

**aprilia**

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**RS 125**

www.serviceaprilia.com

**workshop** manual



8104976

INTRODUCTION

### SUMMARY

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## 0.1. INTRODUCTION

### 0.1.1. FOREWORD

This manual provides the information required for normal servicing.

This publication is intended for use by **aprilia** Dealers and their qualified mechanics; many concepts have been omitted on purpose as their inclusion would be superfluous. Since complete mechanical explanations have not been included in this manual, the reader must be familiar with basic notions of mechanics, as well as with basic repair procedures. Without such familiarity, repairs and checks could be ineffective and even hazardous. Since the repair and vehicle check instructions are not exhaustive, special care must be taken to avoid damage and injury. **Piaggio & C. S.p.A.** undertakes to constantly improve the design of its products and the relevant literature to ensure maximum customer satisfaction. The main technical modifications and changes in repair procedures are communicated to all **aprilia** dealers and agencies worldwide. Such modifications will be entered in subsequent editions of the manual. Should you need assistance or clarifications about the inspection and repair procedures, please contact the **aprilia** SERVICE DEPT., they will be glad to give you any information on the matter, or supply you with any detail on updates and technical changes applied to the vehicle.

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0.1.2. REFERENCE MANUALS

SPARE PARTS CATALOGUE

aprilia part# (description)					
3406	I	F	D	E	UK

MANUALI ATTREZZI SPECIALI

aprilia part# (description)					
8202278	I	F	D	E	UK

CHASSIS WORKSHOP MANUAL

aprilia part# (description)					
8104972	I				
8104973	E				
8104974	F				
8104975	D				
8104976	UK				
8CM0101	I	F	D	E	UK

ENGINE TECHNICAL MANUAL

aprilia part# (description)					
8140880	I				
8140883	E				
8140881	F				
8140882	D				
8140884	UK				
8CM0027	I	F	D	E	UK

OWNER'S MANUALS

aprilia part# (description)					
Model Year 1993					
8102260	I				
Model Year 1994					
8102260	I				
8102319	D	F	UK		
Model Year 1995					
8102476	I				
8102530	D	UK	F		
8102543	E				
Model Year 1996					
8102685	I				
8102682	D	UK	F		
8102530	D	UK	F		
8102683	P	E	NL		
8102543	E				
Model Year 1997					
8102685	I				
8102682	D	UK	F		
8102683	P	E	NL		
8102530	D	UK	F		
8102543	E				
8102752	DK	SF	GR		
8102753	DK	NL	P		
Model Year 1998					
8102685	I				
8102682	D	UK	F		
8102683	P	E	NL		
8102849	DK				
8102934	D	UK	F	AUS	
Model Year 1999					
8102821	I	F	D		
8102937	P	E	UK	AUS	
8102938	DK	NL	SF		
8102939	GR	J	UK		
Model Year 2001					
8202248	USA				
8102821	I	F	D		
8102937	P	E	UK	AUS	
8102938	DK	NL	SF		
8102939	GR	J	UK		
Model Year 2002					
8104465	I	F	D		
8104466	P	E	UK		
8104467	DK	NL	SF		
8104468	GR	J	UK		
Model Year 2006					
8104917	I				
8104934	F	D	E	UK	
8104935	NL	DK	SF	GR	J

**0.1.3. ABBREVIATIONS/SYMBOLS/CONVENTIONS**

<b>#</b>	= number
<b>&lt;</b>	= less than
<b>&gt;</b>	= greater than
<b>≤</b>	= less than or equal to
<b>≥</b>	= more than or equal to
<b>~</b>	= approximately
<b>∞</b>	= infinity
<b>°C</b>	= degrees Celsius (centigrade)
<b>°F</b>	= degrees Fahrenheit
<b>±</b>	= plus or minus
<b>a.c</b>	= alternating current
<b>A</b>	= Ampere
<b>Ah</b>	= Ampere per hour
<b>API</b>	= American Petroleum Institute
<b>AT</b>	= high voltage
<b>AV/DC</b>	= Anti-Vibration Double Countershaft
<b>bar</b>	= pressure measurement unit (1 bar = 100 kPa)
<b>d.c.</b>	= direct current
<b>cc</b>	= cubic centimetres
<b>CO</b>	= carbon monoxide
<b>CPU</b>	= Central Processing Unit
<b>DIN</b>	= German industrial standards (Deutsche Industrie Norm)
<b>DOHC</b>	= Double Overhead Camshaft
<b>ECU</b>	= Electronic Control Unit
<b>rpm</b>	= revolutions per minute
<b>HC</b>	= unburnt hydrocarbons
<b>ISC</b>	= Idle Speed Control
<b>ISO</b>	= International Standardisation Organisation
<b>kg</b>	= kilograms
<b>kgm</b>	= kilograms per metre (1 kgm = 10 Nm)
<b>km</b>	= kilometres
<b>km/h</b>	= kilometres per hour
<b>kΩ</b>	= kiloOhm
<b>kPa</b>	= kiloPascal (1 kPa = 0.01 bar)
<b>KS</b>	= clutch side (from the German "Kupplungsseite")
<b>kW</b>	= kilowatt
<b>ℓ</b>	= litres
<b>LAP</b>	= racetrack lap
<b>LED</b>	= Light Emitting Diode
<b>LEFT</b>	
<b>SIDE</b>	= left side
<b>m/s</b>	= metres per second
<b>max</b>	= maximum
<b>mbar</b>	= millibar (1 mbar = 0.1 kPa)
<b>mi</b>	= miles
<b>MIN</b>	= minimum
<b>MPH</b>	= miles per hour
<b>MS</b>	= flywheel side (from the German "Magnetoseite")
<b>MΩ</b>	= MegaOhm
<b>N.A.</b>	= Not Available
<b>N.O.M.M.</b>	= Motor Octane Number
<b>N.O.R.M.</b>	= Research Octane Number
<b>Nm</b>	= Newton metre (1 Nm = 0.1 kgm)
<b>Ω</b>	= ohm
<b>PICK-UP</b>	= pick-up
<b>BDC</b>	= Bottom Dead Centre
<b>TDC</b>	= Top Dead Centre
<b>PPC</b>	= Pneumatic Power Clutch

**RIGHT****SIDE** = right side**SAE** = Society of Automotive Engineers**TEST** = diagnostic check**T.B.E.I.** = crown-head Allen screw**T.C.E.I.** = cheese-head Allen screw**T.E.** = hexagonal head**T.P.** = flat head screw**TSI** = Twin Spark Ignition**UPSIDE-****DOWN** = inverted fork**V** = volt**W** = watt**Ø** = diameter

GENERAL INFORMATION

1



**SUMMARY**







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## 1.1. GENERAL INFORMATION









### 1.1.1. CONVENTIONS USED IN THE MANUAL

- This manual is divided in sections and subsections, each covering a set of the most significant components. Refer to the index of sections when consulting the manual.
- Unless expressly specified otherwise, assemblies are reassembled by reversing the dismantling procedure.
- The terms "right" and "left" are referred to the rider seated on the vehicle in the normal riding position.
- Motorcycle operation and basic maintenance are covered in the "OWNER'S MANUAL".

In this manual any variants are identified with these symbols:

-  optional
-  catalytic version
-  Full Power version
- all versions
-  250 cc version
-  200 cc version
-  125 cc version
- MP national certification
- SF European certification (EURO 3 limits)

#### VERSION:

- |  |   |  |
|--|---|--|
|  Italy            |  Greece        |  Malaysia                   |
|  United Kingdom |  Holland     |  Chile                    |
|  Austria        |  Switzerland |  Croatia                  |
|  Portugal       |  Denmark     |  Australia                |
|  Finland        |  Japan       |  United States of America |
|  Belgium        |  Singapore   |  Brazil                   |
|  Germany        |  Slovenia    |  South Africa             |
|  France         |  Israel      |  New Zealand              |
|  Spain          |  South Korea |  Canada                   |

**1.1.2. SAFETY WARNINGS**

The following precautionary warnings are used throughout this manual in order to convey the following messages:



**Safety warning.** This symbol appears, whether in the manual or on the vehicle itself, to indicate a personal injury hazard. Non-compliance with the indications given in the messages preceded by this symbol may result in grave risks for your and other people's safety and for the vehicle!

**DANGER**

Indicates a potential hazard which may result in serious injury or even death.

**WARNING**

Indicates a potential hazard which may result in minor personal injury or damage to the vehicle.

**NOTE** The word "NOTE" in this manual precedes important information or instructions.

## 1.2. GENERAL RULES

### 1.2.1. BASIC SAFETY RULES

#### CARBON MONOXIDE

Should it be necessary to perform some operations with the vehicle running, make sure to work outdoors or in a well-aerated room.

Avoid starting the engine indoors.

In case you are working indoors, use a gas exhaust system.



#### DANGER

Exhaust gases contain carbon monoxide, which is extremely toxic if inhaled and may cause loss of consciousness or even lead to death.

#### FUEL



#### DANGER

The fuel used in internal combustion engines is highly flammable and can become explosive under particular conditions.

Refuelling and engine service should take place in a well-ventilated area with the engine stopped.

Do not smoke when refuelling or in the proximity of sources of fuel vapours, avoid open flames, sparks and any element that could ignite fuel or provoke explosions.

**DO NOT DISPOSE OF FUEL IN THE ENVIRONMENT.**

**KEEP AWAY FROM CHILDREN.**

#### HIGH-TEMPERATURE COMPONENTS

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.

#### USED GEARBOX AND FORK FLUIDS



#### DANGER

Wear latex gloves when servicing.

Gear fluid may cause serious damage to the skin if handled daily and for long periods.

Wash your hands carefully after handling gear fluid.

Take it to the filling station where you usually buy it or to an oil salvage centre.

Wear latex gloves when servicing.

**DO NOT DISPOSE OF FLUID IN THE ENVIRONMENT**

**KEEP AWAY FROM CHILDREN.**

#### BRAKE FLUID



#### WARNING

When handling the brake fluid, take care not to spill it on the plastic, rubber or painted parts, since it can damage them. When carrying out the maintenance operations on the braking system, use a clean cloth to cover these parts.

Always wear safety goggles when working on the braking system.

The brake fluid is highly irritant. Avoid contact with your eyes.

If the brake fluid gets in contact with your eyes, carefully wash them with fresh water and immediately seek medical advice.

**KEEP AWAY FROM CHILDREN.**

#### COOLANT

Coolant contains ethylene glycol that is flammable, under certain conditions. When ignited, ethylene glycol produces invisible flames that might cause burns.

**DANGER**

Take care not to spill coolant onto hot engine parts and exhaust system. It may ignite and produce invisible flames.

Wear latex gloves when servicing.

Although toxic, it has a sweet taste that might attract animals. Never leave coolant in open container or in a position easily reachable by animals.

**KEEP AWAY FROM CHILDREN.**

Do not remove radiator cap when engine is still hot. Coolant is under pressure and might cause burns.

**HYDROGEN GAS AND BATTERY ELECTROLYTE****DANGER**

The battery electrolyte is a toxic, caustic substance containing sulphuric acid and thus able to cause severe burns in case of contact with the skin.

Always wear tight gloves and protective clothes when handling this fluid.

In case of contact with skin, rinse with plenty of fresh water.

Always use a protection for your eyes since even a very small amount of the battery fluid can cause blindness. In the event of contact with your eyes, carefully wash them with water for fifteen minutes and then consult immediately an eye specialist.

Should you accidentally drink some fluid, drink abundant water or milk, then drink magnesia milk or vegetable oil and immediately seek medical advice.

The battery gives off explosive gases and must be kept away from flames and sources of ignition or heat; do not smoke near the battery.

**KEEP AWAY FROM CHILDREN.**

Battery fluid is corrosive.

Do not spill it, especially on plastic parts.

Make sure that the electrolyte acid is suitable for the type of battery used.

**GENERAL PRECAUTIONS AND INFORMATION**

Follow these instructions closely when repairing, disassembling or reassembling the motorcycle or its components.

**DANGER**

Using bare flames is strictly forbidden when working on the motorcycle. Before servicing or inspecting the motorcycle: stop the engine and remove the key from the ignition switch; allow for the engine and exhaust system to cool down; where possible, lift the motorcycle using adequate equipment placed on firm and level ground. Be careful of any parts of the engine or exhaust system which may still be hot to the touch to avoid scalds or burns.

Do not put any vehicle parts into your mouth: vehicle components are not edible and some of them are harmful or even toxic.

Unless expressly specified otherwise, assemblies are reassembled by reversing the dismantling procedure. Where a procedure is cross-referred to relevant sections in the manual, proceed sensibly to avoid disturbing any parts unless strictly necessary. Do not polish matt-painted surfaces with polishing paste.

Never use fuel instead of solvent to clean the motorcycle.

Do not clean any rubber or plastic parts or the seat with alcohol, petrol or solvents. Clean with water and mild detergent.

Always disconnect the battery negative (-) lead before soldering any electrical components.

When two or more persons service the same motorcycle together, special care must be taken to avoid personal injury.

**BEFORE DISASSEMBLING ANY COMPONENTS**

- Clean off all dirt, mud, and dust and clear any foreign objects from the vehicle before disassembling any components.
- Use the model-specific special tools where specified.

**DISASSEMBLING THE COMPONENTS**

- Never use pliers or similar tools to slacken and/or tighten nuts and bolts. Always use the suitable spanner.
- Mark all connections (hoses, wiring, etc.) with their positions before disconnecting them. Identify each connection using a distinctive symbol or convention.
- Mark each part clearly to avoid confusion when refitting.
- Thoroughly clean and wash any components you have removed using a detergent with low flash point.
- Mated parts should always be refitted together. These parts will have seated themselves against one another in service as a result of normal wear and tear and should never be mixed up with other similar parts on refitting.
- Certain components are matched-pair parts and should always be replaced as a set.
- Keep away from heat sources.

**REASSEMBLING THE COMPONENTS****DANGER**

**Never reuse a circlip or snap ring. These parts must always be renewed once they have been disturbed.**

**When fitting a new circlip or snap ring, take care to move the open ends apart just enough to allow fitment to the shaft.**

**Make it a rule to check that a newly-fitted circlip or snap ring has located fully into its groove.**

**Never clean a bearing with compressed air.**

**CAUTION** *All bearings must rotate freely with no hard spots or noise. Replace any bearings that do not meet these requirements.*

- Use ORIGINAL **aprilia** SPARE PARTS only.
- Use the specified lubricants and consumables.
- Where possible, lubricate a part before assembly.
- When tightening nuts and bolts, start with the largest or innermost nut/bolt and observe a cross pattern. Tighten evenly, in subsequent steps until achieving the specified torque.
- Replace any self-locking nuts, gaskets, seals, circlips or snap rings, O-rings, split pins, bolts and screws which have a damaged thread.
- Lubricate the bearings abundantly before assembly.
- Make it a rule to check that all components you have fitted are correctly in place.
- After repairing the motorcycle and after each service inspection, perform the preliminary checks, and then operate the motorcycle in a private estate area or in a safe area away from traffic.
- Clean all mating surfaces, oil seal edges and gaskets before assembly. Apply a thin layer of lithium grease along the edges of oil seals. Fit oil seals and bearings with the marking or serial number facing outwards (in view).

**ELECTRICAL CONNECTORS**

To disconnect the electrical connectors, follow the procedures below. Failure to comply with these procedures may lead to irreparable damage to the connector and the wiring as well.

If present, press the special safety hooks.

**WARNING**

**Do not pull cables to disconnect the two connectors.**

- Grasp the two connectors and disconnect them by pulling them in the two opposite directions.
- In case of dirt, rust, moisture, etc., thoroughly clean the inside of the connectors with compressed air.
- Make sure that the cables are correctly fitted inside the connector terminals.

**CAUTION** *The two connectors have just one correct positioning. Make sure to position them in the right direction.*

- Then fit the two connectors. Make sure they are correctly coupled (a click will be heard if hooks are present).

**TIGHTENING TORQUE SETTINGS****DANGER**

**Always remember that the tightening torque settings of all wheel, brake, wheel shaft and other suspension parts play a fundamental role to ensure vehicle safety. Make sure that these values are always within the specified limits.**

**Check fastening parts tightening torque settings at regular intervals. Upon reassembly, always use a torque wrench.**

**Failure to comply with these recommendations could lead to the loosening and detachment of one of these parts with a consequent locking of the wheel or other serious troubles affecting the vehicle manoeuvrability, and thus the risk of falls and serious injuries or death.**

### 1.3. DANGEROUS ELEMENTS

#### 1.3.1. WARNINGS

##### FUEL

**DANGER**

The fuel used to operate engines is highly flammable and becomes explosive under particular conditions.

Refuelling and engine service should take place in a well-ventilated area with the engine stopped.

Do not smoke when refuelling or in the proximity of sources of fuel vapours, avoid open flames, sparks and any element that could ignite fuel or provoke explosions.

Take care not to spill fuel out of the filler, or it may ignite when in contact with hot engine parts.

In the event of accidental fuel spillage, make sure the affected area is fully dry before starting the engine. Fuel expands from heat and when left under direct sunlight.

Never fill the fuel tank up to the brim. Tighten the filler cap securely after each refuelling.

Avoid contact with skin. Do not inhale vapours. Do not swallow fuel. Do not transfer fuel between different containers using a hose.

**DO NOT DISPOSE OF FUEL IN THE ENVIRONMENT.**

**KEEP AWAY FROM CHILDREN.**

Use only premium grade unleaded petrol, min. O.N. 95 (RON) and 85 (MON).

##### LUBRICANTS

**DANGER**

A good lubrication ensures the vehicle safety.

Failure to keep the lubricants at the recommended level or the use of a non-suitable new and clean type of lubricant can lead to the engine or gearbox seizure, thus causing serious accidents, personal injury or even death.

Gear fluid may cause serious damage to the skin if handled daily and for long periods.

Wash your hands carefully after use.

Do not dispose of oil in the environment.

Take it to the filling station where you usually buy it or to the supplier.

**WARNING**

When filling the vehicle with this oil, take care not to spill it out. Immediately clean spilt oil, or it might damage the vehicle paintwork.

In case of contact with oil, the tyres surface will become very slippery, thus becoming a serious danger for your safety.

In case of leaks, do not use the vehicle. Check and trace the cause of leaks and proceed to repair.

##### ENGINE OIL

**DANGER**

Engine oil may cause serious damage to the skin if handled daily and for long periods.

Wash your hands carefully after use.

Do not dispose of oil in the environment.

Dispose of engine oil through the nearest waste oil reclamation firm or through the supplier.

Wear latex gloves when servicing.

##### FRONT FORK FLUID

**DANGER**

Front suspension response can be modified to a certain extent by changing damping settings and/or selecting a particular grade of oil. Standard oil viscosity: SAE 20 W. Different oil grades can be selected to obtain a particular suspension response (choose SAE 5W for a softer suspension, 20W for a stiffer suspension).

The two grades can also be mixed in varying solutions to obtain the desired response.

**BRAKE FLUID**

**NOTE** This vehicle is fitted with front and rear disc brakes. Each braking system is operated by an independent hydraulic circuit. The information provided below applies to both braking systems.

**DANGER**

Do not use the vehicle in case brakes are worn out or do not work properly. The brakes are the parts that most ensure your safety and for this reason they must always be perfectly working. Failure to comply with these recommendations will probably lead to a crash or an accident, with a consequent risk of personal injury or death.

A wet surface reduces brakes efficiency.

**DANGER**

In case of wet ground the braking distance will be doubled, since both brakes and tyre grip on the road surface are extremely reduced by the water present on the road surface.

Any water on brakes, after washing the vehicle or driving on a wet road surface or crossing puddles or gips, can wet brakes so as to greatly reduce their efficiency.

Failure to comply with these recommendations may lead to serious accidents, with a consequent risk of severe personal injuries or death.

Brakes are critical safety components. Do not ride the vehicle in case brakes are not working at their best.

Check for brakes proper operation before every trip.

Brake fluid is irritant. Avoid contact with eyes or skin.

In the event of accidental contact, wash affected body parts thoroughly. In the event of accidental contact with eyes, contact an eye specialist or seek medical advice.

**DO NOT RELEASE BRAKE FLUID INTO THE ENVIRONMENT.**

**KEEP AWAY FROM CHILDREN.**

When handling brake fluid, take care not to spill it onto plastic or paint-finished parts or they will damage.

**DANGER**

Do not use any brake fluids other than the specified type. Never mix different types of fluids to top up level, as this will damage the braking system.

Do not use brake fluid from old containers which have been kept open or in storage for long periods.

Any sudden changes in play or hardness in the brake levers are warning signs of problems with the hydraulic circuits.

Ensure that the brake discs and brake linings have not become contaminated with oil or grease. This is particularly important after servicing or inspections.

Make sure the brake lines are not twisted or worn.

Prevent accidental entering of water or dust into the circuit.

Wear latex gloves when servicing the hydraulic circuit.

**DISC BRAKES****DANGER**

The brakes are the parts that most ensure your safety and for this reason they must always be perfectly working; check them before every trip.

A dirty disc soils the pads.

Dirty pads must be replaced, while dirty discs must be cleaned with a high-quality degreaser.

Perform the maintenance operations reducing by half the indicated frequency if the vehicle is used in rainy or dusty areas, on uneven surfaces or for racing.

Check brake pads for wear.

When the brake pads wear out, the level of the fluid decreases to automatically compensate for their wear.

The front brake fluid reservoir is located on the right handlebar, near the front brake lever.

The rear brake fluid reservoir is located under the right fairing.

Do not use the vehicle if the braking system leaks fluid.



## COOLANT

**DANGER**

Coolant is toxic when ingested, contact with eyes or skin may cause irritation. In the event of contact with your skin or eyes, rinse repeatedly with abundant water and seek medical advice. In the event of ingestion, induce vomiting, rinse mouth and throat with abundant water and seek medical advice immediately.  
**DO NOT RELEASE INTO THE ENVIRONMENT.**  
**KEEP AWAY FROM CHILDREN.**

**DANGER**

Take care not to spill coolant onto hot engine parts. It may ignite and produce invisible flames. Wear latex gloves when servicing.  
**Do not ride when coolant is below the minimum level.**

Coolant mixture is a 50% solution of water and antifreeze. This is the ideal solution for most operating temperatures and provides good corrosion protection.

This solution is also suited to the warm season, as it is less prone to evaporative loss and will reduce the need for top-ups.

In addition, less water evaporation means fewer minerals salts depositing in the radiator, which helps preserve the efficiency of the cooling system.

When the outdoor temperature drops below zero degrees centigrade, check the cooling system frequently and add more antifreeze (up to 60% maximum) to the solution, if needed.

Use distilled water in the coolant mixture. Tap water will damage the engine.

Refer to the chart given below and add water with the quantity of antifreeze to obtain a solution with the desired freezing point:

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

**NOTE** Coolants have different specifications. The protection degree is written on the label.

**WARNING**

Use only nitrite-free antifreeze and corrosion inhibitors with a freezing point of -35°C (-31°F) as a minimum.

## DRIVE CHAIN

Check drive chain operation, wear, slack and lubrication.  
 The vehicle is equipped with an endless chain with a joint link.

**WARNING**

If too slack, the chain can come off the front or rear sprockets thus leading to serious accidents and damage to the vehicle, with consequent serious personal injury or death.  
**Do not use the vehicle if the chain slack has not been correctly adjusted.**  
 To check the chain, take it with your hand where it turns on the rear sprocket and pull it as to separate it from the sprocket itself.  
 If you can move the chain apart of the front sprocket for more than 3 mm (0.125 in), change chain, front and rear sprocket.

**DANGER**

If not properly maintained, chain can early wear out and lead to the damage of both front and rear sprockets.  
 Perform chain maintenance operations more frequently if the vehicle is used on dusty or muddy areas.

## TYRES

**WARNING**

If tyres are excessively inflated, the vehicle will be harder, more difficult and uncomfortable to ride. In addition, the roadworthiness, mainly on wet surfaces and during cornering, will be impaired. Flat tyres (insufficient pressure) can slip on the rim and make you lose the control of the vehicle. In this case too, both vehicle roadworthiness, manoeuvrability and brake efficiency will be impaired. Tyres changing, repair, maintenance and balancing must be carried out by specialised technicians using suitable equipment. When new, tyres can have a thin slippery protective coating. Drive carefully for the first kilometres (miles). Never use rubber treating substances on tyres. In particular, avoid contact with fluid fuels, leading to a rapid wear. In case of contact with oil or fuel, do not clean but change the tyres.

**DANGER**

Some of the factory-assembled tyres of this vehicle are provided with wear indicators. There are several kinds of wear indicators. For more information on how to check the wear, contact your Dealer. Visually check if the tyres are worn and in this case have them changed. If a tyre deflates while driving, stop immediately. Avoid hard brakings or moves and do not close throttles too abruptly. Slowly close the throttle grip, move to the edge of the road and use the engine brake to slow down until coming to a halt. Failure to comply with these recommendations may lead to accidents, with a consequent risk of personal injuries or death. Do not install tyres with air tube on rims for tubeless tyres and vice versa.

## 1.4. RUNNING-IN

### 1.4.1. RUNNING-IN

Correct engine running-in is essential to ensuring proper performance and durability.

If possible, drive on hilly roads and/or roads with many bends, so that the engine, the suspensions and the brakes undergo a more effective running-in.

During running-in, change speed.

In this way the components are first "loaded" and then "relieved" and the engine parts can thus cool down.

Even if it is important to stress the engine components during running-in, take care not to exceed.



#### WARNING

**Top acceleration performance is obtained only after covering the first 1500 km (932 mi).**

Keep to the following indications:

- Do not open the throttle completely if the speed is low, both during and after running-in.
- Apply the brakes gently and avoid hard, prolonged braking until covering the first 100 km (62 mi). This will allow the brake pad lining to break in properly rubbing on the brake disks.
- During the first 800 km (497 mi), never exceed 5000 rpm (see table).



#### DANGER

**After the first 1000 km (621 mi), have the checking operations indicated in the column "After running-in" carried out by an aprilia Authorised Dealer, see REGULAR SERVICE INTERVALS CHART, in order to avoid hurting yourself or other people and/or damaging the vehicle.**

- After the first 800 km (497 mi) and until covering 1600 km (994 mi), drive more briskly, varying speed and using maximum acceleration for just a few seconds, in order to ensure better coupling of the components; never exceed 9000 rpm (see table).
- After the first 1600 km (994 mi), you can expect higher performance from your engine. However, never exceed the maximum rpm allowed (11000 rpm).

Recommended maximum rpm	
Mileage Km (mi)	rpm
0÷800 (497)	6000
800-1600 (497-994)	9000
Over 1600 (994)	11000

## 1.5. VEHICLE IDENTIFICATION

### 1.5.1. POSITION OF THE SERIAL NUMBERS

These numbers are necessary for vehicle registration.

**NOTE** Altering the vehicle identification numbers is a legal offence. Altering the frame number invalidates the warranty.

#### FRAME NUMBER

The frame number is stamped on the right side of the steering column.



#### ENGINE NUMBER

The engine number is stamped on the rear end, near the shock absorber.



TECHNICAL INFORMATION

2

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## 2.1. TECHNICAL INFORMATION

## 2.1.1. TECHNICAL DATA

DIMENSIONS					
Max. length	1955 mm (76.97 in.)				
Max. width	720 mm (28.34 ) in.				
Max. height (at headlight fairing)	1100 mm (43.31 in.)				
Seat height	805 mm (31.69 in.)				
Wheelbase	1345 mm (52.95 in.)				
Minimum ground clearance	163 mm (6.42 in.)				
Weight in running order (including fluids and fuel)	137 kg (302.03 lb.)				
ENGINE					
Type	Single-cylinder 2-stroke with reed intake. Separate lubrication with automatic variable mixer ( 1.0 - 3.0 %).				
Number of cylinders	1				
Total displacement	124.82 cu cm (7.62 cu. in.)				
Bore/stroke	54 mm /54.5 mm (2.12 in. /2.14 in.).				
Compression ratio	12.5 ± 0.5 : 1				
Squish clearance	1.5 mm (0.06 in.)				
Engine idling speed	1250 ± 100 rpm				
Engine maximum rpm	11000 ± 100 rpm				
Ignition	CDI ignition system with electronic spark timing				
Starting	Electric starter				
Clutch	Multiplate wet clutch, with control lever on left handlebar				
Gearbox	mechanical, 6-speed, with control pedal on left side of engine				
Gearbox lubrication	Splash lubrication				
Lubricating system	Separate lubrication with automatic variable mixer ( 1.0 - 1.3 %)				
CAPACITIES					
Fuel (including reserve)	14 l ± 0.5 l (3.70 USgal ± 0.13 USgal) (3.08 gal ± 0.11 gal)				
Fuel reserve	3.5 l (0.92 USgal) (0.77 gal)				
Gearbox fluid	600 cu cm (36.61 cu. in.)				
Gearbox fluid 	600 cu cm (36.61 cu. in.)				
Coolant	0.8 l (50% water + 50% antifreeze with ethylene glycol) (0.21 USgal) (0.17 gal)				
Mixer oil (reserve included)	1,7 l (0.45 USgal) (0.37 gal)				
Mixer oil reserve	0.6 l (0.16 USgal) (0.16 gal)				
Front fork oil/air	440 ± 2,5 cm <sup>3</sup> (26.85 ± 0.15 cuin)				
Seat	2				
Vehicle max. load (rider + passenger + luggage)	180 kg (396.83 lb.)				
TRANSMISSION SYSTEM					
GEAR RATIOS	Ratio	Primary	Final	Final ratio	Total ratio
	1st	19/63 = 1: 3.316	10/30 = 1: 3.000	17/40 = 1: 2.353	1 : 23.406
	2nd		14/29 = 1: 2.071		1 : 16.161
	3rd		17/27 = 1: 1.588		1 : 12.391
	4th		19/25 = 1: 1.316		1 : 10.266
	5th		21/24 = 1: 1.143		1 : 8.916
	6th		22/23 = 1: 1.045		1 : 8.156
FUEL SYSTEM					
Type	Carbureted				
Model	DELL'ORTO PHBH 28				
FUEL SYSTEM					
Fuel	Premium-grade unleaded petrol, minimum octane rating 95 (RON) and 85 (MON), as per DIN 51 607.				

<b>FRAME</b>			
Type	Twin-spar frame with cast and stamped frame sections		
Steering head angle	25° 30'		
Trail	102 mm (4.01 in.)		
<b>SUSPENSIONS</b>			
Front	hydraulically operated telescopic fork		
Travel	120 mm (4.72 in.)		
Rear	Adjustable hydraulic mono-shock absorber		
Wheel stroke	44.5 mm (1.75 in.)		
<b>BRAKES</b>			
Front	Disc - Ø 320 mm (12.60 in.) - with hydraulic transmission		
Rear	Disc - Ø 220 mm (8.66 in.) - with hydraulic transmission		
<b>WHEEL RIMS</b>			
Type	in light alloy		
Front	3.00 x 17"		
Rear	4.00 x 17"		
<b>TYRES</b>			
Wheel	Size	Pressure kPa (bar)	
		Rider only	Rider and passenger
Front	110/70 R 17" 54H 100/70 ZR 17" 54W	180 (1.8)	180 (1.8)
Rear	150/60 R 17" 66 H 150/60 ZR 17" / 66W	200 (2.0)	230 (2.3)
<b>IGNITION</b>			
Type	CDI		
Spark advance	12°±2° at 2000 rpm		
<b>SPARK PLUG</b>			
Standard 	NGK R BR10EG		
Standard	NGK BR8ES		
Spark plug gap	0.7 - 0.8 mm (0.028 - 0.031 in.)		
<b>ELECTRIC SYSTEM</b>			
Battery	12 V - B9 - B		
Fuses	20 - 15 - 7.5 A		
Generator	12 V - 180 W		
<b>BULBS</b>			
Low beam (halogen)	12 V - 55 W H11		
High beam (halogen)	12 V - 55 W H11		
Parking light	12 V - 5 W		
Turn indicator light	Mini lamps (cannot be replaced)		
Rear parking light / number plate light / stoplight	12 V - 5 / 21 W		
Revolution counter	LED		
Speedometer light	LED		
Multifunction display light	LED		
<b>WARNING LIGHTS</b>			
Neutral	LED		
Direction indicators	LED		
High beam lights	LED		
General alarm	LED		
Fuel oil reserve	LED		



## 2.1.2. SCHEDULED MAINTENANCE CHART

Component	After running- in [1000 km (621 mi)]	Every 4000 km (2485 mi) or 12 months	Every 8000 km (4970 mi) or 24 months
Rear shock absorber	-	-	1
Battery - Clamp tightening	1	1	-
Spark plug	1	1	3
Carburettor	1	2	-
Transmission and control cables	1	1	-
RAVE control unit <b>PP</b>	1	-	4
Wheel truing	-	1	-
Steering bearings and steering clearance	1	1	-
Wheel bearings	-	1	-
Brake discs	1	1	-
Air filter	-	2	3
Vehicle operation	1	1	-
Clutch clearance	4	4	-
Braking systems	1	1	-
Cooling system	1	1	-
Light system	1	1	-
Brake fluid	1	1	-
Brake fluid	every year: 3		
Coolant	every 2 years: 3		
Coolant	Every 1500 km (935 mi): 1		
Mixer oil level	Every 500 km (310 mi): 1		
Gearbox fluid	3	1	Every 12000 km (7456 mi): 3
Fork fluid and oil seal	Every 12000 km (7456 mi): 3		
Headlight beam direction - operation	-	1	-
Piston and piston rings	Every 8000 km (4970 mi): 1 Every 16000 km (9941 mi): 3		
Engine idling speed	4	4	-
Odometer drive	-	-	1
Wheels/Tyres and inflation pressure	1	1	-
Wheels/Tyres and inflation pressure	Every 1000 km (621 mi): 1		
Tightening of nuts and bolts	1	1	-
Exhaust silencer (except catalytic version)	2	2	-
Front suspension			1
Mixer oil reserve LED light	1	1	-
Drive chain tension and lubrication	Every 500 km (310 mi): 1		
Final transmission (chain, rear sprocket and front sprocket)	-	1	-
Fuel hose	-	1	every 4 years: 3
Braking system lines	-	1	every 4 years: 3
Mixer oil pipe	-	1	every 4 years: 3
Clutch wear	-	1	-
Front and rear brake wear	1	Every 2000 km (1242 mi): 1	
Exhaust valve <b>PP</b>	1	2 + 4	-















1 = check and clean, adjust, lubricate or change, if necessary; 2 = clean; 3 = change; 4 = adjust.

Carry out the maintenance operations more frequently if you use the vehicle in rainy and dusty areas, on uneven ground or for racing.

( **PP** ) = OPERATIONS THAT CAN BE CARRIED OUT BY THE USER

(\*\*) = Check every two weeks or at the specified intervals.

2.1.3. LUBRICANT CHART

LUBRICANT	PRODUCT
<b>Gearbox fluid</b>	<b>RECOMMENDED:</b>  F.C., SAE 75W - 90. As an alternative to recommended oils, top brand oils meeting or exceeding A.P.I. GL-4 specifications can be used.
<b>Mixer oil</b>	<b>RECOMMENDED:</b>  MAX 2T COMPETITION. As an alternative to recommended oil, top brand oils meeting or exceeding ISO-L-ETC ++,A.P.I. TC ++ specifications can be used.
<b>Fork fluid</b>	<b>RECOMMENDED:</b> Fork fluid  F.A. 5W or  F.A. 20W. When you wish to obtain an intermediate response between those offered by  F.A. 5W and  F.A. 20W oils, you may mix the different products as follows: 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.
<b>Bearings and other lubrication points</b>	<b>RECOMMENDED:</b>  AUTOGREASE MP As an alternative to recommended grease, use top brand rolling bearing grease that will resist a temperature range of -30 °C to +140 °C (-22 °F to +284 °F), with dripping point 150 °C to 230 °C (302 °F to 446 °F), high corrosion protection, good resistance to water and oxidation.
<b>Battery terminals</b>	Use neutral grease or Vaseline.
<b>Aerosol lubricant for chains</b>	<b>RECOMMENDED:</b>  CHAIN SPRAY.
<b>Brake fluid</b>	<b>RECOMMENDED:</b>  F.F., DOT 5 (DOT 4 compatible). <b>CAUTION</b> Use new brake fluid only. Do not mix different makes or types of oil without having checked bases compatibility.
<b>Engine coolant</b>	<b>RECOMMENDED:</b>  ECOBLU – 40°C (- 40 °F). <b>NOTE</b> Use only nitrite-free antifreeze and corrosion inhibitors with a freezing point of - 35°C (- 31°F) as a minimum.

2.1.4. TIGHTENING TORQUE SETTINGS

Check and tighten as required after the first 1000 km (621 mi) and every 4000 km (2485 mi) or 12 months afterwards.



**WARNING**

The fasteners listed in the chart must be tightened to the specified torque using a torque wrench and applying LOCTITE® where specified. Safety-related items are in brackets ( ).

