

GENERAL INFORMATION

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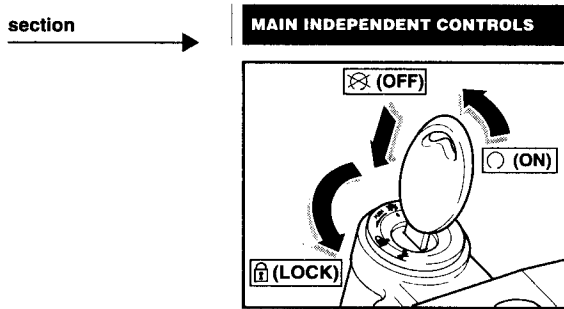
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1.1 INTRODUCTION

This manual is divided into sections, chapters and paragraphs, by subject.
 The procedures described are laid out in single operation, and each operation is indicated by a ♦.
 The numbered parts shown in the figures are identified in the text with the number in parentheses or with the symbol representing them.
 Example (the following text is generic and does not refer to this specific vehicle):



- chapter →
- safety warning →
- paragraph →
- operation →
- position (2) →
- symbol "Ⓚ" →

1.20 STEERING LOCK

⚠ WARNING

Never attempt to place the Ignition switch in the locked "Ⓚ" (LOCK) position while the vehicle is moving.

1.1.1 OPERATION

- To lock the steering:
- ♦ Turn the handlebar completely to the left or to the right.
 - ♦ Turn the key (2) to position "Ⓚ" (OFF).
 - ♦ Press the key and rotate to position "Ⓚ" (LOCK).
 - ♦ Remove the key.

1.2 SAFETY WARNINGS

Throughout this manual you will encounter the following symbols:

⚠ DANGER

When you find this symbol on the vehicle or in the manual, this indicates that a potential for serious personal injury or death exists.
 Failure to follow this warning may result in serious risk of personal injury or death, of the mechanic working on the vehicle, the operator of the vehicle, or the general public.
 It also indicates that serious and permanent damage to the vehicle is possible.

⚠ WARNING

This statement indicates a potential hazard which may result in some personal injury, or damage to the vehicle.

NOTE The term "NOTE" in the present manual calls your attention to important information or instructions.

1.3 GENERAL SAFETY RULES**1.3.1 CARBON MONOXIDE**

If it is necessary to run the engine in order to carry out a maintenance operation, ensure that the area in which you are operating is properly ventilated.

Never run the engine in enclosed spaces.

If it is necessary to work indoors, use an exhaust evacuation system.

▲ DANGER

The exhaust fumes contain carbon monoxide, a poisonous gas that can cause loss of consciousness and even death.

1.3.2 GASOLINE

Work in a well ventilated area.

Keep cigarettes, flames or sparks away from the work area and from the place where gasoline is stored.

▲ DANGER

Gasoline is extremely flammable and becomes explosive under certain conditions.

KEEP GASOLINE AWAY FROM CHILDREN.

1.3.3 HOT COMPONENTS**▲ DANGER**

The engine and the components of the exhaust system become very hot and remain hot for some time after the engine has been stopped.

Before handling these components, wear insulating gloves or wait until the engine and the exhaust system have cooled down.

1.3.4 USED ENGINE OIL AND FORK OIL**▲ DANGER**

Use latex gloves for the maintenance operations that require contact with used oil.

Used oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods.

Although this is unlikely unless you handle used oil on a daily basis, it is advisable to thoroughly wash your hands with soap and water after handling used oil.

KEEP OIL AWAY FROM CHILDREN.

1.3.5 BRAKE FLUID**▲ WARNING**

The brake fluid can damage painted, plastic or rubber parts. When performing maintenance operations on the brake system, place a clean shop towel on these parts.

Always wear goggles when servicing the brake system with brake fluid.

Brake fluid is extremely destructive to your eyes.

If you should accidentally get brake fluid in your eyes, flush immediately with a large quantity of cool clear water and seek professional medical assistance immediately.

KEEP BRAKE FLUID AWAY FROM CHILDREN.

1.3.6 CLUTCH CONTROL FLUID**▲ WARNING**

The clutch control fluid can damage painted, plastic or rubber parts.

When performing maintenance operations on the clutch control system, place a clean shop towel on these parts.

Always wear goggles when servicing the clutch control system with clutch control fluid.

Clutch control fluid is extremely destructive to your eyes. If you should accidentally get clutch control fluid in your eyes, flush immediately with a large quantity of cool clear water and seek professional medical assistance immediately.

KEEP CLUTCH CONTROL FLUID AWAY FROM CHILDREN.

1.3.7 COOLANT

In certain conditions, the ethylene glycol contained in the engine coolant is flammable: its flame is invisible, but you can be burned anyway.

▲ DANGER

Avoid spilling the engine coolant on the exhaust system or on the engine components.

They may be hot enough to cause the coolant to ignite and burn without a visible flame.

The coolant (ethylene glycol) can cause skin irritation and is poisonous if swallowed.

Engine coolant is sweet tasting, and therefore extremely attractive to pets and other animals, as well as being extremely toxic.

Do not leave coolant in an open container where animals may be able to drink it.

KEEP COOLANT AWAY FROM CHILDREN.

Do not remove the radiator the cap when the engine is hot.

The coolant is under pressure and may cause burns.

1.3.8 BATTERY HYDROGEN GAS AND ELECTROLYTE**▲ DANGER**

The battery gives off explosive gases; keep cigarettes, flames and sparks away from the battery. Provide adequate ventilation when operating or recharging the battery.

The battery contains sulphuric acid (electrolyte). Contact with the skin or the eyes may cause serious burns.

Always wear tight fitting goggles and protective clothing when handling battery electrolyte.

It is particularly important for you to protect your eyes, since even a minuscule amount of battery acid can destroy your vision.

Should you accidentally get even the smallest amount of battery acid on your skin or eyes, immediately flush with large quantities of clear cool water and immediately seek professional medical attention.

The electrolyte is poisonous. If the electrolyte is accidentally swallowed, drink large quantities of water or milk and then milk of magnesia or vegetable oil.

Seek professional medical attention immediately.

KEEP BATTERIES AND ELECTROLYTE AWAY FROM CHILDREN.

1.3.9 PRECAUTIONS AND GENERAL INFORMATION

Please scrupulously follow the recommendations below when repairing, disassembling and reassembling the vehicle.

DANGER

Do not use open flames at any time.

Before beginning any maintenance work or inspecting the vehicle, stop the engine and remove the ignition key. Wait for the engine and exhaust system to cool completely. If possible, use the appropriate equipment to raise the vehicle, on a solid, level floor.

Be especially careful around any parts of the engine and exhaust system that may still be warm, to avoid burns.

The brakes also get quite hot in operation.

Be sure that the brakes have cooled thoroughly before beginning any service operations.

No part of the vehicle is safe to hold in your mouth.

Unless explicitly stated otherwise, reassemble all units by carrying out the disassembly operations in reverse.

Use common sense to interpret any overlap in cross-referenced instructions, to avoid unnecessarily removing components. Do not use abrasive pastes to polish matte paints.

Handle fuel with the greatest caution.

Never use fuel as a solvent for cleaning the vehicle.

Use only water and neutral soap to clean all rubber and plastic parts and the saddle. Never use alcohol, gasoline or other solvents.

Disconnect the negative battery cable (-) before soldering.

When two or more people are working together, make sure conditions are safe for each.

Be sure that all the mechanics working on any vehicle are thoroughly briefed as what each will be doing, and make sure that one mechanic is responsible for ensuring that all safety related items, such as tightening torques, are properly considered.

Carefully read paragraph 1.2 (SAFETY WARNINGS).

BEFORE DISMANTLING THE COMPONENTS

- Remove all dirt, mud, dust and foreign matter from the vehicle before dismantling its components.
- Where designated, use the special tools designed for this vehicle.

DANGER

Do not use makeshift tools for any operation which calls for a special tool.

Failure to heed this warning can lead to serious personal injury such as when an ill-fitting wrench slips, and you slam your hand into the workbench or a part of the vehicle.

DISMANTLING THE COMPONENTS

- Do not loosen and/or tighten the screws and nuts using pliers or other tools; always use the appropriate wrench.
- Before disconnecting any line, cable, etc., mark each part with a number or distinguishing mark.
- Each disconnected part must be marked clearly to ensure that it may be reassembled in the same position from which it was taken.
- Clean and wash all dismantled components thoroughly, using non-flammable solvents.
- Keep coupled parts together, since they have "adapted" to each other through normal wear and tear.
- Some components must be used together or replaced completely.
- Keep away from sources of heat.

REASSEMBLING THE COMPONENTS

WARNING

Never reuse a circlip; when on is removed, it must be replaced with a new one.

When mounting a new circlip, be careful not to spread its ends farther than strictly necessary to place it on the shaft.

After mounting a circlip, make sure that is completely and firmly inserted in its seat.

Do not use compressed air to clean any bearing.

NOTE Bearings must rotate freely, without roughness or noise, otherwise they must be replaced.

- Use only ORIGINAL **aprilia** SPARE PARTS.
- Use only the recommended lubricants and consumables.
- Lubricate the parts (whenever possible) before reassembling them.
- When tightening screws and nuts, start with the largest or innermost once, and cross-tighten.
- Tighten gradually in a series of steps before applying the final torque.
- Always replace lock nuts, gaskets, seals, circlips, O-rings, cotter pins and screws with new ones if the threads are damaged.
- Clean all joining surfaces, oil seal edges and gaskets before reassembling. Apply a light coating of lithium-based grease to the edges of the oil seals. Reassemble oil seals and bearings with the brand name or serial number facing outwards (visible side).
- Copiously lubricate bearings before installation and assembly.
- Make sure that all components have been correctly installed and assembled.
- After any repair or periodic maintenance operation is carried out, the vehicle must be test ridden in an area away from traffic and other hazards.

1.3.10 ELECTRICAL CONNECTORS

The electrical connectors must be disconnected as follows. Failure to follow these procedures will irreparably damage the connector and wiring.

- ◆ Press in the click tab.

▲ WARNING

Do not pull the cables to disconnect the two connectors.

- ◆ Grasp the two connectors and disconnect them by pulling in opposite directions.
- ◆ If dirt, rust, dust, or moisture is seen on the connector, blow out the connector with air.
- ◆ Ensure that the cables are correctly crimped to the terminals placed inside the connectors.

NOTE The two halves of the connector fit together properly in only one orientation. Ensure that the connector is properly aligned before attempting to assemble it.

- ◆ Press the connectors firmly together, listening for the typical "click" sound for those connectors provided with a click tab. Ensure that both halves of the connectors are firmly pressed together.

1.3.11 FASTENERS TIGHTENING TORQUES**▲ DANGER**

Remember that the tightening torque of all fasteners on the wheels, brakes, axles, and other components of the suspension system is very important to ensure the safety of the vehicle, and must be kept at the prescribed values.

Check the tightening torque of the fasteners regularly, and always use a torque wrench when reinstalling them.

Failure to comply with this warning could allow one of these components to be lost which could allow one of these components to be lost which could lock a wheel or cause other handling problems with consequent overturning and risk of serious injury or even death.

1.4 SPECIFIC SAFETY RULES

1.4.1 FUEL

DANGER

Gasoline is extremely flammable and in some conditions can become explosive.

It is therefore necessary to refuel and carry out maintenance operations involving the fuel system in a well-ventilated area, with the engine off.

Do not refuel or do any maintenance on the fuel system with the engine running.

Do not smoke while refueling or near fuel vapors.

Never allow any portion of the fuel system to come in contact with open flames, sparks or other heat sources.

Be careful to avoid spilling fuel when you are refueling. Spilled fuel could ignite when it contacts hot engine or exhaust system surfaces.

If you accidentally spill some fuel, ensure that it is wiped up or completely evaporated before starting the vehicle.

Since gasoline expands in the fuel tank when the vehicle is sitting in the open sun, never fill the tank completely to the brim. Leave at least one inch of expansion space.

Avoid any contact of the fuel with your skin, and avoid inhalation of fuel vapors.

Do not ever attempt to siphon fuel from one container to another using your mouth as suction for a siphon hose.

Gasoline is poisonous and carcinogenic and contains chemical substances that cause birth defects and other reproductive problems. If gasoline should be accidentally spilled on the skin or clothes, immediately wash it off with soap and water and change clothes.

Should you accidentally spill gasoline in your eyes, flush with a large quantity of water and immediately contact a health professional.

Should you accidentally get gasoline into your mouth, do not induce vomiting.

Drink a large quantity of milk or clear water and immediately contact a health professional.

Never try to siphon gasoline by sucking it with your mouth.

Use a manual pump or a similar system.

If your vehicle overturns, it will leak gasoline which is extremely flammable.

Flames or sparks may ignite this which will not only destroy the vehicle but also could do serious property damage to surrounding property and cause serious injuries or even death.

