1 - Thermometer
2 - Thermoswitch
- Replace the thermoswitch if the results do not fall within the specification values



Characteristic**Activation** $124 \pm 3^{\circ}\text{C}$ **Deactivation** $114 \pm 3^{\circ}\text{C}$

Thermostat check

Measuring the valve opening temperature:

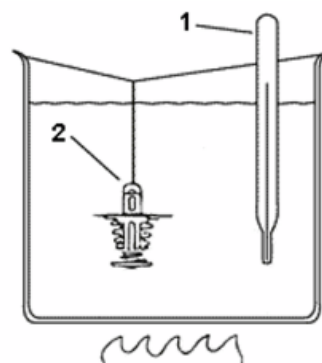
- Immerse the thermostat and the thermometer in hot water.

Neither of them should get into contact with the container walls or bottom; otherwise, the reading will not be accurate.

1 - Thermometer

2 - Thermostat (the thermostat must be totally immersed into the water)

- Replace the thermostat if the results do not fall within the specification values.

**Characteristic**

Valve opening at $67 \pm 3^{\circ}\text{C}$:

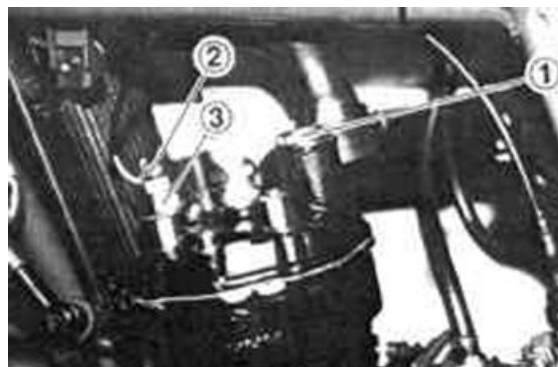
0.1 mm

Valve opening at 75°C :

3 mm

Refitting

- Fit the thermoswitch (3)
- Connect the connector (2) to the thermoswitch
- Fit the thermostat and its fixing screw (1)
- Connect the sleeve to the cylinder head
- Fill up the cooling system with the recommended coolant



INDEX OF TOPICS

CHASSIS

CHAS

Seat

- Lift the fuel tank cap lid
- Remove the saddle by operating on the two clamps indicated in the photograph



Headlight assy.

Headlamp front cowl replacement

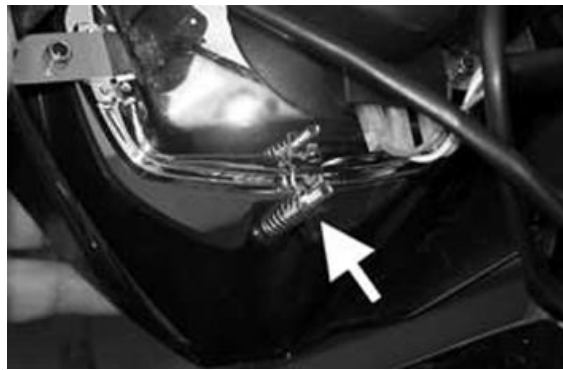
- Remove the rubber connections from the slots as indicated in the figure



- Remove the headlamp retaining bracket from the front cowl by gently pressing the bracket as indicated in the figure



-
- Remove the headlamp central fixing/adjustment screw



-
- Remove the screws fixing the turn indicators support bracket from the front cowl



Front headlight replacement

- After removing the headlamp front cowl and in order to remove the headlight, operate on the tabs indicated in the photograph and on the headlamp fixing/adjustment screws



Footrest

Passenger footrest removal

- Remove the screw shown in the figure and the passenger footrests



Side fairings

Rear fairings

- Remove the saddle
- Remove the two fixing screws indicated in the photograph



- Remove the screw shown in the figure and located under the side fairing



Air deflector

- Undo the two screws indicated in the photograph to remove the air deflector



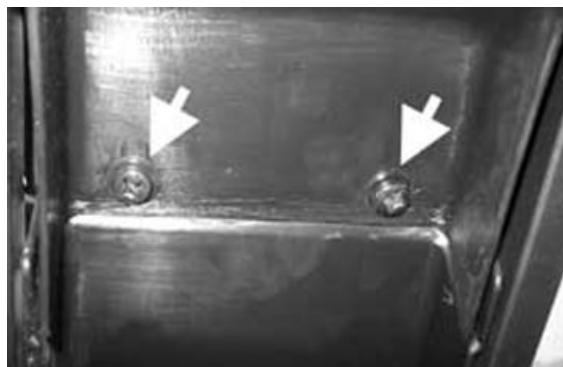
Front fairing replacement

- To replace the fairing halves, remove the fixing screws indicated in the figure



Rear mudguard

- Remove the rear mudguard by loosening the 4 screws indicated in the figure



Fuel tank

- Remove the saddle
- Remove the front fairing halves
- Remove the mixer oil reservoir
- Remove the metal clamp fixing the reservoir by operating on the two screws indicated in the photograph
- Remove the electrical cable harness of the low fuel sensor
- Remove the fuel pipe and the low-fuel intake pipe from the cock
- Slide off the fuel tank from its seat



Front mudguard

- Remove the 4 screws shown in the figure, the transmission clamps and the mudguard



Radiator fan

Radiator removal

- Remove the front fairing
- Remove the radiator clamp indicated in the photograph
- Using the specific pliers, disconnect the coolant pipes

WARNING

CARRY OUT THESE OPERATIONS WHEN THE ENGINE IS COLD. SCALDING COOLANT OR ITS VAPOURS CAN CAUSE SERIOUS BURNS. COLLECT THE COOLANT IN A CONTAINER. COOLANT IS HARMFUL. AVOID CONTACT WITH THE SKIN AND EYES.

