



SERVICE STATION MANUAL

2Q000273



RS 125 - Tuono 125 - Euro 4



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THE VALUE OF SERVICE

Due to continuous updates and technical training programmes specific to Aprilia products, only **Aprilia** 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, performing maintenance correctly and using only **original Aprilia spare parts** are essential factors for the reliability of your vehicle!

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

Only by requesting original Aprilia spare parts can you be of purchasing products that were developed and tested during the design and development of the vehicle itself. All Aprilia 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.

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Not all versions/models shown in this publication are available in all countries. The availability of individual versions/models should be confirmed with the official Aprilia sales network.

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Piaggio & C. S.p.A. Viale Rinaldo Piaggio, 25 - 56025 PONTEDERA (PI), Italy
www.piaggio.com

SERVICE STATION MANUAL

RS 125 - Tuono 125 - Euro 4

This manual provides the main information to carry out regular maintenance operations on your vehicle. This manual is intended to aprilia 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, aprilia s.p.a. commits itself to continually improve its products and the relative documentation. The main technical modifications and changes in repair procedures are communicated to all aprilia 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 aprilia 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



INDEX OF TOPICS

CHARACTERISTICS

CHAR

SPECIAL TOOLS

S-TOOLS

MAINTENANCE

MAIN

ELECTRICAL SYSTEM

ELE SYS

ENGINE FROM VEHICLE

ENG VE

ENGINE

ENG

POWER SUPPLY

P SUPP

SUSPENSIONS

SUSP

CHASSIS

CHAS

BRAKING SYSTEM

BRAK SYS

COOLING SYSTEM

COOL SYS

BODYWORK

BODYW

PRE-DELIVERY

PRE DE

INDEX OF TOPICS

CHARACTERISTICS

CHAR

Rules

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



FUEL USED TO DRIVE EXPLOSION ENGINES IS HIGHLY INFLAMMABLE AND CAN BECOME EXPLOSIVE UNDER SPECIFIC 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 OR NEAR FUEL VAPOUR. AVOID ANY CONTACT WITH NAKED FLAME, SPARKS OR OTHER HEAT SOURCES WHICH MAY CAUSE IGNITION OR EXPLOSION.

**DO NOT ALLOW FUEL TO DISPERSE INTO THE ENVIRONMENT.
KEEP OUT OF THE REACH OF CHILDREN.**

Hot parts

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.

Coolant

The coolant contains ethylene glycol which, under certain conditions, can become flammable.

When it burns, ethylene glycol produces an invisible flame which however can cause burns.

CAUTION



TAKE PARTICULAR CARE NOT TO SPILL COOLANT ONTO HOT PARTS OR THE ENGINE AND EXHAUST SYSTEM; THE FLUID MAY CATCH FIRE AND BURN WITH INVISIBLE FLAMES. WHEN CARRYING OUT MAINTENANCE OPERATIONS, IT IS ADVISABLE TO WEAR LATEX GLOVES. WHILE POISONOUS, COOLANT HAS A SWEET TASTE WHICH MAKES IT EXTREMELY APPEALING TO ANIMALS. NEVER LEAVE COOLANT IN OPEN CONTAINERS WHERE IT MAY BE REACHED AND DRUNK BY AN ANIMAL.

KEEP OUT OF THE REACH OF CHILDREN.

NEVER REMOVE THE RADIATOR CAP WHILE THE ENGINE IS STILL HOT. COOLANT IS UNDER PRESSURE AND MAY CAUSE BURNS.

Used engine oil

CAUTION



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

HANDLING ENGINE OIL FOR PROLONGED PERIODS AND ON A REGULAR BASIS CAN CAUSE SERIOUS SKIN DAMAGE.

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 INTO THE ENVIRONMENT.

KEEP OUT OF THE REACH OF CHILDREN.

Brake fluid



THE BRAKE FLUID MAY DAMAGE PAINTED, PVC OR RUBBER SURFACES. WHEN SERVICING THE BRAKING SYSTEM, PROTECT THESE COMPONENTS WITH A CLEAN CLOTH. ALWAYS WEAR PROTECTIVE GOGGLES WHEN SERVICING THE BRAKING SYSTEM. THE BRAKE FLUID IS EXTREMELY DANGEROUS TO THE EYES. IN THE EVENT OF ACCIDENTAL CONTACT WITH THE EYES, RINSE THEM IMMEDIATELY WITH PLENTY OF 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 OR SPILL ON PLASTIC COMPONENTS IN PARTICULAR. ENSURE THAT THE ELECTROLYTIC ACID IS COMPATIBLE WITH THE BATTERY BEING ACTIVATED.

Maintenance rules

GENERAL PRECAUTIONS AND INFORMATION

When repairs, disassembly and reassembly of the vehicle is carried out, follow the following recommendations strictly.

BEFORE DISASSEMBLING COMPONENTS

- Remove the dirt, mud, dust and foreign objects from the vehicle before disassembling components. Wherever required, use the special tools designed for this vehicle.

DISASSEMBLING COMPONENTS

- Do not loosen and/or tighten the screws and nuts using pliers or other tools, but always use the specific wrench.
- Mark the positions on all the connection joints (hoses, cables, etc.) before separating them and identify them with different distinctive marks.
- Each piece should be clearly marked in order to be identified during the installation phase.
- Carefully clean and wash the disassembled components with detergents with a low flammability grade.
- Keep the coupled parts together because they have "adapted" to one another following normal wear.
- Some components must be used together or replaced entirely.
- Keep away from heat sources.

REASSEMBLING COMPONENTS**CAUTION**

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

- Only use ORIGINAL Aprilia SPARE PARTS.
- Comply with lubricant and consumables use guidelines.
- Lubricate parts (whenever possible) before reassembling them.
- When tightening nuts and screws, start either from the components with the largest diameter or from the innermost components, proceeding 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 parts if the thread 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, carry out pre-ride checks and test the vehicle on private grounds or in an area with low traffic.
- Clean all mating surfaces, oil seal rims and gaskets before refitting. Smear a thin layer of lithium-based grease on the oil seal rims. Reassemble oil seals and bearings with the brand or batch number facing outward (visible side).

ELECTRICAL CONNECTORS

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

Press the relative safety clips, if applicable.

- 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

DO NOT DISCONNECT CONNECTORS BY PULLING THE CABLES.

NOTE

THE TWO CONNECTORS CAN ONLY BE CONNECTED IN ONE DIRECTION: CONNECT THEM THE RIGHT WAY ROUND.

TIGHTENING TORQUE**CAUTION**

REMEMBER THAT THE TIGHTENING TORQUE FOR ALL THE FIXING ELEMENTS LOCATED ON WHEELS, BRAKES, WHEEL AXLES AND OTHER SUSPENSION COMPONENTS PLAY A FUNDAMENTAL ROLE IN GUARANTEEING THE SAFETY OF THE VEHICLE AND MUST BE KEPT AT THE PRESCRIBED VALUES. REGULARLY CHECK THE TIGHTENING TORQUE OF THE FIXING ELEMENTS AND ALWAYS USE A TORQUE WRENCH WHEN REFITTING. IF THESE WARNINGS ARE NOT OBSERVED, ONE OF THESE COMPONENTS COULD LOOSEN AND COME OFF, BLOCKING A WHEEL OR CAUSING OTHER PROBLEMS THAT WOULD COMPROMISE MANOEUVRABILITY, LEADING TO A CRASH WITH THE RISK OF SERIOUS INJURY OR EVEN DEATH.

Running-in

Running the engine in correctly is essential for ensuring engine longevity and functionality. Twisty roads and gradients are ideal for running in the engine, brakes and suspension effectively. Vary your riding speed during the running in period. This ensures that components operate in "loaded" conditions and then "unloaded" conditions, allowing the engine components to cool.

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 fully open the throttle grip abruptly at low engine speeds, either during or after the running in period.
- 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 YOUR VEHICLE TO AN Official Aprilia Dealer FOR THE CHECKS INDICATED IN THE "RECOMMENDED PRODUCTS" TABLE IN THE SCHEDULED MAINTENANCE SECTION TO AVOID INJURING YOURSELF, OTHERS AND /OR DAMAGING THE VEHICLE.

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 CHASSIS NUMBER IMMEDIATELY VOIDS THE WARRANTY.

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

ZD4KC0000YSXXXXXX

KEY:

ZD4: WMI (World Manufacturer Identifier) code;

KC: model;

000: variant;

0: free digit;

Y year of manufacture;

S: production plant (S= Scorzè);

XXXXXX: serial number (6 digits);

CHASSIS NUMBER

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



ENGINE NUMBER (in countries where applicable)

The engine number is stamped on the top of the right hand side of the crankcase, near the rear shock absorber.

The engine number is visible from right hand side of the vehicle, looking from the rear.

Engine No.....



Dimensions and mass

DIMENSIONS

Specification	Desc./Quantity
Max. length	1,968 mm (77.48 in)
Maximum width (RS 125)	760 mm (29.92 in)
Maximum width (Tuono 125)	853 mm (32.87 in)
Max. height to the top fairing (RS 125)	1,135 mm (44.68 in)
Max. height to the top fairing (Tuono 125)	1,090 mm (42.91 in)
Wheelbase	1,353 mm (53.27 in)
Kerb weight	144 kg (317.47 lb)

Engine

ENGINE

Specification	Desc./Quantity
Engine type	Single cylinder 4 stroke
Engine capacity	124.2 cm ³ (7.58 cu in)
Bore x stroke	(58 x 47) mm; (2.28 x 1.85) in
Compression ratio	12.0 +/- 0.5: 1
Start-up	electric
Idle speed	1900 +/- 100 rpm
Clutch	multi plate wet clutch operated from hand lever on left hand side of handlebar.
Cooling	liquid

GEARBOX

Specification	Desc./Quantity
Type	6 speed mechanical gearbox with pedal shifter on the left hand side of engine, which operates the fork and drum selector mechanism. With Quick Shift where applicable.

Transmission

DRIVE RATIOS

Specification	Desc./Quantity
Drive ratio, 1st gear	11 / 33 = 1 : 3.000
Drive ratio, 2nd gear	15 / 30 = 1 : 2.000
Drive ratio, 3rd gear	18 / 27 = 1 : 1.500
Drive ratio, 4th gear	20 / 24 = 1 : 1.200
Drive ratio, 5th gear	25 / 27 = 1 : 1.080
Drive ratio, 6th gear	23 / 22 = 1 : 0.956
Final drive ratio	13 / 60

Capacities

CAPACITY

Specification	Desc./Quantity
Fuel tank	14.5 +/- 1 l (3.19 +/- 0.22 UK gal; 3.83 +/- 0.26 US gal)
Fuel tank reserve	3.3 l (3.19 +/- 0.72 UK gal; 0.87 US gal)
Engine oil	900 cm ³ (54.91 cu in)
Seats	2
Coolant	0.78 l (0.171 UKgal; 0.206 US gal)
Maximum weight limit	325 kg (716.50 lb) (rider + passenger + luggage)

Electrical system

IGNITION

Specification	Desc./Quantity
Type	CDI

SPARK PLUG

Specification	Desc./Quantity
Spark plug	NGK CR9EKB or NGK CR9EB / NGK CR8EB
Electrode gap	0.7-0.8 mm (0.027-0.031 in)

ELECTRICAL SYSTEM

Specification	Desc./Quantity
Battery	12V - 6Ah
Fuses	30A, 25A, 20A, 15A, 7.5A, 3A
Alternator	13V - 235W

BULBS

Specification	Desc./Quantity
Low beam light	H8 - 12V - 35W
High beam light (RS 125)	H11 - 12V - 55W
High beam light (Tuono 125)	H7 - 12V - 55W
Daylight running light	12V - 5W
Turn indicator light	Micro-bulbs
Tachometer lighting	12V - LED
tail light /stop lights	LED
License plate light (where applicable)	12V - 5W

WARNING LIGHTS

Specification	Desc./Quantity
Instrument cluster indicator lamps	led

Frame and suspensions**FRAME**

Specification	Desc./Quantity
Frame type	Aluminium twin-spar frame
Trail	93.6 mm (3.68 in)

SUSPENSIONS

Specification	Desc./Quantity
Front	Upside down hydraulic telescopic fork
Front fork travel	114 mm (4.49 in)
Rear	hydraulic single shock-absorber
Rear shock absorber travel	39.5 mm (1.56 in)

Brakes**BRAKES**

Specification	Desc./Quantity
Front brake with ABS	Ø 300 mm (11.81 in) disc brake
Rear brake without ABS	Ø 218 mm (8.58 in) disc brake

Wheels and tyres**WHEELS**

Specification	Desc./Quantity
Type	made of light alloy
Front	2.75 x 17"
Rear	3.50" x 17"

TYRES

Specification	Desc./Quantity
Front	100 / 80 - 17" 52S
Front - inflation pressure, rider only	1.7 bar (170 kPa) (24.66 PSI)

Specification	Desc./Quantity
Front - inflation pressure, rider + passenger	1.8 bar (180 kPa) (26.11 PSI)
Rear	130 / 70 - 17" 62S
Rear - inflation pressure, rider only	1.8 bar (180 kPa) (26.11 PSI)
Rear - inflation pressure, rider + passenger	1.9 bar (190 kPa) (27.56 PSI)

Supply

FUEL SYSTEM

Specification	Desc./Quantity
Fuel	Unleaded petrol max E10 (95 RON)

Tightening Torques

If the following tables do not expressly indicate the tightening torque values, refer to the table with the generic torque values indicated below.

GENERAL TIGHTENING TORQUES

	M4	M5	M6	M8	M10	M12
Metric tightening torque: TE - TEFL - SHC - TBEI	3 Nm (2.21 lb ft)	6 Nm (4.43 lb ft)	10 Nm (7.38 lb ft)	25 Nm (18.44 lb ft)	50 Nm (36.88 lb ft)	80 Nm (59.00 lb ft)
- TCC - TS						

GENERAL TIGHTENING TORQUES FOR SELF TAPPING SCREWS FOR PLASTIC

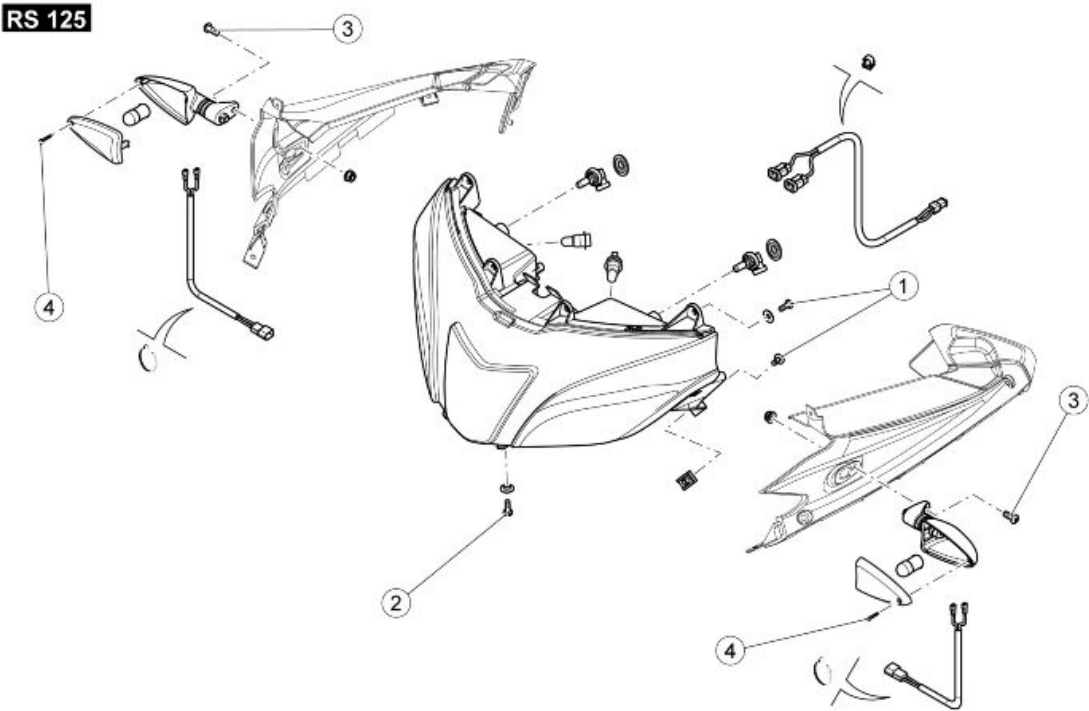
	2.9 mm	3.9 mm	4.2 mm	5 mm
Tightening torque	2 Nm (1.48 lb ft)	2 Nm (1.48 lb ft)	3 Nm (2.21 lb ft)	3 Nm (2.21 lb ft)

CAUTION

THE SCREWS WITH THREAD-LOCK SEALANT (PRE-IMPREGNATED) MUST BE REPLACED WITH NEW SCREWS AFTER THEY HAVE BEEN LOOSENED.
BEFORE FITTING THE NEW SCREWS, CLEAN THE THREADED HOLES CAREFULLY, MAKING SURE THAT ALL TRACES OF THE OLD THREAD-LOCK SEALANT HAVE BEEN ELIMINATED.

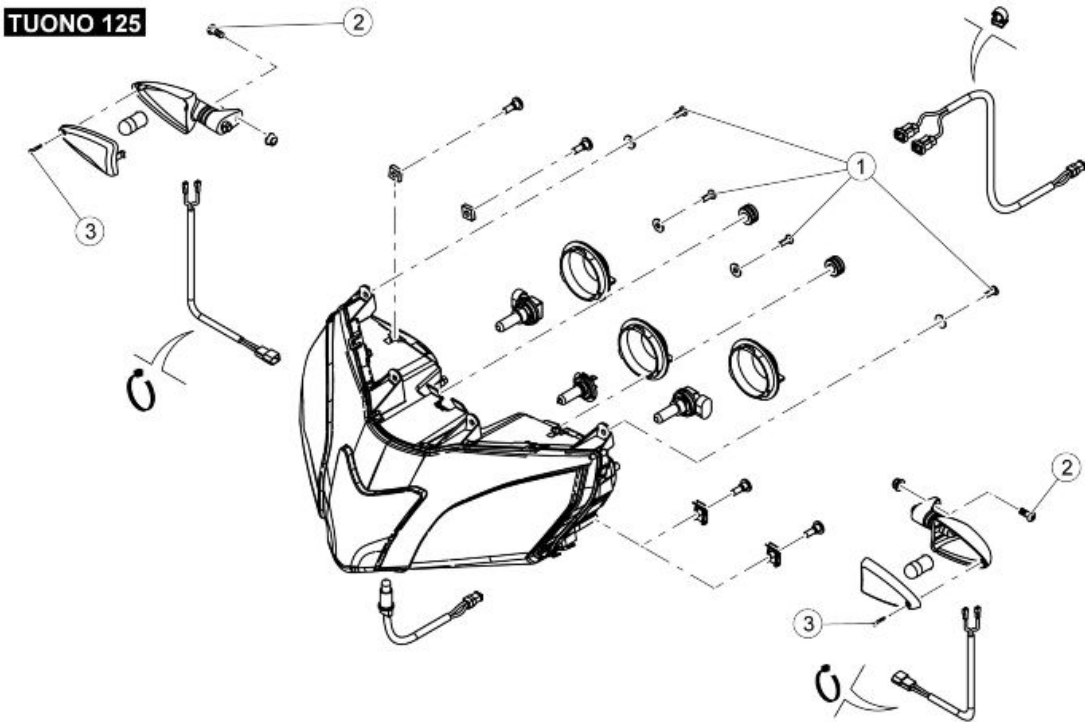
Chassis

Front side



FRONT LIGHTS

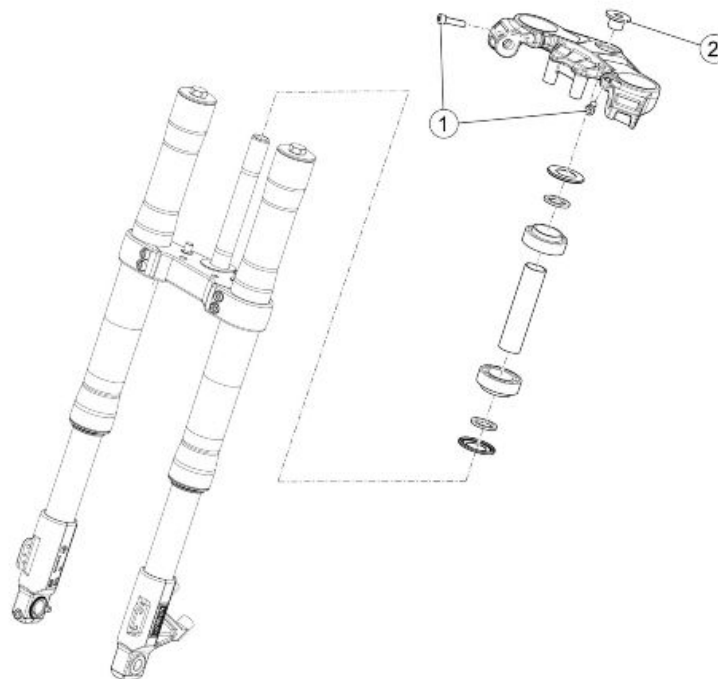
pos.	Description	Type	Quantity	Torque	Notes
1	Headlamp fastener screw	M5x14	4	1.5 Nm (1.11 lb ft)	-
2	Headlamp fastener screw	M5	1	1.5 Nm (1.11 lb ft)	-
3	Turn indicator fastener screw	M5x12	2	3 Nm (2.21 lb ft)	-
4	Turn indicator cover fastener screw	-	2	0.3 Nm (0.22 lb ft)	-



FRONT LIGHTS

pos.	Description	Type	Quantity	Torque	Notes
1	Headlamp fastener screw	M5x14	4	1.5 Nm (1.11 lb ft)	-
2	Turn indicator fastener screw	M5x12	2	3 Nm (2.21 lb ft)	-
3	Turn indicator cover fastener screw	Self tapping	2	0.3 Nm (0.22 lb ft)	-

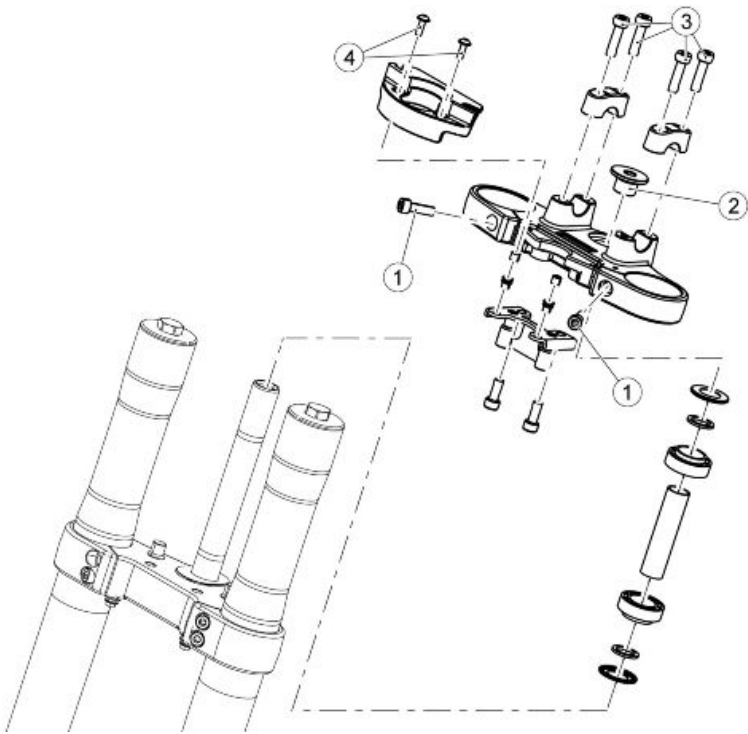
RS 125



STEERING

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening top steering yoke to fork	M8	2	25 Nm (18.44 lb ft)	-
2	Handlebar fastener nut	M20	1	48 Nm (35.40 lb ft)	-

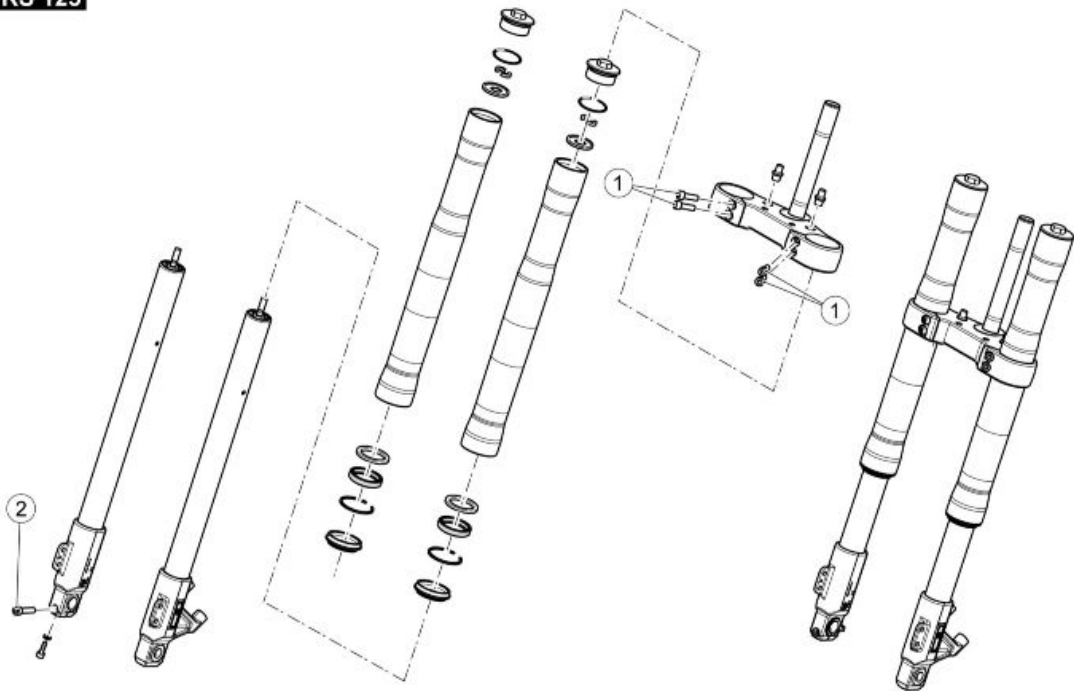
TUONO 125



STEERING

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening top steering yoke to fork	M8	2	25 Nm (18.44 lb ft)	-
2	Handlebar fastener nut	M20	1	48 Nm (35.40 lb ft)	Loct. 243
3	Handlebar U-bolt fastener screws	M8	4	20 Nm (14.75 lb ft)	-
4	Ignition switch assembly cover fastening screws	M5	2	5 Nm (3.69 lb ft)	-

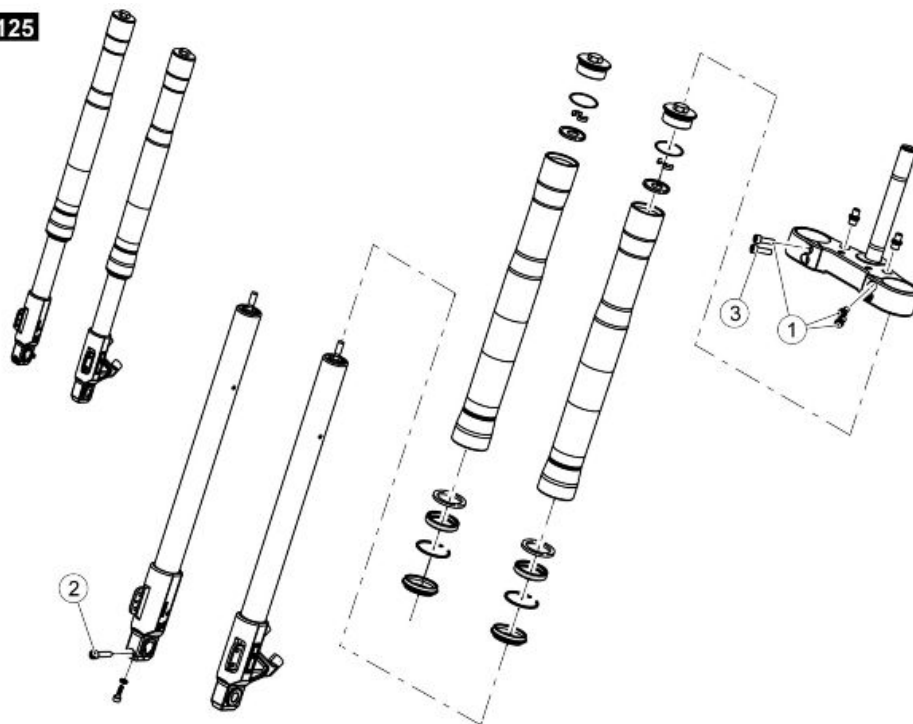
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FRONT SUSPENSION

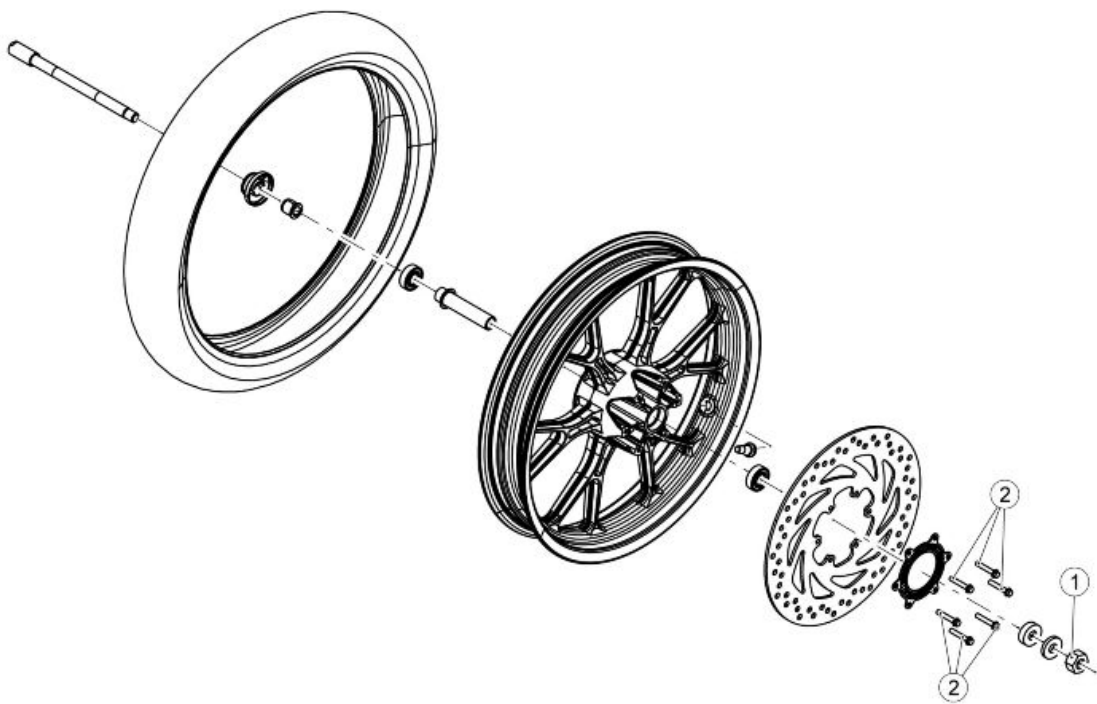
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening bottom steering yoke to fork	M8	4	25 Nm (18.44 lb ft)	-
2	Screw fastening calliper mounting bracket	M8	1	20 Nm (14.75 lb ft)	-

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FRONT SUSPENSION

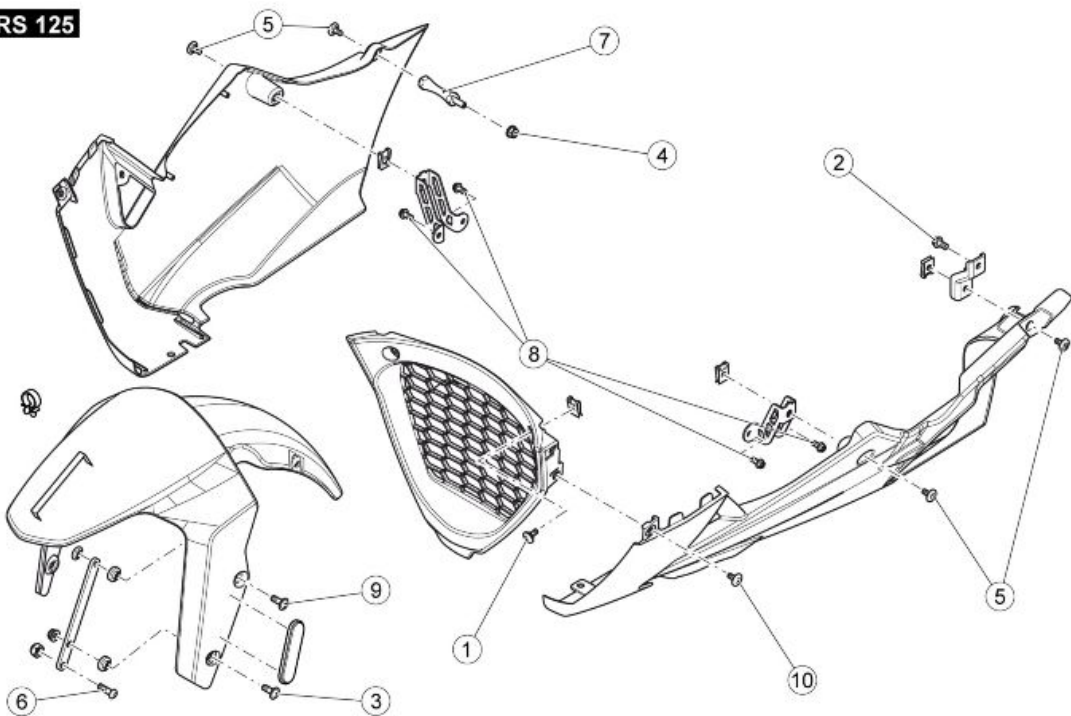
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening bottom steering yoke to fork	M8	3	25 Nm (18.44 lb ft)	-
2	Screw fastening calliper mounting bracket	M8	1	20 Nm (14.75 lb ft)	-
3	Screw fastening bottom steering yoke to fork	M8	1	25 Nm (18.44 lb ft)	-



FRONT WHEEL

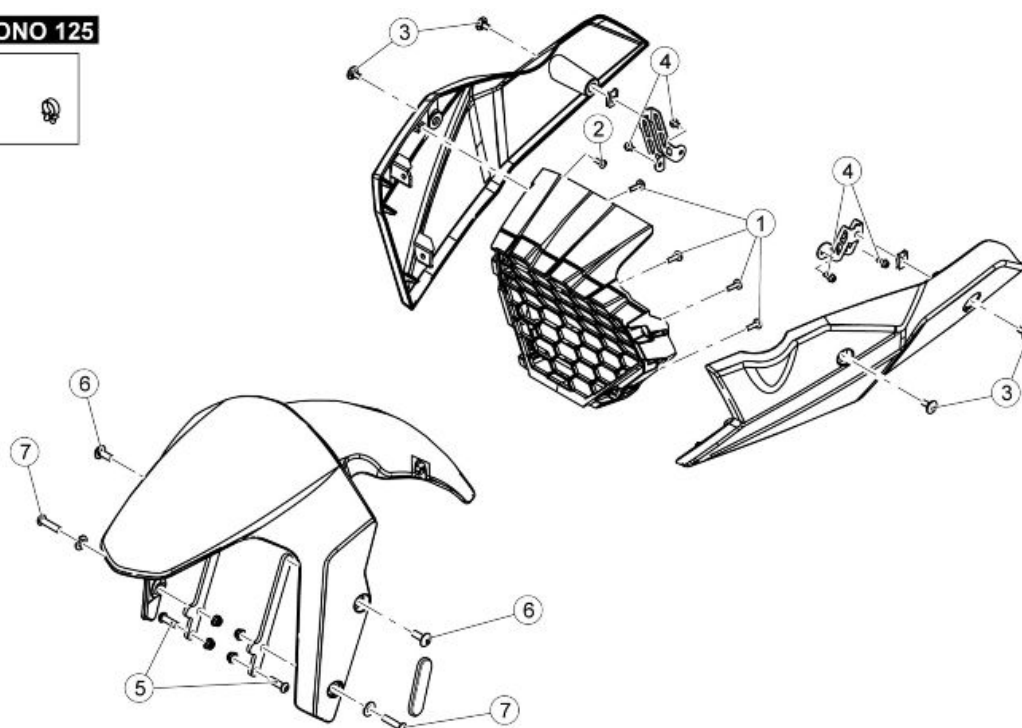
pos.	Description	Type	Quantity	Torque	Notes
1	Front wheel axle nut	M14	1	78 Nm (57.53 lb ft)	-
2	Front disc/tone wheel fastener screws	M6x20	6	12 Nm (8.85 lb ft)	Pre-permeated
-	Flanged hex head screw fastening the ABS sensor	M5x16	1	6 Nm (4.43 lb ft)	Loct. 243

RS 125

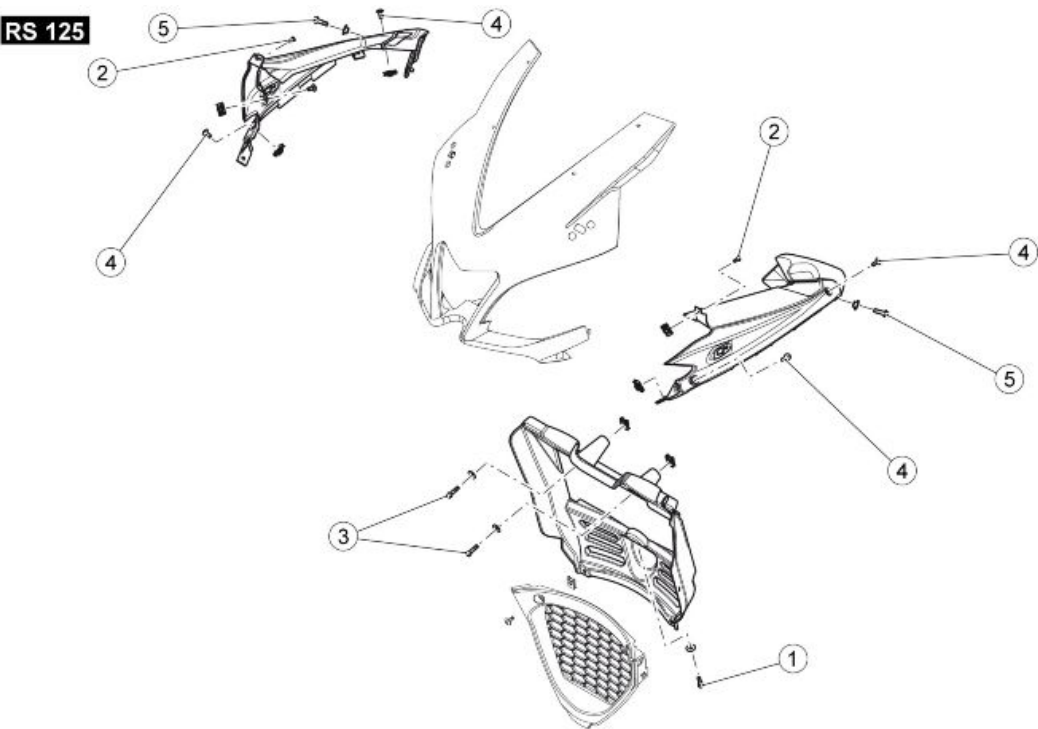


FRONT MUDGUARD - ENGINE FAIRING

pos.	Description	Type	Quantity	Torque	Notes
1	Engine fairing fastening screw	M5x16	2	3 Nm (2.21 lb ft)	-
2	Screw fixing side fairing	M6x12	1	6 Nm (4.43 lb ft)	-
3	Front mudguard fixing screw	M6x25	2	4.4 Nm (3.25 lb ft)	-
4	Flanged self-tapping nut	M6	1	6 Nm (4.43 lb ft)	-
5	Screw fastening the lower fairing to the cradle	M5x12	4	3 Nm (2.21 lb ft)	-
6	Front mudguard mounting fixing screw	M6x20	2	5 Nm (3.69 lb ft)	-
7	Fairing fixing spacer	M6	1	12 Nm (8.85 lb ft)	-
8	Right/left fairing mounting fixing screw	M5	4	5 Nm (3.69 lb ft)	-
9	Front mudguard fixing screw	M6	2	4.4 Nm (3.25 lb ft)	-
10	Screw fastening lower fairing to the engine fairing	M5x12	2	3 Nm (2.21 lb ft)	-

TUONO 125**FRONT MUDGUARD - ENGINE FAIRING**

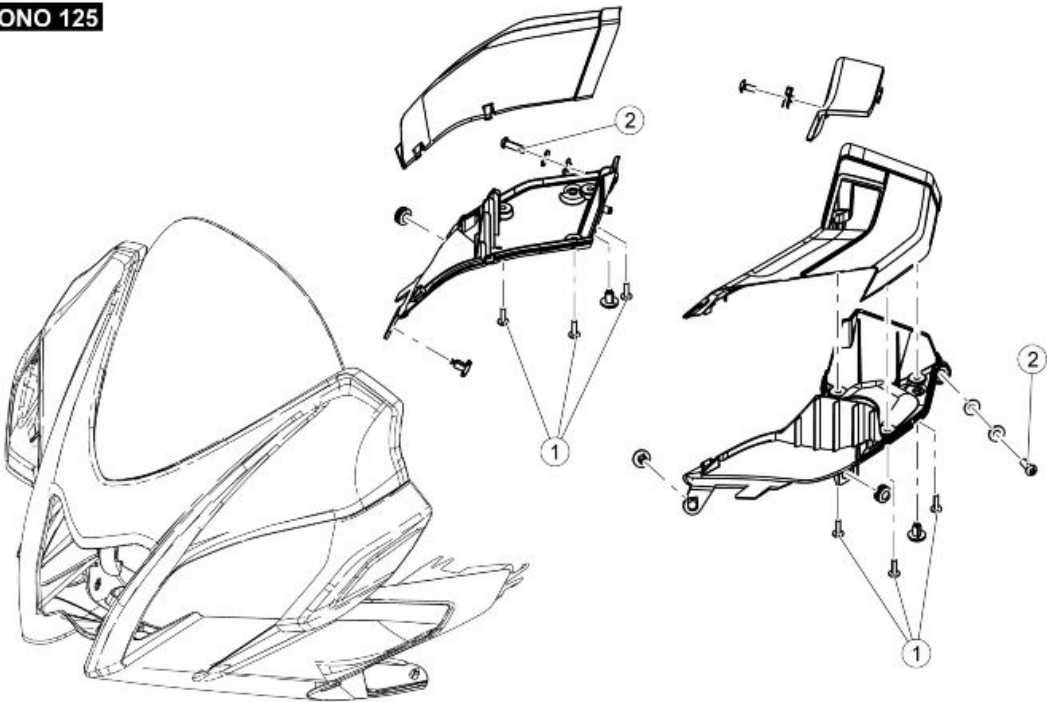
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening lower fairing to the engine fairing	Self tapping screw, Ø 3.9	4	2 Nm (1.48 lb ft)	-
2	Screw fastening lower right fairing to the engine fairing	Self tapping screw, Ø 3.9	1	2 Nm (1.48 lb ft)	-
3	Screw fastening lower fairings to the chassis	M5	4	5 Nm (3.69 lb ft)	-
4	Screws fixing the side fairings mounting to the engine cradle	M5	4	3 Nm (2.21 lb ft)	-
5	Front mudguard mounting fixing screws	M6	2	5 Nm (3.69 lb ft)	With self-locking nut
6	Front mudguard fixing screws	M6	2	4.4 Nm (3.25 lb ft)	-
7	Front mudguard fixing screws	M6	2	4.4 Nm (3.25 lb ft)	-



DUCTS

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening radiator cowl	M5x16	1	2 Nm (1.48 lb ft)	-
2	Screw fastening upper fairing closing	Self tapping screw, Ø 3.9	2	1 Nm (0.74 lb ft)	-
3	Screw fastening radiator cowl	M5x20	2	2 Nm (1.48 lb ft)	-
4	Screw fastening upper fairing closing	M5x16	4	3 Nm (2.21 lb ft)	-
5	Screw fastening upper fairing closing	M6x20	2	6 Nm (4.43 lb ft)	-

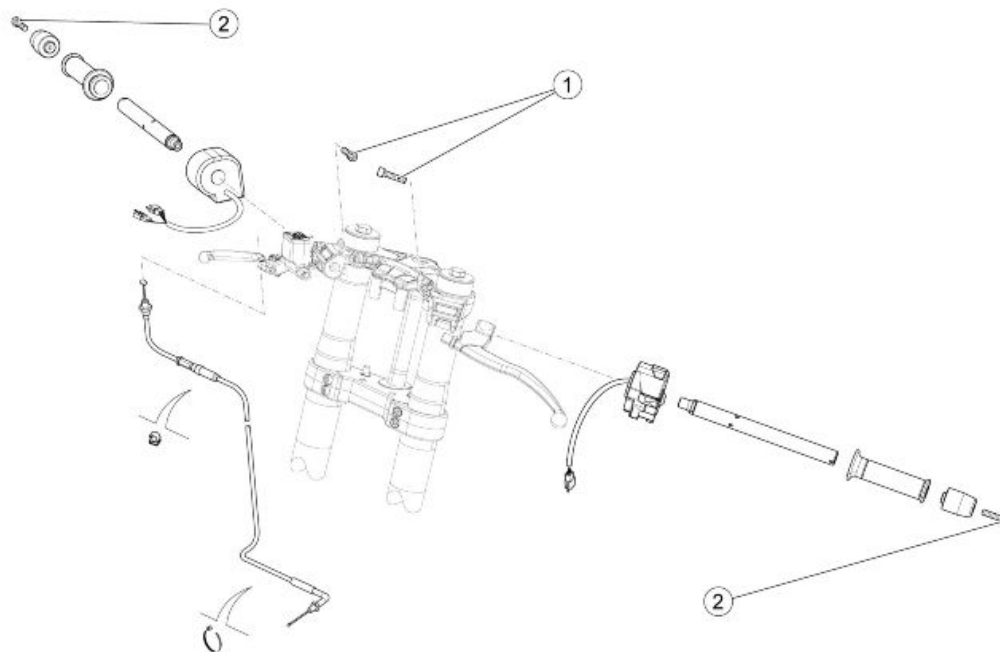
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DUCTS

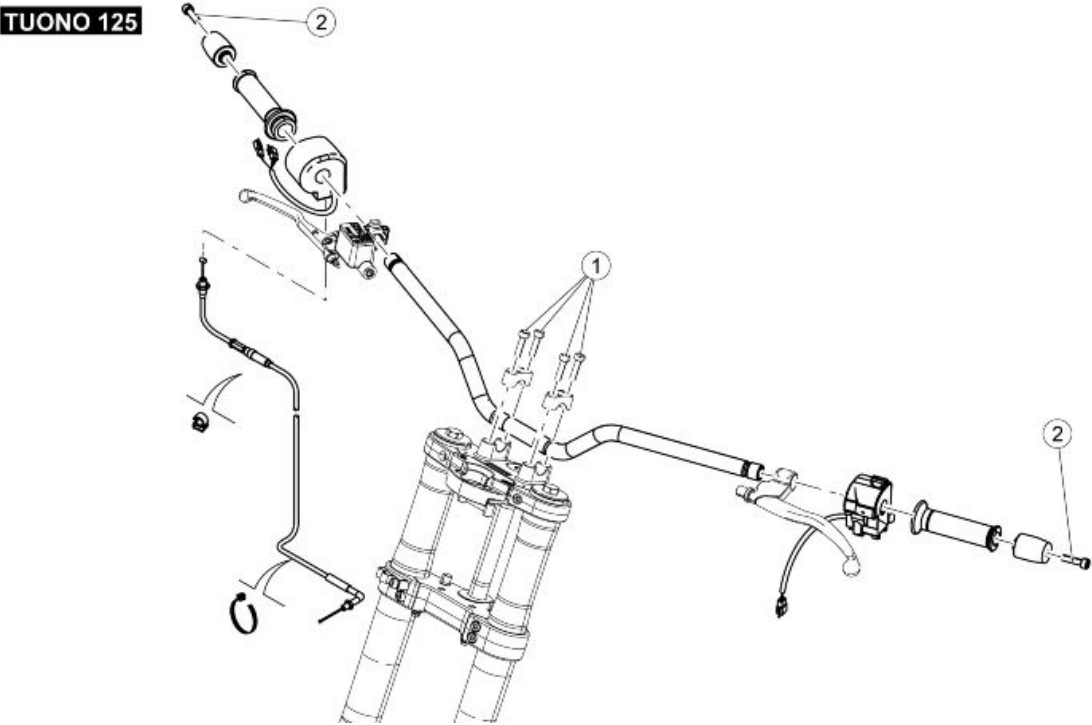
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening upper ducts to lower ones	Self tapping screw, Ø 3.3	6	2 Nm (1.48 lb ft)	-
2	Screws fastening ducts to chassis	M6	2	6 Nm (4.43 lb ft)	-

RS 125



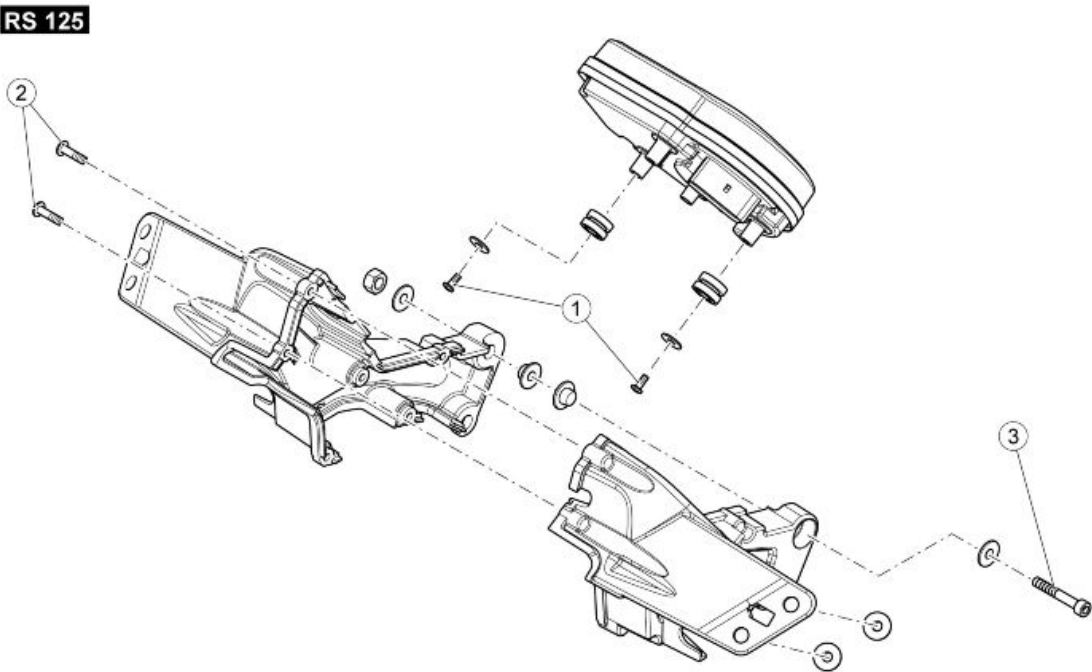
HANDLEBAR AND CONTROLS

pos.	Description	Type	Quantity	Torque	Notes
1	Semi-handlebar fixing screw	M8x30	2	25 Nm (18.44 lb ft)	Loctite 243
2	Handlebar counterweight fastener screw	M5x50	2	5 Nm (3.69 lb ft)	Loctite 243



HANDLEBAR AND CONTROLS

pos.	Description	Type	Quantity	Torque	Notes
1	Handlebar U-bolt fastener screws	M8	4	20 Nm (14.75 lb ft)	-
2	Handlebar counterweight fastener screw	M5x50	2	5 Nm (3.69 lb ft)	Loctite 243

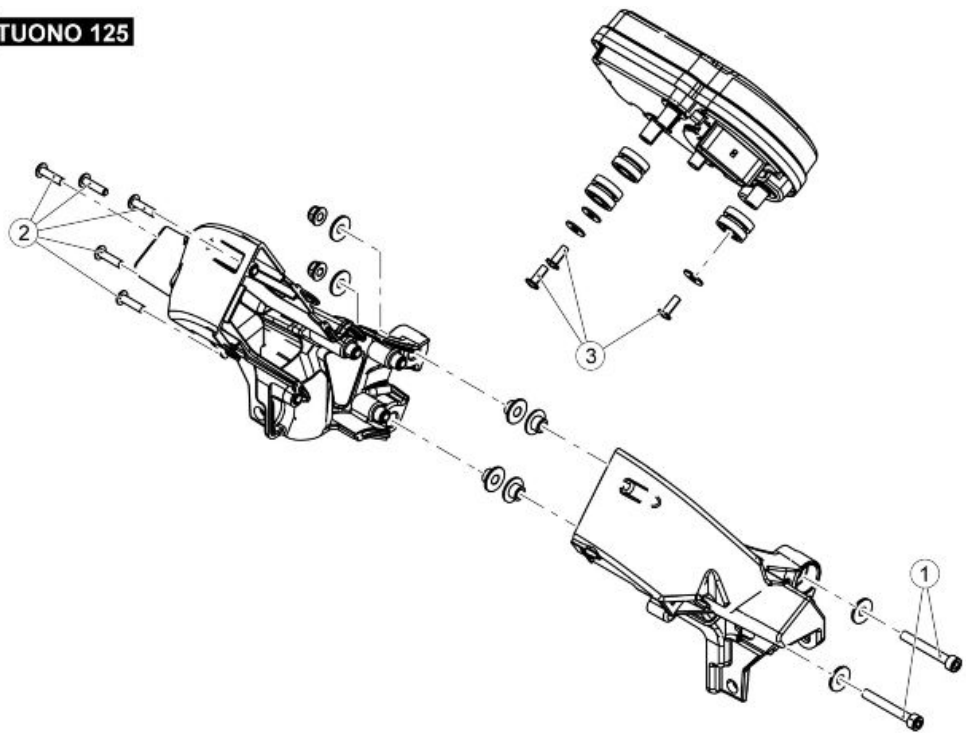


DASHBOARD

pos.	Description	Type	Quantity	Torque	Notes
1	Instrument panel fastening screw	M5x14	3	2.5 Nm (1.84 lb ft)	-

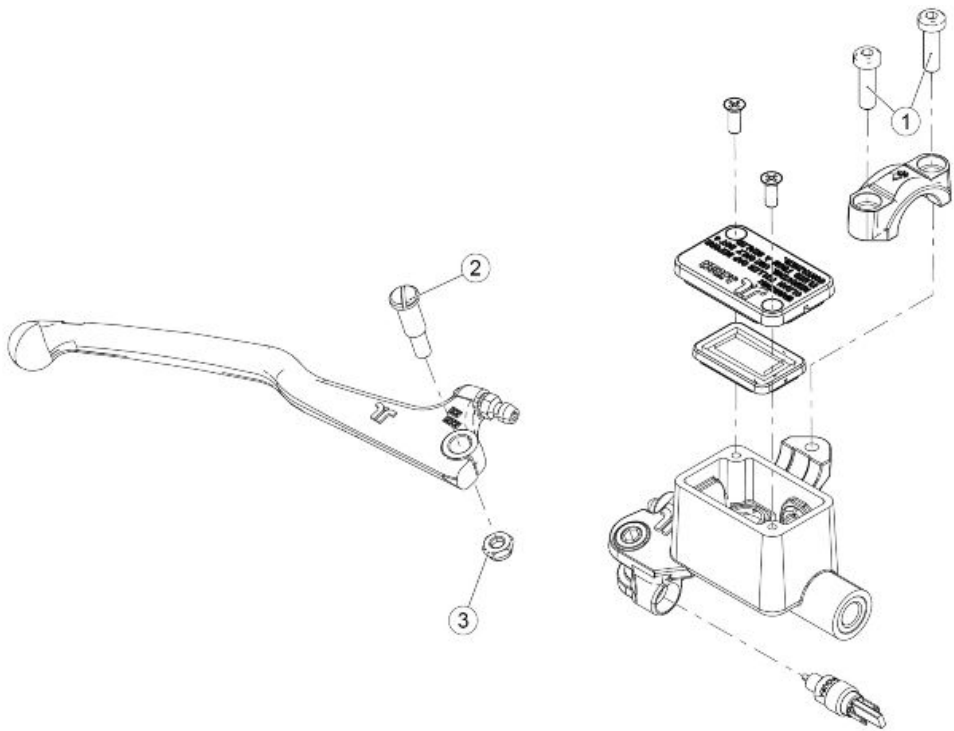
pos.	Description	Type	Quantity	Torque	Notes
2	Instrument panel mounting fixing screw	M5x20	6	2 Nm (1.48 lb ft)	-
3	Instrument panel mounting fixing screw	M6x40	2	8 Nm (5.90 lb ft)	-

TUONO 125



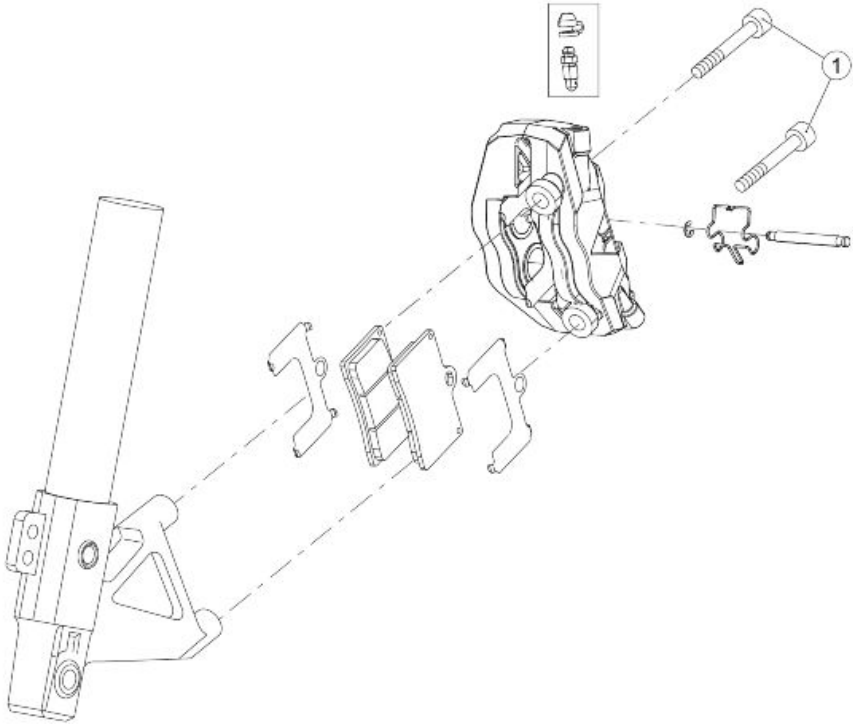
DASHBOARD

pos.	Description	Type	Quantity	Torque	Notes
1	Instrument panel mounting fixing screw	M6	2	8 Nm (5.90 lb ft)	-
2	Instrument panel mounting fixing screw	Self tapping screw, Ø 5	5	2 Nm (1.48 lb ft)	-
3	Instrument panel fixing screws	Self tapping screw, Ø 5	3	2.5 Nm (1.84 lb ft)	-



FRONT BRAKE MASTER CYLINDER

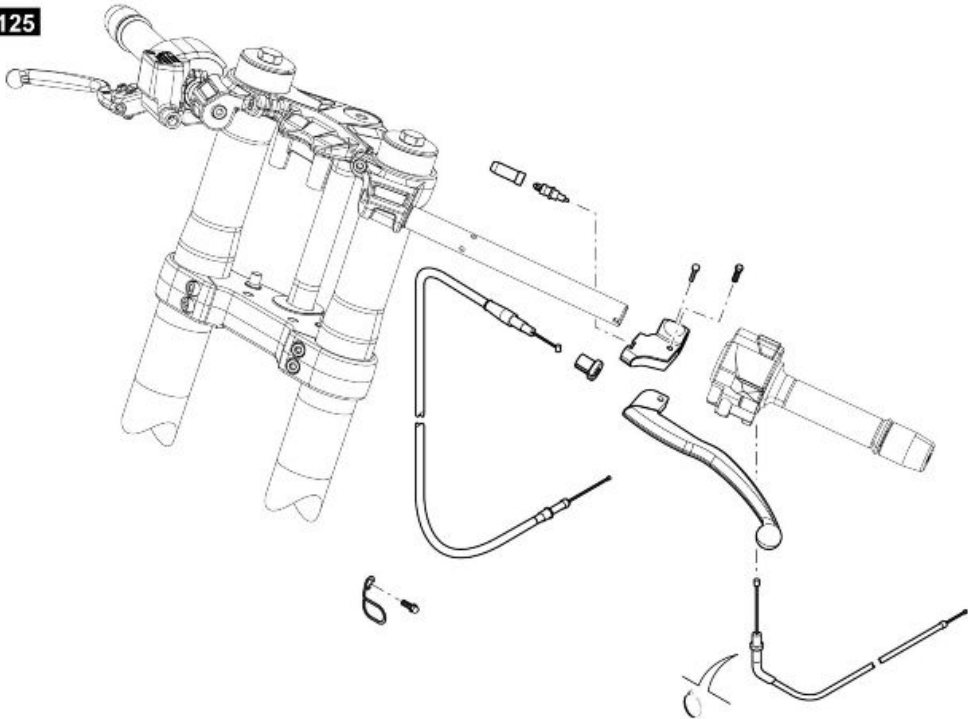
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening front brake master cylinder	M6x30	2	11 Nm (8.11 lb ft)	-
2	Front brake lever fixing screw	-	1	4-7 Nm (2.95-5.16 lb ft)	-
3	Front brake lever fixing screw	-	1	4-7 Nm (2.95-5.16 lb ft)	-



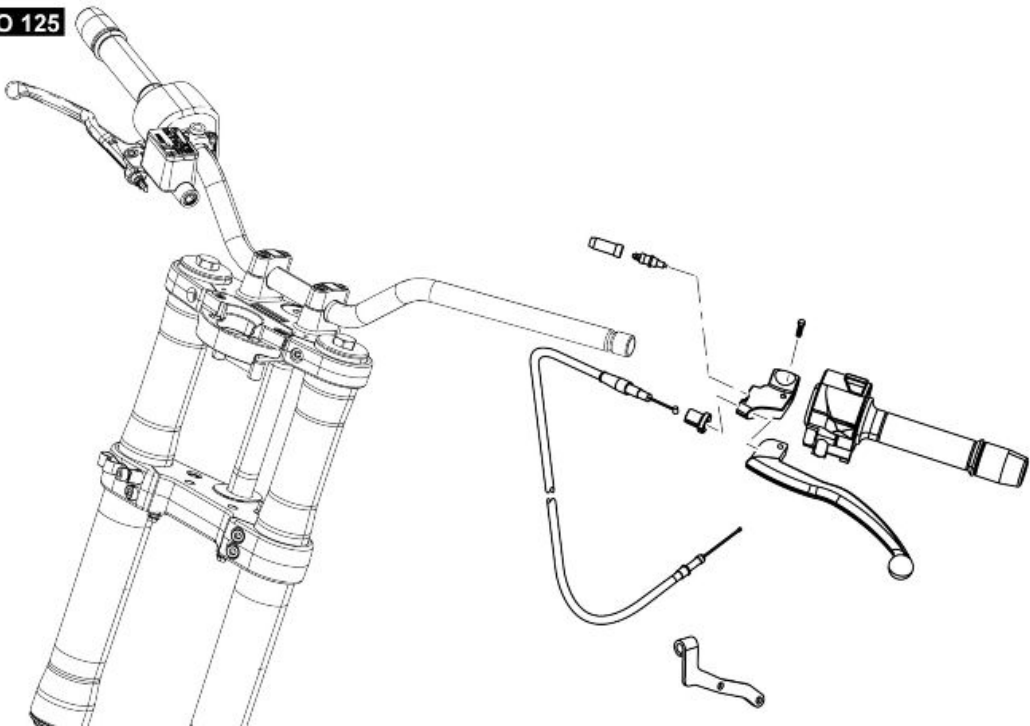
FRONT CALLIPER

pos.	Description	Type	Quantity	Torque	Notes
1	Front calliper fastener screw	M10x60	2	50 Nm (36.88 lb ft)	-

RS 125

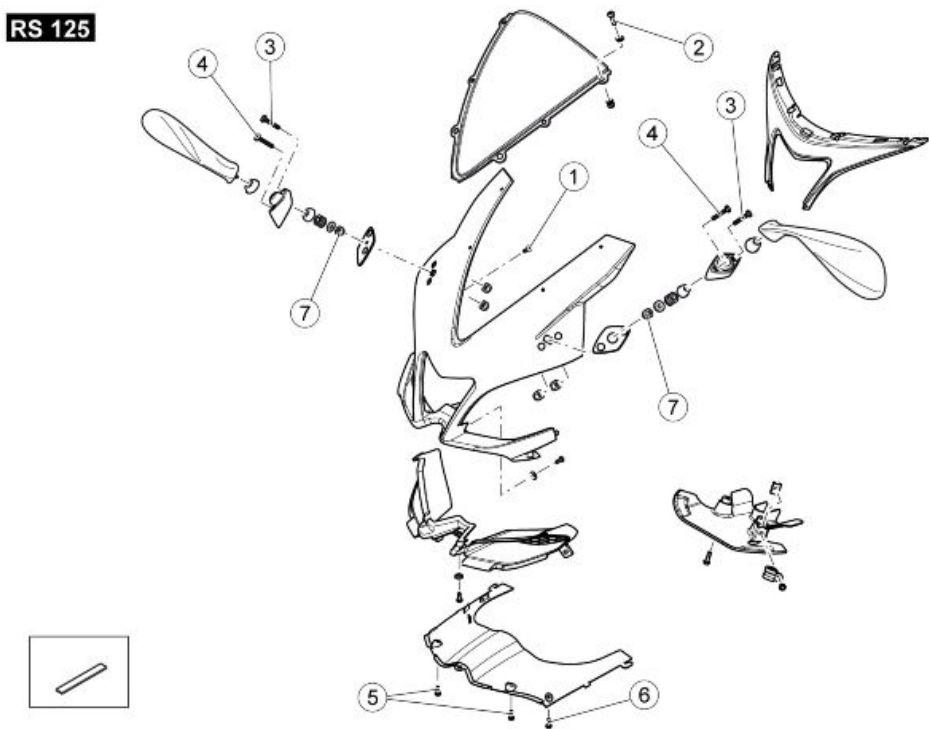


TUONO 125



CLUTCH CONTROL

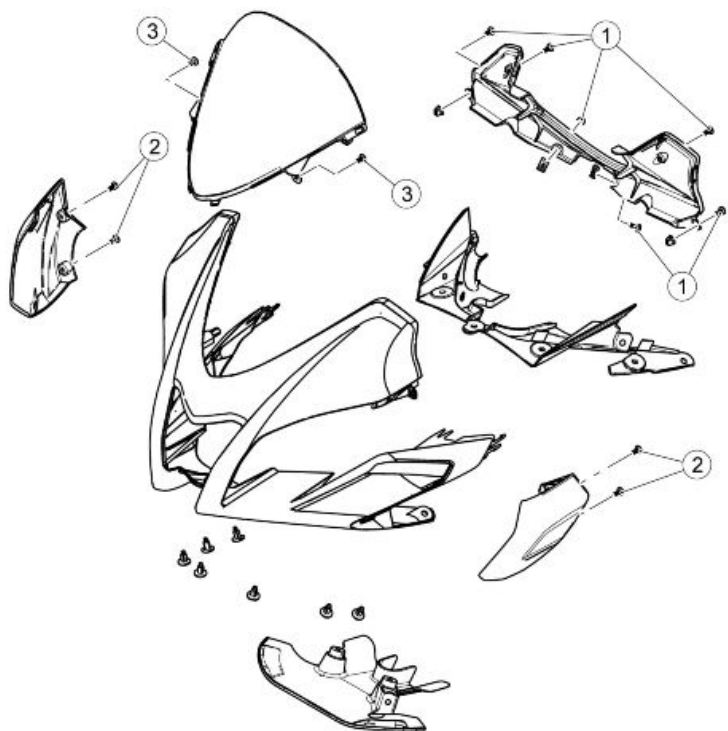
pos.	Description	Type	Quantity	Torque	Notes
-	Clutch cable fastener screw	M6	1	6 Nm (4.43 lb ft)	-
-	Clutch control fastener screw	M6	1	10 Nm (7.38 lb ft)	-
-	Clutch cable fixing nut	M8	1	6 Nm (4.43 lb ft)	-



TOP FAIRING

pos.	Description	Type	Quantity	Torque	Notes
1	Top fairing fastener screw	Self tapping screw, Ø 3.9	2	0.4 Nm (0.30 lb ft)	-
2	Top fairing screen fastener screw	M4	4	1 Nm (0.74 lb ft)	-
3	Rear view mirror fastener screw	M6x30	2	2 Nm (1.48 lb ft)	-
4	Rear view mirror fastener screw	M6x35	2	2 Nm (1.48 lb ft)	-
5	Screw fastening lower front fairing element	Self tapping screw, Ø 3.9	2	1 Nm (0.74 lb ft)	-
6	Screw fastening lower front fairing element	M4x12	2	1 Nm (0.74 lb ft)	-
7	Rear view mirror fastener nut	M6	2	2 Nm (1.48 lb ft)	-

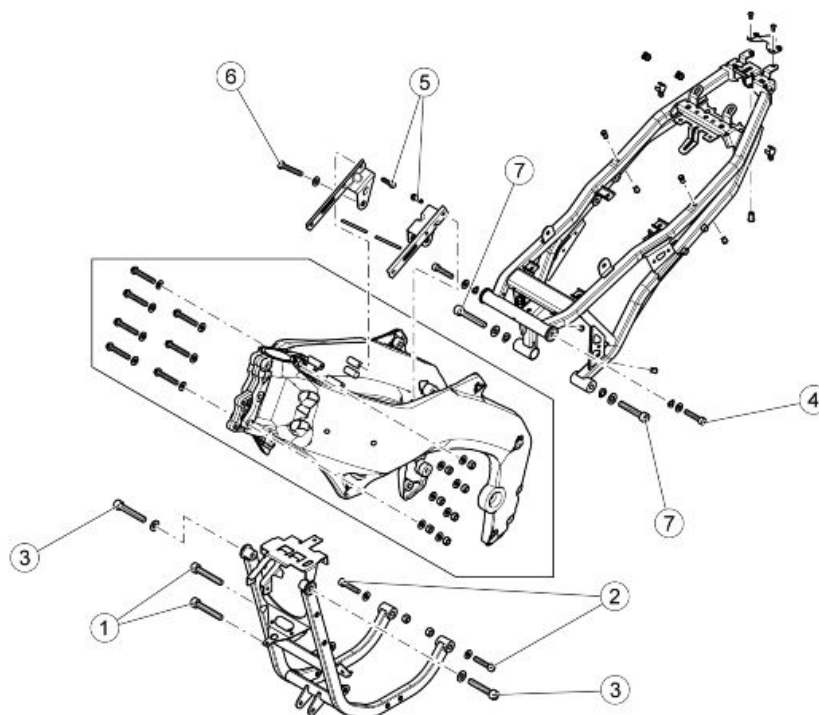
TUONO 125



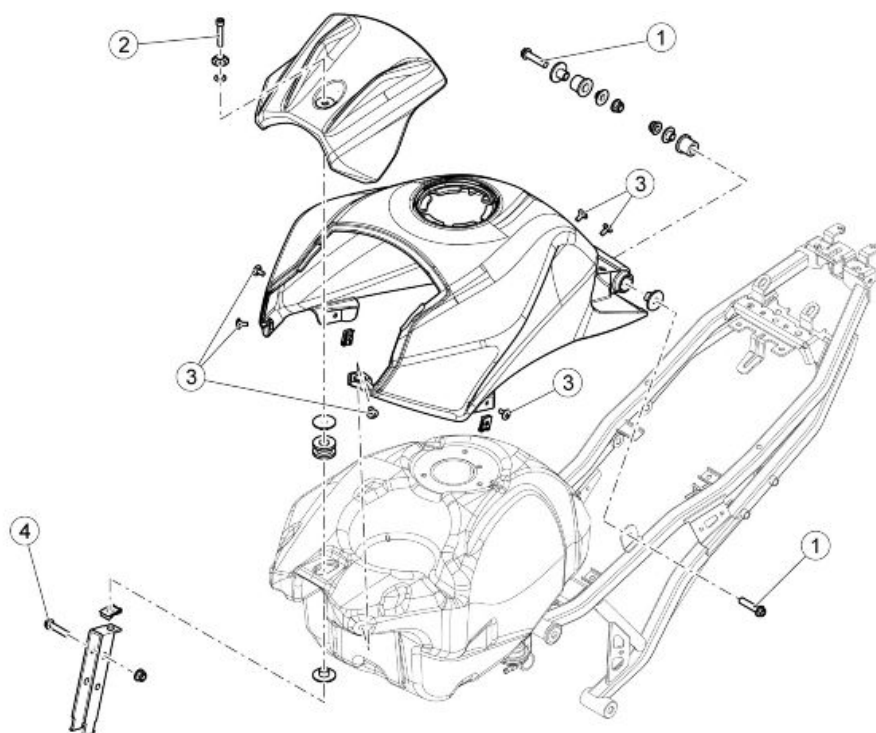
TOP FAIRING

pos.	Description	Type	Quantity	Torque	Notes
1	Instrument panel fastening screws	Self tapping screw, Ø 4.2	6	1 Nm (0.78 lb ft)	-
2	Taillight side panels fixing screws	Self tapping screw, Ø 3.3	4	2 Nm (1.48 lb ft)	-
3	Top fairing fixing screws	Self tapping screw, Ø 4.2	4	3 Nm (2.21 lb ft)	-

Central part

**CHASSIS**

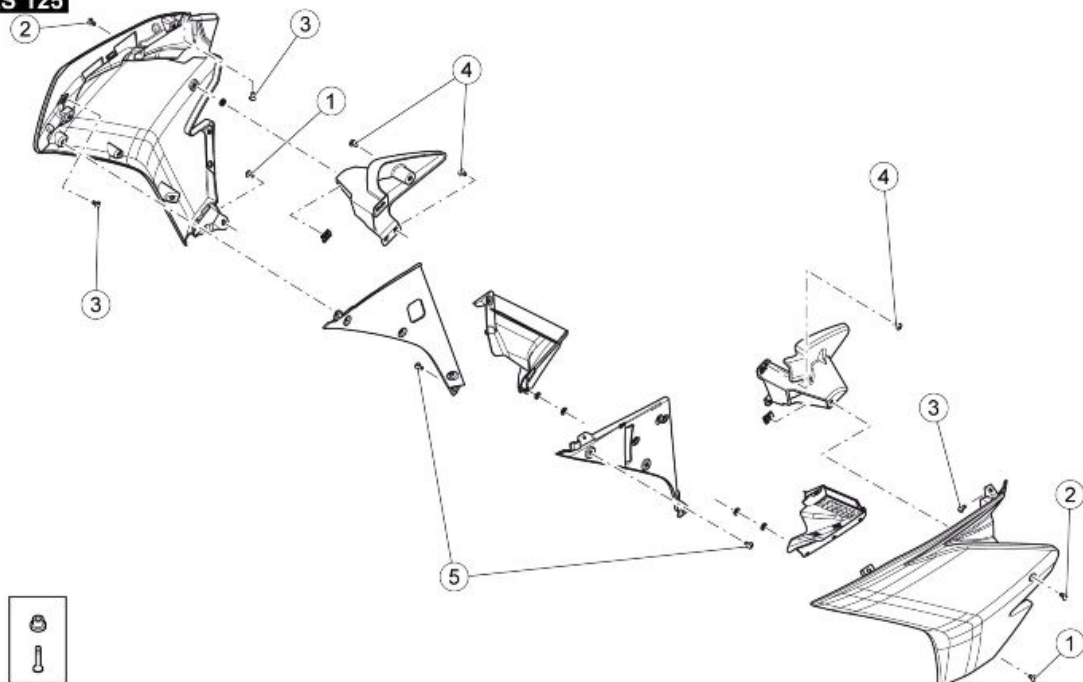
Pos.	Description	Type	Quantity	Torque	Notes
1	Screws fastening the engine to the cradle	M10	2	50 Nm (36.88 lb ft)	-
2	Cradle fixing screw	M8	2	25 Nm (18.44 lb ft)	-
3	Saddle mounting fixing screw	M10x45	2	50 Nm (36.88 lb ft)	-
4	Saddle mounting fixing screw	M8x40	2	25 Nm (18.44 lb ft)	Loctite 243
5	Mounting bracket fixing screw	M6x16	4	12 Nm (8.85 lb ft)	Loctite 243
6	Left and right engine mount screw	M10	2	38 Nm (28.02 lb ft)	Loctite 243
7	Saddle mounting fixing screw	M10	2	50 Nm (36.88 lb ft)	Loctite 243



TANK

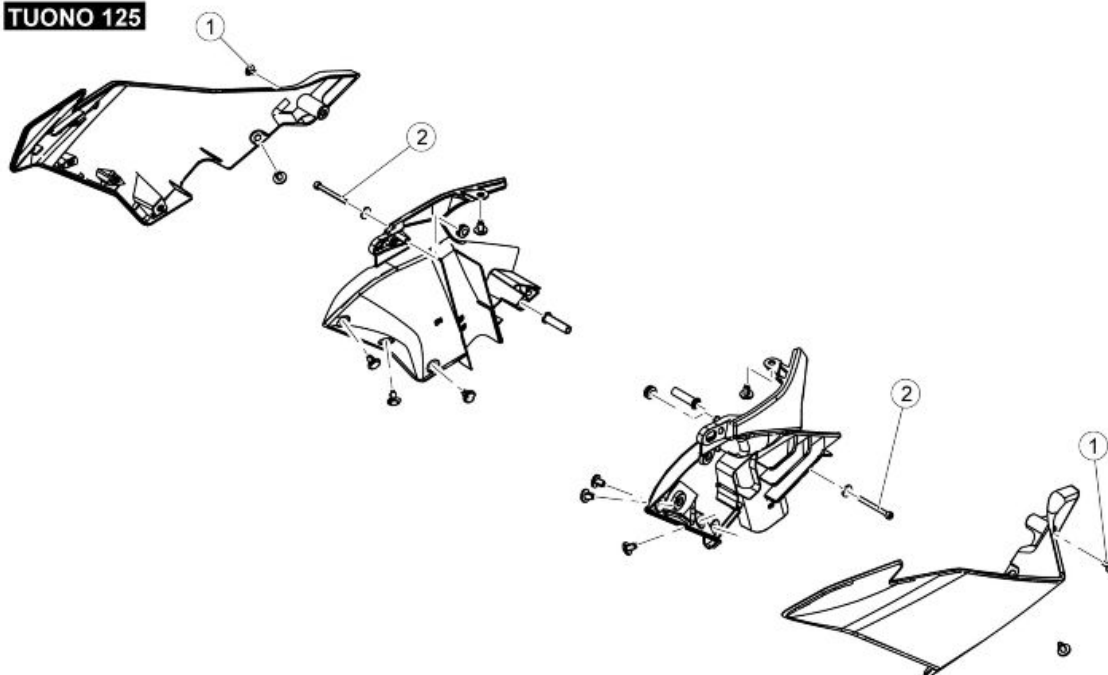
Pos.	Description	Type	Quantity	Torque	Notes
1	Rear tank fixing screw	M8x40	2	8 Nm (5.90 lb ft)	-
2	Tank cover fixing screw	M6x35	1	10 Nm (7.38 lb ft)	-
3	Front tank fixing screw	M5x9	4	3 Nm (2.21 lb ft)	-
4	Tank U-bolt fixing screw	M6x30	2	10 Nm (7.38 lb ft)	-

RS 125

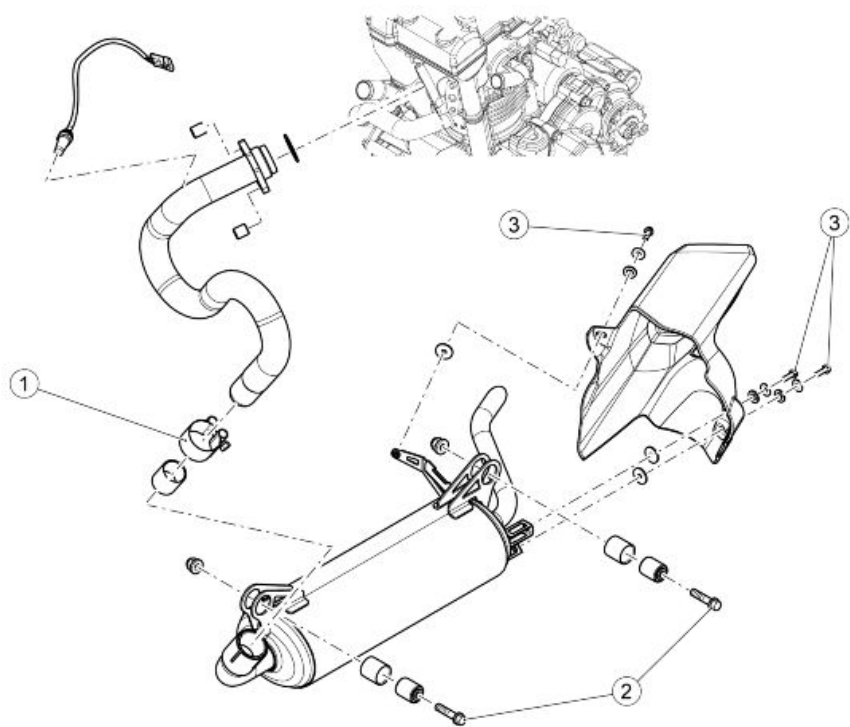


SIDE FAIRINGS

Pos.	Description	Type	Quantity	Torque	Notes
1	Side fairing fastening screw	M5x16	6	0.8 Nm (0.59 lb ft)	-
2	Screw fixing side fairing to engine closure	M5x9	2	3 Nm (2.21 lb ft)	-
3	Side fairing fastening screw	Self tapping screw, Ø 3.9	4	0.4 Nm (0.30 lb ft)	-
4	Engine closing fixing screw	M5x9	6	1.7 Nm (1.25 lb ft)	-
5	Screw fastening inside fairing	M5x16	2	3 Nm (2.21 lb ft)	-

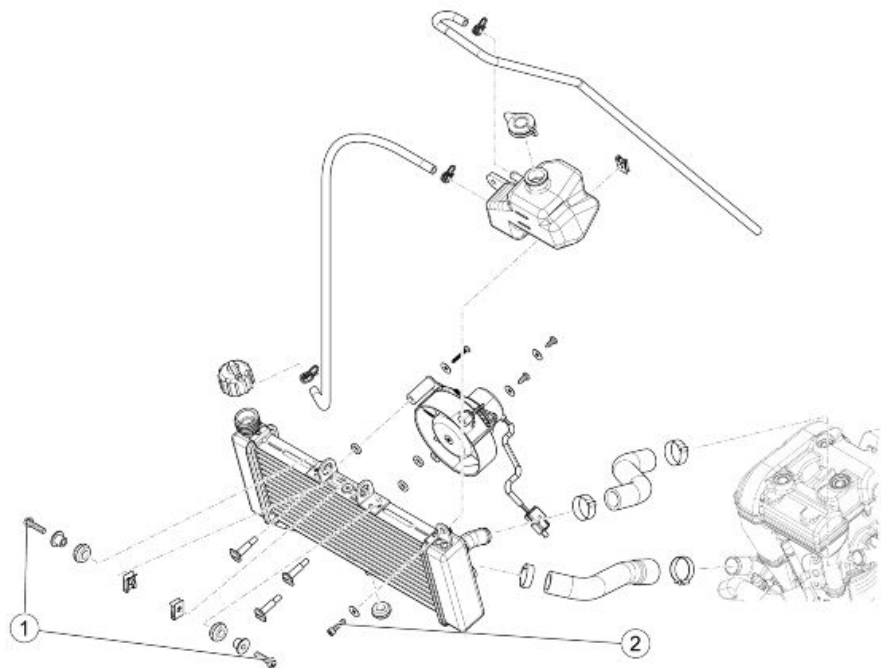
TUONO 125**SIDE FAIRINGS**

Pos.	Description	Type	Quantity	Torque	Notes
1	Side fairing fastening screw	M5	2	3 Nm (2.21 lb ft)	-
2	Screw fastening inner fairing	M5	2	3 Nm (2.21 lb ft)	-



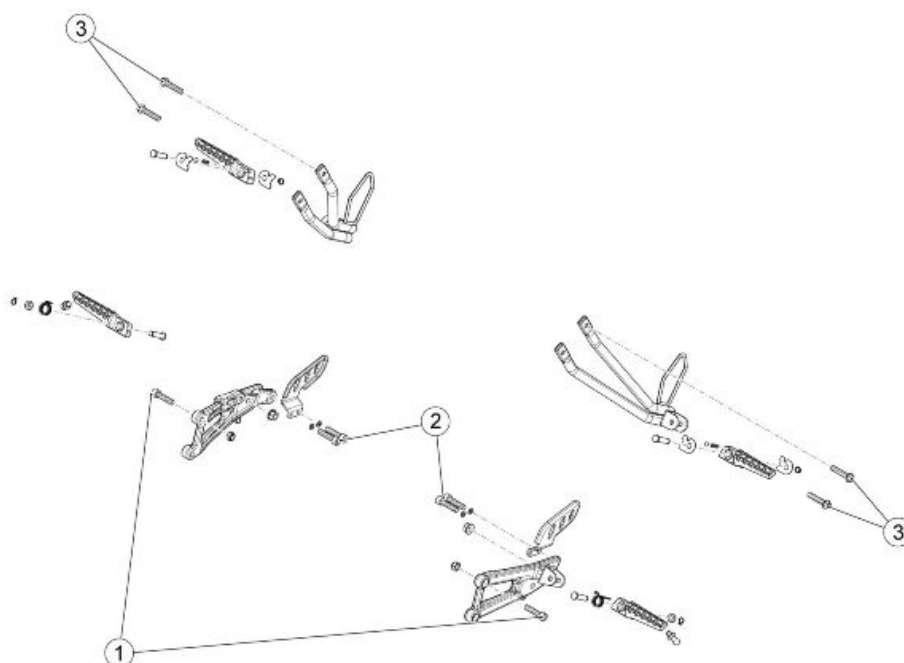
EXHAUST

Pos.	Description	Type	Quantity	Torque	Notes
1	Exhaust fixing clamp	M8	1	15 Nm (11.06 lb ft)	-
2	Silencer fixing screw	M8x50	2	25 Nm (18.44 lb ft)	-
3	Cover fastener screw	M5x16	5	5 Nm (3.69 lb ft)	-



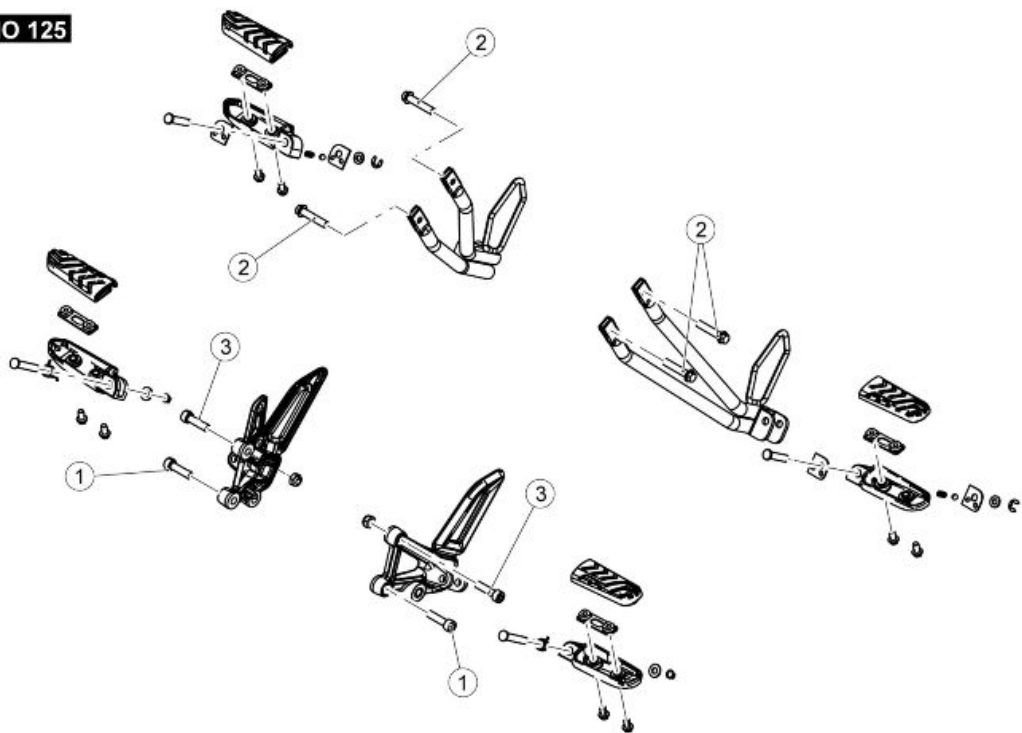
RADIATOR

pos.	Description	Type	Quantity	Torque	Notes
1	Radiator fixing screw	M6x25	2	10 Nm (7.38 lb ft)	-
2	Coolant tank fixing screw	M6x20	1	3.5 Nm (2.58 lb ft)	-

RS 125**FOOTRESTS**

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening the rider footrest mounting	M8x25	2	25 Nm (18.44 lb ft)	Loctite 243
2	Footrest protection fastening screw	M5x12	4	5 Nm (3.69 lb ft)	-
3	Passenger footrest bracket fastening screw	M8x40	4	20 Nm (14.75 lb ft)	-

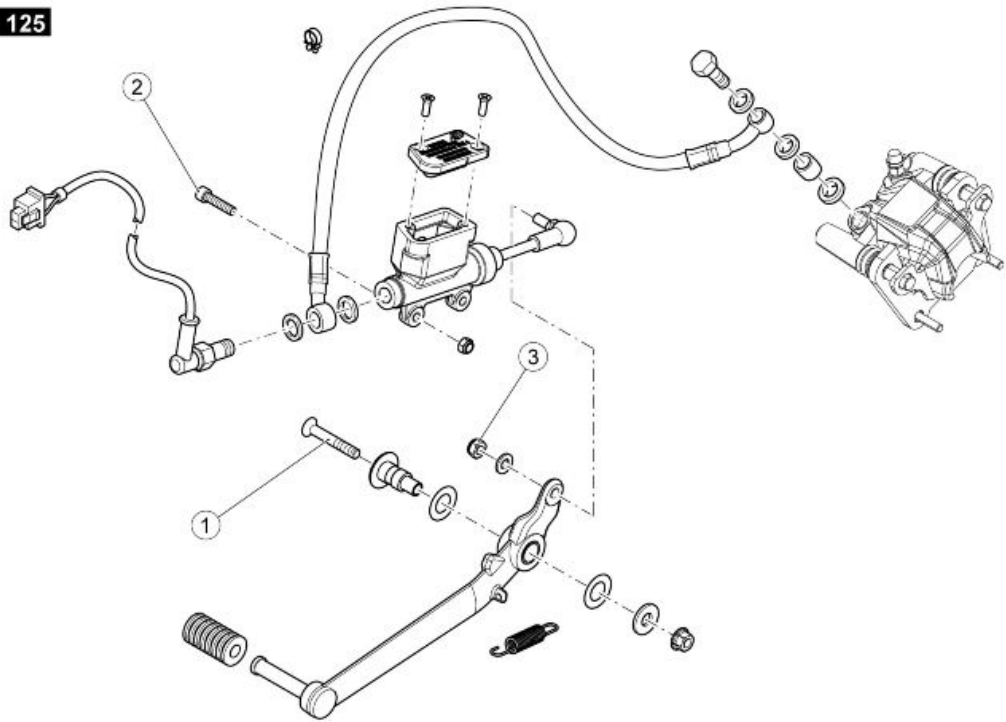
TUONO 125



FOOTRESTS

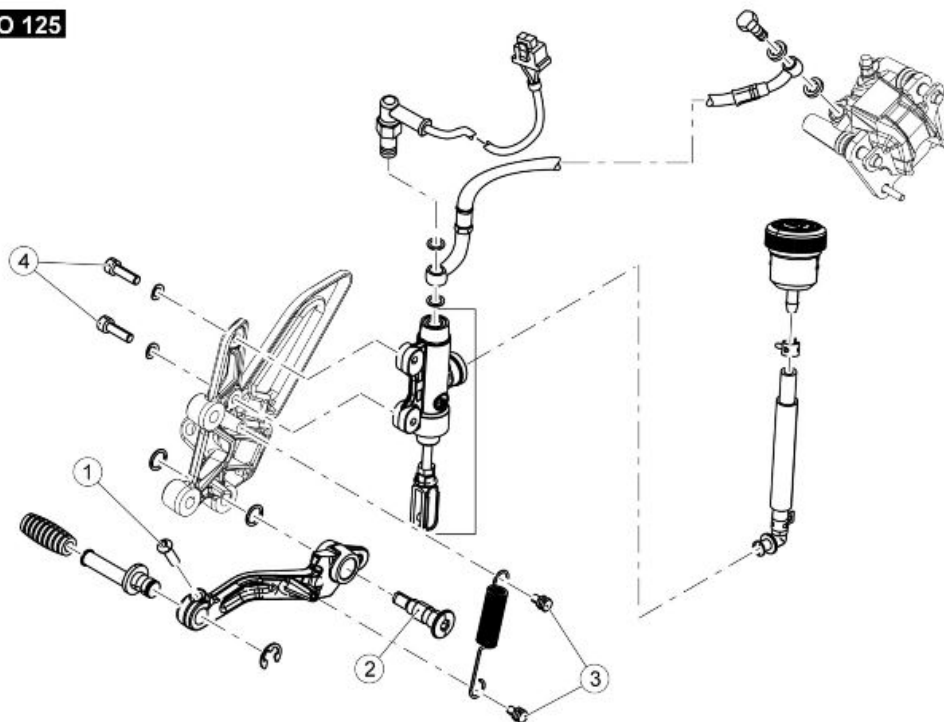
pos.	Description	Type	Quantity	Torque	Notes
1	Screws fastening the rider footrest mounting	M8	2	25 Nm (18.44 lb ft)	Loctite 243
2	Passenger footrest mounting fastening screws	M8	4	20 Nm (14.75 lb ft)	-
3	Screws fastening the rider footrest mounting	M8	2	25 Nm (18.44 lb ft)	With self-locking nut

RS 125

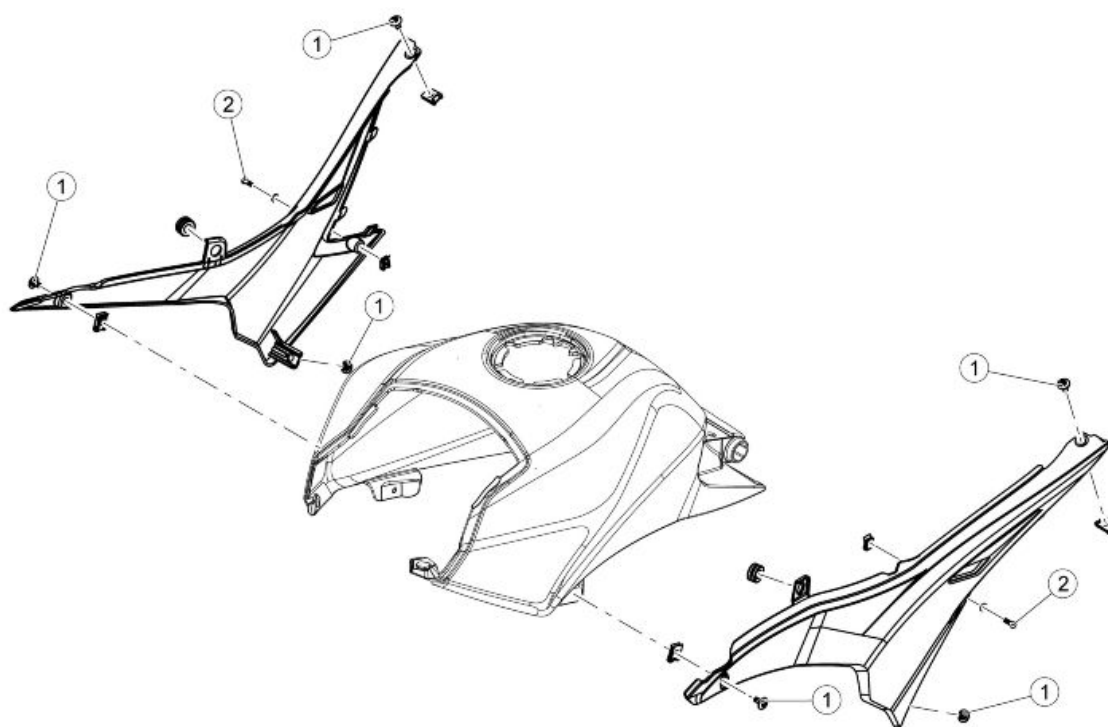


REAR BRAKING SYSTEM

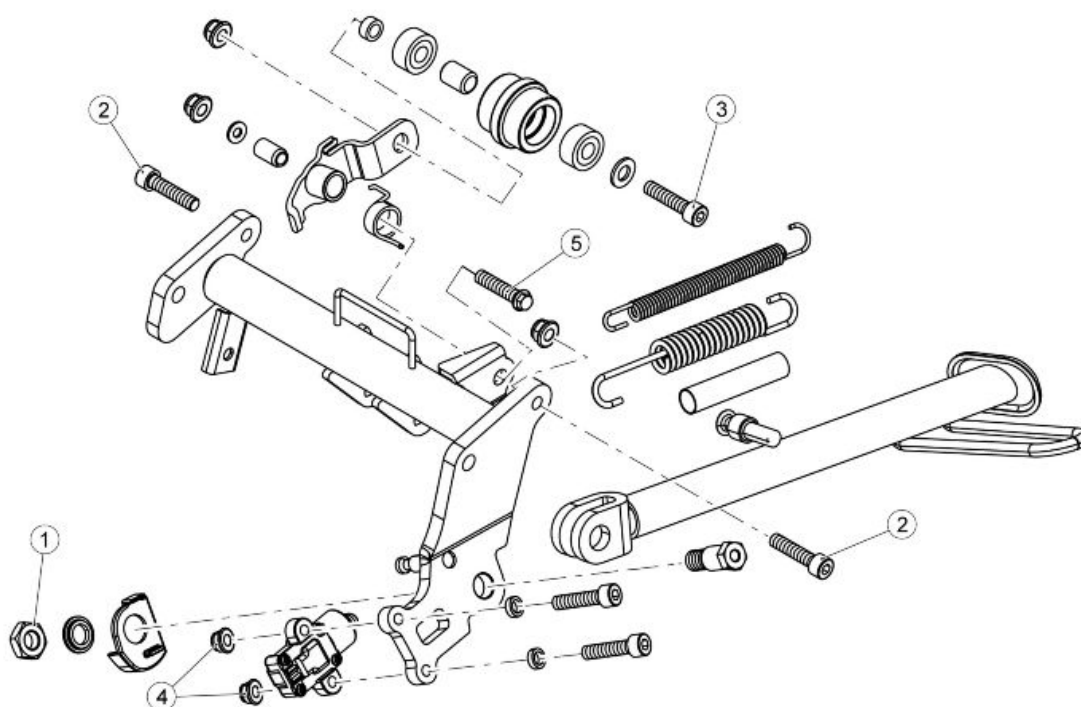
pos.	Description	Type	Quantity	Torque	Notes
1	Brake lever fixing screw	M6x40	1	12 Nm (8.85 lb ft)	-
2	Rear brake pump fixing screw	M6x30	2	10 Nm (7.38 lb ft)	-
3	Brake pump joint fixing screw	M6	1	10 Nm (7.38 lb ft)	-
-	Brake calliper fixing screws	-	2	25 +/- 2 Nm (18.44 +/- 1.48 lb ft)	-