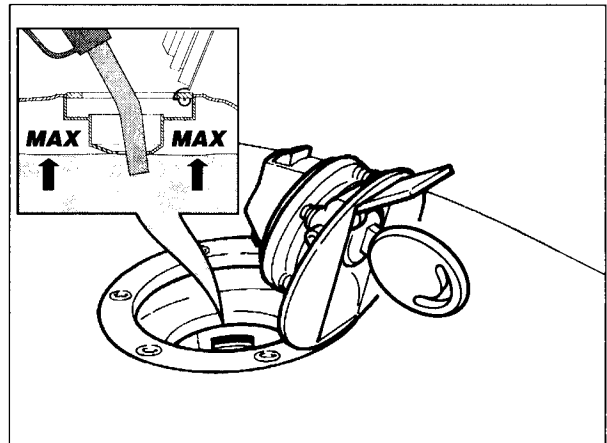
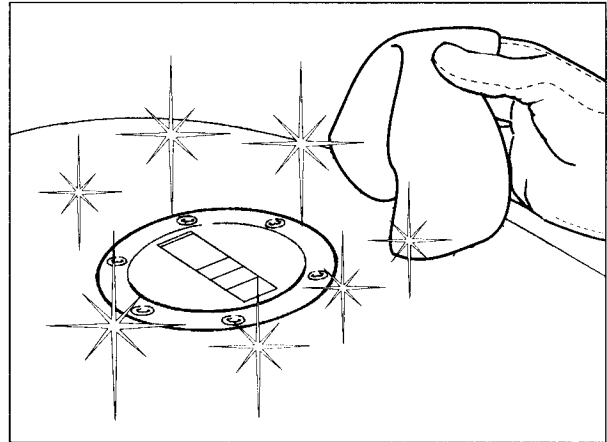
ALWAYS KEEP GASOLINE AWAY FROM CHILDREN.

DISPOSE OF UNWANTED GASOLINE PROPERLY, DO NOT DUMP IT INTO STORM SEWERS OR INTO A SINK OR TOILET.

WARNING

Before opening the fuel filler cap, if necessary, clean the cap and the part around it with a clean cloth. Prevent any foreign material from getting into the fuel tank, this could lead to serious engine damage.

If you use any container or funnel for refueling, make sure that it is perfectly clean. Any foreign matter getting into the fuel tank may lead to severe damage.



DANGER

Do not add any additives or other substances to the gasoline.

Do not refuel the tank completely; the fuel should never be touching the rim of filler cap seat hole.

After refueling, replace the fuel filler cap (1) in the correct position and ensure that it is properly closed.

Use only unleaded gasoline with a minimum octane rating of 92 (M+R)/2.

FUEL TANK CAPACITY

(reserve included): 5.28 US gal (20l).

TANK RESERVE: 1.19 ± 0.26 us GAL (4.5 ± 1l).

1.4.2 LUBRICANTS

⚠ DANGER

Proper vehicle lubrication is critical to safe operation. Failure to maintain proper lubricant levels or to use the proper type of clean, new lubricant, can lead to an engine or transmission seizure with subsequent accident, serious injury or death.

Use latex gloves for the maintenance operations that require contact with used oil.

Used oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods.

Although this is unlikely unless you handle used oil on a daily basis, it is advisable to thoroughly wash your hands with soap and water after handling used oil.

KEEP OIL AWAY FROM CHILDREN.

DISPOSE OF OIL PROPERLY.

⚠ WARNING

Be very careful when putting oil in your vehicle not to spill it.

Clean up any oil spilled immediately because oil can damage the finish of your vehicle.

Also, oil on the tires creates an extremely slippery and therefore dangerous situation.

In case of lubricant leakage do not ride the vehicle, but check to determine the cause of the leakage and repair it.

ENGINE OIL

⚠ DANGER

If the engine oil pressure warning light LED " (1) remains on (when the engine is running), or if it comes on during the normal running of the engine, this means that the oil system is not developing sufficient pressure.

In this case, immediately stop the engine and check the engine oil level, see 2.12 (CHANGING THE ENGINE OIL AND OIL FILTER) if the level is correct, check the engine oil pressure sensor, see 6.10.3 (ENGINE OIL PRESSURE SENSOR).

Failure to heed this warning can lead to engine seizure, upset, and serious injury or even death.

⚠ WARNING

Perform these maintenance operations at one-half of the specified intervals, if the vehicle is often used in rainy or very dusty conditions, on unpaved roads or in any kind of competition.

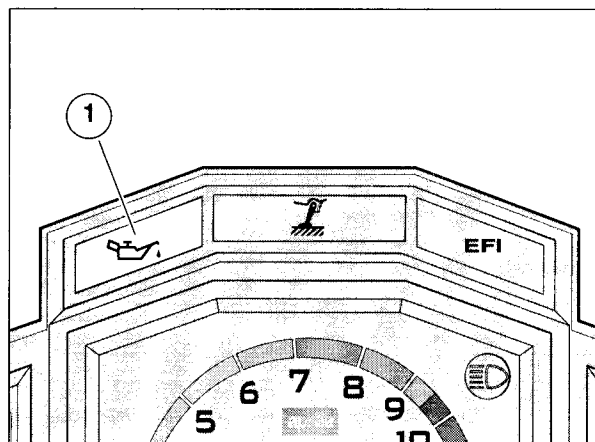
Periodically check the engine oil level, see 2.11 (CHECKING AND TOPPING UP THE ENGINE OIL LEVEL).

Renew the engine oil after the first 600 mi (1,000 Km), and thereafter every 4,600 mi (7,500 km) (*), see 2.12 (CHANGING THE ENGINE OIL AND OIL FILTER).

(*) = For competition use, renew every 2,300 mi (3,750 km).

NOTE Use high-quality 15W-50 oil, see 1.12 (LUBRICANT TABLE).

As an alternative to the recommended oil, it is possible to use high-quality oils with characteristics in compliance with or superior to the CCMC G-4, A.P.I. SG specifications.



FORK OIL

⚠ DANGER

Changing the damper settings and/or the viscosity of the damper oil changes suspension response and could upset vehicle handling. Always follow the recommendations in this manual for suspension adjustments.

The standard fork oil viscosity is SAE 20W.

Oil as light as SAE 5W may be used if a soft fork stiffness is desired, and you may mix 5W with 20W in varying proportions to obtain a desired different fork stiffness.

Ensure that exactly the same mixture is used in each fork.

One of the properties of F.A. or Agip FORK is that their viscosity changes very little with variations in temperature, and their damping response remains fairly constant.

1.4.3 BRAKE

NOTE This vehicle è equipped with front and rear disc brakes, with separate hydraulic circuits.

The following information refers to a single brake system, but is applicable to both.

⚠ DANGER

Do not ride the vehicle with worn or malfunctioning brakes! The brakes are the most important safety system of the vehicle, and using the vehicle with brakes that are anything less than perfect is very likely to lead to a collision or upset, with consequent risk of serious injury or death.

Wet condition seriously degrade the performance of your brakes.

When the road is wet from rain, you should plan to use double the normal stopping distances since both the brakes themselves and the traction of the tires on the road are reduced by the presence of water.

Water on the brakes from washing your vehicle, or splashed up from wet roads, or crossing puddles or ditches, can wet the brakes sufficiently to greatly reduce their effectiveness.

Failure to heed these warnings may lead to a serious accident with consequent risk of serious injury or even death.

The brakes are extremely important for your safety. Do not use the vehicle if the brakes do not work perfectly.

Always check the brake efficiency before riding. Sudden variations in clearance or an elastic resistance in the brake levers may be due to trouble in the hydraulic systems.

Pay special attention to the brake disc and friction material, making sure that they are neither dirty nor oily, especially after maintenance operations or inspections.

Check the brake line, ensure that it is not twisted or kinked, nor leaking.

KEEP BRAKE FLUID AWAY FROM CHILDREN.

DISPOSE OF USED BRAKE FLUID PROPERLY. SEE THE GENERAL WARNINGS AT 1.3.5 (BRAKE FLUID).

1.4.4 DISC BRAKES

DANGER

The brakes are the most important safety system on your vehicle.

For your safety, they must be in perfect repair, so they should be checked every time you ride the vehicle.

Oil or other fluid on a disc will contaminate the brake pads.

Dirty pads must be discarded and replaced, a dirty or oily disc must be cleaned with a high quality degreaser.

DANGER

Perform these maintenance operations at one-half of the specified intervals, if the vehicle is often used in rainy or very dusty conditions, on unpaved roads or in any kind of competition.

Check the levels of the brake fluid in the reservoirs after the first 600 mi (1,000 km) and thereafter every 4,600 mi (7,500 km); see 2.15 (CHECKING AND TOPPING UP THE FRONT BRAKE FLUID) and 2.16 (CHECKING AND TOPPING UP THE REAR BRAKE FLUID); renew the brake fluid every two years, see 2.20 (CHANGING THE FRONT BRAKE FLUID) and 2.21 (CHANGING THE REAR BRAKE FLUID).

NOTE Use high-quality brake fluid, see 1.11 (Lubricant chart).

Check the brake pad wear, as shown on 2.27 (CHECKING THE BRAKE PAD WEAR).

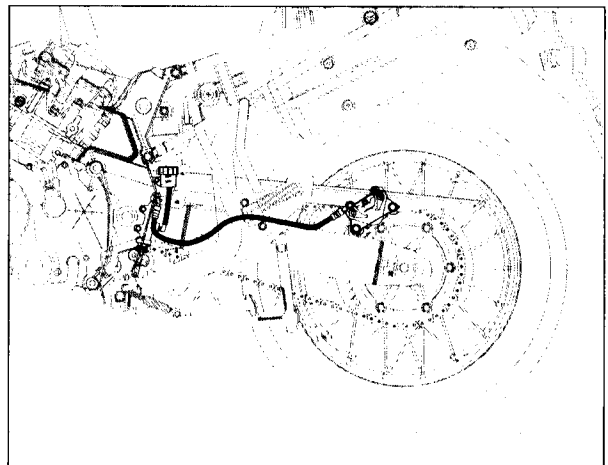
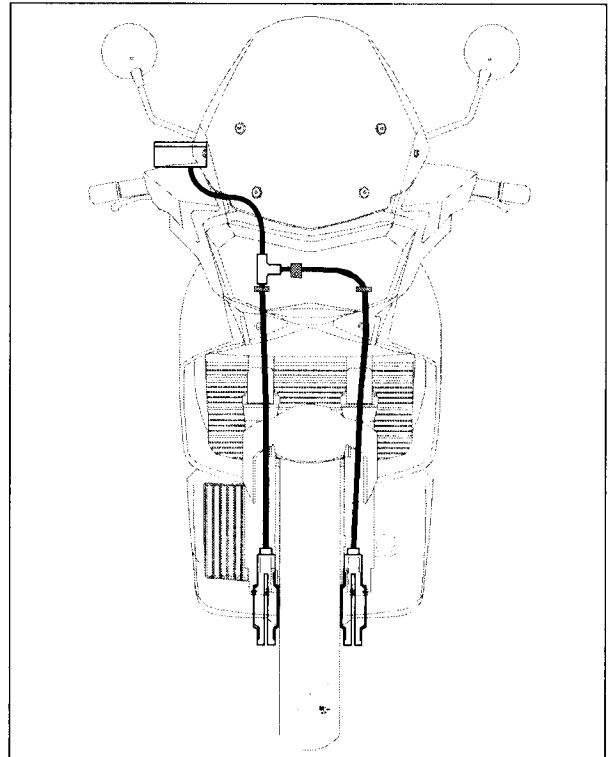
When the pads wear out the brake fluid level in the reservoir decreases to automatically compensate for their wear.

The front brake fluid reservoir (1) is located on the right end of the handlebar near the front brake lever.

The rear brake fluid reservoir (2) is under the fairing on the right side of the vehicle.

DANGER

Never use the vehicle if any portion of either brake system is leaking.



1.4.5 CLUTCH CONTROL FLUID

NOTE This vehicle is equipped with hydraulic clutch control.

⚠ DANGER

Do not ride the vehicle with worn or malfunctioning clutch! The clutch is an important safety system of the vehicle, and using the vehicle with clutch that is anything less than perfect is very likely to lead to a collision or upset, with consequent risk of serious injury or death.

The clutch is extremely important for your safety. Do not use the vehicle if the clutch does not work perfectly. Always check the clutch efficiency before riding.

Sudden variations in clearance or an elastic resistance in the clutch lever may be due to trouble in the hydraulic system.

KEEP CLUTCH FLUID AWAY FROM CHILDREN.

DISPOSE OF USED CLUTCH FLUID PROPERLY. SEE THE GENERAL WARNINGS AT 1.3.6 (CLUTCH CONTROL FLUID).

When using the fluid, take care not to spill it on the plastic and painted parts, since it damages them.

Perform these maintenance operations at one-half of the specified intervals, if the vehicle is often used in rainy or very dusty conditions, on unpaved roads, or in any kind of competition.

Check the levels of the clutch fluid in the reservoir after the first 600 mi (1,000 km), and thereafter every 4,650 mi (7,500 km) [for competition use: thereafter every 2,300 mi (3,750 km)], see 2.17 (CHECKING AND TOPPING UP THE CLUTCH FLUID).

Renew the fluid every two years, see 2.22 (CHANGING THE CLUTCH FLUID).

Never use the vehicle if the clutch hydraulic system is leaking.

⚠ WARNING

To avoid serious damage to the system, do not use fluids other than the recommended ones nor mix different fluids for topping up.

Do not use clutch fluid taken from old or already opened containers.

Check that the clutch control lines are not twisted or worn.

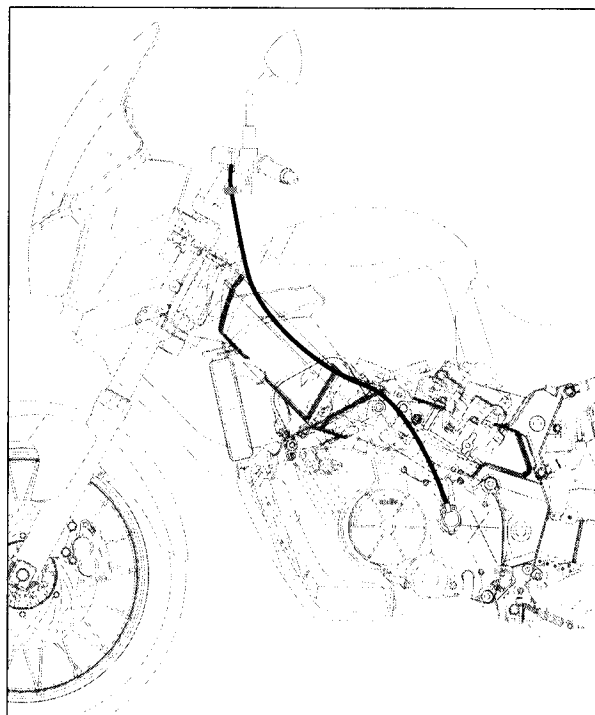
Ensure that neither water nor dust accidentally enter the system.

