PIAGGIO

SERVICE STATION MANUAL

677654 EN

MSS X10 500ie Executive

SERVICE STATION MANUAL

MSS X10 500ie Executive

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

SERVICE STATION MANUAL
MSS X10 500ie Executive

This service station manual has been drawn up by Piaggio & C. Spa to be used by the workshops of Piaggio dealers. It is assumed that the user of this manual for maintaining and repairing Piaggio vehicles has a basic knowledge of mechanical principles and vehicle repair technique procedures. Any significant changes to vehicle characteristics or to specific repair operations will be communicated by updates to this manual. Nevertheless, no mounting work can be satisfactory if the necessary equipment and tools are unavailable. It is therefore advisable to read the sections of this manual concerning special tools, along with the special tool catalogue.

N.B. Provides key information to make the procedure easier to understand and carry out.

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

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

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

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

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

INDEX OF TOPICS

CHARACTERISTICS	CHAR
TOOLING	TOOL
MAINTENANCE	MAIN
TROUBLESHOOTING	TROUBL
ELECTRICAL SYSTEM	ELE SYS
ENGINE FROM VEHICLE	ENG VE
ENGINE	ENG
INJECTION	INJEC
SUSPENSIONS	SUSP
BRAKING SYSTEM	BRAK SYS
COOLING SYSTEM	COOL SYS
CHASSIS	CHAS
PRE-DELIVERY	PRE DE

INDEX OF TOPICS

CHARACTERISTICS	CHAR

Vehicle identification

Identification registration numbers are made up of a prefix and a number, stamped on the chassis and on the engine. These numbers must always be quoted when ordering spare parts. We recommend checking that the chassis registration number stamped on the vehicle corresponds with that on the vehicle documentation.

CAUTION

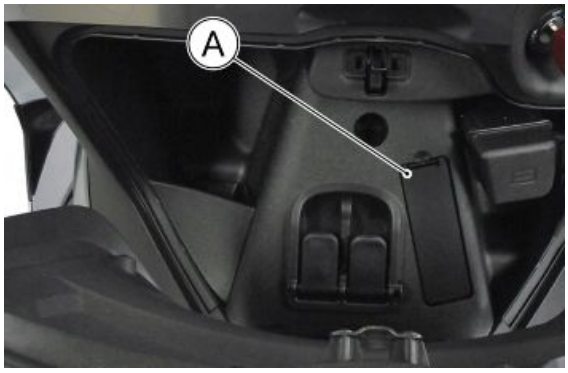
PLEASE REMIND THAT ALTERING IDENTIFICATION REGISTRATION NUMBERS CAN LEAD TO SERIOUS PENAL SANCTIONS (IMPOUNDING OF THE VEHICLE, ETC.).

VEHICLE IDENTIFICATION

Specification	Desc./Quantity
Chassis prefix	ZAPM76301 ÷ 10000001
Engine prefix	M763M 1001

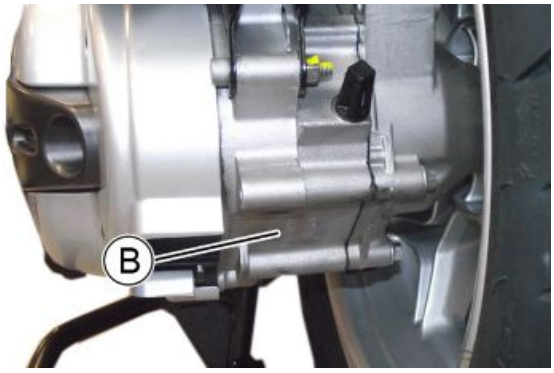
Chassis number

To read the chassis number, remove the port **A** in the front case.

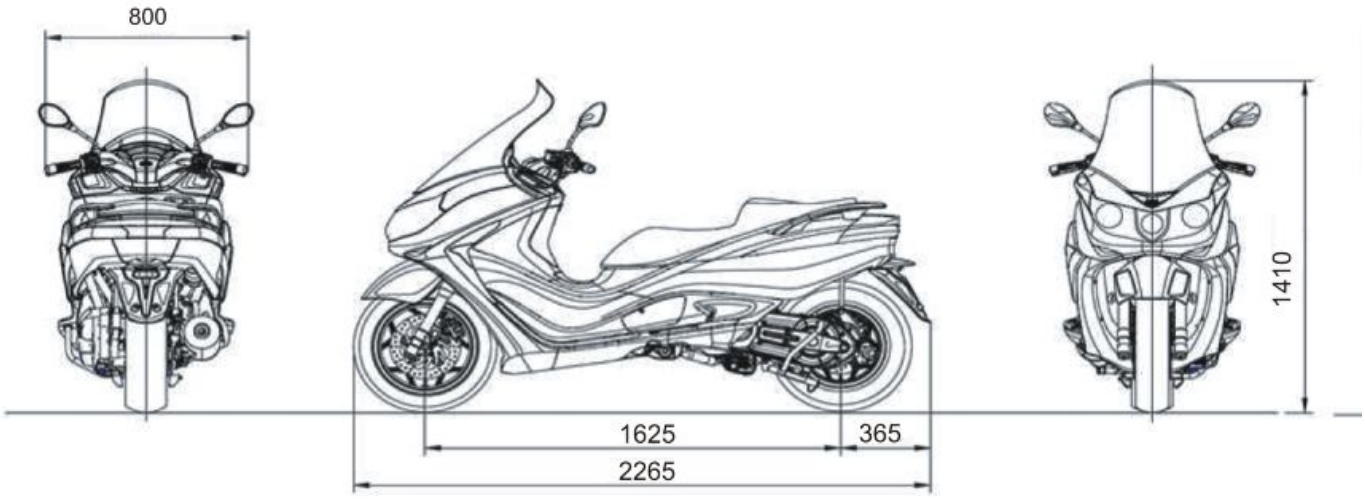


Engine number

The engine number «**B**» is stamped near the rear left shock absorber lower support.



Dimensions and mass



VEHICLE SPECIFICATIONS

Specification	Desc./Quantity
Frame	A closed double cradle in steel tubes
Front suspension	Hydraulic telescopic fork Ø 41 mm
rear suspension	Single shock absorber with electrical preloading adjustment system.
Front brake	Double disc Ø280 with hydraulic control actuated by the right lever; braking assisted by ABS system.
Integral brake	Disc Ø240 with hydraulic control actuated by the left lever; the front disc Ø280 is served by a pressure relief valve; braking assisted by ABS system.
Wheel rim type	Light alloy wheel rims.
Front wheel rim	3.50"x15"
Rear wheel rim	4.00"x13"
Front tyre	120/70-15" M/C 56S Tubeless
Rear tyre	150/70-13" M/C 64S Tubeless
Front tyre pressure (with passenger)	2.3 bar (2.3 bar)
Rear tyre pressure (with passenger)	2.4 bar (2.6 bar)
Kerb weight	229 kg
Maximum weight allowed	420 kg
Battery	SEALED 12V / 10Ah

CAUTION

FOR THIS VEHICLE IT IS RECOMMENDED TO USE TYRES «SAVA MC 28 DIAMONDS».
USE OF OTHER TYRES MAY SIGNIFICANTLY AFFECT THE BEHAVIOUR OF THE VEHICLE ON THE ROAD, AFFECTING THE RIDING STABILITY AT FULL THROTTLE.

Engine

ENGINE SPECIFICATIONS

Specification	Desc./Quantity
Type	Single-cylinder, 4-stroke

Specification	Desc./Quantity
Cubic capacity	493 cm³
Bore x Stroke	94 x 71 mm
Compression ratio	10.5 ± 0.5: 1
Engine idle speed	1,500 ± 100 rpm
Timing system	Four valves, single overhead camshaft, chain-driven.
Valve clearance	Inlet: 0.15 mm Outlet: 0.15 mm
Max. power	30 kW at 7250 rpm
MAX. torque	46 Nm at 5250 rpm
Transmission	CVT expandable pulley variator with torque server, V-belt, self-ventilating dry automatic centrifugal clutch and transmission housing with forced-circulation air cooling.
Final reduction gear	Gear reduction unit in oil bath.
Lubrication	Engine lubrication with lobe pump (inside crankcase), chain-driven, with double filter: mesh and paper.
Cooling	Forced coolant circulation system.
Starter	Electric
Ignition	Highly efficient electronic inductive ignition, integrated with the injection system, with variable advance, separate HV coil and double spark plug.
Ignition advance	Three-dimensional map managed by control unit
Spark plug	NGK CR7EKB
Electrode gap	0.7 ÷ 0.9 mm
Fuel system	Electronic injection with electric fuel pump.
Fuel	Unleaded petrol (95 RON)
Exhaust silencer	Absorption-type exhaust muffler with catalytic converter and lambda probe.
Emissions compliance	EURO 3

Capacities

CAPACITY

Specification	Desc./Quantity
Engine oil	1.7 l
Transmission oil	250 cm³
Cooling system fluid	1.75 l
Fuel tank	15.5 litres (2 l of which is reserve)

Tightening Torques

SWINGING ARM

Name	Torque in Nm
Frame side pin adjustment ring nut	88.5 ÷ 108
Self locking nut fastening pin chassis side	50 to 55
Retainer nut of silent block support bracket on bushing	98 ÷ 117
Lower pin bushing	5 - 7
Self locking nut pin fastening engine side	40 to 45
Self locking nut of fixing silent block support bracket	67 - 75
Rod fixing nut	40 to 45
Rod pin fixing nut	40 to 45

STEERING

Name	Torque in Nm
Handlebar fixing screw	50 to 55
Fixing screws for the handlebar control unit U-bolts	7 ÷ 10
Steering tube upper ring nut	40 to 45
Steering tube lower ring nut	14 - 17
Throttle grip cables right control fastener screw	3 ÷ 4
Hand grip counterweight retainer screw	9 - 11
Mirrors fastening long nut	24 - 26

FRAME

Name	Torque in Nm
Central stand bracket bolts	19,5-24,5
Side stand fixing bolt	40 to 45
Side stand sensor fixing screws	5 - 7
Throttle cable pipe grommet screw	6 - 10

FRONT BRAKE

Name	Torque in Nm
Brake fluid pump-hose fitting	13 to 18 Nm
Oil bleed screw	12 - 16
Pad fastening pin	19.6 to 24.5
Screw tightening calliper to support	20 ÷ 25
Brake disc screws	24 ÷ 27
Brake fluid pipe-calliper fitting	20 ÷ 25
Pump pipe grommet screw - clamp	6 - 10

REAR BRAKE

Name	Torque in Nm
Brake fluid pump-hose fitting	13 to 18 Nm
Oil bleed screw	12 - 16
Pad fastening pin	19.6 to 24.5
Rear brake calliper fixing screws	41 - 51
Brake disc screws	8 ÷ 10
Rear brake calliper-pipe fitting	20 ÷ 25
Pump pipe grommet screw - clamp	6 - 10
Screws fixing the distribution mechanism	10 to 11
Front calliper pipe tightening - distribution mechanism	20 ÷ 25
Brake pipes fixing screw at the distribution mechanism	20 ÷ 25
Screw fixing parking brake calliper to supporting plate	24 ÷ 27 (*)
Pin fixing parking brake pads	15 to 20
Parking brake adjusting nut	10

(*) with Loctite 243

ABS SYSTEM

Name	Torque in Nm
Front ABS sensor tightening screw	6 to 8 Nm (Loctite 243)
Rear ABS sensor tightening screw	3,4 ÷ 3,8
M6x16 screws fastening the ABS control unit to the support	10 to 12 Nm
Pipe fittings - ABS control unit	13 - 18
ABS control unit supporting bracket fixing screw	10 to 11 Nm
ABS control unit bracket fixing screws	8 to 10 Nm
Front elastic plate fixing screws	10 to 11 Nm
Side elastic plate fixing screw	10 to 11 Nm

FRONT SUSPENSION

Name	Torque in Nm
Front wheel axle nut	110 - 120
Wheel axle clamp screws	6 - 7 Nm
Hydraulic rod fixing screw	25 to 35 Nm
Fork locking screws cap	35 - 55
Stem support clamp tightening screws	Apply a torque of 25-34 Nm to lower screw «1» Lock upper screw «2» a torque of 25-34 Nm Lock lower screw «1» a torque of 25-34 Nm
Fixing screw for mudguard plate to fork	9 - 11
front mudguard to plate fixing screw	4.5 to 7

REAR SUSPENSION

Name	Torque in Nm
Rear wheel axle nut	102 - 123
Shock absorber attachment bracket - Frame	110 - 120

Name	Torque in Nm
Rear shock absorber - Attachment bracket	130 ÷ 140
Rear shock absorber - Suspension linkage	130 ÷ 140
Right strut screw - Rear suspension linkage	45 ÷ 50
Left strut screws - Right strut bracket	45 ÷ 50
Right strut bracket screws - Silencer support	24 ÷ 27
Left strut screw - Linkage	45 ÷ 50
Left strut bracket screws - Crankcase	24 ÷ 27
Linkage axis nut	110 ÷ 115
Linkage axis internal ring nut	5 - 7
Linkage axis external ring nut	57 ÷ 63
Silencer bracket screws - Crankcase	34 ÷ 42 (**)

(**) after tightening the rear wheel axle nut

BODYWORK

Name	Torque in Nm
Handlebar upper cover fixing screws	5 - 8
Lower cover fixing screws - handlebar	4 to 5
Central cover fixing screws - handlebar	9
Front frame fixing screws - chassis	13 - 15
Wheel housing fixing screws - front frame	4.5 to 7
Wheel housing fixing screws - chassis	4.5 to 7
Wheel housing fixing screws - shield - lower shield	1 to 1.7
Front case fixing screws - wheel housing	1 to 1.7
Front case fixing screws - central tunnel	1 to 1.7
Front case fixing screws - chassis	4.5 to 7
Fairings fixing screws - front case	1 to 1.7
Fairing fixing screws - central tunnel	1 to 1.7
Shield fixing screws - front case	1 to 1.7
Shield fixing screws - lower shield	1 to 1.7
Shield fixing screws - rear dashboard	1 to 1.7
Shield upper cover fixing screws - front headlight assembly	4.5 to 7
Shield upper cover fixing screws - rear dashboard	1 to 1.7
Front dashboard fixing screws - front frame	1 to 1.7
Front dashboard fixing screws - rear dashboard	1 to 1.7
Dashboard cover fixing screws - rear dashboard	1 to 1.7
Rear dashboard fixing screws - front case	1 to 1.7
Rear dashboard covers fixing screws - rear dashboard	1 to 1.7
Rear dashboard covers fixing screws - rear dashboard	1 to 1.7
Windshield fixing screws - front frame	4.5 to 7
Instrument panel fixing screws	1 to 1.7
Front headlight assembly fixing screws - shield	4.5 to 7
Turn indicator fixing screws - headlight	1 to 1.7
Footrests fixing screws - deflectors - lower shield	1 to 1.7
Footrests front fixing screws	1 to 1.7
Footrests central fixing screws	4.5 to 7
Footrests rear fixing screws	4.5 to 7
Footrest fixing screws - fairings	1 to 1.7
Passenger footrest fixing screws	4.5 to 7
Passenger footrest rubber fixing screws	4.5 to 7
Lower cover fixing screws	1 to 1.7
Saddle fixing screws	8 ÷ 10
Fixing screws pneumatic spring - saddle	15 to 20
Fixing screws pneumatic spring - frame	15 to 20
Handgrips fixing screws	15 to 20
Handgrips upper cover fixing screws	1 to 1.7
Helmet compartment fixing screws	4.5 to 7
Helmet compartment fixing screws - cover	1 to 1.7
Fairing fixing screws - helmet compartment	1 to 1.7
Engine access cover fixing screws	1 to 1.7
Battery door fixing screws	1 to 1.7
Fuses cover retainer screws	1 to 1.7
Spark plug inspection cover fixing screws	1 to 1.7
Upper rear cover fixing screws - helmet compartment	1 to 1.7
Upper rear cover fixing screws	1 to 1.7
Side frame fixing screws	1 to 1.7

Name	Torque in Nm
Splash guard fixing screws	4.5 to 7

MUFFLER

Name	Torque in Nm
Silencer heat guard fixing screw	4 to 5
Silencer screw - silencer bracket	20 ÷ 25
Lambda probe tightening on exhaust manifold	40 to 50
Adjusting screw of silencer support clamp - silencer bracket	10 - 13
Fixing nut for adjusting silencer support clamp	10 ÷ 12 (after adjusting support clamp)
Nuts fixing the exhaust manifold to the head	16 to 18
Screws silencer support - central stand	20 ÷ 25

LUBRICATION

Name	Torque in Nm
Oil pump cover screws	0.7 - 0.9
Screws fixing oil pump to the crankcase	5 ÷ 6

THERMAL GROUP AND TIMING SYSTEM

Name	Torque in Nm
Spark plug	12 ÷ 14
Head fixing stud bolts	***
Head fixing nuts	10 - 12
Exhaust / intake head fixing nuts	10 - 12
Head lubrication control jet	5 - 7
Coolant temperature sensor	10 to 12
counterweight mass fixing screw	7 - 8.5
Tensioner pad fixing screw	10 - 14
Rpm timing sensor fixing screw	3 - 4
injector fixing screw	3 ÷ 4
Revolution timing sensor fixing screw	3 ÷ 4
Valve lifter mass stop bell fixing screws	30 - 35
Intake manifold fixing screws	11 - 13
Tappet cover fixing screws	7 - 9
Throttle body fixing screws	11 ÷ 13
camshaft retaining bracket fixing screws	4 - 6
Head fixing screws	10 - 12
Lambda probe on exhaust manifold	10 - 12
Muffler to bracket fixing screw	14 - 16

**** Apply a preliminary torque of 7 Nm in a crossed sequence. - Tighten by 90° in a crossed sequence. - tighten again by 90° in a criss-crossed sequence.*

TRANSMISSION COVER

Name	Torque in Nm
Driven pulley nut	92 - 100
Drive pulley nut	160 - 175
Anti-vibration roller screw	16.7 ÷ 19.6
M8 retainers for transmission cover	23 ÷ 26
M6 retainer	11 ÷ 13
Anti-vibration roller retainer	17 - 19
Clutch ring nut	65 - 75
Air deflector unit screws	7 to 9
Water pump cover screws	3 ÷ 4
External transmission cover screws	7 to 9
Flywheel cover screws	11 - 13

FLYWHEEL COVER

Name	Torque in Nm
Flywheel fixing nut	115 - 125
Stator clamps	8 - 10
Blow-by recovery duct fixing screws	3 - 4
Screw fixing freewheel to flywheel	13 - 15
Stator cable harness guide bracket screws	3 - 4

CRANKCASE AND CRANKSHAFT

Name	Torque in Nm
Countershaft fixing nut	25 ÷ 29
Engine oil filter	12 - 16
Engine oil drainage plug	24 ÷ 30
Engine-crankcase coupling screws	11 ÷ 13
Oil pump screws	5 ÷ 6
Gear mounting on crankshaft screws	10 -12
Oil pump compartment cover bulkhead screws	8 - 10

COOLING

Name	Torque in Nm
Water pump rotor	4 to 5
Water pump cover screws	3 ÷ 4
Bleed screw	3

FINAL REDUCTION GEAR

Name	Torque in Nm
Rear hub cover screws	24 ÷ 27

ENGINE ASSEMBLY

Name	Torque in Nm
starter motor retainers	11 - 13

Products

RECOMMENDED PRODUCTS TABLE

Product	Description	Specifications
AGIP GEAR SAE 80W-90	Lubricant for gearboxes and transmissions.	API GL-4
eni i-Ride PG 5W-40	Synthetic based lubricant for high-performance four-stroke engines.	JASO MA, MA2 - API SL - ACEA A3
AGIP GP 330	Water repellent stringy calcium spray grease.	R.I.D./A.D.R. 2 10°b) 2 R.I.Na. 2.42 - I.A.T.A. 2 - I.M.D.G. class 2 UN 1950 Page 9022 EM 25-89
AGIP BRAKE 4	Brake fluid.	Synthetic fluid SAE J 1703 -FMVSS 116 - DOT 3/4 - ISO 4925 - CUNA NC 956 DOT 4
AGIP PERMANENT SPEZIAL	Ethylene glycol-based antifreeze fluid with organic inhibition additives. Red, ready to use.	ASTM D 3306 - ASTM D 4656 - ASTM D 4985 - CUNA NC 956-16
AUTOSOL METAL POLISH	Muffler cleaning paste	special product for cleaning and polishing stainless steel muffler
AGIP GREASE PV2	Ivory smooth-textured, slightly-stringy anhydrous calcium-base grease.	TL 9150 066, NATO G 460 symbol

UNIT OF MEASURE - CONVERSION - ENGLISH SYSTEM TO INTERNATIONAL SYSTEM (IS).

Specification	Desc./Quantity
1 Inch (in)	25.4 Millimetres (mm)
1 Foot (ft)	0.305 Meter (m)
1 Mile (mi)	1.609 Kilometre (km)
1 US Gallon (USgal)	3.785 Litre (l)
1 Pound (lb)	0.454 Kilogram (kg)
1 Cubic inch (in^3)	16.4 Cubic centimetres (cm^3)
1 Foot pound (lb ft)	1,356 Newton meter (Nm)
1 Miles per hour (mi/h)	1.602 Kilometres per hour (km/h)
1 Pound per square inch (PSI)	0.069 (bar)
1 Fahrenheit (°F)	32+(9/5) Celsius (°C)

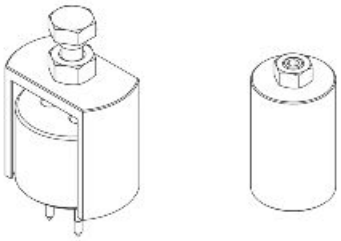
INDEX OF TOPICS

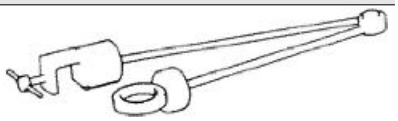
TOOLING	TOOL

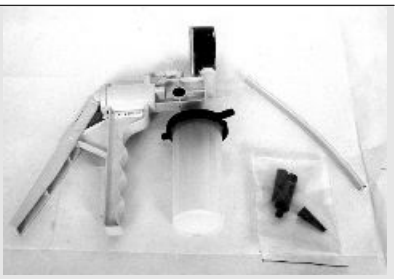
SPECIFIC TOOLS

Stores code	Description	
001467Y002	Driver for OD 73 mm bearing	
001467Y007	Driver for OD 54-mm bearings	
001467Y009	Bell for OD 42-mm bearings	
001467Y010	Driver for OD 25 mm bearings	
001467Y017	Driver for OD 36 mm bearings	
001467Y031	Bell	

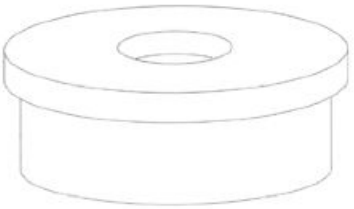
Stores code	Description	
001467Y035	Bearing housing, outside ø 47 mm	
001467Y006	Pliers to extract 20 mm bearings	
001467Y008	Pliers to extract 17 mm ø bearings	
001467Y013	Pliers to extract ø 15-mm bearings	
001467Y034	Pliers to extract ø 15-mm bearings	
002465Y	Pliers for circlips	

Stores code	Description	
020055Y	Wrench for steering tube ring nut	
001330Y	Tool for fitting steering seats	
020004Y	Punch for removing fifth wheels from headstock	
020478Y	Punch for driven pulley roller casing	
020663Y	Water pump shaft oil seal punch	
020661Y	Water pump overall seal replacement kit	

Stores code	Description	
020074Y	Support base for checking crankshaft alignment	
020150Y	Air heater support	
020151Y	Air heater	
020434Y	Oil pressure check fitting	
020193Y	Oil pressure check gauge	
020431Y	Valve oil seal extractor	

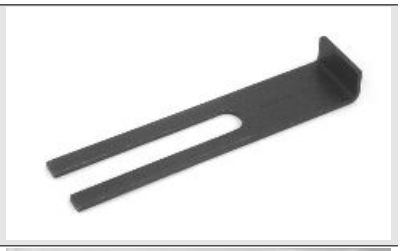
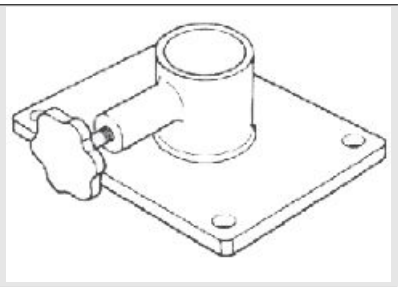
Stores code	Description	
020306Y	Punch for assembling valve seal rings	
020382Y012	bush (valve removing tool)	
020329Y	Mity-Vac vacuum-operated pump	
020330Y	Stroboscopic light to check timing	
020331Y	Digital multimeter	
020335Y	Magnetic support for dial gauge	

Stores code	Description	
020363Y	20-mm guide	
020364Y	25-mm guide	
020412Y	15-mm guide	
020439Y	17-mm guide	
020483Y	30-mm guide	
020376Y	Adaptor handle	

Stores code	Description	
020357Y	32x35-mm Adaptor	
020358Y	37x40-mm Adaptor	
020359Y	42x47-mm Adaptor	
020360Y	52x55-mm Adaptor	
020375Y	28 x 30 mm adaptor	
020456Y	Ø 24-mm adaptor	
020477Y	37 mm adaptor	
020604Y011	Fitting adapter	
020444Y	Tool for fitting/ removing the driven pulley clutch	

Stores code	Description	
020444Y009	wrench 46 x 55	
020474Y	Driving pulley lock wrench	
020922Y	Diagnosis Tool	
020471Y	Pin for countershaft timing	
020468Y	Piston assembly band	
020470Y	Pin retainers installation tool	

Stores code	Description	
020475Y	Piston position checking tool	
020565Y	Flywheel lock calliper spanner	
020467Y	Flywheel extractor	
020472Y	Flywheel lock wrench	
020476Y	Stud bolt set	
020479Y	Countershaft lock wrench	

Stores code	Description	
020480Y	Petrol pressure check kit	
020512Y	Piston fitting fork	
020482Y	Engine support	
020527Y	Engine support base	
020648Y	Single battery charger	

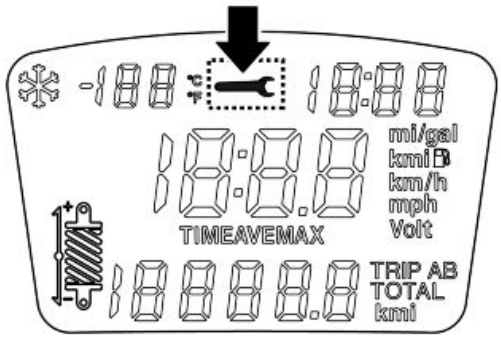
INDEX OF TOPICS

MAINTENANCE	MAIN

RESET SERVICE WARNING LIGHT

At vehicle ignition, immediately after the ignition check, if there are less than 300 km (187.5 miles) to the next scheduled service, the corresponding icon flashes for 5 seconds. Once the service mileage has been reached, the icon remains steadily on until it is reset.

The resetting of the service is done by holding down the SET key to the key connection for more than 10 seconds. For the first 5 seconds, the instrument panel will not give any signal, for the next 5 seconds the key icon will blink at a frequency of 1Hz. If the button is released before the 10 seconds, the service is not reset.



Maintenance chart

SCHEDULED MAINTENANCE TABLE

***I**: CHECK AND CLEAN, ADJUST, LUBRICATE OR REPLACE IF NECESSARY.*
***C**: CLEAN, **R**:REPLACE, **A**: ADJUST, **L**:LUBRICATE*
** Replace every 2 years*

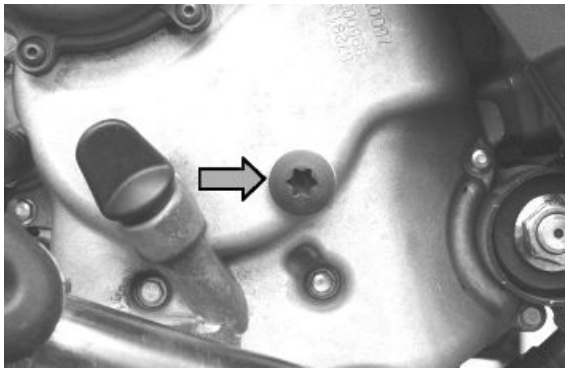
km x 1,000	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
Safety fasteners	I		I				I				I				I		
Spark plugs			R		R		R		R		R		R		R		R
Centre stand		L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Drive belt			R		R		R		R		R		R		R		R
Throttle control	A		A		A		A		A		A		A		A		A
Air filter			C		I		C		I		C		I		C		I
Engine oil filter	R		R		R		R		R		R		R		R		R
Parking brake	A		A		A		A		A		A		A		A		A
Valve clearance					I				I				I				I
Electrical system	I		I		I		I		I		I		I		I		I
Coolant level *	I		I		I		I		I		I		I		I		I
Brake oil level*	I		I		I		I		I		I		I		I		I
Engine oil	R	I	R	I	R	I	R	I	R	I	R	I	R	I	R	I	R
Hub oil	R		I		R		I		R		I		R		I		R
Brake pads	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Sliding shoes / CVT rollers			R		R		R		R		R		R		R		R
Brake pumps				R			R			R			R			R	
Tyre pressure and wear	I		I		I		I		I		I		I		I		I
Vehicle test and brake test - Road test	I		I		I		I		I		I		I		I		I
Suspension			I		I		I		I		I		I		I		I
Steering	I		I		I		I		I		I		I		I		I
Operation time (minutes)	105	10	190	170	220	10	350	10	220	170	190	10	380	10	190	170	220

N.B.

