

Piaggio - X9 Evolution 500 633234

WORKSHOP MANUAL

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X9 Evolution 500

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WORKSHOP MANUAL

X9 Evolution 500

This workshop manual has been drawn up by Piaggio & C. Spa to be used by the workshops of Piaggio-Gilera dealers. This manual is addressed to Piaggio service mechanics who are supposed to have a basic knowledge of mechanics principles and of vehicle fixing techniques and procedures. Any important changes made to the vehicles or to specific fixing operations will be promptly reported by updates to this manual. Nevertheless, no fixing work can be satisfactory if the necessary equipment and tools are unavailable. It is therefore advisable to read the sections of this manual relating to specific tools, along with the specific tool catalogue. Important information in this manual is marked as follows.

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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This section describes the general specifications of the vehicle.

Rules

This section describes general safety rules for any maintenance operations performed on the vehicle.

Safety rules

Should it be necessary to keep the engine running while servicing, make sure that the area or room is well ventilated, and use special exhaust fans, if required. never let the engine run in an enclosed area. Exhaust fumes are toxic.

The battery electrolyte contains sulphuric acid. Protect your eyes, clothes and skin. Sulphuric acid is highly corrosive; in the event of contact with your eyes or skin, rinse thoroughly with abundant water and seek immediate medical attention.

The battery produces hydrogen, a gas that can be highly explosive. Do not smoke and avoid sparks or flames near the battery, especially when charging it.

Fuel is highly flammable, and in some conditions it can be explosive. Do not smoke in the working area, and avoid open flames or sparks.

Clean the brake pads in a well ventilated environment, directing the compressed air jet so as to not inhale the dust produced by the wear of the friction material. Even though the latter contains no asbestos, dust inhalation is harmful.

Maintenance rules

Use original PIAGGIO spare parts and lubricants recommended by the Manufacturer. Non-original or non-conforming spares may damage the vehicle.

Use only the special tools designed for this scooter.

Always use new gaskets, sealing rings and split pins upon reassembly.

After removal, clean the components using non-flammable or low fire-point solvent. Lubricate all the work surfaces except the tapered couplings before refitting.

After reassembly, check that all components have been installed properly and that they are in good working order.

For removal, overhaul and reassembly operations use only tools provided with metric measures. Metric bolts, nuts and screws are not interchangeable with coupling members with English measurement. Using unsuitable coupling members and tools may damage the scooter.

Should any interventions to the scooter electrical system be required, check that the electrical connections - especially earth and battery connections - have been implemented properly.

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Vehicle identification

VEHICLE IDENTIFICATION

Specification Desc./Quantity

Chassis prefix ZAPM 27000 ÷ 4000001

Engine prefix M271M ÷ 1001

Dimensions and mass

WEIGHT AND DIMENSIONS

Specification Desc./Quantity

Total dry weight 206 Kg

Width (at the mirrors) 910 mm

Wheel base 2130 mm

Length 1530 mm

Height (at the saddle) 780 mm

Height at the windscreen (high position) 1450 mm

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Engine

ENGINE

Specification Desc./Quantity

Engine Single-cylinder, four-stroke

Bore 92 mm

Stroke 69 mm

Cubic capacity 460 cm³

Compression ratio 10.5: 1

Timing system Single overhead camshaft with integrated tone wheel, control from flywheel side chain, 4 valves and automatic start-up valve lifting device.

Valve clearance: intake 0.15 mm (when cold)

Valve clearance: discharge 0.15 mm (when cold)

Valve clearance adjustment By threaded adjuster on the rockers

Engine idle speed 1500 ± 50 rpm

Air filter Dry paper filter.

CO % value (measured at the intake manifold) 1 - 1.5%

Starting system Electric starter system with freewheel.

Lubrication By trochoidal pump (inside the crankcase), pressure adjustment by-pass and oil filter.

Lubrication pressure 4 bar

Minimum allowed (at 100° C) 0.8 bar

Fuel supply Electronic injection system with electric fuel pump, Ø 38 mm throttle body and single injector.

Max. power (at crankshaft) 29.5 kW at 7500 rpm

Max. torque (at crankshaft) 43 Nm at 5500 rpm

Cooling system Fluid circulation through a motor-driven pump, 3-way thermostat and electric fan.

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Transmission

TRANSMISSIONS

Specification Desc./Quantity

Transmission With automatic expandable pulley variator with torque server, V belt, automatic clutch, gear reduction unit and transmission housing with forced air circulation cooling.

Capacities

CAPACITIES

Specification Desc./Quantity

Cooling system approx. 1.8 l

Fuel tank (including reserve ~ 2.5 l) ~ 14,5 l

Rear hub ~ 250 cc

Engine oil (empty) 1.7 lt.

Engine oil (at oil and filter change) 1.5 lt.

Electrical system

ELECTRICAL COMPONENTS

Specification Desc./Quantity

1 Ignition type Inductive, high efficiency, integrated with injection, variable advance and separate HV coil.

2 Spark advance (before TDC) Variable, controlled by the injection controller

3 Spark plug CHAMPION RG6YC; NGK CR7EKB

4 Battery 12V-14Ah

5 Fuses n.1 70A_n.1 30A_n.2 15A_n.3 10A_n.4 7,5A_n.2 5A_n.1 3A

6 Generator in three-phase alternating current

Frame and suspensions

FRAME AND SUSPENSIONS

Specification Desc./Quantity

Type Welded structure consisting of steel pipes with asymmetrical trestle structure, front crosspieces and union members made of sheet steel.

Front suspension Hydraulic telescopic fork with dual effect, Ø 40 mm stems and back pin with couplings for dual brake calipers.

Front fork stroke 104 mm

Rear suspension Engine based on oscillating fork pivoted to the chassis by 2-freedom degree oscillating arm and pair of dual effect hydraulic shock absorbers with 4-position preload adjustment

Rear suspension range 76.6 mm (minimum spring preload)

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Please take note that, starting from chassis serial number ZAPM2300003509521, the front small chassis fixing system has changed in order to improve its locking to the chassis. Therefore we have introduced:

N°2 screws drawing 432142

N°2 4x11x0 external teeth spring washers drawing 012533

N°2 nuts drawing 968224

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