In case maintenance operations are to be performed on the hydraulic system, it is advisable to use latex gloves.

NOTE Use high-quality clutch control fluid, see 1.12 (LUBRICANT TABLE).

The clutch control fluid reservoir (1) is located on the left end of the handlebar near the clutch lever.

NOTE The hydraulic clutch is installed in conjunction with PPC (pneumatic power clutch), an exclusive patented system which avoids rear wheel hop.



1.4.6 COOLANT

⚠ WARNING

Do not use the vehicle if the coolant is below the minimum prescribed level.

Before setting off, and every 9,300 mi (15,000 km), check the level of the coolant, see 2.13 (CHECKING AND TOPPING UP THE COOLANT); renew the coolant every two years, see 2.14 (CHANGING THE COOLANT).

⚠ DANGER

Coolant is poisonous! Do not ingest coolant under any circumstance.

Should you get coolant in your mouth, rinse with cool water and immediately seek medical attention.

Coolant is also very dangerous to your skin and eyes.

Should you accidentally get coolant on your clothing or skin, change clothes immediately.

Wash coolant from your skin with hot water and soap.

Should you get coolant in your eyes, flush with plenty of cool water and seek professional medical help at once.

Should someone swallow coolant accidentally, induce vomiting, rinse mouth with water, and immediately seek professional medical attention.

DISPOSE OF THE COOLANT PROPERLY.

BE SURE TO KEEP THE DRAINED COOLANT AWAY FROM CHILDREN AND PETS.

IT IS SWEET TASTING, AS WELL AS EXTREMELY POISONOUS, AND IS VERY ATTRACTIVE TO CHILDREN AND PETS.

Use extra caution not to spill the coolant on any hot parts of the engine. It is flammable, and can emit invisible, noxious fumes.

Always wear rubber or latex gloves when servicing the cooling system.

It is advisable to maintain 50% water/50% antifreeze year round. This way, losses due to evaporation are reduced, and topping up the radiator need not be done very frequently. Thus, the mineral salt deposits left in the radiator by evaporation are reduced, and the cooling efficiency of the system uncompromised. If the outdoor temperature is below 0°C (32°F), check the antifreeze concentration in the coolant. Below 0°, increase the antifreeze concentration to 60%.

⚠ WARNING

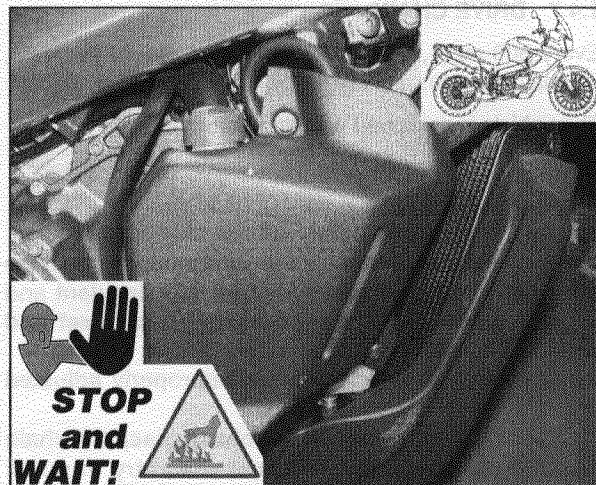
Use only distilled water topping off the cooling system. This will reduce damage to the engine.

⚠ DANGER

The coolant is very hot.

Do not remove the filler cap (1) when the engine is hot since the coolant is under pressure and it will splash out violently.

If it gets in contact with the skin or with your clothing, it may cause severe burns.

**⚠ DANGER**

Be aware of the risk of burns from the coolant. Check the coolant level and top up the expansion tank only after the engine has thoroughly cooled.

Do not use your fingers or any object to check if there is enough coolant.

On the basis of the desired freezing temperature of the coolant mixture, add to the water the percentage of coolant indicated in the following table:

Freezing point °C (°F)	Coolant of the volume %
-20 (-4)	35
-30 (-22)	45
-40 (-40)	55

NOTE The characteristics of the various antifreeze liquids are different.

Be sure to read the label on the product to learn the degree of protection it guarantees.

⚠ WARNING

Use only a high quality antifreeze, specifically intended for use with aluminum and magnesium engines, which contains no nitrite.

1.4.7 DRIVE CHAIN

Every 600 mi (1,000 km) check the condition, the wear, the play (tension) and the lubrication of the drive chain.

The vehicle is equipped with an endless chain.

There is no master link used.

DANGER

An excessively loose chain can come off the sprocket which can result in a serious accident and sprocket damage to the vehicle from the upset and subsequent serious injury or even death.

Do not ride the vehicle with an improperly adjusted chain.

To inspect the condition of the chain, grasp the chain where it goes around the sprocket and try to pull it away from the sprocket.

If you can move it more than one-eighth of an inch away from the sprocket, the chain is worn out and the chain and both front and rear sprockets must be replaced.

WARNING

Lack of maintenance can cause premature wear of the chain and damage to the sprockets.

Maintain your chain more often if your vehicle is used on dusty or muddy roads.

1.4.8 TIRES

DANGER

If the tire is inflated to too high a pressure, an uncomfortably harsh ride will result, and riding comfort will be compromised.

Also, road holding, especially during turns and in wet condition, will likewise be compromised.

If the tire is underinflated (pressure is too low), the tire may slip on the rim with consequent loss of control.

Again road holding and handling characteristics will be degraded, and brake performance will be reduced.

Insure that all tires are equipped with properly installed valve caps.

Changing, repairing, maintenance and balancing operations are very important and should be carried out by qualified technicians with appropriate tools.

If the tires are new, they may still be covered with a slippery film: ride carefully for the first few miles.

Never attempt to treat a tire with any kind of rubber dressing.

Particular avoid contact to the tire with any gasoline fluid as this will cause rapid deterioration of the rubber.

If a tires become contaminated with oil or gasoline, you cannot clean it.

The tire must be replaced.

DANGER

Some of the original equipment tires for this vehicle are provided with wear indicators.

There are several kinds of wear indicators.

Contact your dealer to get the necessary information on the wear check procedures.

Visually check the tire wear and if they are worn, have them replaced.

If a tire should go flat while you are riding the vehicle do not attempt to continue riding.

Avoid abrupt breaking and steering inputs, and avoid shutting the throttle quickly.

Slowly decrease the throttle setting, moving to the side of the road, using engine compression to slow you to a stop.

Non-compliance with these instructions may cause accidents with consequent risk of injuries or even death.

Do not install tires with an inner tube on rims for tubeless tires, and viceversa.

1.4.9 AUTOMATIC CONVERTER

This vehicle is equipped with lights that come on automatically as soon as the ignition switch (1) is turned to position "O" (ON) (low beam lights "D" or high beam lights "D") position "P" (PARKING) (only parking lights "D"). For this reason, there is no light switch on your vehicle. The light can be switched off only by turning the ignition switch (1) to position "X" (OFF). Before starting the vehicle, ensure that the dimmer switch (2) is in the low beam light "D" position.

1.4.10 CATALYTIC CONVERTER

⚠ DANGER

The exhaust system of this vehicle is equipped with a catalytic converter.

It becomes extremely hot, and cause serious burns and forest fires.

Do not touch it! Keep flammable materials away.

If your vehicle is equipped with catalytic converter, do not park near dry brush, wood, or in places easily accessible to children, as the catalytic converter becomes extremely hot during use.

Be careful to avoid any kind of contact before it has completely cooled down.

The catalytic converter, if used, is a metal "platinum-rhodium bivalent" type.

This device provides for the oxidation of the CO (carbon monoxide) and of the HC (unburned hydrocarbons) contained in the exhaust gases, changing them into carbon dioxide and steam, respectively.

⚠ WARNING

Do not use leaded gasoline, since it causes the destruction of the catalytic converter.

1.4.11 EXHAUST SILENCER

⚠ DANGER

Tampering with the exhaust system is prohibited.

It is against the law for you to alter the exhaust system in a manner that increases the noise, carefully read 1.3.9 (PRECAUTIONS AND GENERAL INFORMATION)

Periodically inspect the entire exhaust system, including the exhaust pipe and silencer, to ensure that no holes have rusted through.

Using a wire or a small pick, ensure that the drain hole in the bottom of the muffler is open.

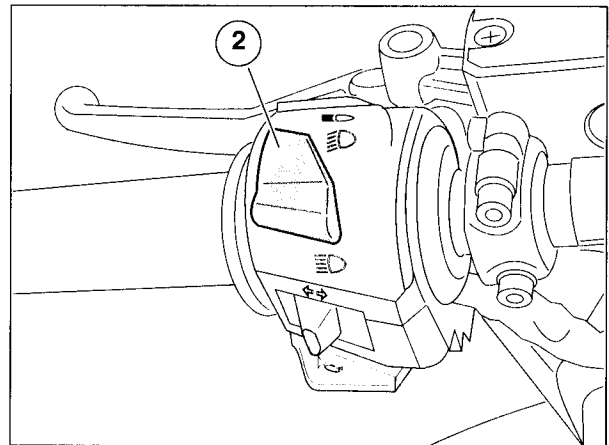
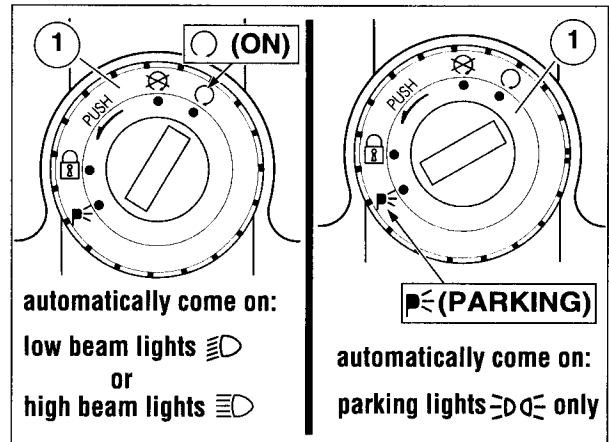
If the noise of your vehicle has increased significantly, replace the defective exhaust system components.

Tampering with the exhaust system not only makes your vehicle loud, it will reduce its performance and shorten its life.

1.4.12 SPARK ARRESTER

⚠ DANGER

If the bike is to be used off-road, on public land, it is the owner's responsibility to install a spark arrester approved by the US Forest Service for this engine displacement or larger.



1.5 RUNNING-IN RULES

The internal parts of the engine and trasmission must be properly run-in to ensure their long life and dependable operation.

If possible, while breaking in your vehicle, ride on hilly roads and/or roads with many curves so that the engine and transmission undergo lots of speed changes.

It is also important that, during the run-in period, the suspension and brakes be treated gently to allow the mating parts to bed.

Therefore, avoid hard braking, high speeds or very bumpy roads during the break in period.

NOTE Only after the first 900 mi (1,500 km) of running-in you can expect the best performance from the vehicle.

During break in, obey the following rules:

- ◆ Do not open the throttle abruptly or fully at low engine speed. This rule applies even after break in has been completed.
- ◆ During the first 60 mi (100 km), apply the brakes with caution, avoid sudden and prolonged braking. This ensure correct bedding in of the pads on the discs.
- ◆ During the first 600 mi (1,000 km), never exceed 6,000 rpm.

▲ DANGER

After the vehicle has been operated for 600 mi (1,000 km) perform the "checking operations" shown in column "After running-in" of the 2.1 (SCHEDULED MAINTENANCE PLAN)

Rectify any faults found. Failure to heed this warning could lead to damage to your vehicle or engine seizure or other malfunction which could cause an up-set and lead to serious injury or even death.

- ◆ Between the first 600 mi (1,000 km) and 900 mi (1,500 km) ride more briskly, changing speed and using maximum acceleration for only a few seconds. Never exceed 7,500 rpm.
- ◆ After the first 900 mi (1,500 km) if you have followed the above break in schedule, the engine should be fully broken in, and will deliver maximum performance. However, never exceed the maximum allowed rpm (9,000 rpm).

Engine maximum rpm for the running-in	
Mileage mi (km)	Max. rpm
0 - 625 (0 - 1,000)	5,000
625 - 937 (1,000 - 1,500)	6,250
over 937 (1,500)	8,750

1.6 HOW TO USE YOUR SERVICE AND REPAIR MANUAL

1.6.1 HOW TO USE THIS MANUAL

This manual is divided into sections, chapters and paragraphs, each one of which corresponds to a category of main components.

To consult them, see TABLE OF CONTENTS.

If not expressly indicated otherwise, for the reassembly of the units report the disassembly operations in reverse order.

The terms "right" and "left" are referred to the rider seated on the vehicle in the normal riding position.

For normal maintenance operations and for the use of the vehicle, consult the "USE AND MAINTENANCE" manual.

★ The operations preceded by this symbol must be repeated on the opposite side of the vehicle.

1.6.2 REQUESTING SPARE PARTS

NOTE When asking your Dealer for spare parts, specify the spare parts code indicated on the SPARE PARTS IDENTIFICATION LABEL.

