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# SERVICE STATION MANUAL

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**V7 II ABS**

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# SERVICE STATION MANUAL

## V7 II ABS

### THE VALUE OF SERVICE

As a result of continuous updates and specific technical training programmes for Moto Guzzi products, only **Moto Guzzi** Official Network mechanics know this vehicle fully and have the specific tools necessary to carry out maintenance and repair operations correctly.

The reliability of the vehicle also depends on its mechanical conditions. Checking the vehicle before riding it, its regular maintenance and the use of **original Moto Guzzi spare parts** only are essential factors!

For information on the nearest **Official Dealer and/or Service Centre** consult our website:

[www.motoguzzi.com](http://www.motoguzzi.com)

Only by requesting Moto Guzzi original spare parts can you be sure of purchasing products that were developed and tested during the actual vehicle design stage. All Moto Guzzi original spare parts undergo quality control procedures to guarantee reliability and durability.

The descriptions and images in this publication are given for illustrative purposes only and are not binding. While the basic characteristics as described and illustrated in this booklet remain unchanged, Piaggio & C. S.p.A. reserves the right, at any time and without being required to update this publication beforehand, to make any changes to components, parts or accessories, which it considers necessary to improve the product or which are required for manufacturing or construction reasons.

Not all versions/models shown in this publication are available in all countries. The availability of individual versions should be checked with the Official Moto Guzzi sales network.

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# SERVICE STATION MANUAL

## V7 II ABS

This manual provides the main information to carry out regular maintenance operations on your vehicle. This manual is intended to **Moto Guzzi Dealers** and their qualified mechanics; several concepts have been deliberately omitted as they are considered unnecessary. As it is not possible to include complete mechanical notions in this manual, users should have basic mechanical knowledge or minimum knowledge about the procedures involved when repairing scooters. Without this knowledge, repairing or checking the vehicle may be inefficient or even dangerous. As the vehicle repair and check procedures are not described in detail, be extremely cautious so as not to damage components or injure individuals. In order to optimise customer satisfaction when using our vehicles, **Moto Guzzi** commits itself to continually improve its products and the relative documentation. The main technical modifications and changes in repair procedures are communicated to all **Moto Guzzi Sales Outlets and its International Subsidiaries**. These changes will be introduced in the subsequent editions of the manual. In case of need or further queries on repair and check procedures, consult **Moto Guzzi CUSTOMER DEPARTMENT**, which will be prepared to provide any information on the subject and any further communications on updates and technical changes related to the vehicle.

**NOTE** Provides key information to make the procedure easier to understand and carry out.

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

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



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



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



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

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CHARACTERISTICS

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## Rules

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### Safety rules

#### Carbon monoxide

If you need to keep the engine running while working on the vehicle, please ensure that you do so in an open or very well ventilated area. Never run the engine in an enclosed area. If you do work in an enclosed area, make sure to use a fume extraction system.

#### CAUTION



**EXHAUST EMISSIONS CONTAIN CARBON MONOXIDE, A POISONOUS GAS WHICH CAN CAUSE LOSS OF CONSCIOUSNESS AND EVEN DEATH.**

#### Fuel

#### CAUTION



**THE FUEL USED TO POWER INTERNAL COMBUSTION ENGINES IS HIGHLY FLAMMABLE AND MAY BE EXPLOSIVE UNDER CERTAIN CONDITIONS. IT IS THEREFORE RECOMMENDED TO CARRY OUT REFUELLING AND MAINTENANCE PROCEDURES IN A VENTILATED AREA WITH THE ENGINE SWITCHED OFF. DO NOT SMOKE DURING REFUELLING AND NEAR FUEL VAPOURS, AVOIDING ANY CONTACT WITH NAKED FLAMES, SPARKS OR OTHER SOURCES WHICH MAY CAUSE THEM TO IGNITE OR EXPLODE.**

**DO NOT DISPERSE FUEL IN THE ENVIRONMENT.**

**KEEP OUT OF THE REACH OF CHILDREN**

#### Hot components

The engine and the exhaust system components become very hot and remain hot for some time after the engine has been switched off. When handling these components, wear insulating gloves or wait until the engine and the exhaust system have cooled down.

#### Used engine oil and transmission oil

#### CAUTION



**IT IS ADVISABLE TO WEAR PROTECTIVE IMPERMEABLE GLOVES WHEN SERVICING THE VEHICLE.**

**THE ENGINE OR GEARBOX OIL MAY CAUSE SERIOUS INJURIES TO THE SKIN IF HANDLED FOR PROLONGED PERIODS OF TIME AND ON A REGULAR BASIS.**

**WASH YOUR HANDS CAREFULLY AFTER HANDLING OIL.**

**HAND THE OIL OVER TO OR HAVE IT COLLECTED BY THE NEAREST USED OIL RECYCLING COMPANY OR THE SUPPLIER.**

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

**KEEP OUT OF THE REACH OF CHILDREN**

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**Brake and clutch fluid**

**BRAKE AND CLUTCH FLUIDS CAN DAMAGE THE PLASTIC OR RUBBER PAINTED SURFACES. WHEN SERVICING THE BRAKING SYSTEM OR THE CLUTCH SYSTEM, PROTECT THESE COMPONENTS WITH A CLEAN CLOTH. ALWAYS WEAR PROTECTIVE GOGGLES WHEN SERVICING THESE SYSTEMS. BRAKE AND CLUTCH FLUIDS ARE EXTREMELY HARMFUL FOR YOUR EYES. IN THE EVENT OF ACCIDENTAL CONTACT WITH THE EYES, RINSE THEM IMMEDIATELY WITH ABUNDANT COLD, CLEAN WATER AND SEEK MEDICAL ADVICE.**

**KEEP OUT OF THE REACH OF CHILDREN**

**Battery electrolyte and hydrogen gas****CAUTION**

**THE BATTERY ELECTROLYTE IS TOXIC, CORROSIVE AND AS IT CONTAINS SULPHURIC ACID, IT CAN CAUSE BURNS WHEN IN CONTACT WITH THE SKIN. WHEN HANDLING BATTERY ELECTROLYTE, WEAR TIGHT-FITTING GLOVES AND PROTECTIVE APPAREL. IN THE EVENT OF SKIN CONTACT WITH THE ELECTROLYTIC FLUID, RINSE WELL WITH PLENTY OF CLEAN WATER. IT IS PARTICULARLY IMPORTANT TO PROTECT YOUR EYES BECAUSE EVEN TINY AMOUNTS OF BATTERY ACID MAY CAUSE BLINDNESS. IF THE FLUID GETS IN CONTACT WITH YOUR EYES, WASH WITH ABUNDANT WATER FOR FIFTEEN MINUTES AND CONSULT AN EYE SPECIALIST IMMEDIATELY. THE BATTERY RELEASES EXPLOSIVE GASES; KEEP IT AWAY FROM FLAMES, SPARKS, CIGARETTES OR ANY OTHER HEAT SOURCES. ENSURE ADEQUATE VENTILATION WHEN SERVICING OR RECHARGING THE BATTERY.**

**KEEP OUT OF THE REACH OF CHILDREN**

**BATTERY LIQUID IS CORROSIVE. DO NOT POUR IT OR SPILL IT, PARTICULARLY ON PLASTIC COMPONENTS. ENSURE THAT THE ELECTROLYTIC ACID IS COMPATIBLE WITH THE BATTERY TO BE ACTIVATED.**

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**Maintenance rules****GENERAL PRECAUTIONS AND INFORMATION**

When repairing, dismantling and reassembling the vehicle follow the recommendations reported below carefully.

**BEFORE REMOVING COMPONENTS**

- Before dismantling components, remove dirt, mud, dust and foreign bodies from the vehicle.  
Use the special tools designed for this bike, as required.

**COMPONENTS REMOVAL**

- Do not loosen and/or tighten screws and nuts using pliers or any other tools than the specific wrench.
- Mark the positions on all connection joints (pipes, cables, etc.) before separating them, and identify them with different distinctive symbols.
- Each component needs to be clearly marked to enable identification during reassembly.
- Clean and wash the dismantled components carefully using a low-flammability detergent.
- Keep mated parts together since they have "adjusted" to each other due to normal wear.

- Some components must be used together or replaced altogether.
- Keep away from heat sources.

### REASSEMBLY OF COMPONENTS

**CAUTION**

**BEARINGS MUST BE ABLE TO ROTATE FREELY, WITHOUT JAMMING AND/OR NOISE: OTHERWISE, THEY NEED TO BE REPLACED.**

- Only use ORIGINAL Moto Guzzi SPARE PARTS.
- Comply with lubricant and consumables use guidelines.
- Lubricate parts (whenever possible) before reassembling them.
- When tightening nuts and screws, start from the ones with the largest section or from the internal ones, moving diagonally. Tighten nuts and screws in successive steps before applying the tightening torque.
- Always replace self-locking nuts, washers, sealing rings, circlips, O-rings (OR), cotter pins and screws with new ones if their tread is damaged.
- When assembling the bearings, make sure to lubricate them well.
- Check that each component is assembled correctly.
- After a repair or routine maintenance procedure, carry out pre-ride checks and test the vehicle on private grounds or in an area with low traffic density.
- Clean all coupling surfaces, oil guard rims and gaskets before refitting them. Smear a light layer of lithium-based grease on the oil guard rims. Reassemble oil guards and bearings with the brand or lot number facing outward (visible side).

### ELECTRIC CONNECTORS

Electric connectors must be disconnected as described below; failure to comply with this procedure causes irreparable damage to both the connector and the cable harness:

Press the relevant safety hooks, if any.

- Grip the two connectors and disconnect them by pulling them in opposite directions.
- If any signs of dirt, rust, moisture, etc. are noted, clean the inside of the connector carefully with a jet of compressed air.
- Ensure that the cables are correctly fastened to the internal connector terminals.
- Then connect the two connectors, ensuring that they couple correctly (if fitted with clips, you will hear them "click" into place).

**CAUTION**

**TO DISCONNECT THE TWO CONNECTORS, DO NOT PULL THE CABLES.**

**NOTE**

**THE TWO CONNECTORS CONNECT ONLY FROM ONE SIDE: CONNECT THEM THE RIGHT WAY ROUND.**

### TIGHTENING TORQUES

**CAUTION**

**IF UNSCREWING A SELF-LOCKING NUT, IT MUST BE REPLACED WITH A NEW ONE.**

**CAUTION**

**DO NOT FORGET THAT THE TIGHTENING TORQUES OF ALL FASTENING ELEMENTS ON WHEELS, BRAKES, WHEEL BOLTS AND ANY OTHER SUSPENSION COMPONENTS PLAY A**

**KEY ROLE IN ENSURING VEHICLE SAFETY AND MUST COMPLY WITH SPECIFIED VALUES. CHECK THE TIGHTENING TORQUES OF FASTENING PARTS ON A REGULAR BASIS AND ALWAYS USE A TORQUE WRENCH TO REASSEMBLE THESE COMPONENTS. FAILURE TO COMPLY WITH THESE RECOMMENDATIONS MAY CAUSE ONE OF THESE COMPONENTS TO GET LOOSE AND EVEN DETACHED, THUS BLOCKING A WHEEL, OR OTHERWISE COMPROMISE VEHICLE HANDLING. THIS CAN LEAD TO FALLS, WITH THE RISK OF SERIOUS INJURY OR DEATH.**

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## Running-in

Engine run-in is essential to ensure engine long life and correct operation. Twisty roads and gradients are ideal to run in engine, brakes and suspensions effectively. Vary your riding speed during the run-in. This ensures that components operate under both "loaded" and "unloaded" conditions, allowing the engine components to cool.

### CAUTION

**THE CLUTCH MAY EMIT A SLIGHT BURNING SMELL WHEN FIRST USED. THIS PHENOMENON SHOULD BE CONSIDERED NORMAL AND WILL DISAPPEAR AS SOON AS THE CLUTCH PLATES GET ADAPTED.**

**IT IS IMPORTANT TO STRAIN ENGINE COMPONENTS DURING RUN-IN, HOWEVER, MAKE SURE NOT TO OVERDO THIS.**

### CAUTION

**THE FULL PERFORMANCE OF THE VEHICLE IS ONLY AVAILABLE AFTER THE SERVICE AT THE END OF THE RUNNING IN PERIOD.**

Follow these guidelines:

- Do not twist the throttle grip abruptly and completely when the engine is working at a low revs, either during or after run-in.
- During the first 100 Km (62 miles) use the brakes gently, avoiding sudden or prolonged braking. That is to permit the adequate adjustment of the pad friction material to the brake discs.



**AFTER THE SPECIFIED MILEAGE, TAKE THE VEHICLE TO AN OFFICIAL Moto Guzzi DEALER FOR THE CHECKS INDICATED IN THE "AFTER RUN-IN" TABLE IN THE SCHEDULED MAINTENANCE SECTION TO AVOID INJURING YOURSELF, OTHERS AND /OR DAMAGING THE VEHICLE.**

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## Vehicle identification

### SERIAL NUMBER LOCATION

These numbers are necessary for vehicle registration.

### NOTE

**ALTERING IDENTIFICATION NUMBERS MAY BE SERIOUSLY PUNISHABLE BY LAW. IN PARTICULAR, MODIFYING THE FRAME NUMBER IMMEDIATELY VOIDS THE WARRANTY.**

This number consists of numbers and letters, as in the example shown below.

**ZGULW10012MXXXXXX**

#### KEY:

**ZGU**: WMI (World manufacturer identifier) code;

**LW**: model;

**1/00** (V7 Stone), **2/00** (V7 Special), **3/00** (V7 Racer): versions;

**0**: free digit

**12**: variable year of manufacture (12 - for 2012)

**M**: production plant (M= Mandello del Lario);

**XXXXXX**: serial number (6 digits);

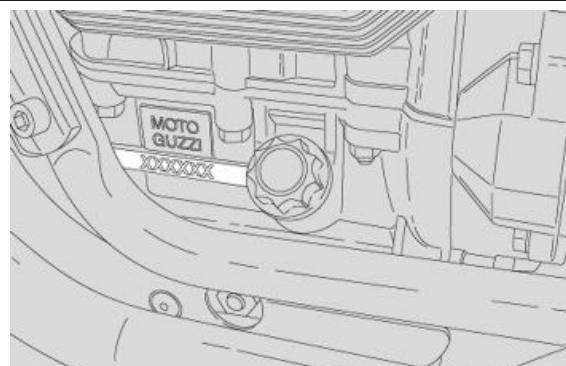


#### FRAME NUMBER

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

#### ENGINE NUMBER

The engine number is stamped on the left side, close to the engine oil level check cap.



## Dimensions and mass

#### WEIGHT AND DIMENSIONS

Specification	Desc./Quantity
Max. length.	2185 mm (86.02 in)
Max. width - V7 Special / V7 Stone	800 mm (31.50 in)
Max. width - V7 Racer	740 mm (29.13 in)
Max. height.	1115 mm (43.90 in)
Saddle height	790 mm (31.10 in)
Wheelbase	1449 mm (57.04 in)
Minimum ground clearance	179 mm (7.05 in)
Kerb weight	198 kg (436 lb)

## Engine

#### ENGINE

Specification	Desc./Quantity
Type	traverse-mounted twin-cylinder four-stroke V 90°
No. of cylinders	2

Specification	Desc./Quantity
Engine capacity	744 cm <sup>3</sup> (45.40 cu.in)
Bore / stroke	80x74 mm (3.15x2.91 in)
Compression ratio	10.4 : 1
Electric	Electric starter
Engine idle speed	1,250 +/- 100 rpm
Intake valve clearance	0.15 mm (0.0059 in)
Exhaust valve clearance	0.20 mm (0.0079 in)
Clutch	dry single-disc clutch with flexible coupling
Lubrication system	Pressure-fed, controlled by valves and trochoidal pump
Air filter	cartridge-type dry filter
Cooling	air

## Transmission

### TRANSMISSION

Specification	Desc./Quantity
Primary drive	with gears, ratio: 18 / 23 = 1 : 1.277
Gear ratios, 1st gear	14 / 37 = 1 : 2.642
Gear ratios, 2nd gear	18 / 32 = 1 : 1.777
Gear ratios, 3rd gear	21 / 28 = 1 : 1.333
Gear ratios, 4th gear	24 / 26 = 1 : 1.083
Gear ratios, 5th gear	25 / 24 = 1 : 0.96
Gear ratios, 6th gear	27 / 24 = 1 : 0.888
Final drive	with cardan shaft, ratio: 8 / 33 = 1 : 4.125

## Capacities

### CAPACITY

Specification	Desc./Quantity
Fuel tank (reserve included)	21 l (4.62 UKgal; 5.55 US gal)
Fuel tank reserve	4 l (0.88 UKgal; 1.06 US gal)
Engine oil	Oil change and oil filter replacement: 2000 cm <sup>3</sup> (122.05 cu.in)
Gearbox oil	500 cm <sup>3</sup> (30.51 cu.in)
Transmission oil	170 cm <sup>3</sup> (10.37 cu.in)
Seats - V7 Special / V7 Stone	2
Seats - V7 Racer	1 + 1*
Maximum carrying load	203 kg (447 lb) (rider + passenger + luggage)
*	2 seats, if vehicle is fitted with long two-seater saddle, passenger footpegs, passenger grab handles (necessitating rear shock absorbers to be installed upside-down) and exhaust mounts. In this case, the user is responsible for finding out the correct procedures for revising the vehicle's road registration documentation from the relevant local authorities.

## Electrical system

### ELECTRICAL SYSTEM

Specification	Desc./Quantity
Battery	12V - 12 Ah
Fuses	5 (2) - 15 (3) - 20 - 30 A
Permanent magnet alternator	12V - 270W

### SPARK PLUGS

Specification	Desc./Quantity
Standard	NGK CPR8EB-9
Spark plug electrode gap	0.6 - 0.7 mm (0.024 - 0.027 in)

Specification	Desc./Quantity
Resistance	5 kOhm

**BULBS**

Specification	Desc./Quantity
Low/high beam light (halogen)	12 V - 55 W / 60 W H4
Front daylight running lights	12V - 5W
Turn indicator light	12 V - 10 W (orange RY 10 W bulb)
tail light /stop lights	12 V - 5 / 21 W
Dashboard lighting	LED

**WARNING LIGHTS**

Specification	Desc./Quantity
Gear in neutral	LED
Turn indicators	LED
Fuel reserve	LED
High beam light	LED
Engine oil pressure	LED
MI warning light	LED
ABS warning light	LED
MGCT warning light	LED

**Frame and suspensions****CHASSIS**

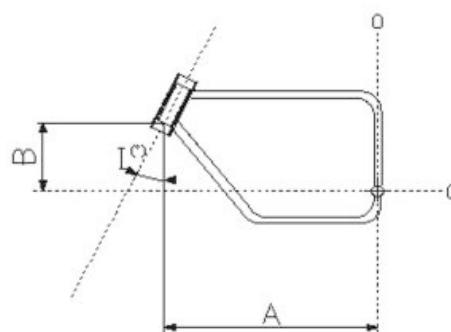
Specification	Desc./Quantity
Type	Modular double cradle, high strength steel tubular chassis
Steering rake	27.5°
Trail	138 mm (5.43 in)

**SUSPENSIONS**

Specification	Desc./Quantity
Front	hydraulic telescopic fork, Ø 40 mm (1.57 in)
Travel	130 mm (5.12 in)
Rear - V7 Special / V7 Stone	Swingarm in die-cast light alloy, 2 shock absorbers with adjustable spring preloading
Rear - V7 Racer	die-cast light alloy swingarm with 2 adjustable shock absorbers
Wheel travel	100 mm (3.93 in)

**SIZES A AND B**

Specification	Desc./Quantity
Size A	692 mm (27.24 in)
Size B	186 mm (7.32 in)



## Brakes

### BRAKES

Specification	Desc./Quantity
Front	stainless steel floating disc, Ø 320 mm (12.59 in), callipers with 4 different and counteracting plungers
Rear	260 mm (10.24 in) stainless steel disc, floating calliper with two 22 mm (0.87 in) diameter pistons

## Wheels and tyres

### WHEEL RIMS

Specification	Desc./Quantity
Type - V7 Stone	Alloy wheels for tubeless tyres
Type - V7 Special / V7 Racer	with spokes, for tyres with inner tubes
Front	2.5"x18"
Rear	3.50 x 17"

### TYRES

Specification	Desc./Quantity
Front tyre	PIRELLI SPORT DEMON
Front (size)	100 / 90 - 18 56H TL
Front (inflation pressure)	2.5 bar (250 kPa) (36.26 PSI)
Front (inflation pressure with passenger)	2.6 bar (260 kPa) (37.71 PSI)
Rear tyre	PIRELLI SPORT DEMON
Rear (size)	130 / 80 - 17 65H TL
Rear (inflation pressure)	2.5 bar (250 kPa) (36.26 PSI)
Rear (inflation pressure with passenger)	2.6 bar (260 kPa) (37.71 PSI)

## Supply

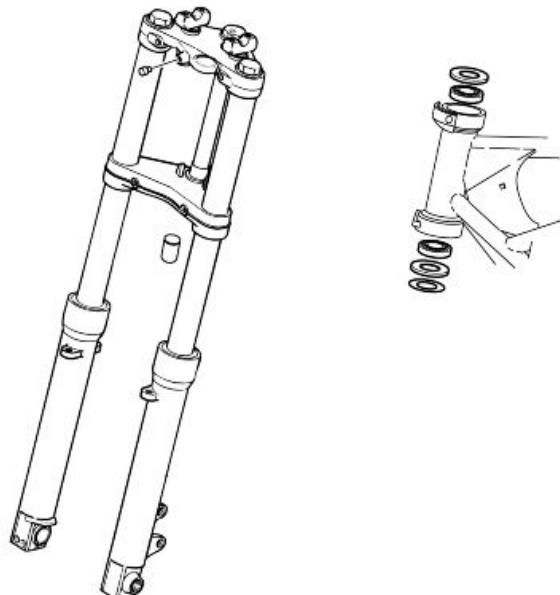
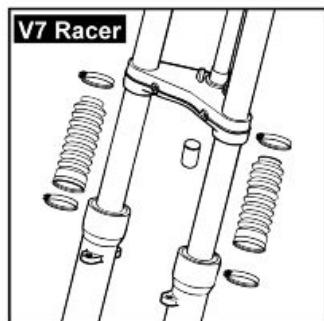
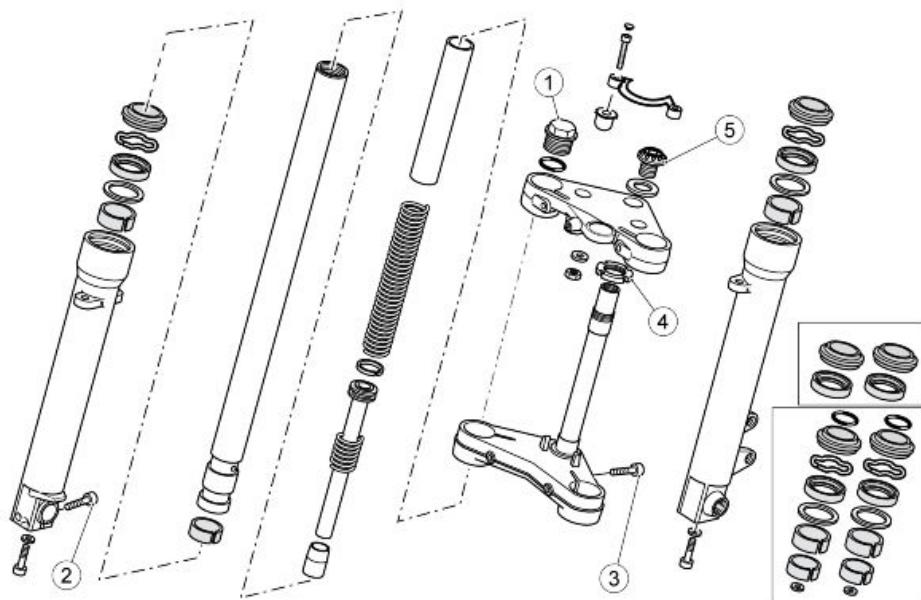
### FUEL SYSTEM

Specification	Desc./Quantity
Type	Electronic injection (Marelli MIU G3)
Venturi	Ø 38 mm (1.50 in)
Fuel	Premium unleaded petrol, minimum octane rating of 95 (NORM) and 85 (NOMM)

## Tightening Torques

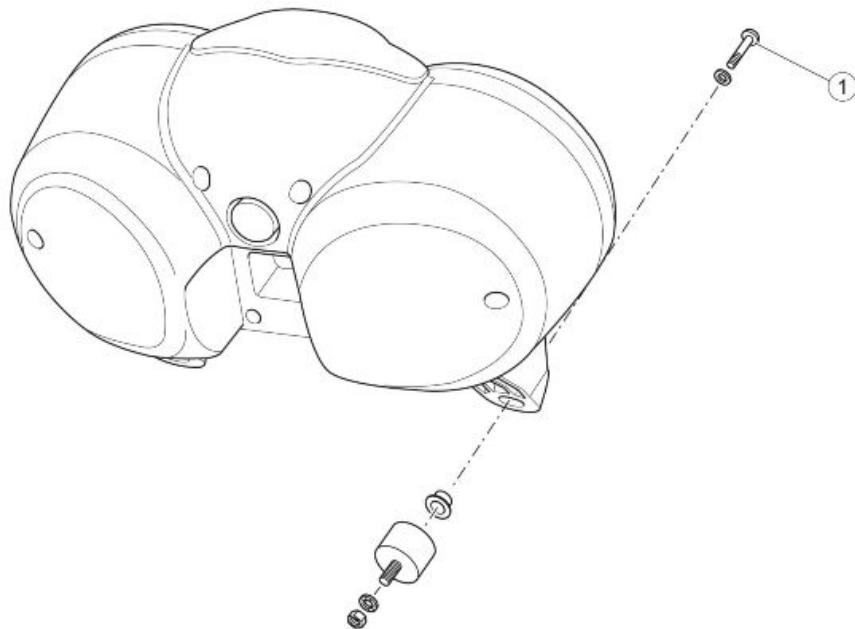
## Chassis

## Front side

**FRONT SUSPENSION - STEERING**

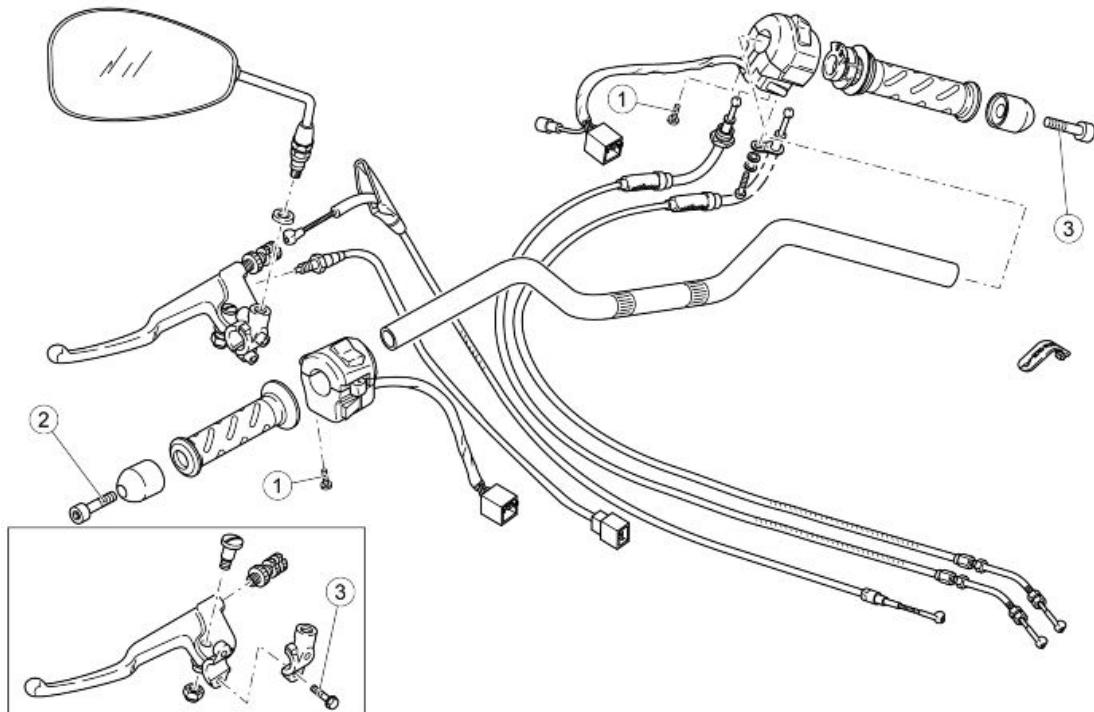
pos.	Description	Type	Quantity	Torque	Notes
1	Stanchion cap	-	2	50 Nm (36.88 lbf ft)	-
2	Screw fixing wheel axle to right fork leg	M6x30	2	10 Nm (7.37 lbf ft)	Tighten using a 1-2-1 sequence
3	Screw fixing stanchions to upper and lower plate	M10x40	4	50 Nm (36.88 lbf ft)	-
4	Headstock ring nut	M25x1	1	7 Nm (5.16 lbf ft)	The fork must fall to one side by itself

pos.	Description	Type	Quantity	Torque	Notes
5	Headstock bushing	M23x1	1	50 Nm (36.88 lbf ft)	-

**INSTRUMENT PANEL**

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fixing instrument panel to headlamp support	M6x10	3	10 Nm (7.37 lbf ft)	-

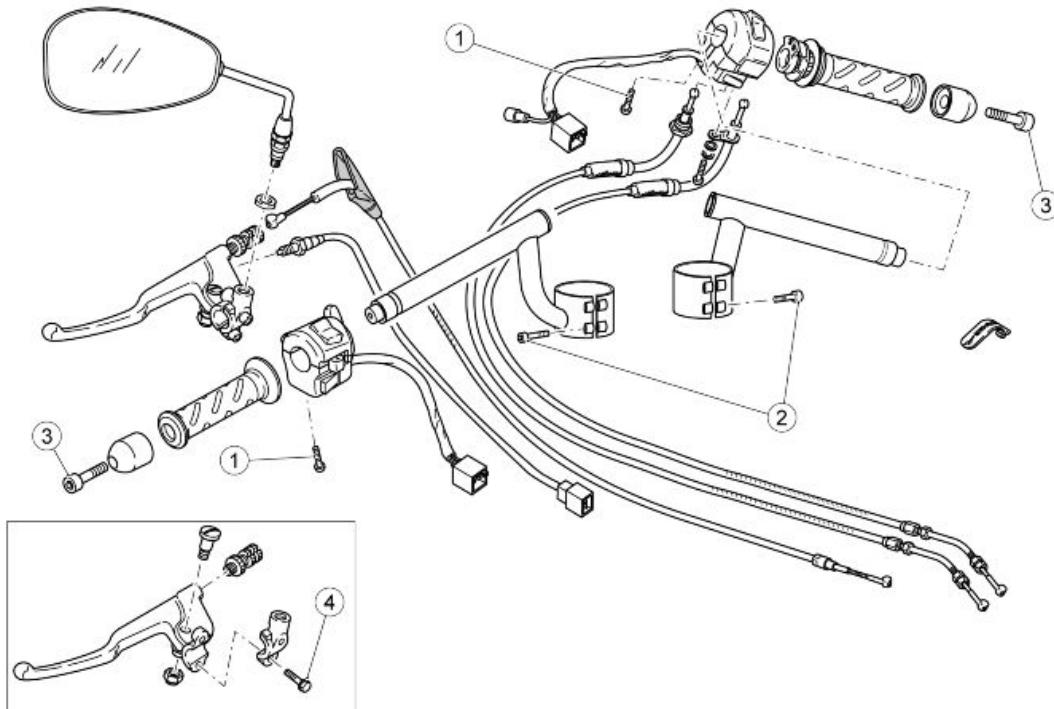
(V7 SPECIAL / V7 STONE)



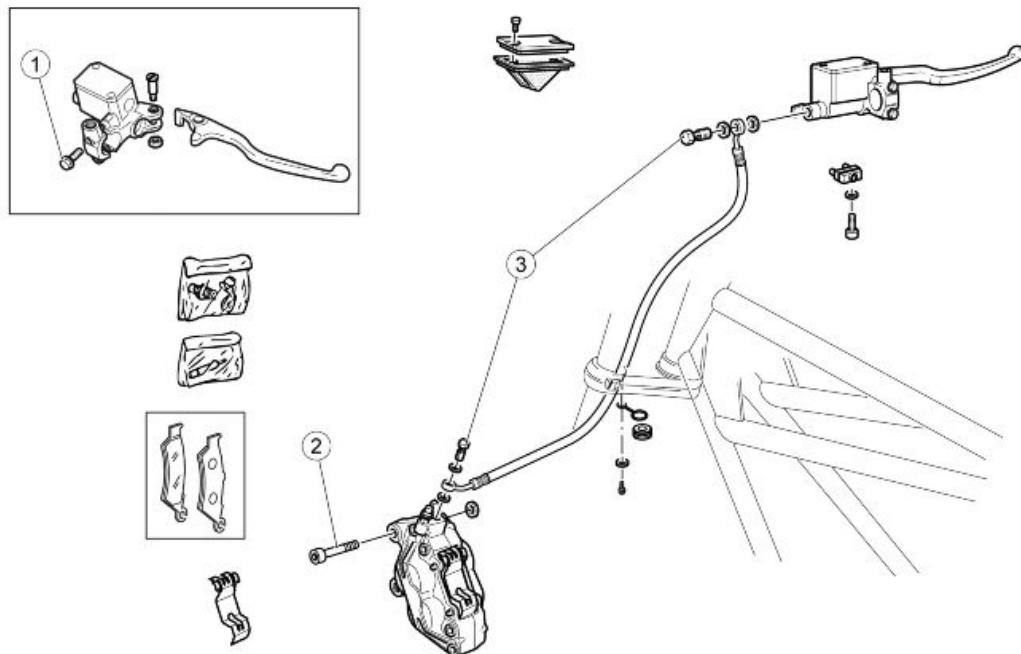
**HANDLEBAR AND CONTROLS**

Pos.	Description	Type	Quantity	Torque	Notes
1	Switch fastener screw	SWP 5	1+1	1.5 Nm (1.11 lb ft)	-
2	Counterweight fixing screw	M6	2	10 Nm (7.37 lb ft)	Loctite 243
3	Screw fastening the clutch control U-bolt to the semi-handlebar	M6x25	2	10 Nm (7.37 lb ft)	-

(V7 RACER)

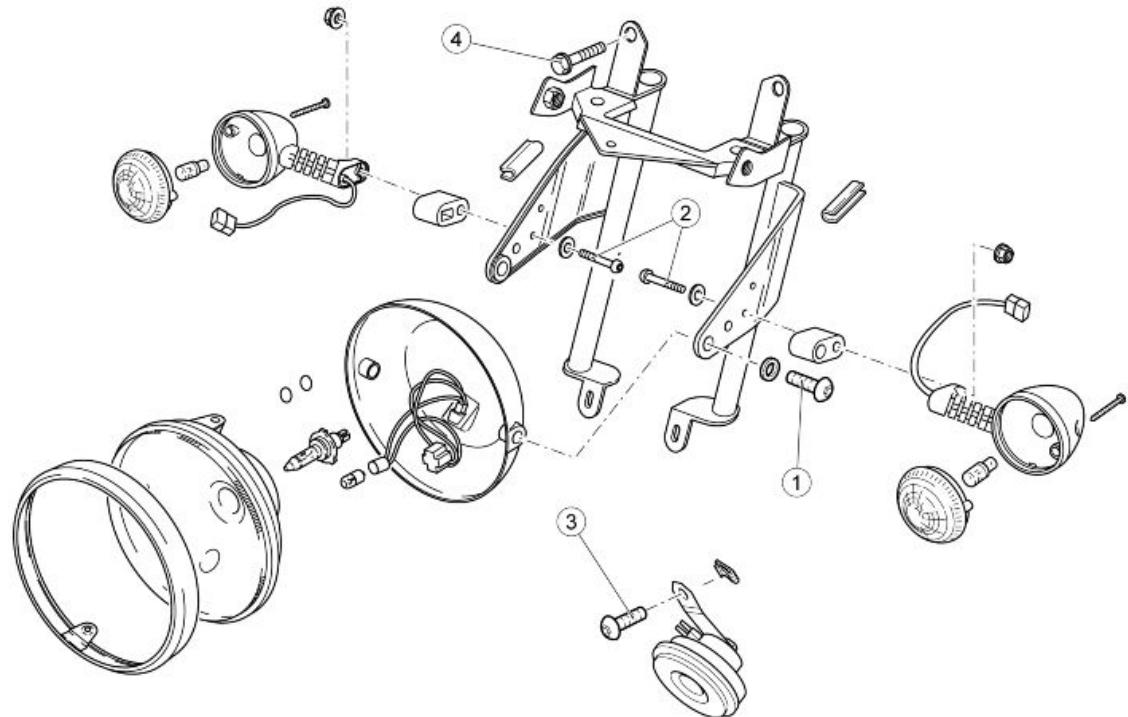
**HANDLEBAR AND CONTROLS**

Pos.	Description	Type	Quantity	Torque	Notes
1	Switch fastener screw	M5	1+1	1.5 Nm (1.11 lb ft)	Tighten using a 1-2-1 sequence
2	Semi-handlebar fixing screw	M6x25	4	10 Nm (7.37 lb ft)	Tighten using a 1-2-1 sequence
3	Counterweight fixing screw	M6	2	10 Nm (7.37 lb ft)	Loctite 243
4	Screw fastening the clutch control U-bolt to the semi-handlebar	M6x25	2	10 Nm (7.37 lb ft)	Tighten using a 1-2-1 sequence



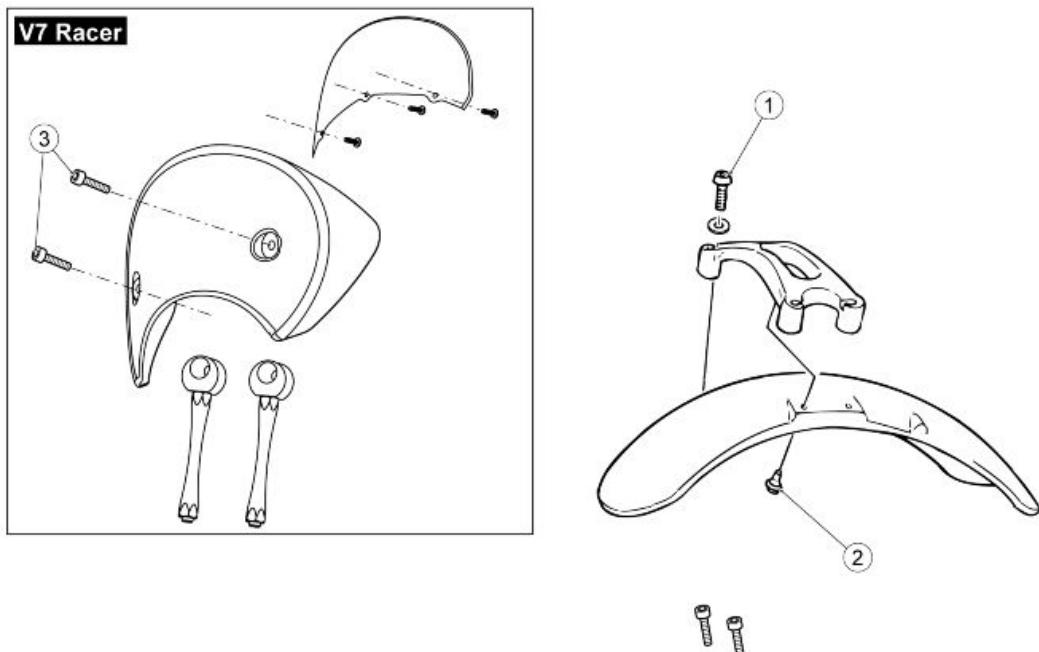
#### FRONT BRAKE SYSTEM

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening the brake pump U-bolt to the semi-handlebar	M6x25	2	10 Nm (7.37 lb ft)	-
2	Front brake calliper fixing screw	M10x30	2	50 Nm (36.88 lb ft)	-
3	Drilled screw for brake fluid pipe on pump and calliper	-	2	25 Nm (18.44 lb ft)	-

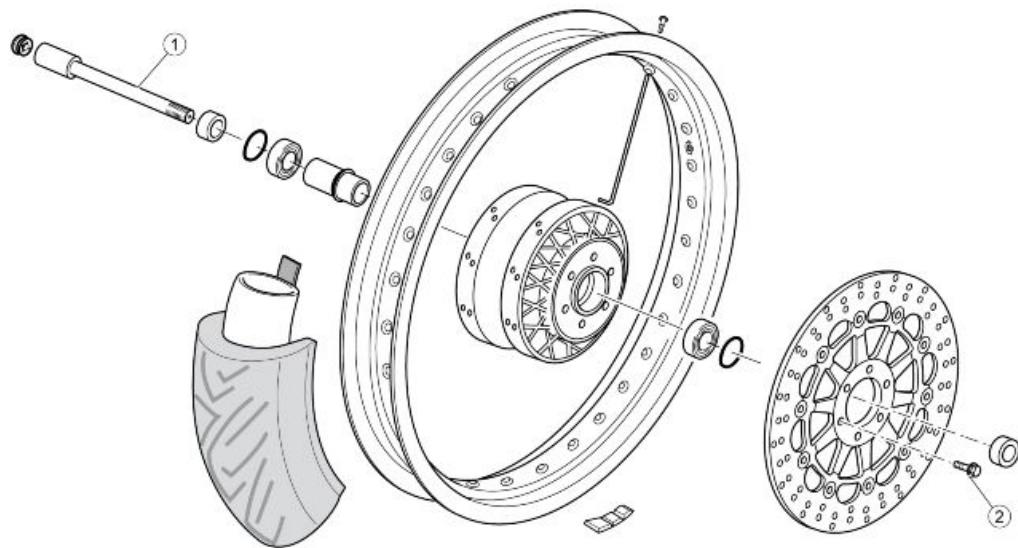


**FRONT LIGHTS**

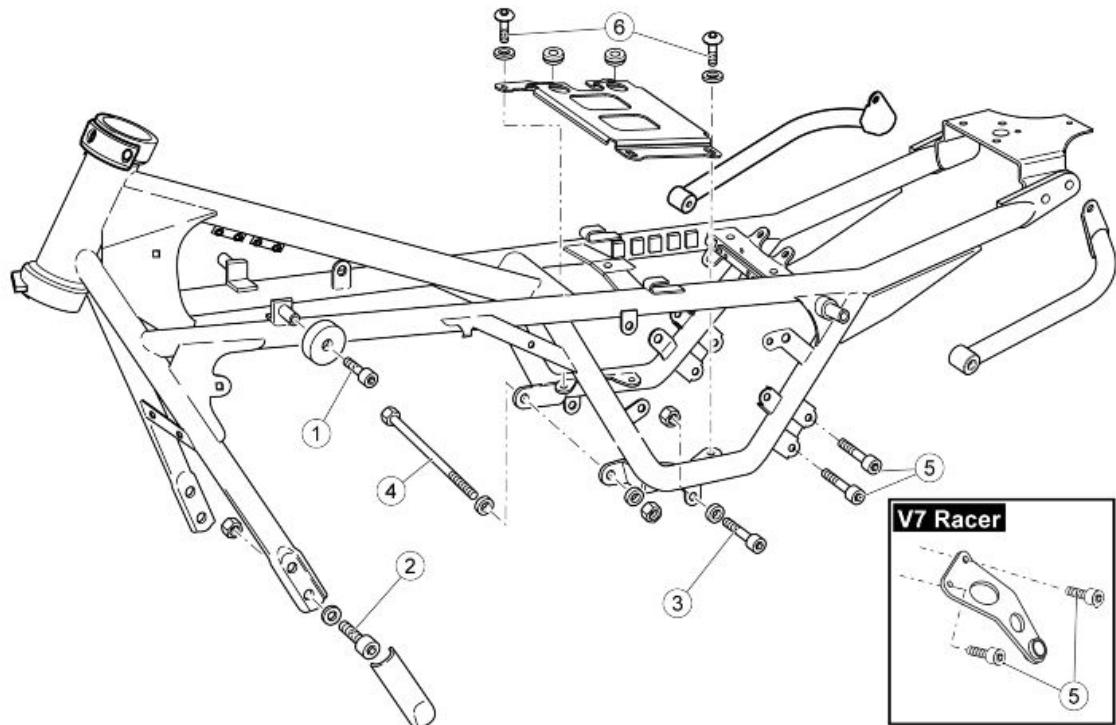
pos.	Description	Type	Quantity	Torque	Notes
1	Headlamp fixing screw	M8x30	2	15 Nm (11.06 lb ft)	-
2	Front turn indicator fixing screw	M6	2	5 Nm (3.69 lb ft)	-
3	Horn fixing screw	M6x16	2	10 Nm (7.37 lb ft)	-
4	Headlamp support bracket fixing screw	M10x40	2	50 Nm (36.88 lb ft)	-

**BODYWORK - FRONT SECTION**

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening stabiliser plate to fork	M8x40	4	15 Nm (11.06 lbf ft)	Loctite 243
2	Screw fastening mudguard to stabiliser plate	M6x11	4	10 Nm (7.37 lbf ft)	Loctite 243
3	Top fairing fixing screw	M6	2	10 Nm (7.37 lbf ft)	

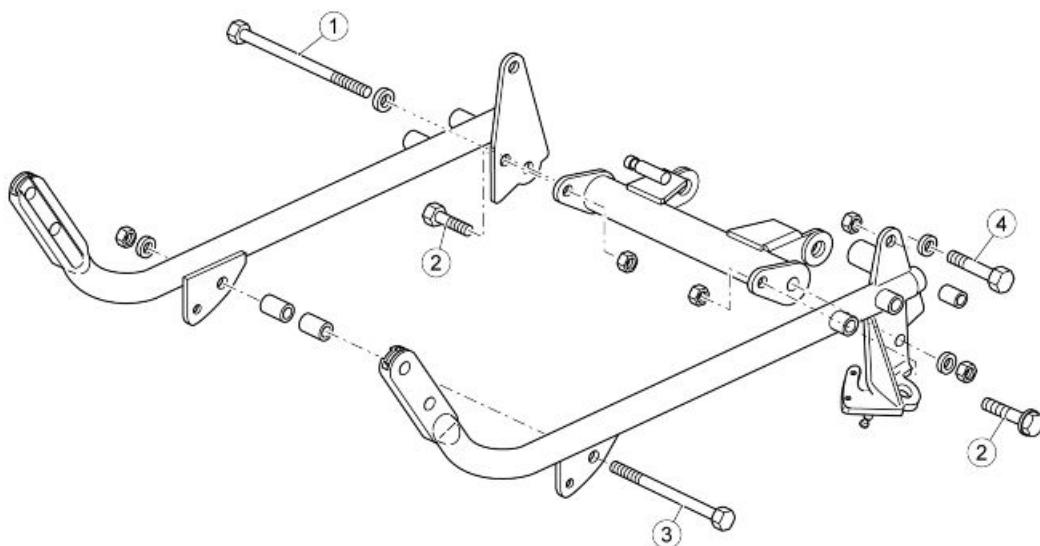
**FRONT WHEEL**

pos.	Description	Type	Quantity	Torque	Notes
1	Front wheel axle	M18x1.5	1	80 Nm (59.00 lbf ft)	-
2	Front brake disc fixing screw	M8x20	6	25 Nm (18.44 lbf ft)	Loctite 243

**Central part**

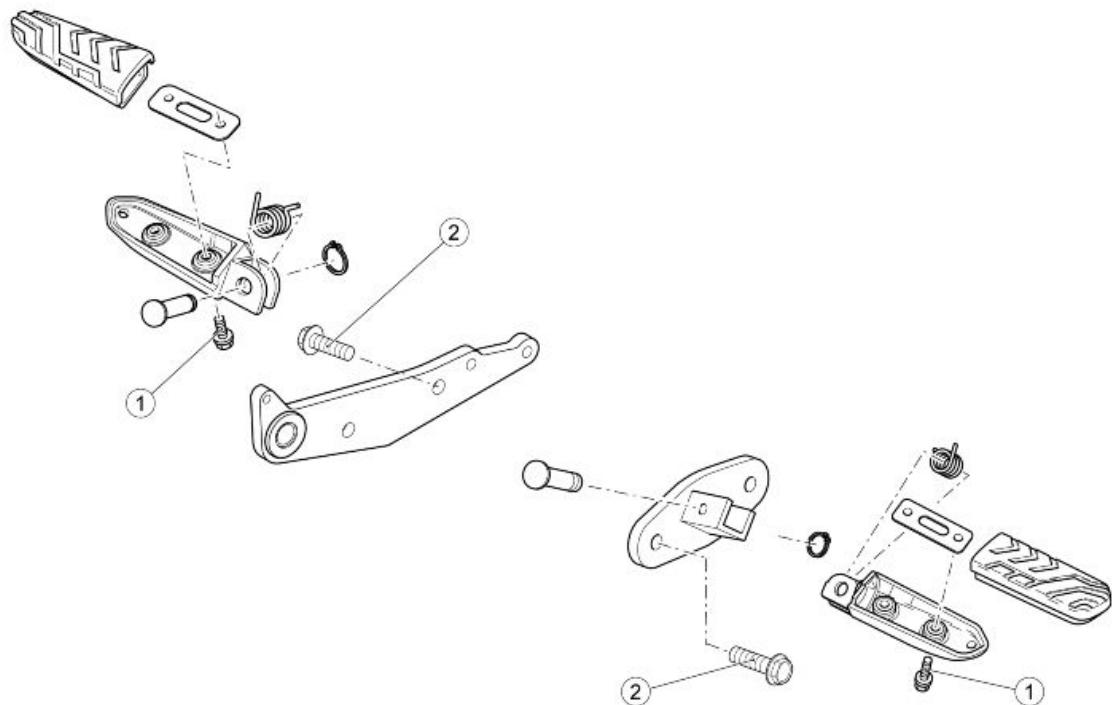
**FRAME**

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fixing tank mounting rubber blocks to frame	M8x14	2	25 Nm (18.44 lbf ft)	-
2	Cradle front fixing screw	M10x30	4	50 Nm (36.88 lbf ft)	-
3	Screw fastening gearbox to frame	M10x55	2	50 Nm (36.88 lbf ft)	-
4	Pin fixing engine/gearbox to chassis	M10x205	1	50 Nm (36.88 lbf ft)	-
5	Screw fixing exhaust silencer mounting to frame	M8x16	4	25 Nm (18.44 lbf ft)	Loctite 243
6	Battery supporting plate fixing screw	M8x16	4	25 Nm (18.44 lbf ft)	-

**FRAME CRADLES**

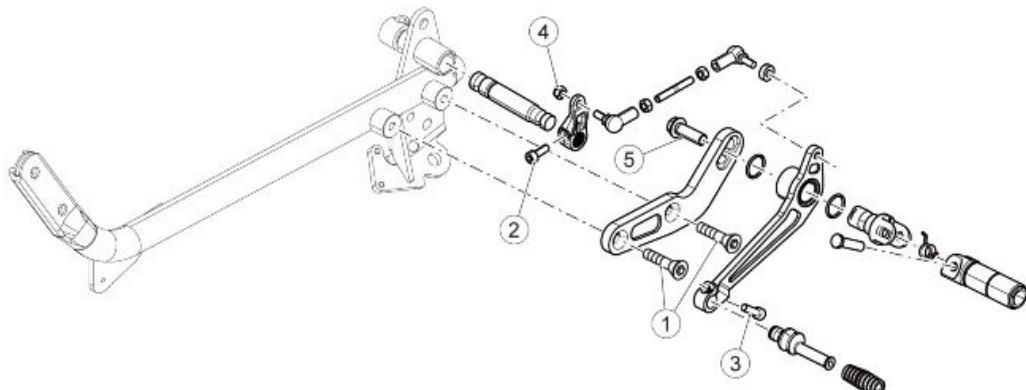
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fixing stand beam to cradle	M10x260	1	50 Nm (36.88 lbf ft)	-
2	Screw fixing stand beam to cradle	M8	1+1	25 Nm (18.44 lbf ft)	-
3	Pin fixing engine/gearbox to chassis	M10x250	1	50 Nm (36.88 lbf ft)	-
4	Screw fastening cradle to frame	M10x65	2	50 Nm (36.88 lbf ft)	-

(V7 SPECIAL / V7 STONE)

**DRIVER FOOTRESTS**

pos.	Description	Type	Quantity	Torque	Notes
1	Pedal rubber fastening screw	M6x12	4	10 Nm (7.38 lb ft)	-
2	Screw fastening rider footrest mounting to frame	M8	2+2	25 Nm (18.44 lb ft)	Loct. 243

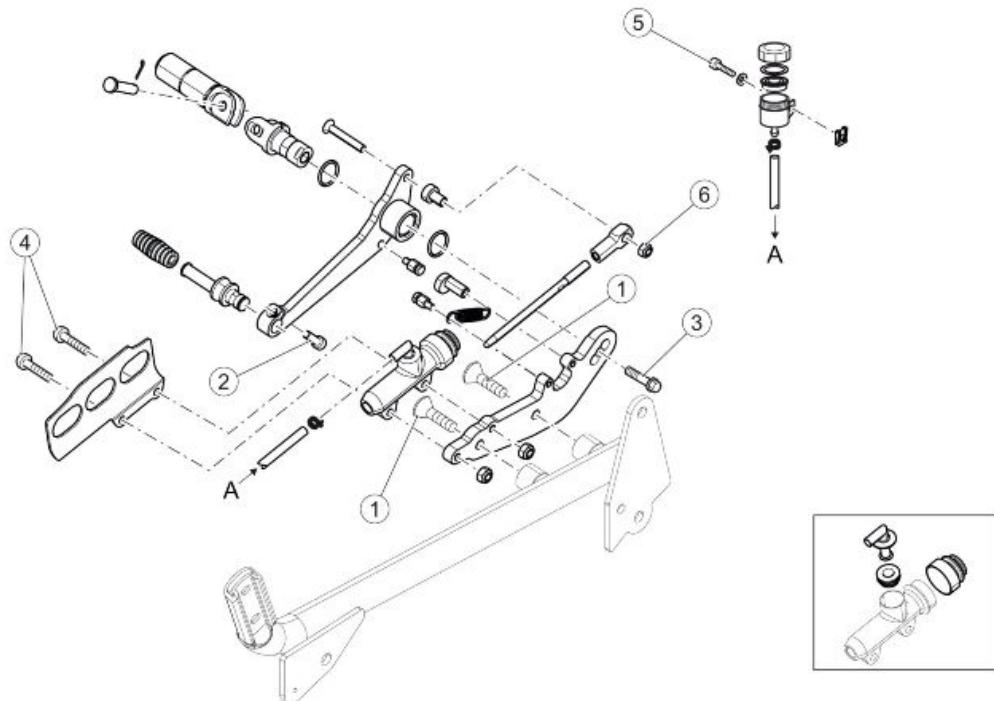
(V7 RACER)