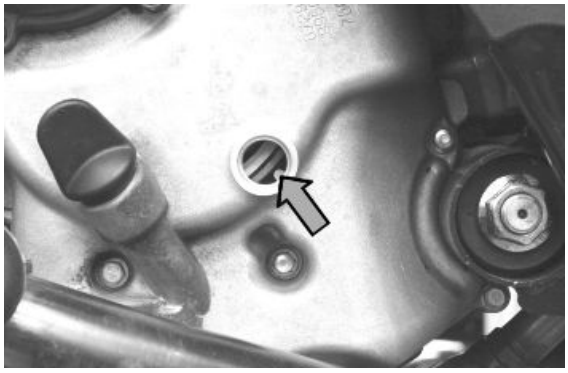
THE TIMES LISTED ON THE SCHEDULED MAINTENANCE TABLE INCLUDE TIME DEDICATED TO MANAGEMENT ACTIVITIES.

Checking the spark advance

The ignition advance is determined electronically on the basis of parameters known by the control unit. For this reason it is not possible to interpret the reference values based on the engine rpm. The ignition advance value is detectable at any time using the diagnostic tester. It is possible to check whether the ignition advance determined by the injection system matches the value actually activated on the engine, by means of the stroboscopic light.



Proceed as follows:
- Remove the spark plugs.
- Remove the transmission crankcase.
- Rotate the driving pulley fan until the reference marks between the flywheel and flywheel cover meet as shown in the photograph.



- Bring the reference mark onto the transmission side between the fan and the transmission cover as shown in the photograph.

- Refit the spark plugs.
- Refit the plastic cap on the flywheel cover.
- Adjust the spark gap to the contact position (no reference mark visible) and install it on the engine between the spark plug and spark plug cap
- Connect the induction clamp to the spark gap cable respecting the proper polarity (the arrow on the clamp must be pointing at the spark plug).

- Connect the diagnostic tester.
- Start the engine.
- Select the «Parameters» function in this menu.
- Set the stroboscopic light control to the traditional four-stroke engine position (1 spark, 2 revs).
- Check that the real values of rpm and ignition advance match those measured using the diagnostic tester.

If the values do not match, check:
- distribution timing
- engine speed sensor
- injection control unit

Specific tooling

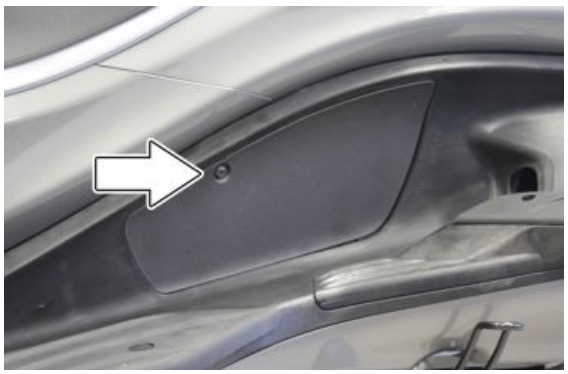
020922Y Diagnosis Tool

020330Y Stroboscopic light to check timing

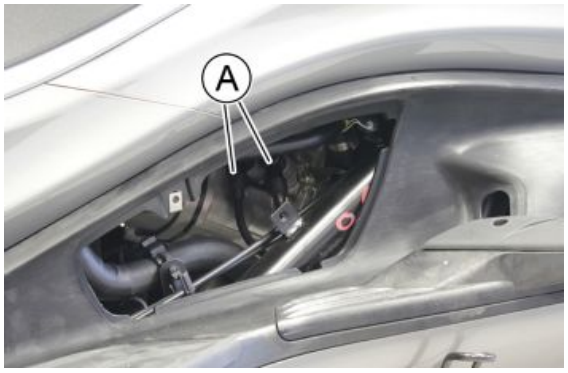
020621Y HV cable extraction adaptor

Spark plug

For the removal of spark plugs proceed as follows:
- undo the indicated spark plug access door screw located on the left side of the vehicle.



- disconnect the caps «**A**» of the HV cables of the spark plugs.
- undo the spark plugs using the wrench supplied.
- when refitting, place the spark plugs at the corresponding angle and tighten it fully by hand. Use the wrench only to tighten it.
- insert the caps «**A**» on the spark plugs all the way to the bottom.



CAUTION

SPARK PLUGS MUST BE REMOVED WHEN THE ENGINE IS COLD. SPARK PLUGS MAINTENANCE OPERATIONS ARE DESCRIBED IN THE SCHEDULED MAINTENANCE TABLE. USING NON-CONFORMING ELECTRONIC CENTRAL UNITS AND ELECTRONIC IGNITIONS OR SPARK PLUGS OTHER THAN THOSE PRESCRIBED MAY SERIOUSLY DAMAGE THE ENGINE.

N.B.

USE OF SPARK PLUGS OTHER THAN THE INDICATED TYPE OR UNSHIELDED SPARK PLUG CAPS CAN LEAD TO FAULTS IN THE VEHICLE 'S ELECTRICAL SYSTEM.

Characteristic

Spark plug

NGK CR7EKB

WHEN REFITTING THE ACCESS DOOR, PAY ATTENTION TO THE FITTING FINS REQUIRED FOR THE CORRECT POSITIONING AND FIXING OF THE SAME DOOR.

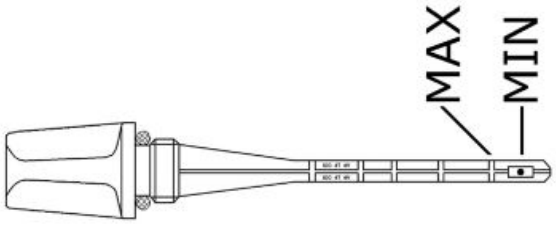
Check

-Place the vehicle on the centre stand on flat ground;

- Remove the oil dipstick «**A**», dry it with a clean cloth and put it back into its hole **tightening it completely**;

Remove the dipstick and check that the oil level is slightly over the second notch starting from the lower end; if the level is below the **MAX** mark, it needs to be filled up with the right amount of hub oil.

-Screw up the oil dipstick again and make sure it is locked properly into place.



Replacement

- Remove the oil filler plug «**A**».
- Unscrew the oil drainage cap «**B**» and drain out all the oil.
- Screw in the drainage cap again and fill the hub with the prescribed oil.

Recommended products

AGIP GEAR SAE 80W-90 Lubricant for gear-boxes and transmissions.

API GL-4

Characteristic

Rear hub oil

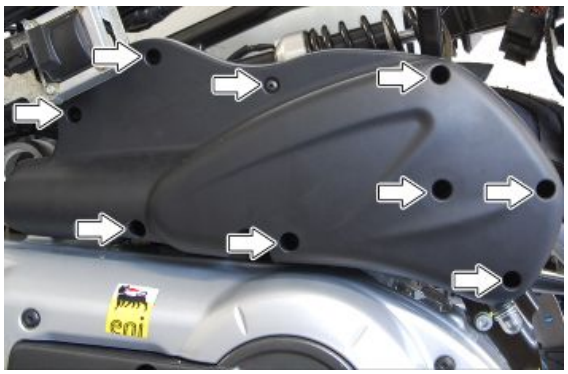
Capacity approximately 250 cc

Air filter

Proceed as follows:

Undo the fixing screws and remove the air filter cover.

- Wash the sponge with water and mild soap.
- Dry it with a clean cloth and short blasts of compressed air.
- Soak it in a mixture of 50% petrol and 50% specific oil.
- Gently squeeze the filtering element with your hands without wringing it; let it drip dry and then refit.



CAUTION

IF THE VEHICLE IS USED ON DUSTY ROADS IT IS NECESSARY TO CARRY OUT MAINTENANCE CHECKS OF THE AIR FILTER MORE OFTEN TO AVOID DAMAGING THE ENGINE.

Recommended products

AGIP FILTER OIL OIL FOR AIR FILTER SPUNGE

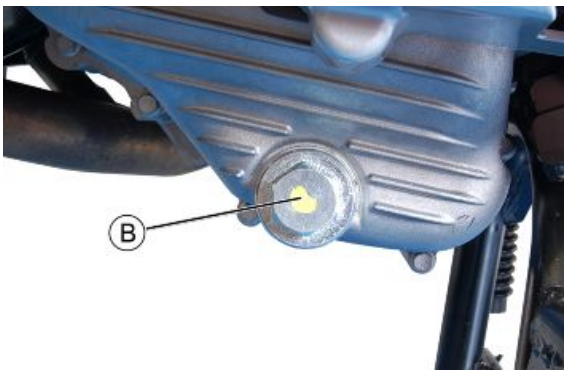
Mineral oil with specific additives for increased adhesiveness

Engine oil

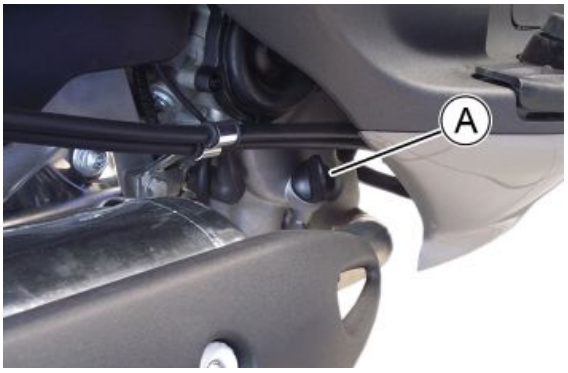
In four stroke engines, the engine oil is used to lubricate the timing elements, the bench bearings and the thermal group. **An insufficient quantity of oil can cause serious damage to the engine.**
In all four stroke engines, the deterioration of the oil characteristics, or a certain consumption should be considered normal, especially if during the run-in period. Consumption levels in particular can be influenced by the conditions of use (e.g.: oil consumption increases when driving at "full throttle".

Replacement

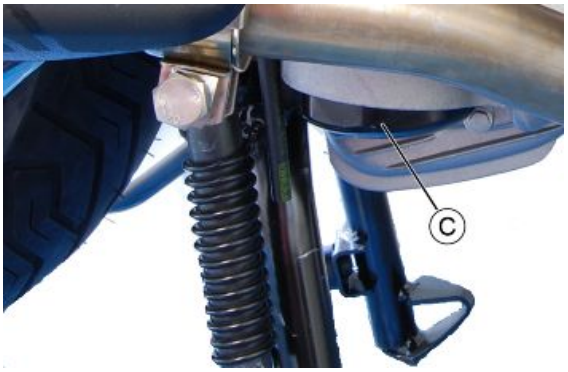
Change oil and replace filter as indicated in the scheduled maintenance table. Empty the engine by draining the oil through drainage plug «**B**».



To facilitate oil drainage, loosen the cap/dipstick «**A**».



Once all the oil has drained through the drainage hole, unscrew and remove the oil cartridge filter «**C** ».



Make sure the pre-filter and drainage plug O-rings are in good conditions.

Lubricate them and refit the mesh filter and the oil drainage plug, screwing them up to the prescribed torque.

Refit the new cartridge filter being careful to lubricate the O-ring before fitting it.

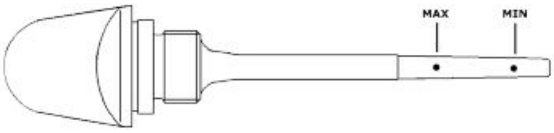
Change the engine oil.

Since a certain quantity of oil still remains in the circuit, engine oil must be added through plug «**A**». Then start up the vehicle, leave it running for a few minutes and switch it off: After about five minutes, check the level and, if necessary, top-up but never exceeding the **MAX** level reference mark.

The cartridge filter must be replaced every time the oil is changed. Use new oil of the recommended type for topping up and changing purposes.

N.B.

THE ENGINE MUST BE HOT WHEN THE OIL IS CHANGED.



Recommended products

eni i-Ride PG 5W-40 Synthetic based lubricant for high-performance four-stroke engines.

JASO MA, MA2 - API SL - ACEA A3

Locking torques (N*m)

Engine oil filter 12 - 16 **Engine oil drainage plug** 24 ÷ 30

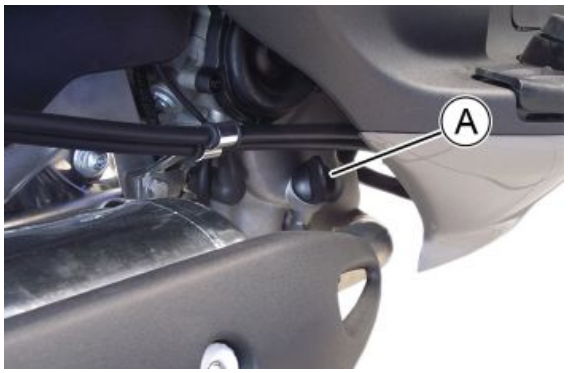
Check

This operation must be carried out with the engine cold and following the procedure below:

- Place the vehicle on its centre stand and on flat ground.

- Unscrew the cap/dipstick «**A**», dry it with a clean cloth and reinsert it, **screwing it all the way down**.

- Remove the cap/dipstick again and check that the level is between the min and max reference marks; top-up, if required.

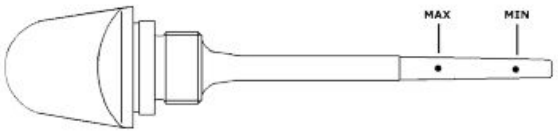


If the check is carried out after the vehicle has been used, and therefore with a hot engine, the level will be lower; in order to carry out a correct check, wait at least 10 minutes after the engine has been stopped so as to get the correct level.

Engine oil top-up

The oil should be topped up after having checked the level and in any case by adding oil **without ever exceeding the MAX. level**.

Restoring the level from the **MIN** to the **MAX** marks requires approx. **400 m³** of oil.



Engine oil filter

Change oil and replace filter as indicated in the scheduled maintenance table. Use new oil of the recommended type for topping up and changing purposes.

Make sure the pre-filter and drainage plug O-rings are in good conditions. Lubricate them and refit the mesh filter and the oil drainage plug, screwing them up to the specified torque. Refit the new cartridge filter being careful to lubricate the O-ring before fitting it. Change the engine oil.

Recommended products

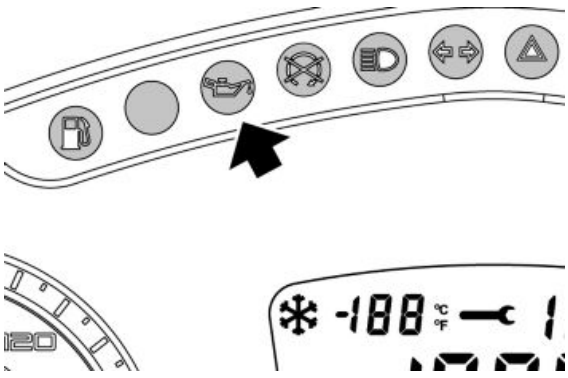
eni i-Ride PG 5W-40 Synthetic based lubricant for high-performance four-stroke engines.

JASO MA, MA2 - API SL - ACEA A3

Oil pressure warning light

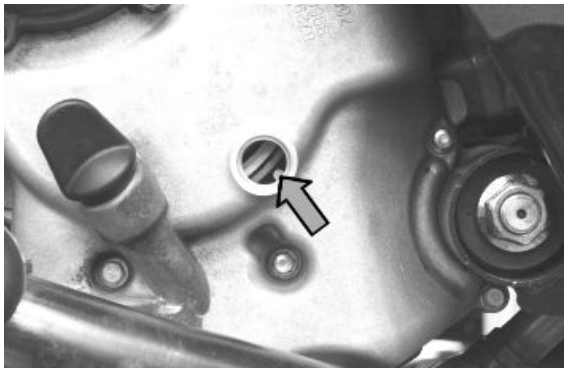
The vehicle is equipped with a telltale light on the dashboard that lights up when the key is turned to the «**ON**» position. However, this light should switch off once the engine has started.

If the light turns on during braking, at idling speed or while turning a corner, it is necessary to check the oil level and the lubrication system.



Checking the ignition timing

- Remove the plastic cap on the flywheel cover
-Turn the flywheel until the reference mark «**T**» on the rotor matches the reference mark on the flywheel cover as shown in the figure (TDC). Make sure that the 4V reference point on the camshaft control pulley is aligned with the reference point on the head as shown in the second figure. If the reference is opposite the indicator on the head, turn the crankshaft once more.
For the use of this reference mark, remove the spark plug and turn the engine in the direction that is the reverse of the normal direction using a calliper spanner applied to the camshaft command pulley casing.



Checking the valve clearance

- To check the clearance in the valves collimate the references between the cam shaft control pulley and head.
- Use a feeler to make sure the clearance between the valve and register screw correspond to the indicated values. If the clearance does not correspond, adjust it by loosening the lock nut using a screwdriver on the set screw as shown in the figure.

Characteristic

Valve clearance: intake

0.15 mm (when cold)

Valve clearance: discharge

0.15 mm (when cold)

Anti-evaporation system

The breather of vapours from the fuel tank is created by means of a valve.

The black-coloured part of such a valve must be connected to the pipe coming from the tank.

INDEX OF TOPICS

TROUBLESHOOTING	TROUBL

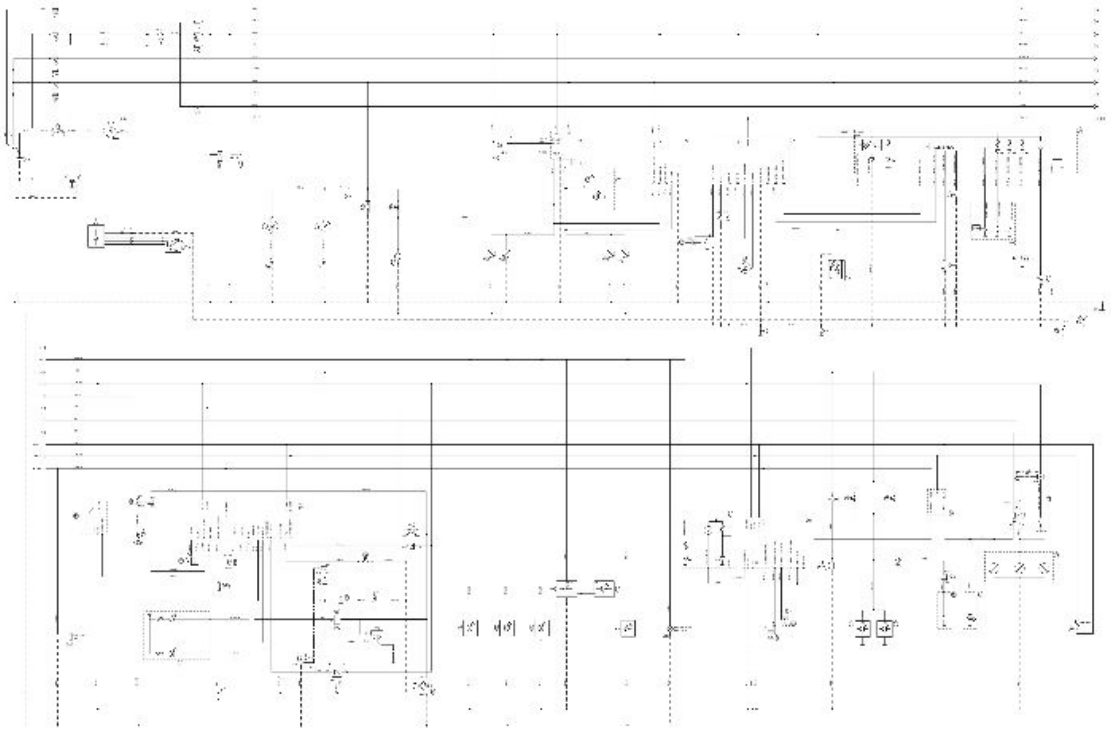
Noisy suspension

NOISY SUSPENSION

Possible Cause	Operation
Faults in the suspension system	If the front suspension is noisy, check: the efficiency of the front shock absorber; the condition of the ball bearings and relevant lock-nuts, the limit switch rubber buffers; and the movement bushings. In conclusion, check the tightening torque of the wheel hub, the brake calliper, the shock absorber disc in the attachment to the hub and the steering tube.
Anomalies on the rear suspension system	Replace it if the problem is not electrical in nature. Check the relative basic circuit diagram. In case of failure with the key set to the «**ON**» position of the «UP» and «**DOWN**» buttons, and if the icon on the digital display flashes, it is necessary to reset the adjustment system. Finally, check the locking torques of the shock absorber to the rear suspension linkage and mounting bracket.

INDEX OF TOPICS

ELECTRICAL SYSTEM	ELE SYS



KEY

1. 12v-10Ah battery

2. Starter motor

3. Starter relay contact

4. Starter relay coil

5. Regulator

6. Flywheel

7. Chassis ground

8. Chassis engine-ground

9. Ignition switch

10. Fuse No. 1 - 15A

11. Fuse No. 2 - 10A

12. Fuse No. 3 - 7.5A

13. Fuse No. 4 - 7.5A

14. Fuse No. 5 - 7.5A

15. Fuses No. 6 - 7.5A

16. Fuse No. 7 - 5A

17. Fuse No. 8 - 3A

18. Fuse No. 9 - 30A

19. USB socket

20. Preinstallation for satellite navigation system
21. Fuel tank flap actuator
22. Fuel tank flap button
23. Saddle actuator
24. Saddle button
25. LV socket
26. Helmet compartment light switch
27. 12v-5w light unit bulb
28. Turn indicator control
29. Emergency light bulb button
30. Turn indicators control device
31. Instrument panel
32. Front left turn indicator
33. Front right turn indicator
34. Rear left turn indicator
35. Rear right turn indicator
36. Fuel level transmitter
37. Engine temperature sensor (instrument)
38. Ambient temperature sensor
39. «Mode» button
40. Injection electronic control unit
41. Front ground node
42. Rear ground node
43. Rear ground regulator
44. Instrument panel ground node
45. Oil pressure sensor
46. Immobilizer
47. Injection relay
48. Radiator electric fan
49. Radiator electric fan solenoid
50. Lambda sensor
51. Engine temperature sensor (C.D.I.)
52. Engine speed sensor
53. Engine stop button
54. Stand button
55. H.V. coil
56. Fuel injector
57. Anti-tipping sensor

58. Fuel pump

59. Diagnostics socket

60. Left front daylight running light

61. Right front daylight running light

62. Left rear tail light bulb

63. Right rear tail light bulb

64. Left side control lighting

65. Right side control lighting

66. License plate light bulb 12V-5W

67. Horn

68. Horn button

69. N.2 stop buttons

70. Engine starter button

71. Left stop light

72. Right stop light

73. Light switch

74. Headlight

75. Headlight relay

76. Pre-installation of «blue dash / anti-theft device»

77. Fuse No. 10- 40A for ABS system

78. Shock absorber adjustment device

79. Shock absorber adjustment button "UP"

80. Shock absorber adjustment button "DOWN"

81. Encoder for shock absorber electric device

82. Shock absorber actuator

83. Shock absorber adjustment device ground node

84. CDI injection control unit ground node

85. Engine signalling relay inhibited

86. Diode 1A

87. ASR Button

88. ABS control unit

89. Front tone wheel sensor for ABS

90. Rear tone wheel sensor for ABS

91. Resistance 120ohm termination of CAN line

Key

Ar: Orange **Az:** Light Blue **Bi**: White **Bl**: Blue **Gi**: Yellow **Gr:**Grey

Ma:Brown **Ne:** Black **Ro**: Pink **Rs:** Red **Ve**: Green **Vi:** Purple

Components arrangement

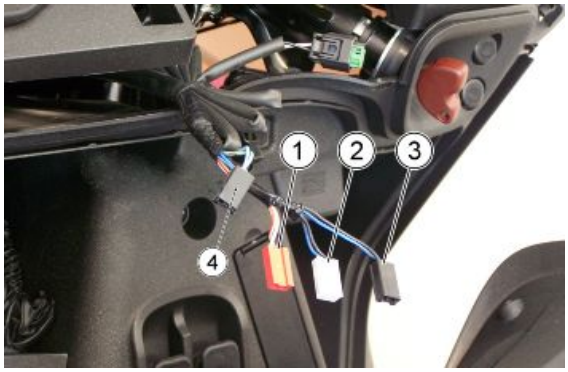
1. Pulsante apertura sella e connettore

2. Pulsante luci di emergenza e connettore

3. Pulsante apertura sportello carburante e connettore

4. Pulsante ASR e connettore

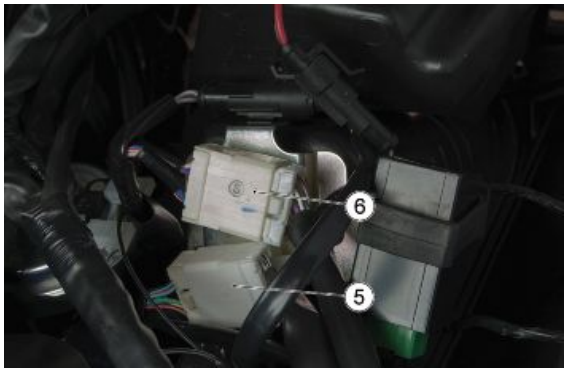
- per accedervi rimuovere la modanatura dei pulsanti.



5. Dispositivo manopola lato destro e connettore

6. Dispositivo manopola lato sinistro e connettore

- per accedervi rimuovere il gruppo ottico anteriore.



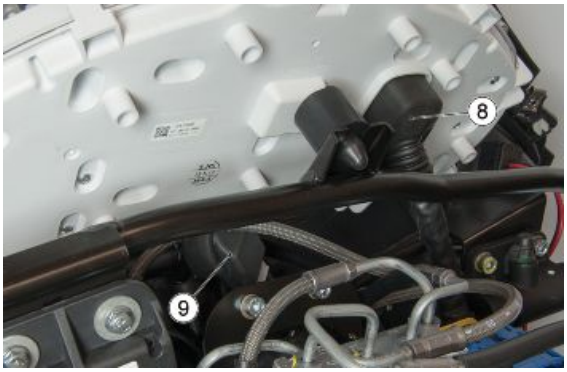
7. Dispositivo presa USB e connettore

- per accedervi rimuovere il gruppo ottico anteriore.

8. Gruppo strumenti e connettore

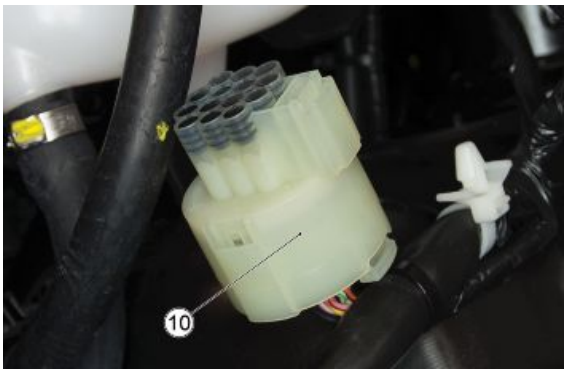
9. Commutatore a chiave e connettore

- per accedervi rimuovere il gruppo cupolino-parabrezza.



10. Predisposizione accessori (predisposizione antifurto e Blue Dash)

- per accedervi rimuovere il gruppo cupolino-parabrezza.



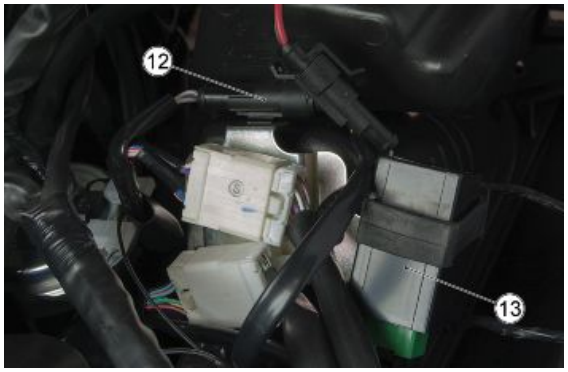
11. Clacson

- per accedervi rimuovere il gruppo ottico anteriore.

12. Briglia connessione proiettore

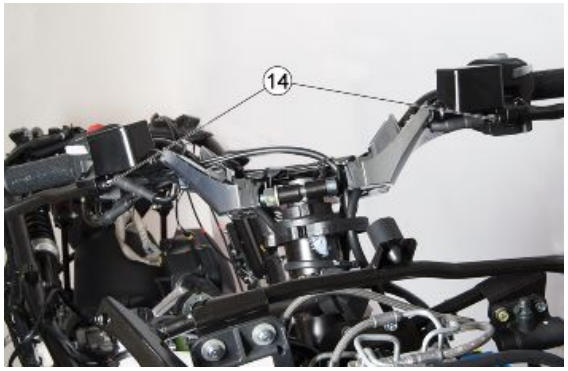
13. Dispositivo comando lampeggiatori

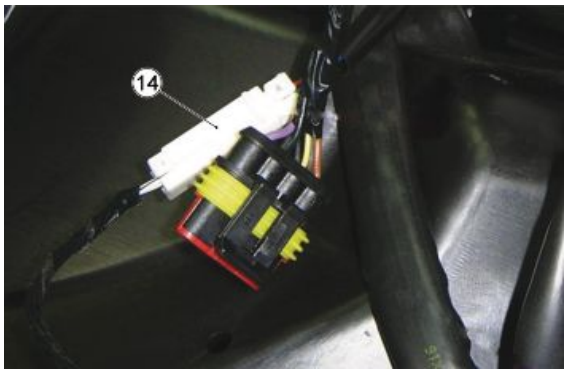
- per accedervi rimuovere il gruppo ottico anteriore.



14. Pulsanti stop e connettori

- per accedervi rimuovere il gruppo ottico anteriore.