Write down the identification code in the space here below, in order to remember it in also case of loss or deterioration of the label.

The label is placed under the saddle, see to be able to read it, remove the saddle see 7.1.1 (LOCKING/RELEASING THE PASSENGER SADDLE) on the right part of the frame.

In this manual the various versions are indicated by the following symbols:

⊕ version with catalytic converter

ASD Automatic Switch-on Device version

EES evaporative emission system

OPT optional

VERSION:

- I** Italy **GR** Greece **Mal** Malaysia
- UK** United Kingdom **NL** Netherlands **RCH** Chile
- A** Austria **CH** Switzerland **HR** Croatia
- P** Portugal **DK** Denmark **AUS** Australia
- SF** Finland **J** Japan **USA** United States of America
- B** Belgium **SGP** Singapore **BR** Brazil
- D** Germany **SLO** Slovenia **RSA** Republic of the South Africa
- F** France **IL** Israel **NZ** New Zealand
- E** Spain **ROK** South Korea **CDN** Canada

april SPARE PARTS IDENTIFICATION		YEAR		Y	1	2	3	4	
		I.M.		A	B	C	D	E	
I	UK	A	P	SF	B	D	F	E	GR
NL	CH	DK	J	SGP	SLO	IL	ROK	MAL	RCH
HR	AUS	USA	BR	RSA	NZ	CDN			

1.7 IDENTIFICATION DATA

Please supply the frame number when you purchase spare parts.

NOTE Do not obliterate or alter the identification numbers under any circumstance.

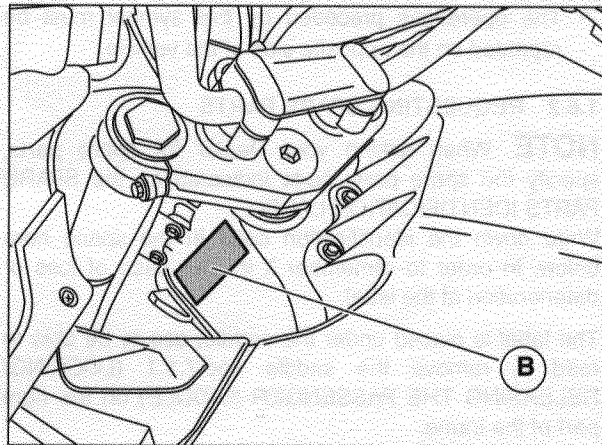
This is illegal in all countries.

In addition, alteration of the identification numbers invalidates the warranty.

1.7.1 VEHICLE IDENTIFICATION NUMBER (V.I.N.) (FRAME NUMBER)

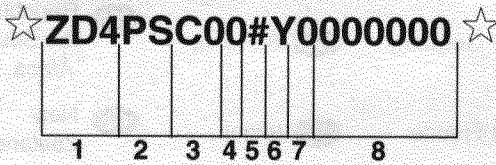
Every vehicle produced by **aprilia** receives a vehicle identification number (V.I.N.) stamped:

- on the steering head of the frame (A), as shown above;
- and also:
- on the identification plate (B) which is located on the front portion near the steering head of the frame.



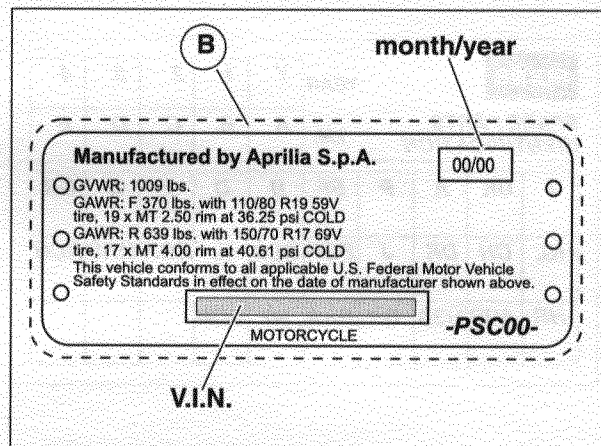
1.7.2 INFORMATION CONTAINED IN THE VEHICLE IDENTIFICATION NUMBER

Description of the vehicle identification number (V.I.N.), stamped on the steering head of the frame (A) and on the identification plate (B).



DIGIT MEANING

- 1) Manufacturer's identification alphanumeric code.
 - 2) Vehicle type.
 - 3) Model.
 - 4) Country for which the vehicle is intended.
 - 5) #=Check digit number.
 - 6) Model year.
 - 7) Assembling factory designation
(N =NOALE-VE-,
S =SCORZÉ -VE-,
0 =NOT SPECIFIED).
- Sequential serial number.



1.8 POSITION OF SERIAL NUMBERS

These numbers are required for vehicle registration.

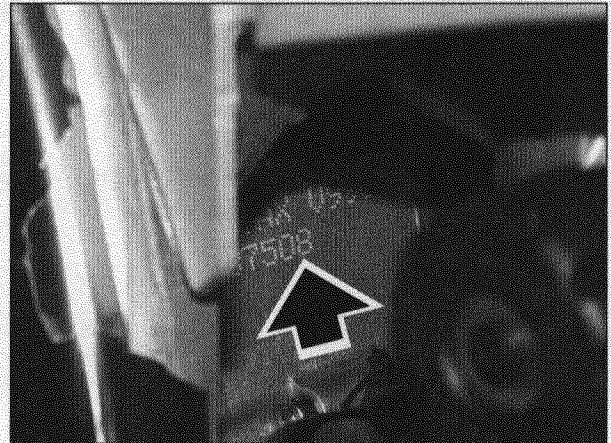
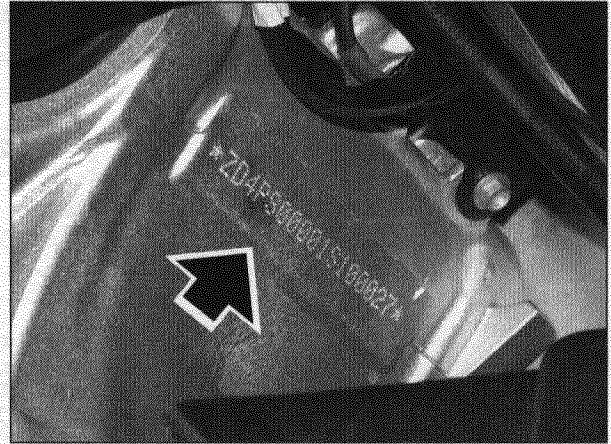
NOTE Tampering with the serial numbers is subject to serious sanctions under criminal and civil law. Altering the frame number will void the warranty effective immediately.

1.8.1 FRAME NUMBER

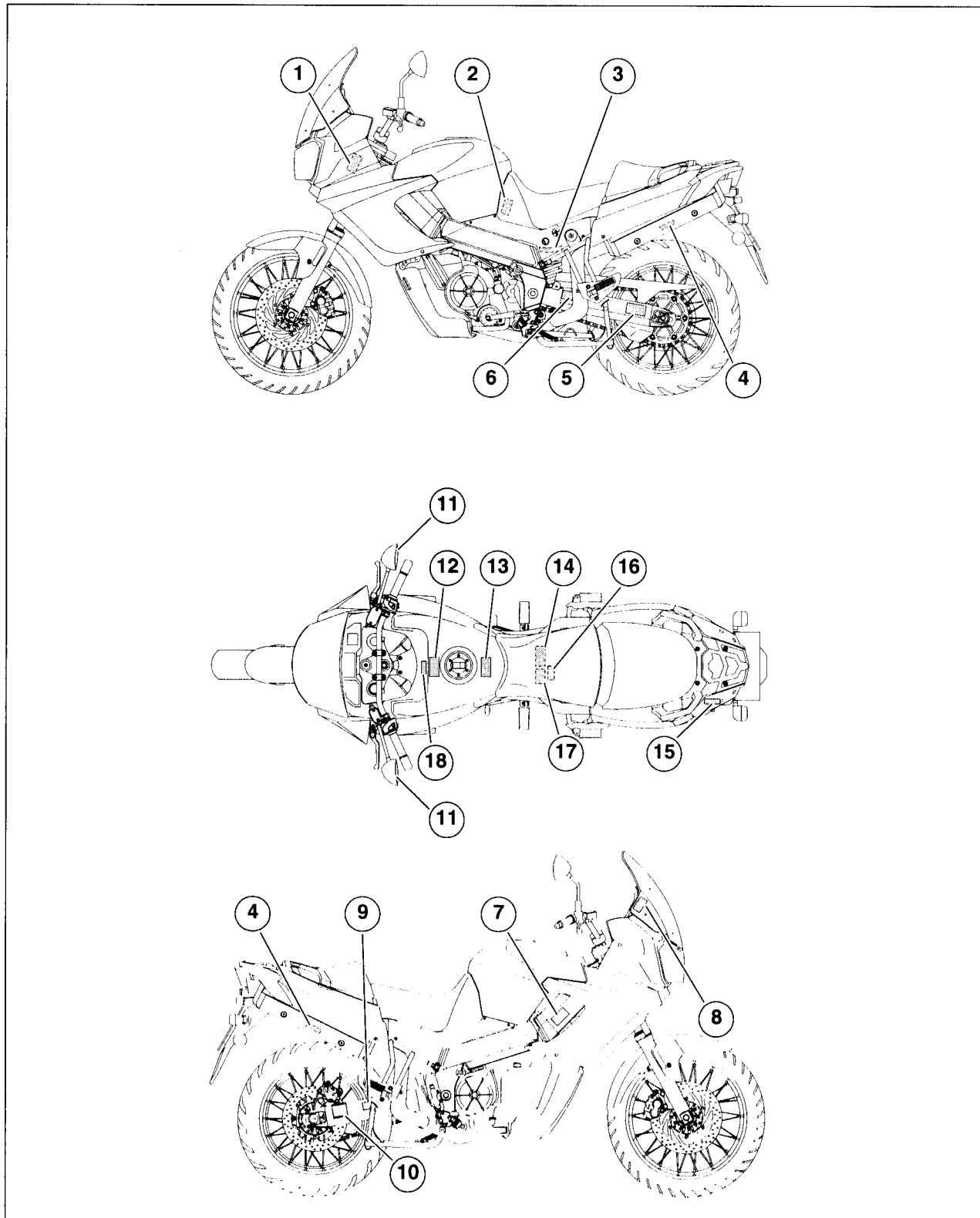
the frame number is engraved on the right side of the steering column.

1.8.2 ENGINE NUMBER

The engine number is engraved on the rear, near the countershaft sprocket.