**Notes:**

L243 = secure with Loctite® 243

Lub= lubricate

DESCRIPTION	Q.ty	Screw / nut	Nm	Kgm	Note
<b>FRAME</b>					
Head to frame	4	Socket-head screw M8x20	22	2.2	
Seat frame to frame fastener	4	Socket-head screw M8x25	22	2.2	
Instrument panel subframe to frame	2	Hex flange screw M6x45	10	1.0	
Filter box fastener onto seat frame	2	Hex flange screw M6x20	5	0.5	
Splitter to frame	2	Hex flange screw M6x20	10	1.0	
<b>FOOTRESTS</b>					
Rider footrest bracket	4	Socket-head screw M8x30	22	2.2	
Passenger footrest bracket	4	Socket-head screw M8x20	22	2.2	
Rider footrest guard	2	Allen crowned-head screw M5x12	3	0.3	
Upper rider footrest bracket	2	Socket-head screw M8x35	22	2.2	
<b>STAND</b>					
Stand connection	2	Hex flange screw M8x35	22	2.2	
Side stand pin	1	M10X1.25	10	1.0	
Side stand pin short nut	1	M10X1.25	25	2.5	
Stand switch fixing screw	1	Hex flange screw M6x16	10	1.0	L243
<b>SWINGING ARM</b>					
Brake line / chain slider clamp	5	Allen crowned-head screw M5x12	2	0.2	
Rear lower mudguard	2	Hex flange screw M6x16	5	0.5	
Swinging arm pivot fastener	1		100	10.0	
Ring nut adjusting bush	1		12	1.2	lub
Chain slider	1	Allen crowned-head screw M5x16	2	0.2	
Swinging arm pivot adjustment	1		35	3.5	
<b>FRONT SUSPENSION</b>					
Stanchion tubes onto fork yoke	4	Socket-head screw M8x30	25	2.5	
Stanchion tubes onto top yoke	2	Socket-head screw M8x30	25	2.5	
Steering column nut	1		80	8.1	
Ring nut	1		7	0.7	
<b>REAR SUSPENSION</b>					
Shock absorber to frame fastener	1	Socket-head screw M10x80	50	5.1	lub
Single connecting rod to frame	1	Socket-head screw M10x120	50	5.1	lub
Double connecting rod to single connecting rod	1	Hex flange screw M10x75	50	5.1	lub
Double connecting rod to swinging arm	1	Socket-head screw M12X78.5	80	8.1	lub
Shock absorber to double connecting rod	1	Hex flange screw M8x40	25	2.5	lub

DESCRIPTION	Q.ty	Screw / nut	Nm	Kgm	Note
<b>ENGINE</b>					
Head to frame screw	4	Socket-head screw M8x20	22	2.2	
Upper front engine mount	1	Socket-head screw M10x120	50	5.1	
Lower front engine mount	1	Hex flange screw M10x205	50	5.1	
Rear engine mount	1	Socket-head screw M8x85	22	2.2	
Gearbox connecting rod	1	Hex flange screw M6x20	10	1.0	
Lower rear fastener	1	Hex flange screw M8x70	22	2.2	
Sprocket cover fastener	2	Socket-head screw M6x20	5	0.5	
<b>FILTER BOX</b>					
Filter box	2	Hex flange screw M6x25	5	0.5	
<b>EXHAUST SYSTEM</b>					
Muffler central section (bracket)	1	Socket-head screw M8x70	22	2.2	
Muffler to bracket	1	Socket-head screw M8x50	22	2.2	
Clamp onto silent block	1	Socket-head screw M8x12	22	2.2	
Silent blocks to supports	3	Nut M8	22	2.2	
<b>COOLING SYSTEM</b>					
Water bleed valve	1	Allen crowned-head screw 5.5x15.9	2	0.2	
<b>FRONT WHEEL</b>					
Front wheel shaft fastener	1	Wheel shaft	80	8.1	
Stanchion tubes to wheel shaft	4	Socket-head screw M6x30	10	1.0	
<b>REAR WHEEL</b>					
Rear wheel shaft fastener	1	Shaft nut	100	10.0	
<b>FRONT BRAKE</b>					
Oil tank mount to pump	1	Hex flange screw M6x12	7	0.7	
Oil tank to mount	1	Hex flange screw M6x25	7	0.7	
Oil tank to mount	1	Nut M6	7	0.7	
Front brake disc	6	Hex flange screw M8x20	22	2.2	
Brake calliper	2	Allen crowned-head screw M10x55	50	5.1	
Brake line to calliper	1	Special screw	20	2.0	
<b>REAR BRAKE</b>					
Hose clamp to swinging arm	2	Hex flange screw M5x12	2	0.2	
Rear brake oil tank	1	Hex flange screw M6x16	7	0.7	
Rear brake disc	6	Hex flange screw M6x20	10	1.0	
Brake line to calliper	1	Special screw	20	2.0	
Adjuster screw on brake lever	1	Hex flange screw M6x25	10	1.0	
Rear brake pump and guard	2	Hex flange screw M6x35	10	1.0	
Brake calliper	2	Hex flange screw M6x30	22	2.2	
<b>HANDLEBAR AND CONTROLS</b>					
Anti-vibration weights	2	Socket-head screw M6x50	10	1.0	
Control casings to handlebar	4	Socket-head screw M6	3	0.3	

DESCRIPTION	Q.ty	Screw / nut	Nm	Kgm	Note
<b>ELECTRICAL COMPONENTS</b>					
Battery box mount bracket	4	Hex flange screw M5x25	5	0.5	
Expansion tanks to battery	1	Hex flange screw M6x16	5	0.5	
Horn fastener	1	Hex flange screw M8x16	22	2.2	
Battery box mount to frame	4	Socket-head screw M8x30	22	2.2	
Undertail and oil tank fastener	5	Hex flange screw M5x16	2	0.2	
Fuse box to frame	2	Hex flange screw M8x20	5	0.5	
Fitment to headlight	4	Crowned cheese-headed screw M4x16	1.5	0.15	
Coil to holder	2	Hex flange screw M6x45	10	1.0	
Voltage regulator fastener	2	Hex flange screw M6x25	10	1.0	
Tail light fastener	2	Allen crowned-head screw M5x16	2	0.2	
Battery box mount	2	Hex flange screw M6x12	5	0.5	
<b>TANKS</b>					
Tank front fastener	2	Socket-head screw M6x50	7	0.7	
Tank rear fastener	2	Socket-head screw M6x70	7	0.7	
Tank filler plug fastener	2	Socket-head screw M5x30	5	0.5	
Tank filler plug / spacer	2	Socket-head screw M5x16	3	0.3	
Fuel cock to fuel tank	2	Tie 16 - 25	2	0.2	
<b>SEAT</b>					
Passenger seat fastener	2	Allen crowned-head screw M6x16	7	0.7	
Passenger grab strap	2	Allen crowned-head screw M6x20	5	0.5	
Passenger grab strap	2	Nut M6	5	0.5	
<b>COMPLEMENTARY ACCESSORIES</b>					
Number plate extension	6	Self-tapping screw 3.9x14	5	0.5	
Turn indicators	2	Nut M8	8	0.8	
Number plate holder	3	Allen crowned-head screw M5x16	9	0.9	
<b>CHAIN</b>					
Chain tensioner wheel to footrest bracket	1	Socket-head screw M8x70	25	2.5	
<b>FRONT BODYWORK</b>					
RH-LH deflector to upper side fairing	5	PLSTC S/TAP screw 3.9x14	1	0.1	
Windscreen to fairing front piece	3	Allen crowned-head screw M4x16	3	0.3	
Mudguard to fork	5	Allen crowned-head screw M5x16	5	0.5	

DESCRIPTION	Q.ty	Screw / nut	Nm	Kgm	Note
<b>CENTRE BODYWORK</b>					
Upper RH-LH fairing to frame	2	Allen crowned-head screw M5x16	2	0.2	
Upper RH-LH fairing to front piece	2	S/TAP crowned cheese-hd screw 4.2X16	1	0.1	
RH-LH fairing to upper side fairing	8	Allen crowned-head screw M5x16 2	2	0.2	
RH-LH fairing to lwr fastening plate	2	Allen crowned-head screw M5x16 2	2	0.2	
RH-LH inner fairing to upper side fairing	8	PLSTC S/TAP crowned chesse-hd screw 4.2X16	1	0.1	
Lower cowl to frame (radiator connection plate)	2	Allen crowned-head screw M5x16	2	0.2	
<b>REAR BODYWORK</b>					
RH-LH seat frame cover to seat frame	8	Allen crowned-head screw M5x16	10	1	
RH-LH tail guard to tail light	4	Allen crowned-head screw M5x16	2	0.2	
RH-LH tail guard to seat frame cover	2	Allen crowned-head screw M5x16	2	0.2	
Seat frame lower cover to seat frame	2	Allen crowned-head screw M5x16	2	0.2	
Seat frame lower cover to tail guard	10	S/TAP crownedcheese-hd screw 4.2X16	1	0.1	
Number plate holder to seat frame lower cover	3	S/TAP crownedcheese-hd screw 4.2X14	2	0.2	
Number plate holder to seat frame lower cover	2	Allen crowned-head screw M5x16	10	1	
Splashguard to number plate holder	6	S/TAP crowned cheese-hd screw 4.2X14	10	1	

**Steel / aluminium fixing screws with similar elastic moduli**

Screw	Nm	Kgm
M4	3	0.3
M5	6	0.6
M6	12	1.2
M8	25	2.5
M10	50	5.0
M12	80	8.0

**2.1.5. SPECIAL TOOLS**

In order to perform assembly, reassembly and settings correctly, special tools suitable for the task must be used.

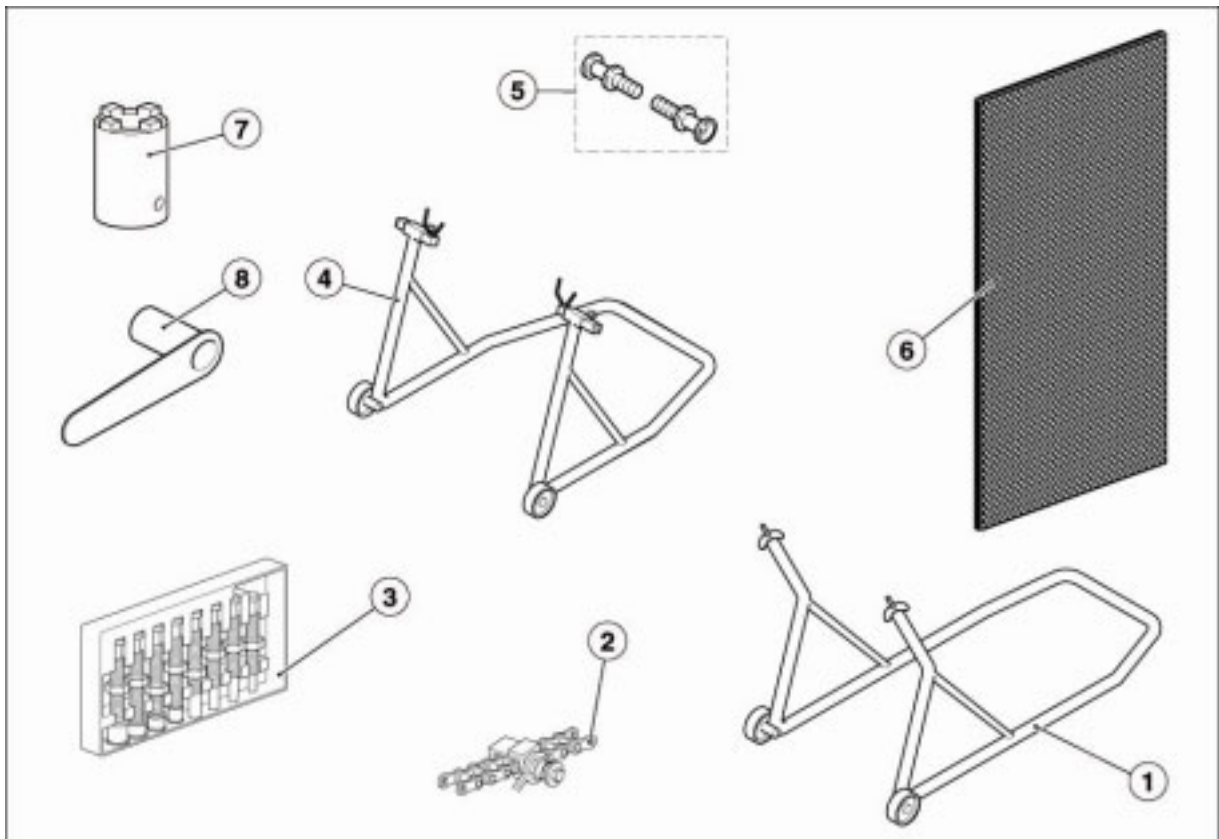
The use of special tools avoids the potential risk of damage as a result of inappropriate tools and/or improvised methods. The special tools developed specifically for this vehicle are listed below.

If you need to order the generic special tools, see the special tools manual.



**WARNING**

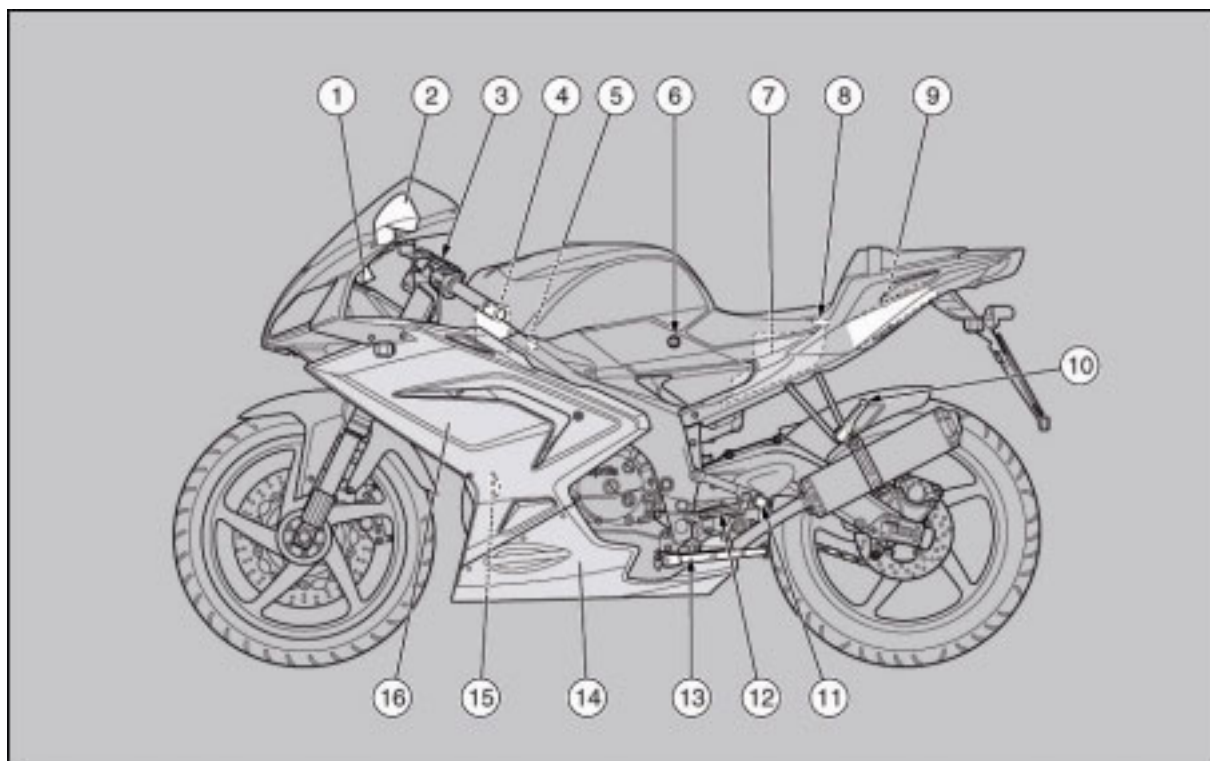
Before using the special tools consult the provided documentation.



Key:

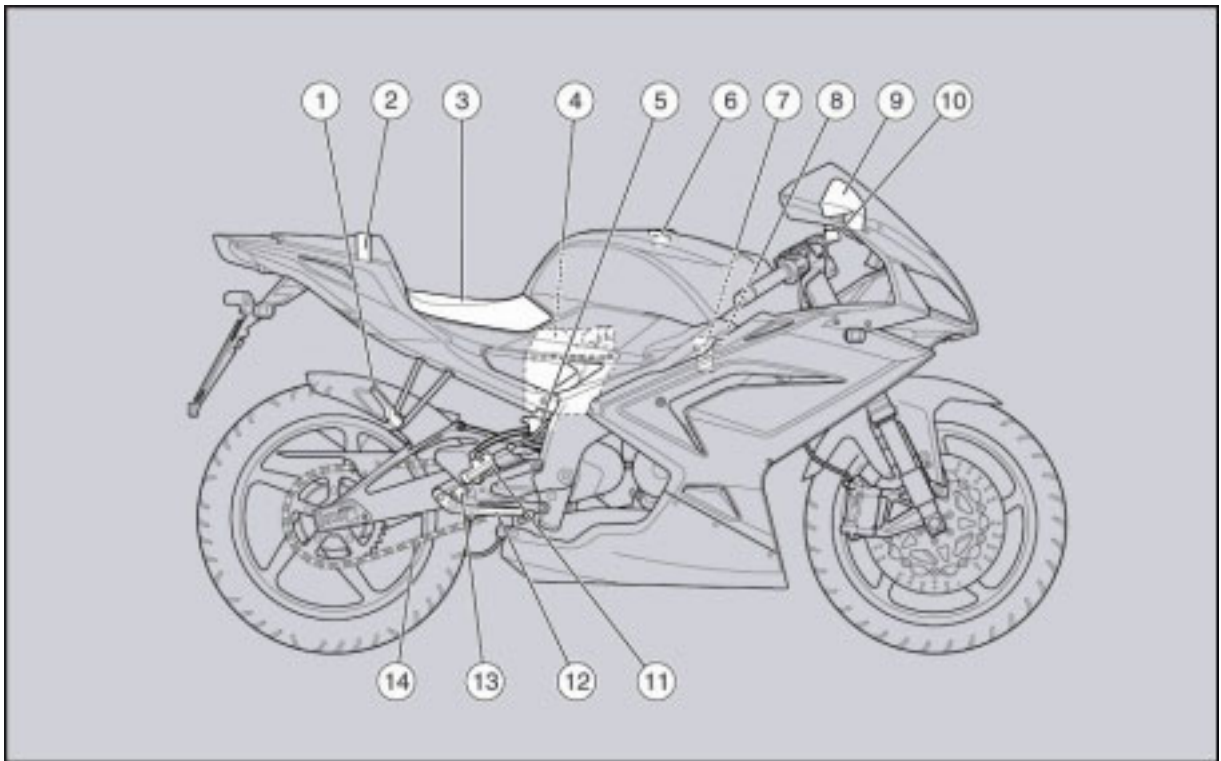
Position	Tool description and purpose	Part number
1	Front support stand	8146486
2	Chain tool	8140192
3	Bearing puller kit, Ø10 mm to Ø 30 mm (Ø 0.39 in. to 1.18 in.)	8140180
4	Rear support stand	8705021
5	Platforms for rear stand	8140204
6	Tool board	8140199
7	Tool to tighten swinging arm pivot ring nut	8101945
8	Tool for clutch adjustment	0276040

## 2.1.6. LOCATION OF KEY COMPONENTS

**Key:**

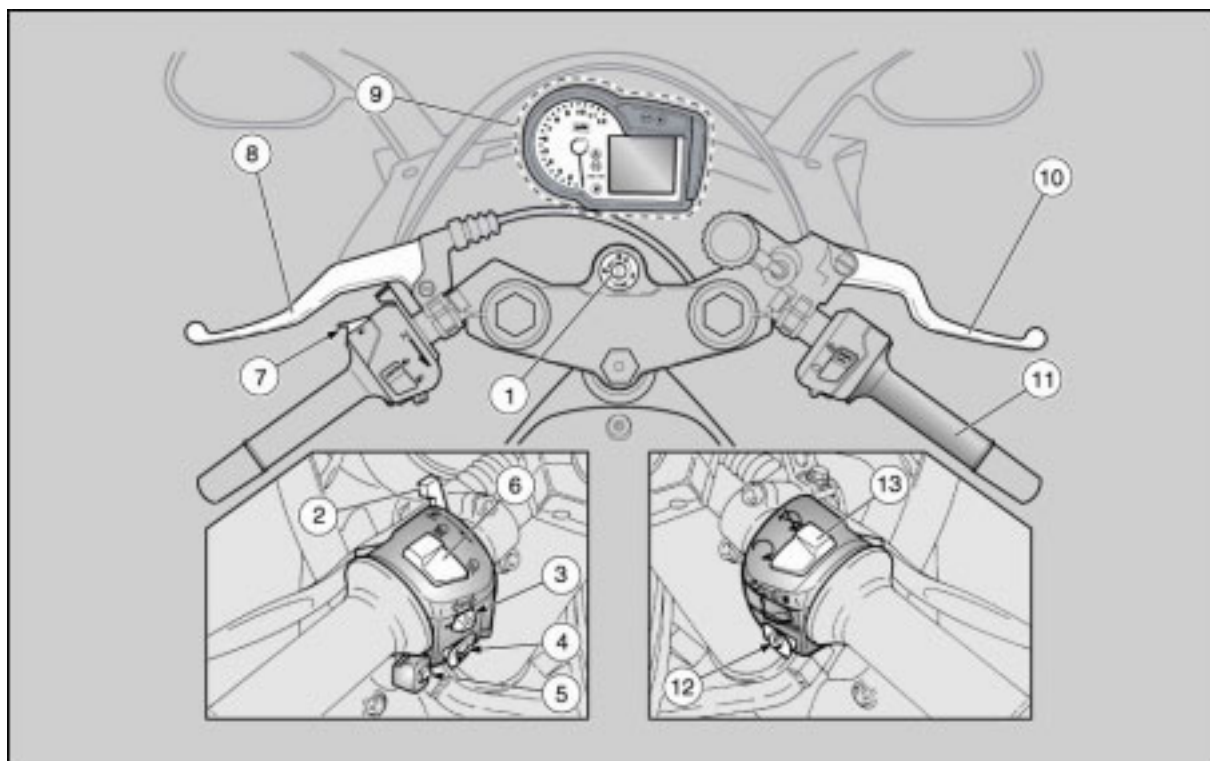
1. Instrument panel
2. Left rear-view mirror
3. Ignition switch/steering lock
4. Battery
5. Fuse carrier
6. Seat lock
7. Mixer oil tank
8. Mixer oil tank plug
9. Glove / tool kit compartment
10. Passenger left footrest (snapping, closed/open)
11. Rider left footrest (with spring, always open)
12. Gear shift lever
13. Side stand
14. Lower fairing
15. Warning horn
16. Left side fairing



**Key:**

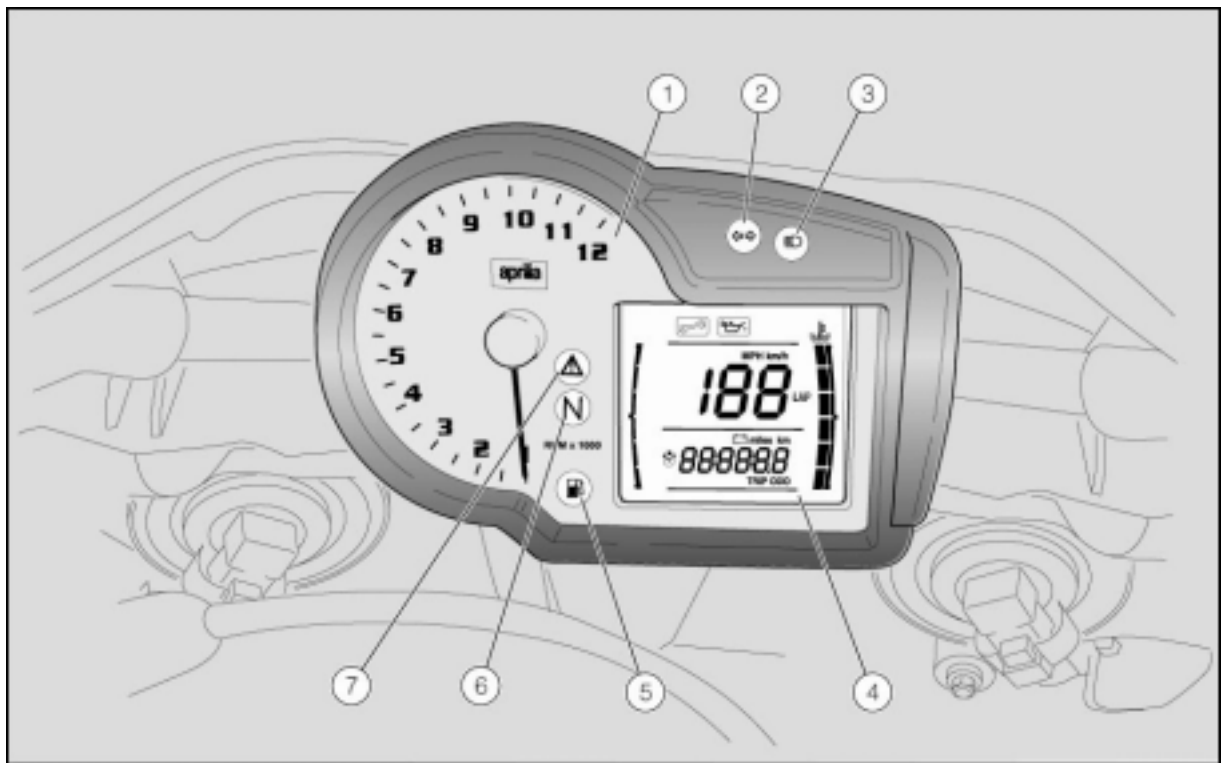
1. Passenger right footrest (snapping, closed/open)
2. Passenger grab strap
3. Rider seat
4. Air filter
5. Rear brake fluid reservoir
6. Fuel tank filler plug
7. Expansion tank
8. Coolant expansion tank plug
9. Right rear-view mirror
10. Front brake fluid reservoir
11. Rear brake master cylinder
12. Rear brake lever
13. Rider right footrest (with spring, always open)
14. Drive chain

2.1.7. LOCATION OF INSTRUMENTS / CONTROLS



Key:

- 1. Ignition switch / steering lock (🔑 - 🔒 - 🔓)
- 2. Choke lever (🔧)
- 3. Turn indicator switch (↔)
- 4. Horn button (🔊)
- 5. MODE button
- 6. Light dimmer switch (🔆 - 📺)
- 7. High beam flasher button (📺)
- 8. Clutch lever
- 9. Instruments and indicators
- 10. Front brake lever
- 11. Throttle grip
- 12. Starter button (🔌)
- 13. Engine kill switch (🔑 - 🔒)

**Key**

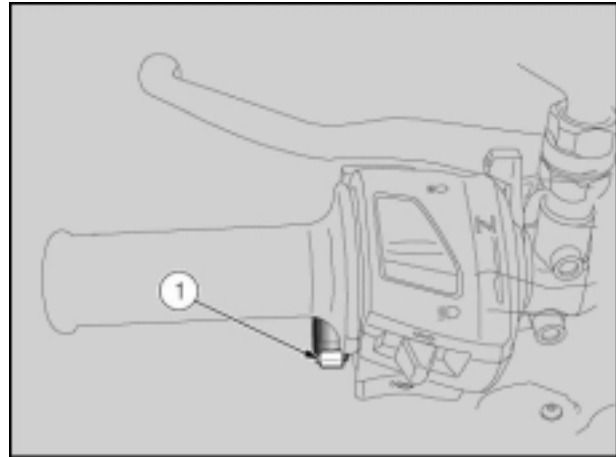
1. Rev counter
2. Green turn indicator warning light (↔)
3. Blue high beam light (⚡)
4. Multifunction digital display: coolant temperature, clock, battery voltage, lap timer, diagnostics, mixer oil level (⚡)
5. Amber low fuel light (⛽)
6. Green neutral light (N)
7. Red general warning light (⚠)

2.1.8. INSTRUMENT PANEL OPERATION

CONTROLS

1) MODE button:

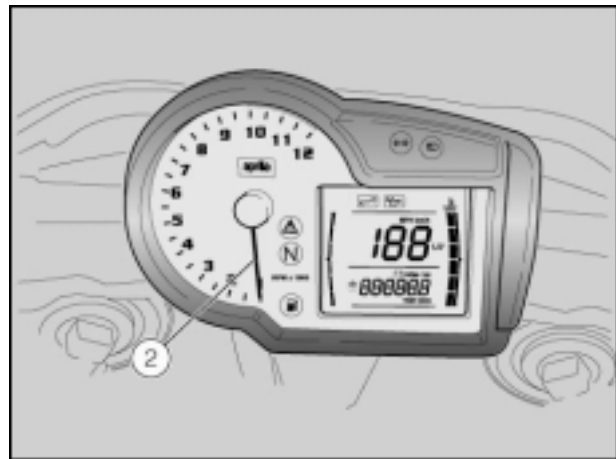
- press briefly to toggle between functions;
- press longer (over three seconds) to enter the setup mode.



Turn the ignition key to ("I") and the following instrument panel lights will come on for two seconds:

- all warning lights;
- backlighting;
- all display segments.

The rev counter pointer (2) goes to full scale and then returns to its initial position.



After the initial test routine, all instruments automatically switch to the current readings of the relevant quantities. Standard display configuration is as follows:

- Alarm icons, (zone A);
- Instantaneous speed, (zone B);
- Odometer / trip meter / clock / battery voltage / lap timer (zone C) (\*);
- Coolant temperature, (zone D).

(\*) The display reverts to the function displayed when last powered off



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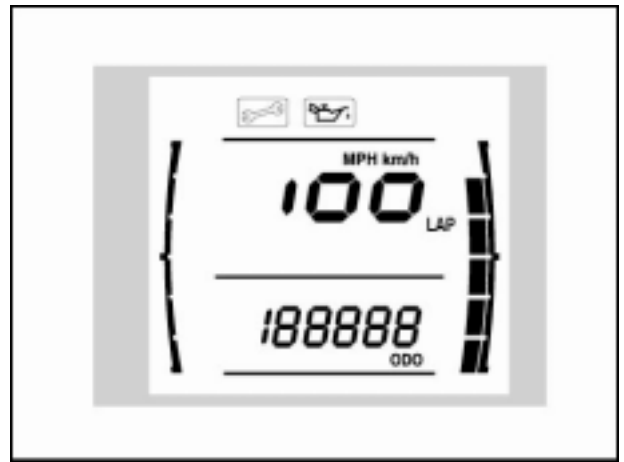
**Description of functions**

Press the MODE button repeatedly and zone C of the display will cycle through the following functions:

- ODOMETER
- TRIP METER
- CLOCK
- BATTERY VOLTAGE
- LAP TIMER

**ODOMETER (ODO)**

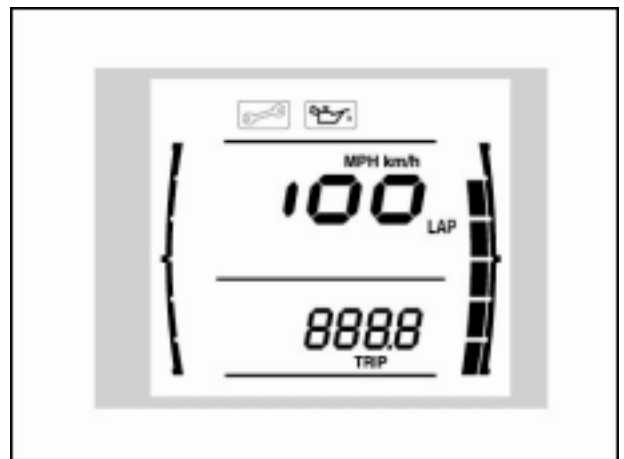
The display shows the total distance covered by the vehicle. The odometer cannot be reset.



**TRIP METER (TRIP)**

When the ODO readout is displayed, press the MODE button briefly to switch to the trip meter.

Hold down the MODE button when the TRIP readout is displayed to reset the trip meter.

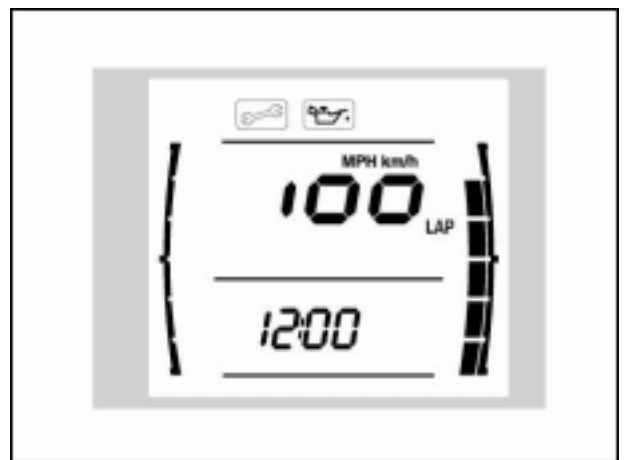


**Clock**

When the TRIP readout is displayed, press the MODE button briefly to switch to the clock.

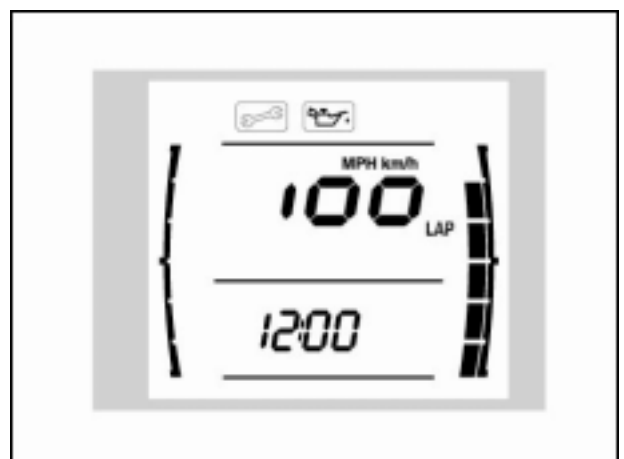
**Clock setting**

With the motorcycle stopped and the clock displayed, hold down the MODE button until entering the clock setup mode. The display shows the two hour digits; hours increase by 1 at each press of the MODE button; hours run from 1 to 12 and then back to 1.



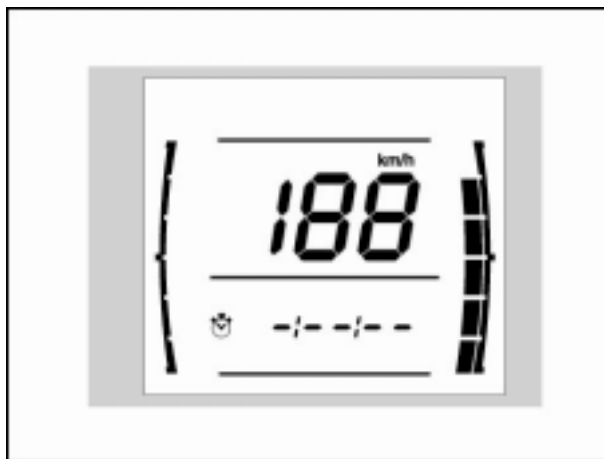
Press and hold the MODE button to confirm the hours setting and switch to minutes setting; the display shows the minute digits; minutes increase by 1 at each press of the MODE button; minutes run from 0 to 59 and then back to 0 at the next press of the MODE button.

When finished, the clock remains frozen for three seconds and the display shows set time.



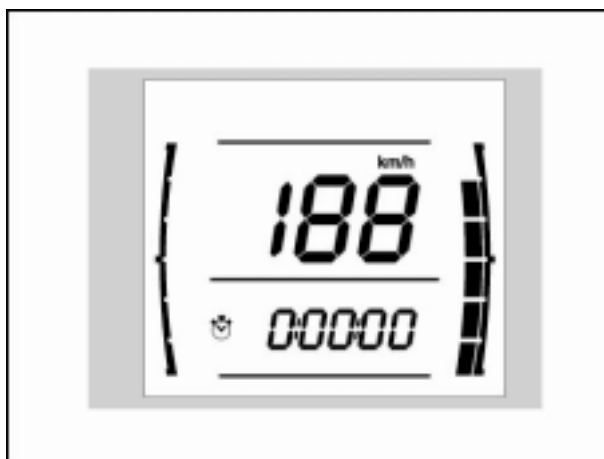
**LAP TIMER**

When the Clock readout is displayed, press the MODE button briefly to switch to the Lap Timer.  
 Press and hold the MODE button while the motorcycle is moving to enter acquisition mode, or - at standstill - to view stored lap times.

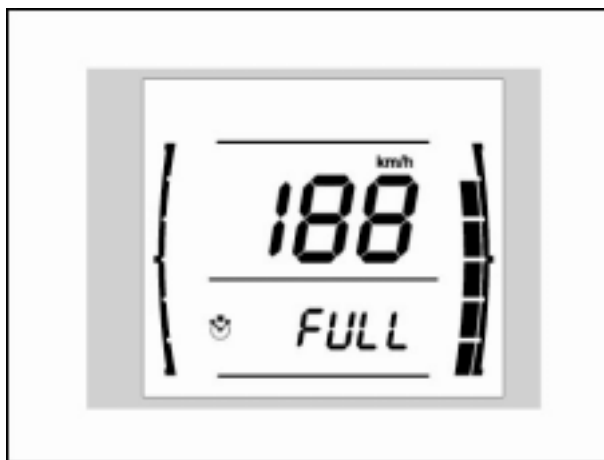


**Acquisition**

A brief press of the MODE button while riding starts the lap timer.  
 At the first press, time count starts; pressing the button again within 10 seconds of starting the time count will reset and restart the time count.  
 After this time, the next press of the button will store lap time and start a new lap time count. Stored lap time is displayed for 10 seconds and then the display switches to current lap time count.  
 Press and hold the MODE button to abort a running time count; the display shows the last lap time stored and then resumes the lap timing session as described above.

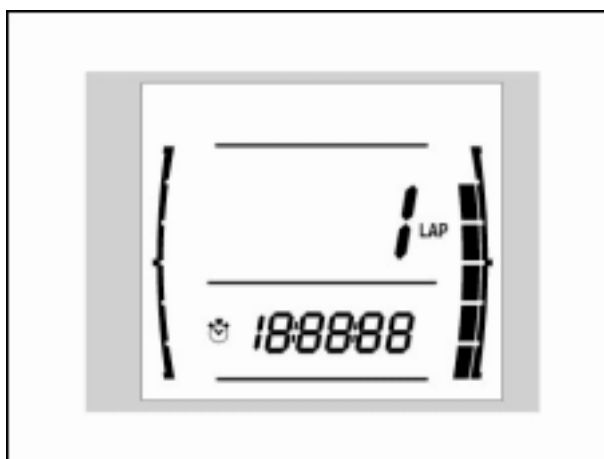


The lap timer can store up to 16 lap times; when the display reads FULL, no additional lap times can be stored.  
 Any lap times stored will be lost when the battery is disconnected.



**How to view stored lap times**

Access the Lap Timer function with the vehicle stopped to view stored lap times.  
 Current speed readout in the middle of the display changes to LAP session number and the lap time count is displayed below.  
 Press and hold the MODE button to exit lap times readout; alternately, the lap times readout turns off automatically as soon as you move off.




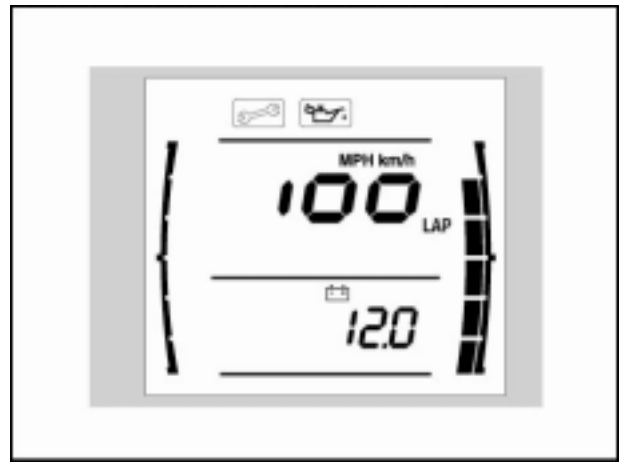
**How to delete stored lap times**

When the ODO readout is displayed, press and hold the MODE button to delete all stored lap times.

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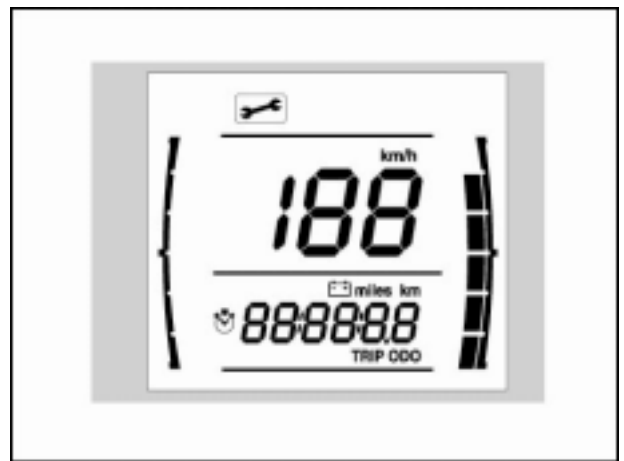
**BATTERY VOLTAGE**

When the Clock readout is displayed, a brief press of the MODE button will turn on the battery icon and battery charge display.  
 When battery voltage is outside the correct operating range (10 to 16 V), the flashing “” symbols is displayed.




**SERVICE INTERVAL**

When the next service interval is drawing near, an icon representing an open-end spanner will flash for five seconds on the display as a reminder.  
 Upon reaching the service interval, the icon stays on permanently.  
 First service reminder 1.000 km (625 mi).  
 Afterwards: every 4000 Km (1.7 mi)  
 The icon will be turned off during the service procedure at an **aprilia** Dealer or Authorised Service Centre.



**HOW TO SELECT KM OR MILES**

Upon power-on with the key set to “”, hold down the MODE button for more than ten seconds to change the unit of measurement from kilometres (Km) to miles (Mi); selection applies to both odometer (ODO) and speedometer. Readout remains blank for five seconds and then the unit of measurement begins to flash.  
 If the MODE button is released before 10 seconds, the current unit of measurement is retained.

2.1.9. GEARBOX FLUID

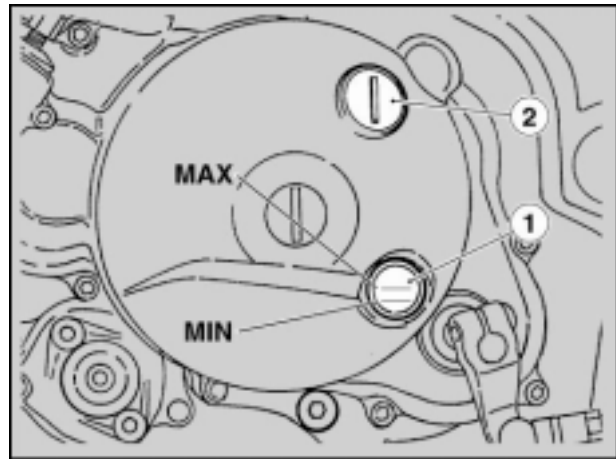
INSPECTION

- Check gearbox fluid level every 4000 km (2500 mi); change gearbox fluid after the first 1000 km (625 mi) and every 12000 km (7500 mi) afterwards, see (CHANGING GEARBOX FLUID).

CHECK

**CAUTION** Place the vehicle on a firm and flat surface.

- Stop the engine and allow 10 minutes for the oil to settle down in the crankcase and cool down.



- Remove the left side fairing, see (REMOVING THE SIDE FAIRINGS).
- Hold the vehicle upright with both wheels on the ground.

**NOTE** The operations described above are critical to ensuring correct oil level measurement.

- Level should be between one quarter (MIN) up to halfway (MAX) up the sight glass (1).

**NOTE** Level should never drop below one quarter or exceed mid-level of the sight glass. A too low level could lead to severe engine damage; on the other hand, excess fluid would leak out.

TOPPING UP

- If level needs to be topped up:
- Unscrew and remove the filler plug (2).
- Fill in a small amount of fluid and wait one minute for fluid to settle down in the crankcase.
- Check the level is between one quarter (MIN) up to halfway (MAX) up the sight glass (1).
- If not so, top up gradually adding small amounts of fluid and checking the sight glass (1) each time, until bringing fluid to the specified (MAX) level.
- When finished, tighten the filler plug (2).
- Ensure that the filler plug is tightened firmly and fluid cannot leak out.



**WARNING**

Periodically check that there are no leaks at the crankcase cover gasket.

Using the vehicle with insufficient lubrication or with contaminated or inadequate lubricants will lead to early wear of moving parts and may result in irreparable damage.



### 2.1.10. CHANGING GEARBOX FLUID

Check gearbox fluid level every 4000 km (2500 mi); change fluid after the first 1000 km (625 mi) and every 12000 km (7500 mi) afterwards.