TUONO 125**REAR BRAKING SYSTEM**

pos.	Description	Type	Quantity	Torque	Notes
1	Peg fixing screw	M6	1	8 Nm (5.90 lb ft)	-
2	Brake lever fixing pin	M8	1	25 Nm (18.44 lb ft)	Pre-permeated
3	Pin spring coupling	M5	2	5 Nm (3.69 lb ft)	Loctite 243
4	Rear brake pump fixing screw	M6	2	11 Nm (8.11 lb ft)	Loctite 243
-	Brake calliper fixing screws	-	2	25 +/- 2 Nm (18.44 +/- 1.48 lb ft)	-

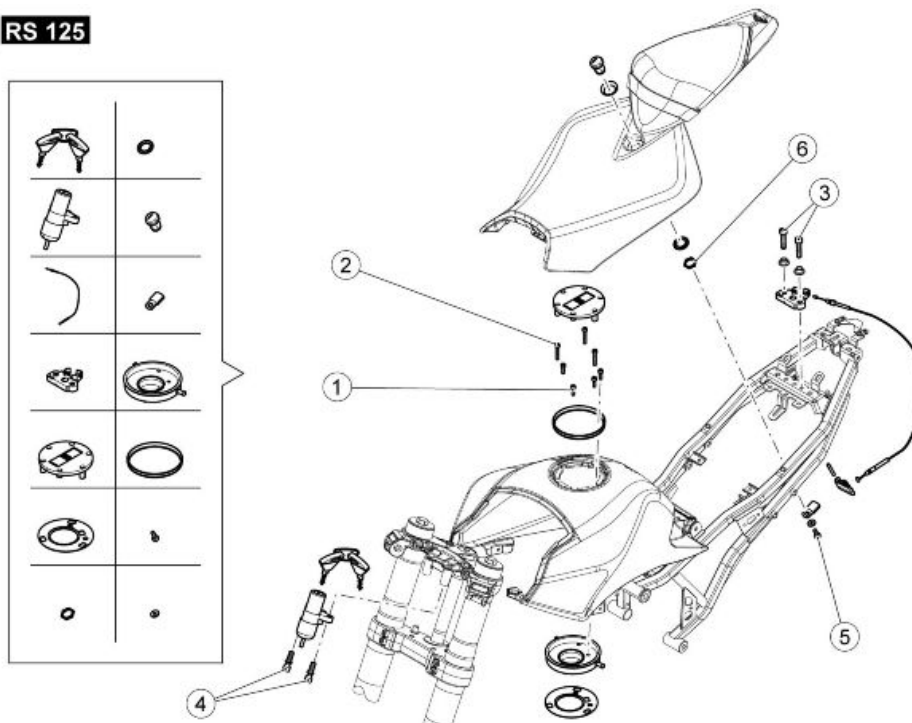
**CENTRAL BODYWORK**

pos.	Description	Type	Quantity	Torque	Notes
1	Fairing fastening screw	M5x9	6	3 Nm (2.21 lb ft)	-
2	Fairing fastening screw	M5x12	2	3 Nm (2.21 lb ft)	-

**STAND**

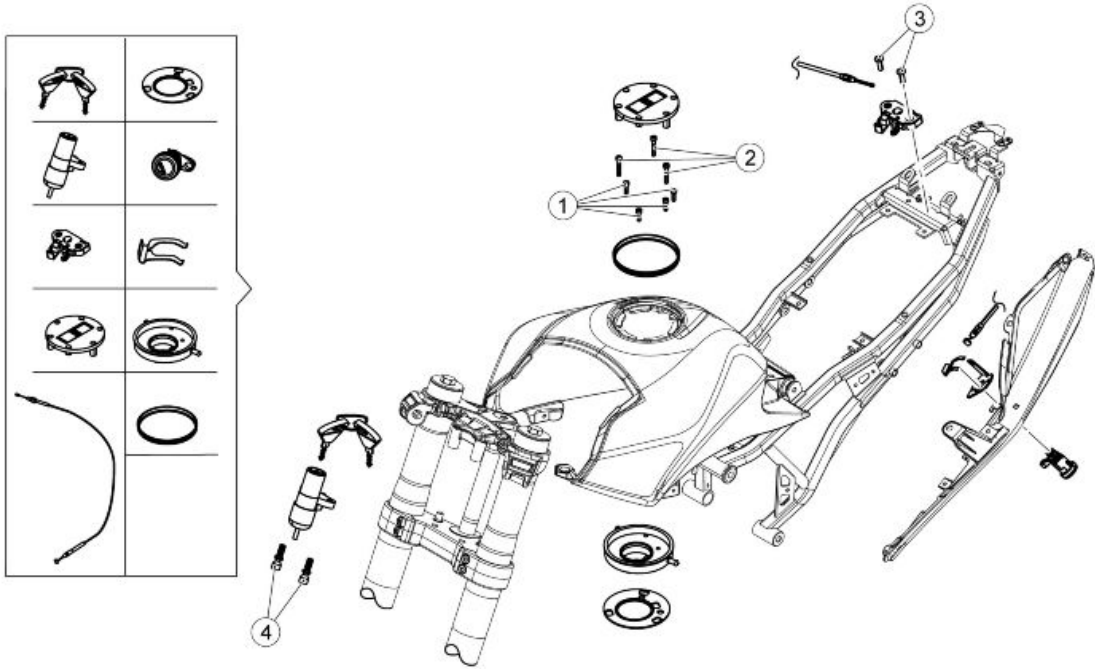
pos.	Description	Type	Quantity	Torque	Notes
1	Low nut	M10x1.25	1	10 Nm (7.38 lb ft)	Loctite 243

pos.	Description	Type	Quantity	Torque	Notes
2	Stand mounting fixing screw	M8x30	2	25 Nm (18.44 lb ft)	Loctite 243
3	Chain roller fixing screw	M8x45	1	25 Nm (18.44 lb ft)	-
4	Side stand switch fastening screws	M5x25	2	3 Nm (2.21 lb ft)	-
5	Stand mounting fixing screw	M6x30	1	10 Nm (7.38 lb ft)	-

RS 125**Locks**

pos.	Description	Type	Quantity	Torque	Notes
1	Tank plug fixing screw	M5x16	3	3 Nm (2.21 lb ft)	-
2	Tank plug fixing screw	M5x30	2	3 Nm (2.21 lb ft)	-
3	Screw fastening saddle lock plate	M6x30	2	6 Nm (4.43 lb ft)	-
4	Ignition lock fixing screw	M8x20	2	6.5 Nm (4.79 lb ft)	Tear-off
5	Saddle lock block fixing screw	M4	1	0.5 Nm (0.37 lb ft)	-
6	Nut fastening saddle lock ring nut	M22x1	1	3 Nm (2.21 lb ft)	-

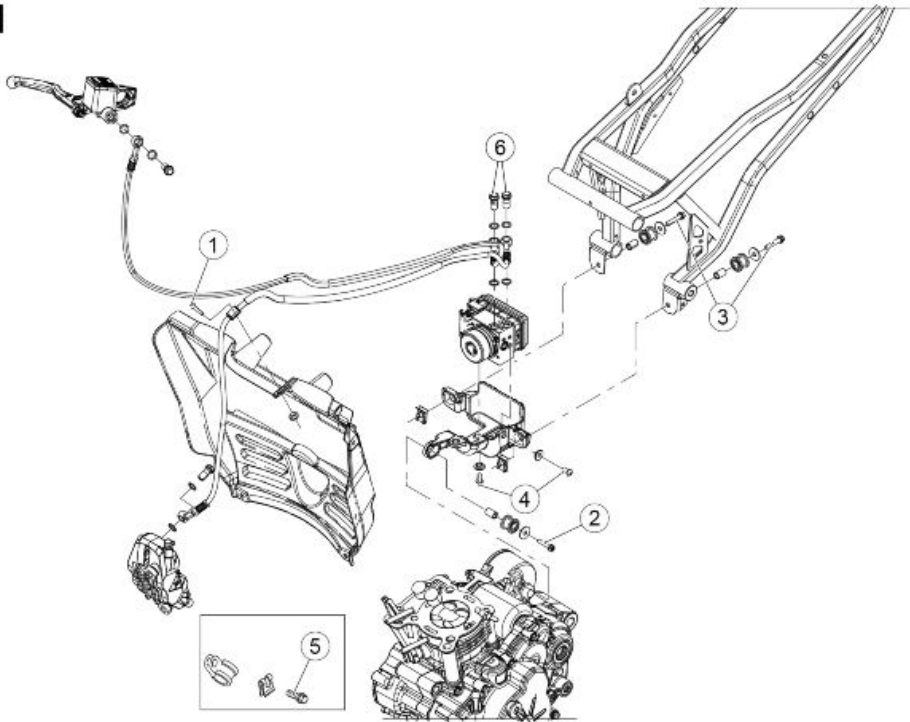
TUONO 125



Locks

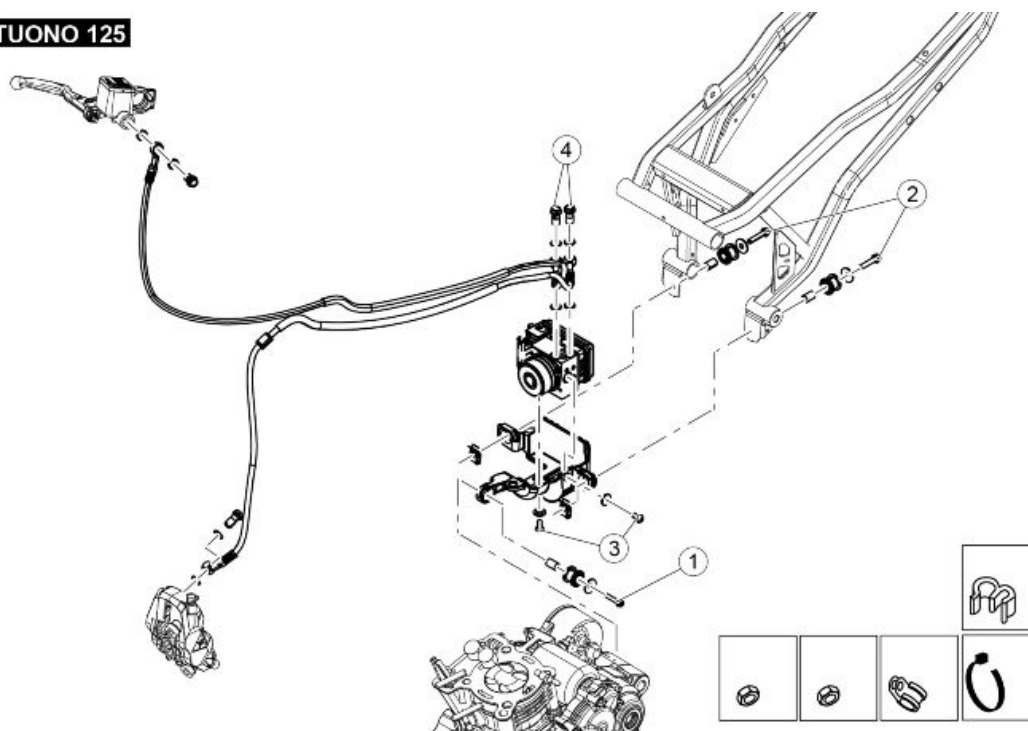
pos.	Description	Type	Quantity	Torque	Notes
1	Tank plug fixing screw	M5x16	3	3 Nm (2.21 lb ft)	-
2	Tank plug fixing screw	M5x30	2	3 Nm (2.21 lb ft)	-
3	Screw fastening saddle lock plate	M6x30	2	6 Nm (4.43 lb ft)	-
4	Ignition lock fixing screw	M8x20	2	6.5 Nm (4.79 lb ft)	Tear-off

RS 125



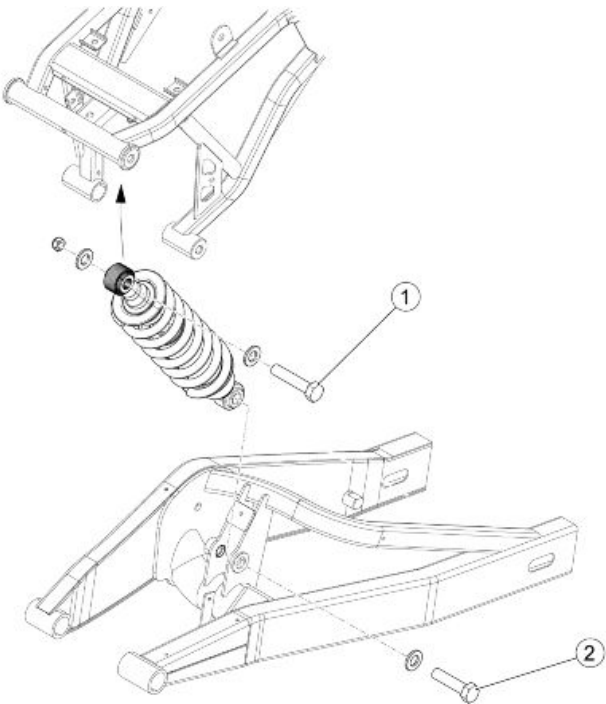
ABS SYSTEM

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening brake pipe to radiator surround	M6	1	10 Nm (7.38 lb ft)	-
2	Flanged hex head screw fastening modulator mounting case	M5x25	1	3.5 Nm (2.58 lb ft)	-
3	Flanged hex head screw fastening modulator mounting case	M6x30	2	10 Nm (7.38 lb ft)	-
4	Hex socket button head screw fastening modulator to mounting case	M6	2	10 Nm (7.38 lb ft)	-
5	Screw fastening brake pipe clamp	M5x16	1	5 Nm (3.69 lb ft)	-
6	Special brake pipe fastening screw	-	2	23-26 Nm (16.96-19.18 lb ft)	-

TUONO 125**ABS SYSTEM**

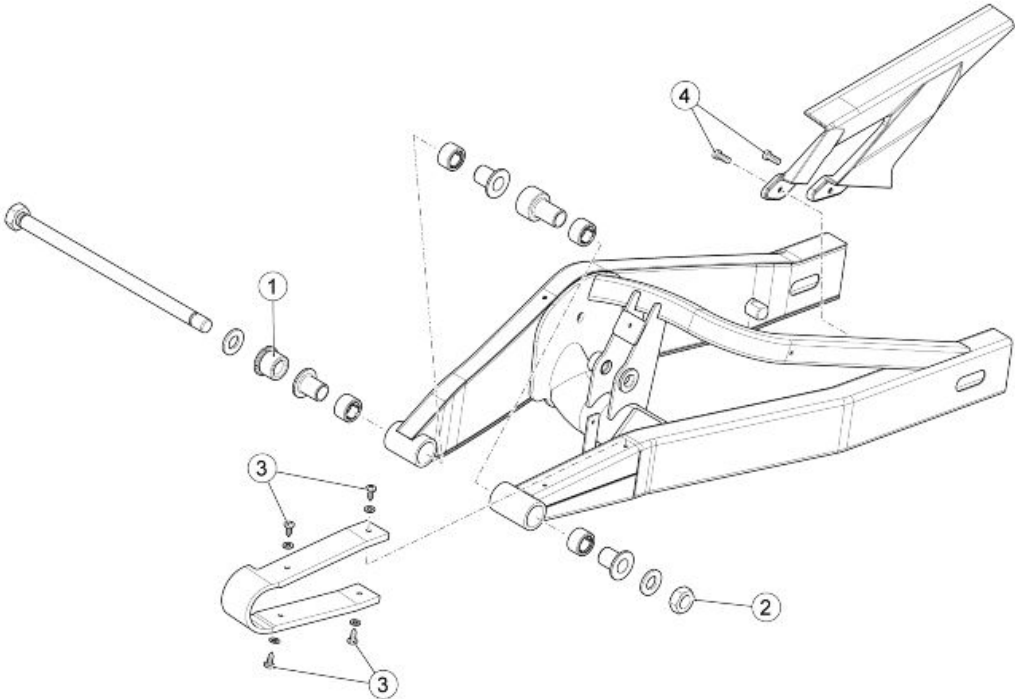
pos.	Description	Type	Quantity	Torque	Notes
1	Flanged hex head screw fastening modulator mounting case	M5x25	1	3.5 Nm (2.58 lb ft)	-
2	Flanged hex head screw fastening modulator mounting case	M6x30	2	10 Nm (7.38 lb ft)	-
3	Hex socket button head screw fastening modulator to mounting case	M6	2	10 Nm (7.38 lb ft)	-
4	Special brake pipe fastening screw	-	2	23-26 Nm (16.96-19.18 lb ft)	-

Back side



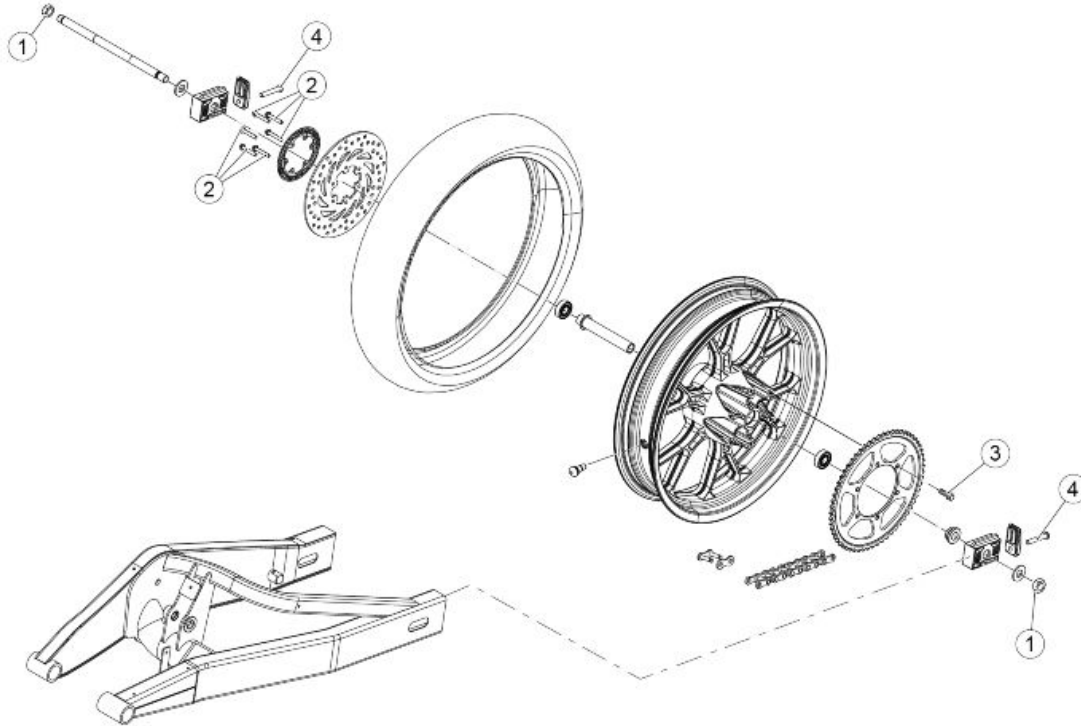
REAR SUSPENSION

pos.	Description	Type	Quantity	Torque	Notes
1	Upper mount fastener screw	M12	1	58 Nm (42.78 lb ft)	-
2	Lower fastener screw	M12	1	58 Nm (42.78 lb ft)	Loctite 243

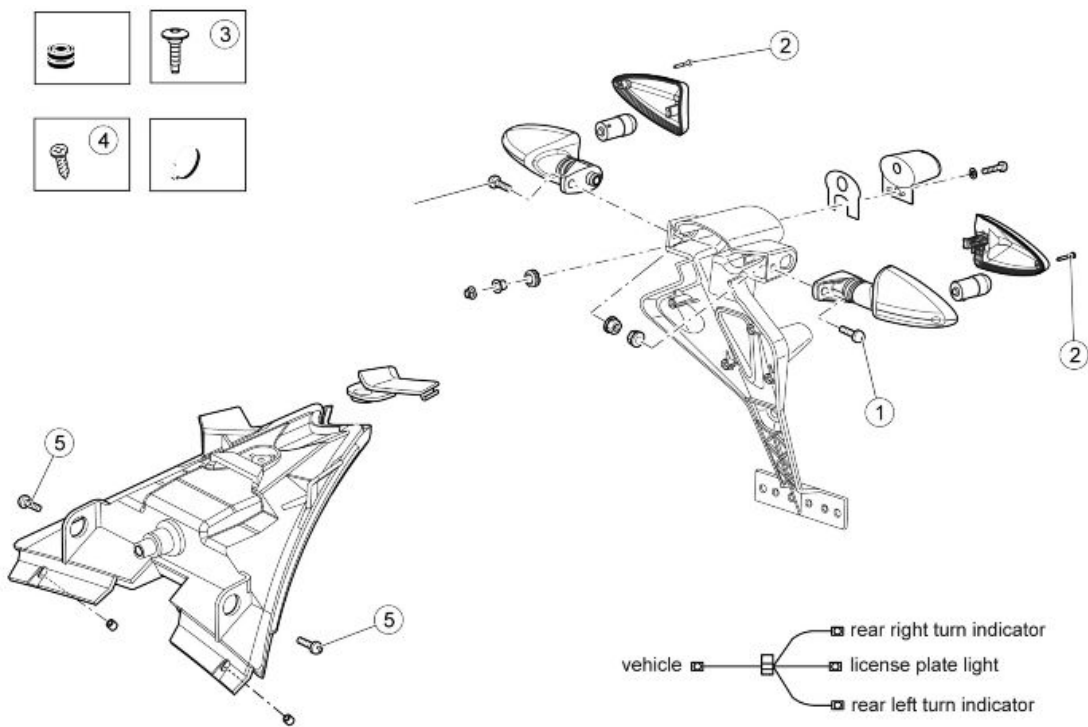


SWINGARM

pos.	Description	Type	Quantity	Torque	Notes
1	Nut adjusting swingarm alignment relative to frame	M25x1.5	1	15 Nm (11.06 lb ft)	-
2	Swingarm pin nut	M14	1	78 Nm (57.53 lb ft)	-
3	Chain guide fastener screw	Self tapping	4	1 Nm (0.74 lb ft)	-
4	Chain guard fastener screw	Self tapping	2	2 Nm (1.48 lb ft)	-

**REAR WHEEL**

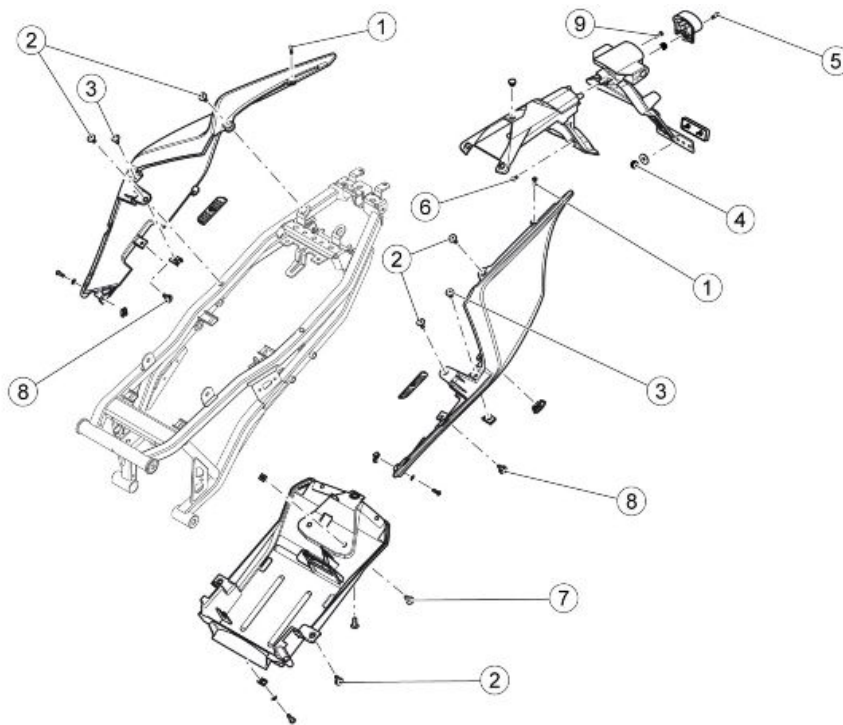
pos.	Description	Type	Quantity	Torque	Notes
1	Rear wheel axle fastener nut	M14	2	78 Nm (57.53 lb ft)	-
2	Rear disc fastening screw	M6x20	6	12 Nm (8.85 lb ft)	Pre-impregnated
3	Rear sprocket fastener screws	M8x25	6	25 Nm (18.44 lb ft)	Pre-impregnated
4	Chain tensioner fastener screw	M8	2	12 Nm (8.85 lb ft)	-



REAR LIGHTS

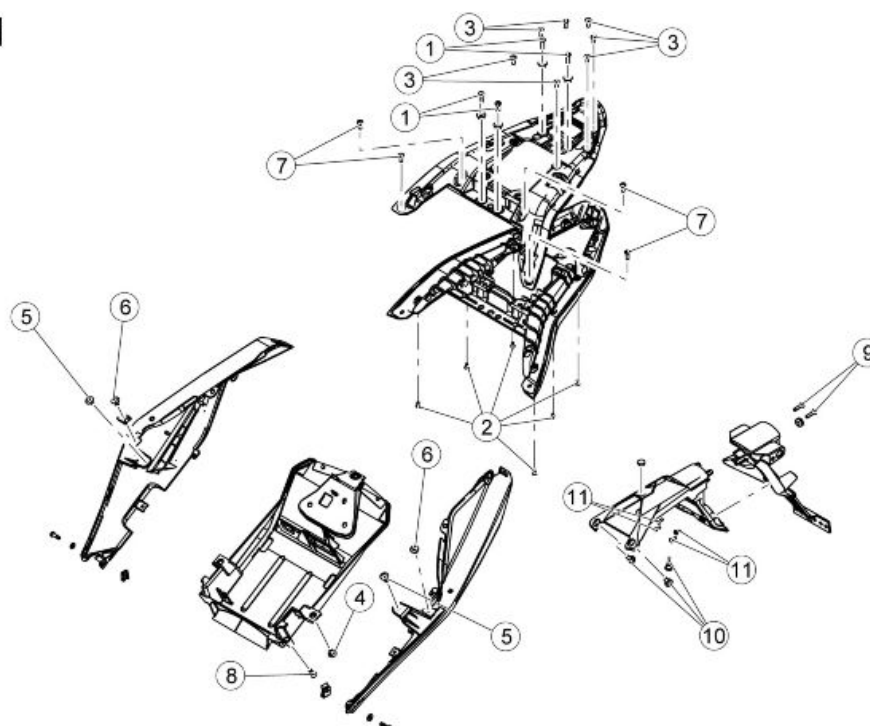
pos.	Description	Type	Quantity	Torque	Notes
1	Turn indicator fastener screw	M5x12	2	3 Nm (2.21 lb ft)	-
2	Turn indicator cover fastener screw	-	2	0.3 Nm (0.22 lb ft)	-
3	Hex socket button head screw	M5x16	2	3 Nm (2.21 lb ft)	-
4	SWP screw	Ø 3.9x7.5	1	0.3 Nm (0.22 lb ft)	-
5	Taillight fastener screw	M5x10	2	3 Nm (2.21 lb ft)	-

RS 125

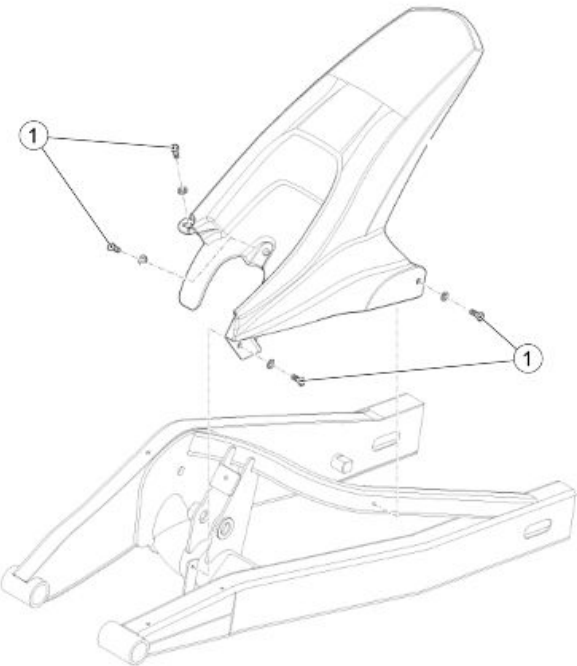


REAR BODYWORK

Pos.	Description	Type	Quantity	Torque	Notes
1	Screw fixing the side fairing to the chassis	M4x14	2	3 Nm (2.21 lb ft)	-
2	Under-saddle fixing screw	M5x9	4	3 Nm (2.21 lb ft)	-
3	Screw fixing the side fairing to the chassis	M5x9	2	3 Nm (2.21 lb ft)	-
4	Reflector fastening screw	M4	2	0.8 Nm (0.59 lb ft)	-
5	License plate light fixing screw	M5x14	2	1.5 Nm (1.11 lb ft)	-
6	License plate holder fixing screw	Self-tapping Ø 3.9x10	4	0.4 Nm (0.30 lb ft)	-
7	License plate holder fixing screw	M6x20	3	3.5 Nm (2.58 lb ft)	-
8	Side fairing fixing screw	-	-	2 Nm (1.48 lb ft)	-
9	License plate holder fixing screw	M5x14	2	1.5 Nm (1.11 lb ft)	-

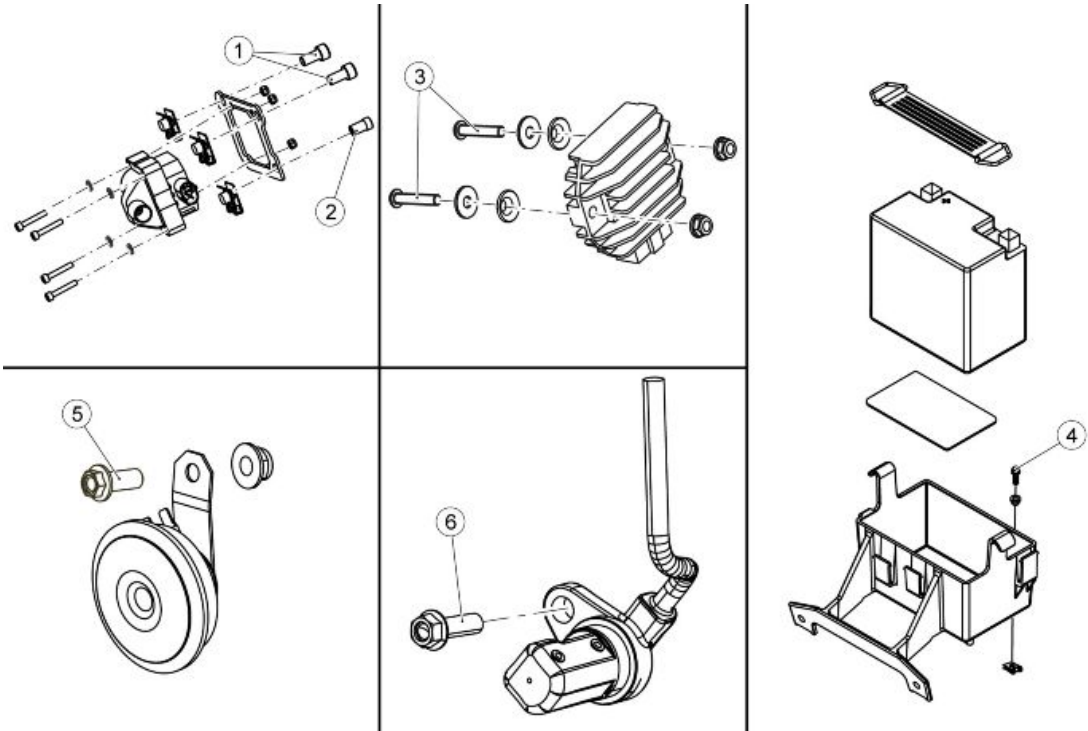
TUONO 125**REAR BODYWORK**

Pos.	Description	Type	Quantity	Torque	Notes
1	Screws fastening grab handle to the chassis	M6	4	8 Nm (5.90 lb ft)	-
2	Screws fastening lower grab handle to the top one	Self tapping screw, Ø 3.9	6	1.5 Nm (1.11 lb ft)	-
3	Screws fastening upper grab handle to the lower one	Self tapping screw, Ø 5	7	1.5 Nm (1.11 lb ft)	-
4	Screws fastening tail fairing to the saddle mounting	Self tapping screw, Ø 5	2	1.5 Nm (1.11 lb ft)	-
5	Screws fastening tail fairing to the chassis	M5	4	3 Nm (2.21 lb ft)	-
6	Screws fastening tail fairing to the chassis	M5	2	3 Nm (2.21 lb ft)	-
7	Screws fastening grab handle to the tail fairing	Self tapping screw, Ø 5	4	2 Nm (1.48 lb ft)	-
8	Under-saddle fixing screw	M5	2	3 Nm (2.21 lb ft)	-
9	Screw fixing upper license plate holder to lower	Self tapping screw, Ø 4.2	2	0.8 Nm (0.59 lb ft)	-
10	Screw fixing license plate holder	M6	3	3.5 Nm (2.58 lb ft)	-
11	Screw fixing license plate holder	Self tapping screw, Ø 3.9	4	1 Nm (0.74 lb ft)	-



REAR MUDGUARD

Pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening rear mudguard to swingarm	Self-tapping M4.8x12	4	3 Nm (2.21 lb ft)	-

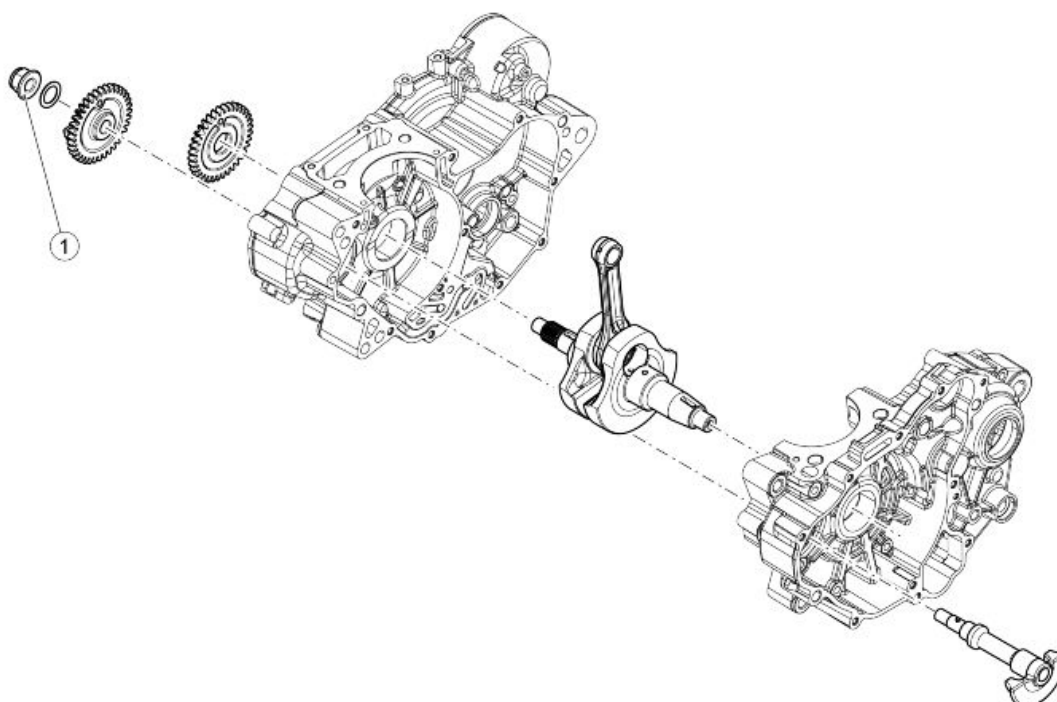


ELECTRICAL COMPONENTS

Pos.	Description	Type	Quantity	Torque	Notes
1	Screw fixing coil to mounting	M8	2	20 Nm (14.75 lb ft)	-
2	Screw fixing coil to mounting	M6x12	1	10 Nm (7.38 lb ft)	-

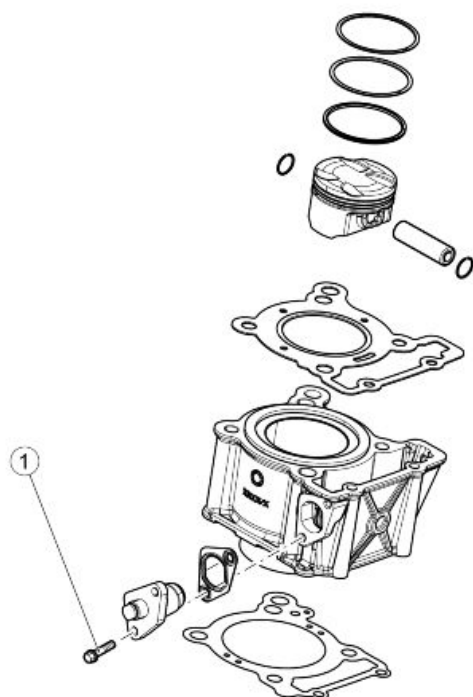
Pos.	Description	Type	Quantity	Torque	Notes
3	Voltage regulator fixing screw	M6x30	2	6 Nm (4.43 lb ft)	-
4	Battery bracket fixing screw	M6x20	2	8 Nm (5.90 lb ft)	-
5	Horn fixing screw	M8x16	1	8 Nm (5.90 lb ft)	-
6	ABS sensors fixing screw	M5	2	6 Nm (4.43 lb ft)	Loctite 243
-	Screw fixing main wiring harness to chassis and saddle mounting	M6x16	2	8 Nm (5.90 lb ft)	-
-	Main wiring harness cable stay support fixing	M6	2	12 Nm (8.85 lb ft)	-
-	Right and left indicator stalk fixing screw	M5	4	1.5 Nm (1.11 lb ft)	-
-	Screw fixing engine ground cable	M6	1	12 Nm (8.85 lb ft)	-

Engine



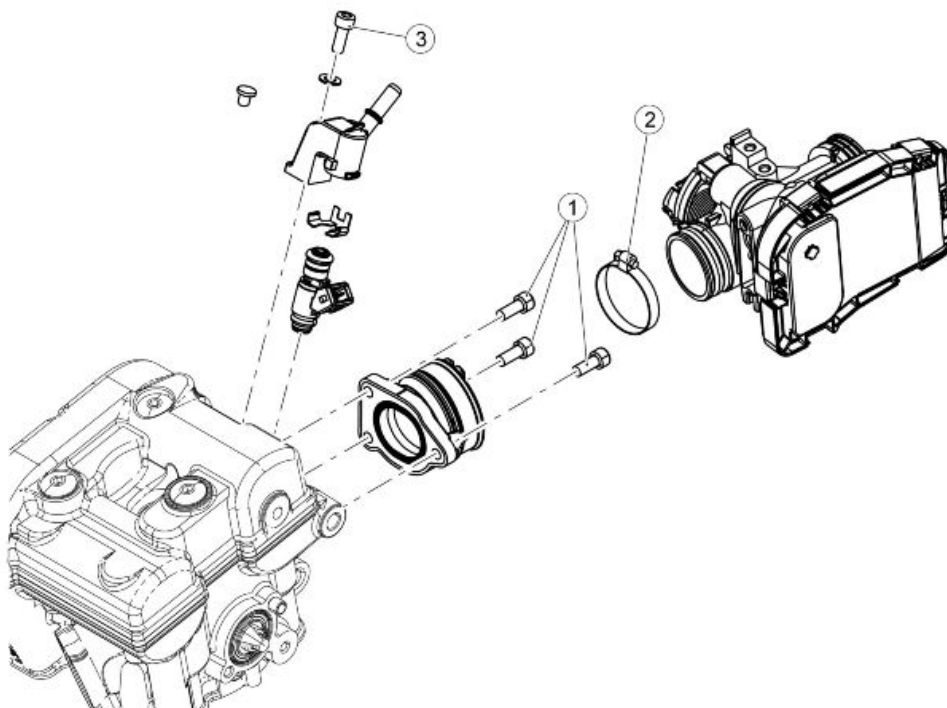
CRANKSHAFT

Pos.	Description	Type	Quantity	Torque	Notes
1	Gear fixing screw	M10	1	40 Nm (29.50 lb ft)	-



CYLINDER - PISTON

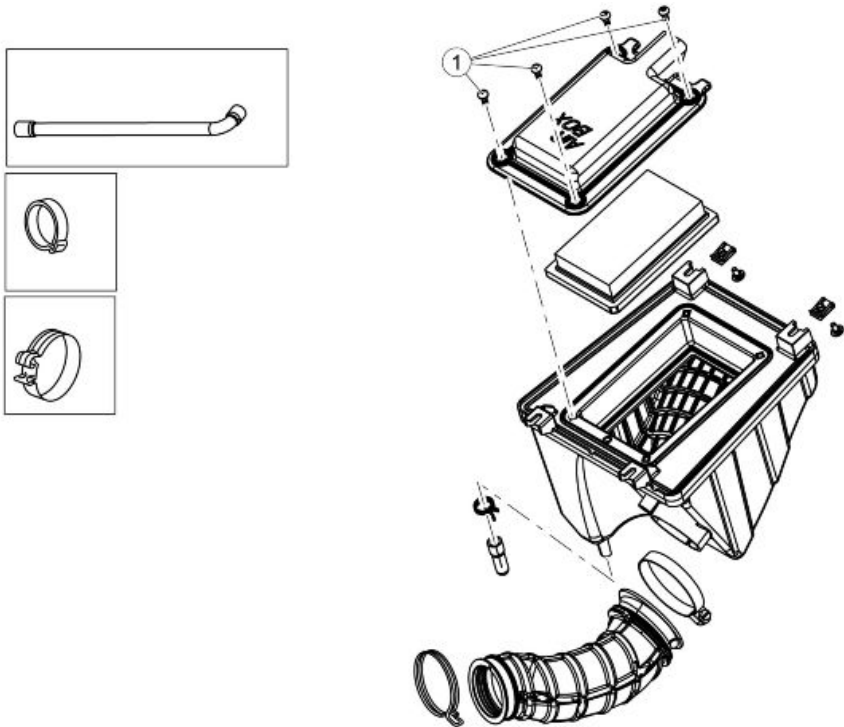
Pos.	Description	Type	Quantity	Torque	Notes
1	Chain tensioner fastener screw	M6x16	2	12 Nm (8.85 lb ft)	-



THROTTLE BODY

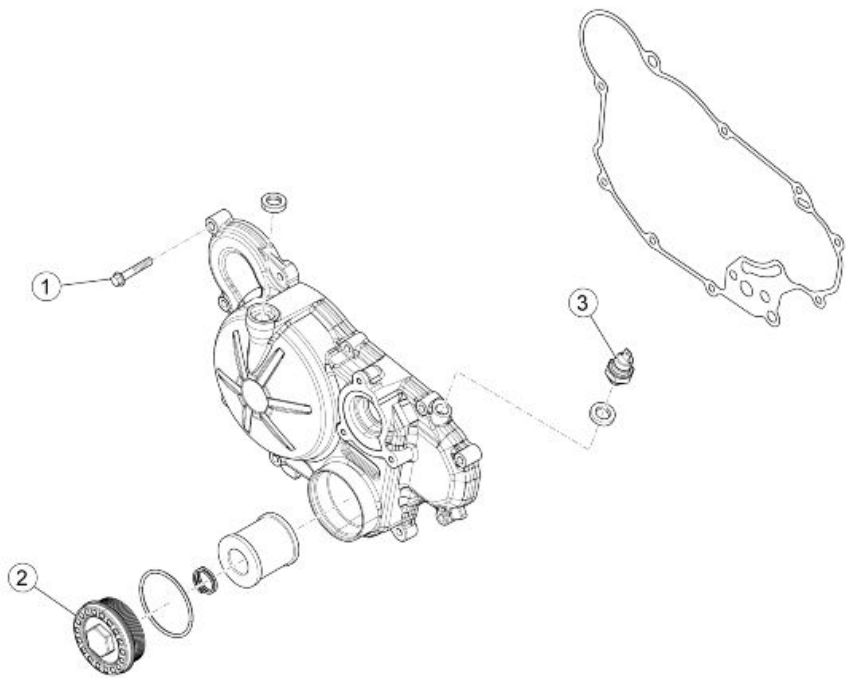
Pos.	Description	Type	Quantity	Torque	Notes
1	Sleeve fixing screw	M6x20	3	12 Nm (8.85 lb ft)	-
2	Sleeve fixing clamp	-	1	0.8 Nm (0.59 lb ft)	-
3	Injector mounting fixing screw	M6x20	1	10 Nm (7.38 lb ft)	-

Pos.	Description	Type	Quantity	Torque	Notes
-	Cable stay on throttle body	M4	1	4 Nm (2.95 lb ft)	-



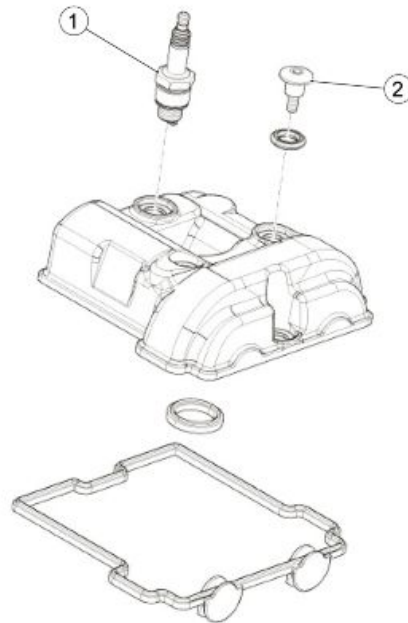
FILTER BOX

Pos.	Description	Type	Quantity	Torque	Notes
1	Air filter box fastening screw	M5	4	3.5 Nm (2.58 lb ft)	-



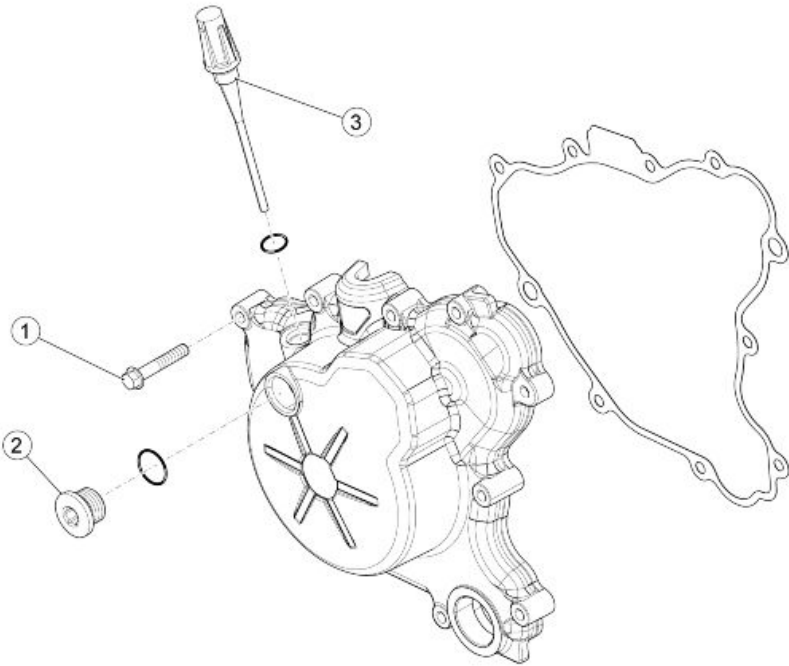
CLUTCH COVER

Pos.	Description	Type	Quantity	Torque	Notes
1	Clutch cover fixing screw	M6x35	10	12 Nm (8.85 lb ft)	-
2	Oil filter cover	M56x1.5	1	25 Nm (18.44 lb ft)	-
3	Oil pressure sensor	M10	1	13 Nm (9.59 lb ft)	-



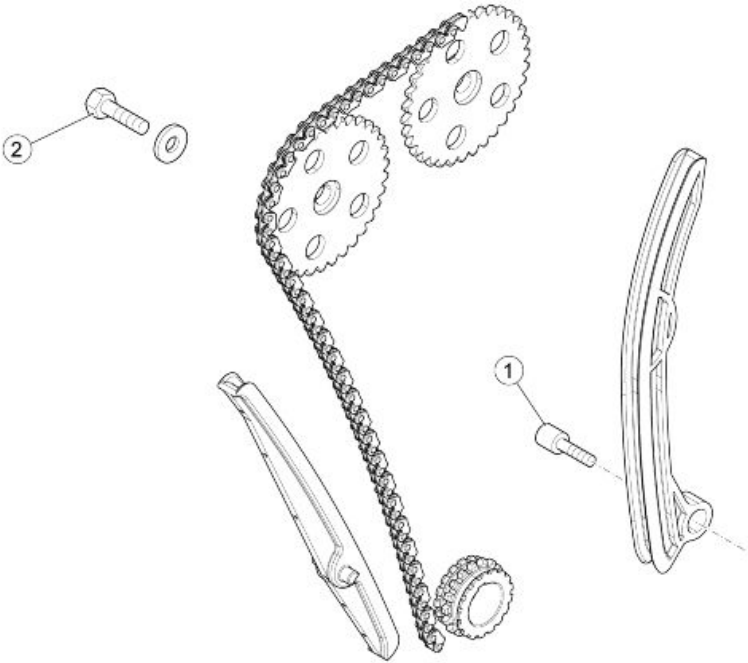
HEAD COVER

pos.	Description	Type	Quantity	Torque	Notes
1	Spark plug	M10	1	13 Nm (9.59 lb ft)	-
2	Head cover fastener screw	M6	4	11 Nm (8.11 lb ft)	-



FLYWHEEL COVER

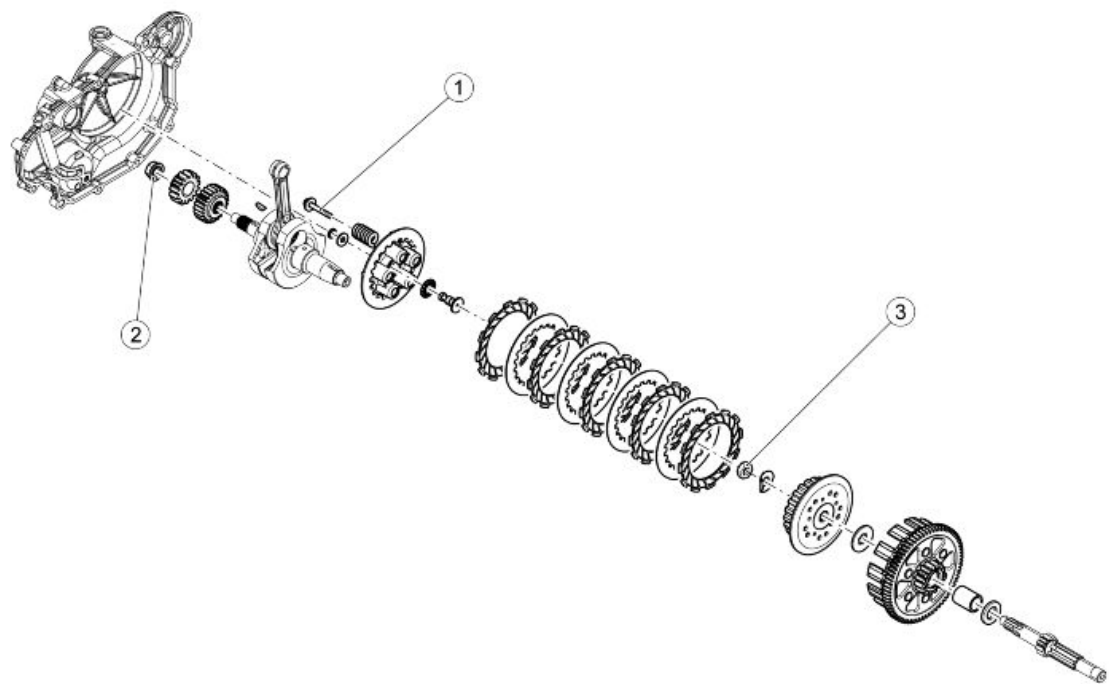
pos.	Description	Type	Quantity	Torque	Notes
1	Flywheel cover fastener screw	M6	10	12 Nm (8.85 lb ft)	-
2	Timing control cap	M18	2	4 Nm (2.95 lb ft)	-
3	Oil dipstick	M12x1.5	1	5 Nm (3.69 lb ft)	-



TIMING SYSTEM

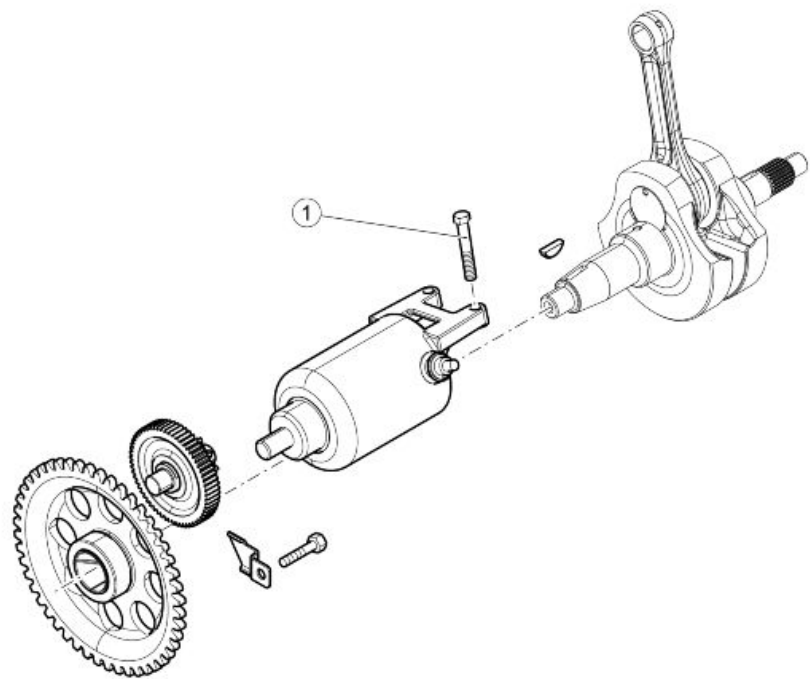
pos.	Description	Type	Quantity	Torque	Notes
1	Chain tensioner pad fastener screw	M6x16	1	10 Nm (7.38 lb ft)	Loctite 243

pos.	Description	Type	Quantity	Torque	Notes
2	Timing system gear fastener screw	M8x40	2	27 Nm (19.91 lb ft)	Loctite 243



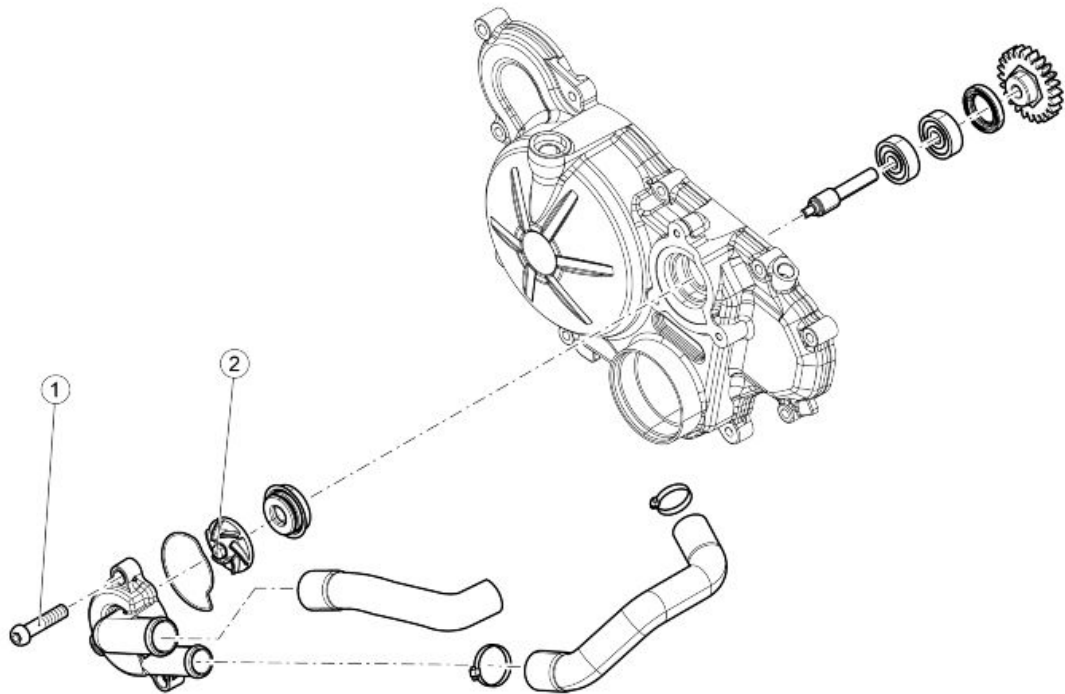
CLUTCH

pos.	Description	Type	Quantity	Torque	Notes
1	Clutch spring screw	M5	5	4 Nm (2.95 lb ft)	-
2	Crankshaft primary gear fastener nut	M12	1	79 Nm (58.27 lb ft)	-
3	Clutch nut	-	1	40 Nm (29.50 lbf ft)	-



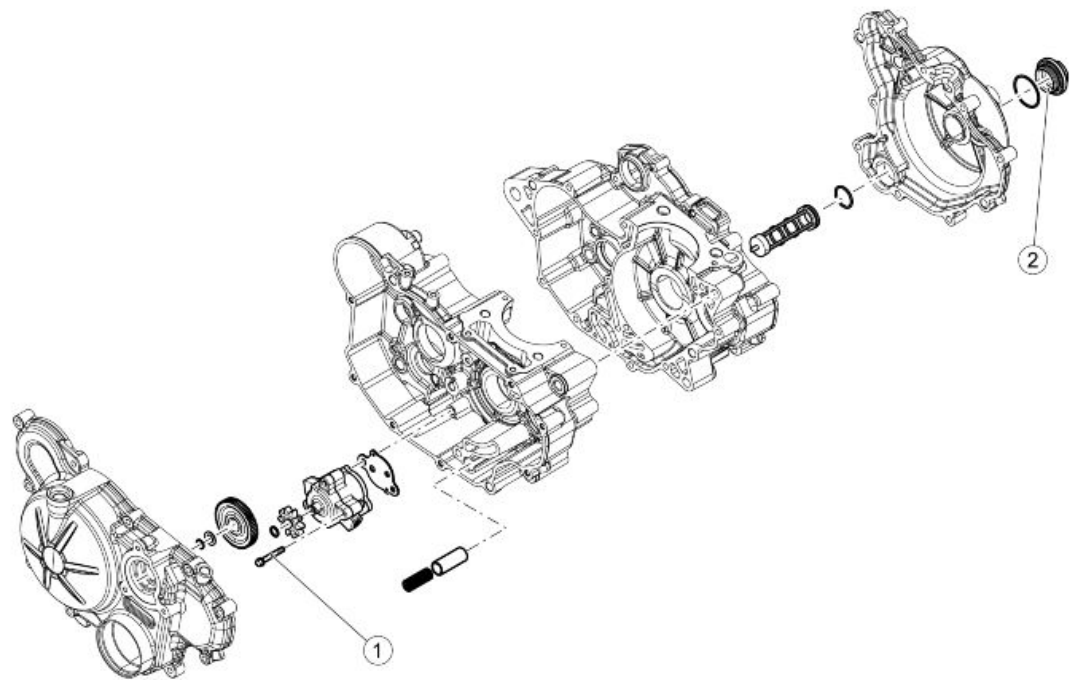
STARTER MOTOR

pos.	Description	Type	Quantity	Torque	Notes
1	Starter motor fastener screw	M6x25	2	12 Nm (8.85 lb ft)	-



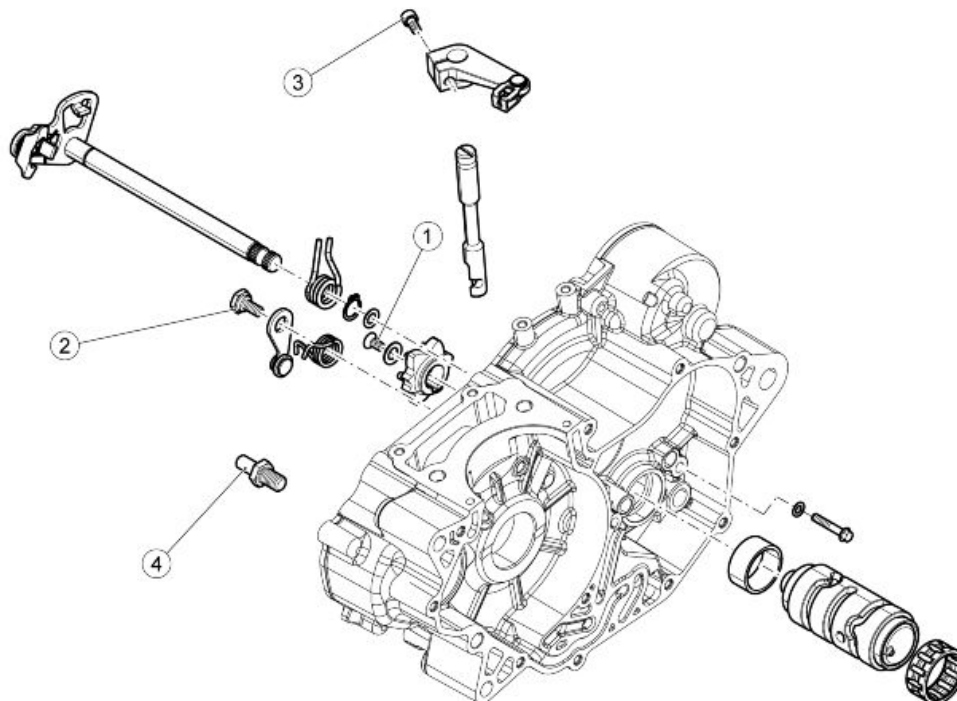
WATER PUMP

pos.	Description	Type	Quantity	Torque	Notes
1	Water pump fastener screw	M5	3	3.5 Nm (2.58 lb ft)	-
2	Water pump rotor fastener screw	-	1	5 Nm (3.69 lb ft)	-



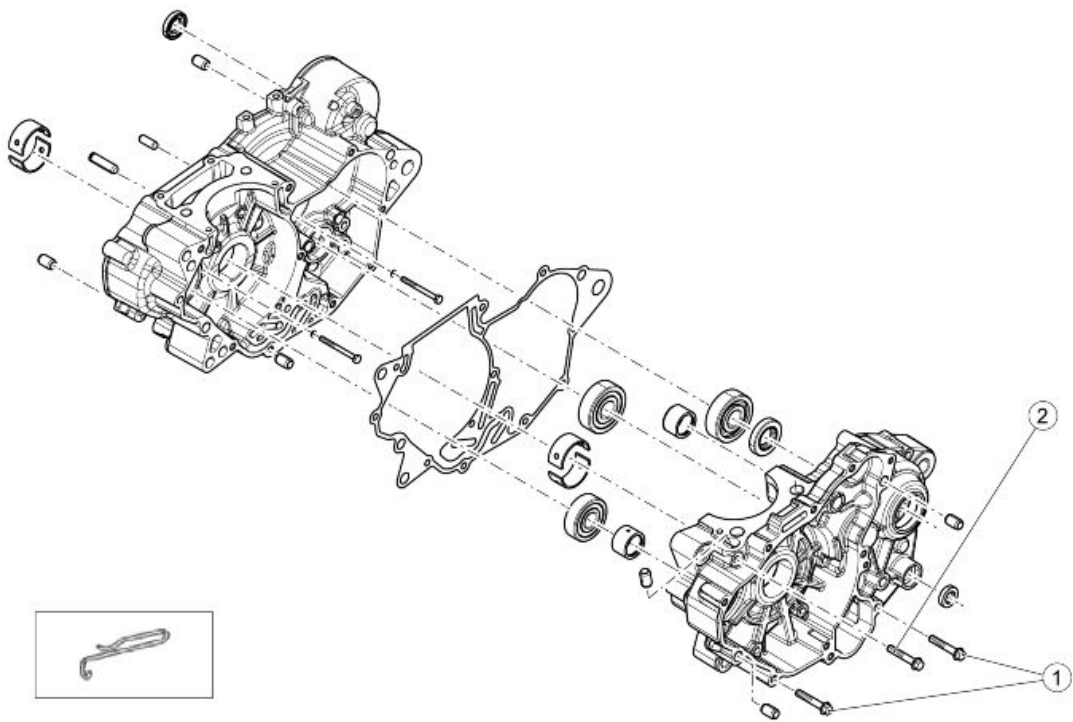
OIL PUMP

pos.	Description	Type	Quantity	Torque	Notes
1	Oil pump fastener screw	M5x35	3	4 Nm (2.95 lb ft)	Loctite 243
2	Oil cap retainer	-	1	25 Nm (18.44 lb ft)	-



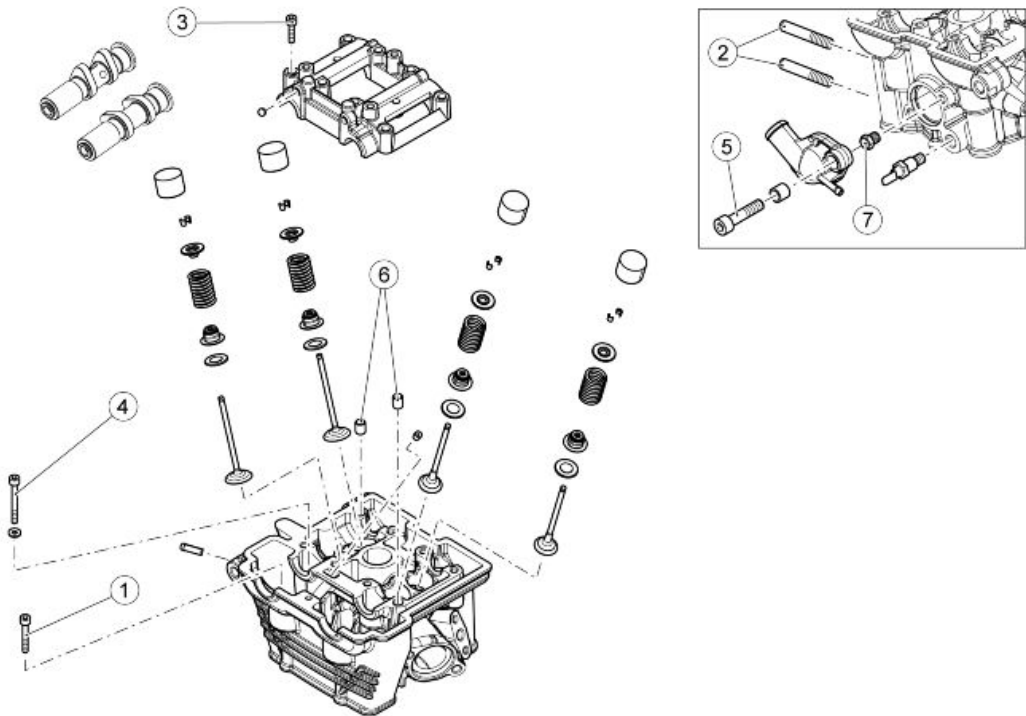
GEAR SELECTOR

pos.	Description	Type	Quantity	Torque	Notes
1	Selector sprocket fastener screw	M5	1	4 Nm (2.95 lb ft)	-
2	Lever fastener screw	M6	1	9 Nm (6.64 lb ft)	-
3	Clutch lever fastener screw	-	1	9 Nm (6.64 lb ft)	-
4	Gear shift selector pin fixing	-	1	9 Nm (6.64 lb ft)	-



ENGINE CRANKCASE

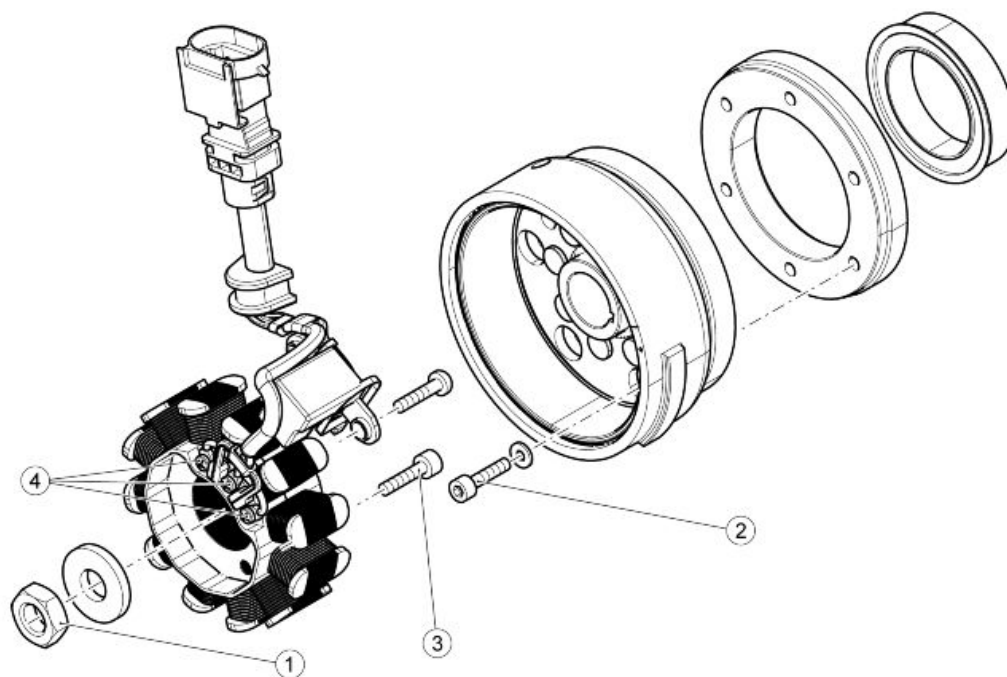
pos.	Description	Type	Quantity	Torque	Notes
1	Crankcase retainer screw	M6x60	4	12 Nm (8.85 lb ft)	-
2	Crankcase retainer screw	M6x75	4	12 Nm (8.85 lb ft)	-



HEAD - VALVES

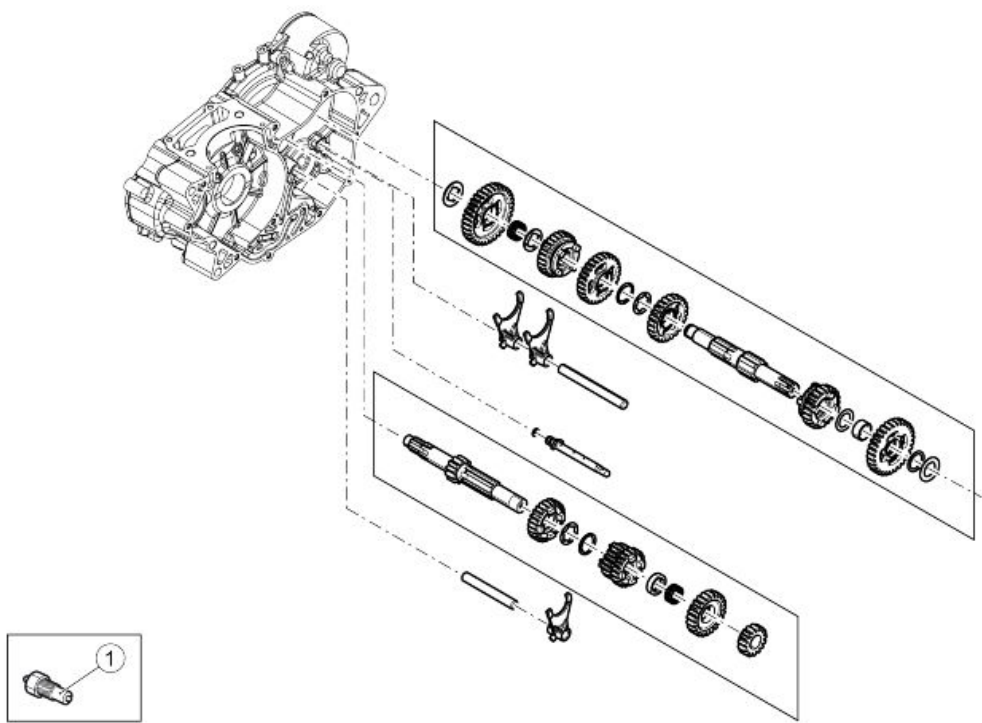
pos.	Description	Type	Quantity	Torque	Notes
1	Head fastener screw	M6x130	2	12 Nm (8.85 lb ft)	-
2	Drainage side stud bolt retainer	M8x40	2	12 Nm (8.85 lb ft)	-

pos.	Description	Type	Quantity	Torque	Notes
3	Camshaft cover fastener screw	M6x40	4	11 Nm (8.11 lb ft)	-
4	Head fastener screw	M8x166	4	27 Nm + 90° (19.91 lb ft + 90°)	-
5	Thermostat cover fastener screw	M6x20	2	11 Nm (8.11 lb ft)	-
6	Head dowels retainer	M8x10	2	6.5 Nm (4.79 lb ft)	-
7	Thermostat retainer	-	1	9 Nm (6.64 lb ft)	-



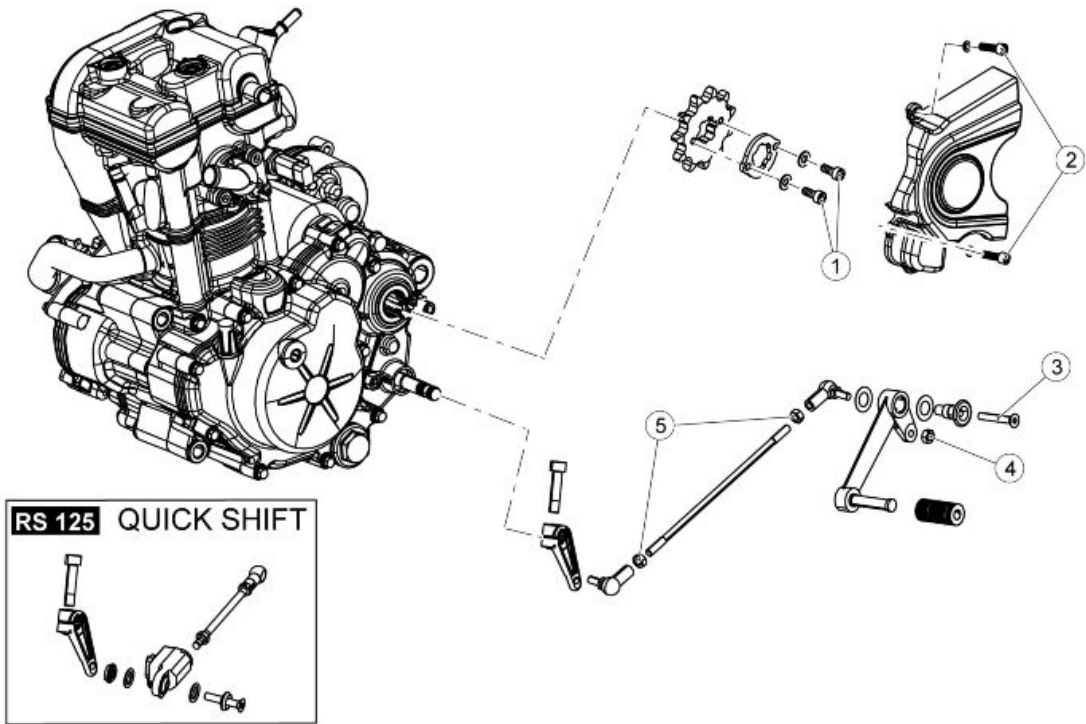
IGNITION UNIT

pos.	Description	Type	Quantity	Torque	Notes
1	Flywheel rotor fixing nut	M14x1.5	1	86 Nm (63.43 lb ft)	-
2	Rotor fastener screw	-	6	12 Nm (8.85 lb ft)	-
3	Stator clamping screws	-	2	6 Nm (4.43 lb ft)	-
4	Pick-Up clamping screw	-	3	3.5 Nm (2.58 lb ft)	-



COMPONENTS OF GEARBOX

pos.	Description	Type	Quantity	Torque	Notes
1	Gear sensor retainer	-	1	3 Nm (2.21 lb ft)	-



LINKAGE

Pos.	Description	Type	Quantity	Torque	Note
1	Sprocket fastener screws	M5x10	2	4 Nm (2.95 lb ft)	Loctite 270
2	Front sprocket cover fastener screw	M5x16	2	4 Nm (2.95 lb ft)	

Pos.	Description	Type	Quantity	Torque	Note
3	Gearbox lever fixing screws	M6	1	10 Nm (7.38 lb ft)	-
4	Gearbox lever fixing nut	M6	1	8 Nm (5.90 lb ft)	-
5	Gear tie-rod fixing nuts	M6	2	6 Nm (4.43 lb ft)	-

Overhaul data

Assembly clearances

Cylinder - piston assy.

CYLINDER - PISTON COUPLING CLEARANCE 125 CM³

Coupling categories with cast-iron cylinder

NAME	ABBREVIATION	CYLINDER		PISTON		FITTING CLEARANCE	
		min	max	min	max	min	max
Cylinder/Piston	M	58.010	58.017	57.963	57.970	0.040	0.054
Cylinder/Piston	N	58.017	58.024	57.970	57.977	0.040	0.054
Cylinder/Piston	O	58.024	58.031	57.977	57.984	0.040	0.054
Cylinder/Piston	P	58.031	58.038	57.984	57.991	0.040	0.054

Rod small end - pin - piston

Characteristic

Rod small end

Maximum diameter: 15.023 mm (0.591 in)

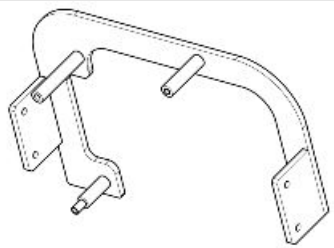


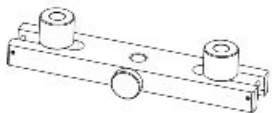
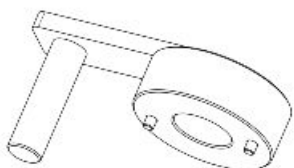
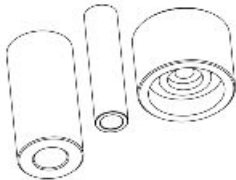
Standard diameter: 15.010 - 15.018 mm (0.5910 - 0.5912 in)

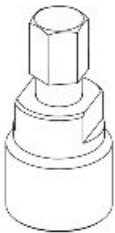

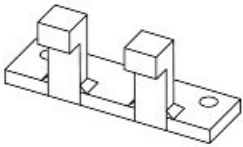

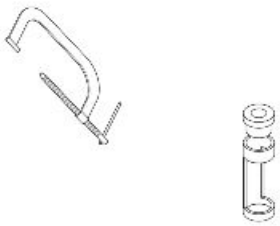
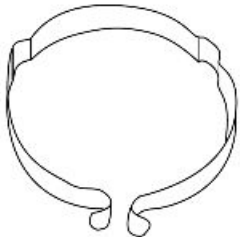

INDEX OF TOPICS

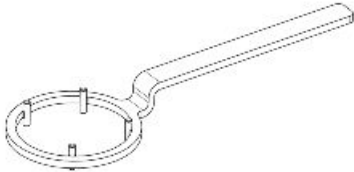
SPECIAL TOOLS







S-TOOLS


SPECIAL TOOLS

Stores code	Description	
020911Y	Engine installation adapter for RS 125 + 020710Y	
866714	Swingarm adjustment	
805181B	Tool for fitting chain link	
AP8140266	Dial gauge mount	
865259	Flywheel retainer	
866380	Water pump tool set	

Stores code	Description	
864868	Flywheel extractor	
864567	Camshaft timing adjustment lock pins	
864486	Countershaft lock tool	
00H05600351	Oil seal guide	
020382Y011	Valve removal/installation tool	
020287Y	Tool for installing seal rings	
865261	Piston retainer	

Stores code	Description	
00H05300041	Clutch lock	
865260	Camshaft sprocket lock tool	
020376Y	Adaptor handle	
020359Y	42 x 47 mm Adaptor	
020358Y	37 x 40 mm Adaptor	
020357Y	32 x 35-mm Adaptor	
020439Y	17 mm punch for secondary shaft oil seal	

Stores code	Description	
020891Y	25 mm (0.98 in) adapter	
020363Y	20 mm diam. punch for crankshaft oil seal	
020412Y	15 mm diam. punch for clutch oil seal	
020375Y	28x30 mm punch	
020483Y	30-mm guide	
020364Y	25 mm adapter	

Stores code	Description	
020922Y	Diagnostic tool	
020955Y	PADS cable kit	

INDEX OF TOPICS

MAINTENANCE

MAIN

Scheduled maintenance table

Correct maintenance is fundamental for ensuring the longevity of your vehicle and maintaining optimum function and performance.

Services must be performed as soon as the specified mileage and time intervals are reached. Services must be performed punctually at the correct intervals to maintain the validity of the warranty. See the "Warranty Booklet" for all other information concerning the applicability of the Warranty and on performing "Scheduled Maintenance" correctly.

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.

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

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

(1) Grease every 500 km (310.69 mi) and before use in extreme conditions.

(2) Replace every 4 years.

(3) Check and clean and adjust or replace, if necessary, before every journey.

(4) Check after every engine start (check brake function, check that handlebar turns freely, check clutch, suspension, engine, lights, indicator lamps).

(5) Replace at whichever of the following occurs first: 36,000 km (22,369.36 mi) or 4 years.

(6) Check every 1,000 km (621.37 mi)

(7) Replace every 30,000 km (18,641.14 mi)

SCHEDULED MAINTENANCE TABLE

Km x 1,000 (mi x 1,000)	1 (0.6)	6 (3.7)	12 (7.5)	18 (11.2)	24 (14.9)	30 (18.6)	36 (22.4)	42 (26.1)	48 (29.8)	EVERY 12 MONTH S	EVERY 24 MONTH S
Rear shock absorber			I		I		I		I		I
Audible and visual warning devices	I	I	I	I	I	I	I	I	I		
Battery		I	I	I	I	I	I	I	I		
Spark plug		I	R	I	R	I	R	I	R		
Timing chain (7)						R					
Steering bearings and steering clearance	I	I	I	I	I	I	I	I	I	I	I
Diagnosis by tool	I	I	I	I	I	I	I	I	I	I	I
Air filter		R	R	R	R	R	R	R	R		
Engine oil filter	R	R	R	R	R	R	R	R	R	R	R
General vehicle operation (4)	I	I	I	I	I	I	I	I	I	I	I
Front light assembly		A	A	A	A	A	A	A	A		
Cooling system		I	I	I	I	I	I	I	I		
Safety switches (front brake, rear brake, stand, clutch)	I	I	I	I	I	I	I	I	I	I	I
Brake lever and throttle grip		I	I	I	I	I	I	I	I	I	I
Brake fluid	I	I	I	R	I	I	R	I	I	I	R
Coolant	I	I	I	R	I	I	R	I	I	I	R
Engine oil	R	R	R	R	R	R	R	R	R	R	R
Brake pads		I	I	I	I	I	I	I	I	I	I
Brake callipers and discs		I	I	I	I	I	I	I	I	I	I
Tyres - pressure / wear (3)	I	I	I	I	I	I	I	I	I	I	I
Valve clearance adjustment		I		I		I		I			

Km x 1,000 (mi x 1,000)	1 (0.6)	6 (3.7)	12 (7.5)	18 (11.2)	24 (14.9)	30 (18.6)	36 (22.4)	42 (26.1)	48 (29.8)	EVERY 12 MONTH S	EVERY 24 MONTH S
Screw tightness			I		I		I		I		
Front suspension: oil (5)							R				
Indicator lamps	I	I	I	I	I	I	I	I	I		
Final drive (1)(6)	I	I	I	I	I	I	I	I	I	I	I
Fuel and oil pipes + filters (2)	I	I	R	I	I	R	I	I	R	I	I
Brake pipes		I	I	I	I	I	I	I	I		
Labour time (minutes)	50	130	80	150	80	240	170	130	80	50	80

SCHEDULED MAINTENANCE TABLE RESERVED TO THE USA-LATAM MARKET

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

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

(1) Grease every 500 km (310.69 mi) and before use in extreme conditions.

(2) Replace every 2 years or 18,000 Km (11,184.68 mi).

(3) Replace every 4 years.

(4) Check and clean and adjust or replace, if necessary, before every journey.

(5) Check after every engine start (check brake function, check that handlebar turns freely, check clutch, suspension, engine, lights, indicator lamps).

(6) Replace at whichever of the following occurs first: 36,000 km (22,369.36 mi) or every 4 years.

(7) Check every 1,000 km (621.37 mi)

(8) Replace every 30,000 km (18,641.14 mi)

SCHEDULED MAINTENANCE TABLE

km (mi) x1000	1 (0.6)	6 (3.7)	12 (7.5)	18 (11.2)	24 (14.9)	30 (18.6)	36 (22.4)	42 (26.1)	48 (29.8)
Rear shock absorber			I		I		I		I
Audible and visual warning devices	I	I	I	I	I	I	I	I	I
Battery		I	I	I	I	I	I	I	I
Spark plug		I	R	I	R	I	R	I	R
Timing chain (8)						R			
Steering bearings and steering clearance	I	I	I	I	I	I	I	I	I
Diagnosis by tool	I	I	I	I	I	I	I	I	I
Air filter		R	R	R	R	R	R	R	R
Oil filter	R	R	R	R	R	R	R	R	R
General vehicle operation (5)	I	I	I	I	I	I	I	I	I
Front light assembly		A	A	A	A	A	A	A	A
Cooling system		I	I	I	I	I	I	I	I
Safety switches (front brake, rear brake, stand, clutch)	I	I	I	I	I	I	I	I	I
Brake lever and throttle grip		I	I	I	I	I	I	I	I
Brake fluid - level (2)	I	I	I	I-R	I	I	I-R	I	I
Coolant - level (2)	I	I	I	I-R	I	I	I-R	I	I
Engine oil	R	R	R	R	R	R	R	R	R
Brake pads		I	I	I	I	I	I	I	I
Brake callipers and discs		I	I	I	I	I	I	I	I
Tyres - pressure / wear (4)	I	I	I	I	I	I	I	I	I
Valve clearance adjustment		I		I		I		I	
Screw tightness			I		I		I		I
Front suspension: oil (6)							R		
Indicator lamps	I	I	I	I	I	I	I	I	I
Final drive (1)(7)	I	I	I	I	I	I	I	I	I

km (mi) x1000	1 (0.6)	6 (3.7)	12 (7.5)	18 (11.2)	24 (14.9)	30 (18.6)	36 (22.4)	42 (26.1)	48 (29.8)
Fuel and oil pipes + filters (3)	I	I	R	I	I	R	I	I	R
Brake pipes		I	I	I	I	I	I	I	I
Labour time (minutes)	50	130	80	150	80	240	170	130	80

NOTE

AT EACH SCHEDULED MAINTENANCE MUST BE VERIFIED WITH THE DIAGNOSTIC TOOL IF THERE ARE ERRORS AND THE IF THE PARAMETERS ARE CORRECT.

Recommended products

Piaggio Group recommends the products of its

"Castrol Official Partner" for the scheduled maintenance of its vehicles.

Use lubricants and liquids having specifications that are equivalent, or superior, to the recommended products. These indications also apply when topping up fluid levels.

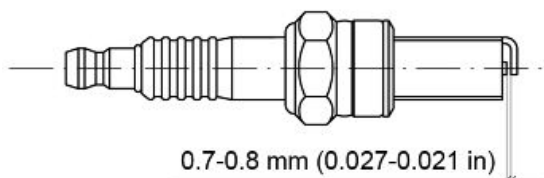


RECOMMENDED PRODUCTS TABLE

Product	Description	Specifications
Engine oil 5W -40	Synthetic-based lubricant for four-stroke engines.	SAE 5W-40; JASO MA, MA2; API SL; ACEA A3
Anti-freeze liquid, ready to use, colour red	Ethylene glycol antifreeze liquid with organic inhibition additives. Red, ready to use.	ASTM D 3306 - ASTM D 4656 - ASTM D 4985 - CUNA NC 956-16
Brake fluid DOT 4	Synthetic brake fluid.	SAE J 1703; FMVSS 116; ISO 4925; CUNA NC 956 DOT4
Lithium-based grease	Lithium-calcium soap based grease	colour - black, contains EP (Extreme Pressure) additives, excellent water-repellent properties
Vaseline	neutral grease for battery terminals	-
Spray grease for chains	Spray lubricant grease	-
Fork oil 7.5W	Fork oil.	SAE 7.5W

Spark plug

- Lift the tank.
- Disconnect the spark plug H.V. cable boot and remove the spark plug.
- Check the condition of the spark plug, check that the insulating material is undamaged and measure the gap between the electrodes with a feeler gauge.
- If necessary, adjust the gap by bending the side electrode very carefully.



- If any defects are found, replace the spark plug with a new component of the specified type.
- Fit the spark plug with the correct inclination and hand-tighten it completely into its seat, then tighten definitively to the specified torque.
- Fit the cap on the spark plug as far as it will go.

CAUTION

THE SPARK PLUG MUST BE REMOVED WHEN THE ENGINE IS COLD. THE SPARK PLUG MUST BE REPLACED EVERY 12,000 KM. USING NON-COMPLYING IGNITION CONTROL UNITS OR SPARK PLUGS OTHER THAN THOSE PRESCRIBED MAY SERIOUSLY DAMAGE THE ENGINE.

SPARK PLUG

Specification	Desc./Quantity
Spark plug	NGK CR9EKB or NGK CR9EB / NGK CR8EB
Electrode gap	0.7-0.8 mm (0.027-0.031 in)

Engine oil**Check**

Check the engine oil level frequently.

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.



ENGINE OIL LEVEL MUST BE CHECKED WHEN THE ENGINE IS WARM.

IF YOU CHECK LEVEL WHEN THE ENGINE IS COLD, OIL LEVEL COULD TEMPORARILY DROP BELOW THE "MIN" MARK.

THIS SHOULD NOT BE CONSIDERED A PROBLEM PROVIDED THAT THE ALARM WARNING LIGHT AND THE ENGINE OIL PRESSURE ICON DO NOT TURN ON SIMULTANEOUSLY ON THE DISPLAY.

CAUTION

DO NOT LET THE ENGINE IDLE WITH THE VEHICLE AT A STANDSTILL TO WARM UP THE ENGINE AND OBTAIN THE OPERATING TEMPERATURE OF ENGINE OIL. PREFERABLY CHECK THE OIL AFTER A JOURNEY OF AFTER TRAVELLING APPROXIMATELY 15 Km (10 miles) IN EXTRAURBAN CONDITIONS (ENOUGH TO WARM UP THE ENGINE OIL TO OPERATING TEMPERATURE).

- Stop the engine and wait at least five minutes.
- Keep the vehicle upright with both wheels on the ground.



- From the left hand side of the engine, unscrew and remove the oil dipstick-cap (1).
- Wipe the dipstick clean with a clean cloth, then refit and retighten it into the oil filler.
- Unscrew and remove the dipstick-cap again and check that the engine oil level is between the two markings:

MAX = maximum level;

MIN = minimum level.

- The oil level should be almost at the "MAX" marking.
- If it is not, top up to the correct level indicated.

CAUTION

THE OIL LEVEL MUST NEVER DROP BELOW THE MINIMUM MARKING OR EXCEED THE MAXIMUM MARKING; AN OIL LEVEL NOT WITHIN THE MINIMUM AND MAXIMUM MARKINGS MAY CAUSE SEVERE ENGINE DAMAGE

Fill with engine oil as required:

- Unscrew and remove the cap (1).

When using a funnel or any other element, make sure it is perfectly clean.



DO NOT ADD ADDITIVES OR ANY OTHER SUBSTANCES TO THE OIL.

CAUTION

USE OIL MEETING THE SPECIFICATIONS INDICATED IN THE TABLE OF RECOMMENDED PRODUCTS AT THE END OF THIS MANUAL.

CAUTION



DO NOT GO BEYOND THE "MAX" AND BELOW THE "MIN" LEVEL MARK TO AVOID SEVERE ENGINE DAMAGE.

- Top-up the oil in the reservoir until you reach the correct level.

Replacement

- Remove the left engine fairing before starting the procedure.
- Start the engine and run at idle speed for a few minutes. This is necessary to facilitate subsequent drainage.

CAUTION



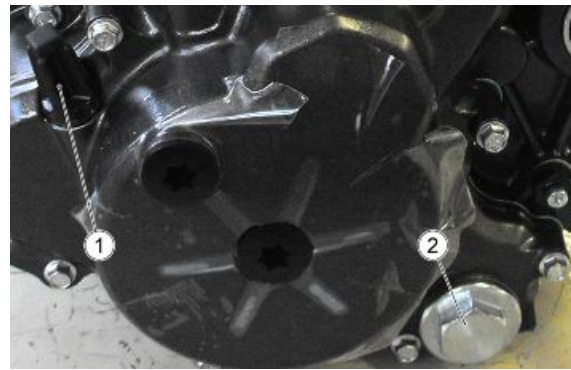
PARK THE MOTORCYCLE ON SAFE AND LEVEL GROUND.

- Shut off the engine.



OIL BECOMES VERY HOT WHEN THE ENGINE IS HOT; BE CAREFUL NOT TO GET BURNED WHEN CARRYING OUT THE OPERATIONS DESCRIBED BELOW.

- Keep the vehicle upright with both wheels on the ground.
- Place a container of suitable capacity under the drain 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 completely.
- Remove any metal scrap attached to the drainage plug (2) magnet.
- Check and, if necessary, replace the drain plug seal washer (2).
- Fit and tighten the drain plug (2) to the specified tightening torque.
- Fill with the specified quantity of engine oil via the filler port (1).



Recommended products

Engine oil 5W -40 Synthetic-based lubricant for four-stroke engines.

SAE 5W-40; JASO MA, MA2; API SL; ACEA A3

Characteristic

Engine oil

900 cm³ (54.91 cu in)

- Fit and tighten the filler plug (1).
- Start the engine and run at idle speed for approximately a minute to allow the oil to distribute correctly throughout the circuit.
- Check the oil level and top up if necessary.



TIGHTEN THE FILLER PLUG SECURELY AND CHECK THAT OIL DOES NOT SEEP FROM AROUND THE PLUG.

PERIODICALLY CHECK THAT THERE IS NO OIL LEAKAGE FROM THE CRANKCASE COVER GASKET.

NEVER USE THE VEHICLE WITH INSUFFICIENT LUBRICANT OR WITH CONTAMINATED OR UNSUITABLE LUBRICANTS, AS THIS WILL ACCELERATE WEAR OF MOVING PARTS AND CAUSE IRREPARABLE DAMAGE.

Engine oil filter

- Remove the bottom fairing and drain the engine oil.
- Undo and remove the oil filter cap.



- Remove the oil filter.

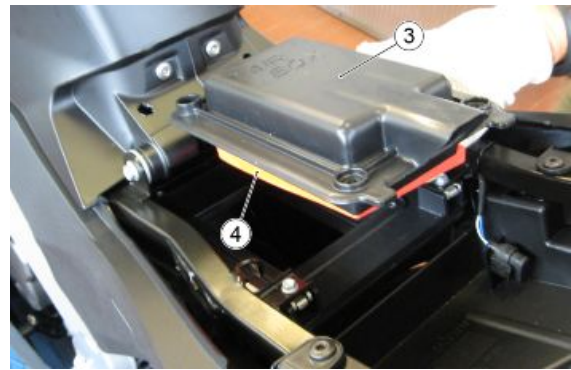


Air filter

- The passenger saddle must be removed in order to remove the air filter.
- Undo and remove the rear two screws (1).
- Undo and remove the two front screws (2), working via the holes in the tank cover.



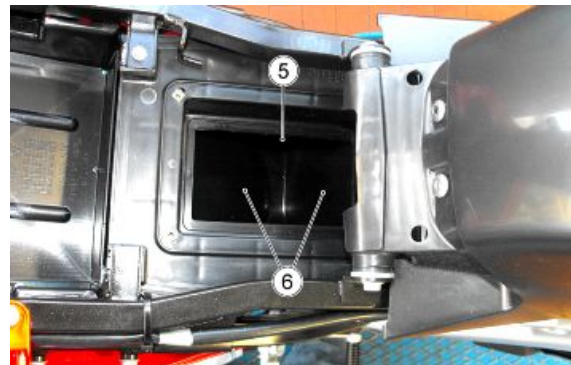
- Working from behind the tank, lift the filter box cover (3) and remove complete with the filter element (4).
- Separate the filter element (4) from the filter box cover (3) on a clean, dry surface.