1.8.3 POSITION OF THE WARNING ADHESIVE LABELS



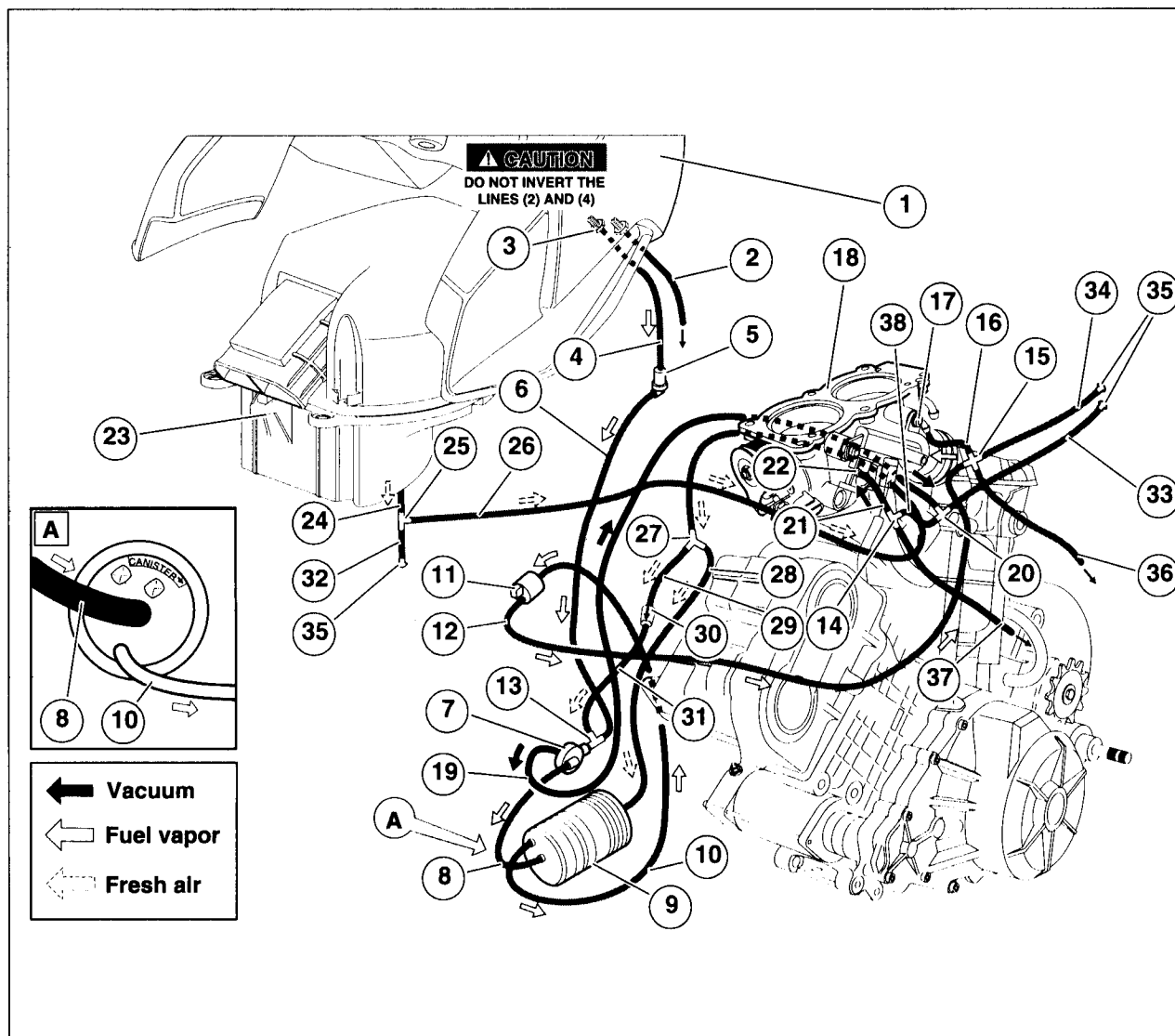
Ref.	Description																								
1	<p>Manufactured by Aprilia S.p.A.</p> <ul style="list-style-type: none"> CVWR: 1009 lbs. GAWR: F 370 lbs. with 110/80 R19 59V tire, 19 x MT 2.50 rim at 36.25 psi COLD GAWR: R 639 lbs. with 150/70 R17 69V tire, 17 x MT 4.00 rim at 40.81 psi COLD <p>This vehicle conforms to all applicable U.S. Federal Motor Vehicle Safety Standards in effect on the date of manufacturer show above.</p> <p style="text-align: right;">-PSC00- MOTORCYCLE</p>																								
2	<p>CAUTION!</p> <p>Before disconnecting the water drain tube and the overflow drain tube, clearly mark them and the relevant couplings on the fuel tank, in order to avoid inverting the drain tubes during reassembly.</p> <p>When you let down the fuel tank in work position, correctly replace the drain tubes in order to avoid bends or squashes that may cause their clogging.</p>																								
3	<p>WARNING!</p> <p>CONTAINS HIGH PRESSURE NITROGEN GAS.</p> <p>SEE WORKSHOP MANUAL FOR DISPOSAL AND ADJUSTING UNIT.</p> <p>DO NOT OPEN. DO NOT INCINERATE, INCINERATION, PUNCTURE OR DISASSEMBLY MAY CAUSE THIS UNIT TO EXPLODE.</p>																								
4	MUFFLER STAMPING																								
5	<p>WARNING!</p> <p>Do not use any tire other than those recommended and approved by Aprilia. Maintain proper tire inflation. Do not use any tire with less than 1/8" (3mm) tread remaining. Do not repair any tire, nor use a repaired tire. Do not ride your motorcycle overloaded or with an unbalanced load. Failure to follow these warnings can lead to an accident and serious injuries or death. Always ensure that the chain is correctly adjusted. See owner's manual.</p> <p>CHAIN TENSION WITH NO LOAD</p> <table border="1"> <tr> <td colspan="2">Tires pressure bar - (psi)</td> <td colspan="2">Front tire</td> </tr> <tr> <td>Front tire</td> <td>Rear tire</td> <td>Pirelli</td> <td>110/80 R19" 59V</td> </tr> <tr> <td>2.5 (31.9)</td> <td>2.5 (36.25)</td> <td>Metzeler</td> <td></td> </tr> <tr> <td>2.5 (36.25)</td> <td>2.5 (40.81)</td> <td>Rear tire</td> <td></td> </tr> <tr> <td>2.5 (36.25)</td> <td>2.5 (40.81)</td> <td>Pirelli</td> <td>150/70 R17" 69V</td> </tr> <tr> <td></td> <td></td> <td>Metzeler</td> <td></td> </tr> </table> <p style="text-align: right;">-PSC00- aprilia</p>	Tires pressure bar - (psi)		Front tire		Front tire	Rear tire	Pirelli	110/80 R19" 59V	2.5 (31.9)	2.5 (36.25)	Metzeler		2.5 (36.25)	2.5 (40.81)	Rear tire		2.5 (36.25)	2.5 (40.81)	Pirelli	150/70 R17" 69V			Metzeler	
Tires pressure bar - (psi)		Front tire																							
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2.5 (36.25)	2.5 (40.81)	Pirelli	150/70 R17" 69V																						
		Metzeler																							
6	<p>MOTORCYCLE NOISE EMISSION CONTROL INFORMATION</p> <p>THIS 2002 ASP42F9988 MOTORCYCLE, B-1122 MEETS EPA NOISE EMISSION REQUIREMENTS OF 80 dBA AT 4338 closing r.p.m. BY FEDERAL TEST PROCEDURE. MODIFICATIONS WHICH CAUSE THIS MOTORCYCLE TO EXCEED FEDERAL NOISE STANDARDS ARE PROHIBITED BY FEDERAL LAW. SEE OWNER'S MANUAL.</p> <p style="text-align: right;">PSC00 aprilia</p>																								
7	<p>WARNING!</p> <p>DO NOT REMOVE THE CAP UNTIL THE ENGINE IS ENTIRELY COOL. COOLANT IS HOT AND UNDER PRESSURE. FAILURE TO OBSERVE THIS WARNING MAY LEAD TO SERIOUS BURNS. USE ONLY FLUID FOR SEALED CIRCUITS. USE ONLY ANTIFREEZE AND ANTICORROSION WITHOUT NITRATE. ENSURING PROTECTION -35°C AT LEAST.</p>																								
8	<p>WARNING!</p> <ul style="list-style-type: none"> Keep windshield clean at all times. Clean only with a soft cloth and warm water with a mild detergent. Replace windshield if becomes scratched or discoloured so as to interfere with view. <p>Do not allow any alkaline or strong acid cleaners, gasoline, brake fluid or any other solvent to contact the windshield.</p> <p>When replacing windshield, use only Aprilia original replacement windshield.</p>																								
9	<p>EVAP FAMILY: 2ASPE0024MLA HOSE ROUTING DIAGRAM Aprilia S.p.A. -PSC00-</p>																								

Ref.	Description																																				
10	<p>VEHICLE EMISSION CONTROL INFORMATION -PSC00-</p> <p>ENGINE DISPLACEMENT: 998 cc ENGINE FAMILY: 2ASPC0.99PSC THIS VEHICLE CONFORMS TO U.S. EPA AND CALIFORNIA REGULATIONS APPLICABLE TO 2002 MODEL YEAR NEW MOTORCYCLES AND IS CERTIFIED TO 1.4 HC/GKM ENGINE FAMILY EXHAUST EMISSION STANDARD IN CALIFORNIA. ENGINE EXHAUST CONTROL SYSTEM: O2S</p> <p>ENGINE TUNE UP SPECIFICATIONS IGNITION TIMING: 12.25° ± 2° AT 2800 RPM IDLE SPEED: 1340 ± 100 RPM IN NEUTRAL VALVE CLEARANCE: INLET 0.005±0.006 inch (0.12±0.17 mm) OUTLET 0.009±0.011 inch (0.23±0.28 mm)</p> <p>SPARK PLUG: NGK R DCPR9E FUEL: MINIMUM OCTANE RATING (M+R)/2 METHOD 90 OIL: ENGINE OIL VISCOSITY SAE 15W-50</p> <p>Aprilia S.p.A. Via G. Galilei 1 30033 Noale (VE) ITALY</p> <p style="text-align: right;">aprilias</p>																																				
11	OBJECTS IN MIRROR ARE CLOSER THAN THEY APPEAR.																																				
12	<p>WARNING!</p> <ul style="list-style-type: none"> Wear a helmet, eye protection, and bright protective clothing. Don't ride after consuming alcohol or other drugs. Slow down on slippery surface, unfamiliar terrain or when visibility is reduced. Read owner's manual carefully. Failure to follow these warnings can lead to an accident and serious injuries or death. USE UNLEADED FUEL. MINIMUM OCTANE RATING (R + M)/2 METHOD 80. See owner's manual for the correct running in and maintenance of the vehicle. 																																				
13	<p>WARNING!</p> <p>Never install accessories or replacement parts not approved by Aprilia as original equipment. This can degrade the handling and safety of your motorcycle, and can cause an upset with subsequent accident and serious injury or even death. The stability and safety of any motorcycle is adversely affected by the addition of any load carrying accessory. See owner's manual.</p>																																				
14	<p>WARNING!</p> <p>Contain sulfuric acid which can cause severe injuries. Avoid contact with skin, eyes or clothing. ATTENTION: - Flush with water. ATTENTION: - Great large quantities of water or milk. Follow with milk of magnesia, beaten egg or veg. oil. Call physician immediately. Eyes: Flush with water for 15 minutes and get prompt medical attention. KEEP OUT OF REACH OF CHILDREN.</p> <p>Batteries produce explosive gases. Keep sparks, flames, cigarettes away. Charge only in well-ventilated space. Always wear protective goggles when working around batteries. Always connect the battery vent tube. Failure to heed this warning will cause corrosion of the electrical system.</p>																																				
15	<p>WARNING!</p> <p>MAXIMUM WEIGHT LOAD ALLOWED lbs 20 (kg 9)</p>																																				
16	<table border="1"> <tr> <td colspan="2">SPARE PARTS IDENTIFICATION</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td>E</td> <td>F</td> </tr> <tr> <td>G</td> <td>H</td> <td>I</td> <td>J</td> <td>K</td> <td>L</td> </tr> <tr> <td>M</td> <td>N</td> <td>O</td> <td>P</td> <td>Q</td> <td>R</td> </tr> <tr> <td>S</td> <td>T</td> <td>U</td> <td>V</td> <td>W</td> <td>X</td> </tr> <tr> <td>Y</td> <td>Z</td> <td>AA</td> <td>AB</td> <td>AC</td> <td>AD</td> </tr> </table>	SPARE PARTS IDENTIFICATION		1	2	3	4	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
SPARE PARTS IDENTIFICATION		1	2	3	4																																
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M	N	O	P	Q	R																																
S	T	U	V	W	X																																
Y	Z	AA	AB	AC	AD																																
17	<p>aprilias BATTERY SERVICE</p> <p>WARNING!</p> <p>This battery is completely sealed. Do not attempt to remove the cap. Replace with sealed battery only. Always keep the battery charged (see Owner's Manual). Never disconnect the battery or regulator with the engine running. This will completely destroy the entire electrical system.</p>																																				
18	<p>WARNING!</p> <p>DO NOT ALLOW KEY CHAIN AND ANY OTHER ITEM TO FALL BETWEEN THE BYE-BRING HEAD AND THE BODY OF MOTORCYCLE. THIS CAN CAUSE LOSS OF CONTROL.</p>																																				

1.9 EVAPORATIVE EMISSION SYSTEM EES

The system consists of:

- | | |
|--|---|
| <ol style="list-style-type: none"> 1) Fuel tank 2) Water drain line 3) Fuel tank breather nipple 4) Breather line (to tee) 5) Roll-over valve 6) Breather line (to purge valve) 7) Purge valve (to carbon canister) 8) Breather line (to carbon canister) 9) Carbon canister 10) Drain line (to electric purge valve) 11) Electric purge valve (from carbon canister) 12) Drain line (from electric purge valve) 13) "T" tee 14) "T" tee 15) "X" tee 16) Drain line (to manifold vacuum port) 17) Manifold vacuum port (on rear part of throttle body) 18) Throttle body | <ol style="list-style-type: none"> 19) Vacuum line (from purge valve) 20) "T" tee 21) Vacuum line (to ported vacuum port) 22) Ported vacuum port (front part of throttle body) 23) Air box 24) Warm air inlet fitting (from air box) 25) "T" tee 26) Warm air inlet (from air box) 27) "Y" tee 28) Warm air inlet (to carbon canister) 29) Warm air inlet (to one way valve) 30) One way valve 31) Warm air inlet (from one way valve) 32) Water or other contaminant drain line 33) Front cylinder "1" synchronization line 34) Rear cylinder "2" synchronization line 35) Plug 36) To power clutch (from manifold vacuum port) 37) To power clutch (from ported vacuum port) |
|--|---|





1.10 SPARE PARTS

When making replacements, use only Original **aprilia** Spare Parts. Original **aprilia** spare parts are high quality, and are designed and built explicitly for **aprilia** vehicles.

⚠ WARNING

Use of spare parts NOT originally manufactured by **aprilia** may cause performance problems and damage.