#### CHANGE

- Start the engine and let it idle for several minutes so the oil will drain off more easily later.

**CAUTION** Place the vehicle on a firm and flat surface.

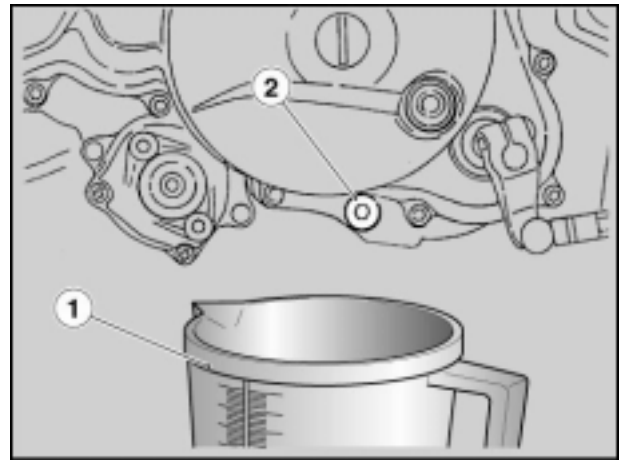
- Stop the engine and let it cool down for at least ten minutes, in order to allow the oil to flow into the crankcase and to cool down.



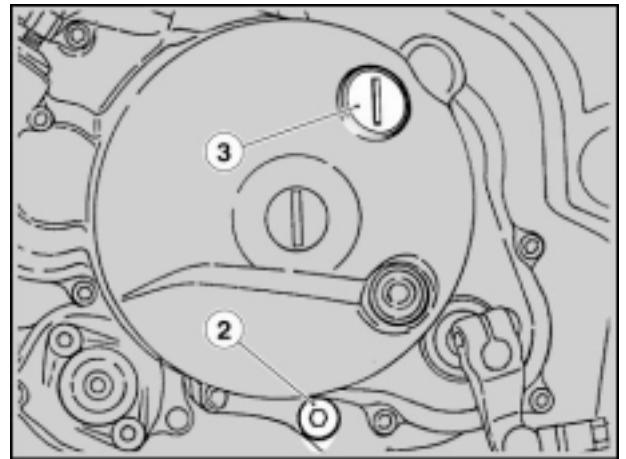
#### WARNING

The oil inside a warm engine will be hot; use great care to avoid scalds during the next operations.

- Remove the left side fairing, see (REMOVING THE SIDE FAIRINGS).
- Hold the vehicle upright with both wheels on the ground.
- Place a container (1) holding over 700 cu cm (42.72 cu. in.) under the drain plug (2).
- Unscrew and remove the drain plug (2).



- Unscrew and remove the filler plug (3).
- Drain the fluid into the container (1) and let it drip out for several minutes.
- Remove any metal debris sticking to the drain plug (2) magnet.
- Check the sealing washer of the drain plug (2) and replace as required.
- Screw and tighten the drain plug (2).
- Pour about 600 cu cm of gearbox fluid into the filler hole (3), see (LUBRICANT CHART).
- Tighten the filler plug (3).
- Start the engine and let it idle for about one minute, in order to allow the fluid to flow to all points of the gearbox circuit.
- Check level and top up as required, see (CHANGING GEARBOX FLUID).



#### WARNING

Firmly tighten the filler and drain plugs and ensure there are no oil leaks.

Periodically check that there are no leaks at the crankcase cover gasket.

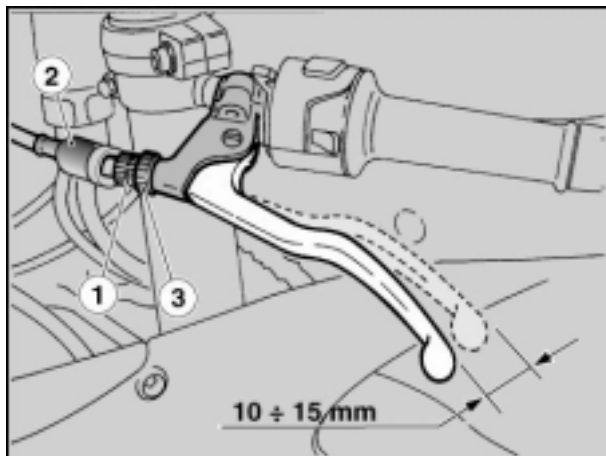
Do not use the vehicle with insufficient lubrication or with contaminated or unsuitable lubricants, since this would cause early wear of the moving parts and may also cause irreparable failures.

2.1.11. CLUTCH ADJUSTMENT

Warning signs that the clutch needs adjusting are the engine stalling, or the vehicle moving forward with the clutch lever pulled and a gear engaged, or clutch slippage, leading to sluggish acceleration compared to engine rpm.

Minor adjustments may be performed using the adjuster (1):

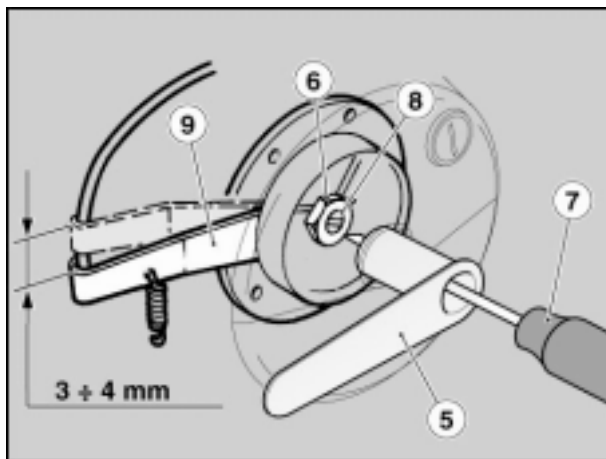
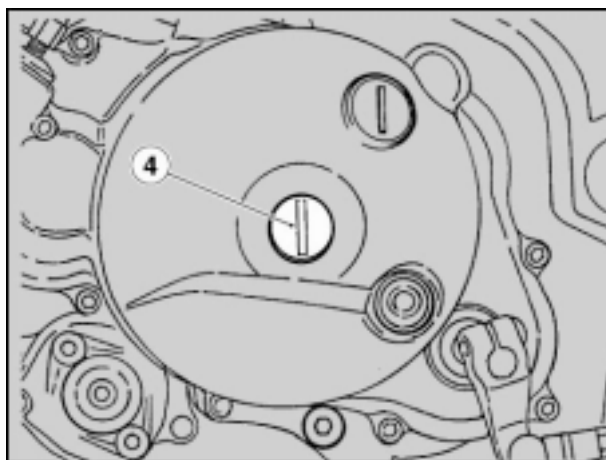
- Withdraw the protection element (2).
- Loosen (turn in as if to tighten) the nut (3).
- Turn the adjuster (1) until achieving about 10÷15 mm free play at clutch lever end (0.39÷0.59 in.).
- Tighten the nut (3) to lock the adjuster (1).
- Check free play at clutch lever end.



- Put back the protection element (2).

If the adjuster (1) is fully loosened, fully tightened or the specified free play cannot be achieved for some other reason:

- Withdraw the protection element (2).
- Tighten the nut (3) onto adjuster (1) fully.
- Tighten the nut adjuster (1) completely.
- Remove the left side fairing, see (REMOVING THE SIDE FAIRINGS).
- Loosen and remove the cap (4) using a flat screwdriver.
- Insert the special key (5) (part no. 0276040) and loosen the nut (6) located inside.
- Insert a flat screwdriver (7) into the special key (5) and tighten the adjuster screw (8) completely.
- Loosen the adjuster screw (8) one half turn - the equivalent of 3÷4 mm (0.12÷0.16 in) free play at clutch lever end (9).
- Lock out rotation of the adjuster screw (8) using the screwdriver (7), turn the special key (5) and tighten the nut (6) inside.



**NOTE** Check the condition of the clutch cable; the cable should not be squashed at any position; check the sheath over its whole length for wear.

**NOTE** Lubricate the clutch cable using a suitable lubricant at regular intervals, see (LUBRICANT CHART), to avoid early wear or corrosion.

## 2.2. SCHEDULED MAINTENANCE

### 2.2.1. BRAKE FLUID

**NOTE** Check brake fluid after the first 1000 km (621 mi) and every 4000 km (2485 mi) or 12 months afterwards; change fluid every year.



#### **WARNING**

In case of excessive stroke of the brake lever, excessive elasticity or air bubbles, bleed the air out of the circuit.

In the event of leakage, brake fluid will damage painted and plastic parts.

Before each ride, ensure that the brake lines are not twisted or cracked and check unions for leaks.

Do not use or mix different types of silicone or oil fluids.

Do not use brake fluid from old containers which have been kept open or in storage for long periods.

Prevent accidental ingress of water or dust into the circuit.

### CHECKING AND TOPPING UP

#### CHECKING THE FRONT BRAKING SYSTEM

**CAUTION** Place the vehicle on a firm and flat surface.

- Place the vehicle on the stand and turn the handlebar to right steering lock.
- Make sure that the fluid in the reservoir is above the "MIN" level mark.
- If the fluid does not reach at least the "MIN" mark, proceed as follows:



#### **WARNING**

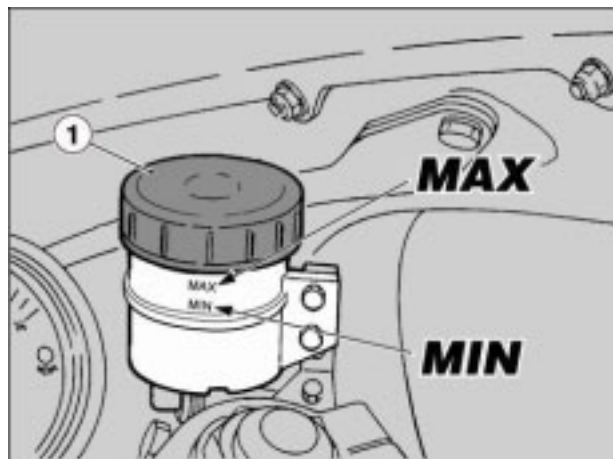
When the disc pads wear out, the level of the fluid decreases progressively to compensate for their wear.

- Check the brake pads for wear, see (BRAKE PADS).
- If the pads and/or the disc do not need replacing, provide for topping up.

**TOPPING UP THE FRONT BRAKING SYSTEM**

**⚠ WARNING**  
**Danger:** brake fluid could leak out. Do not operate the front brake lever when the brake fluid reservoir plug has been loosened or removed. Use a cloth under the brake fluid reservoir to prevent any fluid leaking off.

Unscrew and remove the plug (1).

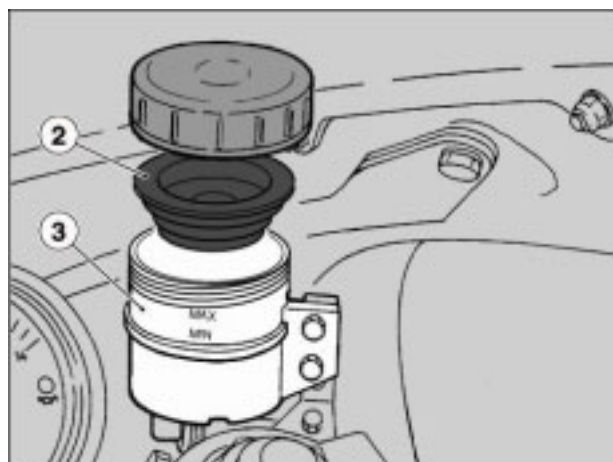


**⚠ WARNING**  
 Avoid long exposure of brake fluid to air. Brake fluid is hygroscopic and will absorb moisture from the air. Keep the brake fluid reservoir open JUST LONG ENOUGH to top up level.

- Remove the gasket (2).

**CAUTION** In order not to spill the brake fluid while topping up, do not shake the vehicle.

- Top up the reservoir (3) by adding brake fluid, see (LUBRICANT CHART), until bringing level between the "MIN" and "MAX" marks.



**⚠ WARNING**  
 Never exceed the "MAX" level. It is advisable to top up until reaching the "MAX" level only with new pads. When the disc pads wear out, the level of the fluid decreases progressively to compensate for their wear. Do not reach the "MAX" level with worn out pads, since this will cause a fluid outflow when the pads are changed.

- To refit components, follow the disassembly procedure in reverse order.

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**CHECKING AND TOPPING UP REAR BRAKE FLUID LEVEL**

- The brake fluid reservoir is on the right side of the vehicle.
- The procedure is the same as for the front brake.

**BLEEDING THE FRONT AND REAR BRAKES**

- See (SCHEDULED MAINTENANCE CHART) for maintenance intervals.
- The air, if any, present inside the hydraulic circuit will serve as "pad" by absorbing most of the pressure coming from the brake master cylinder and thus reducing the calliper efficiency during braking.
- If some air is present inside the circuit, the brake control is "spongy" and the braking efficiency is reduced.

**DANGER**

It is fundamental that air is bled off the hydraulic circuit after the brakes have been refitted and the braking system has been restored to its standard operating conditions, since it would be very dangerous for the vehicle and the rider not to do so.

Brake fluid is an irritant. Avoid contact with eyes or skin. In the event of accidental contact, wash affected body parts thoroughly. In the event of accidental contact with eyes, contact an eye specialist or seek medical advice.

**WARNING**

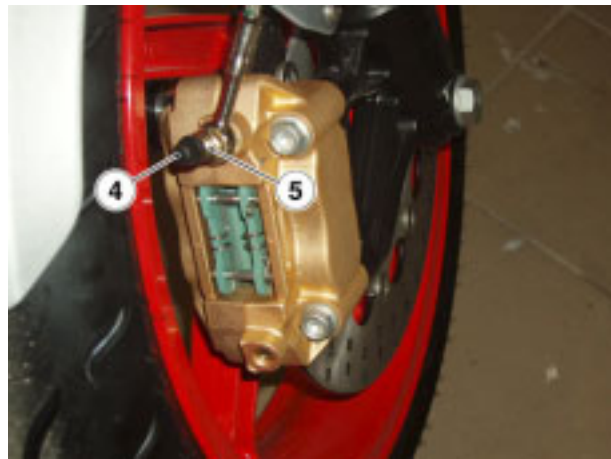
Brake fluid should be handled with care, as it chemically reacts with paintwork, plastic parts, rubber, etc.

Wear latex gloves when servicing.

When handling brake fluid, take care not to spill it onto plastic or paint-finished parts or they will damage.

**FRONT BRAKE**

- Top up the brake fluid reservoir.
- Remove the rubber cap (4) of the bleed valve (5).
- Insert one end of a transparent plastic tubing inside the calliper bleed valve (5) and the other end in a container for collection.
- Pull and release the brake lever repeatedly and finally keep it fully pulled in.
- Loosen the bleed valve by ¼ turn to let brake fluid drain into the container; this will remove any tension from the lever so it can reach end of travel position.



- Repeat process until the fluid draining into the container is totally clear of air bubbles.

**NOTE** Add fluid to the reservoir when needed while bleeding the hydraulic system. Make sure there is always some fluid in the reservoir throughout the process.

- Tighten the bleed valve (5) and remove the tubing.
- Top up brake fluid inside the reservoir up to correct level.
- Refit the rubber cap (4).



**REAR BRAKE**

- Top up the brake fluid reservoir.
- Remove the rubber cap (6) of the bleed valve (7).



- Insert one end of a transparent plastic tubing inside the calliper bleed valve (7) and the other end in a container for collection.
- Pull and release the brake lever repeatedly and finally keep it fully pulled in.
- Loosen the bleed valve by ¼ turn to let brake fluid drain into the container; this will remove any tension from the lever so it can reach end of travel position.
- Repeat process until the fluid draining into the container is totally clear of air bubbles.

**NOTE** Add fluid to the reservoir when needed while bleeding the hydraulic system. Make sure there is always some fluid in the reservoir throughout the process.



**RS125**

- Tighten the bleed valve (7) and remove the tubing.
- Top up brake fluid inside the reservoir up to correct level.
- Refit the rubber cap (6).

2.2.2. BRAKE PADS

**NOTE** The information provided below applies to both braking systems.

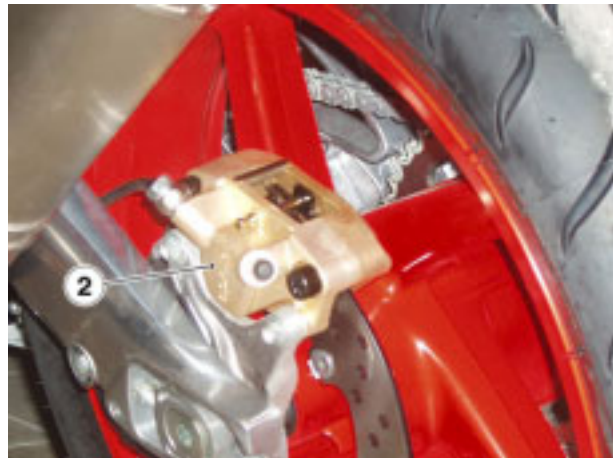
- Check the brake pads for wear after the first 1000 km (621 mi) and every 2000 km (1242 mi) afterwards.
- The wear of the disc brake pads depends on the use, on the riding style and on the road.



**WARNING**  
Check the brake pads for wear before each ride.

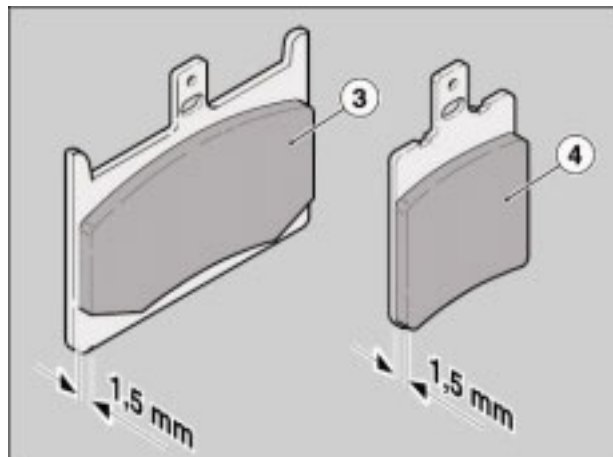


- Outlined below is a quick brake pad inspection procedure:
- Position the vehicle on the stand.
- Carry out a visual check between the brake calliper and the pads, proceeding:
  - from below, on the front part, for the front brake calliper (1);
  - from the top, on the rear part, for the rear brake calliper (2).



**WARNING**  
The excessive wear of the friction material would cause the contact of the pad metal support with the disc, with consequent metallic noise and production of sparks from the calliper; braking efficiency, safety and soundness of the disc would thus be negatively affected.

- If the thickness of the friction material (even of a single pad) has reduced to about 1.5 mm (0.05 in), have both pads changed.
  - Front brake pad (3).
  - Rear brake pad (4).





### 2.2.3. LIFTING THE FUEL TANK

**DANGER**

Allow for the engine and exhaust silencers to cool down completely before proceeding. Fuel vapours are harmful to human health. Ensure that the room is adequately ventilated before proceeding. Do not inhale fuel vapours. Do not smoke or use naked flames. **DO NOT DISPOSE OF FUEL IN THE ENVIRONMENT.**

- Take the fuel tank prop stand.
- Loosen and remove the screw and collect the spacer.
  
- Lift the fuel tank and position the prop stand.



#### 2.2.4. CLEANING THE AIR FILTER

- Check the air filter every 4000 km (2485 mi) or 12 months; change it every 8000 km (4970 mi) or more frequently if the vehicle has been used on dusty or wet roads.
- A partial cleaning of the air filter is allowed after riding in dusty or rainy conditions.

**WARNING**

The partial cleaning of the filter does not exclude or postpone the replacement of the filter itself.

Do not start the engine when the air filter is not in place.

Do not clean the filtering element with petrol or solvents, since they may cause a fire in the fuel supply system, with serious danger for the persons in the vicinity and for the vehicle.

**CLEANING**

- Remove the air filter, see (REMOVING THE AIR FILTER)
- Wash the filtering element with clean, non-inflammable solvents or solvents with high volatility point, then let it dry thoroughly.
- Apply filter oil or a thick oil (SAE 80W - 90) over the entire filter surface and then squeeze the filter to eliminate excess oil.

**WARNING**

Check to ensure the filtering element is not torn while cleaning it.

Replace the filtering element if torn.

**NOTE** The filtering element should be soaked in oil, but not to the point of dripping.

- Clean the outside of the air filter with a clean cloth.
- Clean the inside of the air box with a clean cloth.
- Clean the intake ducts.

**CHANGE****WARNING**

Do not use filters that have already been used.

Change the air filter with a new one of the same type.

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### 2.2.5. COOLANT

#### Check

- Check coolant level before each ride; change coolant every two years.



#### WARNING

Check the coolant level and top up the expansion tank with cold engine.

- Stop the engine and wait until it has cooled down.

**CAUTION** Place the vehicle on a firm and flat surface.

- Lift the fuel tank, see (LIFTING THE FUEL TANK).
- Hold the vehicle upright with both wheels on the ground.
- Make sure that the level of the fluid contained in the expansion tank (1) is included between the "MIN" and "MAX" marks.

If not so:

- Unscrew and remove the filler plug (2).



#### DANGER

Coolant is toxic when ingested and is an irritant, contact with eyes or skin may cause irritation.

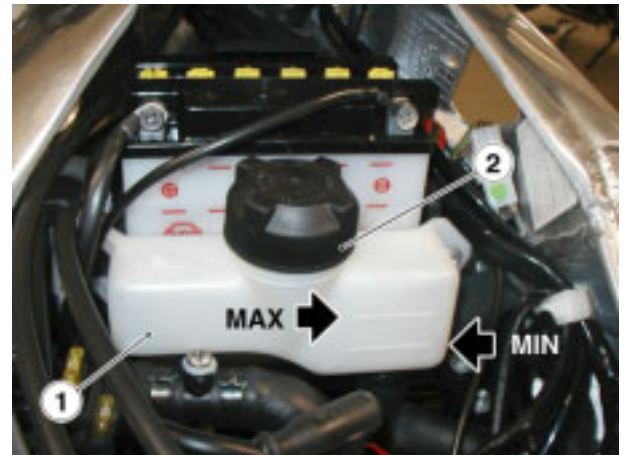
Do not attempt to check coolant level using your fingers or any objects.



#### WARNING

Do not put additives or other substances into the fluid.

If you use a funnel or other similar items, make sure that they are perfectly clean.



#### TOPPING UP

- Top up the expansion tank by adding coolant, see (LUBRICANT CHART), until coolant almost reaches the "MAX" level.
- Do not exceed this level, otherwise the fluid will flow out while the engine is running.
- Refit the filler plug (2).



#### WARNING

In case of excessive consumption of coolant and in case the expansion tank (1) remains empty, make sure that there are no leaks in the circuit.

### 2.2.6. REMOVING THE BATTERY

**NOTE** Removing the battery will reset the digital clock. To set time, see (INSTRUMENT PANEL OPERATION).

- Lift the fuel tank, see (LIFTING THE FUEL TANK).
- Disconnect the negative lead (-) first and then the positive lead (+).
- Remove the battery breather hose (1).
- Loosen and remove the screw (2).
- Move the coolant expansion tank (3) out of the way.
- Remove the battery from its housing and place it on a level surface, in a cool, dry place.



#### WARNING

On refitting, make sure to refit the breather hose correctly; connect the leads to positive terminal (+) first and then to the negative terminal (-).

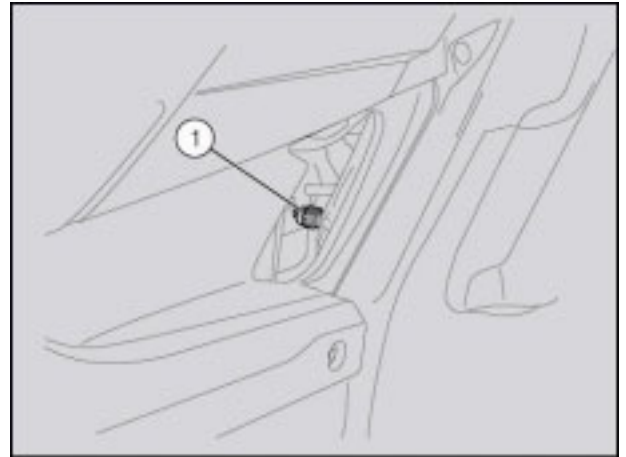


- If you need to remove the battery box mount, loosen and remove the screw (4).

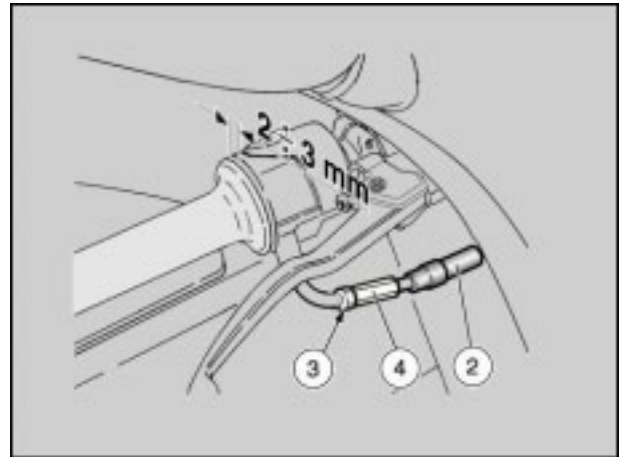


**2.2.7. IDLING SPEED ADJUSTMENT**

- Adjust idling speed in the event of erratic idling.
- Proceed as follows:
- Ride until covering several kilometres to warm up engine up to operating temperature (👤), see (INSTRUMENT PANEL OPERATION).
- Place the gearbox in neutral (green neutral light "N" on).
- Check rev counter reading.
- Engine idling speed should be about  $1250 \pm 100$  rpm.
- If necessary, proceed as follows:
- 



- Position the vehicle on the stand.
- Turn the knob (1).
- TURN KNOB CLOCKWISE to increase rpm.
- TURN KNOB COUNTERCLOCKWISE to decrease rpm.
- Turn the throttle twistgrip so as to accelerate and decelerate repeatedly to establish correct operation and make sure idling speed remains stable.



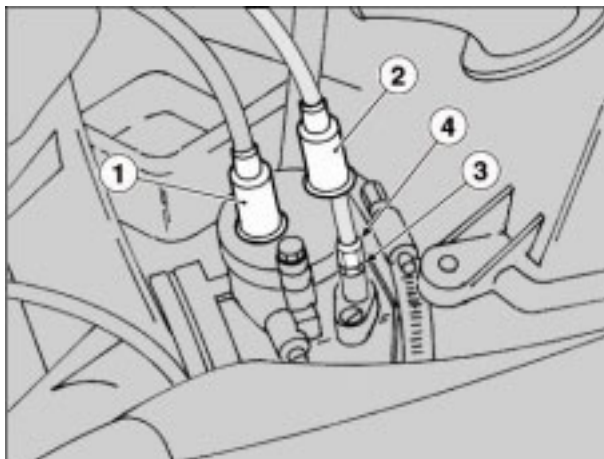
### 2.2.8. CHOKE ADJUSTMENT

Choke control play should be about  $2 \div 3$  mm ( $0.078 \div 0.118$  in).

To adjust play:

- Position the vehicle on the stand.
- Lift the fuel tank, see (LIFTING THE FUEL TANK).
- Stand on the left side of the vehicle.

**NOTE DO NOT** remove the throttle cable protection element (1).



- Withdraw the protection element (2).
- Loosen the nut (3).
- Turn the adjuster (4) on the carburetor.
- After the adjustment:
- Tighten the nut (3) to lock the adjuster (4) and refit the protection element (2).

**2.2.9. DRIVE CHAIN ADJUSTMENT**

If the chain needs adjusting after the inspection, proceed as follows:

- Place the vehicle on the rear support stand (OPT).
- Loosen the nut (1) completely.

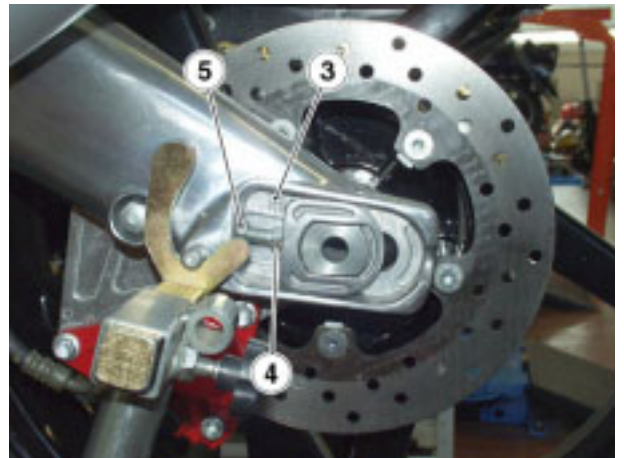


**WARNING**

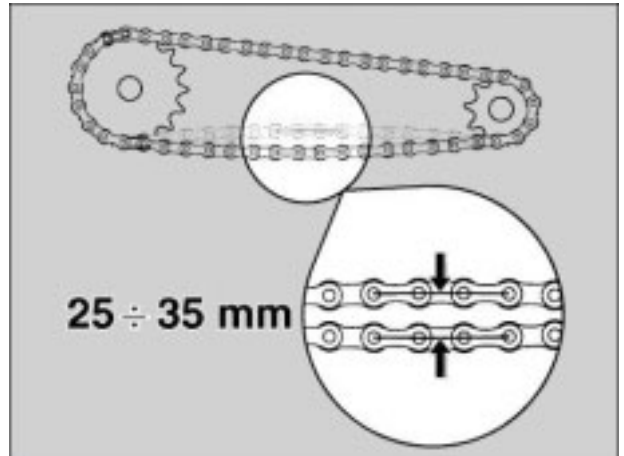
**Fixed references (2-3) for wheel centring are provided on the inside of the tensioner seats on the arms of the swinging arm, before the wheel shaft.**



- Loosen the two lock nuts (4).
- Turn the adjusters (5) and set chain slack so as to match the same reference marks (2-3) on the both sides of the vehicle.
- Tighten the two lock nuts (4).
- Tighten the nut (1).



- Check **chain slack** as follow:
  - Stop the engine.
  - Position the vehicle on the stand.
  - Position the gear shift lever in neutral.
  - Check slack in the lower span of chain midway between front and rear sprocket; slack should be about 25 ÷ 35 mm (0.98 in. – 1.38 in.).
  - Move the vehicle forward so as to check chain slack at several different positions; slack should remain the same throughout one full turn of the wheel.



**WARNING**

**If the chain has more slack at some given positions, it means that some links are squashed or seized. To prevent the risk of seizure, lubricate the chain frequently, see (LUBRICANT CHART).**

- If slack is the same at all positions but outside the 25 ÷ 35 mm (0.98 in. – 1.38 in.) range, adjust the drive chain again.

**WARNING**

Too much slack will result in noise or cause the chain to rattle, leading to slider and chain guide plate wear.

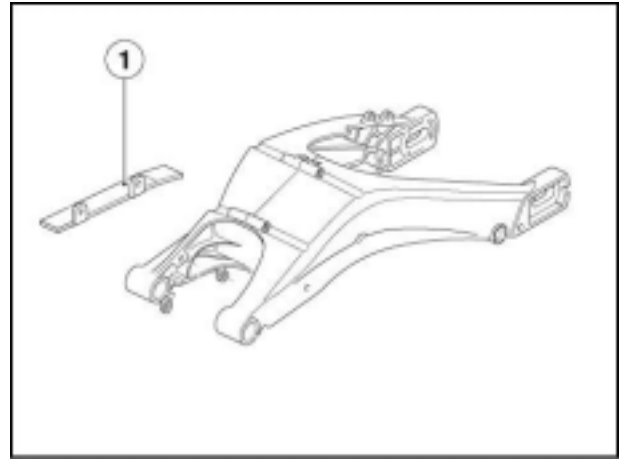
Improper maintenance may lead to early wear of the chain and/or sprocket damage.

Carry out the maintenance operations more frequently if you use the vehicle in rainy and dusty areas or under severe conditions.



**2.2.10. INSPECTING THE DRIVE CHAIN SLIDER**

- Position the vehicle on the stand.
- Check the chain slider (1) for wear or damage, and replace it if necessary, see (REMOVING THE DRIVE CHAIN SLIDER).



FUEL SYSTEM

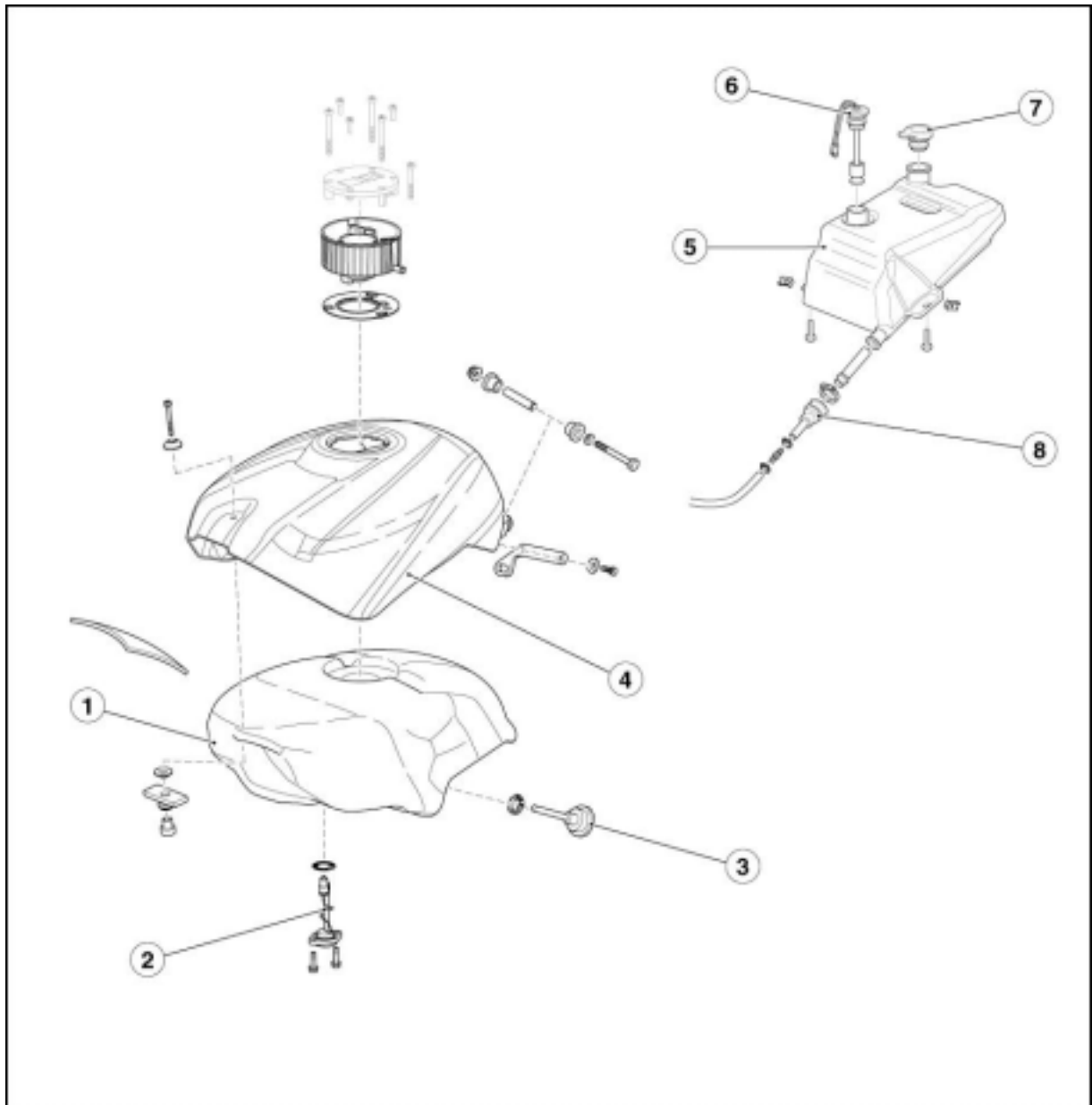
3

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3.2.1. REMOVING THE AIR FILTER ..... 7

### 3.1. FUEL SYSTEM

#### 3.1.1. FUEL SUPPLY SYSTEM DIAGRAM



**Key:**

1. Fuel tank
2. Fuel sensor
3. Fuel cock
4. Fuel tank cover
5. Oil reservoir
6. Oil level indicator
7. Oil tank plug
8. Rubber block

**3.1.2. REMOVING THE FUEL TANK**

- Remove the seat, see (REMOVING THE SEAT).
  - Lift the fuel tank, see (LIFTING THE FUEL TANK).
  - Disconnect the fuel sensor connector.
- 
- Release the two fuel vapour hoses from the clamps.
  - Remove the prop stand and lower the fuel tank.
  - Loosen and remove the screw and collect nut and washer.
- 
- Lift the fuel tank out of the frame in an upward motion.



### 3.1.3. REMOVING THE OIL TANK

- Remove the seat, see (REMOVING THE SEAT).
- Remove the small flap in a downward motion.



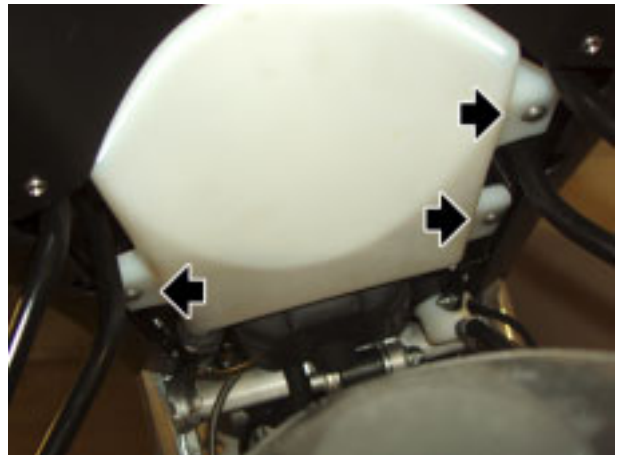
- Disconnect the oil level sensor connectors.



- Place a container of adequate capacity under the oil mixer hose.
- Disconnect the clamp and drain mixer oil into the container.
- Remove the oil mixer tank plug and let all oil drain off of the tank.



- Release and remove the three screws.



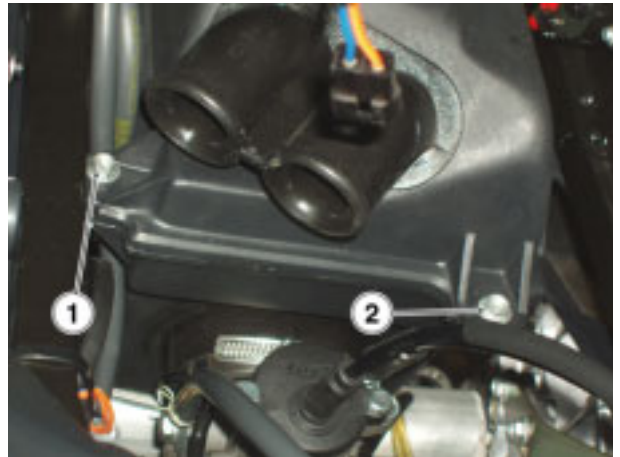
- Remove the oil mixer tank in a downward motion.



### 3.2. AIR FILTER

#### 3.2.1. REMOVING THE AIR FILTER

- Lift the fuel tank, see (LIFTING THE FUEL TANK).
- Unscrew and remove the two screws (1).



- Loosen and remove the two screws (2) and collect the nuts from underneath.



- Remove the air box cover.
- Remove the filtering element along with the containment meshes.