CLEANING - AIR FILTER



NEVER USE SCREWDRIVERS OR OTHER TOOLS TO WORK ON THE FILTER.



- Clean the air filter (4) with compressed air, blowing from the inside of the filter outwards.
- Clean the exterior of the air filter (4) with a clean cloth.
- Clean the interior of the filter housing (5) and the intake ducts (6) with a clean cloth.

CAUTION

WHEN CLEANING THE FILTER ELEMENT, CHECK THAT THERE ARE NO TEARS IN THE ELEMENT ITSELF. REPLACE THE FILTER ELEMENT IF NECESSARY.

REPLACING THE AIR FILTER

Replace the air filter with a new component of the same type.

NOTE

NEVER REUSE AN OLD FILTER.

Braking system

Top-up



RISK OF BRAKE FLUID SPILLING. DO NOT OPERATE THE BRAKE LEVER IF THE BRAKE FLUID RESERVOIR CAP IS LOOSE OR HAS BEEN REMOVED.

CAUTION



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



TO AVOID SPILLING FLUID WHILE TOPPING UP, KEEP THE LEVEL OF THE FLUID IN THE RESERVOIR PARALLEL WITH THE EDGE OF THE RESERVOIR ITSELF (IN HORIZONTAL POSITION). DO NOT ADD ADDITIVES OR OTHER SUBSTANCES TO THE FLUID. FUNNELS OR ANY OTHER IMPLEMENTS USED MUST BE PERFECTLY CLEAN.



BRAKE FLUID IS HIGHLY CORROSIVE. AVOID CONTACT WITH THE SKIN, EYES AND PARTS OF THE MOTORCYCLE.

WHEN TOPPING UP, PROTECT PARTS OF THE MOTORCYCLE IN THE VICINITY OF THE RESERVOIR WITH ABSORBENT MATERIAL.

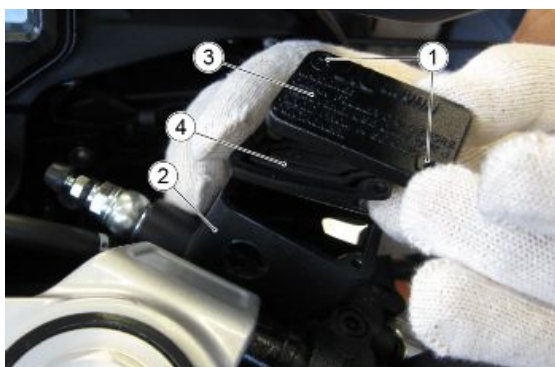
Recommended products

Brake fluid DOT 4 Synthetic brake fluid.

SAE J 1703; FMVSS 116; ISO 4925; CUNA NC 956 DOT4

Front braking system

- Use a short cross-head screwdriver to undo the screws (1) of the front braking system fluid reservoir (2).
- Lift and remove the cover (3), complete with screws (1) and the gasket (4).
- Top up the reservoir (2) with recommended brake fluid to above the minimum level marking "MIN".



CAUTION



ONLY FILL TO THE "MAX" LEVEL AFTER FITTING NEW BRAKE PADS. DO NOT FILL TO THE "MAX" LEVEL WITH WORN PADS, AS THIS WILL CAUSE FLUID TO ESCAPE WHEN REPLACING BRAKE PADS.

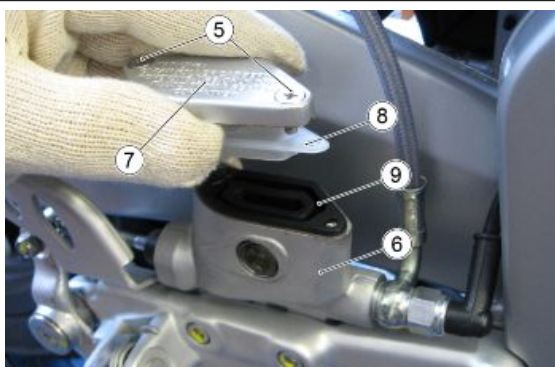
CHECK BRAKING EFFICIENCY.

IF THE DEAD ZONE OF THE BRAKE PEDAL OR BRAKE LEVER IS TOO LONG, OR IN CASE OF FLUID LOSS, IT MAY BE NECESSARY TO BLEED THE AIR TRAPPED IN THE SYSTEM.

(RS 125)

Rear braking system

- Use a short cross-head screwdriver to undo the screws (5) of the rear braking system fluid reservoir (6).
- Lift and remove the cover (7) complete with screws (5)
- Lift and remove the Teflon lid (8) and the gasket (9).



- Top up the reservoir (6) with recommended brake fluid to above the minimum level marking "MIN".

CAUTION

ONLY FILL TO THE "MAX" LEVEL AFTER FITTING NEW BRAKE PADS. DO NOT FILL TO THE "MAX" LEVEL WITH WORN PADS, AS THIS WILL CAUSE FLUID TO ESCAPE WHEN REPLACING BRAKE PADS.

CHECK BRAKING EFFICIENCY.

IF THE DEAD ZONE OF THE BRAKE PEDAL OR BRAKE LEVER IS TOO LONG, OR IN CASE OF FLUID LOSS, IT MAY BE NECESSARY TO BLEED THE AIR TRAPPED IN THE SYSTEM.

(TUONO 125)

- Unscrew the cover (5) from the rear braking circuit fluid tank (7).



- Lift the gasket (6) and remove it.
- Top up the reservoir (7) with recommended brake fluid to above the minimum level marking "MIN".

CAUTION

ONLY FILL TO THE "MAX" LEVEL AFTER FITTING NEW BRAKE PADS. DO NOT FILL TO THE "MAX" LEVEL WITH WORN PADS, AS THIS WILL CAUSE FLUID TO ESCAPE WHEN REPLACING BRAKE PADS.

CHECK BRAKING EFFICIENCY.

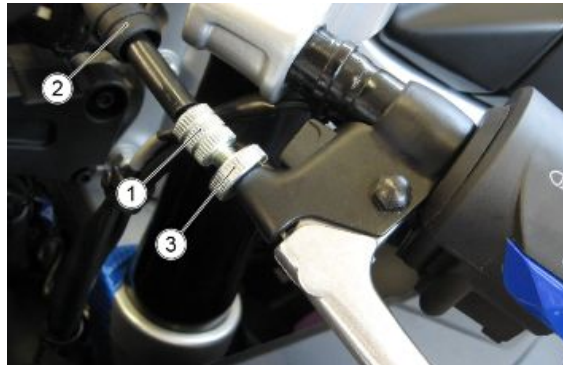
IF THE DEAD ZONE OF THE BRAKE PEDAL OR BRAKE LEVER IS TOO LONG, OR IN CASE OF FLUID LOSS, IT MAY BE NECESSARY TO BLEED THE AIR TRAPPED IN THE SYSTEM.

**Clutch system**

Adjusting the lever

Adjustment clutch when the engine stops or the vehicle tends to move forward even when clutch lever is operated and the gear engaged, or if the clutch "slides", resulting in acceleration delay considering the engine revs.

Minor adjustments can be carried out through the set screw (1):



- Rest the vehicle on its stand.
- Remove the protection casing (2).
- Loosen the lock nut (3).
- Turn the set screw (1) until the empty travel at the clutch lever end is approximately 10 - 15 mm (0.39 - 0.59 in) (see figure).
- After adjusting, tighten the check nut (3) to lock the adjuster screw (1).
- Check the empty travel at the clutch lever end.
- Refit the protection casing (2).

NOTE

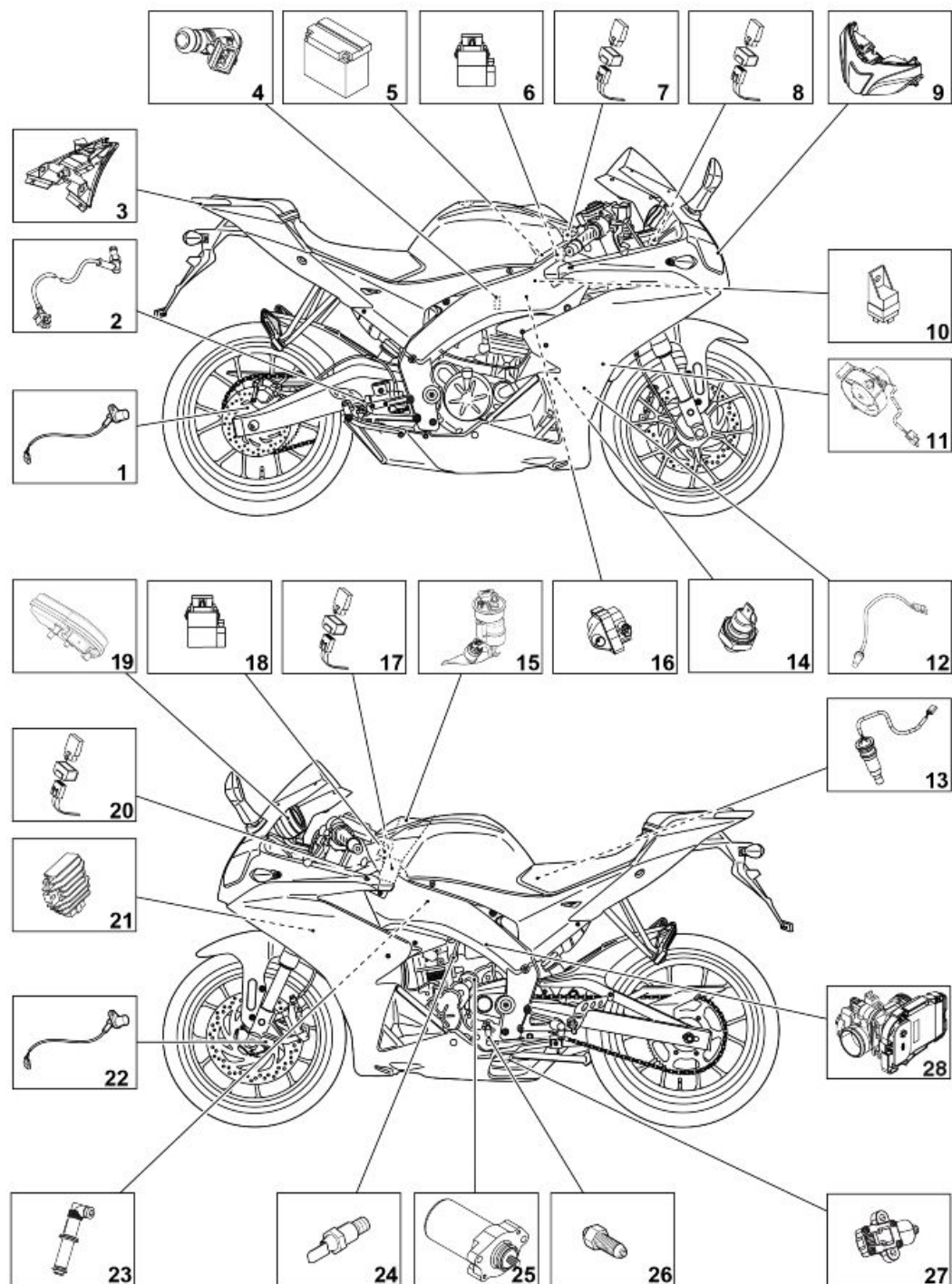
CHECK THE CONDITION OF THE CLUTCH CABLE: THERE MUST BE NO SIGNS OF CRUSHING OR WEAR ALONG THE ENTIRE LENGTH OF THE CABLE SHEATH.

- Lubricate the clutch cable periodically with suitable lubricant to prevent premature wear and corrosion.
-

INDEX OF TOPICS

ELECTRICAL SYSTEM

ELE SYS

Components arrangement**KEY:**

1. Engine speed sensor
2. Stop switch
3. Taillight

4. Injector
5. Battery
6. Main fuses
7. Fan relay
8. Light relay
9. Headlight unit
10. Starter relay
11. Electric fan.
12. Lambda probe
13. Fuel reserve sensor
14. Oil pressure sensor
15. Coil
16. Fuel pump
17. Injection relay
18. Secondary fuses
19. Instrument panel
20. Flasher unit
21. Regulator
22. Front ABS sensor
23. Spark plug boot
24. Temperature sensor
25. Starter motor
26. Neutral sensor
27. Stand sensor
28. MIU G3 control unit

Electrical system installation

Scope and applicability

This document defines the position of the vehicle wiring harness, how it is routed and fixed to the chassis, instrument holder arch brace and saddle post, any problems and special checks to be made on the cable connections and routing in order to achieve vehicle reliability.

Materials used and corresponding quantities

The electrical system consists of the following wiring harnesses and parts:

- 1 main wiring harness
- 1 headlight wiring harness
- 1 license plate holder wiring harness
- 1 chassis - engine ground cable

- 2 turn indicator wiring harnesses
- 1 H.V. cable
- 1 blinker
- 1 start-up relay 12V 80A
- 3 relays 12V 30A

Small parts and mountings:

- 7 large black 290x4.5 (11.42x0.18 in) clamps
- 6 medium black 190x4.5 (7.48x0.18 in) clamps
- 5 small black 160x2.5 (6.30x0.10 in) clamps
- 1 clamp
- 6 rubber clamps
- 1 edge clamp
- 2 cable guides
- 2 White adhesive wire holders
- 3 cable guides
- 1 circlip
- 3 retaining clips
- 1 M6x8 SHC screw
- 1 spring washer

Special checks for the correct connection and routing of cables

It is extremely important that any security-locks for the following connectors are properly connected and correctly tightened to ensure proper engine, and therefore proper vehicle, operation. The operator must also mark these connectors with an indelible pen.

- Sponge connector on licence plate holder light.
- Check the control unit connection and that the relative rubber plug is correctly inserted.
- Check that the metallic bracket screw is correctly fastened on the throttle body .
- Check the injector connection.
- Check the water temperature sensor connection.
- Check the injector and water temperature sensor cable clamp.
- Check that the H.V. cable with coil is correctly inserted.
- Check the coil connection and that the coil ground eyelet is correctly fastened.
- Check that the engine oil cap is correctly inserted.
- Check the ground fastening on the starter motor, starter motor positive and relative hood.
- Check the NEUTRAL cable fastening. (with transparent insulating washer)
- Check the fuel reserve sensor.
- Check the fuel pump connection.
- Check the regulator connection.

- Check fastening of the chassis - engine ground cable.
- Check the flywheel connection.
- Check the lambda connection (with security Lock).
- Check that lambda probe cable is correctly connected.
- Check that the "ABS" connector is correctly inserted.
- Check that the front and rear "ABS" sensors are correctly connected.

The installation is shown with the vehicle ideally divided into three parts:

1. Front section
2. Central section
3. Rear section



Front side

A TABLES - FRONT HEADLIGHT ASSEMBLY

TABLE A1 - Pre-fitting

1. Daylight running light (5W).
2. Cable grommet.
3. Light relay.
4. Low beam light.
5. Headlight wiring harness.
6. High-beam light.

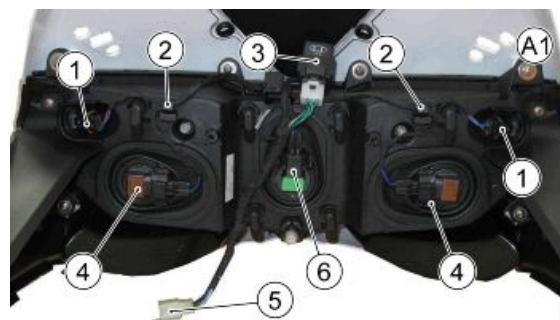


TABLE A2 - Headlight cable routing: LH side

1. Daylight running light (5W).
2. Cable grommet.
3. Low beam light.
4. LH daylight running light wiring harness.
5. LH low beam light wiring harness.

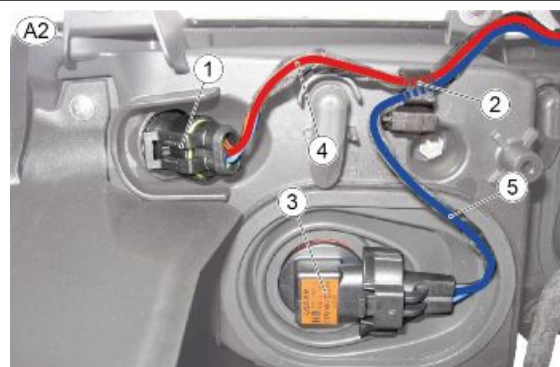
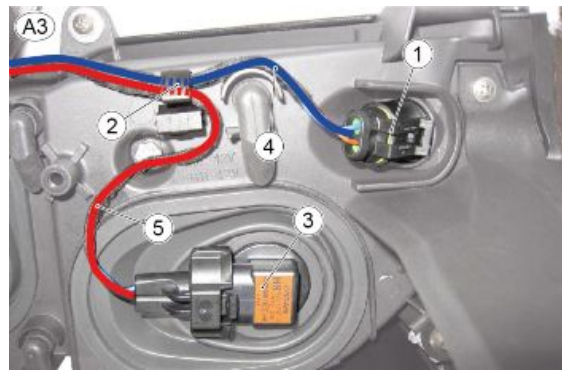
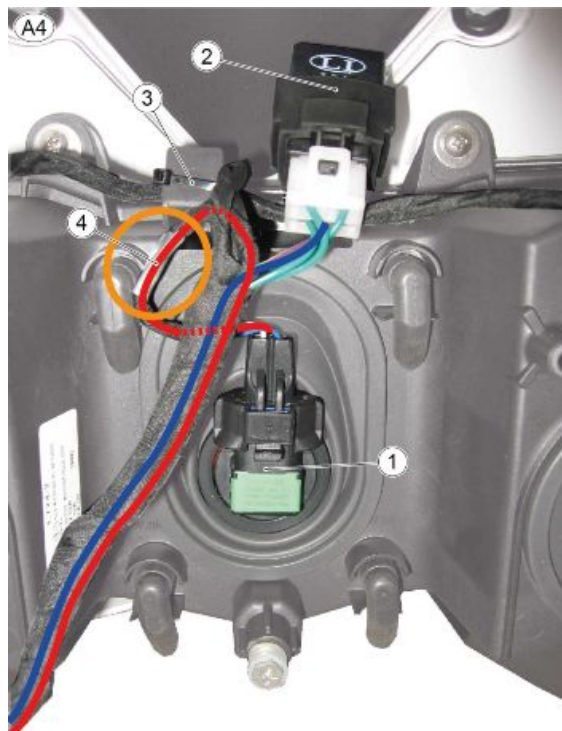


TABLE A3 - Headlight cable routing: RH side

1. Daylight running light (5W).
2. Cable grommet.
3. Low beam light.
4. RH daylight running light wiring harness.
5. RH low beam light wiring harness.

**TABLE A4**

3. High-beam bulb
2. Light relay.
3. Clamp.
4. Grey taping. Indicates that the connector must be connected to the flashing light (central).

**TABLE A5**

1. Daylight running light (5W).
2. Low beam lights (35W).
3. High beam light (35W).



TABLE B - ABS SENSOR

The ABS sensor must be fastened with the cable fasteners onto the front brake pipe, must pass through the eyelet of the brake calliper bleeding cap and must be curved as shown in the photograph.

1. Front ABS sensor.
2. Cable guide
3. Cable fasteners

**C TABLES - POSITIONING OF LH AND RH CABLES****TABLE C1**

- Using two rubber clamps, lock together the wiring harness of the LH light switch and the wiring harness of the clutch switch.



TABLE C2

- Using two rubber clamps, lock together the wiring harness of the RH light switch and the wiring harness of the front brake and the brake pipe.

**D TABLES - ARCH BRACE****TABLE D1**

1. Clamp.
2. Main wiring harness

The clamp must tighten all the cables inside the instrument holder arch brace; The main wiring harness must be held with the clamp on the grey taping.

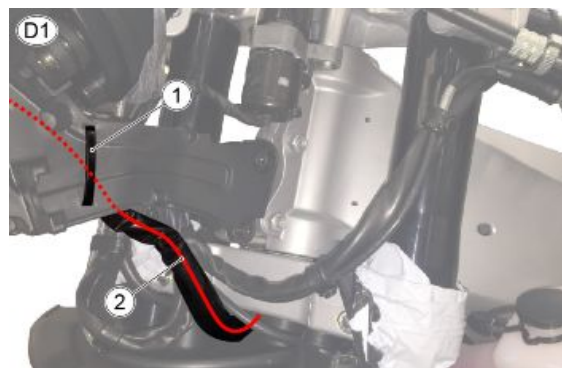


TABLE D2

The headlamp wiring harness connector is inside the instrument holder arch brace

**TABLE E - DETAIL OF LIGHTS**

1. Clamps.
2. LH light switch wiring harness.
3. RH light switch wiring harness.

The clamps must secure the light switch wiring harnesses to the semi-handlebars.

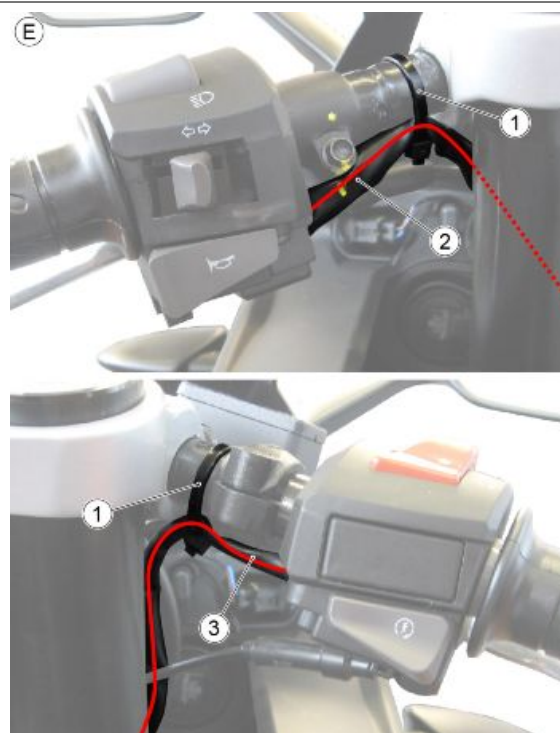
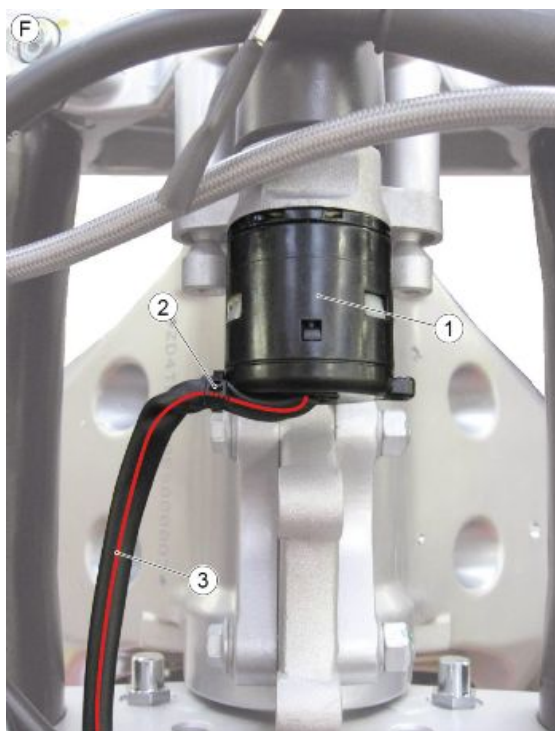


TABLE F - IGNITION SWITCH

1. Ignition switch.
2. Clamp.
3. Ignition switch wiring harness.

The clamp must block the ignition switch wiring harness as shown.

**TABLE G - INSTRUMENT PANEL**

1. Engine oil pressure warning light.

**TABLE H - POSITIONING OF REGULATOR****TABLE H1**

1. Ignition switch.
2. Clamp.
3. Ignition switch wiring harness.

Using the clamp, block the ignition switch wiring harness as shown.

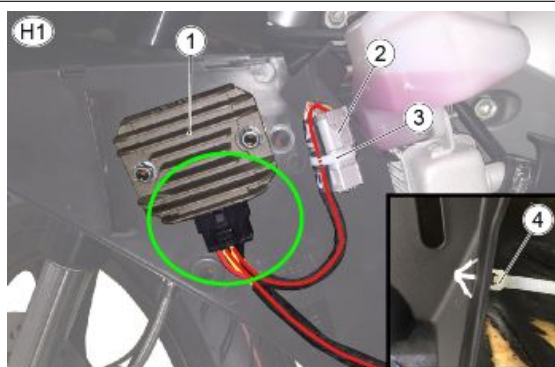
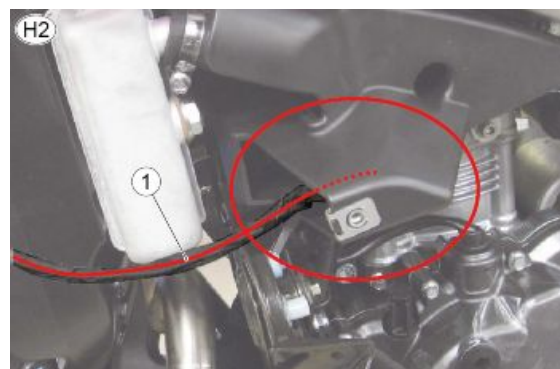


TABLE H2

1. Voltage regulator wiring harness.

CAUTION

CHECK THAT THE REGULATOR IS CORRECTLY CONNECTED.
IN THE AREA SHOWN IN RED (REGULATOR CABLE, BEHIND RADIATOR) THE FLYWHEEL CONNECTION MUST NOT BE SEEN BUT BE CONCEALED BEHIND THE PLASTIC COVER.

**TABLE I - POSITIONING OF FLYWHEEL****CAUTION**

CHECK THAT THE FLYWHEEL IS CORRECTLY CONNECTED.



Central part

A TABLES - PRE-FITTING OF CHASSIS

TABLE A1

1. Retaining clips.
2. Cable guide.

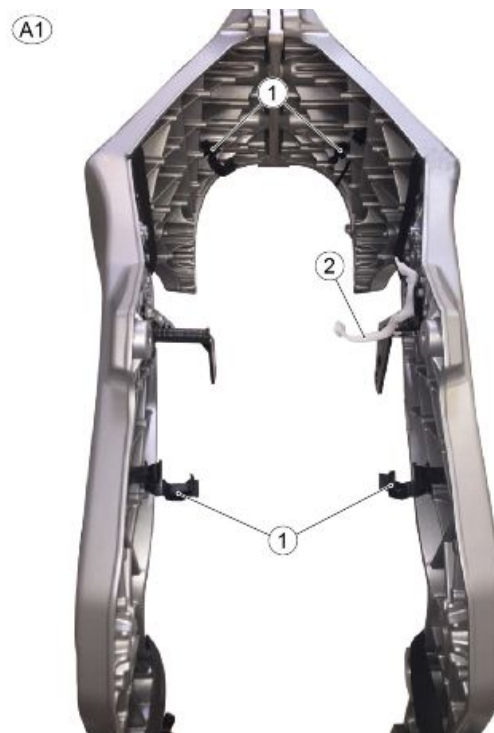


TABLE A2

1. Edge clips

Place the edge clips between the points indicated on the chassis.

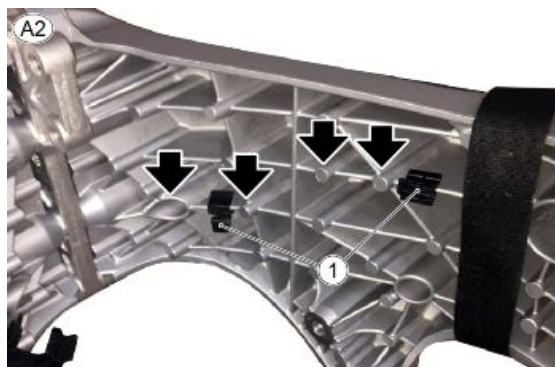


TABLE A3 - RH SIDE

1. Cable guide



TABLE A4 - LH SIDE

1. Cable guide
2. Hole for chassis ground.
3. Rubber edge protectors.

**TABLE B - PRE-FITTING OF FUEL RESERVE SENSOR**

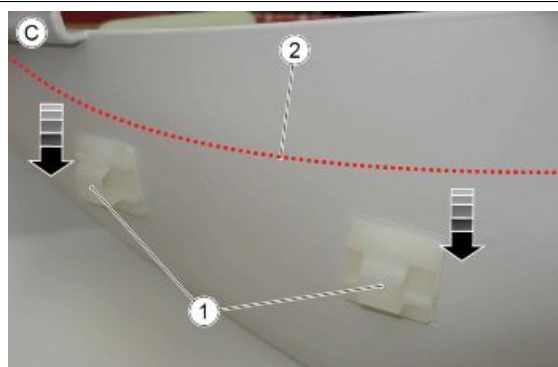
1. Fuel pump
2. Fuel reserve sensor

**WIRING TABLE C**

1. Adhesive wire holders
2. Main wiring harness

CAUTION

THE ADHESIVE WIRE HOLDERS MUST BE PLACED WITH THE OPENING FOR THE CABLE ENTRY AT THE TOP SO THAT THE WIRING HARNESS CAN BE INSERTED FROM THE UPPER SIDE.

**D TABLES - PRE-FITTING OF COIL - HV CABLE - SPARK PLUG BOOT****TABLE D1**

1. Spark plug boot.
2. Coil and support bracket.
3. HV cable
4. Circlip.

CAUTION

CHECK THAT THE HV CABLE IS CORRECTLY CONNECTED TO THE COIL. MAKE SURE YOU DO NOT DAMAGE THE TERMINAL DURING FITTING.

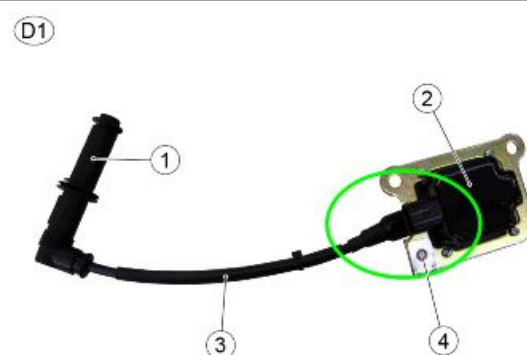
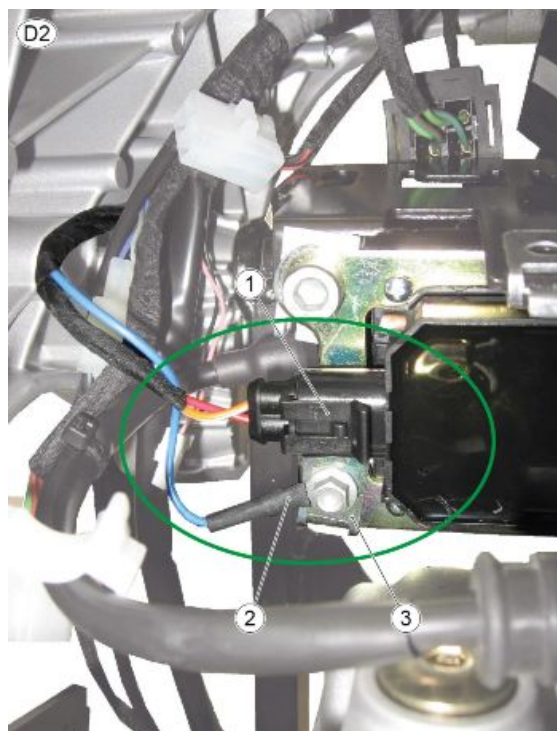


TABLE D2

1. Coil connector
2. Coil earth.
3. Circlip.



E TABLES - CONNECTION OF MIU (3G) CONTROL UNIT - INJECTOR- WATER TEMPERATURE SENSOR

TABLE E1

1. Protective rubber.

**TABLE E2**

1. Protective rubber.
2. Bracket fastening screw.
3. Metal bracket.
4. Hole for passing injector and water sensor cable clamp.

Put the metal bracket into position, fasten it with the special screw and secure the control unit.

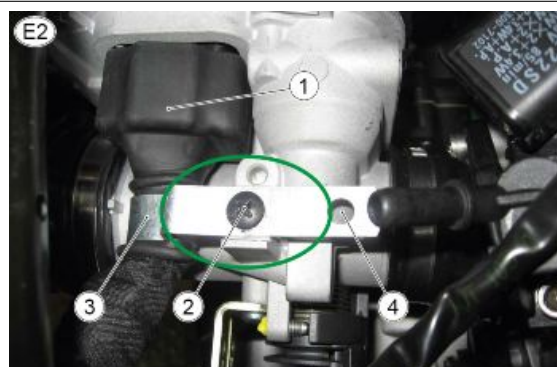
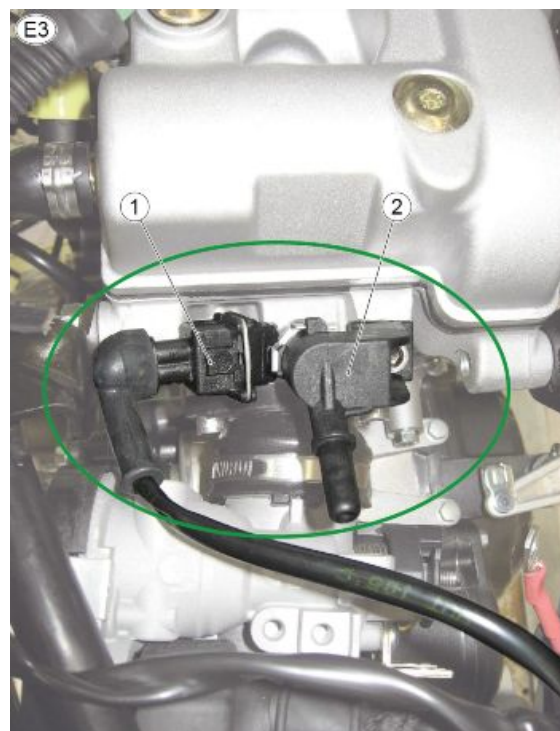


TABLE E3

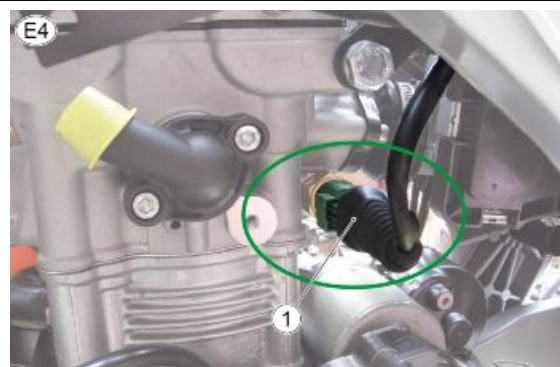
1. Connector.
2. Injector.

CAUTION

CONNECT THE CONNECTOR TO THE INJECTOR AND MAKE SURE IT HAS BEEN CORRECTLY CONNECTED.

**TABLE E4****CAUTION**

CONNECT THE WATER TEMPERATURE SENSOR CONNECTOR AND MAKE SURE THAT IT HAS BEEN CORRECTLY INSERTED. CHECK THE POSITION OF THE RUBBER PLUG.

**TABLE E5**

1. Clamp
2. Injector wiring harness.
3. Water sensor wiring harness.

CAUTION

FASTEN THE WATER SENSOR AND INJECTOR WIRING HARNESSES TOGETHER, SECURE THEM WITH A CLAMP AND ANCHOR THEM TO THE METAL BRACKET VIA THE HOLE ON THE BRACKET.

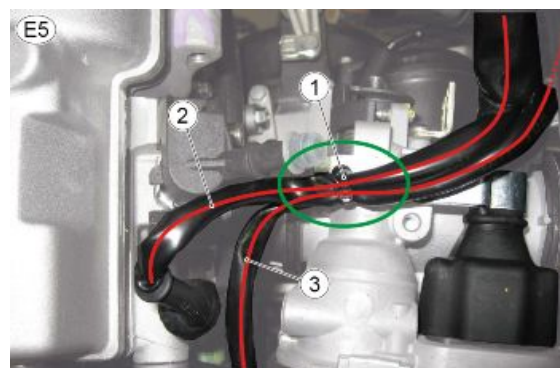


TABLE F - PRE-FITTING OF RADIATOR FAN

1. Radiator fan.

**G TABLES - PRE-FITTING OF ABS - PROCEDURE FOR INSERTION OF ABS CONNECTOR****TABLE G1**

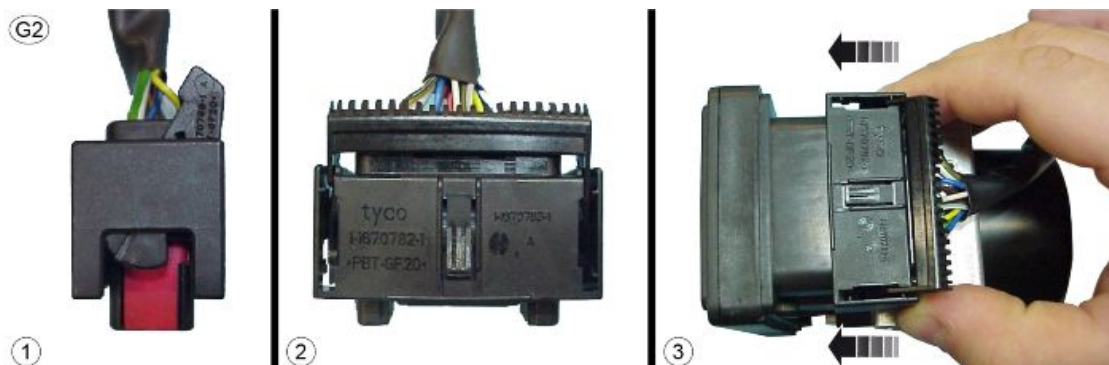
1. ABS Modulator.
2. ABS modulator support.
3. Fastener screw.

Using the special screw, place the ABS modulator on the support

**TABLE G2 - PROCEDURE FOR INSERTION OF ABS CONNECTOR**

The position of the connector fastener lever must be as shown in Figures "1" and "2".

Place the connector on the opposite side of the control unit and lower the driving lever until the "click" that signals the end of the stroke is heard as in Figure "3".

**TABLE G3**

When the connector is fully inserted, the distance between the connector and the ABS control unit must be 7.5 mm.

if the initial position of the connector and the driving lever is not as shown in "TABLE G2 - Figure 1", the connector will not be properly coupled and the distance measured will be greater (approx. 12 mm). If this occurs, repeat the procedure as described in Figures 3 and 4.

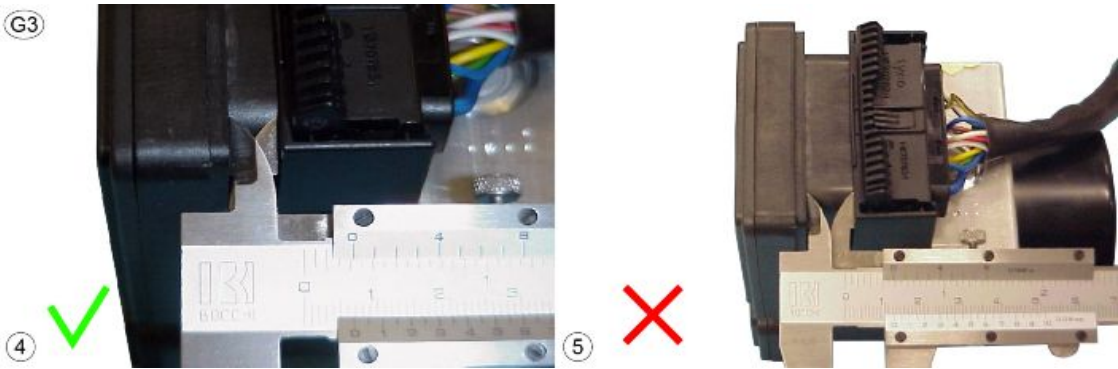
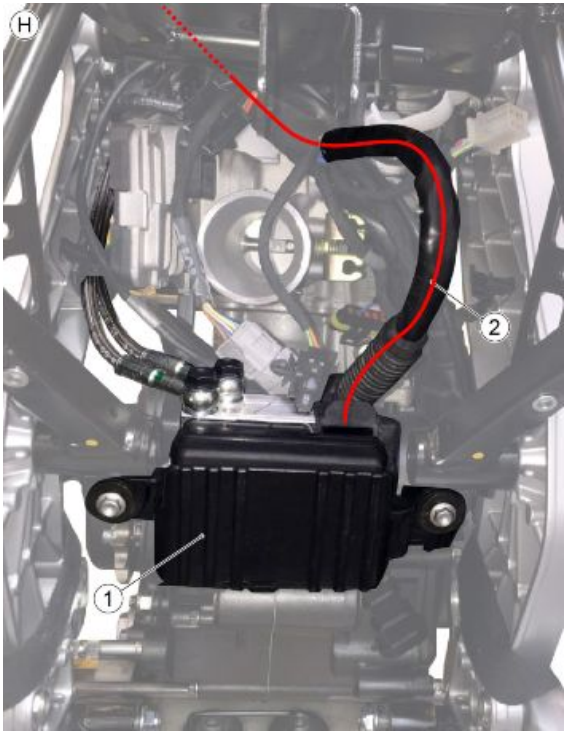


TABLE H - FITTING OF ABS ONTO CHASSIS

- 1. ABS Modulator
- 2. ABS wiring harness



I TABLES - FITTING OF MAIN WIRING HAR-
NESS

TABLE I1

- 1. Front ABS sensor connector.
- 2. Main wiring harness.

CAUTION

PLACE THE GREY REFERENCE MARKS ON THE WIRING HARNESS ONTO THE RESPECTIVE FASTENINGS AND CLOSE THEM, POSITIONING THE WIRING HARNESS CORRECTLY AS SHOWN.

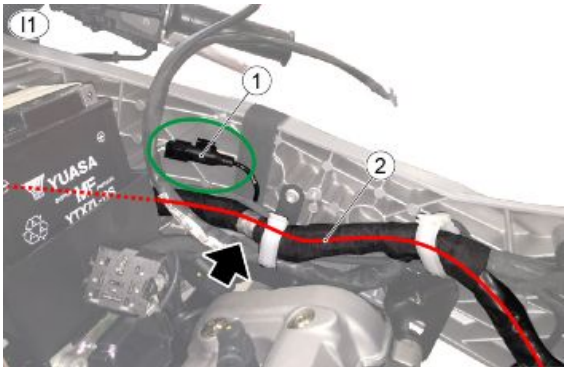


TABLE I2

1. Main wiring harness.
2. Cable guide.

CAUTION

PLACE THE GREY REFERENCE MARKS ON THE WIRING HARNESS IN THE RESPECTIVE CABLE FASTENERS AND CLOSE THEM, POSITIONING THE WIRING HARNESS AS SHOWN IN THE PHOTOGRAPH.

**TABLE I3**

1. Secondary fuses.
2. Main fuses.
3. Main fuse.

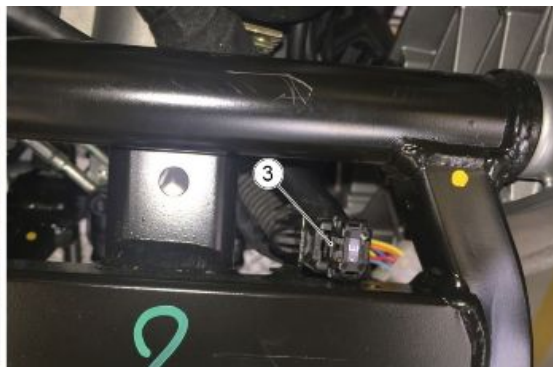
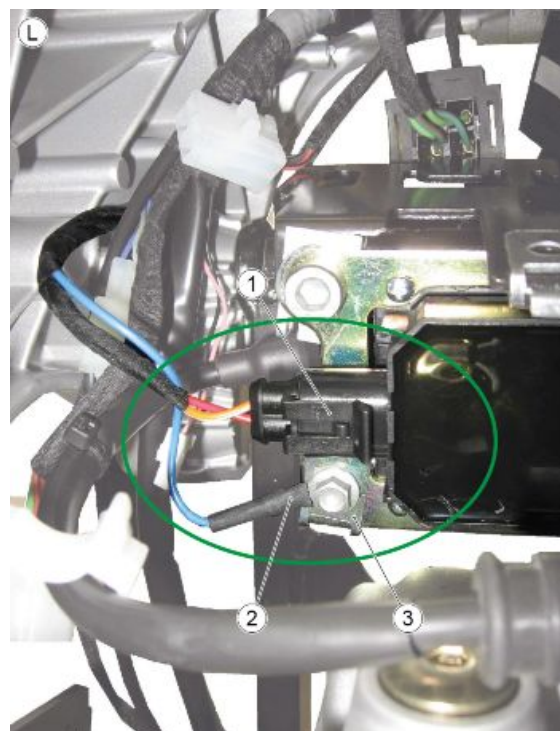


TABLE L - CONNECTING THE COIL

1. Coil connector.
2. Ground cable.
3. Circlip.

CAUTION

MAKE SURE THAT THE CONNECTOR HAS BEEN CONNECTED AND THE GROUND CABLE FASTENED TO THE CIRCLIP CORRECTLY.

**M TABLES - ENGINE GROUND****TABLE M1**

1. Ground cable.

CAUTION

MAKE SURE THAT THE GROUND CABLE IS FASTENED TO THE ENGINE CORRECTLY.

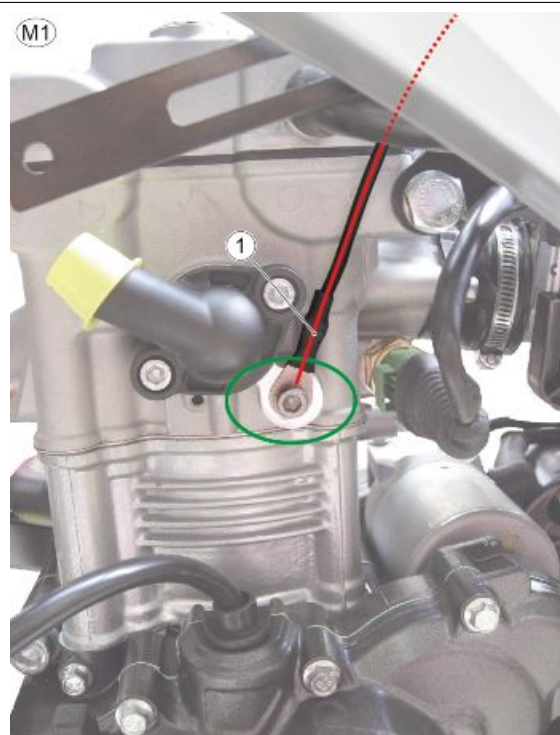
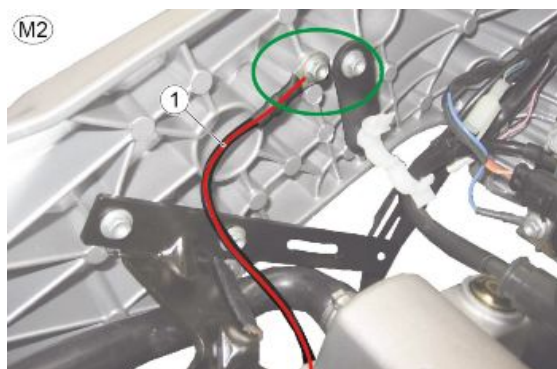


TABLE M2

1. Ground cable.

CAUTION

MAKE SURE THAT THE GROUND CABLE IS FASTENED TO THE CHASSIS CORRECTLY.

**N TABLES - BATTERY AREA COMPONENTS****TABLE N1**

1. Turn indicators relay.
2. Fan relay.
3. Injection relay.

**TABLE N2**

1. Fan connector

After connecting the fan connector, insert it into the special support tab.

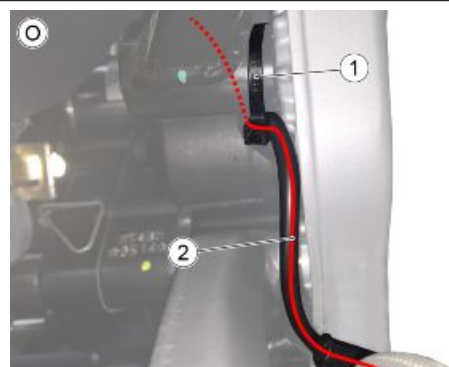


TABLE N3

1. Start-up relay.

**TABLE O - REAR BRAKE SENSOR ROUTING**

1. Clamp.
2. Rear brake sensor wiring harness.

**TABLE P - HORN - NEUTRAL SENSOR - STAND SENSOR**

1. Clamps.
2. Horn wiring harness.
3. Stand sensor wiring harness.
4. Neutral sensor wiring harness.

Check the wiring of the horn wiring harness and clamp it correctly so that it does not come into contact with the engine.



Q TABLES - LAMBDA PROBE - ENGINE OIL PRESSURE SENSOR**TABLE Q1**

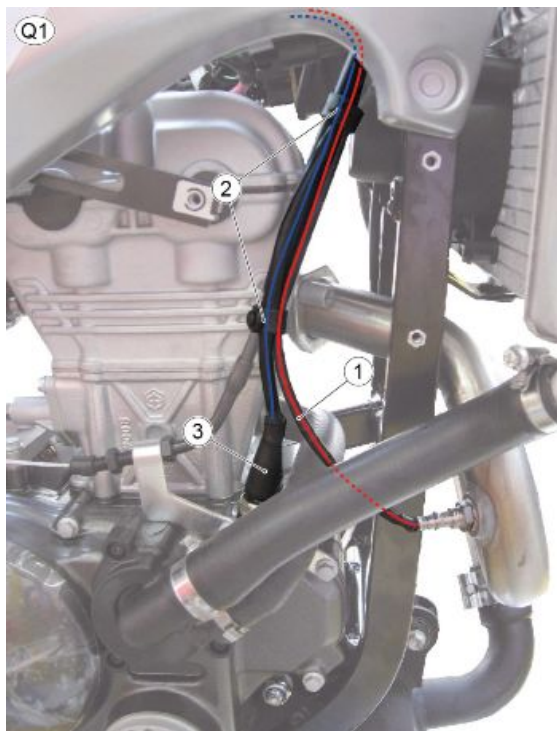
1. Lambda probe wiring harness.
2. Rubber clamps.
3. Engine oil pressure sensor.

CAUTION

CHECK THAT THE CAP IS CORRECTLY INSERTED ON THE ENGINE OIL PRESSURE SENSOR.

CAUTION

THE LAMBDA PROBE WIRING HARNESS MUST BE SLIGHTLY BENT AS SHOWN IN THE PHOTOGRAPH.

**TABLE Q2**

1. Lambda probe connector

Check that the lambda probe connector has been fastened correctly.

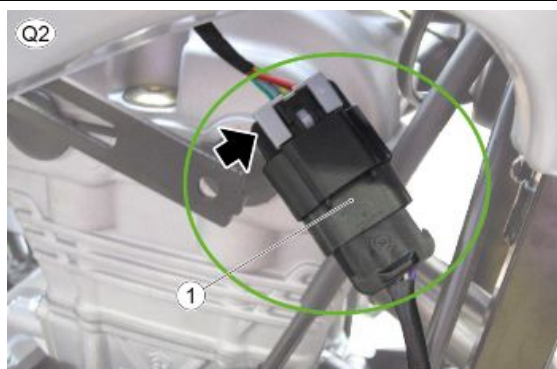
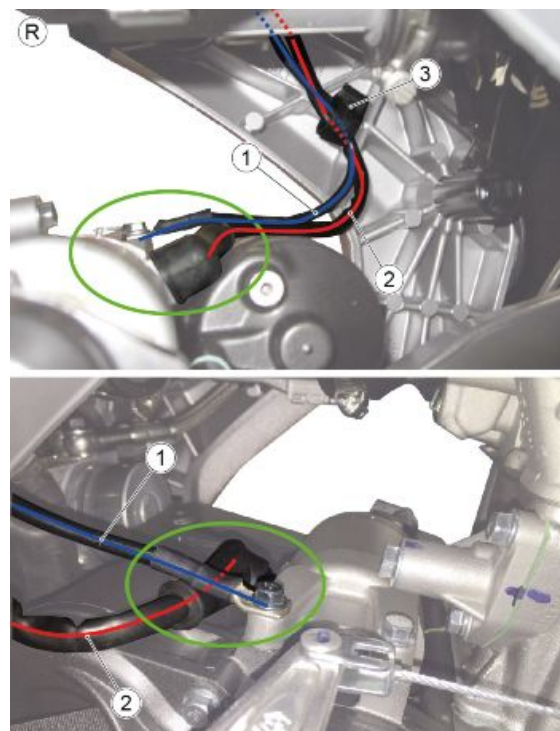


TABLE R - STARTER MOTOR

1. Starter motor ground wiring harness.
2. Starter motor positive wiring harness.

CAUTION

CHECK THAT THE STARTER MOTOR GROUND CABLE AND POSITIVE CABLE HAVE BEEN FASTENED CORRECTLY COMPLETE WITH PROTECTIVE CAP.

**TABLE S - NEUTRAL SENSOR**

1. Neutral sensor wiring harness.
2. Transparent plastic washer.
3. Wiring harness terminal.
4. Toothed washer.
5. Sensor fastener screw.

CAUTION

MAKE SURE THAT THE NEUTRAL CABLE HAS BEEN FASTENED CORRECTLY USING THE SPECIAL SCREW. THE TRANSPARENT PLASTIC WASHER MUST BE PLACED BETWEEN THE SENSOR FITTED ON THE ENGINE AND THE TERMINAL.

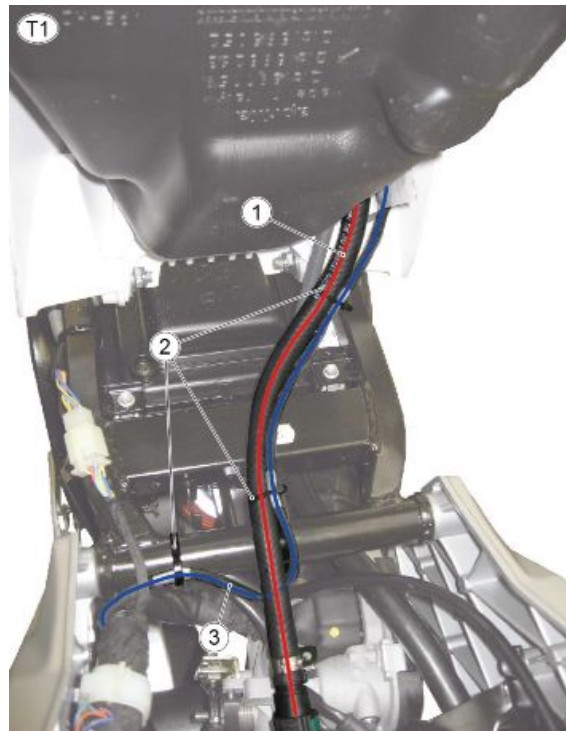


T TABLES - FUEL TANK WIRING HARNESSSES**TABLE T1**

1. Fuel pipe.
2. Clamps.
3. Fuel pump/sensor wiring harness

CAUTION

CONNECT THE BRANCH OF THE FUEL PUMP WIRING HARNESS TO THE FUEL PIPE WITH TWO CLAMPS IN LINE WITH THE GREY TAPING. THE THIRD CLAMP MUST FASTEN THE FUEL PUMP WIRING HARNESS TO THE SADDLE POST.

**TABLE T2**

1. Main wiring harness.
2. Fuel pump wiring harness.
3. Fuel pump connector.

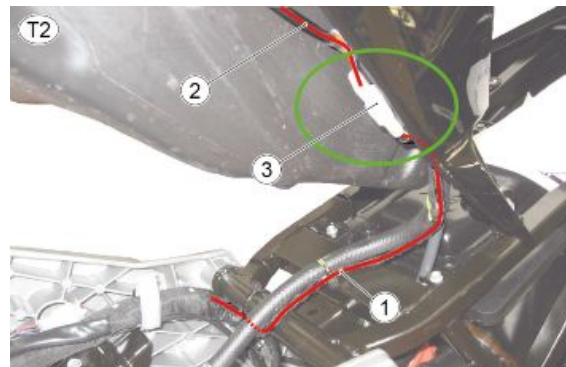
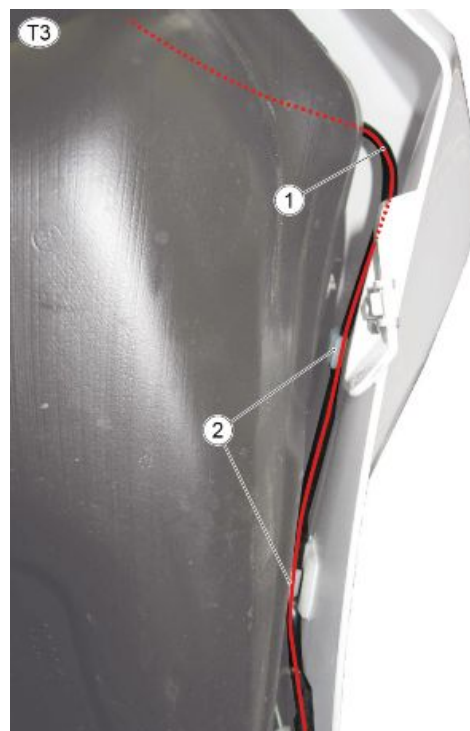


TABLE T3

1. Fuel pump wiring harness.
2. Wire holders.

CAUTION

PASS THE FUEL PUMP WIRING HARNESS ONTO THE LH SIDE OF THE TANK AND INSERT IT IN THE SPECIAL WIRE HOLDERS FITTED PREVIOUSLY.

**TABLE T4**

1. Fuel pump.
2. Fuel pump wiring harness.

CAUTION

CONNECT THE FUEL PUMP AND MAKE SURE THAT THE CONNECTOR HAS BEEN CORRECTLY CONNECTED.

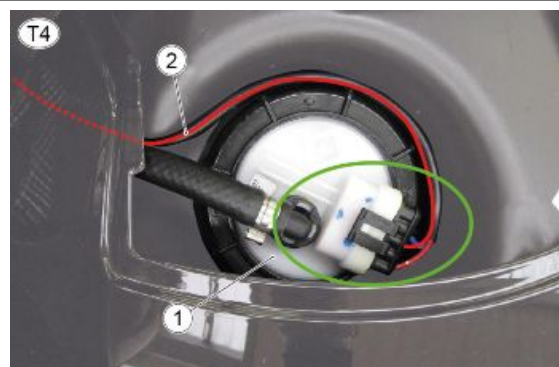
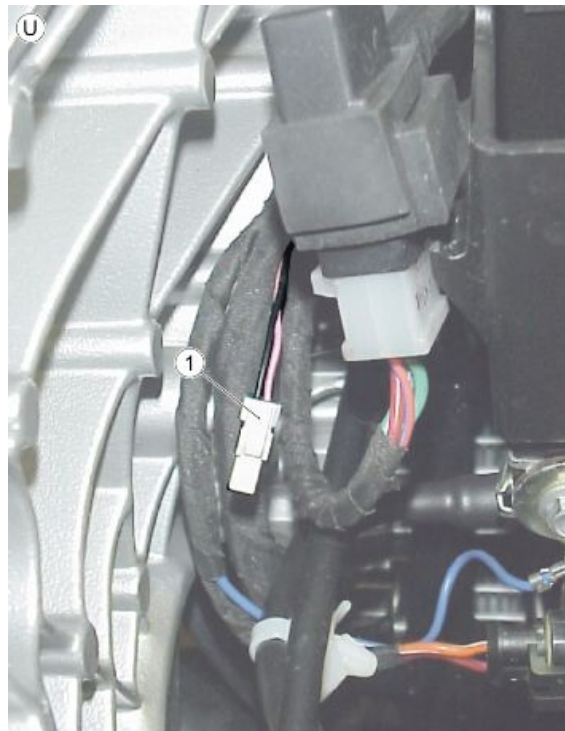


TABLE U

1. Quick shift connector.

**TABLE V**

Correct position of battery.



Back side

TABLE A - PRE-FITTING OF TAILLIGHT

1. Grey taping that indicates the LH rear turn indicator cable.
2. Faston: light blue and blue cables.
3. Faston: red and blue cables.

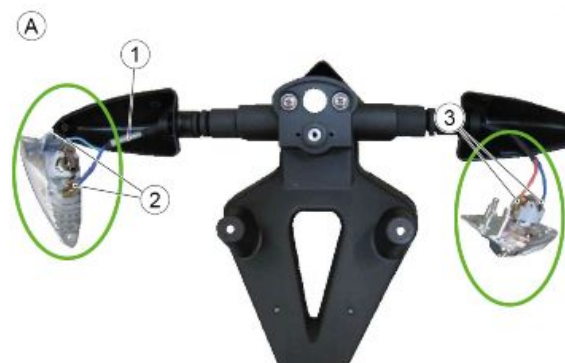
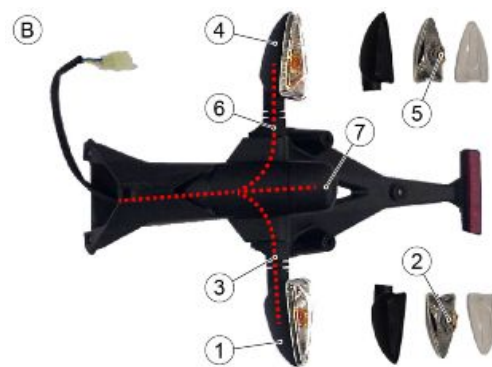


TABLE B - REAR HEADLIGHT ASSEMBLY

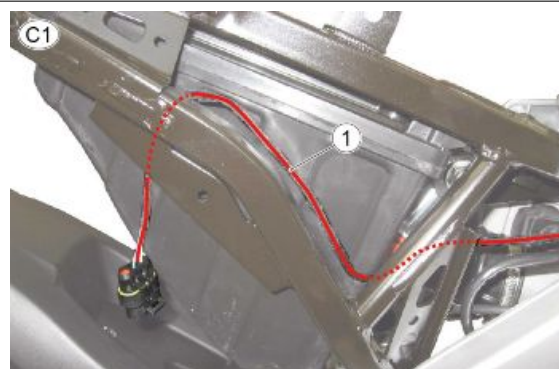
1. LH rear turn indicator.
2. Faston: light blue and blue cables.
3. LH rear turn indicator wiring harness.
4. RH rear turn indicator.
5. Faston: red and blue cables.
6. RH rear turn indicator wiring harness.
7. Licence plate light.

**CAUTION**

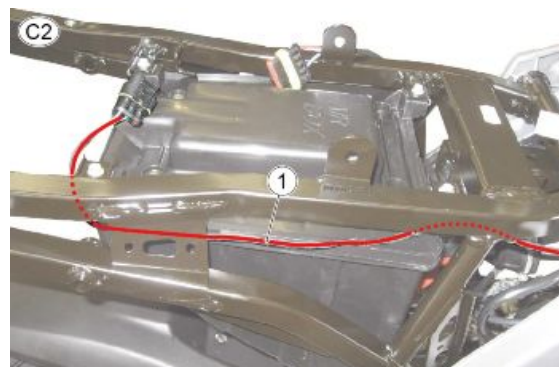
CHECK THERE IS AN ANTI-VIBRATION SPONGE BETWEEN THE LICENCE PLATE LIGHT AND SUPPORT.

**C TABLES - DETAIL OF DIAGNOSTICS CABLE
(PHASES FOR CORRECT FITTING)**
TABLE C1

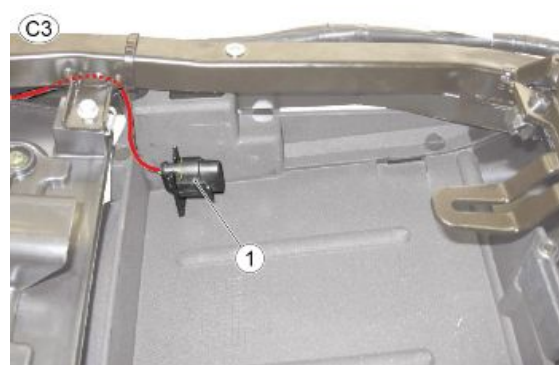
1. Diagnostics cable wiring harness.
- Pass the wiring harness between the frame and the filter casing as shown.

**TABLE C2**

1. Diagnostics cable wiring harness.
- Pass the wiring harness between the frame and the filter casing as shown.

**TABLE C3**

1. Diagnostics connector.
- Insert the diagnostics connector into the special support in the glove box.

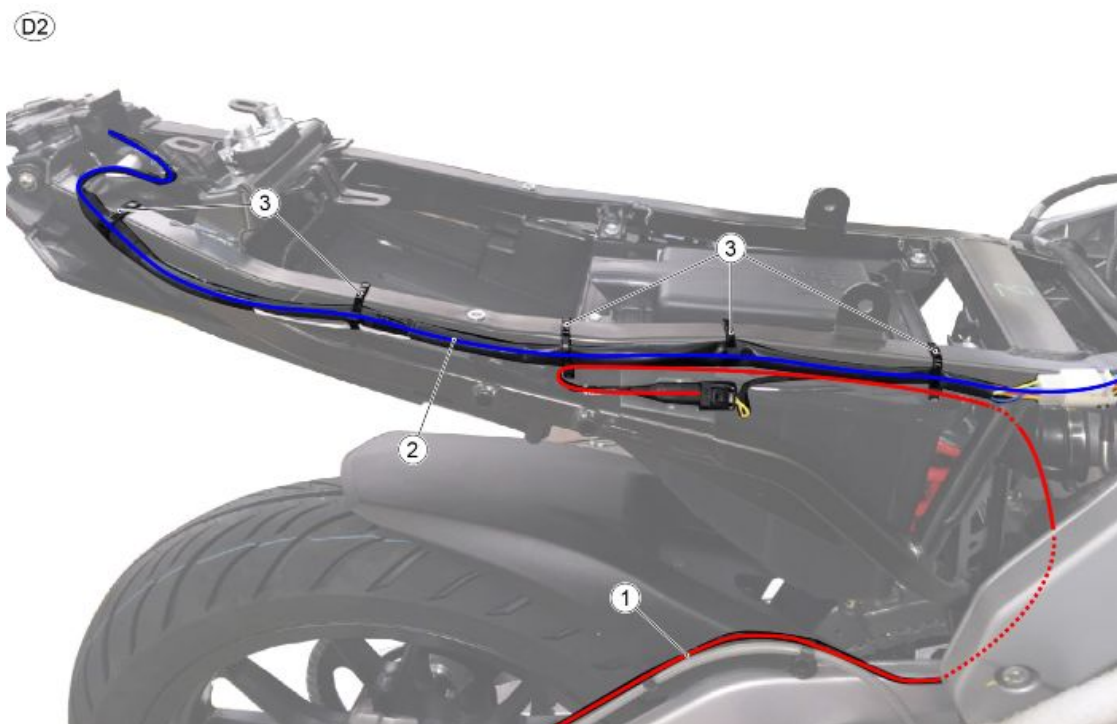


**D TABLES - FASTENING OF TAIL FAIRING
WIRING HARNESS****TABLE D1**

1. Main wiring harness connector.
- Check the position of the connector.

**TABLE D2**

1. Rear speed sensor wiring harness.
2. Taillight wiring harness.
3. Clamps.

**TABLE D3**

1. Taillight wiring harness.
2. Main wiring harness.
3. Taillight wiring harness connector.

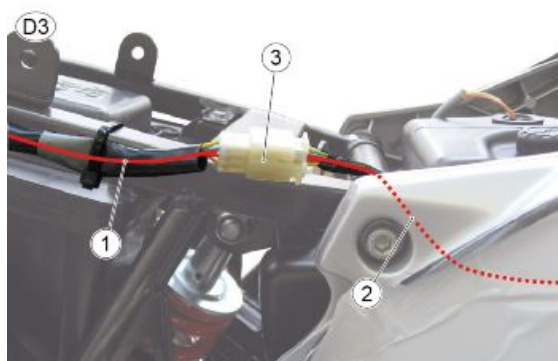
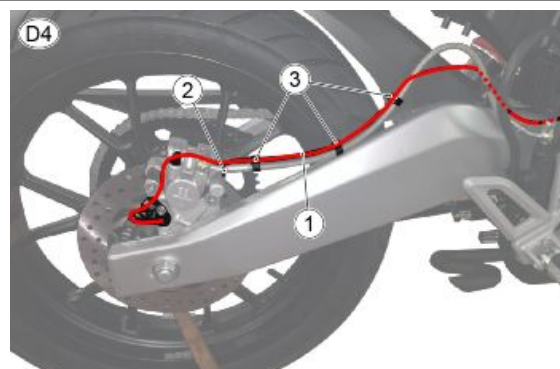


TABLE D4

1. Rear speed sensor wiring harness.
2. Clamp.
3. Cable fasteners.



- The ABS sensor cable must be blocked by the bleeder cap

**TABLE D5**

1. Rear speed sensor connector.

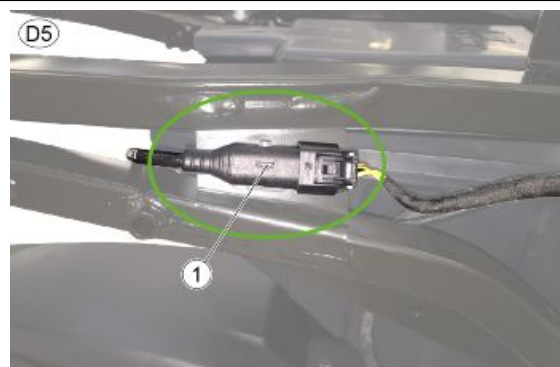
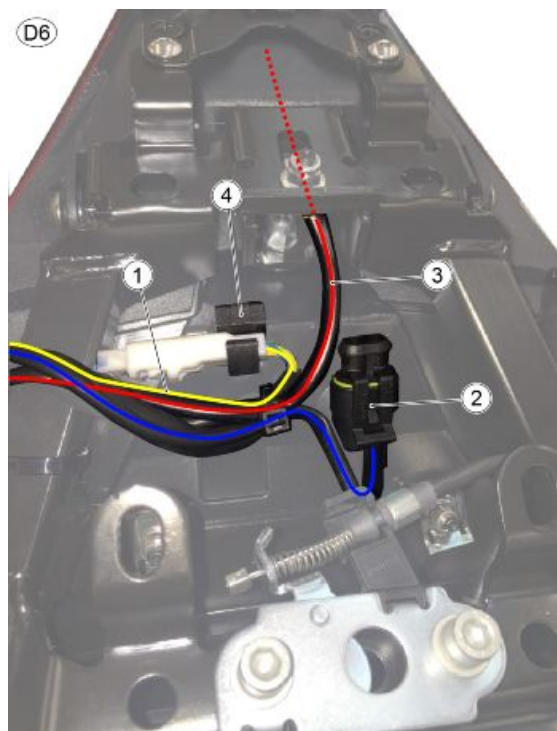
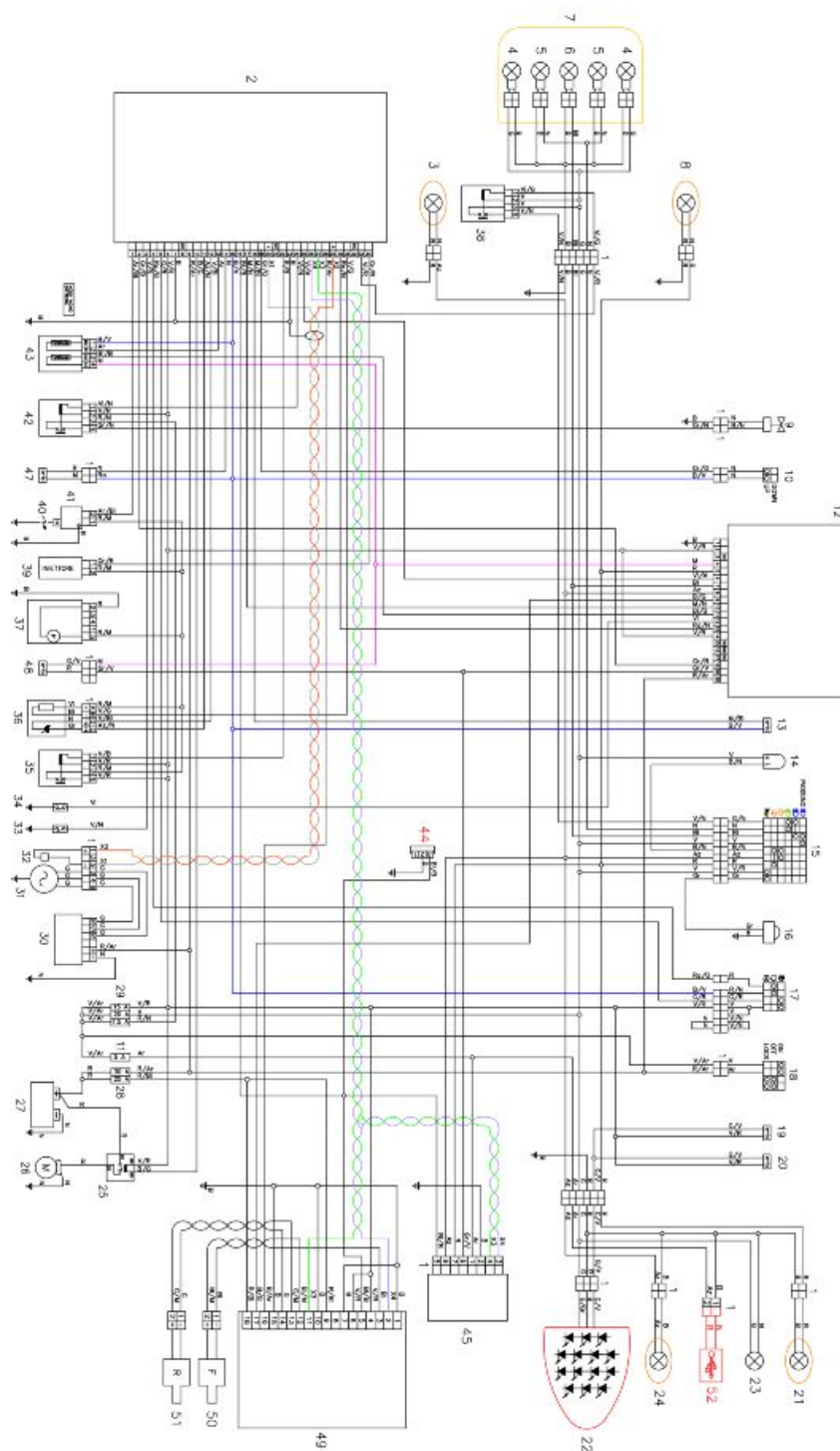


TABLE D6

1. Taillight wiring harness.
2. USB socket connector.
3. Taillight wiring harness.
4. Cable guide.



General wiring diagram



Key

1. Multiple connectors
2. MIU G3 control unit
3. Left hand front turn indicator (10W)
4. Front daytime running lights (5W)

5. Low beam headlight lamp (35W)
6. High beam light bulb (55W)
7. Complete headlamp
8. Right hand front turn indicator (10W)
9. Fan
10. Side stand switch
11. Accessories fuse
12. Instrument cluster
13. Clutch switch
14. Flasher unit
15. Left light switch
16. Horn
17. Right light switch
18. Ignition switch
19. Rear stop switch
20. Front stop switch
21. Right hand rear turn indicator (10W)
22. Taillight (LED)
23. Licence plate light (5W)
24. Left hand rear turn indicator (10W)
25. Starter motor relay
26. Starter motor
27. Battery (YTXL7-BS)
28. Fuses 1 + ABS fuse
29. Fuses 2
30. Regulator
31. Alternator
32. Pick-up
33. Gear in neutral switch
34. Oil sensor
35. Injection relay
36. Lambda probe
37. Pump and battery sensor
38. Light relay
39. Injector
40. Spark plug
41. Coil
42. Fan relay

- 43.Engine water temperature sensor
- 44.ECU diagnostics
- 45.BLUEDASH pre-installation
- 46.Fall sensor
- 47.Electronic gearbox (optional)
- 48.Reserve fuel sensor
- 49.ABS control unit
- 50.Front ABS sensor
- 51.Rear speed sensor
- 52.USB port
- 53.-
- 54.-
- 55.-
- 56.-
- 57.-
- 58.-
- 59.-
- 60.-

Colour key:

- Ar Orange
- Az Light blue
- B Blue
- Bi White
- G Yellow
- Gr Grey
- M Brown
- N Black
- R Red
- Ro Pink
- V Green
- Vi Violet

Checks and inspections**GENERAL NOTIONS FOR TROUBLESHOOTING ELECTRICAL FAULTS**

THE SECTIONS RELATIVE TO THE ELECTRICAL SYSTEM CONTAIN DRAWINGS OF CONNECTORS; NOTE THAT THE DRAWING ALWAYS DEPICT THE CONNECTOR/COMPONENT VIEWED FROM THE WIRING HARNESS SIDE, I.E. FROM THE SIDE ON WHICH THE CABLES LEADING FROM THE MAIN WIRING HARNESS ENTER THE CONNECTOR/COMPONENT.

CAUTION

BEFORE STARTING ANY TROUBLESHOOTING PROCEDURES ON THE VEHICLE, CHECK THAT THE BATTERY VOLTAGE IS ABOVE 12V.

PROCEDURE FOR CHECKING CONNECTOR

This procedure consists of the following checks and inspections:

1. Visually inspect connector and check that it is fitted correctly onto the component or onto the relative connection point, and where applicable, check that the connector retainer or clip is correctly fastened.
2. Visually inspect the terminals on the connector: there must be no signs of corrosion or dirt. It is also important to check that the terminals are positioned correctly on the connector (terminals must all be straight and of the same length) and to check the condition of the terminals themselves (terminals must not be loose, bent etc.).

CAUTION

IN THE CASE OF SPORADIC FAULTS, MOVE OR WIGGLE THE RELATIVE WIRING HARNESS SLIGHTLY WHILE PERFORMING EACH OF THE CHECKS INDICATED FOR TROUBLESHOOTING.

3. Pull cables gently from the back of the connector to check that the terminals are fitted correctly on the connector and that the wires are fastened correctly to the terminals.

Checking electrical CONTINUITY

Purpose of check: the purpose of this check is ensure that there are no interruptions or excess resistance (due to corroded terminals, for example) in the circuit under inspection.

Tester: set the tester selector to the "continuity" symbol and place the probes of the tested at the two ends of the circuit. Normally, the tester will sound an audible signal to confirm continuity in the section of circuit tested. Continuity may also be tested by setting the tester selector to the "Ohm" symbol and checking that the resistance in the circuit is zero or of a few tenths of an Ohm.

IMPORTANT: THE CIRCUIT MUST BE UNPOWERED DURING THIS TEST. IF THE CIRCUIT IS POWERED, THE RESULTS OF THIS TEST ARE MEANINGLESS.

Checking GROUND CONNECTION

Purpose of check: the purpose of this check is to verify that a cable or circuit is correctly connected to the ground (-) of the vehicle.

Tester: set the tester selector to the "continuity" symbol and place one of the tester probes on the vehicle ground point (or on the battery negative pole) and the other probe on the cable under inspection. Normally, the tester will sound an audible signal to confirm continuity in the section of circuit tested.

Continuity may also be tested by setting the tester selector to the "Ohm" symbol and checking that the resistance in the circuit is zero or of a few tenths of an Ohm.

IMPORTANT: WHERE GROUND IS PROVIDED BY THE ECU, CHECK THAT THE ECU IS EFFECTIVELY PROVIDING THE GROUND CONNECTION FOR THE CIRCUIT DURING THE TEST.

Checking VOLTAGE

Purpose of check: the purpose of this check is to determine if a cable is carrying voltage, in other terms, to verify whether it powered by the battery or ECU.

Tester: set the tester selector to the "DC voltage" symbol and place the red tester probe on the cable under inspection and the black tester probe on the vehicle ground point (or on the battery negative pole).

CAUTION

IN THE CASE OF SPORADIC FAULTS, MOVE OR WIGGLE THE RELATIVE WIRING HARNESS SLIGHTLY WHILE PERFORMING EACH OF THE CHECKS INDICATED FOR TROUBLESHOOTING.

Dashboard

Diagnosis

Oil pressure

- The red oil warning lamp (1) illuminates if the pressure in the oil circuit is too low.
- If this occurs, determine the cause of the low oil level.



Fuel reserve

- The fuel reserve warning lamp (2) (or-orange) remains continuously lit in the event of a short circuit.
- In the event of a broken circuit, the MI engine alarm warning lamp does not light, no icons illuminate and none of the fuel gauge indicator bars are displayed. In this case, the fuel reserve warning lamp will not illuminate even when the tank is empty.



Water temperature

- The red water temperature warning lamp (3) illuminates in the event of excessive coolant temperature ($T > 116^{\circ}\text{C}$). The icon illuminates and all the temperature gauge bars are displayed.



Engine alarm warning MI

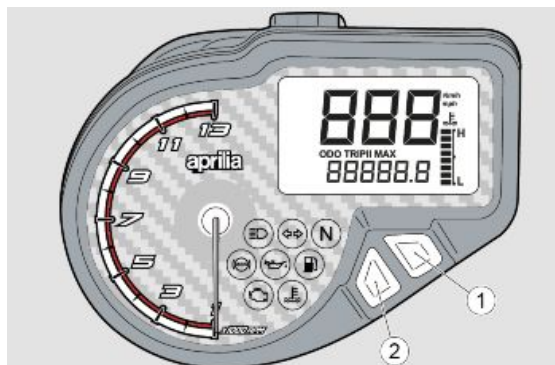
- The amber engine alarm warning lamp MI (4) lights continuously in the event of a fault identified by the engine control unit. Check for errors with the diagnostic tool.

**ABS**

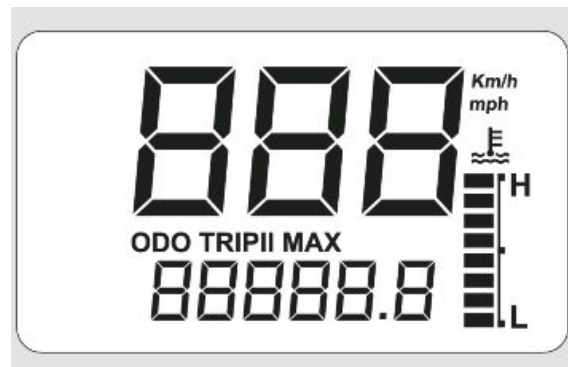
- In the event of a fault identified by the ABS control unit, and particularly in the case of incongruence between the front and rear tone wheel sensor readings (difference in speed between front and rear wheels), the amber ABS warning lamp (5) lights continuously.
- If the warning lamp remains lit after turning the ignition switch OFF and then starting the motorcycle again, check for errors with the diagnostic tester.

**Instrument cluster functions**

The functions of the instrument cluster are accessed and controlled with the SET A (1) and SET B (2) buttons.



- Segments lit when the ignition switch is turned to Key-on.



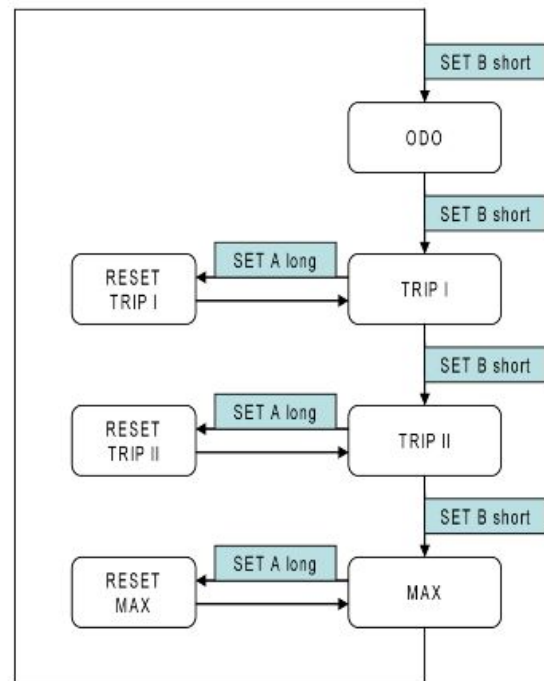
Use the controls to scroll through the display functions in the following order:

- ODO
- TRIP I
- TRIP II
- MAX

To switch between km/miles, press SET A (1) and SET B (2) simultaneously within 1 and 5 seconds after turning the ignition switch to ON and hold for 10 seconds. The newly selected unit is applied to the current speed, maximum speed, total odometer and trip odometer readings.

With the relative mode selected, press and hold SET A (1) for 10 seconds to reset the TRIP I, TRIP II or MAX speed values.

The ODO (total odometer) value can only be reset once during the life of the instrument cluster, and only within the first 255 km travelled by the vehicle. Press SET B (2) to select ODO (total odometer) mode and press and hold SET B (2) for more than 5 seconds.



Ignition circuit

Characteristic

Spark plug

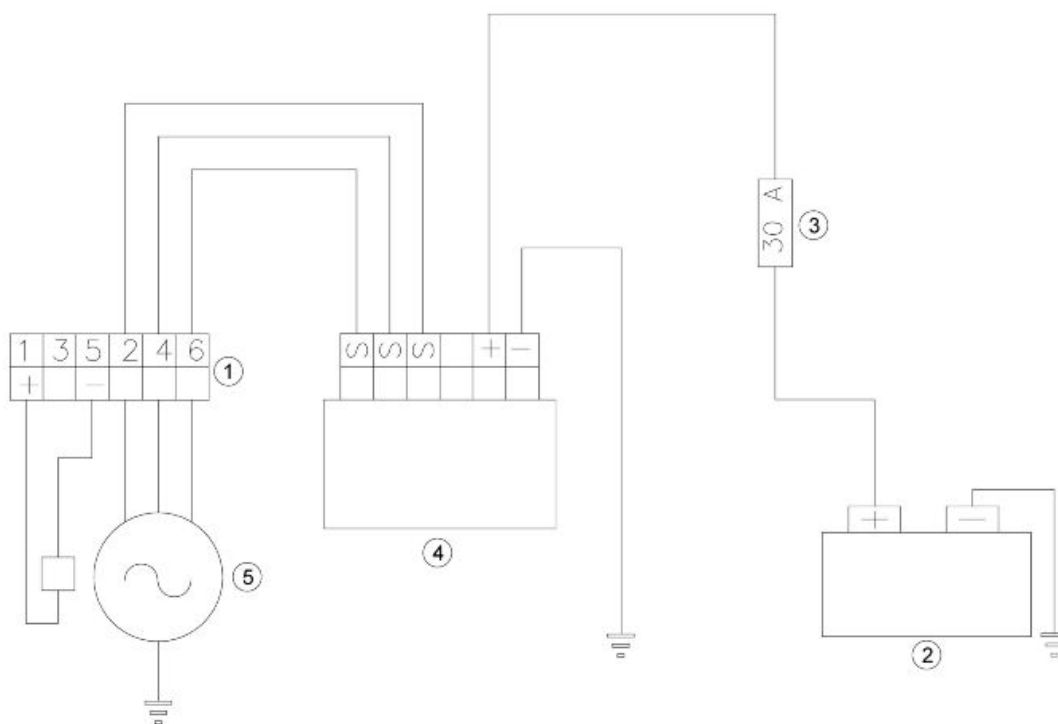
NGK CR9EKB or NGK CR9EB / NGK CR8EB

Electrode gap

0.7-0.8 mm (0.027-0.031 in)



Battery recharge circuit



Key:

1. Multiple connectors
2. Battery
3. Main fuses
4. Voltage regulator
5. Alternator

RECHARGING SYSTEM

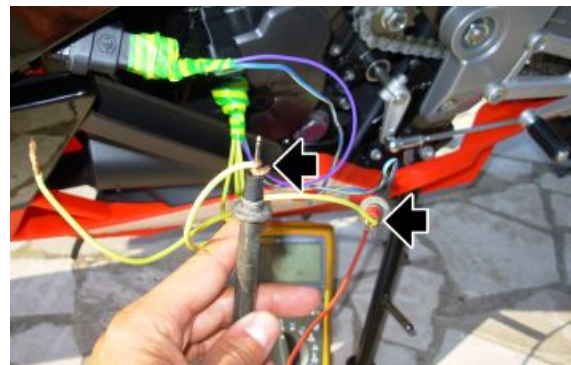
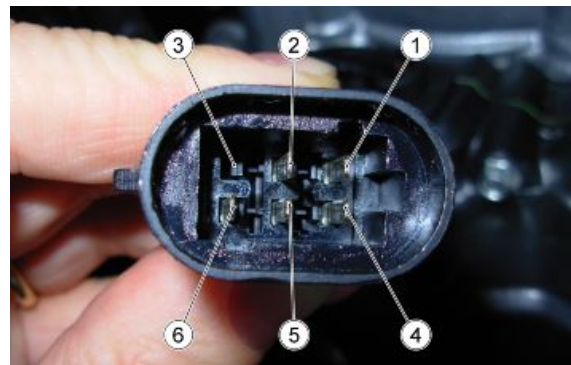
- Disconnect the six-way connector (1) (black colour) located behind the left side cover.

NOTE

THE ENGINE SIDE IS IDENTIFIED WITH THE LETTER "A"

**Measurement of resistance (with engine off)**

- For a correct detection of the alternator resistance, an ambient temperature measurement must be carried out and afterwards a heat stabilisation (after turning fan on) by using a tester, using alternatively 3 of the 5 connector pins (no. 2, 4, 6): stage "1" (pin 2-4), stage "2" (pin 2-6), stage "3" (pin 4-6).



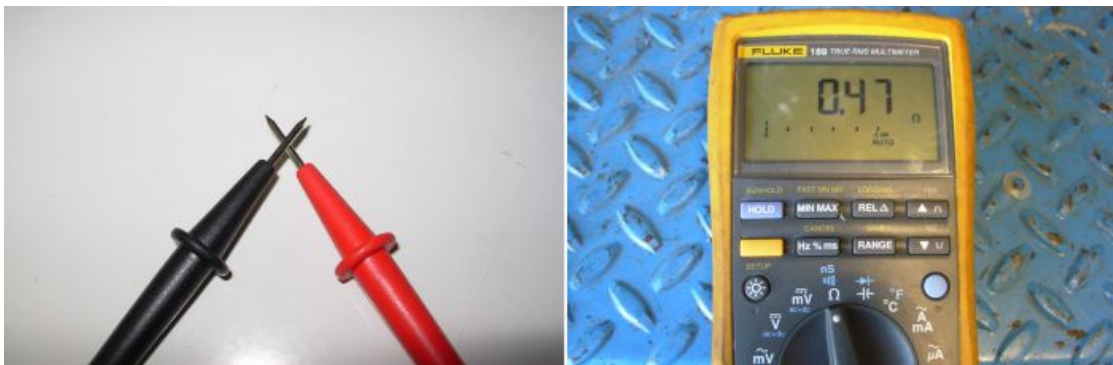
- Take the measurement; The correct value is determined by the value measured for each stage in which from time to time the resistance of the tester wires is subtracted, obtained by touching the two lugs.

Example:

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



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



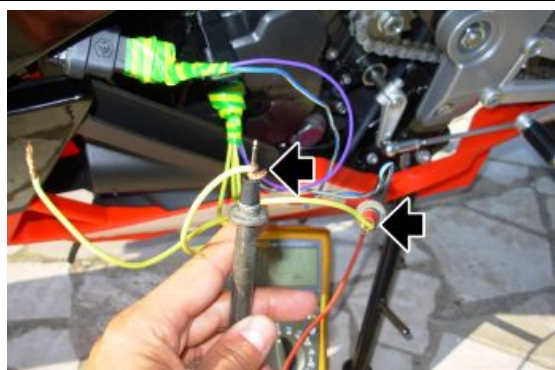
- Effective resistance stage 1 = $0.67 - 0.47 = 0.20$ Ohm
- If there is a significant difference between one stage and another (other than 0.20 Ohm), this means that the alternator is defective and must be replaced.

RESISTANCE MEASUREMENT

Winding stage	Ambient temperature (ohm)	Afterwards heat stabilisation (ohm)
Stage 1	0.15 - 0.30	0.20 - 0.35
Stage 2	0.15 - 0.30	0.20 - 0.35
Stage 3	0.15 - 0.30	0.20 - 0.35

Empty voltage

- Disconnect the six-way connector (1).
- Make a special cable harness using two connectors that can be coupled with those on the alternator side and the chassis side of the motorcycle. The outgoing wires from pins 1 and 5 must maintain the continuity of the positive and negative of the pick-up, otherwise the engine will not start; while the outgoing cables from pins 2, 4, 6 (alternator side) must have the ends free in order to perform the appropriate action.



CAUTION

KEEP THE THREE ENDS OF THE FREE CABLES WELL SEPARATED TO AVOID DANGEROUS SHORT CIRCUITS.

- For a correct detection of the alternator voltage, the measurements must be carried out using alternatively the 3 ends of the free cables: stage "1" (outgoing cables from pins 2 and 4),

stage "2" (outgoing cables from pins 2 and 6), stage "3" (outgoing cables from pins 4 and 6).

- Start the engine and carry out the measurement.
- 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.

EMPTY VOLTAGE

rpm	2000	6000	8000
Vm linked voltage Reference values (V rms)	20 - 30	75 - 85	95 - 105

Short circuit current

- For correct detection of short circuit current it is necessary to make a special cable harness using two connectors that can be coupled with those on the alternator side and the chassis side of the motorcycle. The outgoing wires from pins 1 and 5 must maintain the continuity of the positive and negative of the pick-up, otherwise the engine will not start; while the ends of the outgoing cables from pins 2, 4, 6 (alternator side) must be short circuited with each other in order to be able to perform the appropriate action.
- Start the engine and with an ammeter clamp measure each single cable.
- If there is a significant difference between the measurement taken 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)	12 - 18	12 - 18	12 - 18	12 - 18

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

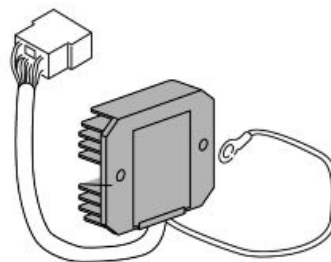
- Start the engine, after about one minute of operating bring the speed to 3000-5000 RPM, then measure with a tester the voltage at the battery poles that must always be between 13V and 15V. Otherwise, if the correct operation of the alternator has already been checked, replace the regulator.

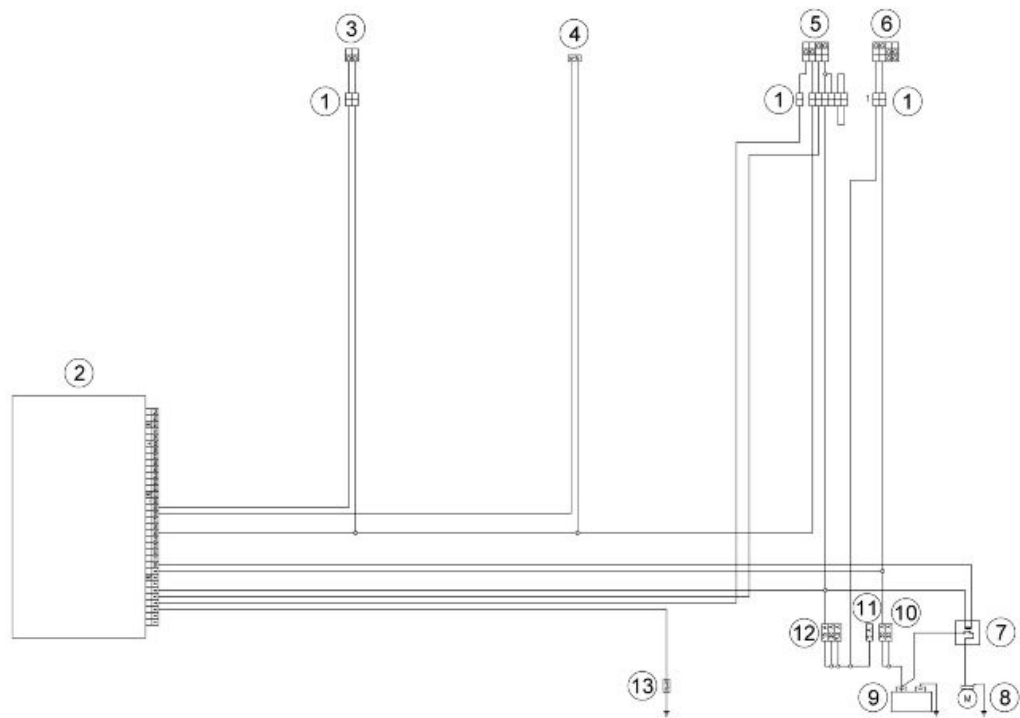
CAUTION

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.

Voltage regulator check

- Output voltage 13.5 V - 15 V
- Output current higher than 10 A (with load)

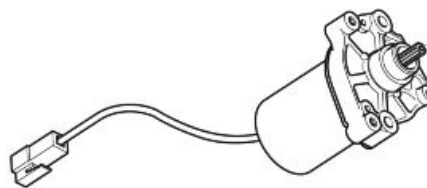


Start-up system check**Key:**

- 1. Multiple connectors
- 2. MIU G3 control unit
- 3. Side stand
- 4. Clutch switch
- 5. Right light switch
- 6. Ignition switch
- 7. Starter motor relay
- 8. Starter motor
- 9. Battery
- 10. Secondary fuses
- 11. Accessory fuses
- 12. Main fuses
- 13. Gear in neutral switch

CHECKING THE STARTER MOTOR

- To carry out the check, power up the motor with a 12 V 9 AH battery.
- With an AC ammeter clamp measure the steady running absorbed current (after 5 seconds).



Correct value 50 - 60 A.

CHECKING THE STARTER MOTOR RELAY

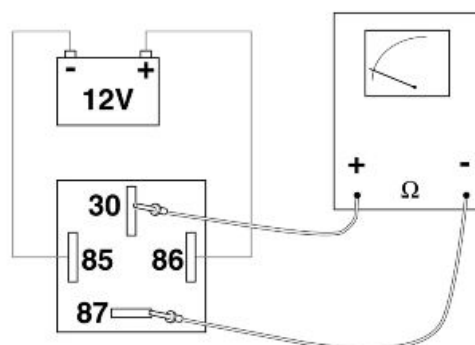
- To check that the relay is operating correctly:
- Power the two male terminals (85 - 86) with a 12 V voltage.
- Using a tester (in ohmmeter mode) check the continuity between the other two terminals (87 - 30).