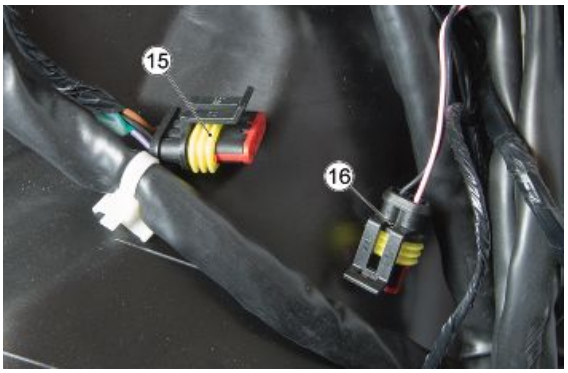




15. Proiettore anabbagliante sinistro e connettore

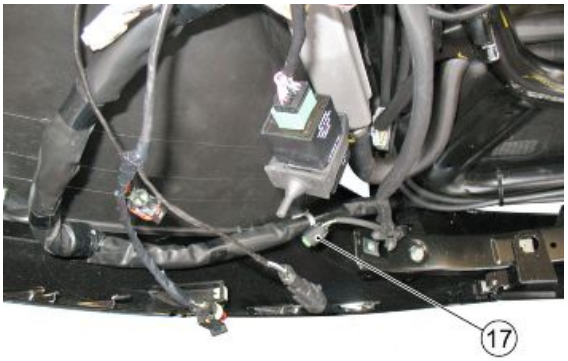
16. Indicatore di direzione anteriore sinistro e connettore

- per accedervi rimuovere il gruppo ottico anteriore.



17. Predisposizione navigatore GPS

- per accedervi rimuovere la modanatura dei pulsanti e la modanatura laterale sinistra.



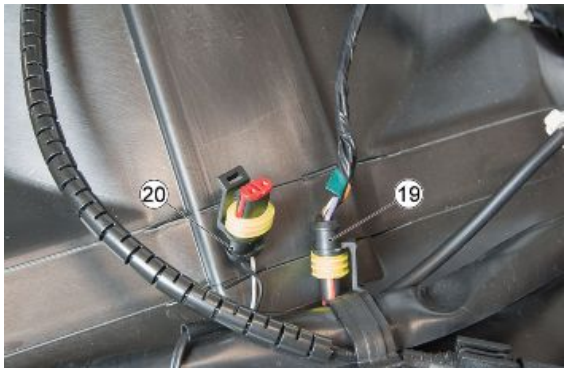
18. Proiettore abbagliante e luce di posizione Anteriore a LED e connettore

- per accedervi rimuovere il gruppo cupolino-parabrezza.

19. Proiettore anabbagliante destro e connettore

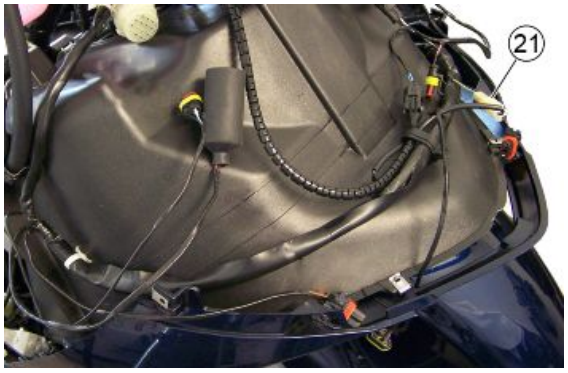
20. Indicatore di direzione anteriore destro e connettore

- per accedervi rimuovere il gruppo ottico anteriore.



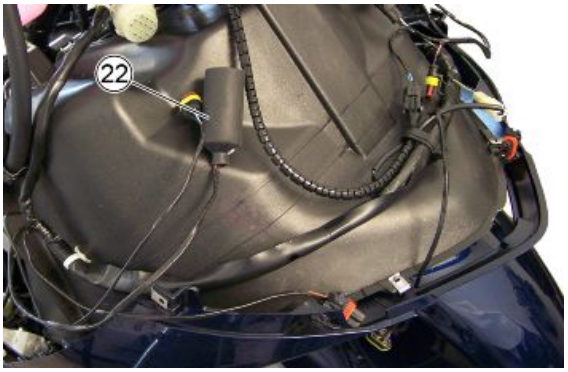
21. Sensore temperatura aria esterna e connettore

- per accedervi rimuovere il gruppo ottico anteriore.



22. Presa B.T. e connettore

- per accedervi rimuovere il gruppo ottico anteriore.

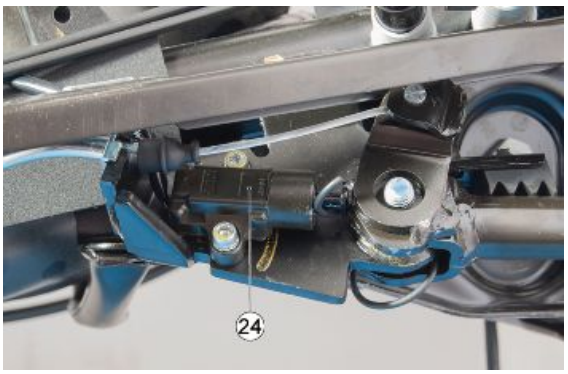


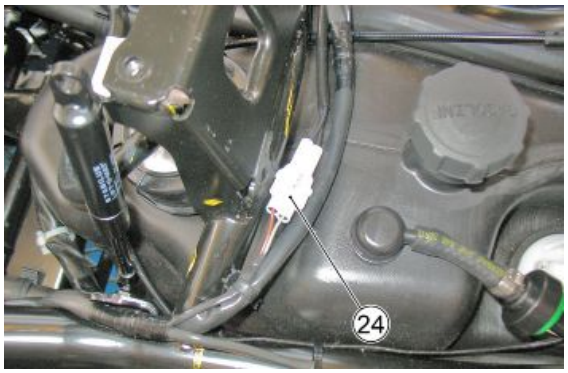
23. Antenna immobilizer

- per accedervi rimuovere la copertura centrale ed il vano porta oggetti.

24. Pulsante cavalletto laterale e connettore

- per accedervi rimuovere la copertura inferiore ed il portello carburante.





25. Elettroventola radiatore e connettore

- per accedervi rimuovere la copertura inferiore ed il portello carburante.

26. Connettore indicatore livello carburante su cruscotto

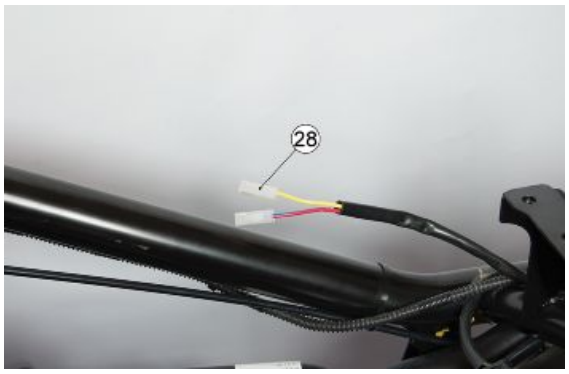
- per accedervi rimuovere la copertura inferiore ed il portello carburante.

27. Pompa carburante e connettore

- per accedervi rimuovere il vano porta casco.

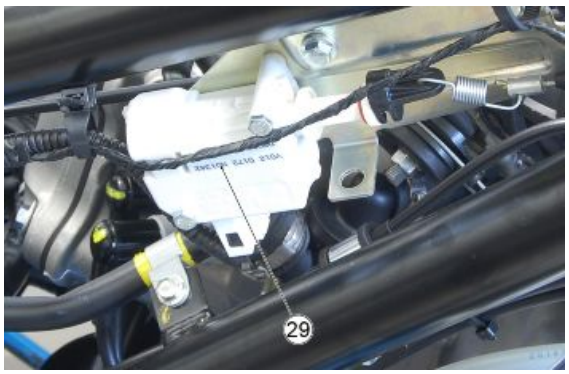
28. Pulsante illuminazione vano casco e connettore

- per accedervi rimuovere il vano porta casco.



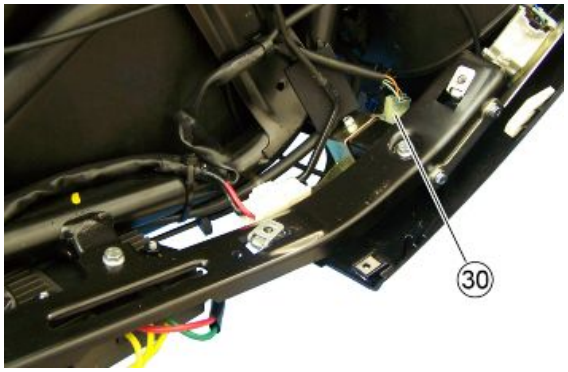
29. Attuatore apertura sella

- per accedervi rimuovere il semi codone sinistro.



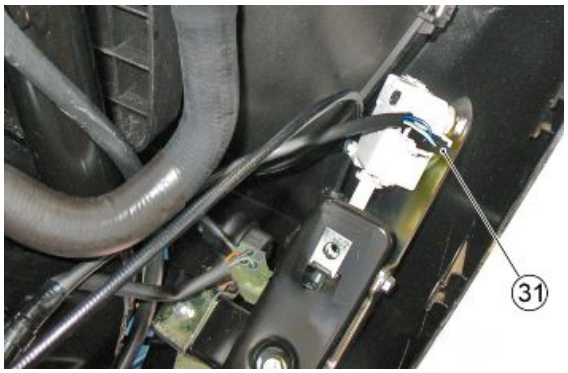
30. Sensore anti-ribaltamento

- per accedervi rimuovere la pedana appoggiapiedi e la fiancata laterale destra.



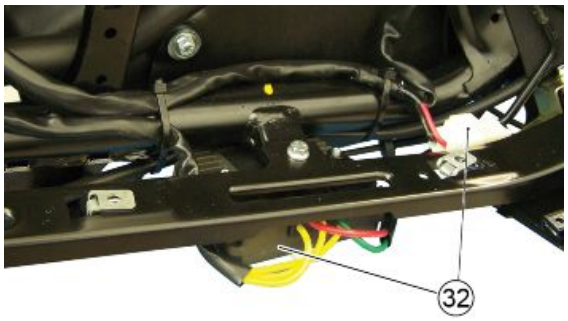
31. Attuatore apertura portello carburante

- per accedervi rimuovere la pedana appoggiapiedi e la fiancata laterale destra.



32. Regolatore di tensione e connettore

- per accedervi rimuovere la pedana appoggiapiedi e la fiancata laterale destra.

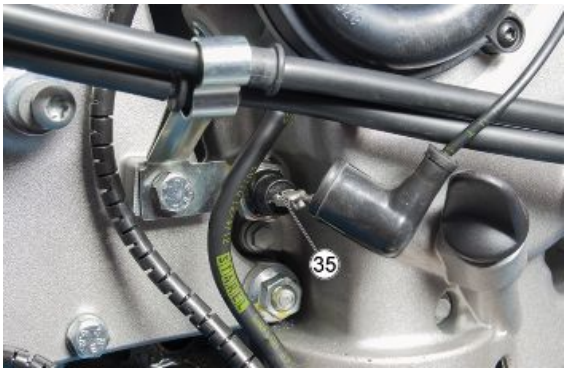


33. Connessione statore

34. Connessione sensore giri motore

- per accedervi rimuovere la pedana appoggiapiedi e la fiancata destra.

35. Sensore pressione olio

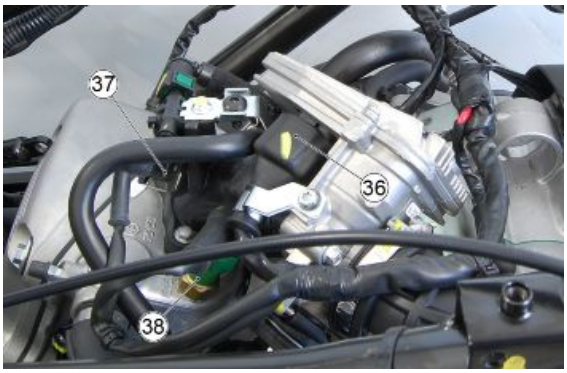


36. Centralina iniezione

37. Iniettore

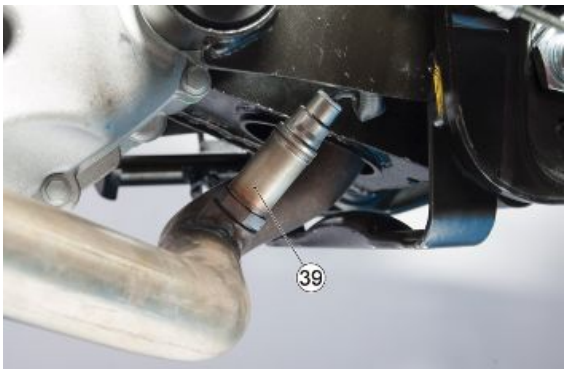
38. Sensore temperatura motore

- per accedervi rimuovere il portello vano porta casco.



39. Sonda lambda e connettore

- per accedervi rimuovere il vano porta casco.



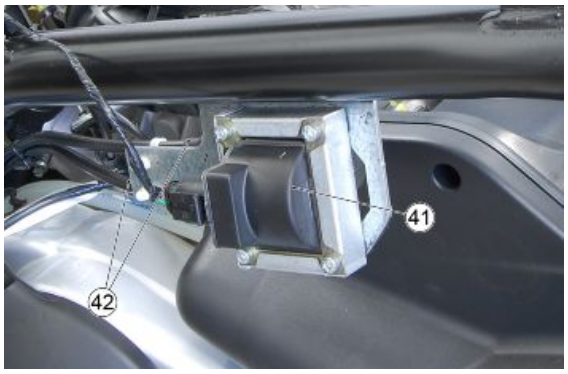
40. Sensore velocità posteriore e connettore

- per accedervi rimuovere il vano porta casco.

41. Bobina A.T.

42. Cavi bobina A.T.

- per accedervi rimuovere la pedana poggiapiedi e la fiancata sinistra.



43. Cappucci candele di accensione

- per accedervi rimuovere il portello ispezione candela.

44. Motorino di avviamento

- per accedervi rimuovere il vano porta casco.

45. Presa di diagnosi

46. Negativo batteria

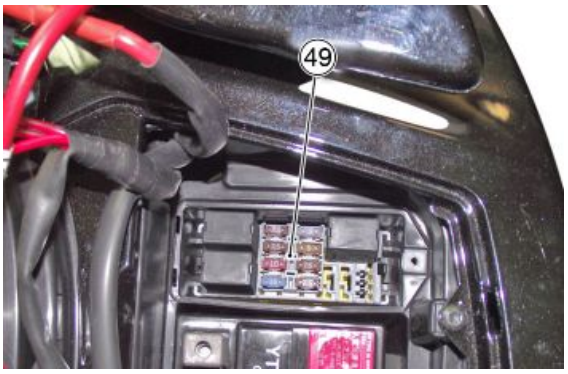
47. Positivo batteria

48. Teleruttore avviamento

- per accedervi rimuovere il coperchio vano batteria.

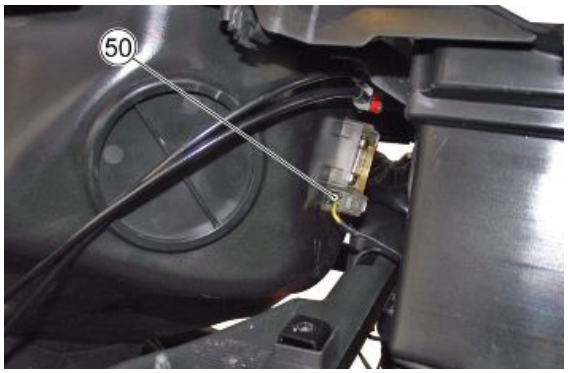
49. Scatola portafusibili e relè

- per accedervi rimuovere il coperchio vano batteria e sollevare il teleruttore avviamento.



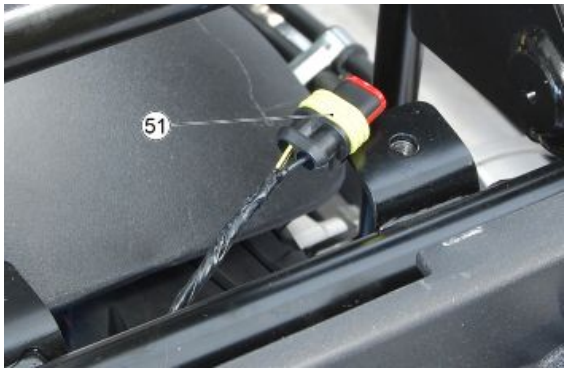
50. Plafoniera illuminazione vano porta casco e connettore

- per accedervi rimuovere la plafoniera dal vano porta casco.



51. Luce illuminazione targa e connettore

- per accedervi rimuovere il supporto targa.



52. Indicatore di direzione posteriore destro e connettore

53. Fanale posteriore destro e connettore

- per accedervi rimuovere la fiancata ed il gruppo ottico posteriore destro.

54. Indicatore di direzione posteriore sinistro e connettore

55. Fanale posteriore sinistro e connettore

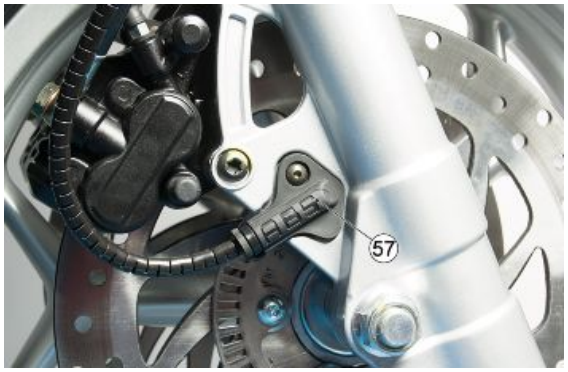
- per accedervi rimuovere la fiancata ed il gruppo ottico posteriore sinistro.

56. Centralina ABS

- per accedervi rimuovere il gruppo cupolino-parabrezza.

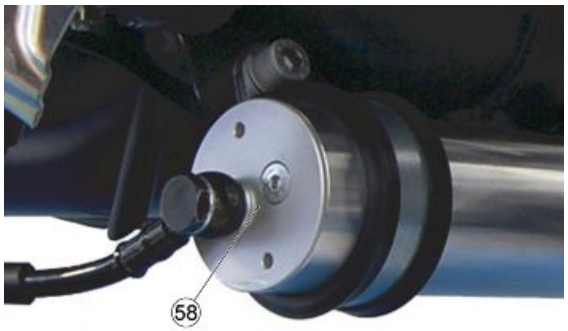
57. Sensore velocità anteriore e connettore

- per accedervi rimuovere il gruppo ottico anteriore.



58. Attuatore regolazione precarico ammortizzatore posteriore e connettore

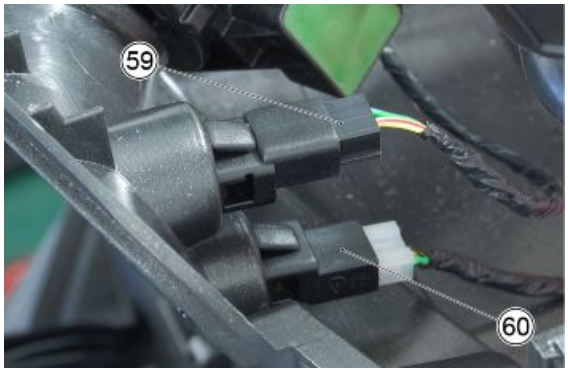
- per accedervi rimuovere la pedana poggiapiedi sinistra e la fiancata sinistra.



59. Pulsante aumento precarico ammortizzatore e connettore

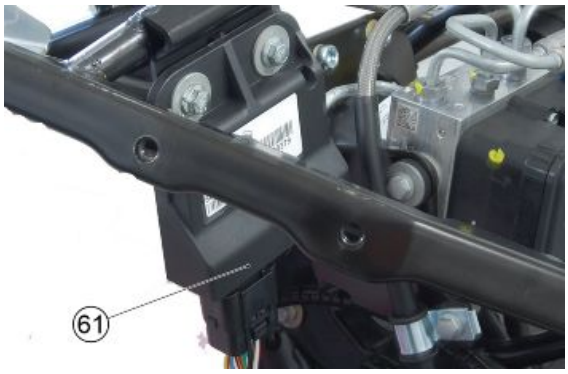
60. Pulsante diminuzione precarico ammortizzatore e connettore

- per accedervi rimuovere il cruscotto.



61. Centralina regolazione precarico ammortizzatore posteriore

- per accedervi rimuovere lo scudo anteriore.



Ground points

Located on the left side of the frame, under the footrest.

Located on the engine in the left part of the vehicle.

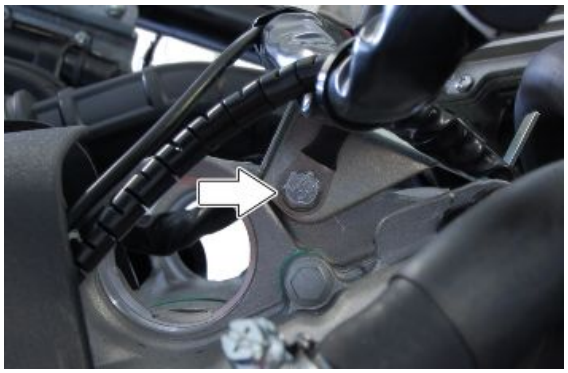
- to reach it, remove the left side fairing.

Located on the frame on the right side of the vehicle

- remove the semi-tail fairing and the right rear light unit to reach it.

Located on the engine under the support bracket of the cabling.

- to reach it, remove the helmet compartment.



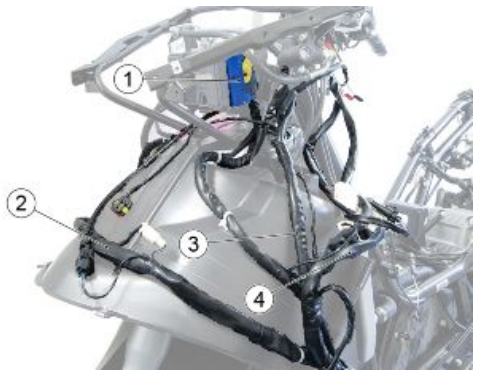
Front side

1. ABS control unit.

2. Preload control unit and command cabling.

3. Dashboard cabling.

4. Command cabling to the handlebar.



5. Adjustment control unit of the preloading.

6. Blue Dash connector.

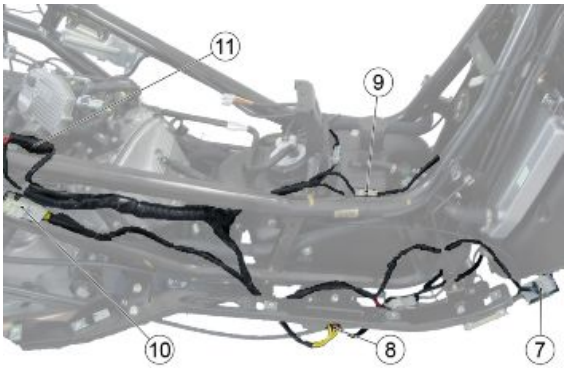
7. Fall sensor and fuel door actuator.

8. Voltage regulator.

9. Electric fan connector.

10. Alternator connector.

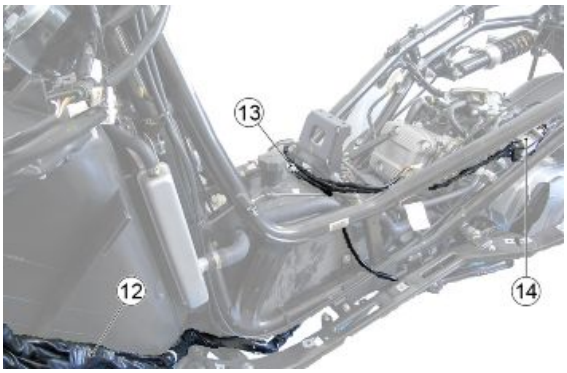
11. Pick-up connector and oil pressure sensor.



12. Main cable harness.

13. Side stand sensor connector.

14. Saddle opening actuator.



Back side

15. Rear wheel speed sensor connector.

16. Right turn indicator connector.

17. Right light connector.

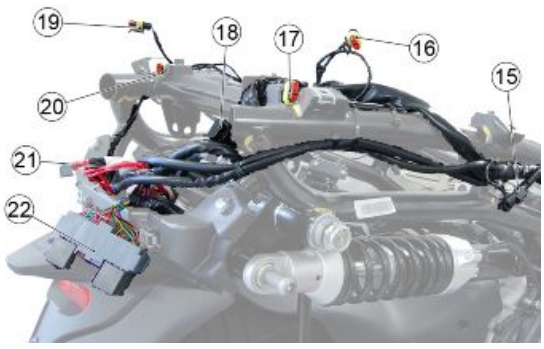
18. Diagnostic socket.

19. Left light connector.

20. Left turn indicator connector.

21. Cables connecting battery and starter relay.

22. Fuses and relays unit.

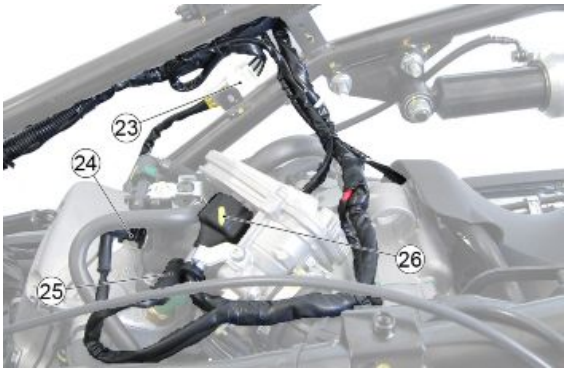


23. Alternator connector.

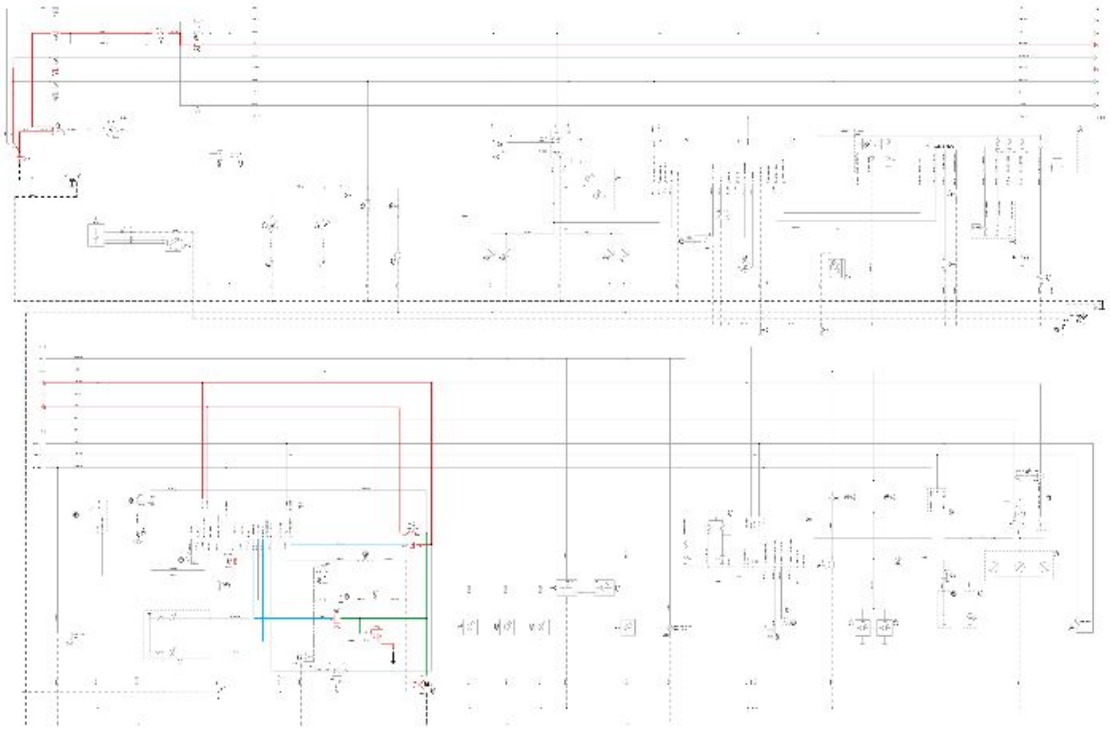
24. Fuel injector.