**NOTE** Block off the opening with a clean cloth to prevent foreign bodies from getting into the intake ducts.





ENGINE

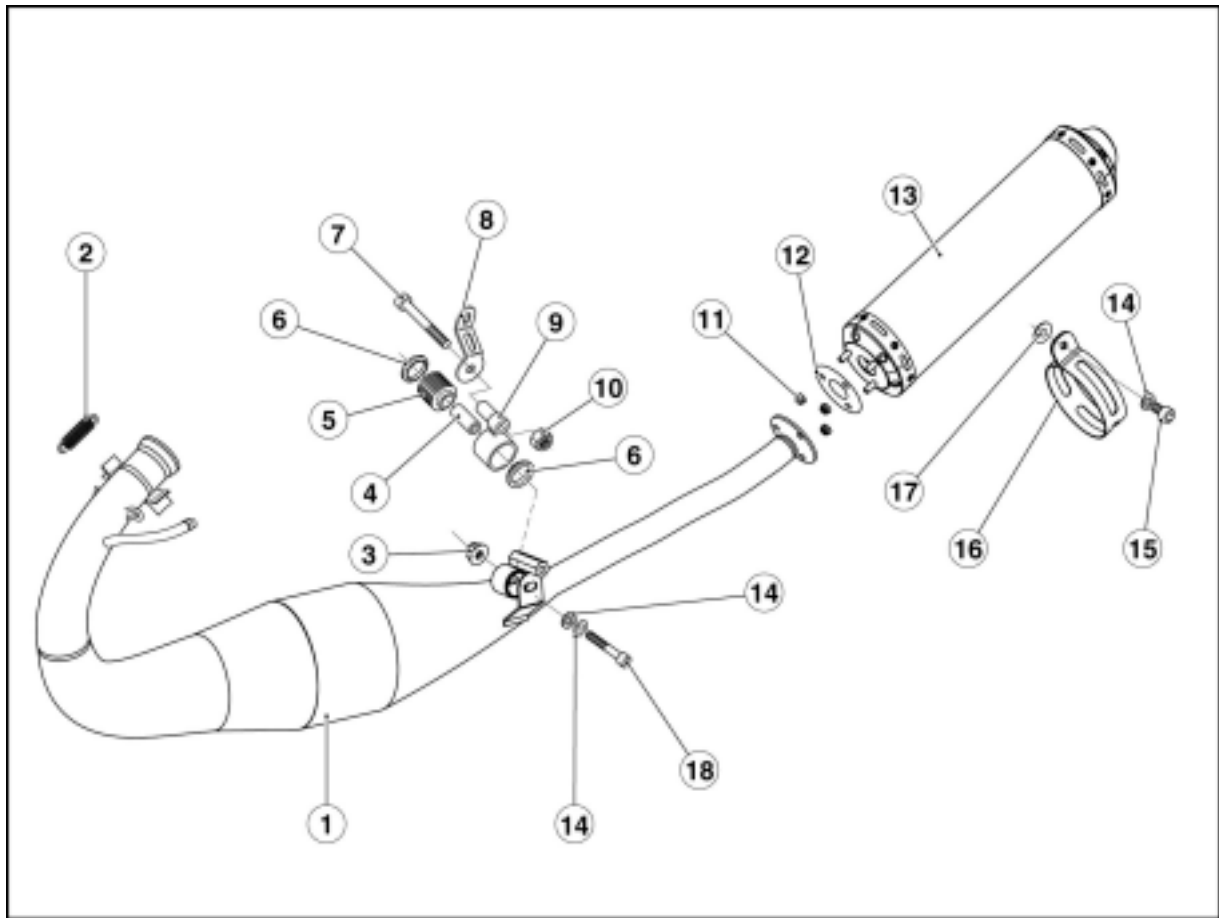
4

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## 4.1. EXHAUST

## 4.1.1. DIAGRAM



## Key:

1. Muffer
2. Spring
3. Flanged self-locking nut
4. Spacer
5. Silent block
6. Washer
7. Shear bolt
8. Fairing retaining plate
9. Muffer central bracket
10. Short self-locking nut
11. Flanged self-locking nut
12. Silencer gasket
13. Silencer
14. Curved spring washer
15. Socket-head screw
16. Silencer clamp
17. Washer
18. Socket-head screw

**4.1.2. REMOVING THE EXHAUST SYSTEM**

- Remove the lower fairing, see (REMOVING THE LOWER FAIRING).
- Remove the side fairings, see (REMOVING THE SIDE FAIRINGS).
- Remove the lower cowl, see (REMOVING THE LOWER COWL).
- Remove the clamp.



- Remove the secondary air hose.



- Unhook both springs from the exhaust flange on the cylinder.



- Working on either side, loosen and remove the screw and collect mounting bracket and spring.



## RS125

- Loosen and remove the screw on the left passenger footrest bracket and collect the spacers.



- Loosen and remove the screw and collect nut and washer.



- Remove the complete exhaust from the left side.

**WARNING**

On refitting, replace the exhaust gasket and ensure that the mounting brackets are positioned correctly.



## 4.2. SECONDARY AIR SYSTEM

### 4.2.1. SECONDARY AIR SYSTEM

The Secondary Air System (SAS) has been developed to reduce carbon oxide and unburnt hydrocarbon emissions in vehicles that are not equipped with a lambda sensor. Natural air (which is rich in oxygen) is channelled into the exhaust stream to trigger a post-combustion process.

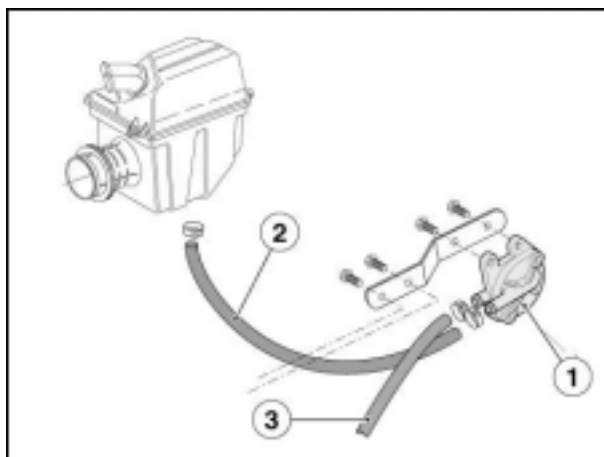
The secondary air system is especially useful when the engine is idling and during warm-up, as the catalyst alone is not capable of triggering post-combustion under these operating conditions.

The post-combustion process is activated just outside of the combustion chamber and raises the temperature of the exhaust gasses for a quick light-off of the catalyst. The secondary air system operates on pressure fluctuation in the exhaust system.

During depression stages, the exhaust takes in oxygen-rich air from the secondary air system so unburnt gasses in the exhaust stream -hot and active- can complete the combustion.

During overpressure stages, the secondary air reed valve cuts air supply to prevent backflow.

The reed valve is equipped with a cut-off device -controlled by a vacuum pick-up point on the intake manifold- that shuts down additional air during cut-off stages, as exceedingly lean exhaust gasses would lead to exhaust blowing, resulting in exhaust valve and catalytic converter damage.



#### WARNING

When adjusting the CO rate, disable the Secondary Air System or exhaust gas dilution caused by the system would give a wrong reading of the carbon monoxide percentage. See CO ADJUSTMENT for instructions on how to disable the SAS.



#### WARNING

After setting the CO rate, remember to re-enable the Secondary Air System. The vehicle will operate regularly even with system disabled but in this case the harmful emissions will be higher. Moreover, overheating might derive due to air not circulating, thus causing damages to SAS tubes and unions.



#### DANGER

Stop air from circulating using only suitable equipment; using plugs to block off the air box scoop might overheat and damage the secondary air system and, if left there for a certain time, the plug might enter the intake channel while the vehicle is running, thus jamming the throttle and making the vehicle impossible to control.

### 4.3. REMOVING AND INSTALLING THE ENGINE

#### 4.3.1. REMOVING THE ENGINE FROM THE FRAME



#### WARNING

Before beginning the next procedure, prepare and position the necessary equipment considering that you will need to lower the engine into the frame in order to remove it.

**NOTE** Prepare a hoist and lifting slings.

- Position the vehicle on the front stand (OPT).
- Remove the lower cover, see (REMOVING THE LOWER COVER).
- Remove the fuel tank, see (REMOVING THE FUEL TANK).
- Remove the lower fairings, see (REMOVING THE LOWER FAIRINGS).
- Remove the lower cowl, see (REMOVING THE LOWER COWL).
- Remove the side fairings, see (REMOVING THE SIDE FAIRINGS).
- Lift hoist arm until the slings attached to the frame are stretched taut.
- Remove the complete exhaust, see (REMOVING THE EXHAUST SYSTEM).
- Remove the radiator, see (REMOVING THE RADIATOR).
- Loosen the screw and withdraw the gearbox connecting rod; leave the connecting rod attached to pushrod and gear change lever.



- Release the clamp (1).

**NOTE** Place some paper under the union to collect any oil drops.

- Disconnect the oil hoses and block off the open ends.



- Loosen and remove the three screws and remove the oil pump cover



- Loosen the adjuster nut.



- Remove the throttle cable from the oil pump.



**WARNING**  
On refitting, adjust throttle cable tension using the nut on the oil pump.





## RS125

- Disconnect the spark plug cap.



- Disconnect the thermistor electric connector.



- Remove the clamp and slide out the hose from the cylinder head cover.



- Loosen the lock washer (2) completely.
- Tighten the adjuster (3) completely.
- Disconnect the clutch cable (4) from the lever.



- Loosen and remove the gearbox fluid filler plug.



- Lever the clutch cable out of its housing using a small flat screwdriver and remove the cable.
- Slide out the clutch cable.

**WARNING**

On refitting, check clutch lever free play, see (CLUTCH ADJUSTMENT).



- Remove the battery, see (REMOVING THE BATTERY).
- Remove the clamp and disconnect the expansion tank hose.



- Loosen and remove the two screws and remove the sprocket cover.



## RS125

- Remove the circlip.

**NOTE** Slacken the drive chain moderately to facilitate removal of the drive sprocket.

- Slide drive sprocket and chain off the shaft.



- Disconnect the following connectors in the order:
  - Starter motor, by releasing the wiring from the ties and removing the screw.



- Generator.



- Pick-up.



- Control unit ground.



- Release the clamps.



- Disconnect the neutral sensor.



## RS125

- Loosen the clamp.



- Loosen and remove the four screws and remove the air box cover.



- Remove the clamp and disconnect the secondary air hose.



- Slide the intake manifold off the carburettor pushing the air box rearwards.
- Loosen and remove the two screws and remove the throttle cable.



- Loosen and remove the screw and disconnect the choke cable.



- Loosen and remove the screw to disconnect the system ground connectors.

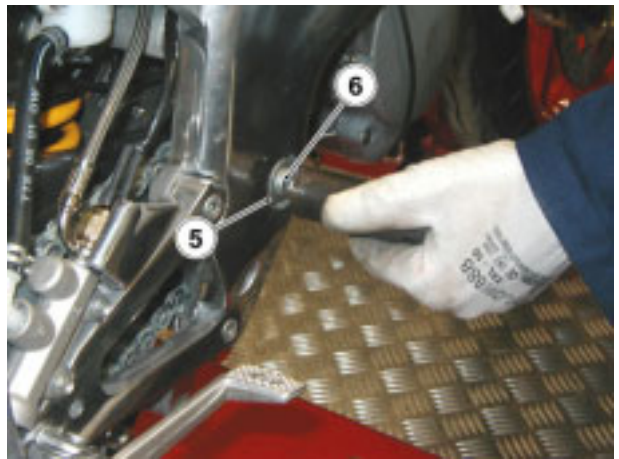


## RS125

- Loosen and remove the screw and disconnect the speed sensor.



- Working from the right side with the box wrench for swinging arm pivot adjustment (part no. 8101945), loosen the ring nut (5) completely.
- Loosen the ring nut adjusting bush (6).



- Working on the left side, loosen and remove the swinging arm pivot (7) and collect the two washers.
- Remove the swinging arm from the frame.



- Loosen and remove the screw at the rear lower end and collect nut and washer.



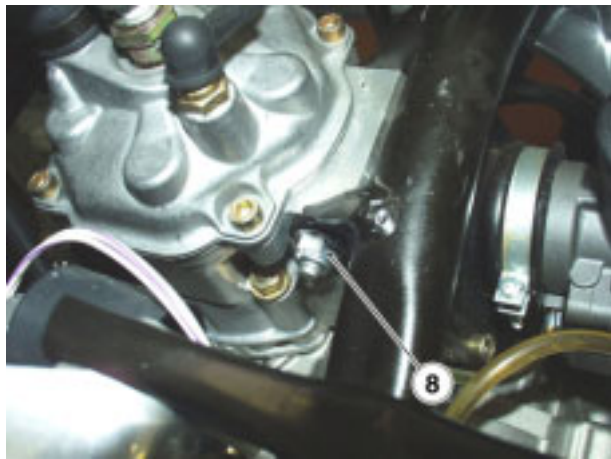
- Working from the right side of the vehicle, loosen and remove the nut and collect the washer.
- Slide out the screw, on the opposite side.

**WARNING**

The engine is heavy. Have someone assist you with the next operations. Plan the whole procedure before proceeding.

**NOTE** Prepare a stand under the engine.

- Loosen and remove the nut (8) and collect the washer.

**DANGER**

Now the engine is retained to the frame by the upper screw only. Proceed with care and be careful of your fingers and limbs. Clear an area on the floor from any tools. This is where you will place the engine.

- Support the engine and remove the screw.
- Lower the engine until it is resting securely on the stand.



#### 4.3.2. INSTALLING THE ENGINE INTO THE FRAME

- Shift the engine in small motions until matching the mounting holes perfectly.
- Insert the upper screw with its washer and tighten the nut (1).



- Insert the upper screw with its washer and tighten the nut.



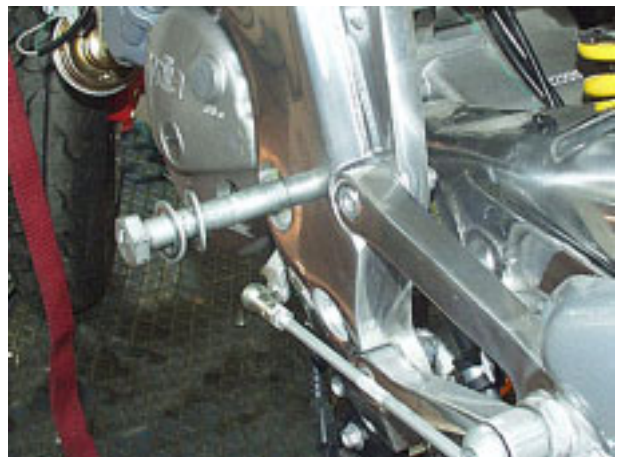
- Insert the rear lower screw with its washer and tighten the nut.



#### **WARNING**

**Have someone help you in positioning and fastening the swinging arm.**

- Position the swinging arm on the frame.
- Set the swinging arm in position so as to match the holes and insert the pivot fully from the left side.



- To achieve correct swinging arm pivot play, tighten the ring nut adjusting bush (2) fully home and then tighten one more  $\frac{1}{4}$  of a turn.

**NOTE** Make sure to have the suitable box wrench for swinging arm pivot adjustment (part no. 8101945) ready at hand.

- Hold the bush (3) steady and tighten the ring nut (2) with the special tool (part no. 8101945).



- Now adjust the rear swinging arm as follows:
  - Use the box wrench for swinging arm pivot adjustment (part no. 8101945) to loosen the ring nut (2) completely working from the right side.
  - Tighten the ring nut adjusting bush (3) to the specified torque.
  - Tighten the ring nut (2) using the suitable box wrench (part no. 8101945).
  - Tighten the swinging arm pivot.

- Position the speed sensor and tighten the screw.



- Position the choke cable and tighten the screw.



## RS125

- Fit the intake manifold to the carburettor pushing the air box forward.
- Fit the throttle cable and tighten the two screws.



- Fit a new clamp and connect the secondary air hose.



- Fit the air box cover and tighten the four screws.





- Tighten the clamp.



- Connect the following connectors in the order:
  - system ground, by tightening the screw.



- Connect the neutral sensor.



## RS125

- Change the clamps.



- Control unit ground.



- Pick-up.



- Generator.



- Starter motor, by releasing the wiring and tightening the screw.



- Fit the drive sprocket with the chain to the shaft.
- Fit the circlip.



- Fit the sprocket cover and tighten the two screws to secure it in place.



## RS125

- Install the battery, see (REMOVING THE BATTERY).
- Fit a new clamp and connect the expansion tank hose.



- Refit the clutch cable into its housing.



- Tighten the gearbox fluid filler plug.



- Fit the clutch cable (4) to the clutch lever.
- Loosen the adjuster (5).
- Tighten the lock washer (6) but not fully.
- Check clutch lever free play, see (CLUTCH ADJUSTMENT).



- Fit a new clamp and fit the hose onto the cylinder head cover.



- Connect the thermistor electric connector.



- Fit the spark plug cap.



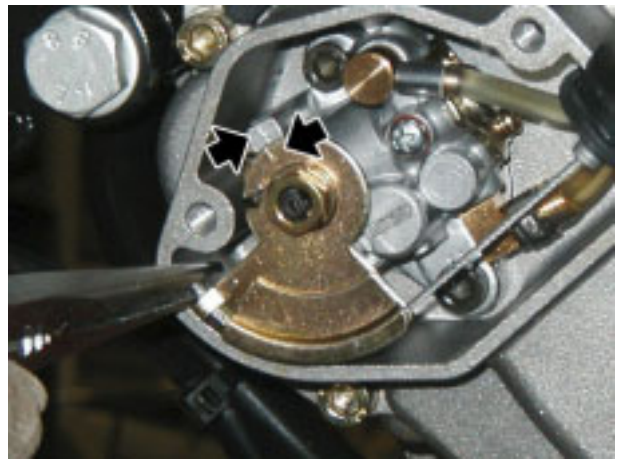
- Fit the throttle cable to the oil pump.





## RS125

- Adjust throttle cable tension by turning the nut on the oil pump until the two reference marks are aligned.



- Fit the oil pump cover and tighten the three screws.



- Connect the oil hoses and secure them with a new clamp.



- Position the gearbox connecting rod and tighten the screw.



- Install the radiator, see (REMOVING THE RADIATOR).
- Install the complete exhaust, see (REMOVING THE EXHAUST SYSTEM).
- Install the lower cowl, see (REMOVING THE LOWER COWL).
- Install the lower fairings, see (REMOVING THE LOWER FAIRINGS).
- Install the lower cover, see (REMOVING THE LOWER COVER).
- Install the fuel tank, see (REMOVING THE FUEL TANK).
- Install the side fairings, see (REMOVING THE SIDE FAIRINGS).

After installing the engine, perform the following procedures.

- Ensure the engine mounting screws/nuts are at the correct tightening torque.
- Top up coolant level, see (COOLANT).
- Check drive chain tension and adjust as required, see (DRIVE CHAIN).

**NOTE** Check all components that have been removed and refitted, taking care to ensure that:

- wiring is firmly secured with suitable ties;



**WARNING**

**Wiring must not be twisted and/or trapped under any components.**

- wiring connectors are matched to the correct components;
- hoses and couplings are correctly in place and firmly secured with suitable clamps;
- throttle and choke cables slide freely and do not bind when handlebar is turned.

#### 4.4. RAVE VALVE

##### 4.4.1. RAVE VALVE GENERAL INFORMATION

The exhaust valve is solenoid-actuated via a Bowden cable. The ECU determines engine rpm based on primary circuit frequency input and operates the solenoid within a preset rpm range.

**NOTE** *Using the exhaust valve on type-approved 11kW vehicles makes such vehicles illegal to ride on public roads. Any such vehicles equipped with this valve may only be used for racing or on closed-circuit tracks.*

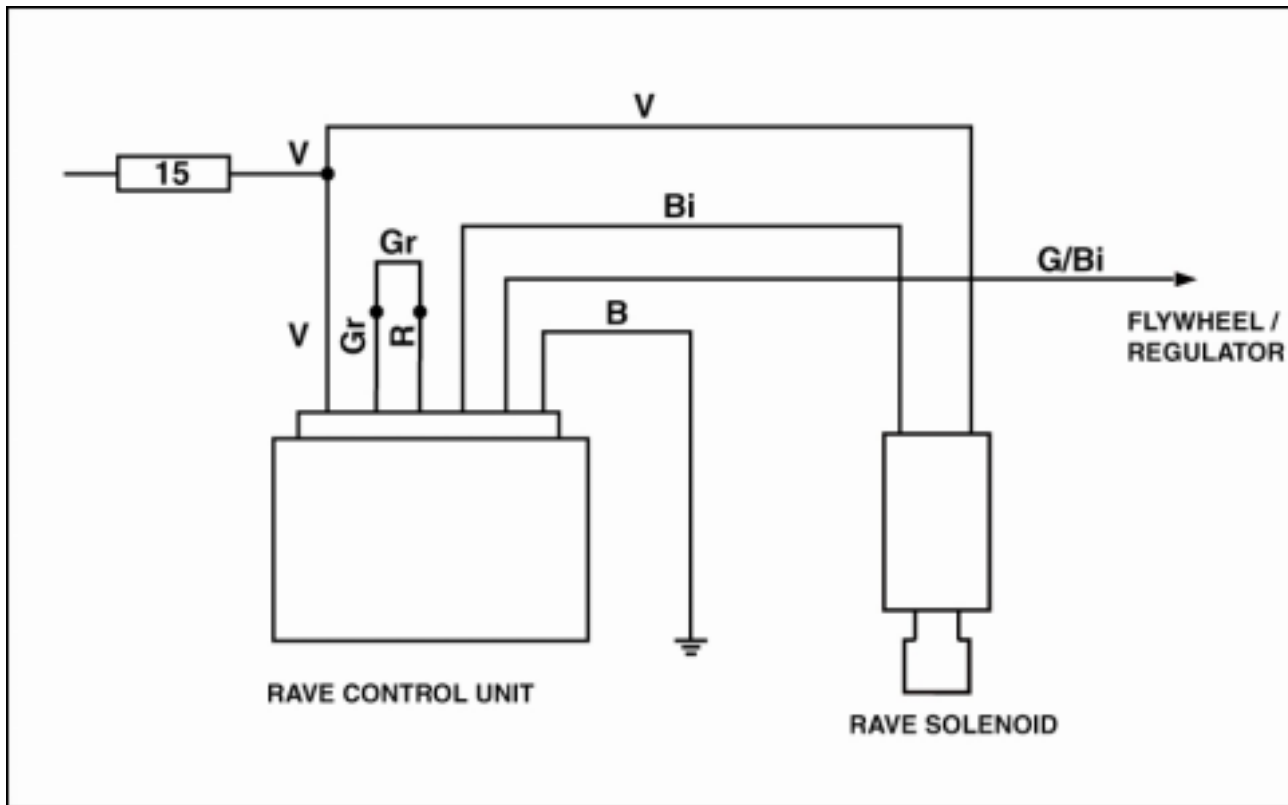
##### “RAVE” valve operation

- The exhaust valve opens between 500 and 2500 rpm to allow for valve stem self-cleaning.
- It closes between 2550 rpm and the actuation point (about 8000 rpm, varies with engine version).
- Beyond the actuation point, the valve stays open.

##### RAVE valve actuation points:

Strada.....8000 - 8100 rpm.  
Sport Pro.....8300 - 8400 rpm.

## 4.4.2. RAVE VALVE CIRCUIT



The solenoid controlled by the Rave control unit opens the exhaust valve at 8100 rpm.

## TROUBLESHOOTING

- Check the condition of the 15-A fuse
- Connect a 12 V battery to the solenoid and check it for proper operation.
- Check the flywheel.
- Replace the regulator with one that is known to operate correctly.
- Replace the Rave control unit with one that is known to operate correctly.

**WARNING**

Cutting the jumper across the grey and red wires of the Rave control unit will set solenoid actuation threshold to 7,800 rpm.

## RS125

## CONTROL UNIT

- Remove the fuel tank, see (REMOVING THE FUEL TANK).
- Remove the battery along with its box mount, see (REMOVING THE BATTERY).
- Disconnect the connector.
- Start the engine and turn on the low beam.
- Rev the engine up to 2500 rpm:



- Measure voltage across the green (V) and blue (B) wires with a tester:

Correct reading =  $12.25 \pm 1$  V D.C.

- Measure voltage across the yellow (G) and blue (B) wires with a tester:

Correct reading =  $8.5 \pm 1$  V A.C.

**NOTE** Readings outside the specified ranges indicate a system fault, not a control unit fault.

## SOLENOID

- Check that the piston moves freely.
- Start the engine and keep it at idling speed
- Measure resistance across the wires using a tester:
- Correct reading =  $2.2 \text{ Ohm} \pm 10\%$ .
- Measure voltage across the solenoid wires with a tester:

Correct reading =  $11.5 \pm 1$  V at idling speed during a one-second (only) pulse; after this initial pulse, reading should stabilise at  $5.5 \pm 1$  V D.C.

#### 4.4.3. REMOVING THE EXHAUST VALVE

- Remove the fuel tank, see (REMOVING THE FUEL TANK).
- Remove the battery along with its box mount, see (REMOVING THE BATTERY).

#### PARTIAL REMOVAL

- Move the protection element (1) out of the way.
- Loosen and remove both screws (2) and collect the lock washers.

If the valve moves freely:

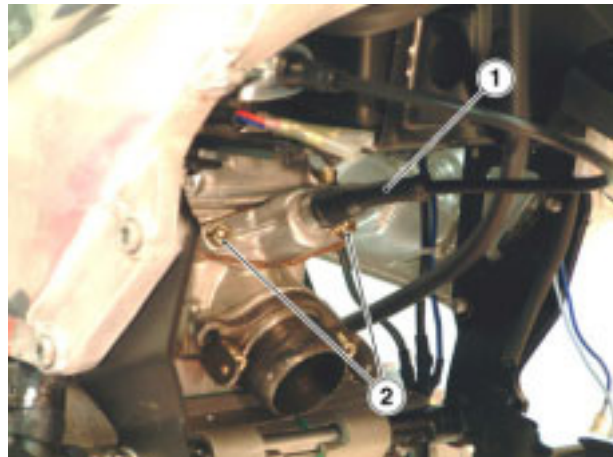
- Take the exhaust valve assembly along with the Bowden cable out of the cylinder.
- Rotate the valve stem housing (3) through 180° and disconnect the Bowden cable (4).
- If the exhaust valve is jammed in the open position (due to combustion residue):
- Push back the valve stem housing (3) using a screwdriver.



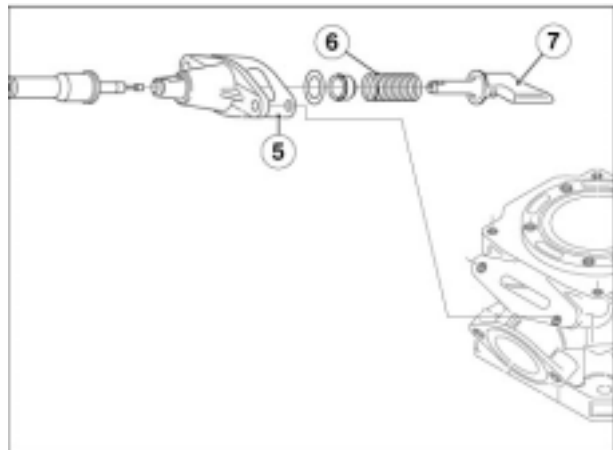
#### WARNING

Take care to not damage the sealing surface.

- Rotate the valve stem housing (3) through 180° and disconnect the Bowden cable (4).



- Remove the valve stem housing (3) and collect spring (6) and seal (5).
- Remove the exhaust valve (7) using the valve puller, see (EXHAUST VALVE PULLER).



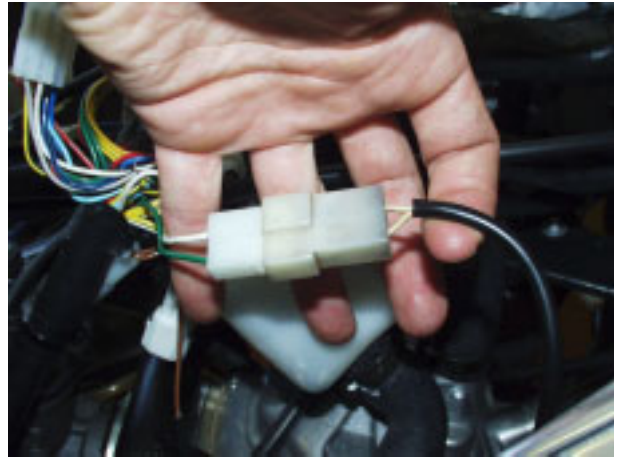
#### COMPLETE REMOVAL

- Loosen and remove both RAVE valve screws and collect the lock washers.
- Take the exhaust valve assembly out of the cylinder.



## RS125

- Disconnect the control unit connector from the system.



- Loosen and remove both screws (8) of the battery mount frame.
- Remove the complete RAVE valve.



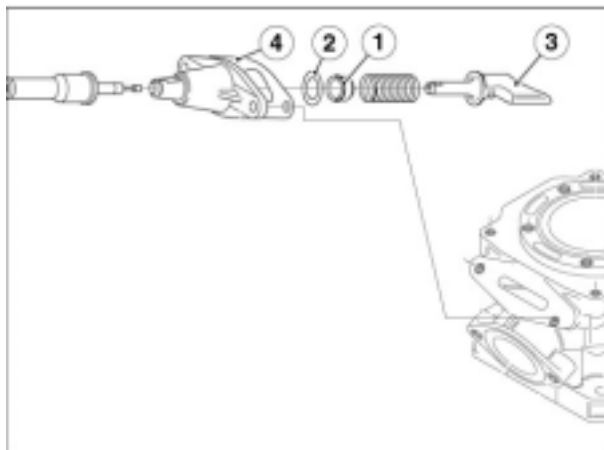
#### 4.4.4. CHECKING THE COMPONENTS

##### SEALS

- Check the valve stem seal (1) and the O-ring (2) located inside the valve housing for wear or damage.

##### EXHAUST VALVE

- Clean off any combustion residue from exhaust valve (3) and valve port in the cylinder.
- Check the exhaust valve for wear or damage.



##### CYLINDER GASKET

Always use a new cylinder gasket (4) on refitting.

##### SOLENOID

- Check the control unit using the diagram for reference, see (RAVE VALVE CIRCUIT).



#### 4.4.5. RAVE VALVE INSTALLATION

- Remove the fuel tank, see (REMOVING THE FUEL TANK).
- Remove the battery along with its box mount, see (REMOVING THE BATTERY).
- On derated vehicles, remove the fixed slide valve by unscrewing the two screws (1) and collect the washers before installing the RAVE valve.



#### COMPLETE INSTALLATION

- Insert the exhaust valve assembly complete with gasket (5) into the cylinder.

**NOTE** Always use a new gasket (5) on refitting.

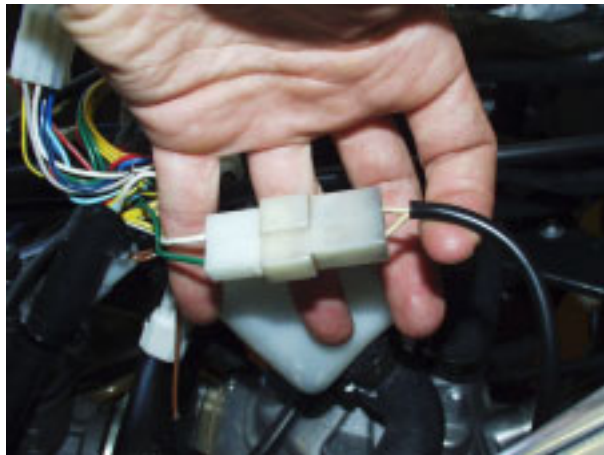
- Install the exhaust valve assembly using the two screws (1) with washers of the fixed slide valve.



- Install the control unit and secure it to the battery mount frame using the two screws (2).



- Connect the control unit connector to the system.



## PARTIAL INSTALLATION

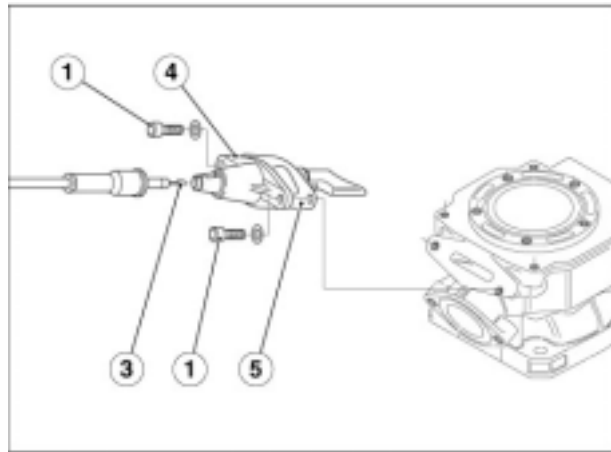
- Connect the Bowden cable (3) to the valve stem housing (4).
- Rotate the valve stem housing (4) through 180°.

**NOTE** The cable connection should be pointing downwards.

- Refit the protection element.
- Insert the exhaust valve assembly complete with gasket (5) into the cylinder.

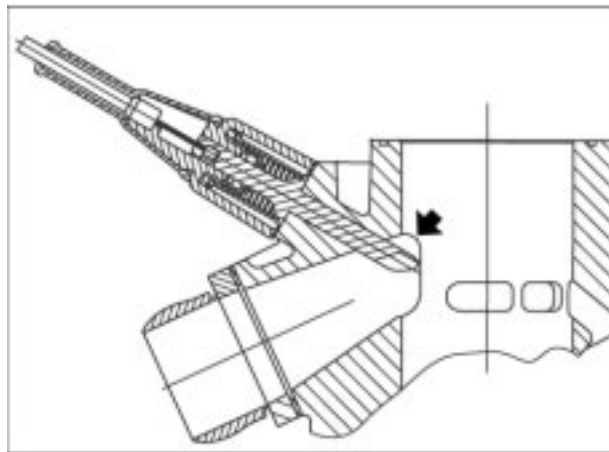
**NOTE** Always use a new gasket (5) on refitting.

- Fit the two screws (1) of the exhaust valve assembly with their washers and tighten.

**WARNING**

**After installing the exhaust valve assembly, check for the following:**

- when the valve is fully open, the edge of the valve stem should be flush with the exhaust port; remove the exhaust flange to check this alignment, see (REMOVING THE EXHAUST SYSTEM);
- the exhaust valve should move freely.



CHASSIS

5

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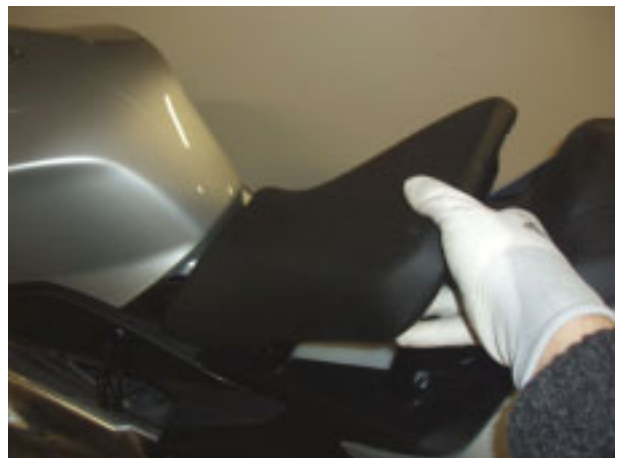
## 5.1. REMOVING THE OUTER STRUCTURES

### 5.1.1. REMOVING THE SEAT

- Insert the key in the seat latch and turn it anticlockwise.

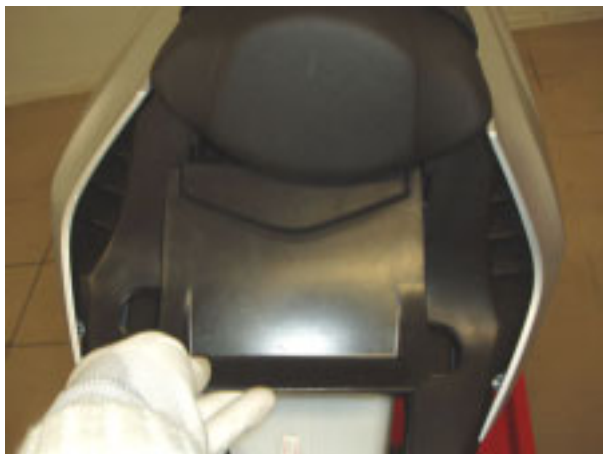


- Remove the seat and take out the key.



**5.1.2. REMOVING THE PASSENGER SEAT**

- Remove the seat, see (REMOVING THE SEAT).
- Remove the small flap in a downward motion.



- Release and remove the two screws.



- Remove the passenger seat by withdrawing it from the front.



### 5.1.3. REMOVING THE SIDE FAIRINGS

**WARNING**

Allow for the engine and exhaust silencer to cool down completely before working on the side fairings.

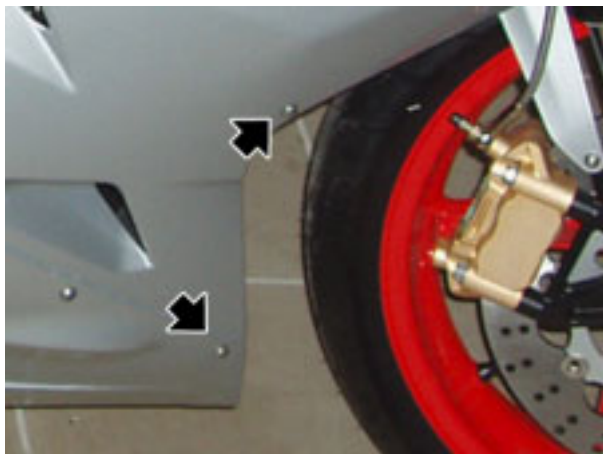
**NOTE** The following information applies to both side fairings.

- Release and remove the two screws.
- Disconnect the two turn indicator electric connectors.
- Loosen and remove the three lower screws.
- Loosen and remove the screw (1) and collect the collar.
- Loosen and remove the screw (2).
- Ease off the side fairing taking care to pull the upper tabs gently out of their seats in the headlight fairing.



**5.1.4. REMOVING THE LOWER COWL**

- If you have not removed the side and lower fairings yet, loosen and remove the two screws working on both sides.



- Working on either side, loosen and remove the screw.



- Remove the lower cowl.





**5.1.5. REMOVING THE LOWER FAIRINGS**

- Working on either side, loosen and remove the four screws.



- Remove the lower fairings in a downward motion.



**5.1.6. REMOVING THE HEADLIGHT FAIRING**

- Working on either side, loosen and remove the screw.



- Working on either side, release the side deflector.



- Working on either side, loosen and remove the two screws.



- Fold in the rear view mirrors and loosen and remove the four retaining screws.



## RS125

- Push the headlight fairing forward.
- Disconnect the parking light connector.



- Disconnect the high / low beam light connector.

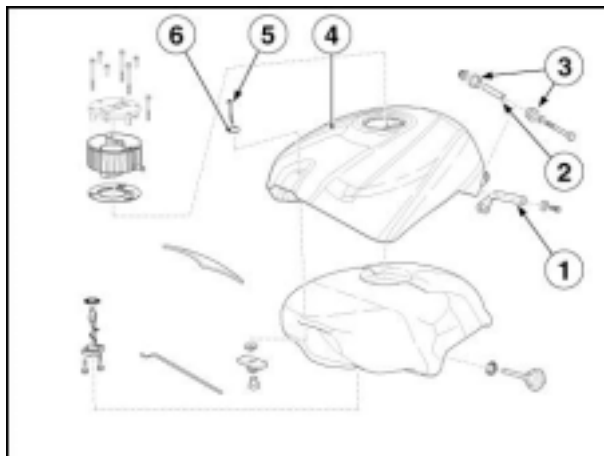


- Remove the headlight fairing in a forward motion.



**5.1.7. REMOVING THE TANK FAIRING**

- Remove the fuel tank, see (REMOVING THE FUEL TANK) and place it on a bench.
- Remove the two rubber elements (3) and the spacer (2).



- Loosen and remove the two screws and collect the washers.

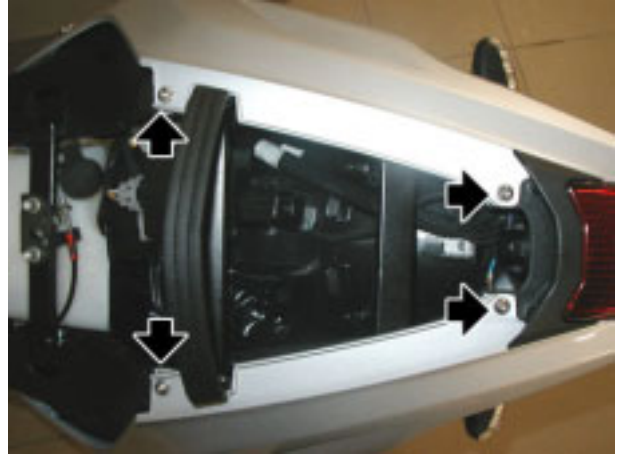
**NOTE** Refit the rubber spacer (1) in the correct position on refitting.



- Remove the fuel tank plug.
- Remove the tank fairing (4) and collect bush (6) and rubber element (5) from the front end.

**5.1.8. REMOVING THE TAIL GUARD**

- Remove the passenger seat, see (REMOVING THE PASSENGER SEAT).
- Release and remove the four screws.



- Working on either side, loosen and remove the three lower screws.



- Disconnect the tail light connector.



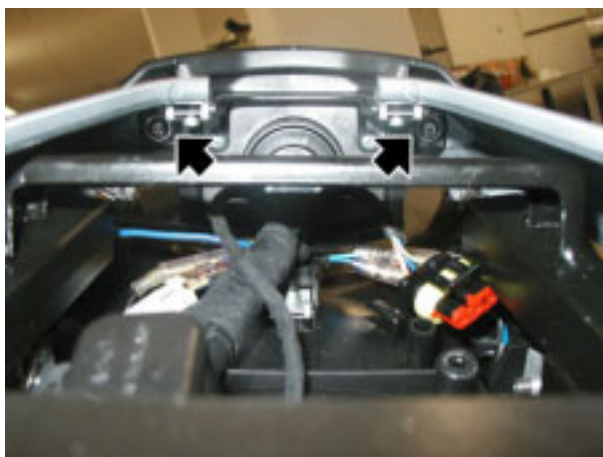
- Remove the tail guard complete with tail light pulling rearwards.