Correct value with relay energised: 0 Ohm

Correct value with relay not energised: infinite ohm

- If the values do not correspond to those indicated, replace the relay.



STARTER COMMAND

Function

Commands engine starting through the injection control unit.

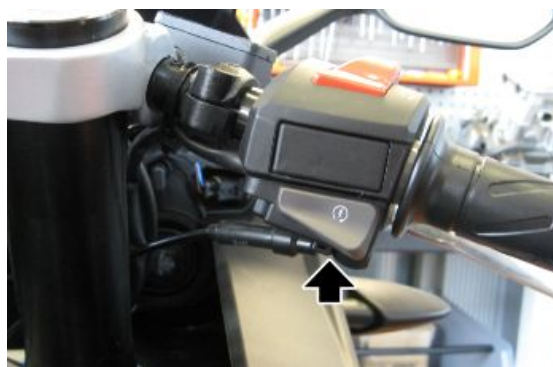
Operation / Operating principle

The starter button, brake switches, No. 25 starter relay and the injection control unit are involved, via PINs 5 and 10.

Level in electrical circuit diagram

Start enable signals, Starting

Position



Starter button: on right hand switch set

Connector: ...

Electrical specifications

- Button released: open circuit
- Button pressed: closed circuit

Diagnostic tool - Parameters and statuses

- Starting request - (Absent, Present, Closed Loop, Closed)

Diagnostics tool - Logic errors

Starter button P0512 - signal not valid

Error cause

- Fault in the switch (lock) of the engine start-up or short circuit to ground

Troubleshooting

- Check if the button remains in start position; if not OK, restore, if OK check that there is no short circuit to ground of the grey/red cable; if it is not, restore. If it is OK, replace

Horn control

Testing voltage: 13 V (nominal 12 V)

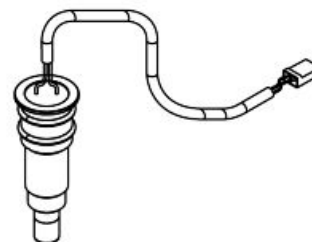
Input: < 3.5 A



level indicators

Sensor operation check

- Lift the fuel tank.
- Disconnect the connector.
- With a tester check the values between the male terminals inside the connector.



Correct value: Warning light off: approximately 1 kOhm.

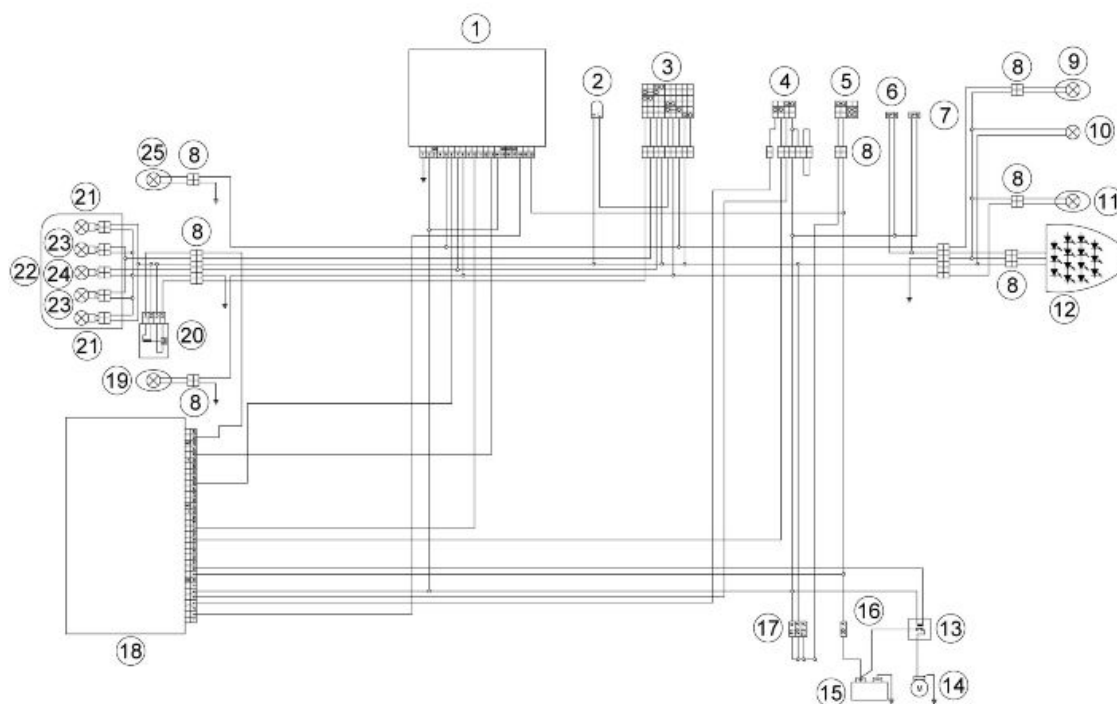
Warning light on: Magnitude range: MOhm

CAUTION

UPON REFITTING, MAKE SURE THE ELECTRIC CONNECTOR IS CORRECTLY COUPLED.

Lights list

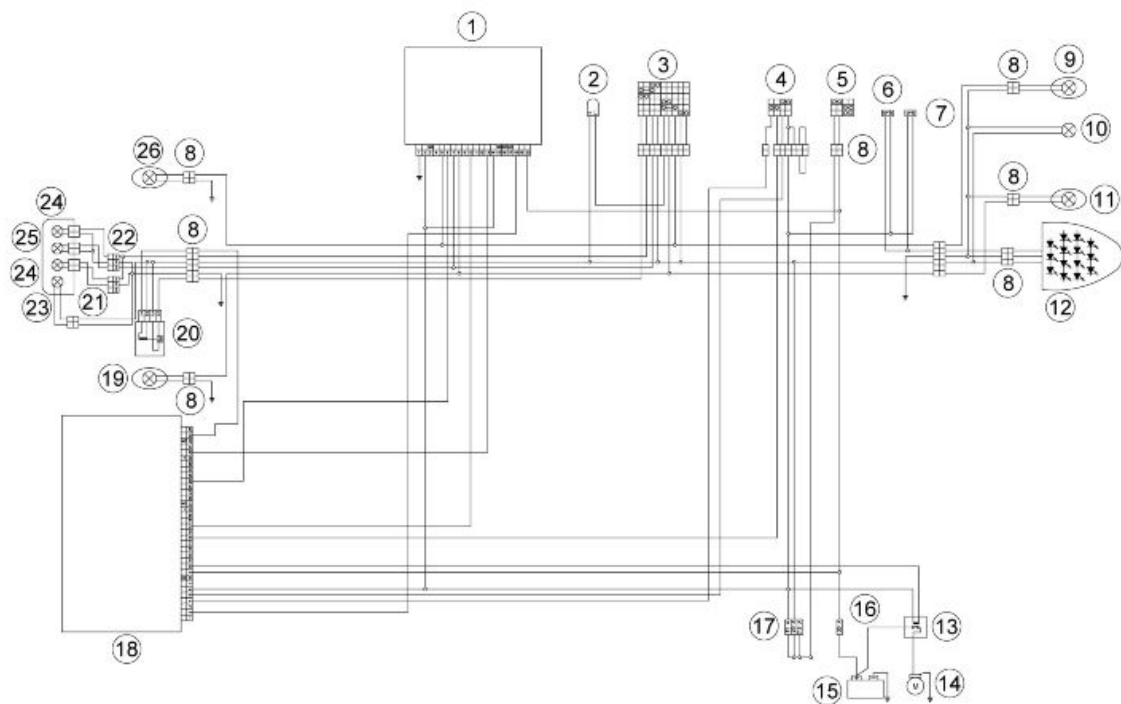
(RS 125)



Key:

1. Instrument panel
2. Flasher unit
3. Left light switch
4. Right light switch
5. Ignition switch
6. Rear stop switch
7. Front stop switch
8. Multiple connectors
9. Rear right turn indicator
10. Licence plate light
11. Rear left turn indicator
12. Taillight
13. Starter motor relay
14. Starter motor

- 15. Battery
- 16. Main fuses
- 17. Secondary fuses
- 18. MIU G3 control unit
- 19. Front left turn indicator
- 20. Light relay
- 21. Front daylight running light
- 22. Headlamp
- 23. Low beam light
- 24. High beam light
- 25. Front right turn indicator

(TUONO 125)**Key:**

- 1. Instrument panel
- 2. Flasher unit
- 3. Left light switch
- 4. Right light switch
- 5. Ignition switch
- 6. Rear stop switch
- 7. Front stop switch
- 8. Multiple connectors

9. Rear right turn indicator
10. Licence plate light
11. Rear left turn indicator
12. Taillight
13. Starter motor relay
14. Starter motor
15. Battery
16. Main fuses
17. Secondary fuses
18. MIU G3 control unit
19. Front left turn indicator
20. Light relay
21. Front left headlight connector
22. Front right headlight connector
23. Front daylight running light
24. Low beam light
25. High beam light
26. Front right turn indicator

Operating voltage: Vdc 5-20 V

Maximum applicable voltage (for 1 minute): 24 V

Maximum inverse voltage: -16 V

Maximum current consumption: 10 mA (excluding pull-up resistance)

Maximum input current (sink): 20 mA

Maximum output voltage - low level: 500 mV

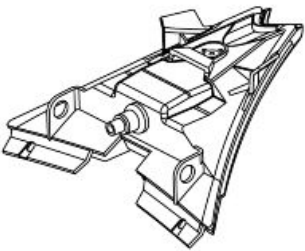
Maximum output voltage - high level: Vdc of the pull-up resistance

Operating temperature range: -20-60 °C (-4 °F- 140 °F)



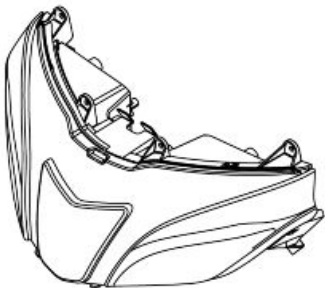
TAILLIGHT

- Rear daylight running light /stop light:
LED
- License plate light (where applicable):
12 V - 5W



HEADLAMP

- Low beam light: H8 - 12V - 35W
- High beam light (RS 125): H11 - 12V - 55W
- High beam light (TUONO 125): H7 - 12V - 55W
- Daylight running light 12V - 5W



Fuses

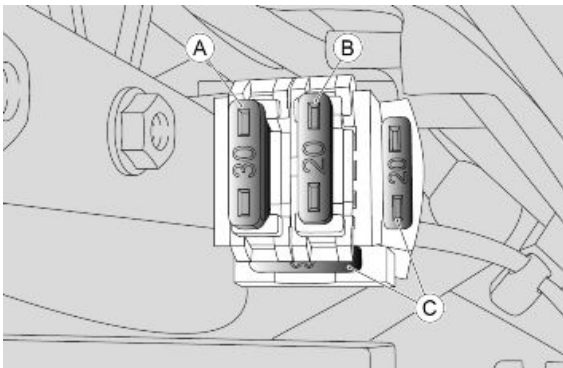
MAIN FUSES DISTRIBUTION

Specification	Desc./Quantity
A) 30A fuse	Main fuse, charging, ECU memory, instrument cluster memory, ignition switch and secondary fuses.
B) 25A fuse	ABS fuse

The main fuses are situated at the front of the motorcycle, under the fuel tank and behind the headstock.

CAUTION

THE 30A AND 25A FUSES INDICATED (C) ARE SPARES.



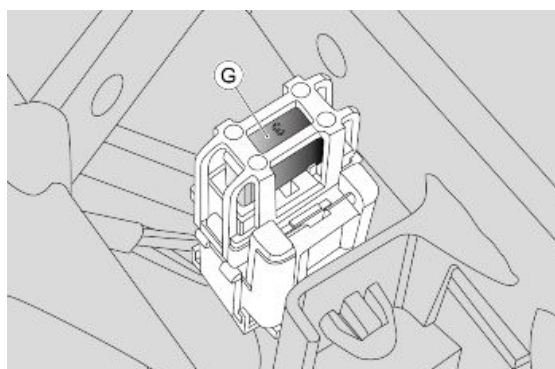
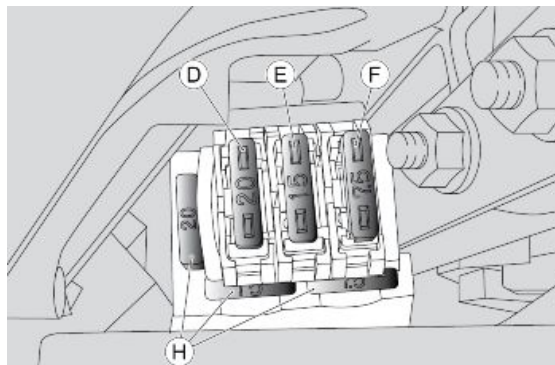
AUXILIARY FUSES DISTRIBUTION

Specification	Desc./Quantity
D) 20A fuse	DRL lights, license plate light, horn, turn signals, low beam/high beam/flash high beam, lights relay.
E) 15A fuse	Starter relay, injection relay, fan relay, instrument cluster +key, ECU +key, ABS +key, brake switches and light, start button.
F) 7.5A fuse	Fan fuse.
G) 3A fuse	PMP2 +key, USB socket (accessory)

The main fuses are situated at the front of the motorcycle, under the fuel tank and behind the headstock.
The 3A fuse is situated under the rear of the fuel tank

CAUTION

THE 20A, 15A AND 7.5A FUSES INDICATED (H) ARE SPARES.



Battery

Function

Provides electrical power to vehicle: the battery (YTX7L-BS) must be activated and charged.

Level in electrical circuit diagram:

Start, ECU base power circuit, injection utilities relay, turn indicators, battery charging, high beam lights logic, low beam lights and DRL lights logic, brake lights logic, ABS system, instrument cluster, horn, pre-configuration for BlueDash, USB port, electric fan

Position:

- on the vehicle: behind headstock
- connector: on the battery

Electrical specifications: 12 V / 4 Ah

Pin out:

1. Positive pole (red): approx. 12,6 V
2. negative pole (black): ground lead



DIAGNOSTIC TOOL:PARAMETERS**Battery voltage**

- Example value with key ON: 12.0 V
- Example value with engine on: 14.2 V

This is one of the values set by the ECU in the event of recovery mode

Battery voltage before prior to Recovery mode

- Example value with key ON: 12.0 V
- Example value with engine on: 14.2 V

Value determined from signal read without taking considering whether recovery mode is implemented

Diagnostics tool - Logic errors**Battery voltage P0560**

- Too high/Too low

Error cause

- If too high: excessively high voltage detected at PIN 9 If too low: excessively low voltage detected at PIN 9 Instrument cluster does not indicate this error even if in ATT state.

Troubleshooting

- If too high: check that the voltage regulator is working correctly.
- If too low: check voltage regulator connectors, engine-vehicle wiring harness connector and ECU connector (check in particular for oxidation): if not OK, repair. If OK, check that resistance of the Red/White cable from the voltage regulator connector to the ECU connector is a few tenths of an Ohm; if not OK, repair the wiring harness. If OK, check that the alternator is working correctly: if not OK, repair. If OK, check that the voltage regulator is working correctly

Speed sensor**FRONT VEHICLE ABS SENSOR****Function:**

Generates a signal used by the ABS control unit to determine the speed value of the wheel.

Operation / Operating principle:

Magneto-resistive sensor: generates a square wave signal with an amplitude of approximately 1V between PIN3 and PIN12.



Electrical circuit diagram - Level in electrical**circuit diagram:**

ABS system

Position on vehicle:

On LH stanchion of fork, near the brake calliper mounting bracket

CAUTION

THE DISTANCE BETWEEN THE ABS SENSOR AND THE PHONIC WHEEL MUST BE BETWEEN 0.3 mm (0.012 in) AND 2 mm (0.079 in).

Position of connector (if applicable):

Inside the chassis, on the RH side, near the battery.

Pin-out:

- PIN1 - Power feed negative/Signal negative (white)
- PIN2 - Power feed positive/Signal positive (white/brown)

Diagnostic tool - Parameters and statuses

- Vehicle speed - (km/h)

Diagnostic tool - Errors

C1024 Comparison of front and rear wheel - Excessive difference.

Error cause

Incorrect wheel or tone wheel dimensions.

Troubleshooting

- Check the type and dimensions of the installed tyres.
- Check the type and dimensions of the installed tone wheels.

C1033 Front wheel speed sensor electrical diagnosis - open circuit, shorted to negative or shorted to positive.

Error cause

Open circuit: circuit interruption detected.

Short-circuit to negative: null voltage detected on PIN 3 of the ABS control unit.

Short-circuit to positive: excessive voltage detected on PIN 3 of the ABS control unit.

Troubleshooting

Open circuit:

- Check the connectors on the component and on the ABS control unit.
- Check the integrity and continuity of the wiring harnesses:
 - between PIN 3 of the ABS control unit and PIN 1 of the sensor (white cable)
 - between PIN 12 of the ABS control unit and PIN 2 of the sensor (white/brown cable)

Short-circuit to negative:

- Disconnect the sensor connector.
- Check the ground insulation of the two PINs.

- If there is no insulation, restore the wiring harness or replace the sensor.

Short-circuit to positive:

- Disconnect the sensor connector.
- Check the battery supply insulation of the two PINS.
- If there is no insulation, restore the wiring harness or replace the sensor.

C1034 Front wheel speed sensor functional diagnosis - inconsistent signal.

Error cause

Possible tone wheel fault due to deformations or dirt.

Troubleshooting

- Check that the tone wheel is not damaged and is clean.
- Check that the number of teeth on the tone wheel is correct.
- Check that the tone wheel and the sensor are correctly positioned;
- Check that the tyre is the correct size.
- If all these checks are positive, replace the sensor.

REAR VEHICLE SPEED SENSOR

Function:

Generates a signal used by the ABS control unit to determine the speed value of the wheel.

Operation / Operating principle:

Magneto-resistive sensor: generates a square wave signal with an amplitude of approximately 1V between PIN13 and PIN14.

Electrical circuit diagram - Level in electrical circuit diagram:

ABS system

Position on vehicle:

RH side of swingarm, on brake calliper mounting bracket.

CAUTION

THE DISTANCE BETWEEN THE ABS SENSOR AND THE PHONIC WHEEL MUST BE BETWEEN 0.3 mm (0.012 in) AND 2 mm (0.079 in).



Position of connector (if applicable):

Saddle post frame, RH side

Pin-out:

- PIN1 - Power feed negative/Signal negative (yellow)
- PIN2 - Power feed positive/Signal positive (yellow/brown)

**Diagnostic tool - Parameters and statuses**

- Vehicle speed - (km/h)

Diagnostic tool - Errors

C1024 Comparison of front and rear wheel - Excessive difference.

Error cause

Incorrect wheel or tone wheel dimensions.

Troubleshooting

- Check the type and dimensions of the installed tyres.
- Check the type and dimensions of the installed tone wheels.

C1031 Rear wheel speed sensor electrical diagnosis - open circuit, shorted to negative or shorted to positive.

Error cause

Open circuit: circuit interruption detected.

Short-circuit to negative: null voltage detected on PIN 14 of the ABS control unit.

Short-circuit to positive: excessive voltage detected on PIN 14 of the ABS control unit.

Troubleshooting

Open circuit:

- Check the connectors on the component and on the ABS control unit.
- Check the integrity and continuity of the wiring harnesses:
 - between PIN 14 of the ABS control unit and PIN 1 of the sensor (yellow cable)
 - between PIN 13 of the ABS control unit and PIN 2 of the sensor (yellow/brown cable)

Short-circuit to negative:

- Disconnect the sensor connector.
- Check the ground insulation of the two PINs.
- If there is no insulation, restore the wiring harness or replace the sensor.

Short-circuit to positive:

- Disconnect the sensor connector.
- Check the battery supply insulation of the two PINS.
- If there is no insulation, restore the wiring harness or replace the sensor.

C1032 Rear wheel speed sensor functional diagnosis - inconsistent signal.

Error cause

Possible tone wheel fault due to deformations or dirt.

Troubleshooting

- Check that the tone wheel is not damaged and is clean.
- Check that the number of teeth on the tone wheel is correct.
- Check that the tone wheel and the sensor are correctly positioned;
- Check that the tyre is the correct size.
- If all these checks are positive, 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

Position

- Sensor: LH side of motorcycle, near flywheel
- Connector: ...

Electrical specifications

- Winding resistance 105-124 Ω at 20°

Pin-out

1. Engine revolution sensor positive signal (X2)
2. Engine revolution sensor negative signal (X1)
3. Engine speed sensor anti-disturbance cable (blue)

Diagnostic tool - Parameters and statuses

- Engine speed - (rpm)
- Target engine revs - (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)

Diagnostic tool - Electrical errors

Engine revolution sensor P0336 - inconsistent signal

Cause of error

- Possible false contact in the electric circuit detected at PIN 20 and 29 of the engine control unit connector

Troubleshooting

- Check the electric circuit is in good conditions and the flywheel teeth cleaning and correct positioning of the sensor in its own housing; if it is not, replace it. If it is OK, replace the sensor

Engine temperature sensor

Function

Serves the purpose of communicating the engine temperature to the control unit in order to optimise performance.

Operation / Operating principle

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

Level in electrical circuit diagram

Temperature sensors

Position

Sensor: On the head, LH side

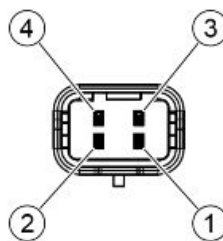
Connector: near the sensor

Electrical specifications

- Resistance (PIN B1 - B2) at 25°C (77° F): 2.05 kΩ +/- 100 Ω
- Resistance (PIN B1 - B2) at 60°C (158° F): 575 Ω +/- 15 Ω
- Resistance (PIN B1 - B2) at 90°C (194° F): 230 Ω +/- 5 Ω
- Resistance (PIN A1 - A2) at 25°C (77° F): 2.4 kΩ +/- 200 Ω
- Resistance (PIN A1 - A2) at 60°C (158° F): 557 Ω +/- 30 Ω
- Resistance (PIN A1 - A2) at 90°C (194° F): 196 Ω +/- 8 Ω

Pin-out:

1. Control unit ground (B2)
2. Instrument panel power (A2)
3. Control unit power (B1)
4. Instrument panel ground (A1)



ELECTRICAL ERRORS

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

Cause of error

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

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

Troubleshooting

Open circuit:

- 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 wiring harness between the sensor connector and the control unit connector: Control unit PIN 13 - sensor PIN 3 and control unit PIN 15 - sensor PIN 1. If necessary, restore the wiring harness.
- If the wiring harness 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.

Short-circuit 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 3 (or control unit connector PIN 13) and restore the cabling.

Short circuit to negative:

- Disconnect the sensor connector.
- Check the sensor connector PIN 3 ground insulation.
- If there is no ground insulation restore the wiring harness.
- If PIN 3 is insulated from the ground and the error persists, this means that there is a probable fault in the control unit.

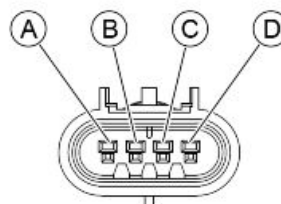
Lambda sensor

Function

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

Operation / Operating principle

Based on the difference of oxygen in the exhaust fumes and the environment, this generates voltage which is read and interpreted by the injection control unit. 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

Lambda probe, Injection utilities relay

Position

- Sensor: exhaust duct
- Connector: underneath battery, behind headstock, RH side

Electrical specifications

- Heater circuit: 12 -14 Ω at 20 °C (68 ° F)

Pin-out:

1. Heater power (A)
2. Heater ground (B)
3. Sensor signal + (C)
4. Sensor signal - (D)

Diagnostic tool - Electrical errors

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

Cause of error

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

Open circuit or short-circuit to negative: interruption of the circuit or null voltage between control unit connector PIN 11 and 12.

Troubleshooting

Short-circuit to positive:

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

Open circuit:

- Disconnect the control unit connector and the sensor connector.
- Check the continuity of the wiring harness between the sensor connector and the control unit connector: Control unit PIN 11 - sensor PIN C and control unit PIN 12 - sensor PIN D. If necessary, restore the wiring harness.

- If the wiring harness is intact and the error persists, proceed with the following checks.

Short circuit to negative:

- Disconnect the sensor connector and the control unit connector.
- Check the sensor connector PIN C ground insulation. If there is no insulation, restore the wiring harness.
- Check the sensor connector PIN D ground insulation. If there is no insulation, restore the wiring harness.
- If PIN C and PIN D 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.

Cause of error

Short-circuit to positive: excessive voltage at PIN 31 of the control unit connector.

Short circuit to negative: lack of insulation from ground on the sensor connector PIN A.

Open circuit: circuit interruption.

Troubleshooting

Short-circuit to positive:

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

Open circuit:

- Disconnect the control unit connector and the sensor connector.
- Verify continuity of the wiring harness between the sensor connector and the control unit connector: control unit PIN 31 - sensor PIN B. If necessary, restore the wiring harness.
- Verify continuity of the wiring harness between the sensor connector and the injection relay: sensor PIN A - injection relay PIN 3. If necessary, restore the wiring harness.
- If the wiring harness is intact and the error persists, proceed with the following checks.

Short circuit to negative:

- Disconnect the sensor connector.
- Check the sensor connector PIN B ground insulation. If there is no insulation, restore the wiring harness.
- If PIN B 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

Provide the correct amount of fuel at the correct time.

Operation / Operating principle

Injector coil is excited for the petrol passage to open.

Level in electrical circuit diagram

Relay for injection utilities, Coils and injectors

Electrical specifications

- 14.8 Ω +/- 5% (at 20 °C - 68°F)

Pin-out:

1. Control unit ground
2. Power via relay

Diagnostic tool - Activation

- Injector control

Diagnostic tool - Electrical errors

Injector P0201 - short circuit to positive / short circuit to negative / open circuit.

Error cause

Short-circuit to positive: excessive voltage to PIN 34 of the control unit connector.

Short circuit to negative: zero voltage to the PIN 2 of the injector connector.

Open circuit: circuit interruption.

Troubleshooting

Short-circuit to positive:

- Disconnect the injector connector, turn the key to ON and activate the component through the diagnostic tool.
- Verify the absence of voltage at the injector connector PIN 1; if present restore the wiring harness, otherwise proceed with the following checks.

Short circuit to negative:

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

Open circuit:

- Carry out the check procedure of the injector and control unit connectors.
- Check continuity of cable between ECU connector and injector connector (ECU PIN 34 - injector PIN 1). In the absence of continuity restore the wiring harness.

Fuel pump

CAUTION

BEFORE CARRYING OUT ANY TROUBLESHOOTING, CAREFULLY READ THE GENERAL TROUBLESHOOTING CONCEPTS FOR ELECTRICAL DEVICES AT THE BEGINNING 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. 35 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. 35 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.

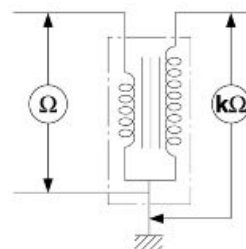
The circuit is open:

- Disconnect the injection relay (No. 35 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

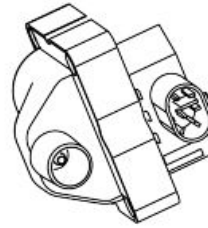
Check

A tester can be used for the check. In every case the continuity of the primary and secondary windings must be checked. The reading in ohms does not need to be exact but, if the windings are intact, their continuity must be detected with the resistance values indicated above.



Primary: 550 +/- 50 mOhm

Secondary: 3.3 +/- 0.3 kOhm

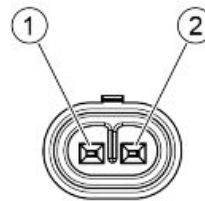


Function

Allows generation of the electrical discharge on the spark plug, with an increase of voltage.

Pin-out:

1. Relay powered (PIN 3 relay side)
2. Activation by control unit (control unit side PIN 1)



CAUTION

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

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 2: 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 2 - 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 1. If no voltage is read, verify the continuity of the cabling between coil and injection relay (No. 35 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 2 ground insulation (or control unit connector PIN 1). Restore the cabling if necessary.

Engine oil pressure sensor

Function

Notifies the instrument panel that the oil pressure in the engine is sufficient.

Operation / Operating principle

The switch is normally closed (connects ECU signal to ground). At pressures above ... bar, the switch opens.

Level in electrical circuit diagram:

Low fuel and oil pressure

Position:

- on the vehicle: RH side, near the water pump
- connector: on the sensor

Electrical specifications: -

Pin out:

1. Voltage: 5 V

NOTE

NO ERRORS



Neutral sensor

Function

Indicates 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

Neutral sensor, Start enable signals.

Position

- Sensor: rear / upper side of the gearbox
- Connector: on the sensor

Electrical specifications

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

Pin-out:

1. Voltage 12V (green/black)

Diagnostic tool - Parameters and statuses

- Gear in neutral - (YES, NO)

Diagnosis**Warning light "N" always off****Error cause**

- Possible malfunction

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

Warning light "N" always on**Error cause**

- Possible malfunction

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 wiring harness.
 - If there is no continuity, restore the wiring harness.
 - If there is no continuity, replace the wiring harness.
-

Clutch lever sensor

Function

Indicates 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 enable switches

Position

- Sensor: under clutch lever
- Connector: ...

Electrical specifications

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

Pin-out

1. 12 V Voltage (brown/white)
2. Ground (blue/green)

Diagnostic tool - Parameters and statuses

- Clutch - (Pulled, Released)

Diagnosis

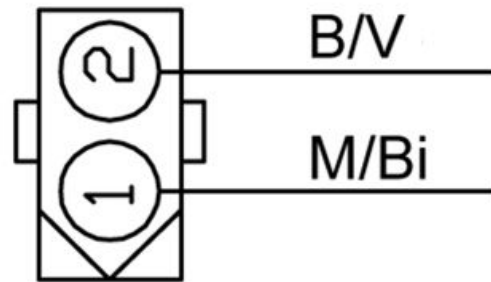
Even with the clutch lever engaged, the vehicle does not start

Error cause

- Possible malfunction

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 18.
- If there is no continuity, restore the wiring harness.
- If there is continuity, disconnect the sensor and, with the clutch engaged, check for continuity between the two sensor PINs.
- If absent, replace the sensor.
- If present, check for continuity of the blue/green cable between the sensor and control unit PIN 15.



- If absent, restore the wiring harness.

The vehicle starts even without pulling the clutch leverError cause

- Possible malfunction

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/green cable which goes from the sensor PIN 2 to the control unit PIN 15 is shorted to ground.
-

Side stand sensor**Function**

Indicates 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

Position

- Sensor: on side stand supporting plate
- Connector: left side, near the starter motor

Electrical specifications

- Side Stand Up: closed circuit (continuity)
- Side Stand Down: open circuit (infinite resistance)

Pin-out

1. Ground (blue/green)
2. 12 V voltage (grey/yellow)

Diagnostic tool - Parameters and statuses

- Side stand - (Up, Down)

Diagnosis

The vehicle with clutch pulled, gear engaged and side stand retracted does not start (side stand switch always open)

Error cause

- Possible malfunction

Troubleshooting

- verify continuity of the grey/yellow cable between the sensor and PIN 19 of the control unit.
- If absent, restore the wiring harness, if present, with the stand up, check for continuity between the two PINs on the sensor. If absent, replace the sensor. If present, check for continuity to ground of the blue/green cable on the wiring harness side connector.

The vehicle, with clutch operated and gear engaged, starts but with the side stand extended

Error cause

- Possible malfunction

Troubleshooting

- disconnect the sensor connector and check that, with side stand extended, there is not continuity between the two 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.

Electric fan circuit

Function

Activates coolant radiator fan

Operation / Operating principle

When the ECU detects a temperature of approximately 101°C, it closes the connection between the fan control relay excitation circuit and ground

Level in electrical circuit diagram:

Electric fan.

Position:

- sensor: relay installed in front frame recess on left hand side
- connector: on relay

DIAGNOSTIC TOOL:STATUSES

Fan relay

- on/off

DIAGNOSTIC TOOL:ACTIVATIONS

Fan

- The fan relay is excited (No. 42 in electrical circuit diagram - ALWAYS CHECK colour of wires to identify relay correctly) for 10 seconds. Electrical continuity is required in the wiring for the relay to activate correctly: no errors are generated if the relay fails to activate

ELECTRICAL ERRORS

Fan relay P0480 - short circuit to positive / short circuit to negative / open circuit.

Error cause

Short-circuit to positive: excessive voltage to PIN 24 of the control unit connector.

Short circuit to negative: null voltage at PIN 24 of the control unit connector.

Open circuit: circuit interruption.

Troubleshooting

Short-circuit to positive:

- Disconnect the fan control relay (No. 42 in electrical circuit diagram), turn the ignition switch to ON and measure the voltage at PIN 1 of the relay connector leading to the wiring harness side: if the voltage is 12V, repair the wiring harness, if the voltage is zero, replace the relay.

Short circuit to negative:

- Disconnect the fan control relay (No. 42 in electrical circuit diagram) and the control unit.
- Check that the cable between the fan control relay (PIN 1) and the ECU (PIN 24) is insulated from ground. Repair the wiring harness if necessary.

Open circuit:

- Check the ECU and relay connectors.
- Check continuity of the cable between the relay connector (PIN 1) and the ECU connector (PIN 2).
- Check continuity of the cable between the relay connector (PIN 2) and the secondary fuse box.
- Check continuity between PIN 1 and PIN 2 of the relay. If continuity is not confirmed, replace the relay.

RUN/STOP switch

Function

Indicates 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 4 of the control unit connector

Level in electrical circuit diagram

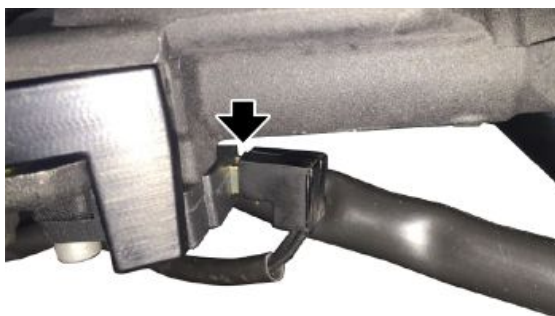
Start-up enabling switches

Position

- Sensor: right light switch
- Connector: next to the headstock, right side

Electrical specifications

- STOP position: open circuit



- RUN position: closed circuit (continuity)

Pin-out

1. Voltage 0 V with engine kill in STOP; 12V if engine kill in RUN (pink/yellow cable)
2. Always voltage 12 V (with key on) (red/yellow cable)

Diagnostic tool - Parameters and statuses

- RUN/OFF Switch - (RUN-OFF)

Diagnosis**Engine does not start****Error cause**

- Possible malfunction

Troubleshooting

- Disconnect the connector and check, with the switch set to RUN, that there is continuity between the two grey/light blue and red/grey cables (sensor side); If not ok, replace the sensor; if ok, check the connector; if not ok, restore the wiring harness; if ok, check, with key set to ON, if there is voltage on Yellow/Red cable (wiring harness side). If not ok, restore the wiring harness; if ok, check the red/yellow cable ground insulation (wiring harness side); If there is continuity with ground connection, restore the wiring harness; if it is OK, set the key to KEY OFF and check the engine control unit connector; if it is OK, replace the engine control unit

Engine does not shut off with switch in "STOP"**Error cause**

- Possible malfunction

Troubleshooting

- Disconnect the connector and verify, with the switch set to STOP, that there is continuity between the two grey/light blue and red/grey cables (sensor side). If present, replace the switch; if absent this means that, with the key ON, the pink/yellow cable shorts to positive; if not OK, restore the wiring harness; if OK, replace the engine control unit

Connectors

ECU

Function

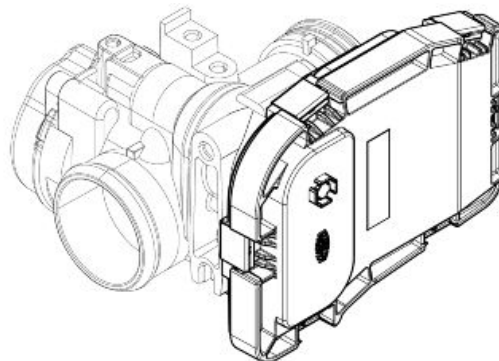
It manages injection/ignition, the system safety checks and the self-diagnosis function. The control unit is Magneti Marelli MIU G3

Level in electrical circuit diagram

Diagnostics, ABS system, pre-configuration for BlueDash

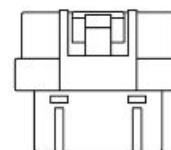
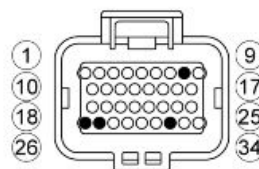
Position

- on the vehicle: under tank, by filter box
- connector: on ECU with 34 PINs



Key

1. Coil output (orange-white)
2. Speed signal output to instrument cluster (grey-blue)
3. Neutral signal input (green-black)
4. RUN-OFF input (pink-yellow)
5. Start button input (yellow-red)
6. Ignition switch (+) input (green-red)
7. Ground (-) (blue)
8. Fuel pump output (NC)
9. 12V battery voltage (+) (red-orange)
10. Starter motor relay output (blue-yellow)
11. Positive lambda probe input (+) (light blue-black)
12. Negative lambda probe input (-) (green-white)
13. Temperature sensor input (orange)
14. Immobilizer input (quick shift) (black)
15. External sensor ground (blue-green)
16. "K" line (white-blue)
17. Neutral indicator lamp output (brown-black)
18. Analogue clutch input (brown-white)
19. Side stand input (grey-yellow)
20. Pick-up input (-) (X1)
21. 5V voltage (+) for sensors (NC)
22. Injection relay (red-blue)

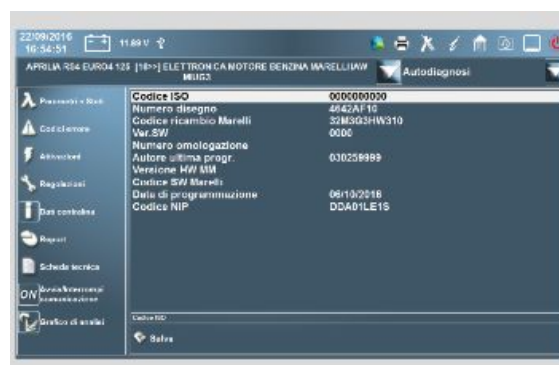


- 23. Ground 2 (power) (blue)
- 24. Fan relay output (purple-black)
- 25. Warning lamp output (purple-brown)
- 26. Can "H" (NC) (X4)
- 27. Can "L" (NC) (X3)
- 28. Speed sensor input (S) (blue-orange)
- 29. Pick-up input (+) (X2)
- 30. Engine speed output (pink-black)
- 31. Lambda probe heater output (green-yellow)
- 32. Water pump output (NC)
- 33. Lights relay output (purple-red)
- 34. Injector output (grey-red)

Diagnostic tool - Control unit info screen page

In this screen page are read the general data regarding the control unit, for example: type of software, mapping, control unit programming data

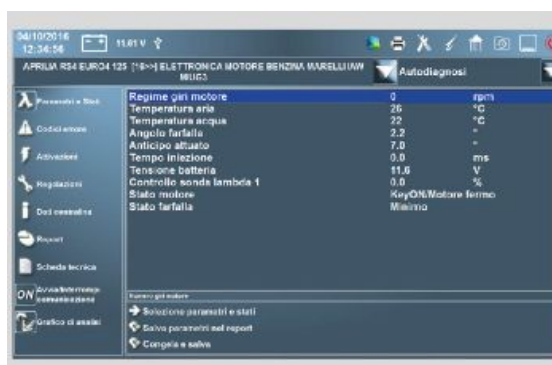
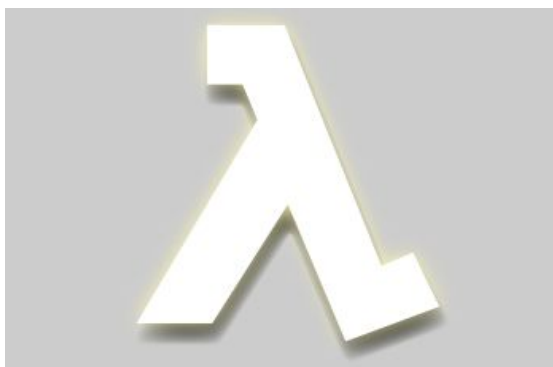
- ISO code
- Drawing number (identification inserted by manufacturer)
- Marelli spare part number
- SW ver. (software version)
- Approval number
- Author last progr. (author of the last programming)
- HW MM version (hardware MM version)
- Marelli SW part number (software part number)
- Programming data (control unit programming data)
- NIP code



Diagnostic tool - Parameters and statuses

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); in addition to the parameters, the status of the vehicle devices or the operation condition of some vehicle systems (for example, lambda probe functioning status) are also shown in this screen page

- Engine speed - (rpm)
- Air temperature - (°C)
- Water temperature - (°C)
- Throttle valve angle (°)
- Implemented advance (°)
- Injection time (ms)
- Battery voltage (V)
- Checking of lambda probe 1 (%)
- Engine status - (Undetermined, PowerON/Engine off, KeyON/engine off, Rotation, Engine Stall, Pwr latch in progress, Pow.Latch Term, Stop, Synchronis. 4 strokes)
- Throttle valve status - (---, idle, full power, partial position)
- Lambda probe voltage (...)
- Atmospheric pressure - (mbar)
- Target minimum revs (rpm)
- Opening of Stepper Cl.Loop (...)
- Int. manifold pressure - (mbar)
- Programmed advance (...)
- Vehicle speed (km/h)
- Throttle valve equiv. stepper - (°)
- Opening of Stepper Base (...)
- Opening of Stepper Reg. (...)
- KON count (...)
- Injector bleeding (...)
- Coil dwell (...)

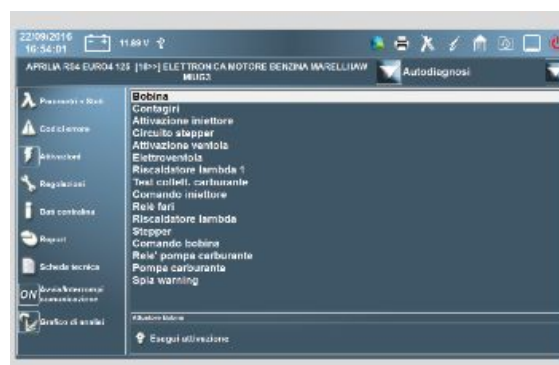


- RUN/OFF Switch - (RUN-OFF)
- Start enable - (NO, YES)
- Checking of Probe1 value (...)
- Lambda probe - (---, Not enabled, Not active (start), Not active (heat.), Not active (rich), Operating, Not active (lean), Fault
- Engine mode (...)
- Stepper motor status (...)
- Tone wheel (...)
- Recharge status Enabling Ignition (...)
- Fan relay (OFF)
- Side stand - (Up, Down)
- Starting request - (Absent, Present, Closed Loop, Closed)
- Gearbox in neutral (...)
- Clutch - (Pulled, Released)

Diagnostic tool - Activation

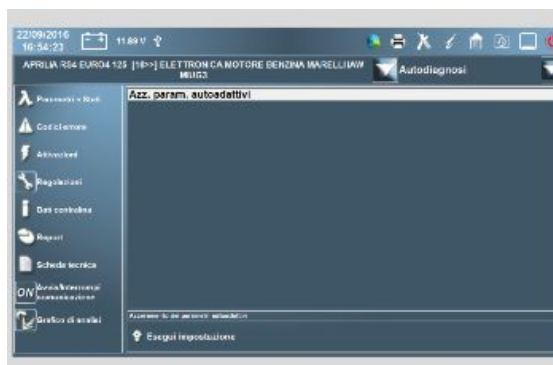
On this screen page, you can delete the errors from the memory of the controller and enable some systems controlled by the control unit

- Coil
- Rpm indicator
- Injector activation
- Stepper circuit
- Fan activation
- Lambda probe heater 1
- Fuel manifold test
- Injector control
- Headlights relay
- Stepper
- Fuel pump
- General warning light



Diagnostic tool - Errors screen page

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

**Diagnostic tool - Electrical errors**

Air pressure sensor P0105 - short circuit to positive / open circuit, short circuit to negative, signal not valid

Cause of error

- Malfunction of sensor inside the control unit

Troubleshooting

- Replace the control unit

Air temperature sensor P0110 - short circuit to positive, open circuit / short circuit to negative

Cause of error

- Malfunction of sensor inside the control unit

Troubleshooting

- Replace the control unit

Error EEPROM P0601 - circuit not working

Cause of error

- The instrument panel does not indicate the presence of this error even in the ATT status

Troubleshooting

- Replace the engine control unit

Saved data file (for safety) P1607 - filled

Cause of error

- This indication appears only if the Level 2 safety has reset the engine (C gravity). The instrument panel does not indicate the presence of this error even in the ATT status.

Troubleshooting

- Replace the engine control unit

Vehicle speed signal/sensor P2162

Error cause

- ABS system malfunction

Troubleshooting

- Connect to the ABS control unit and perform the diagnostics according to the instructions in this manual. Once the error has been identified and the correct operation of the motorcycle has been restored, reconnect to the engine control unit to delete the error P2162.

Sensor potentiometer throttle valve position P0120 - short circuit to positive, open circuit / short circuit to negative

Cause of error

- Malfunction of sensor inside the control unit

Troubleshooting

- Replace the control unit

Diagnostic tool - Adjustment

This screen page is used to adjust some control unit parameters

- Self-adaptive parameters reset



Diagnostic tool - Adjustment

Throttle positioner autodetection

- It allows the control unit to detect the closed throttle position; just press the Enter key

Reset of self-adaptive parameters

- operation to be carried out after the throttle body is cleaned or in the case a new engine, a new lambda probe or a new injector is fitted, or the correct operation of the injection system or the valves is restored.

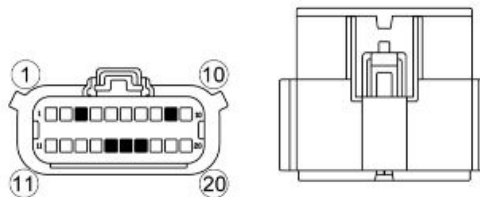
Diagnostic tool - Reset

- Once the throttle body or the injection control unit is replaced, it is necessary to connect to the diagnostic tool selecting FUEL INJECTION and carry out the operation "THROTTLE POSITIONER AUTODETECTION"

Dashboard

Key:

1. Ground (-)
2. + Key
3. NC
4. Ground sensors (-)
5. Right turn indicator warning light
6. MI warning light
7. High beam warning light
8. Left turn indicator warning light
9. ABS Warning Light
10. Neutral indicator light (NEUTRAL)
11. Water temperature warning light
12. Oil level or pressure warning light
13. Tachometer input
14. Pin configuration
15. "K" line
16. NC
17. NC
18. Engine speed sensor
19. Fuel reserve sensor
20. + Battery



Can line

Funzione

Permette la comunicazione tra centralina iniezione, centralina ABS

Funzionamento / Principio di funzionamento

Una linea CAN (Controller Area Network) è un collegamento tra i vari dispositivi elettronici di un veicolo organizzato come una rete di computer (internet). La rete CAN, ha permesso di semplificare notevolmente il layout dell'impianto elettrico e di conseguenza la sua massa complessiva. Con questa linea di comunicazione è stato possibile evitare inutili duplicazioni dei vari sensori presenti sulla moto, poichè i segnali da loro generati vengono condivisi tra le due unità di elaborazione elettronica (cruscotto e centralina).

- Riduzione del numero di cavi: la linea CAN viaggia su doppino tra i vari nodi.
- I nodi sono capaci inoltre di isolare gli errori senza causare il breakdown del sistema (Faults-Confination).
- Insensibilità ai disturbi: il segnale viaggia sui due cavi e la lettura del segnale è differenziale (differenza di voltaggio tra i due segnali sui due cavi). Se i due segnali vengono disturbati da un fattore esterno, la loro differenza rimane inalterata.
- Velocità di comunicazione: i messaggi viaggiano con un bitrate di circa 250 kbps (le informazioni arrivano ai nodi ogni 20 ms ovvero 50 volte/secondo).

PROTOCOLLO CAN (CONT. AREA NETWORK)

Il protocollo di comunicazione è un protocollo CSMA/CD (Carrier Sense Multiple Access /w Collision Detection).

Per poter trasmettere, ogni nodo deve prima verificare che il BUS (la connessione tra tutti i dispositivi) sia libero prima di provare a mandare un messaggio sul BUS (Carrier Sense).

Se in questo periodo non c'è attività sul BUS, ogni nodo ha la stessa opportunità di mandare un messaggio (Multiple Access). Se due nodi iniziano a trasmettere nello stesso momento, i nodi riconoscono la "collisione" (Collision Detection) e intraprendono un'azione di arbitraggio basato sulla priorità del messaggio (i messaggi rimangono inalterati durante l'arbitraggio e non c'è ritardo del messaggio a priorità maggiore).

Il protocollo CAN è basato sui messaggi e non sugli indirizzi. Il messaggio stesso è diviso in varie parti (frames), ognuna di esse con un significato: priorità del messaggio, dati contenuti, rilevamento errori, conferma ricezione ecc.

Tutti i nodi del network ricevono tutti i messaggi inviati sul BUS (con conferma di ricezione o messaggi di errore) e ogni nodo decide se il messaggio va processato oppure scartato. Ogni nodo inoltre può richiedere informazioni agli altri nodi (RTR = Remote Transmit Request).

Livello appartenenza schema elettrico

Linea CAN

Pinatura

- Tra i PIN 26 e 27 centralina motore
 - Tra i PIN 2 e 11 centralina ABS
 - Tra i PIN 3 e 4 predisposizione bluedash
-

INDEX OF TOPICS

ENGINE FROM VEHICLE

ENG VE

Vehicle preparation

- Rest the vehicle on its stand
 - Support the vehicle rear part using belts and hoist.
 - Drain off the cooling system.
 - Beforehand, remove the lug, the side fairings, the battery, the fuel tank, the side fairings, the drive chain, the air filter box, the radiator and the expansion tank.
 - Position an under-ump stand that will be supported on the lower side of the engine.
-

Removing the engine from the vehicle

- Prepare the vehicle as described.
- Disconnect the quick coupler.



- Loosen the clutch adjuster screw.



- Unhook the clutch cable and free it from the cable grommet.
- Undo and remove the screw and disconnect the starter ground cable.



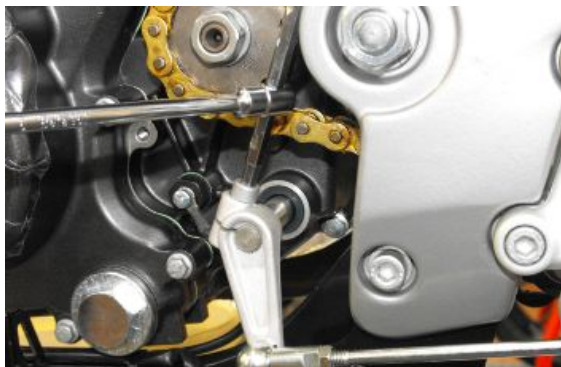
- Remove the rubber plug and loosen the screw.
- Disconnect the starter motor cable.



- Unscrew and remove the two fixing screws.
- Remove the pinion cover.



- Undo and remove the fixing screw.
- Take out the gearbox rod.



- Unhook the chain and remove it.



- Water temperature connector.



- Disconnect the neutral sensor connector



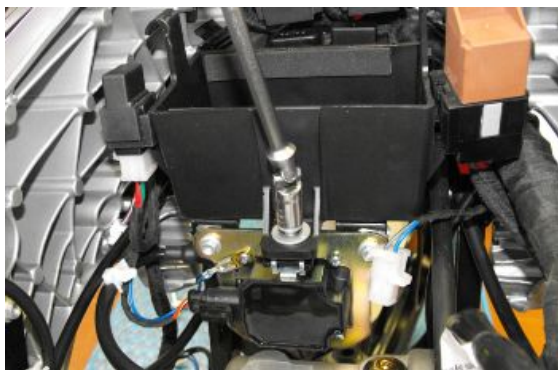
- Remove the oil temperature sensor.



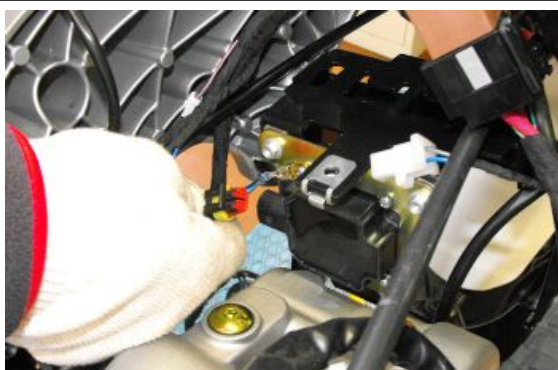
- Remove the oil temperature sensor.



-
- Remove the battery compartment.



-
- Remove the coil.



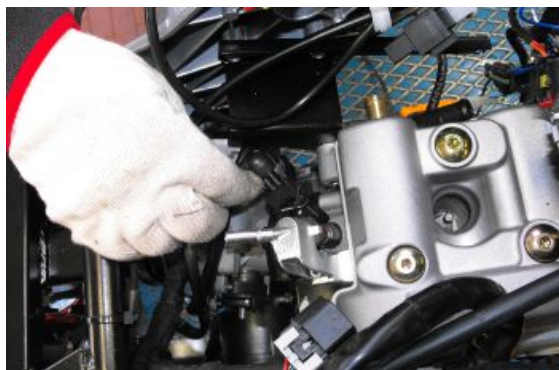
-
- Remove the clamp.
 - Remove the breather pipe.



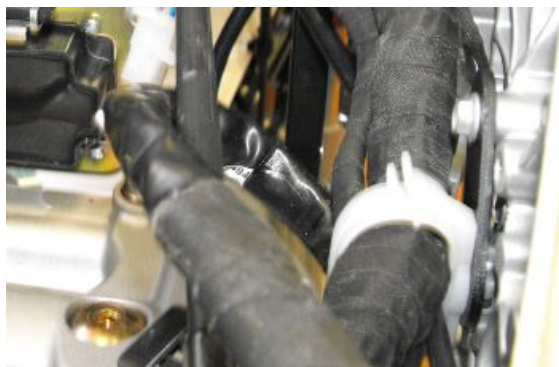
-
- Remove the screw.
 - Remove the cable guide.



- Disconnect the injector connector.



-
- Remove the main cable grommet.



-
- Working on both sides, unscrew and remove the two fastener screws.



- Remove the screw that fastens the ABS modulator support to the engine.

-
- Secure the vehicle adequately.
 - - Working on the left side, loosen the swingarm pin.



- Operating from both sides, remove the pass through screws and collect the retaining nuts.



- Operating from both sides, remove the upper fixing screws.



- Working from the right side, slide off the pin.



- Collect the ring nut.



Installing the engine to the vehicle

- Place the ring nut and tighten it to the prescribed torque.

Specific tooling

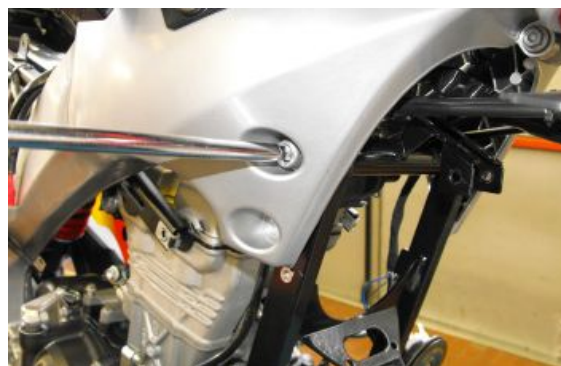
866714 Swingarm adjustment



- Insert the swingarm pin from the right side and slide it until it reaches the other side.



- Working from both sides, tighten the upper screw with the relative washer.
- Tighten the screw to the prescribed torque.



- Working from both sides, start the through screw with the nut.
- Tighten the screws to the prescribed torque.



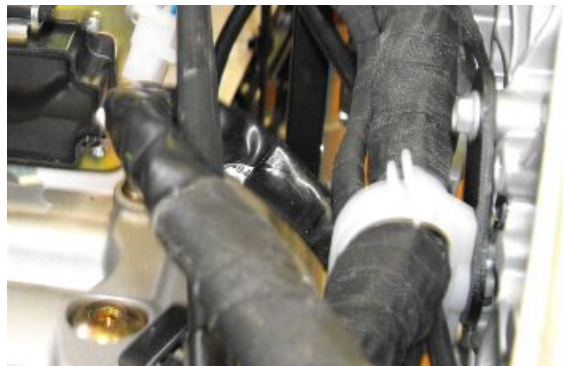
- On the LH side, place the washer on the swingarm pin and start the nut.
- Check that the washer and nut are on the swingarm pin.
- Working on both sides, tighten the nuts to the prescribed torque.



- Insert and tighten the screw that fastens the ABS modulator support to the engine
- Working on both sides, start the two screws on the plate.
- Tighten the screws to the prescribed torque.



- Place the main cable harness in the cable grommet.



- Connect the injector connector to the main cable harness.



- Place the cable guide.
- Tighten the screw to the prescribed torque.



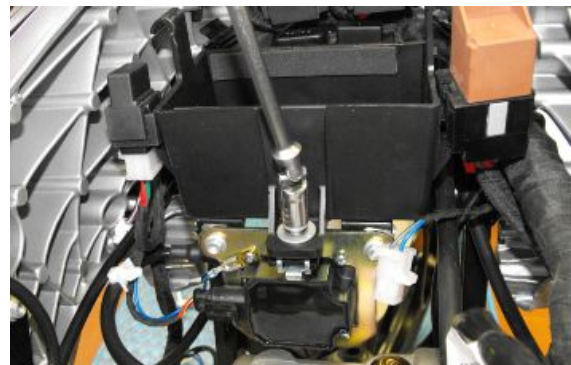
- Place the breather pipe and secure it with the clamp.



- Connect the ground and fix it with the screw.
- Connect the coil connector.



- Place the battery compartment and insert the relays in the appropriate seats.
- Tighten the battery compartment screw to the prescribed torque.



- Connect the horn.



- Connect the oil temperature sensor.



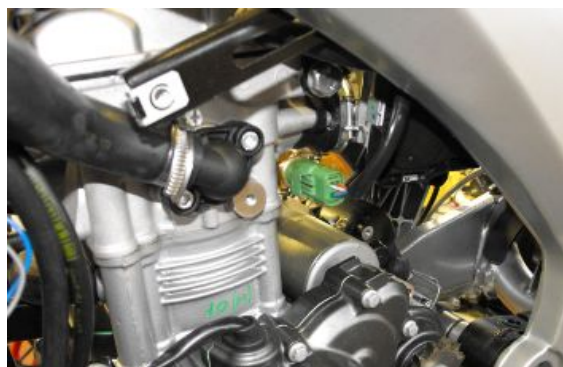
- Connect the neutral sensor.

CAUTION

TAKE CARE NOT TO LOSE THE INSULATING RUBBER HOOD OR THE PLASTIC WASHER FITTED BETWEEN THE CONNECTOR AND THE NEUTRAL SENSOR BULB. ENSURE THAT THE CONNECTOR IS FITTED IN THE CORRECT DIRECTION TO AVOID DAMAGING IT WHEN MOUNTING THE PINION GUARD.



- Connect the water temperature sensor



- Position and reconnect the chain.



- Put in place the gear lever and tighten the screw to the specified torque.



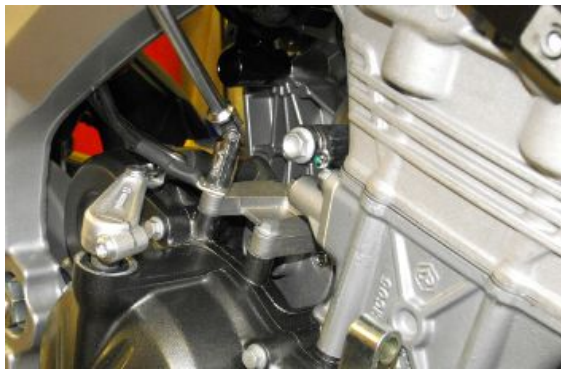
- Put in place the pinion cover and tighten the two screws to the specified torque.



- Connect the starter motor cable and tighten the screw to the specified torque.
- Fit the rubber pipe.



- Connect the starter motor ground wire and tighten the screw to the specified torque.



- Reattach the clutch cable, making sure to insert it in the cable grommet.
- Adjust the clutch cable.

**Characteristic****Clutch cable nut tightening torque**

6 Nm (4.43 lb ft)

- Insert the rapid coupler.



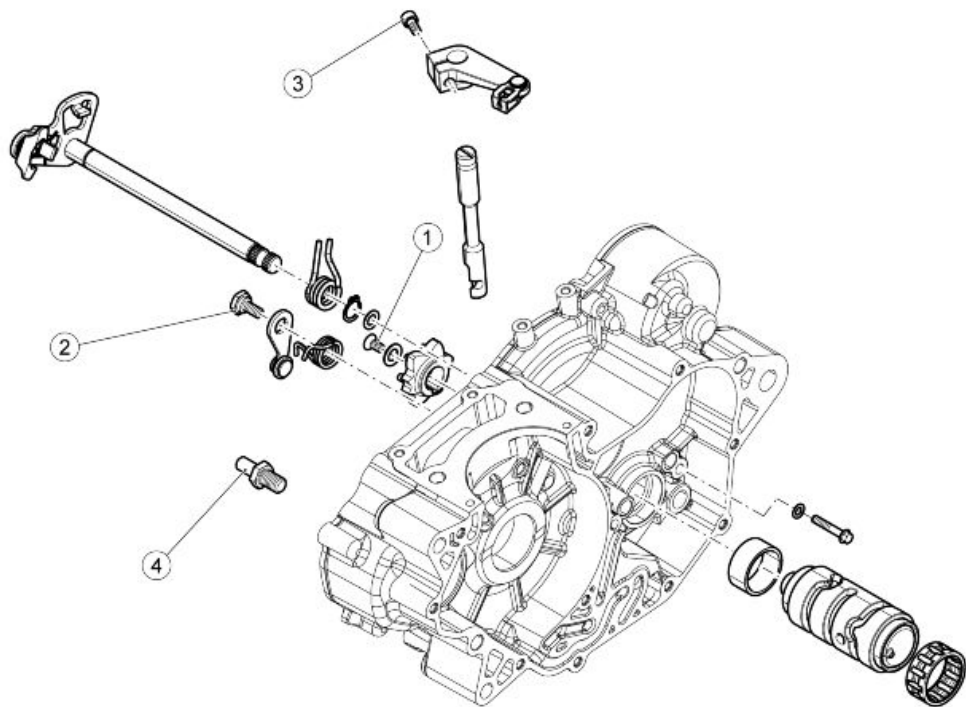
- Install the units removed in the reverse order to that described to what is described for preparing the vehicle.
-

INDEX OF TOPICS

ENGINE

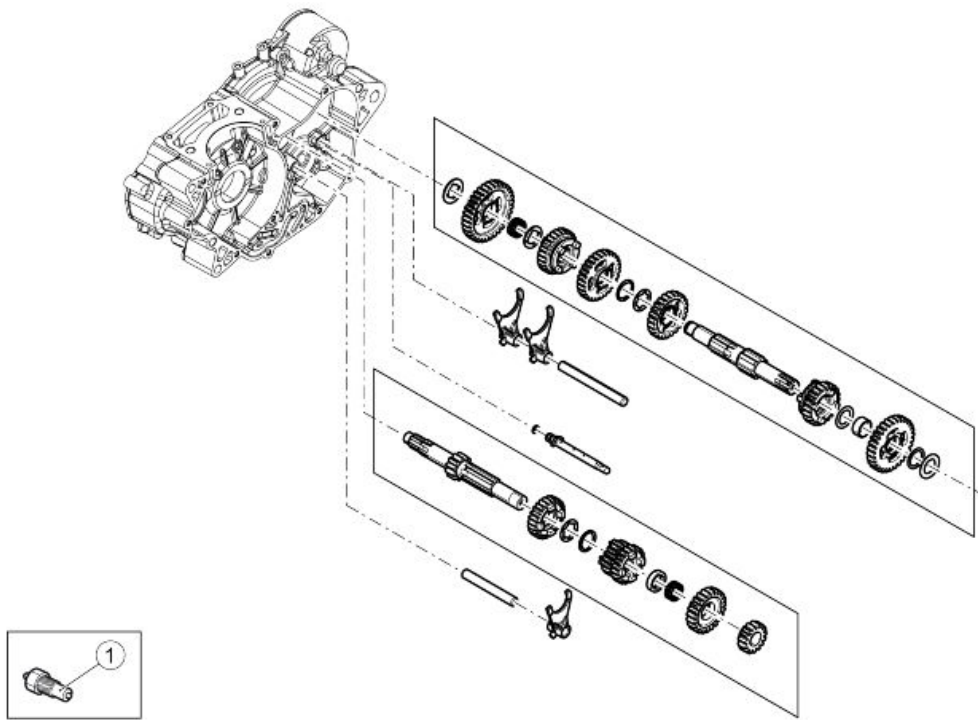
ENG

Gearbox



GEAR SELECTOR

pos.	Description	Type	Quantity	Torque	Notes
1	Selector sprocket fastener screw	M5	1	4 Nm (2.95 lb ft)	-
2	Lever fastener screw	M6	1	9 Nm (6.64 lb ft)	-
3	Clutch lever fastener screw	-	1	9 Nm (6.64 lb ft)	-
4	Gear shift selector pin fixing	-	1	9 Nm (6.64 lb ft)	-



COMPONENTS OF GEARBOX

pos.	Description	Type	Quantity	Torque	Notes
1	Gear sensor retainer	-	1	3 Nm (2.21 lb ft)	-

Diagram

Filtro olio

- Place a recipient with a capacity of at least 900 cm³ (54.91 cu.in) under the drain plug (1) on the clutch side. Remove the plug and drain the oil into the recipient for a few minutes.

NOTE

CHECK AND, IF NECESSARY, REPLACE THE DRAIN PLUG SEAL WASHER



- Remove the gearbox oil filter (2) and replace.



- Remove the drain plug (3) on the alternator side.

NOTE

CHECK AND, IF NECESSARY, REPLACE THE DRAIN PLUG SEAL WASHER



- Remove the oil filter (4) and clean thoroughly before refitting.

NOTE

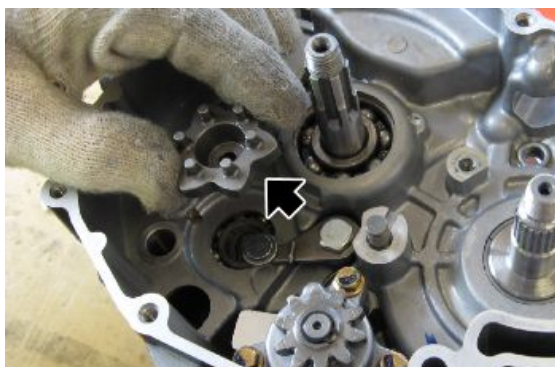
CHECK AND, IF NECESSARY, REPLACE THE FILTER SEAL WASHER



Gearbox shafts

Disassembling the gearbox

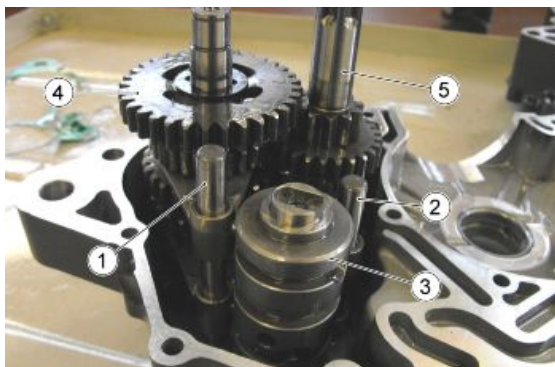
- Remove the desmodromic drum



- Separate the crankcase halves.
- Remove the gasket from the crankcase.



- Remove both the gearbox selector fork rods and the forks (1) (2).
- Remove the desmodromic selector (3).
- Remove the secondary shaft (4).
- Remove the primary shaft (5).



Removing the primary shaft

CAUTION

THE PRIMARY SHAFT CANNOT BE DISASSEMBLED. IF NECESSARY, REPLACE THE ENTIRE PRIMARY SHAFT.

Removing the secondary shaft

CAUTION

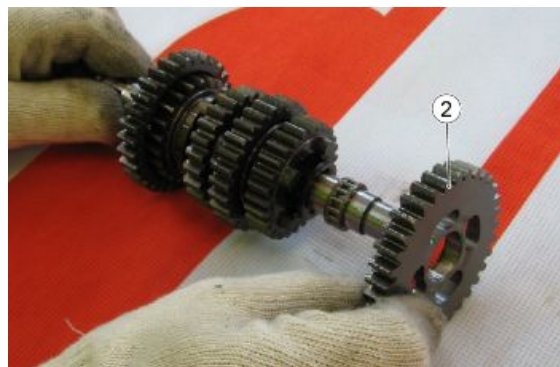
FIT NEW CIRCLIPS WHEN REASSEMBLING

Disassemble the secondary shaft as follows:

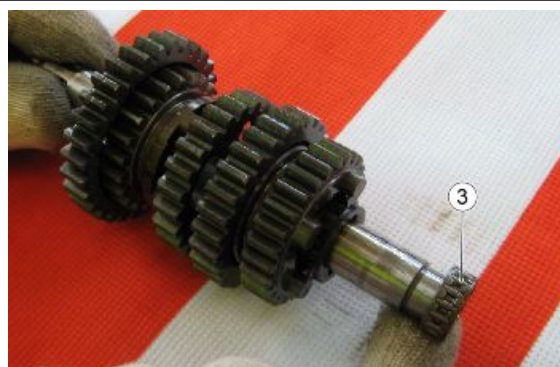
- Remove the shim washer (1)



- Remove the first speed gear (2).



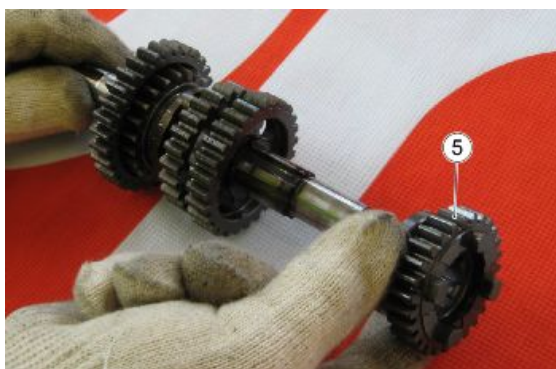
- Remove the roller bearing cage (3).



- Remove the spacer washer (4)



- Remove the fifth speed gear (5).



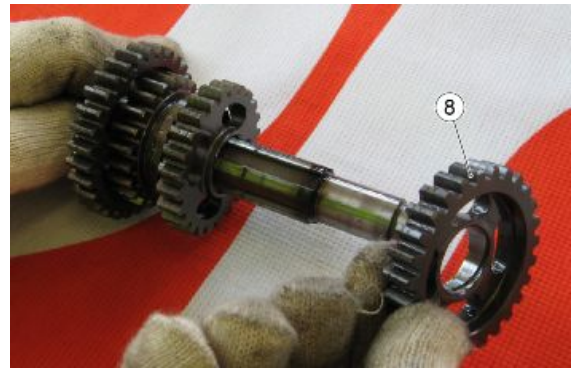
- Remove the circlip (6).



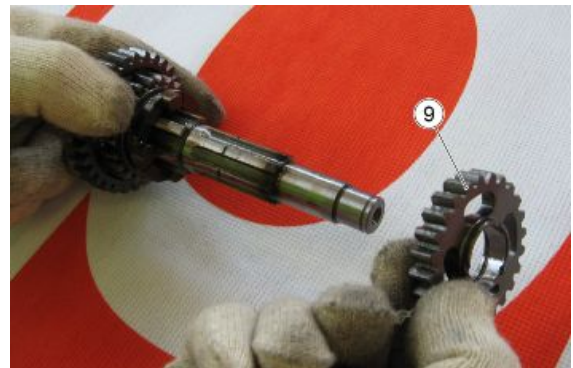
- Remove the spacer washer (7)



- Remove the third speed gear (8).



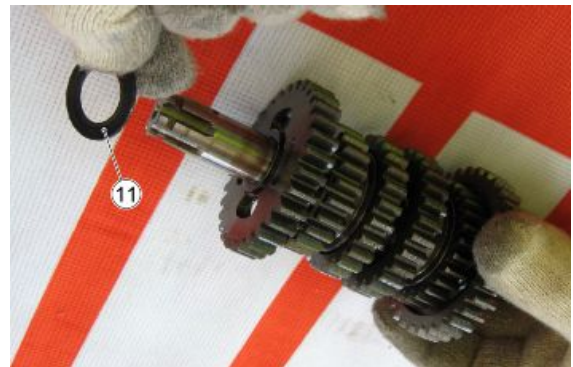
- Remove the fourth speed gear (9).



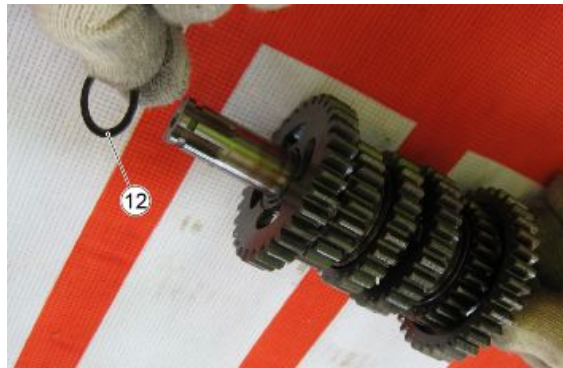
- Remove the sixth speed gear (10).



- Remove the spacer washer (11)



- Remove the spacer washer (12)



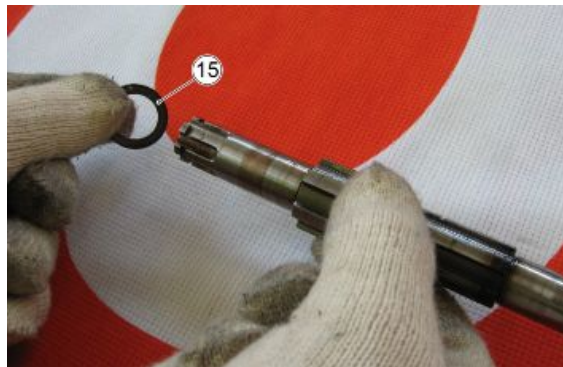
- Remove the second speed gear (13).



- Remove the bush (14).



- Remove the shim washer (15)



Desmodromic demounting

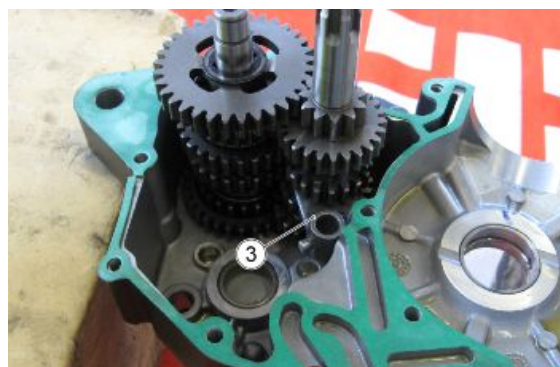
- Remove the fork carrier shaft (1)



- Remove the desmodromic shaft (2)



- Remove the forks (3)



Checking the desmodromic drum

Check the desmodromic shaft and drum for any signs of damage, scratches or wear, and replace if necessary.

Check the channels in the desmodromic drum for any signs of damage or and replace the drum if necessary.

Check the desmodromic drum bearing for any signs of damage or pitting, and change the drum if necessary.

Checking the forks

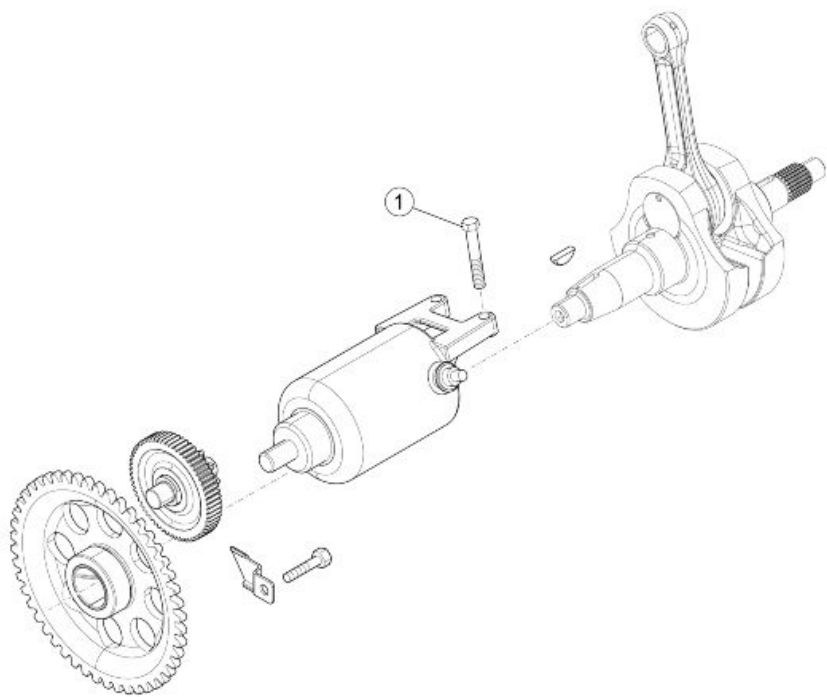
NOTE

THE FOLLOWING PROCEDURE IS APPLICABLE FOR ALL THE GEARBOX SELECTOR FORKS

- Check that the fork moves uniformly and without impediment; check for damage, dents and signs of wear on the roller (1) and on the teeth (2) of the fork.
- Replace the fork if necessary.



Starter motor



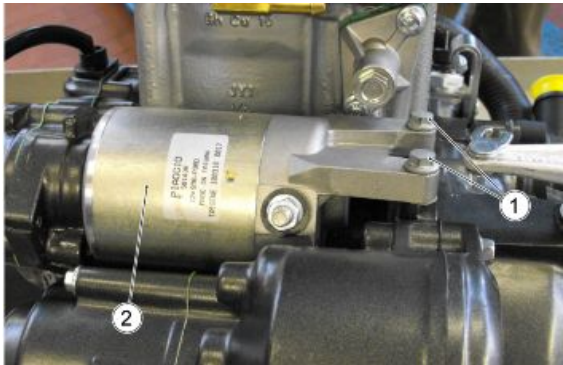
STARTER MOTOR

pos.	Description	Type	Quantity	Torque	Notes
1	Starter motor fastener screw	M6x25	2	12 Nm (8.85 lb ft)	-

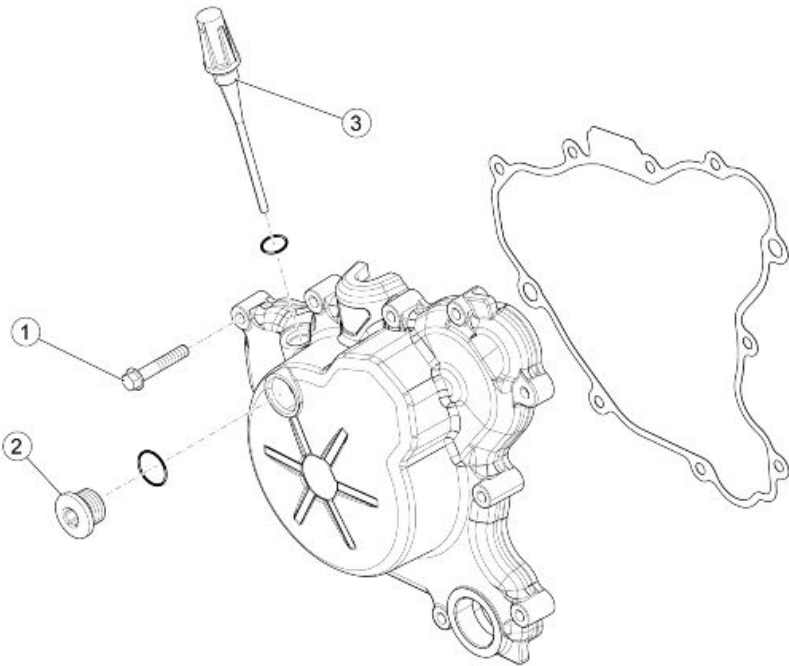
Removing the starter motor

- Undo and remove the two fixing screws (1).
- Remove the starter motor (2).

NOTE
THE STARTER MOTOR CAN ALSO BE REMOVED IF THE ENGINE IS FITTED TO THE VEHICLE.

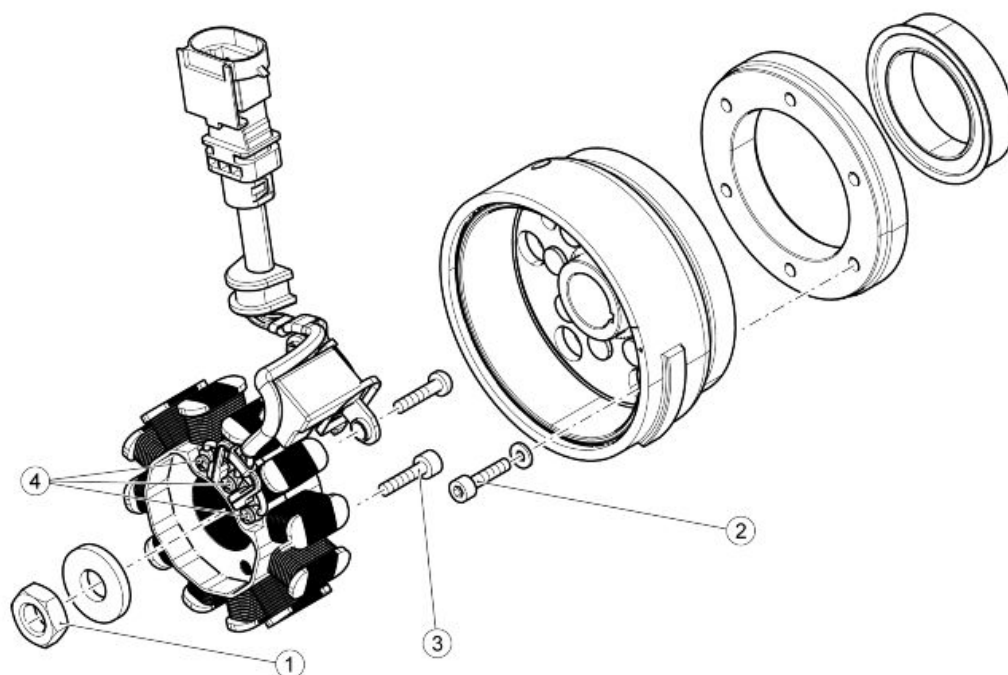


Generator side



FLYWHEEL COVER

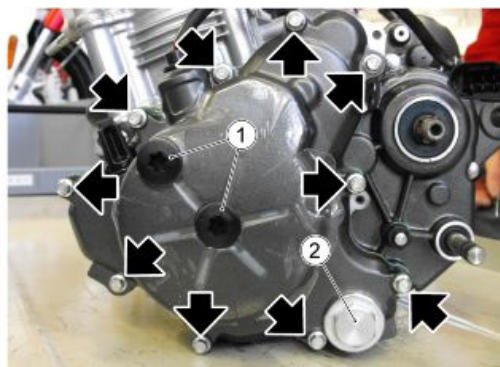
pos.	Description	Type	Quantity	Torque	Notes
1	Flywheel cover fastener screw	M6	10	12 Nm (8.85 lb ft)	-
2	Timing control cap	M18	2	4 Nm (2.95 lb ft)	-
3	Oil dipstick	M12x1.5	1	5 Nm (3.69 lb ft)	-

**IGNITION UNIT**

pos.	Description	Type	Quantity	Torque	Notes
1	Flywheel rotor fixing nut	M14x1.5	1	86 Nm (63.43 lb ft)	-
2	Rotor fastener screw	-	6	12 Nm (8.85 lb ft)	-
3	Stator clamping screws	-	2	6 Nm (4.43 lb ft)	-
4	Pick-Up clamping screw	-	3	3.5 Nm (2.58 lb ft)	-

Removing the flywheel cover

- Unscrew and remove the two adjustment plugs (1).
- Unscrew and remove the engine oil pre-filter plug (2).
- Remove the engine oil pre-filter.
- Undo and remove the ten screws fixing the flywheel cover.
- Remove the flywheel cover.



Rimozione rotore

- Remove the starter motor gear.



- Fit the specific tool.
- Undo and remove the hex socket screw.

Specific tooling

865259 Flywheel retainer



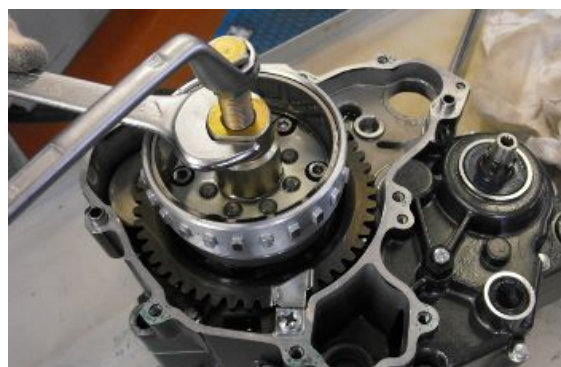
- Retrieve the washer.



- Fit the tool and pull out the rotor.

Specific tooling

864868 Flywheel extractor



- Remove the rotor.

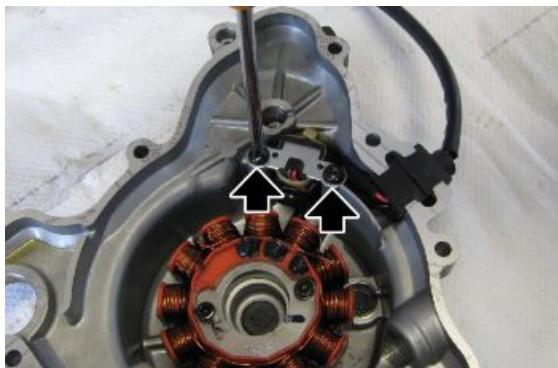


- Remove the key.

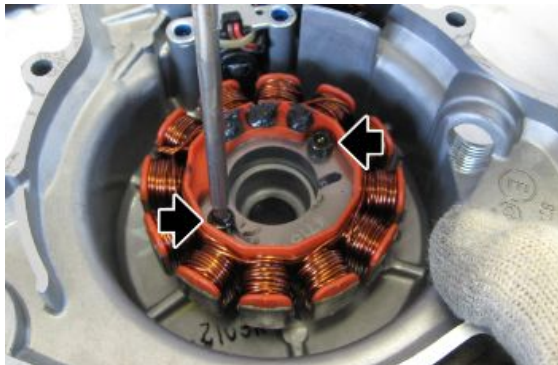


Removing the stator

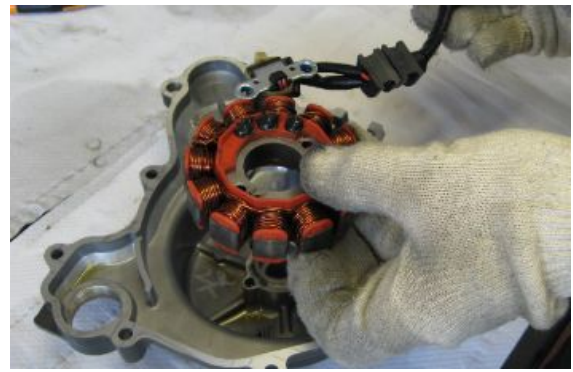
- Remove the two screws fastening the plate securing the stator cable



- Remove the two screws fastening the stator



- Remove the stator.



Freewheel removal

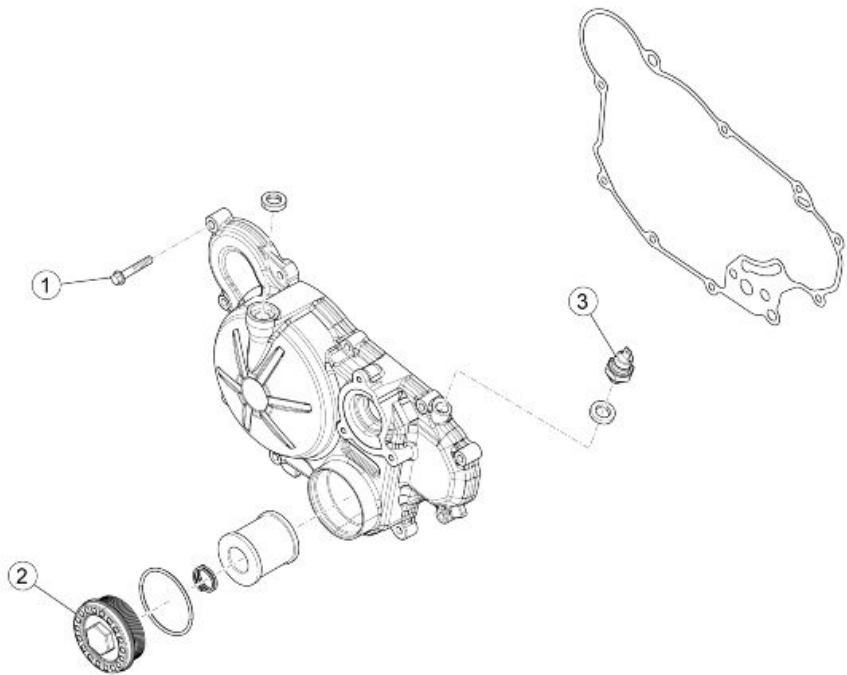
- Undo and remove the indicated retain-
er screw with the relative plate.



- Remove the freewheel.

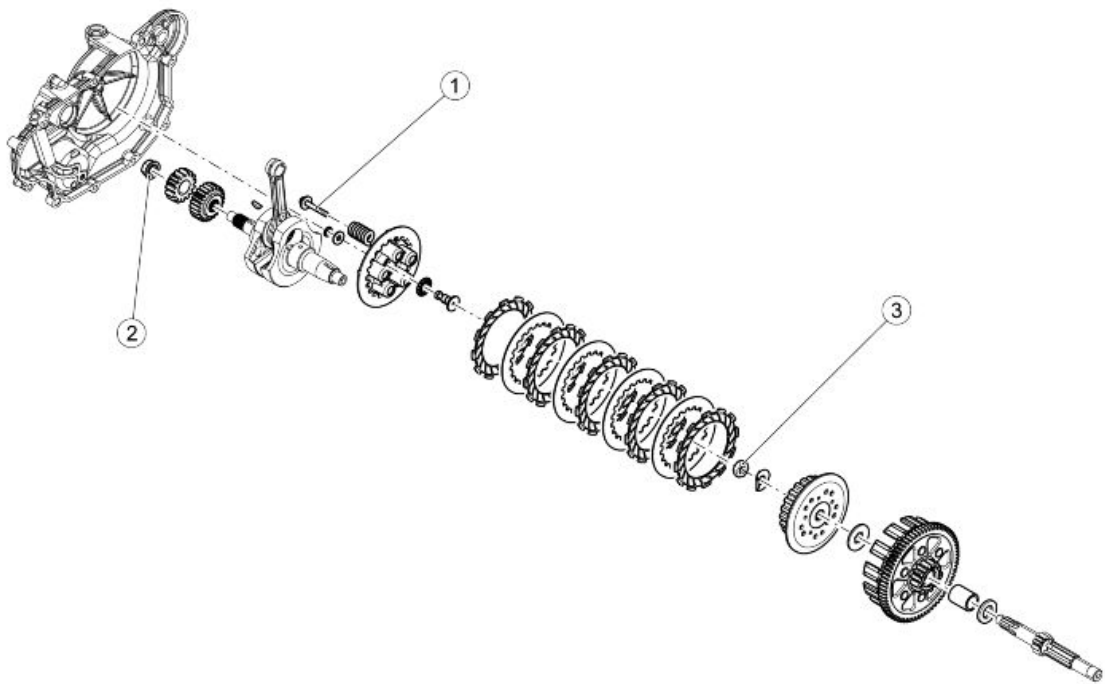


Clutch side



CLUTCH COVER

Pos.	Description	Type	Quantity	Torque	Notes
1	Clutch cover fixing screw	M6x35	10	12 Nm (8.85 lb ft)	-
2	Oil filter cover	M56x1.5	1	25 Nm (18.44 lb ft)	-
3	Oil pressure sensor	M10	1	13 Nm (9.59 lb ft)	-

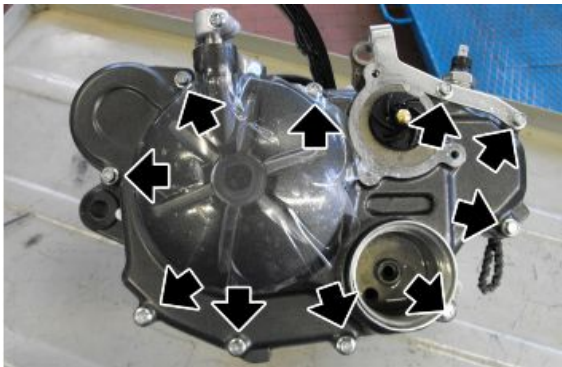


CLUTCH

pos.	Description	Type	Quantity	Torque	Notes
1	Clutch spring screw	M5	5	4 Nm (2.95 lb ft)	-
2	Crankshaft primary gear fastener nut	M12	1	79 Nm (58.27 lb ft)	-
3	Clutch nut	-	1	40 Nm (29.50 lbf ft)	-

Removing the clutch cover

- Undo and remove the ten screws of the clutch cover.



- Remove the clutch cover.

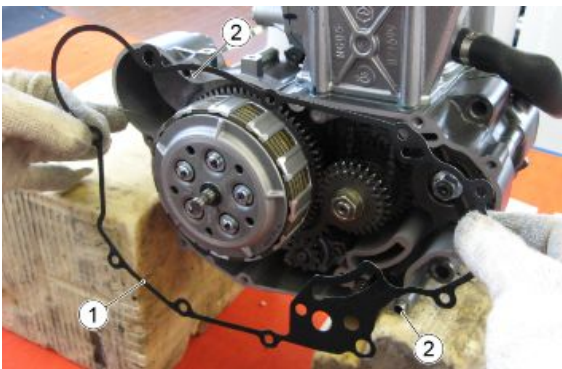


- Remove the gasket (1) and retrieve the locating dowels (2).

WARNING



REPLACE THE GASKET WHEN REASSEMBLING.



Disassembling the clutch

- Unscrew and remove the six screws by loosening them 1/4 of a turn at a time; operate in stages and diagonally, and retrieve the washers and the clutch springs.



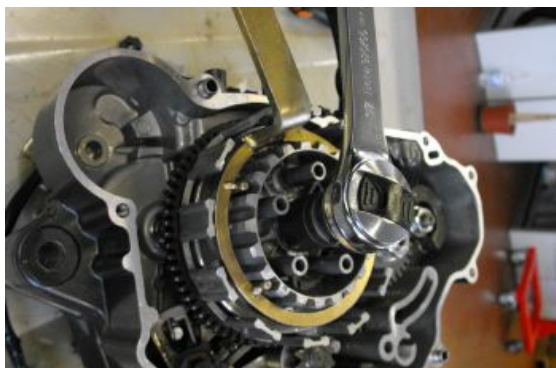
- Remove the thrust bearing.
- Remove the discs.



- Release the screw by lowering the lock tab.



- Block clutch bell rotation using the specific tool.
- Unscrew and remove the clutch bell fixing nut.
- Remove the clutch hub.



Specific tooling

00H05300041 Clutch lock

- Remove the shim and the clutch housing.



- Remove the shim.



Checking the clutch plates

Characteristic

Driving plates thickness

2.85 - 2.95 mm (0.112 - 0.116 in)

Number of driving plates

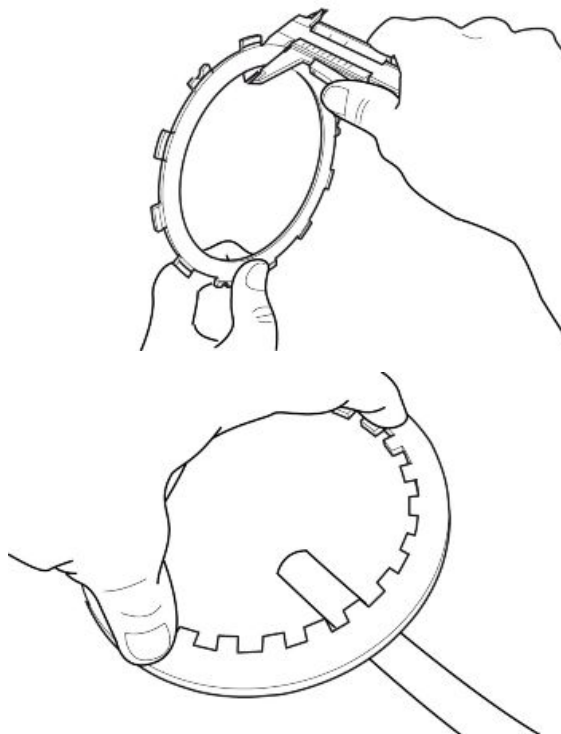
5

Driven plates thickness

1.46 - 1.53 mm (0.057 - 0.06 in)

Number of driven plates

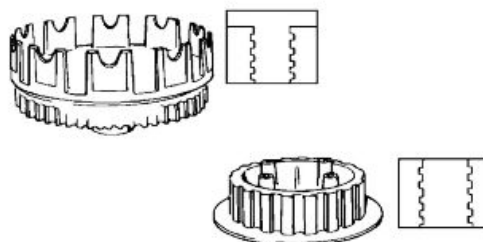
4



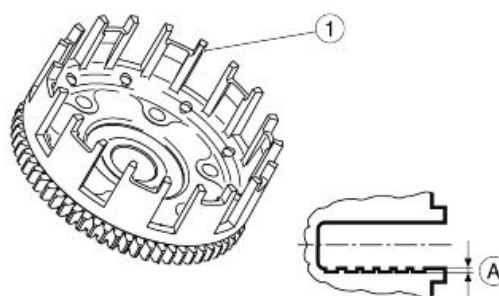
Checking the clutch housing

Check the primary driven gear for damage and wear and, if necessary, replace the primary driven gear and the clutch bell all together.