**RIDER FOOTREST / GEAR SHIFT LEVER**

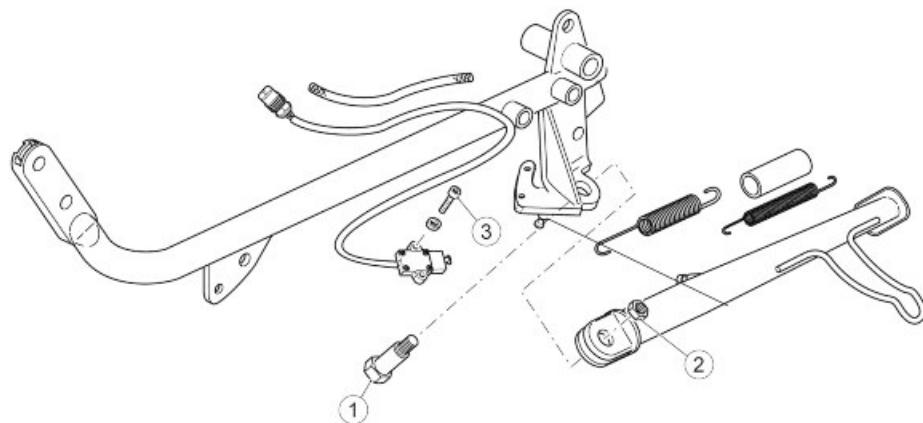
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening left hand rider footrest mounting plate to cradle	M8x20	2	25 Nm (18.44 lb ft)	Loctite 243

pos.	Description	Type	Quantity	Torque	Notes
2	Preselector lever fixing screw	M6x20	1	10 Nm (7.37 lb ft)	-
3	Gearbox lever fixing screws	M6x20	1	10 Nm (7.37 lb ft)	Loctite 243
4	Gearbox control rod fixing nut	M6x1	1	10 Nm (7.37 lb ft)	-
5	Screw fastening rider footrest mount- ing to plate	M8	1	20 Nm (14.75 lb ft)	Loctite 243

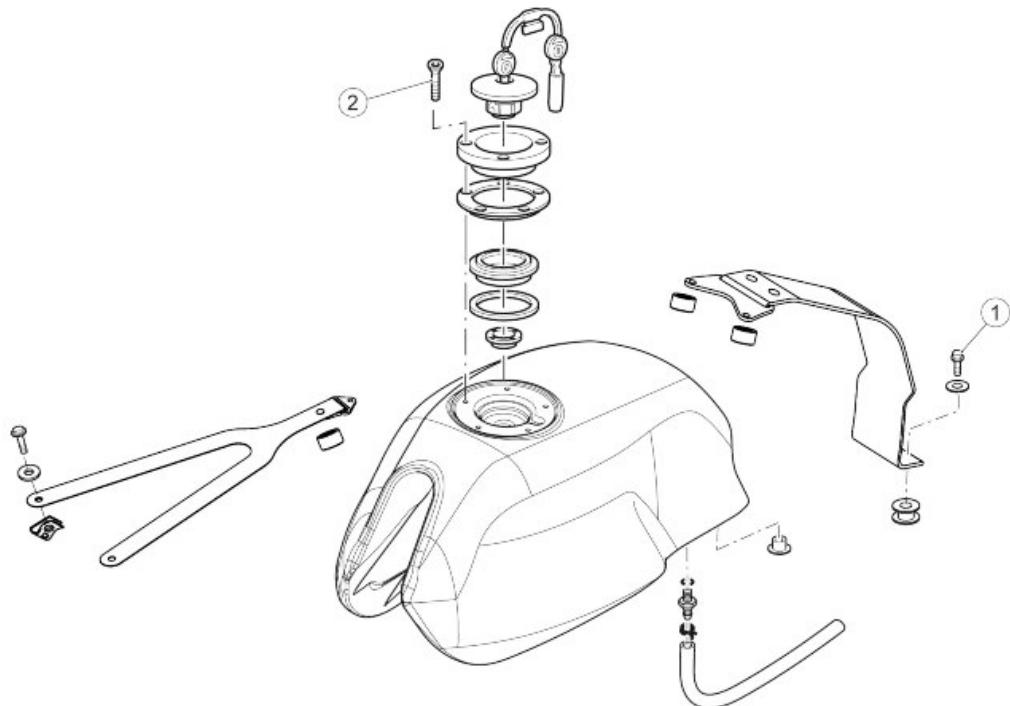
## (V7 RACER)

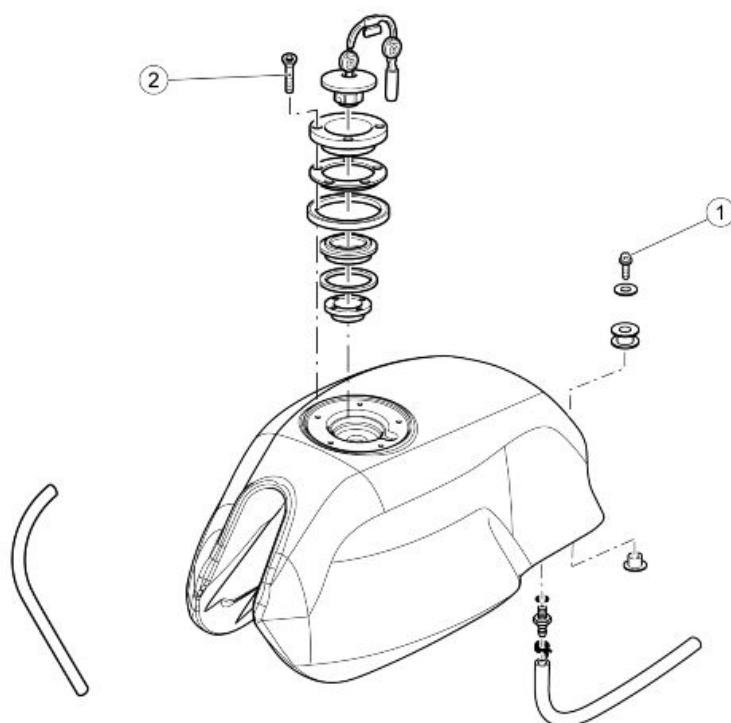
RIDER FOOTREST / REAR BRAKE LEVER

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening right hand rider foot- rest mounting plate to cradle	M8x20	2	20 Nm (14.75 lb ft)	Loctite 243
2	Rear brake lever fixing screw	M6x20	1	10 Nm (7.37 lb ft)	Loctite 243
3	Screw fastening rider footrest mount- ing to plate	M8	1	25 Nm (18.44 lb ft)	Loctite 243
4	Rear brake pump fixing screw	M6x25	2	8 Nm (5.90 lb ft)	Loctite 243
5	Rear brake fluid reservoir fixing screw	M5x15	1	6 Nm (4.43 lb ft)	-
6	Nut fastening rod terminal on brake lever	M6	1	10 Nm (7.37 lb ft)	-

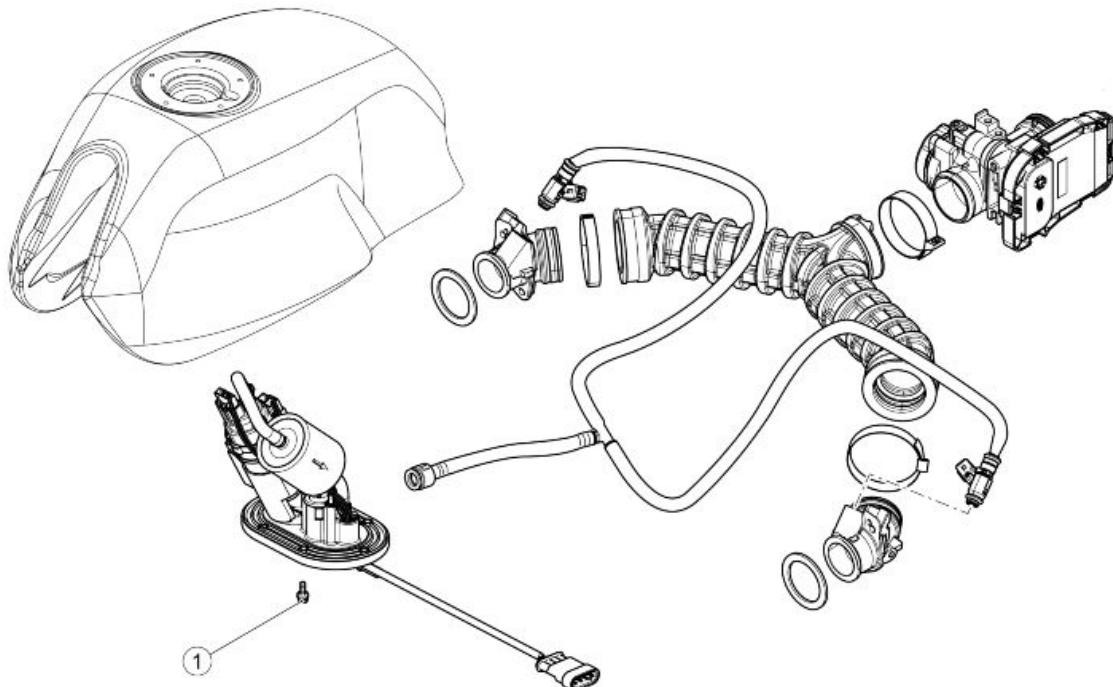
**SIDE STAND**

pos.	Description	Type	Quantity	Torque	Notes
1	Side stand retainer pin	M10x1.2 5	1	10 Nm (7.38 lb ft)	-
2	Lock nut for stand bolt	M10x1.2 5	1	30 Nm (22.13 lb ft)	-
3	Switch fixing screw	M5x16	2	6 Nm (4.42 lb ft)	-

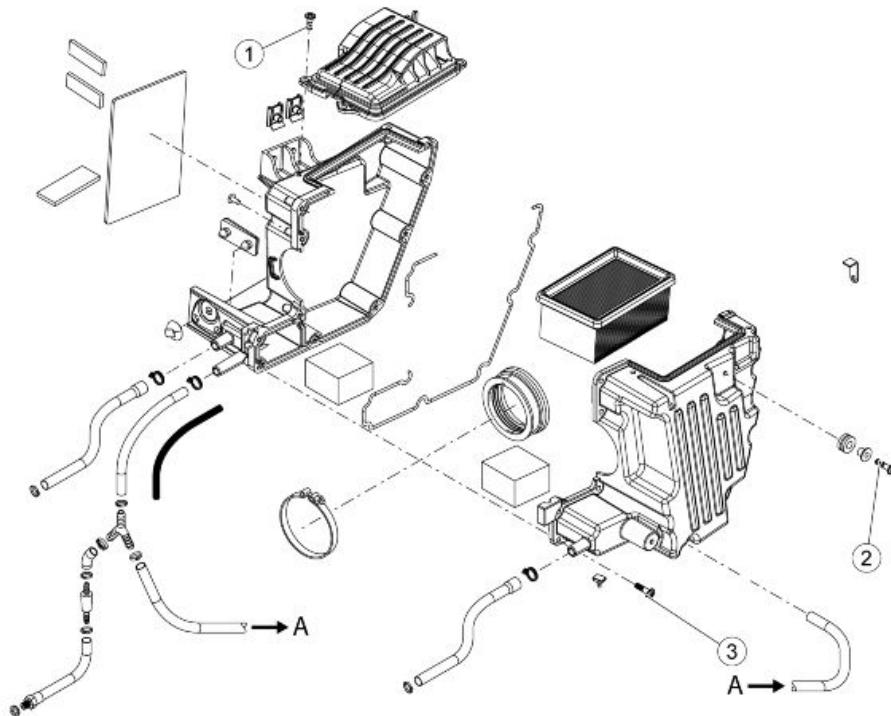
**(V7 RACER)****(V7 SPECIAL / V7 STONE)**

**FUEL TANK**

pos.	Description	Type	Quantity	Torque	Notes
1	Rear tank fixing screw	M8x45	1	25 Nm (18.44 lb ft)	-
2	Screw fastening cap flange to tank	M5x12	2+3	4 Nm (2.95 lb ft)	-

**FUEL SUPPLY SYSTEM**

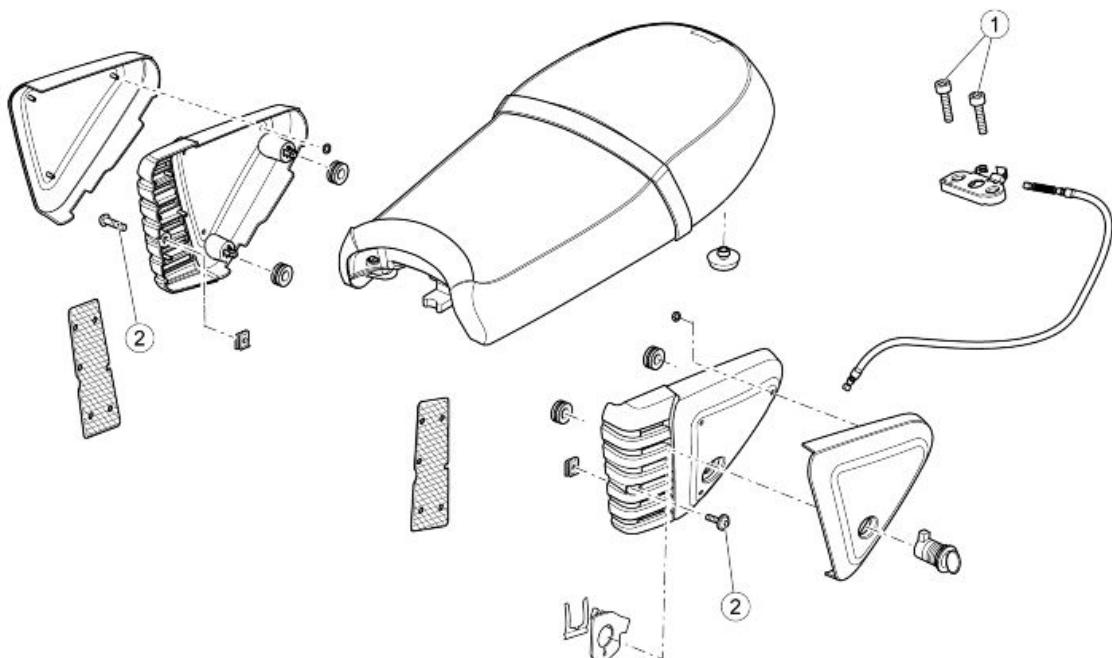
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fixing fuel pump mounting to tank	M5x16	6	6 Nm (4.43 lbf ft)	-



#### TIGHTENING TORQUE - CENTRAL PART - FILTER BOX

pos.	Description	Type	Quantity	Torque	Notes
1	Air filter box cover fastening screw	SWP 5x14	4	3 Nm (2.21 lb ft)	-
2	Air filter box fastening screw to frame	SWP 5x20	2	3 Nm (2.21 lb ft)	-
3	Air filter box fastening screw	SWP 5x20	9	3 Nm (2.21 lb ft)	-

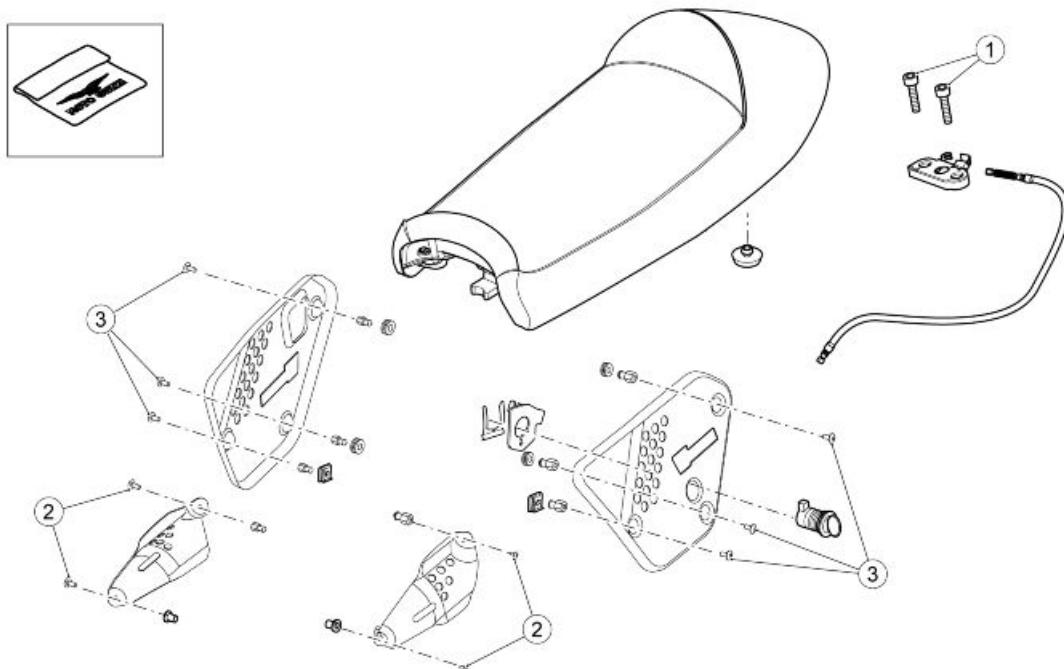
(V7 SPECIAL / V7 STONE)



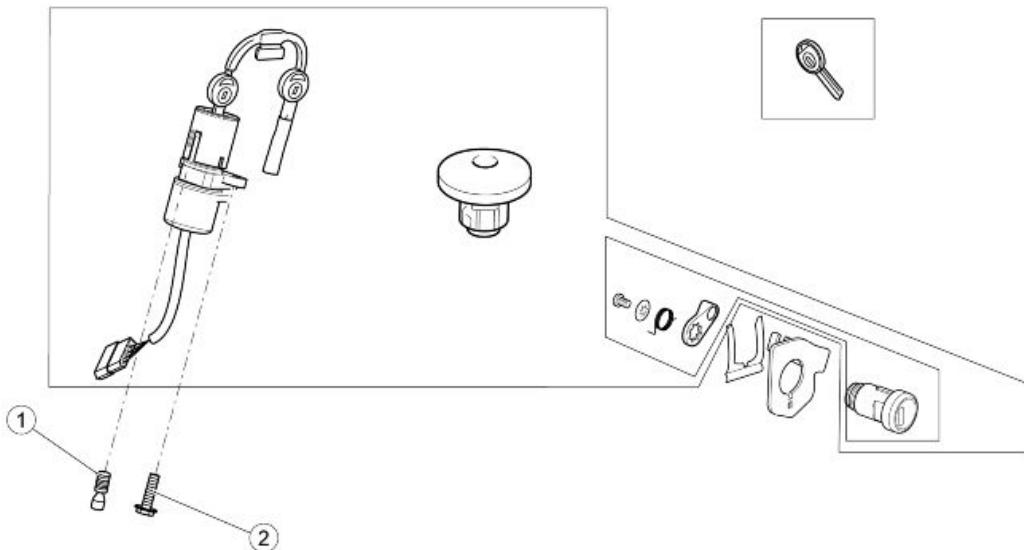
**BODYWORK CENTRAL SECTION - SADDLE**

pos.	Description	Type	Quantity	Torque	Notes
1	Saddle release block fixing screw	M6x25	2	10 Nm (2.37 lb ft)	-
2	Side fairing fixing screw	M5x9	2	4 Nm (2.95 lb ft)	-

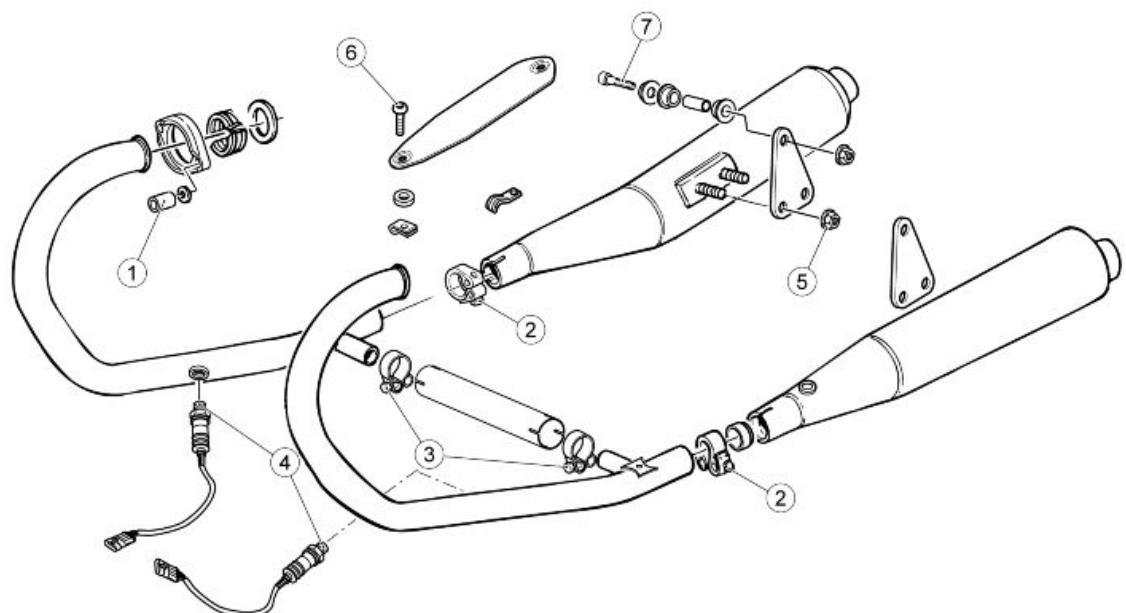
(V7 RACER)

**BODYWORK CENTRAL SECTION - SADDLE**

pos.	Description	Type	Quantity	Torque	Notes
1	Saddle release block fixing screw	M6x25	2	10 Nm (2.37 lb ft)	-
2	Throttle body cover fastener screw	M5x14	4	4 Nm (2.95 lb ft)	-
3	Side fairing fixing screw	M5x9	6	4 Nm (2.95 lb ft)	-

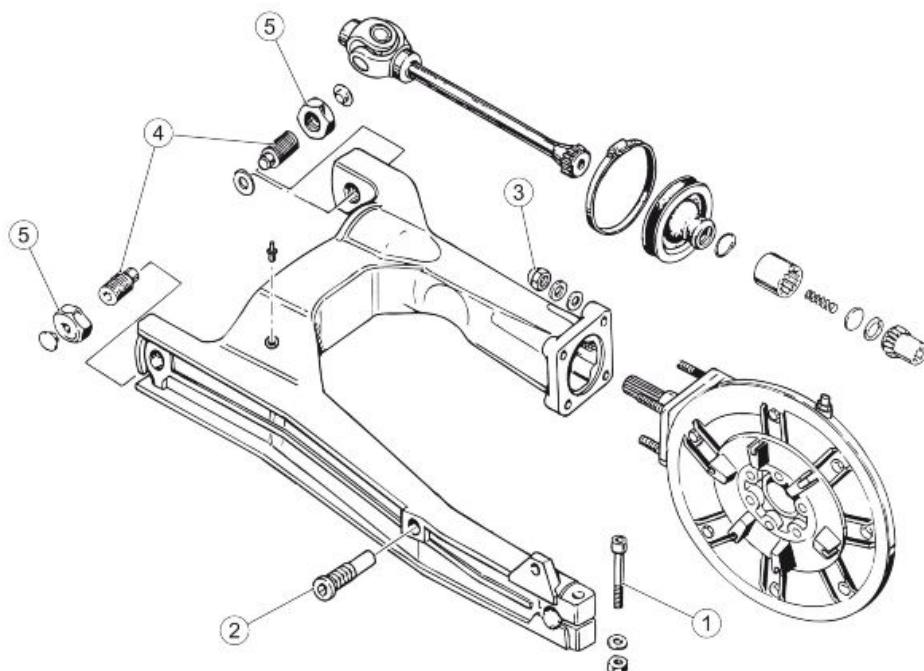
**LOCK KIT**

pos.	Description	Type	Quantity	Torque	Notes
1	(Shear head) screw fixing ignition lock	M8x15	1	-	At the point of failure
2	Ignition lock fixing screw	M8x16	1	25 Nm (18.44 lb ft)	-



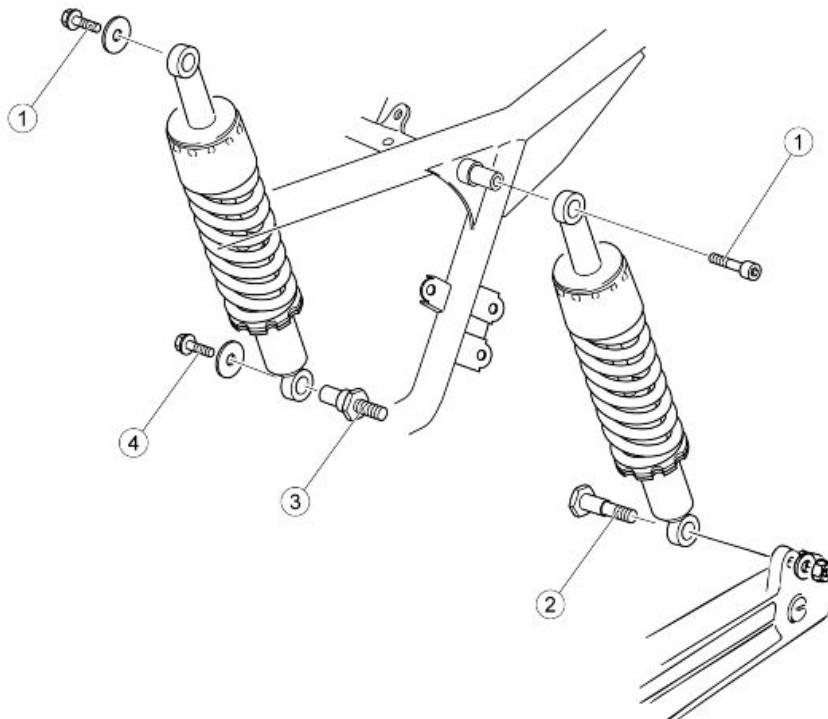
**EXHAUST SYSTEM**

Pos.	Description	Type	Quantity	Torque	Notes
1	Exhaust pipe fixing nut to the engine	M6	4	10 Nm (7.37 lb ft)	-
2	Exhaust pipe fixing clamp screw to the compensator	M6	1+1	10 Nm (7.37 lb ft)	-
3	Compensator fixing clamp screw to the silencer	M6	2	10 Nm (7.37 lb ft)	-
4	Lambda probe on compensator	M18x1.5	1	38 Nm (28.03 lb ft)	-
5	Nut fastening silencer to mounting plate	M8	4	25 Nm (18.44 lb ft)	-
6	Heat shield fixing screw	M6x12	6	10 Nm (7.37 lb ft)	Loctite 270
7	Screw fixing silencer mounting plate to frame	M8x40	2	25 Nm (18.44 lb ft)	-

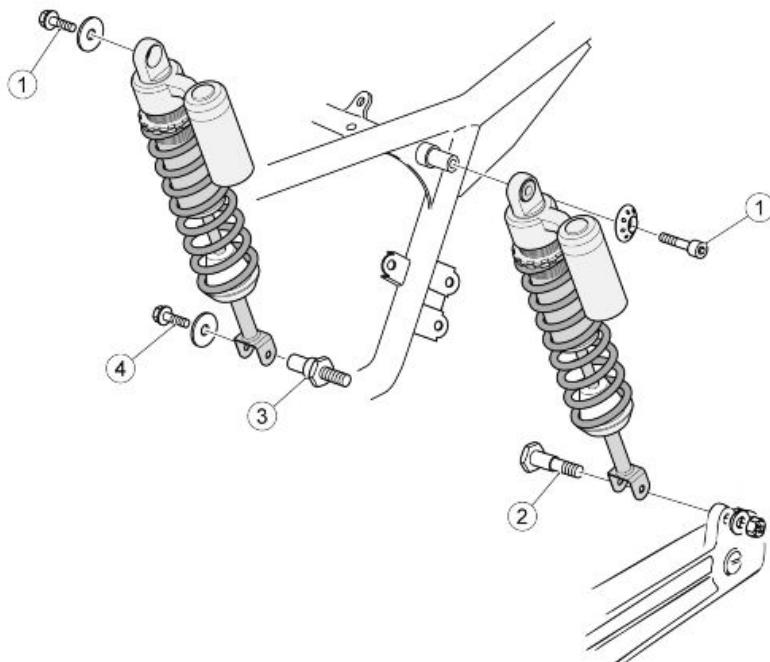
**Back side****REAR TRANSMISSION - SWINGARM**

pos.	Description	Type	Quantity	Torque	Notes
1	Swingarm clamp retaining screw	M10x45	1	30 Nm (22.13 lb ft)	-
2	Pin fixing the rear calliper holding plate to swingarm	M16x1	1	25 Nm (18.44 lb ft)	-
3	Nut fixing gearcase to swingarm	M8	4	25 Nm (18.44 lb ft)	Hold the stud bolt
4	Pin fixing swingarm to gearbox	M20x1	2	-	Fully home with no preload
5	Lock nut on swingarm pin	M20x1	2	50 Nm (36.88 lb ft)	Hold the pin

**(V7 SPECIAL / V7 STONE)**



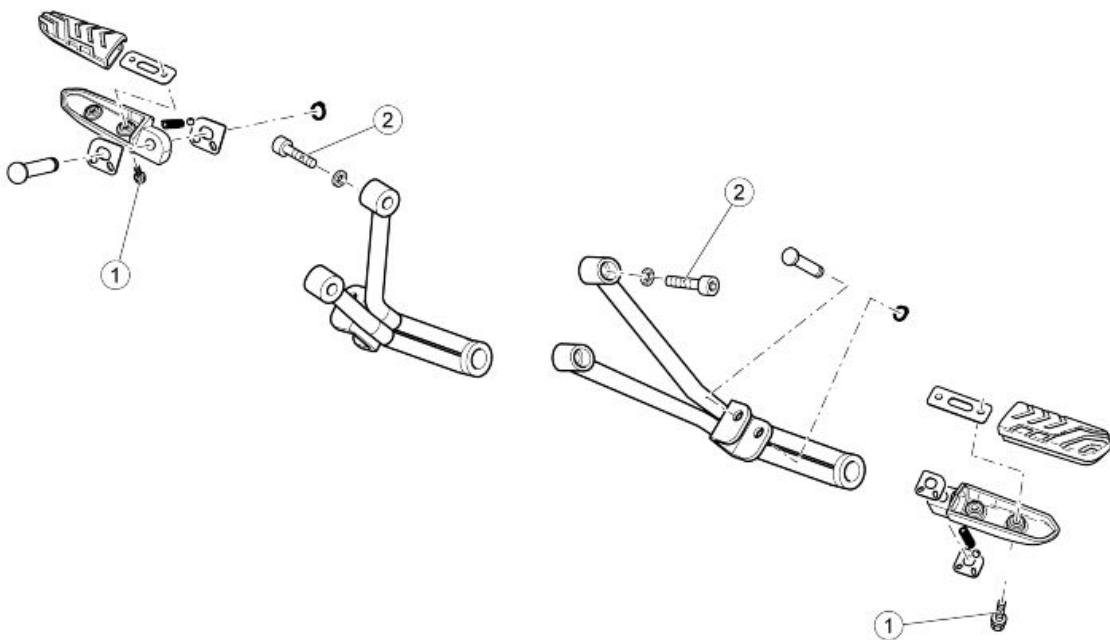
(V7 RACER)

**REAR SUSPENSION**

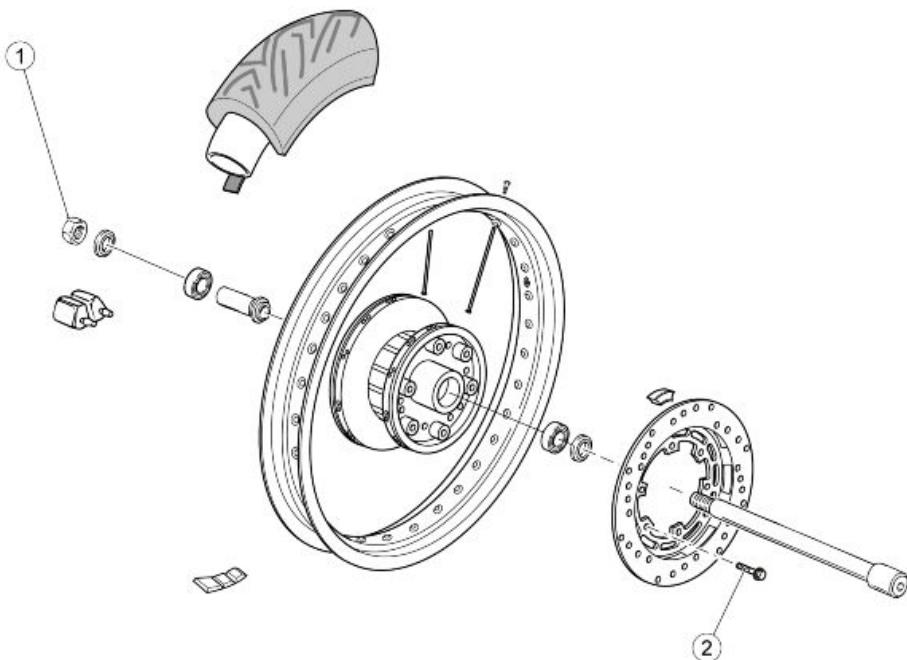
pos.	Description	Type	Quantity	Torque	Notes
1	Upper screw fastening shock absorber to frame	M6x35	2	10 Nm (7.37 lbf ft)	Loctite 243
2	Lower pin fastening left shock absorber to swingarm	M10x1.5	1	35 Nm (25.81 lbf ft)	

pos.	Description	Type	Quantity	Torque	Notes
3	Stud bolt fixing right shock absorber to rear box	M12x1.5	1	35 Nm (25.81 lbf ft)	-
4	Screw fastening right shock absorber to stud bolt	M6x16	1	10 Nm (7.37 lbf ft)	Loctite 243

## (V7 SPECIAL / V7 STONE)

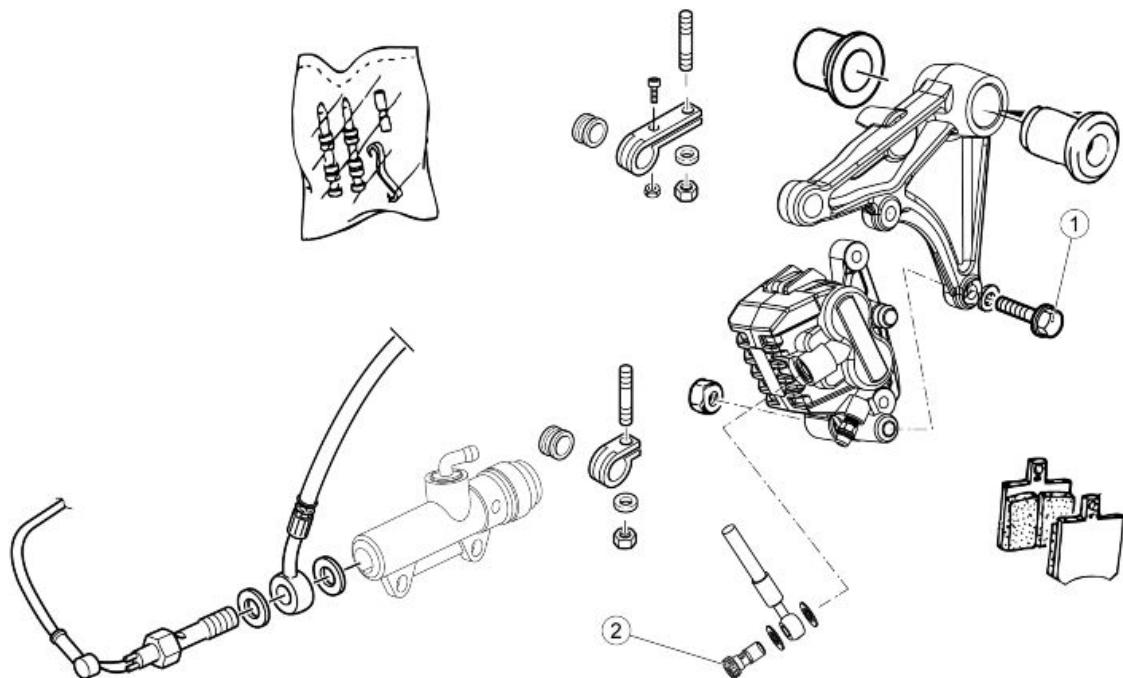
**PASSENGER FOOTRESTS**

pos.	Description	Type	Quantity	Torque	Notes
1	Pedal rubber fastening screw	M6x12	4	10 Nm (7.38 lb ft)	-
2	Screw fastening passenger footrest mounting to frame	M8	2+2	25 Nm (18.44 lb ft)	Loct. 243



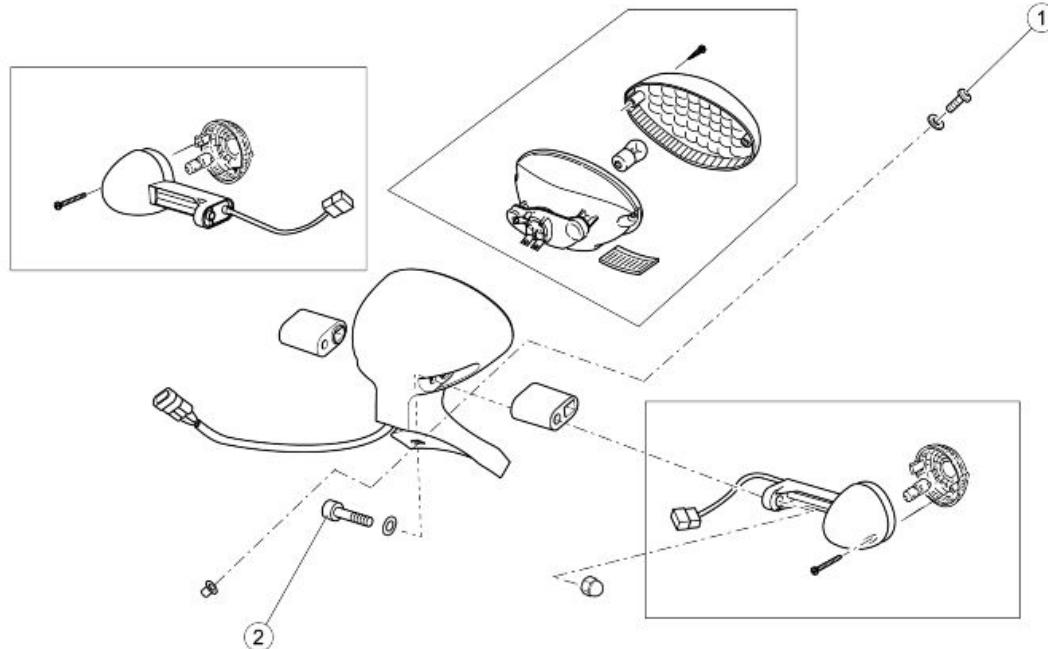
## REAR WHEEL

pos.	Description	Type	Quantity	Torque	Notes
1	Rear wheel axle nut up to frame serial number ZGULWS00XEM200368	M16x1.5	1	120 Nm (88.51 lb ft)	-
2	Rear wheel axle nut from frame serial number ZGULWS00XEM200369	M16x1.5	1	100 Nm (73.75 lb ft)	-
3	Rear brake disc fixing screw	M8x25	6	25 Nm (18.44 lb ft)	Loctite 243



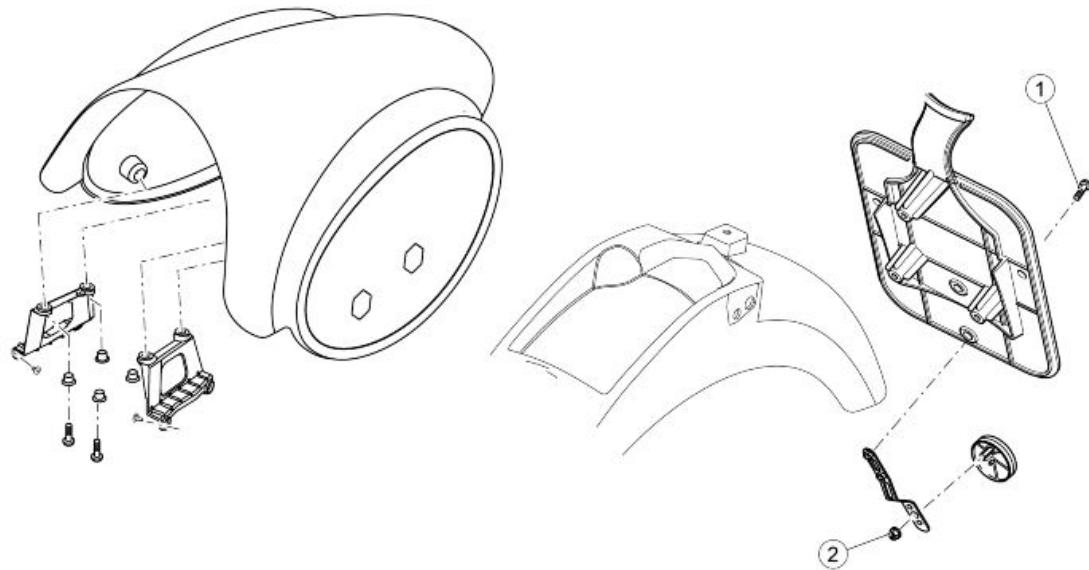
**REAR BRAKE SYSTEM**

pos.	Description	Type	Quantity	Torque	Notes
1	Rear brake calliper fixing screw	M8x30	2	25 Nm (18.44 lb ft)	-
2	Drilled screw for brake pipe on caliper	-	1	25 Nm (18.44 lb ft)	-

**REAR LIGHTS**

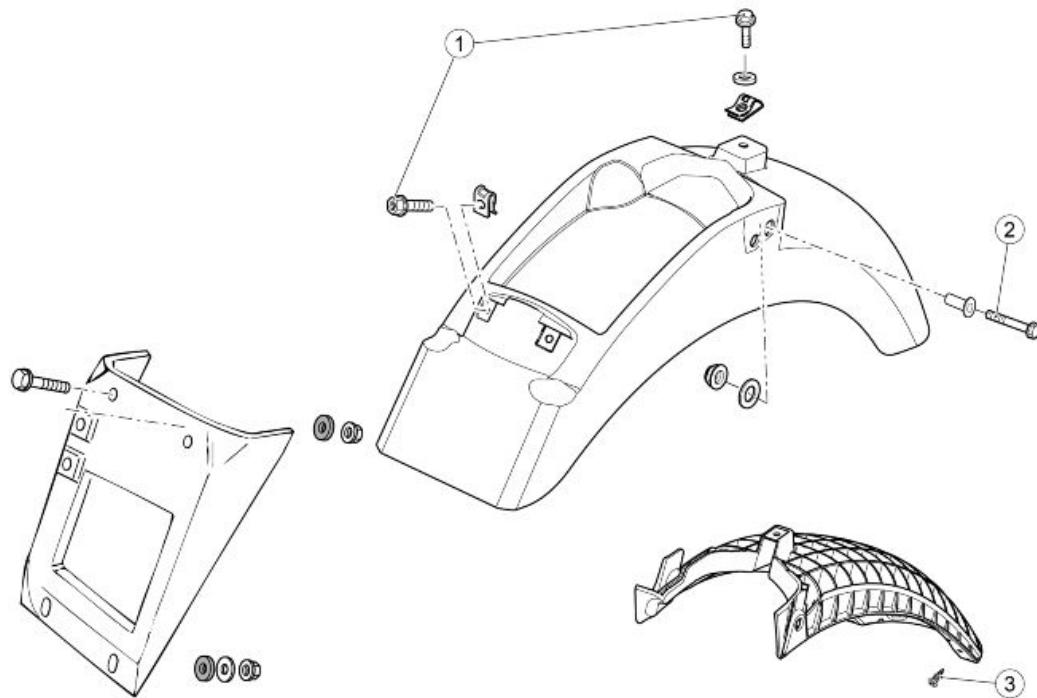
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening taillight support to mudguard	M5x14	3	4 Nm (2.95 lb ft)	-
2	Rear turn indicator fixing screw	M6	2	5 Nm (3.69 lb ft)	-

(V7 RACER)



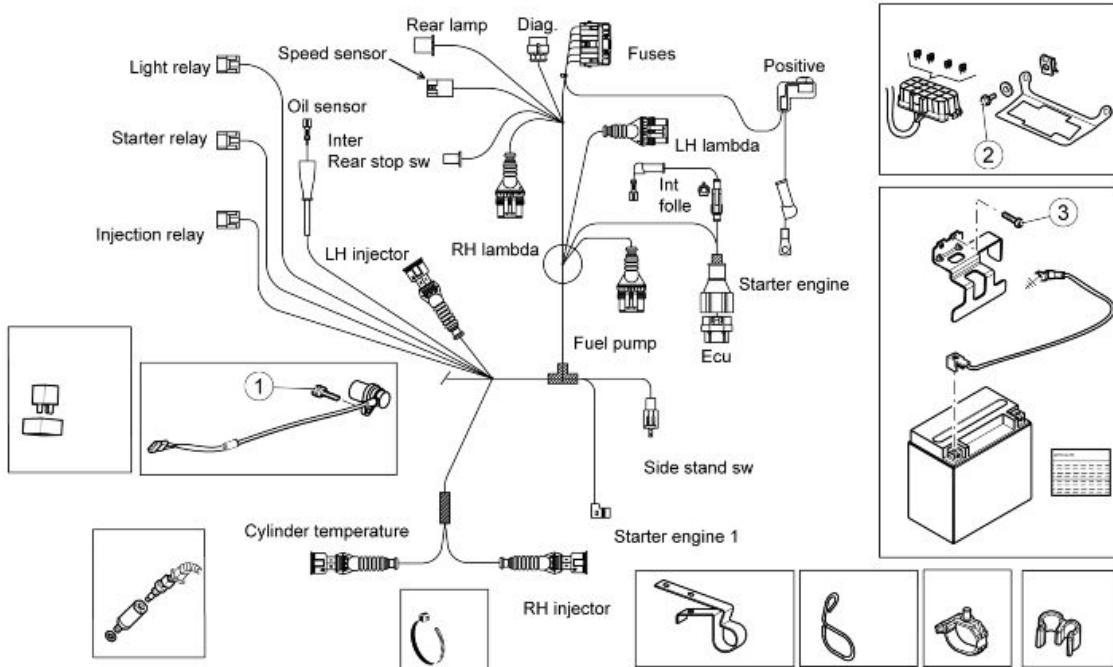
#### REAR SECTION BODYWORK - LICENSE PLATE MOUNTING

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening retroreflector mounting to license plate mounting	M5x10	2	4 Nm (2.95 lbf ft)	-
2	Nut fixing retroreflector to mounting	M5	1	4 Nm (2.95 lbf ft)	-

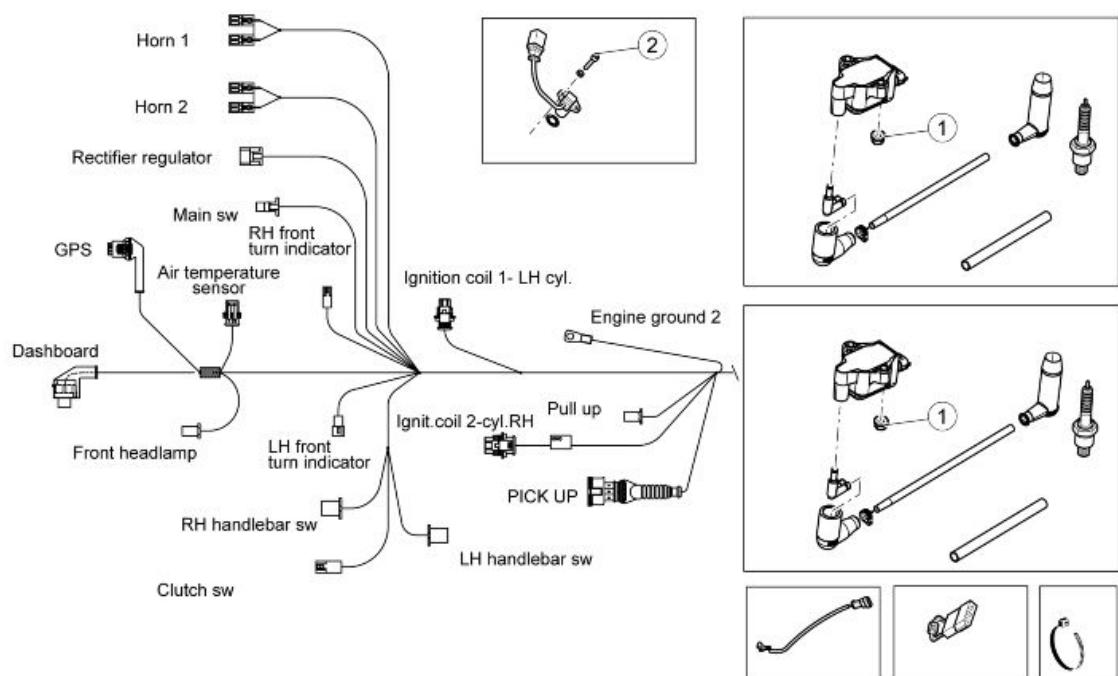


**REAR MUDGUARD**

pos.	Description	Type	Quantity	Torque	Notes
1	Rear mudguard front and central fixing screw	M6	2+1	10 Nm (7.37 lb ft)	
2	Rear mudguard side fixing screw	M8x30	2	25 Nm (18.44 lb ft)	
3	Screw fixing license plate holder to mudguard reinforcement	SWP M5x20	3	3 Nm (2.21 lb ft)	

**ELECTRICAL SYSTEM 01**

pos.	Description	Type	Quantity	Torque	Notes
1	Speed sensor fastening screw	M6	1	10 Nm (7.37 lb ft)	
2	Fuse box bracket fixing screw	M5x12	2	4 Nm (2.95 lb ft)	-
3	Battery holder bracket fastening screw	M6	2	Manual	-



## ELECTRICAL SYSTEM 02

pos.	Description	Type	Quantity	Torque	Notes
1	1 - Coil fixing nut	M6	2+2	10 Nm (7.37 lb ft)	-
2	2 - Timing sensor fastener screw	-	1	.. Nm (... lb ft)	-

## Recommended products chart

## RECOMMENDED PRODUCTS TABLE

Product	Description	Specifications
ENI i-RIDE PG 10W-60	Lubricant formulated with advanced synthetic technology and high performance additives to cater specifically for 4-stroke engines with high specific power outputs.	JASO MA, MA2 - API SG
AGIP GEAR MG SAE 85W-140	Transmission oil	API GL-4 and GL-5
ENI ROTRA LSX 75W-90	Gearbox oil	API GL-5
AGIP FORK 7.5W	Fork oil	SAE 5W / SAE 20W
AGIP GREASE SM 2	Gray black smooth-textured lithium grease, containing molybdenum disulfide.	-
Neutral grease or petroleum jelly.	Battery poles	
AGIP BRAKE 4	Brake fluid	SAE J 1703 -FMVSS 116 - DOT 3/4 - ISO 4925 - CUNA NC 956 DOT 4 synthetic fluid

## **NOTE**

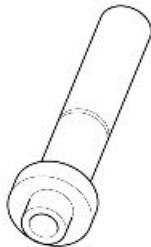
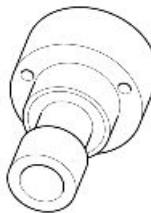
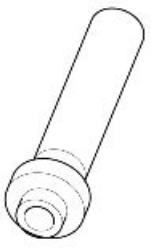
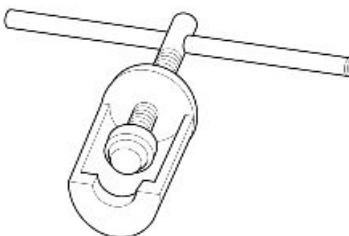
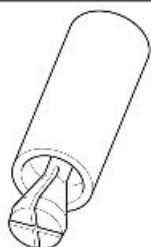
**USE ONLY NEW BRAKE FLUID. DO NOT MIX DIFFERENT BRANDS OR TYPES OF OIL WITHOUT CHECKING THEIR BASE COMPATIBILITY.**

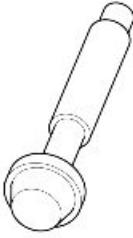
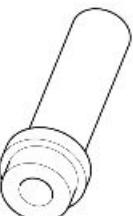
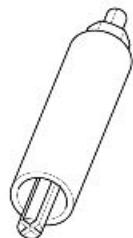
## INDEX OF TOPICS

SPECIAL TOOLS

S-TOOLS

**SPECIAL TOOLS**

Stores code	Description	
19.92.61.00	Punch for seal ring of bevel gear set pinion	
19.92.88.00	Bevel gear set alignment pre-fitting tool	
19.92.60.00	Punch for gearcase sealing ring	
19.90.70.00	Extractor for internal ring on drilled bolt	
19.92.75.00	Extractor for external ring of gearcase bearing	
19.92.62.00	Punch for bearing on bevel gear set pinion	

Stores code	Description	
19.92.64.00	Punch for external ring of tapered bearing on bevel gear set pinion holding body	
19.92.65.00	Punch for external ring of gearcase bearing	
19.92.76.00	Extractor for swinging arm holder bearing on gearbox cover	

## INDEX OF TOPICS

MAINTENANCE

MAIN

## Maintenance chart

**NOTE**

**CARRY OUT MAINTENANCE OPERATIONS AT HALF THE INTERVALS SPECIFIED IF THE VEHICLE IS USED IN PARTICULAR RAINY OR DUSTY CONDITIONS, OFF ROAD OR FOR TRACK USE.**

**NOTE**

**THE TIMES LISTED ON THE SCHEDULED MAINTENANCE TABLE INCLUDE TIME DEDICATED TO MANAGEMENT ACTIVITIES.**

I: INSPECT AND CLEAN, ADJUST, LUBRICATE OR REPLACE IF NECESSARY

V: CHECK AND CLEAN, ADJUST AND REPLACE IF NECESSARY

C: CLEAN, R: REPLACE, A: ADJUST, L: LUBRICATE

(1) Replace in case of leaks.

(2) Replace every 2 years or 20000 Km (12427 mi).

(3) Replace every 4 years.

(4) At each engine start.

(5) Check every month.

(6) Check every 3,000 km (1,864 mi)

(7) Check and clean and adjust or replace, if necessary, every 1,000 Km (621 mi)

**ROUTINE MAINTENANCE TABLE**

km x 1,000	1	10	20	30	40	50	60
Spark plugs		R	R	R	R	R	R
Transmission cables and controls	I	I	I	I	I	I	I
Steering bearings and steering clearance	I	I	I	I	I	I	I
Wheel bearings		I	I	I	I	I	I
Brake discs	I	I	I	I	I	I	I
Air filter		R	R	R	R	R	R
Engine oil filter	R	R	R	R	R	R	R
Lights operation / aiming		I	I	I	I	I	I
Vehicle general operation	I	I	I	I	I	I	I
Braking systems	I	I	I	I	I	I	I
Light circuit	I	I	I	I	I	I	I
Safety switches	I	I	I	I	I	I	I
Brake fluid (2)	I	I	I	I	I	I	I
Gearbox oil	R		R		R		R
Fork oil			R		R		R
Engine oil (6)	R	R	R	R	R	R	R
Final drive oil	R		R		R		R
Fork oil seal (1)	I		I		I		I
Tyres - pressure/wear (5)	I	I	I	I	I	I	I
Valve clearance adjustment	A	A	A	A	A	A	A
Wheels	I	I	I	I	I	I	I
Bolts and nuts tightening	I	I	I	I	I	I	I
Battery terminals tightening	I						
Head screws tightening	A						
Suspension and setting	I		I		I		I
Engine oil pressure warning light (4)							
Fuel lines (3)		I	I	I	I	I	I
Brake lines (3)		I	I	I	I	I	I
Clutch wear		I	I	I	I	I	I
Brake pad wear (7)	V	V	V	V	V	V	V
Labour time (minutes)	100	70	130	70	130	70	130

## Transmission fluid

### Check

- Keep the vehicle upright with both wheels on the ground.
- Unscrew and remove the cap/dipstick (1).
- The level is correct if the oil is close to the hole of the cap/dipstick (1).
- If the oil is lower than specified, top-up until it reaches the cap/dipstick hole (1).