**5.1.9. REMOVING THE TAIL LIGHT**

- Remove the passenger seat, see (REMOVING THE PASSENGER SEAT).
- Disconnect the tail light connector.



- Release and remove the two screws.



- Remove the tail light pulling rearwards.

**5.1.10. REMOVING THE LOWER COVER**

- Remove the passenger seat, see (REMOVING THE PASSENGER SEAT).
- Working on either side, loosen and remove the three screws.



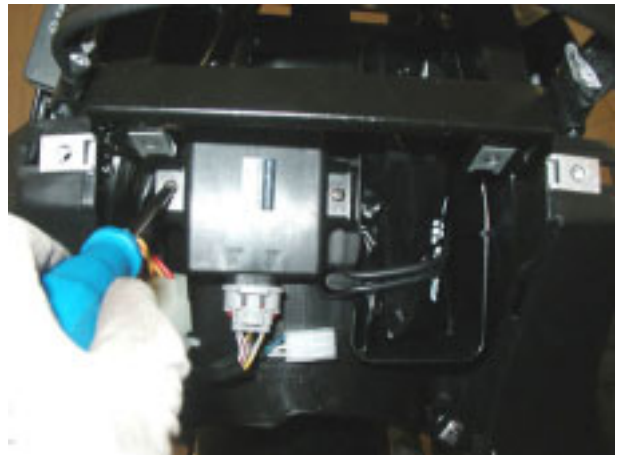
- Working on either side, loosen and remove the screw.



- Pull the connector out of its seat.



- Loosen and remove the two screws and move the control unit aside.



- Working on either side, loosen and remove the two screws.



- Remove the lower cover.

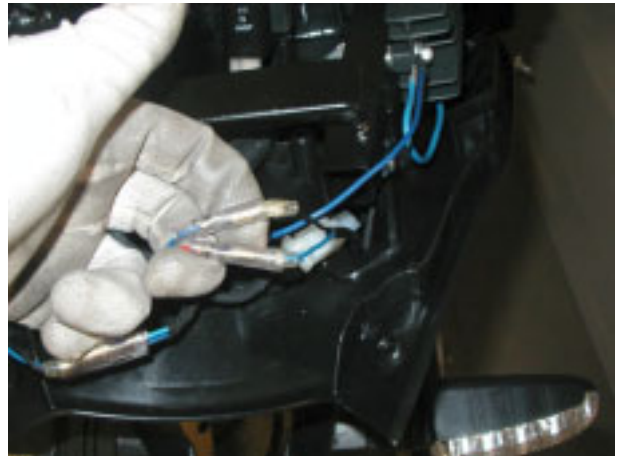


**5.1.11. REMOVING THE NUMBER PLATE HOLDER**

- Remove the tail guard, see (REMOVING THE TAIL GUARD).
- Disconnect the number plate light connector.



- Disconnect the four turn indicator connectors and pull them out in a rearward motion.



- Working on either side, loosen and remove the screw.



- Unscrew and remove the screw.



- Remove the number plate holder pulling in a downward motion.



### 5.1.12. REMOVING THE SIDE BODY PANELS

**NOTE** The following information applies to both components.

- Lift the fuel tank, see (LIFTING THE FUEL TANK).
- Remove the tail guard, see (REMOVING THE TAIL GUARD).
- Unscrew and remove the screw.



- Loosen and remove the three screws and remove the side body panel.



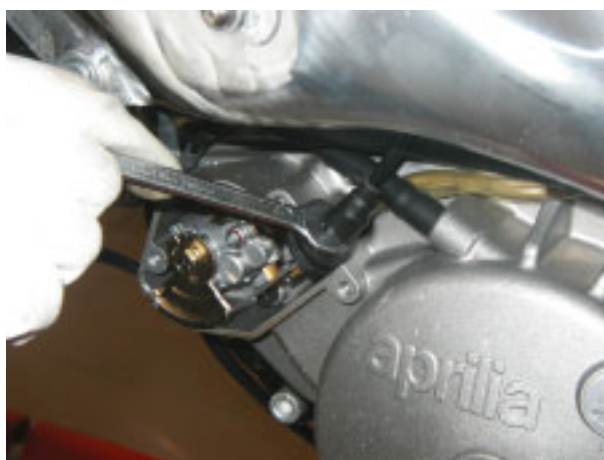
## 5.2. CONTROLS

### 5.2.1. REMOVING THE THROTTLE CONTROL

- Lift the fuel tank, see (LIFTING THE FUEL TANK).
- Remove the left side fairing, see (REMOVING THE SIDE FAIRINGS).
- Loosen and remove the three screws and remove the oil pump cover.



- Loosen the adjuster nut.



- Slide out the throttle cable.



## RS125

- Loosen and remove the screw located on the inside of the frame on the left side of the vehicle.
- Remove the throttle cable splitter cover.



- Remove the throttle cable from the oil pump.

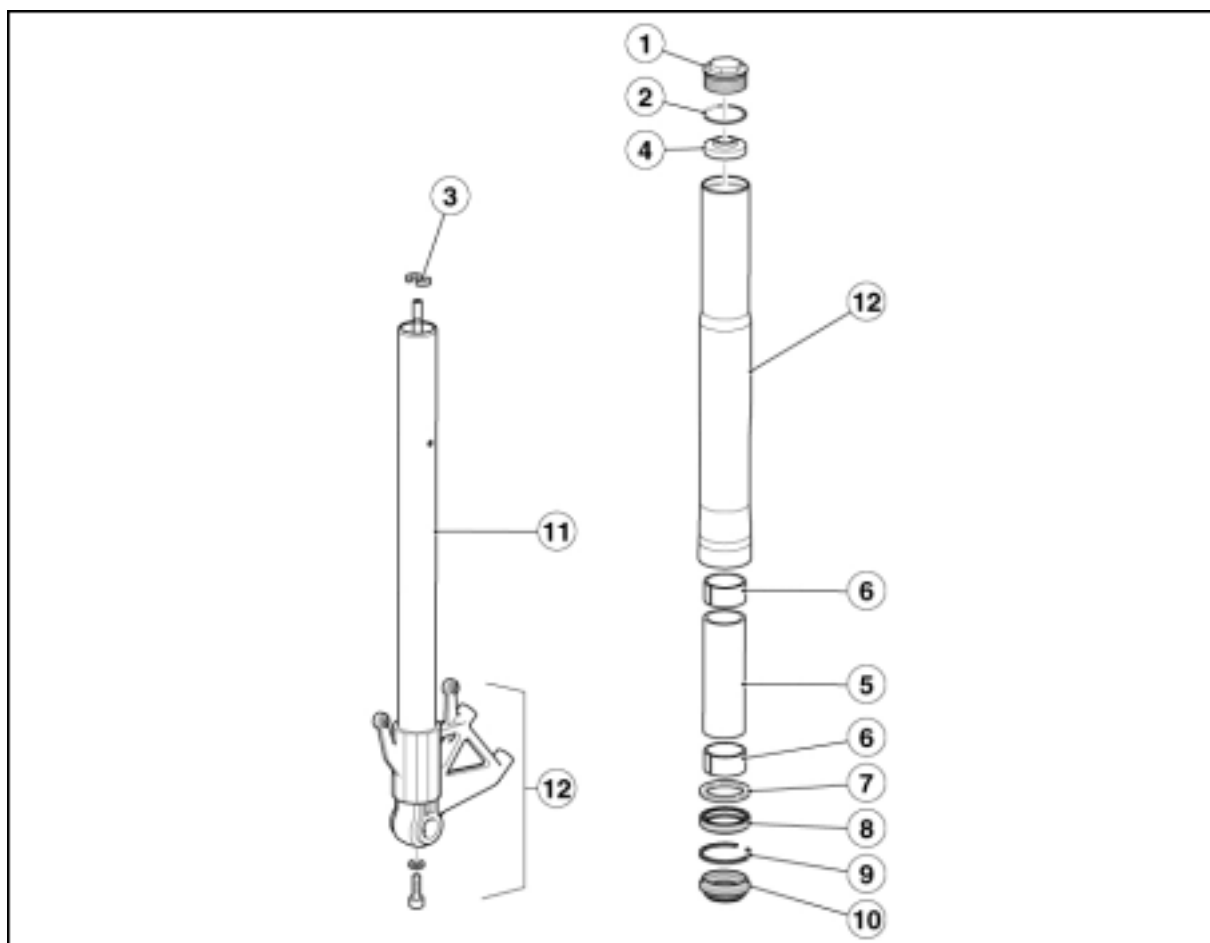


**WARNING**  
On refitting, adjust throttle cable tension using the adjuster nut.



## 5.3. FRONT FORK

## 5.3.1. FRONT FORK DIAGRAM



## Key:

1. Slider cap
2. O-ring
3. Half ring
4. Ring for spring
5. Spacer
6. Sliding bush
7. Guide bush retainer
8. Seal
9. Snap ring
10. Dust seal with spring
11. Sleeve
12. Slider + stanchion tube

### 5.3.2. REMOVING THE FORK LEGS

**NOTE** Position the tall front stand (OPT).

**NOTE** The following information applies to both fork legs.

- Loosen and remove the two screws and remove the bottom yoke cover.



- Position the tall front stand.



- Release and remove the two screws.



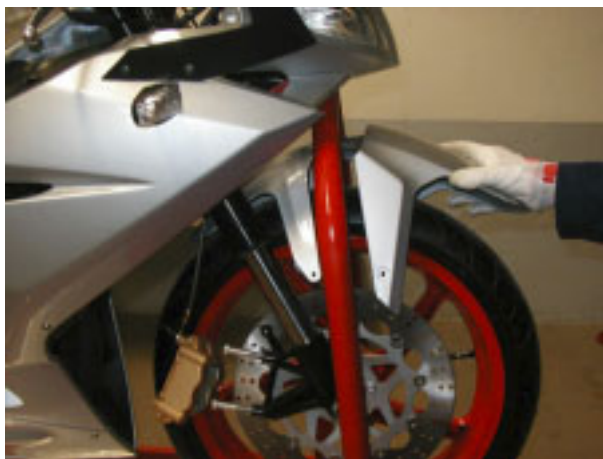
- Remove the front brake calliper.



- Working on either side, loosen and remove the two screws.



- Remove the front mudguard.



- Remove the front wheel, see (REMOVING THE FRONT WHEEL).
- Loosen the screw on the top yoke.



- Loosen the screw on the bottom yoke.
- Lower the fork leg in the yokes until removing it.





### 5.3.3. REMOVING THE FORK LEGS

**NOTE** The procedures described below apply to both stanchion-and-slider assemblies.

- Remove the stanchion-and-slider assembly, see (REMOVING THE FORK LEGS).
- Clean the whole stanchion-and-slider assembly thoroughly.

**NOTE** Before proceeding with the following operations, take a container having a capacity greater than  $440 \pm 2,5 \text{ cm}^3$  ( $26.85 \pm 0.15 \text{ cuin}$ ).

- Place the slider in a vice with soft jaws.



#### WARNING

The stanchion-and-slider assembly contains oil.  
Do not turn it over or tilt it during removal.

- Loosen the top cap (1) taking care to not damage the O-ring during removal.



- Push the stanchion tube into the slider to allow removal of the two half rings (2).
- Pull out the spring ring (3).



- Drain the oil into the container.



- Hold the slider and pull firmly until separating it from the stanchion tube.



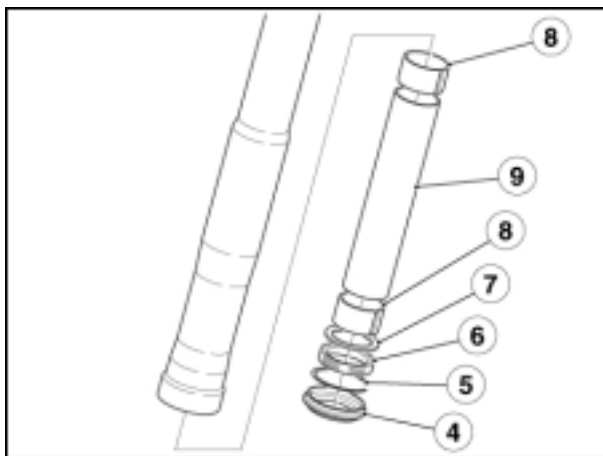
**NOTE** Proceed carefully when removing the different components, or you might damage the inner seating surface of the slider.

- Remove the dust seal (4) using a flat screwdriver.
- Use a thin screwdriver to remove the snap ring (5) from inside the slider.
- Use a large screwdriver to remove the seal (6) from its seat.
- Slide the guide bush retainer (7) out of the slider.
- Tap the slider against a wooden bench to knock out the sliding bushes (8) and the spacer (9).

**WARNING**

Keep the slider at right angles to the wood bench surface.

If the bushes do not fall out, use a suitable puller taking care to not damage the slider inner surface.



### 5.3.4. CHANGING FLUID

Fluid quantity:  $440 \pm 2,5 \text{ cm}^3$  ( $26.85 \pm 0.15 \text{ cuin}$ )  
 Fluid type, see (LUBRICANT CHART).

**NOTE** The procedures described below apply to both stanchion-and-slider assemblies.

#### DRAINING THE FRONT FORK

**NOTE** The procedures described below apply to both stanchion-and-slider assemblies.

- Remove the stanchion-and-slider assembly, see (REMOVING THE FORK LEGS).
- Clean the whole stanchion-and-slider assembly thoroughly.

**NOTE** Before proceeding with the following operations, take a container having a capacity greater than  $440 \text{ cm}^3$  ( $26.85 \text{ cu. in.}$ ).

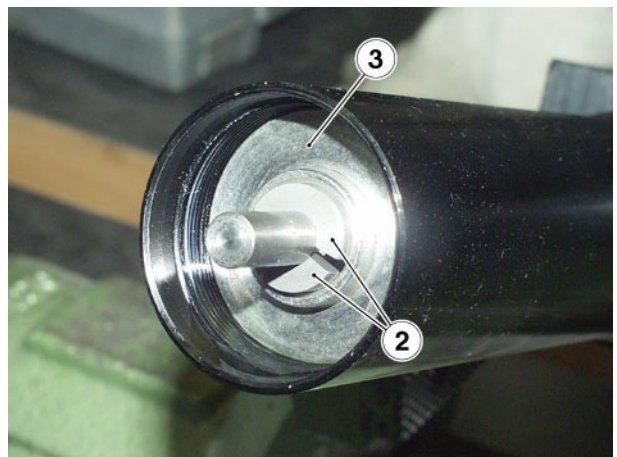
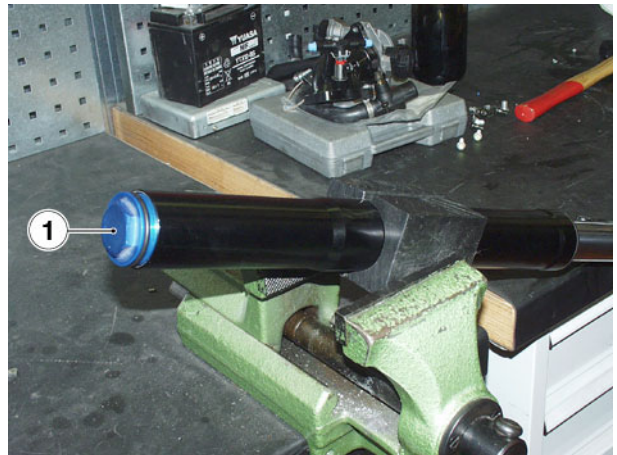
- Place the slider in a vice with soft jaws.



**WARNING**  
 The stanchion-and-slider assembly contains oil.  
 Do not turn it over or tilt it during removal.

- Loosen the top cap (1) taking care to not damage the O-ring during removal.
- Push the stanchion tube into the slider to allow removal of the two half rings (2).
- Pull out the spring ring (3).

- Drain the fluid into the container.



**FILLING THE FORK**

- Place the slider in a vertical position in a vice with soft jaws.
- Pour fork fluid into the slider.
- Fit the spring ring (3).
- Insert the two half rings (2).
- Make sure that the O-ring is in place and tighten the top cap (1).

### 5.3.5. REFITTING THE FORK LEGS

- Check fork components, see (CHECKING FORK COMPONENTS).



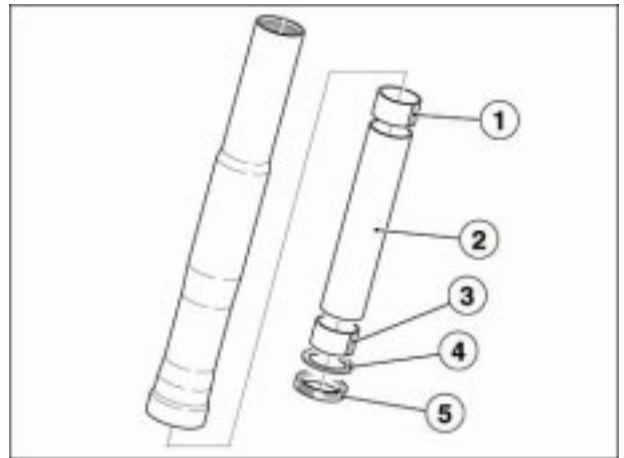
#### WARNING

Make sure no dirt or foreign objects fall into the slider or the stanchion.

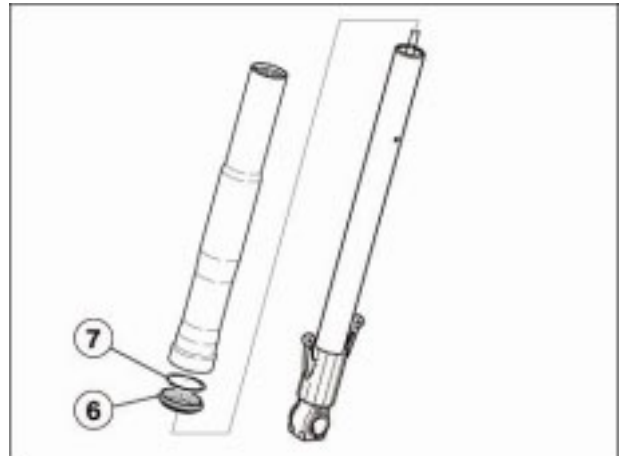
Never reuse the oil you have drained previously.

**CAUTION** Apply a light film of fork oil to the seals and bushes before assembly.

- Insert the sliding bush (1) use the spacer (2) to push it into the slider.
- Insert the other sliding bush (3); push it into place in the slider seat using a drift of adequate size if needed.
- Insert the guide bush retainer (4) into the slider and push it up against the sliding bush (3).
- Lubricate the seal ring (5).
- Position the seal (5) with the hollow side facing the slider and push it up against the guide bush retainer (4).



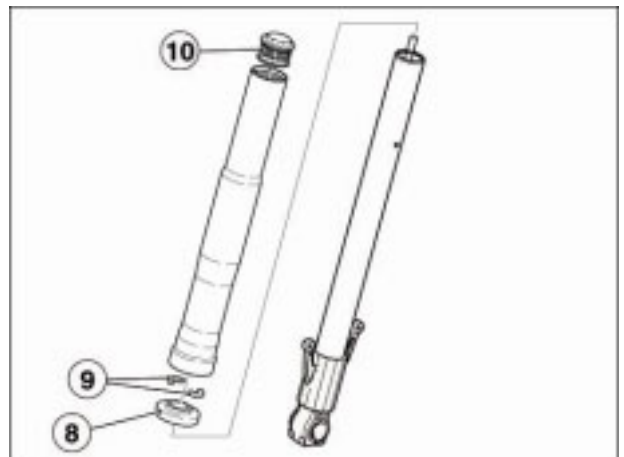
- Fit the following components to the stanchion in the order:
  - dust scraper seal (6).
  - snap ring (7);
- Place the stanchion in a vice with soft (aluminium) jaws.
- Fit the slider to the stanchion tube.
- Install snap ring (7) and dust seal (6) into their seats in the slider.
- Pour fork fluid into the slider.



**Fluid quantity:**  $440 \pm 2,5 \text{ cm}^3$  ( $26.85 \pm 0.15 \text{ cuin}$ ).

**NOTE** Fluid level must be the same in both sliders.

- Insert the spring ring (8) and the two half rings (9) into their seats on the damper rod.
- Lift the slider.
- Make sure that the O-ring is in place in the top cap (10).
- Tighten the top cap (10) onto the slider.



### 5.3.6. CHECKING FORK COMPONENTS

#### STANCHION TUBE

- Inspect the sliding surface for scoring and/or scratching. Eliminate minor scoring with wet sand paper (grain size 1).
- Replace the stanchion if badly scored.
- Check for stanchion buckling using a dial gauge.
- Replace the stanchion if buckled beyond the service limit.

**Service limit: 0.2 mm.**



#### **DANGER**

**NEVER attempt to straighten a buckled stanchion as this would weaken the overall structure leading to a dangerous riding condition.**

#### SLIDER

- Inspect for damage and/or cracking. Replace if damaged.
- Check the condition of the sliding bushes (1).
- Change any component which is badly worn or damaged.

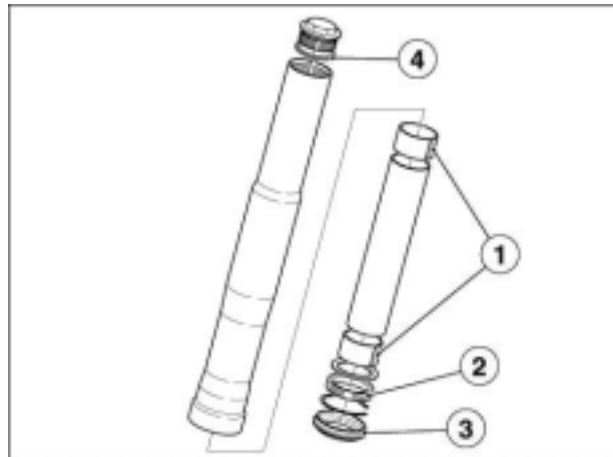


#### **WARNING**

**Remove any debris sticking to the bushes taking care to not scratch them.**

Renew the following components on assembly:

- seal (2);
- dust seal (3);
- top cap O-ring (4).



### 5.3.7. INSTALLING THE FORK LEGS

- Slide the complete slider-and-stanchion assembly through the bottom and top yokes.
- Insert the wheel shaft into the both fork legs to keep the holes aligned.



- Tighten the screw that retains the slider to the bottom yoke.



- Tighten the screw that retains the slider to the top yoke.



- Remove the wheel shaft.
- Install the front wheel, see (FITTING THE FRONT WHEEL).
- Fit the front mudguard.



- Working on either side, tighten the two screws.



- Position the front brake calliper and tighten the two retaining screws.



- Lower the hoist arm.

**WARNING**

Before detaching the slings, make sure the rear stand (OPT) is positioned correctly.

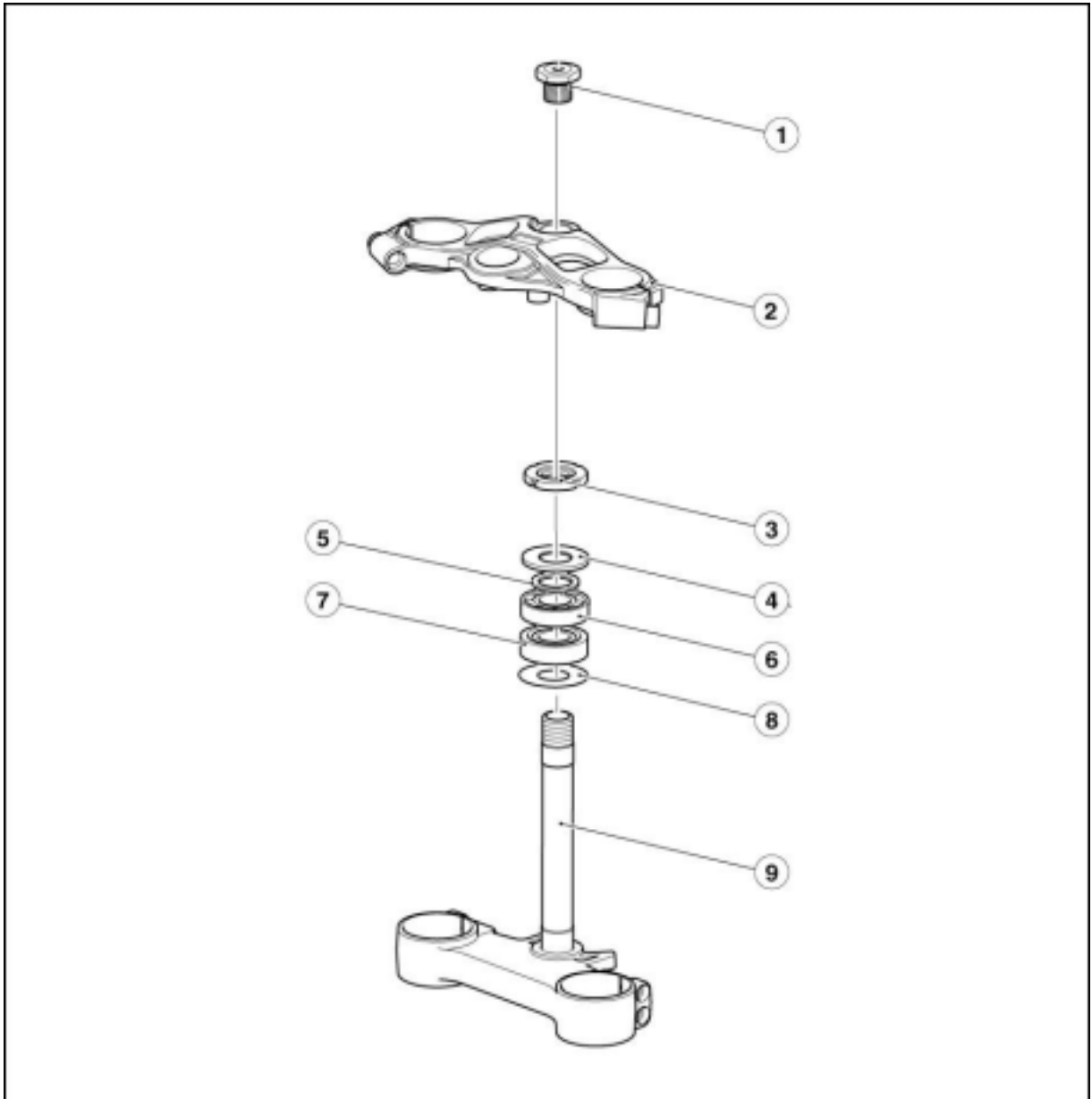
- Detach the slings from the frame.
- When through with the installation procedure, operate the front brake and push down on the front fork repeatedly.
- The front fork should move smoothly and gradually and the sliders must show no traces of oil.

**NOTE** Before riding the vehicle, check for correct track alignment.



## 5.4. STEERING BEARINGS

### 5.4.1. DIAGRAM



#### Key

1. Steering tube cap
2. Front fork top yoke
3. Front fork lower ring nut
4. Seal
5. Steering washer
6. Ball bearing
7. Roller bearing
8. Bottom dust seal
9. Base and steering tube

**5.4.2. CHECKING BEARING PLAY**

- Position the vehicle on the front stand.
- Shake the fork in the direction of travel.
- Adjust if you feel any play.

### 5.4.3. ADJUSTING BEARING PLAY

- Partially loosen the two screws that retain the top yoke.



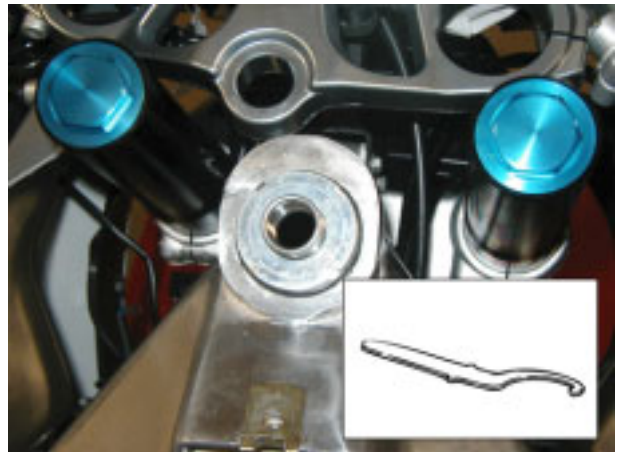
- Loosen and remove the top bush.



- Tap lightly at the bottom end to knock out the top yoke complete with handlebar and ignition switch/steering lock.
- Lean the top yoke forward (2); use a cloth to protect the instrument panel.



- Loosen the ring nut completely using a ring nut wrench. Tighten the ring nut to the specified torque, so as to take up play.



- Refit the top yoke and position it fully home.
- Lubricate the thread and contact face of the bush with oil.
- Tighten the top bush.
- Loosen the bush and retighten it to the specified torque, see (TIGHTENING TORQUES).



- Tighten the two screws (1).

**WARNING**

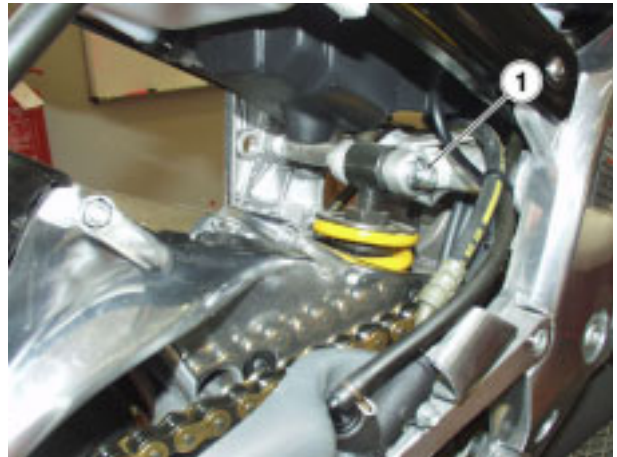
When finished, make sure the handlebar turns smoothly, otherwise the sliding surfaces will damage leading to loss of handling.



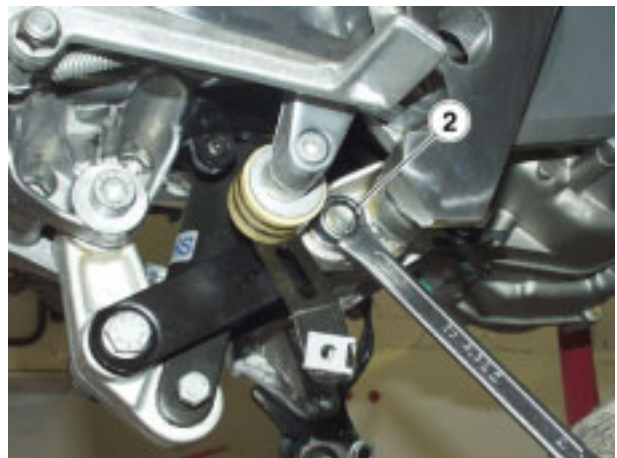
## 5.5. REAR SHOCK ABSORBER

### 5.5.1. REMOVING THE SHOCK ABSORBER

- Place the vehicle on the front support stand (OPT).
- Place the vehicle on the rear support stand (OPT).
- Place a support between swinging arm and seat frame to keep the shock absorber in an unloaded state.
- Working on the right side, loosen and remove the top nut (1).
- Slide out the screw on the opposite side and collect the washer.



- Working on the right side, loosen and remove the nut (2).
- Slide out the screw on the opposite side and collect the washer.



- Working on the left side, loosen and remove the nut (3).
- Slide out the screw on the opposite side.

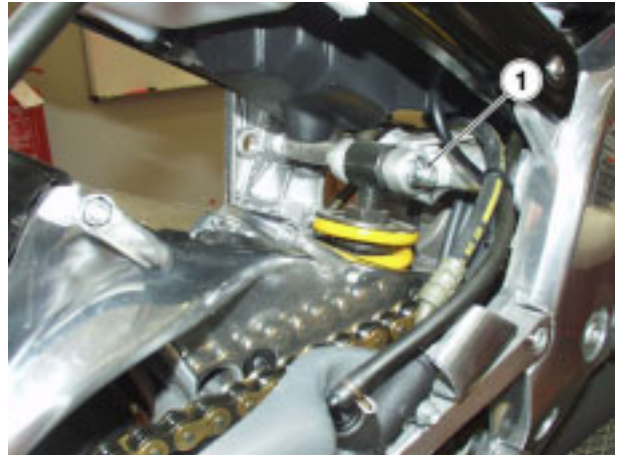


- Remove the shock absorber pulling it downward.

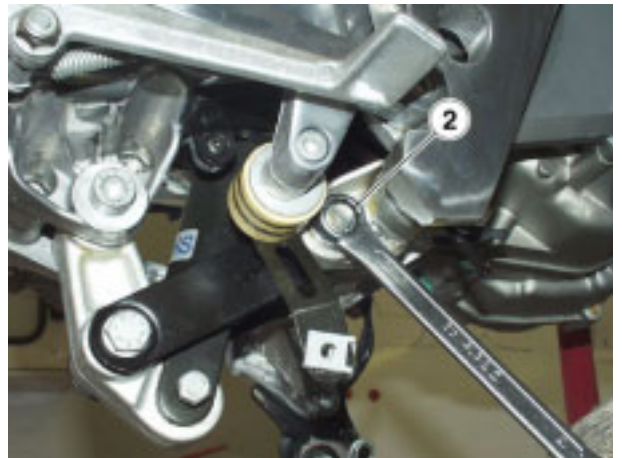


### 5.5.2. FITTING THE SHOCK ABSORBER

- Insert the shock absorber from the bottom up.
- Insert the upper shock absorber screw with its washer from the left side.
- Tighten the nut (1) on the opposite side.



- Fit the connecting rods to the shock absorber.
- Insert the lower shock absorber screw from the right side.
- Tighten the nut (2) on the opposite side.

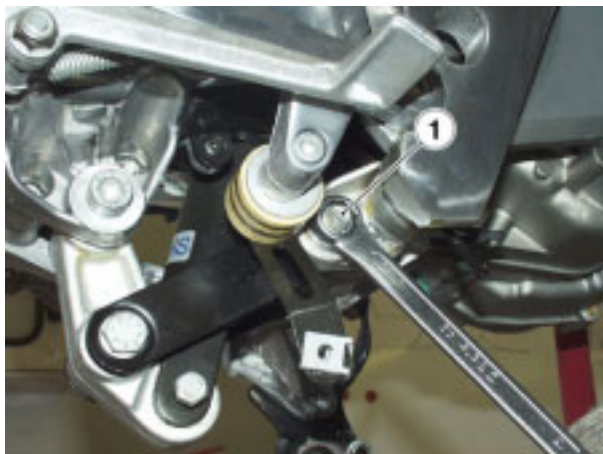


- Fit the double connecting rod into its seat in the frame.
- Insert the screw retaining the connecting rods to the frame with its washer from the left side.
- Tighten the nut (3) on the opposite side.
- Remove the support between swinging arm and seat frame.

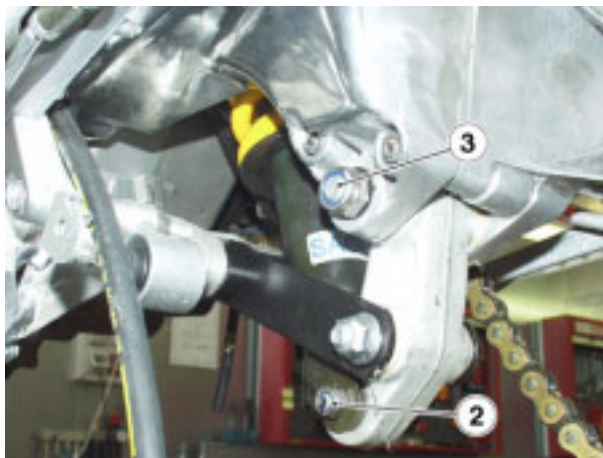


**5.5.3. REMOVING THE REAR SUSPENSION CONNECTING RODS**

- Working on the right side, loosen and remove the nut (1).
- Slide out the screw on the opposite side and collect the washer.



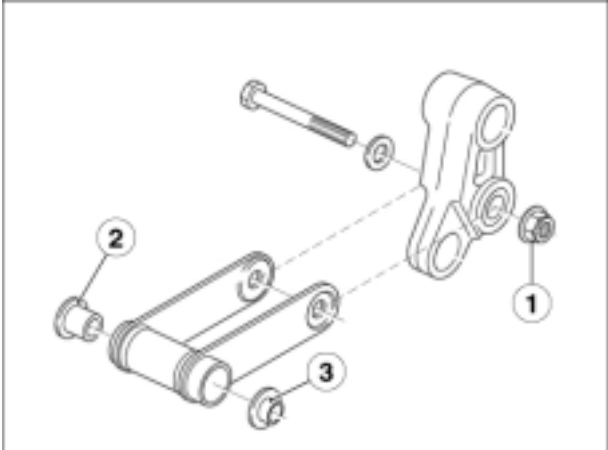
- Working on the left side, loosen and remove the nut (2).
- Slide out the screw, on the opposite side.
- Working on the left side, loosen and remove the nut (3).
- Slide out the screw on the opposite side and collect the washer.
- Remove the complete suspension connecting rods assembly.



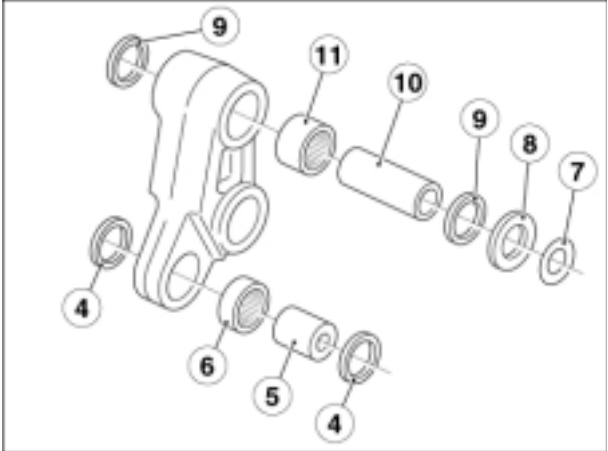


5.5.4. DISASSEMBLING THE CONNECTING RODS

- Remove the complete connecting rods assembly of the suspension, see (REMOVING THE REAR SUSPENSION CONNECTING ROD).
- Unscrew and remove the nut (1).
- Slide out the screw on the opposite side and collect the washer.
- Remove the single connecting rod.
- Remove the right bush (2) and the left bush (3) from the single connecting rod.

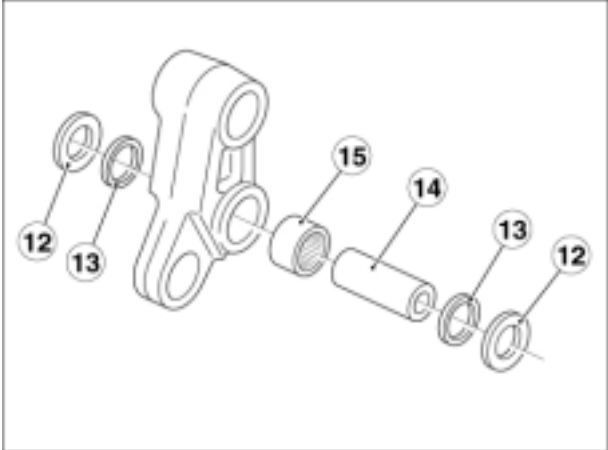


- Remove the oil seal from the double connecting rod (4).
- Remove the pin (5).
- Using a suitable puller, remove the roller cage (6).
- Remove the Belleville washer (7).
- Remove the seal (8).
- Remove both oil seals (9).
- Remove the pin (10).
- Using a suitable puller, remove the roller cage (11).



- Remove the both seals (12).
- Remove both oil seals (13).
- Remove the pin (14).
- Using a suitable puller, remove the roller cage (15).

**NOTE** Wash all components with clean detergent.



**5.5.5. CHECKING THE COMPONENTS**

**NOTE** Check all components for distortion, breakage, cracks and/or denting. Replace any damaged components.

**ROLLER CAGE**

Manually turn the roller cages, they should turn smoothly with no noise and/or hard spots.

No axial play should be noticed.

Faulty roller cages should be changed.

Grease the rollers, see (LUBRICANT CHART).

**SEALS**

Check that all seals are intact; change them if they are damaged or worn.

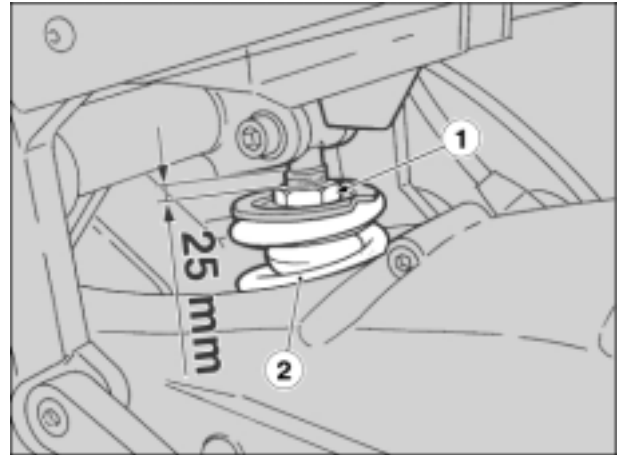
### 5.5.6. ADJUSTING THE REAR SHOCK ABSORBER

Factory setting is designed for any riding condition, low or high speed, with reduced or full load. However, the suspension can be adjusted to suit usage conditions.