25. Engine temperature sensor.

26. Injection ECU.



Ignition



List of components

1 Battery 12V-10Ah

7 Frame ground node

9 Ignition switch

12 Fuse No. 3

16 Fuse No. 7

18 Fuse No. 9

40 CDI injection control unit

41 Rear ground node

42 Rear ground node

43 Rear ground regulator

47 Injection load solenoid

52 Engine revolution sensor

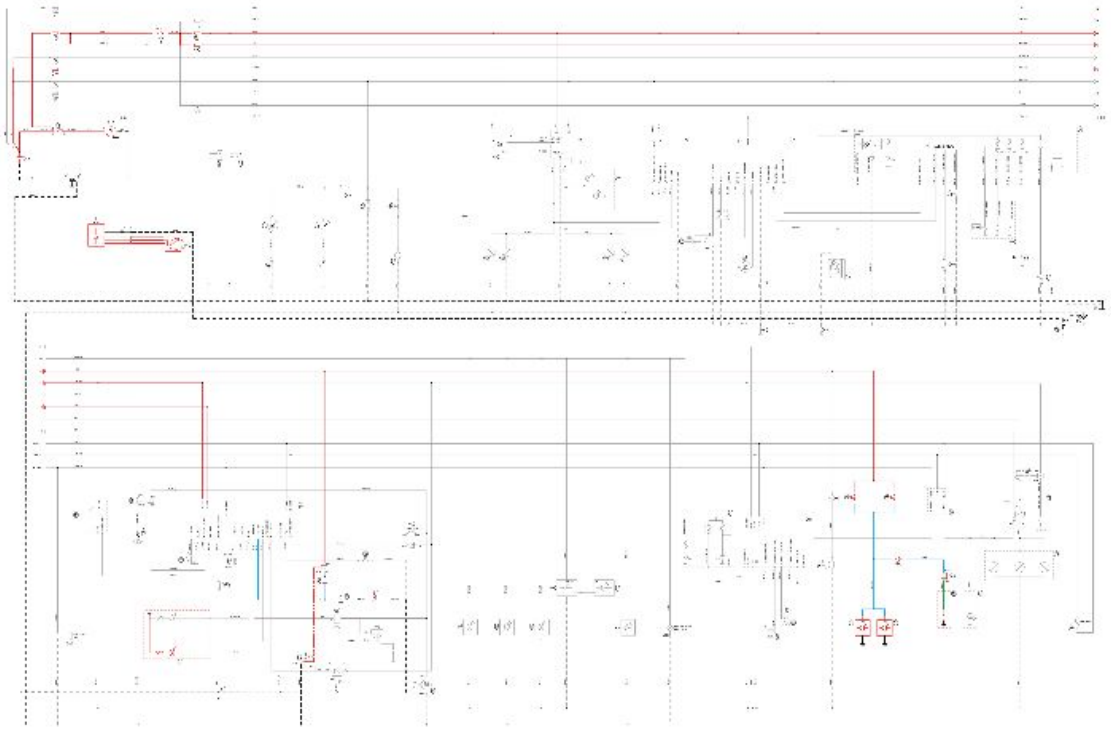
55 HV coil

56 Fuel injector

58 Fuel pump

84 CDI injection control unit ground node

Battery recharge and starting



List of components

1 Battery 12V-10Ah

2 Starter motor

3 Starter relay contact

4 Starter relay coil

5 Voltage regulator

6 Flywheel

7 Frame ground node

8 Frame-engine ground node

9 Ignition switch

12 Fuse No. 3

14 Fuse No. 5

16 Fuse No. 7

18 Fuse No. 9

31 Instrument panel

40 CDI injection control unit

41 Rear ground node

42 Rear ground node

43 Rear ground regulator

53 Engine stop button

54 Side stand switch

69 Stop switch

70 Engine starter button

71 Left stop light

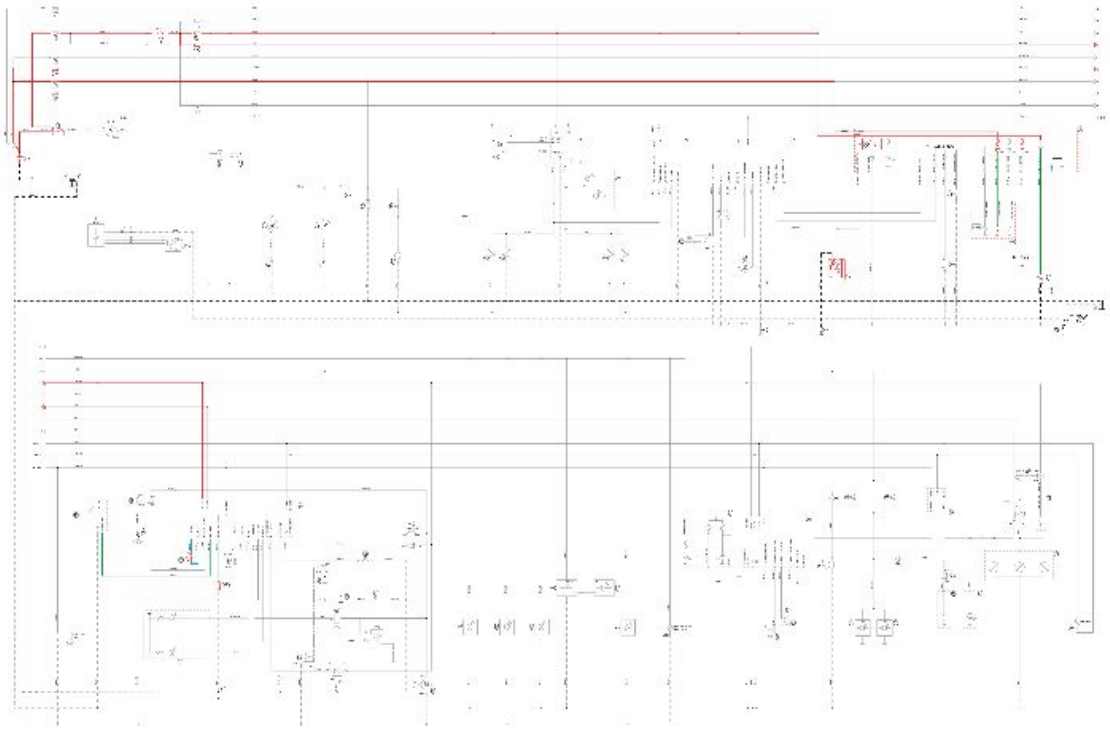
72 Right stop light

84 CDI injection control unit ground node

85 Signal relay engine inhibited

86 Diode 1A

Level indicators and enable signals section



List of components

1 Battery 12V-10Ah

7 Frame ground node

9 Ignition switch

10 Fuse No. 1 -15A

12 Fuse No. 3 -10A

14 Fuse No. 5 -7,5A

16 Fuse No. 7 -5A

31 Instrument panel

36 Fuel level transmitter

37 Engine water temperature sensor for instrument

40 CDI injection control unit

41 Front ground node

42 Rear ground node

43 Rear ground regulator

44 Instrument panel ground node

45 Oil pressure sensor

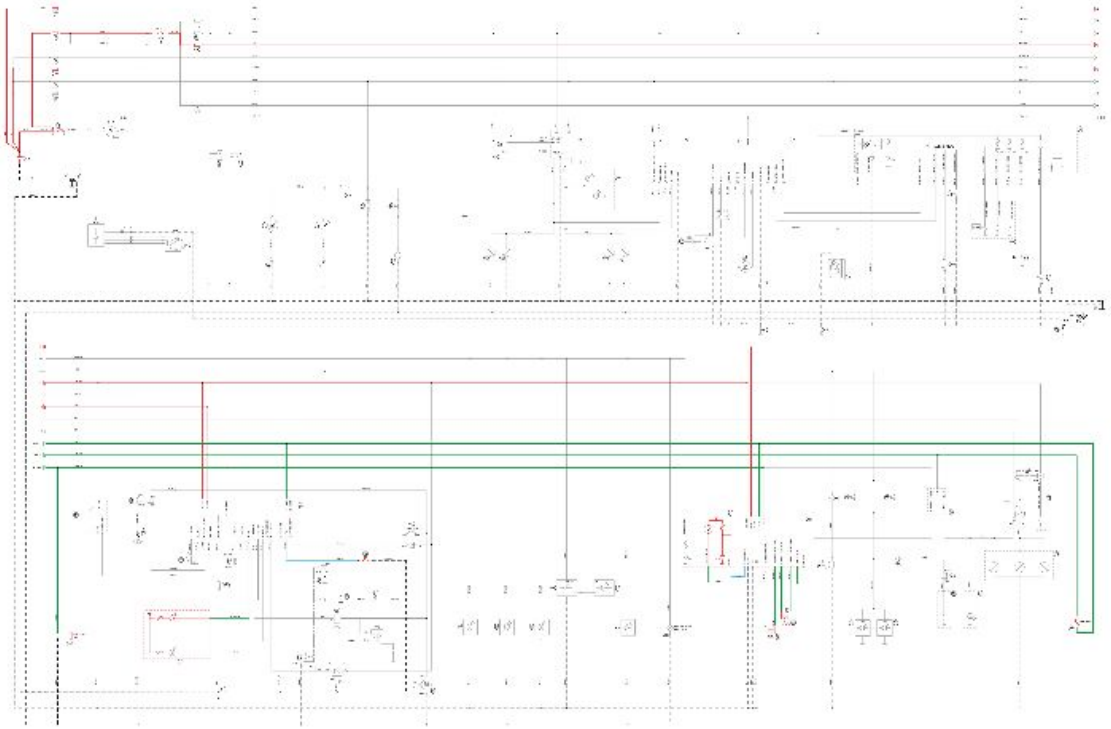
46 Immobilizer

50 Lambda probe

51 Engine water temperature sensor for instrument

84 CDI injection control unit ground node

ABS



List of components

1 Battery 12V-10Ah

7 Frame ground node

9 Ignition switch

16 Fuse No. 7 -5A

18 Fuse No. 9 -30A

31 Instrument panel

40 CDI injection control unit

41 Front ground node

42 Rear ground node

43 Rear ground regulator

59 Diagnostics socket

77 Fuse No. 10 -40A

84 CDI injection control unit ground node

87 ASR BUTTON

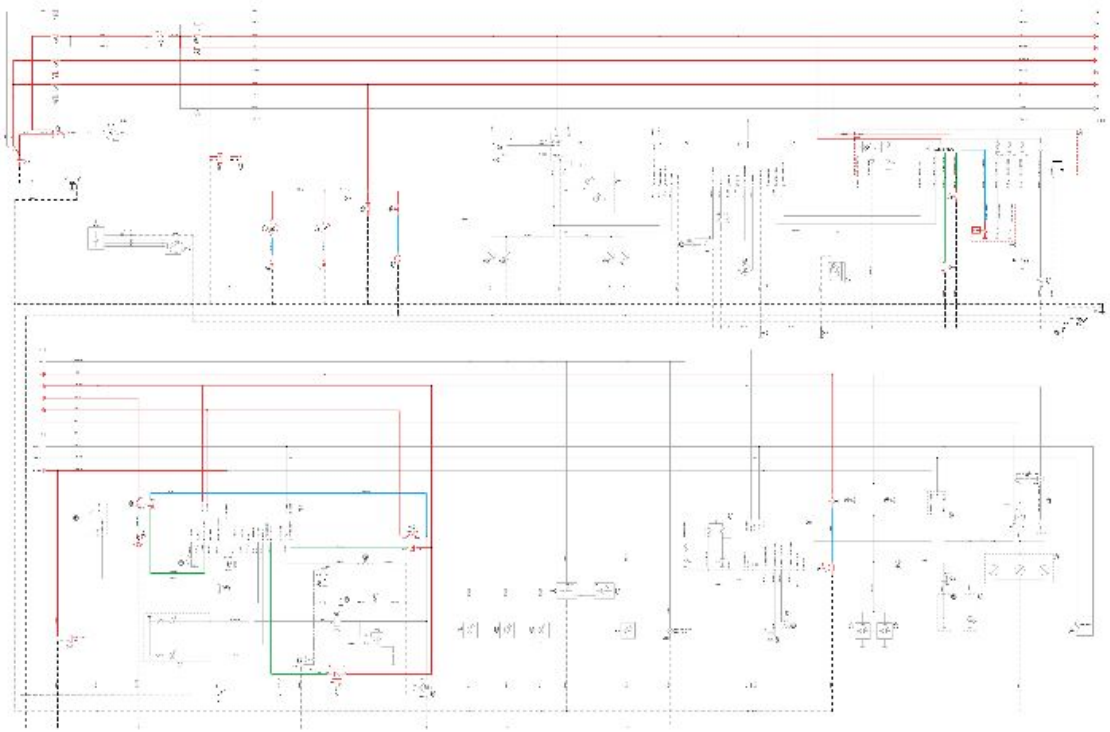
88 ABS Control unit

89 Front tone wheel sensor for ABS

90 Rear tone wheel sensor for ABS

91 Resistance 120ohm termination of CAN line

Devices and accessories



List of components

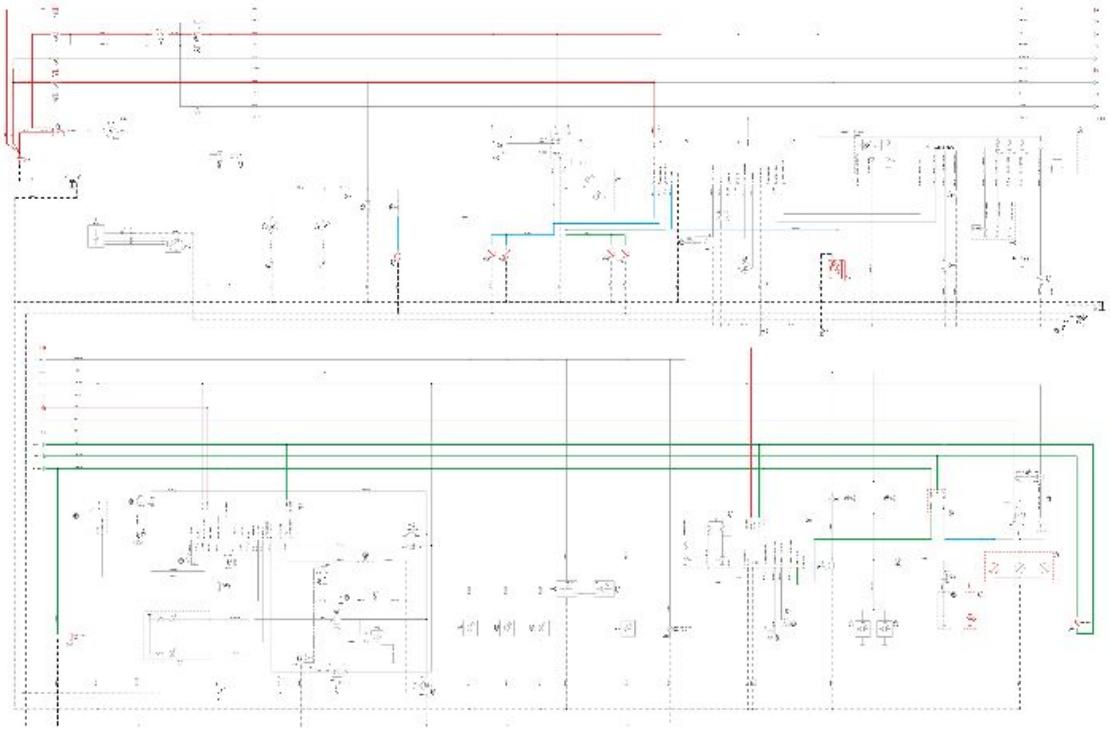
1 Battery 12V-10Ah

7 Frame ground node

9 Ignition switch

10 Fuse No. 1 -15A
12 Fuse No. 3 -10A
13 Fuse No. 4 -7,5A
14 Fuse No. 5 -7,5A
16 Fuse No. 7 -5A
18 Fuse No. 9 -30A
19 USB socket
20 Satellite navigator socket
21 Fuel tank flap actuator
22 Fuel tank flap button
23 Saddle actuator
24 Saddle button
25 LV socket
26 Helmet compartment light switch
27 Light unit
31 Instrument panel
38 Ambient temperature sensor
39 MODE BUTTON
40 CDI injection control unit
41 Front ground node
42 Rear ground node
43 Rear ground regulator
44 Instrument panel ground node
47 Injection load solenoid
48 Electric fan
49 Electric fan relay
57 Anti-tipping sensor
59 Diagnostics socket
67 Horn
68 Horn button
84 CDI injection control unit ground node

BLUE DASH DEVICE



List of components

1 Battery 12V-10Ah

7 Frame ground node

9 Ignition switch

10 Fuse No. 1 -15A

12 Fuse No. 3 -10A

14 Fuse No. 5 -7,5A

27 Light unit

31 Instrument panel

32 Left front turn indicator

33 Right front turn indicator

34 Left rear turn indicator

35 Right rear turn indicator

36 Fuel level transmitter

40 CDI injection control unit

41 Front ground node

42 Rear ground node

43 Rear ground regulator

44 Instrument panel ground node

59 Diagnostics socket

74 Headlight

76 Blue dash device

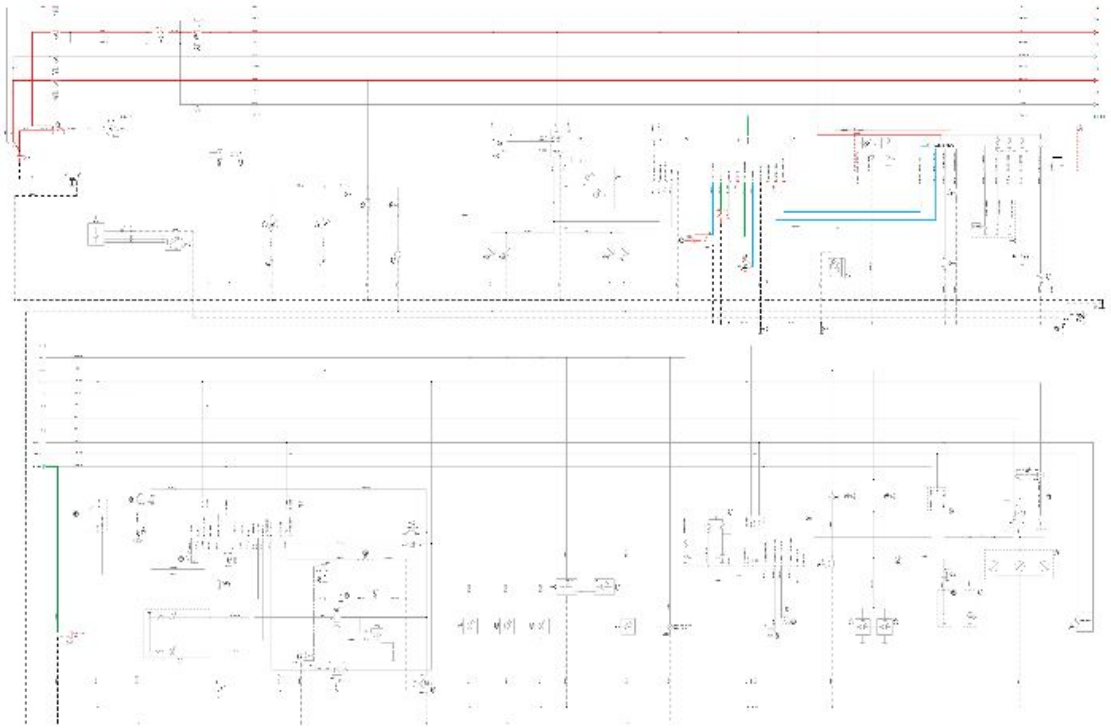
77 Fuse No. 10 -40A

84 CDI injection control unit ground node

88 ABS Control unit

91 Resistance 120ohm termination of CAN line

SHOCK ABSORBER ADJUSTMENT DEVICE



List of components

1 Battery 12V-10Ah

7 Frame ground node

9 Ignition switch

10 Fuse No. 1 -15A

14 Fuse No. 5 -7,5A

18 Fuse No. 9 -30A

31 Instrument panel

41 Front ground node

42 Rear ground node

43 Rear ground regulator

44 Instrument panel ground node

59 Diagnostics socket

78 Shock absorber adjustment device

79 Shock absorber adjustment button "UP"

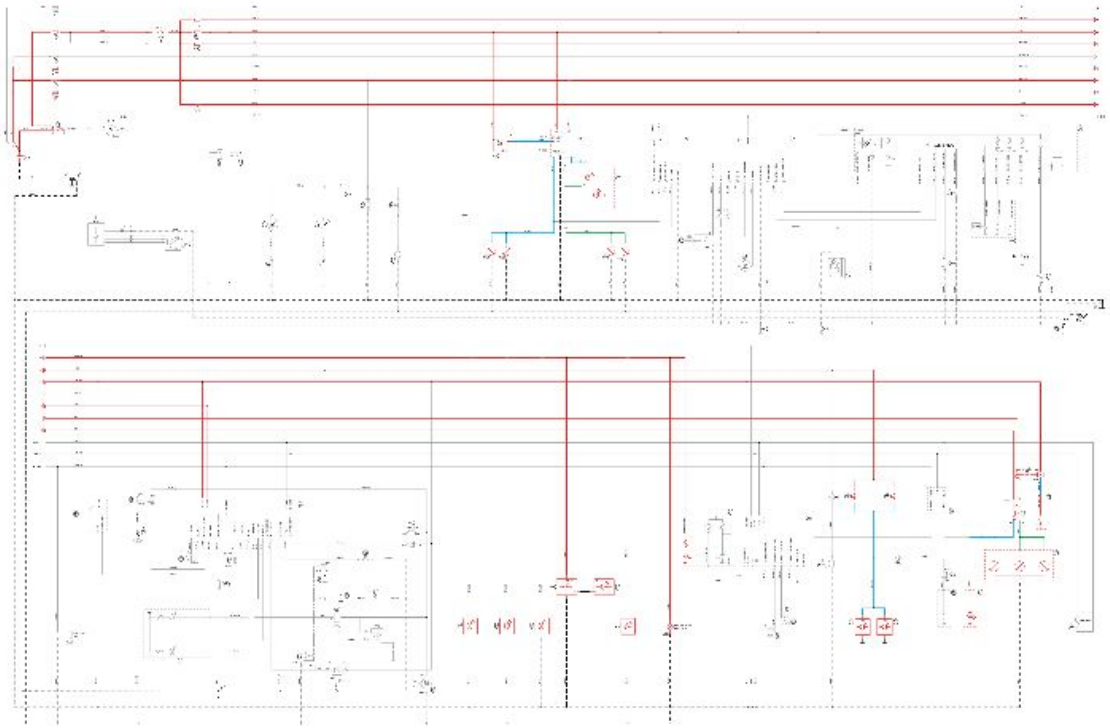
80 Shock absorber adjustment button "DOWN"

81 Encoder for shock absorber electric device

82 Shock absorber actuator

83 Shock absorber adjustment device ground node

Lights and turn indicators



List of components

1 Battery 12V-10Ah

7 Frame ground node

9 Ignition switch

10 Fuse No. 1 -15A

11 Fuse No. 2 -10A

12 Fuse No. 3 -10A

14 Fuse No. 5 -7,5A

15 Fuse No. 6 -7,5A

16 Fuse No. 7 -5A

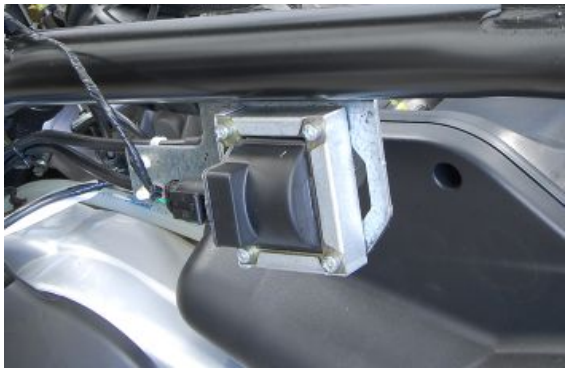
17 Fuse No. 8 -3A

18 Fuse No. 9 -30A
28 Turn indicator command
29 Emergency light bulb button
30 Turn indicator device
31 Instrument panel
32 Left front turn indicator
33 Right front turn indicator
34 Left rear turn indicator
35 Right rear turn indicator
40 CDI injection control unit
41 Front ground node
42 Rear ground node
43 Rear ground regulator
60 Left front daylight running light
61 Right front daylight running light
62 Left rear daylight running light
63 Right rear daylight running light
64 Left control lighting
65 Right control lighting
66 License plate light
69 Stop buttons
71 Left stop light
72 Right stop light
73 Light switch
74 Headlight
75 Headlight relay
84 CDI injection control unit ground node

No spark plug

HV coil primary resistance value:

Disconnect the connector of the HV coil and measure the resistance between the two terminals.



Characteristic

HV coil resistance primary value:

~ 670 mΩ ± 10%

Spark plug cable resistance value

~ 5 kΩ

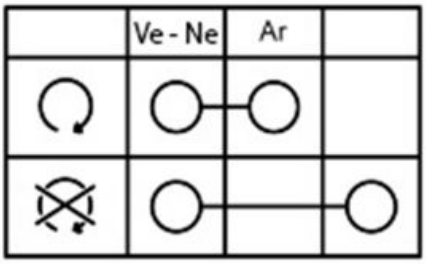
Switches check

To check buttons and switches, check that, according to their position, the continuity of contacts is correct as indicated in the following charts.

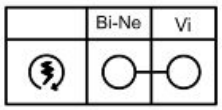
KEY

Ar: Orange **Az:** Sky Blue **Bi:** White **Bl:** Blue **Gi:** Yellow **Gr:** Grey **Ma:** Brown **Ne:** Black **Ro:** Pink **Rs:** Red **Ve:** Green **Vi:** Purple

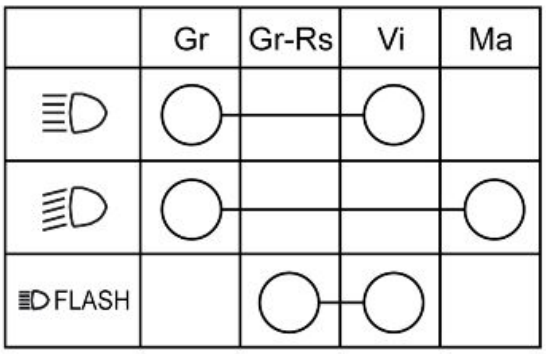
ENGINE STOP SWITCH



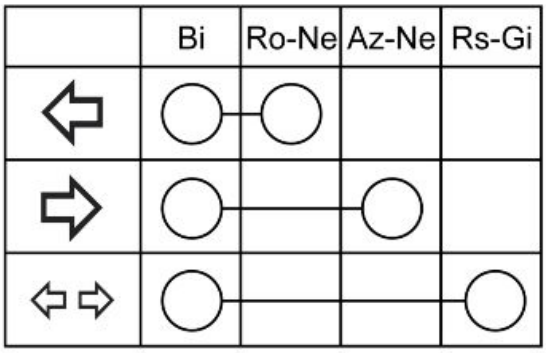
STARTER BUTTON



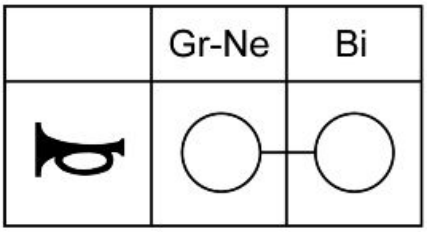
LIGHT SWITCH



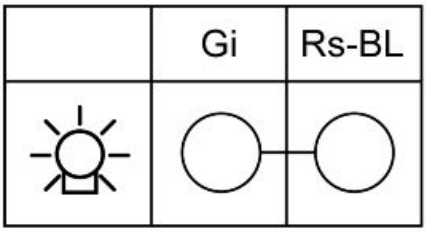
TURN INDICATOR SWITCH



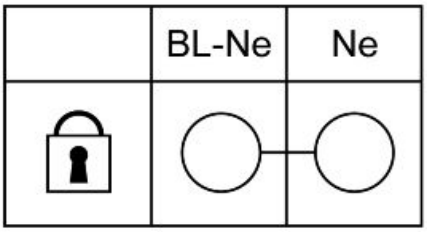
HORN BUTTON



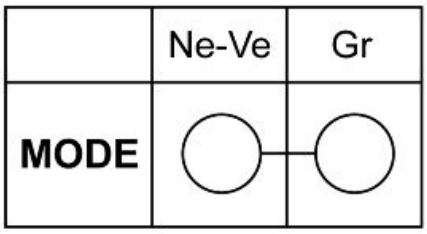
HELMET COMPARTMENT LIGHT SWITCH



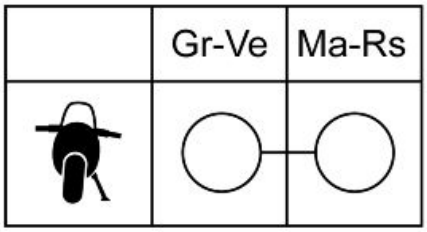
SADDLE OPENING SWITCH



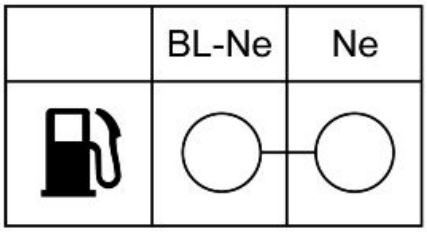
MODE BUTTON



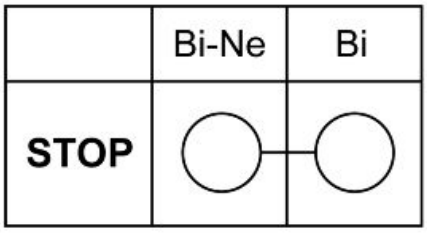
STAND BUTTON



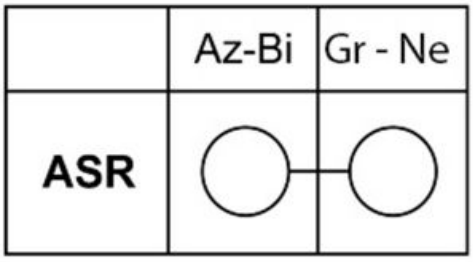
FUEL TANK FLAP BUTTON



STOP BUTTONS

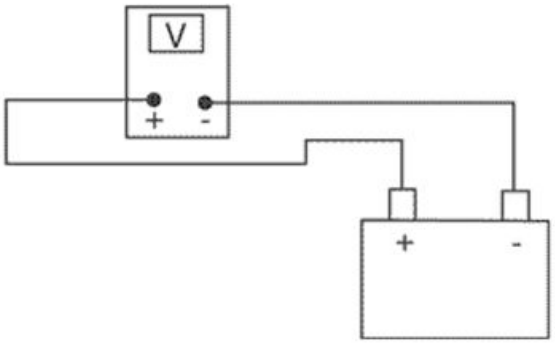


ASR BUTTON



Voltage regulator check

Con batteria perfettamente carica, misurare la tensione presente ai poli della batteria con motore a regime elevato.
La tensione non deve superare 15 Volt.
Rilevando tensioni superiori, procedere con la sostituzione del regolatore.
Rilevando tensioni inferiori a 14 Volt, procedere con le verifiche riguardanti lo statore ed il relativo cablaggio.