**CAUTION**

**DO NOT ADD ADDITIVES OR OTHER SUBSTANCES TO THE FLUID. WHEN USING A FUNNEL OR ANY OTHER ELEMENT, MAKE SURE IT IS PERFECTLY CLEAN.**

### Replacement

**CAUTION**

**THE UNIT MUST BE HOT WHEN THE OIL IS CHANGED AS UNDER SUCH CONDITIONS OIL IS FLUID AND THEREFORE EASY TO DRAIN.**

**NOTE**

**RIDE SOME km (miles) TO WARM UP ENGINE OIL**

- Place a container with + 400 cm<sup>3</sup> (25 cu in) capacity under the drainage plug (3).
- Unscrew and remove the drainage plug (3).
- Unscrew and remove the breather cap (2).
- Drain the oil into the container; allow several minutes for oil to drain out completely.
- Check and if necessary, replace the sealing washer of drainage plug (3).
- Remove any metal scrap attached to the drainage plug (3) magnet.
- Screw and tighten the drainage plug (3).
- Pour new oil through the fill opening (1) until it reaches the cap/dipstick hole (1).

**CAUTION**

**DO NOT ADD ADDITIVES OR OTHER SUBSTANCES TO THE FLUID. WHEN USING A FUNNEL OR ANY OTHER ELEMENT, MAKE SURE IT IS PERFECTLY CLEAN.**

- Screw and tighten the caps (1 - 2).



## Engine oil

### Check

**CAUTION**

**ENGINE MUST BE WARM TO CHECK ENGINE OIL LEVEL.**

**NOTE**

**DO NOT LET THE ENGINE IDLE WITH THE VEHICLE AT STANDSTILL TO WARM UP THE ENGINE OIL AND REACH THE OPERATING TEMPERATURE OF ENGINE OIL. OIL IS BEST CHECKED AFTER RUNNING FOR ABOUT 15 KM (10 miles).**

- Switch off the engine and wait at least five minutes to allow the lubricant to drain back into the sump.
- Keep the vehicle upright with both wheels on the ground.
- Unscrew and remove the cap with dipstick.
- Clean dipstick.
- Refit the cap with dipstick into its hole without tightening.
- Remove the cap with dipstick.
- Check oil level by means of the oil dipstick.
- The oil level is correct when it close to the "MAX" mark.

**MAX** = maximum level

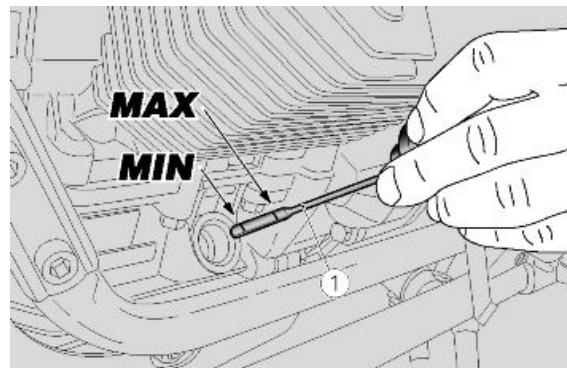
**MIN** = minimum level

Add engine oil if required:

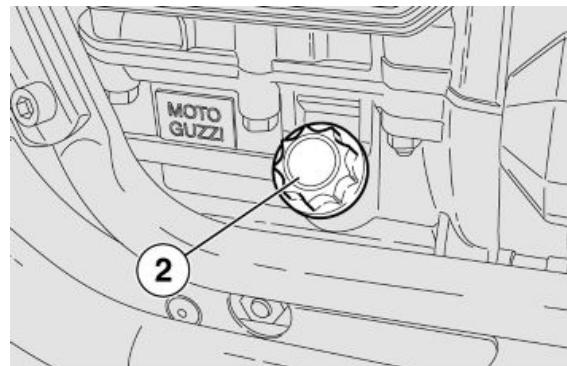
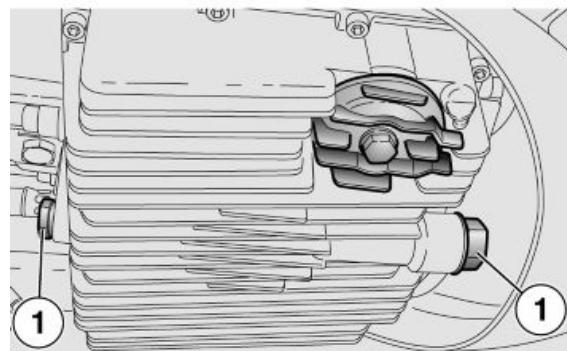
- Unscrew and remove the cap with dipstick.
- Top-up with engine oil until it goes above the minimum level marked "MIN".

**CAUTION**

DO NOT ADD ADDITIVES OR ANY OTHER SUBSTANCE TO THE FLUID. WHEN USING A FUNNEL OR ANY OTHER ELEMENT, MAKE SURE IT IS PERFECTLY CLEAN.

**Replacement**

- Place a container with 2000 cm<sup>3</sup> (122.05 cu.in) capacity under the drainage plugs (1).
- Unscrew and remove the drainage plugs (1).
- Unscrew and remove the filler plug (2).
- Drain the oil into the container; allow several minutes for oil to drain out completely.
- Check and, if necessary, replace the sealing washers of drainage plugs (1).
- Remove any metal scrap attached to the magnet of drainage plugs (1).
- Screw and tighten the drainage plugs (1).



**Tightening torque for drainage plugs (1): 12 Nm (8.85 lb ft).**



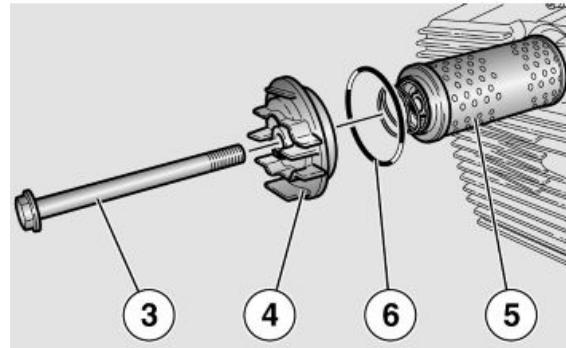
**DO NOT DISPOSE OF OIL INTO THE ENVIRONMENT.  
DISPOSE OF ENGINE OIL STORED IN A SEALED CONTAINER AND TAKE IT TO YOUR SUPPLIER OR TO THE NEAREST USED OIL RECLAMATION FIRM.**

## Engine oil filter

- Undo the two screws (3) and remove the cover (4).
- Remove the engine oil filter (5).

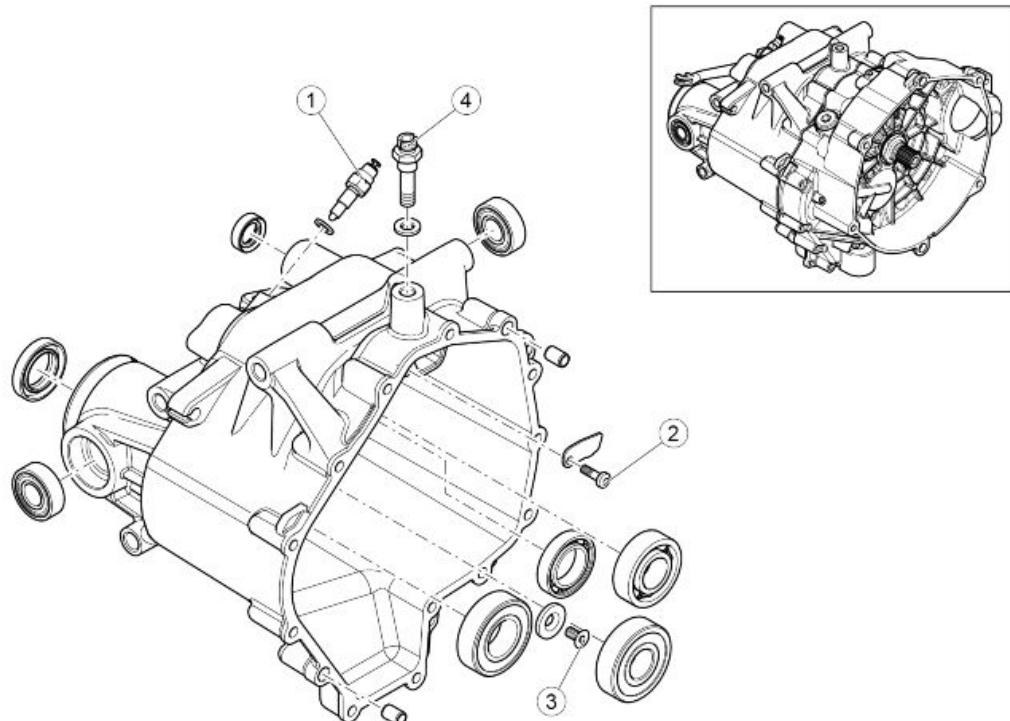
**NOTE**

NEVER REUSE AN OLD FILTER.



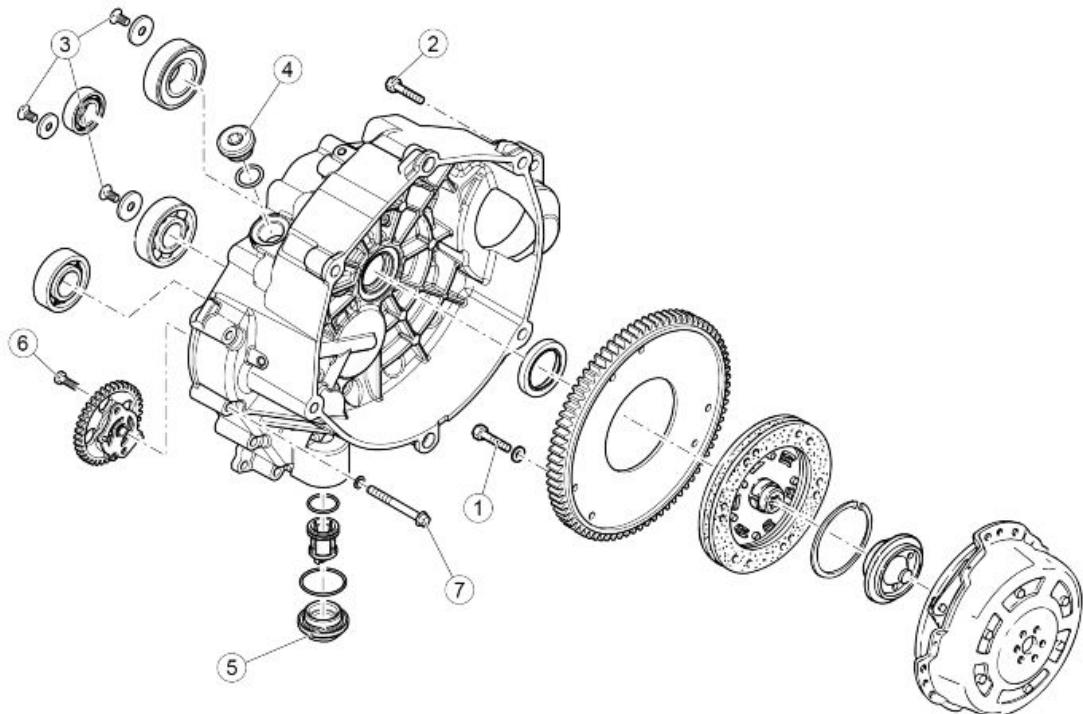
- Spread a thin layer of oil on the sealing ring (6) of the new engine oil filter.
- Fit the new engine oil filter with the spring facing downwards.
- Refit the cover (4), screw and tighten the screw (3).

## Gearbox Oil



**GEARBOX**

pos.	Description	Type	Quantity	Torque	Notes
1	Neutral sensor	-	1	10 Nm (7.38 lb ft)	-
2	Plate fixing screw	Torx M5x16	1	4 Nm (2.95 lb ft)	Loct. 243
3	Bearing block washers fixing screw	TSEI	1	10 Nm (7.38 lb ft)	Loct. 243
4	Breather cap	-	1	20 Nm (14.75 lb ft)	-



### CLUTCH I

pos.	Description	Type	Quantity	Torque	Notes
1	Crown screws	M6x16	6	10 Nm (7.38 lb ft)	Loctite 243
2	Gearbox screws	M8x35	5	25 Nm (18.44 lb ft)	-
3	Bearing block washers fixing screws	TSEI	4	10 Nm (7.38 lb ft)	Loct. 243
4	Oil load cap	-	1	25 Nm (18.44 lb ft)	-
5	Oil filter cap	-	1	.. Nm (... lb ft)	-
6	Oil pump fixing screw	Torx M5x16	1	6 Nm (4.42 lb ft)	Loct. 243
7	Gearbox fixing screws	TCEI M6x55	14	10 Nm (7.38 lb ft)	-

## Replacement

### NOTE

**HOT OIL IS MORE FLUID AND WILL DRAIN OUT MORE EASILY AND COMPLETELY.**

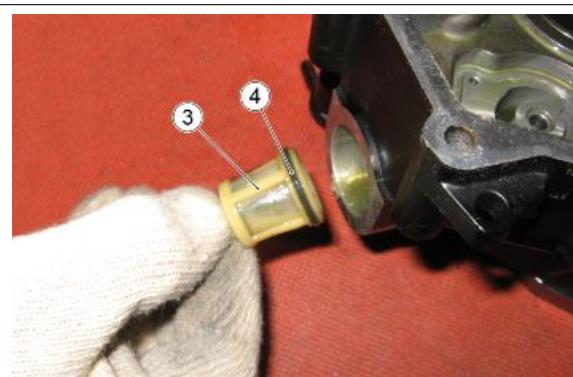
- Place a container with suitable capacity under the drainage plug (2).
- Unscrew and remove the drainage plug (2).



- Unscrew and remove the filler plug (1).
- Drain the oil into the container; allow several minutes for oil to drain out completely.
- Check and if necessary, replace the sealing washers of drainage plug (2).
- Remove any metal scrap attached to the drainage plug (2) magnet.



- Remove the air filter (3) and clean it
- Check the O-Ring (4) and if necessary replace it
- Screw and tighten the drainage plug (2).
- Pour in new oil until it reaches the cap/dipstick opening (1).
- Tighten the filler cap (1).

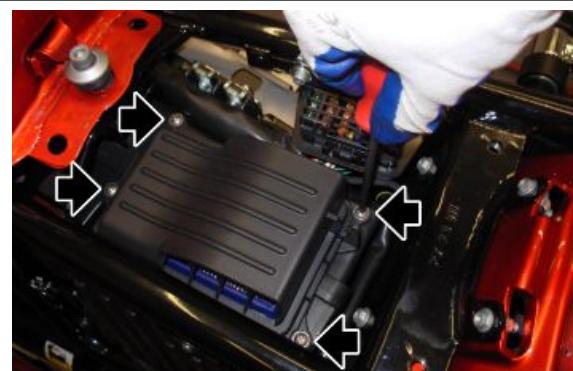


**CAUTION**

**DO NOT ADD ADDITIVES OR OTHER SUBSTANCES TO THE FLUID. WHEN USING A FUNNEL OR ANY OTHER ELEMENT, MAKE SURE IT IS PERFECTLY CLEAN.**

## Air filter

- Remove the saddle
- Unhook the connector from the air-box cover
- Remove the air-box cover fixing screw



- Remove the air-box cover
- Extract the air filter



## Throttle body removal

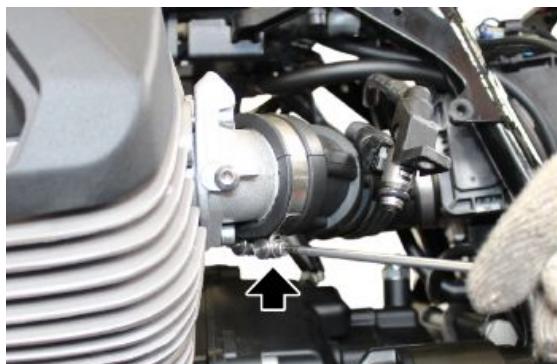
- Remove the clip clamp fixing the sleeve to the filter box

**CAUTION**

DURING REFITTING, REPLACE THE CLIP CLAMP



- Loosen the clamps that secure the sleeve to the intake manifolds



- Remove the sleeve



- Remove the battery
- Remove the MIU G3 control unit connector support bracket fixing screw



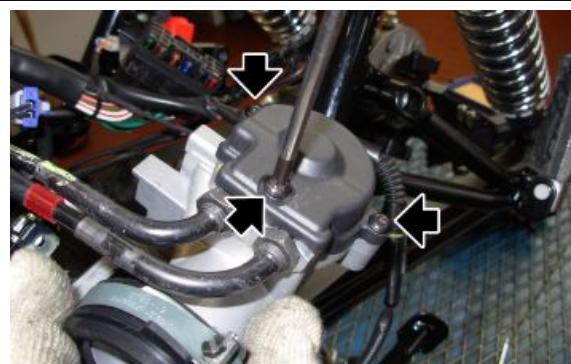
- Disconnect the MIU G3 control unit connector



- Unscrew the clamp that secures the throttle body to the filter box
- Extract the throttle body laterally



- Remove the throttle body guard

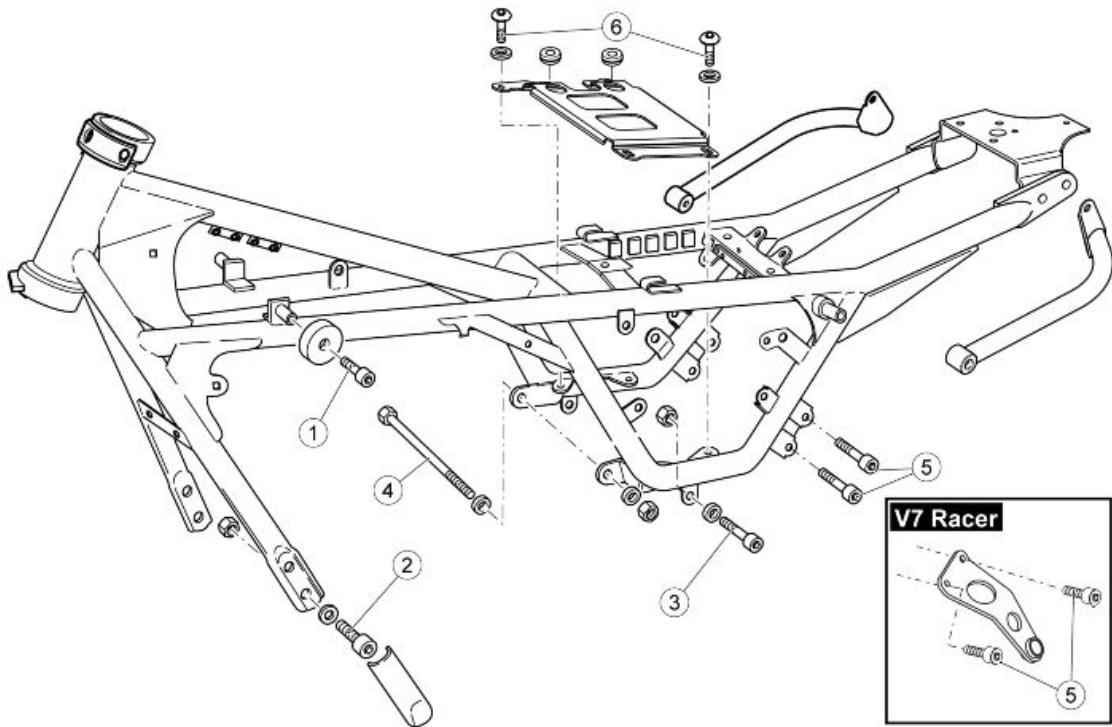


- Loosen the gas cables fixing nuts on the throttle body and unhook them



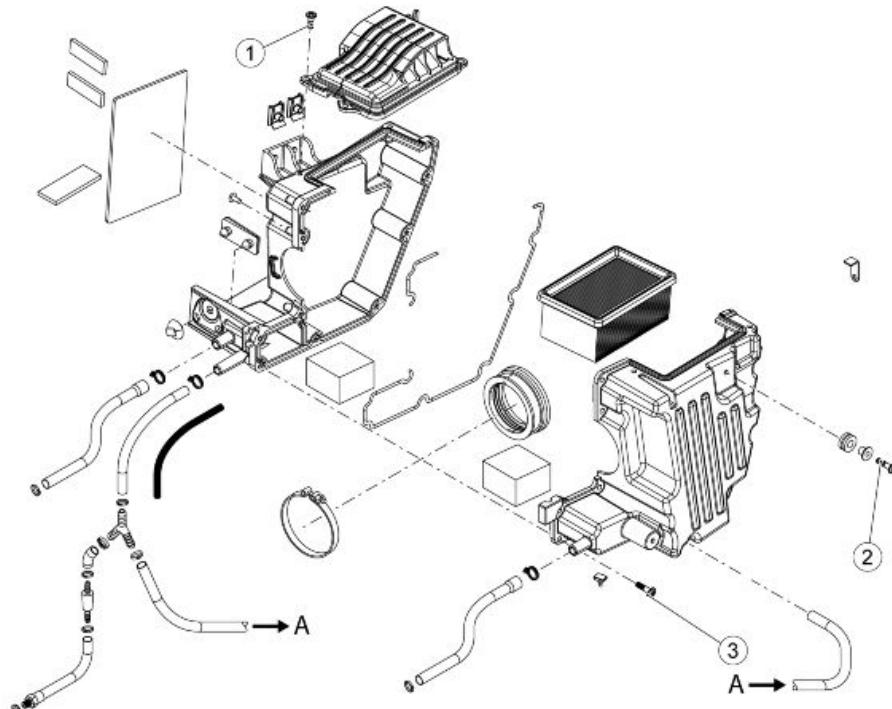
- Remove the throttle body

## Air filter housing



**FRAME**

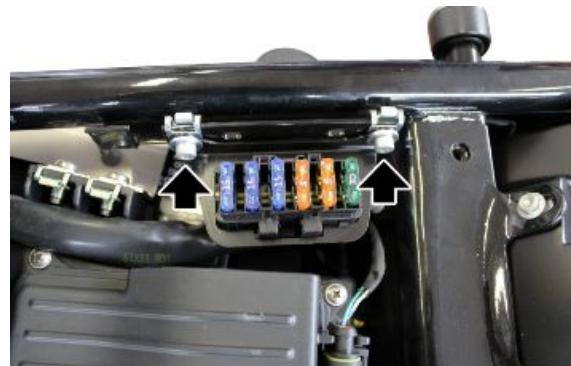
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fixing tank mounting rubber blocks to frame	M8x14	2	25 Nm (18.44 lbf ft)	-
2	Cradle front fixing screw	M10x30	4	50 Nm (36.88 lbf ft)	-
3	Screw fastening gearbox to frame	M10x55	2	50 Nm (36.88 lbf ft)	-
4	Pin fixing engine/gearbox to chassis	M10x205	1	50 Nm (36.88 lbf ft)	-
5	Screw fixing exhaust silencer mounting to frame	M8x16	4	25 Nm (18.44 lbf ft)	Loctite 243
6	Battery supporting plate fixing screw	M8x16	4	25 Nm (18.44 lbf ft)	-

**TIGHTENING TORQUE - CENTRAL PART - FILTER BOX**

pos.	Description	Type	Quantity	Torque	Notes
1	Air filter box cover fastening screw	SWP 5x14	4	3 Nm (2.21 lb ft)	-
2	Air filter box fastening screw to frame	SWP 5x20	2	3 Nm (2.21 lb ft)	-
3	Air filter box fastening screw	SWP 5x20	9	3 Nm (2.21 lb ft)	-

**Air filter housing removal**

- Remove the saddle and the side fairings
- Remove the battery
- Remove the rear wheel.
- Remove the splash guard
- Remove the fuse box support fixing screws (1)



- Move the filter box to the side enough to allow removal of the fixing screws (2) on the left side of the filter box support.



- Move the filter box to the side enough to allow removal of the fixing screws (3) on the right side of the filter box support.



- Disconnect the neutral switch connector
- Lift the air filter box enough to allow the support plate to be removed, sliding out neutral switch cabling



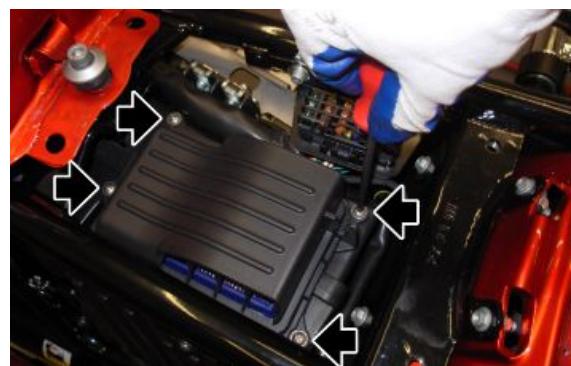
- Unscrew the clamp that fastens the throttle body to the air filter box



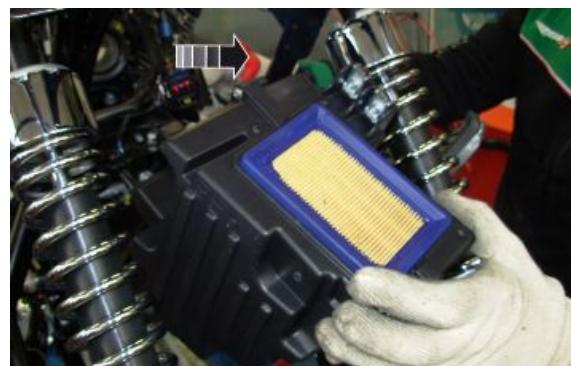
- Disconnect the blow-by pipe



- Remove the air-box cover

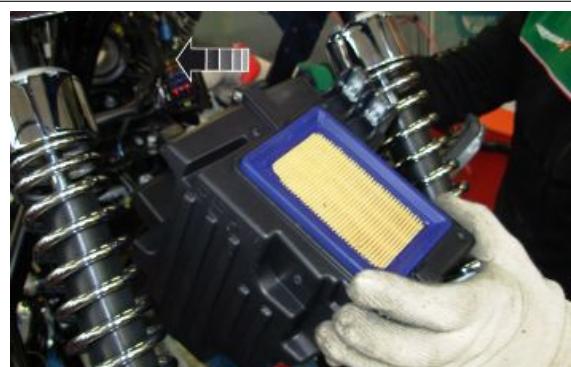


- Remove sliding the complete filter box out toward the rear



### Air filter housing installation

- Insert the filter box from the rear



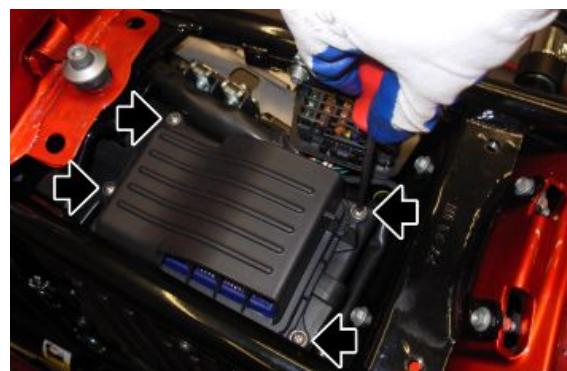
- Insert the throttle body in the sleeve and tighten the clamp to secure it

**CAUTION**

TAKE PARTICULAR CARE THAT THE CLAMP IS POSITIONED CORRECTLY. INCORRECT POSITIONING WILL CAUSE VEHICLE MALFUNCTIONS



- Install the air-box cover



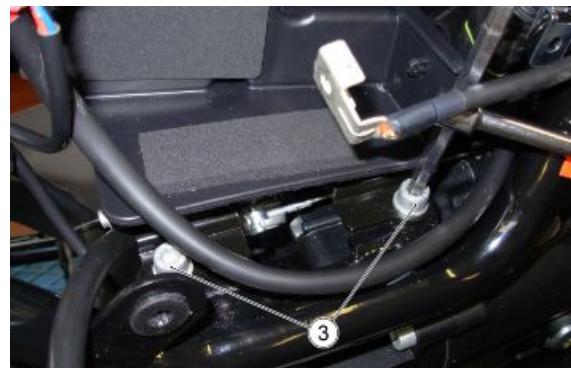
- Connect the blow-by and breather tubes



- Position the air filter box support, taking care to pass the neutral switch cabling through the hole



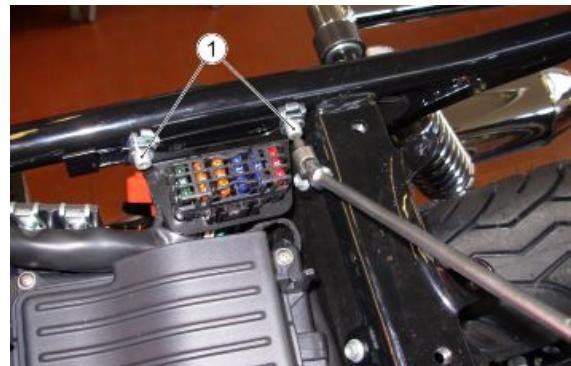
- Move the filter box to the side enough to allow tightening of the fixing screws (3) on the right side of the filter box support.



- Move the filter box to the side enough to allow tightening of the fixing screws (2) on the left side of the filter box support.



- Correctly position the air filter box on the support
- Fix the screws (1) of the fuse box support



## Checking the valve clearance

If the timing system is very noisy, check the clearance between the valves and the rocking levers.

**NOTE**

**ADJUST WITH COLD ENGINE, WITH PISTON AT TOP DEAD CENTRE (TDC) IN COMPRESSION STROKE (VALVES CLOSED).**

- Remove the left spark plug cover



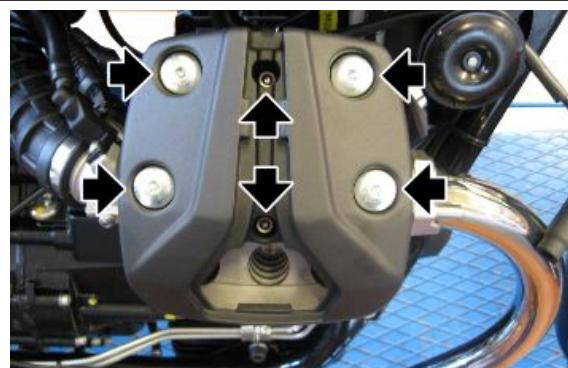
- Disconnect the spark plug tube



- Remove the spark plug



- Remove the six head cover fixing screws and collect the washers



- Remove the head cover together with the gasket



- Loosen the nut (1)
- Use a screwdriver to act on set screw (2) until the following clearances are obtained:

#### Technical specifications

#### Values valid with control clearance between rockers and valve

Inlet valve: 0.15 mm (0.0059 in)

Exhaust valve: 0.20 mm (0.0079 in)

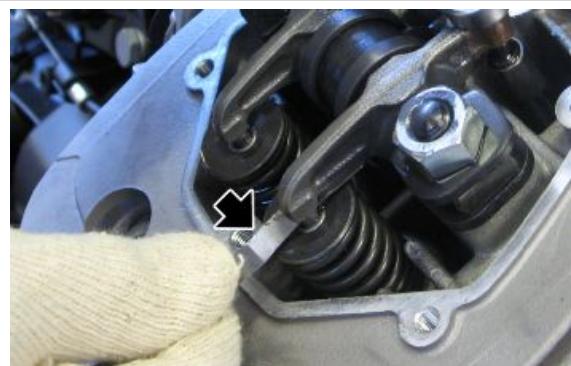


- The measurement must be taken using a special thickness gauge

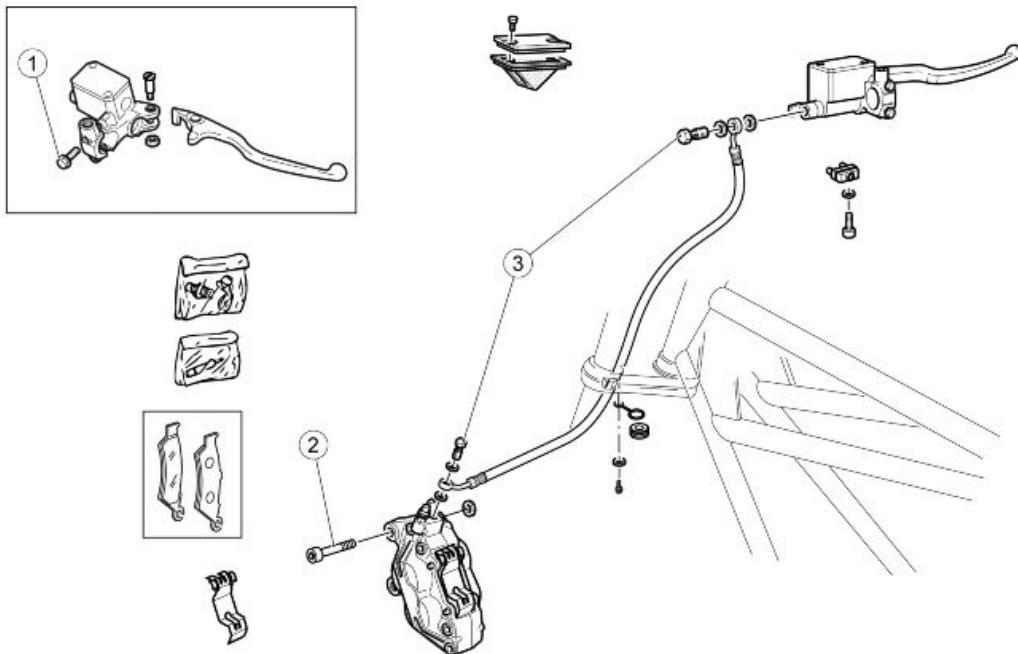
#### CAUTION

IF CLEARANCE IS LARGER THAN RECOMMENDED, THE TAPPETS WILL BE NOISY. OTHERWISE, THE VALVES DO NOT CLOSE CORRECTLY, WHICH CAN LEAD TO PROBLEMS SUCH AS:

- PRESSURE DROP;
- ENGINE OVERHEAT;
- VALVE BURN OUT, ETC.

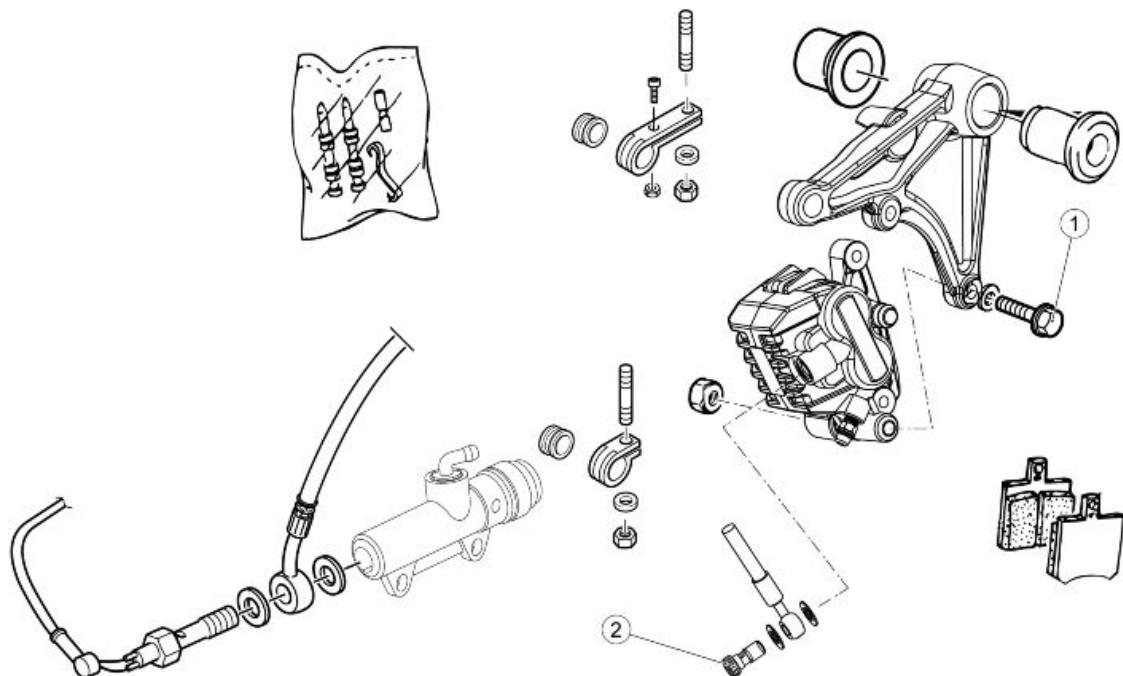


## Braking system



### FRONT BRAKE SYSTEM

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening the brake pump U-bolt to the semi-handlebar	M6	2	10 Nm (7.37 lbf ft)	Tighten using a 1-2-1 sequence
2	Front brake calliper fixing screw	M10x30	2	50 Nm (36.88 lb ft)	-
3	Drilled screw for brake fluid pipe on pump and calliper	-	2	25 Nm (18.44 lb ft)	-



**REAR BRAKE SYSTEM**

pos.	Description	Type	Quantity	Torque	Notes
1	Rear brake calliper fixing screw	M8x30	2	25 Nm (18.44 lb ft)	-
2	Drilled screw for brake pipe on calliper	-	1	25 Nm (18.44 lb ft)	-

**Level check****Brake fluid check**

- Rest the vehicle on its stand.
- For the front brake, turn the handlebar fully to the right.
- For the rear brake, keep the vehicle upright so that the fluid in the reservoir is at the same level with the plug.
- Make sure that the fluid level in the reservoir is above the "MIN" reference mark:

**MIN** = minimum level

**MAX** = maximum level

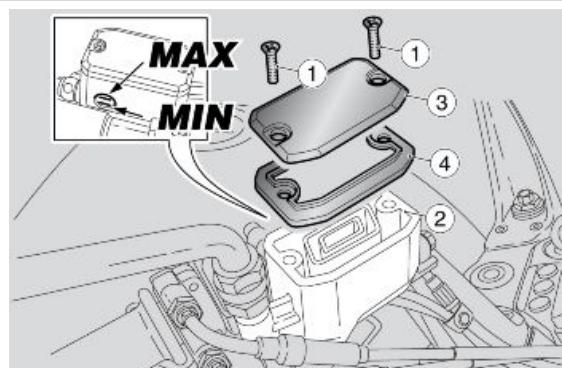
If the fluid does not reach at least the "MIN" reference mark:

- Check brake pads and disc for wear.
- If the pads and/or the disc do not need replacing, top-up the fluid.

**Top-up**

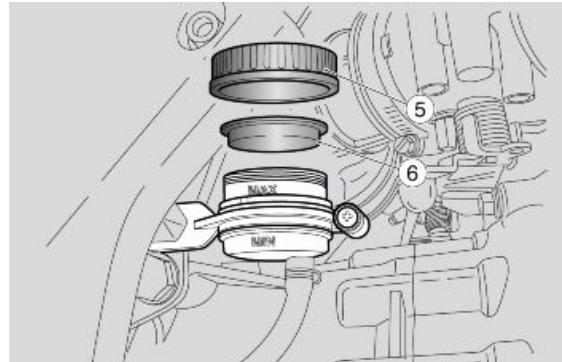
## Front brake:

- Unscrew the two screws (1) of the brake fluid reservoir (2) using a Phillips screwdriver.
- Lift and remove the cover (3) and screws (1) as well.
- Remove the gasket (4).



## Rear brake:

- Unscrew and remove the cap (5).
- Remove the gasket (6).
- Top-up the reservoir with brake fluid to the correct level, which is between the two "MIN" and "MAX" reference marks.



**RISK OF BRAKE FLUID SPILLAGE. DO NOT USE THE BRAKE LEVER WHILE THE BRAKE FLUID TANK CAP IS LOOSENERED OR REMOVED.**

**CAUTION**



AVOID PROLONGED EXPOSURE OF THE BRAKE FLUID TO THE AIR. THE BRAKE FLUID IS HYGROSCOPIC AND ABSORBS MOISTURE WHEN IN CONTACT WITH THE AIR. LEAVE THE BRAKE FLUID RESERVOIR OPEN ONLY FOR THE TIME NEEDED TO COMPLETE THE REFILL PROCEDURE.



TO AVOID SPILLING FLUID WHILE TOPPING-UP, KEEP THE TANK PARALLEL TO THE RESERVOIR EDGE (IN HORIZONTAL POSITION).

DO NOT ADD ADDITIVES OR ANY OTHER SUBSTANCE TO THE FLUID.

WHEN USING A FUNNEL OR ANY OTHER ELEMENT, MAKE SURE IT IS PERFECTLY CLEAN.



DO NOT EXCEED THE "MAX" LEVEL MARK WHEN TOPPING UP.

TOP-UP TO "MAX" LEVEL MARK ONLY WHEN BRAKE PADS ARE NEW. WHEN TOPPING UP DO NOT EXCEED THE "MAX" LEVEL MARK WHEN BRAKE PADS ARE WORN AS YOU RISK SPILLING FLUID WHEN CHANGING THE BRAKE PADS.

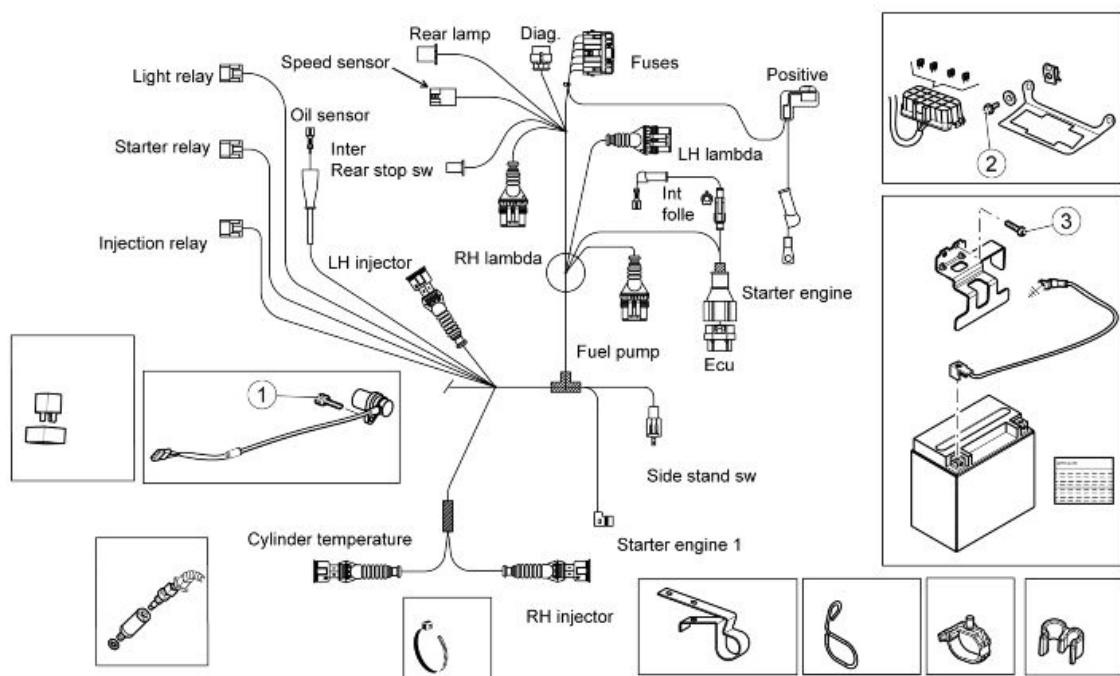
CHECK BRAKING EFFICIENCY. IN CASE OF EXCESSIVE TRAVEL OF THE BRAKE LEVER OR POOR PERFORMANCE OF THE BRAKING SYSTEM, TAKE YOUR VEHICLE TO AN Official Moto Guzzi Dealer, AS IT MAY BE NECESSARY TO PURGE THE AIR IN THE SYSTEM.

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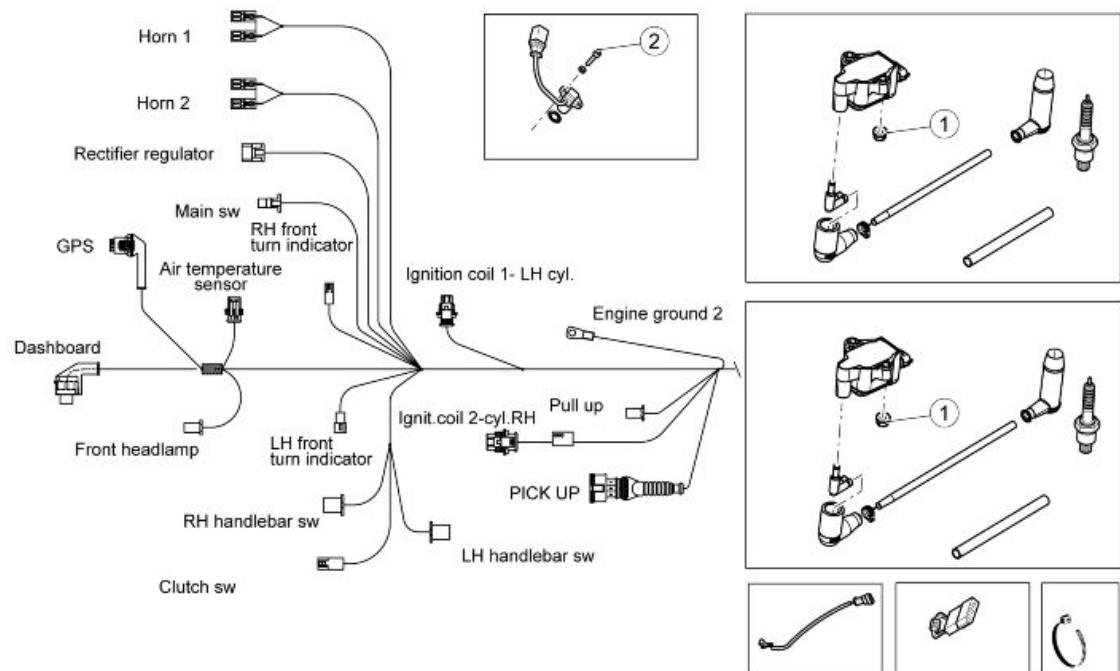
## INDEX OF TOPICS

ELECTRICAL SYSTEM

ELE SYS

**ELECTRICAL SYSTEM 01**

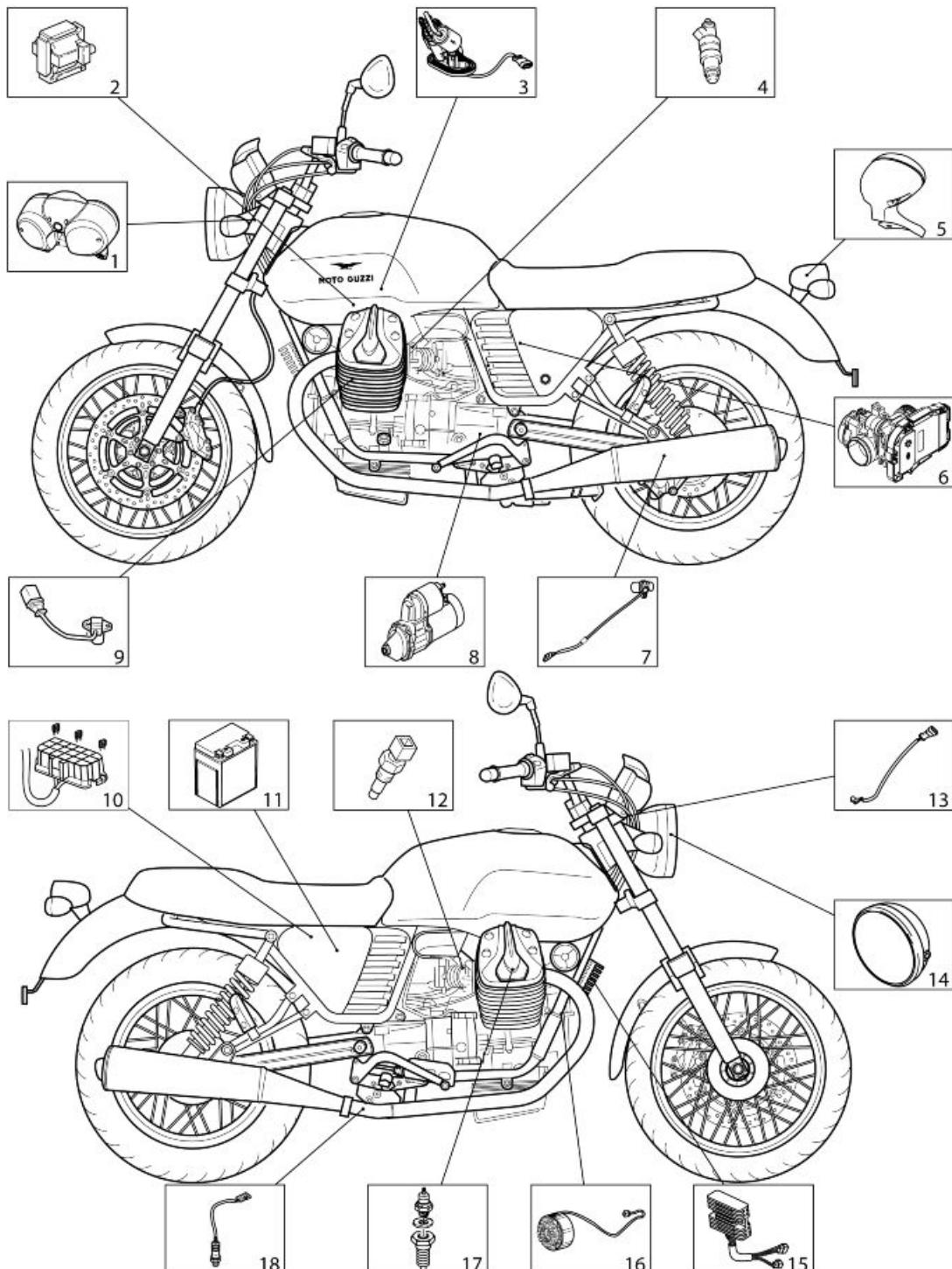
pos.	Description	Type	Quantity	Torque	Notes
1	Speed sensor fastening screw	M6	1	10 Nm (7.37 lb ft)	
2	Fuse box bracket fixing screw	M5x12	2	4 Nm (2.95 lb ft)	-
3	Battery holder bracket fastening screw	M6	2	Manual	-

**ELECTRICAL SYSTEM 02**

pos.	Description	Type	Quantity	Torque	Notes
1	1 - Coil fixing nut	M6	2+2	10 Nm (7.37 lb ft)	-

pos.	Description	Type	Quantity	Torque	Notes
2	2 - Timing sensor fastener screw	-	1	.. Nm (... lb ft)	-

## Components arrangement



### key:

1. Instrument panel
2. Coil

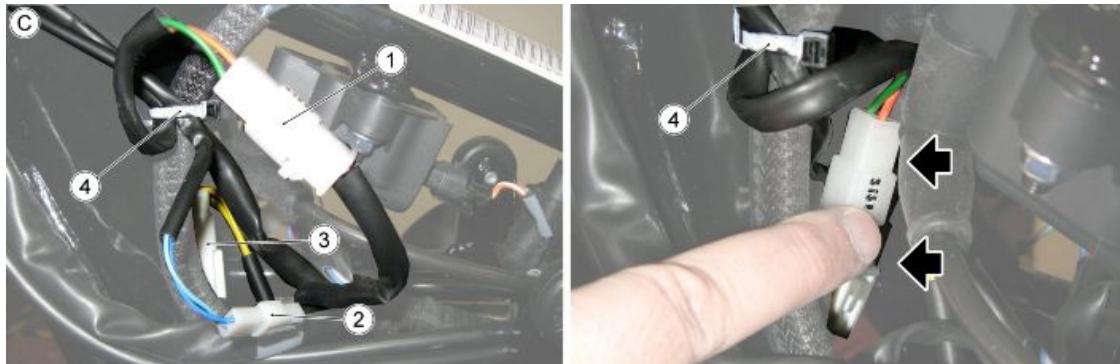
3. Fuel pump
4. Injector
5. Taillight
6. MIU G3 Control Unit
7. Speed sensor
8. Starter motor
9. Engine speed sensor
10. Fuses
11. Battery
12. Head temperature sensor
13. Instrument panel air sensor
14. Headlamp
15. Voltage regulator
16. Alternator
17. Oil pressure sensor
18. Lambda probes

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## Front side

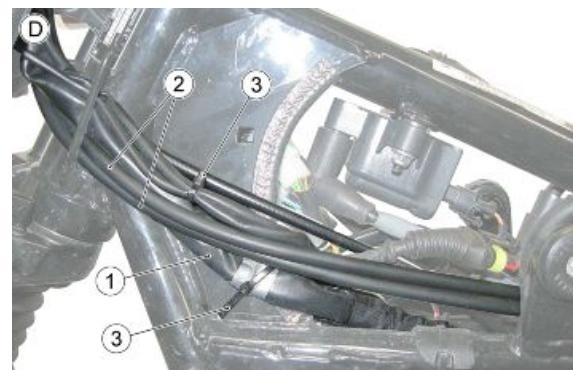
### TABLE C

1. Key connector
2. Left turn indicator connector
  - Both connectors, once connected, are positioned behind the steering tube.

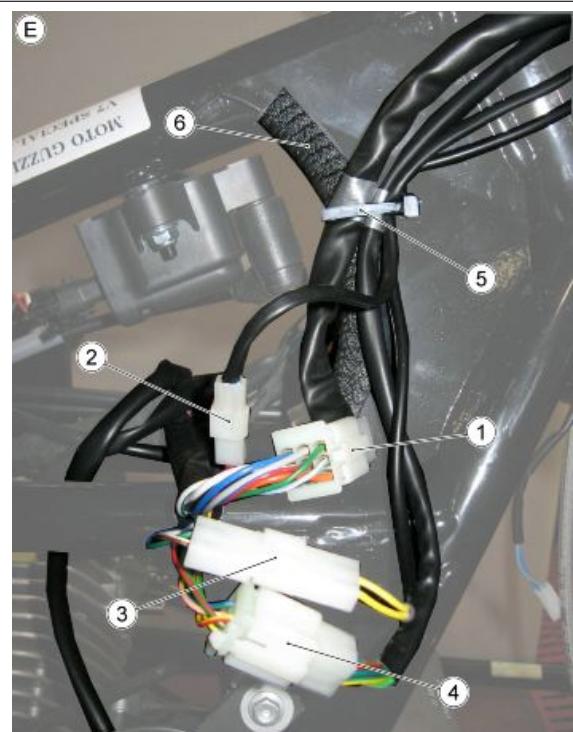


**TABLE D**

1. Main cable harness
2. Gas cables
3. Cable tie that secures the main cabling to the frame in correspondence to the grey taping
  - The gas cables must pass under the main cabling.

**TABLE E**

1. Left light switch connector
2. Right turn indicator connector
3. Clutch switch connector
4. Right light switch connector
5. Cable tie that secures the cabling in correspondence to the grey tapings
6. Profile guards

**TABLE F**

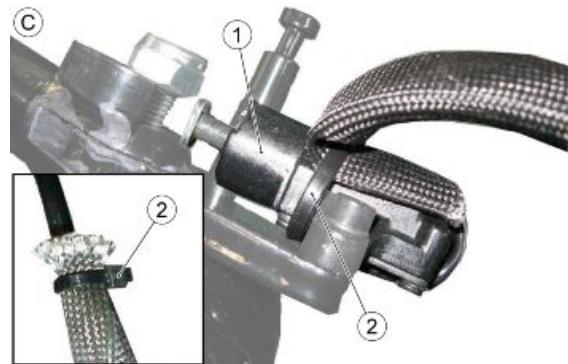
- Pass all the cabling as indicated and move all the connectors, ensuring that they have been correctly connected, behind the steering tube.