1.11 SPECIFICATIONS

DIMENSIONS	
max. Length	90.16 in (2,290 mm)
max. Width	34.49 in (876 mm)
max. Height (at front fairing)	56.53 in (1436 mm)
Saddle height	32.48 in (825 mm)
Wheelbase	60.79 in (1,544 mm)
Minimum ground clearance	9.49 in (241 mm)
Weight in riding condition (including fluids and fuel)	518.08 lb (235 kg)
ENGINE	
Type	60° longitudinal V-type, twin-cylinder, 4-stroke, with 4 valves per cylinder, DOHC.
Number of cylinders	2
Total displacement	60.90 cu in (998 cm ³)
Max. rated power (to crankshaft)	86.5 kW (118 HP) at 9250 rpm
Max. rated power (to crankshaft) 	77 kW (104 HP) at 9250 rpm
Max. Torque	71.2 ftlb (96,5 Nm) at 7250 rpm
Max. Torque 	66.4 ftlb (90 Nm) at 7000 rpm
Bore/stroke	3.82 in / 2.66 in (97 mm / 67.5 mm)
Compression ratio	10.4 ± 0.5: 1
Average piston speed	73.82 ft/s (22.5 m/s) at 10000 rpm
Camshaft during intake stroke	242°, valve lifting = 0.374 in (9.50 mm)
Camshaft during exhaust stroke	242°, valve lifting = 0.374 in (9.50 mm)
Valve advance (with valve clearance 1 mm) opening during intake stroke closing during intake stroke opening during exhaust stroke closing during exhaust stroke	25° before TDC 37° after BDC 57° before TDC 5° after BDC
Intake valve clearance	0.005 - 0.007 in (0.12-0.17 mm)
Exhaust valve clearance	0.09 - 0.011 in (0.23-0.28 mm)
Engine idling rpm	1200 ± 100 rpm
Maximum rpm	9000 ± 100 rpm
Ignition	electronically controlled
Starting	electric
Spark advance	at start: 5° before TDC, additional advance automatic, depending on operating conditions.
Starter motor	12 V / 0.9 kW
Starter motor gear ratio	$i = 49/9 * 30/11 * 64/30 = 31.677$
Clutch	multidisc in oil bath with hydraulic control on the left side of the handlebar and PPC device - 9 lined discs; 0.14 in (3.5 mm) thick - 9 internal discs; 0.06 in (1.5 mm) thick

CONT'D ►

ENGINE	
Gearshift	mechanical, 6 gears with foot control on the left side of the engine
Lubrication system	dry sump with separate oil tank, 2 trochoidal pumps, cooling radiator
Oil pressure	min 72.52 PSI (500 kPa) (5 bar) *max. 80 °C (176 °F) and 6000 rpm
Air filter	dry filter cartridge
Cooling	liquid-cooled
Coolant pump gear ratio	$i_{wp} = 28/27 * 28/28 = 1.037$
Coolant pump delivery (with thermal expansion valve open)	23.8 gal/min (90 l/min) at 9000 rpm
Thermostat valve opening temperature	149 ± 5 °F (65 ± 2 °C)
Engine dry weight	~ 143 lb (~ 67 kg)

CAPACITY	
Fuel (including reserve)	6.60 gal (25 l)
Fuel reserve	1.32 ± 0.26 gal (4 ± 1 l)
Engine oil	oil change only: 262.4 cu in (4300 cm³) oil and filter change 274.6 cu in (4500 cm³)
Fork oil (for each leg)	33.75 ± 0.15 cu in (553 ± 2.5 cm³)
Coolant	0.66 gal (2.5 l) (50% water + 50% nitrite-free anti-corrosion antifreeze, ethylene glycol)
Seats	2
Max. vehicle load (rider + passenger + luggage)	401.24 lb (182 kg)

DRIVE					
GEAR RATIOS	Ratio	Primary 31/60 = 1: 1.935	Secondary	Final ratio 17/45 = 1: 2.647	Total ratio
	1 st		14/35 = 1: 2.50		12.804
	2 nd		16/28 = 1: 1.750		9.041
	3 rd		19/26 = 1: 1.368		7.006
	4 th		22/24 = 1: 1.091		5.582
	5 th		23/22 = 1: 1.957		4.896
6 th	27/23 = 1: 0.852	4.358			
sprocket teeth		17			
Drive chain		Endless type (with no master link) with sealed links, model 525, dimensions 5/8" x 5/16"			

FUEL SYSTEM	
Type	electronic injection
Choke	Ø 1.85 in (Ø 47 mm)

POWER SUPPLY	
Type	indirect injection (MULTIPOINT)
Fuel	Unleaded gasoline, super, minimum octane rating 92 (R + M / 2).

FRAME	
Type	two-beam frame with light alloy cast elements and extruded elements
Rake	28°
Trail	5.08 in (129 mm)

CONT'D ►

SUSPENSIONS	
Front	UPSIDE-DOWN telescopic fork, hydraulic damped, fork leg Ø 1.97 in (Ø 50 mm)
Stroke	6.89 in (175 mm)
Rear	light alloy rear swinging arm with differentiated-profile arms and hydropneumatic adjustable mono-shock absorber
Wheel stroke	4.72 in (120 mm)
BRAKES	
Front	double floating disc - Ø 11.81 in (Ø 300 mm), four pistons calipers - Ø 1.18 in (Ø 30 mm) and Ø 1.26 in (Ø 32 mm)
Rear	single disc - Ø 10.71 in (Ø 272 mm), double piston caliper - Ø 1.34 in (Ø 34 mm)
WHEEL RIMS	
Type	with spokes for tubeless tires
Front	2.50 x 19"
Rear	4.00 x 17"

TIRES					
Wheel	Brand	Type	Size	Pressure PSI (kPa) (Bar)	
				only rider	rider and passenger
Front (standard)	METZELER	TOURANCE	110/80R19"	220 (2.2)	250 (2.5)(36.3)
Rear (standard)	METZELER	TOURANCE	150/70R17"	250 (2.5)	290 (2.9)(42.1)
Front (alternatively)	PIRELLI	SCORPION S/T MT90	110/80R19"	220 (2.2)	250 (2.5)(36.3)
Rear (alternatively)	PIRELLI	SCORPION S/T MT90	150/70R17"	250 (2.5)	290 (2.9)(42.1)

SPARK PLUGS	
Standard	NGK R DCPR9E
Spark plug gap	0.024 - 0.028 in (0.6 - 0.7 mm)
Resistance	5KΩ
ELECTRICAL SYSTEM	
Battery	12 V - 12 Ah
Main fuses	30 A
Secondary fuses	15A
Alternator (with permanent magnet)	12 V - 470 W

CONT'D ►

BULBS	
Low beam/high beam (halogen)	12 V - 60 / 55 W H4 V
Front parking light	12 V - 3 W
Direction indicator light	12 V - 21 W
Rear parking / stop light	12 V - 5 / 21 W
License plate lamp	12 V - 5 W
WARNING LIGHTS	
Gear in neutral	LED
Direction indicators	LED
Fuel reserve	LED
High beam	LED
Side stand down	LED
Engine oil pressure	LED
Backlit LEDs	LED
Diagnostics	LED

1.12 LUBRICANT TABLE

Engine oil (recommended): EXTRA RAID 4, SAE 15W - 50. Alternatively to the recommended oil, you may use brand-name oils with performance ratings greater than or equal to specifics CCMC G-4,A.P.I. SG.

Fork oil (recommended): fork oil F.A. 5W or FORK 20W.

If you intend to achieve a behavior midway between those offered by F.A. 5W and F.A. 20W, you may mix the products together as indicated below:

SAE 10W = F.A. 5W 67% of volume, + F.A. 20W 33% of volume.

SAE 15W = F.A. 5W 33% of volume, + F.A. 20W 67% of volume.

Bearings and other lubrication points (recommended): AUTOGREASE MP.

As an alternative to the recommended product, use high-quality grease for rolling bearings, working temperature range -30°C...+140°C (-22°F...+248°F), dripping point 150°C...230°C (302°F...446°F), high protection against corrosion, good resistance to water and oxidation.

Protection of battery poles: Neutral grease or Vaseline.

Spray grease for chains (recommended): CHAIN SPRAY.

Brake fluid (recommended): F.F., DOT 5 (DOT 4-compatible).

⚠ DANGER

Use only fresh clutch fluid.

Clutch fluid (recommended): F. F. , DOT 5 (DOT 4-compatible).

⚠ DANGER

Use only nitrite-free antifreeze and anticorrosive, that ensures protection at -35 °C (-31 °F) at least.

Engine coolant (recommended): ECO-BLUE - 40°C (-40°F).

⚠ DANGER







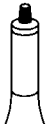
Use only fresh brake fluid.

1.13 CONSUMABLES

Use only the products listed below for any maintenance work. These materials have been tested for many years and are suitable for use in all application conditions indicated by the manufacturer.

NOTE Those consumables that are coded are available upon request, see 1.13.2 (USING CONSUMABLES).

1.13.1 PRODUCT PROPERTIES

Product	Use and Properties
<p>LOCTITE® 243 blue</p> 	<p>Thread locker for screws and nuts up to M36, and to seal connections for fluids, medium strength. It can be used on parts which have not been completely degreased The hardening time depends on the temperature and the material (maximum one hour): Resistance to temperatures in the range -55 to 150° C (-131° F to 302° F).</p>
<p>LOCTITE® 648 green</p> 	<p>High strength thread locker for screw threads. The hardening time depends on the temperature and the material (maximum twelve hours). Resistance to temperatures in the range -55 to 175° C (-131° F to 347° F). To remove nuts that have been fastened with Loctite 648, it may be necessary to heat the assembled parts to a temperature of 250° C (482° F)</p>
<p>LOCTITE® 574 orange</p> 	<p>Solvent-free joint cement, to be used instead of gaskets where components are held firmly together, and where a precise distance is required between the two components. Applied in its liquid state, it hardens after assembly on contact with the metal within a few hours. A seal is created whose surface structure adapts to the surfaces to be sealed. Resistance to temperatures in the range - 55 to 200 °C (from - - 131 to 392 °F); where applied, it seals the surfaces against corrosion.</p>
<p>LOCTITE® 8150</p> 	<p>Paste to be used on components subjected to high temperatures.</p>
<p>LOCTITE® Anti Seize 15378</p> 	<p>Lubricant and anticorrosive, resistant to high temperatures. Sprayed on both components, it ensures low sliding friction and it also prevents corrosion.</p>
<p>MOLYKOTE® G-n</p> 	<p>Lubricating grease, used on connections and bearings subject to heavy loads, and to lubricate threads and connections which are heavily torqued, in order to prevent corrosion, which would prevent subsequent disassembly. To be applied to both joining surfaces.</p>
<p>SILASTIC 732 RTV</p> 	<p>Acts as a sealant, used to prevent water from getting inside the flywheel cover.</p>

1.13.2 USING CONSUMABLES

Product	Code	Description of use
Engine oil (*)	8116050	<ul style="list-style-type: none"> - Assembling rivets on fork, dashboard/front fairing mount, saddle support and frame. - Assembling frame/engine and frame/fork adjusting bushings. - Assembling fairlead screws on frame. - Insertion steering head bearings. - Steering head bushing upper retainer. - On timing intermediate gear roller bearings. - On lower balancshaft thrust washer. - Clutch disengaging shaft. - On valve stems and valve lifter buckets. - On valve guide oil seals. - On camshaft housings. - On the timing chain tightener. - On double starter gear and idler gear pins. - On the sprag clutch gear/sprag clutch contact surface. - On the sprag clutch inner contact surface.
LOCTITE® 243 (**)	0897651	<ul style="list-style-type: none"> - Fastening of steering damper bushing. - Fastening of rear brake caliper lock pivot. - Fastening of pinion. - Fastening of rear brake lever pivot. - Fastening of cooling electrofan on support. - Fastening of fuel return line connection. - Fastening of fuel filler cap. - Throttle cable pullet fastening nut. - Throttle cable support bracket fastening screws. - Throttle valve pin fastening nut. - Throttle valve potentiometer fastening screws. - On coolant pump center fastening screw. - On cylinder joining bracket fastening screws. - On engine half-case bearing lock screws. - On cylinder fastening studs. - On crankshaft position sensor fastening screws. - On index lever and plate fastening screws. - On crankshaft fastening nut. - On timing gear fastening screws. - On upper balancshaft balancweight fastening nut. - On intermediate timing gear bearing support lower fastening screw.
LOCTITE® 648 (**)	0899788	<ul style="list-style-type: none"> - On coolant pump idler gear pin. - On engine oil pump cap. - On clutch gear metal slip fastening screws. - Assembly sprag clutch flange/alternator rotor. - On sprag clutch flange/alternator rotor fastening screws. - On clutch housing fastening nut. - On lower balancshaft balancweight fastening screw. - On the alternator rotor inner taper. - On the flywheel fastening screw.
LOCTITE® 574 orange (**)	0899784	<ul style="list-style-type: none"> - Fastening of coolant thermal switch. - Fastening of coolant thermistors. - On neutral gear switch contact screw. - On the outer surface of the engine oil pump motor. - On cylinder base where it contacts the engine case.
LOCTITE® Anti Seize 15378 (**)	0297434	<ul style="list-style-type: none"> - On the main shaft and countershaft. - On the main shaft and countershaft housings. - On crankshaft and lower balancshaft. - On the main shaft housing and spline.

Product	Code	Description of use
MOLYKOTE® G-n (**)	0297433	<ul style="list-style-type: none"> - On main bushing housings. - On main bushings. - On engine case bearing housings. - On coolant pump shaft. - On valve guide recesses in the head. - On valve guide edges. - On crankshaft and lower balancshaft bushing housings. - On crankshaft and lower balancshaft housings. - On connecting rod/piston pin bores. - On camshafts and cams. - On starter motor fastening housing.
SILASTIC 732 RTV (**)	0297386	<ul style="list-style-type: none"> - On cable bracket on flywheel cover. - On camshaft sensor cable.
Bimol Grease	481 8116053	<ul style="list-style-type: none"> - Assembly of front and rear wheel seals. - Assembly of swinging arm pivot bearings. - Assembly of clutch master cylinder control rod. - On rear wheel axle thread. - On steering head bearings. - Assembly of rear brake master cylinder control rod. - On rear brake lever pivot. - On intermediate timing gear thrust washer. - Lower balancshaft oil seal. - Starter motor gear.
LUBERING ST Grease	8116038	<ul style="list-style-type: none"> - Assembly of cold-start control.
Temporary lubricant AP-LUBE	-	<ul style="list-style-type: none"> - Assembly of handlebar balanceweights grommet. - Assembly of throttle cable adjuster grommets. - Assembly of grommet on gearshift pedal. - Insertion of radiator lower pins on supporting grommets. - Assembly of breather tube on radiator and three-way manifold. - Assembly of coolant couplings on radiators. - Assembly of water and fuel drainage hoses on the fuel pump flange. - Assembly of throttle body torsion springs.
DID CHAIN LUBE Grease		<ul style="list-style-type: none"> - Lubrication of drive chain.
"Biosolvente" Frame detergent	8116031	<ul style="list-style-type: none"> - Washing of engine oil tank.
Cyanoacrylic glue "ACRILON 28"	8116945	<ul style="list-style-type: none"> - Assembly of air cleaner filter case seal.
MOTUL Degreaser MOTOWASH	-	<ul style="list-style-type: none"> - Cleaning of frame and swinging arm.
Anti-seize paste ANTI-SEIZE MOTAGEPASTE AS 1800	8116043	<ul style="list-style-type: none"> - Assembling of caps for checking CO on exhaust pipes.