Make sure there is not excessive noise during operation; if necessary, replace the primary drive gear and the clutch bell all together.

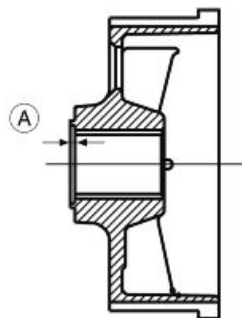


- Check the worn guiding grooves of the clutch bell (1); max. insertion depth (A) = 0.5 mm (0.020 in).

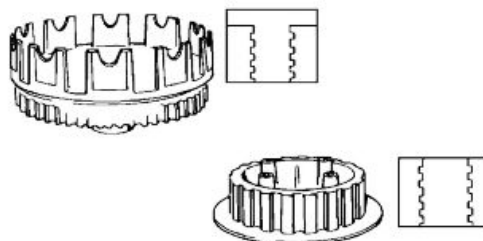


Checking the clutch hub

- When the clutch hub is worn it can create problems with sliding of the housing. The hub should be replaced if the surface of the spring has exceeded the wear limits. Max. wear limit (A) 0.3 mm (0.012 in).

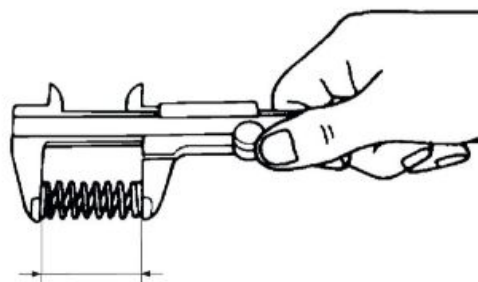


Check the clutch hub for damage and wear that may result in clutch irregular operation. If necessary, replace the hub.



Checking the springs

- Check the springs for damage and, if necessary, replace the them all together.
- Measure the clutch spring length when unloaded; if necessary, replace the springs all together.



Characteristic

Minimum wear limit in the release position of the individual clutch springs

31.6 mm (1.24 in)

Assembling the clutch

- Insert the shim.



- Fit the clutch housing.
- Fit the shim washer.



- Insert the clutch hub.
- Screw in the retainer nut locking the rotation of the clutch housing with the specific tool.

Specific tooling**00H05300041 Clutch lock**

- Lift one side of the lock tab.



- Insert the disc covered with friction material into the housing.
- Continue inserting, alternating a metal disc with one with friction material, finishing with a friction material disc with a black tooth.

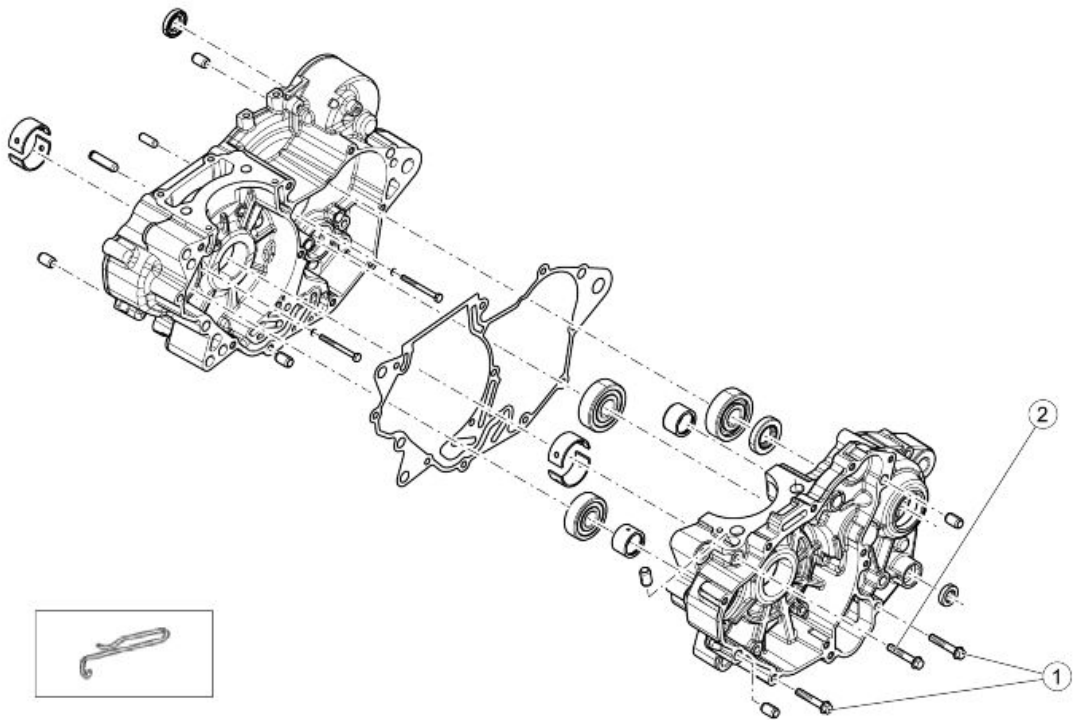


- Place the thrust plate.



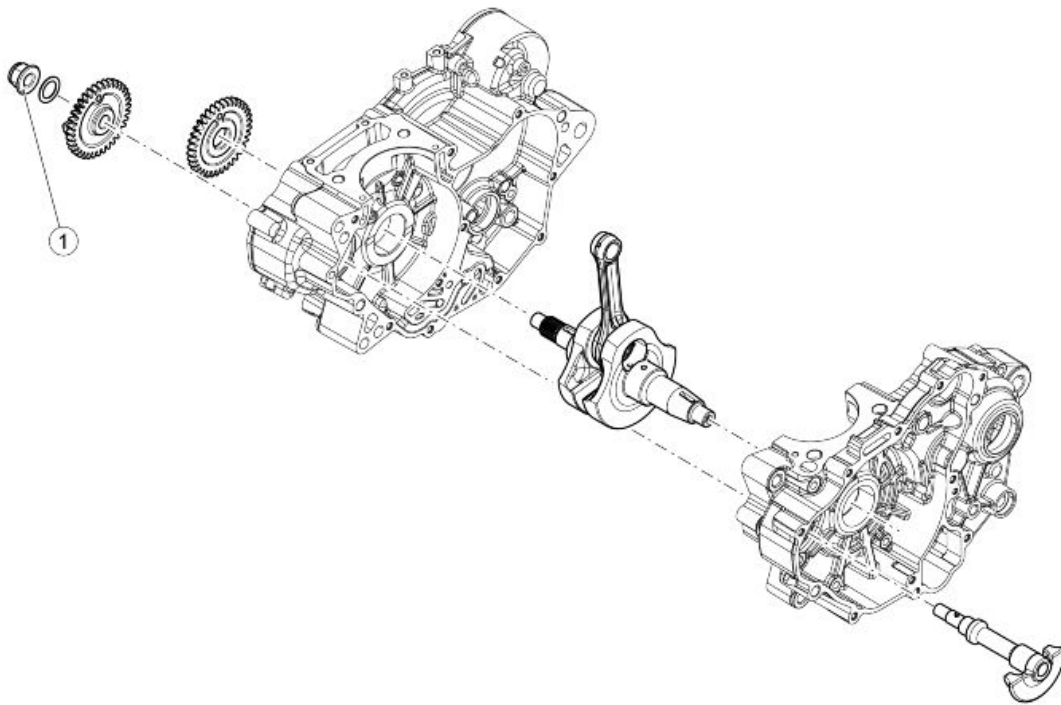
- Fit the clutch springs.
- Fit the screw washers.
- Tighten the six screws operating in stages and diagonally.

Crankcase



ENGINE CRANKCASE

pos.	Description	Type	Quantity	Torque	Notes
1	Crankcase retainer screw	M6x60	4	12 Nm (8.85 lb ft)	-
2	Crankcase retainer screw	M6x75	4	12 Nm (8.85 lb ft)	-



CRANKSHAFT

Pos.	Description	Type	Quantity	Torque	Notes
1	Gear fixing screw	M10	1	40 Nm (29.50 lb ft)	-

Balancing countershaft removal

- Before taking out the balancing countershaft the clutch cover and flywheel cover must be removed.
- Lock the countershaft with the specific tool.

**Specific tooling****864486 Countershaft lock tool**

- Unscrew and remove the nut and collect the washer



- Remove the countershaft gear.



- Remove the countershaft from the alternator side.

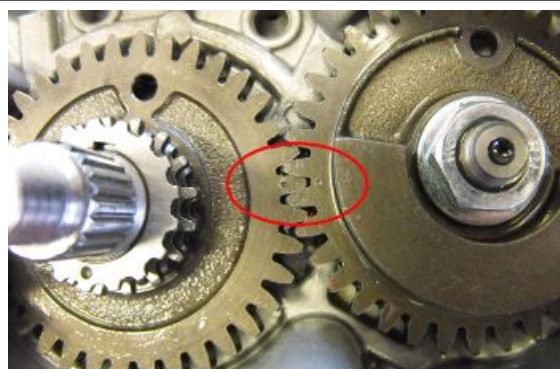


Balancing countershaft fitting

- Insert the countershaft from the alternator side.



- Insert the gear aligning its reference to the primary gear.
- Using the specific tool, tighten the nut remember first to place the washer.



Specific tooling

864486 Countershaft lock tool

Crankcase opening

- Beforehand remove the clutch cover and the clutch.
- Remove the gear selector.



- Install the countershaft blocking tool.

Specific tooling

864486 Countershaft lock tool



- Remove the primary gear unscrewing and removing the nut.
- Collect the washer.
- Remove the countershaft gear.



- Remove the primary remaining gears.
- Remove the head and cylinder.



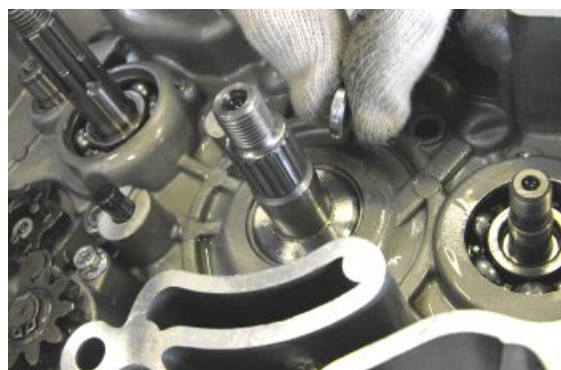
- Remove the chain guide slider, unscrewing and removing the fixing screw.
- Remove the timing chain gear.



- Remove the pump drive gear, removing the seeger and recovering the washer.



- Remove the base gear of the main shaft.
- Remove the cotter.



- Remove the oil pump unscrewing the three fixing screws.
- Collect the gasket.



- Remove the gear spider screw, unscrewing and removing the fixing screw.



- Moving from the left side of the engine, remove the flywheel and all of its components beforehand.
- Unscrew and remove the six screws on the outside of the crankcase (1).



- Unscrew and remove the longest screw (2).



- Unscrew and remove the five screws (3).
- Unscrew and remove the short screw (4).



- Remove the left crankcase.



Bearing removal

- Heat the crankcase surface with a heat gun.
- Remove the bearing using the specific extractor.

List of extractors to be used with sleeve 020376Y:**RIGHT CRANKCASE**

- Insertion of main shaft bearing: 020439Y+020359Y Removal of the main shaft bearing: 020358Y
- Insertion of desmo bearing: 020439Y+020357Y Removal of desmo bearing: 020891Y
- Insertion of secondary shaft roller bearing cage: 020891Y Removal of the secondary shaft roller bearing cage: 020363Y
- Insertion of countershaft bearing: 020412Y+020358Y Removal of countershaft bearing: 020375Y

LEFT CRANKCASE

- Insertion of main shaft bearing: 020439Y+020359Y Removal of the main shaft bearing: 020358Y
- Insertion of desmo roller bearing cage: 020375Y Removal of desmo roller bearing cage: use universal extractor
- Insertion of secondary shaft roller bearing cage: 020363Y Removal of the secondary shaft roller bearing cage: use universal extractor
- Insertion of countershaft roller bearing cage: 020483Y Removal of countershaft roller bearing cage: 020364Y

Crankcase check

- Before checking the crankcase halves, thoroughly clean all the surfaces and the oil pipes.
 - For the crankcase half on the transmission side, take particular care when handling the housing and hoses for the oil pump, the duct with the by-pass valve and the main bushings.
 - As already described in the lubrication chapter, it is especially important that the by-pass valve housing shows no wear that may impair the proper sealing of the lubrication pressure adjustment ball.
 - Check that the surfaces are free from dents or deformations, with special attention to both the crankcase coupling and the cylinder-crankcase surfaces.
 - Defects in the crankcase coupling gasket or the surfaces indicated in the figure can cause a drop in the oil pressure and affect the lubrication pressure for the main bushings and the connecting rod.
 - Check that the surfaces that limit crankshaft axial clearance show no signs of wear. To measure and check sizes follow the procedure described previously for checking crankshaft axial clearance and dimensions.
-

Bushing selection

BUSHING SEAT DIAMETER ON CRANKCASE

Specification	Desc./Quantity
Class 1	MIN 36.500 mm (1.4370 in) MAX 36.508 mm (1.4373 in)
Class 2	MIN 36.508 mm (1.4373 in) MAX 36.516 mm (1.4376 in)

CRANKSHAFT DIAMETER

Specification	Desc./Quantity
Class 1	MIN 32.480 mm (1.2787 in) MAX 32.485 mm (1.2789 in)
Class 2	MIN 32.485 mm (1.2789 in) MAX 32.490 mm (1.2791 in)

BUSHING THICKNESS

Specification	Desc./Quantity
Red	MIN 2.005 mm (0.0789 in) MAX 2.010 mm (0.0791 in)
Blue	MIN 2.010 mm (0.0791 in) MAX 2.015 mm (0.0793 in)

CRANKSHAFT COUPLING/BUSHING SEAT DIAMETER

Specification	Desc./Quantity
Crankshaft type 2	Type 1 crankcase diameter RED + RED Type 2 crankcase diameter RED + BLUE
Crankshaft type 1	Type 1 crankcase diameter RED + BLUE Type 2 crankcase diameter BLUE + BLUE

Bearing fitting

- Heat up the crankcase using the thermal gun.
- Fit the bearing in the seat with the aid of the specific tool.

List of tools for refitting, to be coupled with sleeve 020376Y:

RIGHT CRANKCASE

- Insertion of main shaft bearing: 020439Y+020359Y Removal of the main shaft bearing: 020358Y
- Insertion of desmo bearing: 020439Y+020357Y Removal of desmo bearing: 020891Y
- Insertion of secondary shaft roller bearing cage: 020891Y Removal of the secondary shaft roller bearing cage: 020363Y
- Insertion of countershaft bearing: 020412Y+020358Y Removal of countershaft bearing: 020375Y

LEFT CRANKCASE

- Insertion of main shaft bearing: 020439Y+020359Y Removal of the main shaft bearing: 020358Y
- Insertion of desmo roller bearing cage: 020375Y Removal of desmo roller bearing cage: use universal extractor

- Insertion of secondary shaft roller bearing cage: 020363Y Removal of the secondary shaft roller bearing cage: use universal extractor
- Insertion of countershaft roller bearing cage: 020483Y Removal of countershaft roller bearing cage: 020364Y

NOTE: insertion of the roller bearing cages in line with the crankcase is recommended from the inside to the outside.

Crankcase closing

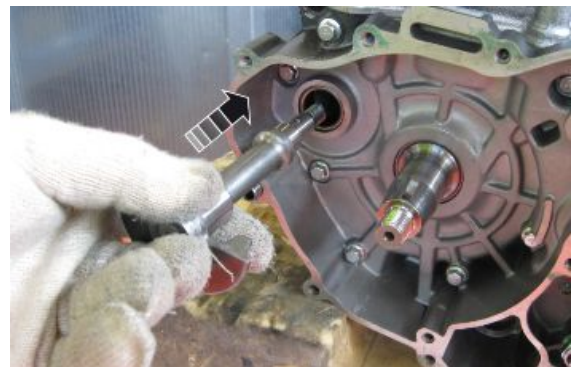
- After installing the gearbox, fit a new gasket.
- Join the two crankcase halves together, using the locating dowels to align correctly.



- Fit and tighten the short screw (1).
- Fit and tighten the five screws (2).
- Fit and tighten the long screw (3).
- Move to the left hand side of the crankcase and fit and tighten the six screws (4).



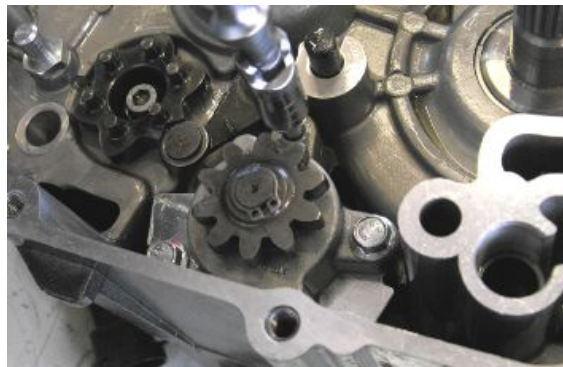
- Install the countershaft.



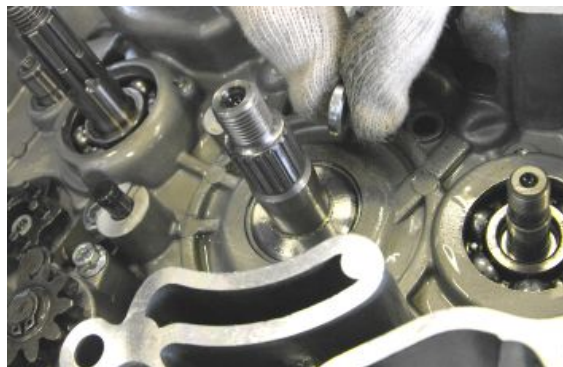
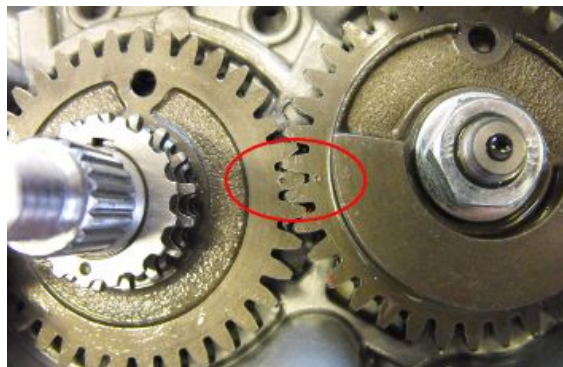
- Fit the selector star.
- Fit and tighten the screw.



-
- Fit a new oil pump gasket.
 - Fit the oil pump, screwing the three screws.



-
- Insert the countershaft gear and position the washer.
 - Use the specific tool to tighten the nut.
 - Apply the cotter to the main shaft.
 - Position the base gear of the primary, aligning the two references.

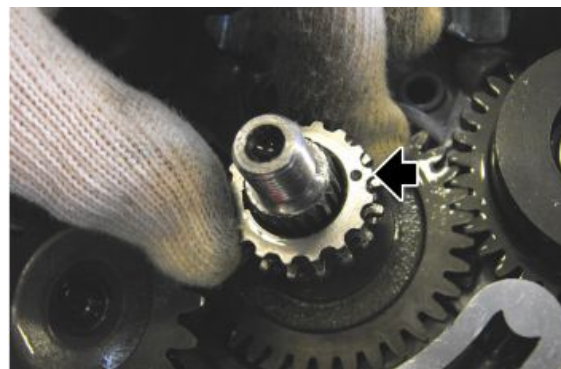




- Insert the pump drive gear.
- Insert the washer and apply the fixing seeger.



- Insert the timing chain gear, paying attention to the direction. The engraving must face upward.
- Fit the timing chain.



- Position the chain guide slider.
- Position and screw the fixing screw.



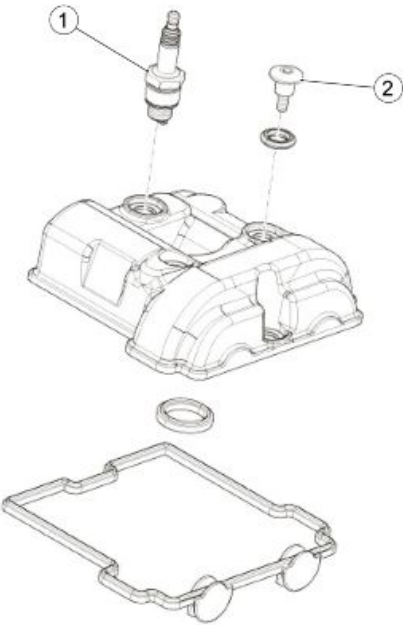
- Fit the rest of the primary gears.
- Tighten the fixing nut.
- Remove the countershaft locking tool.



- Fit the gear selector.

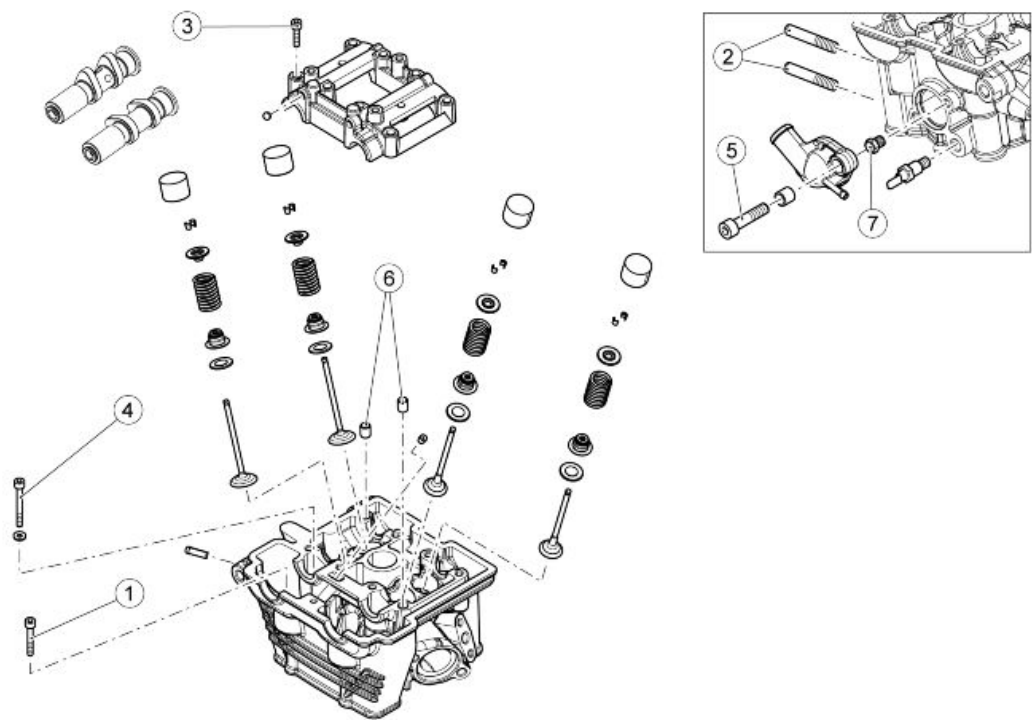


Head and timing



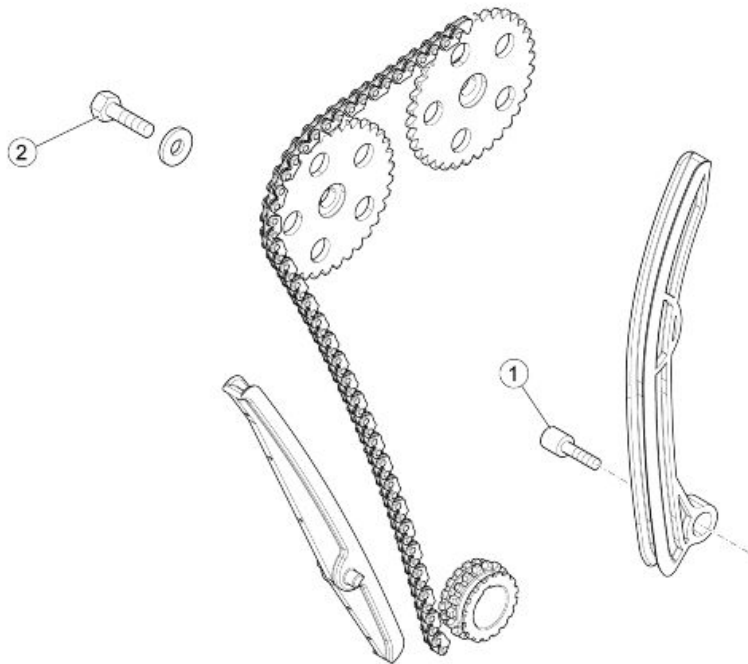
HEAD COVER

pos.	Description	Type	Quantity	Torque	Notes
1	Spark plug	M10	1	13 Nm (9.59 lb ft)	-
2	Head cover fastener screw	M6	4	11 Nm (8.11 lb ft)	-



HEAD - VALVES

pos.	Description	Type	Quantity	Torque	Notes
1	Head fastener screw	M6x130	2	12 Nm (8.85 lb ft)	-
2	Drainage side stud bolt retainer	M8x40	2	12 Nm (8.85 lb ft)	-
3	Camshaft cover fastener screw	M6x40	4	11 Nm (8.11 lb ft)	-
4	Head fastener screw	M8x166	4	27 Nm + 90° (19.91 lb ft + 90°)	-
5	Thermostat cover fastener screw	M6x20	2	11 Nm (8.11 lb ft)	-
6	Head dowels retainer	M8x10	2	6.5 Nm (4.79 lb ft)	-
7	Thermostat retainer	-	1	9 Nm (6.64 lb ft)	-



TIMING SYSTEM

pos.	Description	Type	Quantity	Torque	Notes
1	Chain tensioner pad fastener screw	M6x16	1	10 Nm (7.38 lb ft)	Loctite 243
2	Timing system gear fastener screw	M8x40	2	27 Nm (19.91 lb ft)	Loctite 243

Removing the head cover

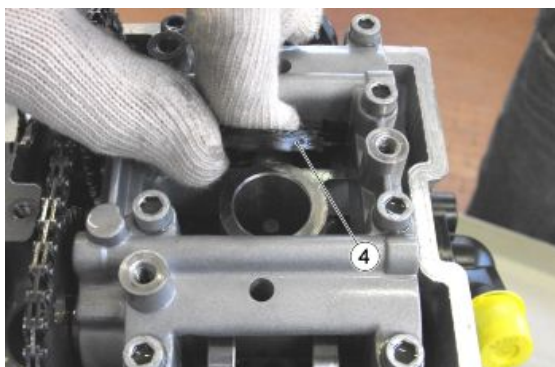
- Remove the adjuster screw covers (1).



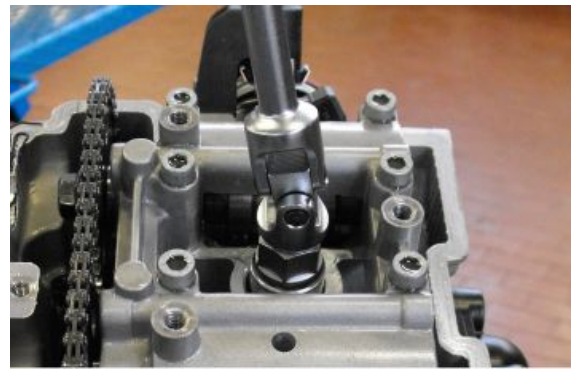
- Unscrew and remove the four cylinder head screws (2).
- Remove the cylinder head (3).



- Remove the gasket (4).

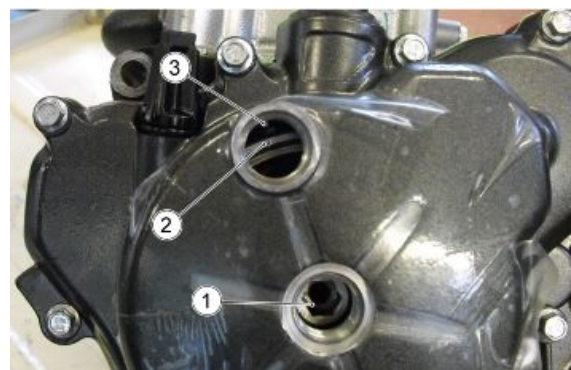


- Remove the spark plug.



Removing the timing control

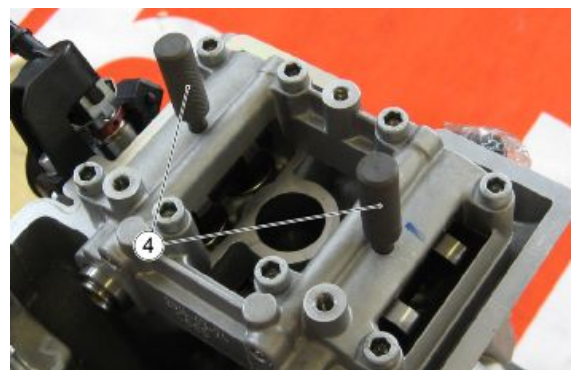
- Turn the crankshaft from the hole on the cover (1)
- Take the piston to TDC.
- The sign (2) must be aligned with the sign (3).



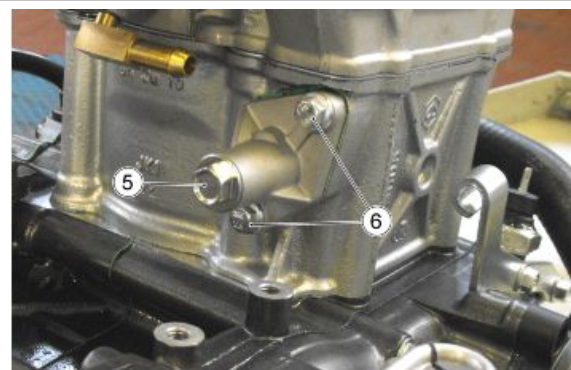
- Insert the specific pins (4) on the valves cam tower.

Specific tooling

864567 Camshaft timing adjustment lock pins



- Remove the starter motor beforehand.
- Loosen and remove the tensioner screw (5).



- Remove the spring.
- Unscrew and remove the two screws (6) and remove the entire tensioner control.



- Lock the timing gear using the specific tool.

Specific tooling

865260 Camshaft sprocket lock tool



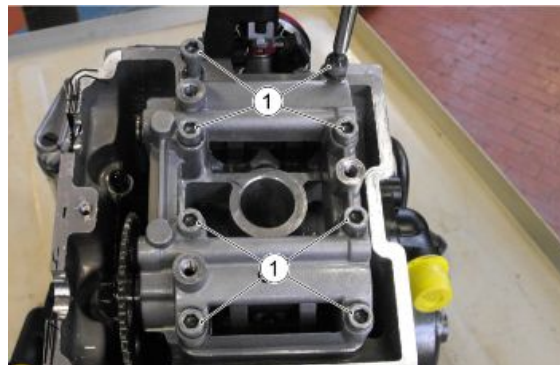
- Unscrew and remove the gear.
- Repeat the operation with the other gear.



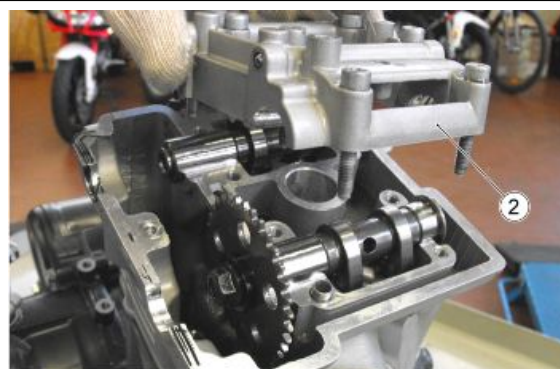
Cylinder head

Removing the overhead camshaft

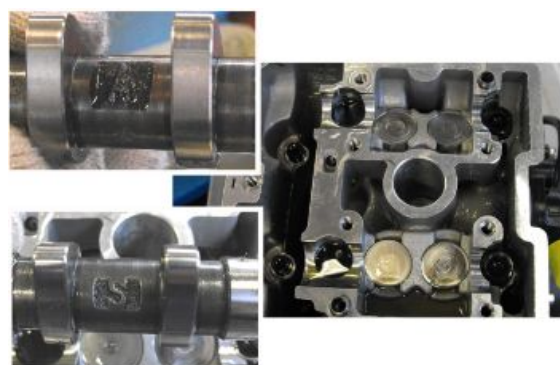
- Remove the two pins from the cam tower.
- Remove the eight screws (1).



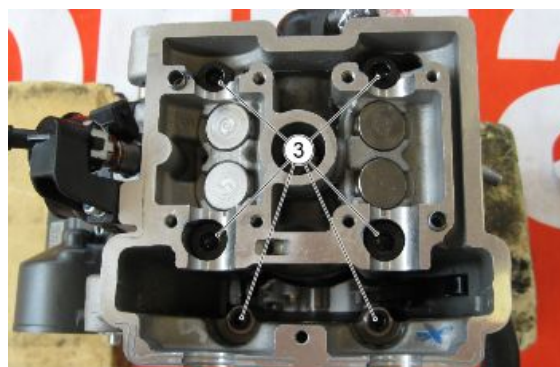
- Remove the cam tower (2).



- Remove the two camshafts (intake side and exhaust side).



- Undo and remove the six screws fastening the head (3)



- Remove the head (4).



Removing the valves

- Remove the head.
- Place the head on supporting surface.
- Number the valves and their bucket tappets in order to position them correctly upon refitting.



- Remove the valve bucket tappets.



- Compress the valve spring using the specific tool.

Specific tooling

020382Y011 Valve removal/installation tool



- Remove both cotter pins.



- Release the valve springs.
- Remove the cap and the valve spring.



Checking the overhead camshaft

- Check the camshaft bearings for signs of abnormal wear.

Characteristic

Standard diameter - Bearing A

19.980 - 19.959 mm (0.7866 - 0.7858 in)

Minimum diameter allowed - Bearing A

19.95 mm (0.7854 in)

Inlet cam height

31.488 mm (1.23968 in)

Exhaust cam height

30.864 mm (1.21511 in)

- Check that the holes used for timing and their shoulders are not worn.
- If values measured are not within the specified limits or there are signs of wear, replace the defective components with new ones.



Characteristic

Maximum axial clearance allowed:

0.4 mm (0.0157 in)

Valve check

- Measure the width of the sealing surface on the valve seats and on the valves themselves.
- If the sealing surface on the valve is wider than the specified limit, damaged in one or more points or curved, replace the valve with a new one.

CAUTION

DO NOT CHANGE THE VALVE FITTING POSITION (RH - LH).

Characteristic

Minimum diameter allowed - Intake

3.96 mm (0.1559 in)

Minimum diameter allowed - Exhaust:

3.95 mm (0.1555 in)

Standard clearance - Intake

0.15/0.20 mm (0.0059/0.0079 in)

Standard clearance - Exhaust

0.20/0.25 mm (0.0079/0.0098 in)

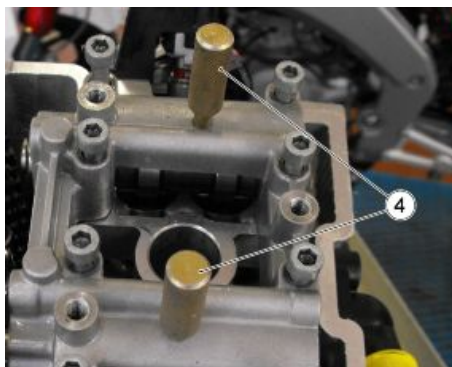
Maximum clearance admitted - Intake:

0.060 mm (0.0023 in)

Maximum clearance admitted - Exhaust:

0.070 mm (0.0027 in)

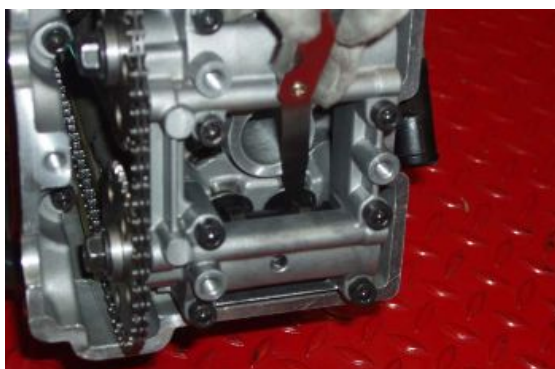
- Remove the head cover.
- Bring the engine to reach the top dead centre and lock it at that position using the specific tool (4).



Specific tooling

864567 Camshaft timing adjustment lock pins

- Use a feeler gauge to check clearance on the four valves.
- If the values measured differ from the values specified, record the difference between MAXIMUM ALLOWED CLEARANCE e CLEARANCE MEASURED.



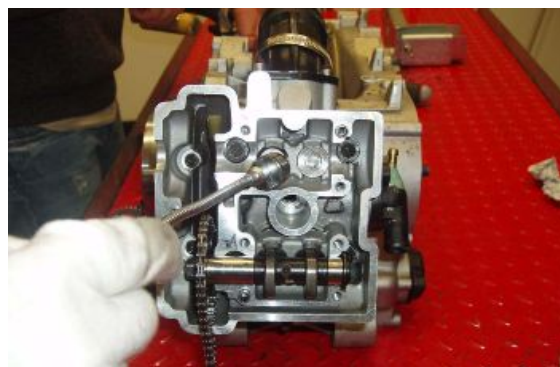
- Remove the chain tensioner.
- Undo and remove the eight screws and remove the cam tower.



- Remove the timing chain and the gears of the camshaft of the valves in question.



- Remove the bucket tappet of the valve in question and read the calibration value for that bowl, found inside the bucket tappet itself.
- Replace the bucket tappet with new one of a size suitable to restore the correct clearance.

**Characteristic****Standard clearance - Intake**

0.15/0.20 mm (0.0059/0.0079 in)

Standard clearance - Exhaust

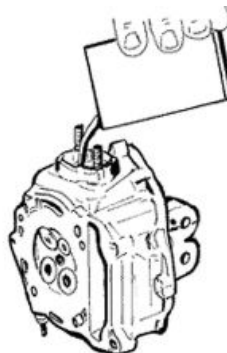
0.20/0.25 mm (0.0079/0.0098 in)



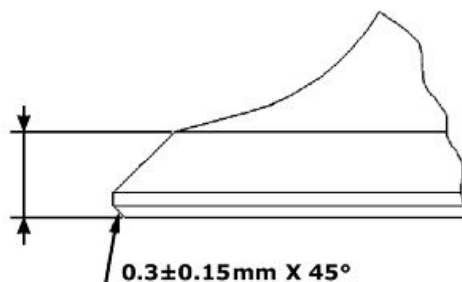
- Fit the camshaft, the gears and the chain in their correct positions, using the references located on the flywheel side of the crankcase.
- Fit the cam tower and tighten the eight screws to the prescribed torque.
- Fit the chain tensioner.
- Check for correct valve clearance.
- Fit the head cover.

Inspecting the valve sealings

- Fit the valves into the cylinder head.
- Alternatively test the intake and exhaust valves.
- This test should be carried out by filling the manifold with petrol and checking that the head does not excessively ooze through the valves.



- Measure the sealing surface width on the valve seats.



VALVE SEALING SURFACE

Specification	Desc./Quantity
Inlet valve - seal surface	2.30 +/- 0.15 mm (0.0905 +/- 0.0059 in)
Outlet valve - seal surface	2.95 +/- 0.15 mm (0.1161 +/- 0.0059 in)
Valve chamfering	0.2 +/- 0.1 mm x 45° (0.0079 +/- 0.0039 in x 45°)

Inspecting the valve housings

- Remove any carbon deposits from the valve guides.
- Measure the inside diameter of each valve guide.
- Measure according to the thrust direction at three different heights.

Characteristic

Intake guide - standard diameter

4.012 mm (0.1579 in)

Intake guide: Wear limit

4.020 mm (0.1582 in)

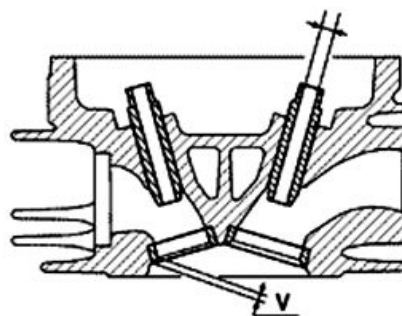
Discharge guide - standard diameter

4.012 mm (0.1579 in)

Discharge guide: Wear limit

4.020 mm (0.1582 in)

-
- Replace the head if the values corresponding to the width of the mark on the valve seat or the valve guide diameter exceed the specified limits.
 - Check the width of the mark on the valve seat «V».



Characteristic

Wear limit for the width of the mark on the valve seat "V"

- Intake: 1.6 mm (0.0630 in)
- Outlet: 1.8 mm (0.0708 in)

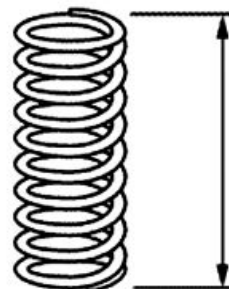
Inspecting the springs and half-cones

-
- Check that the spring upper supporting caps and the cotters show no signs of abnormal wear.
 - Check the unloaded spring length.

Characteristic

Valve spring length:

33.24 +/- 0.25 mm (1.3086 +/- 0.0098 in)



Checking the cylinder head

- Using a trued bar, check that the head surface is not worn or distorted.

- Check that the camshaft bushings are not worn.
 - Check that the head cover surface, the intake manifold and the exhaust manifold are not worn.
-

Installing the valves

- Lubricate the valve guides with engine oil.
 - Position the two oil seals on the cylinder head.
-

- Fit the valves, the springs and the caps. Using the specific tool, compress the springs and fit the cotters in their seats.

Specific tooling

020382Y011 Valve removal/installation tool



Timing

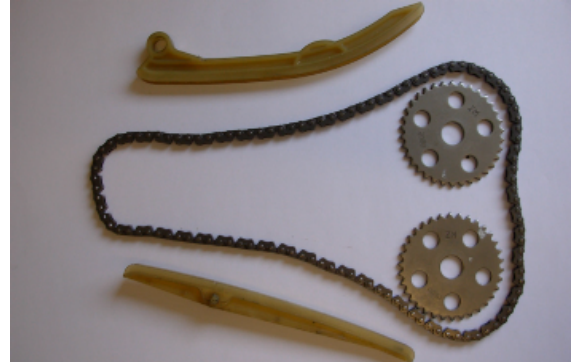
Checking the chain tensioner

- Remove the centre screw with the washer and the tensioner spring. Check that the one-way mechanism is not worn.
 - Check the condition of the tensioner spring.
 - Replace the whole unit if any wear is found.
-



Checking the chain

- Check that the guide slider and the tensioner pad are not excessively worn.
- Check that the chain assembly, the camshaft driving pulleys and the sprocket wheel are not worn.
- Replace the parts if signs of wear are found.



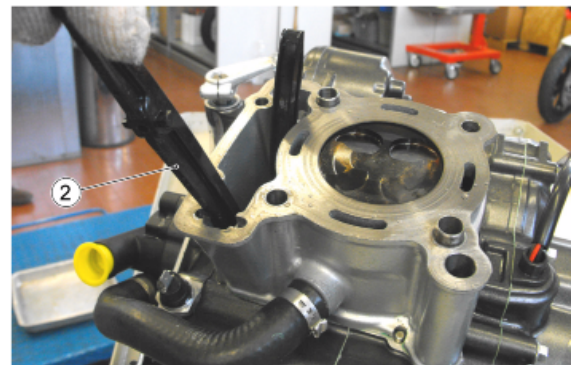
Cylinder-piston assembly

Removing the cylinder

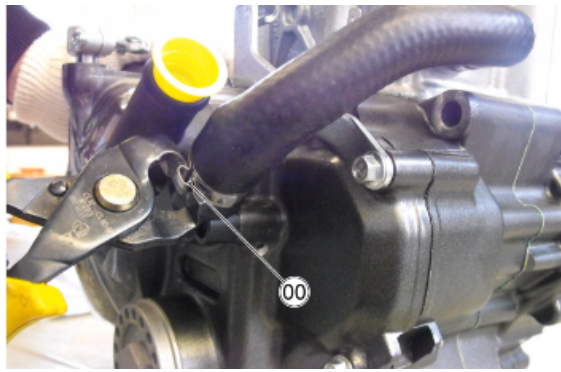
- Remove the head gasket (1).



- Remove the guide shoe (2).



- Remove the water hose clamp (3).



- Remove the cylinder (4).
- Remove the gasket (5).

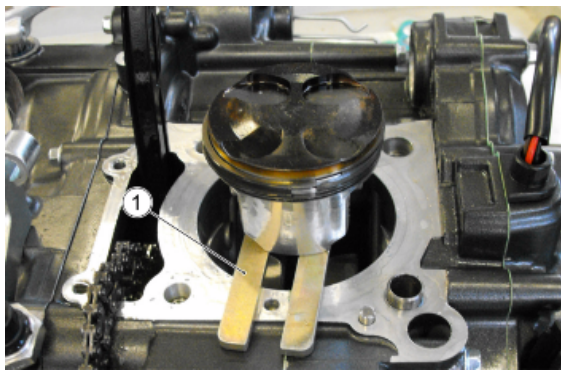


Disassembling the piston

- Apply the tool under the piston (1).
- Cover the base of the cylinder with a cloth.

Specific tooling

865261 Piston retainer



- Remove the retainer ring which locks the pin (2).

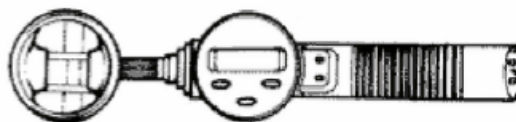


- Remove the pin (3).
- Remove the piston (4).

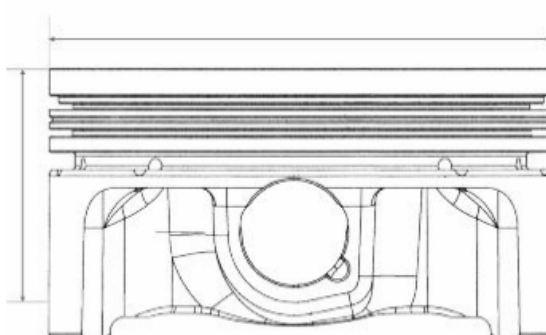


Checking the piston

- Measure the pin seat diameter on the piston.
- Calculate the pin - piston coupling clearance.



- Measure the piston outside diameter, perpendicular to the pin axis.
- Take the measurement at 6 mm (0.24 in) from the base, at the position shown in the figure.



- Carefully clean the sealing rings housings.
- Measure the sealing rings - grooves coupling clearance using suitable sensors, as shown in the diagram
- If clearances measured exceed the limits specified in the table, the piston should be replaced by a new one.



NOTE

MEASURE CLEARANCE BY INSERTING THE BLADE OF THE FEELER GAUGE FROM THE 2nd SEALING RING SIDE.

Characteristic**Piston / cylinder**

Piston pin hole - standard: 15.003 - 15.008 mm

(0.5907 - 0.5908 in)

Maximum piston / cylinder coupling clearance after use

- top ring: 0.075 mm (0.0029 in)

- middle ring: 0.065 mm (0.0025 in)

- oil scraper: 0.25 mm (0.0098 in)

Standard piston / cylinder coupling clearance

- top ring: +0.03 / 0.062 mm (0.0012 / 0.0024 in)

- middle ring: +0.02 / 0.052 mm (0.0008 / 0.0020 in)

- oil scraper: +0.01 / 0.19 mm (0.0004 / 0.007480 in)

cylinder check

- Using a bore meter, measure the cylinder inside diameter at three different points according to the directions shown in the figure.
- Check that the coupling surface with the head is not worn or misshapen.

**CAUTION**

THE MARKING IS LOCATED ON THE PISTON CROWN.

Characteristic**Maximum run-out allowed:**

0.05 mm

CYLINDER - PISTON COUPLING CLEARANCE 125 CM³

Coupling categories with cast-iron cylinder

NAME	ABBREVIATION	CYLINDER		PISTON		FITTING CLEARANCE	
		min	max	min	max	min	max
Cylinder/Piston	M	58.010	58.017	57.963	57.970	0.040	0.054
Cylinder/Piston	N	58.017	58.024	57.970	57.977	0.040	0.054
Cylinder/Piston	O	58.024	58.031	57.977	57.984	0.040	0.054
Cylinder/Piston	P	58.031	58.038	57.984	57.991	0.040	0.054

Inspecting the wrist pin

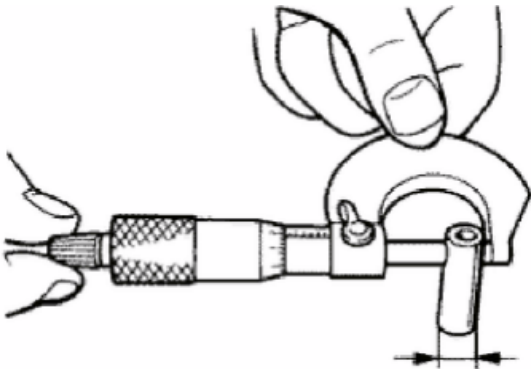
- Check the pin outside diameter.

Characteristic

Pin

Minimum diameter: 14.995 mm (0.590 in)

Standard diameter: 15.0000 +0/-0.0030 mm
(0.00012 in)



Inspecting the piston rings

ANELLI DI TENUTA

Specification	Desc./Quantity
Compression ring (top)	0.2 / 0.35 mm (0.0079 / 0.014 in)
Compression ring (middle)	0.2 / 0.35 mm (0.0079 / 0.014 in)
Oil scraper ring	0.2 / 0.7 mm (0.0079 / 0.027 in)
Top ring maximum value	0.45 mm (0.18 in)
Middle ring maximum value	0.45 mm (0.18 in)

Checking the connecting rod small end

- Measure the inside diameter of the connecting rod small end using a specific micrometer.

NOTE

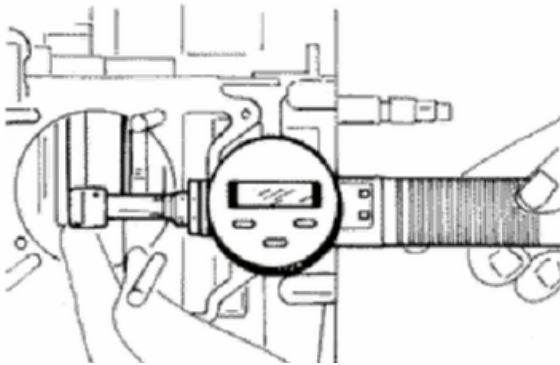
IF THE CONNECTING ROD SMALL END DIAMETER EXCEEDS THE MAXIMUM DIAMETER ALLOWED, SHOWS SIGNS OF WEAR OR OVERHEATING, REPLACE THE CRANKSHAFT AS DESCRIBED IN THE "CRANKCASE AND CRANKSHAFT" CHAPTER.

Characteristic

Rod small end

Maximum diameter: 15.023 mm (0.591 in)

Standard diameter: 15.010 - 15.018 mm (0.5910 - 0.5912 in)

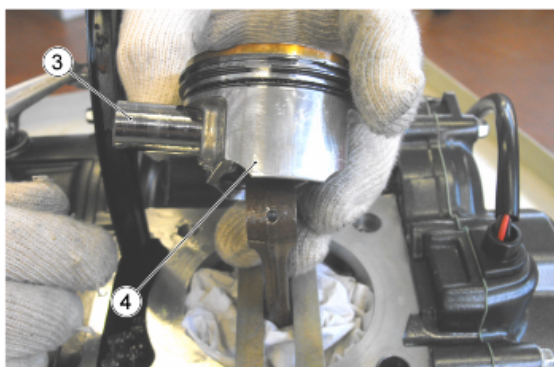


Fitting the piston

- Install the piston and the piston pin on the connecting rod, orienting the piston with the arrow facing towards the exhaust side.



- Fit the retainer circlip.



- Provisionally fit the cylinder onto the piston, without fitting the cylinder base gasket.
- Fit a dial gauge on the specific tool.
- Bring the piston to TDC.
- Place the dial gauge against one side of the cylinder and fasten securely to ensure that the zero position is read correctly.



Specific tooling

AP8140266 Dial gauge mount

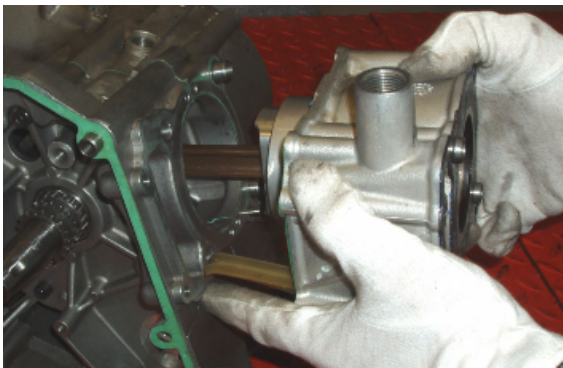
- Move the dial gauge diagonally and measure the protrusion of the piston relative to the reference surface.
- Calculate the thickness of the gasket necessary and select the appropriate gasket by referring to the values indicated in the table in the chapter "SELECTING BASE GASKETS".



Installing the cylinder

- Fit a new cylinder base gasket of the chosen thickness.
- Refit the cylinder as indicated in the figure using the specific clamp tighten-er tool.

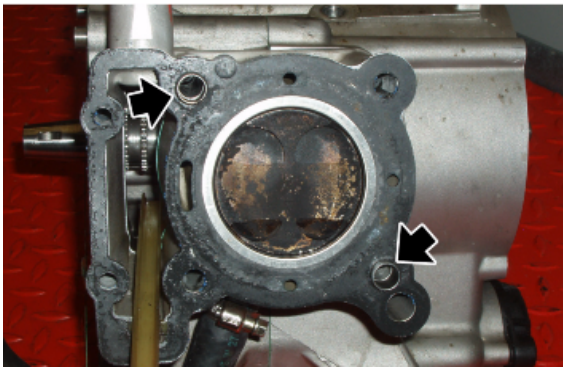
NOTE
BEFORE FITTING THE CYLINDER, CAREFULLY BLOW OUT THE LUBRICATION DUCT AND OIL THE CYLINDER BARREL.



Specific tooling

020287Y Tool for installing seal rings

- Fit a new gasket between the cylinder and the head.
- Place the two dowels.
- Install the head.



Selecting the base gasket

BASE GASKET SELECTION

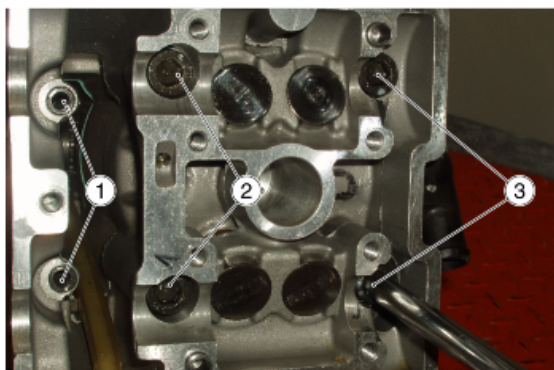
Specification	Desc./Quantity
Size measured: 0.95 / 1.09 mm (0.037 - 0.042 in)	Gasket 0.3+/-0.05 mm (0.012+/-0.001 in)
Size measured: 1.1 / 1.25 mm (0.043 - 0.049 in)	Gasket 0.4+/-0.05 mm (0.015+/-0.001 in)
Size measured: 1.26 / 1.45 mm (0.049 - 0.057 in)	Gasket 0.5+/-0.05 mm (0.019+/-0.001 in)

Installing the cylinder head

- Fit the chain guide slider onto the cylinder.
- Fit the head gasket and the alignment dowels
- Fit the head.



- Screw but do not tighten both central long screws (3) and position the washers.
- Screw but do not tighten both central long screws (2) and position the washers.
- Screw but do not tighten the two side short screws (1).

**NOTE**

BEFORE INSTALLING THE HEAD, MAKE SURE THAT THE LUBRICATION CHANNEL IS GENERALLY CLEAN AND USE A JET OF COMPRESSED AIR FOR CLEANING.

- Tighten the four central screws (2 - 3) crosswise.
 - Lastly, tighten the two side screws (1).
- Insert the timing control chain on the crankshaft.
 - Insert the chain tensioner pad of the head and lock it with the fixing screw.



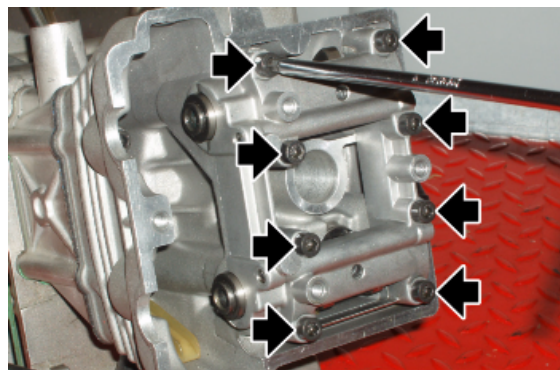
- Insert the camshafts in their seats on the head, remember to position the camshaft marked with the letter (A) on the intake side and the camshaft marked with the letter (S) on the exhaust side.

WARNING

POSITION THE CAMS OF BOTH SHAFTS FACING OUTWARDS.



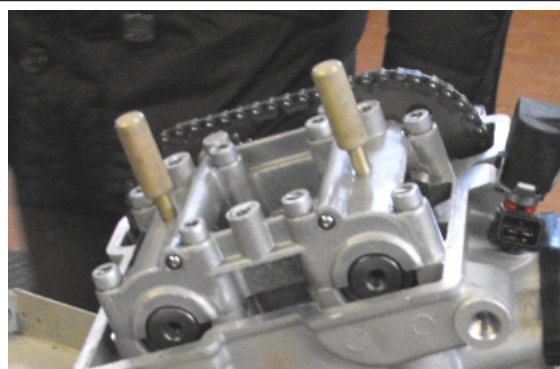
- Position the cam tower cap.
- Screw but do not and tighten the eight screws.



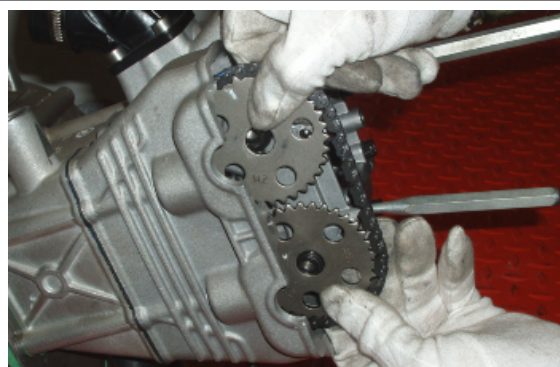
- Place the pins in their positions on the overhead camshafts.

Specific tooling

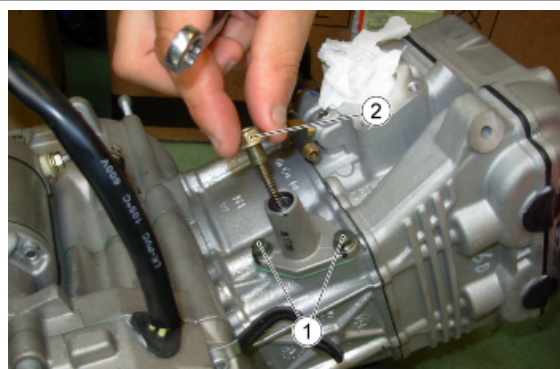
864567 Camshaft timing adjustment lock pins



- Place the camshaft gears on the chain, be careful not to invert the original direction of rotation.
- Keep the camshafts locked with the pins and screw but do not tighten the screws fixing the gears using Loctite 243.



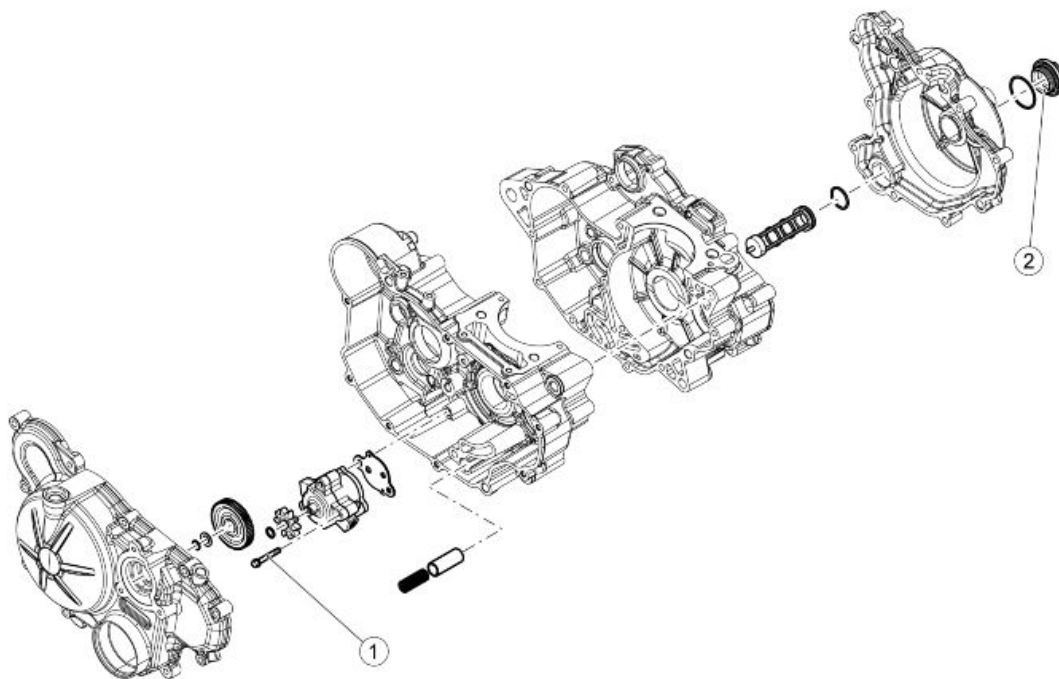
- Fit the chain tensioner on the cylinder using a new gasket, and tighten the two screws (1) to the prescribed torque.
- Insert the spring with the central screw (2) and o-ring, and tighten the cap to the prescribed torque.



- Tighten the screws fixing the camshaft gears to the prescribed torque.
- Remove the pins on the camshafts.
- Remove the specific crankshaft locking tool.
- Tighten the screw on the crankcase.

- Check the valve clearance and adjust it if required.
- Refit the tappet cover.

Lubrication



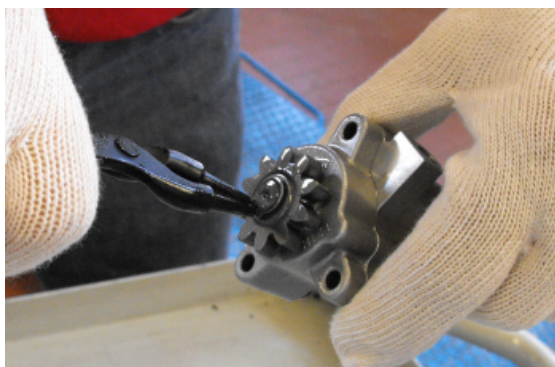
OIL PUMP

pos.	Description	Type	Quantity	Torque	Notes
1	Oil pump fastener screw	M5x35	3	4 Nm (2.95 lb ft)	Loctite 243
2	Oil cap retainer	-	1	25 Nm (18.44 lb ft)	-

Oil pump

Removing

- Remove the Seeger ring.



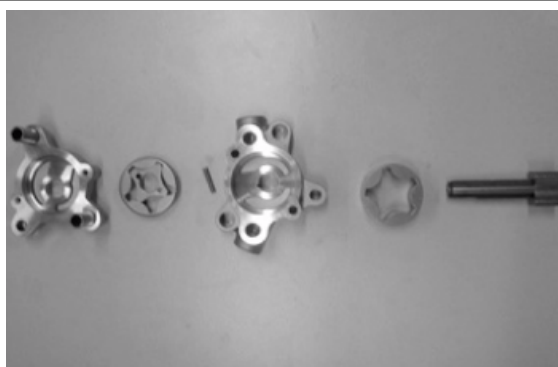
- Remove the pump gear.



- Remove the pump gear.

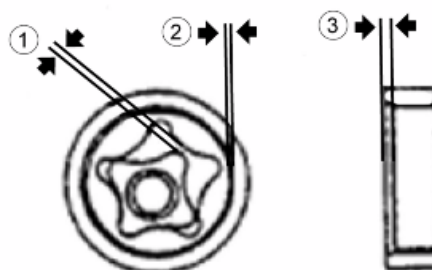


- Separate the components to inspect them.



Inspection

- Measure distance between rotors with a feeler gauge at the positions shown in the picture.



Characteristic

Oil intake rotor

Thickness: 13.5 mm (0.53 in)

Oil supply rotor

Thickness: 8.5 mm (0.33 in)

Standard values

Radial clearance (1) between points of the rotor:

0.04 mm (0.0015 in)

Radial clearance (2) between points of the rotor:

0.08 mm (0.003 in)

Radial clearance (3) between rotor 1 and the pump

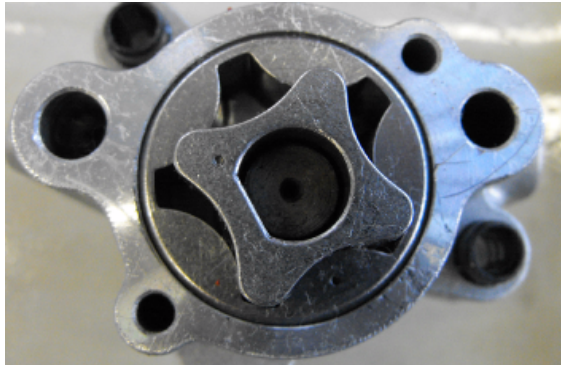
body: 0.04 mm (0.0015 in)

Radial clearance (3) between rotor 2 and the pump

body: 0.05 mm (0.0019 in)

Installing

- Refit the oil pump proceeding in reverse order of disassembly. Pay attention to the direction of the rotor, the dot should stay on the opposite part of the resting face.

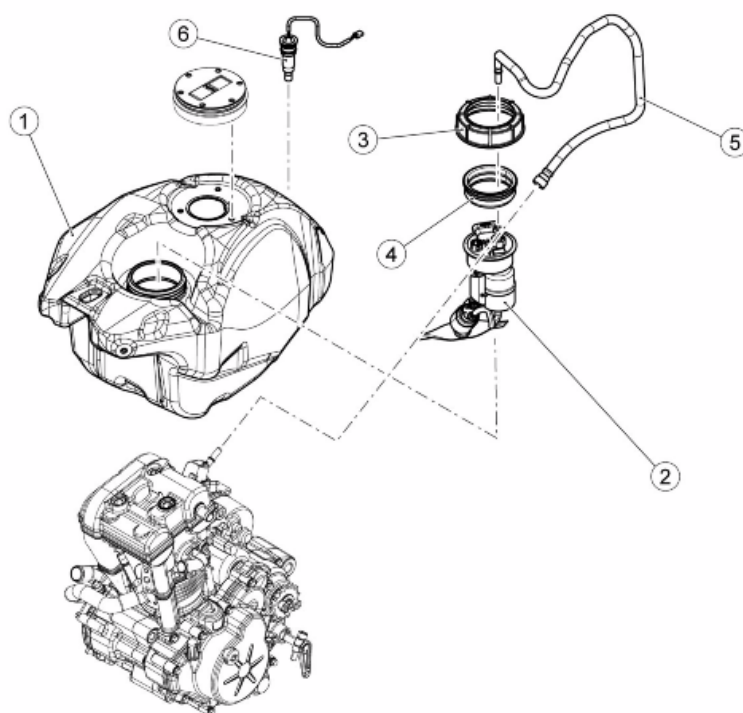


INDEX OF TOPICS

POWER SUPPLY

P SUPP

Circuit diagram



Key:

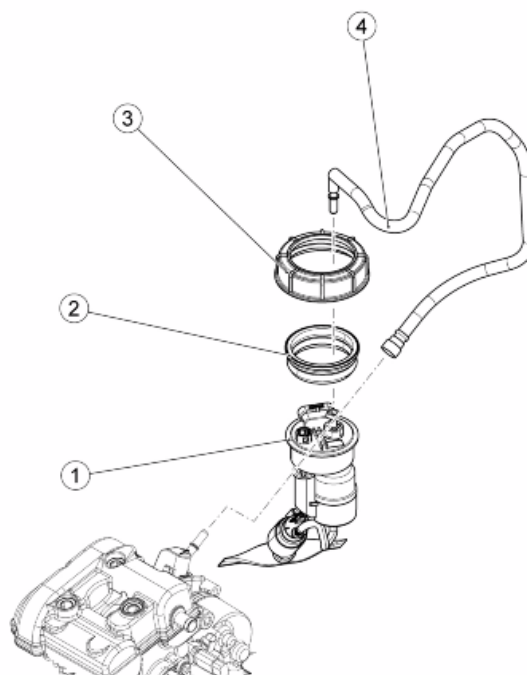
- 1. Fuel tank
- 2. Fuel pump
- 3. Fuel pump ring nut
- 4. Fuel pump gasket
- 5. Fuel pipe
- 6. Fuel level probe

Fuel pump

Removing

Remove and empty the fuel tank.

- Remove the fuel hose (4).
- Loosen the ring nut (3) and slide off the gasket (2).
- Remove the pump (1).



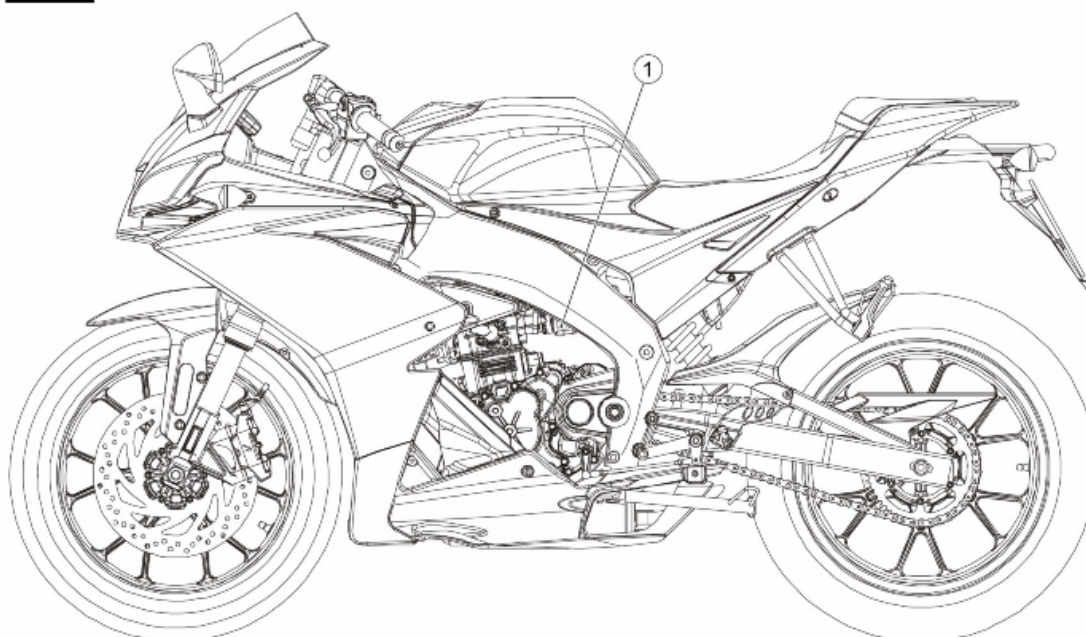
See also

Fuel tank

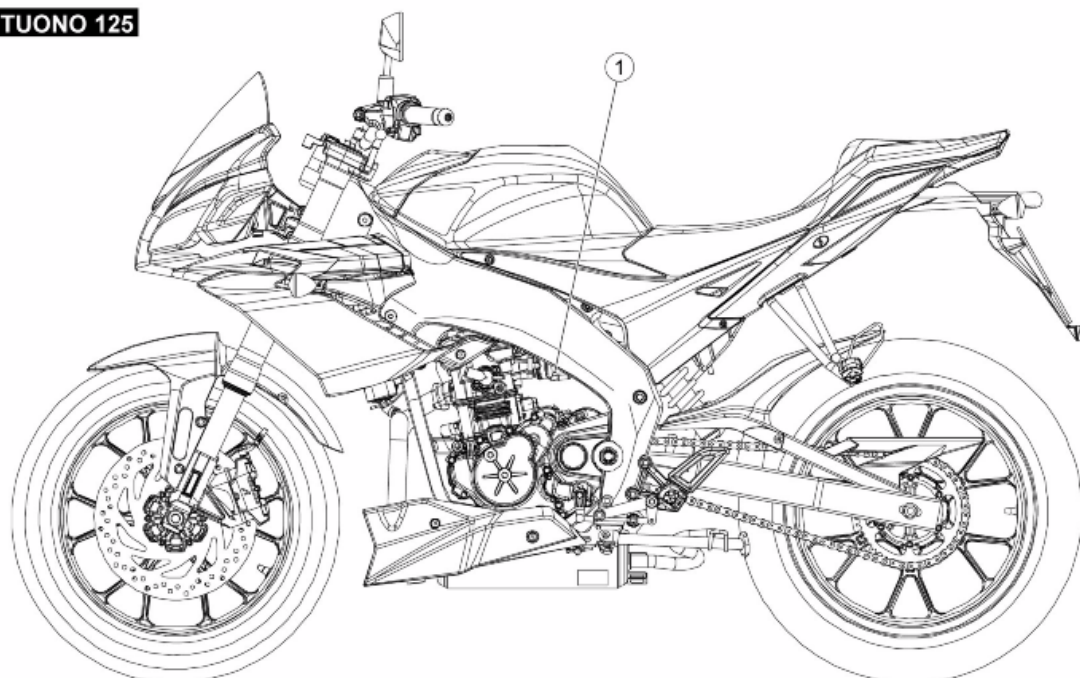
Injection

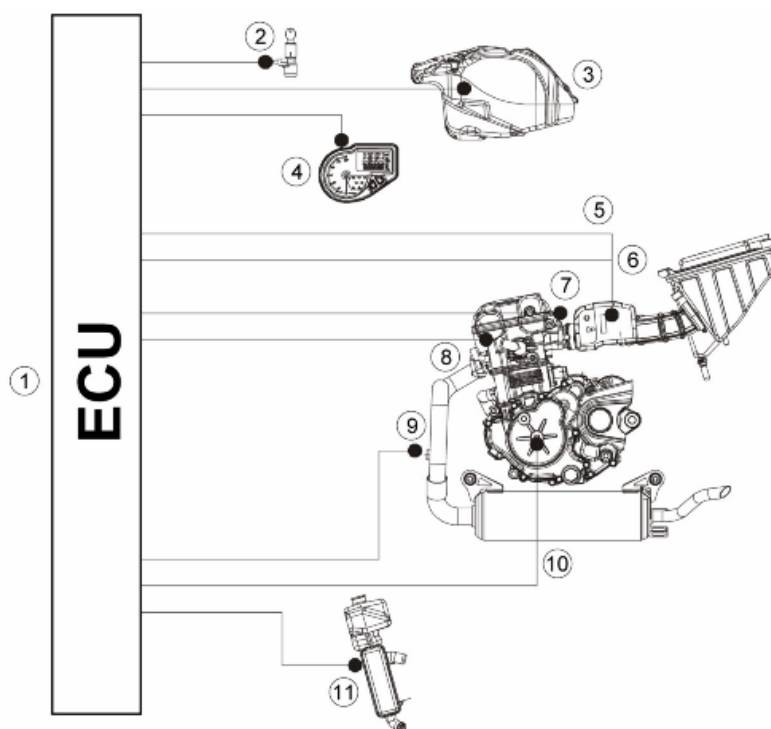
Diagram

RS 125



TUONO 125

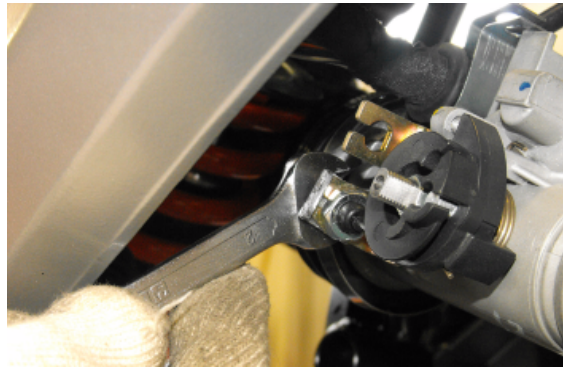


**Key**

1. ECU control unit position
 2. Ignition switch
 3. Fuel pump
 4. Instrument panel
 5. Air temperature sensor
 6. Throttle valve position sensor
 7. Injector
 8. Coolant temperature sensor
 9. Lambda probe position
 10. Engine speed sensor
 11. Electric fan
-

Removing the throttle body

- Remove the filter box.
- Loosen and remove the nut and unhook the throttle cable.



- Disconnect the connector.



- Undo and remove the screw and remove the cable guide.



- Loosen the clamp and remove the throttle body.

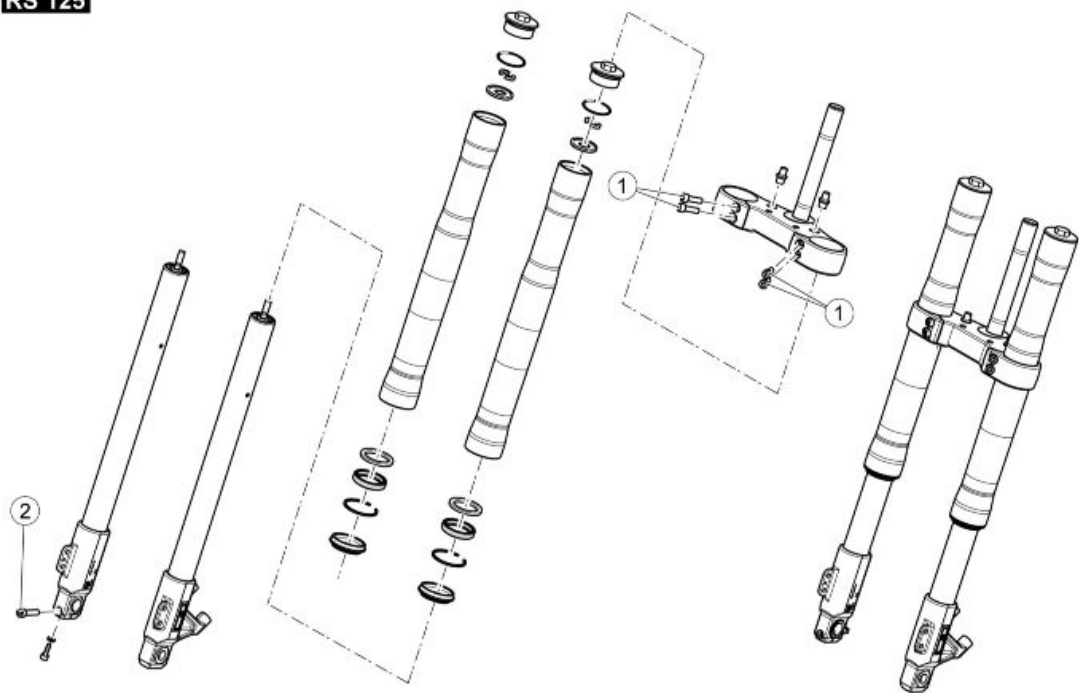


INDEX OF TOPICS

SUSPENSIONS	SUSP
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Front

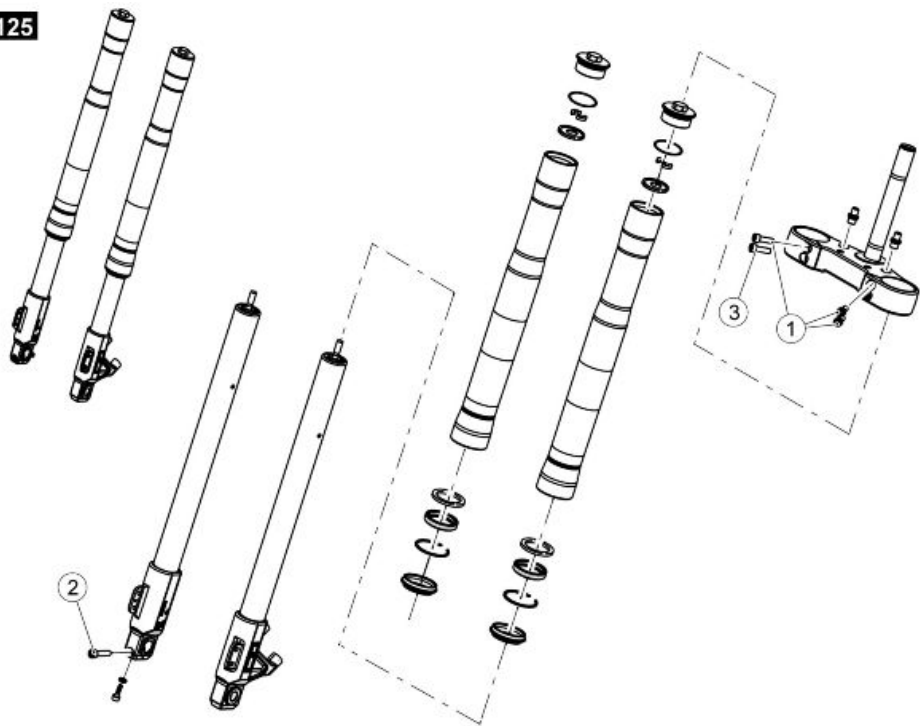
RS 125



FRONT SUSPENSION

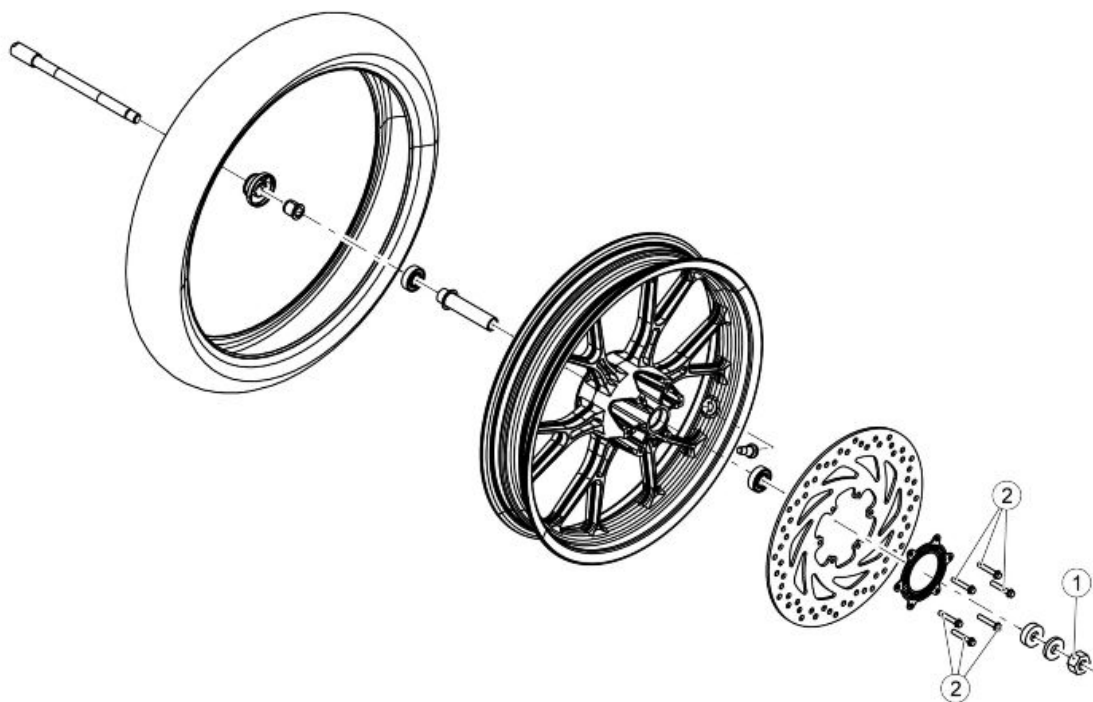
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening bottom steering yoke to fork	M8	4	25 Nm (18.44 lb ft)	-
2	Screw fastening calliper mounting bracket	M8	1	20 Nm (14.75 lb ft)	-

TUONO 125



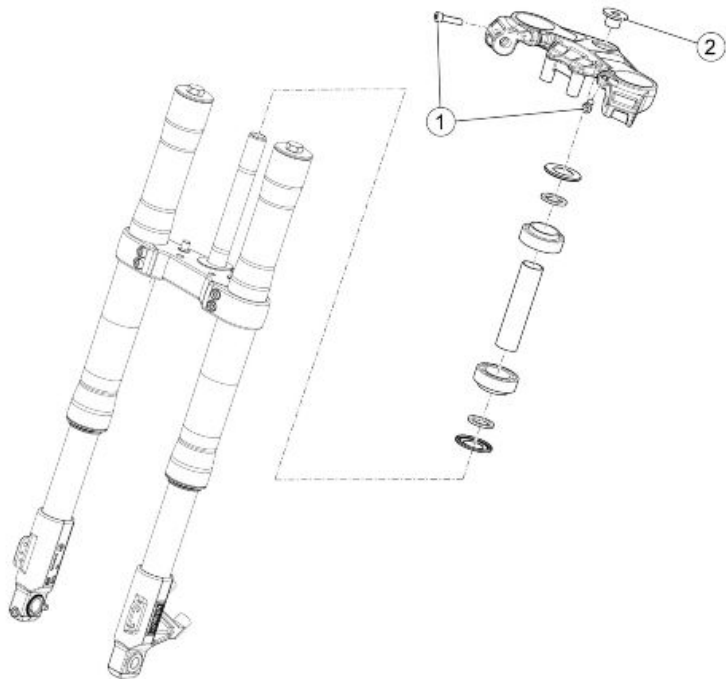
FRONT SUSPENSION

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening bottom steering yoke to fork	M8	3	25 Nm (18.44 lb ft)	-
2	Screw fastening calliper mounting bracket	M8	1	20 Nm (14.75 lb ft)	-
3	Screw fastening bottom steering yoke to fork	M8	1	25 Nm (18.44 lb ft)	-

**FRONT WHEEL**

pos.	Description	Type	Quantity	Torque	Notes
1	Front wheel axle nut	M14	1	78 Nm (57.53 lb ft)	-
2	Front disc/tone wheel fastener screws	M6x20	6	12 Nm (8.85 lb ft)	Pre-permeated
-	Flanged hex head screw fastening the ABS sensor	M5x16	1	6 Nm (4.43 lb ft)	Loct. 243

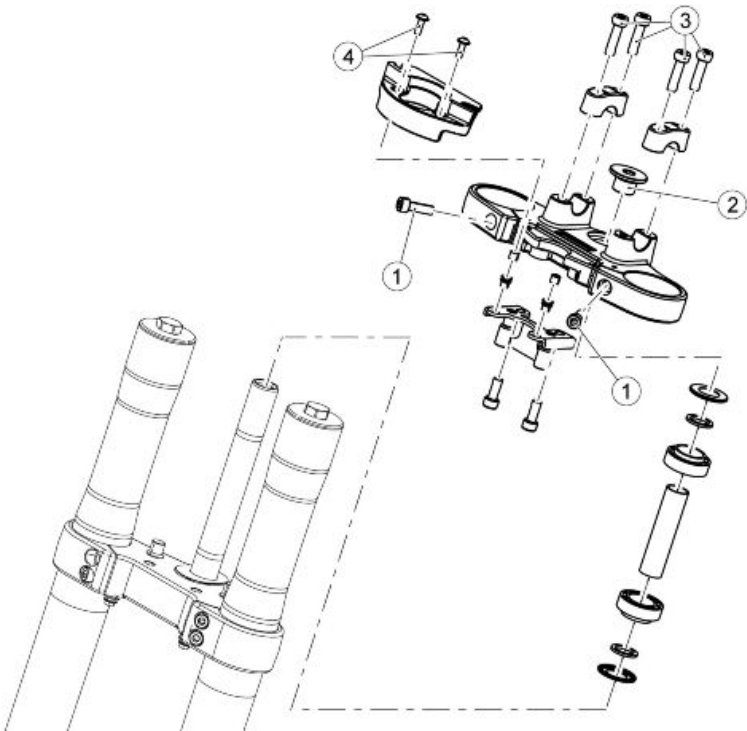
RS 125



STEERING

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening top steering yoke to fork	M8	2	25 Nm (18.44 lb ft)	-
2	Handlebar fastener nut	M20	1	48 Nm (35.40 lb ft)	-

TUONO 125



STEERING					
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening top steering yoke to fork	M8	2	25 Nm (18.44 lb ft)	-
2	Handlebar fastener nut	M20	1	48 Nm (35.40 lb ft)	Loct. 243
3	Handlebar U-bolt fastener screws	M8	4	20 Nm (14.75 lb ft)	-
4	Ignition switch assembly cover fastening screws	M5	2	5 Nm (3.69 lb ft)	-

Removing the front wheel

- Support the front of the vehicle, fastening a suitable strap to the handlebar and to a hoist.
- Undo and remove the fastener nut and retrieve the washer.



- Loosen the screw retaining the calliper mounting bracket.
- Supporting the weight of the wheel, partially pull out the axle from the right hand side of the motorcycle and retrieve the spacer washer on the left hand side of the motorcycle.



- Pull the axle out completely and remove the collar.



- Remove the wheel.



Checking the front wheel

FRONT WHEEL BEARINGS

Check the bearings installed on the wheel.



CHECK THE CONDITION OF ALL COMPONENTS AND OF THE COMPONENTS INDICATED AS FOLLOWS IN PARTICULAR.

CHECKING ROTATION

- Manually rotate the inner race of each bearing. The race must turn smoothly without impediment or noise.

If one or both bearings are not conformant:

- Replace both wheel bearings.

CHECKING RADIAL AND AXIAL PLAY

- Check the radial and axial play.

Axial play: minimal axial play is permitted.

Radial: none.

If one or both bearings are not conformant:

- Replace both wheel bearings.



ALWAYS REPLACE BOTH BEARINGS.

ALWAYS REPLACE THE BEARINGS WITH COMPONENTS OF THE SAME TYPE.

SEALS

- Check the condition of the seals; replace if damaged or excessively worn.

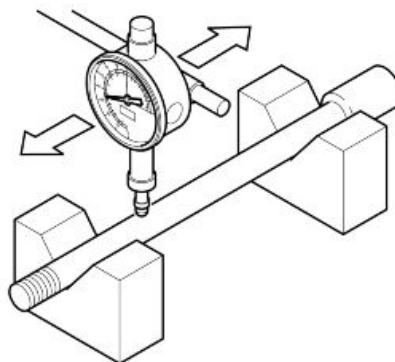


ALWAYS REPLACE BOTH SEALS TOGETHER.

ALWAYS REPLACE THE SEALS WITH COMPONENTS OF THE SAME TYPE.

WHEEL AXLE

- Use a dial gauge to measure the eccentricity of the wheel axle. Replace the wheel axle if the eccentricity measured exceeds the specified limit.



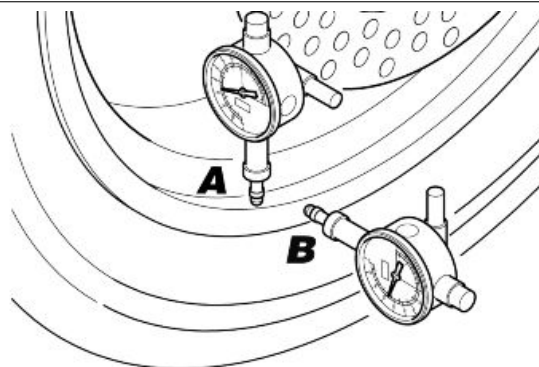
Characteristic

Maximum eccentricity:

0.2 mm (0.0079 in)

WHEEL

- Use a dial gauge to check that the radial (A) and axial (B) eccentricity of the wheel do not exceed the specified limits. Excessive eccentricity is usually caused by worn or damaged bearings. If eccentricity is not within the indicated limits after replacing the bearings, replace the wheel.



Characteristic

Maximum radial (A) eccentricity:

0.6 mm (0.0236 in)

Maximum lateral (B) eccentricity:

0.5 mm (0.0197 in)

Installing the front wheel

- Repeat the front wheel removal procedure in reverse order, making sure that the components are positioned correctly and that the correct tightening torques are applied.

CAUTION

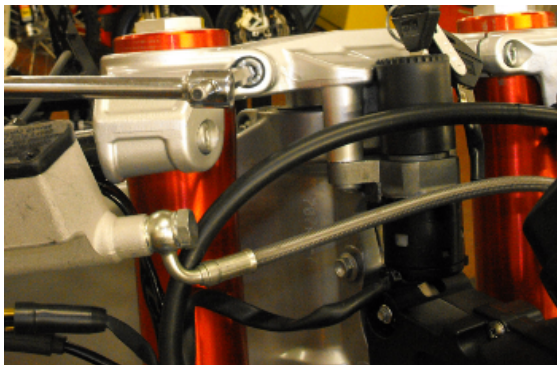
AFTER MOUNTING THE FRONT WHEEL, CHECK THAT THE DISTANCE BETWEEN THE ABS SENSOR AND THE PHONIC WHEEL IS BETWEEN 0.3 mm (0.012 in) AND 1.2 mm (0.047 in).

Front fork

Removing the fork legs

The following instructions describe the procedure for removing one fork but are applicable for both forks.

- Support the front of the vehicle, fastening a suitable strap to the handlebar and to a hoist.
 - Place a support stand under the sump and fit the rear support stand.
 - Remove the front wheel and the front brake callipers.
 - Loosen the screw fastening the fork to the top steering yoke.
-
- Loosen the two screws fastening the fork to the bottom steering yoke.
 - Pull the fork stanchion out from below.



Disassembling the fork

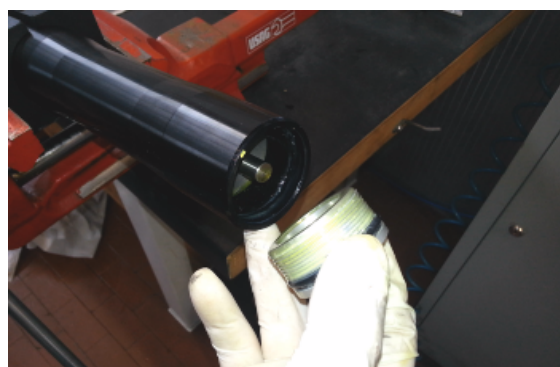
CAUTION

THE FOLLOWING OPERATIONS REFER TO A SINGLE WHEEL HOLDER STEM / SLEEVE BUT APPLY TO BOTH.

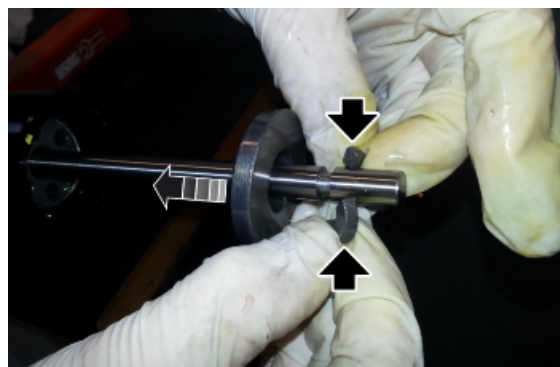
- Fit the fork in the vice using the special Teflon grips.



- Unscrew and remove the cap



- Remove the internal piston and, lowering the lock washer, remove the two half cylinders



- Remove the lock washer

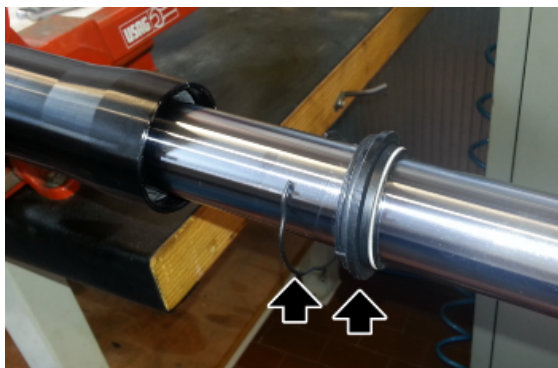
**CAUTION**

BEFORE PROCEEDING WITH THE FOLLOWING OPERATIONS GET A SUITABLE COLLECTION CONTAINER.

- Remove the stem from the vise and drain off the oil inside it into the collection container.



- Reposition the stem in the vise using the specific Teflon shoes.
- Remove the dust gaiter, taking care for the surface of the stem and the integrity of the dust gaiter.
- Remove the retainer ring.



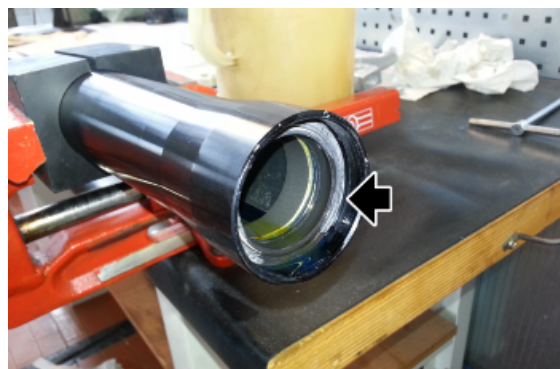
- Remove the stem from the sleeve.

CAUTION

BE CAREFUL NOT TO DAMAGE THE SLEEVE INTERIOR WHEN REMOVING THE DIFFERENT COMPONENTS.



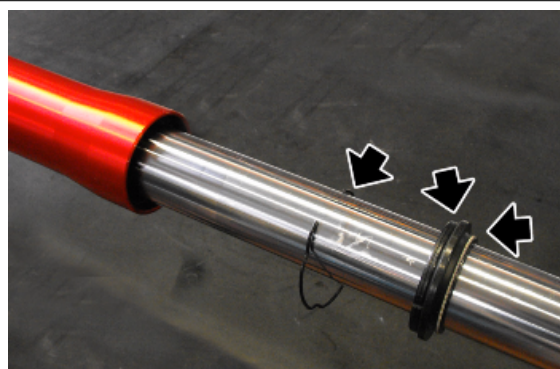
- Remove the oil seal from the sleeve, taking care not to damage it



Checking the components

SPARE WHEEL HOLDER STEM

- Check that the sliding surface is not scratched or scored. Any scoring can be removed by sanding with damp sandpaper (grain 1).
- If the scratches are deep, replace the stem.
- Using a dial gauge, check that any bending of the stem is below the limit value.
- If it is over the limit, replace the stem.