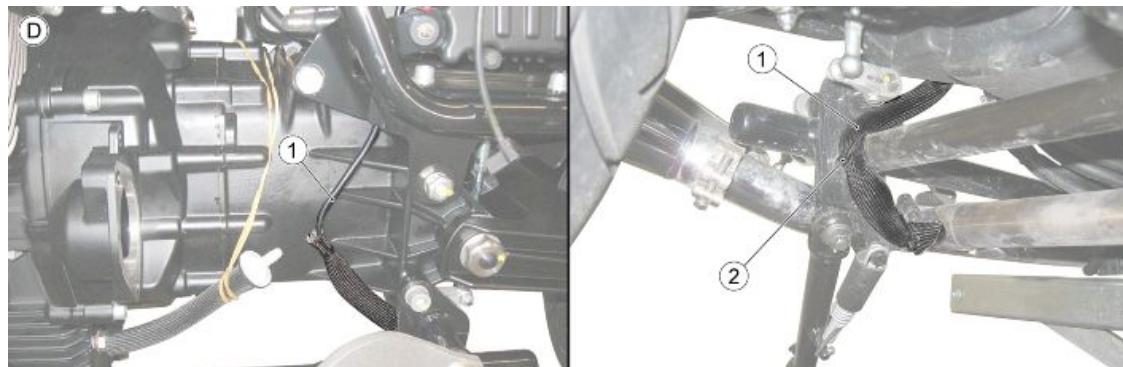
## Central part

**TABLE C**

1. Side stand switch
2. Clamps

**TABLE D**

1. Side stand cabling
2. Cable tie that secures the side switch cabling to the frame

**TABLE E**

1. Side stand switch connector

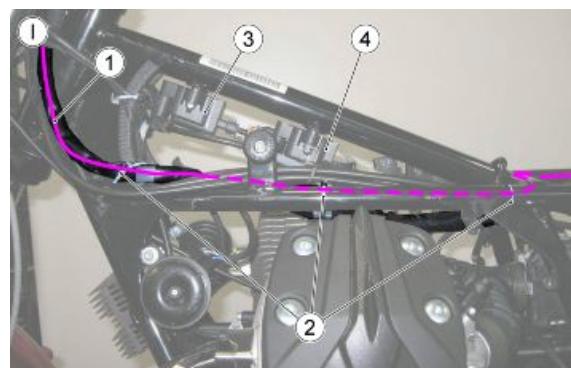


**TABLE F**

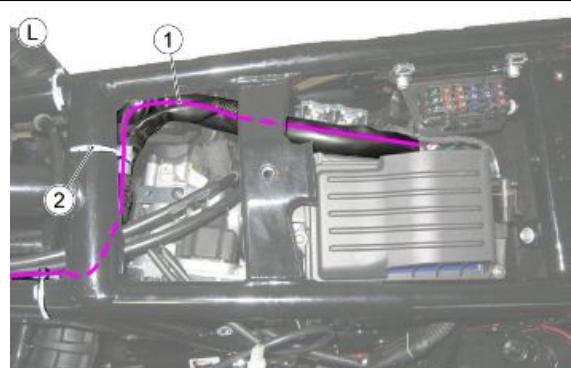
1. Starter motor actuator connector
2. Side stand cabling

**TABLE I**

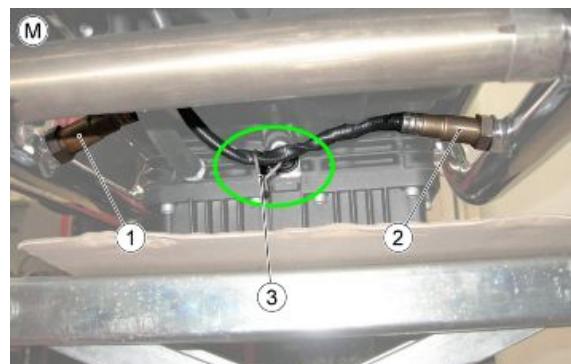
1. Main cable harness
2. Cable ties that secure the main cabling to the frame
3. Left cylinder coil
4. Right cylinder coil

**TABLE L**

1. Main cable harness
2. Cable tie that secures the main cabling to the frame

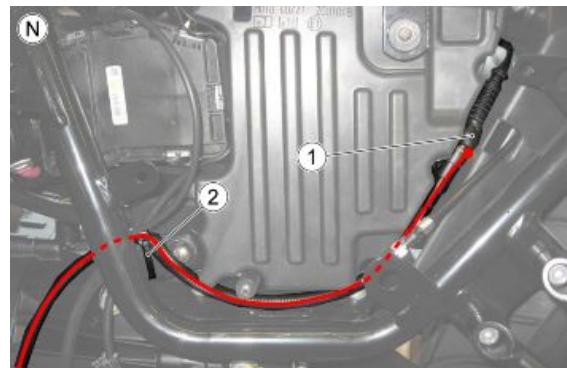
**TABLE M**

1. Left lambda probe
2. Right Lambda probe
  - Pay close attention that the right lambda probe cabling passes through the cable grommet (3)

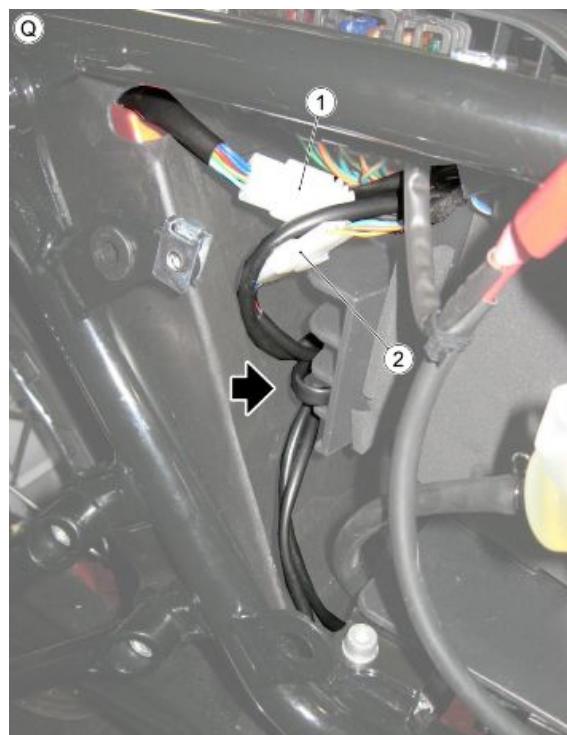


**TABLE N**

1. Left lambda probe connector
2. Cable tie that secures the cabling of the left lambda probe

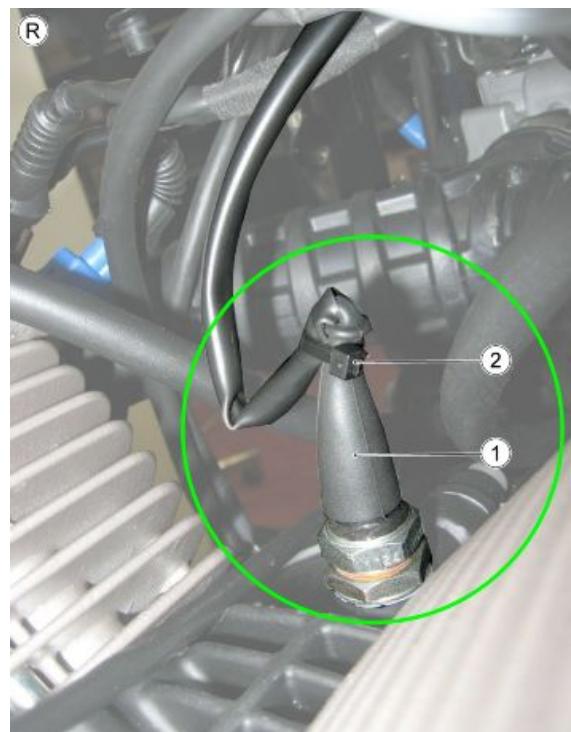
**TABLE Q**

1. Taillight connector
2. Speed sensor connector
  - Hide the taillight and speed sensor connectors between the filter box and mudguard

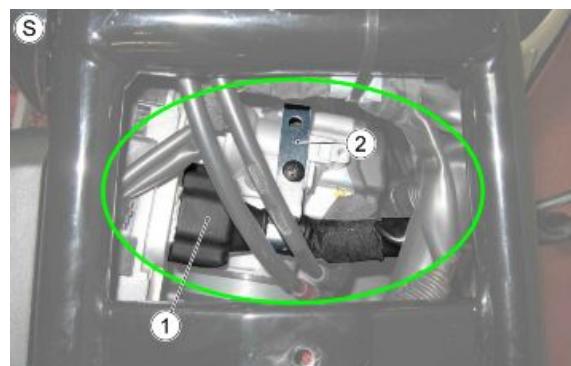


**TABLE R**

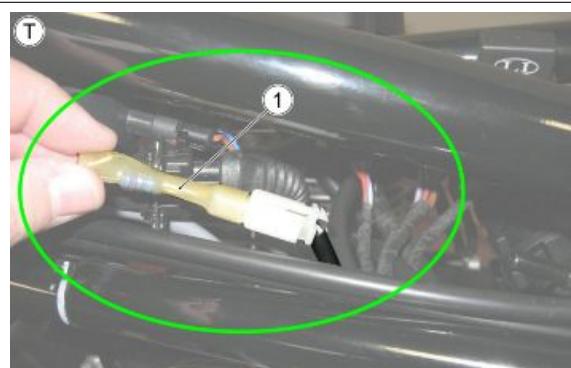
1. Engine oil bulb
2. Clamp

**TABLE S**

1. Control unit connector
2. Control unit fastening bracket

**TABLE T**

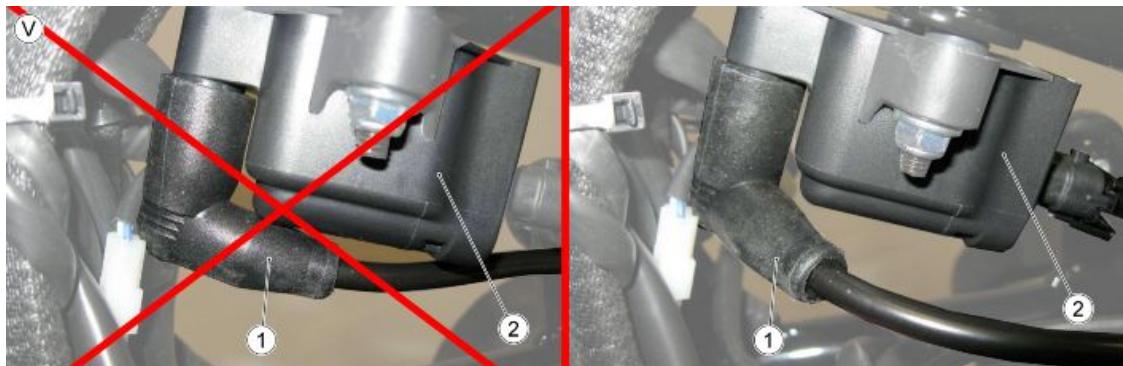
1. Module with resistance (Pull UP)

**TABLE U**

1. Left cylinder coil
  - The grey taping marks the left cylinder coil connector

**TABLE V**

1. Voltage cable
2. Coil
  - Indication of correct connection of the high voltage cable on the coils

**TABLE W**

1. High voltage cable covered by black sheath for right cylinder
2. High voltage cable covered by grey sheath for left cylinder

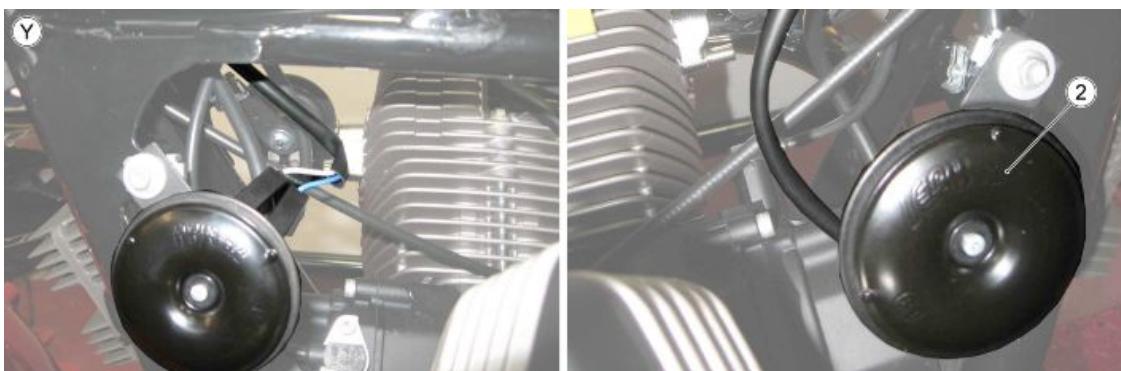


**TABLE X**

1. Pick Up connector

**TABLE Y**

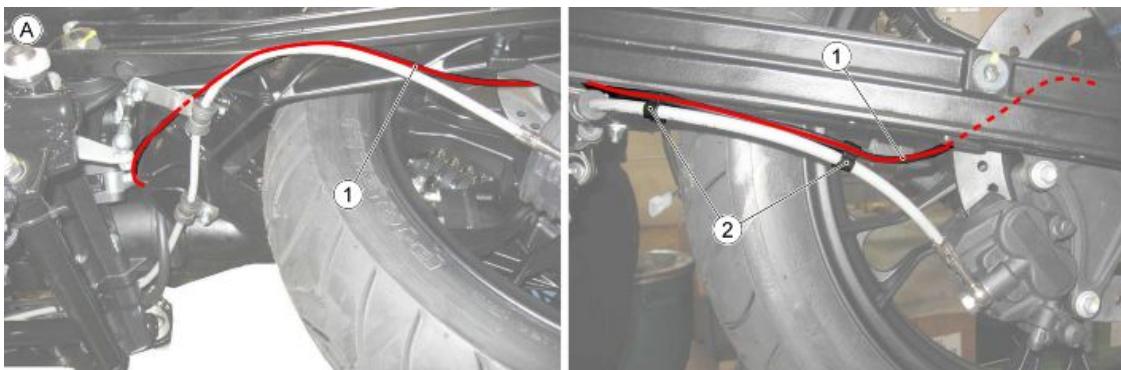
1. Left horn
2. Right horn



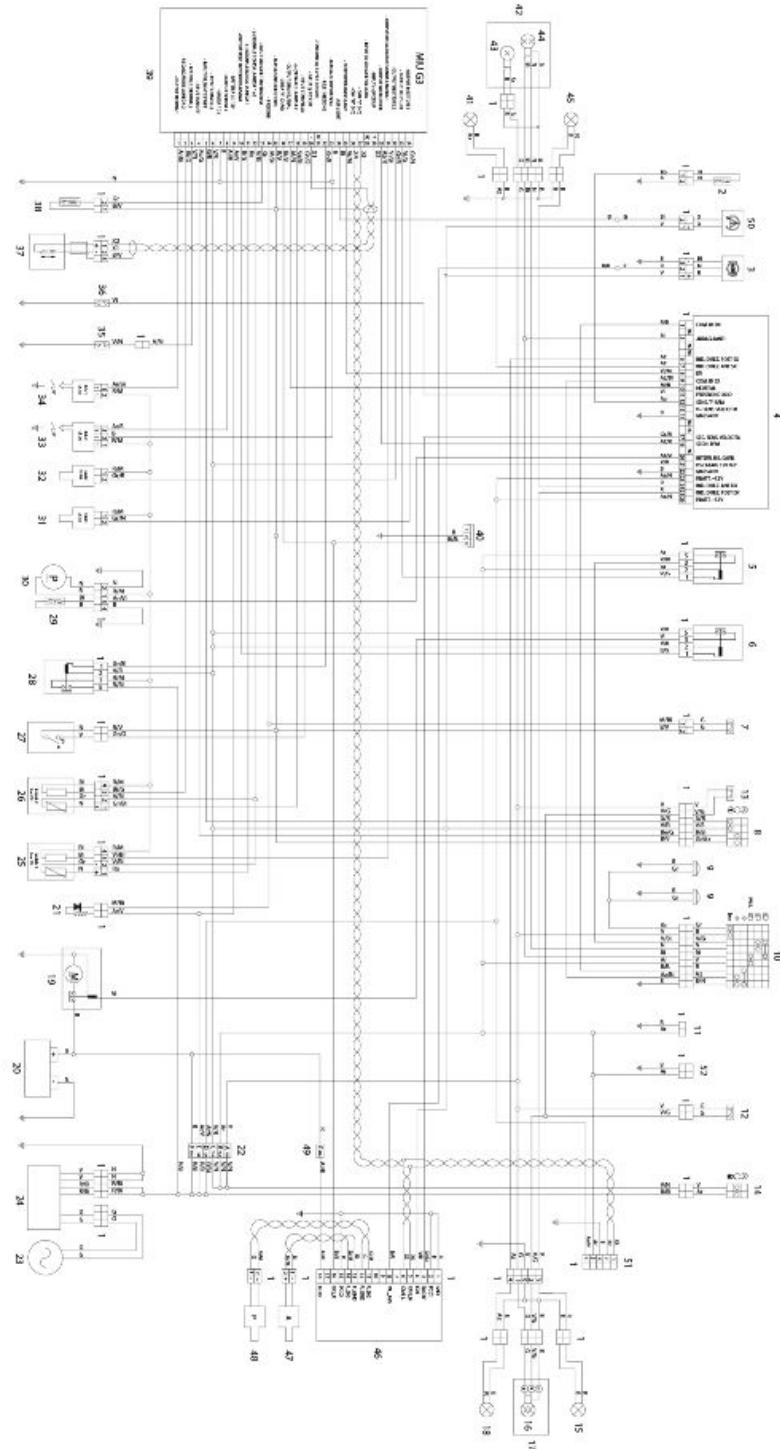
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**Back side****TABLE A**

1. Rear speed sensor cabling
2. Cable grommets



## General wiring diagram



### key:

1. Multiple connectors
2. Air temperature sensor
3. ABS warning light
4. Instrument panel

5. Light relay
  6. Starter motor relay
  7. Clutch switch
  8. Right hand light switch
  9. Horn
  10. Left light switch
  11. GPS wiring
  12. Rear stop switch
  13. Front stop switch
  14. Ignition switch
  15. Rear right turn indicator
  16. Stop - position bulb
  17. Taillight
  18. Rear left turn indicator
  19. Starter motor
  20. Battery
  21. Pull Up (resistance)
  22. Fuses
  23. Flywheel
  24. Regulator
  25. Lambda 1 (left exhaust)
  26. Lambda 2 (right exhaust)
  27. Side stand switch
  28. Injection load relay
  29. Fuel reserve sensor
  30. Fuel pump
  31. Injector 1 (left cylinder)
  32. Injector 2 (right cylinder)
  33. Coil 2 (right cylinder)
  34. Coil 1 (left cylinder)
  35. Neutral sensor
  36. Oil sensor
  37. Pick UP
  38. Engine head temperature sensor
  39. MIU G3 control unit
  40. Diagnosis
  41. Front left turn indicator
  42. Headlight
-

- 43.Front position
- 44.High/low beam bulb
- 45.Front right turn indicator
- 46.ABS control unit
- 47.Front ABS sensor
- 48.Rear ABS sensor
- 49.ABS Fuse
- 50.MGCT warning light
- 51.Bluedash pre-installation
- 52.USB pre-installation

**Cable colour:**

**A**r orange

**A**z sky blue

**B** blue

**B**i white

**G** yellow

**Gr** grey

**M** brown

**N** black

**R** red

**Ro** pink

**V** green

**Vi** purple

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## Checks and inspections

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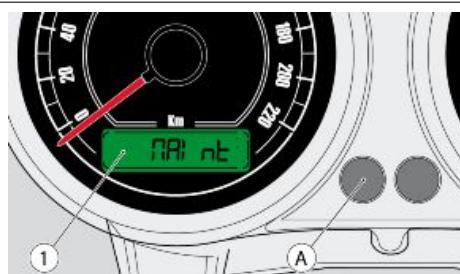
### Dashboard

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#### Service warning light reset

- The system displays the function as follows:

the word "MAInt" is shown on the left LCD Display  
(1) after the mileage corresponding to the first servicing or any subsequent servicing is exceeded.



- This is shown only after each start-up for 5 seconds; afterwards, it will shift to the standard view.

To reset Service proceed as follows:

- Hold down the key (A).
- Turn the ignition key to "ON".
- Wait for the Key OFF.

The next time the vehicle is started, the value will be reset and the word "MAInt" will not be displayed until the next mileage for which maintenance is foreseen.

## Battery recharge circuit

### RECHARGING SYSTEM

- Slightly lift the fuel tank, being careful not to pull the pipes with the relative hooks;
- Remove the connectors from the compartment behind the steering column
- Disconnect the three-way connector (1) (white).

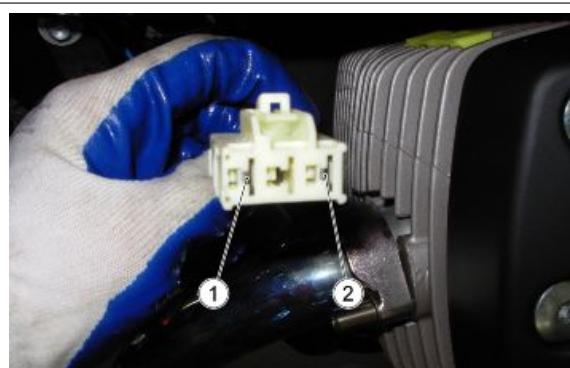


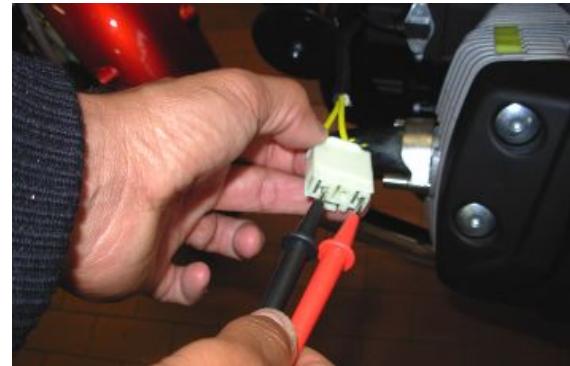
#### NOTE

THE ENGINE SIDE IS IDENTIFIED WITH THE LETTER "A"

### Measurement of resistance (with engine off)

- For a correct detection of the alternator resistance, must be performed an ambient temperature measurement and then a further heat stabilisation with a tester.





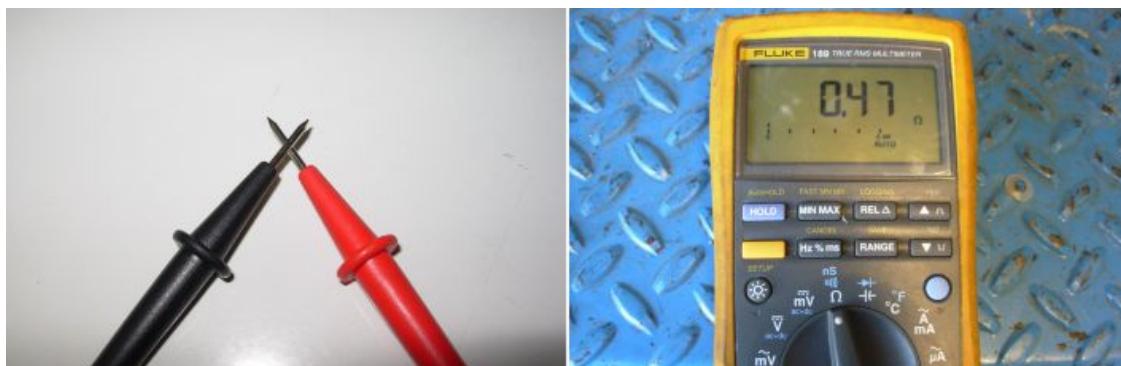
- Take the measurement; The correct value is determined by subtracting the wire resistance of the tester obtained by touching the two pins.

Example:

- Resistance of stage 1 read on the display = 0.67 Ohm



- Resistance of the wires read on the display = 0.47 Ohm



- Effective resistance stage 1 =  $0.67 - 0.47 = 0.20$  Ohm

#### RESISTANCE MEASURE

Winding stage	Ambient temperature (ohm)	Afterwards heat stabilisation (ohm)
Stage 1	0.18 - 0.23	0.20 - 0.25

#### **Zero load voltage**

- Disconnect the three-way connector (1);
- For a correct detection of the alternator voltage, a measurement must be carried out using alternatively the 3 engine side connector pins: stage "1" (pin 1-2), stage "2" (pin 1-3), stage "3" (pin 2-3)
- Take the measurements;
- If there is a significant difference between one stage and another (other than 15 V), this means that the alternator is defective and must be replaced.

**CAUTION**

**WITH THE ENGINE HOT THE VALUES RECORDED ARE ON AVERAGE 4-5 V LESS THAN THOSE DETECTED WITH THE ENGINE COLD.**

**TENSIONE A VUOTO**

Giri / min	2000	4000	6000
Vm tensione concatenata Valori di riferimento ( V rms )	40 - 45	82 - 87	132 - 138

**Short-circuit current**

- For a correct detection of the short-circuit current, a connector must be prepared that generates a downstream short circuit between the three alternator cables;
- Start the engine and with an ammeter clamp measure each single cable.
- If there is a significant difference between the measure of the single cables (other than 10 A), this means that the alternator is defective and must be replaced.

**CAUTION**

**WITH THE ENGINE HOT THE VALUES RECORDED ARE ON AVERAGE 2-3 A LESS THAN THOSE DETECTED WITH THE ENGINE COLD.**

**WARNING**

**NEVER KEEP THE ENGINE RUNNING FOR MORE THAN ONE MINUTE; FAILURE TO DO SO COULD CAUSE SERIOUS OVERHEATING DAMAGES TO THE MOTORCYCLE CIRCUITS.**

**COLD SHORT CIRCUIT CURRENT**

RPM	2000	4000	6000	8000
RMS DC current (Arms) (average of the 3 stage currents)	26 - 30	20 - 25	30 - 35	30 - 35

**Voltage on battery poles with engine speed always between 3000 - 5000 RPM**

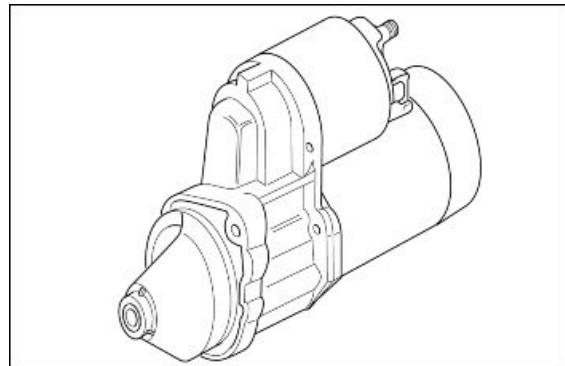
- Start the engine, after about one minute of operating bring the speed to 3000-5000 RPM, then measure with a tester the voltage at the battery poles that must always be between 13V and 15V. Otherwise, if the correct operation of the alternator has already been checked, replace the regulator.

**CAUTION**

**PERFORM THE CHECK DESCRIBED ABOVE WITH A BATTERY IN GOOD CONDITION (START VOLTAGE ABOUT 13V) MAKING SURE THAT THERE ARE NO ELEMENTS IN THE SHORT CIRCUIT.**

**Start-up system check**

pick-up input about 100 A

**STARTER COMMAND****Function**

Commands engine starting through the injection control unit.

**Operation / Operating principle**

The starter button, the brake switches, the No. 6 starter command relay and the injection control unit between PIN 6 and 10 are involved.

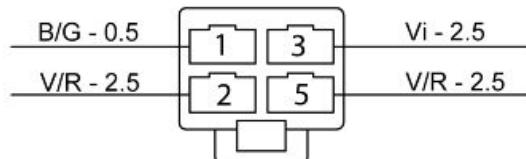
**Level in electrical circuit diagram:** Start-up relay

**Location:**

Under the fuel tank.

**Pin-out:**

- control unit relay output (blue/yellow cable)
- ignition switch live control unit (green/red cable)
- starter motor (violet cable)
- /
- ignition switch live control unit (green/red cable)

**ELECTRICAL ERRORS**

**Starter command P0170 - shorted to positive.**

Error cause

Shorted to positive: excessive voltage at PIN 10 of the control unit connector.

Troubleshooting

Shorted to positive:

- This malfunction is detected with a brake activated and the starter button pressed (voltage of 12V read at PIN 6).
- If the battery voltage does not drop (thanks to the absorption of the No. 6 starter command relay excitation coil) the control unit understands that PIN 10 is shorted to battery.
- Restore the cabling (if the short is in the cabling) or the relay (if the short is in the relay).

**NOTE**

**IN CASE OF SHORT TO GROUND / OPEN CIRCUIT NO ERROR WILL APPEAR: SEE THE TROUBLESHOOTING CHAPTER, THE ENGINE DOES NOT START.**

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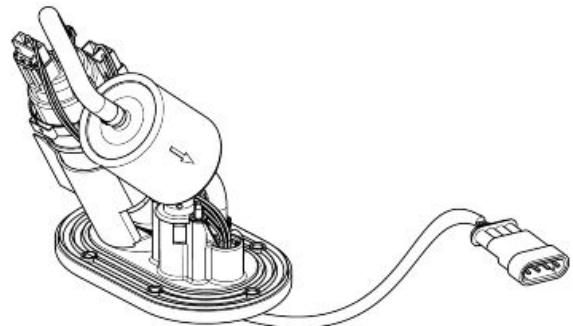
## level indicators

Petrol pump:

Input 4A (to be measured between pins 1 and 2  
with 12V supply voltage)

Fuel level sensor:

Resistance 1.4 Ohm (to be measured between  
pins 3 and 4 with fuel level equal to 0 litres)

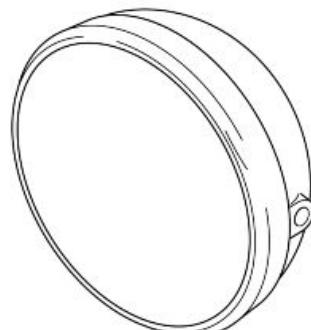



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## Lights list

### BULBS

Specification	Desc./Quantity
Low/high beam light (halogen)	12 V - 55 W / 60 W H4
Front daylight running lights	12V - 5W
Turn indicator light	12 V - 10 W (orange RY 10 W bulb)
Licence plate light	12V - 5 W
tail light /stop lights	12 V - 5 / 21 W
Dashboard lighting	LED





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## Fuses

### FUSE LOCATION

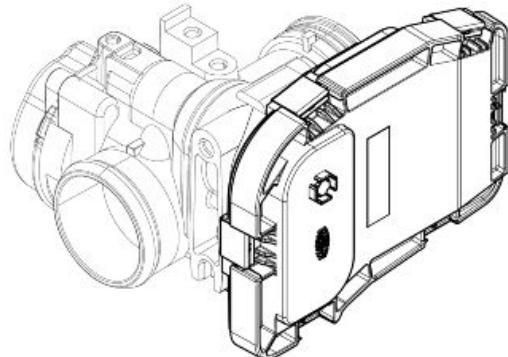
- A) Stop lights, tail lights, horn (15 A).
- B) GPS predisposition, low beam / high beam, passing, USB, bluedash (15 A).
- C) ECU, engine kill, start relay, instrument panel, injection loads relay (15 A).
- D) (Battery positive) Instrument panel, turn indicators, bluedash (5 A).
- E) (Battery positive) MIU G3 ECU (5 A).
- F) Main fuse, coil 1 and 2, injectors 1 and 2, lambda 1 and 2 (30 A).

### ABS FUSE DISTRIBUTION

- A) ABS Control unit (20 A).
  - B) Reserve fuse (20 A).
- 

## Control unit

Engine control unit Magneti Marelli MIU G3

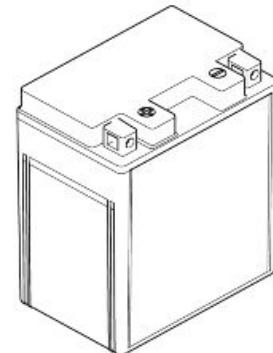


## Battery

### Characteristic

#### Battery

12V - 12 Ah



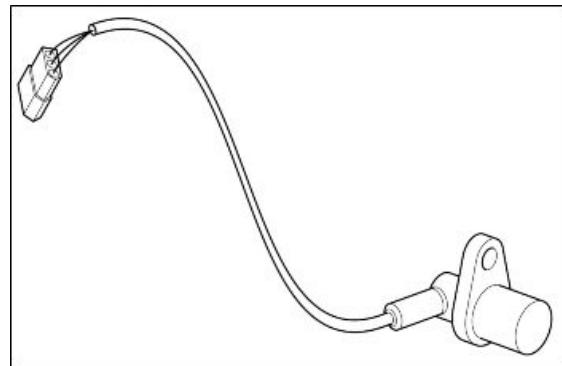
## Speed sensor

### VEHICLE FRONT SPEED SENSOR

**FUNCTION:** To indicate the vehicle speed by reading the front wheel turning speed.

**OPERATION / OPERATING PRINCIPLE:** Magnetoinductive sensor: a square-wave pulse is generated with voltage approx. between 11.55 V and 11.25 V

**WIRING DIAGRAM** Level in wiring diagram: ABS.



### REMOVAL

**LOCATION ON THE VEHICLE:** On the fork, left stanchion, near the brake calliper mounting bracket.

**CONNECTOR LOCATION (if available):** behind the steering tube.

### PINS

- PIN 1- Ground connection (white)
- PIN 2 - Power supply voltage/Output signal (white/brown)

### NAVIGATOR

**Parameters:** Speed (km/h) - Vehicle speed.

### ELECTRICAL ERRORS

#### Speed sensor

**5D90 electric malfunction:** Electrical fault in sensor or cable harness.

**Troubleshooting:** Check the sensor connector and the ABS control unit connector. If they are not OK, restore the connectors. If they are OK, check continuity of the white/brown cable between PIN 2 of the sensor on the cable harness side and PIN 14 of the ABS control unit connector. If there is no continuity,

restore them. If there is, PIN 2 of the sensor on the cable harness side, with the sensor disconnected and key set to ON, must have 12V voltage approximately: if there is no voltage, check PIN 2 for continuity with the vehicle ground connection: if it is grounded, restore the cable harness. If OK, replace the control unit. If PIN 2 has approx. 12 V, check the continuity of the white cable between PIN 1 of the sensor on the cable harness side and PIN 13 of the ABS control unit connector. If there is no continuity, restore the cable harness. If there is, replace the logic errors sensor.

## LOGIC ERRORS

### Speed sensor

**5D91 the signal works irregularly:** faulty sensor or signal interference.

**Troubleshooting:** Check speed sensor retainer. If it is not OK, restore it. If it is OK, check if the tone wheel is dirty, deformed or wrongly fixed. If any of this happens, replace the tone wheel. Otherwise, replace the speed sensor.

**5D92 the signal decreases periodically:** Possible tone wheel fault due to deformations or dirt; possible alterations on the wheel bearing surface. In very rare cases, abnormal tone wheel vibrations.

**Troubleshooting:** Check if the tone wheel is dirty, deformed or wrongly fixed. If the tone wheel is not OK, replace it. If it is OK, check for possible faults in the wheel bearings and if it is not OK, replace the bearings.

**5D93 missing signal or speed measured too low in relation to the rear wheel:** faulty sensor or missing sensor/tone wheel. Or excessive distance between the sensor and the tone wheel or tone wheel with wrong number of teeth.

**Troubleshooting:** Check that the speed sensor and the tone wheel are installed. If they are not, install them. If they are, check the speed sensor retainer. If it is not OK, restore it. If it is, check if the tone wheel has the correct number of teeth or if it is dirty, deformed or wrongly fixed. If it is not OK, replace the tone wheel and if it is OK, replace the speed sensor.

**5D94 no acceleration after pressure reduction:** Faulty sensor or missing sensor/tone wheel or excessive distance between the sensor and the tone wheel.

**Troubleshooting:** Check that the speed sensor and the tone wheel are installed. If they are not, install them. If they are, check the speed sensor retainer. If it is not OK, restore it. If it is, check if the tone wheel has the correct number of teeth or if it is dirty, deformed or wrongly fixed. If it is not OK, replace the tone wheel and if it is OK, replace the speed sensor.

**5D95 excessive speed measured:** Faulty sensor or tone wheel, or tone wheel with wrong number of teeth or wrong tyre size.

**Troubleshooting:** Check that the speed sensor and the tone wheel are installed. If they are not, install them. If they are, check the speed sensor retainer. If it is not OK, restore it. If it is, check if the tone wheel has the correct number of teeth or if it is dirty, deformed or wrongly fixed. If it is not OK, replace the tone wheel and if it is OK, check that the tyre size is the correct one. If it is not OK, replace it. If it is

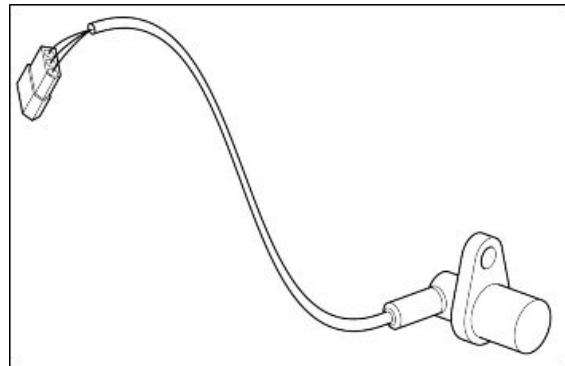
OK, check that the tyre pressure is the correct one. If it is not OK, restore it; if it is OK, replace the speed sensor.

### VEHICLE REAR SPEED SENSOR

**FUNCTION:** To indicate the vehicle speed by reading the rear wheel turning speed.

**OPERATION / OPERATING PRINCIPLE:** Magnetoinductive sensor: a square-wave pulse is generated with voltage approx. between 11.55 V and 11.25 V

**WIRING DIAGRAM** Level in wiring diagram: ABS.



### REMOVAL

**LOCATION ON THE VEHICLE:** On the swingarm, left side, on the rear brake calliper support plate.

**CONNECTOR LOCATION (if available):** under the saddle, right side, between the battery and the rear wheel splash guard.

### PINS

- PIN 1- Ground connection (yellow)
- PIN 2 - Power supply voltage/Output signal (yellow/brown)

### NAVIGATOR

**Parameters:** Speed (km/h) - Vehicle speed.

### ELECTRICAL ERRORS

#### Speed sensor

**5DA0 electric malfunction:** Electrical fault in sensor or cable harness.

**Troubleshooting:** Check the sensor connector and the ABS control unit connector. If they are not OK, restore the connectors. If they are OK, check continuity of the yellow/brown cable between PIN 2 of the sensor on the cable harness side and PIN 11 of the ABS control unit connector. If there is no continuity, restore them. If there is, PIN 2 of the sensor on the cable harness side, with the sensor disconnected and key set to ON, must have 12V voltage approximately: if there is no voltage, check PIN 2 for continuity with the vehicle ground connection: if it is grounded, restore the cable harness. If OK, replace the control unit. If PIN 2 has approx. 12 V, check continuity of the yellow cable between PIN 1 of the sensor on the cable harness side and PIN 12 of the ABS control unit connector. If this is not OK, restore the cable harness. If it is OK, replace the sensor.

### LOGIC ERRORS

#### Speed sensor

**5DA1 the signal works irregularly:** faulty sensor or signal interference.

**Troubleshooting:** Check speed sensor retainer. If it is not OK, restore it. If it is OK, check if the tone wheel is dirty, deformed or wrongly fixed. If any of this happens, replace the tone wheel. Otherwise, replace the speed sensor.

**5DA2 the signal decreases periodically:** Possible tone wheel fault due to deformations or dirt; possible alterations on the wheel bearing surface. In very rare cases, abnormal tone wheel vibrations.

**Troubleshooting:** Check if the tone wheel is dirty, deformed or wrongly fixed. If the tone wheel is not OK, replace it. If it is OK, check for possible faults in the wheel bearings and if it is not OK, replace the bearings.

**5DA3 no signal or speed measured too low in relation to the front wheel:** Faulty sensor or missing sensor/tone wheel. Or excessive distance between the sensor and the tone wheel or tone wheel with wrong number of teeth.

**Troubleshooting:** Check that the speed sensor and the tone wheel are installed. If they are not, install them. If they are, check the speed sensor retainer. If it is not OK, restore it. If it is, check if the tone wheel has the correct number of teeth or if it is dirty, deformed or wrongly fixed. If it is not OK, replace the tone wheel and if it is OK, replace the speed sensor.

**5DA4 missing acceleration after pressure reduction:** Faulty sensor or missing sensor/tone wheel or excessive distance between the sensor and the tone wheel.

**Troubleshooting:** Check that the speed sensor and the tone wheel are installed. If they are not, install them. If they are, check the speed sensor retainer. If it is not OK, restore it. If it is, check if the tone wheel has the correct number of teeth or if it is dirty, deformed or wrongly fixed. If it is not OK, replace the tone wheel and if it is OK, replace the speed sensor.

**5DA5 excessive measured speed:** Faulty sensor or tone wheel, or tone wheel with wrong number of teeth or wrong tyre size.

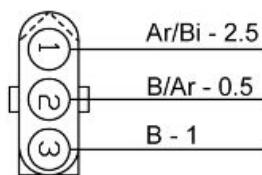
**Troubleshooting:** Check that the speed sensor and the tone wheel are installed. If they are not, install them. If they are, check the speed sensor retainer. If it is not OK, restore it. If it is, check if the tone wheel has the correct number of teeth or if it is dirty, deformed or wrongly fixed. If it is not OK, replace the tone wheel and if it is OK, check that the tyre size is the correct one. If it is not OK, replace it. If it is OK, check that the tyre pressure is the correct one. If it is not OK, restore it; if it is OK, replace the speed sensor.

## Function

To indicate the vehicle speed by reading the rear wheel turning speed.

## Operation / Operating principle

Hall effect sensor: a square-wave pulse is generated with voltage between 12V and approximately 0.6 V.



## Level in electrical circuit diagram:

Speed sensor

**Location:**

- Sensor: on the swingarm, left side, next to the rear brake calliper.
- Connector: under right fairing, next to the Marelli control unit.



**Pin-out:**

**PIN:**

- PINS 1-3 Voltage: approx. 12 V
  - PINS 2-3 Voltage: between 0.6V-12V (turning the rear wheel)
1. Power supply voltage (Orange/White - sensor side)
  2. Output signal (Blue/Orange - sensor side)
  3. Ground (Blue - sensor side)



## ELECTRICAL ERRORS

Error cause

Faulty sensor or cabling, interference on the signal

Troubleshooting

- Disconnect the sensor connector.
- Verify, with the key ON, the voltage between sensor PIN 1-3.
- If no voltage is detected, check the continuity of the cabling between sensor PIN 1 and instrument panel connector PIN 13.
- Carry out the check procedure on instrument panel connector PIN 13.
- If the cabling is intact, check for continuity with the sensor PIN 3 ground.
- Check continuity of the cabling between sensor PIN 2 and instrument panel connector PIN 17.
- Carry out the check on instrument panel PIN 17.
- In the event that these checks have not detected the fault, replace the sensor.

## Engine rpm sensor

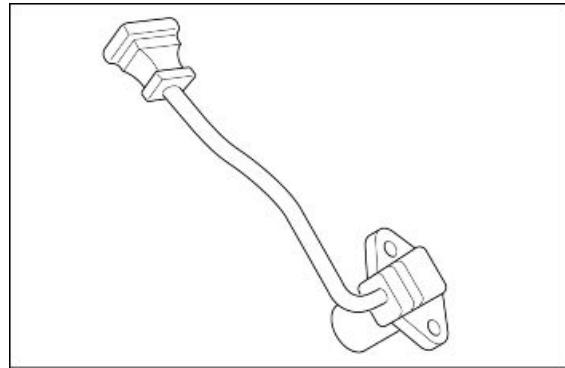
### Function

It informs crankshaft position and speed to the Marelli control unit.

### Operation / Operating principle

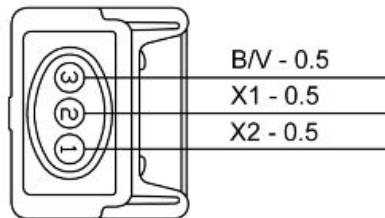
Inductive sensor: sinusoidal-type generated voltage; two teeth are missing on the flywheel for the reference position.

**Level in electrical circuit diagram:** engine speed sensor



### Location:

- Sensor: engine front left section, under the left cylinder.
- Connector: under the fuel tank.



### Electrical characteristics:

- Winding resistance:  $650 \Omega \pm 15\%$  Output alternating voltage, value range: minimum: 0.5 V - maximum: 5 V



### Pin-out:

1. Engine speed sensor positive signal (cable X2)
2. Engine speed sensor negative signal (cable X1)
3. Engine speed sensor anti-jamming cable (blue/green cable)

### PARAMETERS

#### Target engine revs

**Example value:** 1100 +/- 100 rpm

Parameter valid at idle, setting depends especially on engine temperature: the ECU unit will try to keep the engine running at this revs, acting on the ignition advance.

### STATUSES

#### Synchronisation

**Example value:** Synchronised / Not synchronised

Indicates if the control unit detects the engine speed sensor signal correctly

### ELECTRICAL ERRORS

#### Cause

Faulty cabling or pick up

### Troubleshooting

- An interruption in the sensor circuit has been detected, from PIN 20 to PIN 29 of the control unit connector.
- Check the sensor connector and the injection ECU connector:
- If the values are incorrect restore them.
- If the values are correct, check the continuity of the two cables that go from PIN 20 to PIN 29 of the control unit connector:
- If there is no continuity, restore the cabling.
- If there is continuity check interruption in the sensor and replace it.

Short circuit.

- Conduct an electrical check of the sensor.
- If the sensor check value is incorrect replace it.
- If the value is correct, check insulation of the power from ground of the two cables.
- Conduct tests from the sensor connector toward the sensor.
- If the sensor value is incorrect restore the cabling/replace the sensor.
- If the value is correct conduct tests from PIN 20 and 29 of the Marelli control unit connector toward the cable harness.

### **Installation**

Place the sensor plus the corresponding spacers; the air gap should be between 0.7 and 0.9 mm.

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## **Engine temperature sensor**

### **Function**

indicates the engine temperature to the control unit so as to optimise carburetion and idle control

### **Operation / Operating principle**

NTC type sensor (resistance sensor, inversely variable with temperature).

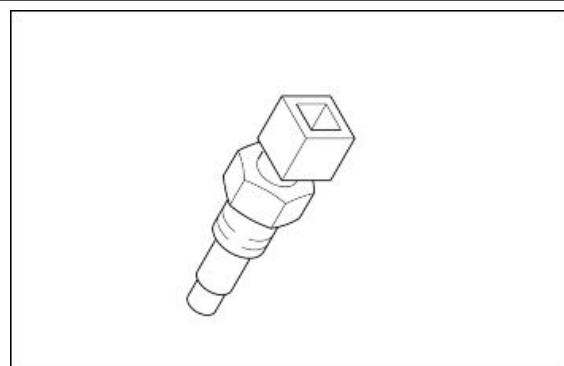
**Level in electrical circuit diagram:** Temperature sensors

### **Location:**

- on the right head, next to the throttle body
- connector: on the sensor

### **Electrical characteristics:**

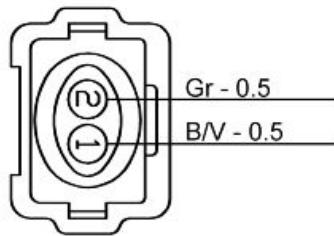
- Resistance at 0°C:  $9.75 \text{ k}\Omega \pm 5\%$
- Resistance at 20°C:  $3.747 \text{ k}\Omega \pm 5\%$



- Resistance at 40°C:  $1.598 \text{ k}\Omega \pm 5\%$
- Resistance at 60°C:  $0.746 \text{ k}\Omega \pm 5\%$
- Resistance at 80°C:  $0.377 \text{ k}\Omega \pm 5\%$
- Resistance at 100°C:  $0.204 \text{ k}\Omega \pm 5\%$

**Pin-out:**

- Grey (cable harness side): 0-5 V signal
- Blue/green (cable harness side):  
Ground connection

**ELECTRICAL ERRORS**

**Engine temperature sensor P0115** - open circuit or shorted to positive / shorted to negative.

Error cause

Open circuit or shorted to positive: interruption of the circuit or excessive voltage at PIN 13 of the control unit connector.

Shorted to negative: null voltage between PIN 13 and 15 of the control unit connector.

Troubleshooting

The circuit is open:

- Disconnect the connector of the control unit.
- Measure the resistance value of the sensor at different temperatures between PIN 13 and 15.
- Disconnect the sensor connector.
- Verify continuity of the cabling between the sensor connector and the control unit connector: Control unit PIN 13 - sensor PIN 2 and control unit PIN 15 - sensor PIN 1. Restore the cabling if necessary.
- If the cabling is intact but the sensor resistance value is incorrect, this means that the sensor is faulty and must be replaced, otherwise proceed with the checks.

Shorted to positive:

- With the sensor connector and the control unit disconnected, verify that the fault is shorted with the battery positive of sensor connector PIN 2 (or control unit PIN 13) and restore the cabling.

Shorted to negative:

- Disconnect the sensor connector.
- Check the sensor connector PIN 2 ground insulation.
- If there is no ground insulation restore the cabling.
- If PIN 2 is insulated from the ground and the error persists, this means that there is a probable fault in the control unit.

## Lambda sensor

### Function

In charge of telling the control unit whether the mixture is lean or rich.

### Operation / Operating principle

The Marelli injection control unit reads and interprets a voltage generated by the difference in oxygen content between the exhaust fumes and the ambient. It does not require an external supply source but, in order to work properly, it should reach a high operating temperature: that is why there is a heating circuit inside.

**Level in electrical circuit diagram:** Right Lambda probe

### Location:

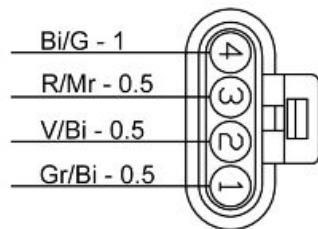
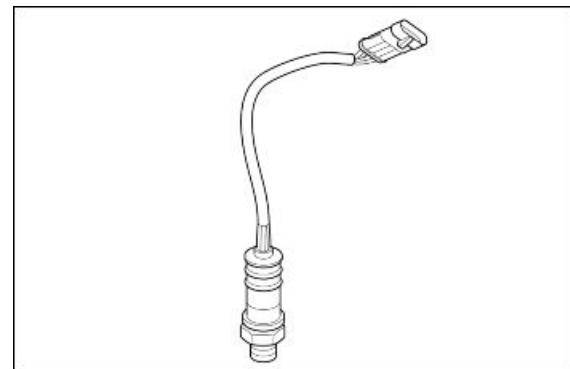
- sensor: right exhaust pipe
- connector: near the throttle body right side

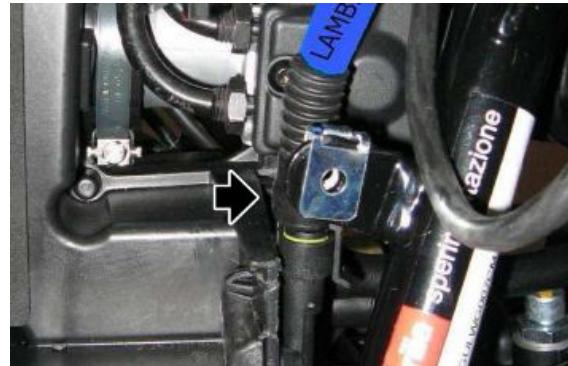
### Electrical characteristics:

Heater circuit:  $12 - 14 \Omega$  at  $20^\circ\text{C}$  ( $68^\circ\text{F}$ )

### Pin-out:

1. Sensor signal + (grey/white wire)
2. Sensor signal - (green/white wire)
3. Heater ground (white/yellow)
4. Heater power supply (white)





## ELECTRICAL ERRORS

**Check the air-fuel ratio / right Lambda probe P0130** - short to positive / open circuit, short to negative or carburetion excessively lean / signal not plausible for abnormal title correction or probe signal fault.

### Error cause

Shorted to positive: excessive voltage at PIN 18 or PIN 12 of the control unit connector.

Circuit open or shorted to negative: interruption of the circuit or null voltage between control unit connector PIN 18 and 12.

### Troubleshooting

Shorted to positive:

- Disconnect the control unit connector and the sensor connector.
- Verify that there is no short to battery positive on sensor connector PIN 1 (corresponding to control unit connector PIN 18); if there is a short, restore the cabling.
- Verify that there is no short to battery positive on sensor connector PIN 2 (corresponding to control unit connector PIN 12); if there is a short, restore the cabling.

The circuit is open:

- Disconnect the control unit connector and the sensor connector.
- Verify continuity of the cabling between the sensor connector and the control unit connector: Control unit PIN 18 - sensor PIN 1 and control unit PIN 12 - sensor PIN 2. Restore the cabling if necessary.
- If the cabling is intact and the error persists, proceed with the following checks.

Shorted to negative:

- Disconnect the sensor connector and the control unit connector.
- Check the sensor connector PIN 1 ground insulation. In the absence of insulation restore the cabling.
- Check the sensor connector PIN 2 ground insulation. In the absence of insulation restore the cabling.
- If PIN 1 and PIN 2 are insulated from the ground and the error persists, this means that there is a probable fault in the control unit.

**Lambda probe heater P0135** - shorted to positive / shorted to negative / open circuit.

Error cause

Shorted to positive: excessive voltage at PIN 2 of the control unit connector.

Shorted to negative: lack of insulation from ground on the sensor connector PIN 4.

The circuit is open: interruption of the circuit.

Troubleshooting

Shorted to positive:

- Disconnect the control unit connector and the sensor connector.
- Verify that there is no short to battery positive on sensor connector PIN 3 (corresponding to control unit connector PIN 2); if there is a short, restore the cabling.

The circuit is open:

- Disconnect the control unit connector and the sensor connector.
- Verify continuity of the cabling between the sensor connector and the control unit connector: Control unit PIN 2 - sensor PIN 3. Restore the cabling if necessary.
- Verify continuity of the cabling between the sensor connector and the injection relay: sensor PIN 4 - injection relay PIN 3. Restore the cabling if necessary.
- If the cabling is intact and the error persists, proceed with the following checks.

Shorted to negative:

- Disconnect the sensor connector.
- Check the sensor connector PIN 3 ground insulation. In the absence of insulation restore the cabling.
- If PIN 3 is insulated from ground and in the absence of other errors (fuel pump, injector, coil), this means that the control unit is most likely faulty.

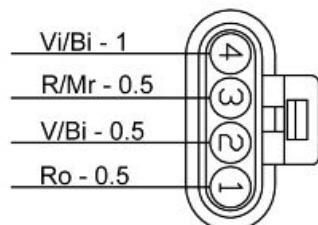
**LEFT LAMBDA**

**Level in electrical circuit diagram:** Left lambda

probe

**Location:**

- sensor: right exhaust pipe
- connector: adjacent to the filter box, left side

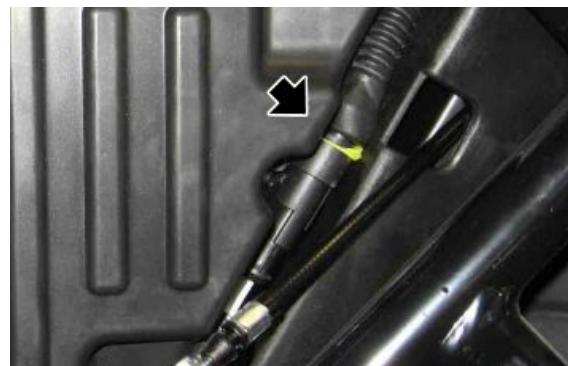


**Electrical characteristics:**

Heater circuit:  $12 - 14 \Omega$  at  $20^\circ\text{C}$  ( $68^\circ\text{F}$ )

**Pin-out:**

1. Sensor signal + (pink wire)
2. Sensor signal - (green/white wire)
3. Heater ground (violet/white)
4. Heater power (red/brown cable)



## ELECTRICAL ERRORS

**Check the air-fuel ratio / right Lambda probe P0136** - short to positive / open circuit, short to negative or carburetion excessively lean / signal not plausible for abnormal idle correction or probe signal fault.