Specific tooling

020544y Pliers for clamps



Radiator fitting

Radiator fitting

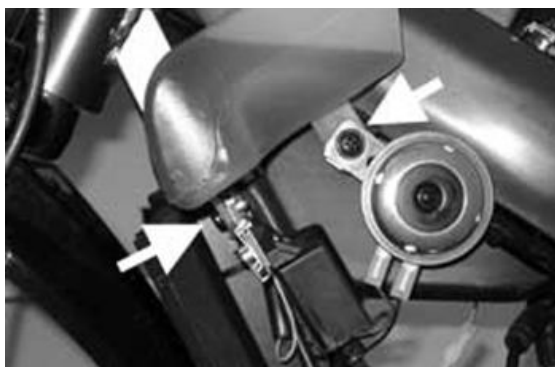
- Fit the radiator following the removal procedures but in reverse order
- Fill the reservoir with the recommended coolant and make sure there are no leaks in the system

Locking torques (N*m)

Radiator clamps: 8 ÷ 10 Nm

Expansion tank

- Remove the side Fairings
- Drain out the expansion tank
- Remove the two screws shown in the figure and the pipes connected to the reservoir
- Remove the reservoir



Mixture oil tank

- Remove the saddle
- Remove the rear fairings
- Remove the oil intake pipes and drain out the mixer oil reservoir
- Remove the electric connections from the oil level indicator
- Slide off the reservoir from its seat



Battery**Battery compartment**

- Remove the rear mudguard
- Remove the side fairings
- Remove the two screws indicated in the photograph and then remove the battery compartment





INDEX OF TOPICS

PRE-DELIVERY

PRE DE

Aesthetic inspection

Vehicle check

- Paintwork
 - Plastic parts fitting
 - Damage
 - Dirt
-

Tightening torques inspection

Locking Check

- All the tightening torques
 - External screw of covers
-

Electrical system

Electrical system

- Fill up the battery with acid for batteries, charge it using a suitable battery charger.
- Key switch
- Low-beam light, high-beam light, warning lights, tail light
- Headlight adjustment
- Rear light
- Stop light (front and rear brake, if necessary)
- Turn indicators and their warning lights
- Speedometer and instrument panel lighting
- Horn
- Starter button

CAUTION

TO ENSURE MAXIMUM PERFORMANCE, THE BATTERY MUST BE CHARGED BEFORE USE. INADEQUATE CHARGING OF THE BATTERY WITH A LOW LEVEL OF ELECTROLYTE BEFORE IT IS FIRST USED SHORTENS BATTERY LIFE.

WARNING

BEFORE RECHARGING THE BATTERY, REMOVE THE CAPS OF EACH CELL. KEEP THE BATTERY AWAY FROM NAKED FLAMES OR SPARKS WHILE IT IS CHARGED. FIRST DETACH THE NEGATIVE LEAD BEFORE REMOVING THE BATTERY FROM THE VEHICLE.

CAUTION

WHEN INSTALLING THE BATTERY, ATTACH THE POSITIVE LEAD FIRST AND THEN THE NEGATIVE LEAD.

WARNING

THE BATTERY ELECTROLYTE IS POISONOUS AS IT MAY CAUSE SERIOUS BURNS. IT CONTAINS SULPHURIC ACID. AVOID CONTACT WITH THE EYES, THE SKIN AND CLOTHING. IF COMING INTO CONTACT WITH EYES OR SKIN, WASH ABUNDANTLY WITH WATER FOR APPROX. 15 MIN. AND SEEK IMMEDIATE MEDICAL ATTENTION.

IN THE EVENT OF ACCIDENTAL INGESTION OF THE LIQUID, IMMEDIATELY DRINK LARGE QUANTITIES OF WATER OR MILK, MAGNESIUM MILK, BATTERED EGG OR VEGETABLE OIL. SEEK IMMEDIATE MEDICAL ATTENTION.

THE BATTERIES PRODUCE EXPLOSIVE GAS; KEEP CLEAR OF NAKED FLAMES, SPARKS OR CIGARETTES; VENTILATE THE AREA WHEN RECHARGING INDOORS.

ALWAYS WEAR EYE PROTECTION WHEN WORKING IN THE PROXIMITY OF BATTERIES.

KEEP OUT OF REACH OF CHILDREN

CAUTION

NEVER USE FUSES WITH A CAPACITY HIGHER THAN THE RECOMMENDED CAPACITY. USING A FUSE OF UNSUITABLE RATING MAY SERIOUSLY DAMAGE THE VEHICLE OR EVEN CAUSE A FIRE.

Levels check

Level check

- Brake oil level
- Gearbox oil level
- Mixer oil level

Road test

Test drive

- Cold start
- Speedometer operation check
- Throttle control operation
- Riding stability
- Rear and front brake efficiency
- Front and rear wheel shock absorber
- Abnormal noise
- Restarting when warmed up
- Fluid leakage (after the road test)

Static test

Static check

- Tyre pressure
- Correct operation of all locks
- Mirrors and accessories fitting
- Tools supplied, user manual, warranty certificate and customer services document

N.B.

CHECK AND ADJUST TYRE PRESSURE WITH TYRES AT AMBIENT TEMPERATURE. REGULATE PRESSURE ACCORDING TO THE WEIGHT OF THE RIDER AND ACCESSORIES

CAUTION

NEVER EXCEED THE RECOMMENDED INFLATION PRESSURES OR TYRES MAY BURST.

WARNING

Be very careful when handling fuel.

Functional inspection

Functional check

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 - Throttle control adjustment and free travel
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