#### DANGER

Allow for engine and silencer to cool down completely before proceeding.  
Do not tighten the adjuster nut deeper than 25 mm (0.98 in.) (distance from beginning of thread, see figure). Exceeding this limit will cause unexpected jerkiness whenever hitting the slightest bumps.



- Turn the adjuster nut (1) (shock absorber spring preload adjustment) (see table).



#### WARNING

Turn the adjuster nut (1) gradually by one turn at a time.  
Road test the vehicle repeatedly until achieving the ideal adjustment.

#### REAR SHOCK ABSORBER SETTINGS TABLE

Adjuster nut (1)	Tighten	Loosen
Function	Increases spring preload (2).	Decreases spring preload (2).
Impact on driveability	Stiffer ride	Softer ride
Recommended for	Smooth or regular road pavement	Bumpy roads
Note	Riding with a passenger	Riding solo

## 5.6. SWINGING ARM

### 5.6.1. REMOVAL

**NOTE** Support the front end of the vehicle using the front stand (OPT); support the rear end using slings and a hoist (OPT).

- Connect the slings to the frame at the engine top mount.
- Lift hoist arm until the slings are stretched taut.
- Remove the chain, see (REMOVING THE DRIVE CHAIN).
- Remove the rear wheel, see (REMOVING THE REAR WHEEL).
- Working on the left side, loosen and remove the nut (1) and collect the washer.
- Slide out the screw on the opposite side.
- Remove the connecting rods from the swinging arm.



- Release and remove the screw (2) on the inside.
- Slip off the hose clamp on the swinging arm and leave it connected to the rear brake line.



- Release and remove the screw (3) on the outside.
- Slip off the hose clamp on the swinging arm and leave it connected to the rear brake line.



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- Loosen and remove the screw and remove the speed sensor.



- Loosen the screw retaining the engine (4) to the frame to facilitate swinging arm removal.



**NOTE** Make sure to have the suitable special tool part no. 8101945 (box wrench for swinging arm pivot adjustment) ready at hand.

- Working on the right side, loosen the ring nut (5) completely using the suitable box wrench.
- Loosen the ring nut adjusting bush (6).

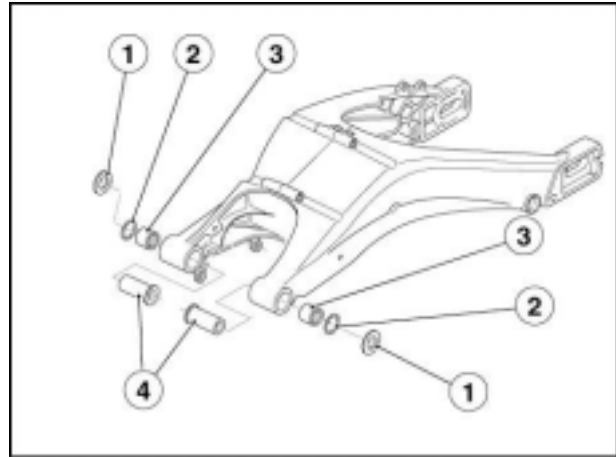


- Working on the left side, loosen and remove the swinging arm pivot (7) and collect the two washers.
- Remove the swinging arm from the frame. You will need someone to help with this operation.



**5.6.2. REMOVAL AND REASSEMBLY****REMOVAL**

- Remove the swinging arm, see (REMOVAL).
- Place the swinging arm on a bench.
- Clean the two sides of the bearing housings with a cloth.
- Remove the plastic washers (1) on the outside.
- Remove the two bushes of the needle roller bearings (4) from inside the swinging arm.
- Remove the two O-rings (2).
- Extract the two roller cages (3) using a drift of adequate size.

**REASSEMBLY**

**NOTE** Replace both needle roller cages.

- Clean all components of the swinging arm joint and grease them with lithium-based grease.
- Install two new roller cages (3) using a drift of adequate size; make sure to fit them squarely into their housings.
- Fit the two O-rings (2).
- Fit the two bushes of the needle roller bearings (4) from the inside of the swinging arm.
- Fit the plastic washers (1) on the outside.

### 5.6.3. CHECKING THE REAR SWINGING ARM COMPONENTS

**NOTE** Check all components for distortion, breakage, cracks and/or denting. Replace any damaged components.

#### NEEDLE ROLLER CAGES

Manually turn the needle roller cages, they should turn smoothly with no noise and/or hard spots.

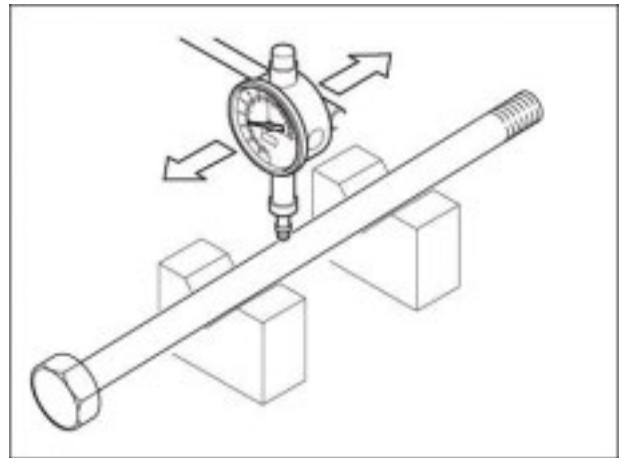
No axial play should be noticed.

Faulty needle roller cages should be changed.

Grease the needle rollers, see (LUBRICANT CHART).

#### SEALS

Check that all seals are intact; change them if they are damaged or worn.



#### SWINGING ARM PIVOT

Using a dial gauge, check that shaft runout does not exceed the service limit. If it does, replace the shaft.

Shaft runout limit: 0.3 mm (0.01 in.).

## 5.6.4. INSTALLATION

**WARNING**

The tail end is heavy. Have someone assist you with the next operations.

- Position the swinging arm on the frame.
- Set the swinging arm in position so as to match the holes and insert the pivot (1) fully from the left side.



- To achieve correct swinging arm pivot play, tighten the ring nut adjusting bush (2) fully home and then tighten one more quarter of a turn.

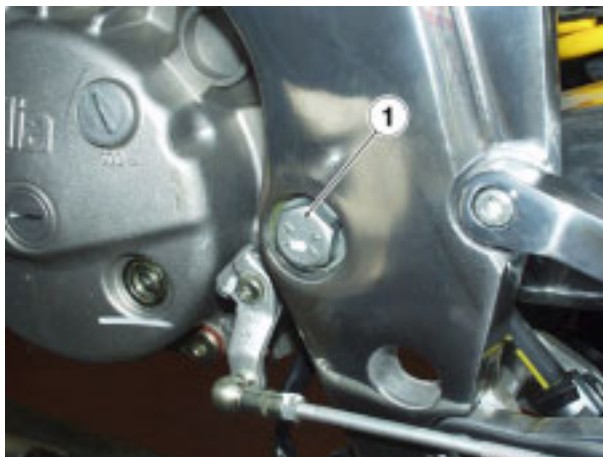
**NOTE** Make sure to have the suitable special tool part no. 8101945 (box wrench for swinging arm pivot adjustment) ready at hand.

- Hold the bush (2) steady and tighten the ring nut (3) with the special tool.



- Now adjust the rear swinging arm as follows:

- Loosen the nut (1) working on the left side.



- Use the suitable box wrench (part no. 8101945) to loosen the ring nut (2) completely working from the right side.
- Tighten the adjusting bush (2) to the specified torque.
- Tighten the ring nut (2) using the suitable box wrench (part no. 8101945).
- Tighten the pivot (1).





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- Tighten the screw retaining the engine (4) to the frame.



- Fit the connecting rods to the swinging arm.
- Insert the screw from the right side.
- Fit the washer and tighten the nut (5).



- Route the brake hose along the swinging arm.
- Secure the internal brake line clamp with the screw (6).



- Secure the brake line retainer with the screw (7).
- Install the rear wheel, see (INSTALLING THE REAR WHEEL).
- Install the chain, see (REFITTING THE DRIVE CHAIN).
- Lower the hoist arm.
- Detach the slings from the frame.
- Install the fuel tank.

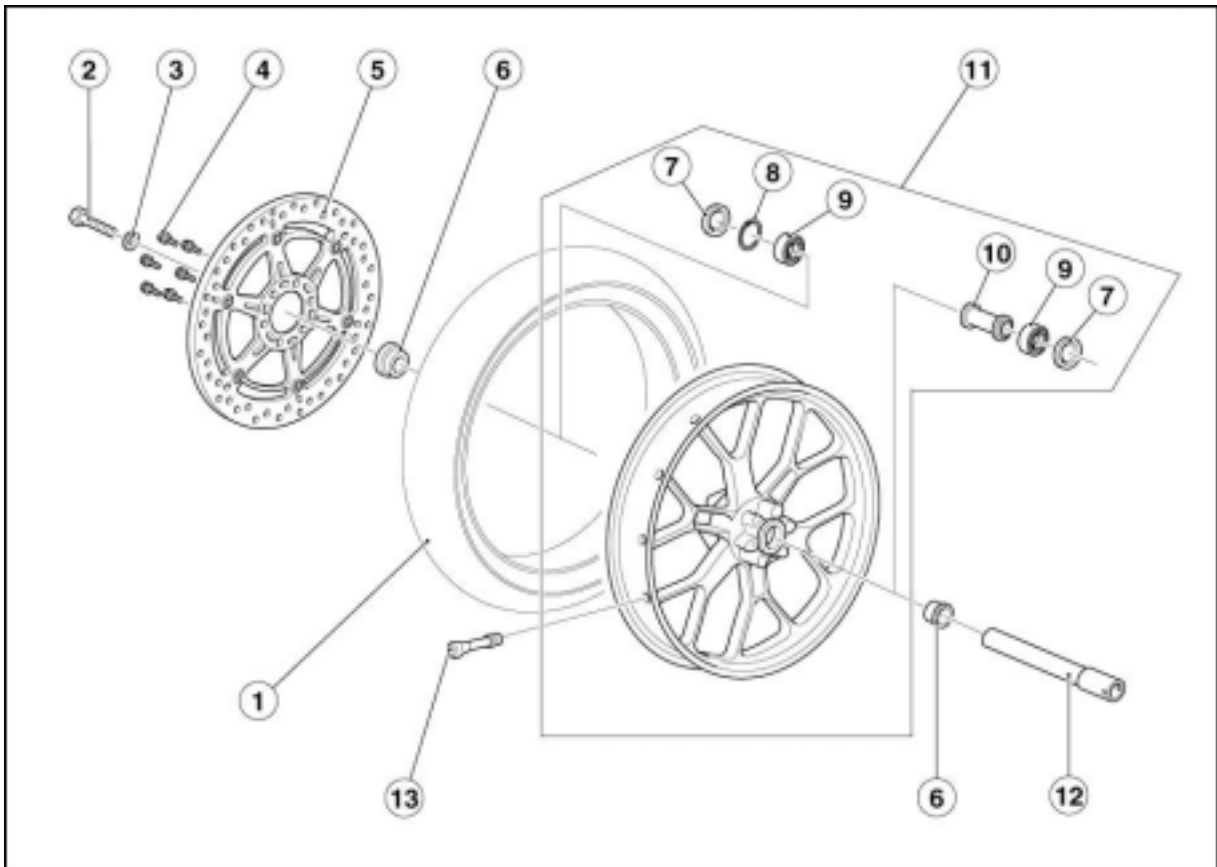


- Fit the speed sensor.



## 5.7. FRONT WHEEL

## 5.7.1. DIAGRAM



## Key:

1. Front tyre
2. Wheel shaft special screw
3. Washer
4. Flanged screw
5. Front brake disc
6. Front wheel external right spacer
7. Seal
8. Snap ring
9. Bearing
10. Internal spacer
11. Naked front wheel
12. Front wheel shaft
13. Tubeless tyre valve

## 5.7.2. REMOVING THE FRONT WHEEL

**WARNING**

When removing, pay utmost attention not to damage the brake lines, discs and pads.

- Place the vehicle on the rear support stand (OPT).

**NOTE** Ensure that the vehicle is stable. Have an assistant hold the handlebar steady pointing in the direction of travel so that it cannot move.

- Loosen and remove the two screws securing the front brake calliper.
- Remove the brake calliper.

**WARNING**

Do not operate the front brake lever when the brake calliper is not in place or the calliper pistons might come off their housing, thus causing brake fluid leakage.

- Working on either side, loosen and remove the two screws.



- Remove the front mudguard in a forward motion.



- Working on the left side, loosen the two screws.

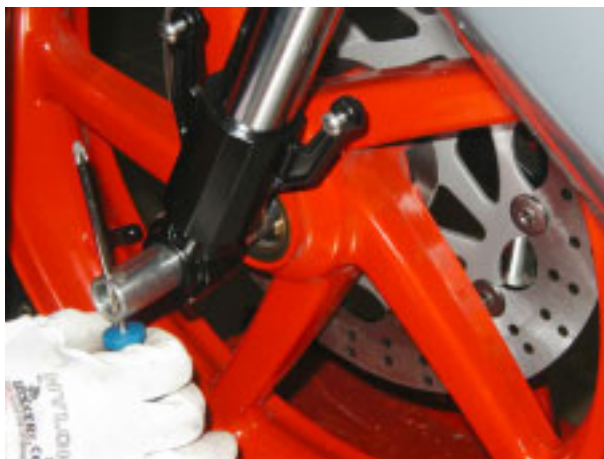


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- Working from the right side, loosen and remove the plug and collect the washer.



- Place a support under the tyre so the wheel will stay in place after you release it.
- Remove the wheel shaft from the left side.



- Collect the bush from the left side.
- Collect the spacer from the right side.



- Remove the wheel by withdrawing it from the front.

## 5.7.3. CHECKING THE FRONT WHEEL COMPONENTS

**WARNING**

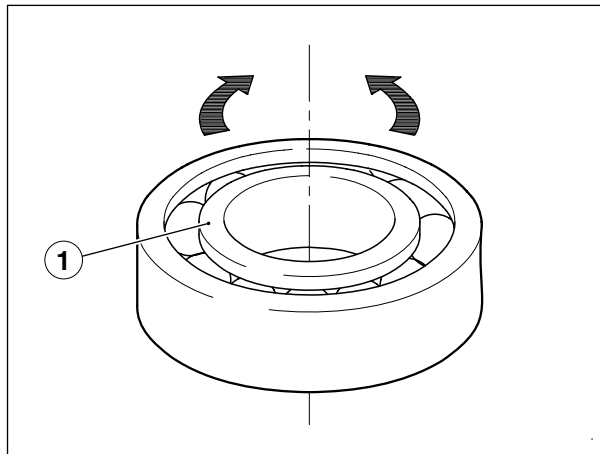
Ensure that all components are intact and especially the following ones.

**BEARINGS**

Manually turn the inner ring (1); it should turn smoothly with no noise and/or hard spots.

No axial play should be noticed.

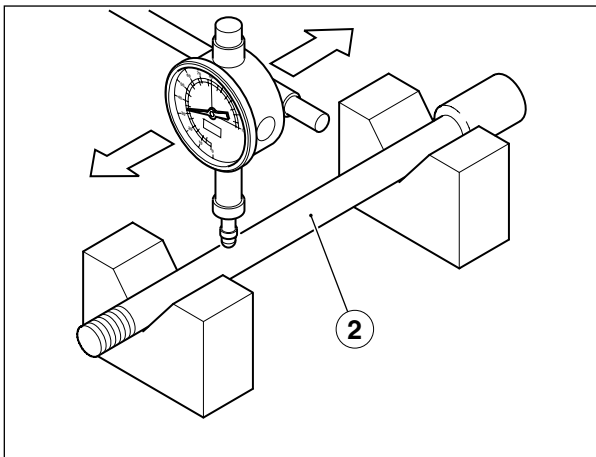
Faulty bearings should be changed.

**SEALS**

Check that all seals are intact; change them if they are damaged or worn.

**WHEEL SHAFT**

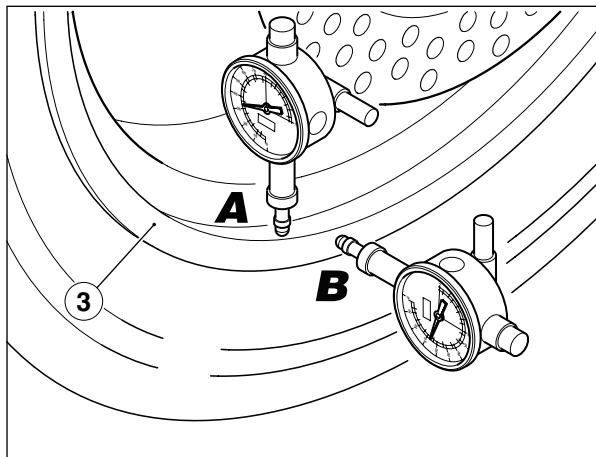
Using a dial gauge, check shaft runout (2). If runout exceeds the limit, change the shaft (2). Maximum runout: 0.25 mm.

**WHEEL RIM**

Using a dial gauge, check that rim (3) radial (A) and axial (B) runout does not exceed the specified limit. Excessive runout is usually due to worn or damaged bearings. If value still exceeds the specified limit after replacing the bearings, change the rim (3). Maximum radial and axial runout: 2 mm.

**Tyre**

Check tyre condition, see 2.19.1.



#### 5.7.4. INSTALLING THE FRONT WHEEL

- Smear some grease all along the wheel shaft.

**WARNING**  
When refitting, pay utmost attention not to damage the brake lines, discs and pads.

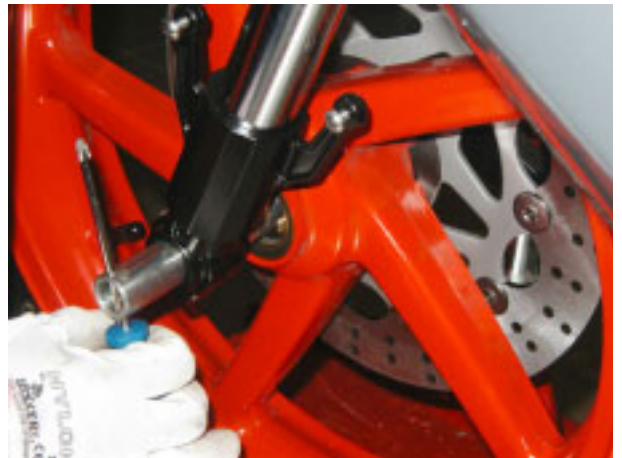
**NOTE** Fit the spacer with the larger diameter facing the right fork leg.



- Position the spacer into place on the wheel.
- Place the wheel between the fork legs above the support.

**DANGER**  
Possible injury. Do not insert your fingers into the holes to bring the holes into alignment.

- Move the wheel until its central hole and the holes on the fork are aligned.
- Working from the left side, insert the wheel shaft completely.



- Fit the washer and tighten the cap manually.
- Lock out wheel shaft rotation.
- Tighten the cap fully.

**WARNING**  
Proceed carefully to avoid damaging the brake pads.

Fit the brake calliper to the disc and match the mounting holes to the bracket holes.

**WARNING**  
When refitting the brake calliper, use two new retaining screws of the same type fitted originally.



- Tighten the two brake calliper retaining screws.
- Keep the front brake lever pulled and press down on the handlebar repeatedly to compress the fork. In this way the fork legs will settle properly.



- Tighten the two screws of the wheel shaft clamp.



- Fit the front mudguard.



- Working on either side, tighten the two screws.



- Remove the front stand (OPT).
- Remove the rear stand (OPT).

**WARNING**

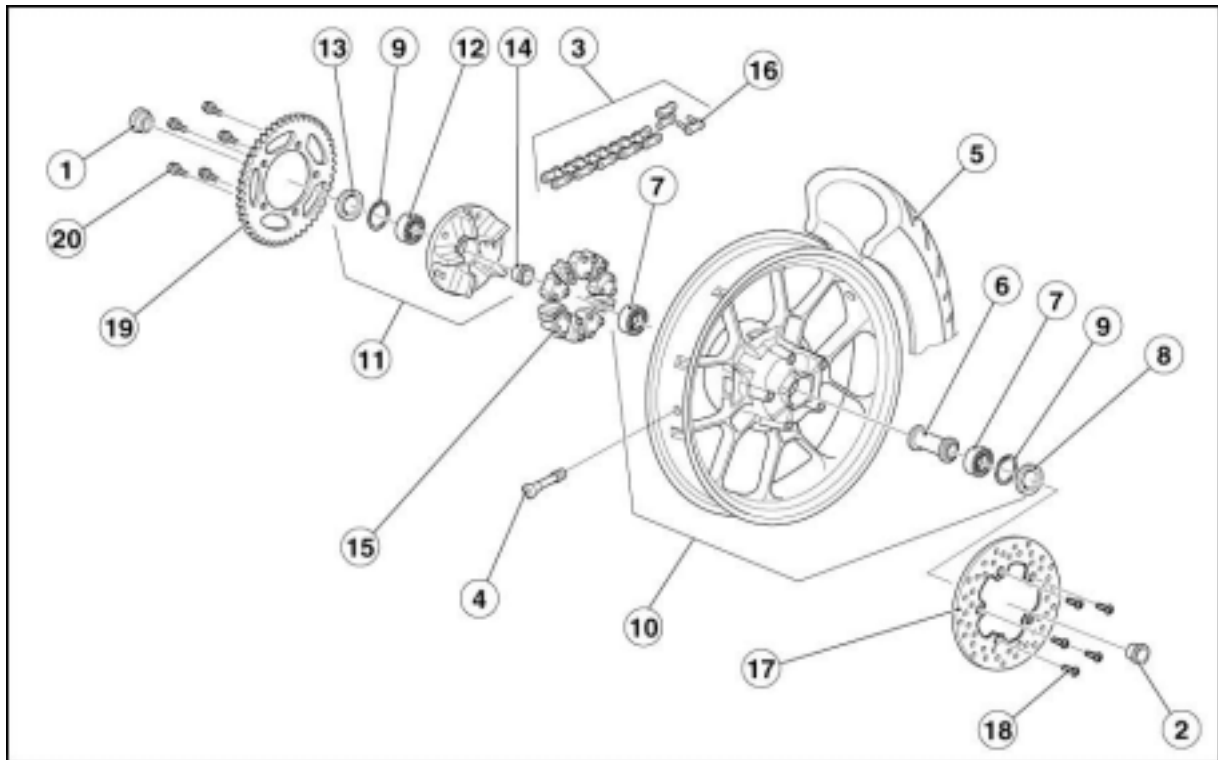
After reassembly, pull the front brake lever repeatedly and check the braking system for correct operation.

- Check that wheel is centred.



## 5.8. REAR WHEEL

## 5.8.1. DIAGRAM



## Key:

1. Wheel RH ext. spacer
2. Wheel LH ext. spacer
3. Comp. chain, master link
4. Tubeless valve
5. Rear tyre 150/60"
6. Rear wheel int. spacer
7. Bearing 20x47x14
8. Seal 28x47x7
9. Snap ring d47
10. Naked blue rear wheel
11. Rear chain sprocket carrier
12. Bearing 25x47x14
13. Seal 30x47x7
14. Int. spacer
15. Vibration damper seal
16. Master link
17. Rear brake disc
18. Flat socket cap screw M8x20
19. Rear sprocket z=40
20. Flanged hex-head screw M10x30

## 5.8.2. REMOVING THE REAR WHEEL

**WARNING**

Before carrying out the following operations, let the engine and the silencer cool down until they reach room temperature, in order to avoid burns. When removing, pay utmost attention not to damage the brake line, disc and pads.

**NOTE** Make sure to have the suitable rear support stand (OPT) ready before removing the rear wheel.

- Place the vehicle on the rear support stand (OPT).
- Place a support under the tyre so the wheel will stay in place after you release it.
- Loosen and remove the nut (1) and collect the washer.
- Remove the wheel shaft (2) from the left side.



- Loosen and remove the two screws and move the rear brake calliper out of the way.



- Loosen and remove the screw and refit the cable guide.



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**NOTE** Note the position of the right (3) and left (4) chain tensioners to refit them to their original positions later on.

- Take the right (3) and left (4) chain tensioners.

**NOTE** Drop the chain outboard of the rear chain sprocket.

- Move the wheel forward and take the drive chain of the rear sprocket.
- Remove the wheel from swinging arm pulling from the back; pay utmost attention when removing the brake disc from the calliper.

**WARNING**

Do not operate the rear brake lever when the wheel is not in place or the calliper pistons might come off their housing, thus causing brake fluid leakage.

**NOTE** Note the position of the spacers to refit them to their original positions later on.

- Collect the right and left spacers.



### 5.8.3. REMOVING THE FINAL DRIVE ASSEMBLY

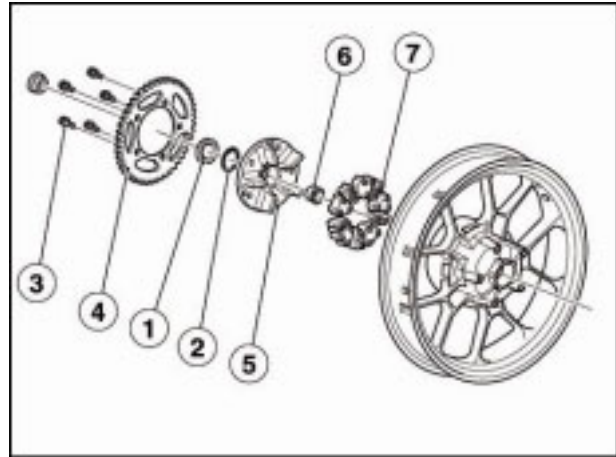
#### REMOVAL

- Remove the rear wheel, see (REMOVING THE REAR WHEEL).

**NOTE** If you only need to remove the rear chain sprocket, perform only five of the steps described here.

- Clean the two sides of the hub with a clean cloth.
- Remove the seal (1).
- Remove the circlip (2).
- Unscrew and remove the five screws (3).
- Remove the rear chain sprocket (4).
- Clean the inner part of the hub thoroughly.

**NOTE** Wash all components with clean detergent.



If necessary, proceed as follows:

- Remove the rear sprocket carrier (5) and collect the five nuts and the spacer.
- Remove the vibration damper seal (7).

#### REASSEMBLY

Fit the rear chain sprocket (4) and tighten the five nuts with the sprocket carrier (5) removed from the wheel.



#### WARNING

**Tighten in a cross pattern.**

- Refit the vibration damper seal (7) to wheel inside.
- Refit the rear chain sprocket carrier (5) complete with sprocket (4) to the wheel.
- Refit the circlip (2).
- Refit the seal (1).
- Refit the wheel, see (INSTALLING THE REAR WHEEL).

#### 5.8.4. CHECKING THE REAR WHEEL COMPONENTS

**WARNING**

Ensure that all components are intact and especially the following ones.

**BEARINGS, SEALS, WHEEL SHAFT, WHEEL RIM**

See (CHECKING THE FRONT WHEEL COMPONENTS).

**VIBRATION DAMPER**

Inspect the vibration damper seal for damage and/or excess wear. Replace the vibration damper seal as required. Insert the vibration damper seal into the wheel hub. Fit the complete final drive assembly to the wheel, turn the rear chain sprocket manually in both directions and check clearance between vibration damper seal and hub. Change the vibration damper seal if you find exceeding clearance.

**REAR SPROCKET**

Check the condition of front and rear chain sprocket teeth, and replace the both sprockets and chain if exceedingly worn, see (REMOVING THE FINAL DRIVE ASSEMBLY) and (REMOVING THE DRIVE CHAIN).

**WARNING**

Change all three components as a set to avoid premature wear of new components.

**Tyre**

Check tyre condition after the first 1000 km (625 mi) and every 4000 km (2485 mi) or 8 months afterwards. Measure before and after long trips. Check inflation pressure monthly at room temperature. This vehicle is equipped with tubeless tyres. Inflation pressure, see (TECHNICAL DATA).

## TREAD CONDITION

**WARNING**

Inspect tyre surface condition and check for wear, as worn tyres lead to poor road holding and handling.

Change the tyre when worn or punctured, if the puncture in the tread is larger than 5 mm (0.19 in.).

Some of the tyres approved for this vehicle are equipped with wear indicators.

There are several kinds of wear indicators.

Contact your dealer for instructions on how to check tyre wear.

Do not install tyres with air tube on rims for tubeless tyres and vice versa. Always check that the caps are in place on the valves (1), or the tyres may deflate suddenly.

Tyres changing, repair, maintenance and balancing must be carried out by specialised, knowledgeable technicians using suitable equipment.

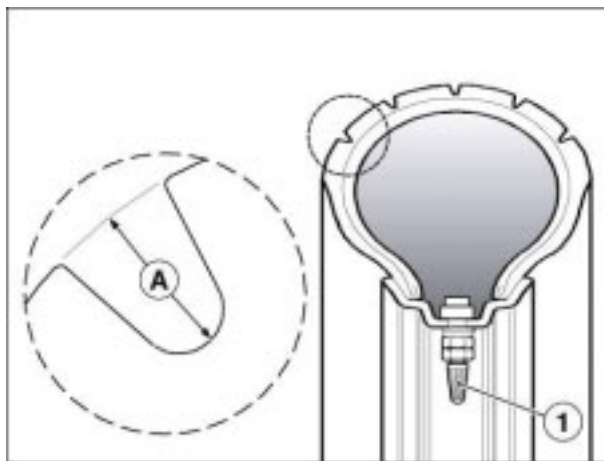
Have the wheel balanced after repairing a tyre.

New tyres may be coated with an oily residue; ride with extra care until covering a few kilometres. Do not oil the tyres with unsuitable fluids.

Tyre size is reported on the registration document; using any tyres other than those specified is illegal.

Using tyres of a size other than specified may alter vehicle track alignment, affecting handling and vehicle safety.

Use only tyres of the same type as the first-equipment tyres selected by aprilia, see (TECHNICAL DATA).

**MINIMUM TREAD DEPTH (A):**

Front and rear 2 mm ( 0.08 in.).

## 5.8.5. INSTALLING THE REAR WHEEL

**WARNING**

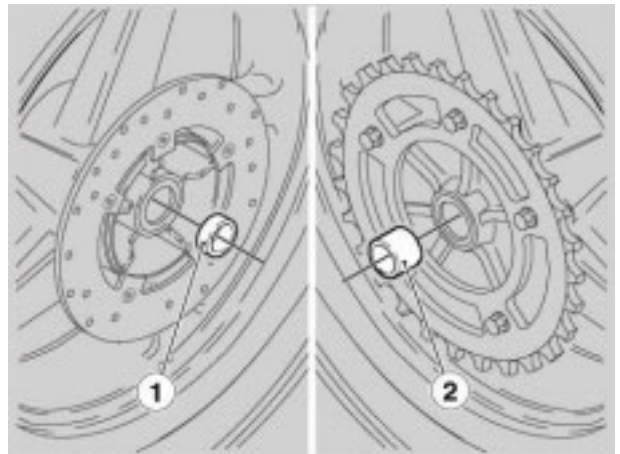
Before carrying out the following operations, let the engine and the silencer cool down until they reach room temperature, in order to avoid burns.

When removing, pay utmost attention not to damage the brake line, disc and pads.

- Grease the external seats of the wheel hub moderately.

**NOTE** Do not swap the left (1) and right (2) spacers.

- Insert the left (1) and right (2) spacers into their seats in the wheel hub.



- Place the wheel between the arms of the swinging arm above the support.

**DANGER**

Do not place your fingers between chain and rear chain sprocket.

- Tighten the two rear brake calliper screws.



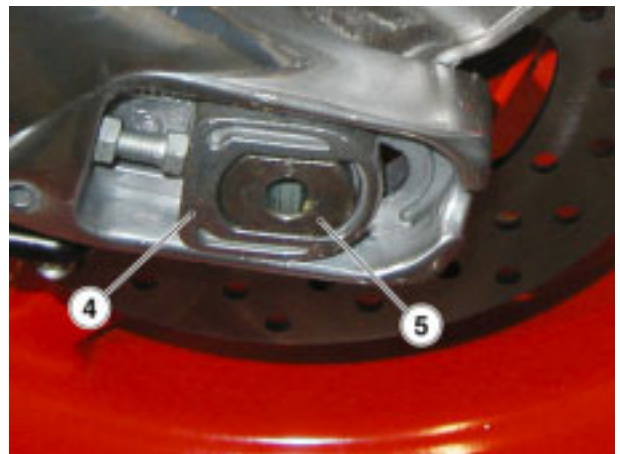
- Fit the cable guide and tighten the screw.



**NOTE** Do not swap the right (3) and left (4) chain tensioners.

- Insert the right (3) and left (4) chain tensioners into their seats in the swinging arm.
- Apply a moderate amount of grease evenly on the wheel shaft (5).
- Insert the wheel shaft (5) fully from the left side.

**NOTE** Ensure that the wheel shaft (5) is fully inserted, with its head into place in the suitable seat on the left chain tensioner (4).



- Fit the washer and tighten the nut (6) manually.
- Check chain tension, see (DRIVE CHAIN ADJUSTMENT).
- Tighten the nut (6).

**WARNING**

After reassembly, pull the rear brake lever repeatedly and check the braking system for correct operation.  
Check that wheel is centred.





## 5.9. DRIVE CHAIN

### 5.9.1. REMOVING THE DRIVE CHAIN

- Slacken the chain, see (DRIVE CHAIN ADJUSTMENT).
- Turn the rear wheel until locating the master link.
- Remove the clip (1).
- Remove the bottom plate.



- Remove the master link from the opposite side.
- Remove the chain.



#### **WARNING**

If the chain is badly worn, change chain and chain sprockets as a set, see CHECKING CHAIN AND CHAIN SPROCKETS FOR WEAR.



### 5.9.2. CHECKING CHAIN AND CHAIN SPROCKETS FOR WEAR

Check the following components and inspect chain and chain sprockets for:

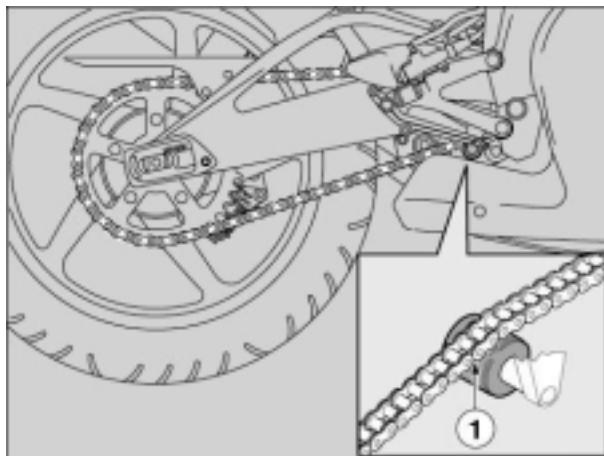
- damaged rollers;
- loose pins;
- dry, rusty, crushed or seized links;
- excessive wear;
- sprocket or teeth excessively worn or damaged.



#### **WARNING**

**If chain rollers are damaged and/or the pins are loose, change chain and chain sprockets as a set. Lubricate the chain frequently, especially if you find any dry areas or rust spots. Lubricate and repair any squashed or seized links.**

- Check the chain tensioner wheel (1) for wear.
- Finally, check the wear of the swinging arm protection slider.



### 5.9.3. REFITTING THE DRIVE CHAIN

- Check that the chain is correctly positioned on the sprockets.
- Bring the two open ends of the chain midway between the sprockets in the lower span.
- Join the open ends and insert the master link pins from the inside outward.
- Fit the plate over the pins.



- Fit the clip (1) on the pins.



#### **WARNING**

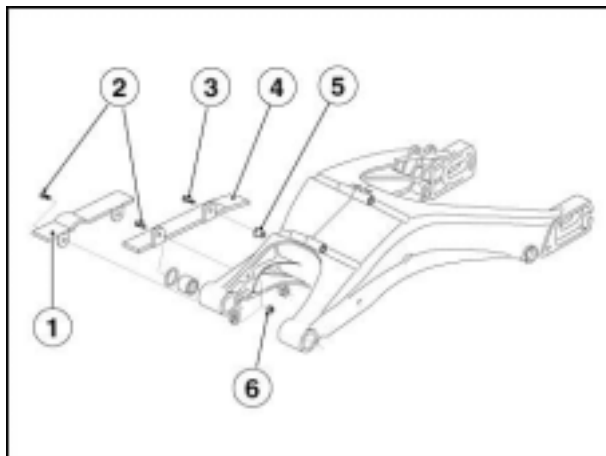
Fit the master link clip (1) with the open end facing away from direction of travel.



**5.9.4. REMOVING THE DRIVE CHAIN SLIDER**

**NOTE** Break the chain to facilitate access to affected components, see (REMOVING THE DRIVE CHAIN).

- Loosen and remove the upper screw (2) and collect the nut (6).
- Loosen and remove the screw (3) and collect the seal (5).
- Remove the upper chain guide slider (4).
- Loosen and remove the two lower screws (2).
- Remove the lower chain guide slider (1).



COOLING SYSTEM

6

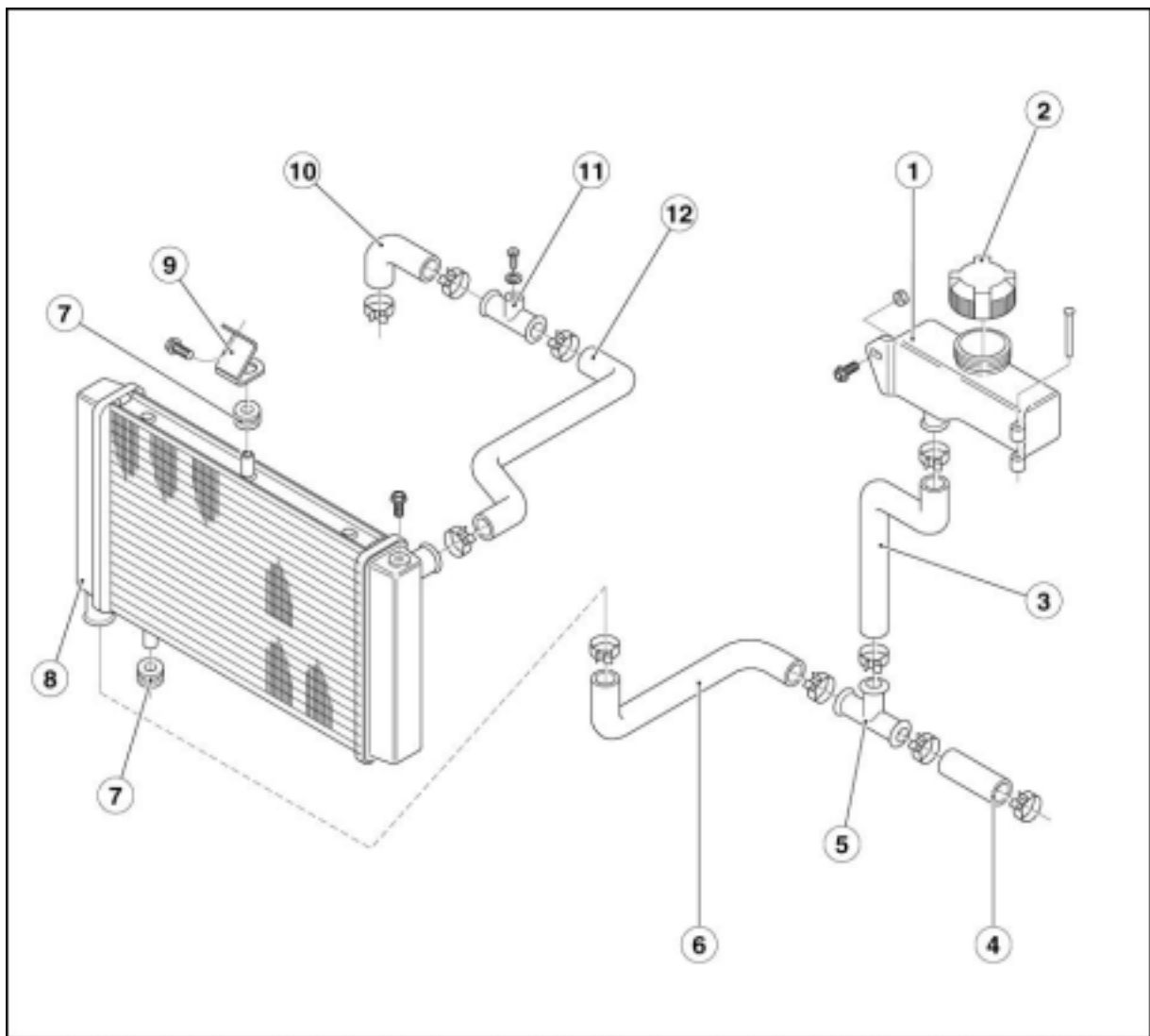
**SUMMARY**

6.1. COOLING SYSTEM ..... 3  
6.1.1. DIAGRAM ..... 3  
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6.1.3. REMOVING THE RADIATOR ..... 5  
6.1.4. REMOVING THE EXPANSION TANK ..... 6

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## 6.1. COOLING SYSTEM

## 6.1.1. DIAGRAM

**Key:**

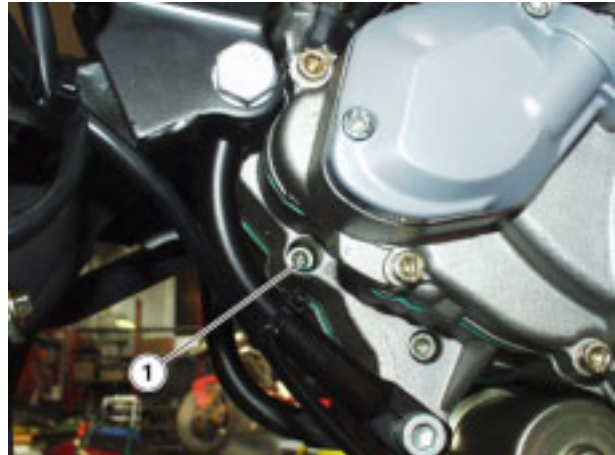
1. Expansion tank
2. Radiator plug
3. Tube - from union to expansion tank
4. Tube - from pump to union
5. Tee
6. Tube - from radiator to tee
7. Rubber block
8. Cooler
9. Upper radiator bracket
10. Tube - from head to union
11. Breather union
12. Tube - from radiator to union

## 6.1.2. CHANGING COOLANT

**WARNING**

Do not ride when coolant is below the minimum level. Check coolant level every 1500 km (935 mi) and after a long trip; change coolant every 24 months.