### Error cause

Shorted to positive: excessive voltage at PIN 11 or PIN 12 of the control unit connector.

Circuit open or shorted to negative: interruption of the circuit or null voltage between control unit connector PIN 11 and 12.

### Troubleshooting

Shorted to positive:

- Disconnect the control unit connector and the sensor connector.
- Verify that there is no short to battery positive on sensor connector PIN 1 (corresponding to control unit connector PIN 11); if there is a short, restore the cabling.
- Verify that there is no short to battery positive on sensor connector PIN 2 (corresponding to control unit connector PIN 12); if there is a short, restore the cabling.

The circuit is open:

- Disconnect the control unit connector and the sensor connector.
- Verify continuity of the cabling between the sensor connector and the control unit connector: Control unit PIN 11 - sensor PIN 1 and control unit PIN 12 - sensor PIN 2. Restore the cabling if necessary.
- If the cabling is intact and the error persists, proceed with the following checks.

Shorted to negative:

- Disconnect the sensor connector and the control unit connector.
- Check the sensor connector PIN 1 ground insulation. In the absence of insulation restore the cabling.
- Check the sensor connector PIN 2 ground insulation. In the absence of insulation restore the cabling.
- If PIN 1 and PIN 2 are insulated from the ground and the error persists, this means that there is a probable fault in the control unit.

**Lambda probe heater P0141 - shorted to positive / shorted to negative / open circuit.**

Error cause

Shorted to positive: excessive voltage at PIN 35 of the control unit connector.

Shorted to negative: lack of insulation from ground on the sensor connector PIN 4.

The circuit is open: interruption of the circuit.

Troubleshooting

Shorted to positive:

- Disconnect the control unit connector and the sensor connector.
- Verify that there is no short to battery positive on sensor connector PIN 3 (corresponding to control unit connector PIN 31); if there is a short, restore the cabling.

The circuit is open:

- Disconnect the control unit connector and the sensor connector.
- Verify continuity of the cabling between the sensor connector and the control unit connector: Control unit PIN 31 - sensor PIN 3. Restore the cabling if necessary.
- Verify continuity of the cabling between the sensor connector and the injection relay: sensor PIN 4 - injection relay PIN 3. Restore the cabling if necessary.
- If the cabling is intact and the error persists, proceed with the following checks.

Shorted to negative:

- Disconnect the sensor connector.
  - Check the sensor connector PIN 3 ground insulation. In the absence of insulation restore the cabling.
  - If PIN 3 is insulated from ground and in the absence of other errors (fuel pump, injector, coil), this means that the control unit is most likely faulty.
-

## Injector

### Function

To supply the correct amount of petrol at the right timing.



### Operation / Operating principle

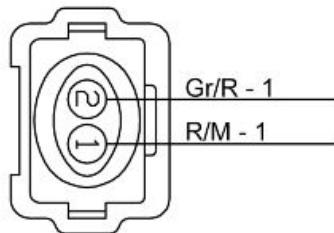
Injector coil is excited for the petrol passage to open.

**Level in electrical circuit diagram:** Coils and injectors

### Right injector position:

- on the intake manifold
- connector: on injector

**Electrical characteristics:** 14.8 Ohm +/- 5% (at 20 °C - 68 °F)



### Pin-out:

1. Power 12V (red/brown cable)
2. Ground (grey/red cable)



## ELECTRICAL ERRORS

**Front injector P0201** - shorted to positive / shorted to negative / open circuit.

### Error cause

Shorted to positive: excessive voltage at PIN 32 of the control unit connector.

Shorted to negative: null voltage at PIN 1 of the injector connector.

The circuit is open: interruption of the circuit.

### Troubleshooting

Shorted to positive:

- Disconnect the injector connector, turn the key to ON and activate the component through the diagnostics instrument.
- Verify the absence of voltage at the injector connector PIN 2; if present, restore the cabling, otherwise proceed with the following checks.

Shorted to negative:

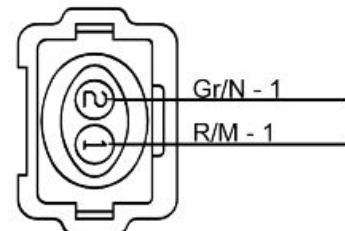
- Disconnect the injector connector, turn the key to ON and activate the component through the diagnostics instrument.
- Verify the presence of voltage at the ends of the injector connector; if there is no voltage, restore the cabling, otherwise proceed with the following checks.

The circuit is open:

- Carry out the check procedure of the injector and control unit connectors.
- Verify continuity of the cabling between the control unit connector and the injector connector (control unit PIN 32 - injector PIN 2). In the absence of continuity restore the cabling.

## LEFT INJECTOR

**Level in electrical circuit diagram:** Coils and injectors



**Left injector position:**

- on the intake manifold
- connector: on injector

**Electrical characteristics:** 14.8 Ohm +/- 5% (at 20 °C - 68 °F)

**Pin-out:**

1. Power 12V (red/brown cable)
2. Ground (grey/black cable)



## ELECTRICAL ERRORS

**Left injector P0202** - shorted to positive / shorted to negative / open circuit.

Error cause

Shorted to positive: excessive voltage at PIN 32 of the control unit connector.

Shorted to negative: null voltage at PIN 1 of the injector connector.

The circuit is open: interruption of the circuit.

Troubleshooting

Shorted to positive:

- Disconnect the injector connector, turn the key to ON and activate the component through the diagnostics instrument.
- Verify the absence of voltage at the injector connector PIN 2; if present, restore the cabling, otherwise proceed with the following checks.

Shorted to negative:

- Disconnect the injector connector, turn the key to ON and activate the component through the diagnostics instrument.
- Verify the presence of voltage at the ends of the injector connector; if there is no voltage, restore the cabling, otherwise proceed with the following checks.

The circuit is open:

- Carry out the check procedure of the injector and control unit connectors.
- Verify continuity of the cabling between the control unit connector and the injector connector (control unit PIN 34 - injector PIN 2). In the absence of continuity restore the cabling.

## Fuel pump

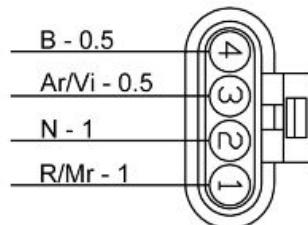
### Function

Fuel pump: keeps pressure of the injectors supply duct.

Low fuel: tells to the instrument panel about low fuel

### Operation / Operating principle

Low fuel: it is a resistance that if correctly supplied varies its electrical resistance if it is damped or not by petrol.



### Level in electrical circuit diagram:

Injection load relay

### Location:

- on the vehicle: on the tank.
- connector: on the front left part of the bike, under the fuel tank.



### Electrical characteristics:

#### Pin out:

1. + 12V (red/brown cable)
2. ground (black cable)
3. Signal + to instrument panel (orange/violet cable)
4. Ground (blue cable)

#### CAUTION

BEFORE CARRYING OUT ANY TROUBLESHOOTING,  
CAREFULLY READ THE GENERAL TROUBLESHOOTING  
CONCEPTS FOR ELECTRICAL DEVICES AT THE BEGIN-  
NING OF THE CHECK AND CONTROL SECTION IN THE  
ELECTRICAL SYSTEM CHAPTER.

## ELECTRICAL ERRORS

**Fuel pump relay P0230** - shorted to positive / shorted to negative / open circuit.

### Error cause

Shorted to positive: excessive voltage at PIN 22 of the control unit connector.

Shorted to negative: null voltage at PIN 2 of the injection relay.

The circuit is open: interruption of the circuit.

### Troubleshooting

Shorted to positive:

- Disconnect the injection relay (No. 28 on the electrical circuit diagram), turn the key to the ON position and activate the relay through the diagnostics instrument.
- Verify the presence of voltage between relay connector PIN 1 and 2 toward the cabling.
- If no voltage is read, disconnect the control unit and verify insulation from battery positive of the relay PIN 1 (or control unit PIN 22). Restore the cabling if necessary.

Shorted to negative:

- Disconnect the injection relay (No. 28 on the electrical circuit diagram) and the control unit.
- Verify ground insulation of the relay connector PIN 1 and 2 toward the cabling: if there is no insulation, restore the cabling.

The circuit is open:

- Disconnect the injection relay (No. 28 on the electrical circuit diagram) and the control unit.
- Verify continuity of the cabling between the relay and control unit: Relay PIN 1 - control unit PIN 22. Restore the cabling if necessary.

## Coil

### **Function**

It controls the ignition spark plug in order to generate the fuel ignition spark.

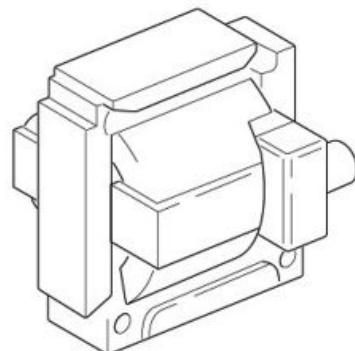
### **Operation / Operating principle**

Inductive discharge system.

**Level in electrical circuit diagram:** Left coil and injector

### **Location:**

- centred under the fuel tank.
- connector: on the coils.



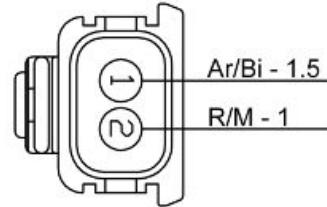
### **Electrical characteristics:**

- Primary winding resistance:  $550 \text{ k}\Omega \pm 10\%$

- Secondary winding resistance:  $3 \text{ k}\Omega \pm 10\%$
- Tube resistance  $5 \text{ k}\Omega$

**Pin-out:**

1. Circuit ground (orange/white cable)
2. Power (red/brown cable)

**ELECTRICAL ERRORS**

**H.V. Coil P0351** - shorted to positive / open circuit or shorted to negative.

Error cause

Shorted to positive: excessive voltage at PIN 1 of the control unit connector.

Circuit open or shorted to negative: interruption of the circuit or null voltage at PIN 1 of the control unit connector.

Troubleshooting

Shorted to positive:

- Disconnect the coil connector, turn the key to ON and activate the component through the diagnostics instrument.
- Verify the presence of voltage on the coil connector PIN 1: if present, restore the cabling, otherwise replace the coil.

The circuit is open:

- Carry out the check procedure of the coil and control unit connectors.
- Verify continuity of the cabling between the coil and control unit: Coil PIN 1 - control unit PIN 1. In the absence of continuity restore the cabling.
- Verify, with the key turned ON, the presence of voltage on the coil connector PIN 2. If no voltage is read, verify the continuity of the cabling between coil and injection relay (No. 34 on the electrical circuit diagram): Coil PIN 2 - relay PIN 3.
- If the above tests provided a positive result, the coil should be replaced.

Shorted to negative:

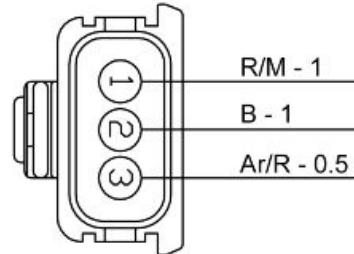
- Disconnect the control unit connector and the coil connector.
- Verify the coil connector PIN 1 ground insulation (or control unit connector PIN 1). Restore the cabling if necessary.

### RIGHT COIL

**Level in electrical circuit diagram:** Right coil and injector

**Location:**

- centred under the fuel tank.
- connector: on the coils.



**Electrical characteristics:**

- Primary winding resistance:  $550 \text{ k}\Omega \pm 10\%$
- Secondary winding resistance:  $3 \text{ k}\Omega \pm 10\%$
- Tube resistance  $5 \text{ k}\Omega$



**Pin-out:**

1. Power (red/brown cable)
2. Power ground 2 (blue cable)
3. Circuit ground (orange/red cable)

### ELECTRICAL ERRORS

**H.V. Coil P0352** - shorted to positive / open circuit or shorted to negative.

Error cause

Shorted to positive: excessive voltage at PIN 8 of the control unit connector.

Circuit open or shorted to negative: interruption of the circuit or null voltage at PIN 8 of the control unit connector.

Troubleshooting

Shorted to positive:

- Disconnect the coil connector, turn the key to ON and activate the component through the diagnostics instrument.
- Verify the presence of voltage on the coil connector PIN 3: if present, restore the cabling, otherwise replace the coil.

The circuit is open:

- Carry out the check procedure of the coil and control unit connectors.
- Verify continuity of the cabling between the coil and control unit: Coil PIN 3 - control unit PIN 8. In the absence of continuity restore the cabling.

- Verify, with the key turned ON, the presence of voltage on the coil connector PIN 1. If no voltage is read, verify the continuity of the cabling between coil and injection relay (No. 33 on the electrical circuit diagram): Coil PIN 1 - relay PIN 3.
- If the above tests provided a positive result, the coil should be replaced.

Shorted to negative:

- Disconnect the control unit connector and the coil connector.
- Verify the coil connector PIN 3 ground insulation (or control unit connector PIN 8). Restore the cabling if necessary.

## Engine oil pressure sensor

**Function:** Indicates the instrument panel if there is enough oil pressure (0.35 +/- 0.2 bar) (5.1 +/- 2.9 PSI) in the engine.

**Operation / Operating principle:** normally closed switch. With oil pressure above 0.35 +/- 0.2 bar (5.1 +/- 2.9 PSI), open circuit.

**Level in wiring diagram:** fuel reserve and oil pressure.



**Location:**

- sensor: between the two heads, at the back.
- connector: on the sensor.



**Electrical characteristics:**

- With engine off: closed circuit (continuity).
- With engine started: open circuit (infinite resistance).

**Pin-out:** Voltage 12V

**Instrument panel**

**Warning light always off**

Troubleshooting

- Check the sensor connector and the instrument panel connector (PIN 11): If not OK, restore. If OK, check the continuity of the purple cable between the sensor connector and the instrument panel connector PIN 11: if not OK, restore the cable harness; if OK, replace the sensor

**Warning light always on**

Troubleshooting

- Detach the sensor connector and check the purple cable is ground insulated: if there is continuity to ground, restore the cable harness; if it is ground insulated, replace the switch. If this error persists, use a pressure gauge to check the pressure of the oil in the engine circuit

## Neutral sensor

### Function

it tell the gear position to the instrument panel: if it is in neutral or in gear.



### Operation / Operating principle

for neutral gear, the circuit is closed to ground connection: the instrument panel turns on the neutral warning light.

**Level in electrical circuit diagram:** Start-up enabling switches

### Location:

- sensor: rear / upper section of the gear-box
- connector: on the sensor

### Electrical characteristics:

- Gear in neutral: closed circuit (0 V on wire from control unit to sensor / switch in continuity).
- Gearshift engaged: circuit open (12 V on the wire from control unit to sensor)

### Pin-out:

- Voltage 12V (green/black cable)

### Instrument panel

### NEUTRAL warning light always off

### Troubleshooting

- Carry out the check procedure on the green black sensor/control unit cable.
- Restore if damaged.
- If OK, with the transmission in neutral, check for continuity to ground of the sensor connector.
- If there is no continuity, replace the sensor.
- If OK, carry out the check procedure of the brown black cable between control unit and instrument panel.

- Restore if damaged.
- If OK, check continuity.
- If there is no continuity, restore the cabling.
- If OK, replace the instrument panel if the vehicle performs properly.

### **NEUTRAL Warning light always on**

#### Troubleshooting

- Disconnect the terminals from the sensor and verify that, with the transmission in gear, there is continuity with the ground.
- If there is continuity, replace the sensor.
- If there is no continuity this means that there is a short to ground of the green black cable which goes to PIN 3 of the control unit, therefore restore the cabling.
- If the error persists, disconnect the terminals from control unit PIN 17 to instrument panel PIN 10 and verify continuity.
- If there is no continuity, restore the cabling.
- If there is no continuity, replace the cabling.

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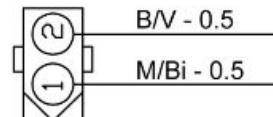
## **Clutch lever sensor**

#### **Function**

It tells the clutch lever position to the control unit.

#### **Operation / Operating principle**

In order to start the engine, pull the clutch also with the gear in neutral.



**Level in electrical circuit diagram:** Start-up enabling switches.

#### **Location:**

- sensor: under clutch lever
- connector: under the fuel tank on right side



#### **Electrical characteristics:**

- Clutch pulled: closed circuit (continuity)
- Clutch released: open circuit (infinite resistance)

#### **Pin-out:**

1. 12 V Voltage (brown white cable)
2. Ground (blue black cable)

**Even with the clutch lever pulled, the vehicle does not start**

Troubleshooting

- Verify that, if a gear is engaged, the stand is up.
- If it is up, check continuity of the brown/white cable and control unit PIN 14.
- If there is no continuity, restore the cabling.
- If there is continuity, disconnect the sensor and, with the clutch pulled, check for continuity between the two sensor PINs.
- If absent, replace the sensor.
- If present, check for continuity of the blue violet cable between the sensor and control unit PIN 15.
- If absent, restore the cable harness.

**The vehicle starts even without pulling the clutch lever**Troubleshooting

- Disconnect the terminals from the sensor and check that, with the clutch released, there is continuity between the two PINs.
- If there is continuity, replace the sensor.
- If there is no continuity, this means that the blue violet cable which goes from the sensor PIN 2 to the control unit PIN 15 is shorted to ground.

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**Side stand sensor****Function**

It tells the side stand position to the control unit.

**Operation / Operating principle**

If the gear is engaged and the side stand is unfolded, and therefore the circuit is open, the control unit does not enable vehicle start-up or shuts off the engine if it is rotating.

**Level in electrical circuit diagram:** Start-up enabling switches

**Location:**

- sensor: on side stand supporting plate
- connector: left side, near the starter motor

**Electrical characteristics:**

- Side Stand Up: closed circuit (continuity)

- Side Stand Down: open circuit (infinite resistance)

**Pin-out:**

- Blue green (cable harness side): ground connection
- Grey yellow (cable harness side): Voltage 12V

**Troubleshooting**

- The vehicle with clutch pulled, gear engaged and side stand retracted does not start (side stand switch always open): verify continuity of the grey/yellow cable between the sensor and PIN 19 of the control unit.
- If absent, restore the cable harness, if present, with the stand up, check for continuity between the 2 PINS on the sensor. If absent, replace the sensor. If present, check for continuity to ground of the blue/green cable on the cable harness side connector.
- The vehicle, with clutch operated and gear engaged, starts but with the side stand extended: disconnect the sensor connector and check that, with side stand extended, there is not continuity between the 2 PINS.
- If present, replace the sensor. If absent, disconnect from control unit PIN 19 and check insulation from the ground of the grey/yellow cable between sensor and control unit.

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## Air temperature sensor - instrument panel

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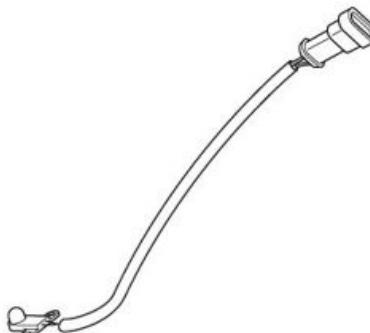
**Function**

It tells the ambient air temperature to the instrument panel.

**Operation / Operating principle**

NTC type sensor (resistance sensor, inversely variable with temperature).

**Level in electrical circuit diagram:** Temperature sensors

**Location:**

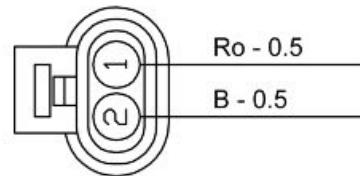
- under instrument panel supporting bracket
- connector: under the start-up lock

**Electrical characteristics:**

- Resistance at 0°C: 32.5 kOhm +/- 5%
- Resistance at 25°C: 10.0 kOhm +/- 5%

**Pin-out:**

1. Voltage 5V (pink cable)
2. Ground (blue cable)



Air temperature sensor fault

Error cause

- An instrument panel temperature sensor failure is signalled when it is detected that the sensor circuit is open or shorted to positive/negative

Troubleshooting

- Check the sensor connector and the instrument panel connector (PIN 12):
- Restore if not OK.
- If OK check continuity of pink cable between the sensor connector (cable harness side) and PIN 12 of the instrument panel connector.
- If there is no continuity, restore the cabling.
- If there is continuity check correct resistance of the sensor:
- If the sensor resistance is not OK replace the sensor.
- If OK check, with the key turned ON, for the presence of voltage at sensor connector PIN 1:
- If there is no voltage at PIN 1 replace the instrument panel.
- If about 12 V is present, restore the cabling (there is a short to battery).
- If about 5 V is present, connect a 10 kOhm resistance to PIN 1 of the sensor connector and the vehicle ground.
- If, with the key ON, the voltage measured upstream of the resistance drops, replace the instrument panel. If it continues to stay at about 5 V restore the pink cable (there is a short to + 5V).

- In case there is a short circuit to ground connection of PIN 12 of the instrument panel connector:
- Check the ground insulation of the sensor connector pink cable:
- If connected to ground, restore the cabling. If insulated from ground, check correct resistance of the sensor:
- if not OK, replace the sensor; if OK, replace the instrument panel

## RUN/STOP switch

### Function

It tells the control unit if the rider wishes to enable engine start-up or to keep the engine running.

### Operation / Operating principle

If the driver wants to shut off the engine or to disable engine start-up, the switch should be open, i.e. the Marelli control unit should not detect voltage at PIN 26 of the control unit connector.



**Level in electrical circuit diagram:** start-up enabling switches.

### Location:

- sensor: right light switch
- connector: next to the headstock, right side

### Electrical characteristics:

- STOP position: the circuit is open
- RUN position: closed circuit (continuity)

### PIN:

pink/yellow cable (looking at the cabling):

- voltage 0 V with engine kill in STOP;
- 12V if engine kill in RUN.

Blue/Green cable (cable harness side): always voltage 12 V (with key on)

### DIAGNOSIS

- The engine does not start: disconnect the connector and check, with the switch set to RUN, that there is continuity between the two grey/light blue and red/white cables (sensor side): if absent replace the sensor; if present carry out the check procedure on the connector; if not OK restore the cabling; if OK verify, with the key ON, the presence of voltage on the blue/green cable (cable harness side); if absent, restore cabling; if present verify insulation

from ground of the red/yellow cable (cable harness side). If there is continuity with ground connection, restore the cable harness; if it is OK, set the key to KEY OFF and check the control unit connector; if it is OK, replace the Marelli control unit

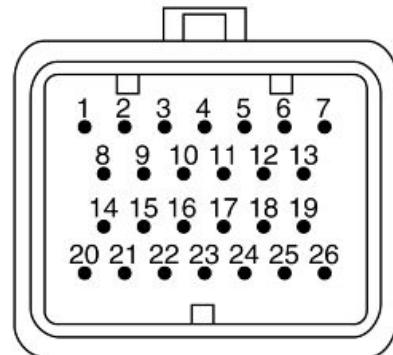
- Engine does not shut off with switch in "STOP": disconnect the connector and verify, with the switch set to STOP, that there is continuity between the two grey/light blue and red/white cables (sensor side). If present, replace the switch; if absent this means that, with the key ON, the pink/yellow cable shorts to positive: restore the cable harness. If cable harness is OK, replace the Marelli control unit

## Connectors

### ECU

#### PIN:

1. Throttle position sensor supply - Power output
2. Lambda probe signal (ground) - Analogue input
3. Rpm indicator control - Frequency output
4. Cylinder head temperature sensor signal - Analogue input
5. -
6. Right injector control - Power output
7. Engine revolution sensor - Frequency input
8. Lambda probe signal (positive) - Analogue input
9. Diagnosis line (K) - Communication line
10. Diagnosis line (L) - Communication line
11. Throttle position signal - Analogue input
12. Engine revolution sensor - Frequency input
13. Right injector control - Power output
14. Right coil control - Power output
15. Injection telltale light control - Digital output
16. Fall sensor signal - Digital input
17. Control unit supply - Power input
18. Intake air temperature sensor signal - Analogue input
19. Injection relay control - Digital output



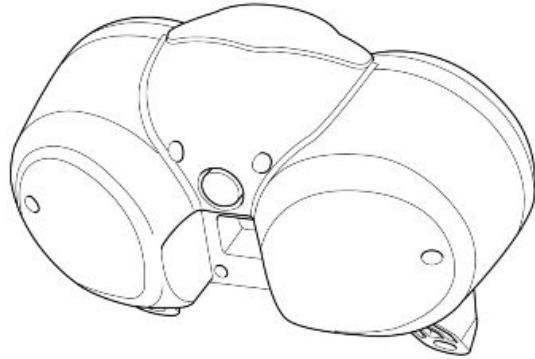
- 20.Left coil control - Power output
  - 21.-
  - 22.Sensors supply (ground) - Power output
  - 23.Control unit supply (ground) - Power input
  - 24.Control unit supply (ground) - Power input
  - 25.-
  - 26.Control unit supply (+15) - Power input
- 

## Dashboard

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### PIN:

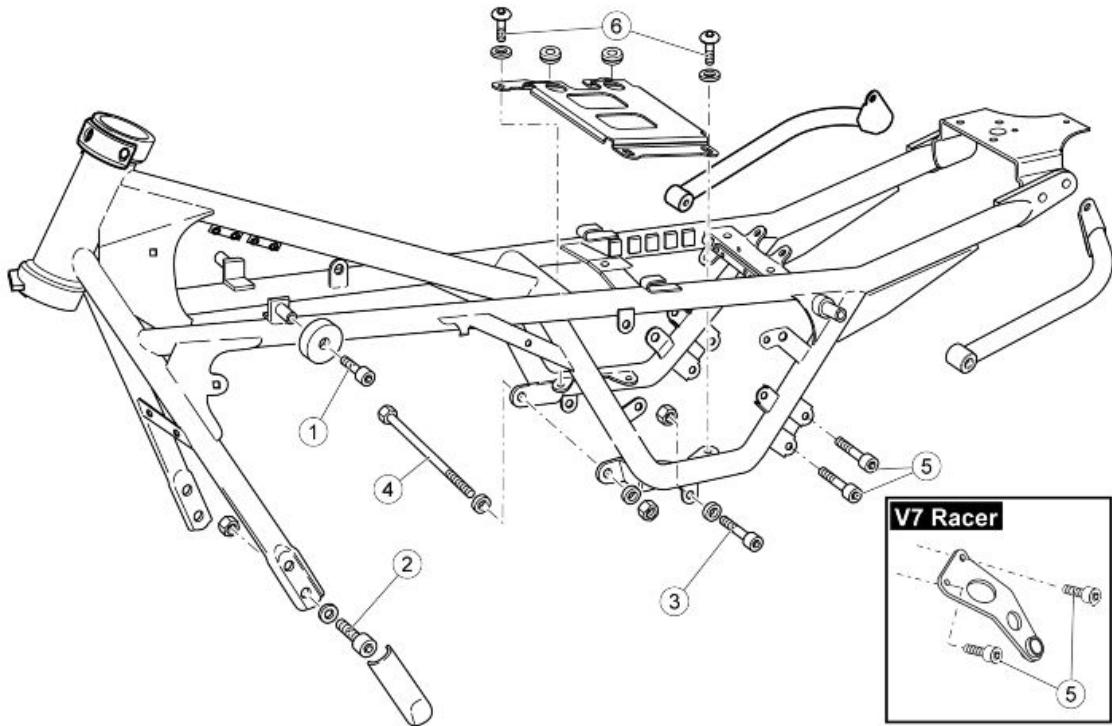
- 1. Right arrow input
  - 2. Set rework input
  - 3. High-beam lights input
  - 4. n.c.
  - 5. n.c.
  - 6. Rear left arrow output
  - 7. Front left arrow output
  - 8. EFI input
  - 9. Left arrow input
  - 10.Neutral input
  - 11.Oil input
  - 12.Air temperature input
  - 13.Speed sensor power supply
  - 14.Ground connection
  - 15.K Line
  - 16.n.c.
  - 17.Speed input
  - 18.Engine revs input
  - 19.n.c.
  - 20.Reserve input
  - 21.Key
  - 22.Ground connection
  - 23.Battery
  - 24.Front right arrow output
  - 25.Rear right arrow output
  - 26.Battery
- 



## INDEX OF TOPICS

ENGINE FROM VEHICLE

ENG VE



#### FRAME

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fixing tank mounting rubber blocks to frame	M8x14	2	25 Nm (18.44 lbf ft)	-
2	Cradle front fixing screw	M10x30	4	50 Nm (36.88 lbf ft)	-
3	Screw fastening gearbox to frame	M10x55	2	50 Nm (36.88 lbf ft)	-
4	Pin fixing engine/gearbox to chassis	M10x205	1	50 Nm (36.88 lbf ft)	-
5	Screw fixing exhaust silencer mounting to frame	M8x16	4	25 Nm (18.44 lbf ft)	Loctite 243
6	Battery supporting plate fixing screw	M8x16	4	25 Nm (18.44 lbf ft)	-

#### Vehicle preparation

- To arrange for the removal of the engine block, you must first remove the saddle, fuel tank, side fairings and the battery
- From the front, secure the vehicle with belts attached to a hoist
- Position a centre stand under the engine sump
- Position an engine support so as not to damage the rubber bellows of the drive shaft

## Removing the engine from the vehicle

- Remove the two fixing screws of the collector cover and remove the latter

**NOTE**

REPEAT THE OPERATION FOR THE RIGHT COVER AS WELL



- Loosen the clamp between the exhaust end and the catalytic converter



- Unscrew and remove silencer retaining nut and collect the screw and the bushing



- Remove the muffler

**NOTE**

REPEAT THE OPERATION ALSO FOR THE LEFT SILENCER



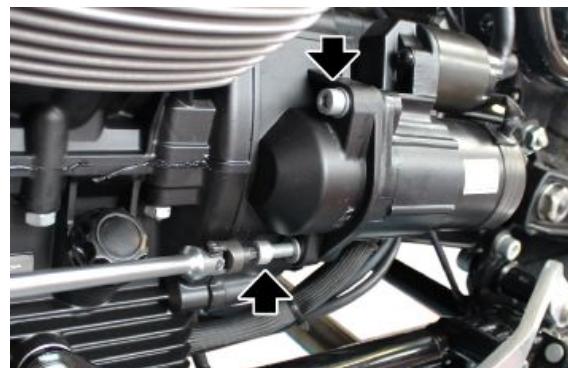
- Remove the starter motor power supply cable



- Remove the ground lead connector



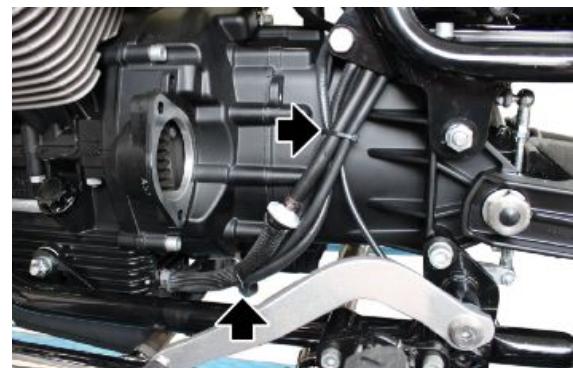
- Remove the starter motor fixing screws



- Remove the starter motor



- Remove the lambda probe, side stand and blow by recovery wiring retainer clamps



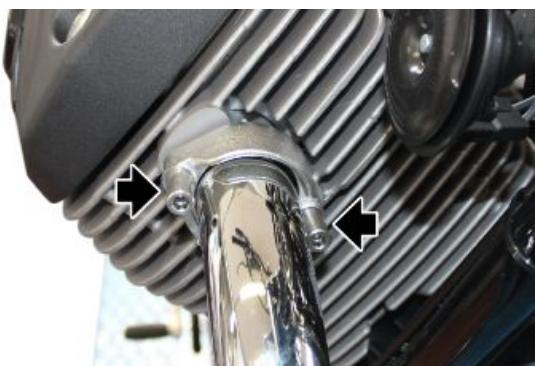
- Disconnect the connectors of the lambda probes



- Disconnect the blow-by recovery pipe after having removed the clip clamp



- Remove the exhaust ring fixing nuts, taking care to recover the washers



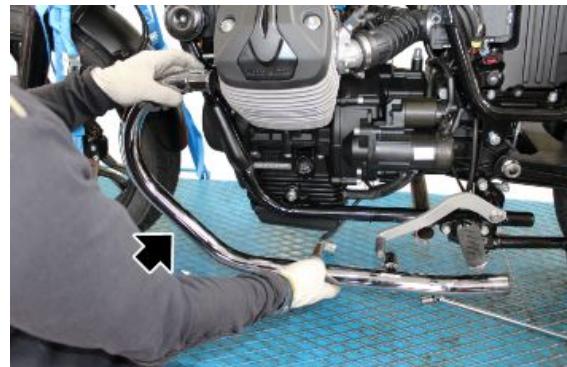
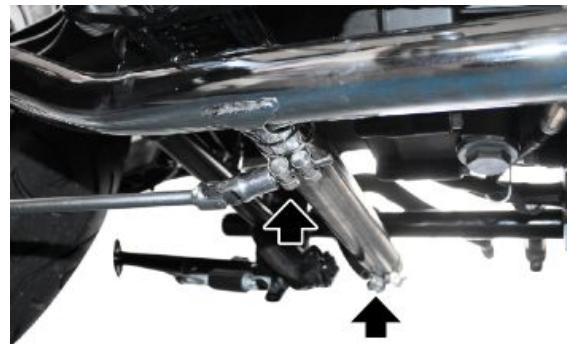
- Remove the spacers



- Remove the ring nuts



- Loosen the clamps between the joint and the exhaust manifolds
- Remove the manifolds



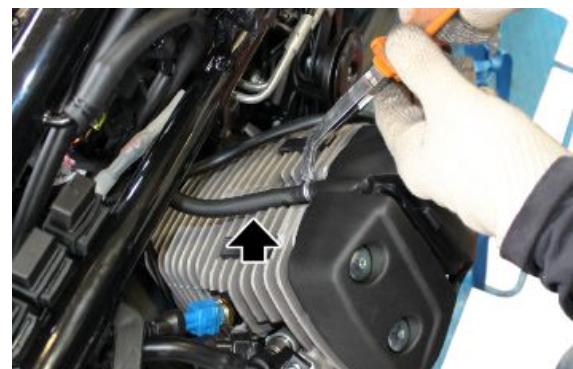
- Remove the spark plug covers



- Disconnect the caps from the spark plugs



- Disconnect the blow-by oil recovery tubes from the big ends



- Remove the fixing screws of the injectors and disconnect them



- Disconnect the engine temperature sensor connector



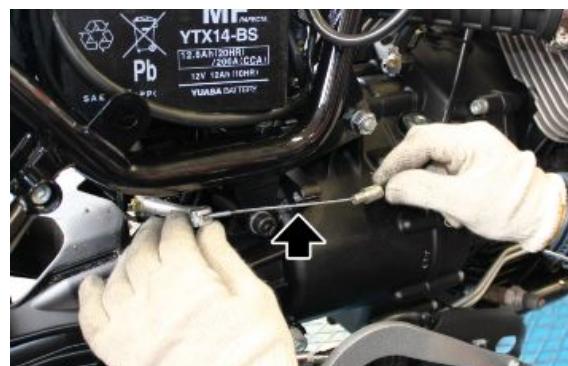
- Loosen the retainer clamps of the sleeve, from the intake pipe



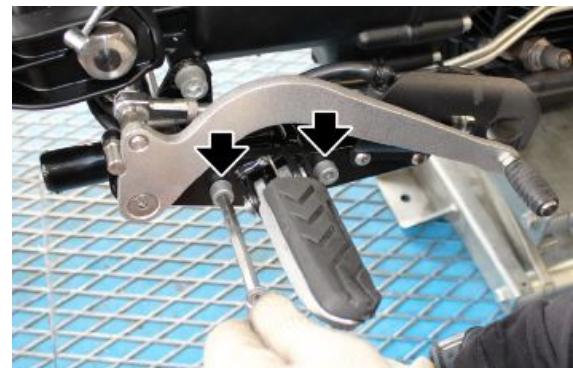
- Disconnect the clutch cable from the lever



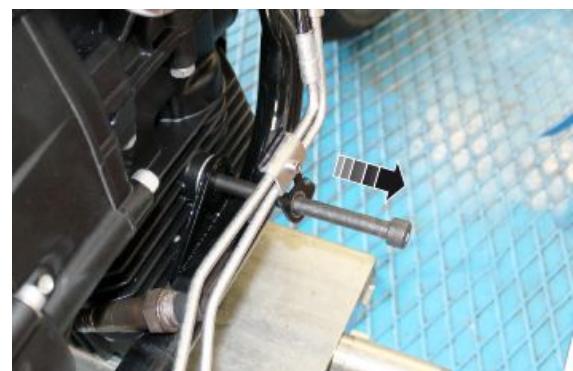
- Disconnect the clutch cable from the disengagement lever



- Remove the fixing screws of the right footrest support



- Remove the lower fixing pin of the cradle making sure to collect the washer and the nut



- Remove the front fastening screws covers of the cradle



- Remove the front screws fixing the cradle, making sure to recover the nuts and washers



- Remove the two rear screws that fix the cradle



- Disconnect the side stand switch connector



- Remove the two screws with washer and relative nut
- Slightly lower the engine to allow the removal of the pre-selector lever



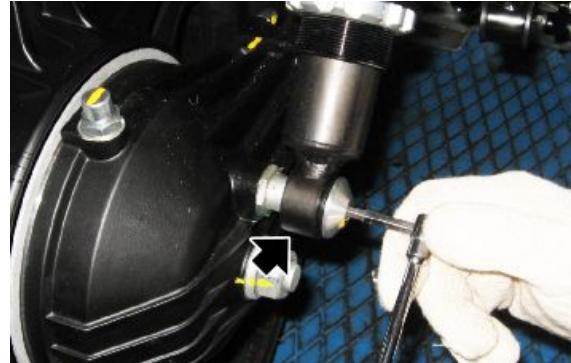
- Remove the cradle together with the side stand and gear footrest



- Remove the cable grommet and disconnect the cable harness from the rear brake pipe



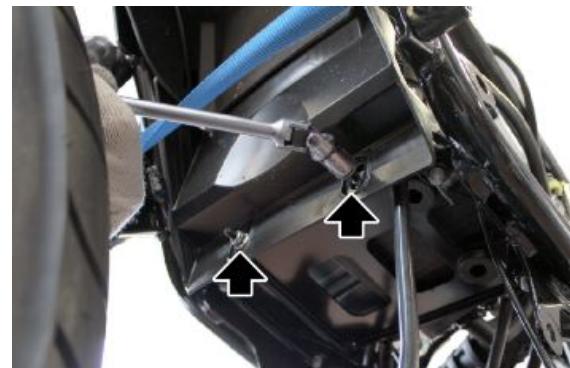
- Remove the screw and the relative nut fixing the left rear shock absorber
- Remove the screw fixing the right-hand rear right shock absorber and pull it from the pin on the drive shaft



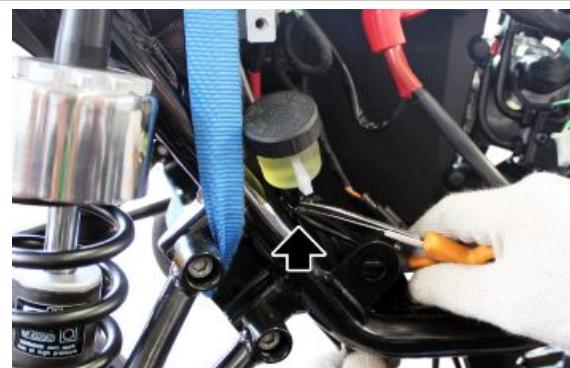
- Remove the central pin, pulling it from the right side of the motorcycle
- Remove the two screws with washer and relative nut
- Remove the cable grommet and disconnect the cable harness from the rear brake
- After removing the clamp, disconnect the ABS sensor and rear stop
- Remove the fixing screw of the rear brake tank



- Remove the lower screws of the wheel housing



- Remove the clamp, remove the wheel housing to allow sliding off the tank



- Remove the rear brake tank from the fork



## INDEX OF TOPICS

ENGINE

ENG

**TO CONSULT THE CHAPTER ABOUT THE ENGINE AND ITS COMPONENTS PLEASE REFER TO  
THE APPROPRIATE MANUAL:  
"MSS Engine V750 IE My2012"**

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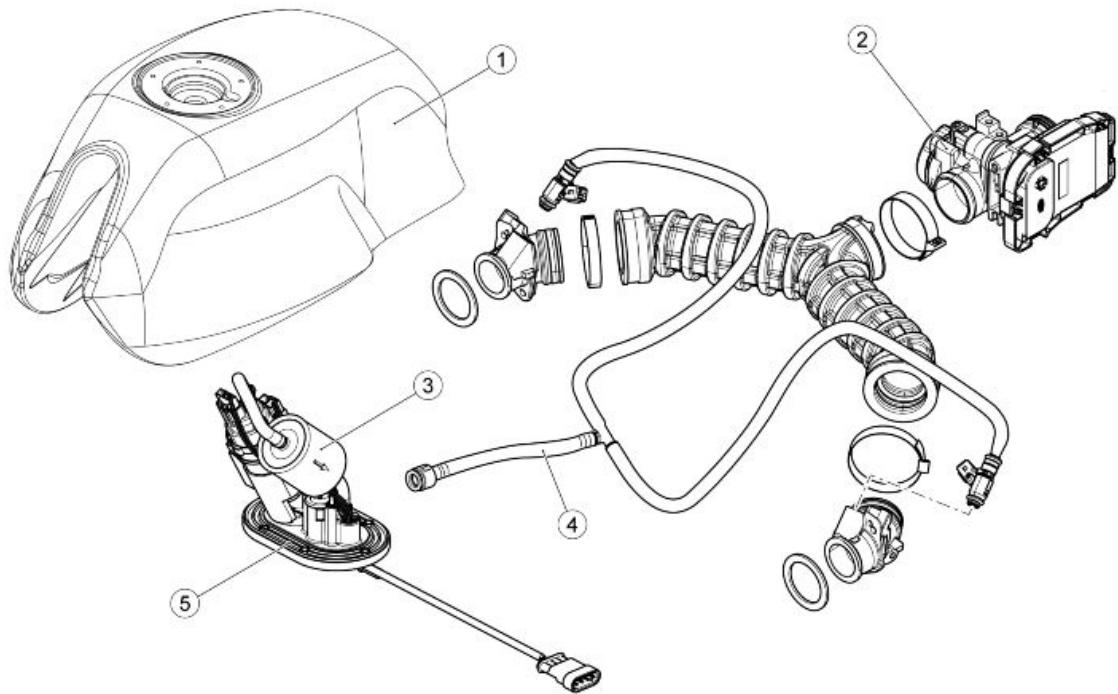
## INDEX OF TOPICS

**POWER SUPPLY**

**P SUPP**

---

## Circuit diagram

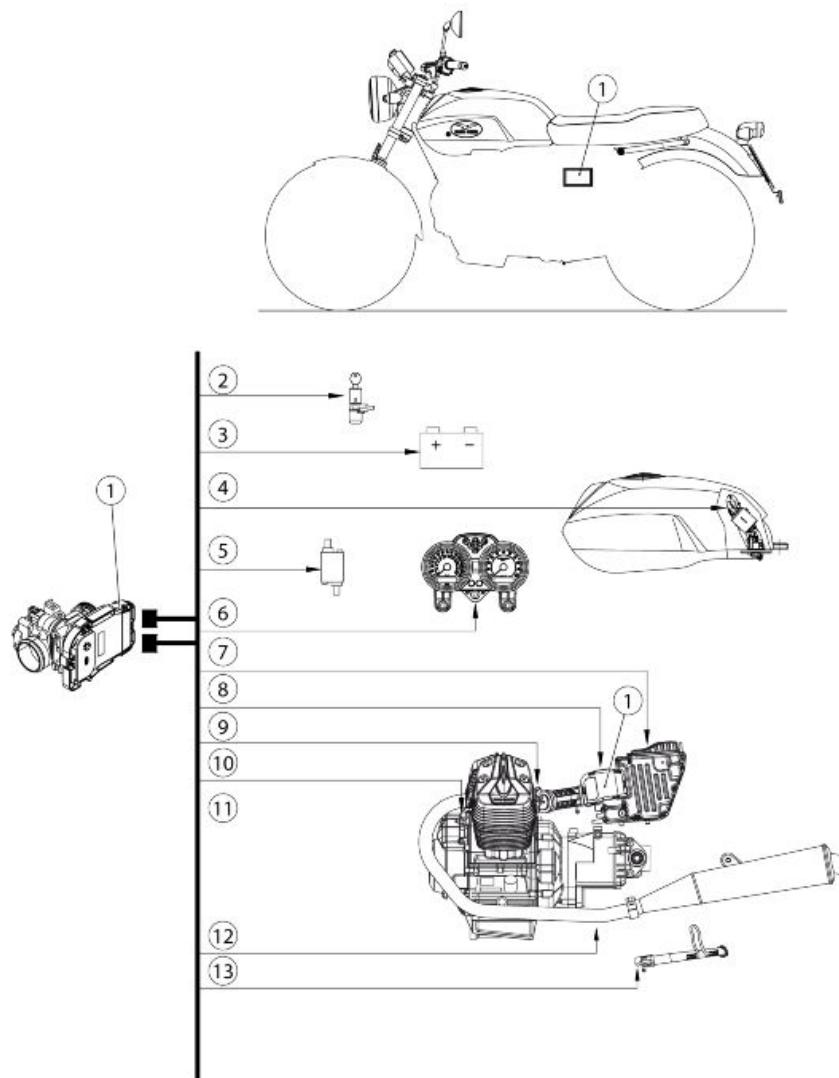
**key:**

1. Fuel tank
2. Throttle body
3. Fuel filter
4. Fuel delivery pipe
5. Fuel pump unit

---

## Injection

---

**Diagram****key:**

1. Control unit position
2. Ignition switch
3. Battery
4. Fuel pump
5. Coils
6. Instrument panel
7. Air temperature sensor
8. Throttle valve position sensor
9. Injectors
- 10.Crankshaft position sensor
- 11.Engine temperature sensor
- 12.Lambda probe

---

13.Side stand

---

## ECU INFO screen page

This screen page shows general data regarding the control unit, for example software type, mapping, control unit programming date



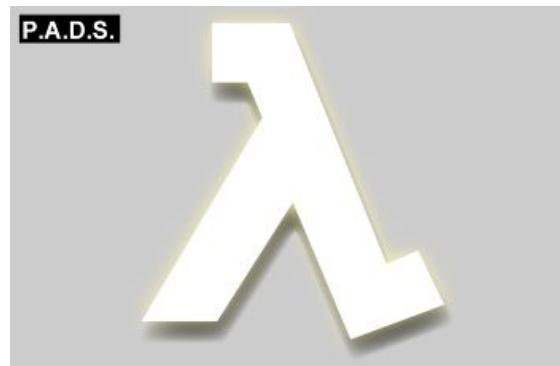
### INFO ECU SCREEN PAGE

Specification	Desc./Quantity
Mapping	-

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## PARAMETERS screen page

This screen page shows the parameters measured by the several sensors (engine revs, engine temperature, etc.) or values set by the control unit (injection time, ignition advance, etc.)



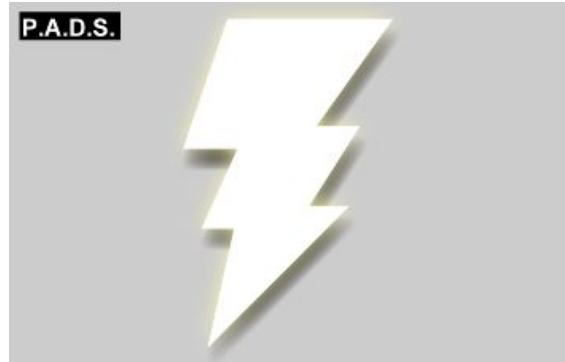
### ENGINE PARAMETER READING SCREEN PAGE

Navigator characteristic	P.A.D.S. characteristic	Description / Value
Engine rpm	Engine rpm	Rpm: the minimum value is set by the control unit cannot be adjusted
Entire throttle position	Throttle angle	Rpm: the minimum value is set by the control unit cannot be adjusted
Engine temperature	Engine temperature	°C

Navigator characteristic	P.A.D.S. characteristic	Description / Value
Left lambda probe voltage	Lambda probe voltage 1	100 - 900 mV (indicative values) Signal when energized that the control unit receives from the lambda probe: inversely proportional to the presence of oxygen
Right lambda probe voltage	Lambda probe voltage 2	100 - 900 mV (indicative values) Signal when energized that the control unit receives from the lambda probe: inversely proportional to the presence of oxygen
Left cylinder lambda correction	Lambda correction factor 1	-
Right cylinder lambda correction	Lambda correction factor 2	-
Steps carried out	Steps carried out	Steps carried out of the control unit in minimum control phase
Advance ignition carried out	Advance carried out	Value referring to left cylinder
Advance ignition programmed	Advance programmed	Value referring to left cylinder
Injection time	Injection time	-
Left cylinder adaptive correction	Lambda adaptive gain 1	-
Right cylinder adaptive correction	Lambda adaptive gain 2	-
Atmospheric pressure	Atmospheric pressure	The value is estimated by the control unit
Intake pressure	Intake pressure	Pressure detected in the intake duct
Target idle rpm	Idling target	is a target value for the engine speed at the minimum set by the control unit (with engine warm)
Programmed steps	Programmed steps	Steps corresponding to the reference position of the engine idle
Idle motor equivalent throttle	Stepper equivalent throttle	Expresses the minimum contribution of air in the motor throttle degrees

## ACTIVATION screen page

This screen page is used to delete errors in the control unit memory and to activate some systems controlled by the control unit.



## DEVICES ACTIVATION

Navigator characteristic	P.A.D.S. characteristic	Description / Value
H.V. coil left cylinder	Coil 1	-
H.V. coil right cylinder	Coil 2	-
Rpm indicator	Rpm indicator	-
Left injector	Injector 1	-
Right injector	Injector 2	-

Navigator characteristic	P.A.D.S. characteristic	Description / Value
Idle motor	Stepper	-
Left lambda probe heater	Lambda probe heater 1	-
Right lambda probe heater	Lambda probe heater 2	-
Headlamp relay	Headlamp relay	-
Fuel pump relay	Fuel pump relay	-
Warning lamp control or EFI icon	General warning light	-
Error clearing	-	-
Reading errors of environmental parameters	-	-
Freezes and saves the parameter values of the states	-	-

## Using P.A.D.S. for injection system

### STATUS screen page

This screen page shows the status (usually ON/OFF) of the vehicle devices or the operation condition of some vehicle systems (for example, lambda probe functioning status).



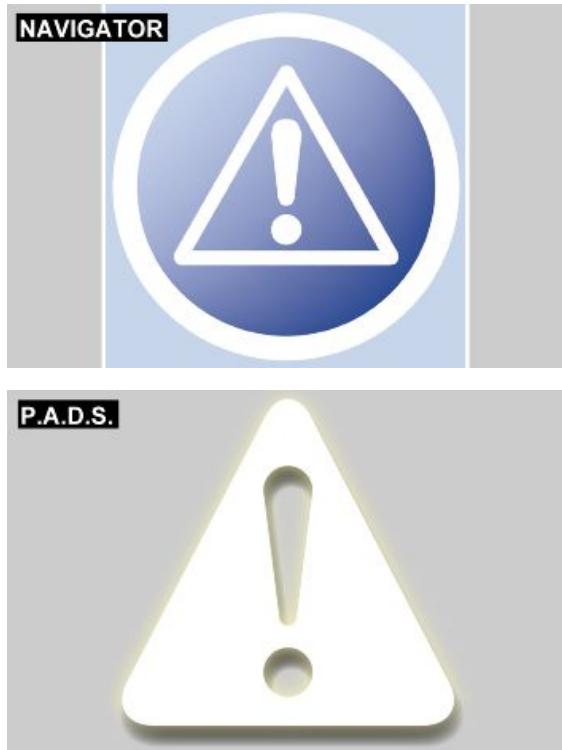
### DEVICE STATUS

Navigator characteristic	P.A.D.S. characteristic	Navigator Description / Value	P.A.D.S Description / Value
Lean title (left cylinder)	Lean title cylinder 1	Yes/No	Yes/No
Lean title (right cylinder)	Lean title cylinder 2	Yes/No	Yes/No
Idle motor	Idle motor	Ready for start / Open loop / Closed loop	OK start-up / OLoop / ClosLoop / Closed
Left cylinder lambda control	Lambda circuit 1	Open loop / Closed loop	Open / Closed / Diagnosis / Error
Right cylinder lambda control	Lambda circuit 2	Open loop / Closed loop	Open / Closed / Diagnosis / Error
Rich title (left cylinder)	Rich title cylinder 1	Yes/No	Yes/No
Rich title (right cylinder)	Rich title cylinder 2	Yes/No	Yes/No
Engine status	Engine status	Undetermined / Power-On and Engine Off / Key-On and Engine Off / Engine in rotation / Engine Stalled /	Undetermined / ON/Stop / Key/Stop / Rotat. / Stall / PL course / PL Term / Sync_4t

Navigator characteristic	P.A.D.S. characteristic	Navigator Description / Value	P.A.D.S Description / Value
		Power-Latch in course / Power-Latch finished / Engine in stop phase	
Engine control	-	Synchronized on the 4 stroke cycle / Not synchronized on the 4 stroke cycle	
Throttle	Throttle status	Minimum opening / Partial opening / Maximum opening	Minimum / Partial / FullPot
Start request	Start request	Yes/No	Absent/present
Rpm sensor signals panel	Synchronised panel	Not synchronized / synchronized / Partially synchronized	Partial / NO / YES / Lean / Rich / Rich title/ Error / Lean title
Engine stop button	RUN / OFF switch	Gear enabled / Gear not enabled	RUN / OFF
Side stand	-	Up/Down	
Left lambda probe short term diagnosis	-	Complete / Not complete	
Right lambda probe short term diagnosis	-	Complete / Not complete	
Left lambda probe short term error	-	Yes / No / Not detectable	
Right lambda probe short term error	-	Yes / No / Not detectable	
Minimum motor short term diagnosis	motor.diag min.comp	Complete / Not complete	Complete / Not done
Minimum motor short term error	Idle motor error	Yes / No / Not detectable	Yes/No
Fan relay	Fan relay	Not activated / Activated	OFF / 2 active / 1 active / req. 1 / req. 2
Engine mode	Engine mode	Undetermined/ Start-up / Start-up stabilized / Start-up with deceleration / Start-up with acceleration / Idling compensated for start-up / Engine stable outside idling / Engine idling	Undeterm / Start / Stabil / Start_dec / Start_acc / Min_Comp / Stable / Min / Accel. / Decel. / Cut-Off / RCUT-OFF
Engine mode	Engine mode	Engine in acceleration / Engine in deceleration / Cut-Off /	
Gearbox in neutral	Gear engaged	Yes/No	Yes/No
Clutch	Clutch	Released / Pulled	Released / Pressed
Left lambda probe	-	Operative / Not operative (Error) / Not operative (Rich) / Not operative (Lean) / Not operative (Heater) / Not operative (Start-up) / Not enabled	
Right Lambda probe	-	Operative / Not operative (Error) / Not operative (Rich) / Not operative (Lean) / Not operative (Heater) / Not operative (Start-up) / Not enabled	
Riding Enable	Start-up enabling switch	Yes/No	
-	Stepper motor status	-	OK start-up / O.Loop / ClosLoop
-	Fall sensor	-	Inhibited / Consent / --- / Crack Decel. / Crank Accel. / Crank Minimum / Stabilized / Minimum / Accelerated / Decelerated / CAT-OFF status / CAT-OFF Output
-	Recharge status Enabling Ignition	-	OFF / ON / Kick Down / Close Loop / Diag ShortTerm / Error ShortTerm

## ERRORS screen page

This screen page shows potential errors detected in the vehicle (ATT) or stored in the control unit (MEM) and it allows to check error clearing (STO).