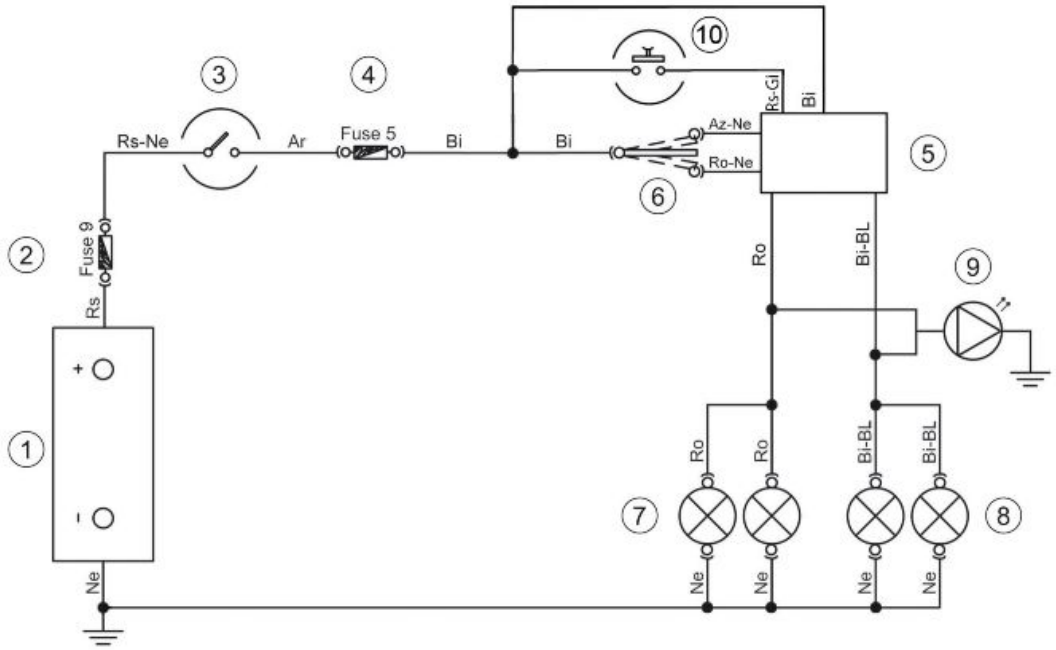


Electric characteristic

Control voltage

14÷15 V to 1500÷12000 rpm

Turn signals system check



KEY

1. Battery

2. Fuse No. 9

3. ignition switch contacts

4. Fuse No. 5

5. Turn indicators control device

6. Turn indicator control

7. LH indicators

8. RH indicators

9. Turn indicator warning light bulb

10. Emergency light bulb button

WARNING

ALL CONTINUITY TESTS MUST BE CARRIED OUT WITH THE CORRESPONDING CONNECTORS DISCONNECTED.

1) Check the working order of bulbs.

2) Check fuses No. 9 and 5 and the ignition key contacts.

3) Check for voltage between the Pink-Blue cable of the turn indicators control device and ground.

4) If there is no voltage, check that the cable harness is not interrupted.

5) Check the turn indicator control.

6) Check that the Blue-Black and Pink-Black cables between the control and turn indicator device is not interrupted.

7) Check that the Pink and White-Blue cables connecting the bulbs and the turn indicator device are not interrupted.

8) Check the bulbs ground connection.

level indicators

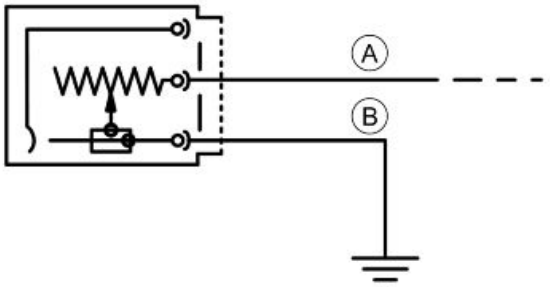
WARNING

ALL CONTINUITY TESTS MUST BE CARRIED OUT WITH THE CORRESPONDING CONNECTORS DISCONNECTED.

If faults are detected:

1) With a multimeter, check resistance values between the White-Green cable and the Black cable of the fuel level transmitter by moving the arm with the float.

2) If the transmitter operates correctly but the indication on the instrument panel is not exact, check that the cable harnesses between them are not interrupted.



COMPONENT CABLE KEY:

A - White-green cable

B - Black ground cable

Electric characteristic

Resistance value when the tank is full

<= 7 Ω

Resistance value when the tank is empty

98 ±5 Ω

Lights list

BULBS

	Specification	Desc./Quantity
1	Low beam light bulb	**Type: Halogen** H8 **Quantity**: 2 **Power**: 12V - 35W
2	High beam light bulb	**Type**: Halogen H1 **Quantity**: 1 **Power**: 12V - 55W
3	Front tail light bulb	**Type**: LED **Quantity**: 1 Right - 1 Left **Power**: -
4	Turn indicator bulbs	**Type**: Amber spherical BAU 15s **Quantity**: 1 Right -1 Left (front); 1 Right -1 Left (rear) **Power**: 12V - 10W
5	Stop light/rear daylight running light bulb	**Type**: LED **Quantity**: 1 Right - 1 Left **Power**: -
6	License plate light bulb	**Type**: All glass W5W

	Specification	Desc./Quantity
		Quantity: 1 **Power**: 12V - 5W
7	Helmet compartment light bulb	**Type**: Cylindrical C5W **Quantity**: 1 **Power**: 12V - 5W
8	Instrument panel lighting bulb	**Type**: LED **Quantity**: 10 **Power**: -
9	Lighting bulb switches	**Type**: LED **Quantity**: 2 **Power**: -

Line for daylight running lights and instrument panel lighting line

In the event of a malfunction, check:

- Efficiency of the bulbs
- Fuses No. 7, 8 and 9
- Ignition key contacts
- Cable harness continuity

High beam/low beam light line

In the event of a malfunction, check:

- Efficiency of the bulbs
- Light switch
- Headlight from solenoid
- Fuses No. 2, 6 and 9
- Ignition key contacts
- Cable harness continuity

Fuses

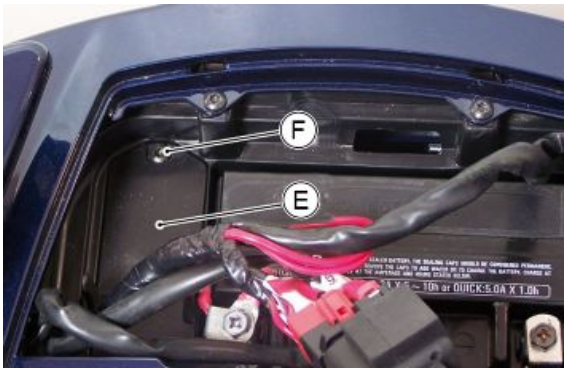
The fuses are located to the right of the battery.

To access it, operate as described:

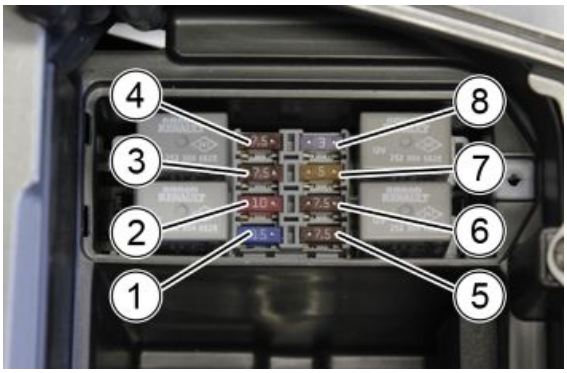
- rest the vehicle on its stand;
- lift the saddle;
- remove the battery cover, as described in the procedure to access the battery.

Remove the main fuse box «**A**» from the tongue «**B**».

Once the main fuse box «**A**» is removed, unscrew the screw «**F**» and remove the cover«**E**» of the secondary fuse box.

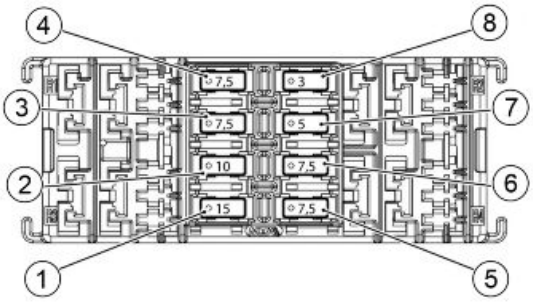


SECONDARY FUSES



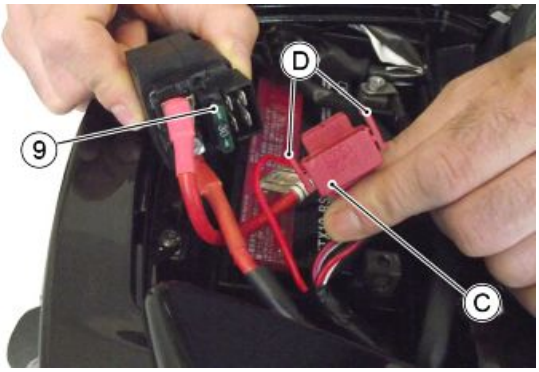
SECONDARY FUSES

Specification	Desc./Quantity
Fuse No. 1	**Capacity:** 15 A **Protected circuits:** Powered by battery LV socket, helmet compartment bulb, turn indicators control device, instrument panel, antitheft-device pre-installation. Seat opening actuator ignition switched live and fuel door opening actuator.
Fuse No. 2	**Capacity:** 10A **Protected circuits:** Light relay, light switch.
Fuse No. 3	**Capacity:** 10A **Protected circuits:** control unit, injection load relay.
Fuse No. 4	**Capacity:** 7.5 A **Protected circuits:** Electric fan relay.
Fuse No. 5	**Capacity:** 7.5 A **Protected circuits:** satellite navigator pre-installation ignition switched live, USB socket, shock absorber control device, turn indicators control device, instrument panel, antitheft device pre-installation, horn, stop light bulb, starter relay.
Fuse No. 6	**Capacity:** 7.5 A **Protected circuits:** high beam light bulbs ignition switched live, high beam warning light, antitheft device pre-installation.
Fuse No. 7	**Capacity:** 5A **Protected circuits (live):**Control unit, ABS control unit, immobilizer antenna, anti-tipping sensor, injection load solenoid, Light solenoid.
Fuse No. 8	**Capacity:** 3A **Protected circuits (live):**Daylight running light, license plate light, control lighting, instrument lighting.



MAIN FUSES

Working on the side fins«**D**», remove the cover«**C**» to access the main fuse «**9**».



On the other side of the battery compartment, the main fuse is located instead «**10**».

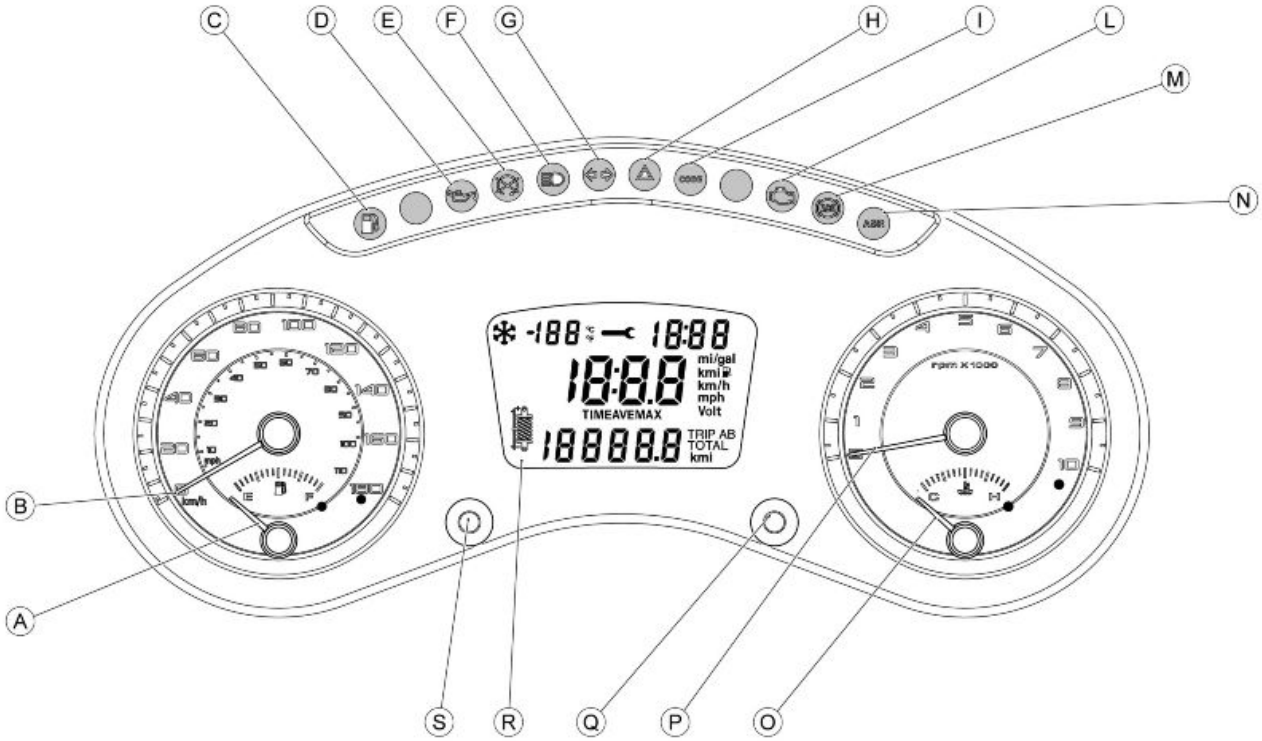
The spare fuse «**11**» is positioned in the same box, but on the side.

MAIN FUSES

Specification	Desc./Quantity
Fuse No. 9	**Capacity:** 30 A **Protected circuits:**Recharge, fuses No. 5, No. 6, No. 7 and No. 8 (live).

Specification	Desc./Quantity
Fuse No. 10	**Capacity:** 40A **Protected circuits:**ABS control unit.
Fuse No. 11	**Capacity:** 30 A **Protected circuits:**Reserve.

Dashboard



A - Fuel gauge

B - Speedometer

C - Fuel reserve warning light

D - Insufficient oil pressure warning light

E - Engine not startable warning light

F - Low beam warning light

G - Turn indicator warning light

H - Hazard warning light

I - Immobilizer LED

L - Engine control telltale light and engine failure warning light

M - ABS warning light

N - ASR warning light

O - Coolant temperature indicator

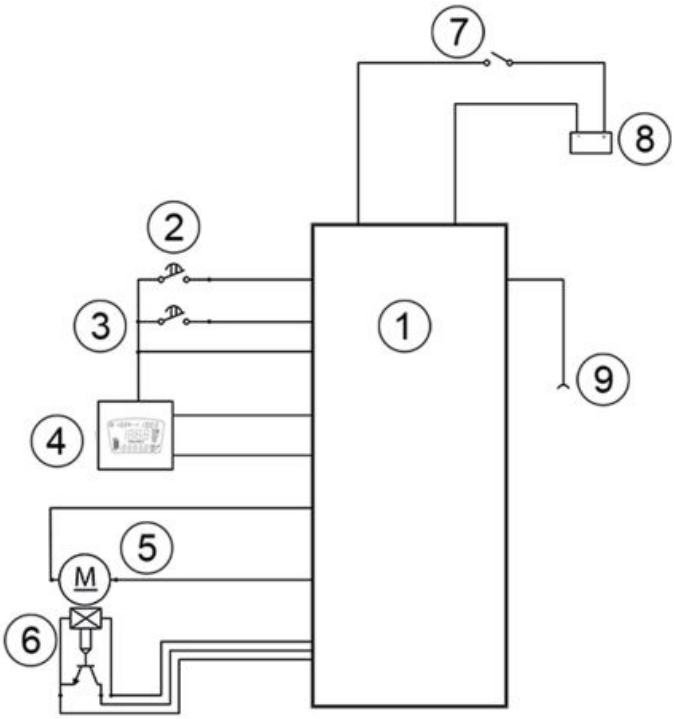
P - Engine rpm indicator

Q - SET Button

R - Digital display

S - ODO/TRIP Button

Actuators master box



1. Shock absorber preloading control unit

2. UP button

3. DOWN button

4. Digital instrument panel

5. Actuator

6. Encoder

7. Ignition switch

8. Battery

9. K Line

SYSTEM CONTROL

WARNING

ALL CONTINUITY TESTS MUST BE CARRIED OUT WITH THE CORRESPONDING CONNECTORS DISCONNECTED.

1) Check that between pins 6 and 9 and between pins 11 and 9 there is no continuity

2) Check between pins 7 of the wiring of the control unit and pin 2 of the actuator there is continuity

3) Check between pins 8 of the wiring of the control unit and pin 1 of the actuator there is continuity

4) With the key «ON» check that between pins 1 and 10 of the control unit there is a voltage of about 12V

RESETTING THE ADJUSTMENT SYSTEM

In case of failure with the key set to the «**ON**» position of the «**UP**» and «**DOWN**» buttons, and if the icon on the digital display flashes, it is necessary to reset the adjustment system.

Proceed as follows:

- position the vehicle on centre stand.
- set the switch to «**OFF**» position.
- simultaneously hold down the «**UP**» and «**DOWN**» buttons and set the switch to «**ON**» position.
- The system proceeds to the resetting by performing a complete travel on the shock absorber, first in extension then in compression, by repositioning it to the lower stop and normalizing the indication on the digital display.
- set the switch to «**OFF**» position.

Battery installation

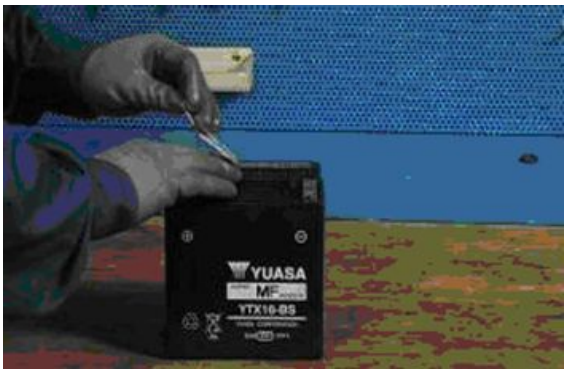
VRLA battery (valve-regulated lead-acid battery) Maintenance Free (MF)

WARNING

BATTERY ELECTROLYTE IS TOXIC AND IT MAY CAUSE SERIOUS BURNS. IT CONTAINS SULPHURIC ACID. AVOID CONTACT WITH YOUR EYES, SKIN AND CLOTHING. IN CASE OF CONTACT WITH YOUR EYES OR SKIN, RINSE WITH ABUNDANT WATER FOR ABOUT 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.
IN THE EVENT OF ACCIDENTAL INGESTION OF THE LIQUID, IMMEDIATELY DRINK LARGE QUANTITIES OF WATER OR MILK. MAGNESIUM MILK, BATTERED EGG OR VEGETABLE OIL. SEEK IMMEDIATE MEDICAL ATTENTION.
BATTERIES PRODUCE EXPLOSIVE GASES; KEEP CLEAR OF NAKED FLAMES, SPARKS OR CIGARETTES; VENTILATE THE AREA WHEN RECHARGING INDOORS.
ALWAYS PROTECT YOUR EYES WHEN WORKING CLOSE TO BATTERIES.
KEEP OUT OF THE REACH OF CHILDREN

1) Battery preparation

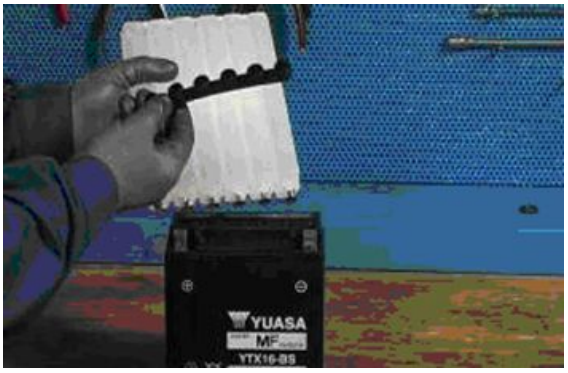
Position the battery on a flat surface. Remove the adhesive sheet closing cells and proceed as quickly as possible to run the subsequent activation phases.



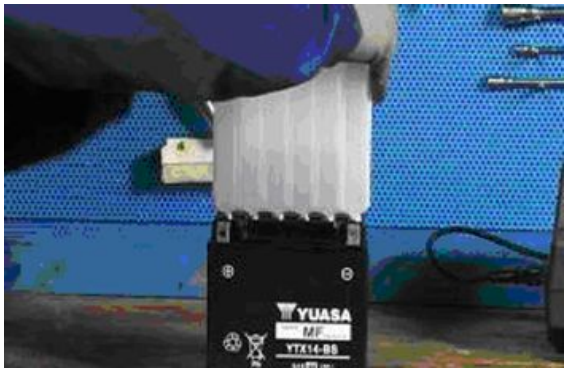
2) Electrolyte preparation.

Remove the container of the electrolyte from the pack. Remove and preserve cover strips from the container, in fact, the strip will later be used as a closing cover.

Note: Do not pierce the sealing of the container or the container itself because inside there is sulphuric acid.



3) Procedure for filling the battery with acid.



Position the electrolyte container upside down with the six areas sealed in line with the six battery filler holes. Push the container down with enough force to break the seals. The electrolyte should start to flow inside the battery.

Note: Do not tilt the container to prevent the flow of electrolyte from pausing or stopping.

4) Control the flow of electrolyte

Make sure air bubbles are rising from all six filling holes. Leave the container in this position for 20 minutes or more.

Note: If there are no air bubbles coming out of the filling holes, lightly tap the bottom of the container two or three times. Do not remove the container from the battery.

5) Take out the container.

Make sure all the electrolyte in the battery is drained. Gently tap the bottom of the container if electrolyte remains in the container. Now, gently pull the container out from the battery, only do this when the container is completely empty, and proceed immediately to the next point.

6) Battery closing.

Insert the airtight cover strips into the filling holes. Press horizontally with both hands and make sure that the strip is levelled with the top part of the battery.

Note: To do this, do not use sharp objects that could damage the closing strip, use gloves to protect your hands and do not bring your face close to the battery.

The filling process is now complete.

Do not remove the strip of caps under any circumstances, do not add water or electrolyte.

Place the battery down for 1 to 2 hours prior to the charging from the battery.

7) Recharging the new battery

With the above-mentioned procedure, the battery will have gained around 70% - 75% of its total electrical capacity. Before installing the battery on the vehicle, it must be fully charged and then must be recharged.

If the battery is to be installed on the vehicle prior to this pre-charged one, the battery will not be able to exceed 75% charge without jeopardising its useful life on vehicle.

The dry charge battery MF like the completely loaded YTX, must have a no-load voltage between

12.8 - 13.15 V Bring the battery to full charge, using the 020648Y battery charger:
a - select the type of battery with the red switch on the left of the panel battery charger panel
b - select NEW on the yellow timer
c - connect the clamps of the battery charger to the battery poles (black clamp to negative pole (-) and red clamp to positive pole (+)).

d - Press the red button, as shown in figure.

e - Press the "MF" black button to activate the battery recharge **Maintenance Free** as shown in figure.

f - Check the ignition of the green LED indicated with a red arrow in figure.

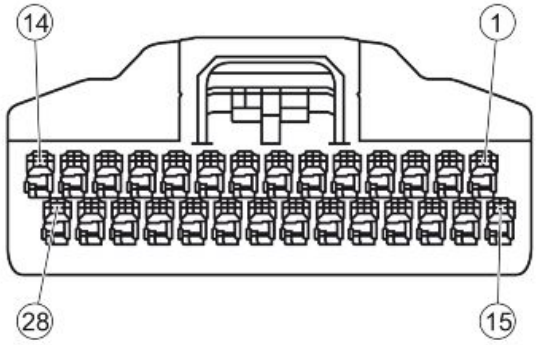
g - The activation cycle of the new battery lasts for 30 minutes after the ignition of the recharge LED has taken place

h - Disconnect the clamps from the battery and check the voltage, if voltages are detected of less than 12.8 V, proceed with a new recharge of the battery starting from point c of the recharge procedure of **the new battery**, otherwise go to point i

i - The battery is now completely activated, disconnect the battery charger from the fuel supply grid, disconnect the clamps from the battery and proceed to fitting the battery on the vehicle.

Connectors

INSTRUMENT PANEL CONNECTOR



1. Battery-powered (Red-Blue)

2. Live power supply (White)

3. Instrument panel ground (Black)

4. Speed sensor signal (Sky blue)

5. Power supply for shock absorber sensor (Brown-Green)

6. Ambient temperature sensor (Yellow-Blue)

7. Signal for engine temperature indicator (Yellow-Pink)

8. Fuel level indicator (White - Green)

9. High-beam warning light (Violet)

10. Power supply for instrument panel lighting (Yellow-Black)

11. Left turn indicator warning light (Pink)

12. Right turn indicator warning light (White-Blue)

13. Emergency warning light (White-Black)

14. Oil pressure warning light (White-Purple)

15. Engine check warning light (Brown-White)

16. ABS Warning Light (Orange)

17. ASR Warning Light (Brown-Sky blue)

18. Parking brake warning light (Black)

19. Engine unable to start warning light (Blue)

20. Not connected

21. Rpm indicator signal (Green)

22. Not connected

23. P.B. Mode (Grey)

24. Shock absorber sensor signal (Sky blue-Green)

25. Not connected

26. Not connected

27. Not connected

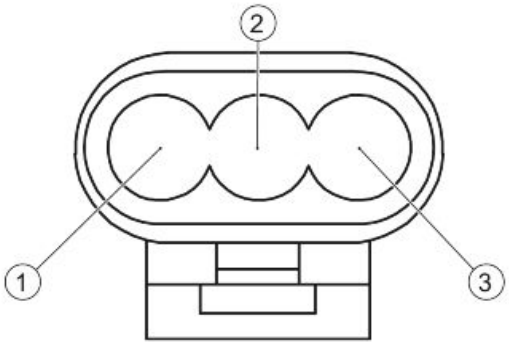
28. Immobilizer LED (Yellow)

IMMOBILIZER ANTENNA CONNECTOR

1. Live (Orange-Blue)

2. Ground lead (Black)

3. Ignition enabling signal (Orange-White)



FUEL PUMP CONNECTOR

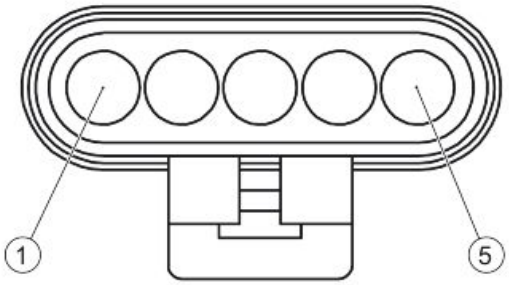
1. Not connected

2. Ground lead (Black)

3. Not connected

4. Not connected

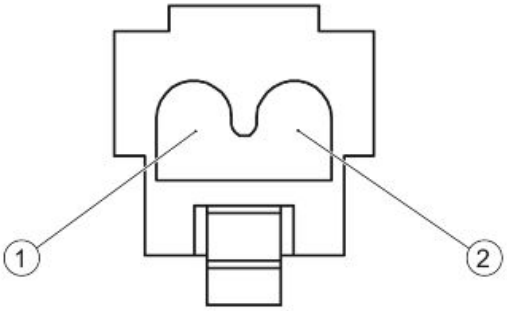
5. Power from injection relay (Black-Green)



ELECTRIC FAN CONNECTOR

1. Ground lead (Black)

2. Power via electric fan relay (Red-Green)

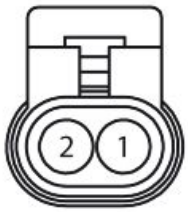


PICKUP CONNECTOR

1. Engine speed sensor positive signal (Red)

2. Engine speed sensor negative signal (Brown)

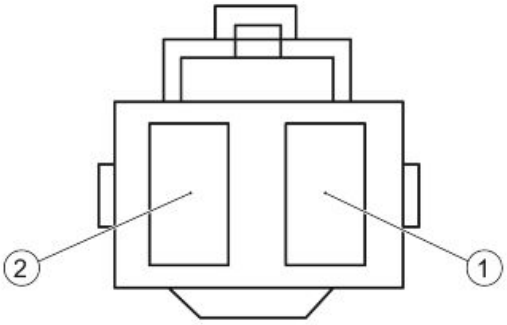
3. Oil pressure sensor signal (White-Purple)



REGULATOR CONNECTOR

1. Battery positive (Red-Black)

2. Ground lead (Black)



CDI INJECTION CONTROL UNIT CONNECTOR

1. Injection warning light (Brown-White)

2. Rpm indicator (Green)

3. CAN L Line (Pink-White)

4. Lambda probe negative (Light blue-Black)

5. Live (Orange-Blue)

6. Battery power (Red-White)

7. Immobilizer aerial (Orange-White)

8. Electric fan enabling (Green-White)

9. Water temperature sensor (Sky blue-Green)

10. CAN H line (Pink-Red)

11. Lambda probe positive (Green-Blue)

12. ASR on signal (Sky blue-White)

13. Pick-up sensor positive (Red)

14. Petrol injector command (Purple)

15. Pick-up sensor negative (Brown)

16. Serial line K (Orange-Black)

17. Immobilizer (Yellow)

18. Side stand signal (Orange)

19. Headlight consent (White-Black)

20. Injection load solenoid (Black-Purple)

21. ASR Warning Light control (Brown-Sky blue)

22. High voltage coil command (Pink-Black)

23. Not connected

24. Anti-tipping sensor signal (Grey-Black)

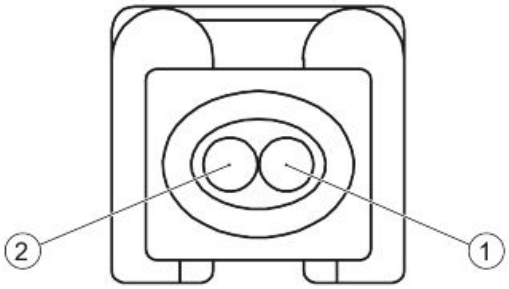
25. Start-up enabling switch (Purple-White)