- Do not ride when coolant is below the minimum level. Check coolant level every 1500 km (935 mi) and after a long trip; change coolant every 24 months.
- Remove the left side fairing, see (REMOVING THE SIDE FAIRINGS).
- Lift the fuel tank, see (LIFTING THE FUEL TANK).



- Place a container of adequate capacity under the drain plug (1).
- Unscrew and remove the drain plug (1).
- Loosen and remove the plug (2) of the expansion tank; coolant will drain off more easily.

**NOTE DO NOT RELEASE INTO THE ENVIRONMENT.**

- Refit the drain plug (1).
- Top up the expansion tank (3) with adequate coolant up to maximum level, see (LUBRICANT CHART).



- Loosen the screw (4) on the radiator.
- Let coolant drain off and then tighten the screw (4).
- Top up coolant level, see (COOLANT).



- Loosen the screw (5) on the union.
- Let coolant drain off and then tighten the screw (5).
- Top up coolant level again if needed, see (COOLANT).





### 6.1.3. REMOVING THE RADIATOR

#### REMOVAL

- Drain all coolant from the cooling circuit, see (CHANGING COOLANT).
- Remove the right side fairing, see (REMOVING THE SIDE FAIRINGS).
- Unhook the hose clamp head (1) and slide out the hose from the radiator.



- Unhook the hose clamp head (2) and slide out the hose from the radiator.

- Loosen and remove the screw (3).



**WARNING**  
Proceed with care to avoid damaging the radiator fins.

- Lean the radiator slightly forward while lifting it, so as to ease the two bottom mounting lugs off their seats in the radiator mount.
- Remove the radiator.



**WARNING**  
Block off the open ends of the hoses to keep out any foreign objects.

#### REASSEMBLY



**WARNING**  
Blow with compressed air to remove any foreign bodies, dirt, etc.. from the radiator fins. Straighten any bent fins using a small flat screwdriver. Change the hoses if sheared or cracked. Before reassembly, wash the inside of the radiator with clean water.

**NOTE** Change the rubber elements on radiator mount if damaged.

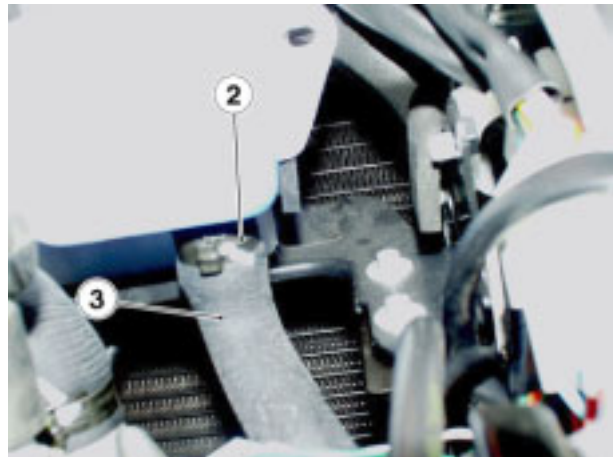
- Place the radiator in the correct position on its mount and secure it in place with the screw (3).
- Reconnect the hoses to the radiator and secure with new clamps.
- Fill the cooling circuit with coolant, see (COOLANT).

**6.1.4. REMOVING THE EXPANSION TANK****REMOVAL**

- Drain all coolant from the cooling circuit, see (CHANGING COOLANT).
- Unscrew and remove the screw (1).
- Remove the clamp (2).
- Disconnect the hose (3) from the expansion tank (4).
- Take the expansion tank (4) out of its seat.



**WARNING**  
Store the expansion tank (4) in a safe place.

**REASSEMBLY**

- Refit the expansion tank (4) into its seat.

**NOTE** On reassembly, make sure to have a pair of suitable hose clamp pliers ready at hand and use new clamps of the same type fitted originally.

- Refit the hose (3) to the expansion tank (4).
- Tighten the screw (1).
- Fill the cooling circuit with coolant, see (CHANGING COOLANT).



ELECTRIC SYSTEM

7

**SUMMARY**

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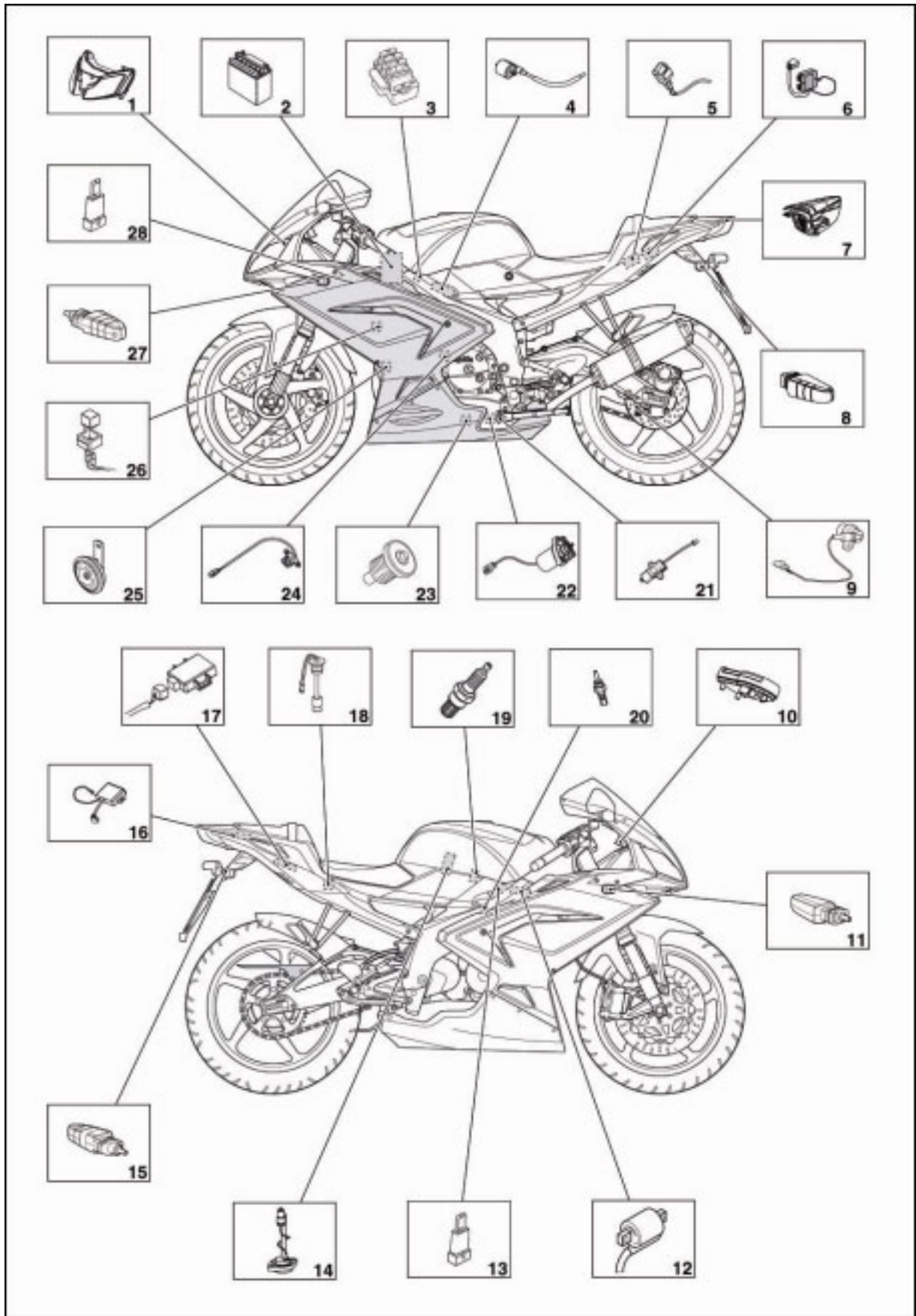
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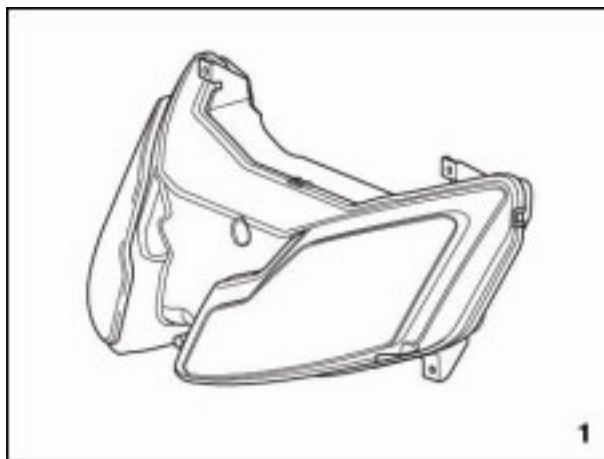
7.1. ELECTRIC SYSTEM

7.1.1. ELECTRIC PARTS TROUBLESHOOTING CHART



**1. HEADLIGHT**

Low beam light (halogen):	12 V - 55 W H11
High beam light (halogen):	12 V - 55 W H11
Parking light:	12 V - 5 W

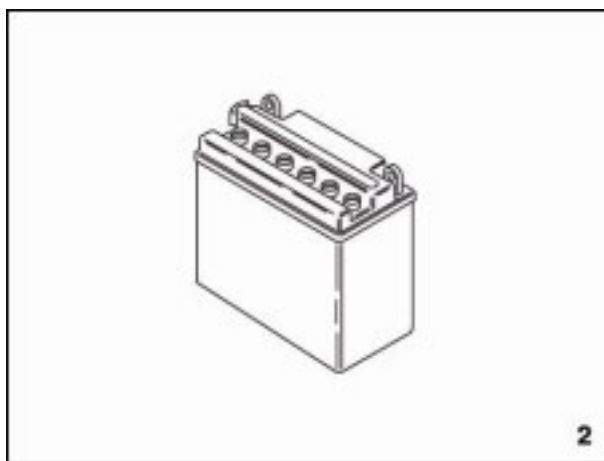
**2. BATTERY**

(12 V - B9 - B)

In the event of abnormal operation, firstly check that the charging system is operating correctly. To check the battery, remove it from the vehicle, see (REMOVING THE BATTERY) and proceed as follows;

Visual inspection :

- check for apparent signs of sulphation (white coating on one or more cells);
- check that battery fluid level is between the "MIN" and "MAX" marks;
- check the (outer) casing for leaks.



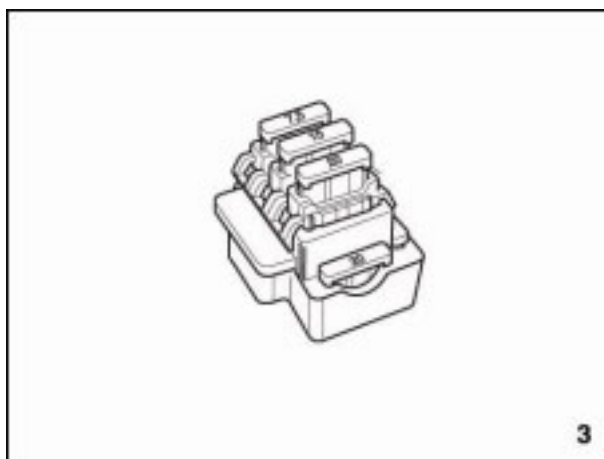
Slow charge the battery for at least 10 hours.

After charging, check battery fluid density in each cell using a density meter. If density in some cells is lower than 1.26 or voltage under no-load conditions is less than 12V, change the battery.

**3. FUSES****FUSE ARRANGEMENT**

1. 20A Fuse:  
From battery to ignition switch, voltage regulator, clock.
2. 15A Fuse:  
From ignition switch to all light loads and horn, solenoids (RAVE), RAVE motor.
3. 7.5A Fuse:  
From ignition switch to ignition, starter lockout.

**NOTE** There is one spare fuse.



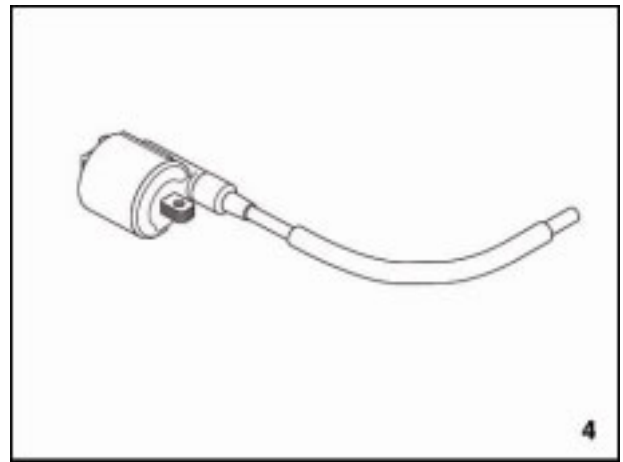
## RS125

## 4. COIL

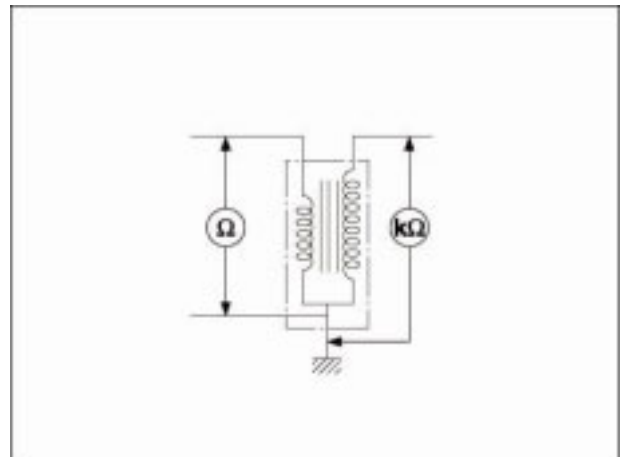
**Coil winding resistance**

Primary 0.11 – 0.21 Ohm

Secondary 4.3 – 8.1 kOhm

**Check**

You may use a hand-held tester for this test. Check the continuity of primary and secondary windings. Please note that some degree of deviation from the specified Ohm readings is acceptable; if the windings are in good working order, continuity should give the Ohm readings listed above.



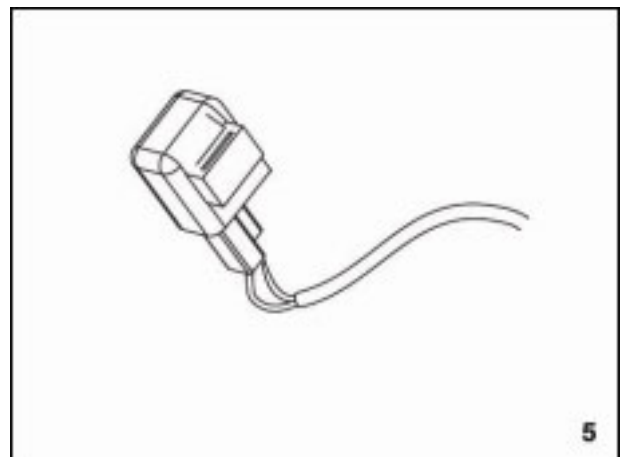
## 5. REPEATER

Touch the tester probes to the poles and verify the following:

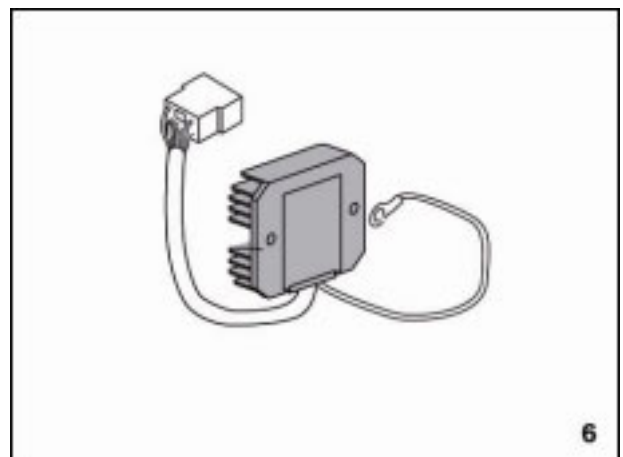
+/- 5.8 kΩ.

-/L (bulb) 5.3 kΩ.

+/L (bulb) 4.8 kOhm.

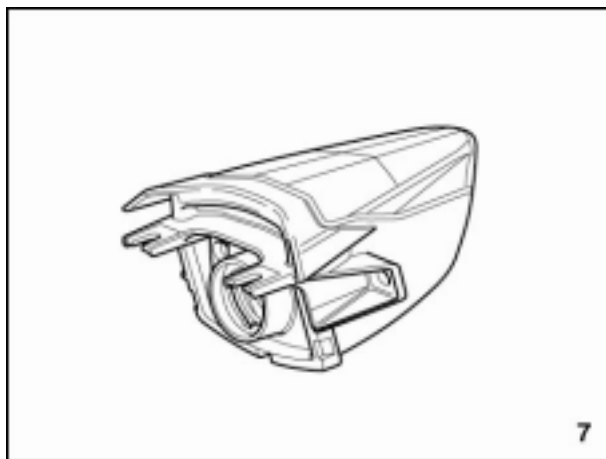


## 6. VOLTAGE REGULATOR

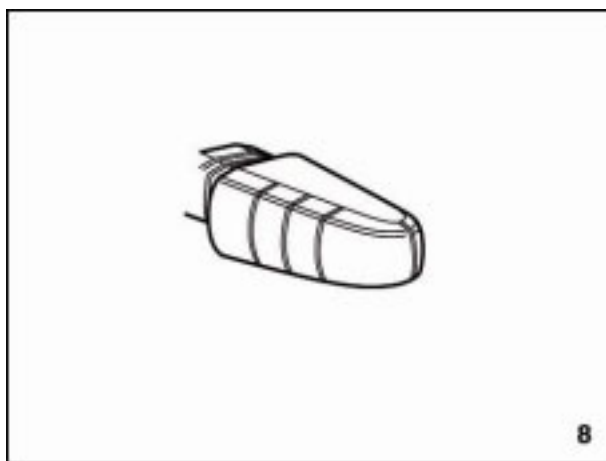


**7. TAIL LIGHT**

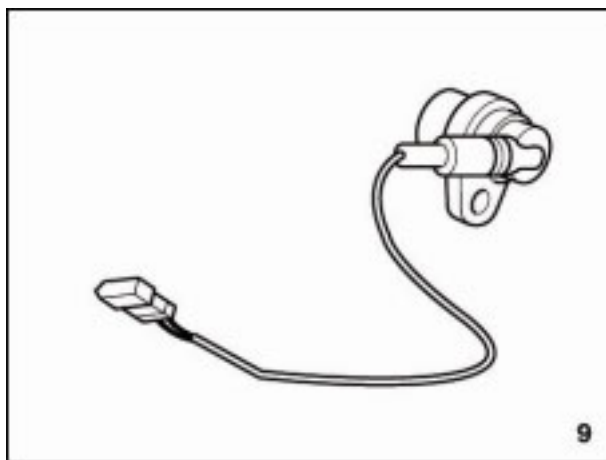
Rear parking light / number plate light / stoplight:  
12 V – 5 / 21 W

**8. REAR RIGHT TURN INDICATOR**

Turn indicator light:  
Mini lamps (cannot be replaced)

**9. SPEED SENSOR**

Operating voltage: VDC= 5÷24 V  
Peak voltage capacity: 26 V  
Maximum inverse voltage: -16 V  
Maximum consumption current: 10 mA  
Operating temperature in service:  
-20 °C - +80 °C (-7.6 °F - +112 °F)

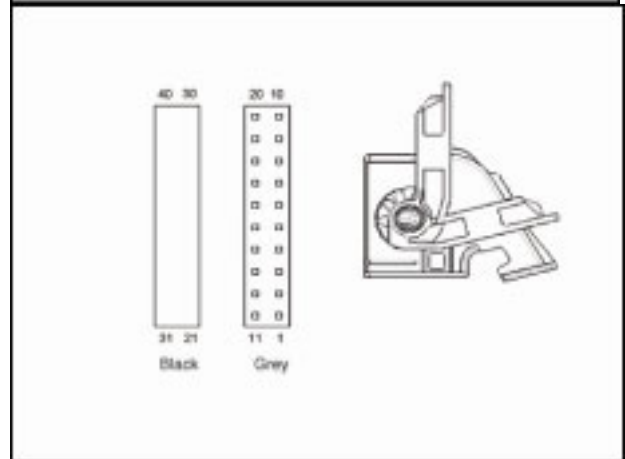
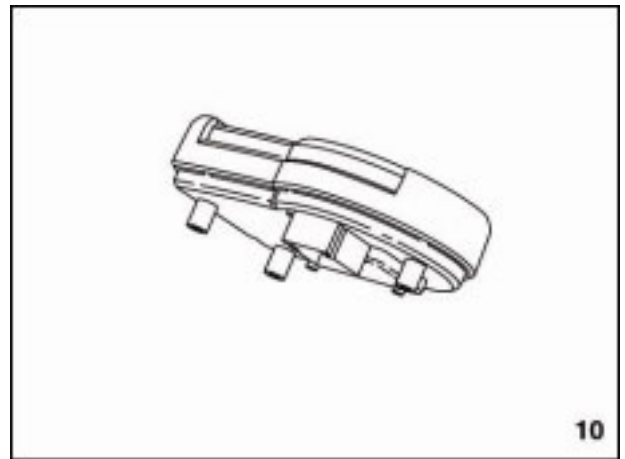




RS125

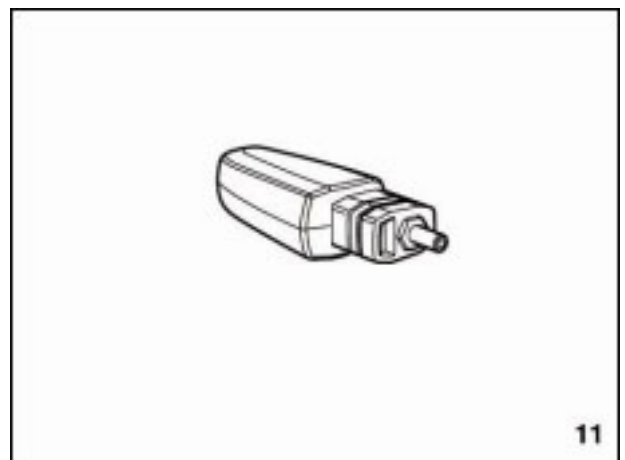
## 10. INSTRUMENT PANEL

Pin	Service	Pin	Service
1	+Key	11	+Battery
2	RH indicator input	12	LH indicator input
3	Speed sensor power	13	High beam input
4	RPM input	14	Speed sensor input
5	Speed sensor ground	15	-
6	General ground	16	K line / Lap timer input
7	Neutral input	17	Oil level sensor
8	Functions ground	18	Fuel level sensor
9	Functions ground (option)	19	Water temperature sensor
10	Functions ground (option)	20	Mode



## 11. FRONT RIGHT TURN INDICATOR

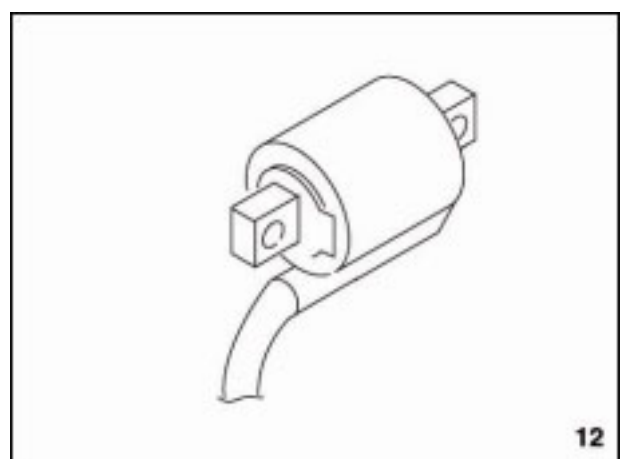
Turn indicator light:  
Mini lamps (cannot be replaced)



## 12. RAVE CONTROL SOLENOID (RF)

The solenoid controlled by the Rave control unit opens the exhaust valve at 8100 rpm.

- Check the condition of the 15-A fuse
- Connect a 12 V battery to the solenoid and check it for proper operation.
- Replace the regulator with one that is known to operate correctly.
- Replace the Rave control unit with one that is known to operate correctly.



**WARNING**

Cutting the jumper across the grey and red wires of the Rave control unit will set solenoid actuation threshold to 7,800 rpm.

- Check that the piston moves freely.
- Start the engine and keep it at idling speed.
- Measure resistance across the wires using a tester:

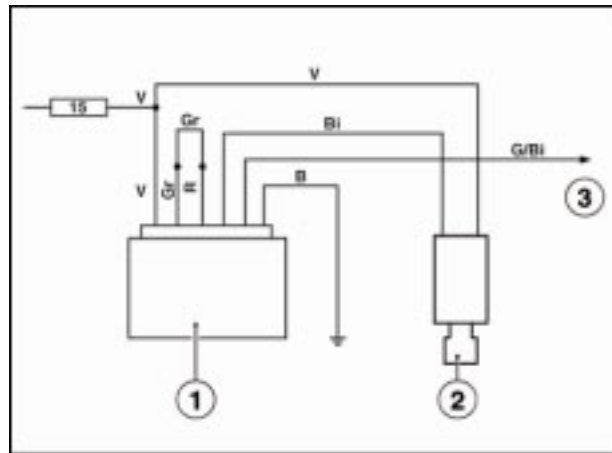
**Correct reading = 2.2 Ohm  $\pm$  10%.**

**Key:**

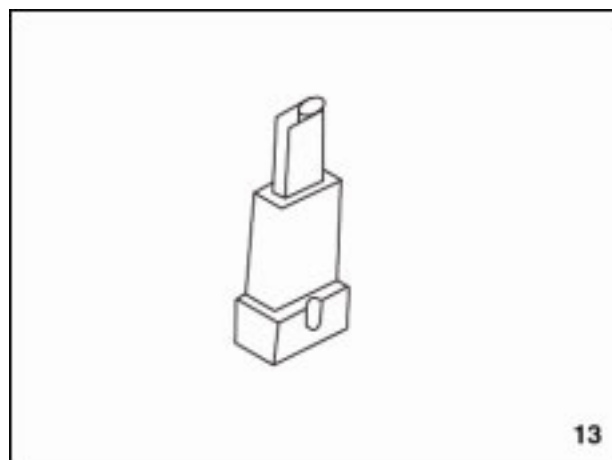
- 1 – RAVE control unit
- 2 – RAVE solenoid
- 3 – Flywheel / regulator

- Measure voltage across the solenoid wires with a tester:

**Correct reading = 11.5  $\pm$  1 V at idling speed during a one-second (only) pulse; after this initial pulse, reading should stabilise at 5.5  $\pm$  1 V D.C.**

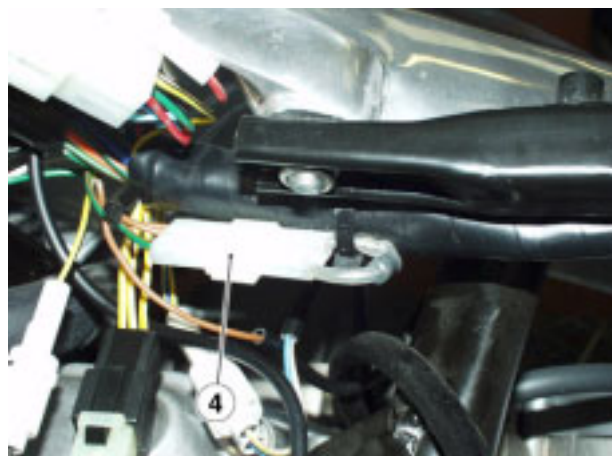


### 13. Safety diode (stand, neutral, neutral light, starter relay)

**Diode test**

- Disconnect the (white) two-way connector (4).

Check diodes for correct operation as follows:



RS125

**WARNING**

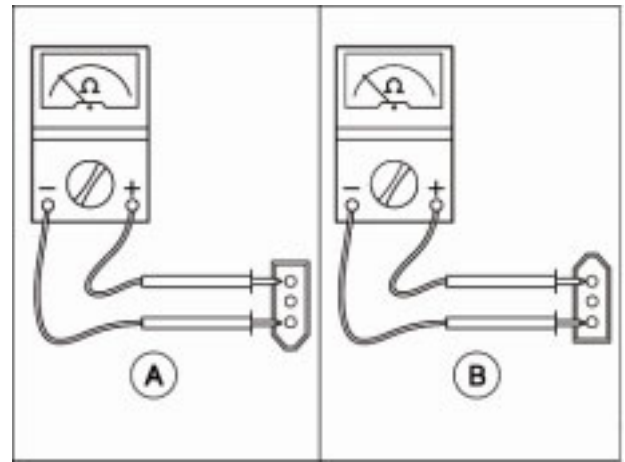
On reassembly, make sure to match the connector (4) to the correct component.

Use a tester (placed in diode test mode) to check across the two male terminals inside the diode as shown in the figure.

Correct reading (layout A): 0 – 1  $\Omega$ .

Correct reading (layout B):  $\infty$ .

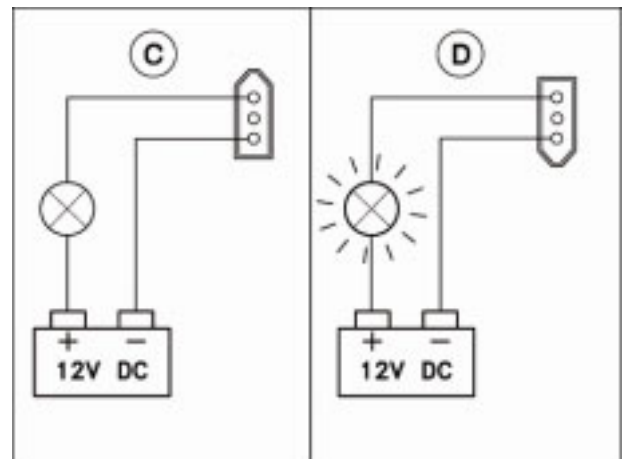
If your tester does not support diode testing, feed 12 V, connect a 12 V – 2 W bulb to the positive lead and connect the diode as shown in the figure.

**WARNING**

Do not use a bulb rated more than 2 W or the diode might damage.

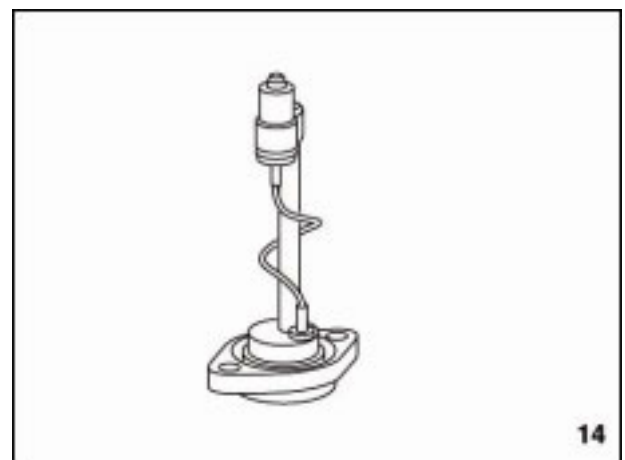
Test (C): the bulb remains off.

Test (D): the bulb lights up.

**14. FUEL LEVEL SENSOR****Sensor test**

- Lift the fuel tank, see (LIFTING THE FUEL TANK).
- Disconnect the connector (5).
- Use a tester to check across the two male terminals inside the connector.

Correct reading: 1.8 k $\Omega$  at 20°C (68 °F)

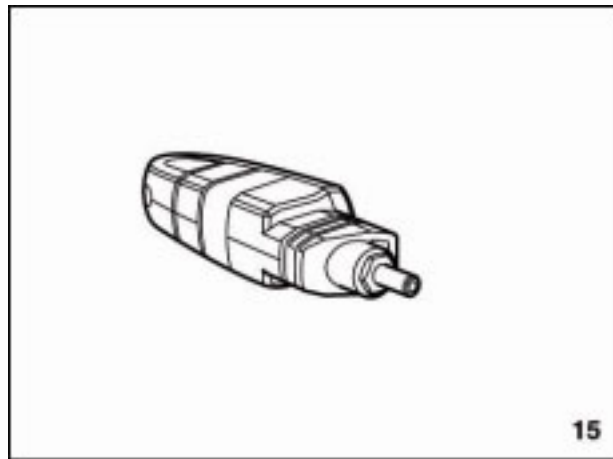
**WARNING**

On reassembly, make sure to match the connector (5) to the correct component.



**15. Rear right turn indicator**

Turn indicator light:  
Mini lamps (cannot be replaced)



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**16. RAVE CONTROL UNIT (RF)**

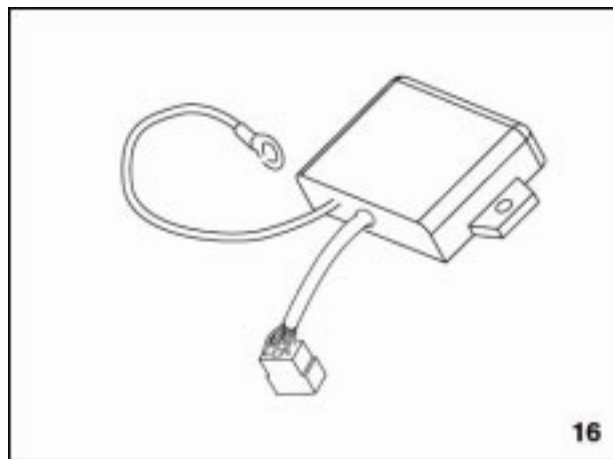
- Remove the tail guard, see (REMOVING THE TAIL GUARD).
- Disconnect the connector.
- Start the engine and turn on the low beam.
- Rev the engine up to 2500 rpm.
- Measure voltage across the green (V) and white (Bi) wires with a tester:

**Correct reading = 12.25 ± 1 V D.C.**

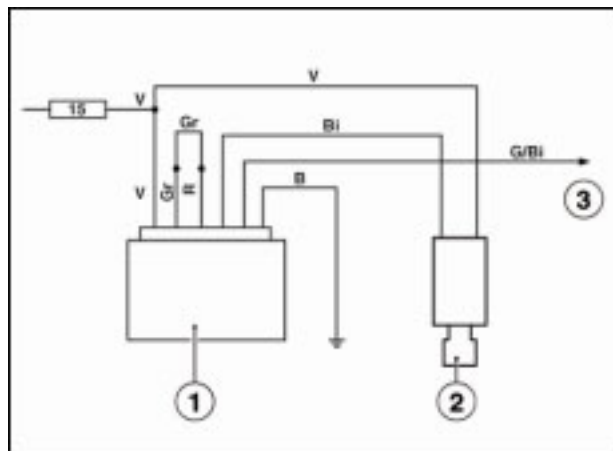
- Rev the engine up to 8100 rpm.
- Measure voltage across the yellow/white (G/Bi) and blue (B) wires with a tester:

**Correct reading = 8.5 ± 1 V A.C.**

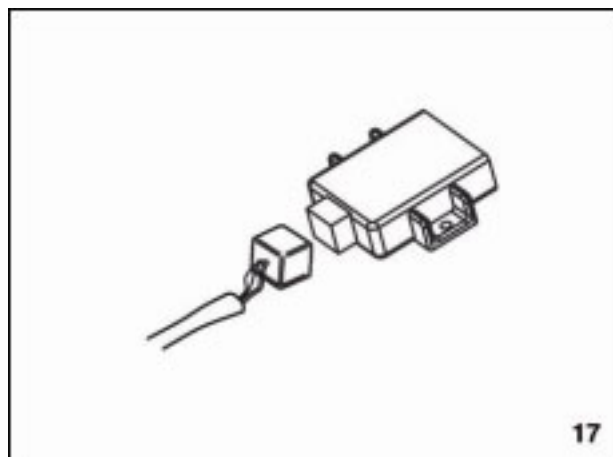
**NOTE** Readings outside the specified ranges indicate a system fault, not a control unit fault.



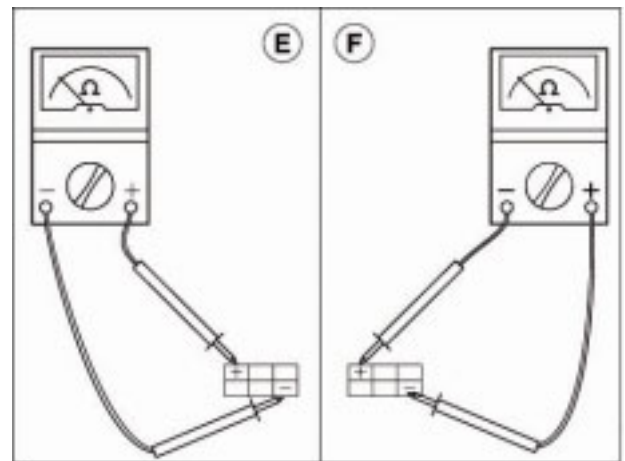
16

**17. CDI CONTROL UNIT**

- Use a tester to check across the two male terminals ( + ) and ( - ) inside the connector as shown in the figure.
- Invert the +/- probes between the power supply poles (E and F).
- If reading equals zero (0), the control unit is damaged.
- Change the control unit.



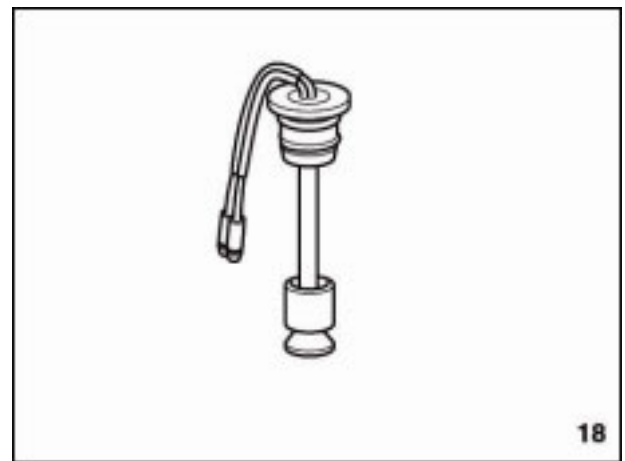
17



### 18. MIXER OIL LEVEL SENSOR


Measure resistance across the two terminals using a tester:

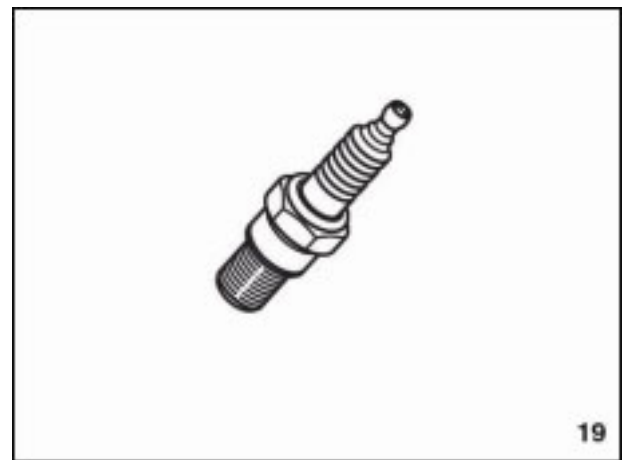
- a full tank will give infinite resistance ( $\infty$ ).
- an empty tank will give 0  $\Omega$



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### 19. SPARK PLUG

Standard (  )	NGK R BR10EG
Standard	NGK BR8ES
Spark plug gap	0.7 – 0.8 mm (0.028 – 0.031 in.)