### ERRORS DISPLAY

Err or	Navigator characteristic	P.A.D.S. characteristic	Navigator Description / Value	P.A.D.S Description / Value
P0 10 5	Air pressure sen- sor	Ambient pres- sure sensor	short circuit to positive / open or short circuit to negative / signal not plausible	Short circuit to positive / Open or short circuit to ground / Signal not plausible
P0 11 0	Air temperature sensor	Air temperature sensor	short circuit or open circuit to positive / short circuit to negative	Open or short circuit to positive / Short circuit to ground
P0 11 5	Engine tempera- ture sensor	Engine tempera- ture sensor	short circuit or open circuit to positive / short circuit to negative	Open or short circuit to positive / Short circuit to ground
P0 12 0	TPS	Throttle position sensor (TPS)	short circuit or open circuit to positive / short circuit to negative	Open or short circuit to positive / Short circuit to ground
P0 13 0	Control of air-fuel ratio / Left lamb- da probe	Lambda probe signal (Bank 1)	short circuit to positive / open circuit, short circuit to negative or excessively lean carburation / signal not plausible for title correction	Short circuit to positive / Open or short circuit to ground / Signal not plausible
P0 13 5	Left lambda probe heater	Lambda heater circ. (Bank 1)	short circuit to positive/ short circuit to negative / open circuit	Short circuit to positive / Short circuit to ground / Open circuit
P0 13 6	Control of air-fuel ratio / Right lamb- da probe	Lambda probe signal (Bank 2)	short circuit to positive / open circuit, short circuit to negative or excessively lean carburation / signal not plausible for title correction	Short circuit to positive / Open or short circuit to ground / Signal not plausible
P0 14 1	Right lambda probe heater	Lambda heater circ. (Bank 2)	short circuit to positive/ short circuit to negative / open circuit	Short circuit to positive / Short circuit to ground / Open circuit
P0 16 9	Starter button	Starter signal	shorted to positive	Short circuit to positive
P0 17 0	Starter	Starter diagnosis (relay)	TBD	Short circuit to positive / Open circuit to ground

Err	Navigator or characteristic	P.A.D.S. characteristic	Navigator Description / Value	P.A.D.S Description / Value
P0 20 1	Left cylinder in- jector	Injector circuit cylinder 1	short circuit to positive/ short circuit to negative / open circuit	Short circuit to positive / Short circuit to ground / Open circuit
P0 20 2	Right cylinder in- jector	Injector circuit cylinder 2	short circuit to positive/ short circuit to negative / open circuit	Short circuit to positive / Short circuit to ground / Open circuit
P0 23 0	Fuel pump relay	Fuel pump relay control circuit	short circuit to positive/ short circuit to negative / open circuit	Short circuit to positive / Short circuit to ground / Open circuit
P0 33 5	Engine speed sensor (electric)	Engine speed sensor	open circuit	Open Circuit
P0 33 6	Engine speed sensor (function- al)	Engine speed sensor (Plausibil- ity)	signal not valid	Signal not valid
P0 35 1	H.V. coil	No. 1 coil circuit	short circuit to positive / short circuit or open circuit to negative	Short circuit to positive / Short circuit or open circuit to ground
P0 35 2	H.V. coil	No. 2 coil circuit	short circuit to positive / short circuit or open circuit to negative	Short circuit to positive / Short circuit or open circuit to ground
P0 50 5	Idle control	Idle control (Stepper motor)	short circuit to positive/ short circuit to negative / open circuit / overpressure	Short circuit to positive / Short circuit to ground / Open circuit / Overpressure above specifications
P0 53 0	Light relay	Headlamp relay command	short circuit to positive/ short circuit to negative / open circuit	Short circuit to positive / Short circuit to ground / Open circuit
P0 56 0	Battery voltage	Battery voltage	above maximum threshold / below mini- mum threshold	Voltage exceeds maximum limit
P0 60 1	Control unit	EEPROM Error (emul. Flash)	EEPROM error	Internal failure to ECU
P0 60 4	Control unit	RAM error	RAM error	Internal failure to ECU
P0 60 5	Control unit	ROM error (Flash)	ROM error (Flash)	Internal failure to ECU
P0 60 6	Control unit	Microprocessor error	Microprocessor error	Internal failure to ECU
P0 65 0	Warning lamp	Warning Lamp Command	short circuit to positive/ short circuit to negative / open circuit	Short circuit to positive / Short circuit to ground / Open circuit

## SETTINGS screen page

This screen page is used to adjust some control  
unit parameters.





#### ADJUSTABLE PARAMETERS

Navigator characteristic	P.A.D.S. characteristic	Description / Value
Throttle position self-acquisition	TPS reset	-
Saved data file download	Mem. data download (Download + Clearing)	-
Clearing memorized data	Mem. data download (Download + Clearing)	-
Self-adjustable parameters reset	Self-adjustable parameters reset	-

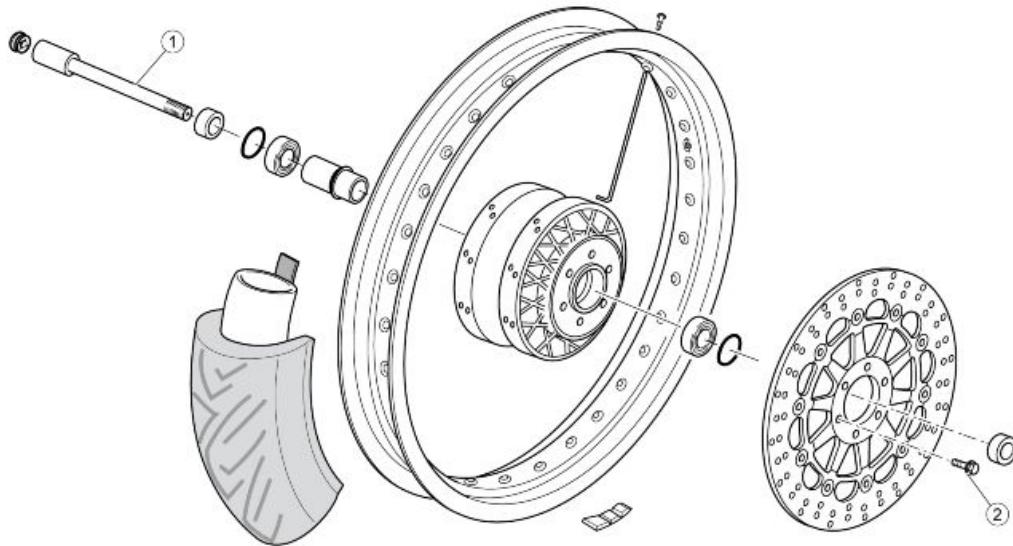
## INDEX OF TOPICS

SUSPENSIONS

SUSP

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## Front



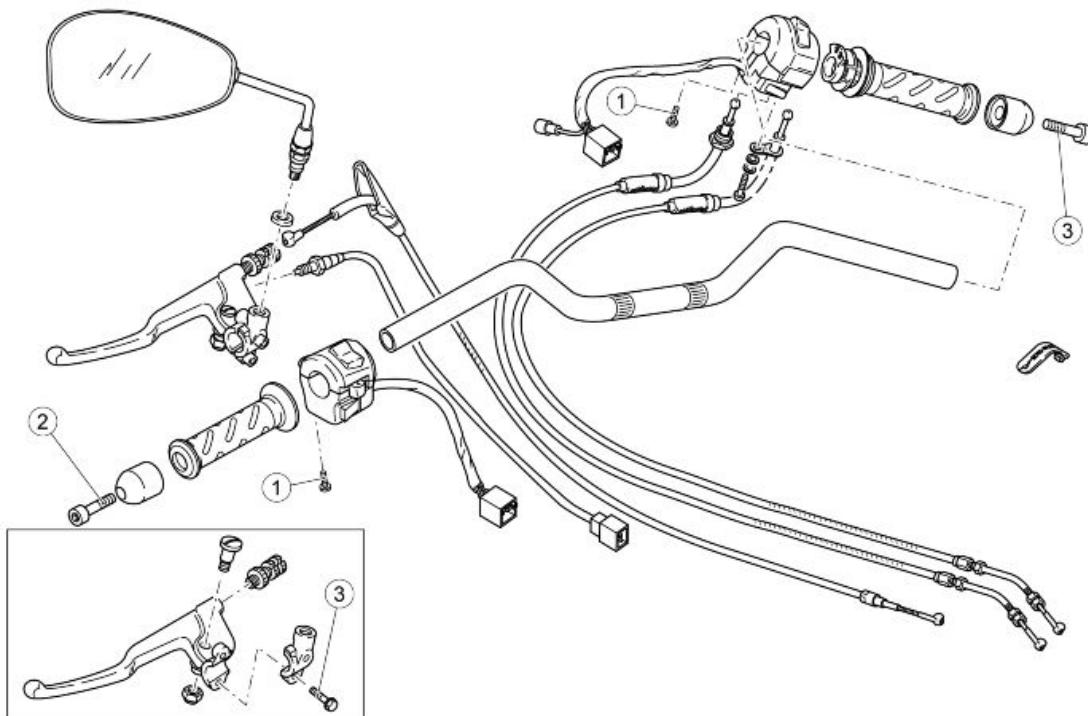
### FRONT WHEEL

pos.	Description	Type	Quantity	Torque	Notes
1	Front wheel axle	M18x1.5	1	80 Nm (59.00 lbf ft)	-
2	Front brake disc fixing screw	M8x20	6	25 Nm (18.44 lbf ft)	Loctite 243

---

## Handlebar

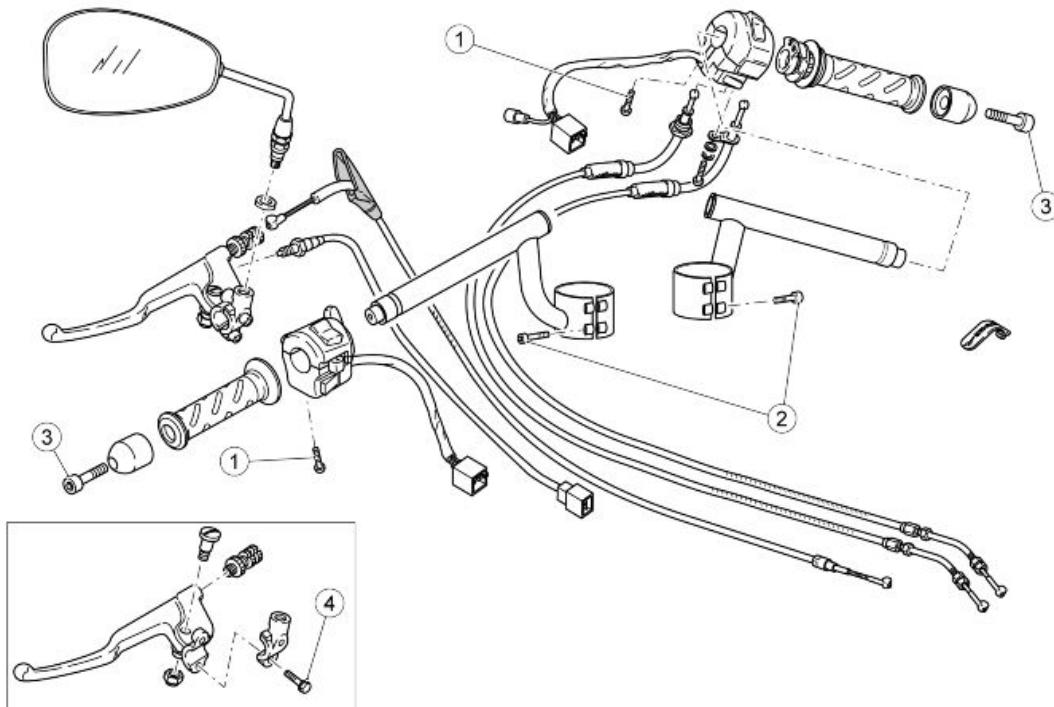
(V7 SPECIAL / V7 STONE)



#### HANDLEBAR AND CONTROLS

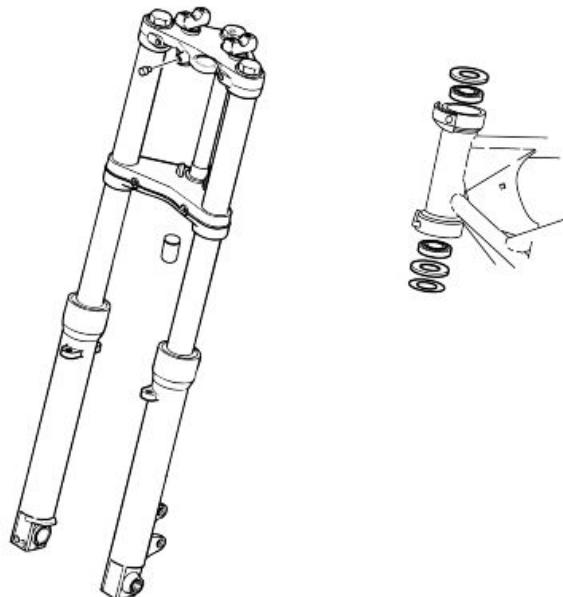
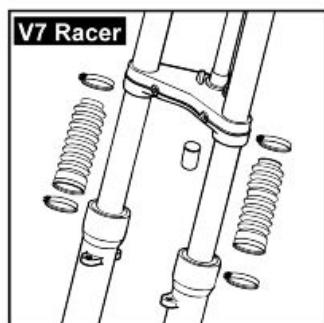
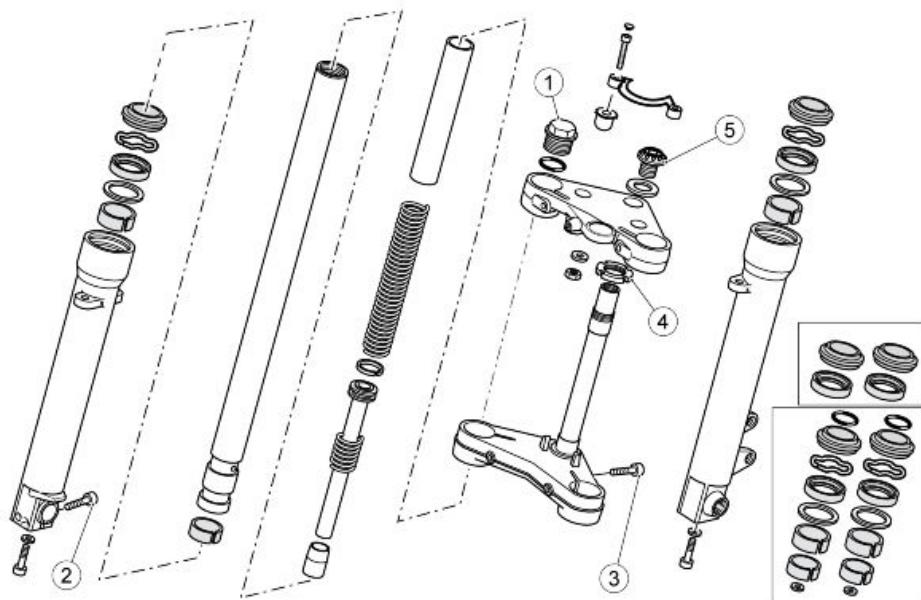
Pos.	Description	Type	Quantity	Torque	Notes
1	Switch fastener screw	SWP 5	1+1	1.5 Nm (1.11 lb ft)	-
2	Counterweight fixing screw	M6	2	10 Nm (7.37 lb ft)	Loctite 243
3	Screw fastening the clutch control U-bolt to the semi-handlebar	M6x25	2	10 Nm (7.37 lb ft)	-

(V7 RACER)



**HANDLEBAR AND CONTROLS**

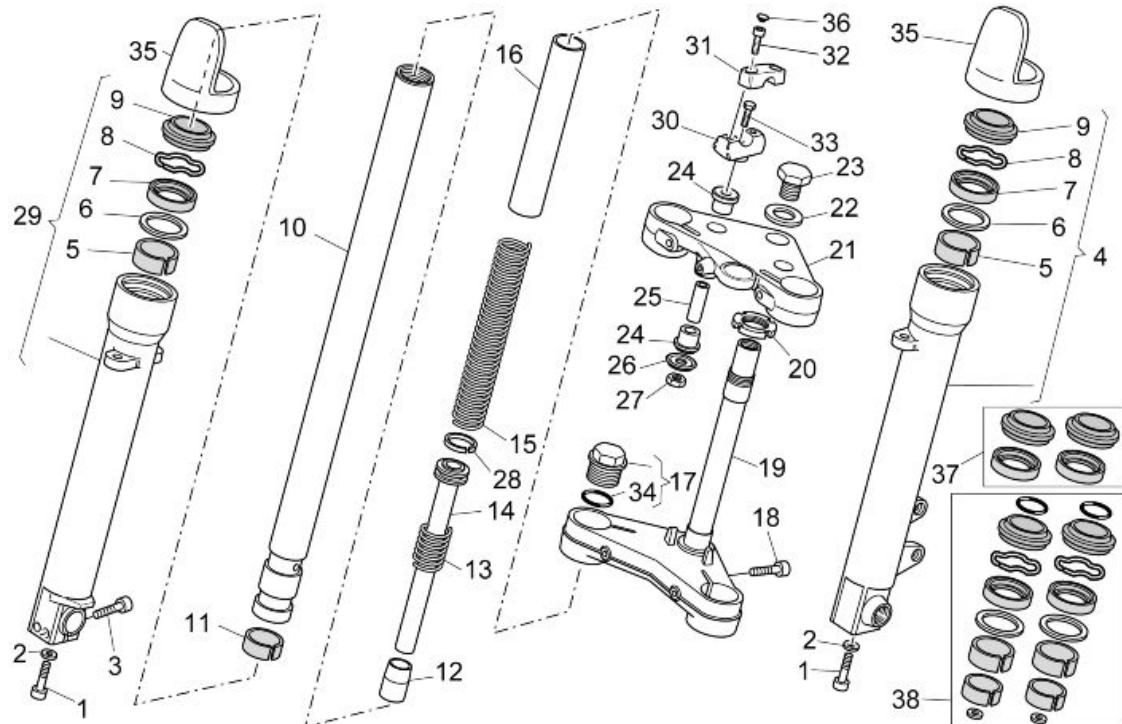
Pos.	Description	Type	Quantity	Torque	Notes
1	Switch fastener screw	M5	1+1	1.5 Nm (1.11 lb ft)	Tighten using a 1-2-1 sequence
2	Semi-handlebar fixing screw	M6x25	4	10 Nm (7.37 lb ft)	Tighten using a 1-2-1 sequence
3	Counterweight fixing screw	M6	2	10 Nm (7.37 lb ft)	Loctite 243
4	Screw fastening the clutch control U-bolt to the semi-handlebar	M6x25	2	10 Nm (7.37 lb ft)	Tighten using a 1-2-1 sequence

**Front fork****FRONT SUSPENSION - STEERING**

pos.	Description	Type	Quantity	Torque	Notes
1	Stanchion cap	-	2	50 Nm (36.88 lbf ft)	-
2	Screw fixing wheel axle to right fork leg	M6x30	2	10 Nm (7.37 lbf ft)	Tighten using a 1-2-1 sequence
3	Screw fixing stanchions to upper and lower plate	M10x40	4	50 Nm (36.88 lbf ft)	-
4	Headstock ring nut	M25x1	1	7 Nm (5.16 lbf ft)	The fork must fall to one side by itself

pos.	Description	Type	Quantity	Torque	Notes
5	Headstock bushing	M23x1	1	50 Nm (36.88 lbf ft)	-

## Diagram



### Key:

1. Screw
2. Washer
3. Screw
4. Complete left sleeve
5. Upper bushing
6. Washer
7. Sealing ring
8. Snap ring
9. Dust guard
10. Stem
11. Lower bushing
12. Buffer
13. Counter spring
14. Complete pumping member
15. Spring
16. Pipe
17. Complete cap

- 
- 18.Screw
  - 19.Base with headstock
  - 20.Ring nut
  - 21.Fork upper plate
  - 22.Washer
  - 23.Nut
  - 24.Rubber ring
  - 25.Spacer
  - 26.Cap
  - 27.Nut
  - 28.Ring
  - 29.Complete right sleeve
  - 30.Lower U-bolt
  - 31.Upper U-bolt
  - 32.Screw
  - 33.Screw
  - 34.O-ring
  - 35.Stem protection
  - 36.Chrome-plated cap
  - 37.Gasket kit
  - 38.Oil seal kit

---

## Removing the fork legs

The vehicle is equipped with a non adjustable fork. The operations described below are valid for both stanchions.

**CAUTION**

**DURING THE OPERATIONS DESCRIBED BELOW, THE STANCHIONS AND THEIR INTERNAL COMPONENTS SHOULD BE TIGHTENED ON A VICE. MAKE SURE NOT TO DAMAGE THEM BY OVERTIGHTENING; ALWAYS USE ALUMINUM JAW CAPS.**

- 
- Remove the front wheel.
  - Remove the front mudguard.



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



- Move the instrument panel forwards.

- Undo the upper sealing screw.



- Undo the lower sealing screw.



- Slide off the stem downwards by turning it slightly first in one direction then to the opposite direction.

## Disassembling the fork

- Drain all the oil from the stem.
- Block the wheel holder fork leg on the vice.
- Undo the bottom screw and remove it with the corresponding gasket.



- Remove the dust scraper using a screwdriver as a lever.

**CAUTION**

BE CAREFUL NOT TO DAMAGE THE FORK LEG RIM AND THE DUST SCRAPER.



- Slide the dust scraper off and upwards.



- Remove the locking ring inside the fork leg using a thin screwdriver.

**CAUTION**

BE CAREFUL NOT TO DAMAGE THE FORK LEG RIM.



- Slide off the bearing tube from the wheel holder fork leg together with the sealing ring, the cap, the upper bushing and lower bushings.

**NOTE**

WHEN REMOVING THE PIPE FROM THE WHEEL HOLDER FORK LEG SOME PARTS MAY REMAIN INSIDE THE FORK LEG. IF THIS OCCURS, THESE PARTS MUST BE REMOVED AFTERWARDS, BEING CAREFUL NOT TO DAMAGE THE FORK LEG RIM AND THE UPPER BUSHING SEAT



## Checking the components

- Check every component removed from the fork leg, specially: the sealing ring and the dust guard as they are elements that guarantee sealing; replace them if some of them are damaged.
- Check the bushing on the bearing tube; remove it and replace it if damaged or worn.
- Slide off the pumping member unit from the holding tube; if it is damaged, replace the counter spring and the ring.



## Reassembling the fork

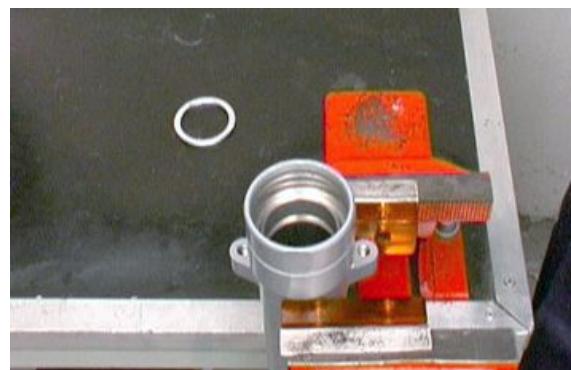
**CAUTION**

**ALL COMPONENTS MUST BE CAREFULLY WASHED AND DRIED WITH COMPRESSED AIR BEFORE REFITTING.**

- Carry out any necessary service operation.
- Insert the pumping member unit with the counter spring and the ring in the bearing tube.



- Check that the upper guide bushing is fitted on the wheel holder fork leg.



- Insert the lower sliding bushing in its seat on the bearing tube.



- Reassemble the bearing tube in the wheel holder fork leg.



- Insert the bearing tube in the wheel holder and push it until it stops.



- Screw the bottom screw and tighten it to the prescribed torque.



- Insert the cap and the well-lubricated sealing ring on the bearing tube.
- Use a suitable inserting tool to push the sealing ring in the fork leg until it stops.



- Fit the locking ring.



- Fit the dust scraper.
  - Pour oil into the bearing tube so that it also fills the internal grooves of the pumping member rod.
  - Pump with the bearing tube, making sure the oil has completely filled the pumping member rod.
  - Introduce the spring and the preload tube.
  - Place the cap on the bearing tube, taking care not to damage the O-ring.
- Then, tighten the cap to the prescribed torque.

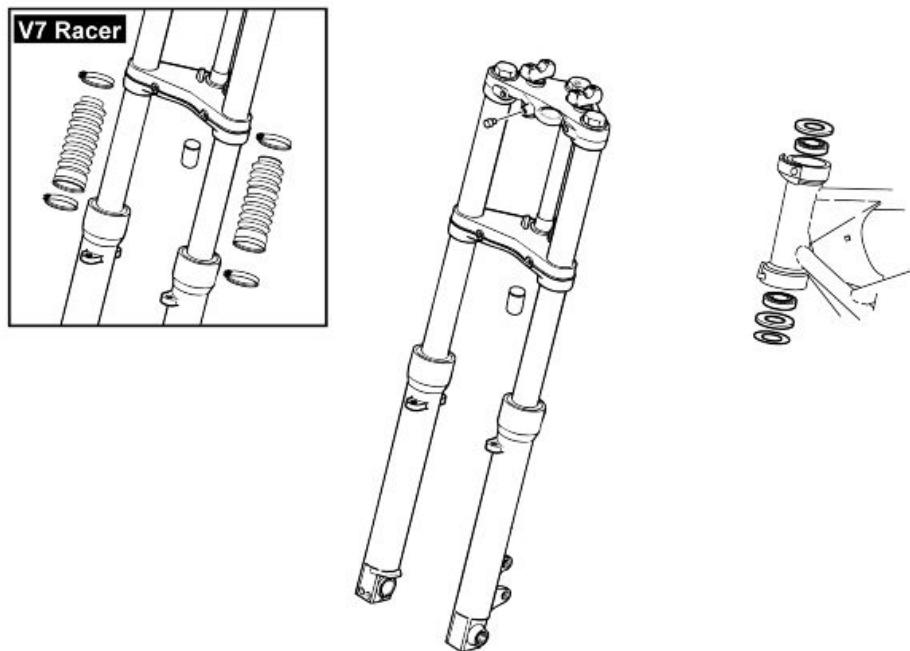
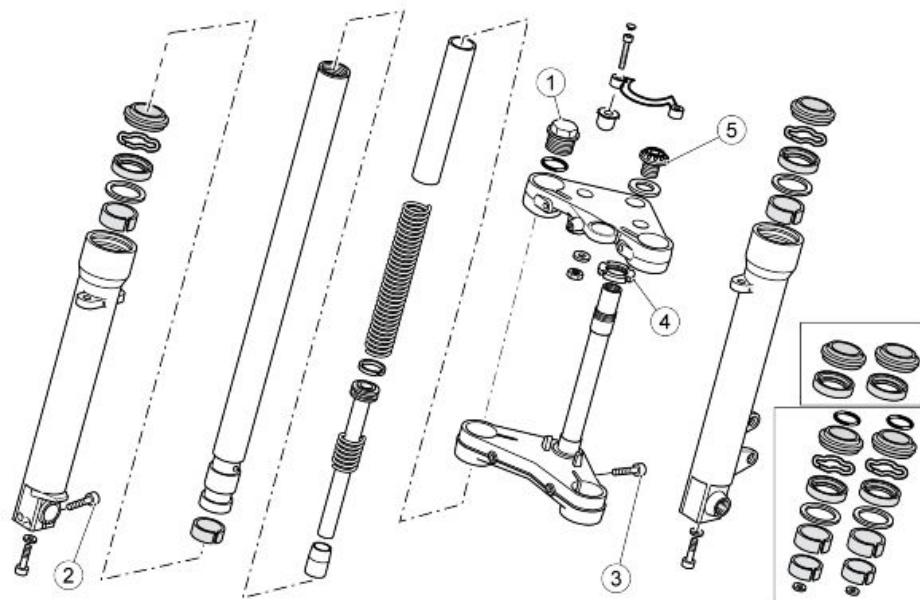


## Installing the fork legs

- Insert the stem on the vehicle going through the lower plate and the upper plate.
  - Tighten the screws to the prescribed torque.
- 



## Steering bearing



### FRONT SUSPENSION - STEERING

pos.	Description	Type	Quantity	Torque	Notes
1	Stanchion cap	-	2	50 Nm (36.88 lbf ft)	-
2	Screw fixing wheel axle to right fork leg	M6x30	2	10 Nm (7.37 lbf ft)	Tighten using a 1-2-1 sequence
3	Screw fixing stanchions to upper and lower plate	M10x40	4	50 Nm (36.88 lbf ft)	-
4	Headstock ring nut	M25x1	1	7 Nm (5.16 lbf ft)	The fork must fall to one side by itself

pos.	Description	Type	Quantity	Torque	Notes
5	Headstock bushing	M23x1	1	50 Nm (36.88 lbf ft)	-

## Adjusting play

- Undo and remove the screws and collect the U-bolt, holding the handlebar.
- Move the handlebar forward, be careful not to turn over the front brake fluid reservoir.
- Remove the instrument panel.



- Working from both sides, undo and remove the screw locking the upper plate to the front fork.



- Unscrew and remove the central nut.



- Remove the upper plate from the front fork.



- Adjust the ring nut.
- Fit the upper plate on the front fork.



- Tighten the central nut.



- Working from both sides, tighten the screw locking the upper plate to the front fork.
- Fit the handlebar.
- Fit the instrument panel.

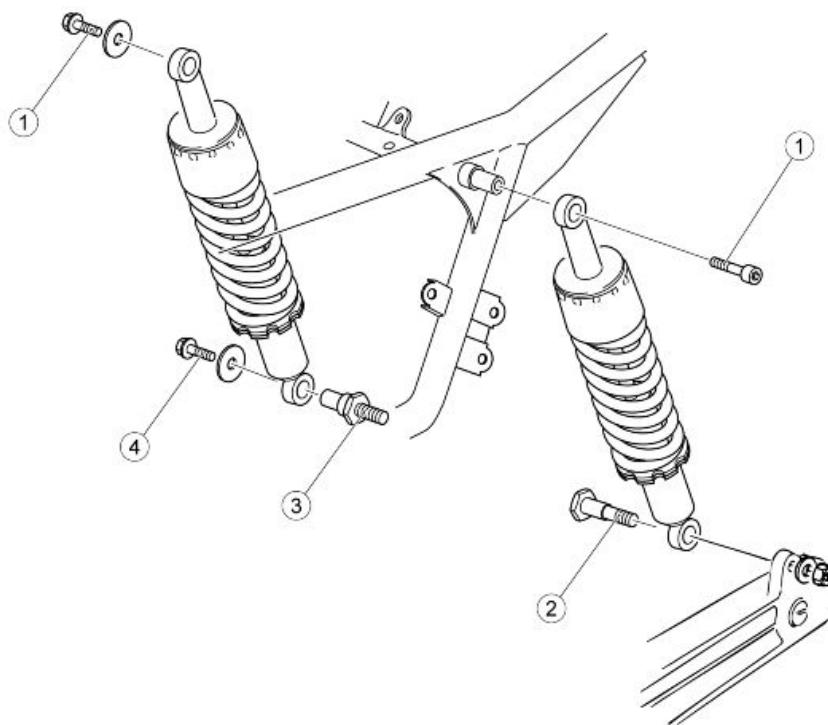
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## Rear

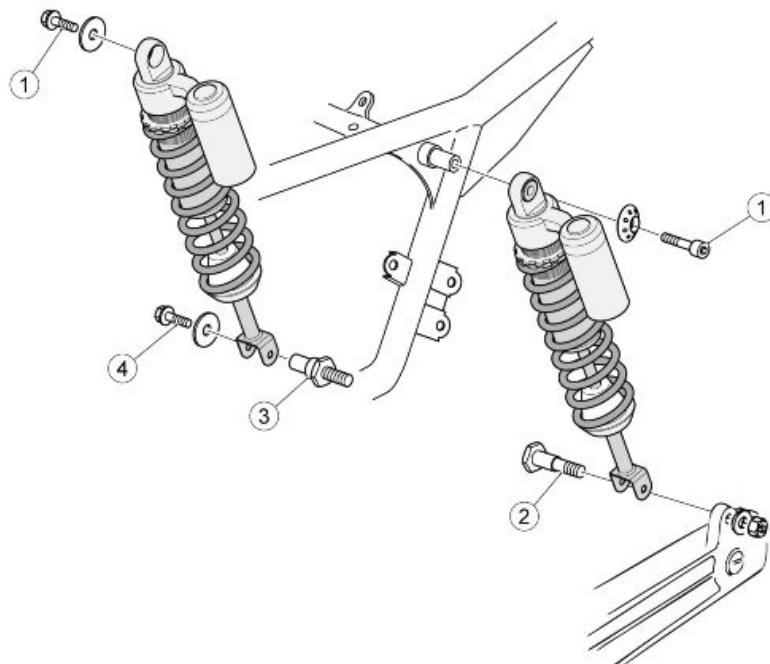
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### Shock absorbers

(V7 SPECIAL / V7 STONE)



(V7 RACER)

**REAR SUSPENSION**

pos.	Description	Type	Quantity	Torque	Notes
1	Upper screw fastening shock absorber to frame	M6x35	2	10 Nm (7.37 lbf ft)	Loctite 243
2	Lower pin fastening left shock absorber to swingarm	M10x1.5	1	35 Nm (25.81 lbf ft)	

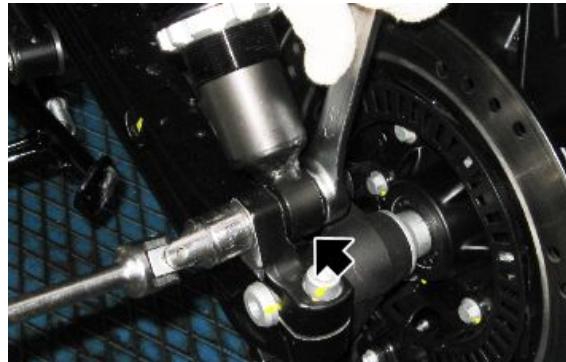
pos.	Description	Type	Quantity	Torque	Notes
3	Stud bolt fixing right shock absorber to rear box	M12x1.5	1	35 Nm (25.81 lbf ft)	-
4	Screw fastening right shock absorber to stud bolt	M6x16	1	10 Nm (7.37 lbf ft)	Loctite 243

## Removing

- Remove the screw fixing the right-hand rear right shock absorber and pull it from the pin on the drive shaft



- Remove the screw and the relative nut fixing the left rear shock absorber



- Unscrew and remove the upper screws;
- Remove the shock absorbers.



## INDEX OF TOPICS

CHASSIS

CHAS

## Wheels

### Front wheel

#### Removal

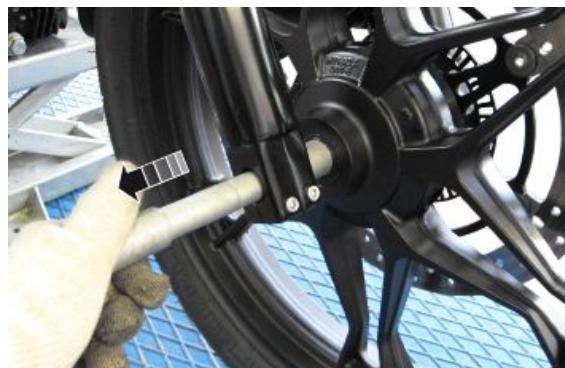
- Place the vehicle on a stable support so that the front wheel does not touch the ground;
- Remove the brake calliper without disconnecting the oil pipes;
- Working on the right side of the motorcycle, remove the cap from the pin;



- Loosen the two wheel pin locking screws;



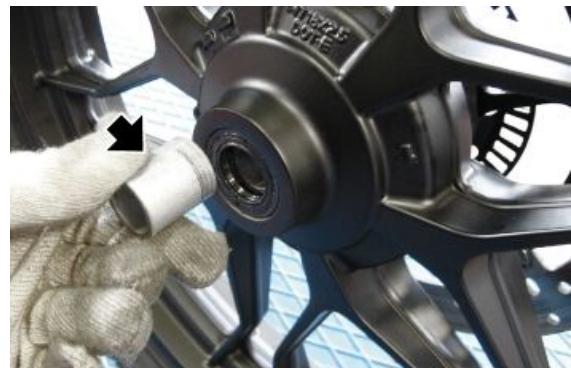
- Unscrew and remove the wheel pin;



- Working on the opposite side, remove the left spacer;

**NOTE**

DURING REFITTING, PAY ATTENTION TO THE CORRECT POSITIONING OF THE SPACER WHICH MUST BE INSERTED IN THE DUST SEAL UNTIL IT REACHES THE BEARING



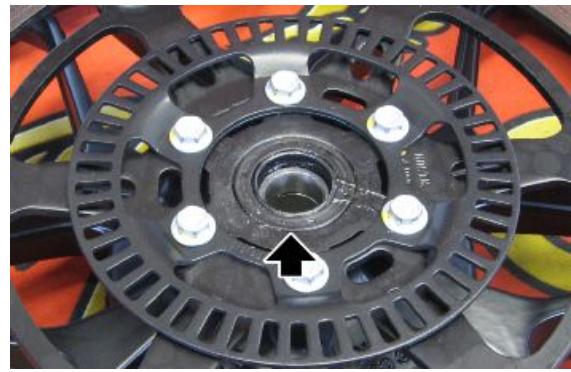
- Working on the opposite side, remove the left spacer;

**NOTE**

DURING REFITTING, PAY ATTENTION TO THE CORRECT POSITIONING OF THE SPACER WHICH MUST BE INSERTED IN THE DUST SEAL UNTIL IT REACHES THE BEARING



- Remove the dust seal from both sides



- Using a generic bearing extractor remove the bearings from both sides

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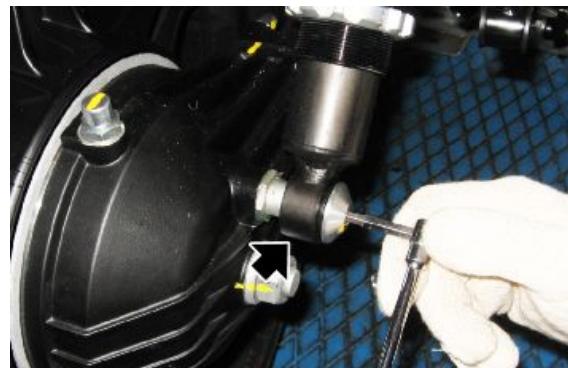
## Rear wheel

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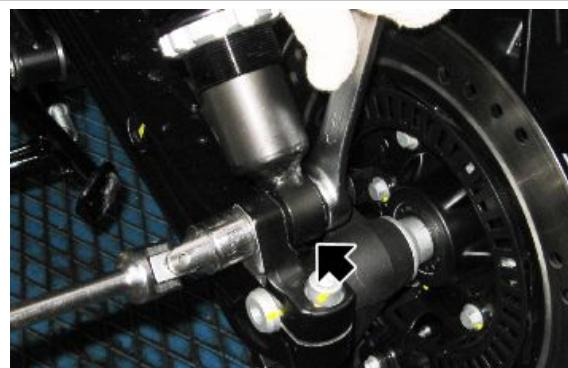
### Rimozione

- Remove the complete rear brake calliper support

- Remove the screw fixing the right-hand rear right shock absorber and pull it from the pin on the drive shaft



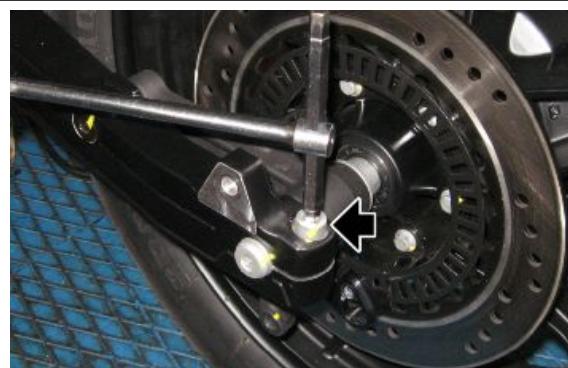
- Remove the screw and the relative nut fixing the left rear shock absorber



- Unscrew and remove the nut and collect the washer.



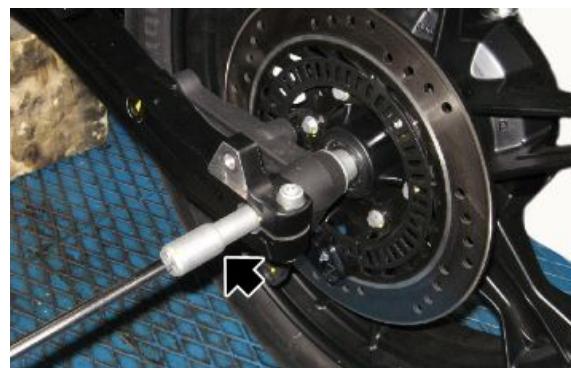
- Loosen the wheel pin locking screw.



- Unscrew and remove the fixing screw of the calliper holder.



- Remove the wheel pin and collect the spacer.



- Remove the complete rear brake calliper support



- Remove the rear wheel



**PLACE A SUPPORT UNDER THE SWINGARM TO AVOID THAT THE PROTECTION CASING OF THE CARDAN COULD BE DAMAGED**



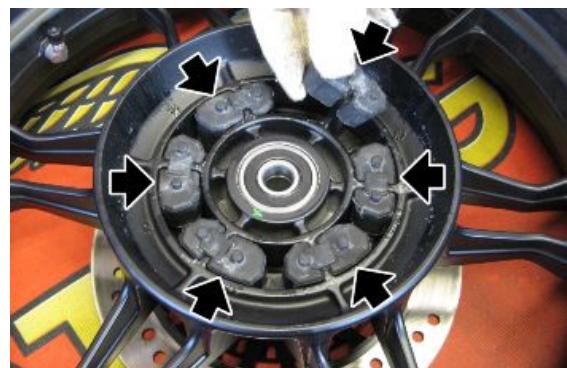
- Working on the left side, remove the spacer;

**NOTE**

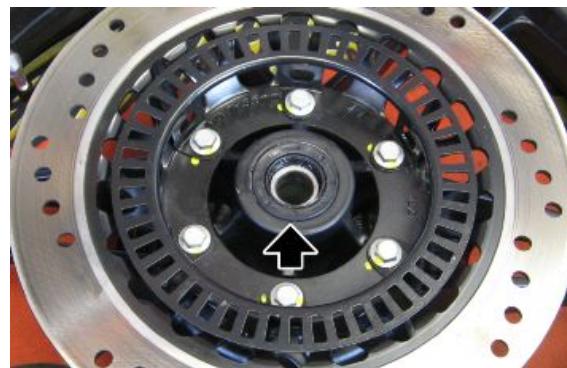
DURING REFITTING, PAY ATTENTION TO THE CORRECT POSITIONING OF THE SPACER WHICH MUST BE INSERTED IN THE DUST SEAL UNTIL IT REACHES THE BEARING



- Remove and if necessary replace the six flexible couplings



- Remove the dust seal



- Using a generic bearing extractor remove the bearings from both sides

## Spoke tension adjustment

**CAUTION**

**DO NOT ADJUST THE TENSION OF THE WHEEL SPOKES WITH TIRES FITTED ON THE WHEEL RIM, AS THIS COULD CAUSE BREAKING OF THE NIPPLE GUARDS AND RESULTING IN HOLES OF THE AIR CHAMBER.**

**IT IS IMPORTANT TO LOCK THE ROTATION OF ALL NIPPLES.**

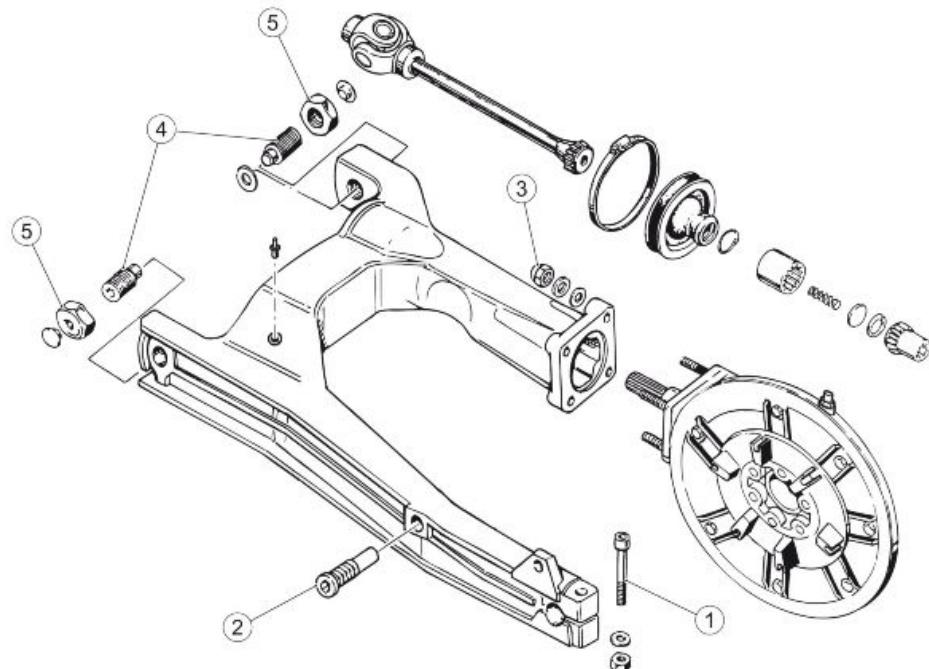
**LOOSENING THE NIPPLE MODIFIES THE TENSION OF THE WHEEL SPOKES COMPROMISING THE SAFETY OF THE WHEEL RIMS AND THE STABILITY OF THE VEHICLE**

- Remove the wheel
- Remove the tires, the air chamber and the nipple guards;
- Locate the wheel spokes (1) to be tightened;

- Operate on the nipple (2) to adjust the relative spoke tension (1);
- screw to tighten the spoke;
- unscrew to loose the spoke;
- The indicative tightening torque of the nipples is:
- front wheel 3 Nm (2.21 lb ft)
- rear wheel 4 Nm (2.95 lb ft).
- Repeat the operation for all spokes by proceeding in successive order;
- After having adjusted the tension of the wheel spokes, check the axial and radial clearance of the wheel rim.

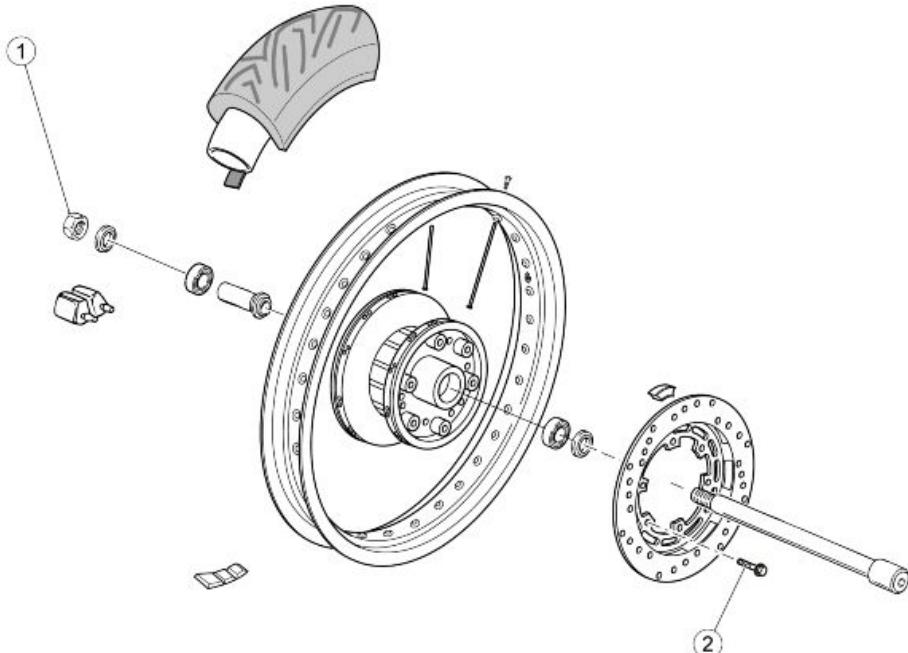
**CAUTION**

**DO NOT ADJUST THE TENSION OF THE WHEEL SPOKES WITH TIRES FITTED ON THE WHEEL RIM, AS THIS COULD CAUSE BREAKING OF THE NIPPLE GUARDS AND RESULTING IN HOLES OF THE AIR CHAMBER.**  
**IT IS IMPORTANT TO LOCK THE ROTATION OF ALL NIPPLES.**  
**LOOSENING THE NIPPLE MODIFIES THE TENSION OF THE WHEEL SPOKES COMPROMISING THE SAFETY OF THE WHEEL RIMS AND THE STABILITY OF THE VEHICLE**

**Swinging arm****REAR TRANSMISSION - SWINGARM**

pos.	Description	Type	Quantity	Torque	Notes
1	Swingarm clamp retaining screw	M10x45	1	30 Nm (22.13 lb ft)	-
2	Pin fixing the rear calliper holding plate to swingarm	M16x1	1	25 Nm (18.44 lb ft)	-

pos.	Description	Type	Quantity	Torque	Notes
3	Nut fixing gearcase to swingarm	M8	4	25 Nm (18.44 lb ft)	Hold the stud bolt
4	Pin fixing swingarm to gearbox	M20x1	2	-	Fully home with no preload
5	Lock nut on swingarm pin	M20x1	2	50 Nm (36.88 lb ft)	Hold the pin



#### REAR WHEEL

pos.	Description	Type	Quantity	Torque	Notes
1	Rear wheel axle nut up to frame serial number ZGULWS00XEM200368	M16x1.5	1	120 Nm (88.51 lb ft)	-
2	Rear wheel axle nut from frame serial number ZGULWS00XEM200369	M16x1.5	1	100 Nm (73.75 lb ft)	-
3	Rear brake disc fixing screw	M8x25	6	25 Nm (18.44 lb ft)	Loctite 243

### Removing

- Remove the left silencer.



- Remove the fixing nut of the cable grommet plate and disconnect it from the swingarm



- Remove the ABS sensor and the brake calliper



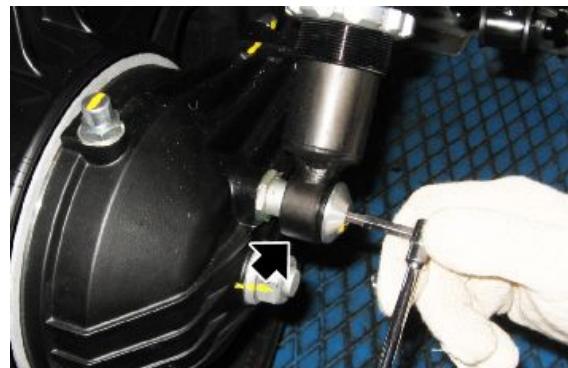
- Unscrew and remove the fixing screw of the calliper holder.



- Remove the screw and the relative nut fixing the left rear shock absorber



- Remove the screw fixing the right-hand rear right shock absorber and pull it from the pin on the drive shaft



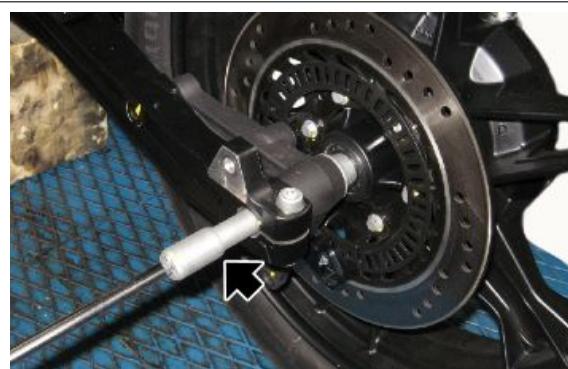
- Unscrew and remove the nut and collect the washer.



- Loosen the wheel pin locking screw.



- Remove the wheel pin and collect the spacer.



- Remove the rear brake calliper support



- Remove the rear wheel.



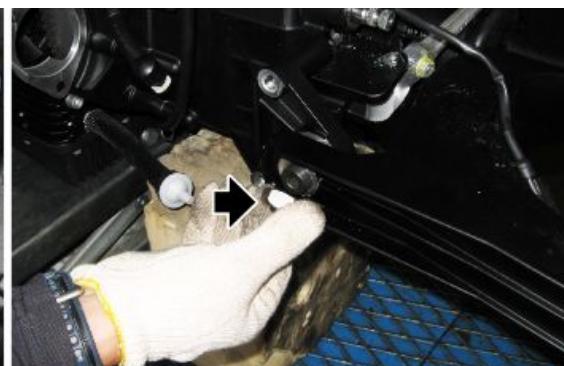
- Cut the sealing clamp and lift the folding

**CAUTION**

PAY ATTENTION NOT TO CUT AND DAMAGE THE RUBBER FOLDING



- Unscrew the nuts.



- Loosen the pins so that the oscillating swingarm can be removed from the gearbox.



- Remove the shimming washer between the swingarm right arm and the gearbox.



## Checking

- Check that the universal joint is not damaged, the gear teeth inserting in the sleeve grooves and the grooves on the joint are not deformed or damaged; otherwise, replace the joint.
- Check that the rubber bellows are not cut or pierced; otherwise, replace it.
- Check that the swingarm pin threads and the swingarm fixing nuts are not damaged, deformed or flattened; otherwise, replace them.
- Check that the sleeve grooves are not damaged, deformed or deteriorated; otherwise, replace the sleeve.
- Check that the spring is not deformed; otherwise, replace it.
- Check that the sealing ring (Seeger) is still flexible and is not deformed.
- Check that the sleeve outer toothing and internal grooves are not damaged.

## Bevel gears

## Removing

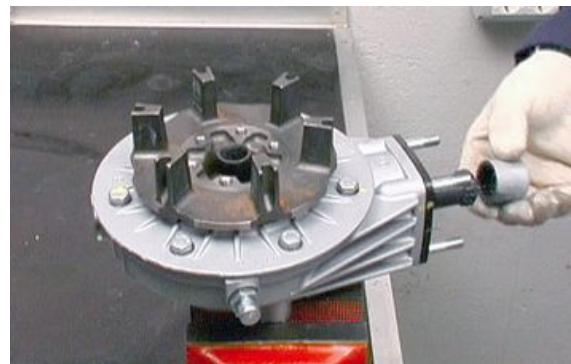
- Undo the four nuts and collect the washers.



- Slide off the gearcase together with the swingarm.



- Slide off the sleeve from the pinion.
- Slide off the spring.
- Slide off the sealing ring.
- Slide off the base.