Bending limit: 0.2 mm

CAUTION



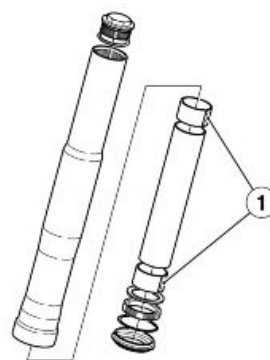
A BENT STEM SHOULD NEVER BE STRAIGHTENED SINCE ITS STRUCTURE WOULD BE WEAKENED MAKING THE VEHICLE DANGEROUS TO USE.

- Replace the following components with new ones:
 - seal ring;
 - dust gaiter;
 - O-ring on the cap.

- Check for damage and/or cracks; if it is damaged, replace it.
- Check the condition of the sliding bushings (1).
- If there is evidence of excessive wear or damage, replace the component concerned.

CAUTION

REMOVE ANY IMPURITIES FROM THE BUSHINGS, BEING CAREFUL NOT TO SCRATCH THEIR SURFACES.

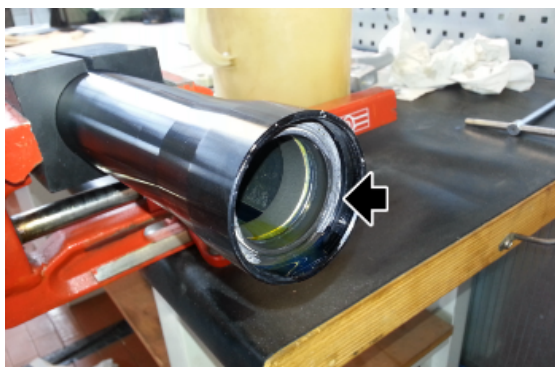


Reassembling the fork

CAUTION

THE FOLLOWING OPERATIONS REFER TO A SINGLE WHEEL HOLDER STEM / SLEEVE BUT APPLY TO BOTH.

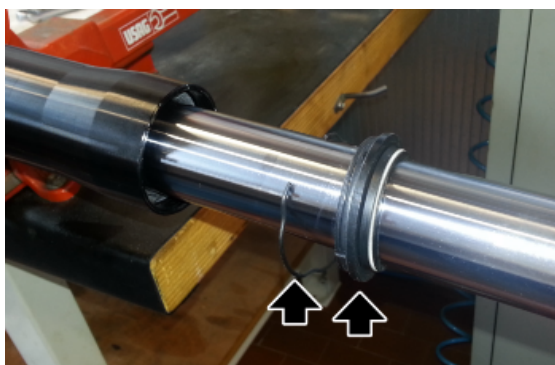
- Insert the oil seal in the sleeve



- After inserting the dust gaiter in the stem as well as the retainer ring, insert the stem itself in the sleeve



- Position the retainer and push the dust gaiter into its seat

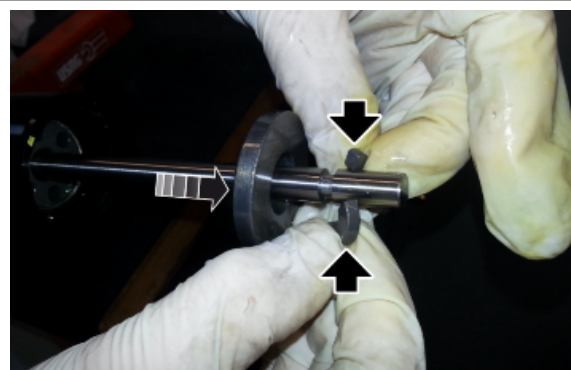


- Insert the retainer ring

- Insert the retainer ring



- Position the two half cylinders and lock them in place with the retainer ring



- Position the fork vertically in a vice
- Fill the fork with oil

Characteristic**Fork MingXing oil quantity**

Right stem: 355+/-5 ml (0.0781+/-0.0011 UK gal;
0.0938 +/-0.0013 US gal)

Left stem: 360 +/-5 ml (0.0792+/-0.0792+/-0.0011
UK gal; 0.0951 +/-0.0013 US gal)



- Screw the cap on the sleeve



Installing the fork legs

- Fit the fork tube complete with stanchion into the bottom and top steering yokes.
- Insert the wheel axle into both stanchions to align the holes.



- Tighten the screws fastening the fork tube to the bottom steering yoke.



- Tighten the screw fastening the top steering yoke to the fork tube.



- Remove the wheel axle.
- Fit the front wheel.
- Fit the front brake calliper and tighten the two fastener screws.

- Lower the hoist arm.

CAUTION

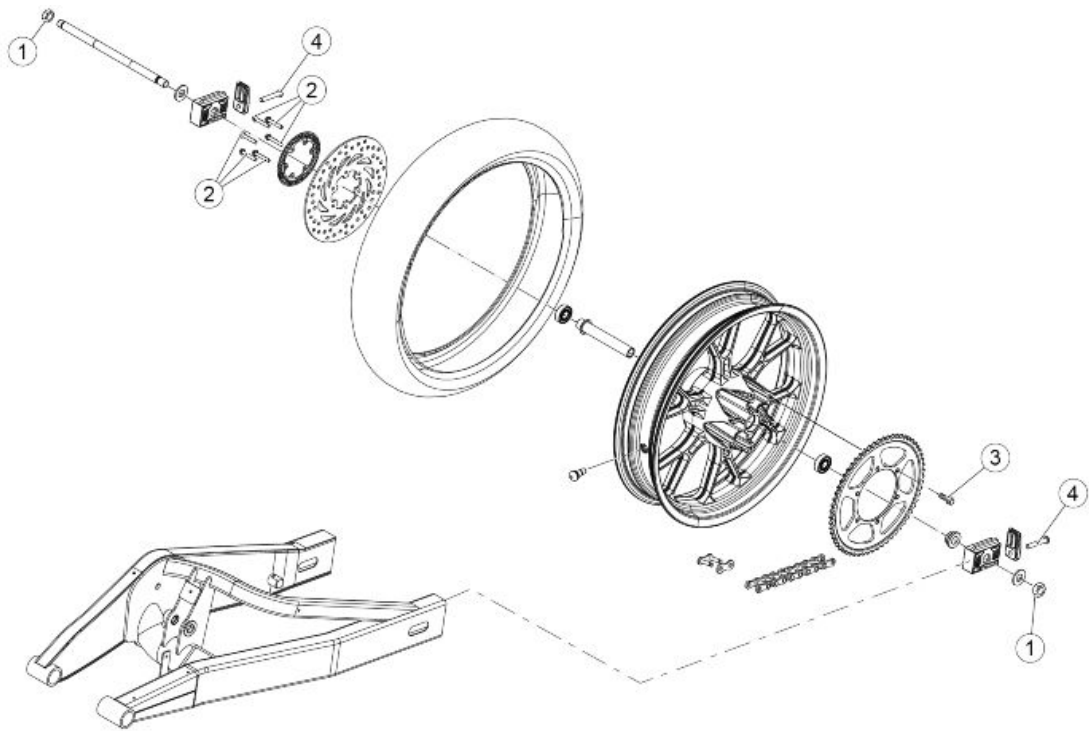
BEFORE RELEASING THE BELTS MAKE SURE THAT THE OPTIONAL REAR STAND IS CORRECTLY POSITIONED.

- Correctly install the lower shield, the mudguard, the front wheel and the brake callipers.
- Release the belts from the chassis.
- Check that the forks are working correctly by applying the front brake and pushing repeatedly on the forks.
- Operating must be progressive and there must not be any traces of oil on the stanchions.

CAUTION

BEFORE USING THE VEHICLE, CHECK THAT IT IS CORRECTLY SET.

Rear



REAR WHEEL

pos.	Description	Type	Quantity	Torque	Notes
1	Rear wheel axle fastener nut	M14	2	78 Nm (57.53 lb ft)	-
2	Rear disc fastening screw	M6x20	6	12 Nm (8.85 lb ft)	Pre-impregnated
3	Rear sprocket fastener screws	M8x25	6	25 Nm (18.44 lb ft)	Pre-impregnated
4	Chain tensioner fastener screw	M8	2	12 Nm (8.85 lb ft)	-

Removing the rear wheel



BEFORE CARRYING OUT THE FOLLOWING OPERATIONS, LEAVE THE ENGINE AND MUFFLER TO COOL TO AMBIENT TEMPERATURE TO PREVENT THE RISK OF BURNS.

CAUTION

DURING REMOVAL, TAKE CARE NOT TO DAMAGE THE PIPE, THE DISC AND THE BRAKE PADS.

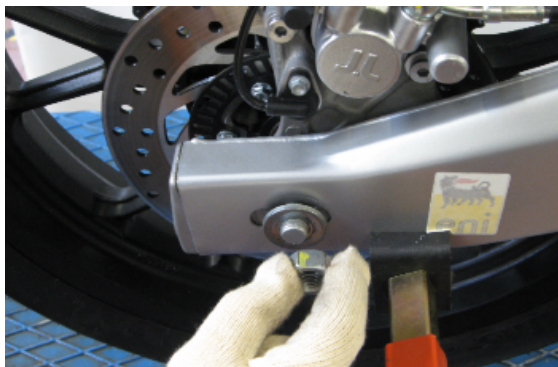
CAUTION

THE SPECIFIC REAR SUPPORT STAND IS NEEDED TO REMOVE THE REAR WHEEL.

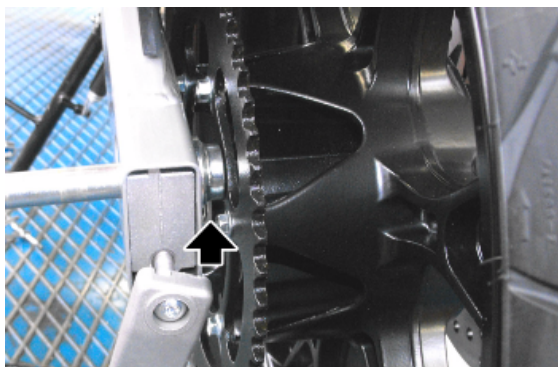
- Place the vehicle on the specific rear stand.
- Remove the drive chain.
- On both sides of the vehicle, remove the two adjuster screws.



- On the right hand side of the vehicle, undo and remove the fastener nut and retrieve the washer.



- Move the wheel back by a few millimetres while supporting it, then drive out the pivot bolt and remove from the left hand side.
- Retrieve the washer and the spacer.



- Remove the rear wheel completely and check the mechanical components.

Checking the rear wheel



CHECK THE CONDITION OF ALL COMPONENTS AND OF THE COMPONENTS INDICATED AS FOLLOWS IN PARTICULAR.

REAR WHEEL BEARINGS

Check the bearings installed on the wheel.

CHECKING ROTATION

- Manually rotate the inner race of each bearing. The race must turn smoothly without impediment or noise.

If one or both bearings do not fall within the control parameters:

- Replace both wheel bearings.



ALWAYS REPLACE BOTH BEARINGS.

ALWAYS REPLACE THE BEARINGS WITH COMPONENTS OF THE SAME TYPE.

- Check the radial and axial play.

Axial play: minimal axial play is permitted.

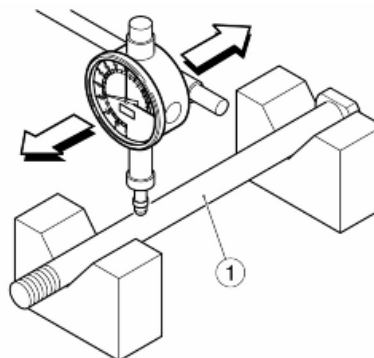
Radial: none.

If one or both bearings do not fall within the control parameters:

- Replace both wheel bearings.

WHEEL AXLE

- Use a dial gauge to measure the eccentricity of the wheel axle (1). Replace the wheel axle (1) if the eccentricity measured exceeds the specified limit.



Characteristic

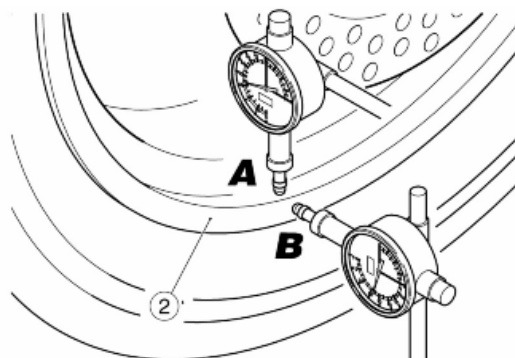
Maximum eccentricity:

0.2 mm (0.0079 in)

WHEEL RIM

- Use a dial gauge to check that the radial (A) and axial (B) eccentricity of the wheel (2) do not exceed the specified limits.

Excessive eccentricity is usually caused by worn or damaged bearings. If eccentricity is not within



the indicated limits after replacing the bearings,
replace the wheel (2).

Characteristic**Maximum radial (A) eccentricity:**

0.6 mm (0.0236 in)

Maximum lateral (B) eccentricity:

0.5 mm (0.0197 in)

CROWN GEAR

- Check the condition of the teeth of the crown gear (3).

If excessively worn:

- replace the crown gear.



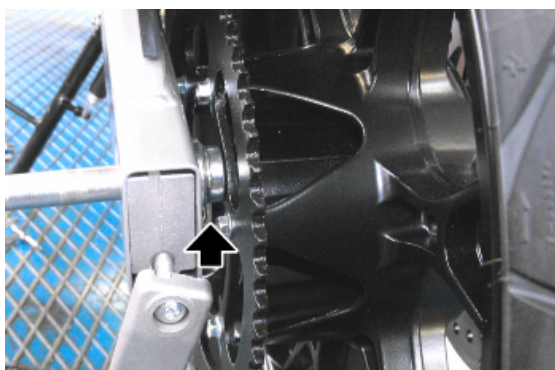
TO PREVENT NEW COMPONENTS FROM WEARING PREMATURELY, THE REAR SPROCKET, FRONT SPROCKET AND DRIVE CHAIN MUST ALWAYS BE REPLACED TOGETHER AS A SET.

CAUTION

WHEN REPLACING THE SPROCKET REPLACE THE PRE-IMPREGNATED SCREWS WITH NEW ONES. BEFORE FITTING THE SCREWS CAREFULLY CLEAN THE THREADED HOLES REMOVING ANY RESIDUES..

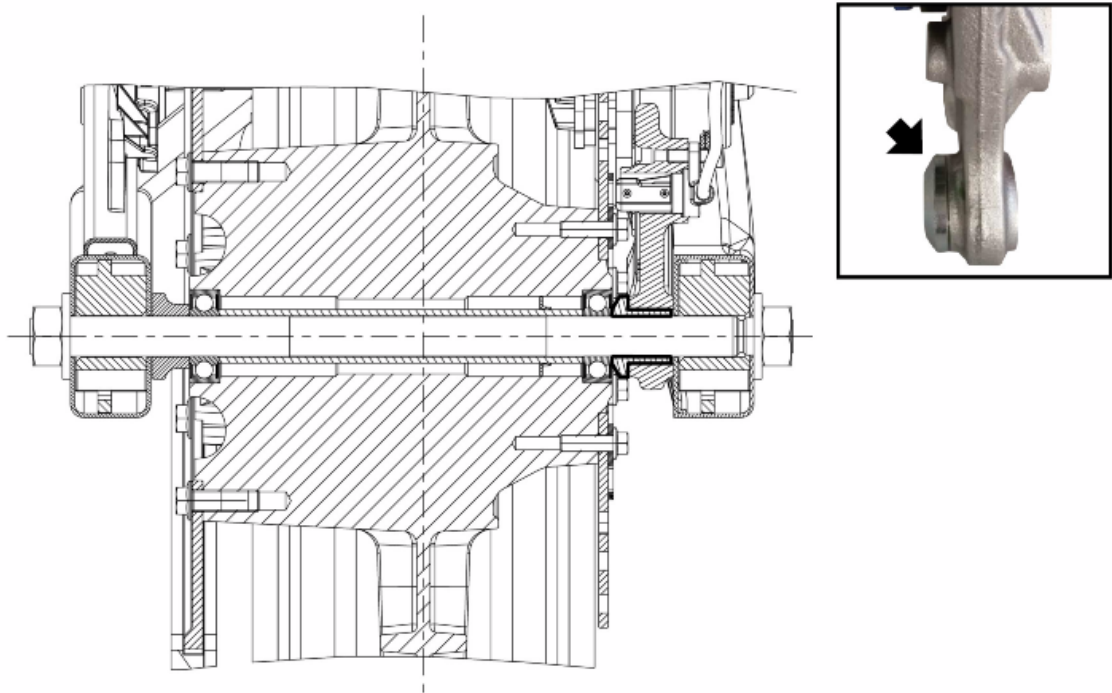
Installing the rear wheel

- Repeat the removal procedure in reverse order, taking care to insert the spacer correctly on the left hand side, as indicated in figure.
- Tighten the nuts, applying the pre-determined torque.

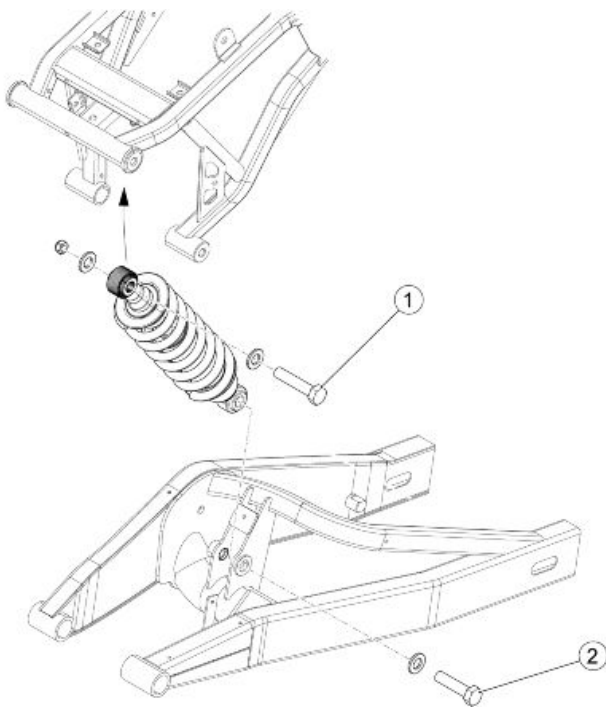
**CAUTION**

AFTER MOUNTING THE REAR WHEEL, CHECK THAT THE DISTANCE BETWEEN THE ABS SENSOR AND THE PHONIC WHEEL IS BETWEEN 0.3 mm (0.012 in) AND 2 mm (0.079 in).

- Ensure the spacer bushing mounted on the rear brake calliper plate is mounted in the correct direction.



Shock absorbers

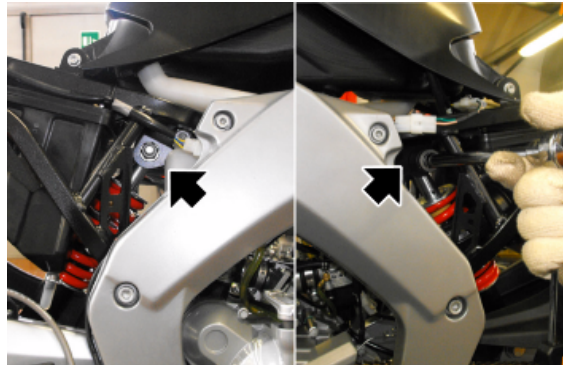


REAR SUSPENSION

pos.	Description	Type	Quantity	Torque	Notes
1	Upper mount fastener screw	M12	1	58 Nm (42.78 lb ft)	-
2	Lower fastener screw	M12	1	58 Nm (42.78 lb ft)	Loctite 243

Removing

- Remove both central side fairings.
- Place the vehicle on its optional front service stand.
- Support the vehicle rear part using belts and hoist.
- Place a support under the swingarm, so that it stays in neutral position.
- Unscrew and remove the front screw and collect the washer
- At the same time, collect the nut and washer from the right side.

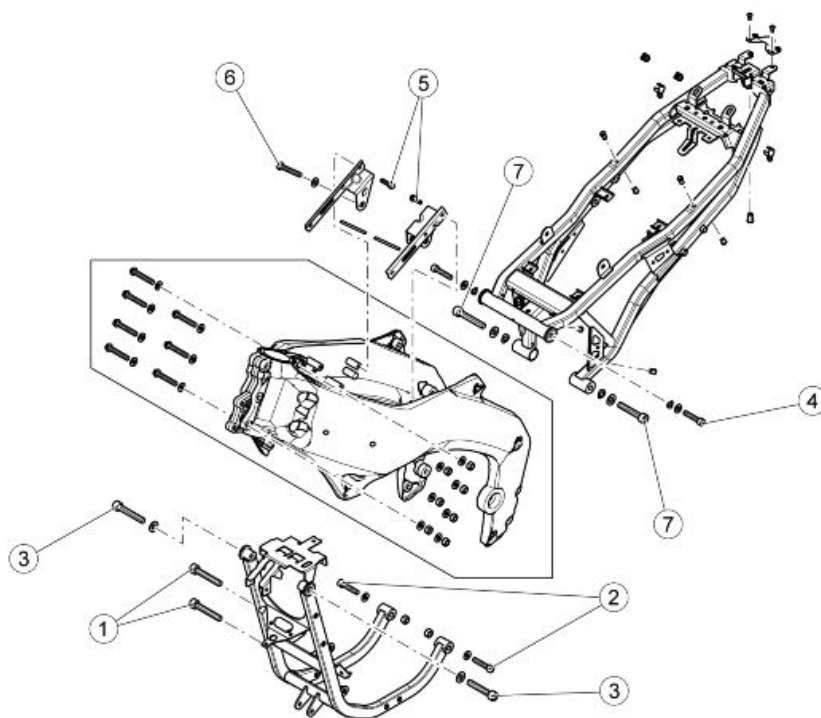


- Unscrew and remove the lower screw on the left side and collect the washer
- At the same time, collect the nut and washer from the right side.



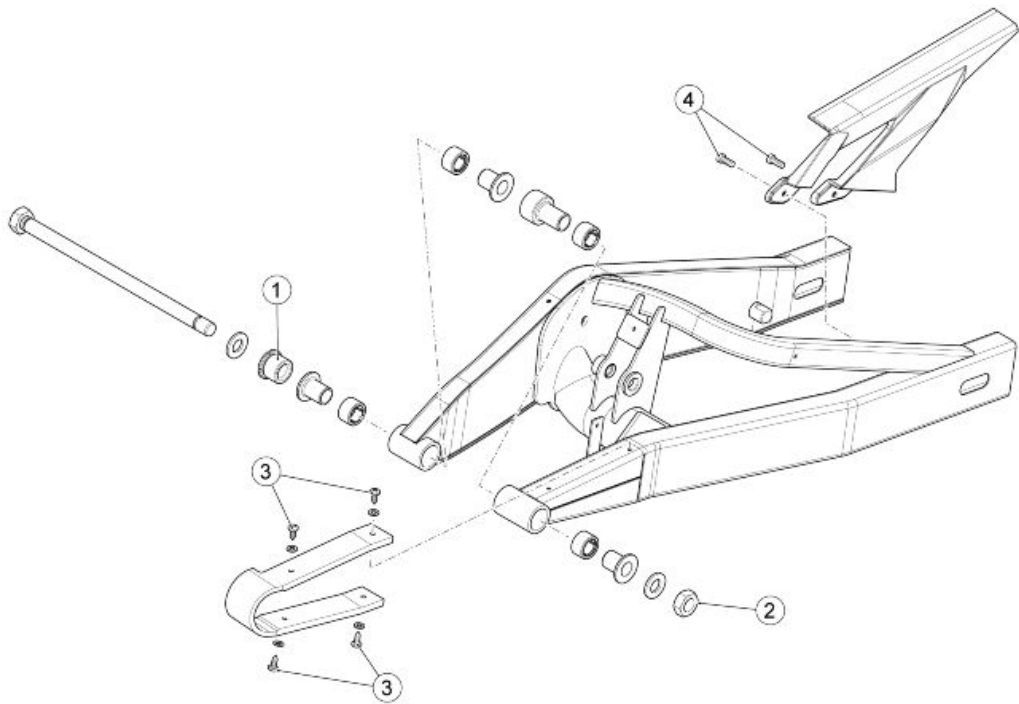
INDEX OF TOPICS

CHASSIS	CHAS
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**CHASSIS**

Pos.	Description	Type	Quantity	Torque	Notes
1	Screws fastening the engine to the cradle	M10	2	50 Nm (36.88 lb ft)	-
2	Cradle fixing screw	M8	2	25 Nm (18.44 lb ft)	-
3	Saddle mounting fixing screw	M10x45	2	50 Nm (36.88 lb ft)	-
4	Saddle mounting fixing screw	M8x40	2	25 Nm (18.44 lb ft)	Loctite 243
5	Mounting bracket fixing screw	M6x16	4	12 Nm (8.85 lb ft)	Loctite 243
6	Left and right engine mount screw	M10	2	38 Nm (28.02 lb ft)	Loctite 243
7	Saddle mounting fixing screw	M10	2	50 Nm (36.88 lb ft)	Loctite 243

Swinging arm



SWINGARM

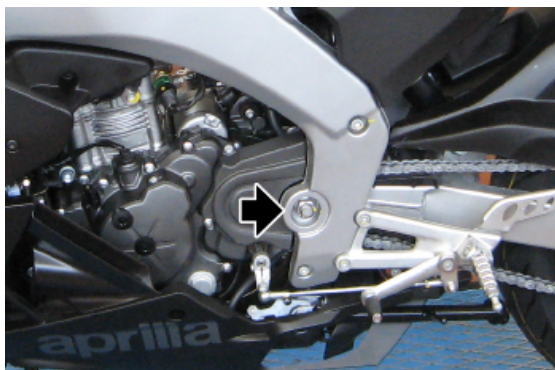
pos.	Description	Type	Quantity	Torque	Notes
1	Nut adjusting swingarm alignment relative to frame	M25x1.5	1	15 Nm (11.06 lb ft)	-
2	Swingarm pin nut	M14	1	78 Nm (57.53 lb ft)	-
3	Chain guide fastener screw	Self tapping	4	1 Nm (0.74 lb ft)	-
4	Chain guard fastener screw	Self tapping	2	2 Nm (1.48 lb ft)	-

Removing

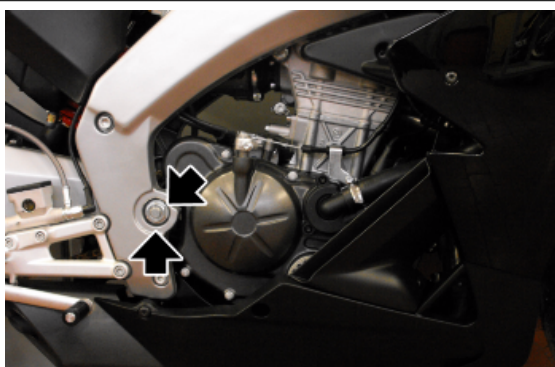
- Place the vehicle on the front stand.
- Support the rear of the vehicle with straps and a hoist.
- Remove the rear brake calliper complete with speed sensor and remove the tube connected to the sensor cable.
- Remove the wheel and the rear shock absorbers.



- Working on both sides, loosen the nuts fastening the swingarm pivot bolt.
- On the LH side, undo and remove the nut and retrieve the washer.



- On the RH side of the vehicle, undo and remove the nut and retrieve the washer.
- Loosen the fastener ring nut using the special wrench.



Specific tooling

866714 Tool for adjusting swingarm nut

- Tapping gently with a rubber mallet, drive the swingarm pivot bolt and remove from the LH side of the vehicle.
- Remove the rear mudguard and the chain guard if necessary.

Checking

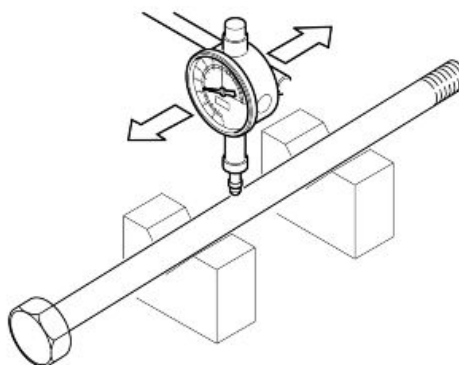
CAUTION

**CHECK THAT NO COMPONENT IS NOTICEABLY DISTORTED, DAMAGED, CRACKED AND/OR DENTED.
REPLACE ALL DAMAGED COMPONENTS.**

SWINGARM PIN

With a dial gauge check if the pin eccentricity exceeds the limit value. Otherwise, replace the pin.

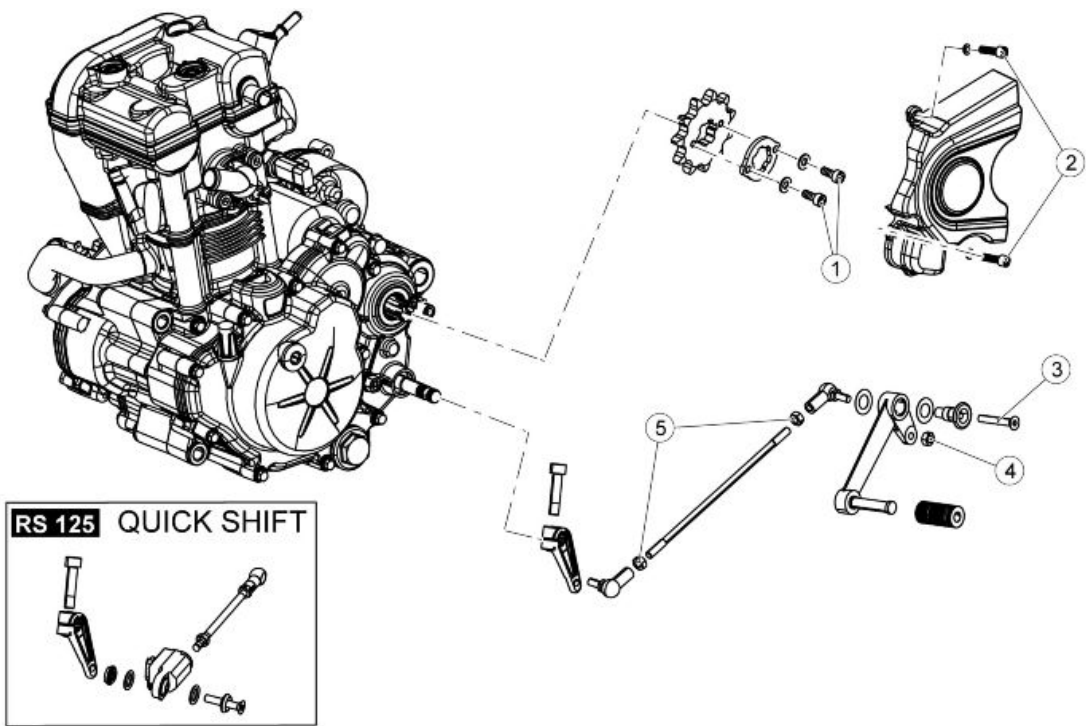
Maximum pin eccentricity: 0.3 mm (0.01 in)



Installing

- To install the swingarm follow the operations described for removal in reverse order, being careful to tighten the ring nuts, nuts and screws to the prescribed torque.

Pinion

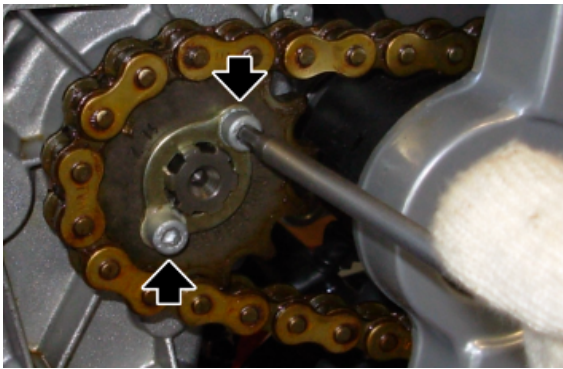


LINKAGE

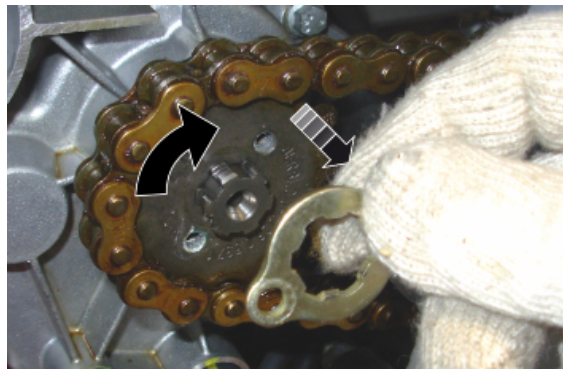
Pos.	Description	Type	Quantity	Torque	Note
1	Sprocket fastener screws	M5x10	2	4 Nm (2.95 lb ft)	Loctite 270
2	Front sprocket cover fastener screw	M5x16	2	4 Nm (2.95 lb ft)	
3	Gearbox lever fixing screws	M6	1	10 Nm (7.38 lb ft)	-
4	Gearbox lever fixing nut	M6	1	8 Nm (5.90 lb ft)	-
5	Gear tie-rod fixing nuts	M6	2	6 Nm (4.43 lb ft)	-

Removing

- Remove the pinion cover crankcase.
- Increase the chain clearance to allow removal of the pinion
- Remove fixing screws of the pinion lock plate



- Rotate the pinion lock plate to remove it from the shaft.



- Remove the pinion



Inspection

- Check the state of the teeth of the front and rear sprockets. If excessively worn, replace: the rear sprocket, front sprocket and drive chain.

CAUTION

TO PREVENT NEW COMPONENTS FROM WEARING PREMATURELY, REPLACE ALL THREE TOGETHER AS A SET.

Installing

- To install the front sprocket, follow the procedure for removal described previously in reverse order, tightening the screws to the specified torque.
-

Drive chain

Removing

- Support the vehicle with the optional rear stand.
- Loosen the chain tension, by unscrewing the rear adjuster screws.
- Identify the master link; slide off the clip.
- Remove the plate underneath.
- Collect the chain.



CAUTION

REPLACE THE ENTIRE UNIT IF THE CHAIN IS PARTICULARLY WORN.

See also

[Adjusting](#)

inspection

Also check the following parts and check that the chain, the front sprocket and the rear sprocket do not have:

- Damaged rollers.
- Loosened pins.
- Dry, corroded, crushed or seized links.
- Excessive wear.
- Excessively worn or damaged front or rear sprocket teeth.

CAUTION

IF ANY DAMAGED CHAIN ROLLERS AND/OR LOOSENED PINS ARE FOUND, THE ENTIRE CHAIN SET (FRONT SPROCKET, REAR SPROCKET AND CHAIN) MUST BE REPLACED. LUBRICATE THE CHAIN EVERY 500 km (310.69 mi), ESPECIALLY IF ANY DRY OR RUSTY PARTS ARE NOTED.

CRUSHED OR SEIZED LINKS MUST BE LUBRICATED AND RESTORED TO PROPER WORKING ORDER.

The vehicle has a chain with a 1/2" pitch closed using a link.

With wear, the chain lengthens. Replace the chain if there is lengthening equal to or more than 2%.

To check the chain wear, use the **Ognibene 529510001** ruler and follow the instructions below:

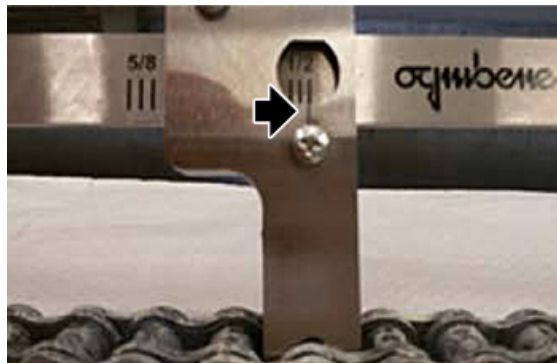
- Tension the chain
- Place the Ognibene 529510001 ruler on the chain rollers, in a section formed by eight chain steps



- Check that the measurement notches between the mobile part and the fixed part of the instrument match (1/2 step)

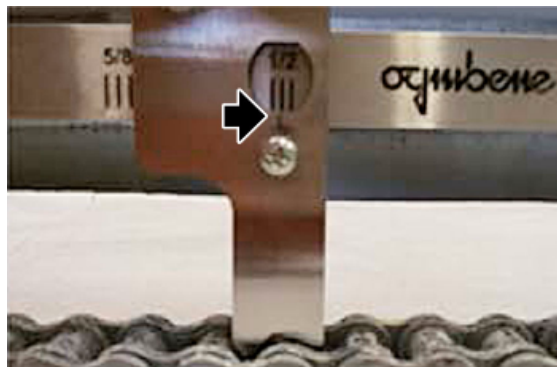
New chain:

- the notch of the mobile measuring instrument coincides with the first notch on the right of the fixed part of the instrument



Chain to be replaced:

- the notch of the mobile measuring instrument coincides with the central notch of the fixed part of the instrument



Installing

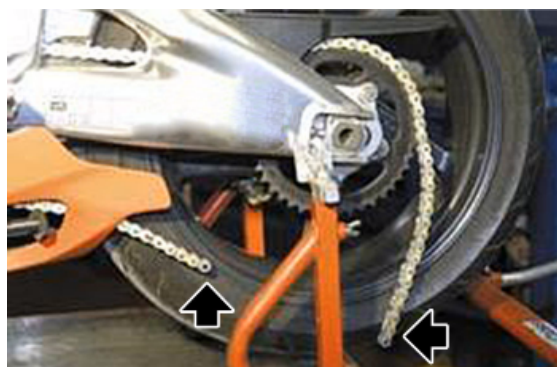
CAUTION

THIS VEHICLE IS FITTED WITH A CHAIN HAVING A PRESS-FIT TYPE CONNECTING LINK. TO INSTALL THE CHAIN, PROCEED AS FOLLOWS.

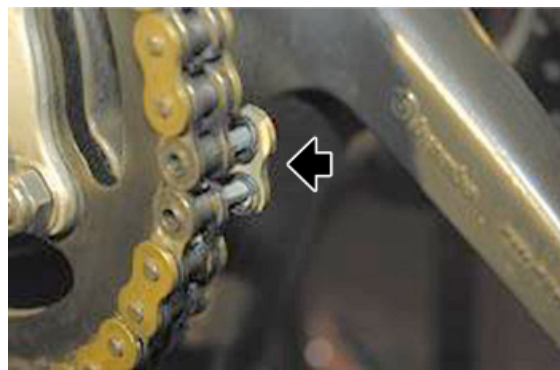
- Place the two ends of the new chain around the crown so that one follows the other on two teeth

CAUTION

THE LINK IS SUPPLIED ALREADY LUBRICATED WITH A SPECIAL GREASE THAT ENSURES A LONG LIFE. TO PREVENT REMOVING THE LUBRICANT FROM THE PINS GRIP THE LINK FROM THE OUTSIDE PLATE.



- Insert the new fork from the rear
- Insert the connecting plate at the point of the dowels



- Place the tool on the chain, inserting the centring dowel between the chain rollers
- Tighten the slider of the tool until it rests against the outer plate of the chain
- Using a wrench tighten until the top of the fork pins are against the holes of the mobile slider

**CAUTION**

DO NOT FORCE. THE LINK PLATE IS THUS FITTED WITH THE CORRECT PROTRUSION OF THE PINS.

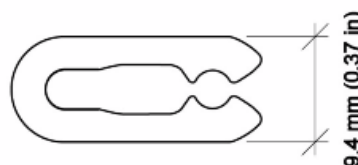
Specific tooling**805181B Tool for fitting chain link**

- Gradually unscrew the tool until the chain is free
- Place the safety spring on the pins
- Using a clamp force the spring so that it is perfectly housed in the channels of the pins
- Check that the link has been fitted correctly

**CAUTION**

THE POINTS OF THE SPRING SHOULD FACE THE OPPOSITE DIRECTION TO THE ROTATION DIRECTION OF THE CHAIN. BE CAREFUL NOT TO BEND OR DAMAGE THE SPRING WHEN FITTING IT.

The spring has been inserted in its housing correctly when it measures a maximum of 9.4 mm (0.37 in).



Adjusting

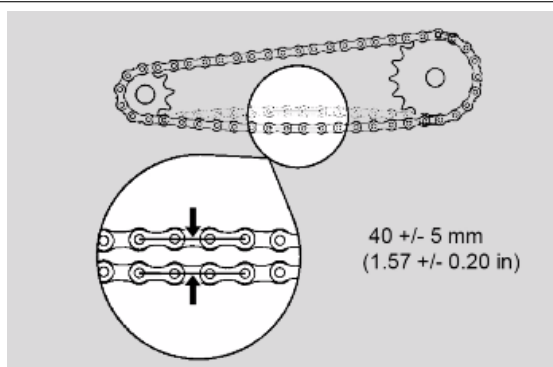
To check chain deflection:

- Shut off the engine.
- Rest the vehicle on the side stand.
- Select neutral.
- Move the tensioner roller away from the chain.

CAUTION

ENSURE THAT THE CHAIN TENSIONER ROLLER IS NOT IN CONTACT WITH THE CHAIN, AS THIS WILL PRODUCE AN INCORRECT DEFLECTION MEASUREMENT

- Check that the vertical deflection, in an intermediate position between the front and rear sprockets on the bottom section of chain, is 40 +/- 5 mm (1.57 +/- 0.20 in)
- Move the vehicle forwards to check the vertical deflection of the chain in other positions; the chain deflection must be constant throughout the entire rotation of the wheel.
- After checking, re-engage the roller with the chain.



CAUTION

IF THE DEFLECTION MEASURED IS LARGER IN CERTAIN POSITIONS, THIS IS INDICATIVE OF CRUSHED OR SEIZED CHAIN LINKS, AND THE CHAIN MUST BE REPLACED.

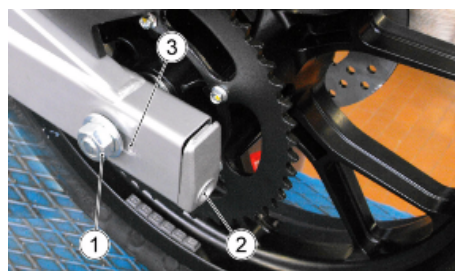
TO PREVENT THE RISK OF SEIZURE, LUBRICATE THE CHAIN REGULARLY - AT LEAST EVERY 500 km (310.69 mi)

SEE SCHEDULED MAINTENANCE TABLE

If the deflection is uniform but greater or lower than 40 +/- 5 mm (1.57 +/- 0.20 in), adjust the chain tension.

If, after checking the deflection, it is necessary to adjust the chain tension, follow the instructions given below.

- Place the vehicle on the specific rear support stand.
- On both sides of the vehicle, loosen the nut (1) completely.
- Turn the adjuster screw (2) relative to the reference markings (3) to adjust chain deflection.
- The nuts must be turned by the same amount relative to the reference markings (3) on both sides.
- Tighten the nuts (1).



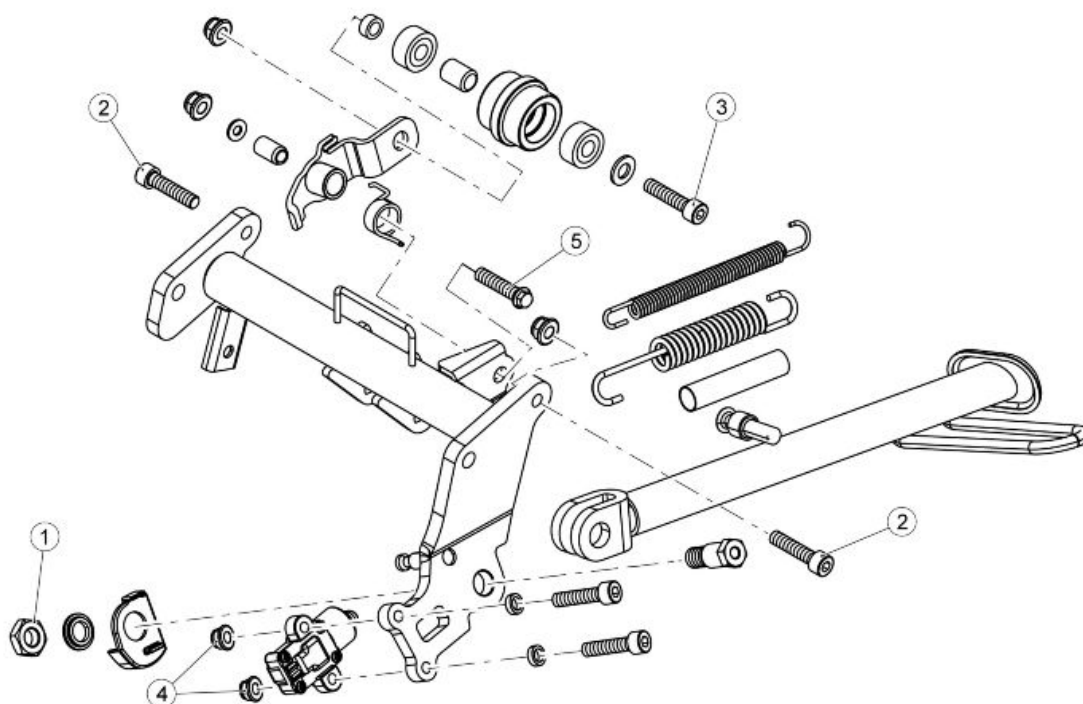
CAUTION

IF THE DEFLECTION MEASURED IS LARGER IN CERTAIN POSITIONS, THIS IS INDICATIVE OF CRUSHED OR SEIZED CHAIN LINKS. LUBRICATE THE CHAIN REGULARLY TO PREVENT THE RISK OF SEIZURE.

CAUTION

THE SPECIFIC OPTIONAL REAR SUPPORT STAND IS NECESSARY TO ADJUST THE CHAIN.

Chain tensioner

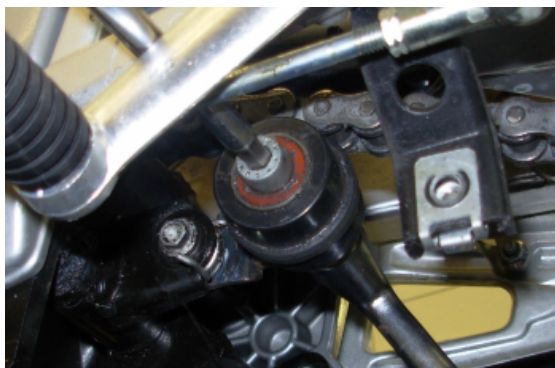


STAND

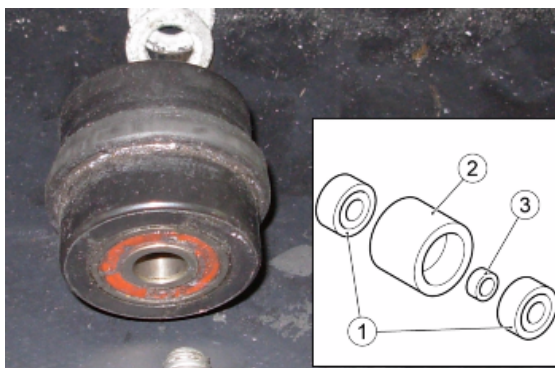
pos.	Description	Type	Quantity	Torque	Notes
1	Low nut	M10x1.25	1	10 Nm (7.38 lb ft)	Loctite 243
2	Stand mounting fixing screw	M8x30	2	25 Nm (18.44 lb ft)	Loctite 243
3	Chain roller fixing screw	M8x45	1	25 Nm (18.44 lb ft)	-
4	Side stand switch fastening screws	M5x25	2	3 Nm (2.21 lb ft)	-
5	Stand mounting fixing screw	M6x30	1	10 Nm (7.38 lb ft)	-

Removing

- Remove the screw with the relative re-
tainer nut being careful to recover the
shimming washers.



- In case replacing the roller bearings
only, be careful to retrieve the spacer
between the two.



- Remove the screw and the relative re-
tainer nut of the chain tensioner plate.

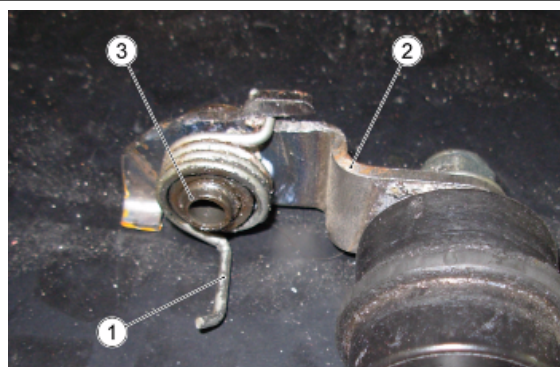


- If necessary, replace the spring.



Installing

- Fit the spring (1) on the chain tensioner bracket (2), positioning correctly.
- Fit the bush (3) with the machined end on the outer side as shown in the figure.



- Fit the screw with the relative washer and the nut for fastening the chain tensioner bracket, ensuring that the spring remains in the correct position.



- After assembling the roller, complete with bearings and spacer, install the assembly on the chain tensioner bracket.

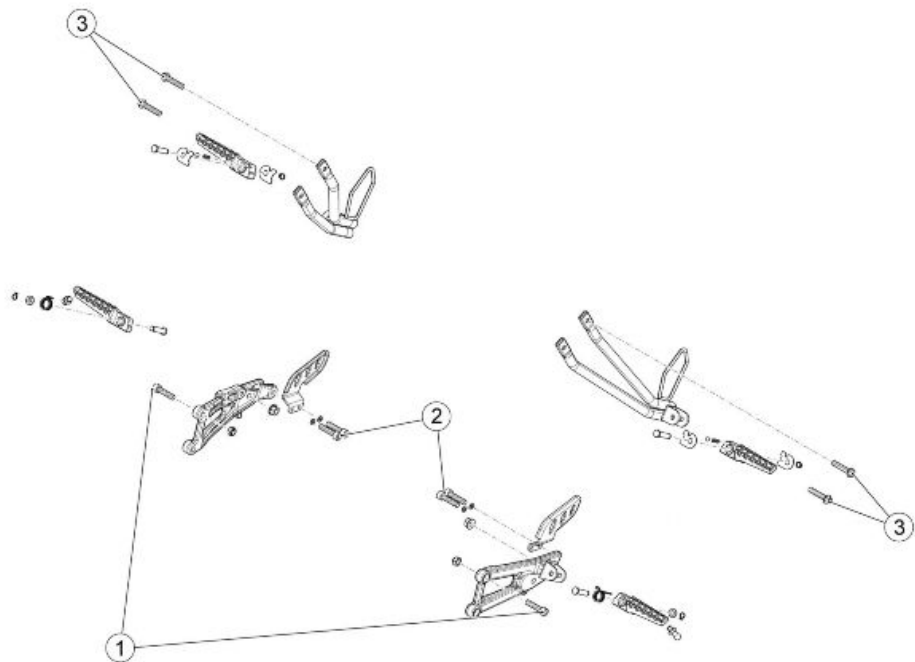
CAUTION



ENSURE THAT THE PIVOT OF THE CHAIN TENSIONER ROLLER CARRIER ARM IS CLEAN AND CORRECTLY LUBRICATED, AND TURNS WITHOUT IMPEDIMENT.

Pedaline

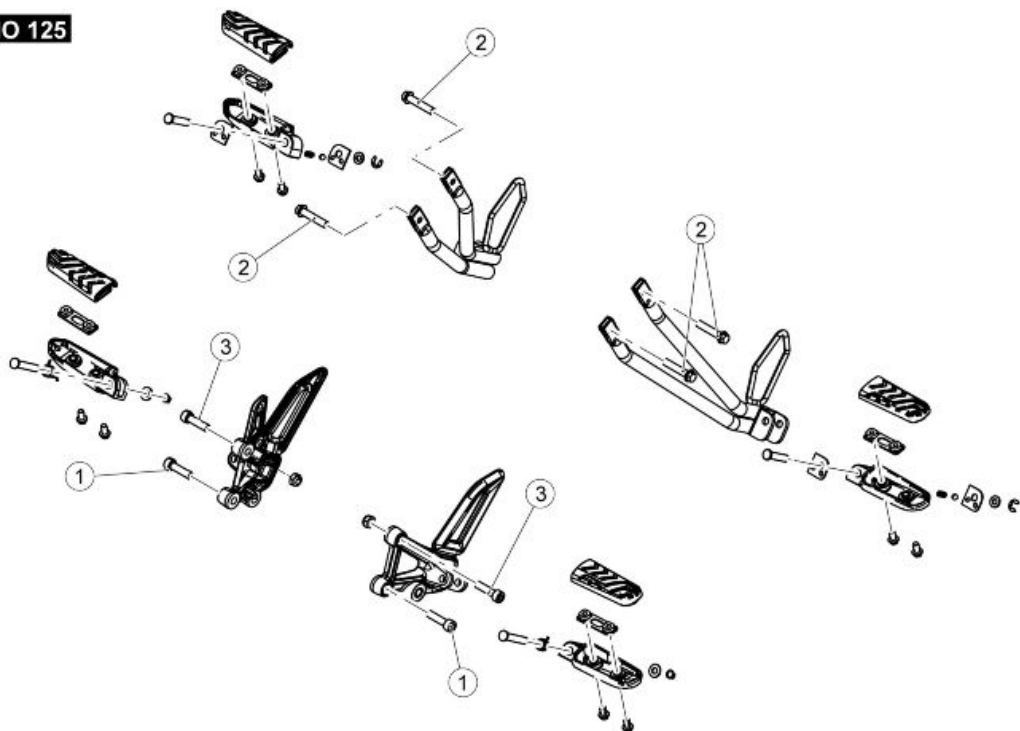
RS 125



FOOTRESTS

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening the rider footrest mounting	M8x25	2	25 Nm (18.44 lb ft)	Loctite 243
2	Footrest protection fastening screw	M5x12	4	5 Nm (3.69 lb ft)	-
3	Passenger footrest bracket fastening screw	M8x40	4	20 Nm (14.75 lb ft)	-

TUONO 125

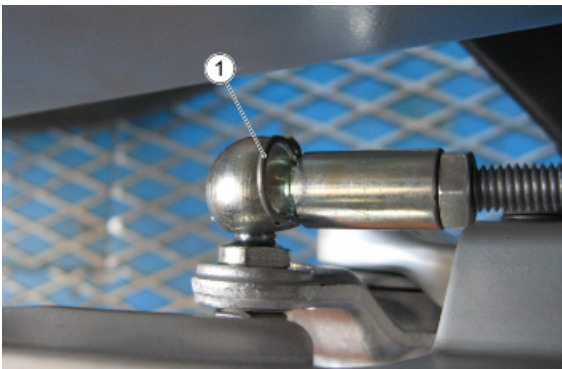


FOOTRESTS					
pos.	Description	Type	Quantity	Torque	Notes
1	Screws fastening the rider footrest mounting	M8	2	25 Nm (18.44 lb ft)	Loctite 243
2	Passenger footrest mounting fastening screws	M8	4	20 Nm (14.75 lb ft)	-
3	Screws fastening the rider footrest mounting	M8	2	25 Nm (18.44 lb ft)	With self-locking nut

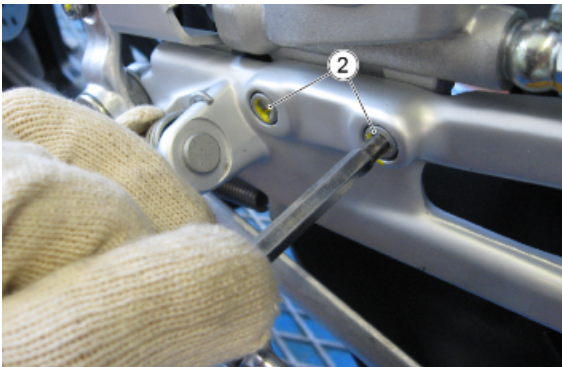
Rimozione

RIGHT HAND SIDE RIDER FOOTPEG:

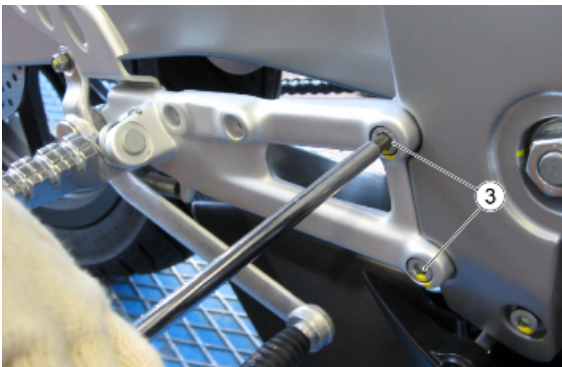
- Working on the right hand side of the motorcycle, remove the circlip (1) retaining the rear brake control rod.



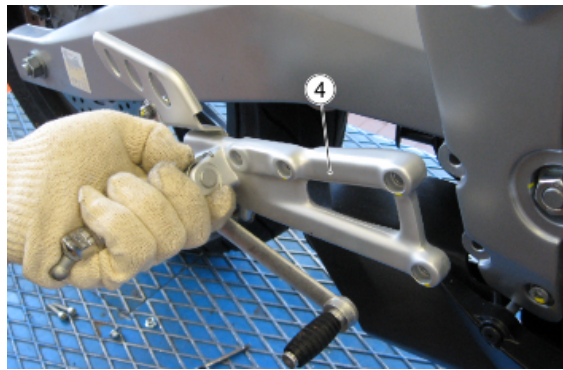
- Remove the two screws (2) fastening the brake master cylinder and move it aside.



- Remove the two screws fastening (3) the footpeg mount.



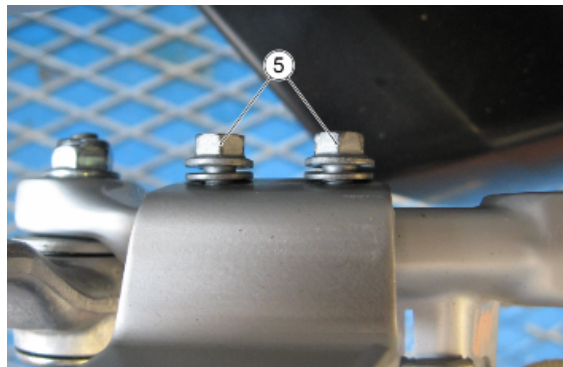
- Remove the footpeg mount (4).



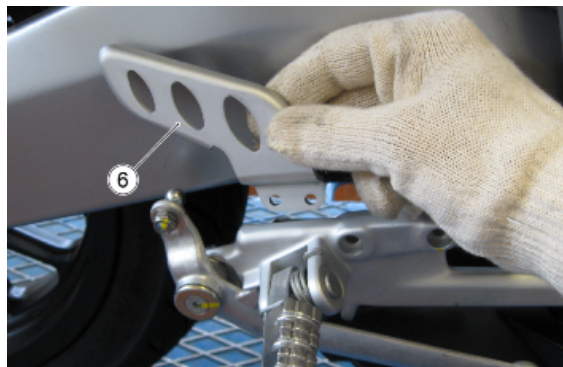
REMOVING THE RIGHT HAND SIDE RIDER FOOTPEG:

FOOTPEG GUARD:

- After disconnecting the rear brake master pump, remove the two fastener screws (5) of the footpeg guard, taking care not to lose the washers.

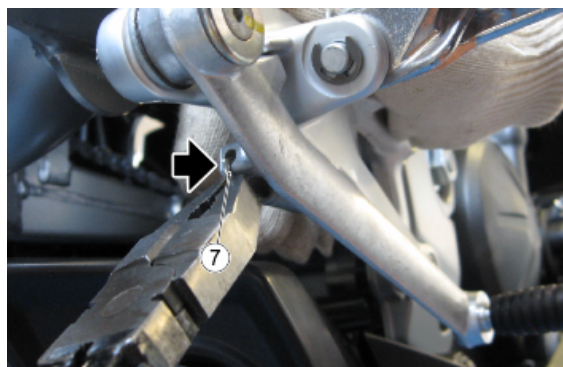


- Remove the footpeg guard (6)

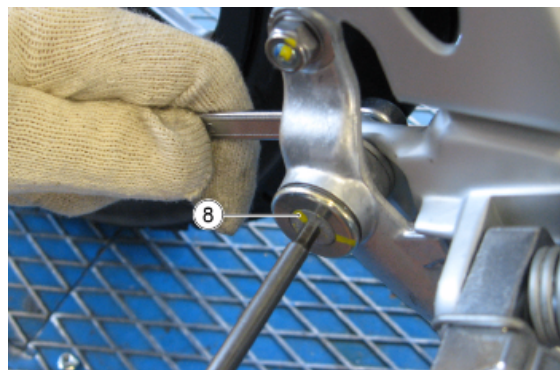


BRAKE LEVER:

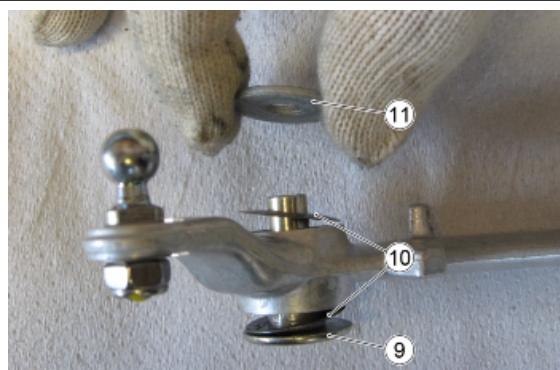
- After disconnecting the rear brake master pump, detach and remove the brake lever return spring (7).



- Remove the screw (8) fastening the brake lever, holding the nut to prevent it from turning.



- Remove the bush (9), the spring washers (10) and the spacer washer (11).

**FOOTPEGS:****NOTE**

THE PROCEDURE DESCRIBED AS FOLLOWS IS THE SAME FOR BOTH FOOTPEGS

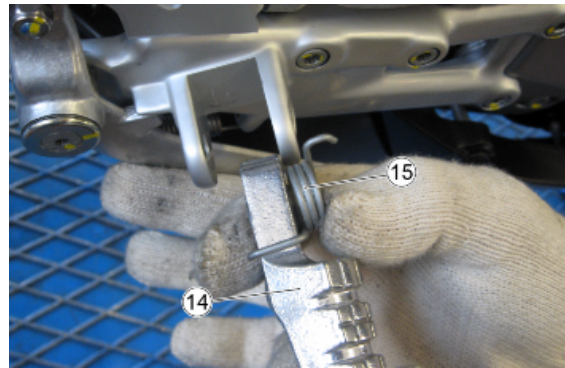
- Remove the retainer circlip (12).



- Remove the pin (13).

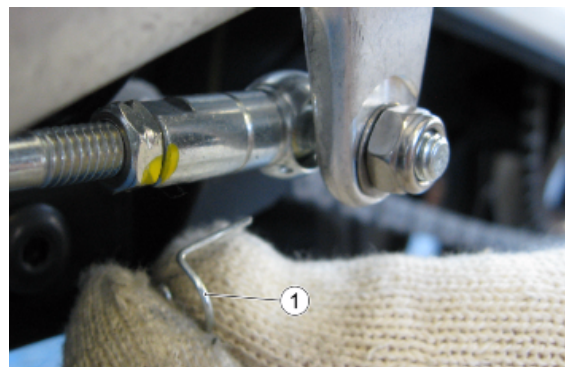


- Remove the footpeg (14) and the return spring (15).

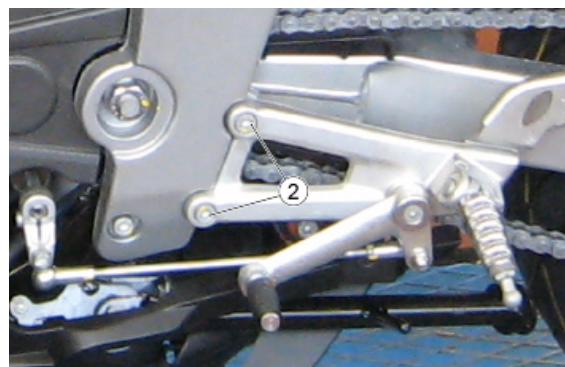


LEFT HAND SIDE RIDER FOOTPEG:

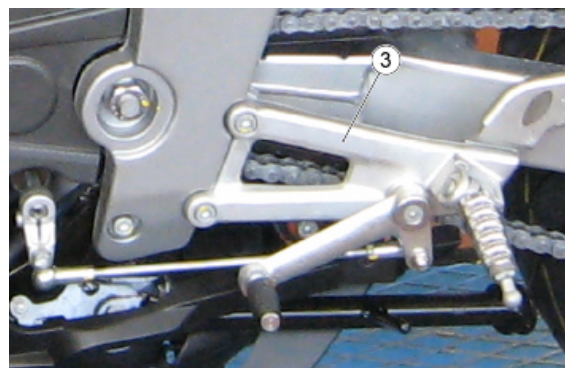
- Working on the left hand side of the motorcycle, remove the circlip (1) retaining the gear lever control rod.



- Remove the two screws fastening (2) the footpeg mount.

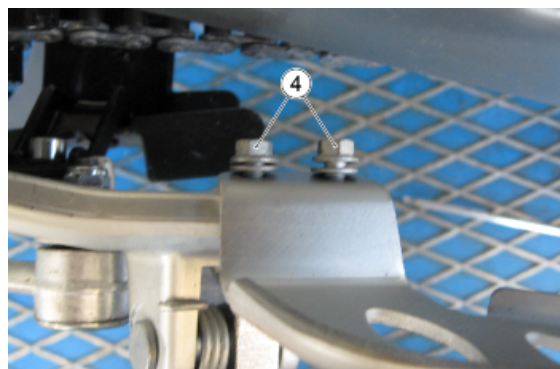


- Remove the footpeg mount (3).

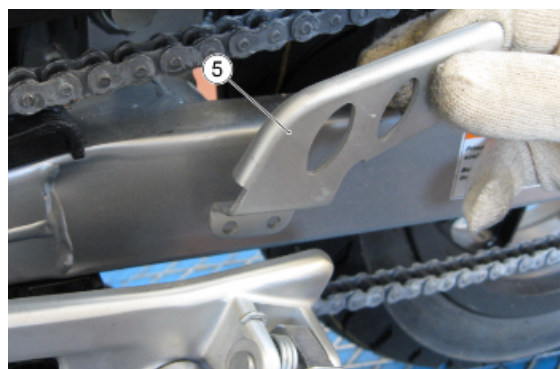


REMOVING THE LEFT HAND SIDE RIDER**FOOTPEG:****FOOTPEG GUARD:**

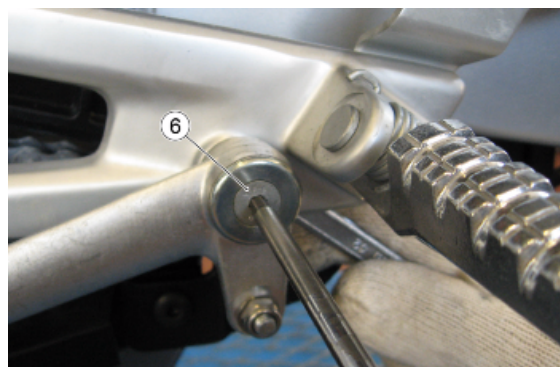
- Remove the two screws (4) fastening the footpeg guard, taking care not to lose the washers.



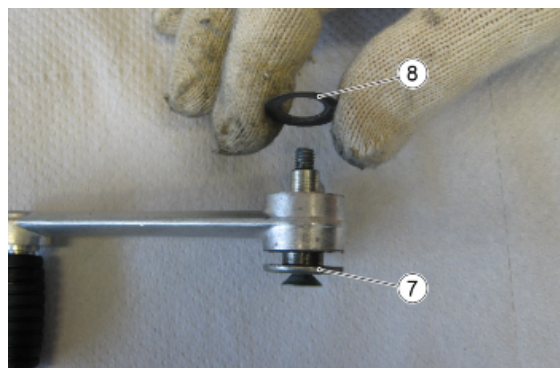
- Remove the footpeg guard (5).

**GEAR LEVER:**

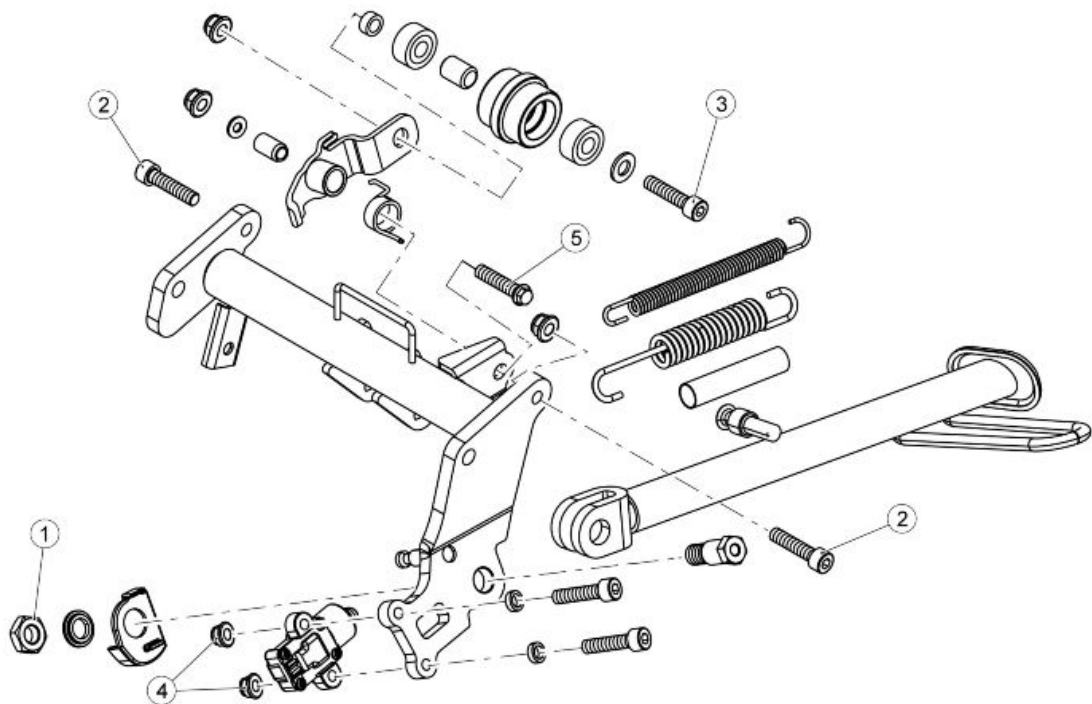
- Remove the screw (6) fastening the gear lever, holding the nut to prevent it from turning.



- After removing the gear lever, remove the bush (7) and the spring washer (8).



Stand



STAND					
pos.	Description	Type	Quantity	Torque	Notes
1	Low nut	M10x1.25	1	10 Nm (7.38 lb ft)	Loctite 243
2	Stand mounting fixing screw	M8x30	2	25 Nm (18.44 lb ft)	Loctite 243
3	Chain roller fixing screw	M8x45	1	25 Nm (18.44 lb ft)	-
4	Side stand switch fastening screws	M5x25	2	3 Nm (2.21 lb ft)	-
5	Stand mounting fixing screw	M6x30	1	10 Nm (7.38 lb ft)	-

Side stand

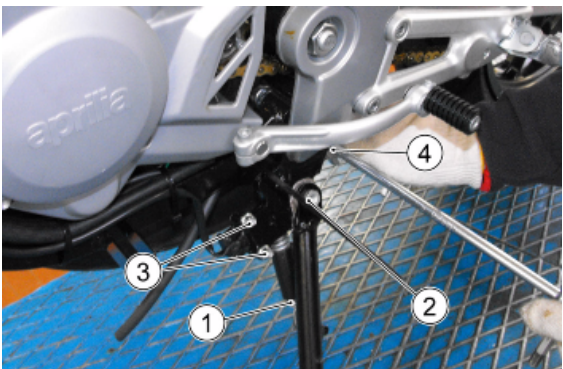
- Rest the vehicle on the optional rear stand.

Stand rod removal

- With closed stand, release the spring (1)
- Unscrew and remove the nut (2).

Remove stand together with the plate

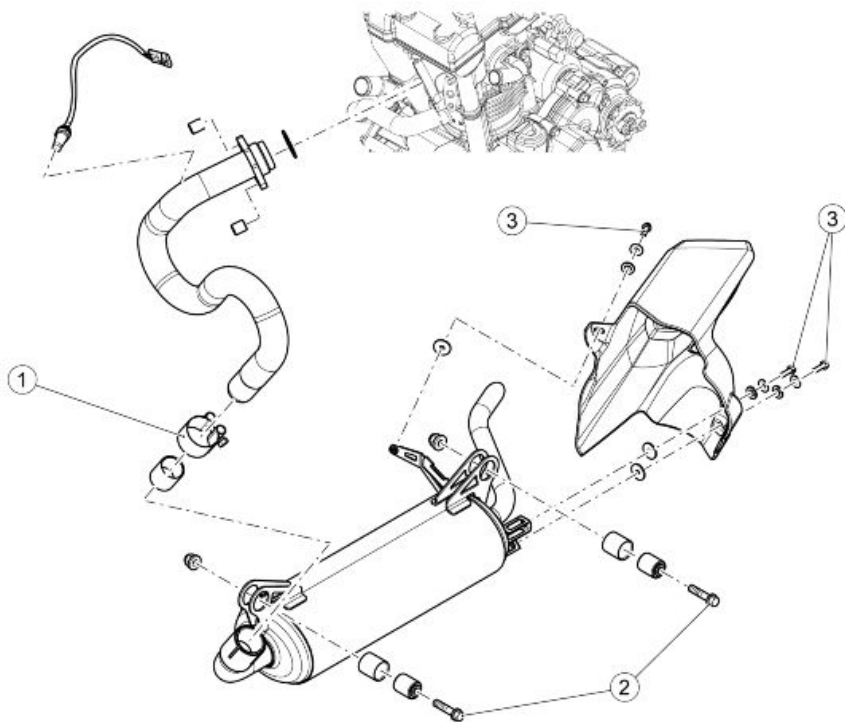
- Unscrew and remove the two stand switch fixing nuts (3).
- Unscrew and remove the internal nut and the pin (4) by collecting the washer.



- Slide off the nut and remove the cable grommet.
- Slide off the stand together with the plate.



Exhaust

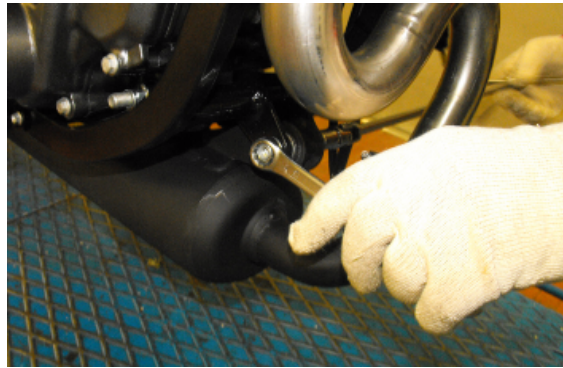


EXHAUST

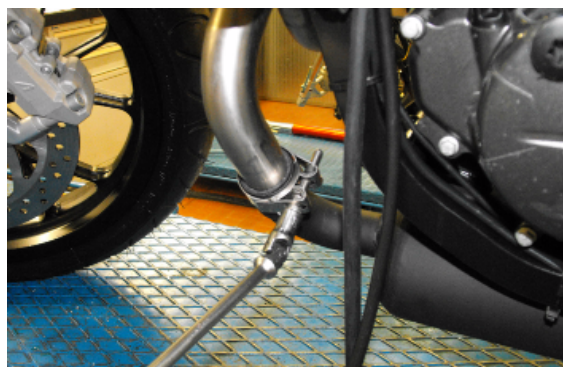
Pos.	Description	Type	Quantity	Torque	Notes
1	Exhaust fixing clamp	M8	1	15 Nm (11.06 lb ft)	-
2	Silencer fixing screw	M8x50	2	25 Nm (18.44 lb ft)	-
3	Cover fastener screw	M5x16	5	5 Nm (3.69 lb ft)	-

Removing the tail pipe

- Undo and remove the two upper stay-screws and collect the relative nuts and washers.



- Beforehand, remove the side fairings and the fairing lug.
- Loosen the clamp.



See also

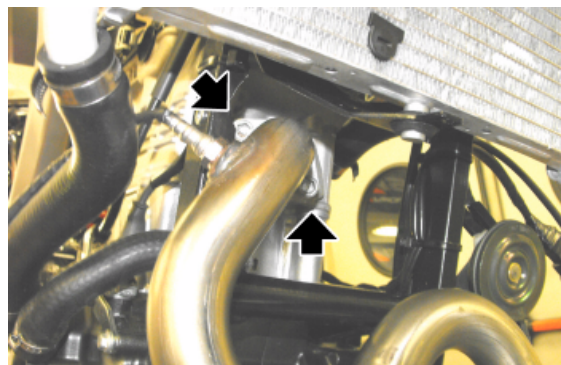
Side fairings

- Remove the exhaust end.

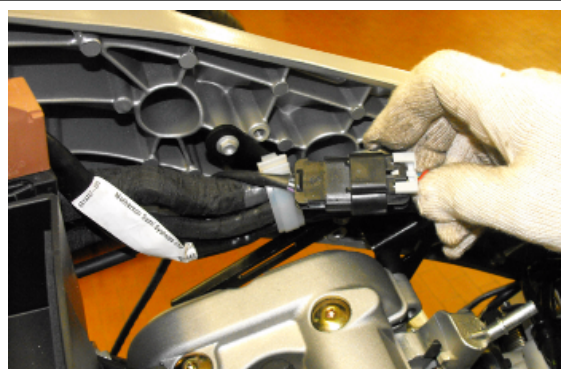


Removing the exhaust manifold

- Unscrew and remove the two screws.
- Remove the manifold.



- Remove the muffler.
- Lift the saddle and disconnect the lambda probe connector.



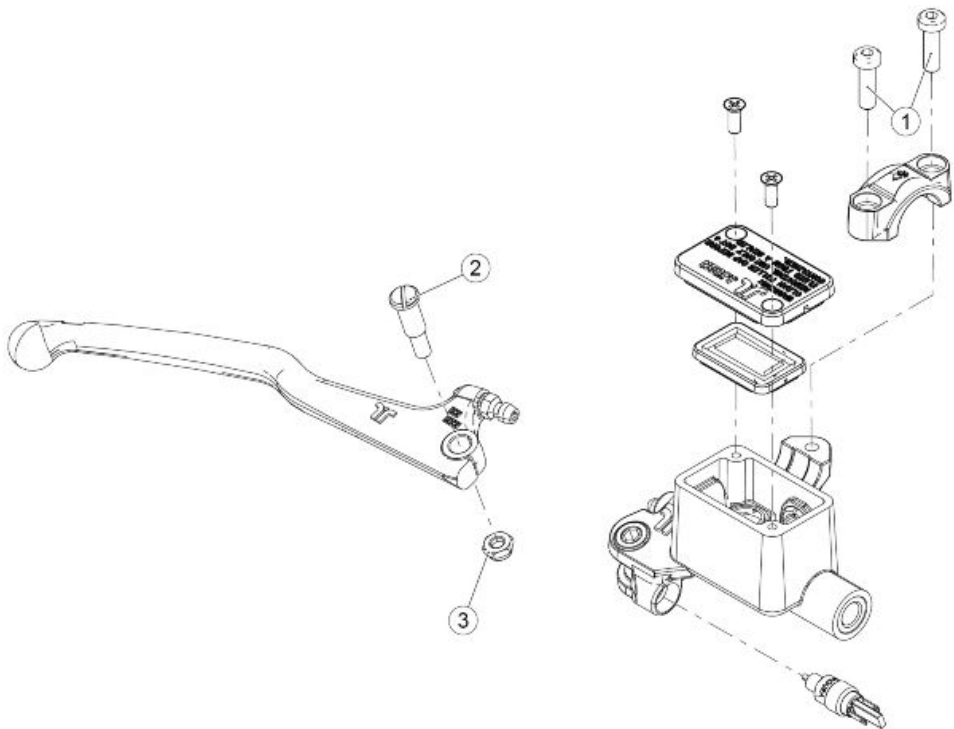
See also

[Removing the tail pipe](#)

INDEX OF TOPICS

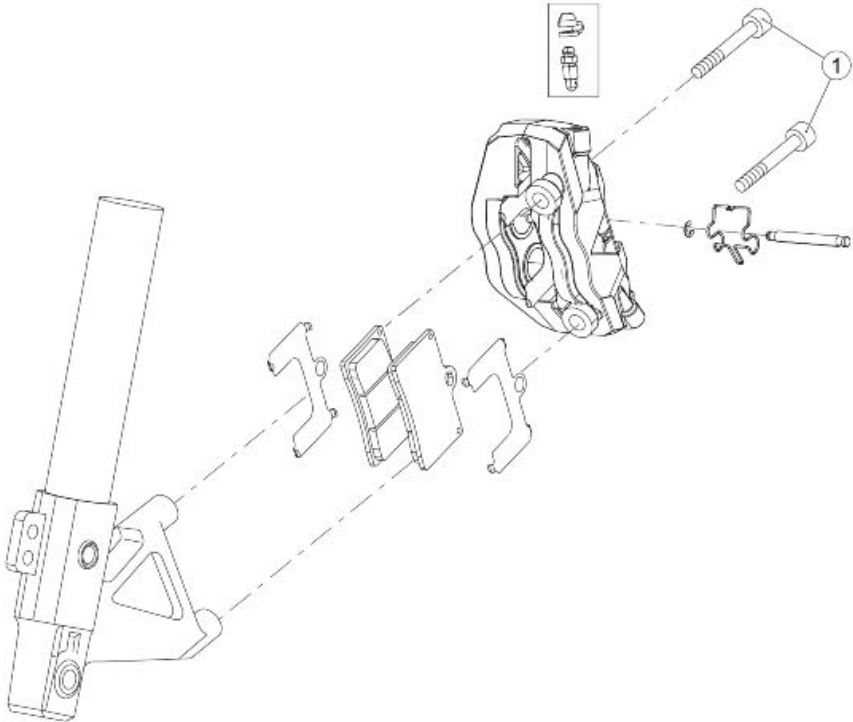
BRAKING SYSTEM

BRAK SYS



FRONT BRAKE MASTER CYLINDER

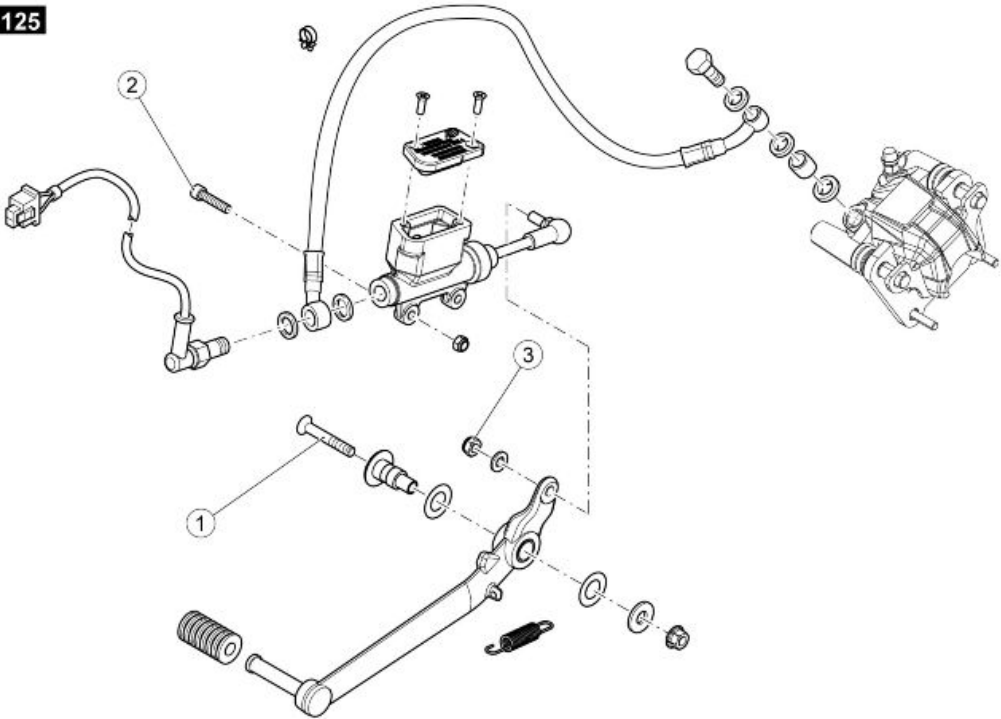
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening front brake master cylinder	M6x30	2	11 Nm (8.11 lb ft)	-
2	Front brake lever fixing screw	-	1	4-7 Nm (2.95-5.16 lb ft)	-
3	Front brake lever fixing screw	-	1	4-7 Nm (2.95-5.16 lb ft)	-



FRONT CALLIPER

pos.	Description	Type	Quantity	Torque	Notes
1	Front calliper fastener screw	M10x60	2	50 Nm (36.88 lb ft)	-

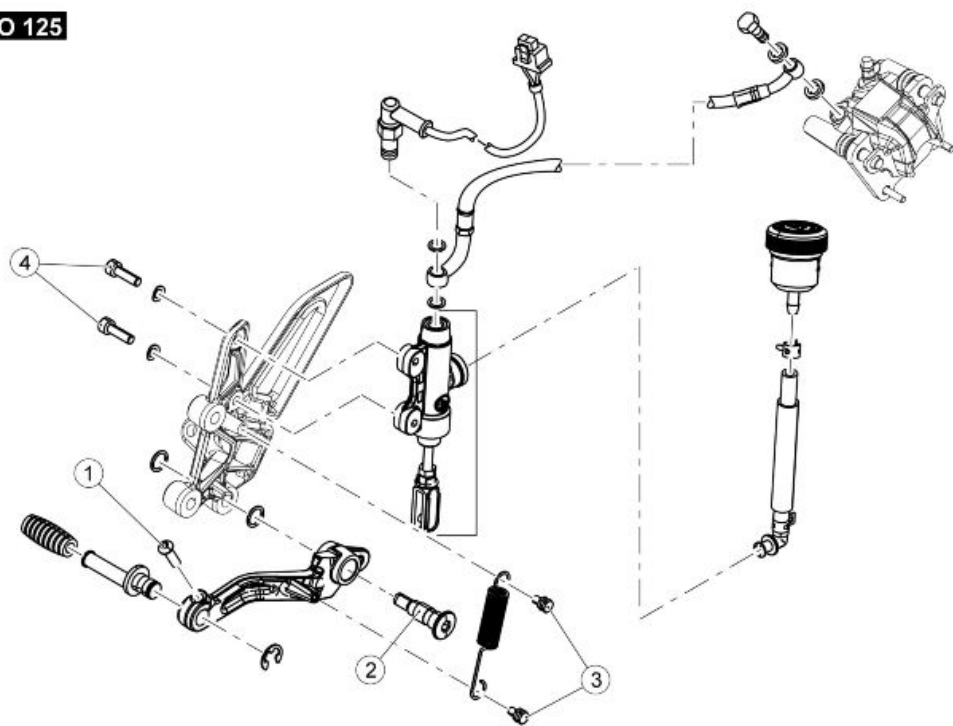
RS 125



REAR BRAKING SYSTEM

pos.	Description	Type	Quantity	Torque	Notes
1	Brake lever fixing screw	M6x40	1	12 Nm (8.85 lb ft)	-
2	Rear brake pump fixing screw	M6x30	2	10 Nm (7.38 lb ft)	-
3	Brake pump joint fixing screw	M6	1	10 Nm (7.38 lb ft)	-
-	Brake calliper fixing screws	-	2	25 +/- 2 Nm (18.44 +/- 1.48 lb ft)	-

TUONO 125

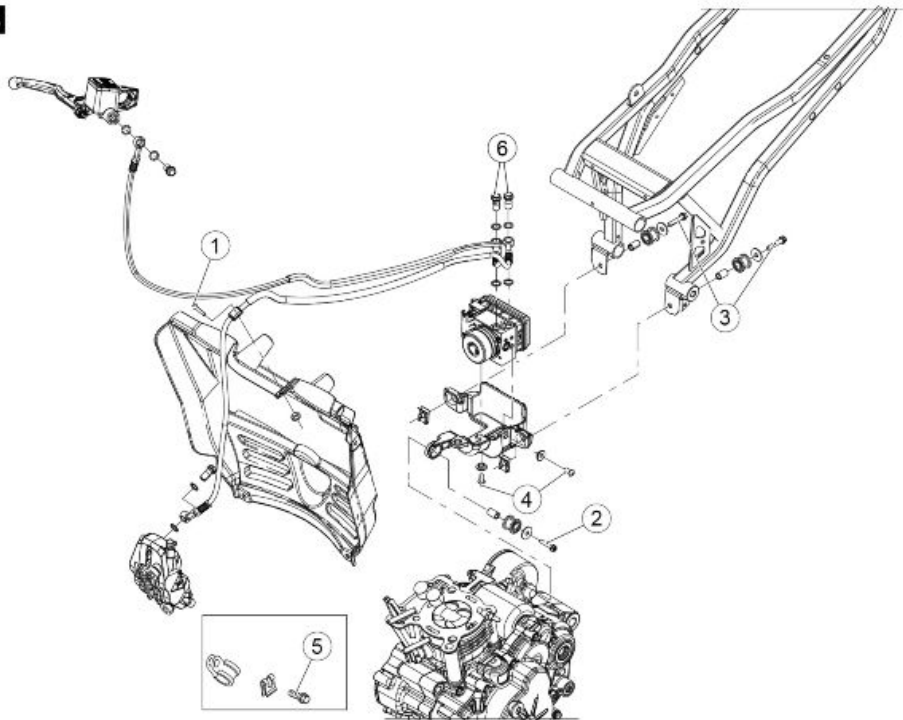


REAR BRAKING SYSTEM

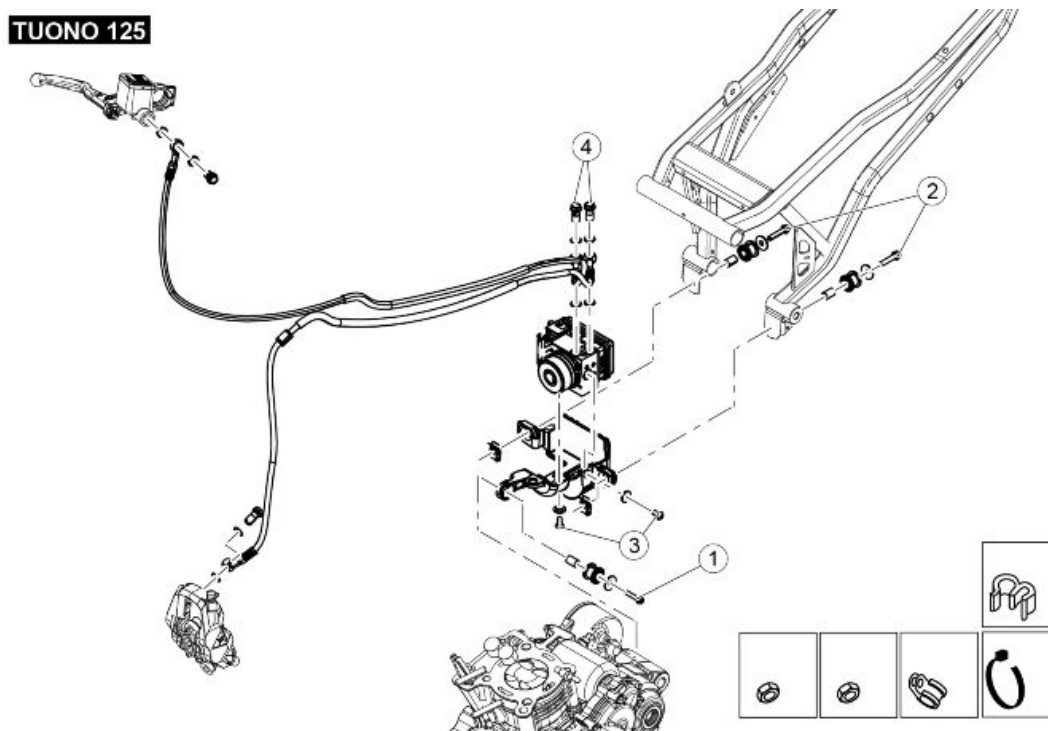
pos.	Description	Type	Quantity	Torque	Notes
1	Peg fixing screw	M6	1	8 Nm (5.90 lb ft)	-
2	Brake lever fixing pin	M8	1	25 Nm (18.44 lb ft)	Pre-permeated
3	Pin spring coupling	M5	2	5 Nm (3.69 lb ft)	Loctite 243
4	Rear brake pump fixing screw	M6	2	11 Nm (8.11 lb ft)	Loctite 243
-	Brake calliper fixing screws	-	2	25 +/- 2 Nm (18.44 +/- 1.48 lb ft)	-

ABS

RS 125

**ABS SYSTEM**

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening brake pipe to radiator surround	M6	1	10 Nm (7.38 lb ft)	-
2	Flanged hex head screw fastening modulator mounting case	M5x25	1	3.5 Nm (2.58 lb ft)	-
3	Flanged hex head screw fastening modulator mounting case	M6x30	2	10 Nm (7.38 lb ft)	-
4	Hex socket button head screw fastening modulator to mounting case	M6	2	10 Nm (7.38 lb ft)	-
5	Screw fastening brake pipe clamp	M5x16	1	5 Nm (3.69 lb ft)	-
6	Special brake pipe fastening screw	-	2	23-26 Nm (16.96-19.18 lb ft)	-

**ABS SYSTEM**

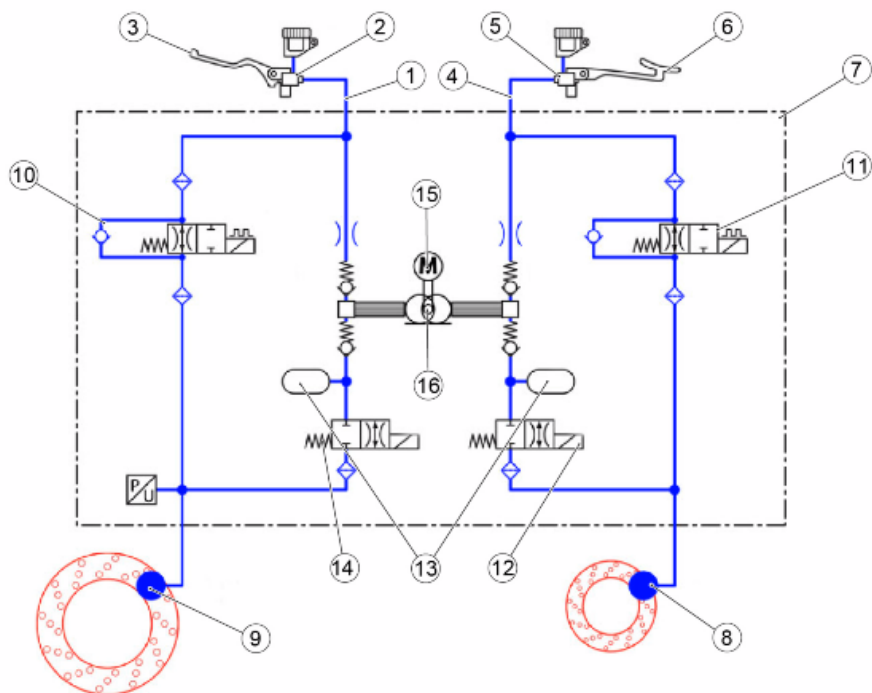
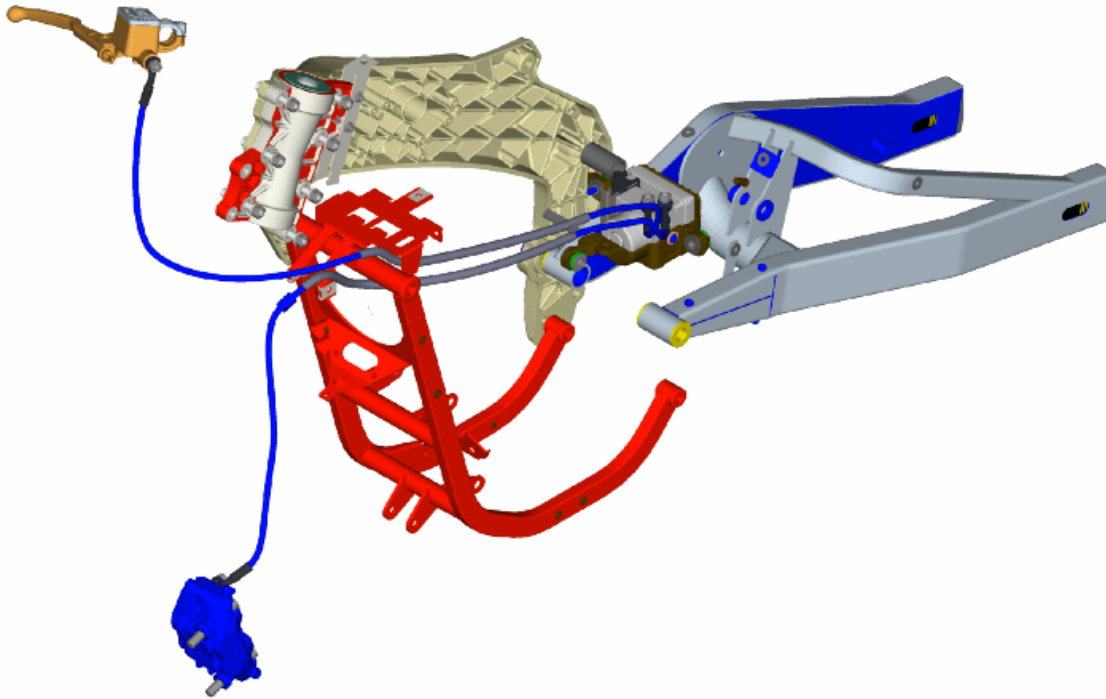
pos.	Description	Type	Quantity	Torque	Notes
1	Flanged hex head screw fastening modulator mounting case	M5x25	1	3.5 Nm (2.58 lb ft)	-
2	Flanged hex head screw fastening modulator mounting case	M6x30	2	10 Nm (7.38 lb ft)	-
3	Hex socket button head screw fastening modulator to mounting case	M6	2	10 Nm (7.38 lb ft)	-
4	Special brake pipe fastening screw	-	2	23-26 Nm (16.96-19.18 lb ft)	-

ABS control unit pin assignment

- PIN 1 (Blue) - Ground for valves and ECU
- PIN 2 (X4) - CAN H line (high speed)
- PIN 3 (White) - Front speed sensor input
- PIN 4 (Green/Red) - Control unit key positive
- PIN 5 (White/Blue) - Serial K Line for diagnosis
- PIN 6 (Green/Red) - Hwvc 1 (+)
- PIN 7 (Blue) - Hwvc 2 (-)
- PIN 8 - N.C.
- PIN 9 (Red/White) - Battery positive for valves
- PIN 10 (Blue) - Pump motor ground
- PIN 11 (X3) - CAN L line (low speed)
- PIN 12 (White/Brown) - Front speed sensor positive
- PIN 13 (Yellow/Brown) - Rear speed sensor positive
- PIN 14 (Yellow) - Rear speed sensor input

- PIN 15 (Blue) - Hwvc 3 (-)
- PIN 16 (Blue/Orange) - Wso_R
- PIN 17 (Blue/Yellow) - ABS indicator light
- PIN 18 (Red/White) - Battery positive for ABS pump motor

Operating diagram

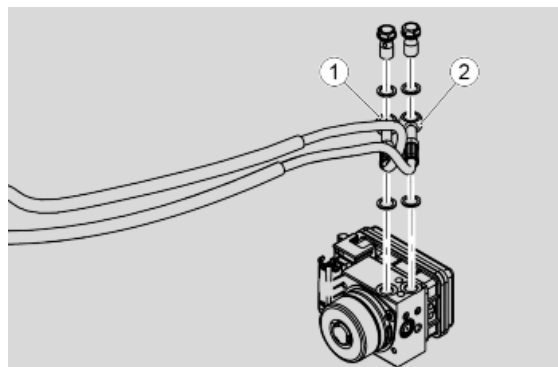


ABS functional diagram key

1. Front system circuit.
2. Front brake master cylinder.
3. Front brake control lever.
4. ABS control unit.
5. Front brake calliper.
6. Front brake circuit inlet solenoid valve (normally open).
7. Front brake circuit low pressure accumulator.
8. Front brake outlet circuit solenoid valve (normally closed).
9. DC electric motor.
10. Hydraulic circuit pump (ABS).