26. Ground lead (Grey-Green)

INJECTOR CONNECTOR

1. Power from injection relay (Black-Green)

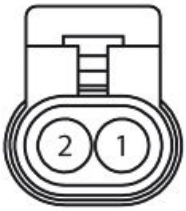
2. Negative from injection control unit (Purple)



H.V. COIL CONNECTOR

1. Negative from injection control unit (Pink-Black)

2. Power from injection relay (Black-Green)

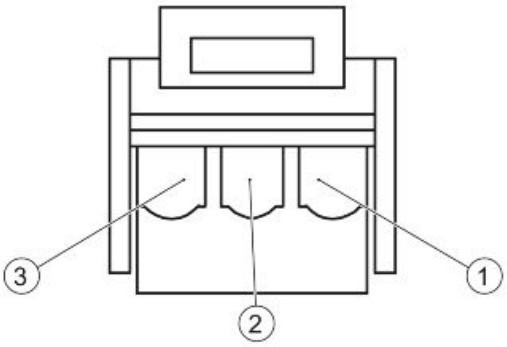


FUEL LEVEL TRANSMITTER CONNECTOR

1. Fuel level indicator (White-Green)

2. Ground lead (Black)

3. Not connected



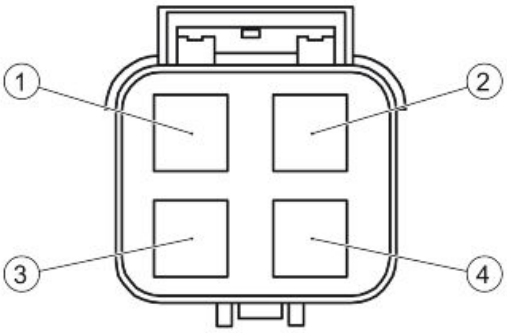
COOLANT TEMPERATURE SENSOR CONNECTOR

1. Electronic injection control unit (Sky blue - Green)

2. Instrument panel (Yellow-Pink)

3. Ground lead (Grey-Green)

4. Ground lead (Black)



CONNECTOR FOR PRE-INSTALLATION OF ACCESSORIES / BLUE DASH

1. Ground lead (Black)

2. Fuel level indicator (White-Green)

3. CAN H line (Pink-Red)

4 CAN L Line (Pink-White)

5. Serial line K (Orange-Black)

6. Helmet compartment lighting signal (Yellow)

7. Battery-powered (Red-Blue)

8. Live power supply (White)

9. Not connected

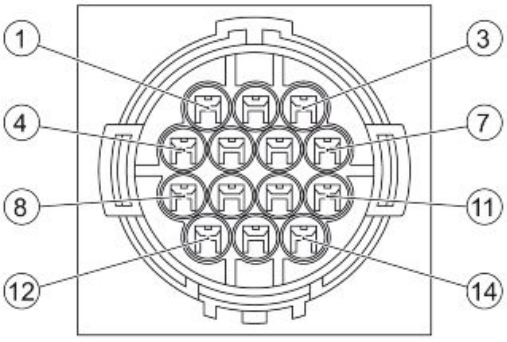
10. Not connected

11. Signal from left side turn indicator (Pink)

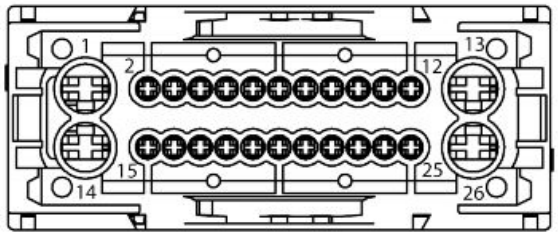
12. Signal from right side turn indicator (White-Blue)

13. Signal from high beam headlight (Purple)

14. Speed sensor signal (Sky blue)



ABS CONTROL UNIT CONNECTOR



1. Battery-powered (Red)

2. Negative from rear speed sensor (Brown-Black)

3. Positive from rear speed sensor (Brown-Red)

4. Ground lead (Black)

5. Not connected

6. Not connected

7. Not connected

8. Negative from front speed sensor (Brown-Black)

9. Positive from front speed sensor (Sky blue-Red)

10. ABS Warning Light (Orange)

11. Not connected

12. Not connected

13. Not connected

14. Not connected

15. Not connected

16. Not connected

17. Speed signal (Sky blue)

18. Serial line K (Orange-Black)

19. Not connected

20. Live (Orange-Blue)

21. CAN L Line (Pink-White)

22. Ground lead (Black)

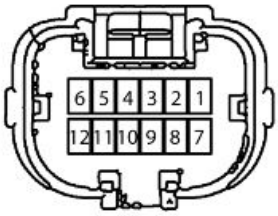
23. CAN L line (Pink-Red)

24. Not connected

25. Not connected

26. Ground lead (Black)

SHOCK ABSORBER ADJUSTMENT DEVICE CONNECTOR



1. Live (White)

2. Encoder power supply (Sky blue-Red)

3. Shock absorber position sensor signal (Sky blue-Green)

4. Power supply for shock absorber position sensor (Brown-Green)

5. Serial line K (Orange-Black)

6. Signal from UP control button (Yellow-Red)

7. Positive for shock absorber actuator (Brown-Red)

8. Negative for shock absorber actuator (Brown-Black)

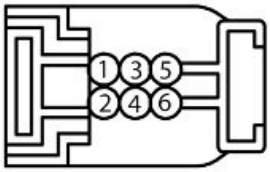
9. Ground lead (Black)

10. Ground lead (Black)

11. Signal from DOWN control button (Yellow-Black)

12. Encoder signal (Sky blue)

SHOCK ABSORBER ELECTRIC DEVICE CONNECTOR



1. Negative shock absorber actuator (Brown-Black)

2. Positive shock absorber actuator (Brown-Red)

3. Ground for encoder (Black-Green)

4. Encoder signal (Sky blue)

5. Encoder power supply (Sky blue-Red)

6. Not connected

ENGINE OIL PRESSURE SENSOR CONNECTOR

Engine oil pressure signal for instrument (Brown)

BATTERY POSITIVE CONNECTOR (Red)

STARTER MOTOR POSITIVE CONNECTOR

(Red)

STARTER MOTOR CONNECTOR NEGATIVE

(Black)

FRAME-ENGINE GROUND CONNECTOR

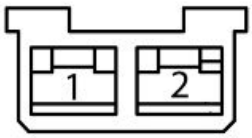
(Black)

FRAME GROUND CONNECTOR (Black)

ASR BUTTON CONNECTOR

1. Ground (Grey-Black)

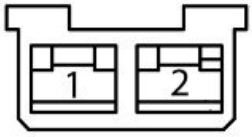
2.signal for CDI injection control unit (Sky blue-White)



SADDLE BUTTON CONNECTOR

1. Ground lead (Black)

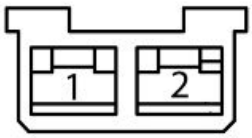
2.Actuator control (Blue-Black)



FUEL TANK FLAP BUTTON CONNECTOR

1. Ground lead (Black)

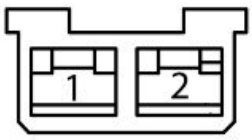
2.Actuator control (Blue-Black)



SHOCK ABSORBER CONTROL BUTTON CONNECTOR (UP)

1. Ground lead (Black-Green)

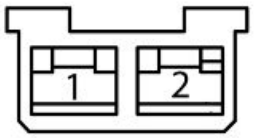
2.Signal for shock absorber adjustment device (Yellow-Red)



SHOCK ABSORBER CONTROL BUTTON CONNECTOR (DOWN)

1. Ground lead (Black-Green)

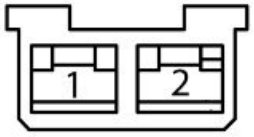
2.Signal for shock absorber adjustment device (Yellow-Black)



EMERGENCY LIGHT BUTTON CONNECTOR

1. Signal for turn indicator control device (Red-Yellow)

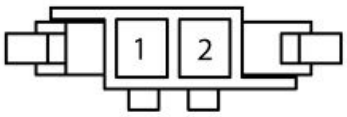
2. Live power supply (White)



SADDLE ACTUATOR CONNECTOR

1. Negative from button (Blue-Black)

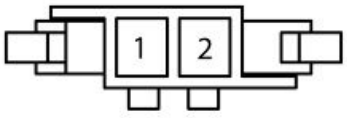
2. Live positive (Blue-Yellow)



FUEL DOOR ACTUATOR CONNECTOR

1. Negative from button (Blue-Black)

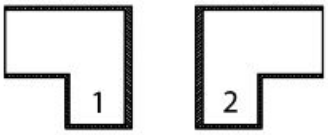
2. Live positive (Blue-Yellow)



HORN CONNECTOR

1. Ground lead (Black)

2. Button control (Grey-Black)

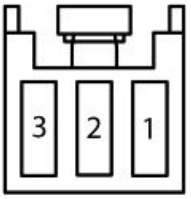


LV SOCKET CONNECTOR

1. Not connected

2. Battery-powered (Red-Blue)

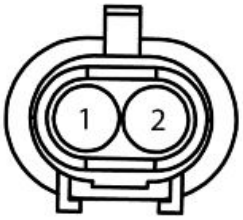
3. Ground lead (Black)



USB SOCKET CONNECTOR

1. Ground lead (Black)

2. Live (White)



SATELLITE NAVIGATOR SOCKET CONNEC-

TOR

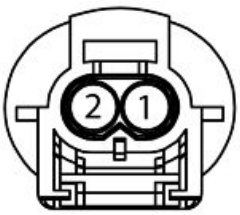
1. Ground lead (Black)

2. Live power supply (White)

FRONT TONE WHEEL SENSOR CONNECTOR

1. Negative signal for ABS control unit (Sky blue-black)

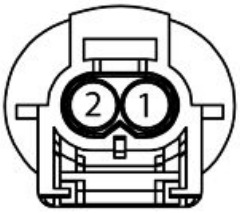
2. Positive signal for ABS control unit (Sky blue - Red)



REAR TONE WHEEL SENSOR CONNECTOR

1. Negative signal for ABS control unit (Brown-black)

2. Positive signal for ABS control unit (Brown - Red)



SIDE STAND SWITCH CONNECTOR

1. Ground lead (Grey-Green)

2. Raised side stand signal (Brown-Red)

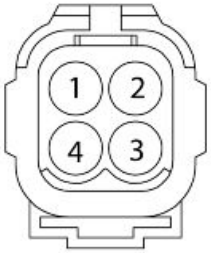
ANTI-TIPPING SENSOR CONNECTOR

1. Not connected

2. Ground lead (Grey-Green)

3 Live (Orange-Blue)

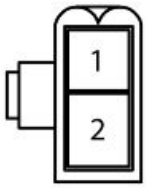
4. Signal for CDI injection control unit (Grey-Black)



AMBIENT TEMPERATURE SENSOR CONNECTOR

1. Ground lead (Black)

2. Signal for instrument (Yellow-Blue)



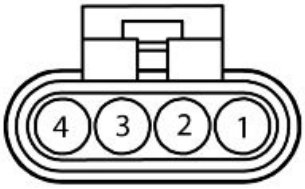
HEADLIGHT CONNECTOR

1. Low light command (Purple)

2. Ground lead (Black)

3. Daylight running light (Yellow-Black)

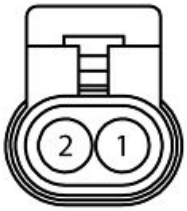
4. Low beam control (Brown)



LAMBDA PROBE CONNECTOR

1. Positive (green-Blue)

2. Negative (Sky blue-Black)

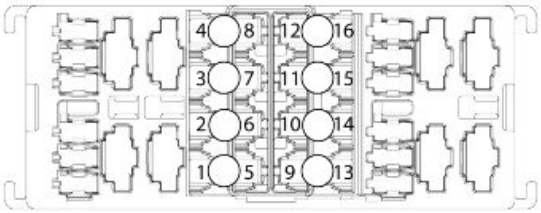


FUSE BOX TERMINAL BLOCK

1. Live positive from fuse F5 (7.5A) for satellite navigator socket - USB socket - turn lights system - Blue dash - shock absorber adjustment device - instrument panel - inhibited engine signal relay - horn - stop lights - starter relay (White)

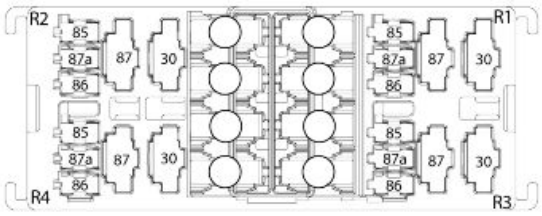
2. Live positive from fuse F6 (7.5A) for light flashes system (Grey-Red)

3. Live positive from fuse F7 (5A) for immobilizer antenna - CDI injection control unit - injection relay - anti-tipping sensor- ABS control unit - headlight relay (Orange-Blue)



4 Live positive from fuse F8 (3A) for daylight running light - License plate light - control lighting - instrument panel lighting (Yellow-Black)
5. Live positive from battery for power supply of fuses F5-F6-F7-F8 (Orange)
6. Live positive from battery for power supply of fuses F5-F6-F7-F8 (Orange)
7. Live positive from battery for power supply of fuses F5-F6-F7-F8 (Orange)
8. Live positive from battery for power supply of fuses F5-F6-F7-F8 (Orange)
9. Direct battery positive for power supply of fuses F1-F2-F3-F4 (Red)
10. Direct battery positive for power supply of fuses F1-F2-F3-F4 (Red)
11. Direct battery positive for power supply of fuses F1-F2-F3-F4 (Red)
12. Direct battery positive for power supply of fuses F1-F2-F3-F4 (Red)
13. Battery positive from fuse F1 (15A) for LV socket - turn lights device command - instrument panel - Blue Dash - saddle actuator - fuel door actuator - Helmet compartment lighting (Red-Blue)
14. Battery positive from fuse F2 (10A) for Headlight (Grey)
15. Battery positive from fuse F3 (10A) for injection control unit CDI - Injector - electric fan relay - HV coil - fuel pump (Red-White)
16. Battery positive from fuse F4 (7.5A) for electric fan (Red-Green)

RELAY BOX TERMINAL BLOCK



R1

85. Negative from injection control unit (Black-Purple)

86. Live positive from fuse F7 (5A) (Orange-Blue)

87. Positive for Injection loads (Black-Green)

87a. Not connected

30. Positive from F3 fuse (10A) (Red-White)

R2

85. Negative from injection control unit (Green-White)

86. Positive from R1 injection loads relay (Black-Green)

87. Positive for electric fan (Red-Green)

87a. Not connected

30. Battery positive from fuse F4 (7.5A) (Red-Green)

R3

85. Negative from injection control unit (Green-Black)

86. Live positive from fuse F7 (5A) (Orange-Blue)

87a. Not connected

87. Positive for light switch (Grey)

30. Positive battery from F2 fuse (10A) (Grey)

R4

85. Engine stop signal from diode 1A (Orange-White)

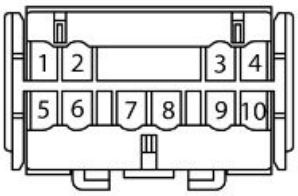
86. Live positive from fuse F5 (7.5A) (White)

87. Not connected

87a. Ground lead (Black)

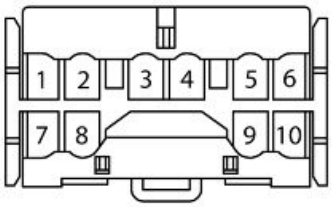
30. Consent for telltale light inhibited engine (blue)

RIGHT CONTROL DEVICE CONNECTOR



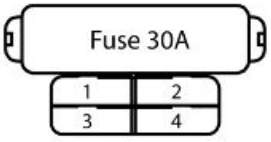
1. Engine stop control (orange)
2. Consent from engine stand button (Brown-Red)
3. Ground lead (Black-Green)
4. MODE button signal (Grey)
5. Ground lead (Black)
6. Control panel lighting (Yellow-Black)
7. Not connected
8. Not connected
9. Engine starter control (Purple)
10. Engine start-up enabling switch from stop button (white-black)

CONNECTORS LEFT CONTROL DEVICE



1. Light flashes positive (grey-red)
2. R3 relay positive for headlight (Grey)
3. Low light command (Purple)
4. Low beam control (Brown)
5. Left turn lights device command (red-black)
6. Live positive from fuse F5 (7.5A) (White)
7. Not connected
8. Live positive from fuse F5 (7.5A) (White)
9. Horn control (grey-black)
10. Right turn lights device command (Sky blue-Black)

STARTER RELAY CONNECTOR

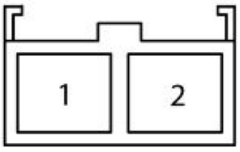


1. Negative from injection control unit (Purple-White)
2. Engine start-up enabling switch positive (Purple)
3. Battery positive from fuse F9 (30A) (Red-Black)
4. Battery positive from fuse F9 (30A) (Red-Black)

ABS FUSE-BOX CONNECTOR

1. ABS control unit positive (Red)

2. Battery positive (Red)

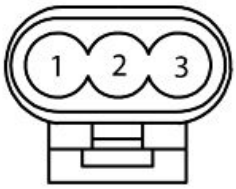


DIAGNOSTICS CONNECTOR

1. Not connected

2. Ground lead (Black)

3. Serial line K (Orange-Black)



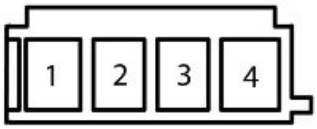
IGNITION SWITCH CONNECTOR

1. Positive for fuses F5-F6-F7-F8 (Orange)

2. Positive from fuse F9 (30A) (Red-Black)

3. Consent for saddle and fuel door actuator (Blue-Yellow)

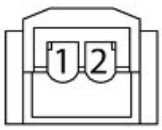
4. Positive from fuse F1 (15A) (Red-Blue)



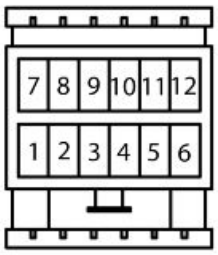
STOP BUTTONS CONNECTOR

1. Stop lights control and start-up enabling (White-Black)

2. Live positive from fuse F5 (7.5A) (White)

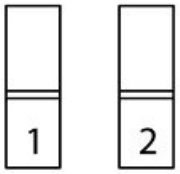


TURN INDICATORS DEVICE CONNECTOR



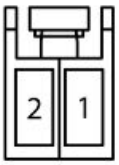
1. Command from emergency lights button (Red-Grey)
2. Command from left side indicator light switch (Pink-Black)
3. Command from right side indicator light switch (Sky blue-Black)
4. Left side taillight command (Pink)
5. Right side taillight command (White-Blue)
6. Battery positive from fuse F1 (15A) (Red-Blue)
7. Emergency warning light command (White-Black)
8. Live positive from fuse F5 (7.5A) (White)
9. Ground lead (Black)
10. Not connected
11. Not connected
12. Not connected

HELMET COMPARTMENT LIGHT SWITCH CONNECTOR



1. Battery positive from fuse F1 (15A) (Red-Blue)
2. Helmet compartment light unit command (Yellow)

HELMET COMPARTMENT LIGHT UNIT CONNECTOR

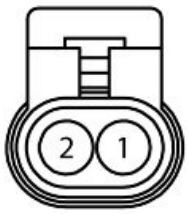


1. Command from helmet compartment button (Yellow)
2. Ground lead (Black)

LICENSE PLATE LIGHT LAMP CONNECTOR

1.Battery positive from fuse F8 (3A) (Yellow-Black)

2. Ground lead (Black)

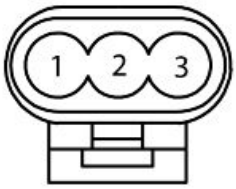


RIGHT TAILLIGHT CONNECTOR

1. Daylight running light command (Yellow-Black)

2. Ground lead (Black)

3. Stop lights command (White-Black)

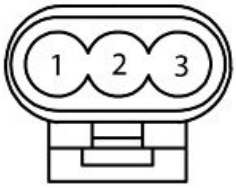


LEFT TAILLIGHT CONNECTOR

1. Daylight running light command (Yellow-Black)

2. Ground lead (Black)

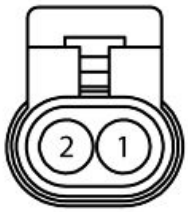
3. Stop lights command (White-Black)



FRONT LEFT TURN INDICATOR

1. Ground lead (Black)

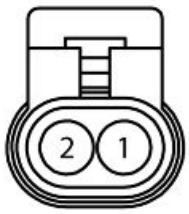
2. Turn lights device command (Pink)



REAR LEFT TURN INDICATOR

1. Ground lead (Black)

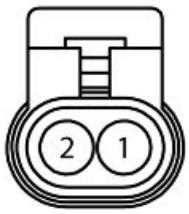
2. Turn lights device command (Pink)



FRONT RIGHT TURN INDICATOR

1. Ground lead (Black)

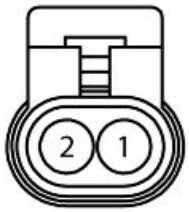
2. Command from turn lights device (White-Blue)



REAR RIGHT TURN INDICATOR

1. Ground lead (Black)

2. Command from turn lights device (White-Blue)



Strumento di diagnosi

SOSPENSIONE POSTERIORE

N.B.

I SEGUENTI CONTROLLI SI RIFERISCONO A VERIFICHE SUL SISTEMA DI REGOLAZIONE SOSPENSIONE POSTERIORE.

CODICE ERRORE: C1000 - Motore elettrico

Causa errore: Sovracorrente

Procedure di controllo:

1. Verificare a connettore staccato durante la modifica del precarico che tra i pin 1 e pin 2 del connettore attuatore centralina lato cablaggio sia presente una tensione di 12V.

2. Verificare che tra i pin 1 e 2 del connettore attuatore centralina lato attuatore sia presente una resistenza di 2150 Ohm.

Soluzioni (se procedura di controllo da esito negativo):

1. Sostituire la centralina regolazione ammortizzatore.

2. Sostituire ammortizzatore completo di sistema regolazione precarico.

CODICE ERRORE: C1001 - Motore elettrico

Causa errore: Battuta meccanica inaspettata

Procedure di controllo:

1. Effettuare procedura azzeramento sistema di regolazione precarico ammortizzatore.

Soluzioni (se procedura di controllo da esito negativo):

1. Sostituire ammortizzatore completo di sistema regolazione precarico.

CODICE ERRORE: C1002 - Encoder

Causa errore: Segnale assente

Procedure di controllo:

1. Verificare continuità tra pin 2 connettore centralina regolazione ammortizzatore e pin 5 connettore dipositivo regolatore ammortizzatore.

2. Verificare continuità tra pin 12 connettore centralina regolatore ammortizzatore e pin 4 connettore dispositivo regolatore ammortizzatore.

3. Verificare continuità tra pin 3 connettore dispositivo regolatore ammortizzatore e massa.

Soluzioni (se procedura di controllo da esito negativo):

1. - 2. - 3. Sostituire cablaggio.

CODICE ERRORE: C1003 - Motore elettrico

Causa errore: Segnale assente

Procedure di controllo:

1. Verificare continuità tra pin 1 connettore dispositivo regolatore ammortizzatore e pin 8 connettore centralina regolatore ammortizzatore.

2. Verificare continuità tra pin 2 connettore dispositivo regolatore ammortizzatore e pin 7 connettore centralina regolatore ammortizzatore.

Soluzioni (se procedura di controllo da esito negativo):

1. - 2. Sostituire cablaggio.

Se, effettuati i controlli sopraindicati, l'errore persiste, sostituire l'ammortizzatore completo di sistema regolazione precarico.

CODICE ERRORE: C1004 - Motore elettrico

Causa errore: Guasto al circuito di pilotaggio

Procedure di controllo:

1. Verificare continuità tra pin 1 pulsante comando ammortizzatore UP e massa.

2. Verificare continuità tra pin 2 pulsante comando ammortizzatore UP e pin 6 connettore centralina regolatore ammortizzatore.

3. Verificare continuità tra pin 1 pulsante comando ammortizzatore DOWN e massa.

4. Verificare continuità tra pin 2 pulsante comando ammortizzatore DOWN e pin 11 connettore centralina regolatore ammortizzatore.

5. Verificare che non sia presente continuita tra i pin del pulsante UP quando non premuto e che sia presente continuità se premuto.

6. Verificare che non sia presente continuita tra i pin del pulsante DOWN quando non premuto e che sia presente continuità se premuto.

Soluzioni (se procedura di controllo da esito negativo):

1. - 2. - 3. - 4. Sostituire cablaggio.

5. Sostituire pulsante UP.

6. Sostituire pulsante DOWN.

CODICE ERRORE: C1005 - Tensione batteria

Causa errore: Tensione alimentazione sotto la soglia minima

Procedure di controllo:

1. Verificare integrità fusibile N° 5 e fusibile N° 9.

2. Verificare alimentazione fusibile N° 5.

3. Verificare che il connettore centralina regolatore ammortizzatore si correttamente inserito.

4. Verificare che tra i pin 1 e pin 10 del connettore centralina regolatore ammortizzatore sia presente una tensione di 12 V.

5. Verificare continuità tra fusibile 5 e pin 1 connettore centralina regolatore ammortizzatore.

6. Verificare continuità tra pin 10 connettore centralina regolatore ammortizzatore e massa.

Soluzioni (se procedura di controllo da esito negativo):

1. Sostituire fusibili.

2. Sostituire cablaggio.

3. Ripristinare il contatto.

4. Procedere con le verifiche.

5. - 6. Sostituire cablaggio.

Se, effettuati i controlli sopraindicati, l'errore persiste, sostituire la centralina di regolazione ammortizzatore.

CODICE ERRORE: C1006 - Tensione batteria

Causa errore: Tensione alimentazione sopra la soglia massima

Procedure di controllo:

1. A motore acceso verificare che tra i pin 1 e pin 10 del connettore centralina regolatore ammortizzatore sia presente una tensione di 12 V.

Soluzioni (se procedura di controllo da esito negativo):

1. Sostituire il regolatore di tensione.

CODICE ERRORE: C1007 - Encoder

Causa errore: Tensione alimentazione troppo bassa

Procedure di controllo:

1. Verificare stato delle connessioni.

2. Verificare che tra i pin 3 e pin 5 connettore dispositivo regolatore ammortizzatore sia presente una tensione di 12 V.

Soluzioni (se procedura di controllo da esito negativo):

1. Ripristinare i contatti.

2. Sostituire centralina regolazione ammortizzatore.

Se, effettuati i controlli sopraindicati, l'errore persiste, sostituire l'ammortizzatore completo di sistema di regolazione precarico.

CODICE ERRORE: C1008 - Potenziometro elettronico

Causa errore: Tensione di riferimento troppo bassa

Soluzioni:

Sostituire centralina regolazione ammortizzatore.

CODICE ERRORE: C1008 - Potenziometro elettronico

Causa errore: Segnale non plausibile

Soluzioni:

Sostituire centralina regolazione ammortizzatore.

INDEX OF TOPICS

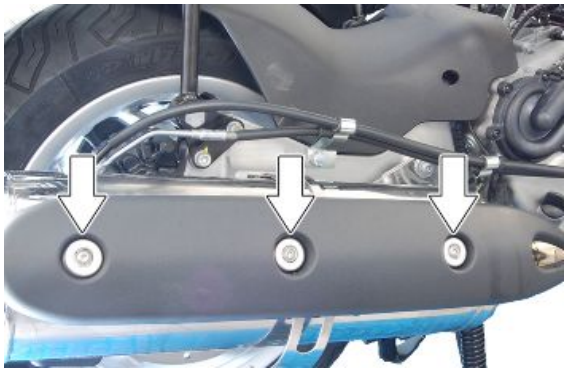
ENGINE FROM VEHICLE	ENG VE

Exhaust assy. Removal

SMONTAGGIO MARMITTA COMPLETA:

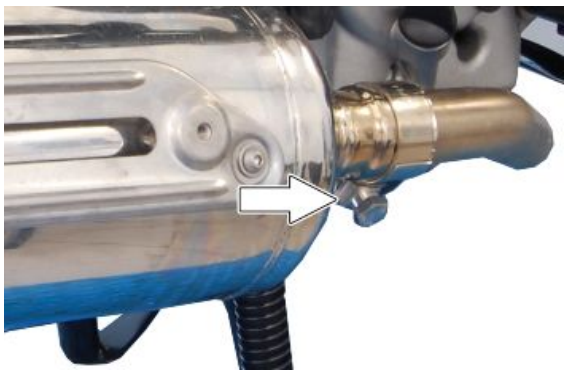
- Rimuovere preventivamente il vano sottosella e scollegare il connettore della sonda lambda.

- Svitare le viti di fissaggio e rimuovere la protezione della paratia paracalore dal silenziatore.



- Svitare le viti di fissaggio e rimuovere la paratia paracalore dal silenziatore.

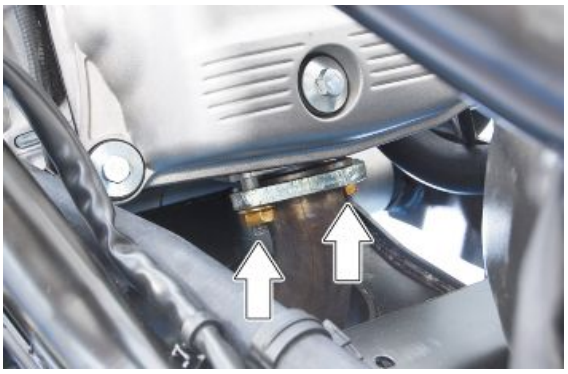
- Allentare la fascetta di supporto del silenziatore.



- Allentare il dado e svitare la vite disimpegnando la fascia di sostegno del silenziatore al collettore.