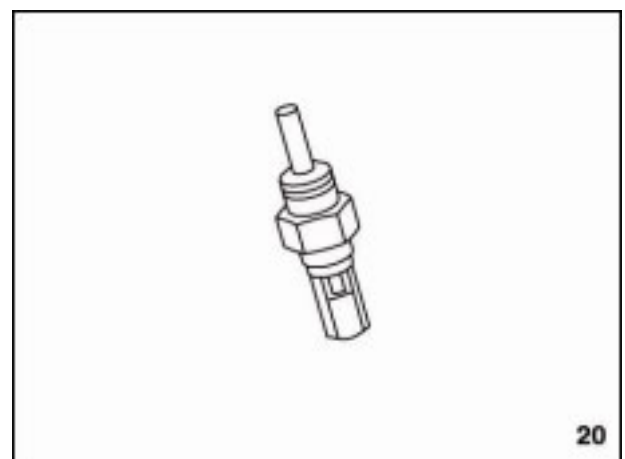
19

### 20. COOLANT THERMISTOR

#### Water temperature

- Disconnect the thermistor wire and connect three resistors rated 1,000  $\Omega$ , 50  $\Omega$  and 15  $\Omega$ , respectively, as shown in the figure.
- The display will show the temperature readings or message listed below (with the ignition key set to "ON").

Resistor connected	Readout on display
1000 $\Omega$	COLD
50 $\Omega$	90 ÷ 95 °C (194 ÷ 203 °F)
15 $\Omega$	120 ÷ 130 °C (248 ÷ 266 °F)

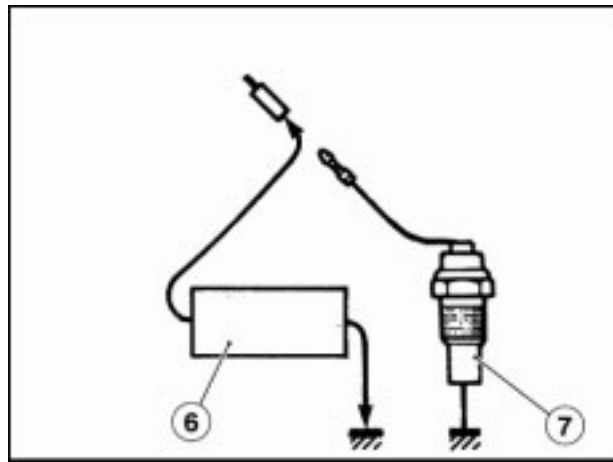


20

- If display gives the correct readouts, change the thermistor.
- Otherwise replace the display.

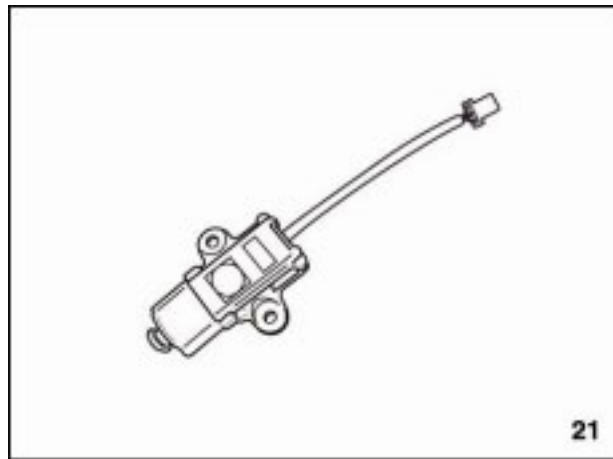
**Key:**

- 6) Resistor
- 7) Thermistor

**21. SIDE STAND SWITCH**

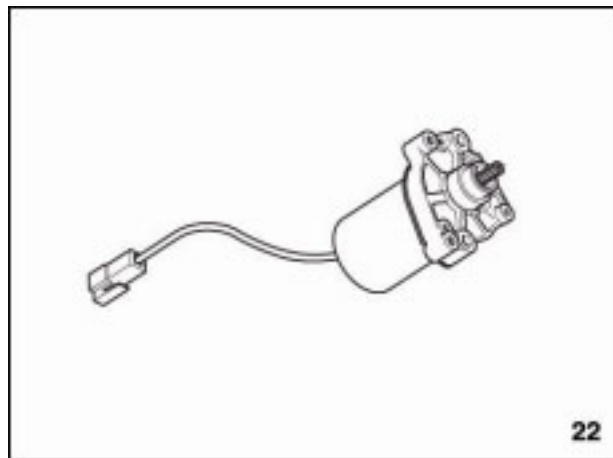
Measure resistance across the two terminals using a tester:

- with the stand down, resistance should be infinite ( $\infty$ ).
- with the stand folded up, resistance should be 0  $\Omega$

**22. STARTER MOTOR**

Feed the starter motor from a 12 V 9 AH battery.  
Measure current draw under regular operating conditions (after 5 seconds) with a DC amperemeter.

**Correct reading 50 - 60 A.**

**23. NEUTRAL SENSOR**

Check for the following readings using a tester:

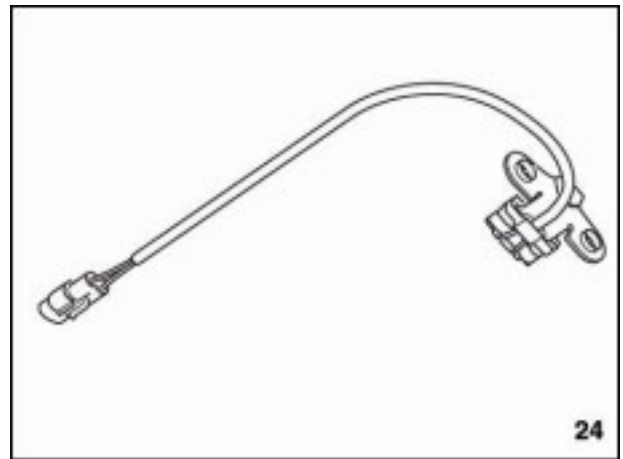
- with a gear engaged, resistance should be infinite.
- in neutral, resistance should be 0  $\Omega$



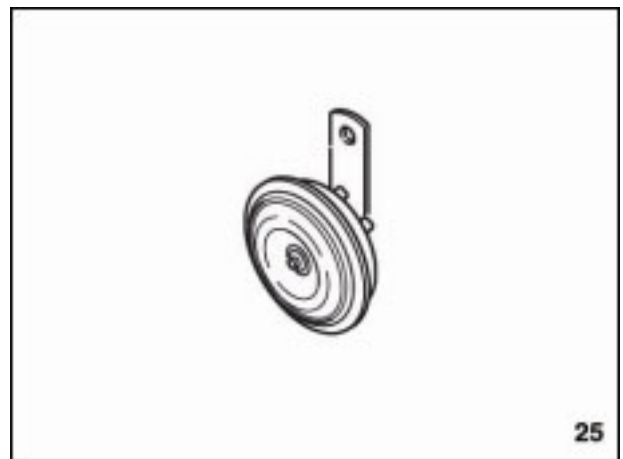
## RS125

**24. PICK-UP SENSOR****Pick-up test**

- Disconnect the pick-up terminal connector.
- Measure resistance across the yellow/white and blue/violet wire terminals with a hand-held tester set to the 1000  $\Omega$  scale: Resistance reading should be between 190 and 300  $\Omega$ .
- If resistance reading is outside the specified range, change the pick-up.

**25. WARNING HORN**

Test voltage: 13 V (rated voltage 12 V)  
 Current draw: < 3.5 A

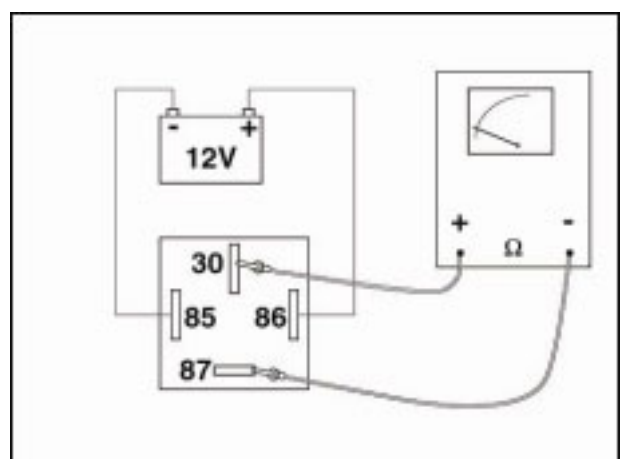
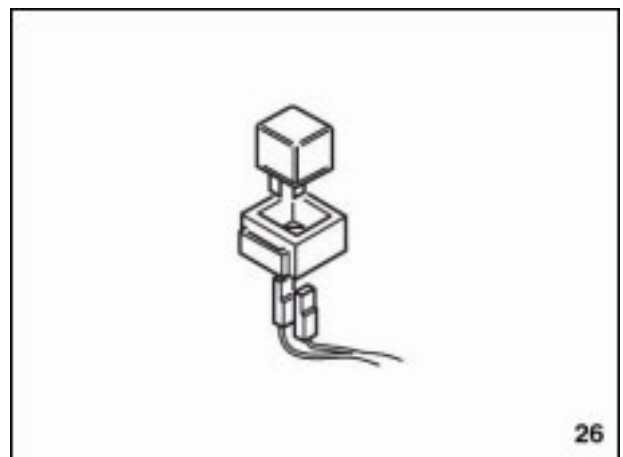
**26. STARTER RELAY****Starter relay test**

- Check relay for correct operation as follows:
- Feed 12 V to the two male terminals (85 -86).
- Use a tester (placed in ohmmeter mode) to check continuity across the other two terminals ( 87 - 30).

**Correct reading with live relay: 0  $\Omega$**

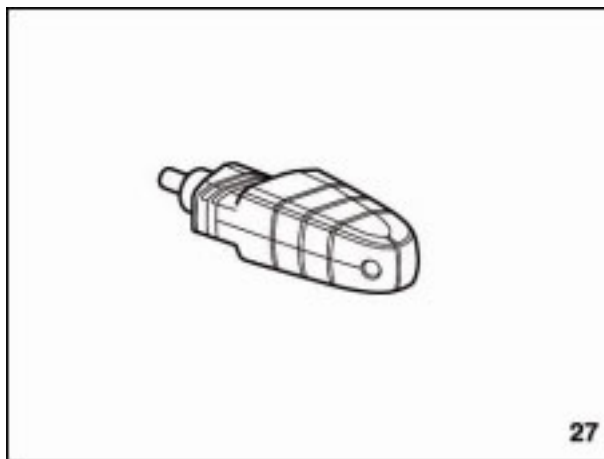
**Correct reading when relay is not fed:  $\infty \Omega$**

- If readings are not as specified, change the relay.



**27. FRONT LEFT TURN INDICATOR**

Turn indicator light:  
Mini lamps (cannot be replaced)



27

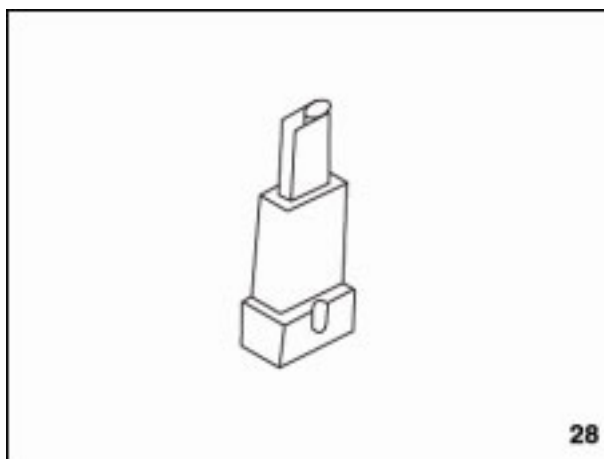
**28. SAFETY DIODE (horn)**

Use a tester placed in ohmmeter mode to check the continuity of contacts according to the diagram below.

**Diode test**

- Disconnect the (white) two-way connector.

Check diodes for correct operation as follows:



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**WARNING**

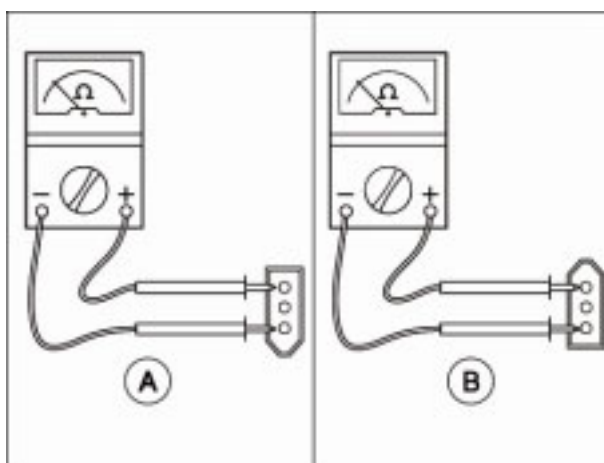
On reassembly, make sure to match the connector to the correct component.

Use a tester (placed in diode test mode) to check across the two male terminals inside the diode as shown in the figure.

Correct reading (layout A): 0 – 1 Ω.

Correct reading (layout B): ∞.

If your tester does not support diode testing, feed 12 V, connect a 12 V – 2 W bulb to the positive lead and connect the diode as shown in the figure.

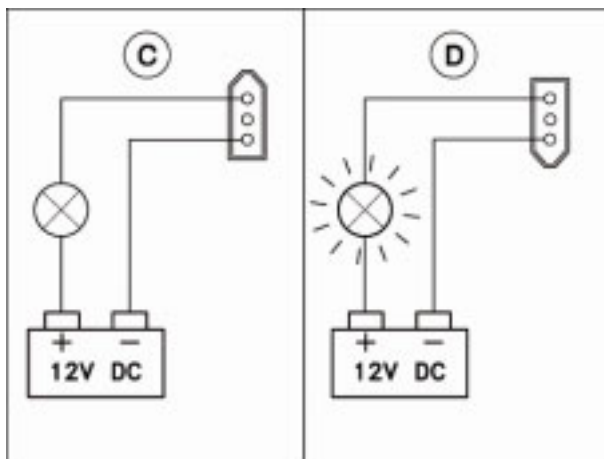


**WARNING**

Do not use a bulb rated more than 2 W or the diode might damage.

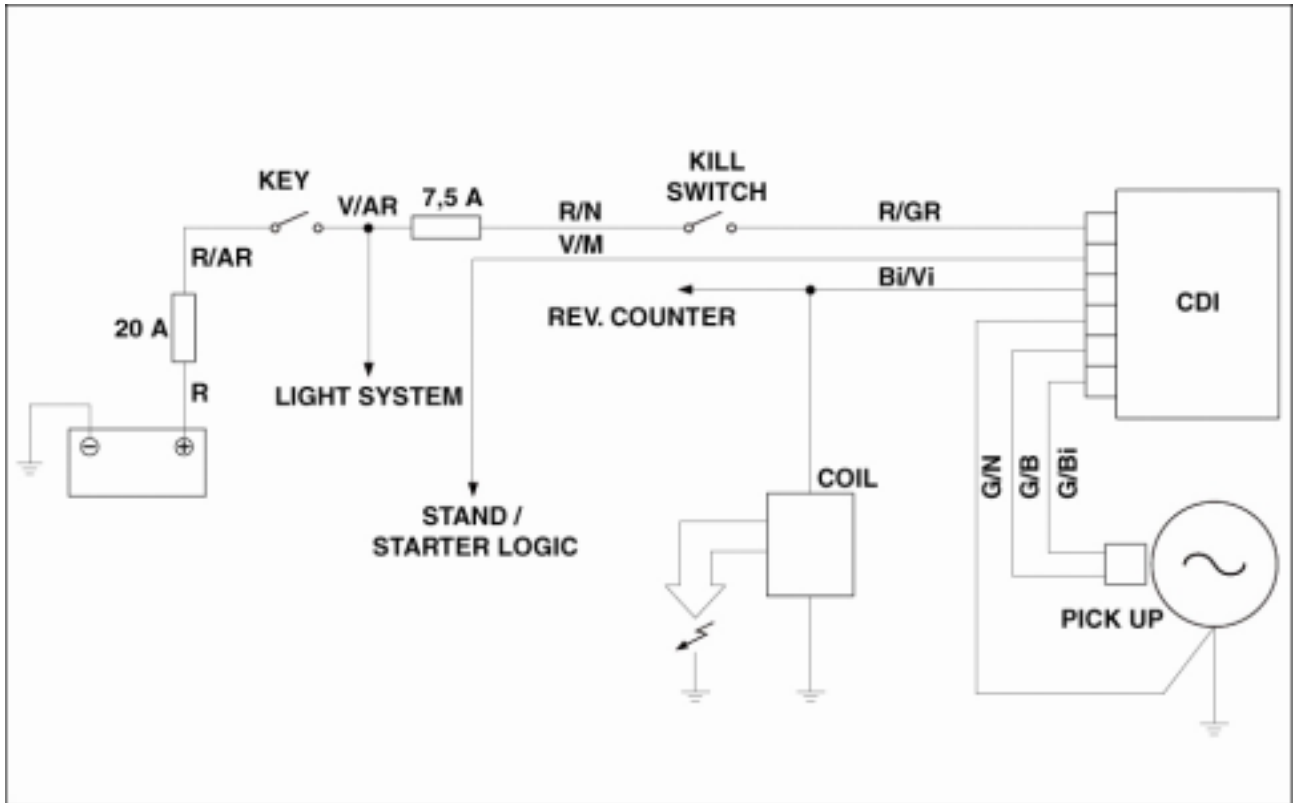
Test (C): the bulb remains off.

Test (D): the bulb lights up.





## 7.1.2. IGNITION SYSTEM



## TROUBLESHOOTING

- Check the condition of the 7.5 A and 20 A fuses.

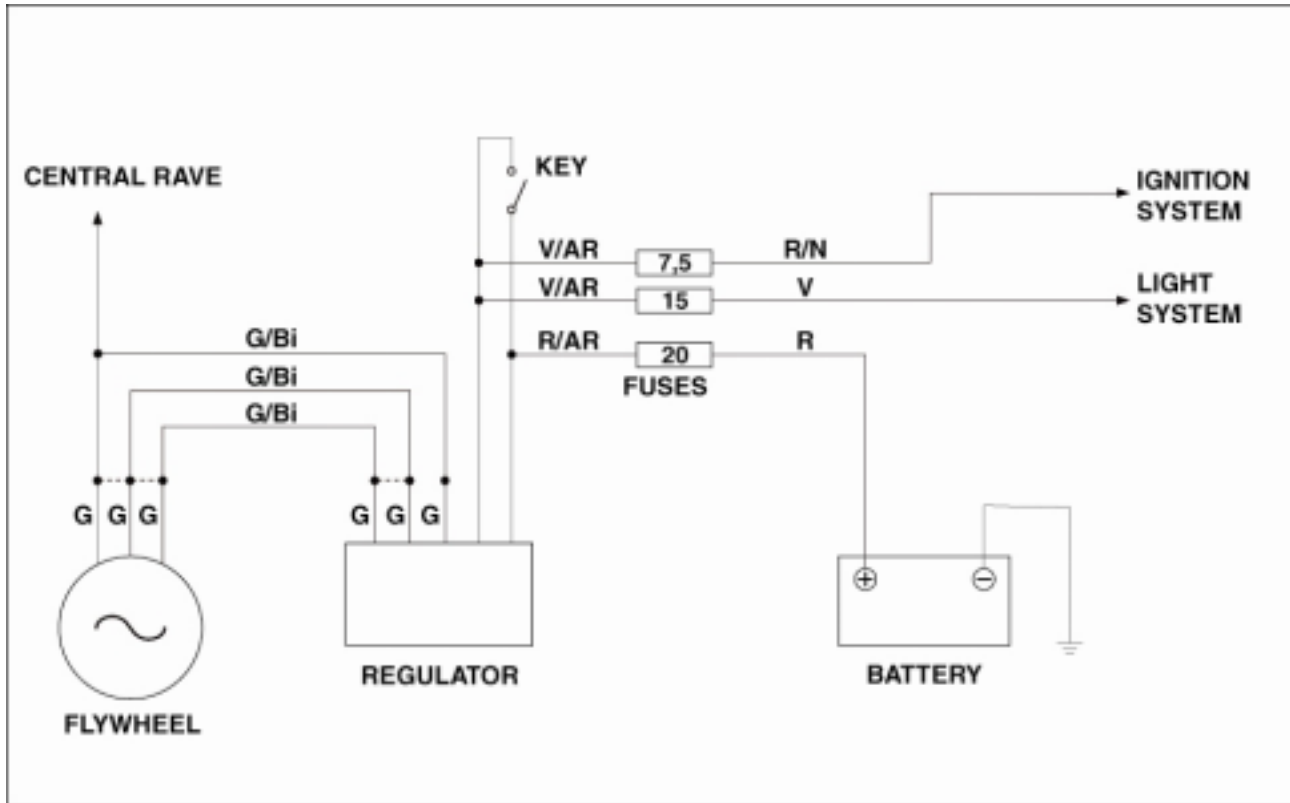
**NOTE** For instructions on how to test electric components, see (ELECTRIC PARTS TROUBLESHOOTING CHART).

- Check the spark plug and replace as required.
- Check the high-voltage cable and the spark plug cap.
- Check the coil.
- Check the pick-up.
- Connect the green brown cable to ground.

**NOTE** Starting and ignition are inhibited when the stand is down and/or a gear is engaged.

- If the ignition is operating properly, check the stand logic system.
- Check the condition of the 15-A fuses.
- Check the neutral sensor.
- Check the stand switch.
- Check the diode.
- Check the starter relay.
- Replace the CDI control unit with one that is known to operate correctly.

## 7.1.3. CHARGING SYSTEM AND MAIN POWER SUPPLY



## Charging system test

- Start the engine and rev it up to 6000 rpm.
- Connect a tester placed into voltmeter mode across battery terminals.
- Turn on the low beam.
- Voltage reading should be between 13.5 and 15 V.

## TROUBLESHOOTING

**NOTE** For instructions on how to test electric components, see (ELECTRIC PARTS TROUBLESHOOTING CHART).

- Check the condition of the 20-A fuse.
- Check the connections of flywheel, regulator and fuse wires.
- Check the flywheel.
- Check the battery.
- Replace the regulator with one that is known to operate correctly.

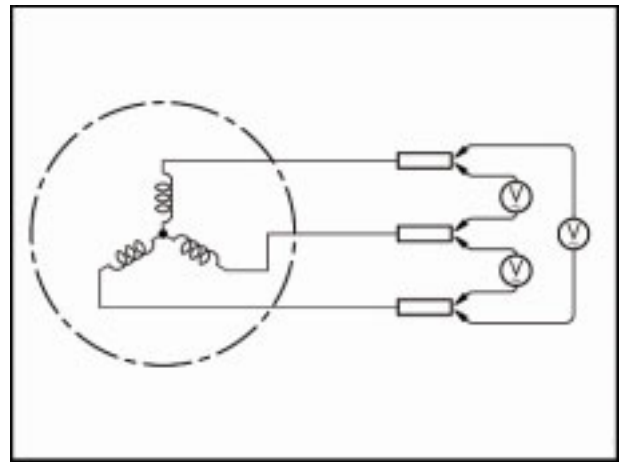
## RS125

## Test data

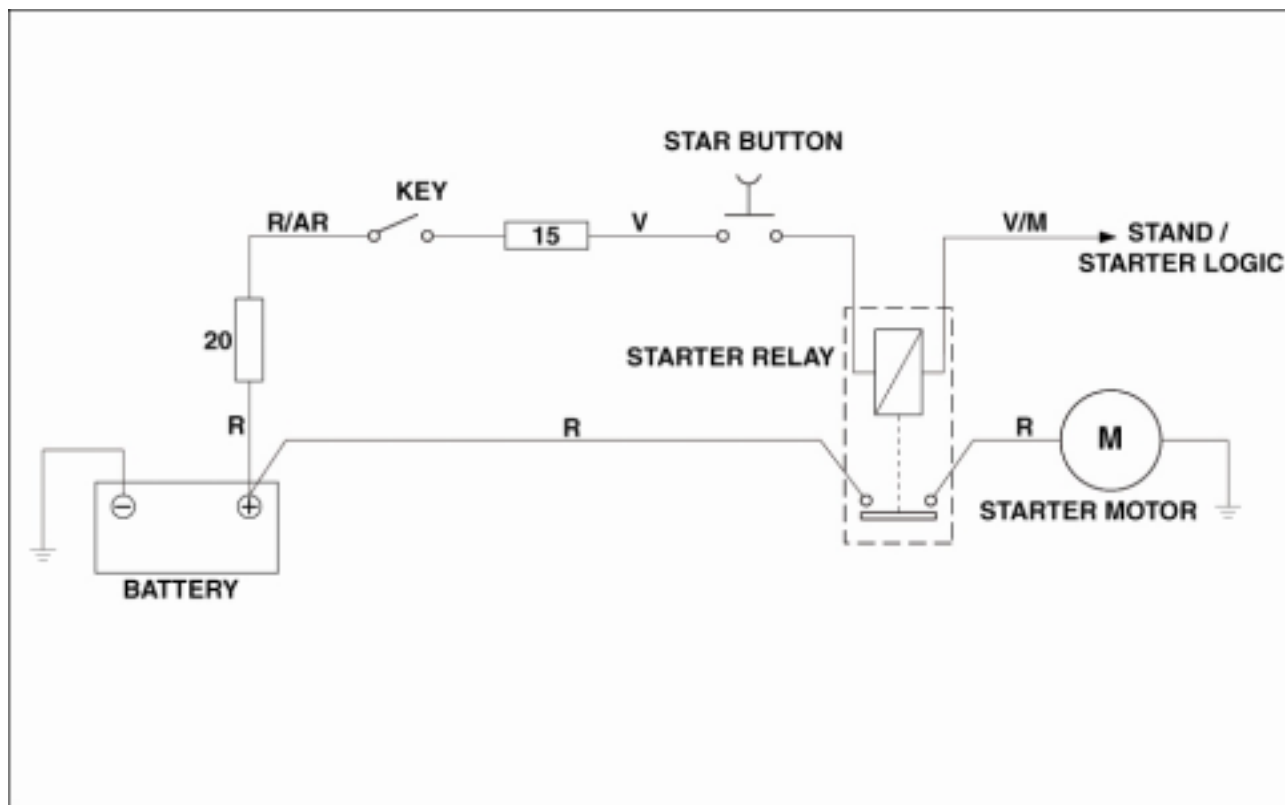
## Flywheel test

- Disconnect the alternator wiring connector.
- Start the engine and rev it up to 5000 rpm.
- Use the hand-held tester to measure voltage (VAC) across the three yellow wires. A reading lower than 53 V indicates a faulty alternator.

Standard voltage under no-load conditions: over 53 V (A.C.) at 6000 rpm.



## 7.1.4. STARTER CIRCUIT

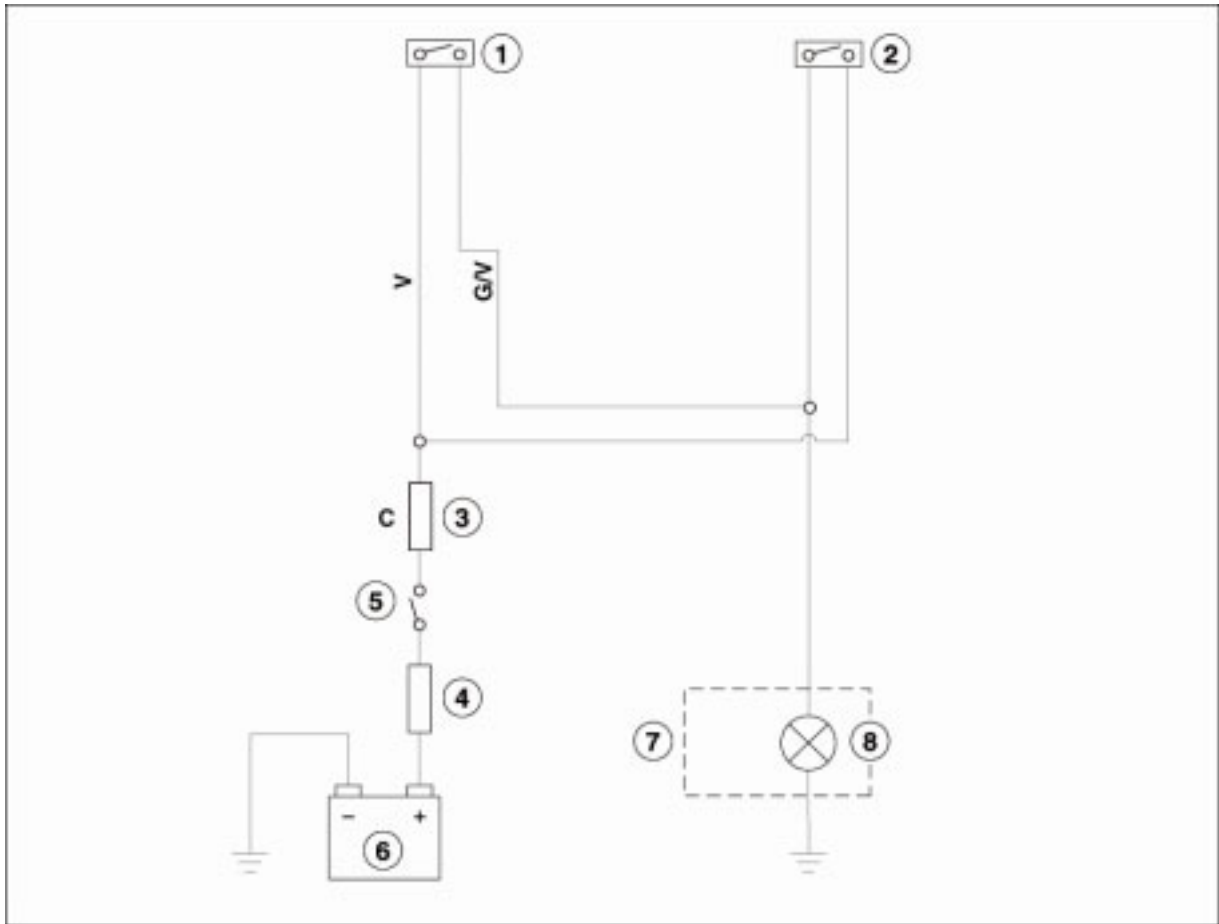


## TROUBLESHOOTING

**NOTE** For instructions on how to test electric components, see (ELECTRIC PARTS TROUBLESHOOTING CHART).

- Check the condition of the fuses.
- Check the starter button.
- Check the starter relay.
- Check the starter motor.
- Connect the green brown cable to ground. If the starting system operates correctly, check the stand/starter logic circuit, see (IGNITION SYSTEM).

## 7.1.5. STOPLIGHT CIRCUIT

**Key:**

1. Front brake switch
2. Rear brake switch
3. Fuse (15 A)
4. Fuse (20 A)
5. Key
6. Battery
7. Tail light
8. Stoplights

**NOTE** For instructions on how to test electric components, see (ELECTRIC PARTS TROUBLESHOOTING CHART).

**TROUBLESHOOTING**

- Check the condition of the 15-A and 20-A fuses.
- Check the condition of the stoplight bulb.

**Switches**

Use a tester to check the continuity of the switches according to the diagram below.  
Change the switch assembly if continuity is not as specified.

**Stoplight switch on front brake**

Position	Wires	
	V	V/G
Operated	○ — ○	

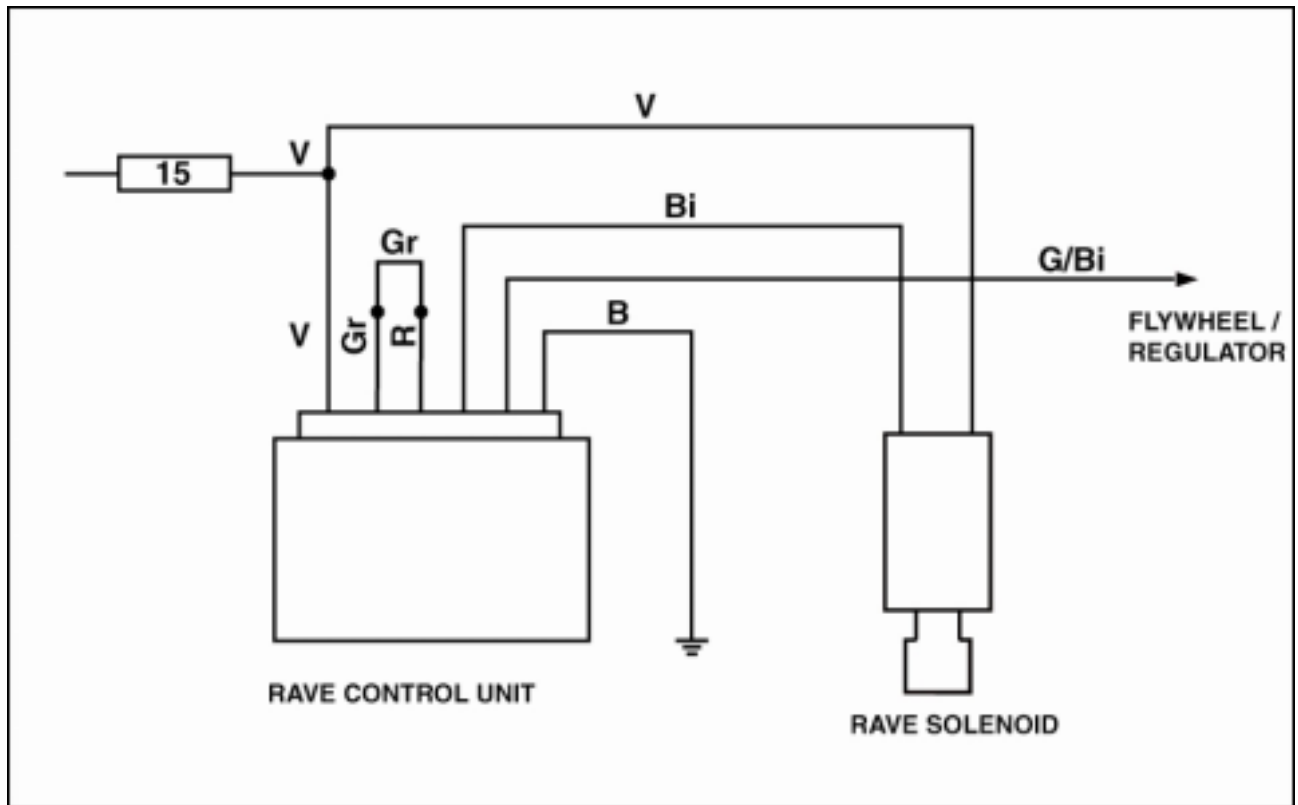


**Stoplight switch on rear brake**

Position	Wires	
	V	V/G
Operated	○ — ○	



## 7.1.6. RAVE VALVE CIRCUIT



The solenoid controlled by the Rave control unit opens the exhaust valve at 8100 rpm.

**TROUBLESHOOTING**

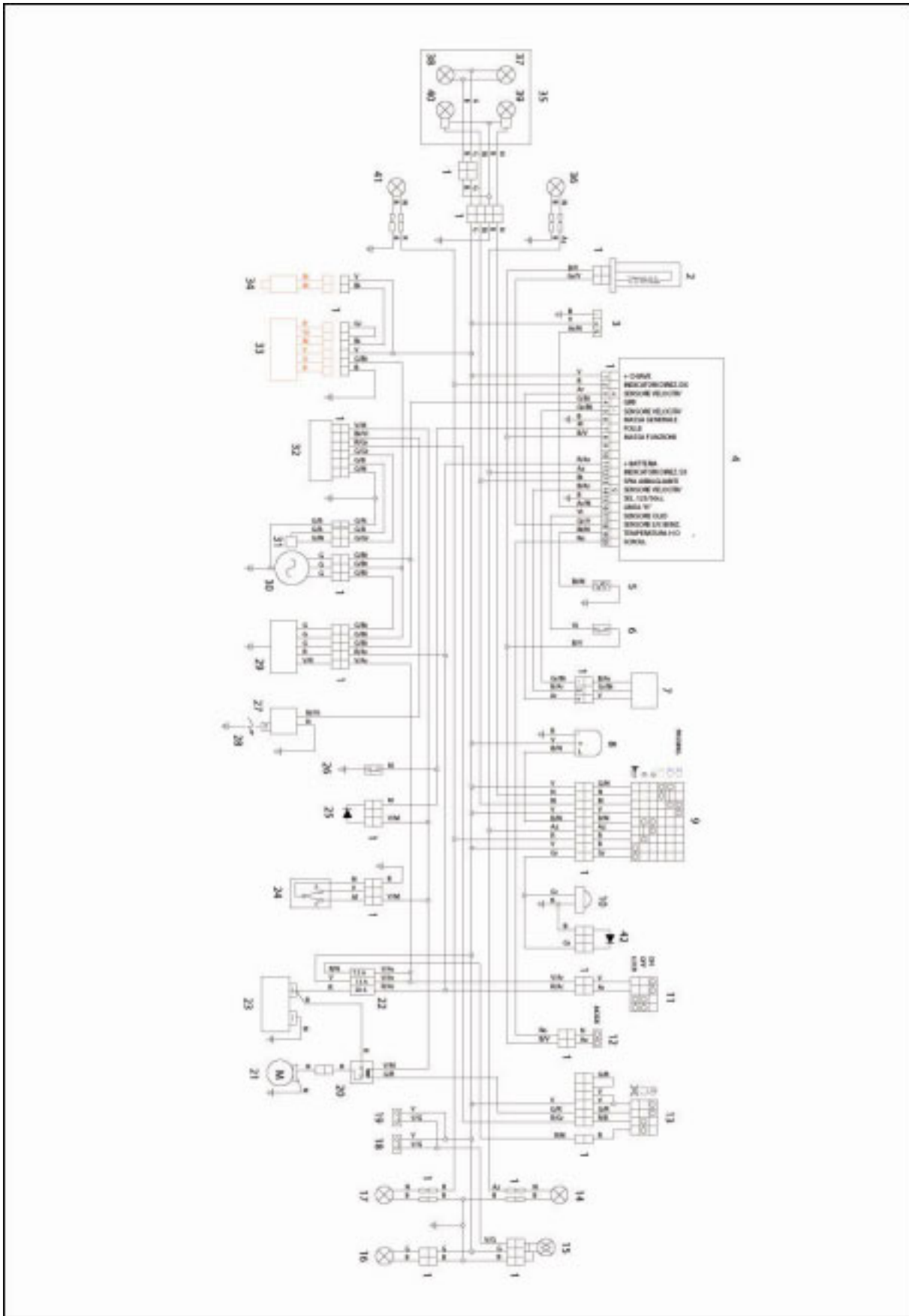
**NOTE** For instructions on how to test electric components, see (ELECTRIC PARTS TROUBLESHOOTING CHART).

- Check the condition of the 15-A fuse
- Connect a 12 V battery to the solenoid and check it for proper operation.
- Check the flywheel, see (CHARGING SYSTEM AND MAIN POWER SUPPLY)
- Replace the regulator with one that is known to operate correctly.
- Replace the Rave control unit with one that is known to operate correctly.

**WARNING**

Cutting the jumper across the grey and red wires of the Rave control unit will set solenoid actuation threshold to 7,800 rpm.

7.1.7. WIRING DIAGRAM





**Key:**

1. Multiple connectors
2. Fuel level sensor
3. Serial diagnosis connector
4. Electronic instrument panel
5. Water temperature sensor
6. Oil level sensor
7. Speed sensor
8. Repeater
9. Left dimmer switch
10. Warning horn
11. Key-operated switch
12. "MODE" button
13. Right dimmer switch
14. Rear left turn indicator
15. Parking light/brake light
16. Number plate light
17. Rear right turn indicator
18. Rear brake switch
19. Front brake switch
20. Starter relay
21. Starter motor
22. Fuses
23. Battery
24. Side stand switch
25. Diode 1
26. Neutral sensor
27. Ignition coil
28. Spark plug
29. Voltage regulator
30. Generator
31. Pick-up
32. C.D.I. control unit
33. Rave control unit (version **PP**)
34. Solenoid (version **PP**)
35. Complete headlight
36. Front left turn indicator
37. Parking light bulb
38. Parking light bulb
39. Low beam bulb
40. High beam bulb
41. Front right turn indicator
42. Diode 2
43. –
44. –
45. –

**WIRE COLOUR CODES**

<b>Ar</b>	orange
<b>Az</b>	light blue
<b>B</b>	blue
<b>Bi</b>	white
<b>G</b>	Yellow
<b>Gr</b>	grey
<b>M</b>	brown
<b>N</b>	black
<b>R</b>	red
<b>V</b>	green
<b>Vi</b>	violet



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