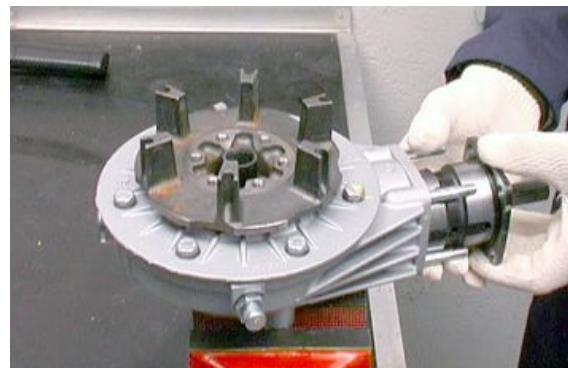
- Slide off the gear.



## Checking

### Gruppo pignone

- Remove the housing of the swingarm .
- Slide the complete case of the gear-case.



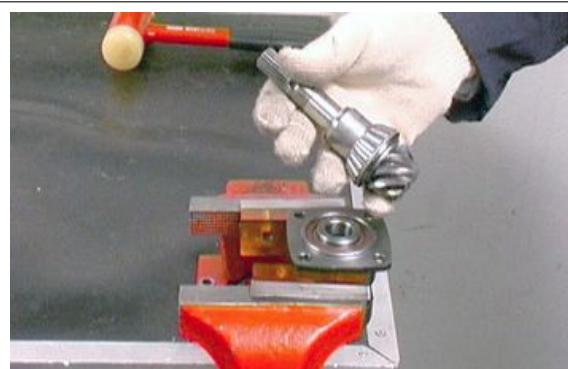
- Lock on the vice the sealing tool (19907100) of the bevel gear pair.



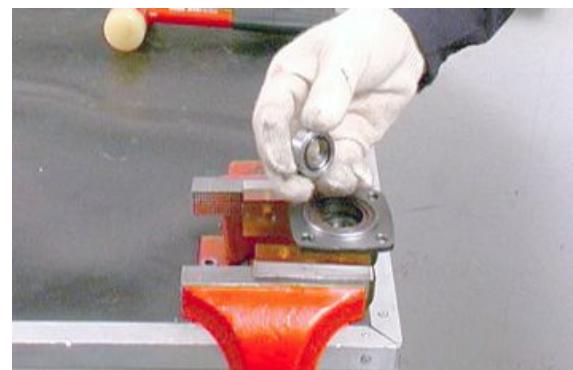
- Insert the grooved shank of the pinion on the tool and unscrew the nut.



- Slide off the spacer.
- Slide off the pinion.



- Slide off the shim adjustment washer.
- Slide off the O-ring.



- Slide off the oil seal.



- Slide off the tapered bearing from the case.
- Slide off the O-ring.
- Slide off the spacer.
- Slide off the two shim washers.



- Slide off the tapered bearing from the case.



### Controllo

- Check that the pinion toothing is not damaged, worn or deformed; otherwise, replace the pair.

- Check that both tapered bearings are not damaged, that the rollers are not damaged or worn; otherwise, replace them.
  - Check that the adjustment washers are not deformed or broken; otherwise, replace them.
  - Check that the sealing rings are not shattered, spoiled or worn; otherwise, replace them.
- 

## Montaggio

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- If the bevel pinion should be replaced, replace also the crown fitted on the housing. The pinion and the crown should have the same number stamped.



- Fit the external ring of the tapered bearings on the bevel pinion holder case using the suitable punch (19926400).



- 
- Fit the adjustment shim washer.



- 
- Fit the internal ring of the bearing on the pinion using the suitable punch (19926200).



- 
- Fit both shim washers on the pinion.
  - Fit the spacer on the pinion.
  - Fit the O-ring.



- 
- Fit the complete pinion on the case using the suitable punch (19926100).



- Fit the oil seal.
- Fit the O-ring.



- Fit the spacer.



- Insert the grooved shank of the pinion on the tool (19907100) and tighten the nut.



---

### Smontaggio gruppo scatola

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- Undo the screws and collect the washers.



- Remove the braking disc from the drilled bolt.
- Undo the screws and collect the plates and the wave washers.
- Slide off the complete cover.
- Slide off the gaskets.
- Slide off the shimming ring.



- Remove the O-ring from the groove on the drilled bolt.



From the cover, slide off:

- The needle bearing.
  - Remove the internal ring of the needle bearing using a suitable punch (19907000).
  - Remove the washer.
  - Remove the washer.
- 
- Undo the screws and collect the corresponding safety plates.



- 
- Remove the conical crown.



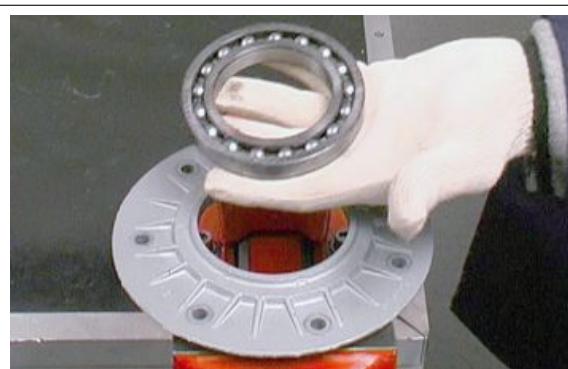
- Slide off the drilled bolt from the bearing.



- Remove the sealing ring.



- Slide off the bearing from the cover using the suitable punch.



- Remove the external ring of the needle bearing from the housing using the suitable extractor (19927500).



- Remove the sealing ring and the washer.



---

**Controllo**

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- Check that the drilled bolt tongues, where the anti-vibration rubbers operate, are not spoiled; that the surfaces of: the sealing ring; the bearing on the cover, the external ring of the bearing on the housing; the groove for the circlip on the drilled bolt are not worn, deformed or spoiled; otherwise, replace them.
- Check that the sealing ring on the housing is not shattered or is still flexible; otherwise, replace it.
- That the needle bearing on the housing does not have flattened or worn rollers; otherwise, replace it.
- Check efficiency of every component and that the coupling surfaces of the housing and cover are not scored or distorted.

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**Accoppiamento pignone corona**

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For coupling, proceed as follows:

- Provisionally lock the complete pinion case on the housing with two nuts and appropriate spacers.
- Fit the corresponding tool on the crown (19928800).



- Insert the tool on the bearing cage in the housing.



- Check alignment between pinion teeth and the crown teeth.
- If alignment is not regular, properly vary the thickness of the ring between the pinion and the tapered bearing.
- Also check the contact area between the pinion teeth and the crown teeth, proceeding as follows:



- Apply suitable colours available in the market on the pinion teeth.



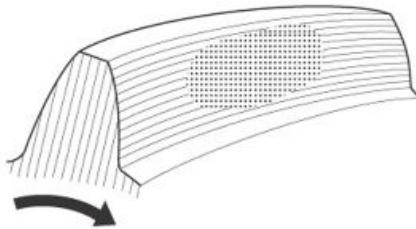
- Fit the drilled bolt-crown unit cover and their spacers and gaskets on the housing and provisionally tighten the screws.



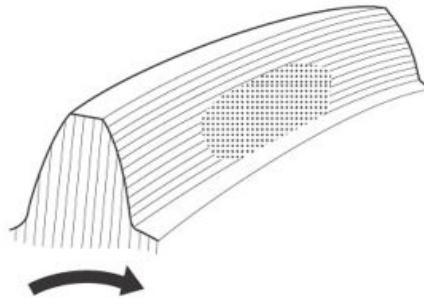
- On the crown holder drilled bolt, fit a "Universal" extractor that with appropriate central spacers slightly presses the crown towards the brake disc side.
- Turn the pinion in the riding direction, with the crown braked so that the rotation is carried out under load, and leaves a contact mark on the pinion surface.



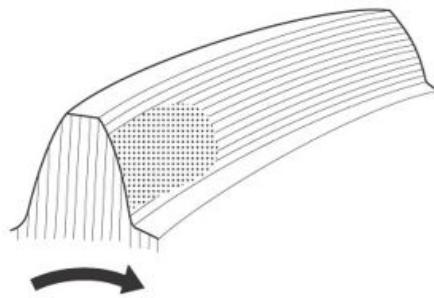
- If the contact is regular, the mark on the pinion teeth will be like this (the pinion is seen from the crankshaft side)



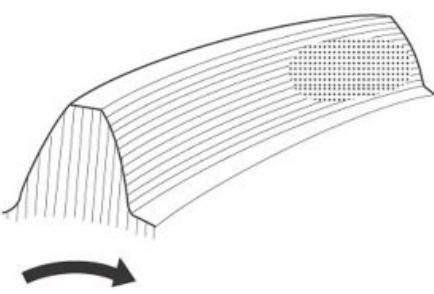
- If the contact is like this, the crown is too near the pinion rotation axis: detach the crown by increasing spacer thickness.



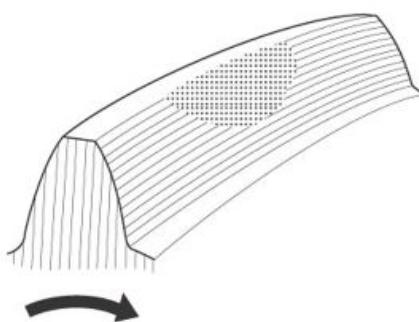
- If the contact is like this, the pinion is too near the rotation axis of the crown: detach the pinion by reducing spacer thickness



- If the contact is like this, the pinion is too far from the rotation axis of the crown: approach the pinion by increasing spacer thickness



- If the contact is like this, the crown is too far from the pinion rotation axis: approach the crown by reducing spacer thickness.



### Montaggio gruppo scatola

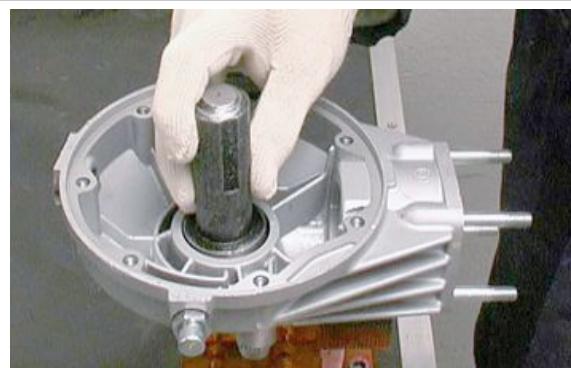
- Fit the washer on the gearcase.



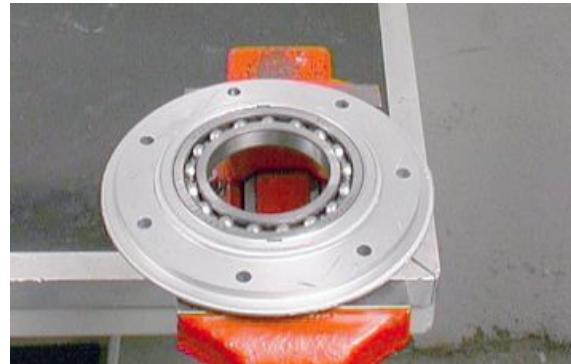
- Fit the sealing ring on the housing using the suitable punch (19926000).



- Fit the external ring of the needle bearing on the housing using the suitable punch (19926500).



- Fit the bearing on the cover using the suitable punch.



- Fit the internal ring of the needle bearing on the drilled bolt using the suitable punch (19927900).
- Insert the sealing ring in the drilled bolt.



- Fit the drilled bolt on the cover.



- Fit the crown.



- Fit the plates and tighten the screws.



- 
- Insert the washer.



- 
- Insert the washer.



- 
- Fit the O-ring.
  - Insert the gaskets and the shimming ring on the cover.
  - Tighten the screws with plates and washers.

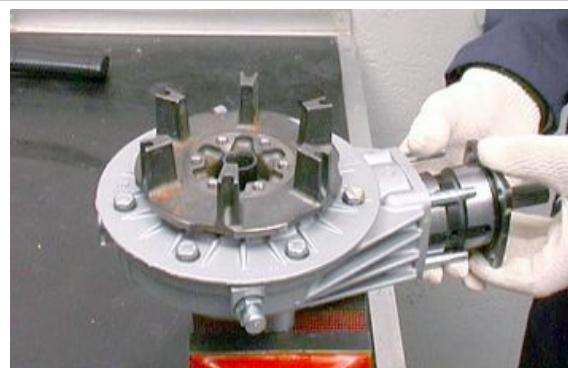


- 
- Fit the braking disc on the drilled bolt by locking the screws with the washers using a torque wrench.



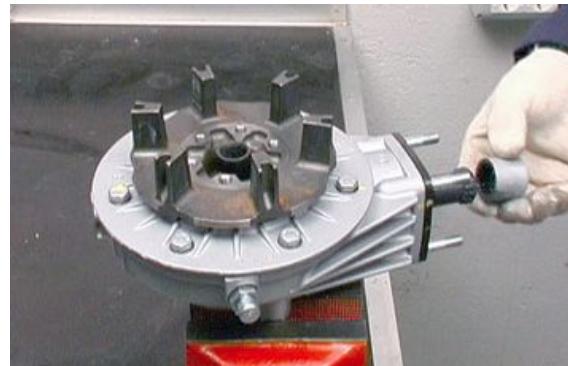


- When refitting the bevel pinion case on the transmission, bear in mind that the oil passage grooves with holes should be fitted vertically (observing the grooves, one should be facing upwards and the other facing the ground).

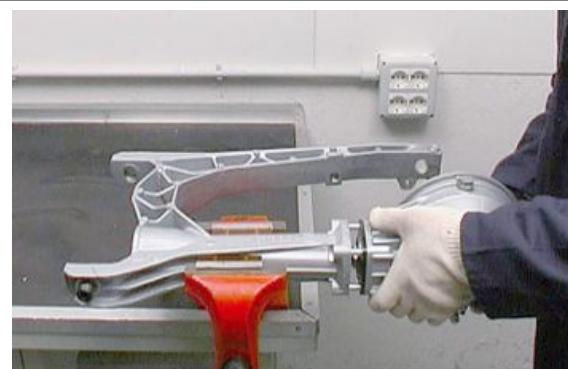


## Installing

- Insert the sleeve and base on the bevel pinion of the gearcase.



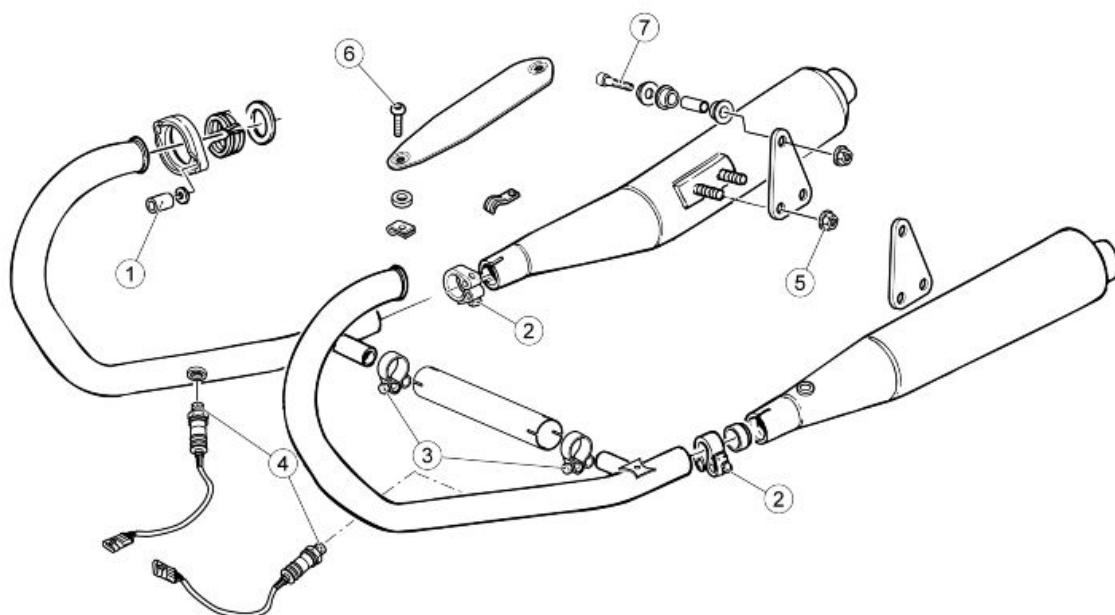
- Correctly insert the stud bolts of the gearcase in the holes of the swingarm .



- Screw the nuts with the washers without locking them.



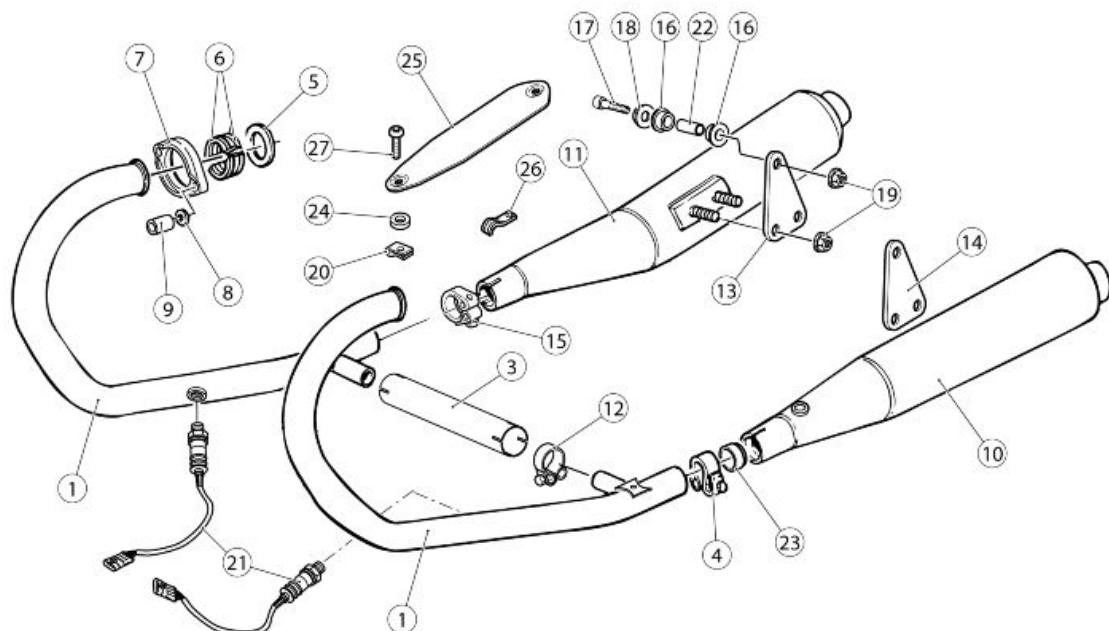
## Exhaust



### EXHAUST SYSTEM

Pos.	Description	Type	Quantity	Torque	Notes
1	Exhaust pipe fixing nut to the engine	M6	4	10 Nm (7.37 lb ft)	-

Pos.	Description	Type	Quantity	Torque	Notes
2	Exhaust pipe fixing clamp screw to the compensator	M6	1+1	10 Nm (7.37 lb ft)	-
3	Compensator fixing clamp screw to the silencer	M6	2	10 Nm (7.37 lb ft)	-
4	Lambda probe on compensator	M18x1.5	1	38 Nm (28.03 lb ft)	-
5	Nut fastening silencer to mounting plate	M8	4	25 Nm (18.44 lb ft)	-
6	Heat shield fixing screw	M6x12	6	10 Nm (7.37 lb ft)	Loctite 270
7	Screw fixing silencer mounting plate to frame	M8x40	2	25 Nm (18.44 lb ft)	-

**key:**

1. Right exhaust pipe
2. Left exhaust pipe
3. Exhaust manifold fitting
4. Left silencer clamp
5. Gasket
6. Spacer
7. Ring nut
8. Washer
9. Nut
10. Left silencer
11. Right silencer
12. Clamp
13. Right plate
14. Left plate

- 15.Right silencer clamp
- 16.Muffler rubber ring
- 17.TCEI screw
- 18.Silencer fixing bushing
- 19.Nut
- 20.Elastic plate
- 21.Lambda probe
- 22.Spacer
- 23.Bushing
- 24.Insulating washer
- 25.Silencer heat protection
- 26.U-bolt
- 27.Flanged TBEI screw

### Removing the tail pipe

The engine and the exhaust system components get very hot and remain in this condition for a certain time interval after the engine has been switched off. Before handling these components, make sure that you are wearing insulating gloves or wait until the engine and the exhaust system have cooled down.

- Loosens the clamps between the exhaust pipes and catalytic converter.



- Unscrew and remove the muffler fixing nut and collect the screw and the bushing.

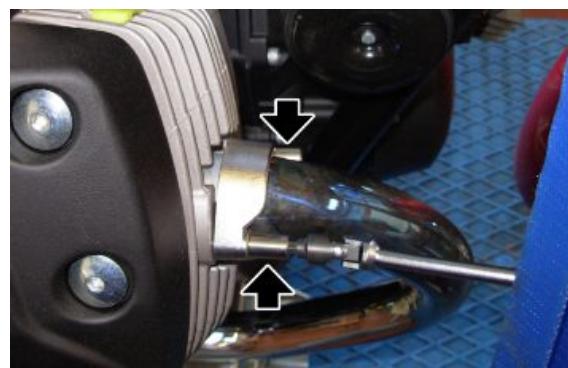


- Remove the silencer



## Removing the exhaust manifold

- Remove the exhaust ring fixing nuts, taking care to recover the washers



- Remove the spacers



- Remove the ring nuts



- Disconnect the left lambda probe connector



- Remove the starter motor to allow the removal of the left lambda probe wiring.



- Disconnect the right Lambda probe connector and slide the cabling from the cable grommet



- Loosen the clamps between the joint and the exhaust manifolds
- Remove the manifolds



## Removing the lambda sensor

- Remove the starter motor
- Disconnect the left lambda probe connector (1)



- Disconnect the right Lambda probe connector (2)



- Unscrew and remove the lambda probes (3)



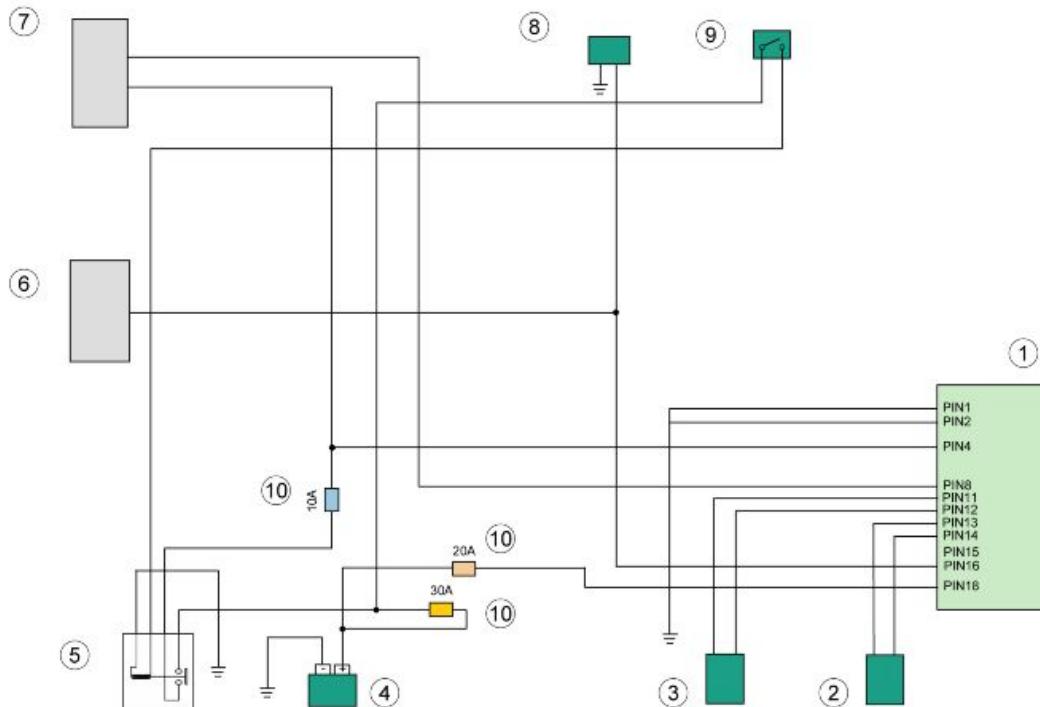
## INDEX OF TOPICS

BRAKING SYSTEM

BRAK SYS

**ABS****ABS SYSTEM**

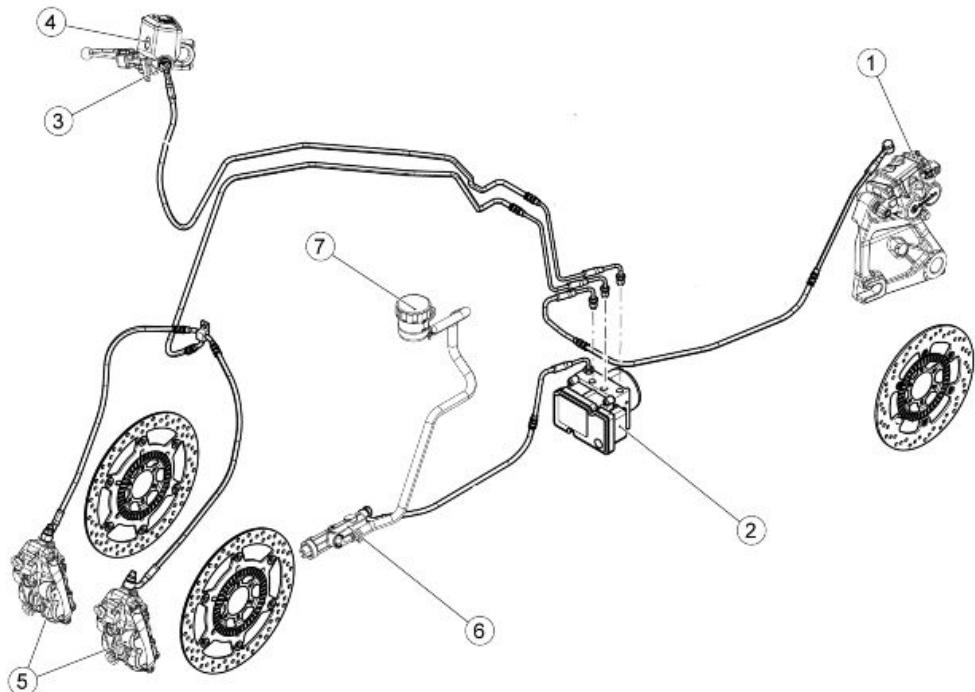
pos.	Description	Type	Quantity	Torque	Notes
-	ABS ECU fastener screw	M6x25	1	10 Nm (7.37 lb ft)	Loctite 243
-	ABS ECU fastener nut	M6	2	10 Nm (7.37 lb ft)	-

**key:**

1. ABS ECU control unit
2. Front ABS sensor
3. Rear ABS sensor
4. Battery
5. Main relay
6. ECU
7. Instrument panel
8. K line (diagnosis)
9. Key
10. Fuses

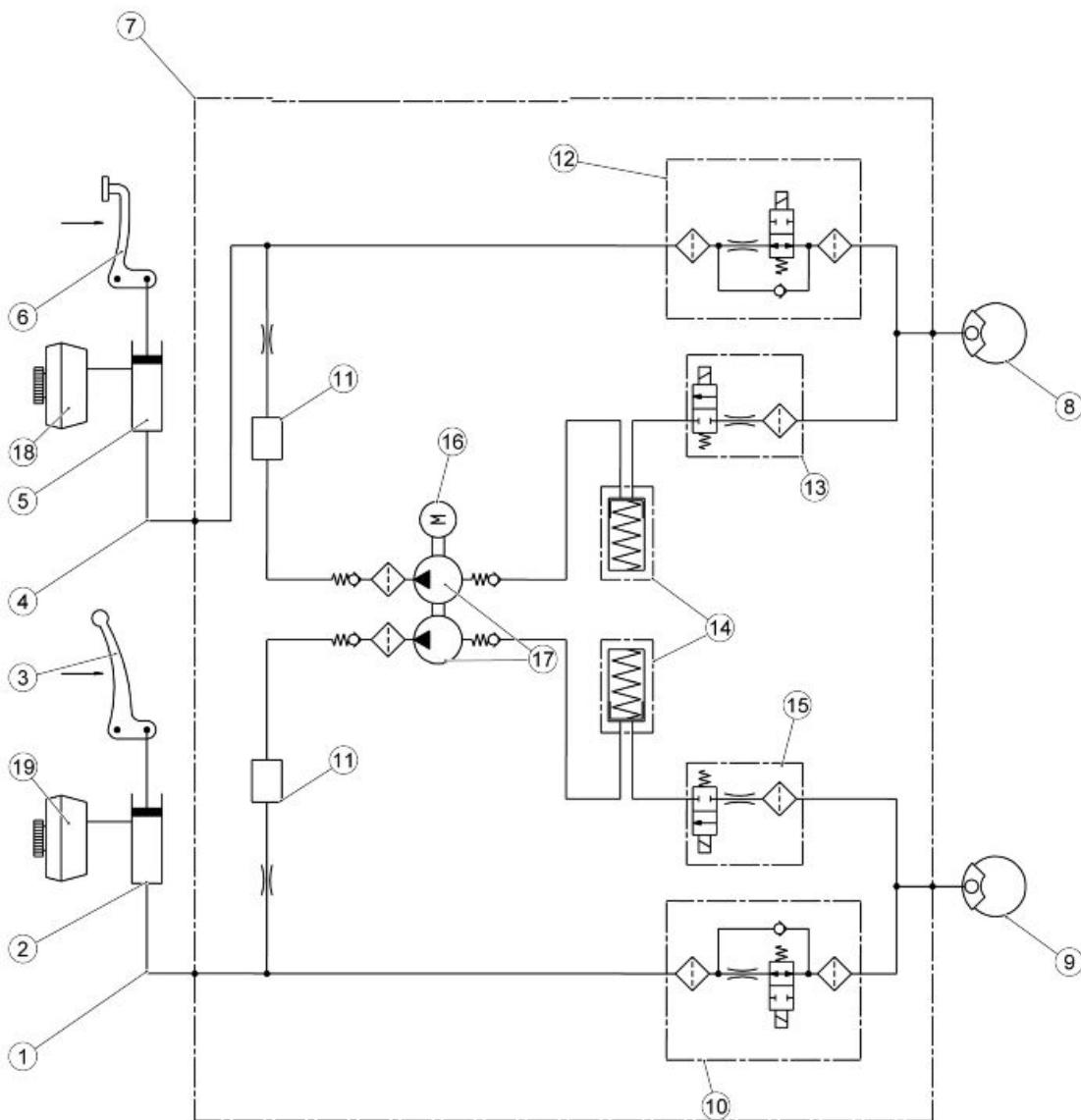
**ABS ECU control unit pin configuration**

- PIN 1 - GND - Ground
  - PIN 2 - PCC1 - Vehicle identification ground connection
  - PIN 4 - IGN - Injection
  - PIN 8 - WL - Alarm warning light
  - PIN 11 - R\_SIGN - Rear ABS sensor signal
  - PIN 12 - R\_GND - Rear ABS sensor ground connection
  - PIN 13 - F\_GND - Front ABS sensor ground connection
  - PIN 14 - F\_SIG - Front ABS sensor signal
  - PIN 15 - PCC2 - Vehicle identification ground connection
  - PIN 16 - ISO\_K - K line (diagnosis)
  - PIN 18 - KL30 - Power supply
-

**Foreword****key:**

1. Rear brake calliper
2. Modulator
3. Front bleed valve
4. Front brake reservoir
5. Front brake callipers
6. Rear brake pump
7. Rear brake reservoir

## Operating diagram



### ABS functional diagram key

1. Front system circuit
2. Front brake pump
3. Front brake lever
4. Rear system circuit

5. Rear brake pump
6. Rear brake pedal control
7. ABS control unit
8. Rear brake calliper
9. Front Calliper
10. Front brake circuit intake solenoid valve (normally open)
11. Humidifier
12. Rear brake circuit intake solenoid valve (normally open)
13. Rear brake exhaust circuit solenoid valve (normally closed)
14. Rear/front brake circuit low pressure accumulator
15. Front brake exhaust circuit solenoid valve (normally closed)
16. DC electric motor
17. Double circuit hydraulic pump (ABS)
18. Rear brake reservoir
19. Front brake reservoir

## **ABS OPERATION**

### **General specifications:**

The front circuit is similar to the rear circuit.

- The ABS inlet valve (10 - 12) is normally open and it is closed only when the system intervenes to avoid wheel locking.
- The outlet valve (13 - 15) is normally closed and it is opened only when the system intervenes to avoid wheel locking.
- When the system is in standby, the ABS processor never stops monitoring the speed of the wheels in order to assess potential wheel slippage.
- When in standby, the system does not intervene at all when the rider brakes; the braking system is the same as the one without ABS.

### **Stages in ABS cycle (the following operations refer to the front circuit but are also applicable to the rear one):**

**A - Brake activation:** the rider starts braking as he would usually do.

**B - Pressure reduction:** it coincides with danger recognition (wheel slippage above threshold): the system closes the inlet valve (10-12) and opens the outlet valve (13-15) temporarily.

At this stage the rider cannot increase the pressure on the callipers (8-9) and the system reduces the pressure on the callipers partially. The excess fluid temporarily fills the front reservoir (18-19) until the ABS pump (17) self-activates and delivers the fluid back to the brake pump (2-5).

**C - Pressure maintained:** the pressure in the callipers (8-9) remains low until total recovery of speed / wheel grip.

The system restores the fluid taken from the calliper (8-9) in the section of the system between the brake pump (2-5) and the ABS inlet valve (10-12).

**D - Pressure restored:** by opening the inlet valve (10-12) momentarily, the pressure of the callipers (8-9) is increased until maximum deceleration is reached. Then, the system gives the control over the braking back to the rider.

**E -** If the wheel does not reach complete grip, the system continues operating as before until complete grip is obtained or until the vehicle stops. An error can be detected if the duration of the pressure reduction phase exceeds the pre-set time limit.

### ABS SYSTEM DESCRIPTION

The ABS system is a device to avoid wheels locking in case of emergency braking, increasing vehicle braking stability when compared to a traditional braking system.

Sometimes when the brake is operated, the tyre locks with a consequent loss of grip, which makes it difficult to control the vehicle. A position sensor (3) on the tone wheel (2), forming an integral unit with the vehicle wheel, "reads" the status of the vehicle wheel spotting any possible lock.

A control unit (1) signals this out and adjusts the pressure in the braking circuit accordingly.

#### NOTE

**WHEN THE ABS SYSTEM STARTS WORKING, A VIBRATION IS FELT ON THE BRAKE LEVER.**



**THE WHEEL ANTILOCK BRAKING SYSTEM DOES NOT PREVENT FALLS WHILE ON A BEND. AN EMERGENCY BRAKING WITH THE VEHICLE INCLINED, HANDLE BAR TURNED, ON UN-EVEN OR SLIPPERY ROADS, OR WITH POOR GRIP CREATES LACK OF STABILITY DIFFICULT TO HANDLE. THEREFORE, RIDE CAREFULLY AND SENSIBLY AND ALWAYS BRAKE GRADUALLY. BRAKING WHILE TURNING A CORNER IS SUBJECT TO LAWS OF PHYSICS WHICH NOT EVEN ABS CAN ELIMINATE.**



When the sensors (3) detect a significant speed difference between the rear and the front wheels (for example, when rearing up on the back wheel), the ABS system could take this as a dangerous situation. In this case, two things may occur:

- The ABS system intervenes by releasing pressure from the calliper until the wheel turns again at the same speed of the other wheel. It is not possible to brake for an instant.
- if the speed difference lasts long, the system may detect an error and deactivate the ABS system. As a consequence, the system works like any regular braking system.

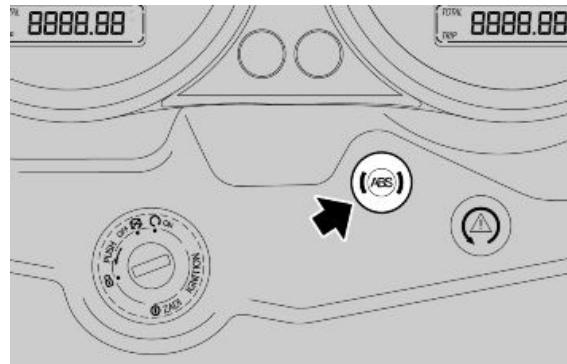
### Riding with an active ABS system

- When starting the engine, the ABS warning light on the dashboard (4) lights up and flashed until reaching 5 km/h (3.1 mph), at this point it turns off.

**CAUTION**

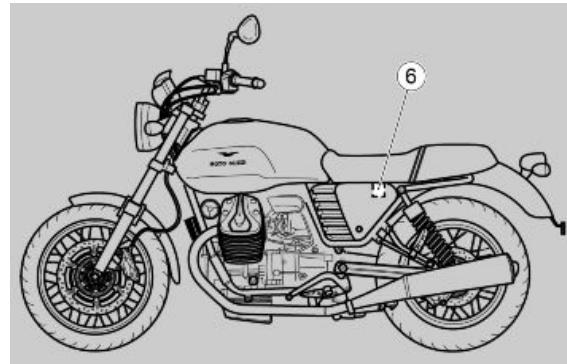


THE STEADY LIGHTING OR THE CONTINUOUS FLASHING OF THE ABS WARNING LIGHT INDICATES THE PRESENCE OF AN ANOMALY AND THE DEACTIVATION OF THE ABS FUNCTIONALITY.



### 20 A fuse (ABS Main fuse) (6)

Protects: ABS Control unit.



## Guide to diagnosis

### PREMISE

Each time the key is ON, at least one current or stored\* error of the ABS system is often detected:

- the ABS warning light turns on permanently

The ABS system is deactivated!

The system operates perfectly just as any other braking system without ABS

\* The diagnosis requires exceeding the 5 km/h.

Each time the key is ON, if at least one current or stored\* error of the ABS system is not detected:

- the ABS warning light flashes

When the 5 km/h (3.11 mph) are exceeded:

- if errors are not detected

- the ABS warning light turns off

- if at least one malfunction is detected

- the ABS warning light turns on permanently

**The ABS system is deactivated!**

**The system operates perfectly just as any other braking system without ABS.**

The detection of malfunctions may require more or less time according to the type of failure.

Error detection logic foresees that for the errors to be diagnosed one or more conditions must persist within a given time.

If during this given time one of the conditions is missing but then it comes back, the timer is reset and the system is no longer able to diagnose the error.

The ABS system is still inactive.

**Example:**

- error code 5D93 requires some minutes before it is diagnosed during the given time:

- the ABS warning light ABS keeps flashing
- 

**ABS FAULTS - GUIDE TO THE DIAGNOSIS**

1. ABS WARNING LIGHT ON

2. CONNECT PADS

**PADS COMMUNICATE? (NO, go to 3; YES, go to 4)**

3.PERFORM THESE CHECKS:

- A. Ground connection PIN 1
- B. +12V at PIN 18
- C. +12V at PIN 4 with key ON

**4. ARE THERE ANY ERRORS? YES, go to point 5; NO, go to 6)**

5. CONSULT THE ERRORS TABLE

6. ABS WARNING LIGHT ACTIVATION

**ACTIVE?(YES, go to 7; NO, go to 8)**

7. CONTACT TECHNICAL SERVICE

8. CHECK:

- A. Cable continuity between PIN 8 of the ABS control unit connector and PIN 28 of the instrument panel.
- B. Check connectors - refer to the operations described in the chapter

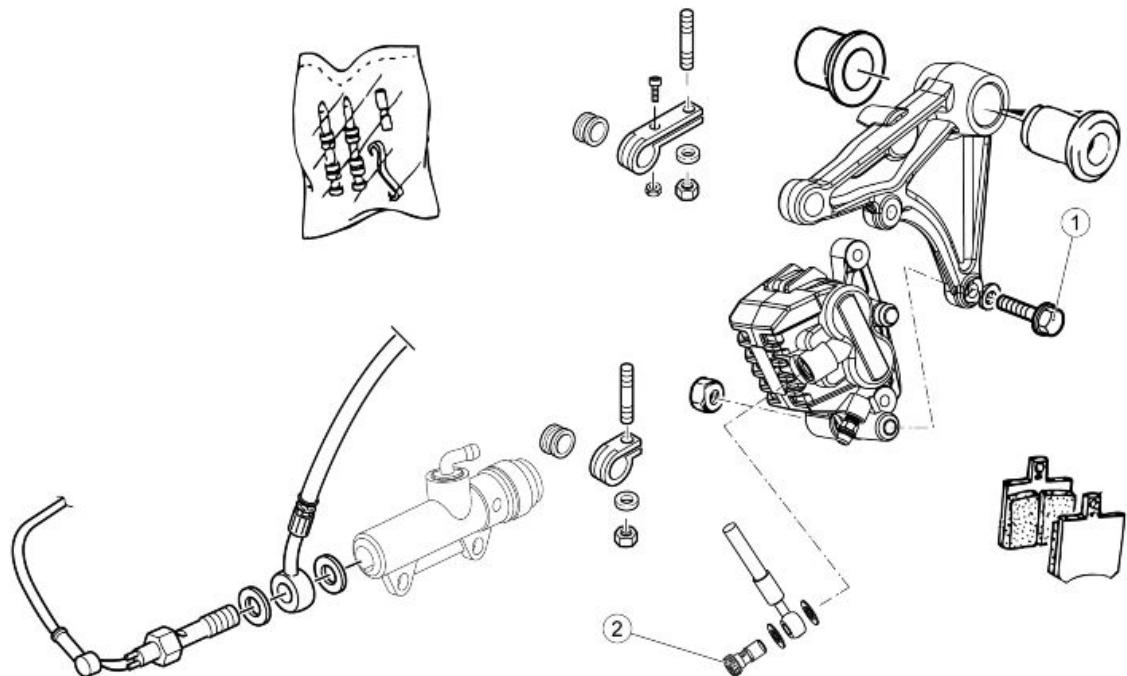
**If the previous checks are OK, the causes might be:**

- C. ABS control unit malfunction
- D. Instrument panel malfunction

**NOTE: to check the wheel speed sensor using the NAVIGATOR, follow the instructions given in chapter "ELECTRICAL SYSTEM/CHECKS AND TESTS/SPEED SENSOR".**

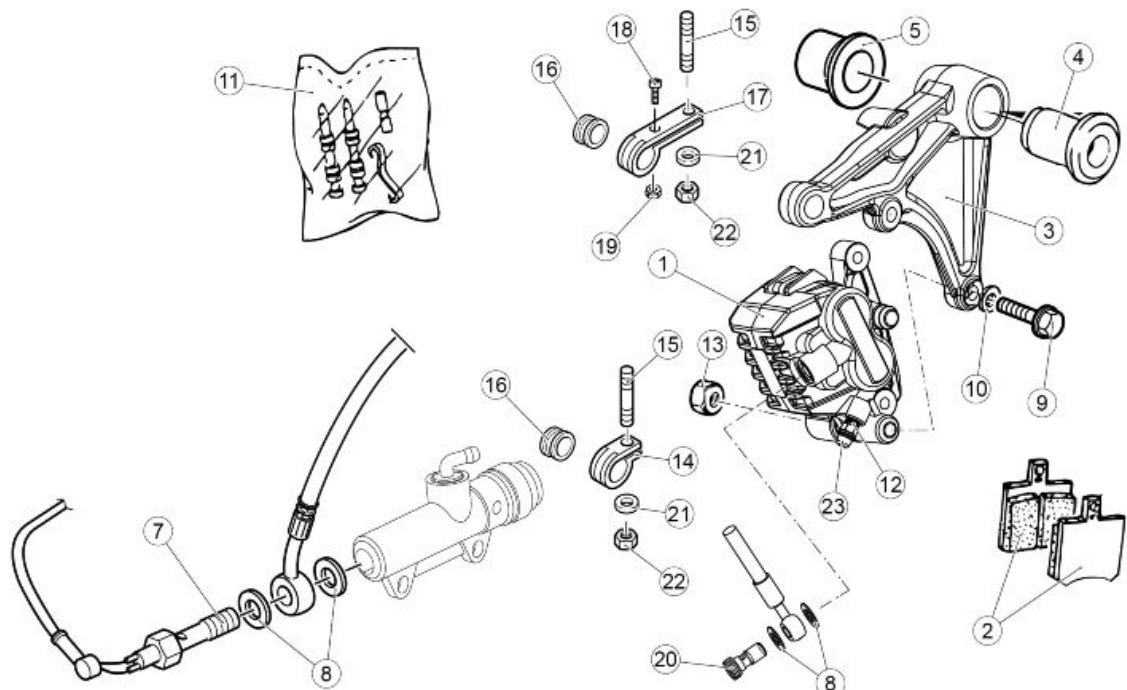
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## Rear brake calliper



### REAR BRAKE SYSTEM

pos.	Description	Type	Quantity	Torque	Notes
1	Rear brake calliper fixing screw	M8x30	2	25 Nm (18.44 lb ft)	-
2	Drilled screw for brake pipe on caliper	-	1	25 Nm (18.44 lb ft)	-



1. Rear brake calliper

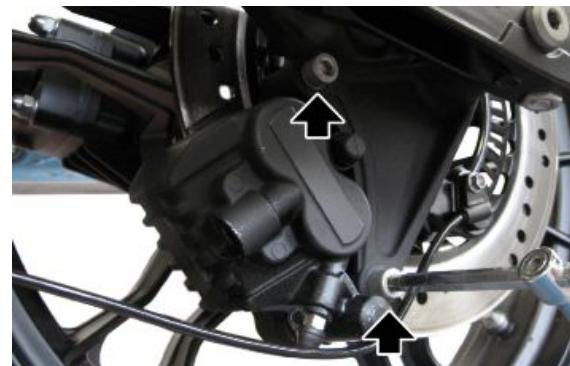
2. Plate-torque
  3. Brake calliper mounting plate
  4. Bushing
  5. Spacer
  6. Rubber rear brake pipe / Braid rear brake pipe
  7. Hydraulic switch
  8. Gasket
  9. TE Flanged screw
  10. Washer 8.4x15
  11. Pins + Calliper springs
  12. Air bleed
  13. M8 Flanged self-locking nut
  14. Clamp
  15. Stud bolt
  16. Ring
  17. Clamp
  18. Screw
  19. Nut M4x0.7
  20. Oil pipe screw
  21. 6.4x12x1.2 washer
  22. M6 Flanged self-locking nut
  23. Air bleed cap
- 

## Removal

- Obtain a special container and empty the system
- Remove the screw fixing the brake pipe to the clamp



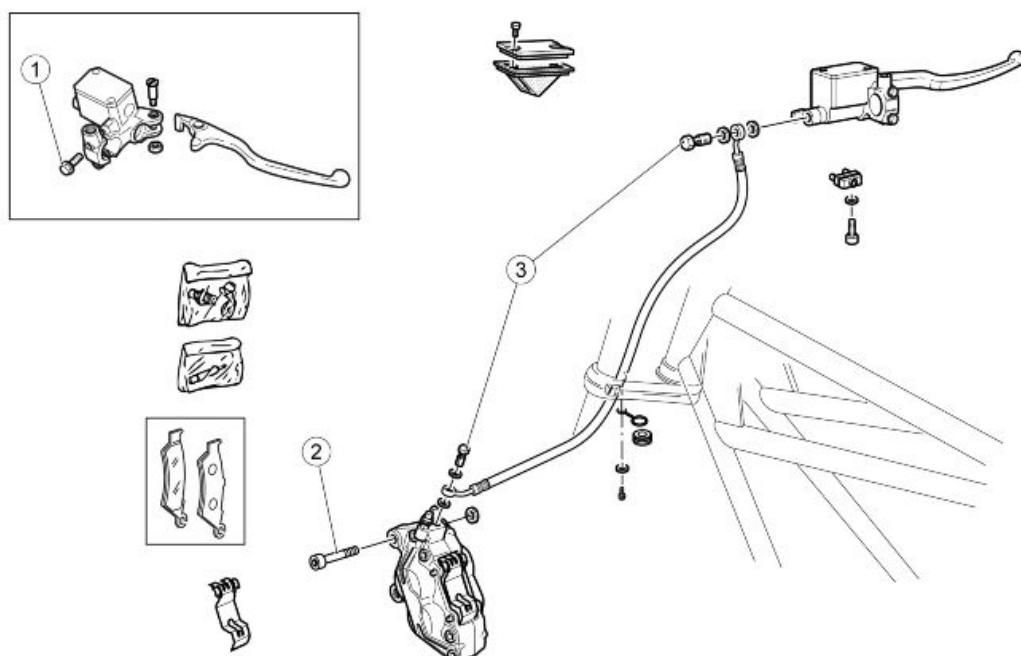
- Remove the two calliper fixing screws



- Remove the calliper



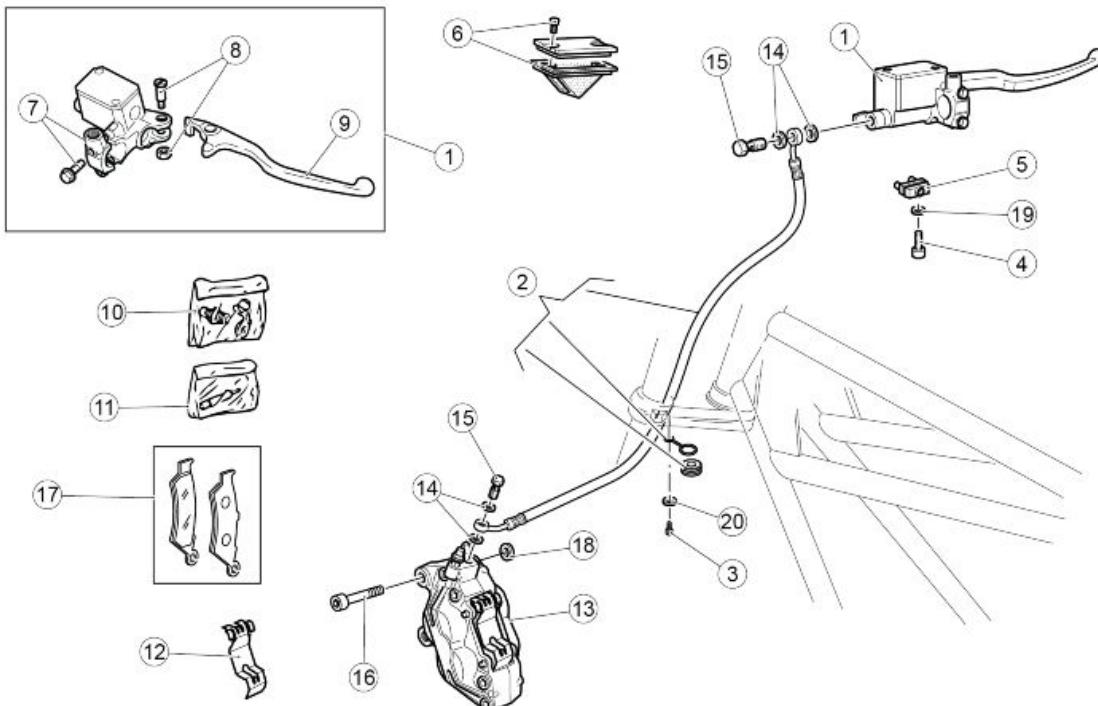
## Front brake calliper



### FRONT BRAKE SYSTEM

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening the brake pump U-bolt to the semi-handlebar	M6x25	2	10 Nm (7.37 lb ft)	-
2	Front brake calliper fixing screw	M10x30	2	50 Nm (36.88 lb ft)	-

pos.	Description	Type	Quantity	Torque	Notes
3	Drilled screw for brake fluid pipe on pump and calliper	-	2	25 Nm (18.44 lb ft)	-



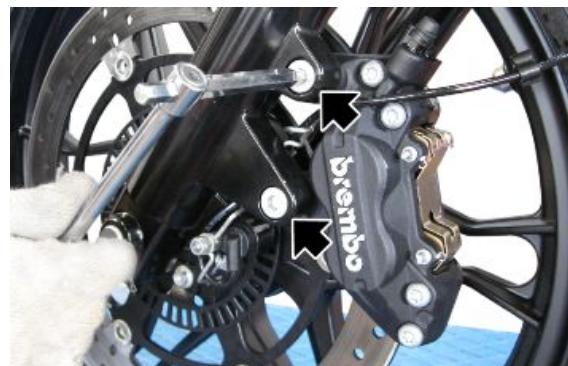
1. Front brake pump
2. Brake pipe
3. M6x12 TE flanged screw
4. TBEI M4x12 screw
5. Stop switch
6. Pump cover
7. U-bolt
8. Lever pin
9. Brake lever
10. Bleeding+hood
11. Pins + Calliper springs
12. Spring
13. Left front brake calliper black
14. Gasket
15. Oil pipe screw
16. TCEI M10x1.25 screw
- 17 Pads-torque
18. 10.25X20X4 spacer
19. 4.3x8x1.5 washer
20. 6.4x12x1.2 washer

## Removal

- Obtain a special container and empty the system
- Remove the screw fixing the brake pipe to the clamp



- Remove the two calliper fixing screws



- Remove the calliper



## Rear brake disc

## Removal

- Remove the rear wheel
- Remove the six fixing screws (1) of the tone wheel and the front disc



- Remove the tone wheel (2)



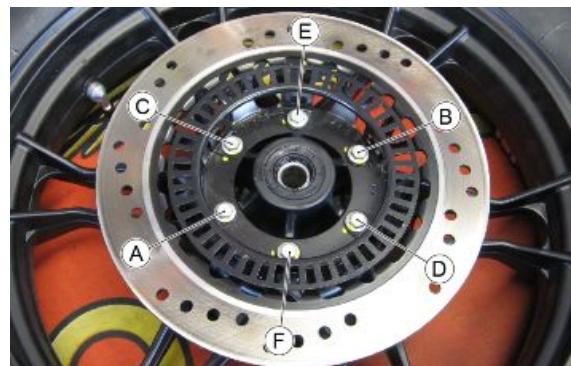
- Remove the brake disc (3)



DURING REFITTING, APPLY LOCTITE 243 ON THE THREAD OF THE BRAKE DISC SCREWS (1).

**CAUTION**

DURING REFITTING, SCREW ALL THE SCREWS (1) MANUALLY AND TIGHTEN THEM OPERATING DIAGONALLY FOLLOWING THIS SEQUENCE: A-B-C-D-E-F.



## Disc Inspection

**CAUTION**

THE BRAKE DISC SHAPE DOES NOT CHANGE THE OPERATING AND MAINTENANCE SPECIFICATIONS OF THE SYSTEM.

- The following operations are to be carried out with brake disc fitted on the wheel.
- Check the disc for wear by measuring the minimum thickness with a micrometer in different points. If the minimum thickness, even in a single point of the disc, is less than the minimum value, replace the disc.



**Disc thickness minimum value: 4.5 mm (0.18 in)**

## Front brake disc

### Removal

- Remove the rear wheel
- Remove the six fixing screws (1) of the tone wheel and the front disc



- Remove the tone wheel (2)



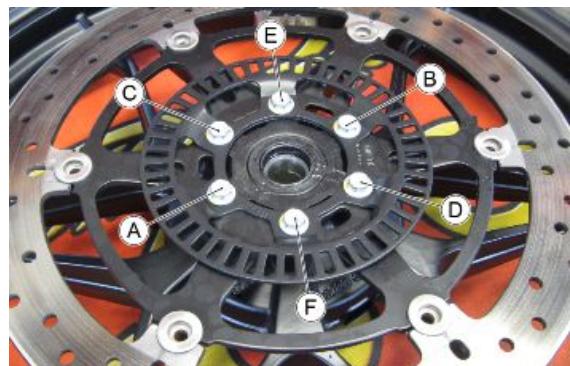
- Remove the brake disc (3)



**DURING REFITTING, APPLY LOCTITE 243 ON THE THREAD OF THE BRAKE DISC SCREWS (1).**

**CAUTION**

**DURING REFITTING, SCREW ALL THE SCREWS (1) MANUALLY AND TIGHTEN THEM OPERATING DIAGONALLY FOLLOWING THIS SEQUENCE: A-B-C-D-E-F.**

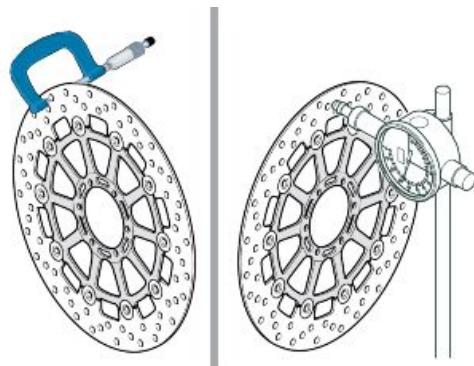


## Disc Inspection

**CAUTION**

**THE FRONT BRAKE DISC SHAPE DOES NOT CHANGE THE OPERATING AND MAINTENANCE SPECIFICATIONS OF THE SYSTEM.**

- The following operations must be carried out with the brake discs fitted on the wheel; they refer to a single disc, but are valid for both.
- Check the disc for wear by measuring the minimum thickness with a micrometer in different points. If the minimum thickness, even in a single point of the disc, is less than the minimum value, replace the disc.