- Svitare la vite di fissaggio del silenziatore alla staffa di supporto del silenziatore e sfilarlo dal collettore prestando attenzione a non farlo cadere.

- Svitare i dadi di fissaggio del collettore alla testa e sfilarlo dall'apposito foro presente sul braccio oscillante.



- Rimuovere se necessario la sonda lambda dal collettore.

MONTAGGIO MARMITTA COMPLETA:

Per il montaggio procedere nell'ordine inverso allo smontaggio.

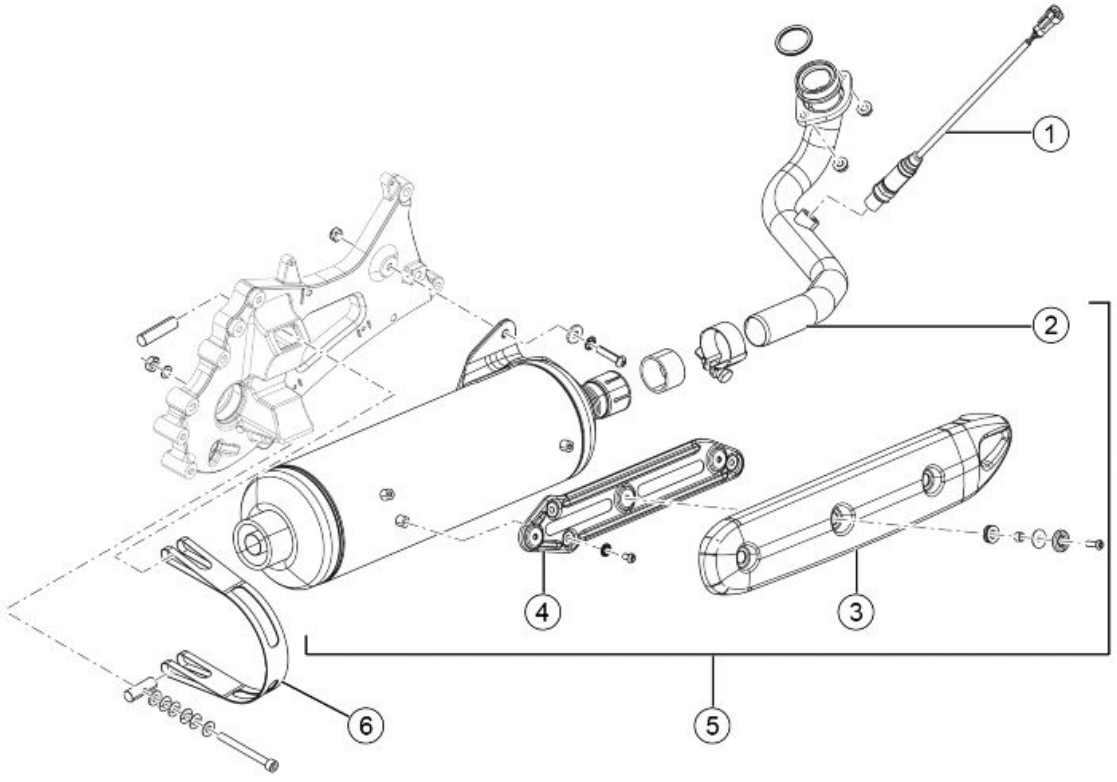
Prestare attenzione alle coppie di serraggio.

N.B.

ALWAYS REPLACE THE GRAPHITE BUSHING BETWEEN THE MANIFOLD AND THE SILENCER.

MUFFLER

Name	Torque in Nm
Silencer heat guard fixing screw	4 to 5
Silencer screw - silencer bracket	20 ÷ 25
Lambda probe tightening on exhaust manifold	40 to 50
Adjusting screw of silencer support clamp - silencer bracket	10 - 13
Fixing nut for adjusting silencer support clamp	10 ÷ 12 (after adjusting support clamp)
Nuts fixing the exhaust manifold to the head	16 to 18
Screws silencer support - central stand	20 ÷ 25



LEGENDA:

1. Sonda lambda

2. Collettore di scarico con p.i.

3. Protezione

4. Telaio supporto paracalore

5. Marmitta completa di protezione

6. Fascia sostegno marmitta

Removal of the engine from the vehicle

SMONTAGGIO MOTORE DAL VEICOLO:

Rimuovere preventivamente:

- il vano portacasco
- le fiancate laterali
- la marmitta completa
- i puntoni della sospensione posteriore
- il freno di stazionamento
- il freno posteriore
- le pedane laterali

Svuotare l'impianto di raffreddamento

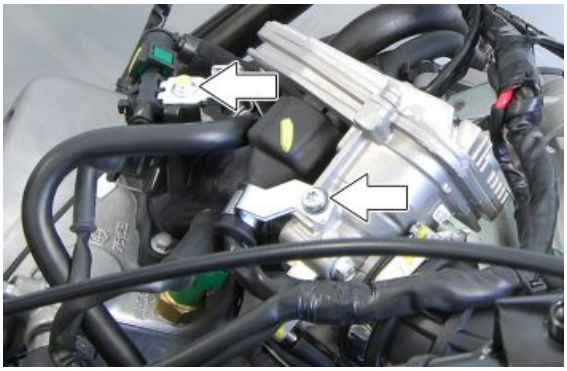
CAUTION

SUPPORT THE VEHICLE ADEQUATELY.

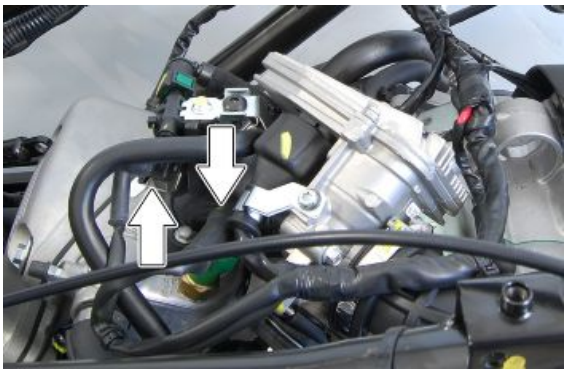
WARNING

CARRY OUT THESE OPERATIONS WHEN THE ENGINE IS COLD.

- Undo and remove the screw, collect the washer and release the control unit cables from the cable grommet.



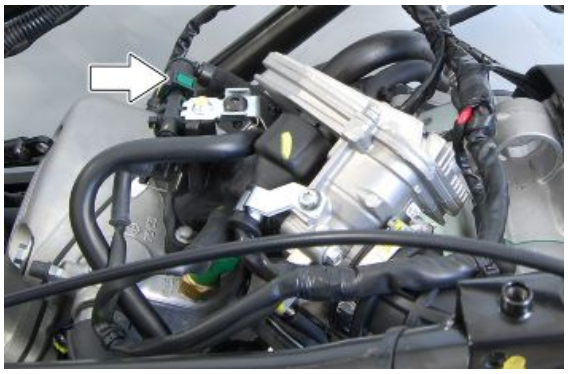
- Disconnect the connections of the main cable harness from the injector and from the head temperature sensor.



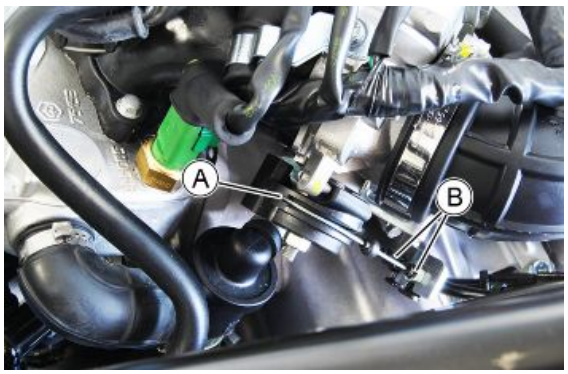
- Scollegare il connettore della centralina.

- Svitare la vite di fissaggio della massa al motore.

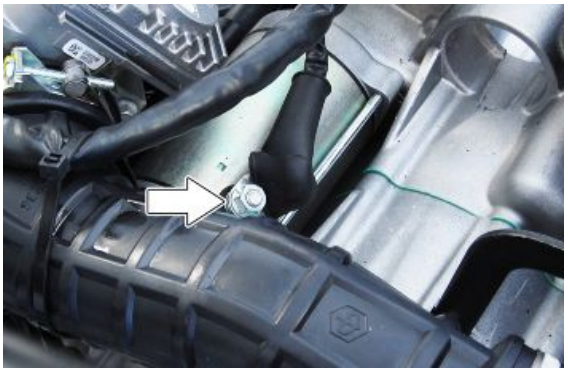
- Scollegare la tubazione carburante dall'iniettore premendo sul fermo di sicurezza verde.



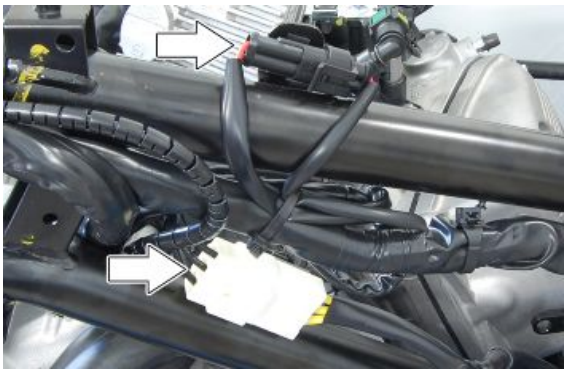
- Scollegare i cavi dell'acceleratore «**A**» allentando i dadi di registrazione «**B**».



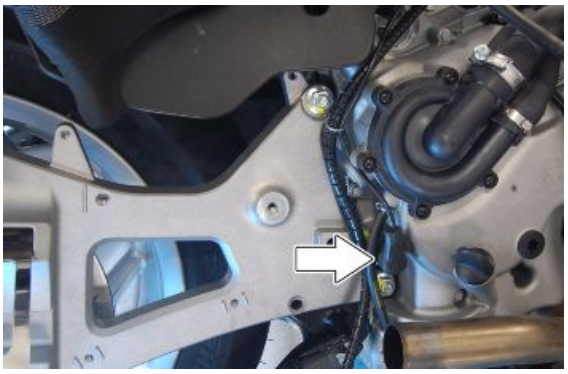
- Scollegare il cavo di alimentazione del motorino di avviamento.



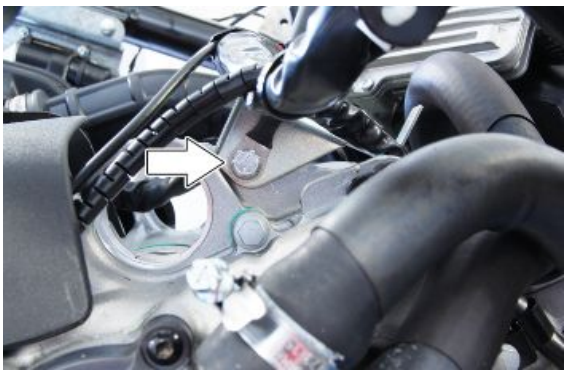
- Scollegare i connettori del pick-up e del generatore.



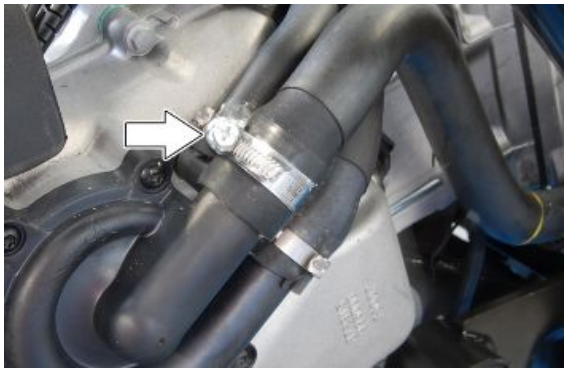
- Rimuovendo le viti dal lato destro del parafango posteriore, rimuovere il cavo del sensore pressione olio dal passacavo.



- Svitare la vite di fissaggio della massa al motore.

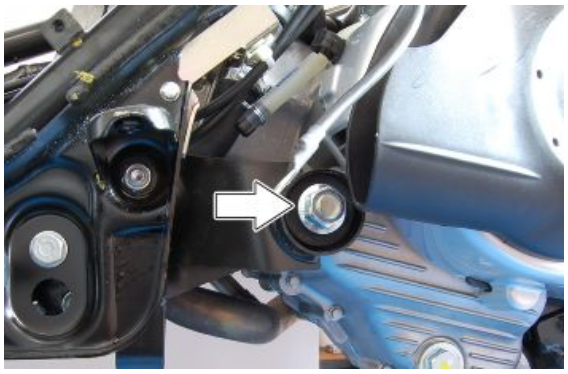


- Disimpegnare la fascetta di fissaggio e rimuovere la tubazione radiatore-pompa acqua del circuito di raffreddamento.



- Disimpegnare la tubazione del liquido refrigerante dalla valvola by-pass.

- Svitare il dado dell'asse di fissaggio braccio oscillante lato motore.
- Sfilare l'asse e rimuovere il motore.



MONTAGGIO MOTORE SUL VEICOLO:

Per il montaggio del motore procedere in senso inverso allo smontaggio, prestando attenzione al corretto posizionamento dei cablaggi, connettori, tubazioni e trasmissioni.

- Rispettare le coppie di bloccaggio.
- Ripristinare il livello del circuito di raffreddamento e procedere con le operazioni di spurgo aria.
- Registrare opportunamente i cavi comando gas sul corpo farfallato.
- Avviare il motore per alcuni minuti assicurandosi del corretto funzionamento del sistema.

Locking torques (N*m)

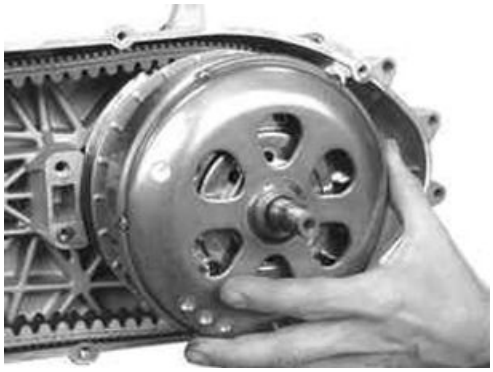
Self locking nut pin fastening engine side 40 to 45

INDEX OF TOPICS

ENGINE	ENG

Removing the driven pulley

- Remove the clutch bell.



- Remove the stationary driving half-pulley.
- Remove the driven pulley assembly with the belt.

CAUTION

SIMULTANEOUSLY WHEN CHANGING THE BELT, CARRY OUT THE CLEANING THE REAR TRANSMISSION BY MEANS OF BLOWING AND REMOVAL OF ANY DEPOSITS FROM THE FRICTION SEALS OF THE CLUTCH BY MEANS OF LIGHT SANDING.

Inspecting the rollers case

Verificare che le bronzine interne mostrate in figura non presentino usure anomale e rilevare il diametro interno.

CAUTION

DO NOT LUBRICATE OR CLEAN THE BUSHINGS

Characteristic

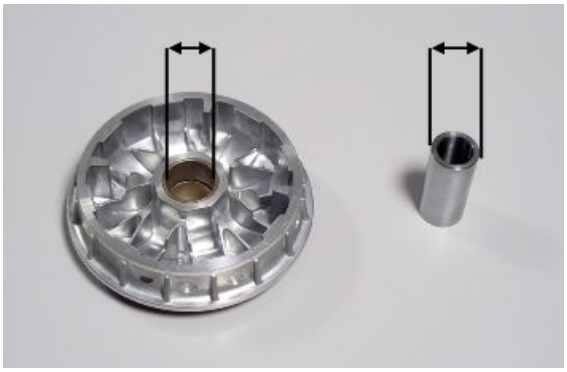
Diametro massimo ammesso:

30,021 mm

Diametro minimo:

30,0 mm

- Measure the pulley sliding bushing outside diameter shown in the figure.



Characteristic

Diametro minimo ammesso:

Ø 29,959 mm

Diametro massimo:

Ø 29,98 mm

Verificare che i rulli non siano danneggiati od usurati.

Characteristic

Diametro minimo ammesso:

Ø 24,8 mm

Diametro massimo:

Ø 25,0 mm

Peso:

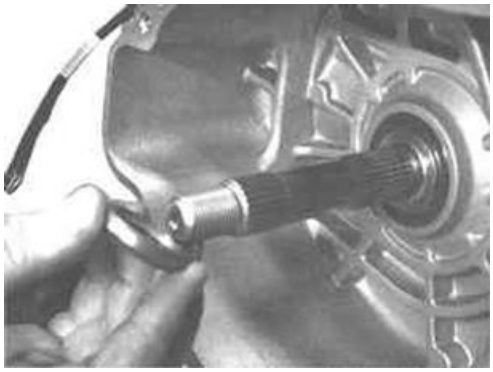
18,4 ± 0,15 g

- Check the guide shoes for the variator back-plate are not worn.
- Check the wear of the roller housings and of the belt contact surfaces on both pulley halves.

Refitting the driving pulley

Installing the roller container

- Install the spacer with the internal chamfer facing towards the inside.



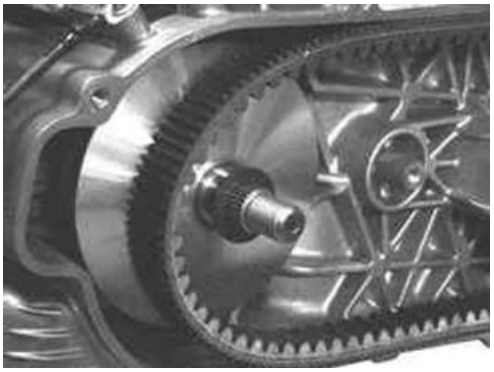
- Position the rollers on the half-pulley as shown in the figure.
- The closed side must rest on the inside thrust face of the roller container.

- Assembly the half-pulley with the roller contrast plate and sliding blocks.

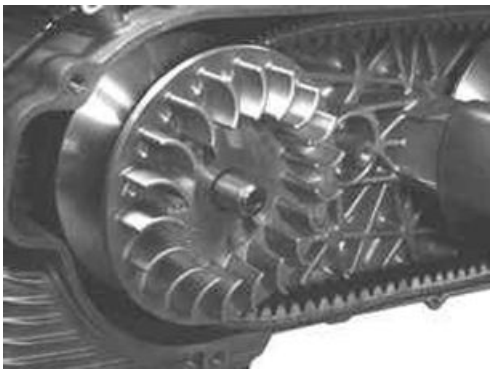
- Insert the half-pulley on the crankshaft.
- Insert the spacer bushing.

Installing the fixed driving half-pulley

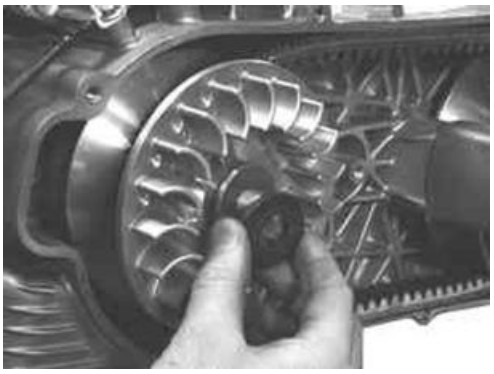
- Insert the spacer.



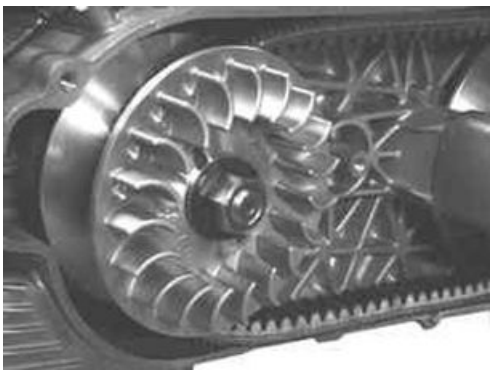
- Install the fixed driving half-pulley and check that it is in contact with the spacer and with the guide bushing of the movable driving pulley.



- Remove the flat washer and the spring washer as shown in the figure.



- Insert the nut in the original position (nut side in contact with the belleville washer).



- Turn the central pulley nut to horizontally align the holes and install the special tool.

N.B.

CHECK THAT THE STOP WRENCH TOOL IS EASILY INSERTED INTO THE PULLEY AND IN THE ENGINE CRANKCASE.

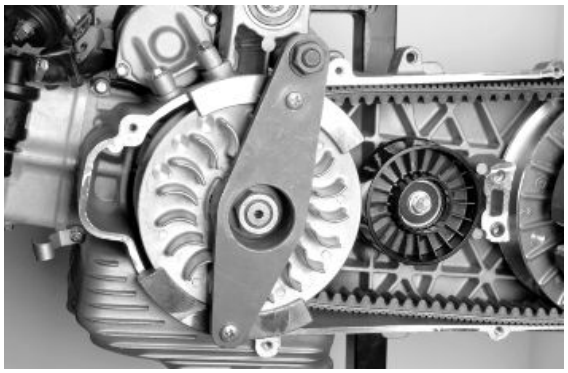
Specific tooling

020474Y Driving pulley lock wrench

- Install the lock ring from the rear so that the splines are completely engaged.
- Finally install the tool by siding the nuts by hand and ensuring the tool is resting flatly.
- Tighten the driving pulley fastening nut to the prescribed torque
- Remove the special tool.

Locking torques (N*m)

Drive pulley nut **160 - 175**

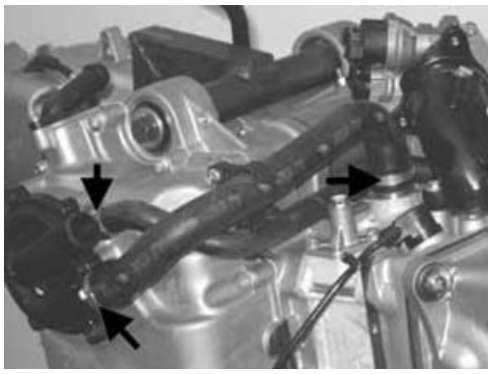


Flywheel and starting

- Remove the three bands shown in the figure for an easier removal of the flywheel cover, remove the feed hoses and disconnect the return hose from the pump cover.

N.B.

THE BANDS MUST BE REPLACED. TO REMOVE THEM, OPEN WITH A SCREWDRIVER OR CUT THEM.
BE CAREFUL NOT TO DAMAGE THE PLASTIC UNIONS.



Il motorino di avviamento viene commercializzato completo.

Prima di decidere la sostituzione è necessario procedere con le seguenti verifiche:

1 - **Batteria**

Verificare la tensione a riposo (alcune ore):

Tensione > 12,5 V

Peso specifico: 1,25 ÷ 1,26

SI punto 2 No punto 3

2 - Verificare il corretto collegamento dei terminali negativi (negativo batteria e negativo motorino di avviamento) fra di loro ed al telaio.

SI punto 4 NO punto 5

3 - Recharge and if necessary replace the battery.

4 - Connect the diagnostic tester (see chapter "Injection system").

Connect the induction clamp of an ammeter to the positive power supply cable of the starter motor.

Remove the 10A fuse no. 12 (see "fuses" chapter).

Switch in position "ON" with interrupt switch in position "RUN" and side stand raised.

Select the "PARAMETERS" function.

Start the engine (so that it cannot move) long enough to measure the rpm and starter absorption.

N.B.

THE DECLARED RPM VALUE IS THAT INDICATED BY THE TESTER, THE RPM READING IS NOT THE REAL ONE, BUT IS VALID FOR DIAGNOSTIC PURPOSES.

Specific tooling

020922Y Diagnosis Tool

Electric characteristic

Absorption at trailing speed:

80 - 120 A

Revolution speed =

approx. 300-400 rpm

YES go to 6 NO go to 7 NO go to 8 NO go to 9

5 - Restore the connections

6- **The values are correct.**

Finally carry out a check of the power consumption at idle speed.

Remove the starter motor (see the flywheel and starter system).

Reconnect the earth and positive and perform the test.

Electric characteristic

Current consumption at idle speed:

<40 A

YES go to 10 NO go to 11

7- **Low trailing speed**

High electrical absorption

Carry out a test of the engine rotation (example: possible melting of the bushes) and if no anomalies are found, replace the starter motor.

8- **Low trailing speed**

Low electrical absorption

Repeat the test, bridging the power terminals of the starter remote control switch or even better replacing them.

Check the new values.

YES go to 12 NO go to 13

9 - High trailing speed

Low electrical absorption

The engine turns too freely, check the compression end pressure.

If the values are not correct proceed as follows.

10 - The starter motor works properly.

11 - Check the rotation of the armature.

12 - Replace the starter remote control switch.

13 - Test the battery again and if necessary replace the starter motor.

N.B.

IF THE TRAILING SPEED OF THE CRANKSHAFT IS LOW AND COMBINED WITH STRANGE NOISE, CHECK THE FREEWHEEL OF THE TORQUE LIMITER (SEE THE "FLYWHEEL AND STARTER SYSTEM" CHAPTER).

STARTER MOTOR

Specification	Desc./Quantity
Type	Mitsuba sm13d
Power	0.9 kW

BATTERY

Specification	Desc./Quantity
Capacity	14 Ah
Starting current	125 A

START-UP REMOTE CONTROL SWITCH

Specification	Desc./Quantity
Type	SEALED
Maximum load	150 A continuous

STARTER TRANSMISSION

Specification	Desc./Quantity
Ring gear and freewheel coaxial to the flywheel.	Intermediate gear with built-in torque limiter.

The starter system has a transmission between the motor armature and engine shaft equipped with freewheel coaxial to the flywheel and torque limiter on the intermediate shaft.

The limiter is calibrated to 10 kgm (100 Nm); this component protects the structure of the engine and the starter kinematic mechanism in the event of incorrect starting with consequent inverse rotations.

The freewheel is used for a sufficiently silent starting.

The starter control (energised remote control) is slaved to enabling signals by the side stand and the emergency OFF/RUN switch, which does not allow starting given dangerous conditions.
The starter control circuit is not controlled by the immobilizer system, therefore before insisting on the starter system, check the consensus of the immobilizer.
In order to check the enabling switches circuit, see the «Electrical system» chapter, whereas to check the engine shaft control transmission, follow what is described in the «Flywheel and starter system» chapter.

INDEX OF TOPICS

INJECTION	INJEC

Terminals setup

CDI INJECTION CONTROL UNIT CONNECTOR

1. Injection warning light (Brown-White)

2. Rpm indicator (Green)

3. CAN L Line (Pink-White)

4. Lambda probe negative (Light blue-Black)

5. Live (Orange-Blue)

6. Battery power (Red-White)

7. Immobilizer aerial (Orange-White)

8. Electric fan enabling (Green-White)

9. Water temperature sensor (Sky blue-Green)

10. CAN H line (Pink-Red)

11. Lambda probe positive (Green-Blue)

12. ASR on signal (Sky blue-White)

13. Pick-up sensor positive (Red)

14. Petrol injector command (Purple)

15. Pick-up sensor negative (Brown)

16. Serial line K (Orange-Black)

17. Immobilizer (Yellow)

18. Side stand signal (Orange)

19. Headlight consent (White-Black)

20. Injection load solenoid (Black-Purple)

21. ASR Warning Light control (Brown-Sky blue)

22. High voltage coil command (Pink-Black)

23. Not connected

24. Anti-tipping sensor signal (Grey-Black)

25. Start-up enabling switch (Purple-White)

26. Ground lead (Grey-Green)

EMS circuit diagram

Elenco componenti

1 Batteria 12V-10Ah

2 Motorino di avviamento

3 Contatto teleruttore di avviamento

4 Bobina teleruttore di avviamento

5 Regolatore di tensione

6 Volano

7 Nodo massa telaio

8 Nodo massa telaio-motore

9 Commutatore a chiave

12 Fusibile N.3-10A

13 Fusibile N.4-7,5A

14 Fusibile N.5-7,5A

16 Fusibile N.7-5A

18 Fusibile N.9-30A

31 Gruppo strumenti

37 Sensore temperatura acqua motore

40 Centralina iniezione CDI

41 Nodo massa anteriore

42 Nodo massa posteriore

43 Nodo massa regolatore

44 Nodo massa strumento

46 Immobilizer

47 Teleruttore carichi iniezione

48 Elettroventola radiatore

49 Teleruttore elettroventola radiatore

50 Sonda lambda

51 Sensore temperatura acqua motre (CDI)

52 Sensore giri motore

53 Pulsante arresto motore

54 Pulsante cavalletto laterale

55 Bobina AT

56 Iniettore benzina

57 Sensore anti-ribaltamento

58 Pompa carburante

59 Presa diagnostica

69 Pulsante stop

70 Pulsante avviamento motore

84 Nodo di massa centralina iniezione CDI

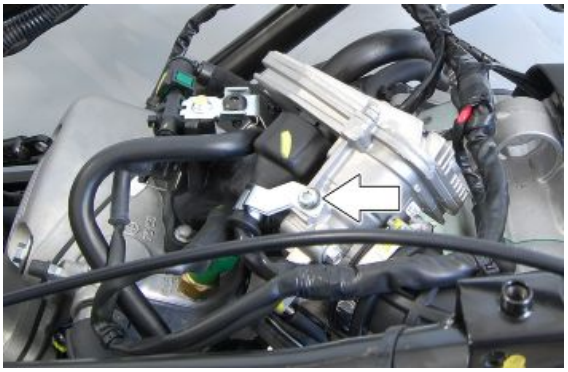
91 Resistenza 120ohm terminazione linea CAN

Removing the butterfly valve

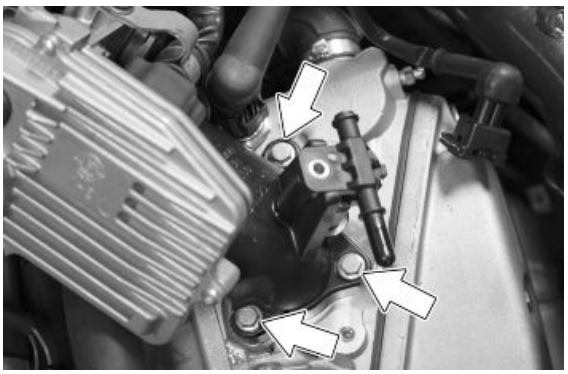
Rimuovere preventivamente:

- la fiancata laterale sinistra
- la cassa filtro aria
- il portello di ispezione corpo farfallato.