Inlets and outlets:

1. Inlet from front brake master cylinder.
2. Outlet to front brake calliper.

**ABS OPERATION****General specifications:**

- The ABS inlet valve (6) is normally open and only closes when the system intervenes to prevent wheel lock-up.
- The outlet valve (8) is normally closed and only opens when the system intervenes to prevent wheel lock-up.
- With the system in stand-by mode, the ABS processor controls the wheel speed instant by instant to assess any slippage of the wheels.
- When in standby state, the system does not intervene at all when the rider brakes; the functions of the braking system are identical to the system without ABS.

Stages in ABS cycle:

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

B - Pressure reduction: coincides with the recognition of the dangerous situation (wheel slippage exceeds the threshold): The system closes the inlet valve (6) and temporarily opens the outlet valve (8).

In this condition, the rider cannot increase the pressure exerted on the calliper (5) and the system partially reduces the pressure in the calliper itself. The excess fluid temporarily fills the reservoir inside the ABS modulator until the ABS modulator (10) automatically triggers and returns fluid towards the brake master cylinder (2).

C - Maintaining pressure: the pressure in the calliper (5) remains low until total recovery of the correct wheel speed state / wheel grip.

The system returns the fluid taken from the calliper (5) to the section of circuit between the brake master cylinder (2) and the ABS inlet valve (6).

D - Pressure restoration: momentarily opening the inlet valve (6) increases the calliper pressure (5) until maximum deceleration is attained, at which point the system restores control over 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 may be shown in the event that the duration of the pressure reduction phase exceeds a predetermined time limit.

ABS SYSTEM DESCRIPTION

The ABS system is a device that prevents the front wheel from locking in the event of emergency braking, to offer greater vehicle stability under braking than a conventional braking system.

The ABS system enhances control over the vehicle, taking into consideration never to exceed the physical limits of vehicle grip on the road. The rider is fully responsible for riding at a suitable speed based on weather and road conditions, always leaving an appropriate safety margin. Under no circumstances can the ABS system compensate for the rider's misjudgement or improper use of brakes. 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.

CAUTION

WHEN THE ABS STARTS WORKING, A PULSING 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 UNEVEN 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 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, 2 things may occur:

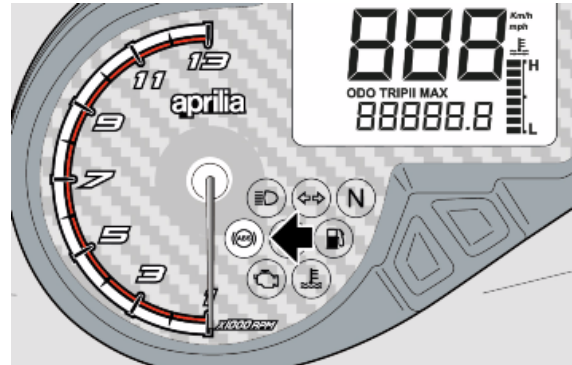
- the ABS system intervenes by releasing pressure from the calliper until the wheel turns again at the same speed of the other wheel; it is not possible to brake for an instant.
- if the speed difference lasts long, the system may detect an error and deactivates the ABS system.

As a consequence, the system works as any regular braking system.

Riding with an active ABS system

- During the vehicle start-up, after the instrument panel initial check, the ABS warning light stops flashing when the speed is under 5 km/h (3.1 mph).

If the ABS warning light remains on when the vehicle is running, it means that a fault has been detected and the ABS system has been automatically deactivated.



IN CASE OF FAILURE OR WITH ABS DISCONNECTED, THE VEHICLE OPERATES AS IF IT DID NOT HAVE THIS SYSTEM.

NOTE

WHEN THE IGNITION KEY IS TURNED, IF THE SYSTEM IS FUNCTIONING CORRECTLY, THE ABS INDICATOR LAMP WILL FLASH (THE SYSTEM IS ACTIVATED AS SOON AS THE VEHICLE SPEED EXCEEDS 5 km/h - 3.1 mph)

Riding with the ABS system inactive

The warning light (5) comes on steady, the system has been deactivated.

REPLACEMENT OF ABS SYSTEM

- First remove the side fairings, the radiator protection, the flap underneath the steering and the pinion protector.
- Remove the breather pipe (1) from the modulator support (2)



- Remove the screw (3) that fastens the modulator support to the engine.



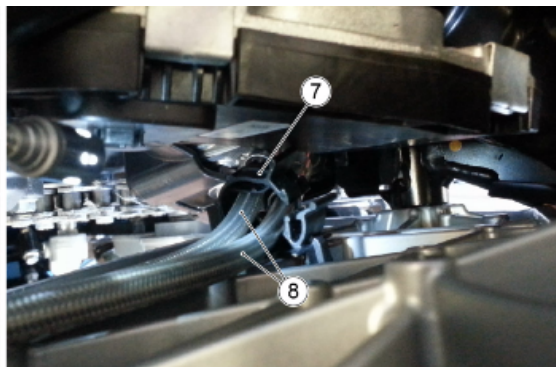
- Remove the two screws (4) that fasten the modulator support to the chassis.



- Remove the protective casing (5) of the control unit connector (6) and disconnect



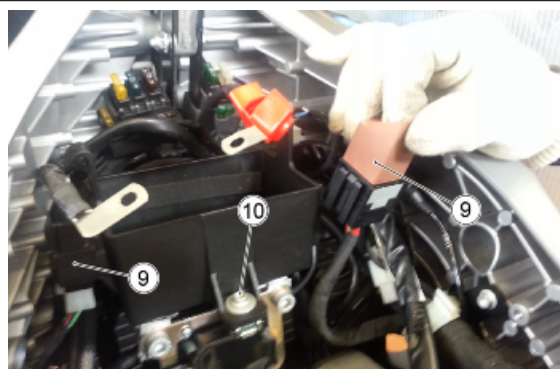
- Open the cable fasteners (7) and free the brake pipes (8).



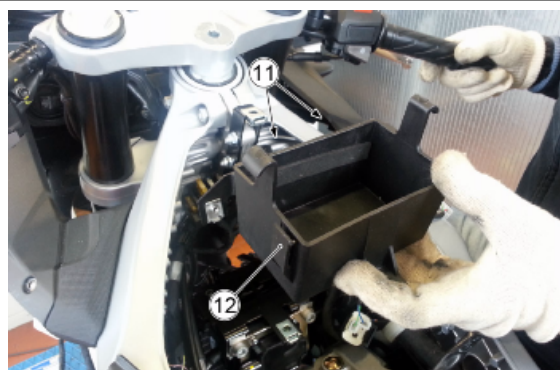
- Operating from the LH side of the motorcycle, remove the ABS modulator with support



- Release the relays (9) on the sides from the battery support and remove the support fastener screw (10).



- Release the relays (11) on the sides from the battery support and remove the battery support (12).

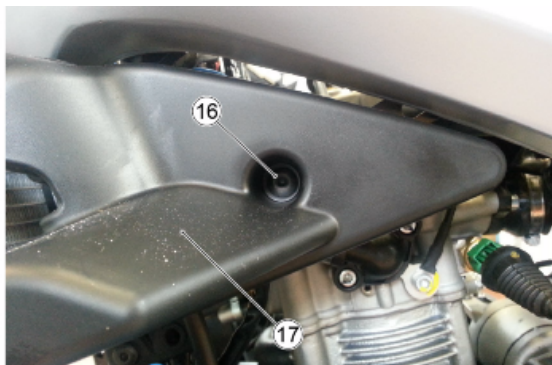


- Remove the two internal screws (13) that fasten the spacer bracket (14) and the external screw (15) that fastens the bracket to the engine.
- They remove the bracket.

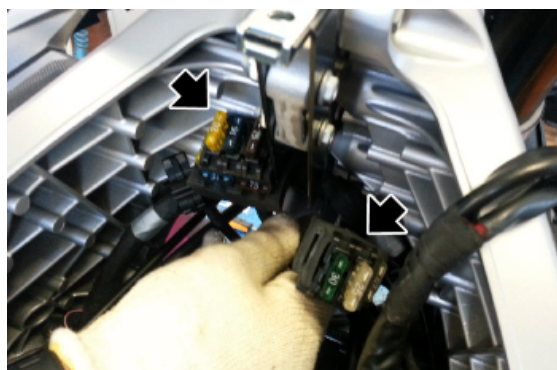


- Remove the three screws (16) that fasten the side fairing support (17).

- Move the support aside.



- Disconnect the fuse supports from the two brackets on the headstock.



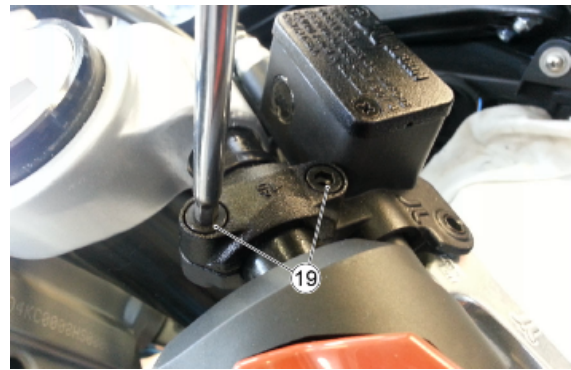
- After releasing the front ABS sensor wiring harness from the brake pipe, remove the two brake calliper fastener screws (18).



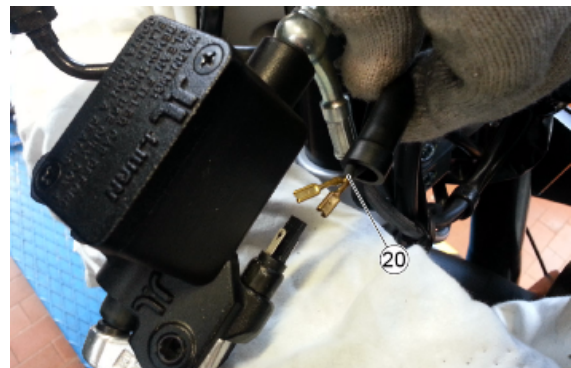
- Remove the brake calliper through the space between the headstock and the engine. Then remove it from the LH side of the motorcycle.



- Remove the two brake pump fastener screws (19).



- Disconnect the front brake sensor (20) of the brake pump.



- Remove the clamp (21) and the cable fastener (22) to release the brake pump.



- Remove the brake pump through the space between the headstock and the engine. Then remove it from the LH side of the motorcycle

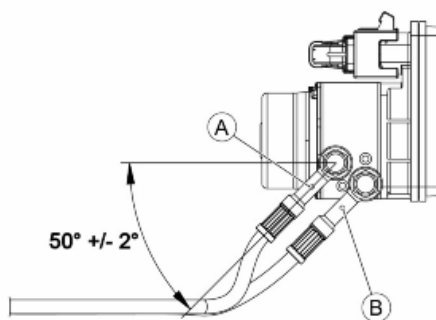


- Remove the complete ABS system.



REMOVAL OF MODULATOR / ABS CONTROL UNIT

- Remove the modulator as described above.
- Mark the pipes so that they can be correctly re-installed on the new modulator.
- The brake pipe with the RED sticker (A) (ABS-front brake pump control unit): mounted on the control unit, in correspondence with the threaded hole marked "MC". the red sticker must be visible once the mounting procedure is complete.
- The brake pipe with the GREEN sticker (A) (ABS-front clamp control unit): mounted on the control unit, in correspondence with the threaded hole marked "F". the green sticker must be visible once the mounting procedure is complete.
- After replacing the control unit or pipes, the entire ABS system must be bled.
- To bleed the ABS system in the best possible way, we recommend using devices such as vacuum pumps or similar.



CAUTION



MORE OIL IS REQUIRED TO BLEED THE ABS SYSTEM THAN A CONVENTIONAL SYSTEM. FOR THIS REASON, CAREFULLY CHECK THE OIL LEVEL IN THE BRAKE TANK.

- If even after bleeding, the front brake lever feels "spongy", the secondary circuit in the ABS control unit must be bled. To do this, perform a road test and repeatedly activate the ABS system.
- Bleed and using the diagnostic tool, delete any errors on the ABS and on the MIU G3 control unit.
- Before handing back the vehicle, perform a functional road test.

REPLACEMENT / ACTIVATION OF NEW ABS CONTROL UNIT

If the ABS requires replacement, check that the new one has closing caps on both hydraulic couplings and then proceed as follows:

- Before disconnecting the electrical connectors, do a "KEY OFF".
- After connecting the new ABS control unit hydraulically and electrically, it must be activated/recognised.
- Do a "KEY ON".
- Check that the ABS warning light flashes rapidly.
- Do a "KEY OFF" followed by a "KEY ON".
- If activation has been successful, the warning light should come on and flash slowly.
- In the event of a fault, with the diagnostic tool disconnected, the warning light should be permanently lit.
- Connect the diagnostic tool and check for errors.

Guide to diagnosis

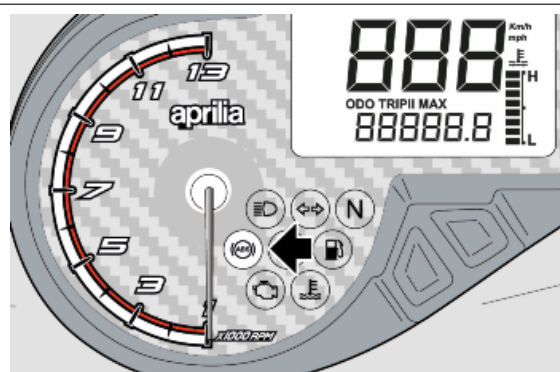
PREMISE

Each time the key is ON, if, at least one current or stored* error is detected, the ABS warning light turns on permanently.

The ABS system is deactivated automatically

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

*** The diagnosis requires exceeding the 5 km/h (3.1 mph).**



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 (3.1 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 disabled!

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 continues to be inactive.

ABS FAULTS - GUIDE TO THE DIAGNOSIS

1. ABS WARNING LIGHT ON

2. CONNECT DIAGNOSTICS INSTRUMENT

DOES THE DIAGNOSTICS INSTRUMENT COMMUNICATE? (NO, point 3; YES, point 4)

3. PERFORM THESE CHECKS:

- A. Ground connection PIN 1
- B. +12V at PIN 18
- C. +12V live at PIN 4

4. ARE THERE ERRORS? (YES, point 5; NO, point 6)

5. CONSULT THE ERRORS TABLE

6. ABS WARNING LIGHT ACTIVATION

IS IT ACTIVATED? (YES, point 7; NO, point 8)

7. CONTACT TECHNICAL SERVICE

8. CHECK:

- A. Cable continuity between PIN17 of the ABS control unit connector and PIN28 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

Use of diagnostics instrument for ABS system

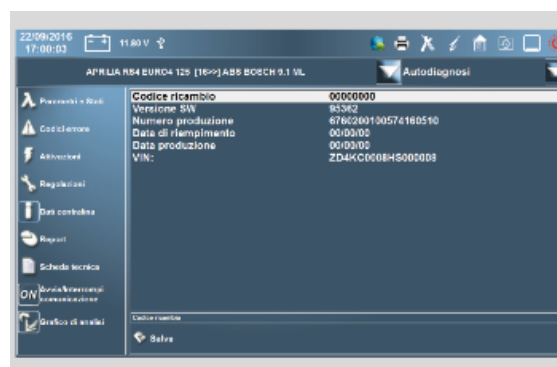
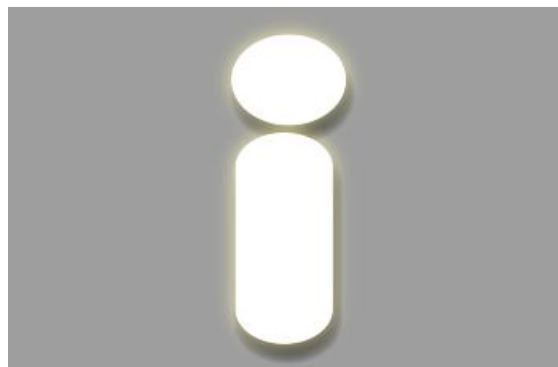
Abs screen pages

ECU INFO screen page

Diagnostic tool - Control unit info screen page

In this screen page are read the general data regarding the control unit, for example: type of software, control unit programming data, etc.

- Spare part code
- SW version (software version)
- Production number
- Filling date
- Production date
- VIN (Vehicle Identification Number)

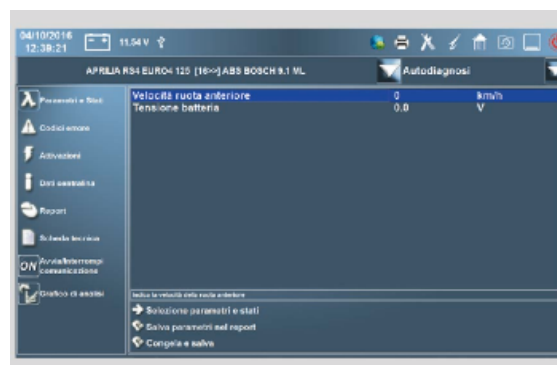


PARAMETERS screen page

Diagnostic tool - Parameters and statuses

This screen page is used to adjust some control unit parameters

- Front wheel speed.
- Battery voltage.

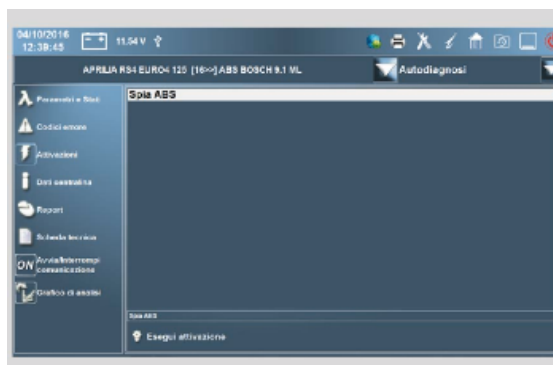


Quality test of the sensors

When turning the wheel or acting on the brake, a variation of parameters must be detected.

ACTIVATION screen page

On this screen page, you can delete the errors from the memory of the controller and you can enable some systems controlled by the control unit.



ACTIVATIONS

Diagnostic tool characteristics	Value/example	Units of measurement	Notes
ABS Warning Light	-	-	During the test the warning light flashes

ERRORS screen page

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



ERRORS

P.A.D.S. characteristic.	Value/example	Units of measurement	Notes
Comparison of front and rear wheel	C1024		Excessive difference

P.A.D.S. characteristic.	Value/example	Units of measurement	Notes
Rear wheel speed sensor electrical diagnosis	C1031		Short circuit or open circuit to negative or short circuit to positive
Rear wheel speed sensor functional diagnosis	C1032		Signal not plausible
Front wheel speed sensor electrical diagnosis	C1033		Short circuit or open circuit to negative or short circuit to positive
Front wheel speed sensor functional diagnosis	C1034		Signal not plausible
Inside error	C1014		Solenoid valve relay failure
Inside error	C1015		Recirculation pump failure
Inside error	C1021		Control unit failure
Inside error	C1049		Rear circuit output solenoid valve failure
Inside error	C1054		Front circuit inlet solenoid valve failure
Low power supply voltage	C1058		
High power supply voltage	C1059		
Configuration error	C1089		
CAN error	U2921		Controller error
CAN error	U2922		Line failure (busoff)
CAN error	U2925		Failed reception from injection ECU

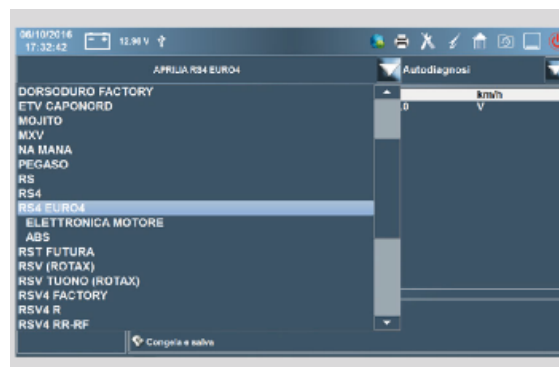
Diagnostic tool report diagnostic tool

In the following are described the procedure to be performed through the diagnostic tool in order to generate an errors report:

- When started the program, select the brand.



- Select the vehicle and the component.

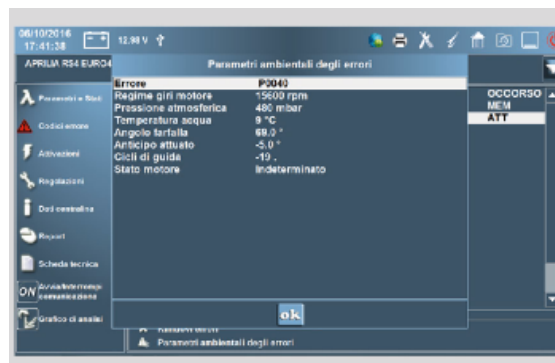


- Select Self-diagnosis.



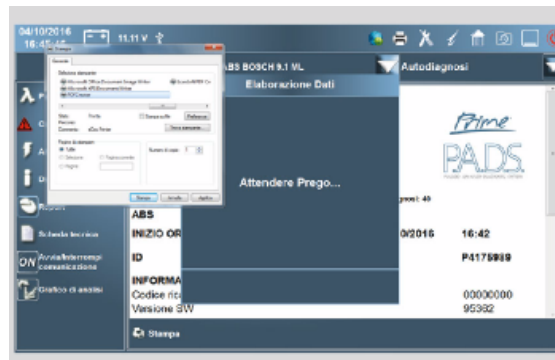
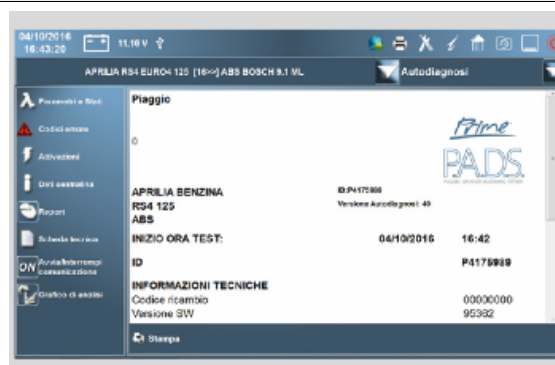
- Go to the page [Error codes](#).

- Select an error and show the Ambient parameter error(where provided).

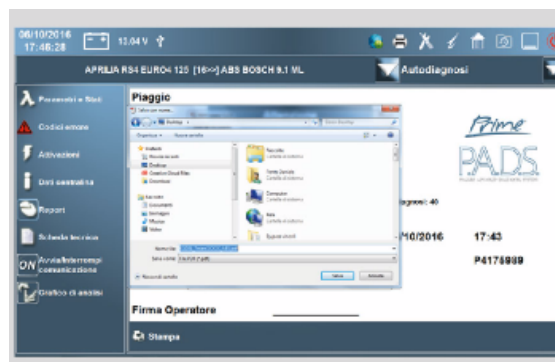


- Repeat the operation by selecting each error and showing the corresponding Ambient parameter error (where provided).

- Go to the page Report and then on Print and select the virtual PDF printer.

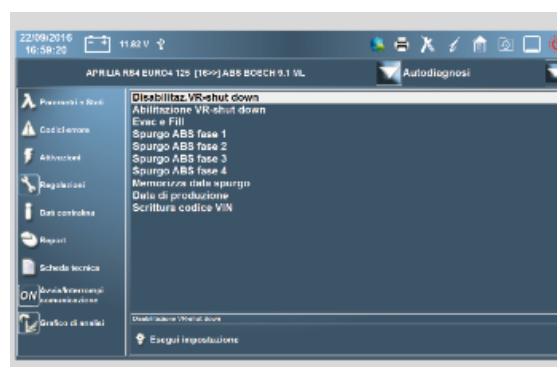


- If there is no PDF printer, there are several free programs, ask the information systems to install it.
- Name the file with a name that contains the main information of the vehicle and the analysed component e.g. CN1200-Chassis0465-Instrument panel.



SETTINGS screen page

This screen is used to adjust some control unit parameters.



ADJUSTMENTS

Diagnostic tool characteristics	Value/example	Units of measurement	Notes
Disabling of VR-shut down	-	-	-
Enabling of VR-shut down	-	-	-
EVAC and wires	-	-	-
ABS bleeding phase 1	-	-	-
ABS bleeding phase 2	-	-	-
ABS bleeding phase 3	-	-	-
ABS bleeding phase 4	-	-	-
Stores bleeding date	-	-	-
Production date	-	-	-
Writing of VIN code	-	-	-

Diagnosis

VOLTAGE ERRORS

C1058 Low power supply voltage

C1059 High power supply voltage

Cause of error

Power supply voltage below minimum threshold or above maximum threshold detected on PIN 4 or on PIN 18 of the ABS control unit.

Troubleshooting

- Check that the voltage regulator is working correctly.
- Check the battery.

CONFIGURATION ERRORS

C1089 Configuration errorCause of error

The configuration stored in the ABS control unit does not correspond to the configuration in the vehicle it is installed on.

Troubleshooting

Check the control unit mapping and reset the vehicle configuration.

CAN LINE ERRORS**U2921 Controller error****U2922 Line failure (busoff)**Cause of error

Communication problem on CAN line: possible contact.

Troubleshooting

Check the integrity and continuity of the wiring harness:

- between PIN 2 of the ABS control unit, PIN3 of the bluedash pre-installation and PIN 26 of the injection control unit (orange cable)
- between PIN 11 of the ABS control unit, PIN 4 of the bluedash pre-installation and PIN 27 of the injection control unit (black/white cable)

U2925 Failed reception from injection control unitCause of error

Communication problem with the injection control unit: possible CAN line contact.

Troubleshooting

Check continuity of wiring harness:

- between PIN 2 of the ABS control unit and PIN 26 of the injection control unit
- between PIN 11 of the ABS control unit and PIN 27 of the injection control unit.

Rear brake calliper

Removal

- Remove the two screws that fasten the brake calliper to the support.



- Remove the rear brake calliper.
- Unscrew the coupling from the rear brake calliper after placing a container for collecting the brake fluid.

CAUTION

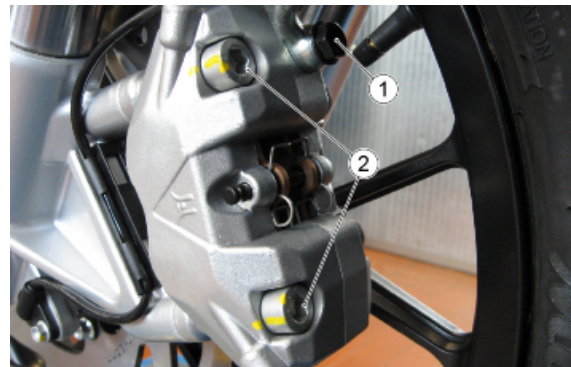
WHEN FITTING THE REAR BRAKE CALLIPER TIE THE ABS SENSOR CABLE TO THE BLEED PROTECTION CAP.



Front brake calliper

Removal

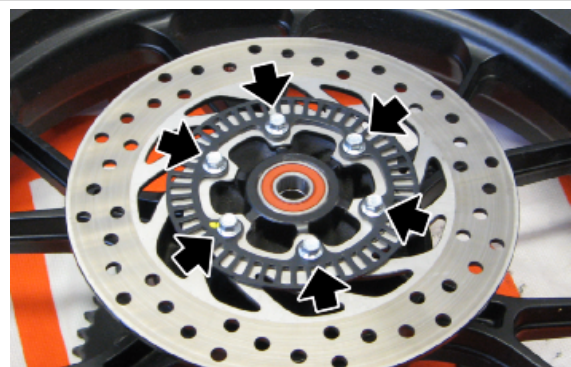
- Undo the union (1) of the front calliper after placing a suitable container underneath to collect the brake fluid.
- Undo and remove the two screws (2) fastening the calliper.
- Remove the calliper.



Rear brake disc

Removal

- Remove the rear wheel.
- Undo and remove the six screws fastening the tone wheel/brake disc.



- Remove the tone wheel.



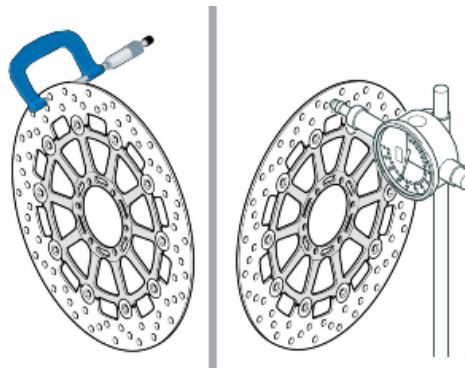
- Remove the brake disc.



Disc Inspection

This procedure must be performed with the brake disc installed 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: 3 mm (0.12 in)

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

Disc oscillation tolerance: 0.2 mm (0.0079 in)

Installing

- Fit the brake disc and tone wheel in the respective seat.
- Fit the six fastener screws and tighten to specified torque.

NOTE

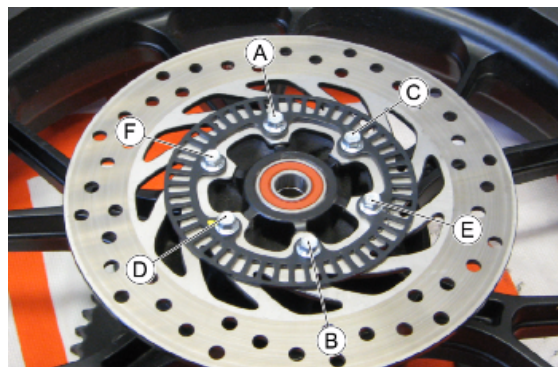
FIRST HAND-TIGHTEN ALL THE SCREWS, THEN TIGHTEN TO THE DEFINITIVE TORQUE IN A CROSSED PATTERN IN THE SEQUENCE A-D-B-E-C-F

CAUTION

THE BRAKE DISC FIXING SCREWS ARE THE PRE-IMPREGNATED VARIETY. ONCE REMOVED THEY SHOULD BE REPLACED WITH NEW SCREWS.

CAUTION

BEFORE FITTING THE NEW SCREWS, CLEAN THE THREADED HOLES CAREFULLY, MAKING SURE THAT ALL TRACES OF THE OLD THREAD-LOCK SEALANT HAVE BEEN ELIMINATED.



Front brake disc

Removal

- - Remove the front wheel.
- Undo and remove the six screws fastening the tone wheel/brake disc.



- Remove the tone wheel.



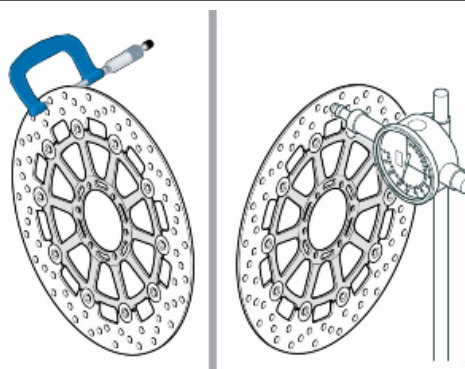
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NOTE

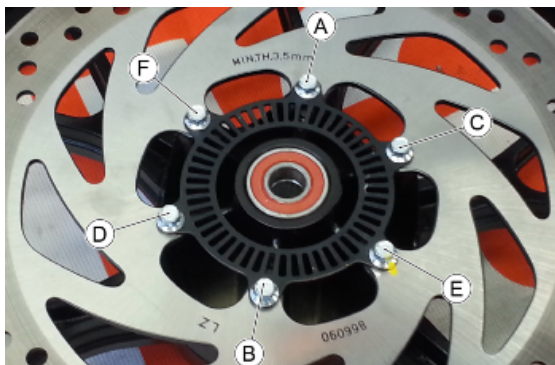
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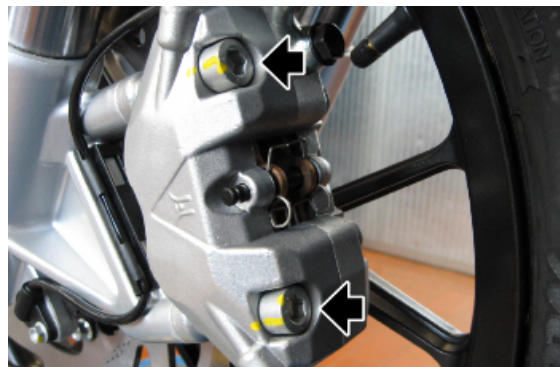


ALL TRACES OF THE OLD THREAD-LOCK SEALANT
HAVE BEEN ELIMINATED.

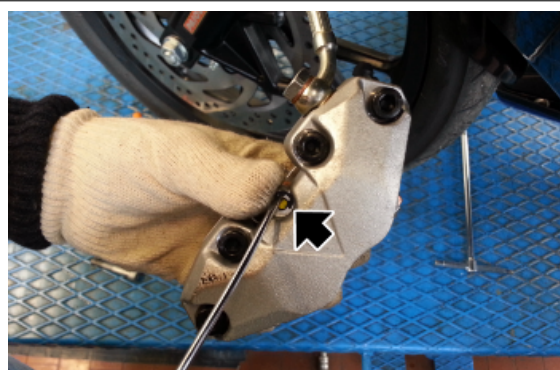
Front brake pads

Removal

- Working on the front brake calliper, on the left side of the vehicle, unscrew and remove the two screws fixing the brake calliper.



- Remove the seeger ring.



- Remove the fastening pin of the brake pads.



- Remove the brake pads.



- Check the brake pads.
- Measure the thickness of the brake pads. If either one is under the service limit, replace them.

Service limit 1.5 mm (0.05 in).

WARNING

IF THE BRAKE LEVER IS OPERATED WITH THE CLAMP EXTRACTED IT MIGHT BE NECESSARY TO CARRY OUT THE CORRESPONDING BLEEDING.

CAUTION

WHEN FITTING, TIE THE ABS SENSOR CABLE TO THE BLEED CAP.

Rear brake pads

Removal

- Remove the rear brake calliper.
- Press the external pad, in the direction indicated by the arrow.



- Slide the pads out.



- Check the brake pads.

- Measure the thickness of the brake pads. If either one is under the service limit, replace them.

Service limit 1.5 mm (0.05 in).

WARNING

IF THE BRAKE LEVER IS OPERATED WITH THE CLAMP EXTRACTED IT MIGHT BE NECESSARY TO CARRY OUT THE CORRESPONDING BLEEDING.

Bleeding the braking system

NOTE

IF AIR CONTINUES TO COME OUT DURING THE BLEED OPERATION EXAMINE ALL THE FITTINGS:

IF SAID FITTINGS DO NOT SHOW SIGNS OF BEING FAULTY, LOOK FOR THE AIR INPUT AMONG THE VARIOUS SEALS ON THE PUMP AND CALLIPER PISTONS.

CAUTION

DURING THESE OPERATIONS, THE VEHICLE MUST BE UPRIGHT.

NOTE

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

WARNING

BRAKE FLUID IS HYGROSCOPIC; IT TENDS TO ABSORB MOISTURE FROM THE SURROUNDING AIR.

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

THEREFORE, ALWAYS USE FLUID FROM SEALED CONTAINERS.

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

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

CAUTION

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

CAUTION

MAKE SURE THE BRAKE FLUID DOES NOT GET INTO YOUR EYES OR ON YOUR SKIN OR CLOTHES. IF THIS HAPPENS ACCIDENTALLY, WASH WITH WATER.

WARNING

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

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 poor braking efficiency.



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

NOTE

THE FOLLOWING OPERATIONS REFER TO ONE FRONT BRAKE CALLIPER ONLY, BUT ARE VALID FOR BOTH. 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 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.
- Quickly press and release the front brake lever several times and then keep it fully pressed.
- Loosen the bleed valve 1/4 of a turn so that the brake fluid flows into the container. This will release the tension on the brake lever and will make it reach the end of stroke.
- Close the bleed valve before the lever reaches its end of stroke.
- Repeat the operation until the fluid draining into the container is air-bubble free.

**NOTE**

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.

- 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 and by poor braking.

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. 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 of 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.
- Repeatedly quickly pull and release the rear brake lever, then keep it fully pulled.
- Loosen the bleed valve by a 1/4 turn so that the brake fluid flows into the container, this will release the tension on the brake lever and it will arrive at the end stop.
- Close the bleed valve before arriving at the end of the stroke with the lever.
- Repeat the operation until there are no air bubbles in the fluid going into the container.

**NOTE**

WHEN BLEEDING THE HYDRAULIC SYSTEM, FILL THE TANK WITH BRAKE FLUID WHEN NECESSARY CHECK THAT DURING THE OPERATION THERE IS ALWAYS BRAKE FLUID.

- 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.

Changing the brake fluid

- To replace the brake fluid, operate the same way as for the front part and for the rear one.
- Open the brake fluid tank, unscrewing the two screws and removing the cover and gasket.

- Drain the system as for the bleeding procedure, proceeding till reaching the indicated level in the inspection glass.
- Place the gasket and the cover and tighten the two fixing screws.

WARNING

IF THE BRAKE LEVER IS OPERATED WITH THE CLAMP EXTRACTED IT MIGHT BE NECESSARY TO CARRY OUT THE CORRESPONDING BLEEDING.



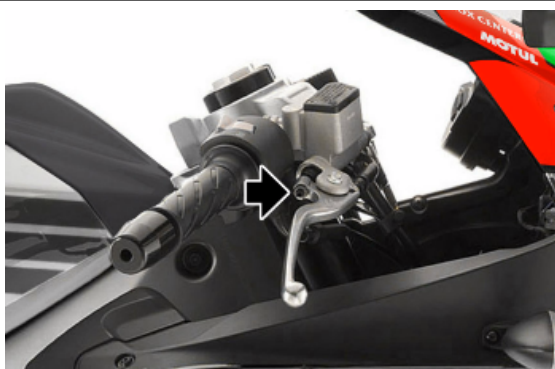
Front brake pump

Removal

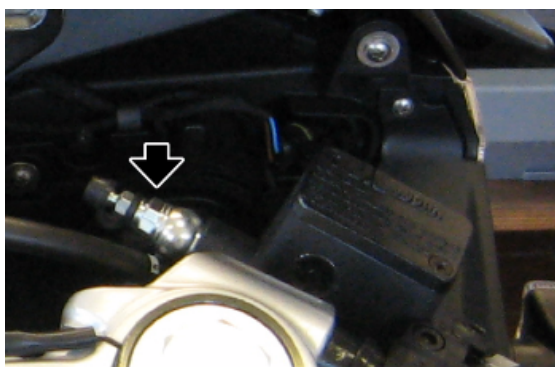
To remove the front brake pump, do not unscrew the thrust screw on the brake lever as it is adjusted and locked in the optimum position for the dead stroke of the lever.

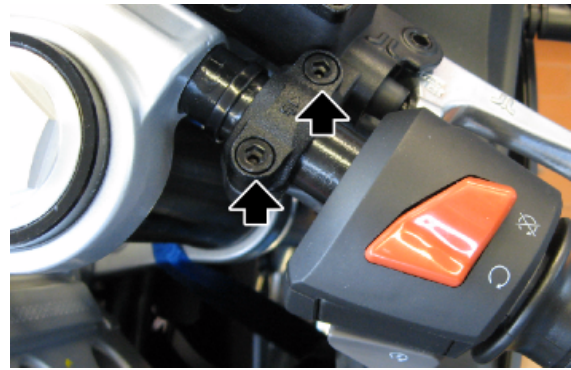
CAUTION

MODIFYING THE POSITION OF THE THRUST SCREW COULD COMPROMISE THE CORRECT OPERATION OF THE LEVER.



- Unscrew and remove the screw. Disconnect the pipe to recover the brake oil in the tank in a suitable container.
- Unscrew and remove the two screws fixing the U-bolt to the handlebar and remove the front brake pump tank.
- To reassemble, carry out the operations described in reverse order, tightening the screws to the prescribed torques.





Installing

Where you need to replace the front brake lever:

- Carry out a complete inspection of the piston and the cylinder to check the braking system is working properly. Make sure no other component is damaged.
- Tighten the thrust screw on the lever while gently reapplying Loctite 270.
- Fit the assembled brake lever on the pump body



- Adjust the thrust screw to adjust the brake lever to the rest position.



- Check the clearance by measuring the free stroke of the brake lever, which should be 3 to 5 mm (A).

- The measurement must be carried out at the indicated point.

**CAUTION**

LIFT THE FRONT WHEEL AT THE END OF THE OPERATION AND CHECK THAT IT SPINS FREELY WITH THE BRAKE LEVER IN REST POSITION.

CHECK THAT THE BRAKE LEVER HAS FREE STROKE WITHIN THE LIMITS PRESCRIBED IN THE ASSEMBLY PHASE.

IF THE BRAKE LEVER DOES NOT HAVE ANY CLEARANCE, THIS COULD CAUSE FAILURE OR LOCKING OF THE FRONT BRAKE, DUE TO OVERHEATING OF THE DISC AND THE BRAKE CALLIPER.

ONCE YOU HAVE FINISHED AND AFTER CHECKING THE CONTROLS, IT IS NECESSARY TO LEAVE THE BRAKE THREAD SEALANT TO CURE.

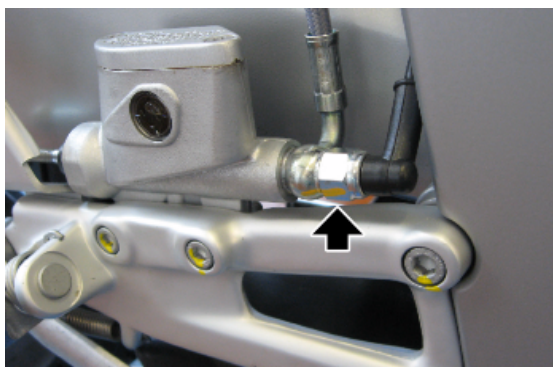
ONLY USE THE VEHICLE ONCE THE BRAKE THREAD SEALANT HAS CURED.

Rear brake pump

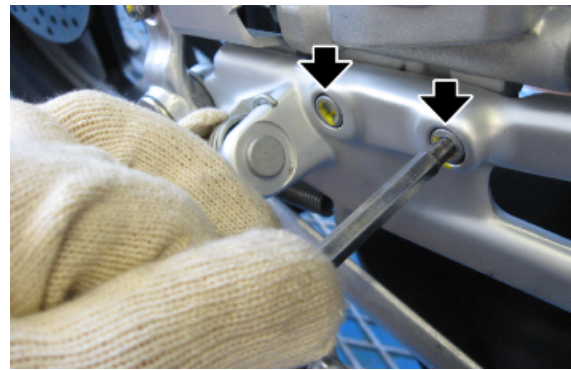
Rimozione

(RS 125)

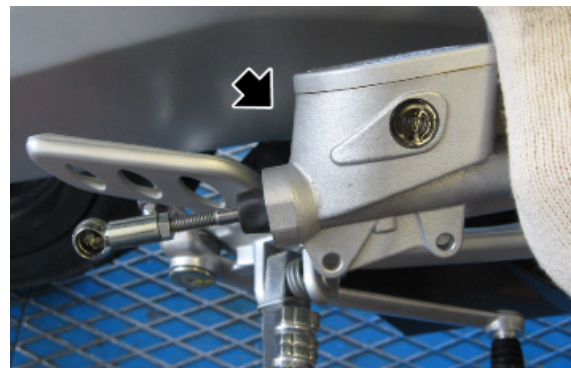
- Remove the screws, disconnect the pipe and collect the brake fluid in a suitable receptacle.



- Unscrew and remove the two screws, and retrieve the respective nuts.

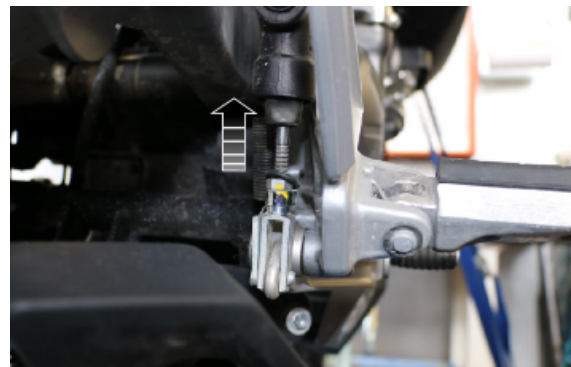


- Unscrew and remove the nut, and retrieve the screw.
- Remove the rear brake pump.
- To reassemble, repeat the procedure described above in reverse order.

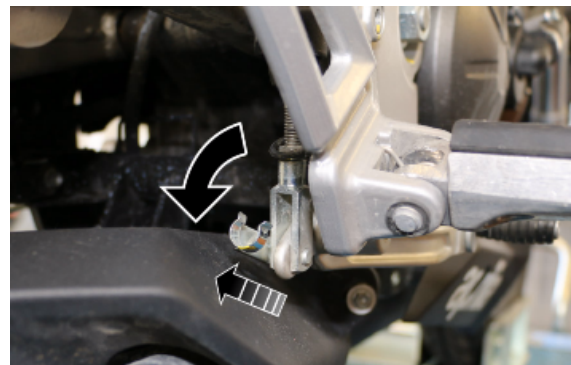


(TUONO 125)

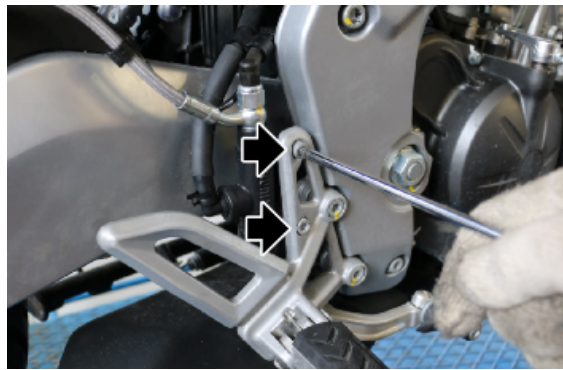
- Remove the rubber O-ring and release the stop on the rear brake pump command rod.



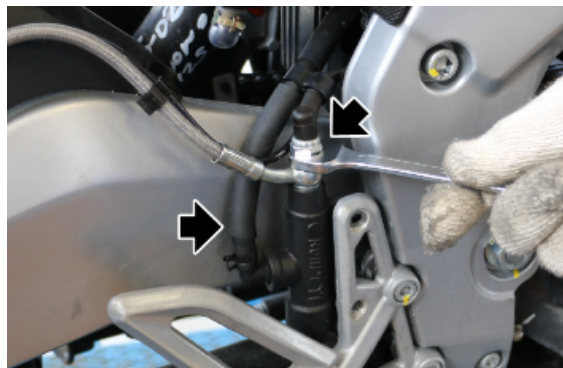
- Unfasten the stop and remove it from the rear brake pump command rod.



- Remove the two brake pump fixing screws.



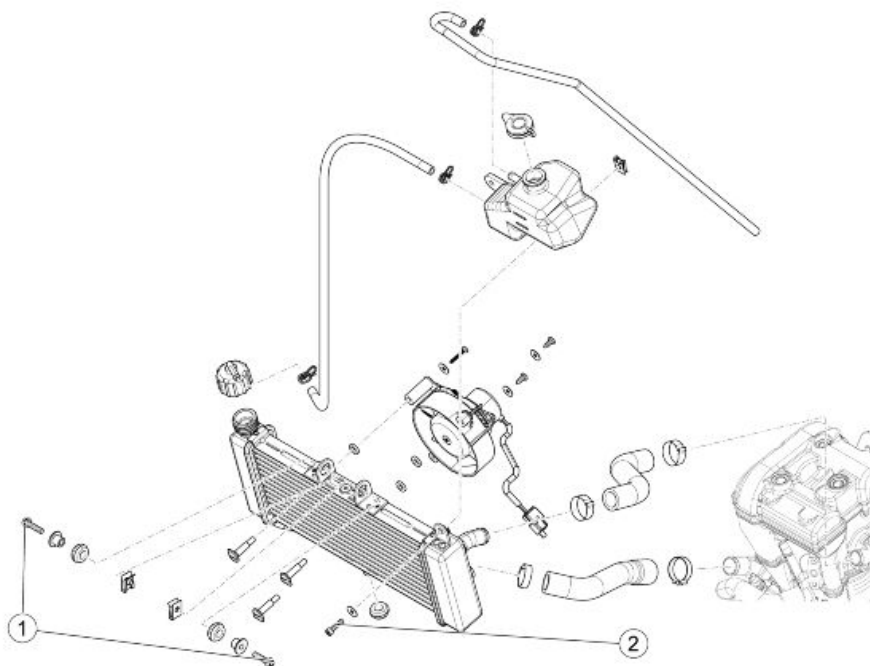
- Unscrew the coupling and disconnect the oil pipes from brake pump in order to remove it.



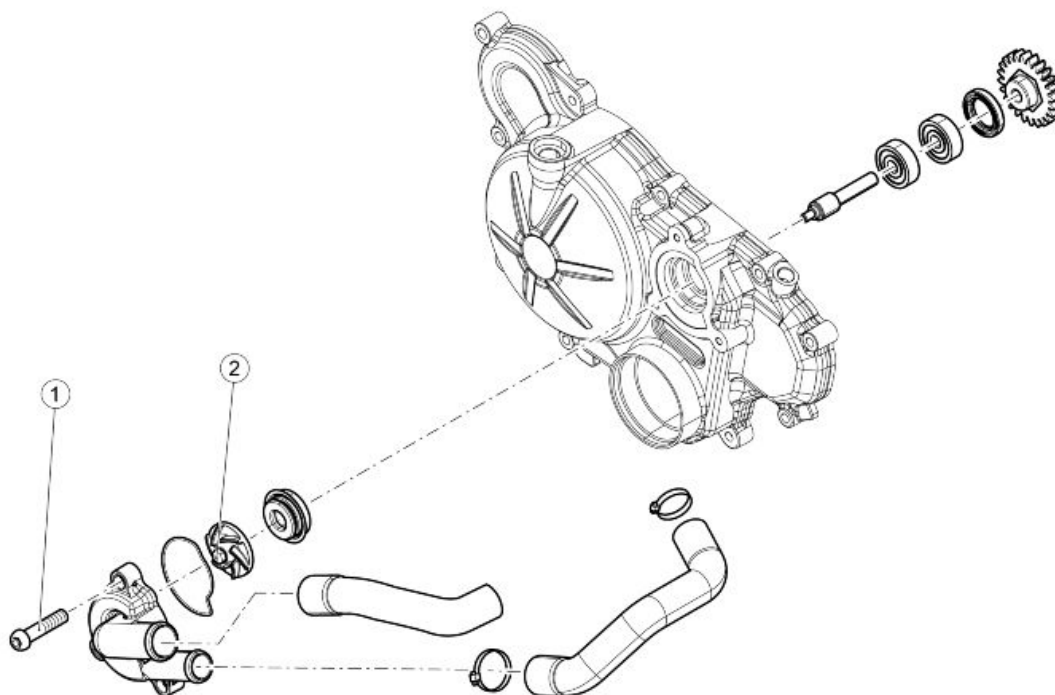
INDEX OF TOPICS

COOLING SYSTEM

COOL SYS

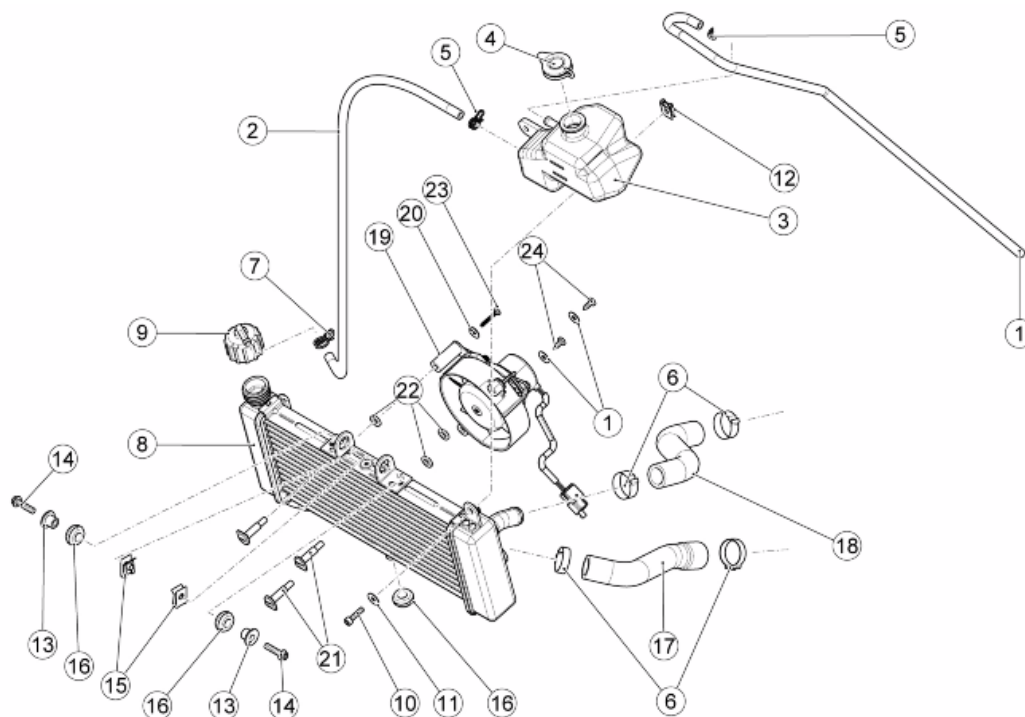
**RADIATOR**

pos.	Description	Type	Quantity	Torque	Notes
1	Radiator fixing screw	M6x25	2	10 Nm (7.38 lb ft)	-
2	Coolant tank fixing screw	M6x20	1	3.5 Nm (2.58 lb ft)	-

**WATER PUMP**

pos.	Description	Type	Quantity	Torque	Notes
1	Water pump fastener screw	M5	3	3.5 Nm (2.58 lb ft)	-
2	Water pump rotor fastener screw	-	1	5 Nm (3.69 lb ft)	-

Circuit diagram



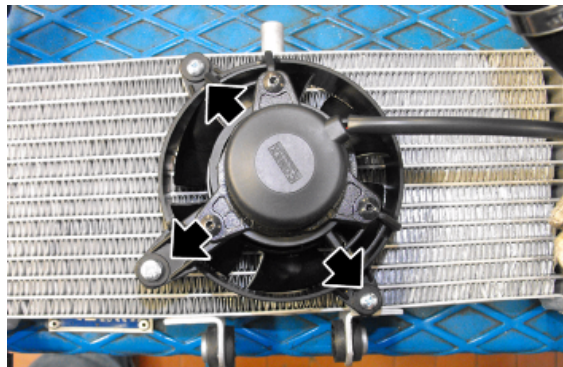
key:

1. Breather pipe
2. Radiator - expansion tank pipe
3. Cooling liquid reservoir
4. Cap
5. Clamp
6. Clamp D16-24x8
7. D10.1 clamp
8. Water radiator
9. Cap
10. TCEI screw M6x20
11. 6.6x18x1.6 washer
12. Elastic plate M6
13. T-shaped bushing
14. TE flanged screw M6x25
15. Elastic plate M6
16. Cable grommet rubber ring
17. Pump-radiator pipe
18. Head-radiator pipe

- 19. Electric fan
- 20. Washer
- 21. Pin
- 22. Washer
- 23. Screw
- 24. Screw

Electric fan

- Remove the radiator
- Undo and remove the three screws and collect the washers; remove the electric fan.



See also

[Removing the radiator](#)

Coolant replacement

CAUTION

**DO NOT USE YOUR VEHICLE IF THE COOLANT IS BELOW THE MINIMUM LEVEL.
CHECK THE COOLANT LEVEL PERIODICALLY OR AFTER LONG TRIPS.**

- Remove the right fairing.
- Working on the left side of the vehicle,



See also

[Side fairings](#)

- Release the clamp.



Remove the pipe and drain the coolant into a container of adequate capacity.

CAUTION



DO NOT DISPOSE OF THE FLUID INTO THE ENVIRONMENT.

FILLING THE COOLING SYSTEM

- Reconnect the pipe on the engine fitting, right side.



- Refill the system with the quantity described in the technical characteristics.

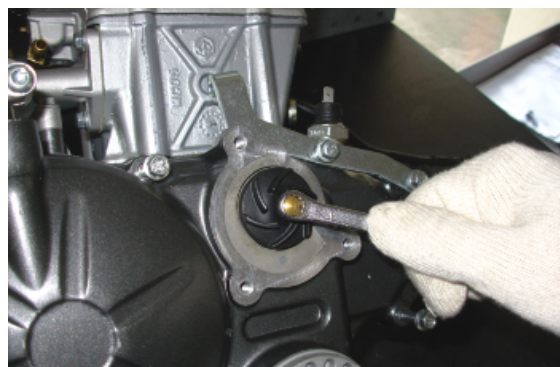
CAUTION

CHECK THAT THE COOLANT LEVEL IS BETWEEN THE REFERENCE MARKS "MIN" AND "MAX"

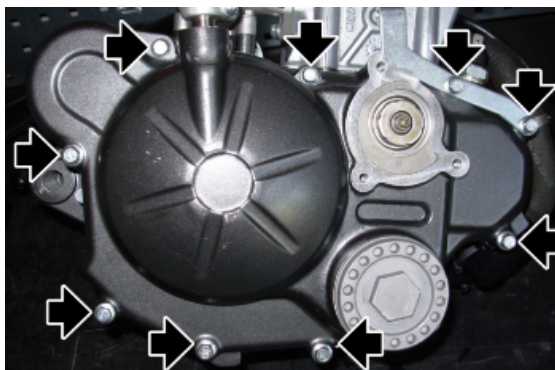
Water pump

Removal

- Remove the water pump and rotor cover;
- Remove the rotor;



- Remove the clutch cover;



- Heat the clutch cover to facilitate extraction of the water pump spindle assembly;
- Support the clutch cover on a press and with the specific tool "B", remove the water pump shaft group, acting from the external part to the internal one.

Specific tooling

866380 tool description



- Turn the clutch cover and acting from the internal part to the external one with the specific tool "C", take out the seal ring;

Specific tooling

866380 tool description



- Support the group of the water pump shaft on a vice and after it is sufficiently heated up, separate it with a punch from the gear;



Installing

CAUTION

ALWAYS REPLACE THE BEARINGS, THE OIL SEAL, AND THE SEALING RING, WHENEVER IT IS NECESSARY TO REMOVE THE WATER PUMP.

- Place the new bearings on the press and with the specific tool "B" push the shaft until it stops;

Specific tooling

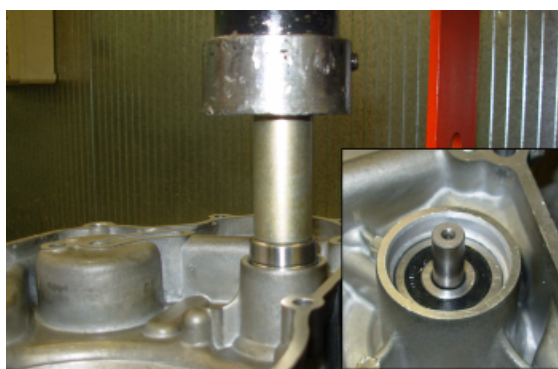
866380 tool description



- Warm up the clutch cover to facilitate the insertion of the shaft with the bearings;
- Place the specific tools "B" and "A" as in the figure in order to push with the press the shaft and the bearings until it stops;

Specific tooling

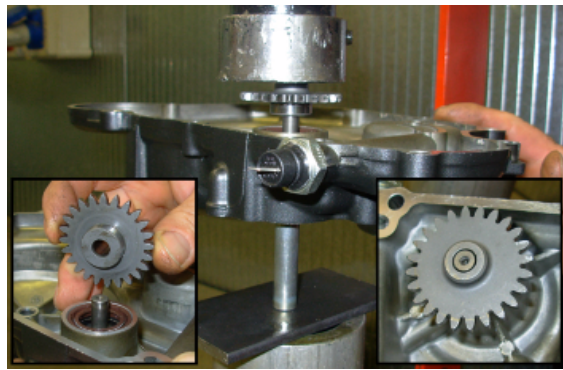
866380 tool description



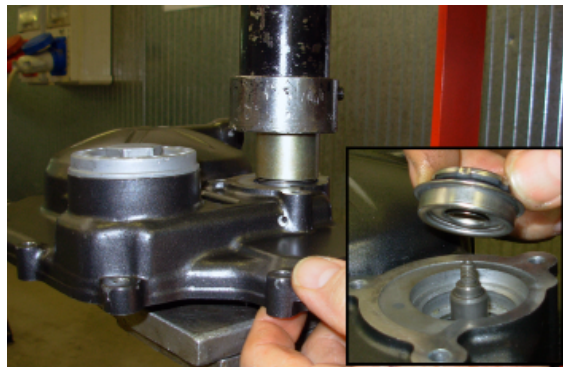
- Place the oil seal as in figure and push it until it stops;



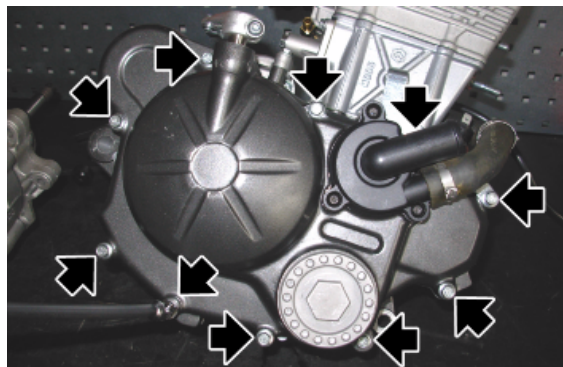
- Place the gear paying attention that the operation is oriented to the cover;
- Use the specific tool "B" as an endstop in order to push the gear, with the press, until it is in line with the shaft.

Specific tooling**866380 tool description**

- Place the sealing ring and push it until it stops with the specific tool "C" by using the press.

Specific tooling**866380 tool description**

- Install the clutch cover;
- Install the rotor and the water pump cover.

**Removing the radiator**

- Remove the expansion tank and the radiator cowl.
- Unscrew the screw and loosen the radiator hose fastening clamp.



- Lift the fuel tank and disconnect the electric fan connector.

**See also**

[Removing the expansion tank](#)

- Unscrew the radiator cover and let it connect to the hoses.



- Loosen the clamp with a screwdriver.
- Slide off the radiator - head pipe.

WARNING

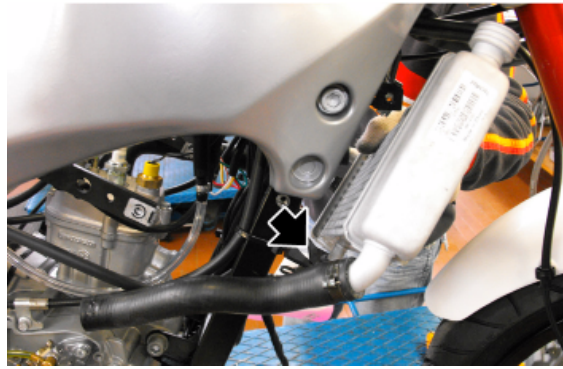
THIS OPERATION MUST BE CARRIED OUT WHEN THE ENGINE IS COLD BECAUSE THE BOILING COOLANT OR VAPOURS MAY CAUSE SERIOUS BURNS. COLLECT THE COOLANT IN A SPECIAL CONTAINER. COOLANT IS HARMFUL, AVOID CONTACT WITH THE SKIN AND EYES.



- Unscrew and remove both screws fixing from the radiator to the chassis.



- Sliding it off the fitting slots, remove the radiator.



- Remove the electric fan if necessary.



Radiator installation

- Install the radiator following the removal operations but in reverse order.
- Fill the coolant tank with the recommended product.
- Check that the system does not show leaks.

Removing the expansion tank

- Remove the left side fairing and drain off the coolant.
- Lift the tank and fasten it in position with the supplied supporting stem.
- Unscrew and remove the two screws and slide the piping out.



- Loosen the clamp and slide off the hoses.

**See also**

Side fairings

Coolant replacement

- Unscrew and remove the tank fixing screw.
- Slide off the coolant tank.

INSTALLATION

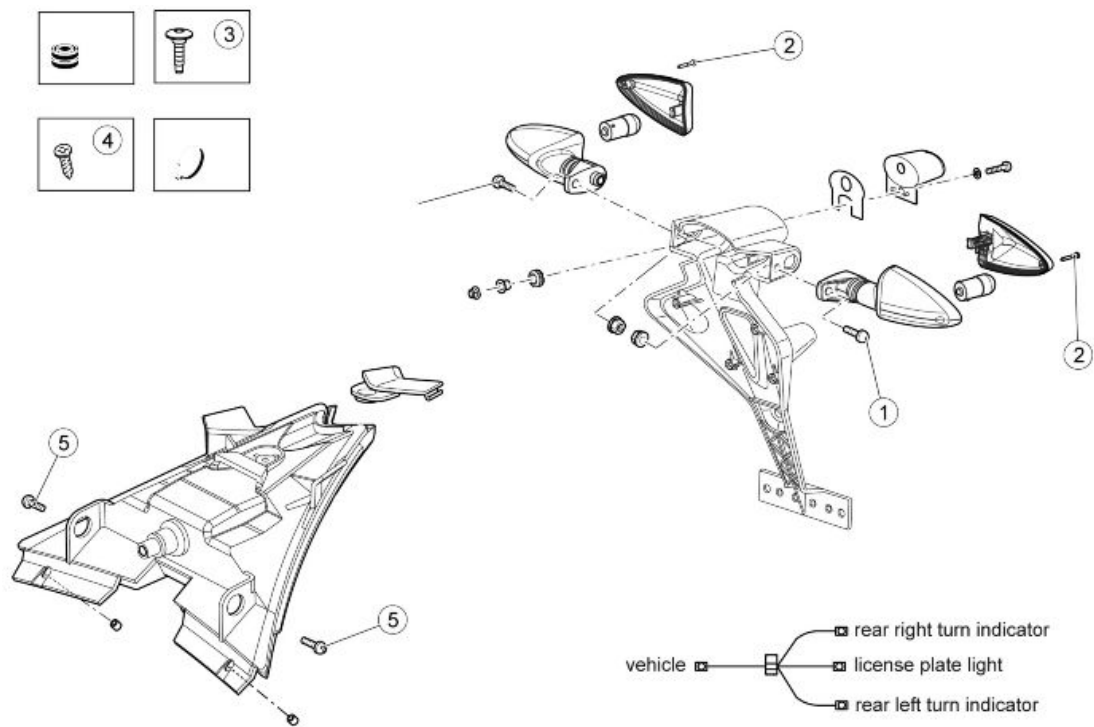
- For the installation, proceed in reverse order as described and fill the system after having replaced the recommended clamps.



INDEX OF TOPICS

BODYWORK

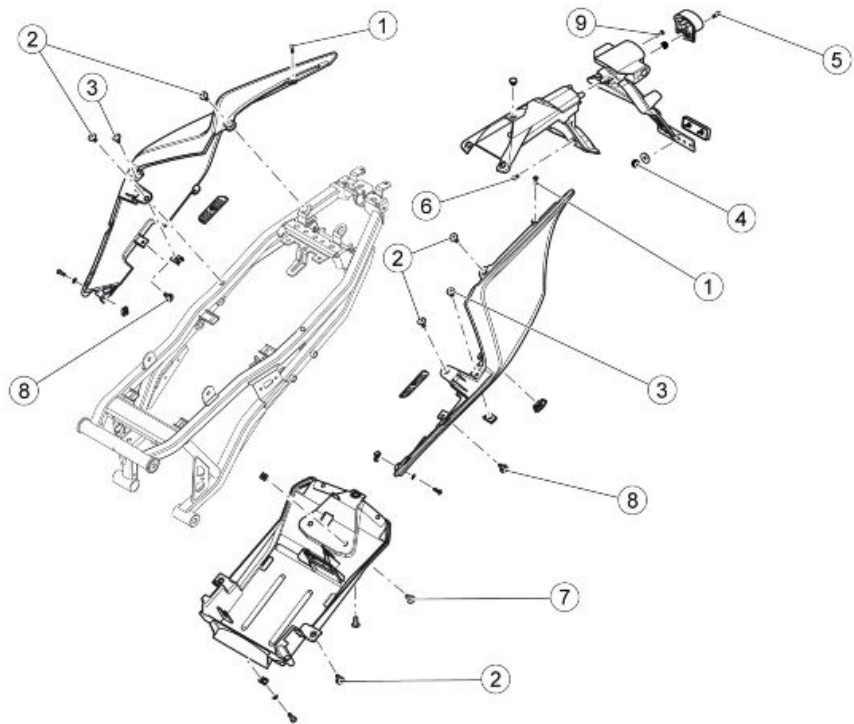
BODYW



REAR LIGHTS

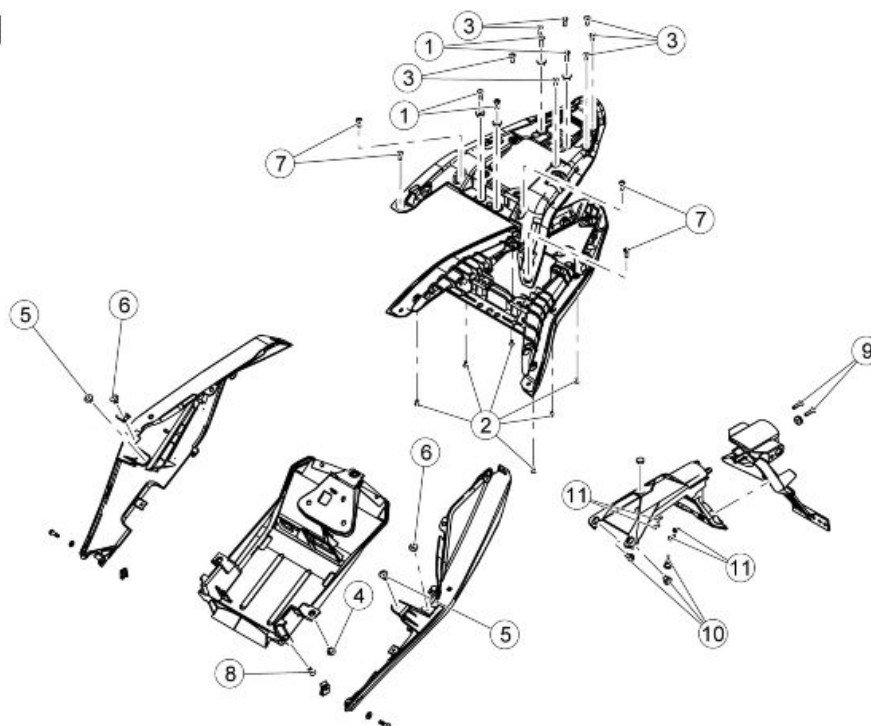
pos.	Description	Type	Quantity	Torque	Notes
1	Turn indicator fastener screw	M5x12	2	3 Nm (2.21 lb ft)	-
2	Turn indicator cover fastener screw	-	2	0.3 Nm (0.22 lb ft)	-
3	Hex socket button head screw	M5x16	2	3 Nm (2.21 lb ft)	-
4	SWP screw	Ø 3.9x7.5	1	0.3 Nm (0.22 lb ft)	-
5	Taillight fastener screw	M5x10	2	3 Nm (2.21 lb ft)	-

RS 125



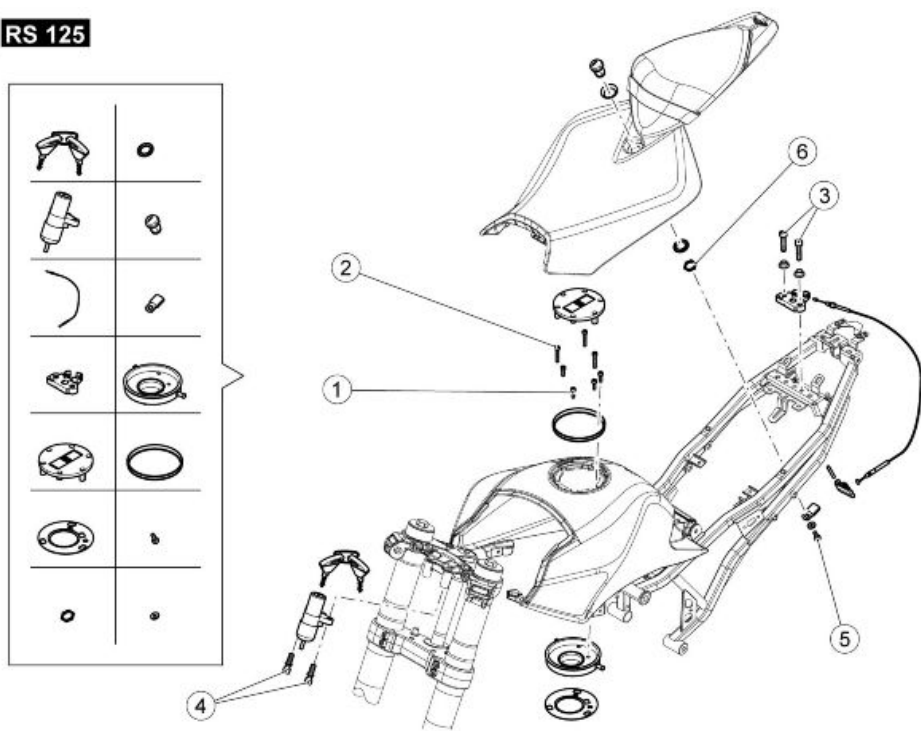
REAR BODYWORK

Pos.	Description	Type	Quantity	Torque	Notes
1	Screw fixing the side fairing to the chassis	M4x14	2	3 Nm (2.21 lb ft)	-
2	Under-saddle fixing screw	M5x9	4	3 Nm (2.21 lb ft)	-
3	Screw fixing the side fairing to the chassis	M5x9	2	3 Nm (2.21 lb ft)	-
4	Reflector fastening screw	M4	2	0.8 Nm (0.59 lb ft)	-
5	License plate light fixing screw	M5x14	2	1.5 Nm (1.11 lb ft)	-
6	License plate holder fixing screw	Self-tapping Ø 3.9x10	4	0.4 Nm (0.30 lb ft)	-
7	License plate holder fixing screw	M6x20	3	3.5 Nm (2.58 lb ft)	-
8	Side fairing fixing screw	-	-	2 Nm (1.48 lb ft)	-
9	License plate holder fixing screw	M5x14	2	1.5 Nm (1.11 lb ft)	-

TUONO 125**REAR BODYWORK**

Pos.	Description	Type	Quantity	Torque	Notes
1	Screws fastening grab handle to the chassis	M6	4	8 Nm (5.90 lb ft)	-
2	Screws fastening lower grab handle to the top one	Self tapping screw, Ø 3.9	6	1.5 Nm (1.11 lb ft)	-
3	Screws fastening upper grab handle to the lower one	Self tapping screw, Ø 5	7	1.5 Nm (1.11 lb ft)	-
4	Screws fastening tail fairing to the saddle mounting	Self tapping screw, Ø 5	2	1.5 Nm (1.11 lb ft)	-
5	Screws fastening tail fairing to the chassis	M5	4	3 Nm (2.21 lb ft)	-
6	Screws fastening tail fairing to the chassis	M5	2	3 Nm (2.21 lb ft)	-
7	Screws fastening grab handle to the tail fairing	Self tapping screw, Ø 5	4	2 Nm (1.48 lb ft)	-
8	Under-saddle fixing screw	M5	2	3 Nm (2.21 lb ft)	-
9	Screw fixing upper license plate holder to lower	Self tapping screw, Ø 4.2	2	0.8 Nm (0.59 lb ft)	-
10	Screw fixing license plate holder	M6	3	3.5 Nm (2.58 lb ft)	-
11	Screw fixing license plate holder	Self tapping screw, Ø 3.9	4	1 Nm (0.74 lb ft)	-

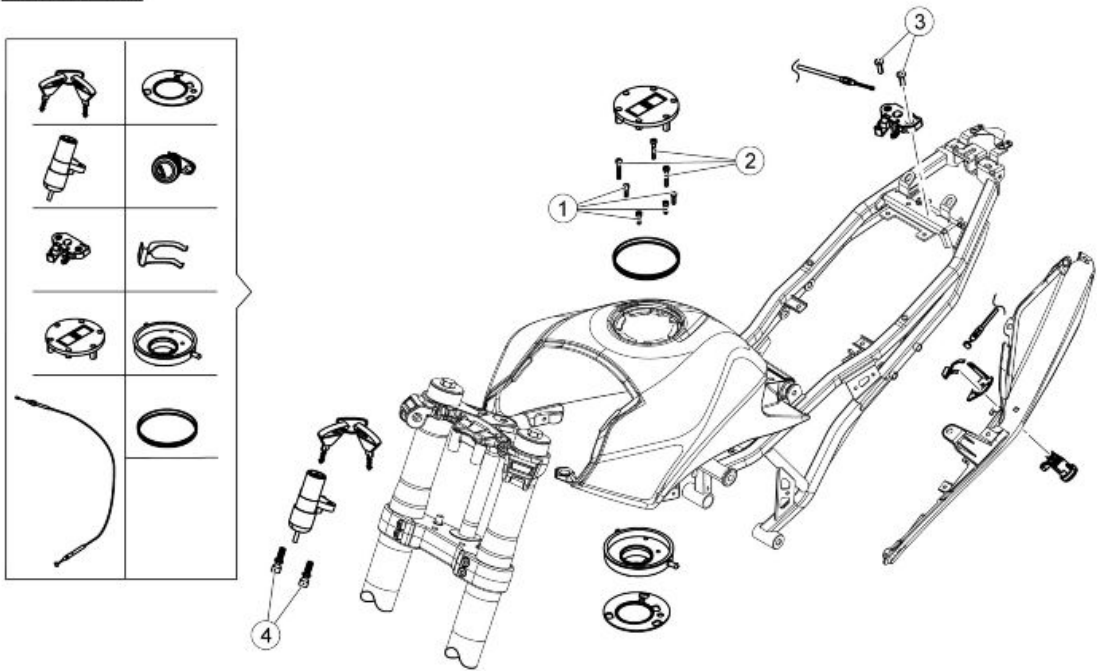
RS 125



Locks

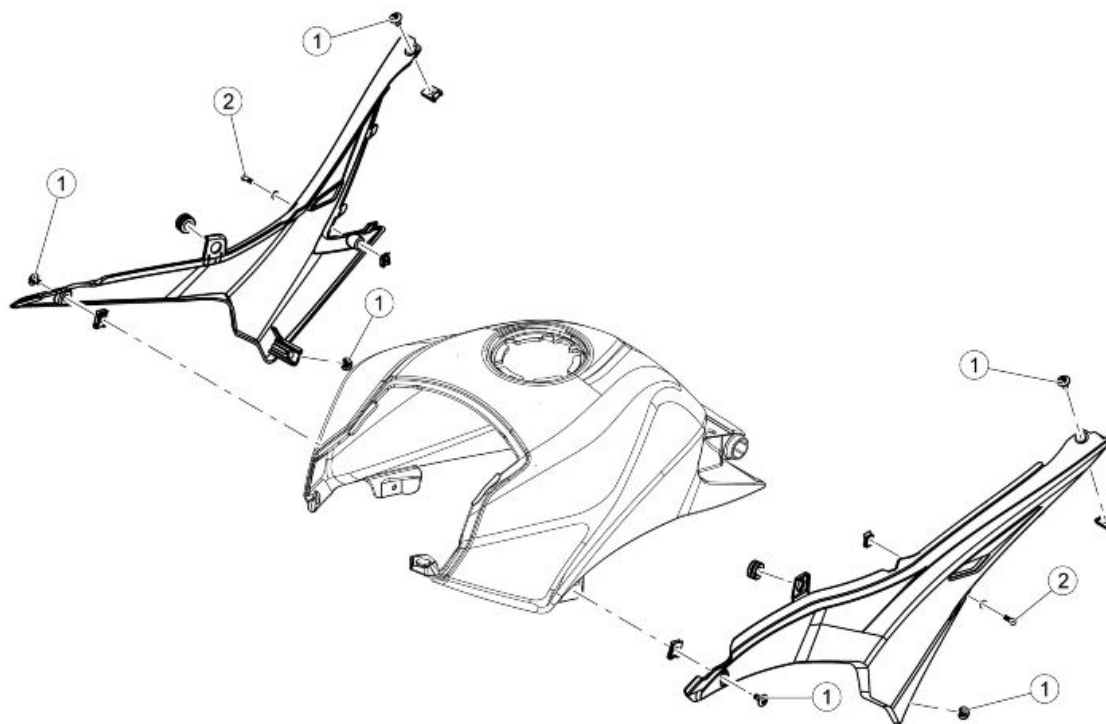
pos.	Description	Type	Quantity	Torque	Notes
1	Tank plug fixing screw	M5x16	3	3 Nm (2.21 lb ft)	-
2	Tank plug fixing screw	M5x30	2	3 Nm (2.21 lb ft)	-
3	Screw fastening saddle lock plate	M6x30	2	6 Nm (4.43 lb ft)	-
4	Ignition lock fixing screw	M8x20	2	6.5 Nm (4.79 lb ft)	Tear-off
5	Saddle lock block fixing screw	M4	1	0.5 Nm (0.37 lb ft)	-
6	Nut fastening saddle lock ring nut	M22x1	1	3 Nm (2.21 lb ft)	-

TUONO 125

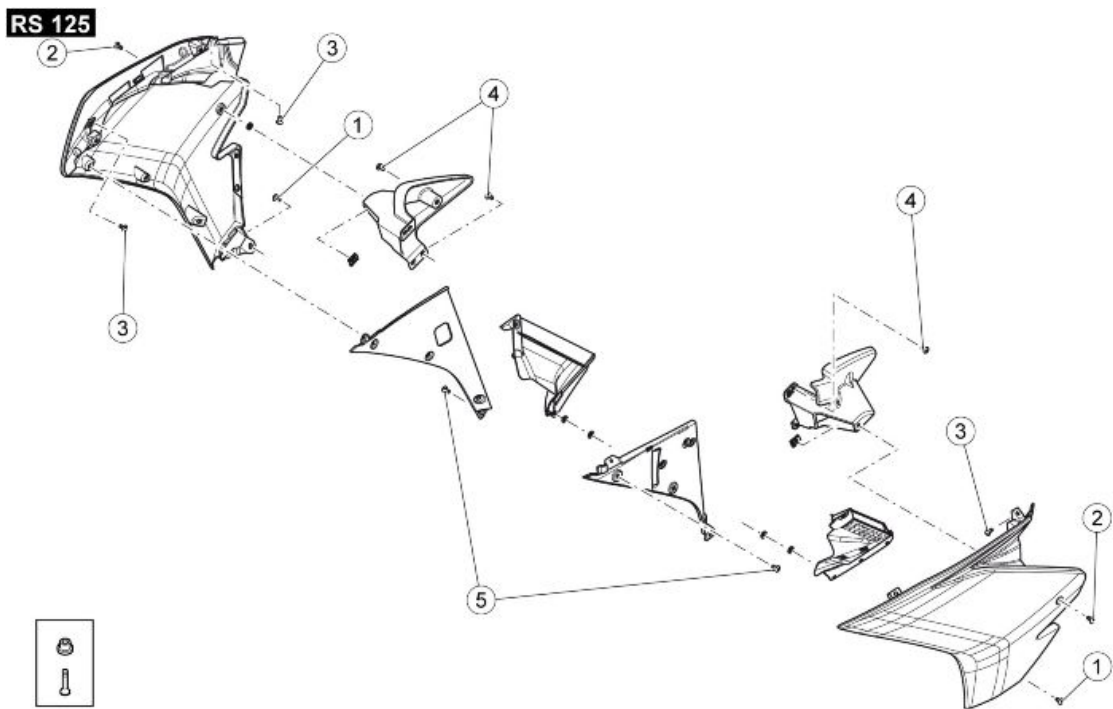


Locks

pos.	Description	Type	Quantity	Torque	Notes
1	Tank plug fixing screw	M5x16	3	3 Nm (2.21 lb ft)	-
2	Tank plug fixing screw	M5x30	2	3 Nm (2.21 lb ft)	-
3	Screw fastening saddle lock plate	M6x30	2	6 Nm (4.43 lb ft)	-
4	Ignition lock fixing screw	M8x20	2	6.5 Nm (4.79 lb ft)	Tear-off

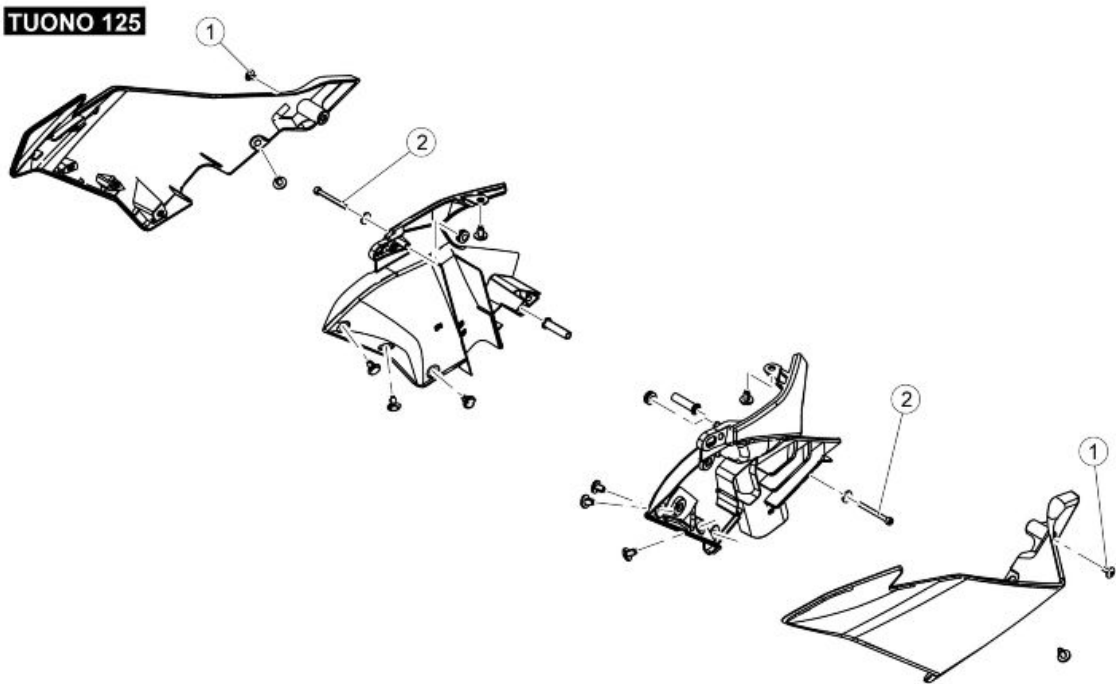
**CENTRAL BODYWORK**

pos.	Description	Type	Quantity	Torque	Notes
1	Fairing fastening screw	M5x9	6	3 Nm (2.21 lb ft)	-
2	Fairing fastening screw	M5x12	2	3 Nm (2.21 lb ft)	-



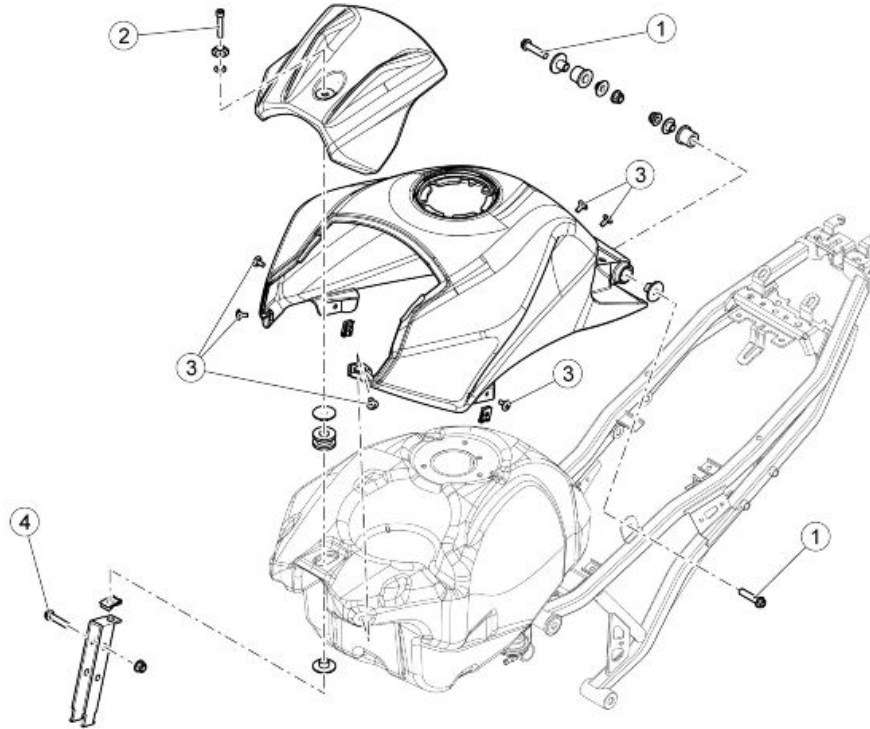
SIDE FAIRINGS

Pos.	Description	Type	Quantity	Torque	Notes
1	Side fairing fastening screw	M5x16	6	0.8 Nm (0.59 lb ft)	-
2	Screw fixing side fairing to engine closure	M5x9	2	3 Nm (2.21 lb ft)	-
3	Side fairing fastening screw	Self tapping screw, Ø 3.9	4	0.4 Nm (0.30 lb ft)	-
4	Engine closing fixing screw	M5x9	6	1.7 Nm (1.25 lb ft)	-
5	Screw fastening inside fairing	M5x16	2	3 Nm (2.21 lb ft)	-

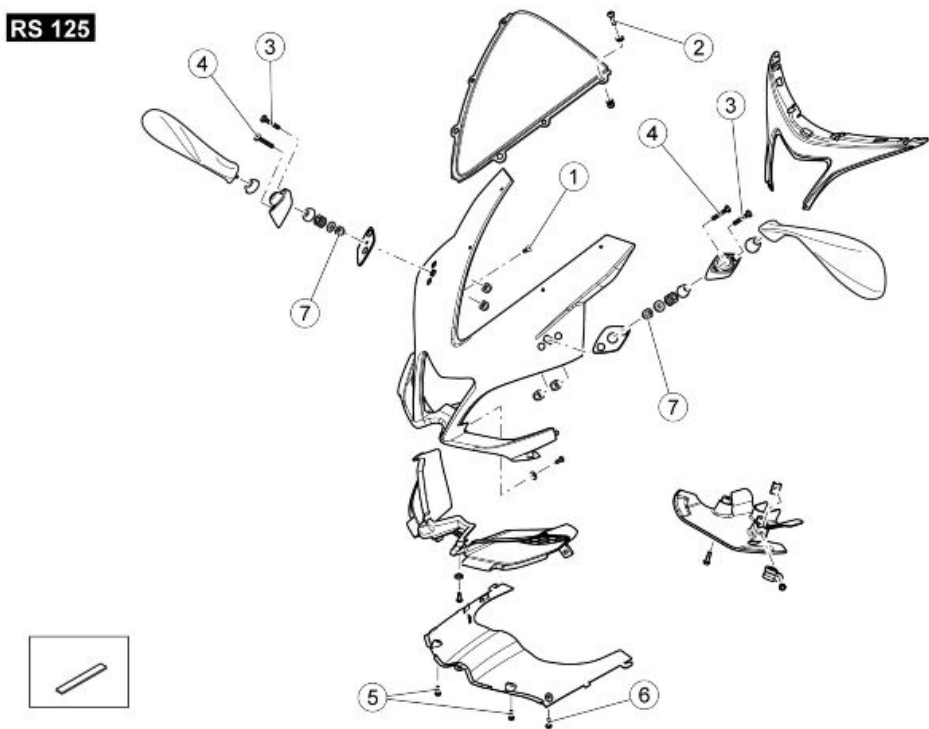


SIDE FAIRINGS

Pos.	Description	Type	Quantity	Torque	Notes
1	Side fairing fastening screw	M5	2	3 Nm (2.21 lb ft)	-
2	Screw fastening inner fairing	M5	2	3 Nm (2.21 lb ft)	-

**TANK**

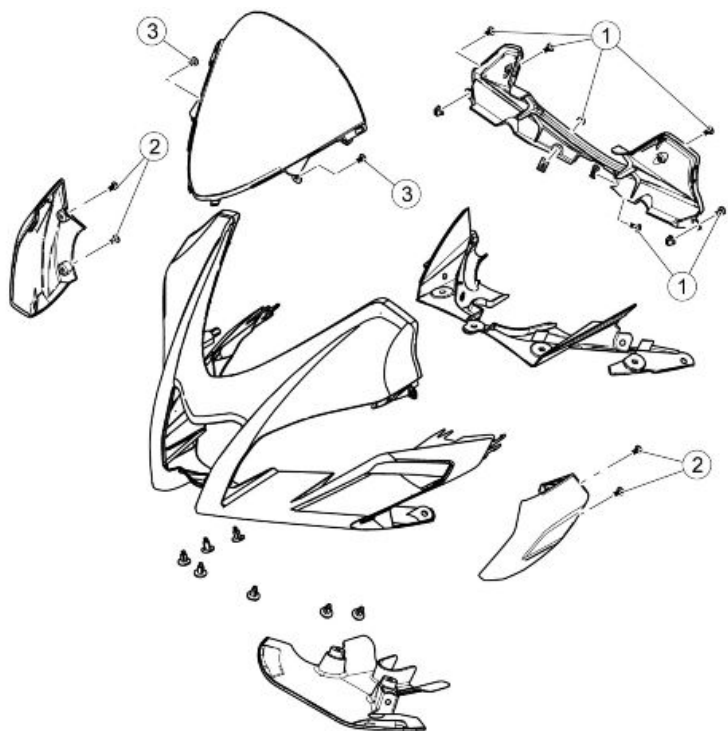
Pos.	Description	Type	Quantity	Torque	Notes
1	Rear tank fixing screw	M8x40	2	8 Nm (5.90 lb ft)	-
2	Tank cover fixing screw	M6x35	1	10 Nm (7.38 lb ft)	-
3	Front tank fixing screw	M5x9	4	3 Nm (2.21 lb ft)	-
4	Tank U-bolt fixing screw	M6x30	2	10 Nm (7.38 lb ft)	-



TOP FAIRING

pos.	Description	Type	Quantity	Torque	Notes
1	Top fairing fastener screw	Self tapping screw, Ø 3.9	2	0.4 Nm (0.30 lb ft)	-
2	Top fairing screen fastener screw	M4	4	1 Nm (0.74 lb ft)	-
3	Rear view mirror fastener screw	M6x30	2	2 Nm (1.48 lb ft)	-
4	Rear view mirror fastener screw	M6x35	2	2 Nm (1.48 lb ft)	-
5	Screw fastening lower front fairing element	Self tapping screw, Ø 3.9	2	1 Nm (0.74 lb ft)	-
6	Screw fastening lower front fairing element	M4x12	2	1 Nm (0.74 lb ft)	-
7	Rear view mirror fastener nut	M6	2	2 Nm (1.48 lb ft)	-