Product	Code	Description of use
Alcohol		<ul style="list-style-type: none">- Cleaning of left handlebar prior to assembly or grip.- Inserting of radiator breather tubes on "T" union.- Assembly of HV coil support grommet.- Assembly of side fairing grommets.- Cleaning of lower part of engine.- Assembly of start relay grommet.- Assembly of flexible couplings on rear wheel sprocket.- Assembly of grommets on engine oil radiator.- Assembly of coupling on coolant filler.- Cleaning of engine oil tank prior to application of transfers.- Assembly of dashboard/front fairing mount grommets.- Assembly of grommet on rear brake lever.- Assembly of lines on fuel filter (inside tank).- Assembly of coolant radiator union coupling.- Assembly of fuel lines on tank.- Cleaning of fuel tank prior to application of transfers.

(*) = see 1.12 (LUBRICANT TABLE).

(**) = see 1.13.1 (PRODUCT PROPERTIES).

1.14 SPECIAL TOOLS

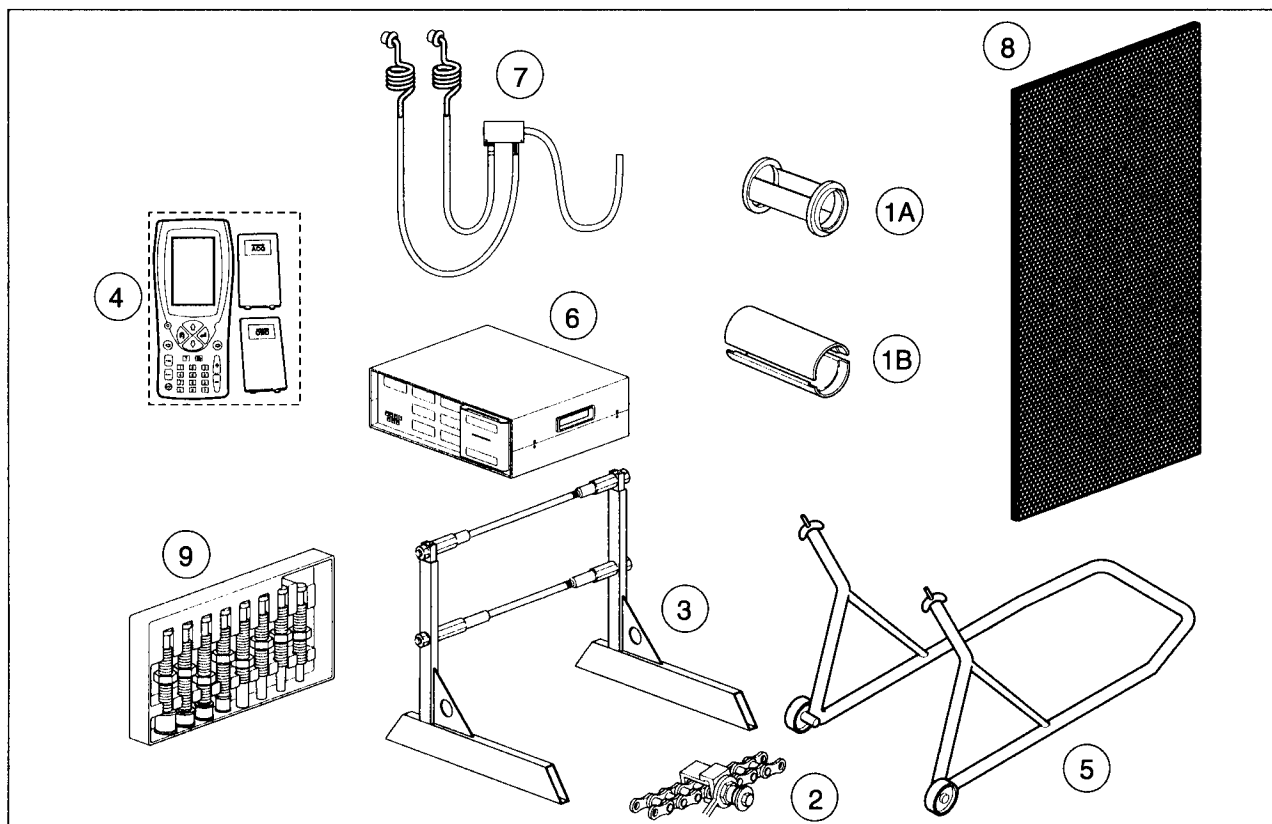
The appropriate special tools must be used in order to properly disassemble, reassemble, and adjust parts. The use of special tools avoids to potential risk of damage caused by inappropriate tools and/or improvised methods. Below is a list of the special tools designed especially for this specific vehicle. When ordering generic special tools, refer to the special tools manual.

⚠ WARNING

Before using special tools, consult any documents attached.

⚠ DANGER

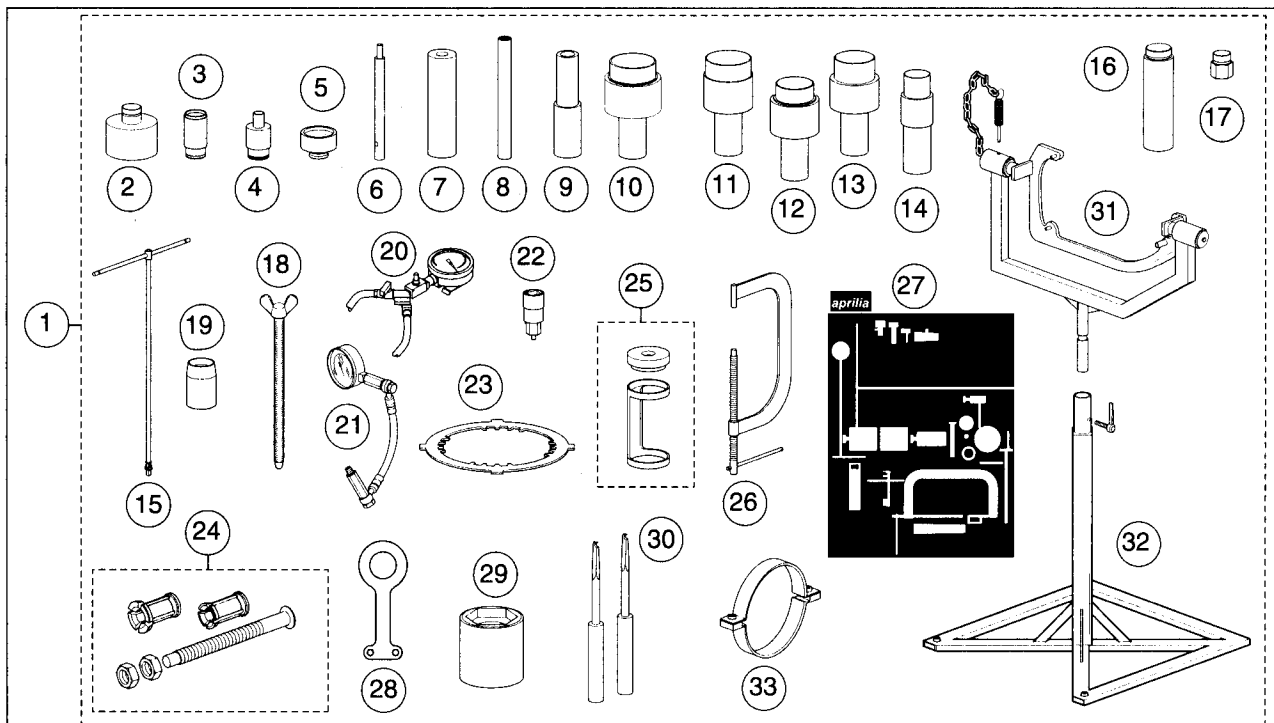
Do not attempt to use makeshift tools to work on this vehicle. To do so will not only ensure that you damage the vehicle, sometimes irreparably, but you will also hurt yourself. Failure to use special tools will certainly lead to injury to the mechanic.



1.14.1 MISCELLANEOUS TOOLS

Pos.	Tool name and function	Code
1A	Tool for assembling Ø 50 mm O-ring	8140580
1B	Halves of the controls or assembling oil seals fork Ø 50 mm	8140146
2	Chain breaking/riveting tool	8140192
3	Center support stand	8140176
4	Axone 2000	8140595
5	Front support stand	8140195
6	Exhaust gas analyzer	8140196
7	Tubing kit for exhaust gas analyzer	8140202
8	Tool holder panel	8140199
9	Kit to extract bearings from Ø 0.39 in to Ø 1.18 in (Ø10 mm to Ø 30 mm)	8140180


1.14.2 ENGINE TOOLS

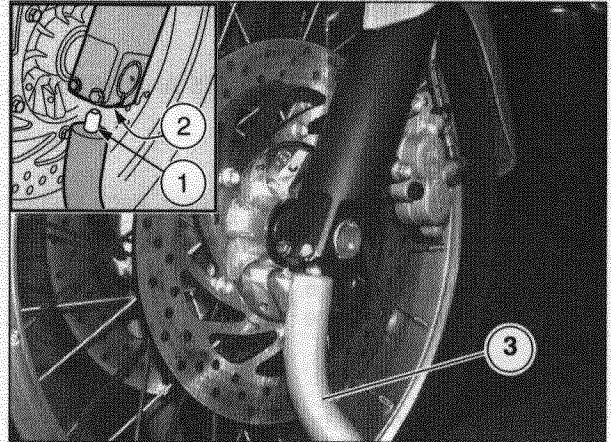


Pos.	Tool name and function	Code
1	Complete engine tool kit	8140175
2	Countershaft oil seal assembly drift	0277680
3	Upper balancershaft oil seal assembly drift	0277660
4	Coolant pump shaft housing oil seal assembly drift	0277670
5	Coolant pump shaft housing sliding ring assembly drift	0877257
6	Valve guide disassembly drift	0277510
7	Valve guide oil seal assembly drift	0277695
8	Valve guide assembly drift	0277210
9	Main shaft oil seal-clutch shaft oil seal assembly drift	8140155
10	Crankshaft bushing inserter drift	0277729
11	Crankshaft sleeve puller drift	0277720
12-14	Crankshaft bushing inserter drift	0277725
13	Crankshaft-clutch cover bushing inserter drift	0277727
15	Cap socket wrench	8140177
16	Flywheel cover removal tool	0277252
17	Flywheel removal hexagonal bolt	0277780
18	Threaded bolt to lock the crankshaft at TDC	0240880
19	Countershaft guide bushing	0277308
20	Vacuum gauge	8140256
21	Fuel-oil pressure gauge	8140181
22	Alternator rotor bolt removal bushing	8140182
23	Clutch locking tool	0277881
24	Clutch cover bushing extractor	8140156 + 8140157 + 0276377
25	Valve spring-pusher tool	0276479
26	Valve disassembly and reassembly clamp	8140179
27	Adhesive for tool holder panel	8157143
28	Engine lifting eye hook	8140183
29	Primary transmission nut disassembly bushing	8140184
30	Clutch disc extraction hook levers	8140185
31	Engine mount	8140188
32	Engine support stand	8140187
33	Piston ring compression tool	8140186

1.15 PLACING THE VEHICLE ON THE SUPPORT STANDS

1.15.1 PLACING THE VEHICLE ON THE FRONT SUPPORT STAND 

- ◆ Place the vehicle on the center stand .
- ◆ At the same time insert the two ends (1) of the side stand (3) into the two holes (2) located at the lower ends of the front fork.
- ◆ Rest one foot at the front of the stand (3).
- ◆ Push the stand (3) all the way down.

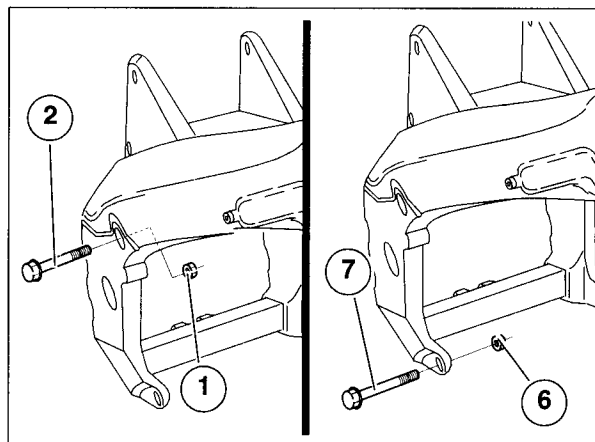



1.15.2 PLACING THE VEHICLE ON THE CENTER SUPPORT STAND OPT

Carefully read 1.3.9 (PRECAUTIONS AND GENERAL INFORMATION).

code 8140176 (complete stand).