**Disc thickness minimum value: 4 mm (0.16 in)**

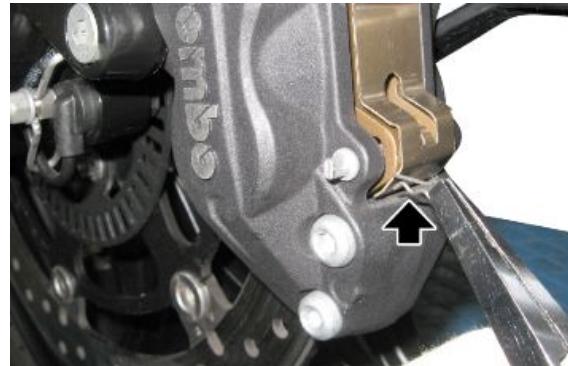
- Using a dial gauge, check that the maximum oscillation of the disc does not exceed the tolerance; otherwise, replace it.

**Disc oscillation tolerance: 0.15 mm (0.0059 in)**

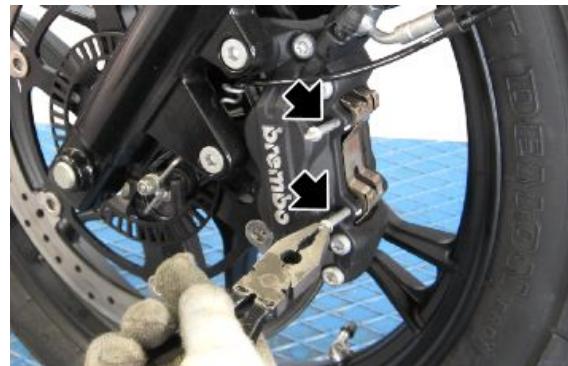
## Front brake pads

### Removal

- Remove the Seeger locking the retaining pins of the brake pads



- Remove the brake pad retaining pins



- Collect the protection plate.



- Remove the brake pads



## Rear brake pads

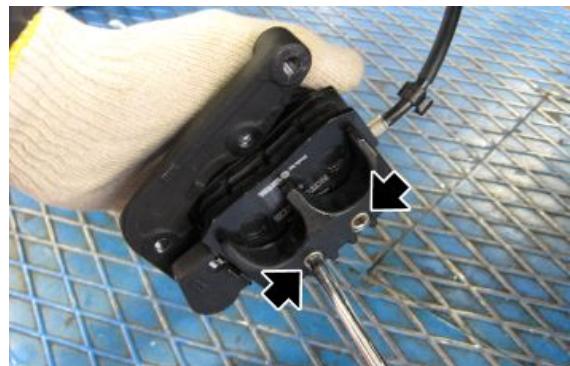
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### Removal

- Remove the rear brake calliper



- Remove the screws locking the brake pads



- Remove the brake pads



---

## Bleeding the braking system

---

### Front

Any air trapped in the hydraulic circuit acts as a cushion, absorbing much of the pressure applied by the brake pump and minimising the braking power of the calliper.

The presence of air is signalled by the "sponginess" of the brake control and by poor braking efficiency.

**CAUTION**

**CONSIDERING THE DANGER FOR VEHICLE AND RIDER, IT IS STRICTLY NECESSARY, AFTER REFITTING BRAKES AND RESTORING THE BRAKING SYSTEM TO THE REGULAR USE CONDITIONS, THAT THE HYDRAULIC CIRCUIT BE AIR PURGED.**

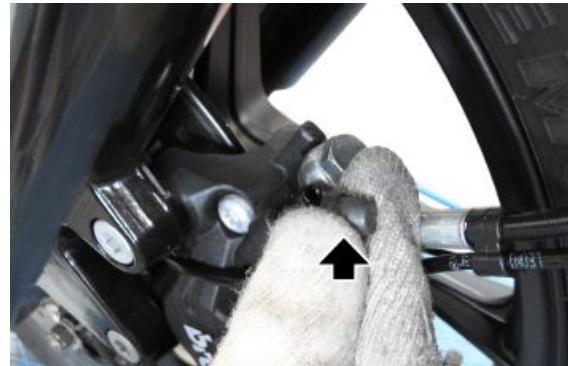
**NOTE**

**THE VEHICLE MUST BE ON LEVEL GROUND TO BE PURGED. WHILE PURGING THE HYDRAULIC SYSTEM, FILL THE RESERVOIR WITH THE NECESSARY QUANTITY OF BRAKE FLUID. CHECK THAT, DURING THE OPERATION, THERE IS ALWAYS BRAKE FLUID IN THE RESERVOIR.**

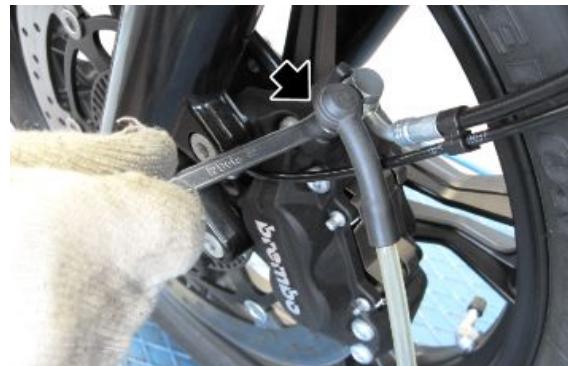
The bleeding procedure can be performed in a traditional way or using specific tools such as vacuum pumps or similar.

In the following is shown the "traditional" bleeding procedure.

- Remove the rubber protection cover from the bleed valve.



- Insert the transparent plastic pipe in the front brake calliper bleed valve and slide the other end of this pipe in a container to collect the fluid.
- Remove the front brake fluid reservoir cap.
- Operate the brake lever and then open the bleed valve on the calliper 1/4 of a turn to let the air out.
- Close the bleed again before reaching the lever end of the stroke and repeat the operation until there is no air.
- Repeat the procedure for both callipers.
- Screw the bleeding valve and remove the pipe.
- Top-up the reservoir until the correct brake fluid level is obtained.
- Refit and block the front brake oil reservoir cap.
- Refit the rubber protection cover.



## Rear

Any air trapped in the hydraulic circuit acts as a cushion, absorbing much of the pressure applied by the brake pump and minimising the braking power of the calliper.

The presence of air is signalled by the "sponginess" of the brake control and by poor braking efficiency.

**CAUTION**

CONSIDERING THE DANGER FOR VEHICLE AND RIDER, IT IS STRICTLY NECESSARY, AFTER REFITTING BRAKES AND RESTORING THE BRAKING SYSTEM TO THE REGULAR USE CONDITIONS, THAT THE HYDRAULIC CIRCUIT BE AIR PURGED.

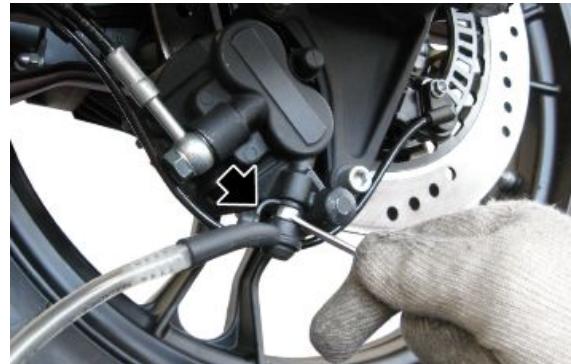
**NOTE**

THE VEHICLE MUST BE ON LEVEL GROUND TO BE PURGED. WHILE PURGING THE HYDRAULIC SYSTEM, FILL THE RESERVOIR WITH THE NECESSARY QUANTITY OF BRAKE FLUID. CHECK THAT, DURING THE OPERATION, THERE IS ALWAYS BRAKE FLUID IN THE RESERVOIR.

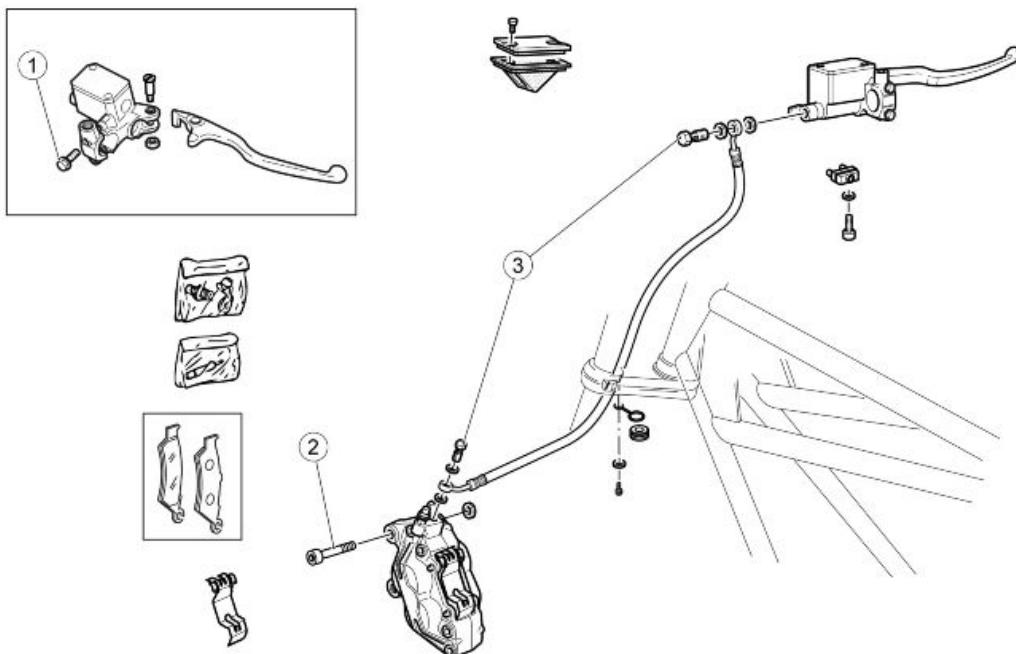
- Remove the rubber protection cover from the bleed valve.



- Insert the transparent plastic pipe in the rear brake calliper bleed valve and insert the other end of this pipe into a container to collect the fluid.
- Remove the rear brake fluid reservoir cap.
- Operate the brake lever and then open the bleed valve on the calliper 1/4 of a turn to let the air out.
- Close the bleed again before reaching the lever end of the stroke and repeat the operation until there is no air.
- Screw the bleeding valve and remove the pipe.
- Top-up the reservoir until the correct brake fluid level is obtained.
- Refit and lock the rear brake oil reservoir cap.
- Refit the rubber protection cover.



## Front brake pump



**FRONT BRAKE SYSTEM**

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening the brake pump U-bolt to the semi-handlebar	M6x25	2	10 Nm (7.37 lb ft)	-
2	Front brake calliper fixing screw	M10x30	2	50 Nm (36.88 lb ft)	-
3	Drilled screw for brake fluid pipe on pump and calliper	-	2	25 Nm (18.44 lb ft)	-

## Removal

- Remove the rear-view mirror
- Drain off the front brake system
- Disconnect the brake switch connectors



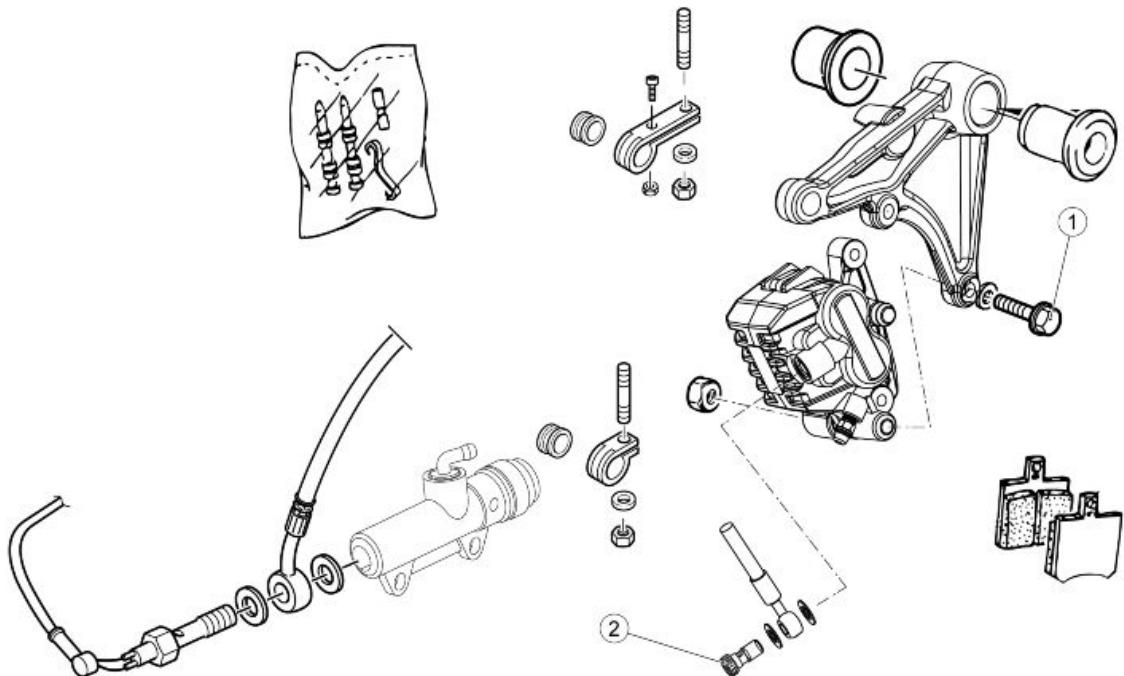
- Remove the two brake pump fixing screws



- Remove the brake pump

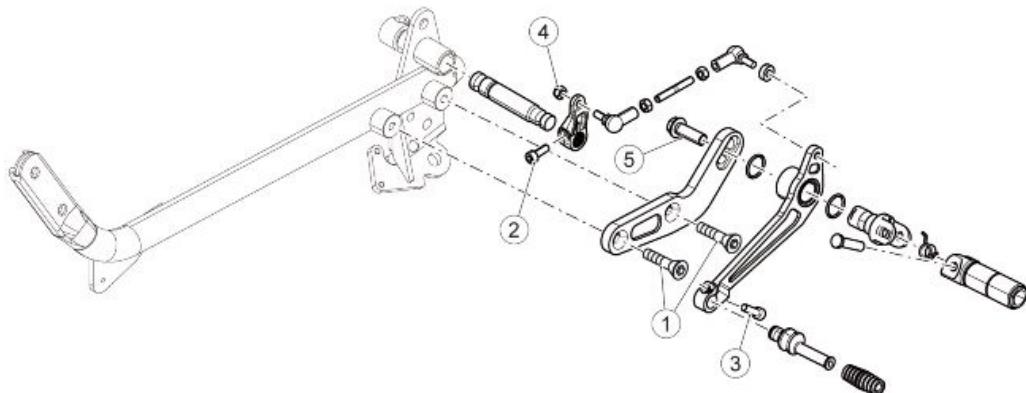
**CAUTION**

DURING REFITTING FILL UP THE BRAKE SYSTEM WITH THE RELATIVE BLEEDING PROCEDURE TO AVOID AIR BUBBLES IN THE SYSTEM

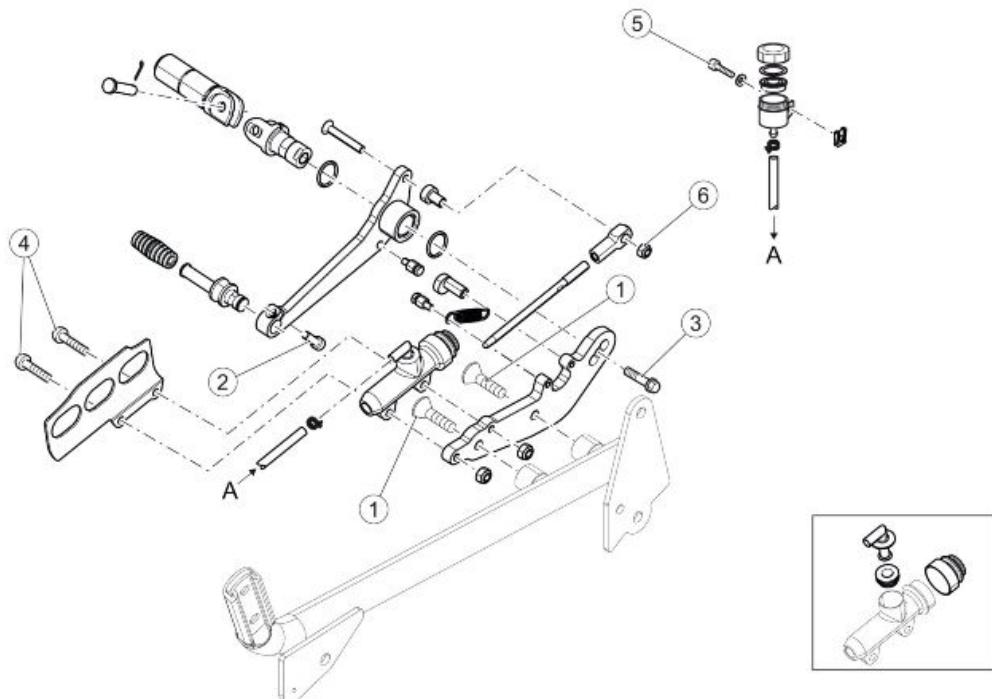
**Rear brake pump****REAR BRAKE SYSTEM**

pos.	Description	Type	Quantity	Torque	Notes
1	Rear brake calliper fixing screw	M8x30	2	25 Nm (18.44 lb ft)	-
2	Drilled screw for brake pipe on calliper	-	1	25 Nm (18.44 lb ft)	-

(V7 RACER)

**RIDER FOOTREST / GEAR SHIFT LEVER**

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening left hand rider footrest mounting plate to cradle	M8x20	2	25 Nm (18.44 lb ft)	Loctite 243
2	Preselector lever fixing screw	M6x20	1	10 Nm (7.37 lb ft)	-
3	Gearbox lever fixing screws	M6x20	1	10 Nm (7.37 lb ft)	Loctite 243
4	Gearbox control rod fixing nut	M6x1	1	10 Nm (7.37 lb ft)	-
5	Screw fastening rider footrest mounting to plate	M8	1	20 Nm (14.75 lb ft)	Loctite 243



## Rimozione

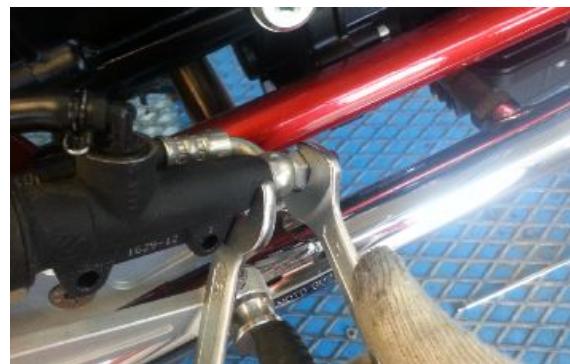
- Drain off the rear brake system
- Remove the screws fixing the protection plate, making sure to recover the spacer washers



- Take the pump from the brake pump shaft



- Remove the brake pipe by acting on the fitting and remove the complete pump

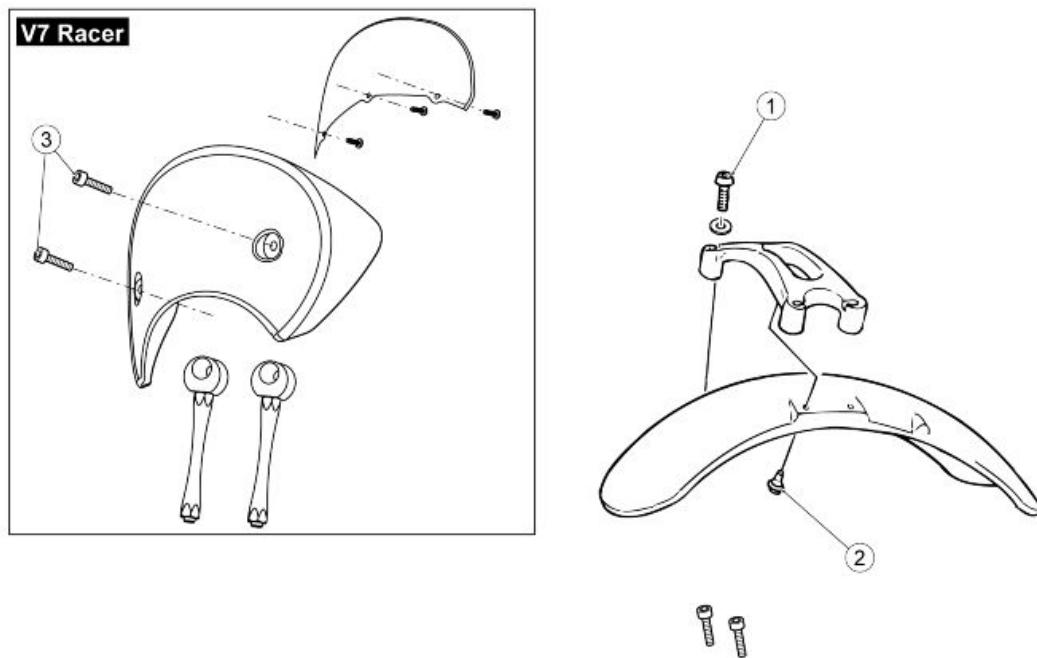
**CAUTION**

DURING REFITTING FILL UP THE BRAKE SYSTEM WITH THE RELATIVE BLEEDING PROCEDURE TO AVOID AIR BUBBLES IN THE SYSTEM

## INDEX OF TOPICS

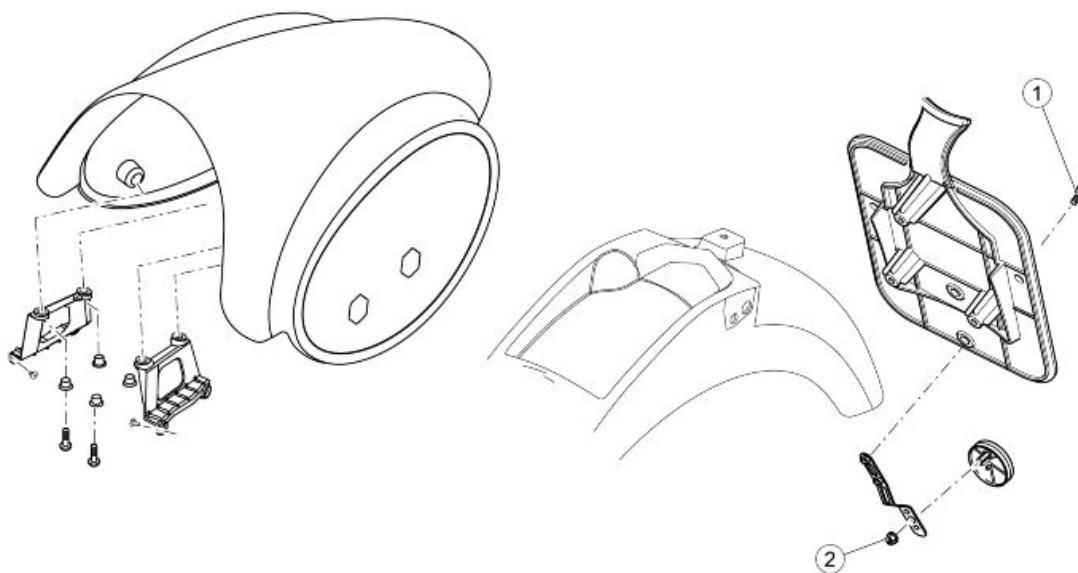
BODYWORK

BODYW

**BODYWORK - FRONT SECTION**

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening stabiliser plate to fork	M8x40	4	15 Nm (11.06 lbf ft)	Loctite 243
2	Screw fastening mudguard to stabiliser plate	M6x11	4	10 Nm (7.37 lbf ft)	Loctite 243
3	Top fairing fixing screw	M6	2	10 Nm (7.37 lbf ft)	

(V7 RACER)



**REAR SECTION BODYWORK - LICENSE PLATE MOUNTING**

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening retroreflector mounting to license plate mounting	M5x10	2	4 Nm (2.95 lbf ft)	-
2	Nut fixing retroreflector to mounting	M5	1	4 Nm (2.95 lbf ft)	-

**Disassembling the lock**

- Remove the left side fairing.
- Remove the fork spring



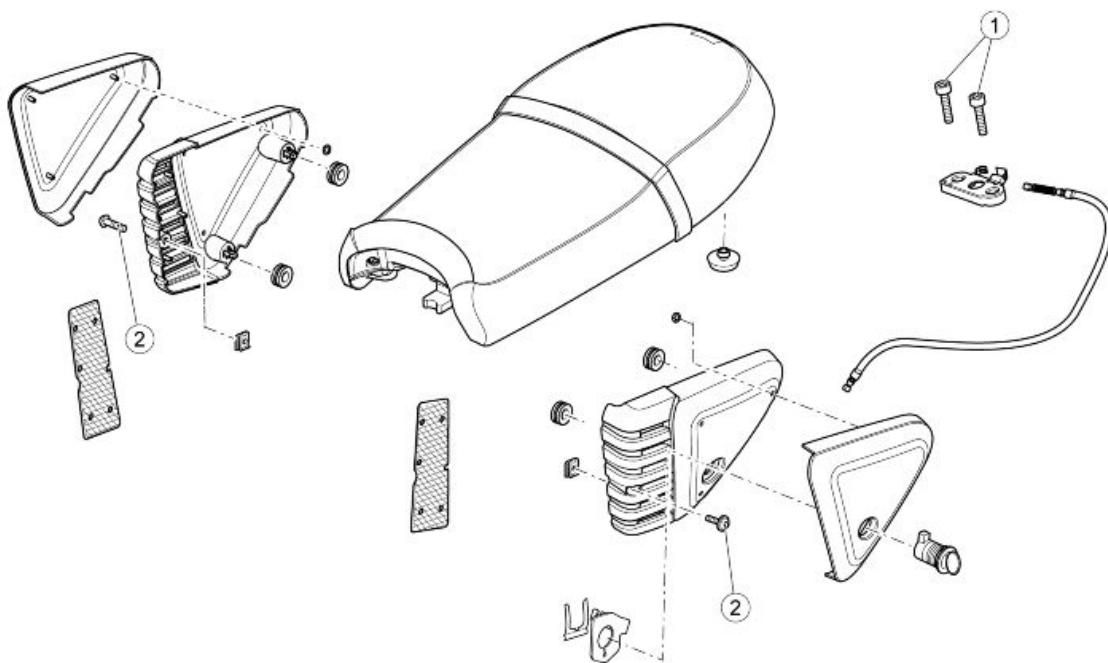
- Remove the cable support plate



- Extract the ignition switch assembly externally

**Side body panels**

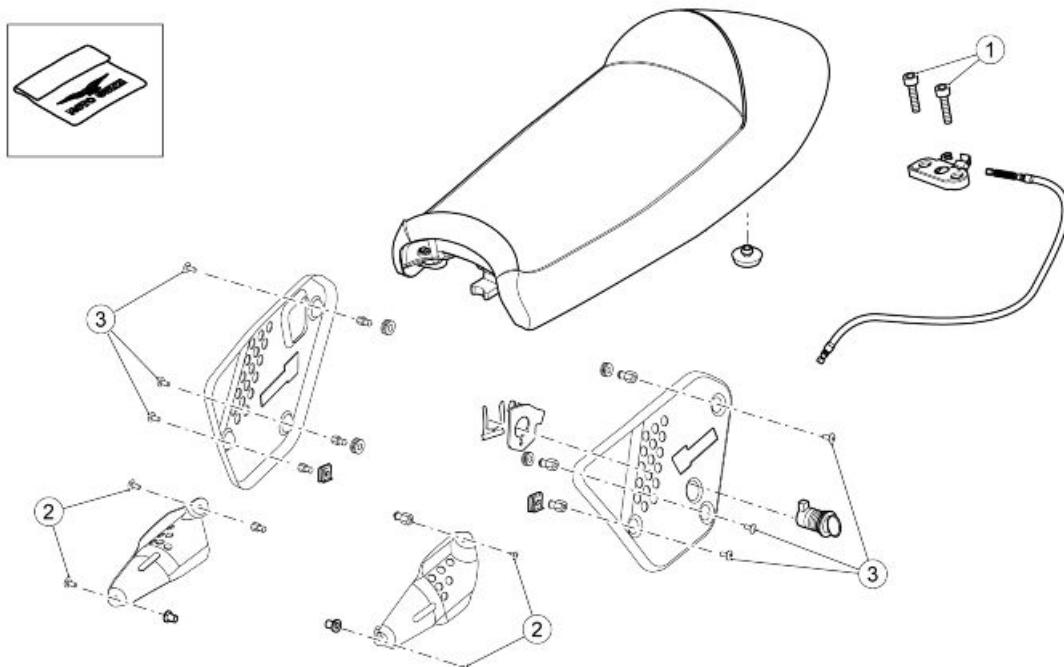
(V7 SPECIAL / V7 STONE)



#### BODYWORK CENTRAL SECTION - SADDLE

pos.	Description	Type	Quantity	Torque	Notes
1	Saddle release block fixing screw	M6x25	2	10 Nm (2.37 lb ft)	-
2	Side fairing fixing screw	M5x9	2	4 Nm (2.95 lb ft)	-

(V7 RACER)



**BODYWORK CENTRAL SECTION - SADDLE**

pos.	Description	Type	Quantity	Torque	Notes
1	Saddle release block fixing screw	M6x25	2	10 Nm (2.37 lb ft)	-
2	Throttle body cover fastener screw	M5x14	4	4 Nm (2.95 lb ft)	-
3	Side fairing fixing screw	M5x9	6	4 Nm (2.95 lb ft)	-

**(V7 SPECIAL / V7 STONE)**

- Remove the side fairing fixing screw (1)
- Delicately unhook the pins (2) from the relative retaining rubber clamps
- Remove the side fairing.

**(V7 RACER)**

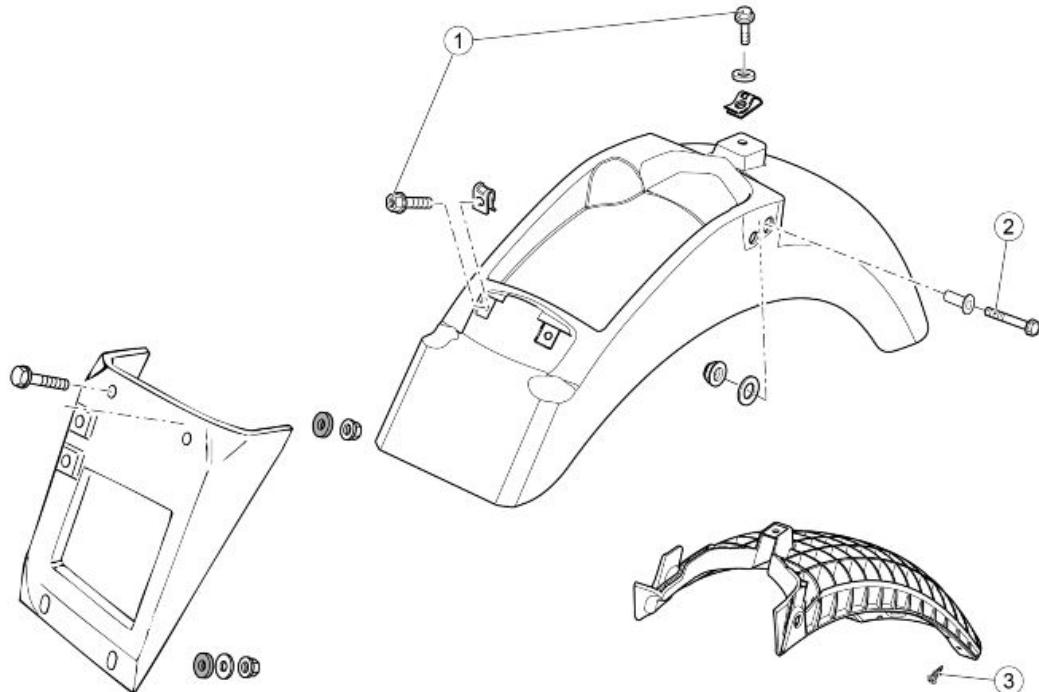
- Remove the side fairing fixing screw (1)
- Remove the side fairing.



- To remove the left side fairing the saddle opening cable (3) must be unhooked from the ignition switch assembly (4).



## Rear mudguard



### REAR MUDGUARD

pos.	Description	Type	Quantity	Torque	Notes
1	Rear mudguard front and central fixing screw	M6	2+1	10 Nm (7.37 lb ft)	
2	Rear mudguard side fixing screw	M8x30	2	25 Nm (18.44 lb ft)	
3	Screw fixing license plate holder to mudguard reinforcement	SWP M5x20	3	3 Nm (2.21 lb ft)	

- Remove the saddle
- Remove the upper central screw (1) that secures the mudguard to the frame



- After unhooking the opening cable from the ignition switch assembly, remove it from the mudguard.



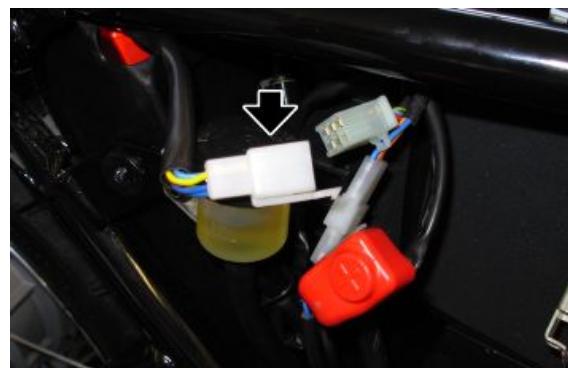
- Remove the front screws (2) that secure the mudguard to the frame, taking care to recover the nuts



- Remove the lateral screws (3) that secure the mudguard and the passenger handgrips from both sides, taking care to recover the nuts



- Disconnect the taillight connector.



- Remove the rear mudguard by sliding the light cabling through the wheel housing



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## Splash guard

- Remove the lower screws (1)



- Remove the upper screws (2) taking care to recover the nuts

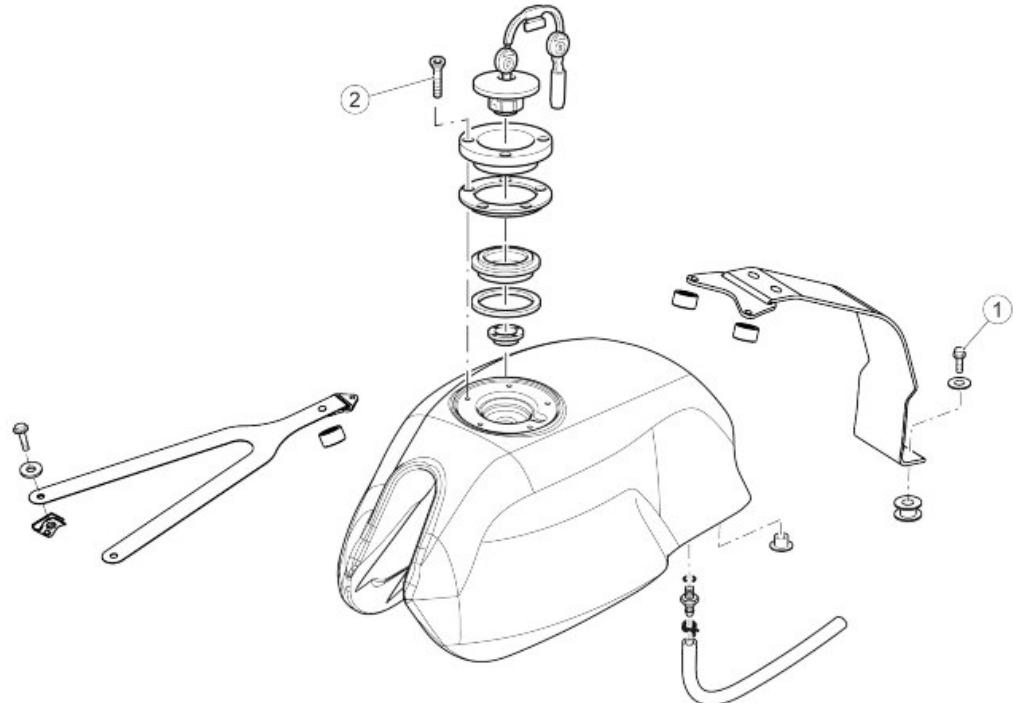


- 
- Remove the splash guard, pulling it to the rear

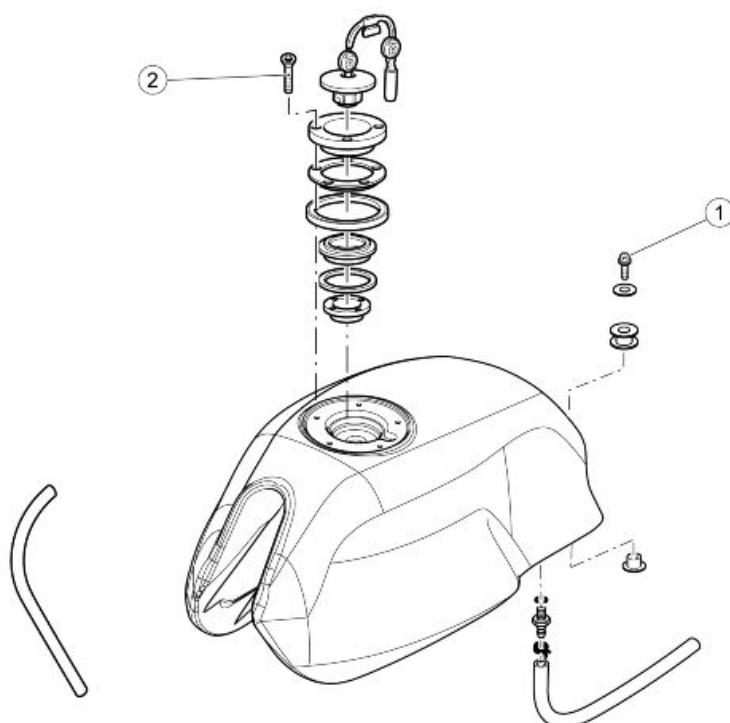


**Fuel tank**

(V7 RACER)



(V7 SPECIAL / V7 STONE)

**FUEL TANK**

pos.	Description	Type	Quantity	Torque	Notes
1	Rear tank fixing screw	M8x45	1	25 Nm (18.44 lb ft)	-

pos.	Description	Type	Quantity	Torque	Notes
2	Screw fastening cap flange to tank	M5x12	2+3	4 Nm (2.95 lb ft)	-

**(V7 SPECIAL / V7 STONE)**

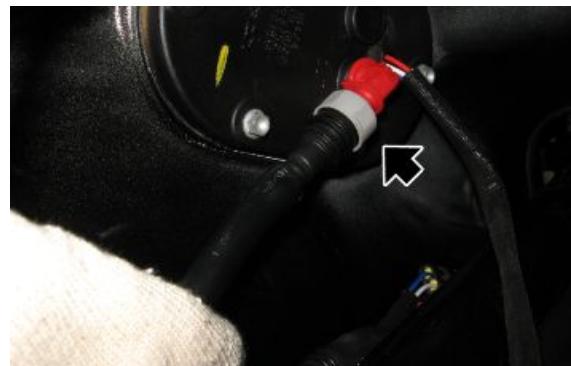
- Unscrew and remove the rear screw.



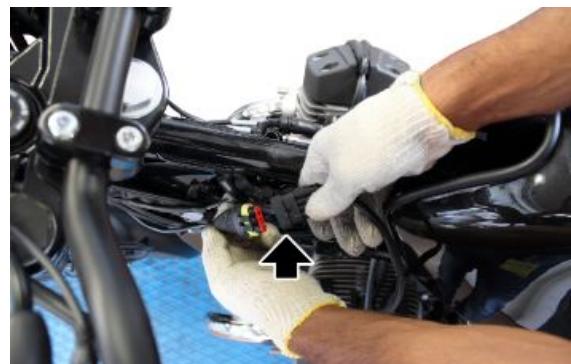
- Partially lift the fuel tank in order to be able to disconnect the fuel hose fitting, avoiding damaging it.

**CAUTION**

PAY PARTICULAR ATTENTION DURING THE LIFTING OPERATION IN THAT THE FUEL HOSE FITTING CAN BE DAMAGED



- Disconnect the connector.



- Remove the fuel breather pipe.



- Remove the fuel tank by sliding it off and back.

**(V7 RACER)**

- Remove the screws that fix the horns.



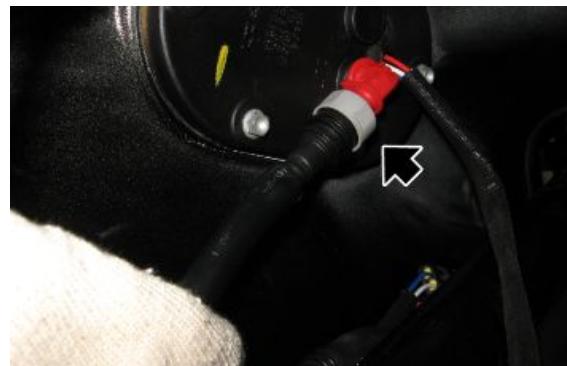
- Unscrew and remove the rear screw.



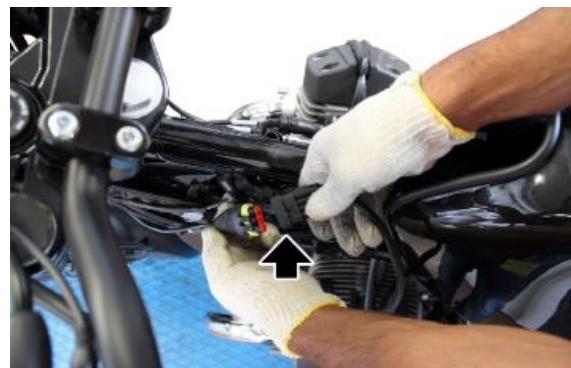
- Partially lift the fuel tank in order to be able to disconnect the fuel hose fitting, avoiding damaging it.

**CAUTION**

PAY PARTICULAR ATTENTION DURING THE LIFTING OPERATION IN THAT THE FUEL HOSE FITTING CAN BE DAMAGED



- Disconnect the connector.



- Remove the fuel breather pipe.



- Remove the fuel tank by sliding it off and back.
-

## INDEX OF TOPICS

PRE-DELIVERY

PRE DE

Carry out the listed checks before delivering the motorcycle.

**WARNING**

**HANDLE FUEL WITH CARE.**

---

## Aesthetic inspection

- Paintwork
  - Fitting of Plastic Parts
  - Scratches
  - Dirt
- 

## Tightening torques inspection

- Safety fasteners:
    - front and rear suspension unit
    - front and rear brake calliper retainer unit
    - front and rear wheel unit
    - engine - chassis retainers
    - steering assembly
    - Plastic parts fixing screws
- 

## Electrical system

- Main switch
  - Headlamps: high beam lights, low beam lights, tail lights (front and rear) and their warning lights
  - Headlight adjustment according to regulations in force
  - Front and rear stop light switches and their bulbs
  - Turn indicators and their warning lights
  - Instrument panel lights
  - Instrument panel: fuel and temperature indicator (if present)
  - Instrument panel warning lights
  - Horn
  - Electric starter
  - Engine stop via emergency stop switch and side stand
  - Through the diagnosis tool, check that the last mapping version is present in the control unit/s and, if required, program the control unit/s again: consult the technical service website to know about available upgrades and details regarding the operation.
-

**CAUTION**

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

**CAUTION**

WHEN INSTALLING THE BATTERY, ATTACH THE POSITIVE LEAD FIRST AND THEN THE NEGATIVE ONE, AND PERFORM THE REVERSE OPERATION DURING REMOVAL.

**CAUTION**

THE BATTERY ELECTROLYTE IS TOXIC, CORROSIVE AND AS IT CONTAINS SULPHURIC ACID, IT CAN CAUSE BURNS WHEN IN CONTACT WITH THE SKIN. WHEN HANDLING BATTERY ELECTROLYTE, WEAR TIGHT-FITTING GLOVES AND PROTECTIVE APPAREL. IN THE EVENT OF SKIN CONTACT WITH THE ELECTROLYTIC FLUID, RINSE WELL WITH PLENTY OF CLEAN WATER. IT IS PARTICULARLY IMPORTANT TO PROTECT YOUR EYES BECAUSE EVEN TINY AMOUNTS OF BATTERY ACID MAY CAUSE BLINDNESS. IF THE FLUID GETS IN CONTACT WITH YOUR EYES, WASH WITH ABUNDANT WATER FOR FIFTEEN MINUTES AND CONSULT AN EYE SPECIALIST IMMEDIATELY. THE BATTERY RELEASES EXPLOSIVE GASES; KEEP IT AWAY FROM FLAMES, SPARKS, CIGARETTES OR ANY OTHER HEAT SOURCES. ENSURE ADEQUATE VENTILATION WHEN SERVICING OR RECHARGING THE BATTERY.

KEEP OUT OF THE REACH OF CHILDREN

BATTERY LIQUID IS CORROSIVE. DO NOT POUR IT OR SPILL IT, PARTICULARLY ON PLASTIC COMPONENTS. ENSURE THAT THE ELECTROLYTIC ACID IS COMPATIBLE WITH THE BATTERY TO BE ACTIVATED.

**CAUTION**

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

---

## Levels check

- Hydraulic braking system fluid level
  - Clutch system fluid level (if present)
  - Gearbox oil level (if present)
  - Transmission oil level (if present)
  - Engine coolant level (if present)
  - Engine oil level
  - Mixer oil level (if present)
- 

## Road test

- Cold start
  - Instrument panel operation
-

- Response to throttle control
  - Stability when accelerating and braking
  - Front and rear brake efficiency
  - Front and rear suspension efficiency
  - Abnormal noise
- 

## Static test

### Static check after test drive:

- Restarting when warmed up
  - Starter operation (if present)
  - Minimum holding (turning the handlebar)
  - Uniform turning of the steering
  - Possible leaks
  - Radiator electric fan operation (if present)
- 

## Functional inspection

- Hydraulic braking system
- Stroke of brake and clutch levers (if present)
- Clutch - Check for correct operation
- Engine - Check for correct general operation and absence of abnormal noise
- Other
- Documentation check:
  - Chassis and engine numbers check
  - Supplied tools check
  - License plate fitting
  - Locks checking
  - Tyre pressure check
- Installation of mirrors and any possible accessories



**NEVER EXCEED THE RECOMMENDED INFLATION PRESSURES AS TYRES MAY BURST.**

**CAUTION**



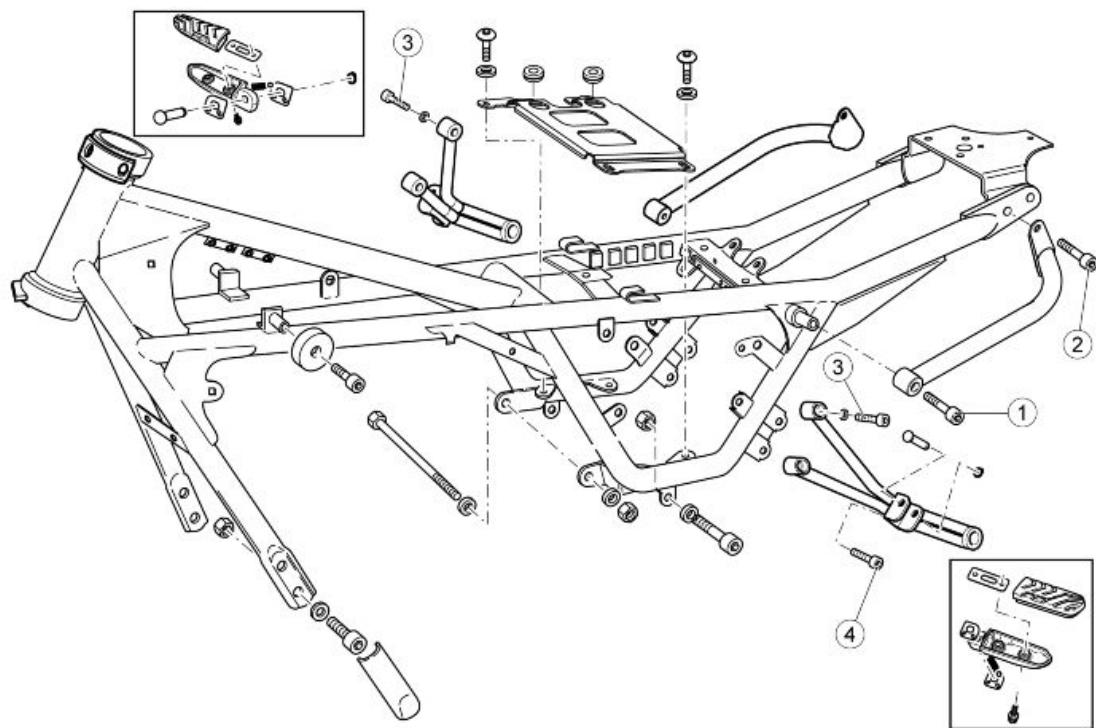
**CHECK AND ADJUST TYRE PRESSURE WITH TYRES AT AMBIENT TEMPERATURE.**

---

## Specific operations for the vehicle

**(V7 RACER)**

---



#### TWO SEATER VERSION

pos.	Description	Type	Quantity	Torque	Notes
1	Passenger handgrip front fixing screw	M6	2	10 Nm (7.37 lbf ft)	-
2	Passenger handgrip rear fixing nut	M8	2	25 Nm (18.44 lbf ft)	-
3	Passenger footrest mounting bracket fixing screw	M8x16	4	25 Nm (18.44 lbf ft)	Loctite 243
4	Countersunk-head Allen screw	M8	2	25 Nm (18.44 lbf ft)	-

**WARNING**
**OPERATIONS REQUIRED TO RENDER VEHICLE COMPLIANT WITH TWO SEATER TYPE APPROVAL.**

- Remove the three fixing screws of the exhaust mounting plate.
- Remove the mounting plate.



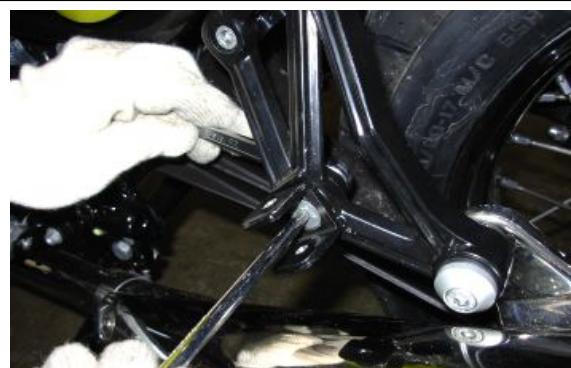
- Fit the exhaust mounting plate preset for fixing the passenger footrest, so as to turn the vehicle into a two seater version.
- Tighten the three fastener screws to the specified torque.



- Fit the countersunk screw with hexagonal hole on "C" supporting the pedal and afterwards fit the washer.



- Place "C" on the exhaust supporting plate, pay attention that the holes to insert the pedal are adequately oriented.
- Hold the countersunk screw with hexagonal hole firmly in place and tighten the nut to 25 Nm (18.44 lbf ft).



- Position the pedal on "C" and insert the fixing pin.



- Lock the bolt with the Seeger ring.

**NOTE**

**REPEAT THE STEPS TO FIT THE PASSENGER FOOTPEG ON THE OPPOSITE SIDE.**

**Rotazione ammortizzatori e posizionamento maniglie passeggero**

- Remove the two shock absorber fixing screws.



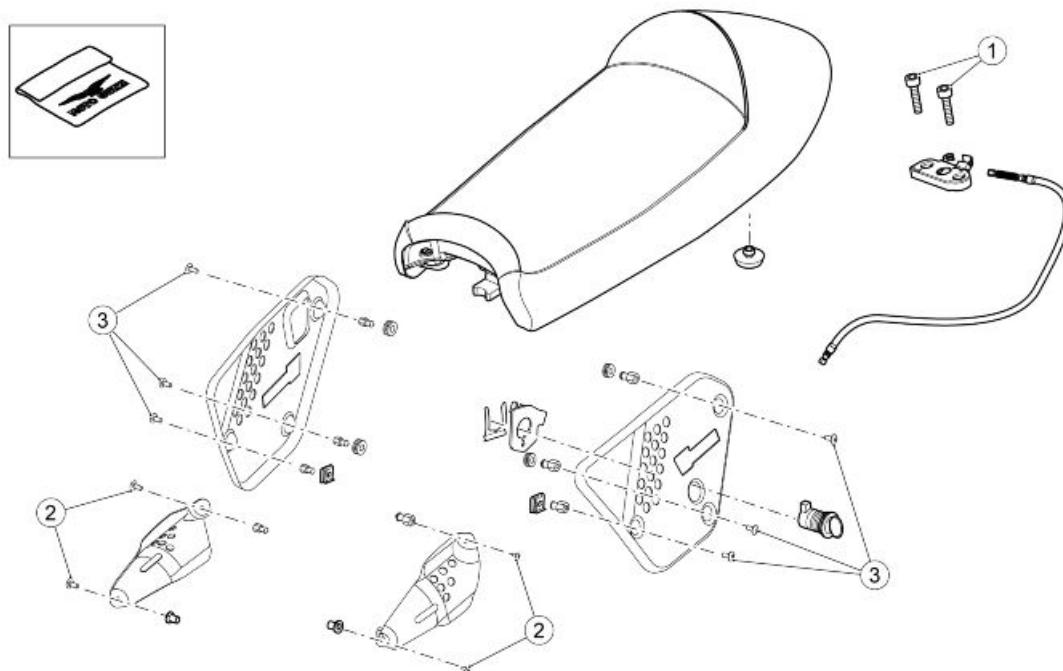
- Turn the shock absorber as shown and fasten it at the bottom.
- Fit the passenger handgrip and tighten the screw to the prescribed torque.



- Tighten the passenger handgrip rear fastening screw.

**NOTE**

**REPEAT THE PROCEDURE TO MODIFY EVEN THE OTHER SIDE.**

**SELLA****BODYWORK CENTRAL SECTION - SADDLE**

pos.	Description	Type	Quantity	Torque	Notes
1	Saddle release block fixing screw	M6x25	2	10 Nm (2.37 lb ft)	-
2	Throttle body cover fastener screw	M5x14	4	4 Nm (2.95 lb ft)	-
3	Side fairing fixing screw	M5x9	6	4 Nm (2.95 lb ft)	-

**Sostituzione sella**

- Insert the key in the lock and turn it clockwise.
- Remove the single-seat saddle.



- Place the two-seat saddle.



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