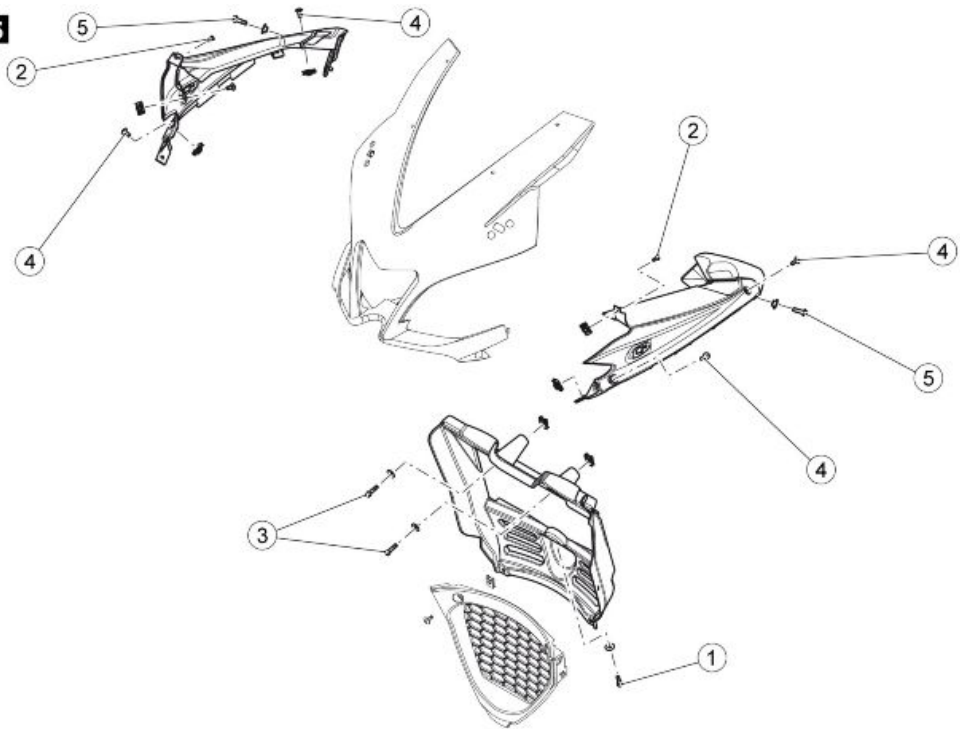
TUONO 125



TOP FAIRING

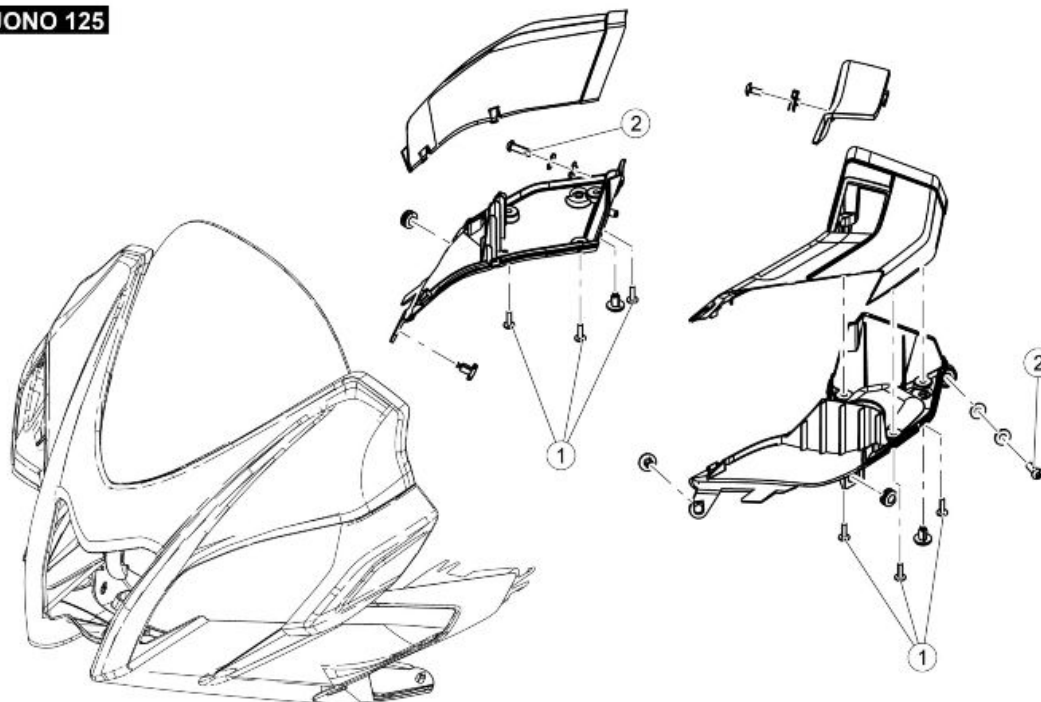
pos.	Description	Type	Quantity	Torque	Notes
1	Instrument panel fastening screws	Self tapping screw, Ø 4.2	6	1 Nm (0.78 lb ft)	-
2	Taillight side panels fixing screws	Self tapping screw, Ø 3.3	4	2 Nm (1.48 lb ft)	-
3	Top fairing fixing screws	Self tapping screw, Ø 4.2	4	3 Nm (2.21 lb ft)	-

RS 125

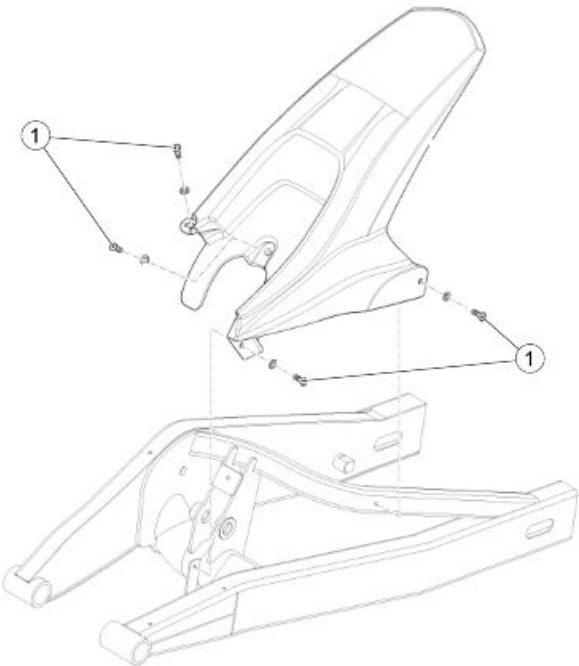


DUCTS

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening radiator cowl	M5x16	1	2 Nm (1.48 lb ft)	-
2	Screw fastening upper fairing closing	Self tapping screw, Ø 3.9	2	1 Nm (0.74 lb ft)	-
3	Screw fastening radiator cowl	M5x20	2	2 Nm (1.48 lb ft)	-
4	Screw fastening upper fairing closing	M5x16	4	3 Nm (2.21 lb ft)	-
5	Screw fastening upper fairing closing	M6x20	2	6 Nm (4.43 lb ft)	-

TUONO 125**DUCTS**

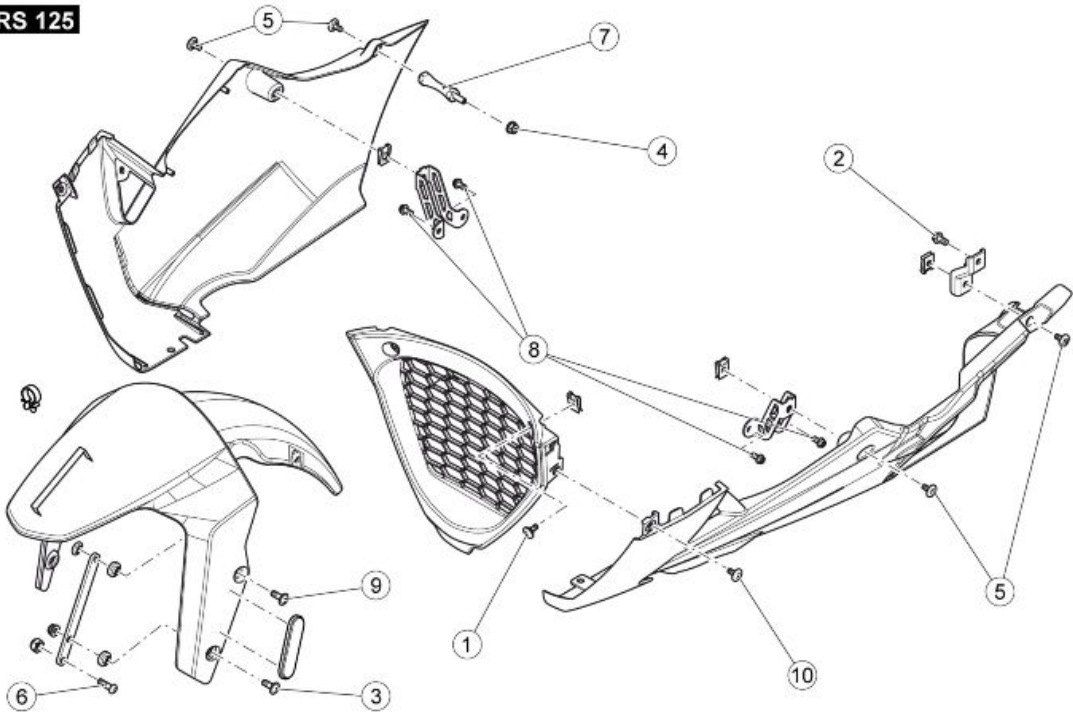
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening upper ducts to lower ones	Self tapping screw, Ø 3.3	6	2 Nm (1.48 lb ft)	-
2	Screws fastening ducts to chassis	M6	2	6 Nm (4.43 lb ft)	-



REAR MUDGUARD

Pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening rear mudguard to swingarm	Self-tapping M4.8x12	4	3 Nm (2.21 lb ft)	-

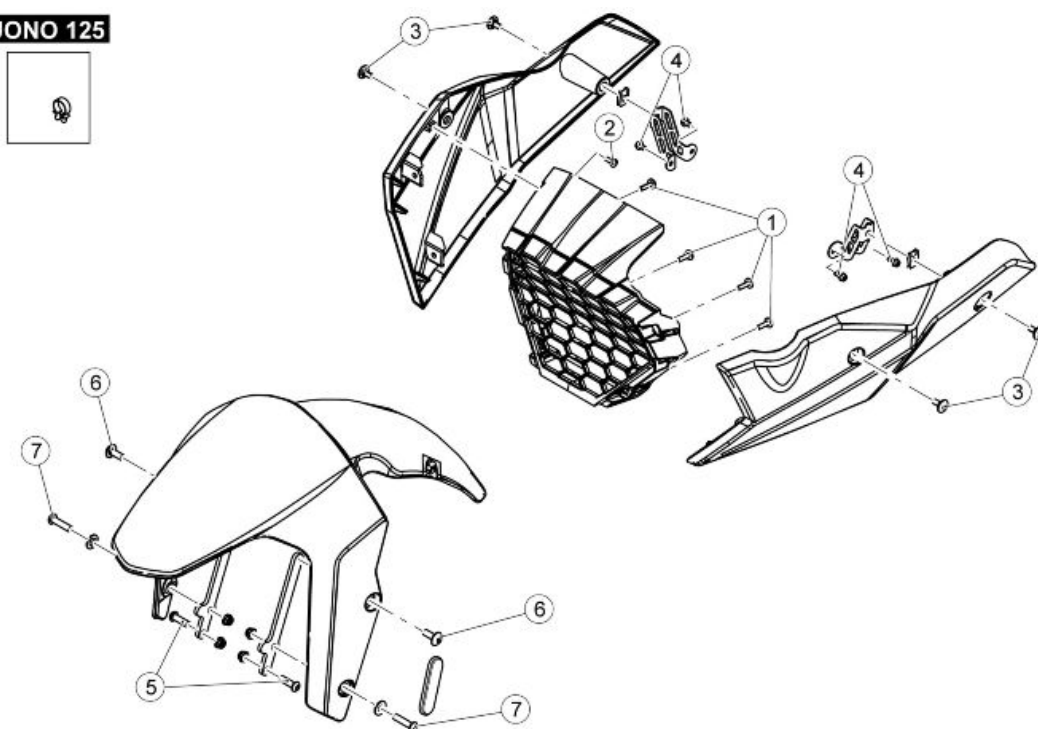
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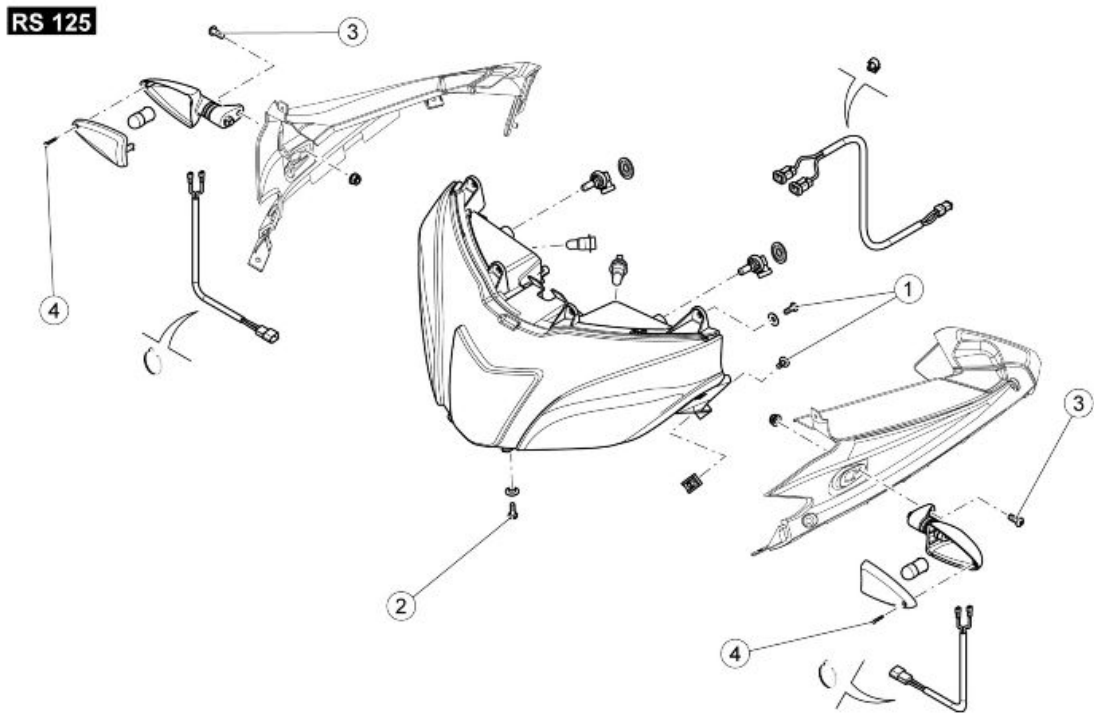
FRONT MUDGUARD - ENGINE FAIRING

pos.	Description	Type	Quantity	Torque	Notes
1	Engine fairing fastening screw	M5x16	2	3 Nm (2.21 lb ft)	-
2	Screw fixing side fairing	M6x12	1	6 Nm (4.43 lb ft)	-

pos.	Description	Type	Quantity	Torque	Notes
3	Front mudguard fixing screw	M6x25	2	4.4 Nm (3.25 lb ft)	-
4	Flanged self-tapping nut	M6	1	6 Nm (4.43 lb ft)	-
5	Screw fastening the lower fairing to the cradle	M5x12	4	3 Nm (2.21 lb ft)	-
6	Front mudguard mounting fixing screw	M6x20	2	5 Nm (3.69 lb ft)	-
7	Fairing fixing spacer	M6	1	12 Nm (8.85 lb ft)	-
8	Right/left fairing mounting fixing screw	M5	4	5 Nm (3.69 lb ft)	-
9	Front mudguard fixing screw	M6	2	4.4 Nm (3.25 lb ft)	-
10	Screw fastening lower fairing to the engine fairing	M5x12	2	3 Nm (2.21 lb ft)	-

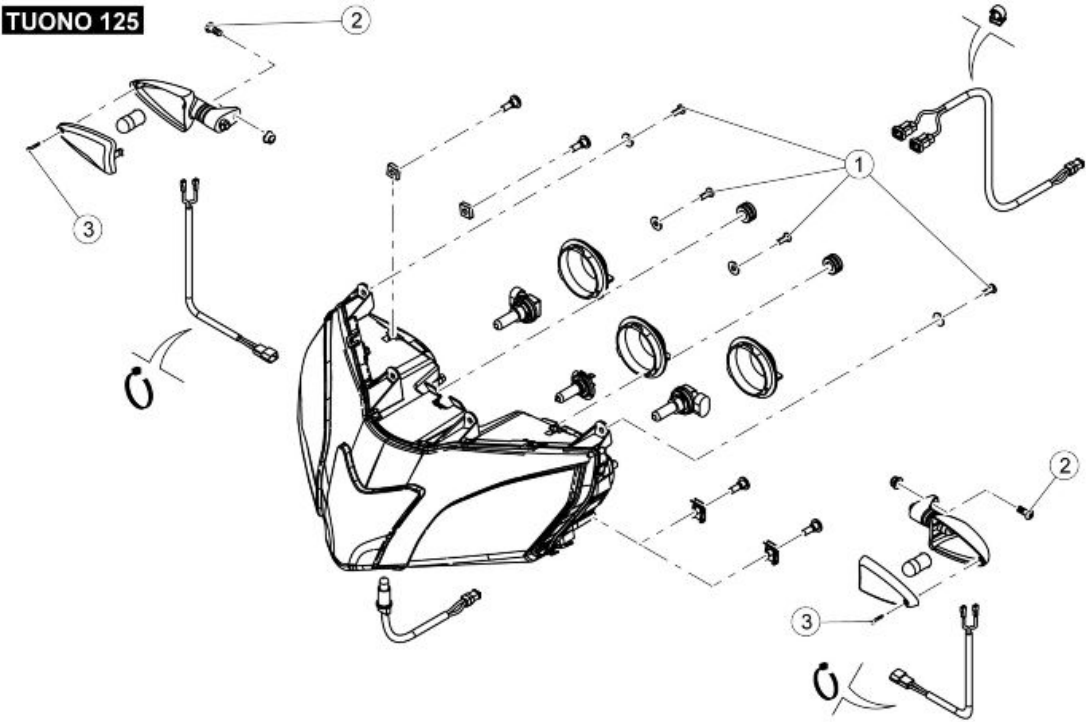
TUONO 125**FRONT MUDGUARD - ENGINE FAIRING**

pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening lower fairing to the engine fairing	Self tapping screw, Ø 3.9	4	2 Nm (1.48 lb ft)	-
2	Screw fastening lower right fairing to the engine fairing	Self tapping screw, Ø 3.9	1	2 Nm (1.48 lb ft)	-
3	Screw fastening lower fairings to the chassis	M5	4	5 Nm (3.69 lb ft)	-
4	Screws fixing the side fairings mounting to the engine cradle	M5	4	3 Nm (2.21 lb ft)	-
5	Front mudguard mounting fixing screws	M6	2	5 Nm (3.69 lb ft)	With self-locking nut
6	Front mudguard fixing screws	M6	2	4.4 Nm (3.25 lb ft)	-
7	Front mudguard fixing screws	M6	2	4.4 Nm (3.25 lb ft)	-



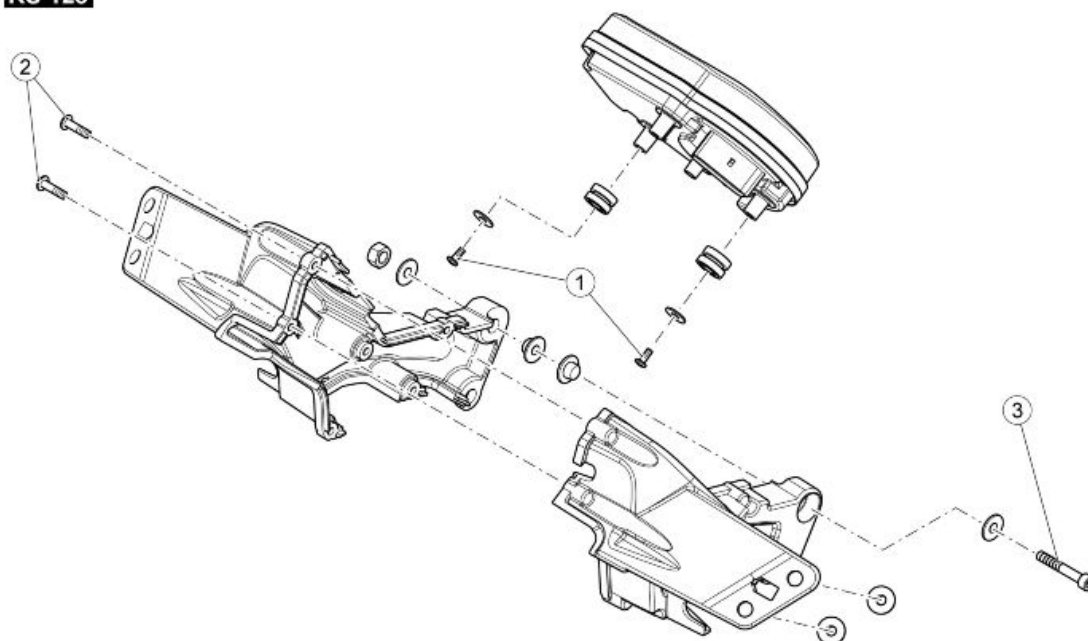
FRONT LIGHTS

pos.	Description	Type	Quantity	Torque	Notes
1	Headlamp fastener screw	M5x14	4	1.5 Nm (1.11 lb ft)	-
2	Headlamp fastener screw	M5	1	1.5 Nm (1.11 lb ft)	-
3	Turn indicator fastener screw	M5x12	2	3 Nm (2.21 lb ft)	-
4	Turn indicator cover fastener screw	-	2	0.3 Nm (0.22 lb ft)	-



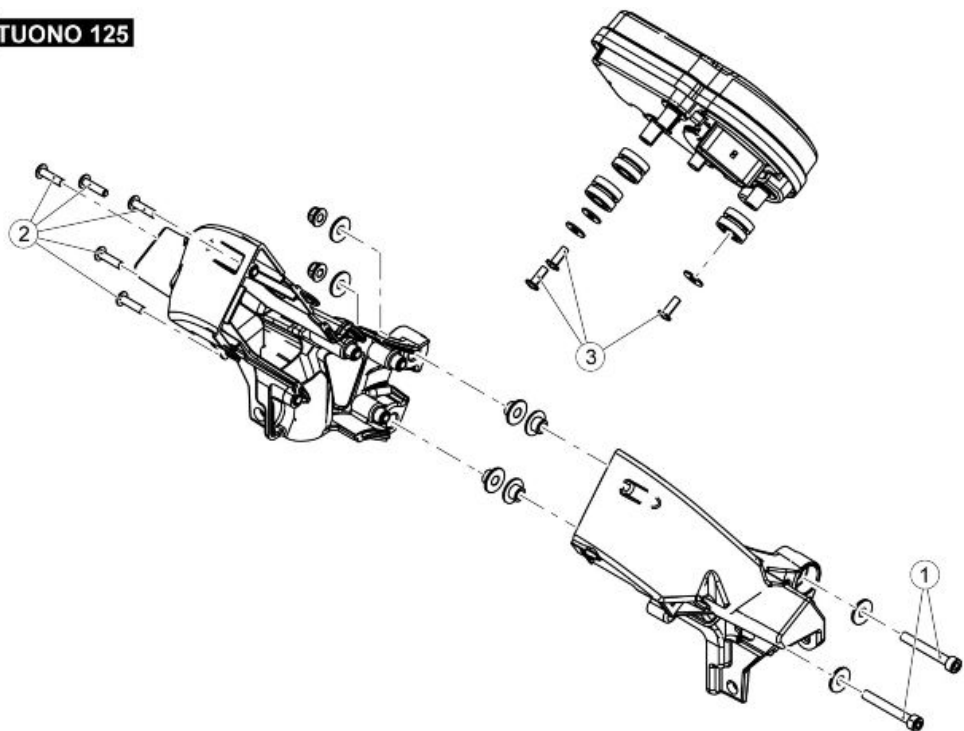
FRONT LIGHTS

pos.	Description	Type	Quantity	Torque	Notes
1	Headlamp fastener screw	M5x14	4	1.5 Nm (1.11 lb ft)	-
2	Turn indicator fastener screw	M5x12	2	3 Nm (2.21 lb ft)	-
3	Turn indicator cover fastener screw	Self tapping	2	0.3 Nm (0.22 lb ft)	-

RS 125**DASHBOARD**

pos.	Description	Type	Quantity	Torque	Notes
1	Instrument panel fastening screw	M5x14	3	2.5 Nm (1.84 lb ft)	-
2	Instrument panel mounting fixing screw	M5x20	6	2 Nm (1.48 lb ft)	-
3	Instrument panel mounting fixing screw	M6x40	2	8 Nm (5.90 lb ft)	-

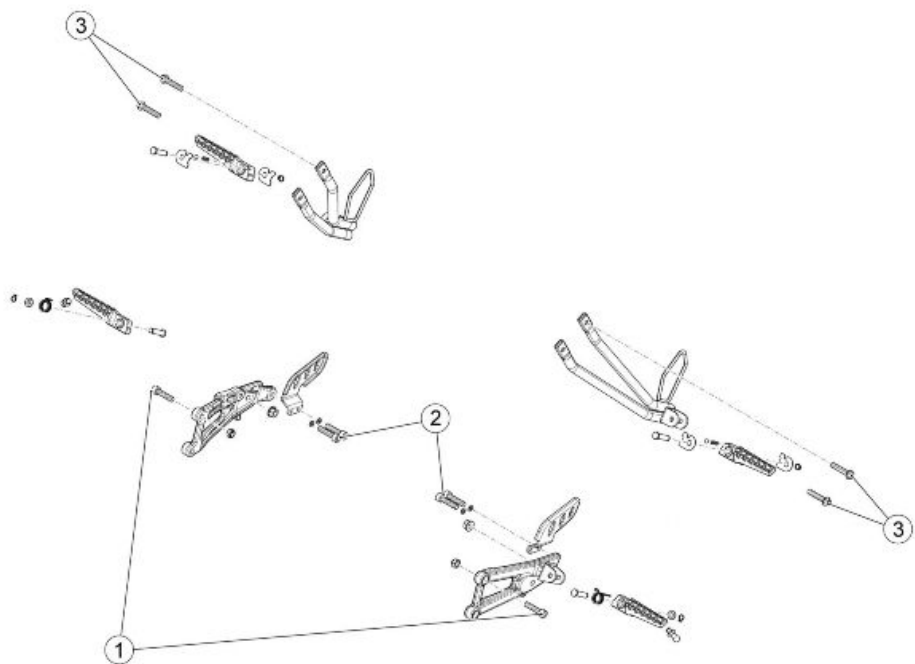
TUONO 125



DASHBOARD

pos.	Description	Type	Quantity	Torque	Notes
1	Instrument panel mounting fixing screw	M6	2	8 Nm (5.90 lb ft)	-
2	Instrument panel mounting fixing screw	Self tapping screw, Ø 5	5	2 Nm (1.48 lb ft)	-
3	Instrument panel fixing screws	Self tapping screw, Ø 5	3	2.5 Nm (1.84 lb ft)	-

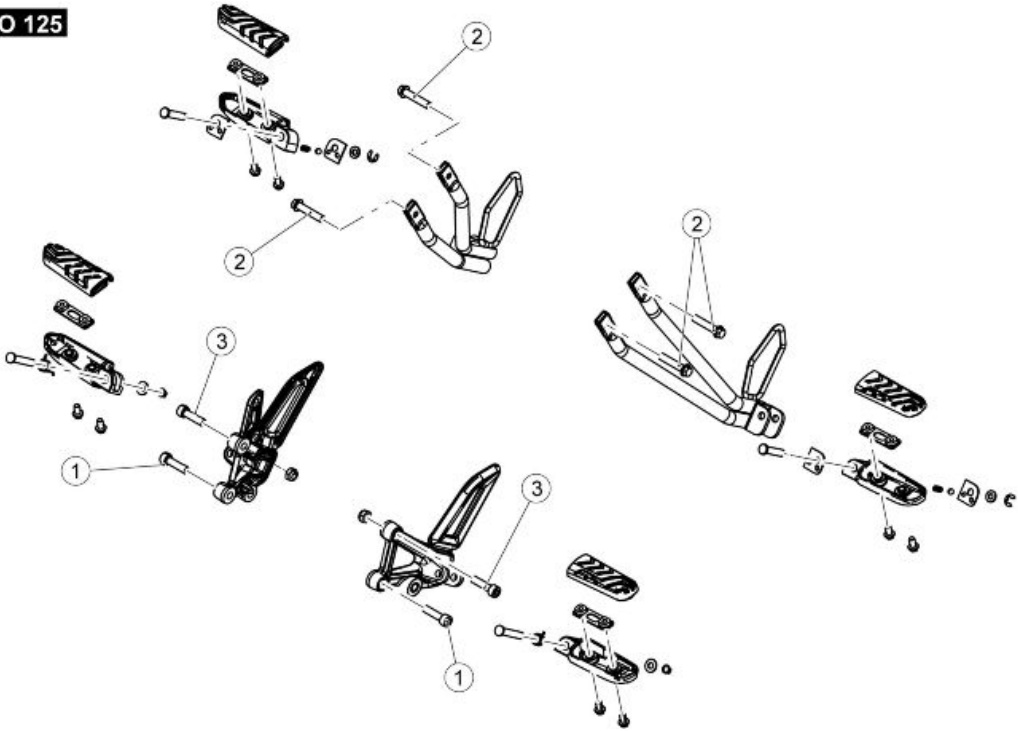
RS 125



FOOTRESTS

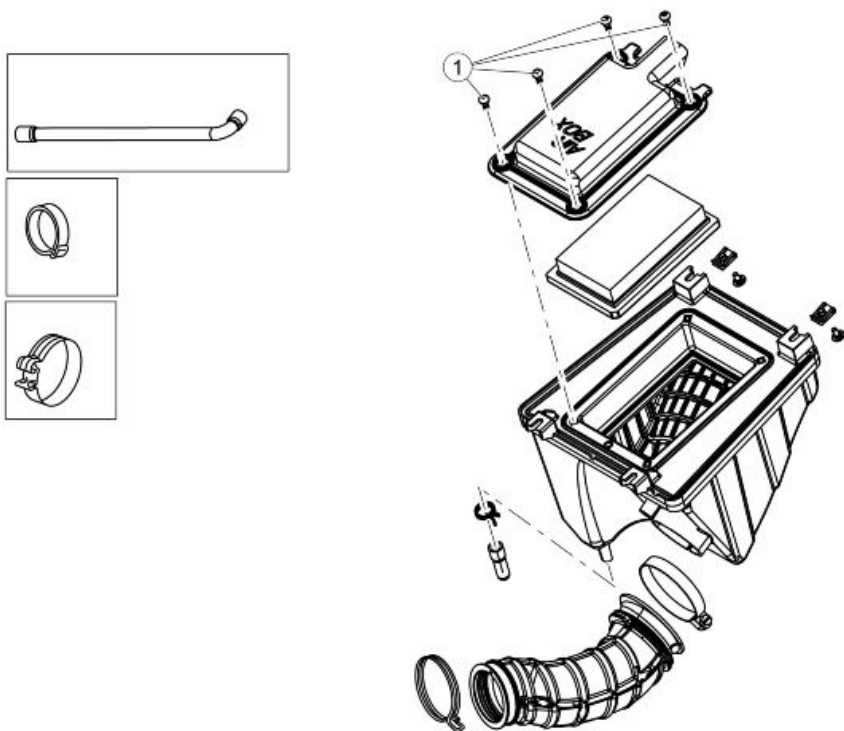
pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening the rider footrest mounting	M8x25	2	25 Nm (18.44 lb ft)	Loctite 243
2	Footrest protection fastening screw	M5x12	4	5 Nm (3.69 lb ft)	-
3	Passenger footrest bracket fastening screw	M8x40	4	20 Nm (14.75 lb ft)	-

TUONO 125



FOOTRESTS

pos.	Description	Type	Quantity	Torque	Notes
1	Screws fastening the rider footrest mounting	M8	2	25 Nm (18.44 lb ft)	Loctite 243
2	Passenger footrest mounting fastening screws	M8	4	20 Nm (14.75 lb ft)	-
3	Screws fastening the rider footrest mounting	M8	2	25 Nm (18.44 lb ft)	With self-locking nut



FILTER BOX

Pos.	Description	Type	Quantity	Torque	Notes
1	Air filter box fastening screw	M5	4	3.5 Nm (2.58 lb ft)	-

Driving mirrors

(RS 125)

- Unscrew and remove the two nuts inside the top fairing, two for each mirror.
- Remove the rear-view mirrors.



(TUONO 125)

- Remove the protective rubber (1)
- Using a suitable wrench unscrew the threaded pin (2)



- Remove the right rear view mirror (3)
- Repeat the entire procedure to remove the left rear-view mirror



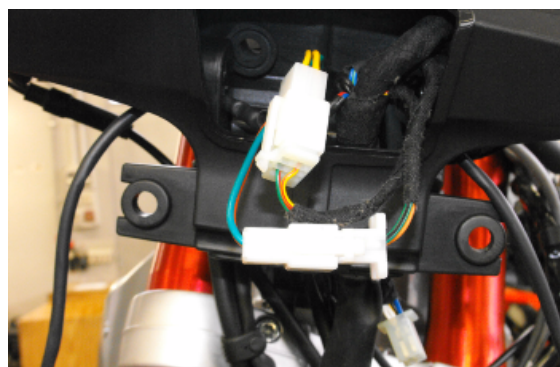
Instrument panel

(RS 125)

- Remove the top fairing.
- Lift the instrument panel and disconnect the connector.



- Disconnect the two connectors of the turn indicators and remove the instrument panel from the mounting.

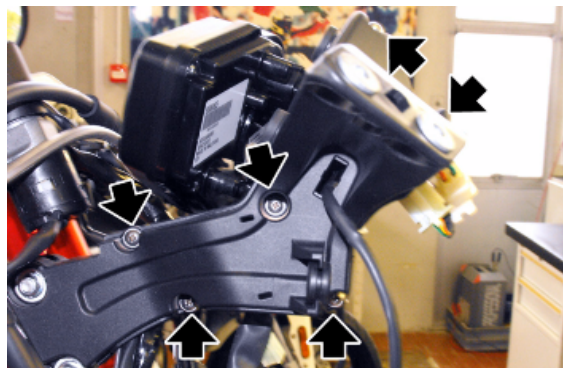


- Unscrew and remove the six perimeter screws and remove the two cases.



REMOVING INSTRUMENT CLUSTER MOUNTING

- Unscrew and remove the two through-passing screws and retrieve the washer from the left side and the nut from the right side.

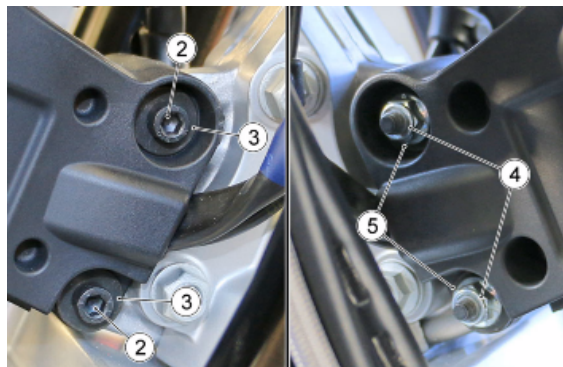


(TUONO 125)

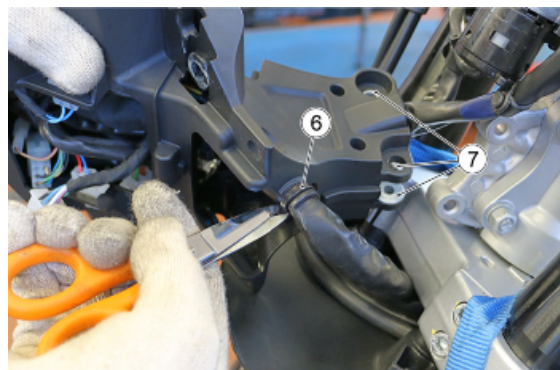
- Remove the top fairing
- Undo and remove the fastening screw (1)



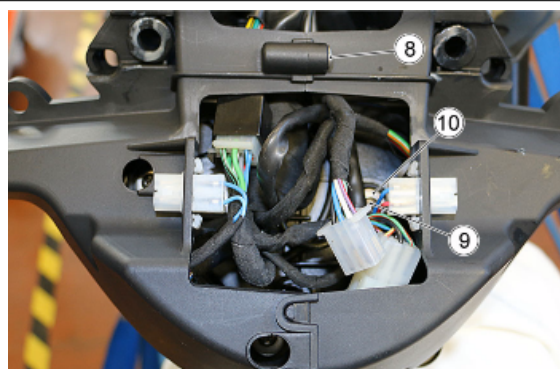
- Unscrew and remove the two screws (2)
- Retrieve the two washers (3), the two nuts (4) and the two washers (5)



- Remove the clamp (6)
- Retrieve the four bushings (7)
- Turn the instrument panel mounting 180°



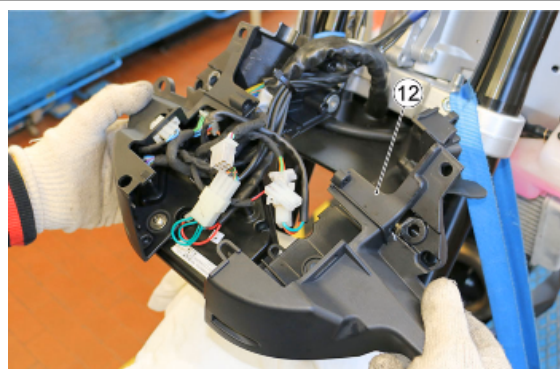
- Unscrew and remove the screw (8)
- Unscrew and remove the screw (9) and retrieve the washer (10)



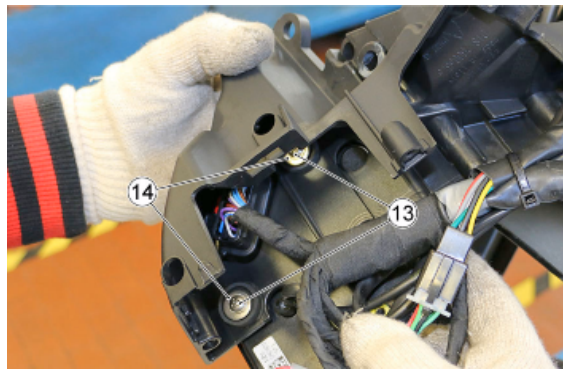
- Unscrew and remove the three screws (11)



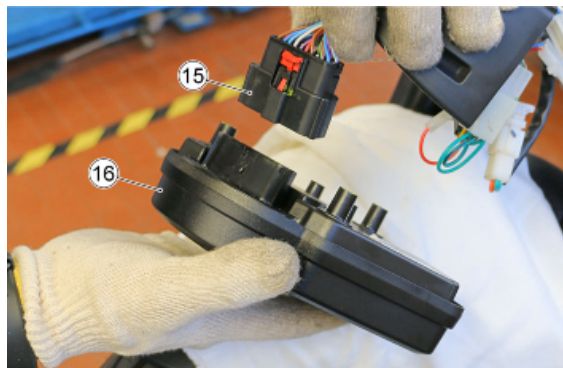
- Remove the left instrument panel mounting (12)



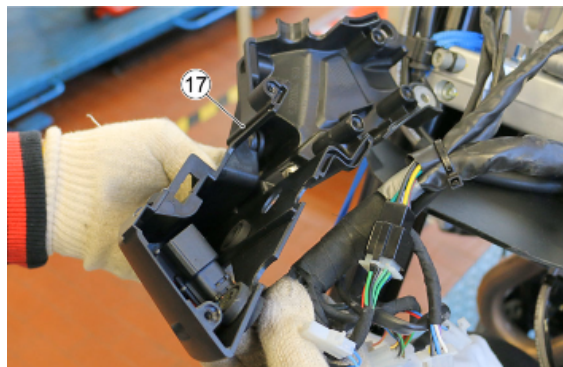
- Unscrew and remove the two screws (13) and retrieve the two washers (14)



- Disconnect the connector (15)
- Remove the instrument panel (16)



- Remove the left instrument panel mounting (17)



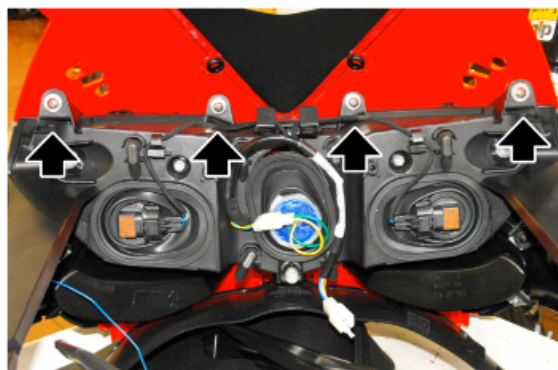
Headlight assy.

(RS 125)

- First remove the top fairing.
- Disconnect the connectors of the two lamps.
- Disconnect the connectors of the turn indicators on both sides.

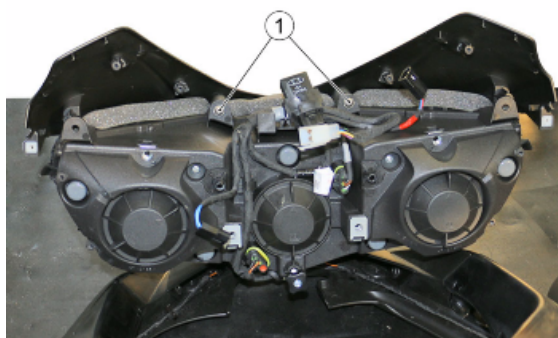


- Unscrew and remove the four top fairing fastening screws
- Remove the light assembly.

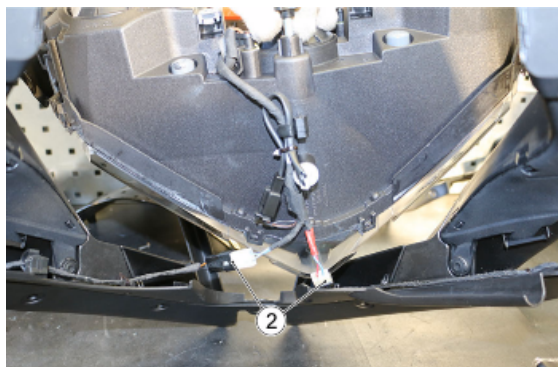


(TUONO 125)

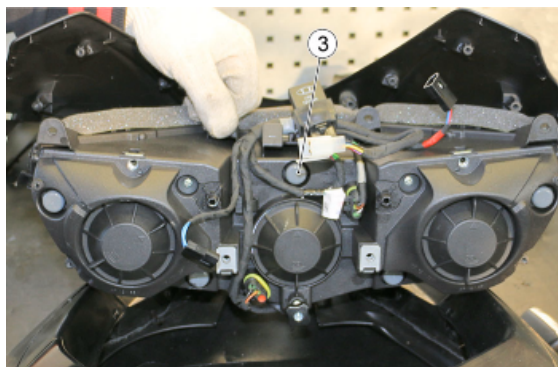
- Remove the top fairing
- Unscrew and remove the two screws (1)



- Disconnect the two connectors (2)



- Remove the front light assembly (3)



Headlight fairing

(RS 125)

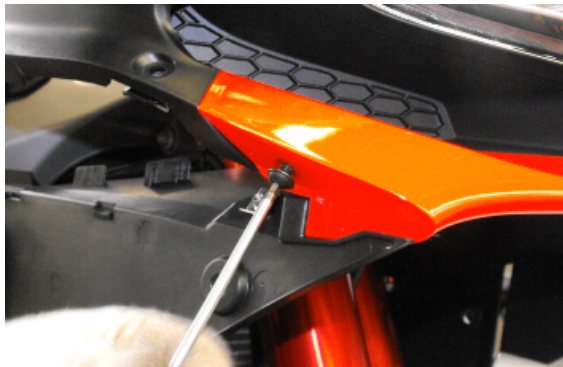
- First remove the fairing and the rear-view mirrors.
- Unscrew and remove the turn indicator screw.
- Remove the glass and disconnect the two bulb wires.
- Remove the two screws inside the top fairing from both sides of the motorcycle.



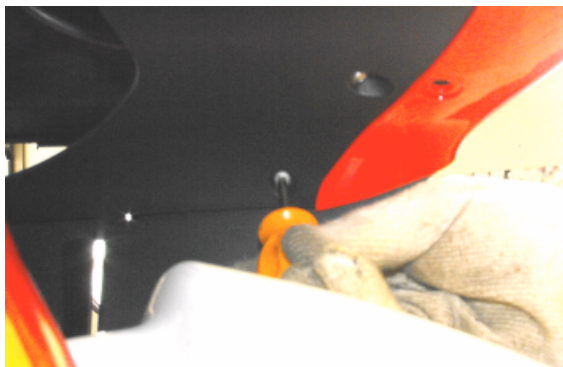
- Remove the two side screws that fasten the top fairing to the chassis.



- Unscrew and remove the two side screws on the top fairing.



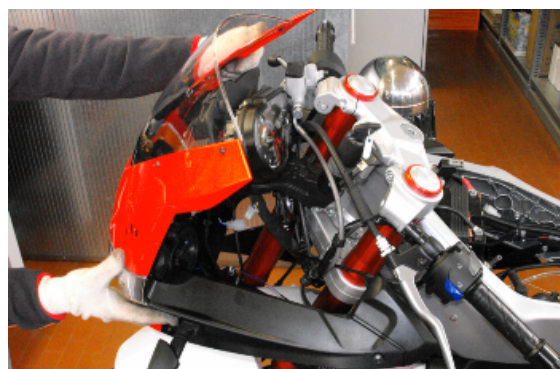
- Unscrew and remove the two screws under the front fairing.



- Disconnect the instrument panel connector.

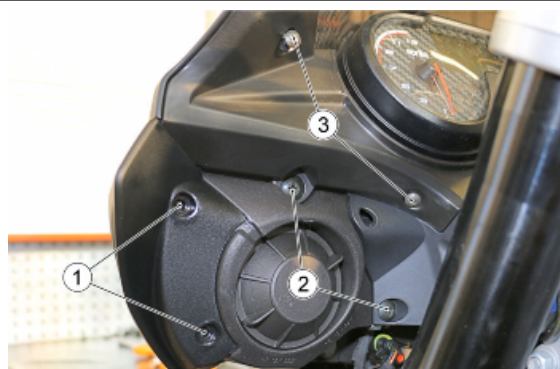


- Remove the top fairing.



(TUONO 125)

- Remove the side fairings
 - Unscrew and remove the two screws (1)
 - Unscrew and remove the two screws (2)
 - Unscrew and remove the two screws (3)
 - Repeat the operation from the right side of the vehicle
-
- Remove the left lamp side panel (4)



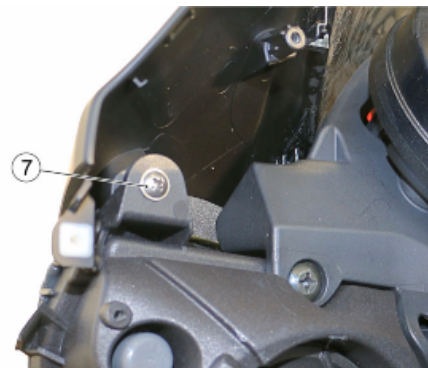
- Remove the right lamp side panel (5)



- Remove the instrument panel dashboard (6)



- Undo and remove the screw (7)



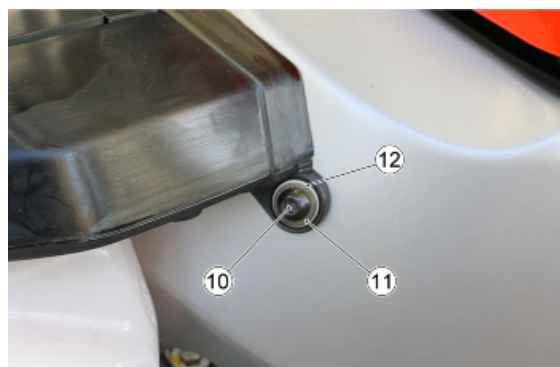
- Unscrew and remove the screw (8)



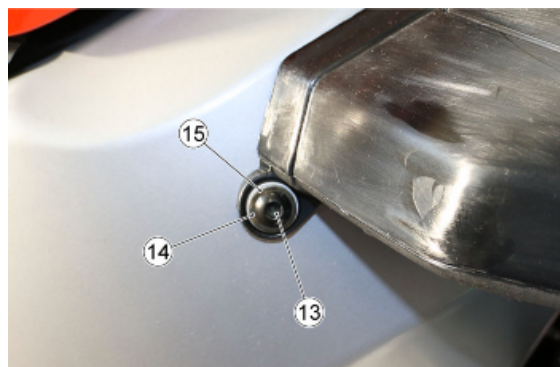
- Remove the rivet (9).



- Undo and remove the screw (10)
- Retrieve the washer (11) and the spacer (12)



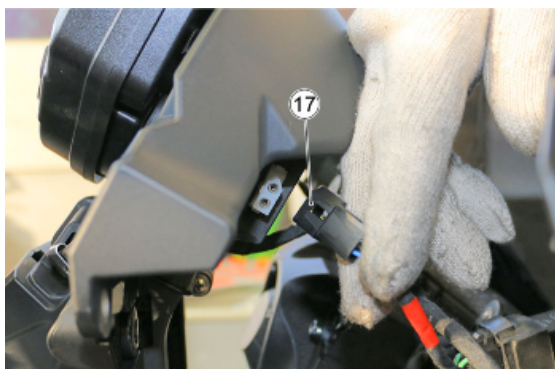
- Undo and remove the screw (13)
- Retrieve the washer (14) and the bushing (15)



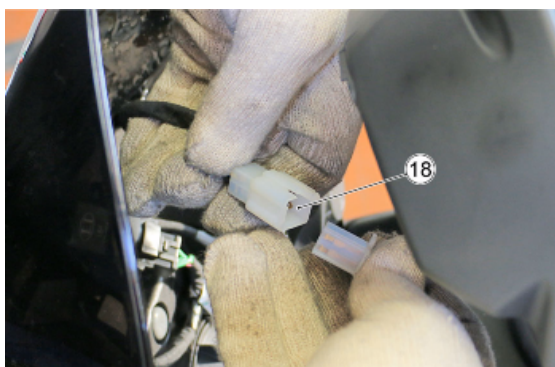
- Disconnect the connector (16)



- Disconnect the connector (17)



- Disconnect the connector (18)



- Remove the front fairing (19)



- Unscrew and remove the two screws (20)

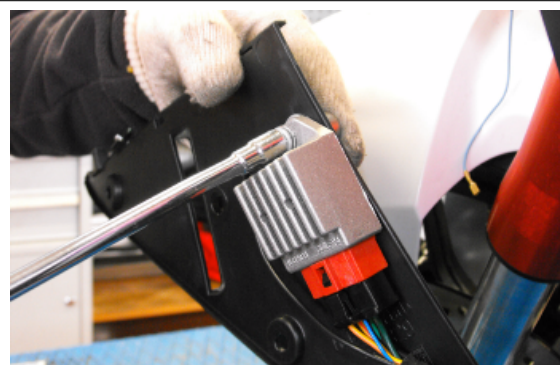


- Remove the top fairing (21)



Front wheelhouse

- Remove the fairing from the side of the wheel housing that you want to remove.
- Operating from the left shield, unscrew and remove the regulator fixing screw, collecting the nut and the washer.



- Operating from both sides, Unscrew and remove the lower screw.
- Remove the wheel housing.

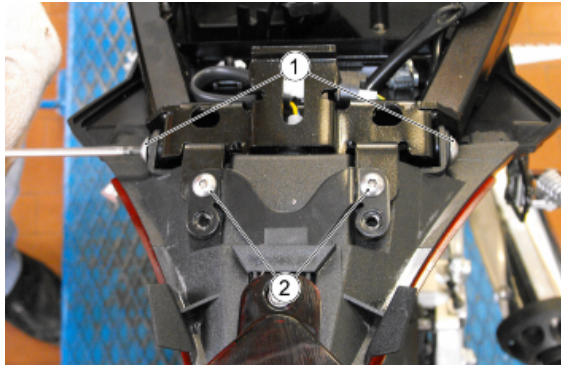


See also

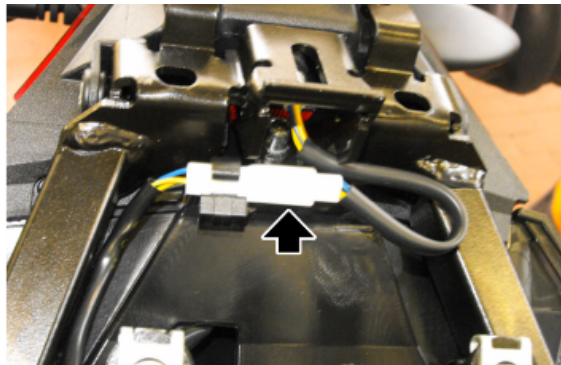
Side fairings

Taillight assy.

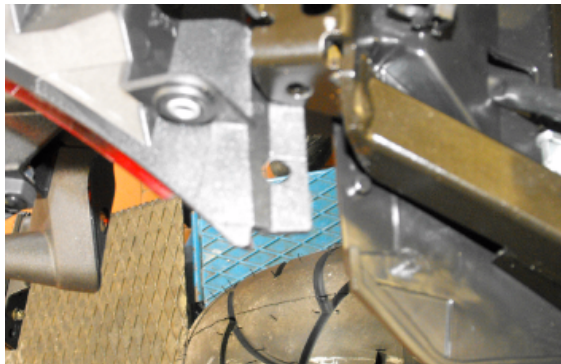
- First remove the tail fairing and the passenger seat.
- Remove the two side screws (1).
- Remove the two top screws (2).



- Disconnect the connector.



- Take off the rear light unit, by removing it from the hooks.

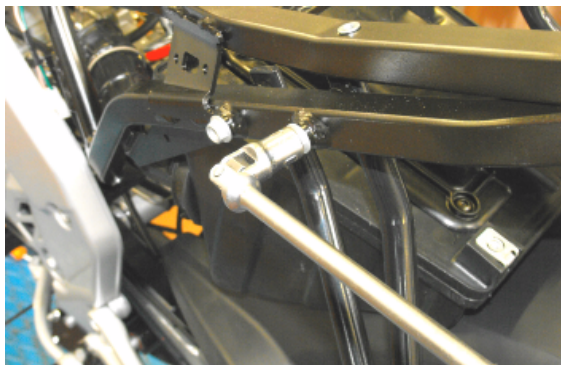


Footrest

PASSENGER FOOTREST

The following procedures only refer to one footrest, but they are applicable to both.

- Remove the tail fairing.
- Unscrew and remove the two fixing screws.
- Remove the passenger footrest.



See also

[Tail guard](#)

Side body panels

The following procedure is only shown from one side of the vehicle, but it is valid for both side fairings

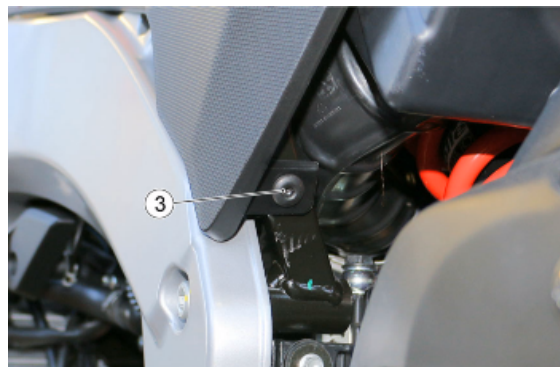
- Remove the saddle
- Undo and remove the screw (1)



- Undo and remove the screw (2)



- Undo and remove the screw (3)
- Remove the left side fairing
- Repeat the entire procedure to remove the right side fairing

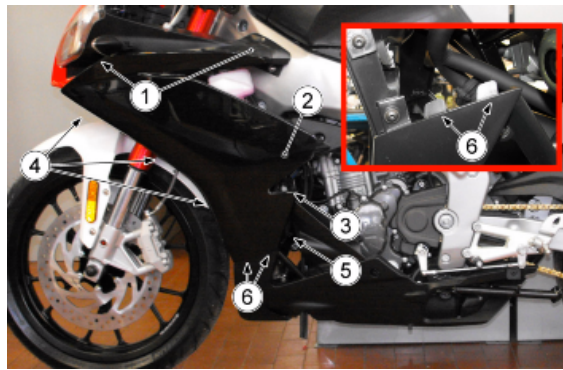


Side fairings

(RS 125)

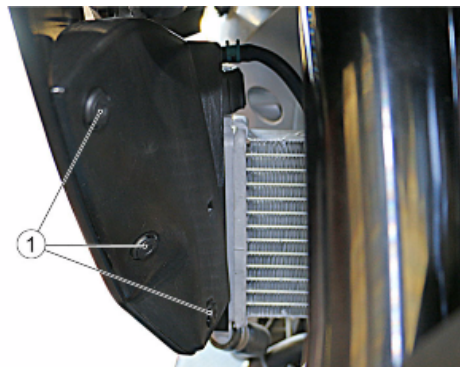
The following describe the procedure for removing one fairing but are applicable for both.

- Rest the vehicle on its stand.
- Remove the side fairing.
- Unscrew and remove the two screws (1) and retrieve the washers.
- Undo and remove the screw (2) and retrieve the washer.
- Remove the rivet (3).
- Working at the front of the vehicle, remove the three rivets (4).
- Loosen and remove screw (5).
- Pulling it out from the slots (6), being careful not to damage the plastic, remove the fairing.

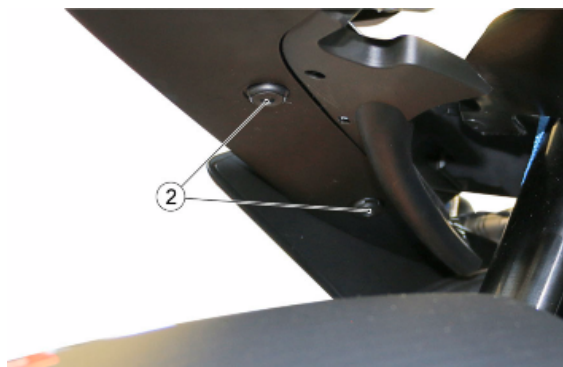


(TUONO 125)

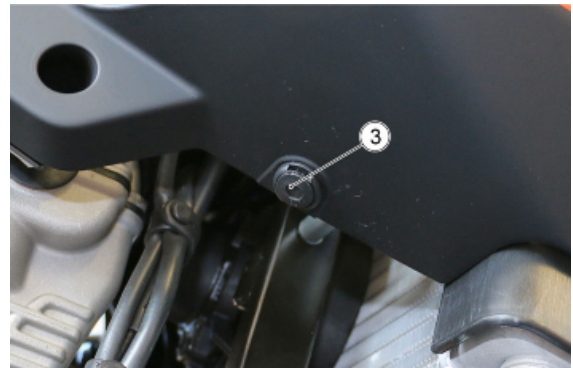
- Remove the three rivets (1)



- Remove the two rivets (2)



- Remove the rivet (3)



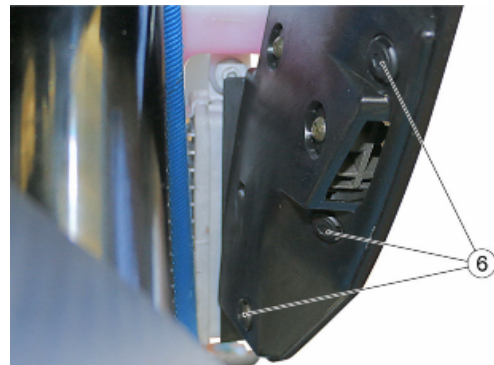
- Undo and remove the screw (4)



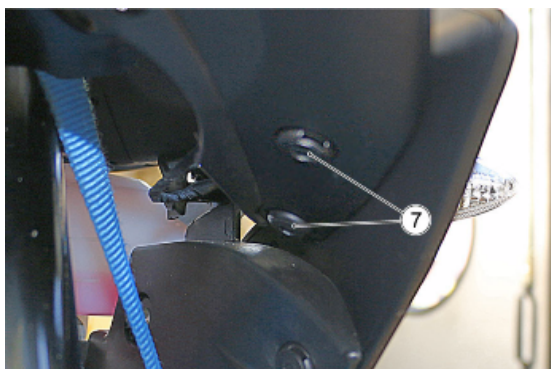
- Remove the right side engine fairing (5)



- Remove the rivets (6)



- Remove the rivets (7)



- Remove the rivet (8)



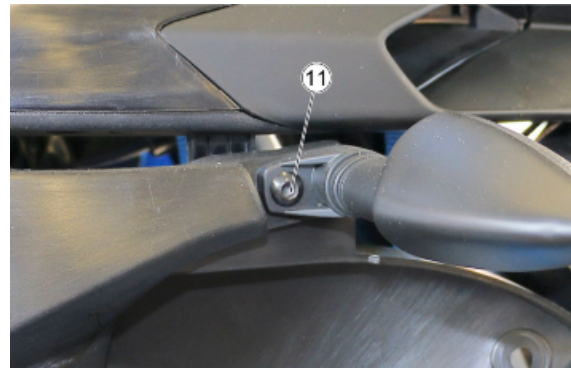
- Undo and remove the screw (9)



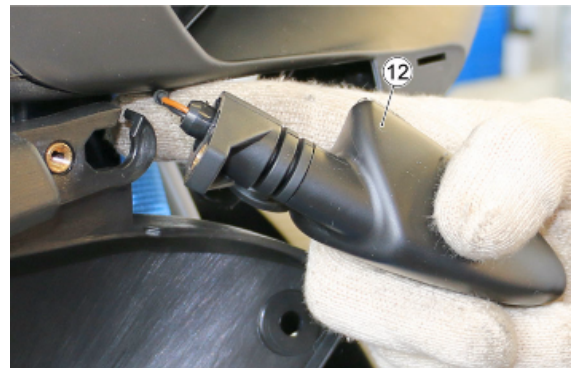
- Remove the left side engine fairing (10)



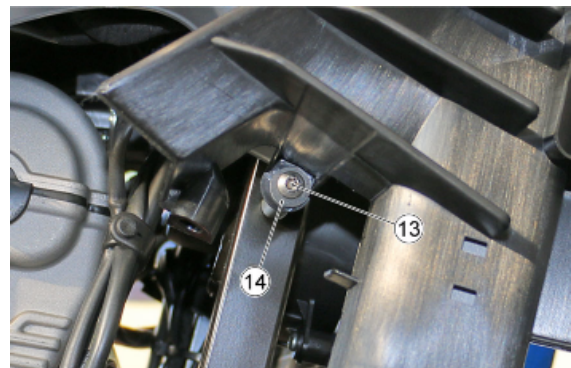
- Undo and remove the screw (11)



- Remove the front right turn indicator from its seat (12)



- Undo and remove the screw (13)
- Remove the washer (14)



- Remove the spacer (15)



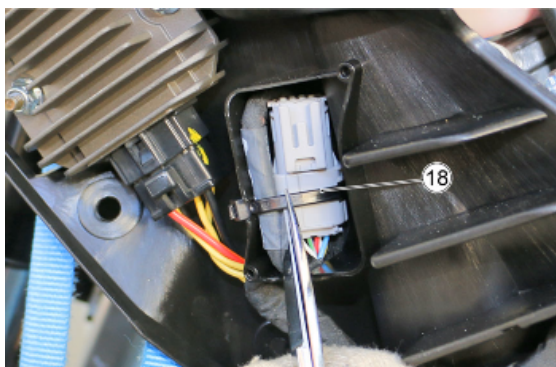
- Remove the inside right side fairing (16)



- Remove the clamp (17)



- Remove the clamp (18)



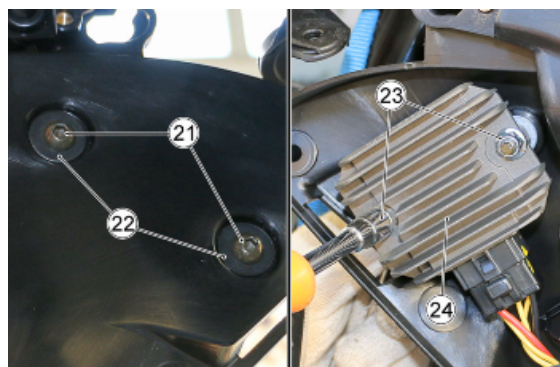
- Undo and remove the screw (19)



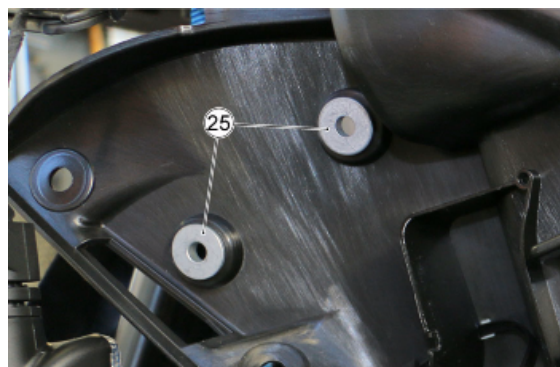
- Remove the front left turn indicator from its seat (20)



- keeping the two screws locked (21) unscrew and remove the two fastening nuts (23)
- Retrieve the two washers (22)
- Remove the voltage regulator (24)



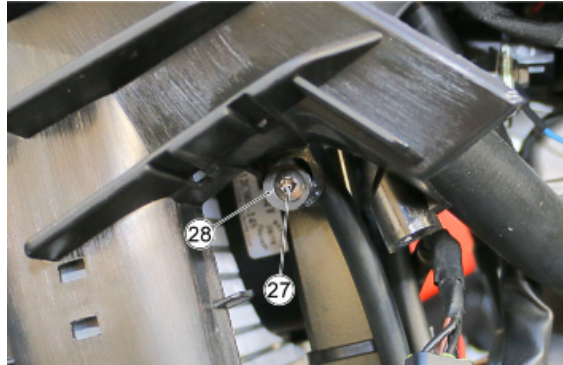
- Retrieve the two bushings (25)



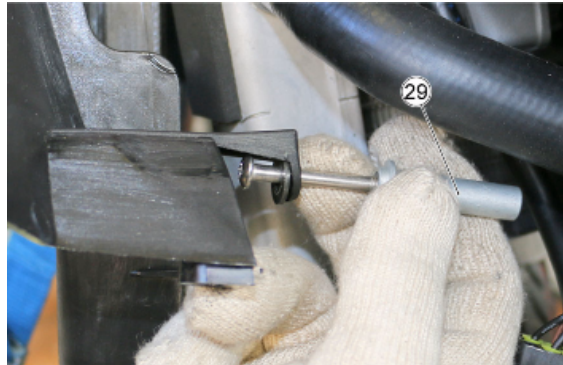
- Remove the clamp (26)



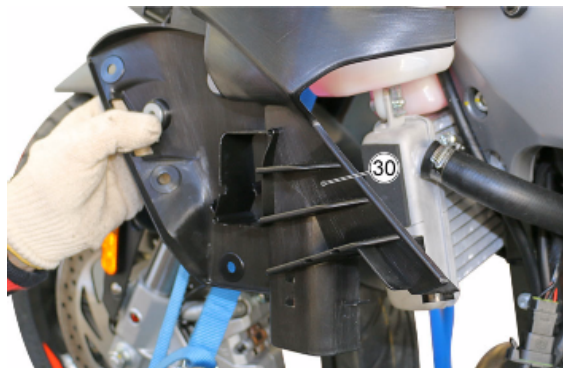
- Undo and remove the screw (27)
- Retrieve the washer (28)



- Retrieve the washer (29)



- Remove the inside left side fairing (30)



License plate holder

- First remove the passenger saddle.
- Remove the lower cap of the licence plate holder.



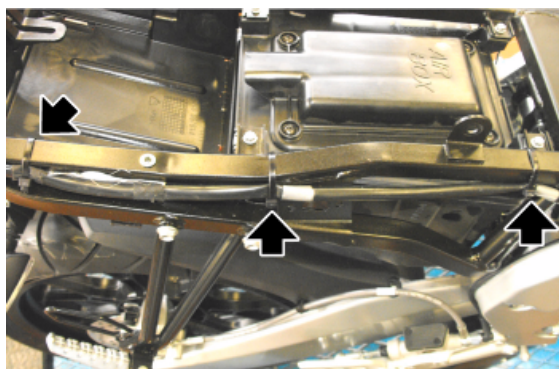
- Unscrew and remove the lower central screw.



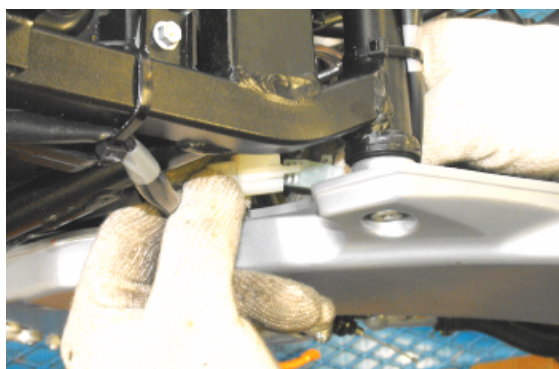
-
- Unscrew and remove the two lower screws.



-
- Remove the three clamps.

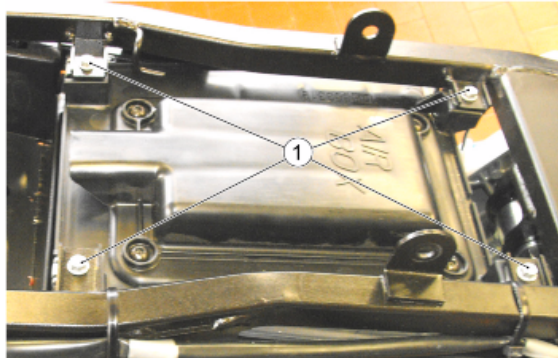


-
- Disconnect the connector.
 - Remove the licence plate support.

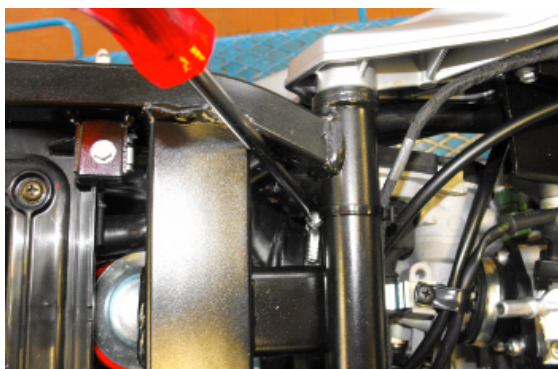


Air box

- Remove the passenger footrest, the saddle, the tank, the fairing and the splash guard.
- Unscrew and remove the four screws (1).



- Loosen the clamp and remove the intake tube.



See also

[Footrest](#)

[Fuel tank](#)

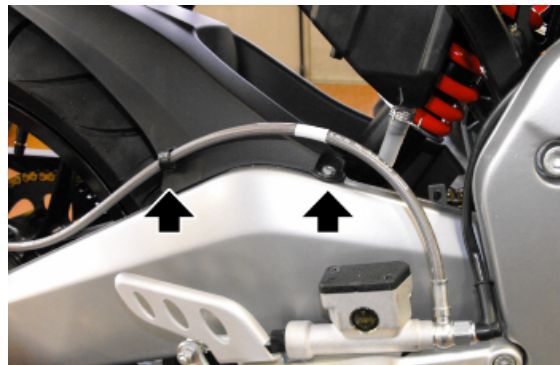
[Rear wheelhouse](#)

-
- Remove the air filter box.



Rear mudguard

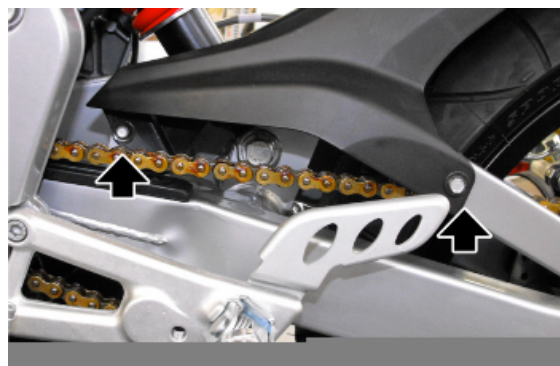
- Unscrew and remove the screw.
- Slide off the pipe grommet.



- Operating from the right side, unscrew and remove the central screw.



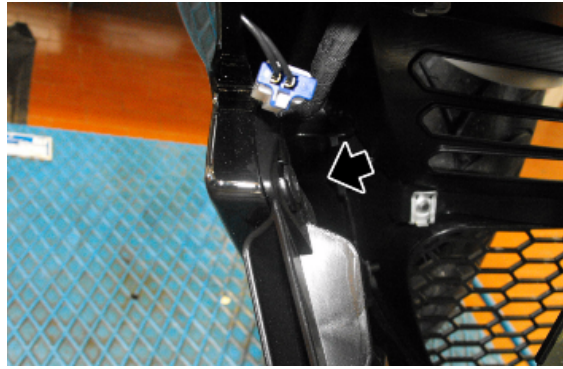
- Working on the left side, unscrew and remove the two screws.
- Remove the rear mudguard.



Lower cowl

(RS 125)

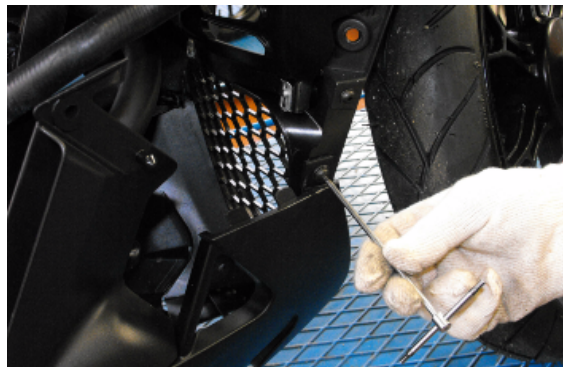
- - Remove the side fairings.
- Put the vehicle on the optional rear stand, with the side stand open.
- Remove the side rivet.



- Carry out the following operations on one side of the vehicle and then on the other side.
- Unscrew and remove the rear screw.



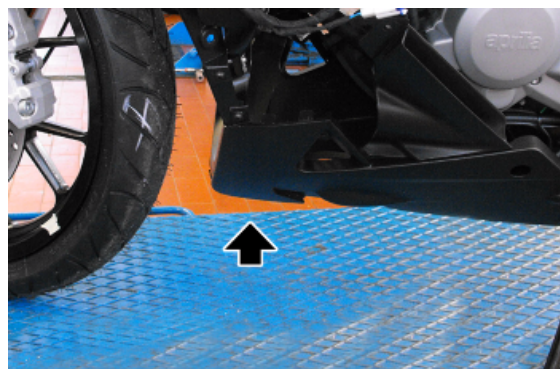
- Unscrew and remove the front screw, accompanying the engine fairing downwards.



- Unscrew and remove the central screw.



- Remove the lower rivet.
- From the right side take out the right half-fairing.
- Remove the left engine fairing from the left side, accompanying it along the profile of the stand.

**(TUONO 125)**

- Undo and remove the screw (1)
- Undo and remove the screw (2)
- Retrieve the washer (3)



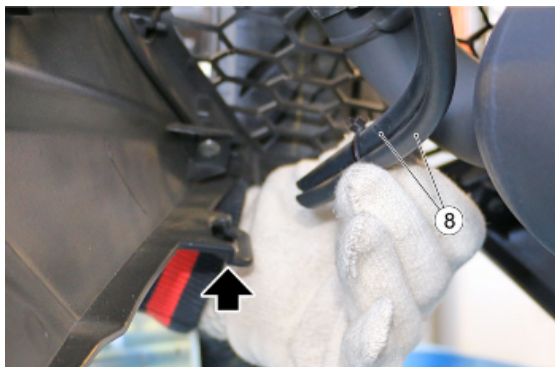
- Undo and remove the screw (4)
- Undo and remove the screw (5)
- Retrieve the washer (6)



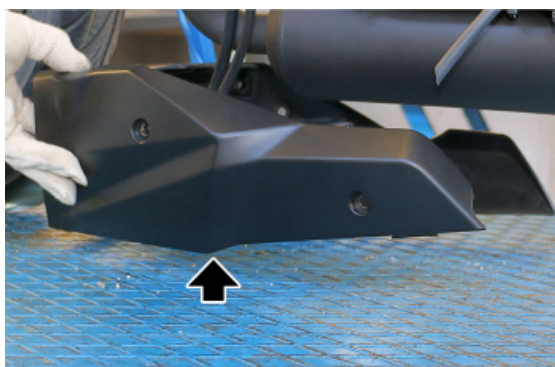
- Retrieve the spacers (7)



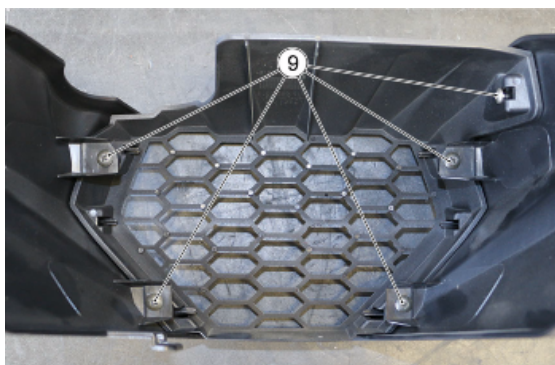
- Remove the pipes (8) from the point shown in the figure



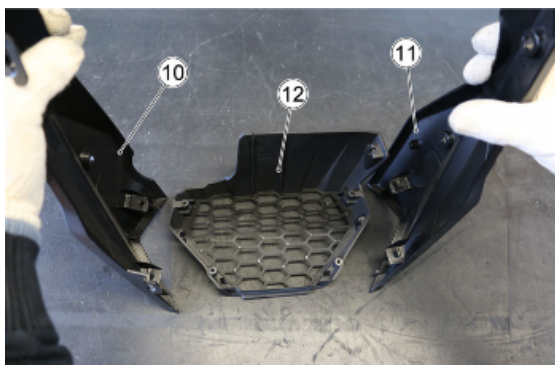
- Remove the engine fairing complete with lower fairings



- Unscrew and remove the five fixing screws (9)



- Remove the lower left fairing (10)
- Remove the lower right fairing (11)
- Remove the engine fairing (12)



Fuel tank

- Remove the rider saddle.
- Working on both sides of the vehicle, undo and remove the lateral screw.



- After removing the passenger saddle, lift the saddle and support its weight adequately.



- Remove the cable ties, as indicated in the procedure for installing the electrical system.
- Disconnect the quick coupler and the fuel reserve connector.



CAUTION



FIRE HAZARD. FUEL OR ANY OTHER INFLAMMABLE SUBSTANCES MUST NOT BE CLOSE TO ELECTRICAL COMPONENTS.

- Remove the fuel tank breather pipe.



- Operating from both sides, unscrew and remove the screw and collect the nut on the internal side.
- Keeping the tank in position, lower it by removing the supporting rod.
- Remove the tank.



Rear wheelhouse

- Beforehand, remove the tail fairing, the taillight the saddle and the passenger saddle.
- Unscrew and remove the two fixing screws.
- Remove the mudflap.

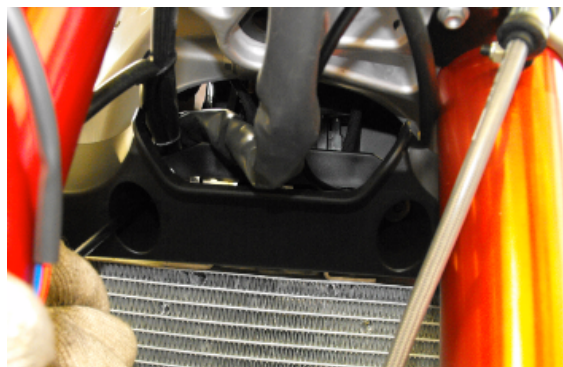


Radiator cover

- Unscrew and remove the central screw.



- Unscrew and remove the two upper screws.
- Retrieve the corresponding washers.



- Unscrew and remove the two lower screws.
- Slide off the radiator cover.



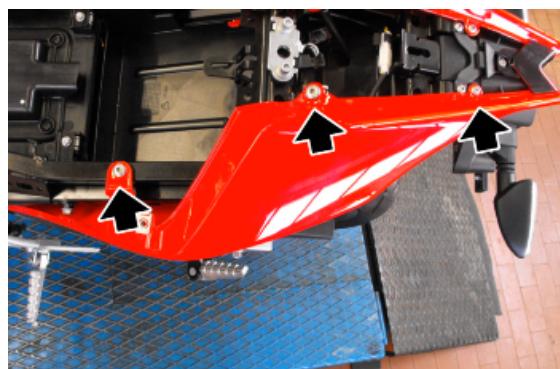
- Working from both sides of the vehicle, release the two rivets and slide off the front lug.



Tail guard

(RS 125)

- The following procedures are described for the left side of the vehicle but are valid for both sides.
- First remove the side central panel and the passenger saddle.
- Unscrew and remove the two front screws and the rear screw.



- Remove the side panel.

CAUTION



WHEN REMOVING BE CAREFUL WITH THE JOINTS.

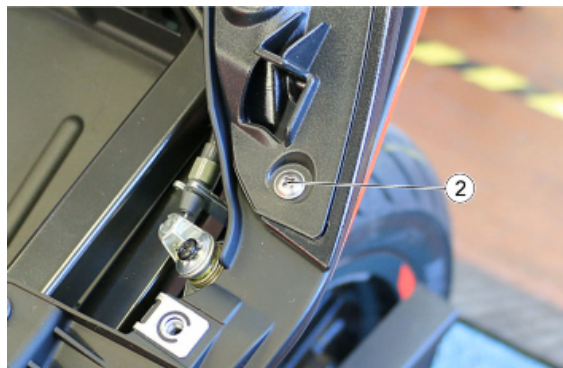


(TUONO 125)

- Remove the saddle
- Remove the side fairings
- Unscrew and remove the screw (1)



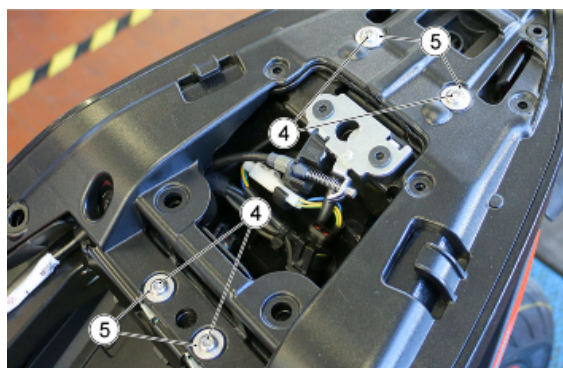
- Unscrew and remove the screw (2)



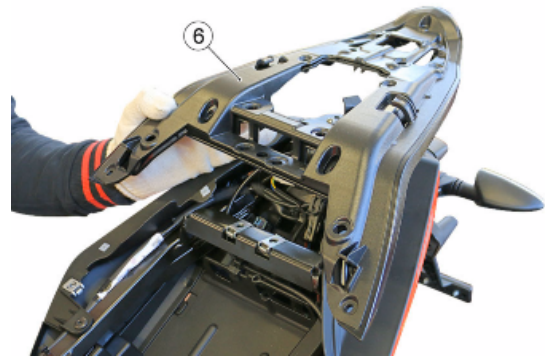
- Unscrew and remove the seven screws (3)



- Unscrew and remove the four screws (4)
- Retrieve the four bushings (5)



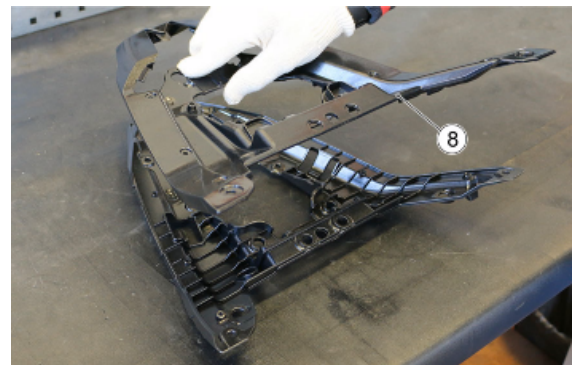
- Remove the top handle (6)



- Unscrew and remove the six screws (7)



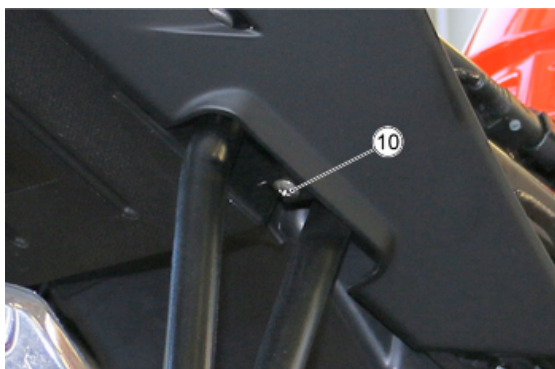
- Remove the top handle (8)



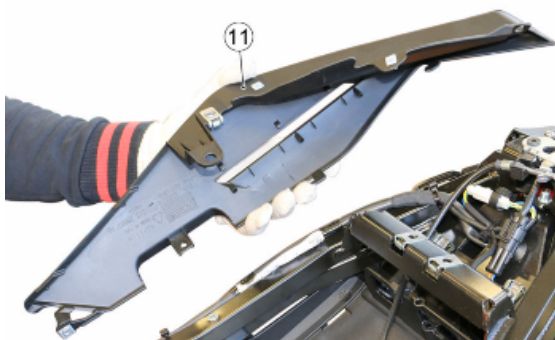
- Unscrew and remove the two screws (9)



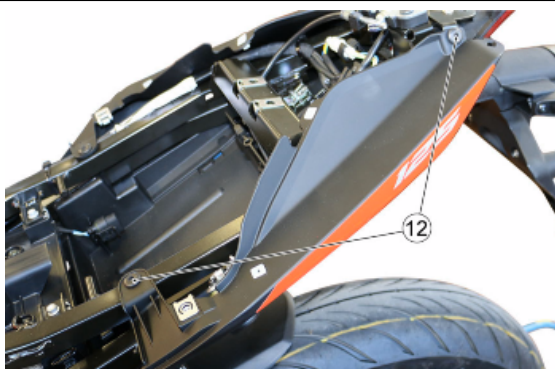
-
- Undo and remove the screw (10)



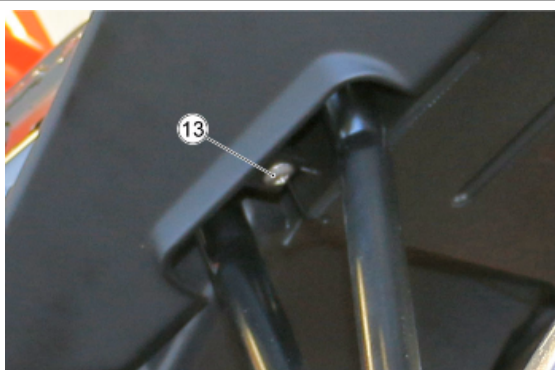
-
- Remove the right tail fairing (11).



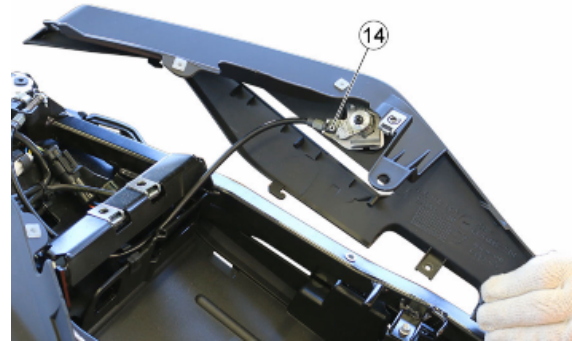
-
- Unscrew and remove the screws (12)



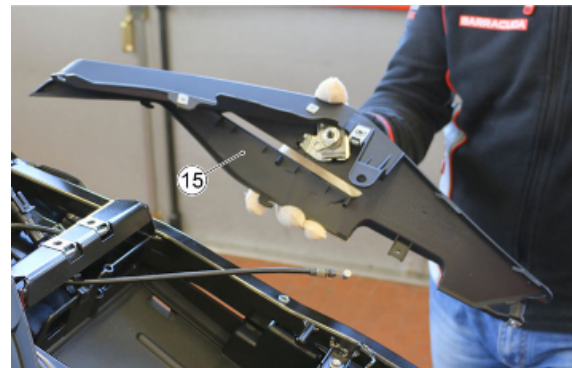
-
- Undo and remove the screw (13)



- Disengage the saddle opening cable (14)



- Remove the left tail fairing (15).



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
 - Electric helmet compartment lock release switch (if applicable)
-

- Through the diagnostic 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 THE LIFE OF THE BATTERY.

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 OR SPILL ON PLASTIC COMPONENTS IN PARTICULAR. ENSURE THAT THE ELECTROLYTIC ACID IS COMPATIBLE WITH THE BATTERY BEING ACTIVATED.

CAUTION

NEVER USE FUSES WITH A CAPACITY HIGHER THAN THAT RECOMMENDED. THE USE OF A FUSE OF UNSUITABLE CAPACITY MAY RESULT IN SERIOUS DAMAGES TO THE WHOLE 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
- Brake and clutch lever travel
- Clutch - Check for correct operation
- Engine - Check for correct general operation and absence of abnormal noise
- Other
- Check documentation
- Check the chassis and engine numbers
- Licence plate fitting
- Locks checking
- Tyre pressure check
- Fitting of mirrors and possible accessories



NEVER EXCEED THE RECOMMENDED INFLATION PRESSURES SINCE THE TYRES MAY BURST.

CAUTION



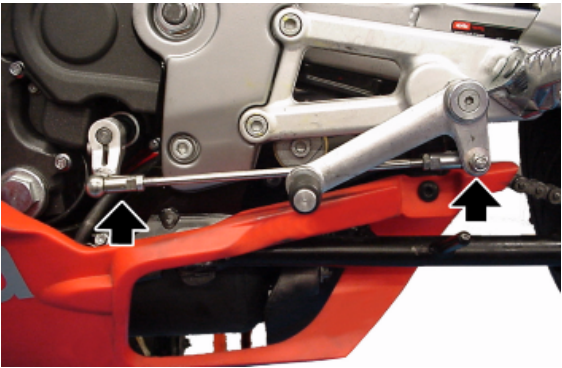
CHECK AND ADJUST TYRE PRESSURE WITH TYRES AT AMBIENT TEMPERATURE.

Specific operations for the vehicle

(RS 125)

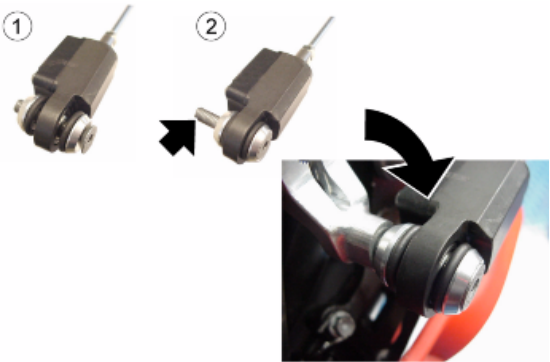
To fit the Quick Shift, follow the fitting instructions.

- Remove the gear tie-rod by unscrewing and removing the two fixing screws.

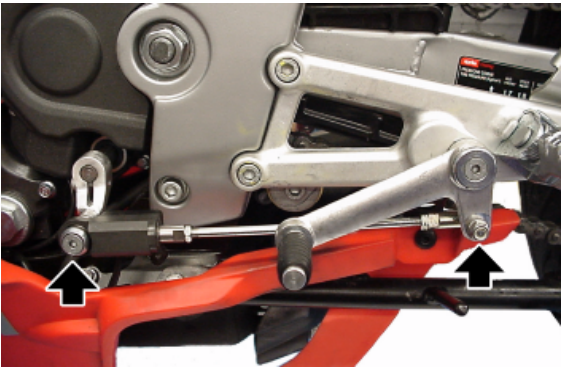


- Place the screw (1) with its components in the spherical joint of the Quick Shift sensor.

WARNING
BEFORE POSITIONING AND TIGHTENING THE QUICK SHIFT SENSOR, PUT SOME LOCTITE 243 ON THE FIXING SCREW OF THE SPHERICAL JOINT.

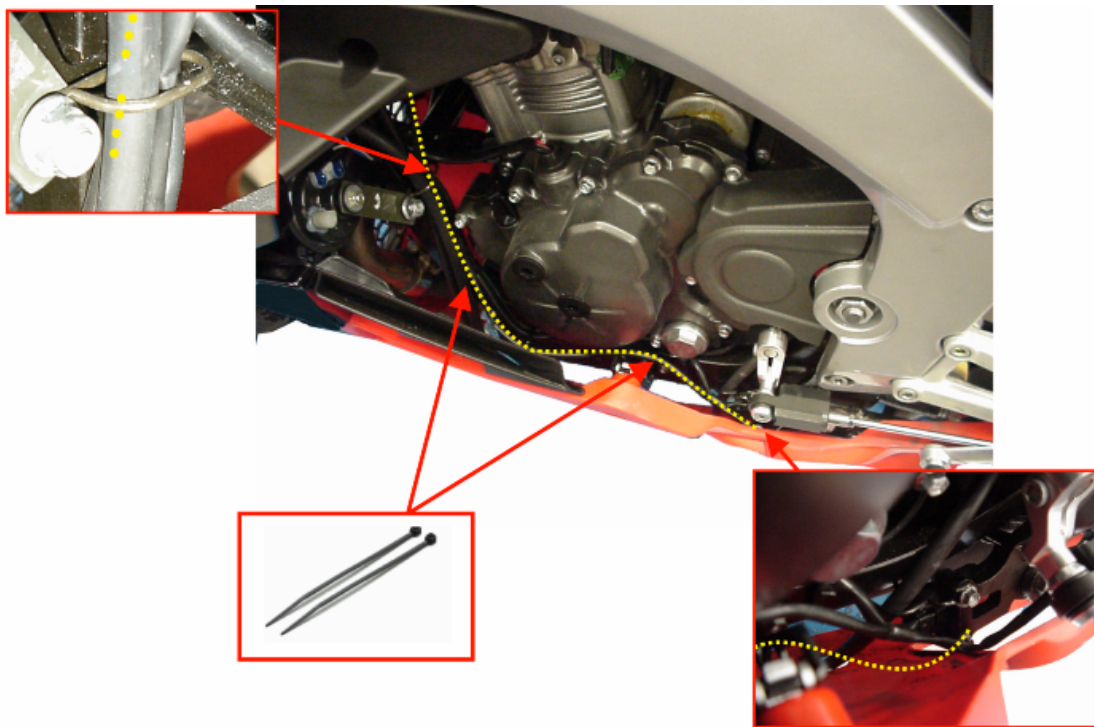


- Install the gear tie-rod with the integrated Quick Shift sensor tightening the two screws to the specified torque.

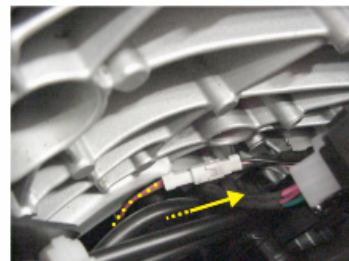
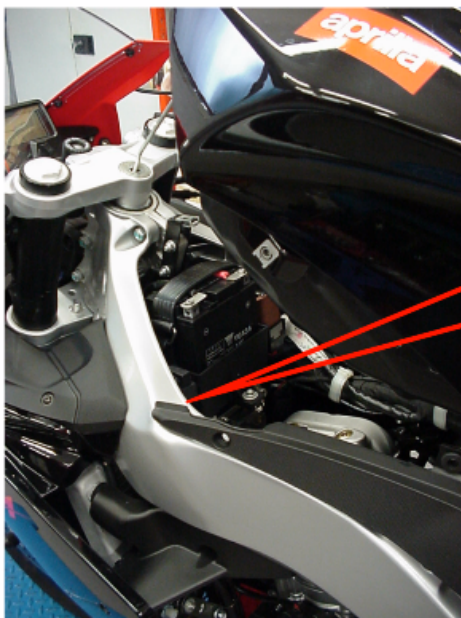


QUICK SHIFT TIE-ROD					
Pos.	Description	Type	Quantity	Torque	Note
1	Gearbox lever tie-rod fixing nut	M6	1	10 Nm (7.38 lb ft)	-
2	Screw fixing tie-rod to shift shaft	M6	1	10 Nm (7.38 lb ft)	Loctite 243

- Pass the connecting cable as shown in figure.



- Access the Quick Shift connector by lifting the tank, the connector is placed, as shown in the figure, internally on the left side of the chassis.
- Connect the two cables.



A

ABS: 276, 288

Air filter: 70

B

Battery: 112, 124

Brake: 294, 295, 297, 299, 300, 303, 304, 306

Brake calliper: 294, 295

Brake disc: 295, 297

Brake fluid: 303

Brake pads: 299, 300

Brake pump: 304, 306

Bulbs:

C

CAN line: 150

Chain: 210, 211, 254, 259

Chain tensioner: 210, 259

Clutch: 73, 139, 180–185

Coil: 135

Connectors: 143

coolant: 312, 319

Coolant: 312, 319

Countershaft: 188, 189

Crankcase: 187, 189, 193, 195

Crankshaft:

Cylinder: 56, 202, 209, 211, 217

D

Desmodromic drum: 173

Diagnostics: 288

Drive chain: 254

E

ECU: 144, 289

Electric fan: 141, 312

Electrical system: 12, 76, 77, 371

Engine oil: 67

Engine temperature sensor: 130

Exhaust: 269, 271

Exhaust manifold: 271

F

Fairings: 270, 312, 319, 347, 349

Filter box:

Fork: 236, 240, 242

Forks: 173

Front wheel: 233–235

Fuel: 134, 224, 225, 358, 363

Fuel pump: 134, 224

Fuses: 123

H

Handlebar:

Head cover: 200

Headlight: 340, 341

Horn: 119

I

Identification: 11

Instrument panel: 337

L

License plate holder: 356

M

Maintenance: 8, 64

Mirrors: 336

Mudguard: 359

O

Oil filter: 70

Oil pressure sensor: 137

P

Primary shaft: 169

R

Radiator: 312, 316, 364

Rear wheel: 243, 245, 246

Recommended products: 66

Run/Stop switch: 142

S

Scheduled maintenance: 64

Secondary shaft: 169

Shock absorbers: 247

Side fairings: 349

Side stand: 140, 268

Side stand sensor: 140

Spark plug: 66

Speed sensor: 125

Stand: 140, 268

Start-up: 117

Starter motor: 174, 175

T

Tank: 225, 317, 318, 358, 363

Throttle body: 228

Top fairing:

Transmission: 12

Tyres: 13

U

Use: 288

V

Voltage regulator: 116

W

Warning lights:

Water pump: 313

Wiring diagram: 105