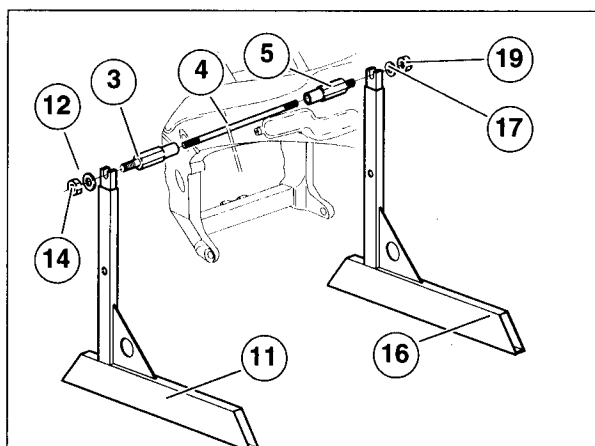
- ◆ Place the vehicle on the appropriate front support stand OPT, see 1.15.1 (PLACING THE VEHICLE ON THE FRONT SUPPORT STAND).
- ◆ ★ Hold the nut (1) in place.
- ◆ ★ Loosen and remove the upper right rear engine bolt (2).




 Tightening torque nut (1) / bolt (2): 36 ftlb (50 Nm).

NOTE the bolt (2) on the left side is longer.

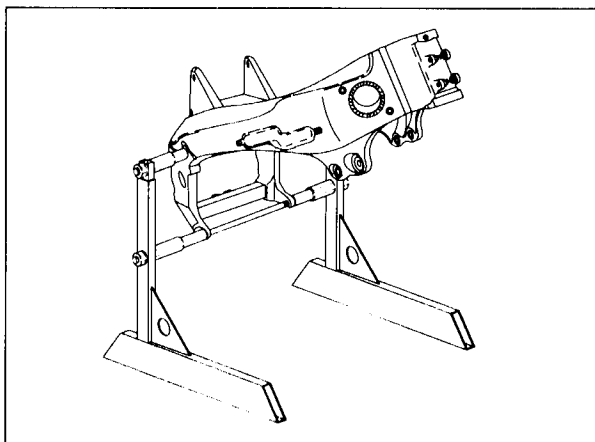
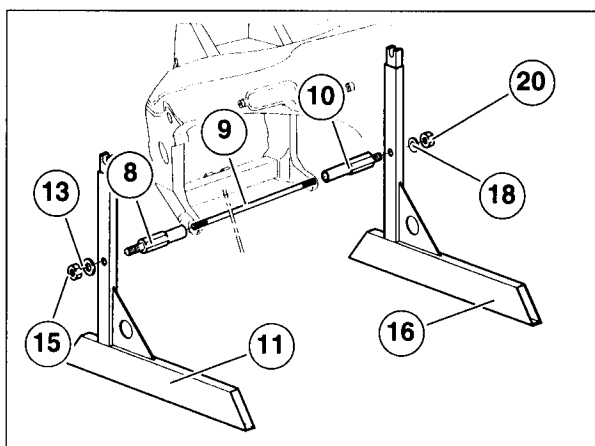
- ◆ ★ Retrieve the nut (1).
- ◆ Insert the upper right support pin (3) in the upper hole on the right-hand side.
- ◆ Insert the threaded shaft (4) in the upper hole on the left-hand side, and bolt it all the way onto the pin (3).
- ◆ Bolt the upper left support pin (5) all the way onto the threaded shaft (4) and tighten.
- ◆ ★ Hold the nut (6) in place.
- ◆ ★ Loosen and remove the upper right rear engine bolt (7).



 Tightening torque nut (6) / bolt (7): 36 ftlb (50 Nm).

NOTE The bolt (7), on the right side, is longer.

- ◆ Insert the lower right support pin (8) in the lower hole on the right-hand side.
- ◆ Insert the threaded shaft (9) in the lower hole on the left-hand side, and bolt it all the way onto the pin (8).
- ◆ Bolt the lower left support pin (10) all the way onto the threaded shaft (9) and tighten.
- ◆ Place the support bracket (11), with its longer side facing forward, on the two support pins (3-8).
- ◆ Insert the two washers (12-13) and two nuts (14-15), screwing them on by hand.
- ◆ Tighten the two nuts (14-15).
- ◆ Place the support bracket (16), with its longer side facing forward, on the two support pins (5-10).
- ◆ Insert the two washers (17-18) and two nuts (19-20), screwing them on by hand.
- ◆ Tighten the two nuts (19-20).



1.16 INSTRUCTIONS FOR APPLYING THE TRANSFERS

When removing parts from the frame:

WARNING

Handle all plastic and painted components with care to avoid scraping or scratching them.

Work very carefully.

Do not damage the tabs and/or slots into which they are fitted.

When applying the transfers, carefully follow the instructions given below.

We recommend using the following tools:

- relatively stiff spatula (1);

NOTE Generally speaking, soft squeegee-type spatulas do not remove enough water from under the transfers.

- sponge or spray bottle (2) with water.

NOTE Add a bit of detergent (1-3%) to the water, and shake to create bubbles.

Proceed as follows to apply a transfer:

- ◆ Place the transfer (3) upside-down on a work surface.
- ◆ Keeping the transfer spread flat on the work surface, remove the backing paper (4) completely.

NOTE We recommend using a spray bottle (2).

If using a sponge, sponge the surface without pressing, to keep from ruining the glue.

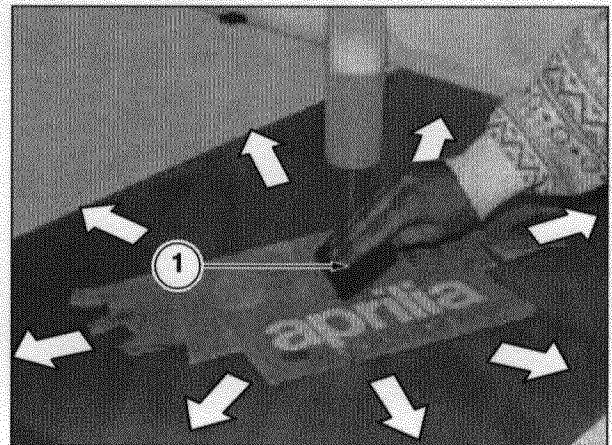
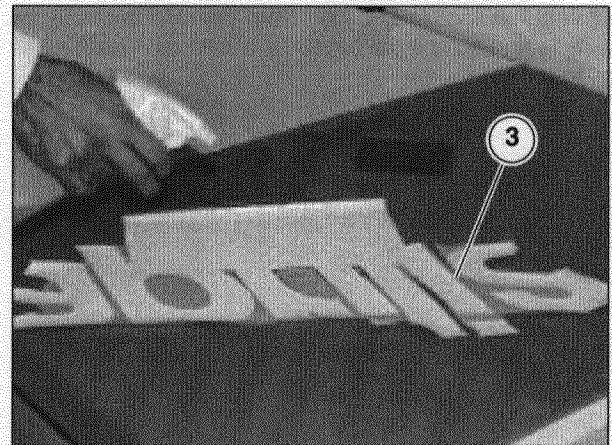
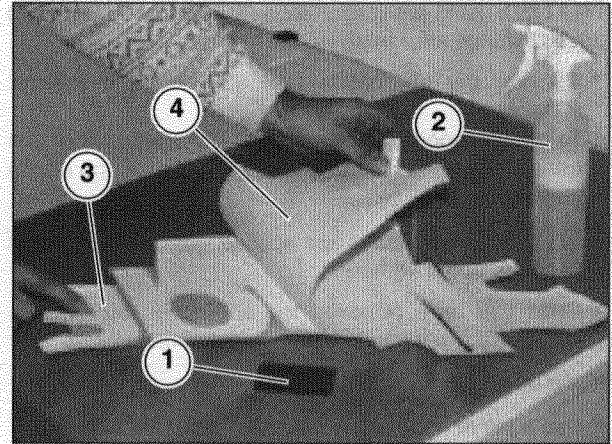
- ◆ Wet the surface of the adhesive with soapy water.
- ◆ Apply the transfer (3) to the surface to be decorated and move it to the desired position.

NOTE Always move the spatula in even strokes, from the center of the transfer out.

- ◆ Using the spatula (1), press down fairly hard and move the spatula across the surface of the transfer until all excess soap and water has been removed from underneath.

NOTE Do not lift the corners and/or sides of the transfer.

- ◆ Use an absorbent cloth and, working from the center out, dry the transfer.
- ◆ Move the spatula over the transfer again with firm, even strokes, pressing down as hard as possible. Move the spatula in strokes from the center out, being especially careful at the corners and sides, to ensure that the entire surface adheres evenly.



NOTE If using application tape (5)¹, it must be removed 20-30 minutes after applying the transfer.

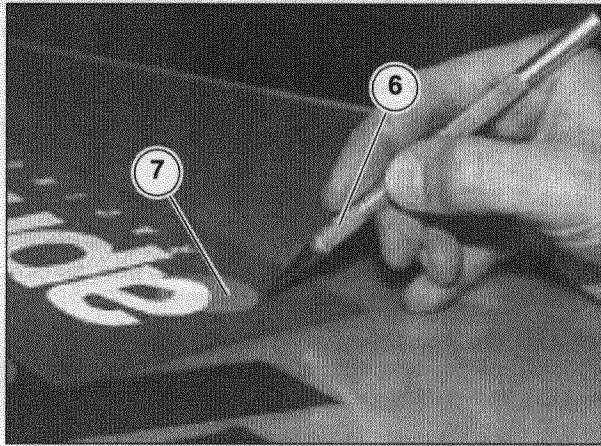
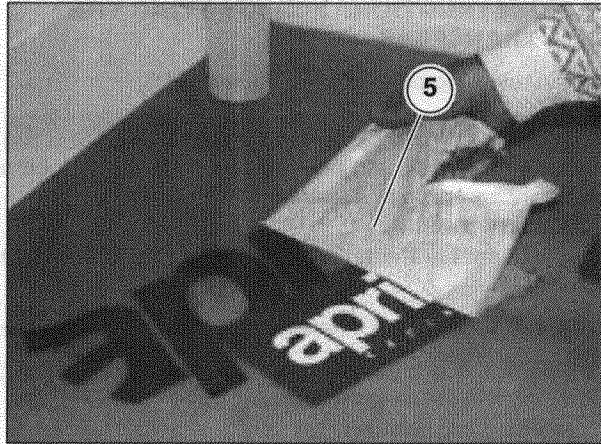
- ◆ Remove the application tape (5) from the transfer surface.
- ◆ To ensure good adhesion, move the spatula over the transfer again, concentrating in particular on the edges and corners.

NOTE When transfers are applied wet, the glue is not fully set for about 48 hours.

- ◆ Once you have removed the application tape, make sure there are no air bubbles on the surface.

If you do find surface air bubbles:

- ◆ Use a pin or hobby knife (6) to puncture the edge (7) of the air bubble.
- ◆ With the spatula (1), start from the side opposite the hole and scrape the bubble to allow any remaining air to escape.



1 Application tape is used to facilitate the application of trademarks and letters, arranging them as desired on the surface to be decorated, and to add extra firmness to the adhesive backing during application.

1.17 FASTENERS

Carefully read 1.3.11 (FASTENERS TIGHTENING TORQUES) joints with click clamps and with screw-type clamps

WARNING

Remove **ONLY** the clamps indicated in the maintenance procedures.

The following text does not authorize the arbitrary removal of the clamps present on the vehicle.


DANGER

Before removing a clamp, make sure that the removal does not cause any fluid leakage; if so, have appropriate plugs to prevent such leakage on hand, and protect the other parts of the motorcycle which might come in contact with spilled fluid.

CLICK CLAMPS

Plain pliers are acceptable for removal, but a special installation tool is required.

These clamps are destroyed upon removal, so new ones must be used upon reinstallation.

NOTE Have the appropriate special tool  available:
- **aprilia** part #0277295 (click clamp installation pliers).

WARNING

Upon installation, replace the click clamp that has been removed with a new click clamp having the same dimensions, see 0.4.2 (SPARE PARTS CATALOGUES).

Do not attempt to reinstall the removed click clamp, since it is unusable.

Do not replace the removed click clamp with a screw-type clamp or with other types of clamps.

WARNING

Proceed with care, in order not to damage the joint components.

◆ Using pliers on the head of the click clamp, squeeze it until it releases.

SCREW-TYPE CLAMPS

A screwdriver is used to remove and install screw type clamps. These clamps are reusable.

WARNING

Check the conditions of the screw-type clamp and if necessary replace it with a new screw-type clamp of the same dimensions, see 0.4.2 (SPARE PARTS CATALOGUES).

1.17.1 GENERAL VALUES OF TIGHTENING TORQUES

The following table shows tightening torques for screws and bolts with metric ISO threads, as is used in this vehicle. These are general values to be used if no specific value is given in this manual or other **aprilia** service literature.

Screw or bolt thread	Wrench	Tightening torque	
		ftlb	Nm
M 6	10	4.34	6
M 8	12	10.84	15
M 10	14	21.70	30
M 12	17	39.79	55
M 14	19	61.49	85
M 16	22	94.03	130

For specific fasteners, see 2.41 (FASTENERS). If not otherwise indicated, the tightening torques shown should be used for clean and dry threads, at room temperature.

NOTE To avoid damage to the threads, tighten screws and bolts as follows:

- ◆ Run up the fasteners finger tight.
- ◆ Applying half the prescribed tightening torque, tighten the fasteners that are diametrically opposite each other: (A) and (B); (C) and (D).
- ◆ Repeat, applying the prescribed tightening torque.

NOTE In this way the pressure exerted by the fasteners will be uniformly distributed across the joint surface.

Steel/aluminum fastening screw with similar coefficient of elasticity:

Screw	ftlb	Nm
M4	2.2	3
M5	4.4	6
M6	8.7	12
M8	18	25
M10	36	50
M12	58	80