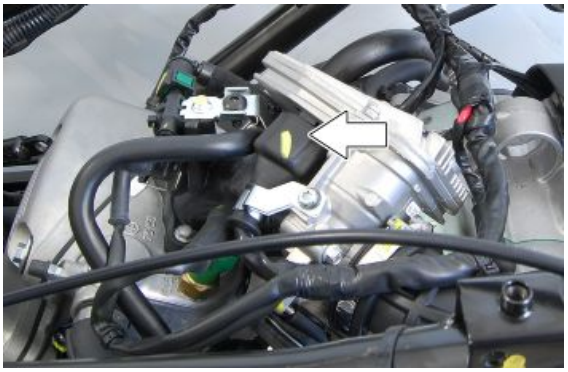
Svitare la vite e disimpegnare la fascetta di ritegno del connettore centralina.



Scollegare la tubazione carburante e il connettore dell'iniettore, svitare le viti di fissaggio del raccordo di ammissione.

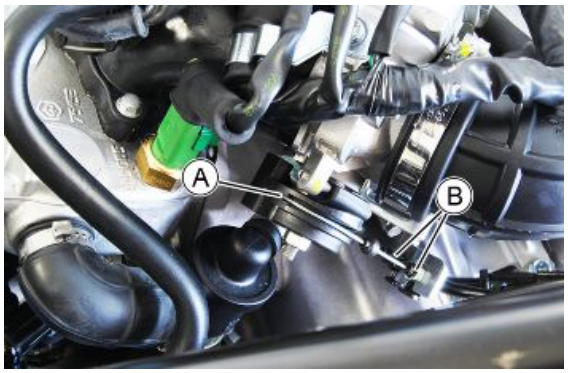


Scollegare il connettore dalla centralina.

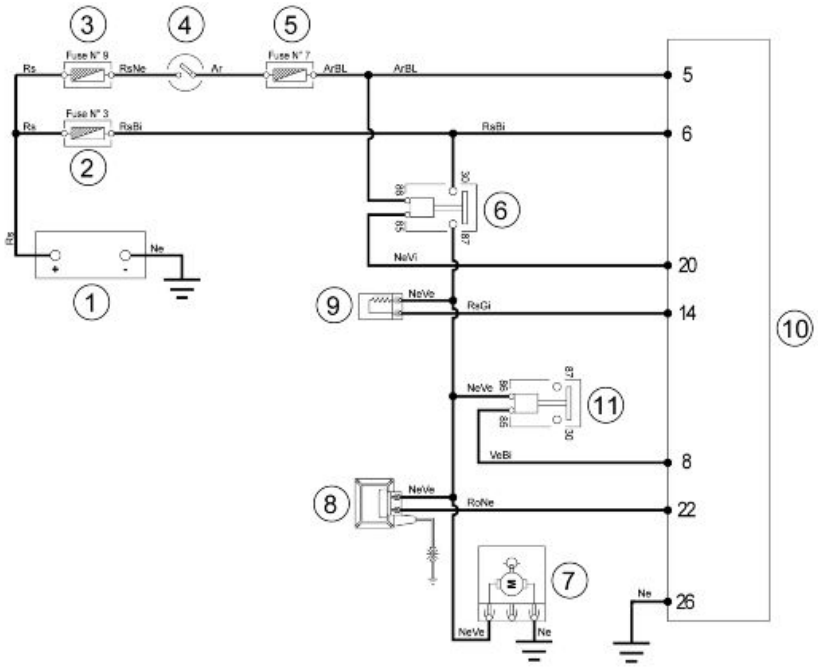


Rimuovere la fascetta di fissaggio del manicotto filtro aria al corpo farfallato.

Liberare i cavi di trasmissione dal comando gas «**A**» allentando i dadi di registro «**B**».
Rimuovere il corpo farfallato completo di centralina.



Pump supply circuit



CARICHI INIEZIONE

	Specification	Desc./Quantity
1	Battery	12V - 12 Ah
2	Fusibile N° 3	10 A
3	Fuse No. 9	30A

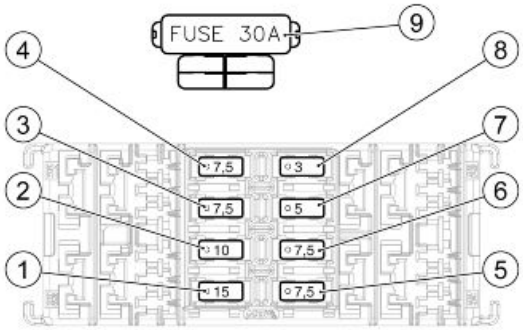
	Specification	Desc./Quantity
4	Ignition switch contacts	
5	Fuse No. 7	5A
6	Injection load solenoid	
7	Fuel pump	
8	HV coil	
9	Fuel injector	
10	Injection ECU	
11	Electric fan solenoid	

When switched to «ON», the fuel pump starts to rotate for 2 seconds and then stops. When the engine starts, in the presence of rpm timing signal the pump is continuously supplied.

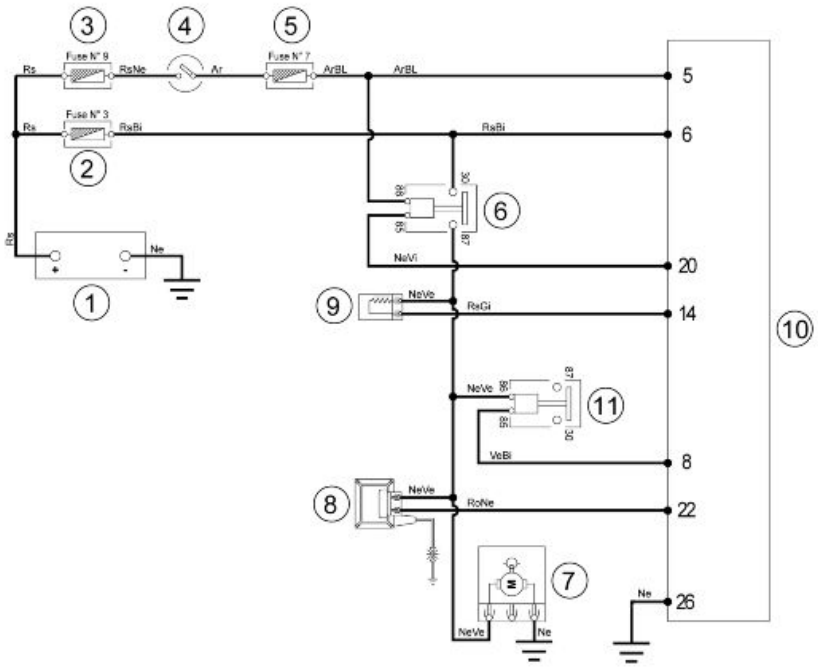
ELECTRICAL DATA

- Pump winding resistance ~ 1.5 Ohm
- Input current during normal functioning 1.4 to 1.8 A
- Input current to the closed hydraulic circuit ~ 2 A (to be checked with specific tool for fuel pressure control, choking the circuit on the return pipe)

Check function of fuses No. 3 and 7 for the ECU and injection load solenoid.



Inspecting the injector circuit

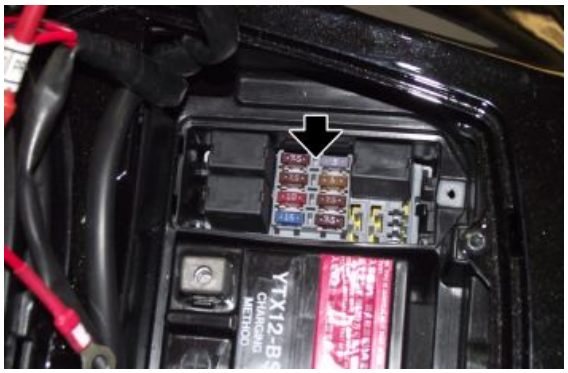


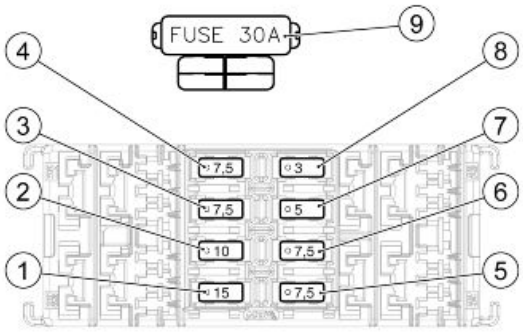
CARICHI INIEZIONE

	Specification	Desc./Quantity
1	Battery	12V - 12 Ah
2	Fusibile N° 3	10 A
3	Fuse No. 9	30A
4	Ignition switch contacts	
5	Fuse No. 7	5A
6	Injection load solenoid	
7	Fuel pump	
8	HV coil	
9	Fuel injector	
10	Injection ECU	
11	Electric fan solenoid	

Check the resistance at the injector ends: 14.5 ± 5% Ohm

Check function of fuses No. 3 and 7 for the ECU and injection load solenoid.





Inspecting the injector hydraulics

Lift the saddle and remove the engine compartment access cover.

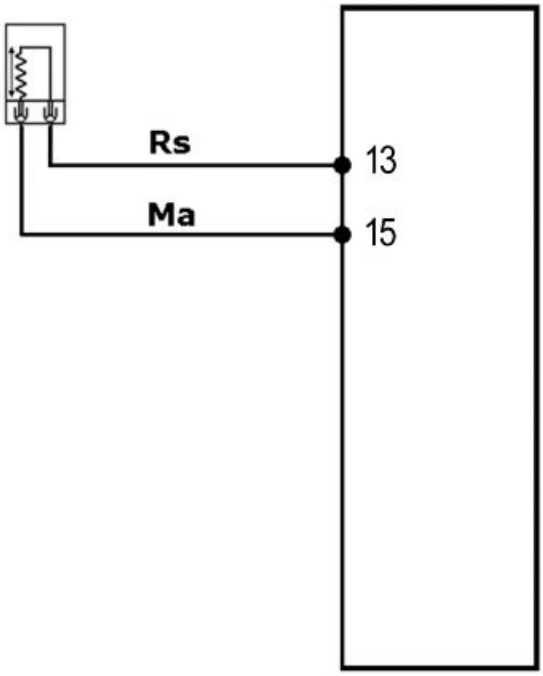
Remove the injector, by unscrewing the screw indicated in figure.

Install the appropriate tool for checking fuel pressure and position the manifold over a container graduated by at least 100 cm³. Connect the injector with the cable making up part of the supply for the injection tester. Connect the clamps of the cable to an auxiliary battery. Activate the fuel pump with the active diagnosis. Check that, within fifteen seconds, approximately 40 cm³ of fuel is dispensed with an adjustment pressure of approximately 2.5 BAR.

Specific tooling

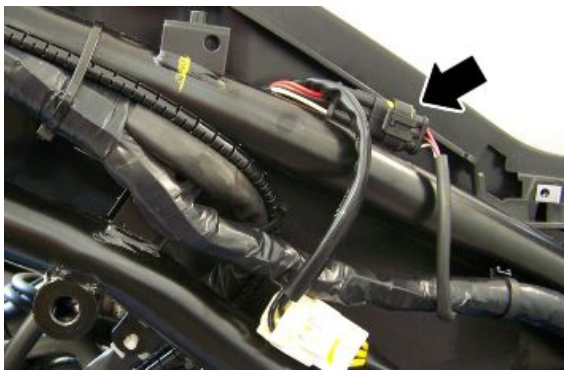
020480Y Petrol pressure check kit

Tachometer



Scollegare il connettore pompa carburante. Avviare il motore ed attendere il suo arresto. Con cablaggio collegato a centralina ed impianto eseguire un tentativo di avviamento e verificare che la tensione tra i pin 13 e 15 sia di circa 2,8 V ~

- Verificare la continuità tra il pin 13 della centralina iniezione e il cavetto rosso del connettore sensore giri motore.
- Verificare la continuità tra il pin 15 della centralina iniezione e il cavetto marrone del connettore sensore giri motore.

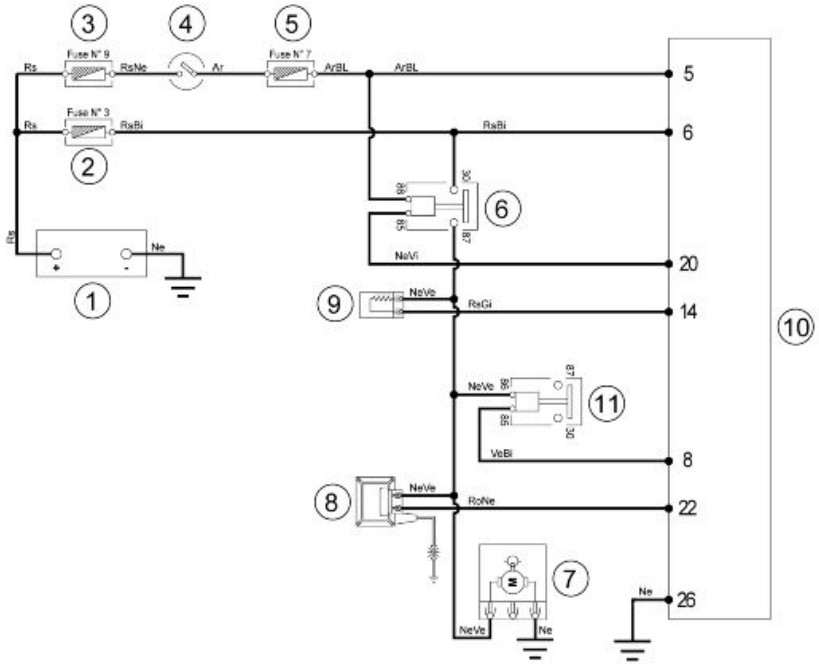


- Verificare che i pin 13 e 15 della centralina siano isolati tra di loro e isolati da massa.

Specific tooling

020331Y Digital multimeter

HT coil



CARICHI INIEZIONE

	Specification	Desc./Quantity
1	Battery	12V - 12 Ah
2	Fusibile N° 3	10 A
3	Fuse No. 9	30A
4	Ignition switch contacts	
5	Fuse No. 7	5A
6	Injection load solenoid	
7	Fuel pump	
8	HV coil	
9	Fuel injector	
10	Injection ECU	
11	Electric fan solenoid	

The ignition system is integrated with the injection and it is a high-efficiency inductive type ignition.

The control unit controls two important parameters:

- Ignition advance

This is optimised from moment to moment in accordance with the engine revs, engine load, temperature and environmental pressure.

With idle engine, it is optimised to obtain the stabilisation of the speed at 1450 ± 50 R/1'.

- Magnetisation time

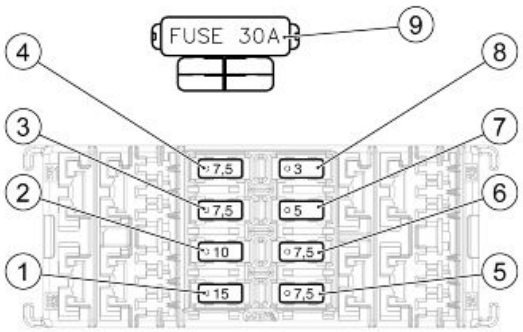
The coil magnetisation time is controlled by the control unit. The ignition power is increased during the engine start-up phase.

The injection system recognises the four-stroke cycle so the ignition is only commanded in the compression phase.

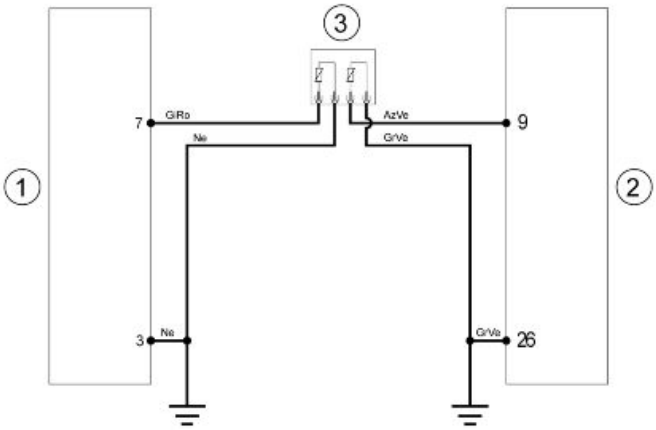
Specific tooling

020331Y Digital multimeter

Check function of fuses No. 3 and 7 for the ECU and injection load solenoid.



Coolant temperature sensor



TEMPERATURE SENSOR

	Specification	Desc./Quantity
1	Instrument panel	
2	Injection ECU	
3	Water temperature sensor	

Con connettore lato centralina scollegato e connettore sensore temperatura liquido di raffreddamento collegato, verificare che i valori resistivi, tra il pin 9 e massa, corrispondano alla temperatura del motore.

20° = 2500 ± 100 Ω

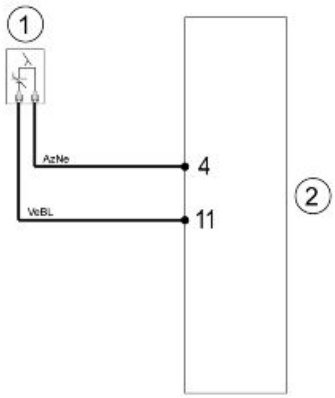
80° = 308 ± 6 Ω

Con connettore lato centralina scollegato e connettore sensore temperatura liquido di raffreddamento scollegato, verificare l'isolamento tra il cavetto azzurro-verde e massa.

Specific tooling

020331Y Digital multimeter

Lambda probe



LAMBDA PROBE

	Specification	Desc./Quantity
1	Lambda sensor	
2	Injection ECU	

CORRISPONDENZA PIN

PIN	PIN	Componente	Valore di riferimento
4	11	Sonda lambda	~ 0V con farfalla chiusa; ~ 1V con farfalla completamente aperta

The Lambda probe or oxygen sensor is a sensor which provides indications concerning the oxygen content in the exhaust gas. The signal generated is not of the proportional type but of the ON/OFF type,

i.e. there is oxygen or there is not. The sensor is positioned on the exhaust manifold before the catalytic converter in an area where the gas temperature is always high. The temperature at which the sensor works is at least 350°C at 600°C and it has a reaction time of just 50 milliseconds. The signal generated passes from a high value to a low value with a mixture with lambda =1.

INDEX OF TOPICS

SUSPENSIONS	SUSP

Refitting the front wheel

Eseguire le operazioni in senso inverso allo smontaggio rispettando la coppia prescritta

CAUTION

PER UN PRIMO LOTTO DI VEICOLI, SARÀ PRESENTE UNA RONDELLA Ø26 mm SOTTO IL DADO DI FISSAGGIO RUOTA. SE PRESENTE, ASSICURARSENE DELLA PRESENZA IN FASE DI RIMONTAGGIO.

Locking torques (N*m)

Front wheel axle nut 110 - 120 Wheel axle clamp screws 6 - 7 Nm

Refitting

- First grease the splitting chamber of the two sealing lips of a new oil seal.
- Fit the sealing ring on the stem and keep the identification words facing upwards.
- Drive the oil seal as far as it will go using the appropriate tool.

Specific tooling

020376Y Adaptor handle

020359Y 42x47-mm Adaptor

- Pre-fit the stem with the hydraulic rod, the spring and the stop bushing.
- Fit the pre-assembled components inside the fork leg.
- Place the washer and tighten the screw.

- Fit the oil seal retaining circlip.

- Grease and fit a new dust gaiter.

- Fill the fork leg with the recommended product.

Recommended products

AGIP FORK 10 W Oil for fork.

-

Characteristic

Oil quantity per stem

155 cm³

- Bleed the hydraulic rod by actuating the stem repeatedly.

- Fit the spring into the stem.

CAUTION

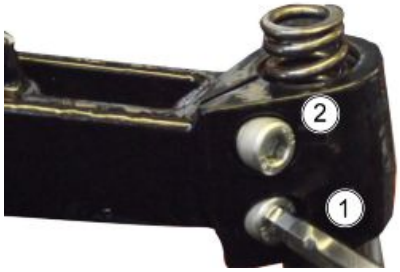
FIT THE SPRING WITH THE SMALLER PITCH TO THE UPPER PART OF THE STEM.

- Fit the fork leg together with the stem on the fork supporting clamp until it stops.

- Tighten the two screws to the prescribed torque in the sequence indicated in the picture.

Locking torques (N*m)

Stem support clamp tightening screws **Apply a torque of 25-34 Nm to lower screw «1» Lock upper screw «2» a torque of 25-34 Nm Lock lower screw «1» a torque of 25-34 Nm**



- Lubricate the closing cap O-ring of the stem.

- Preload the spring, fit the closing cap and tighten to the prescribed torque.

Locking torques (N*m)

Fork locking screws cap **35 - 55**

- Repeat the procedure for the other fork leg.

N.B.

IF BOTH FORK LEGS ARE SERVICED AT THE SAME TIME, BE CAREFUL NOT TO INVERT THE RIGHT FORK LEG WITH THE LEFT ONE.

- Fit the hydraulic rod fixing screw with the copper sealing washer and tighten to the prescribed torque using the recommended product.

CAUTION

ALWAYS USE NEW COPPER WASHER.

Locking torques (N*m)

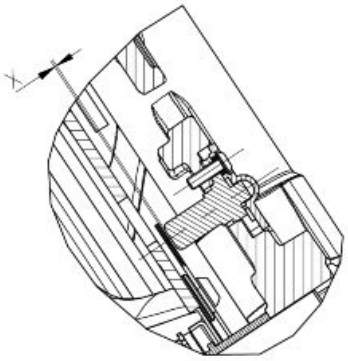
Hydraulic rod fixing screw 25 to 35 Nm

PAY PARTICULAR ATTENTION TO THE FITTING OF THE SPEED SENSOR; PROCEED AS FOLLOWS:

- install the speed sensor with its washer.
- Measure the height «**X**» with the aid of a feeler gauge and check that its value is correct.

X = 0.4 to 1.65 mm

- If the measurement «**X**» is too large, remove the washer and measure again.



Locking torques (N*m)

Front wheel speed sensor fastener screw 6 - 8

Refitting

- Fit the lower steering bearing on the steering tube.
- Fit the fork together with the lower steering bearing on the headstock and hold it so that it does not fall.

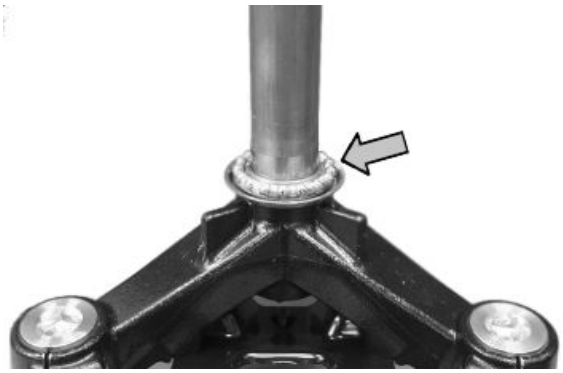
N.B.

LUBRICATE THE STEERING FIFTH WHEEL TRACKS WITH RECOMMENDED GREASE BEFORE USE.

Recommended products

AGIP GREASE PV2 Ivory smooth-textured, slightly-stringy anhydrous calcium-base grease.

TL 9150 066, NATO G 460 symbol



- Fit the upper steering bearing.

CAUTION

INSERT THE UPPER STEERING BEARING WITH THE CAGE FACING UPWARDS.

- Fit the steering bearing upper seat.

- Fit the cover plate.

- Insert the lower tightening ring nut, screw until it stops and, with the specific tool, tighten to the prescribed torque.

Specific tooling

020055Y Wrench for steering tube ring nut

Locking torques (N*m)

Steering tube lower ring nut **14 - 17**

- Fit the spacer between the two ring nuts on the steering tube in the position indicated.

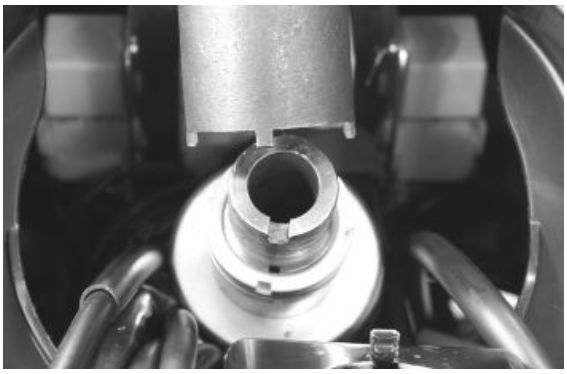
- Insert the upper tightening ring nut, screw until it stops and, with the specific tool, tighten to the indicated torque.

Specific tooling

020055Y Wrench for steering tube ring nut

Locking torques (N*m)

Steering tube upper ring nut **40 to 45**



Insert the collar shown in the figure and restore the cable passage as shown in the figure.

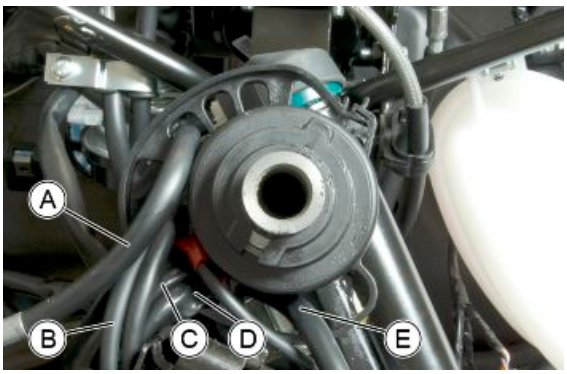
A - Left brake lever pump pipe.

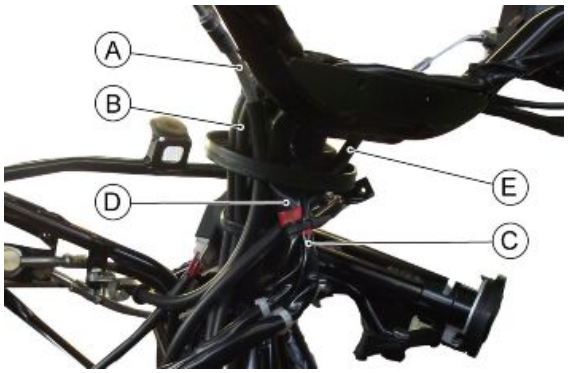
B - Throttle grip cables.

C - Left control block cable harness.

D - Right control block cable harness.

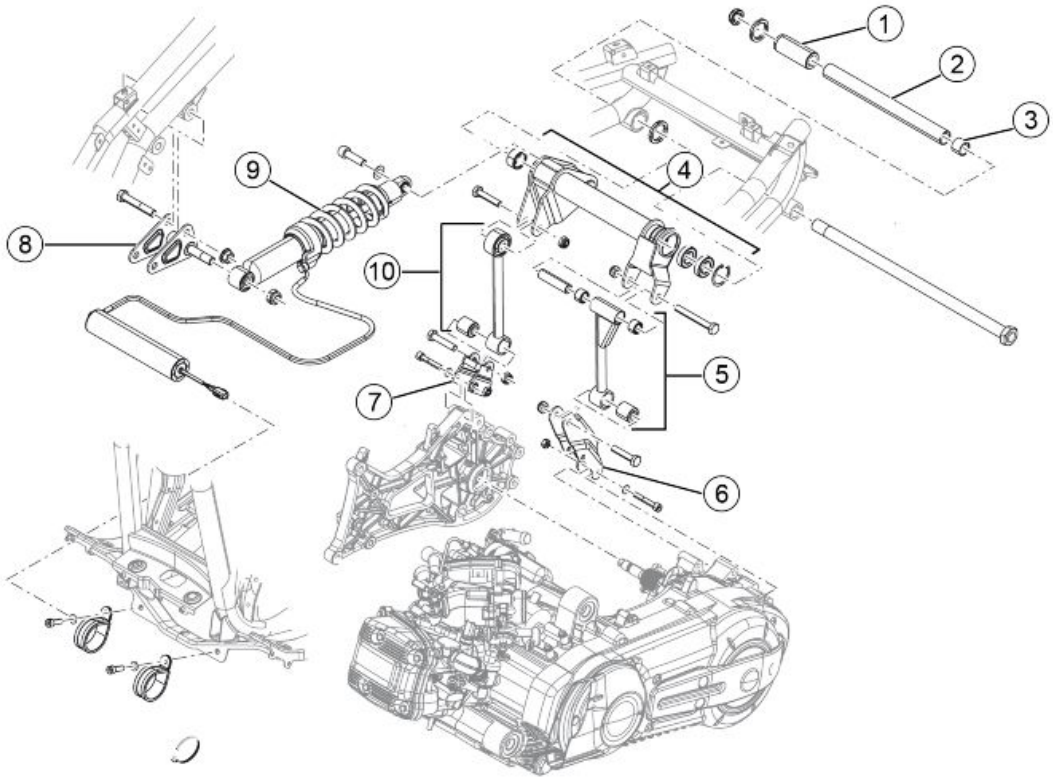
E - Right brake lever pump pipe.





- Fit the front wheel.

Rear



LEGENDA:

1. Bussola filettata

2. Distanziale

3. Distanziale

4. Leveraggio sospensione posteriore completo

5. Assieme puntone sinistro

6. Staffa fissaggio puntone sinistro

7. Staffa supporto puntone destro

8. Staffa attacco ammortizzatore

9. Ammortizzatore posteriore completo

10. Assieme puntone destro

Removing the rear wheel

- Rimuovere il supporto marmitta.

- Rimuovere il distanziale.

- Rimuovere la ruota posteriore.

See also

Removal

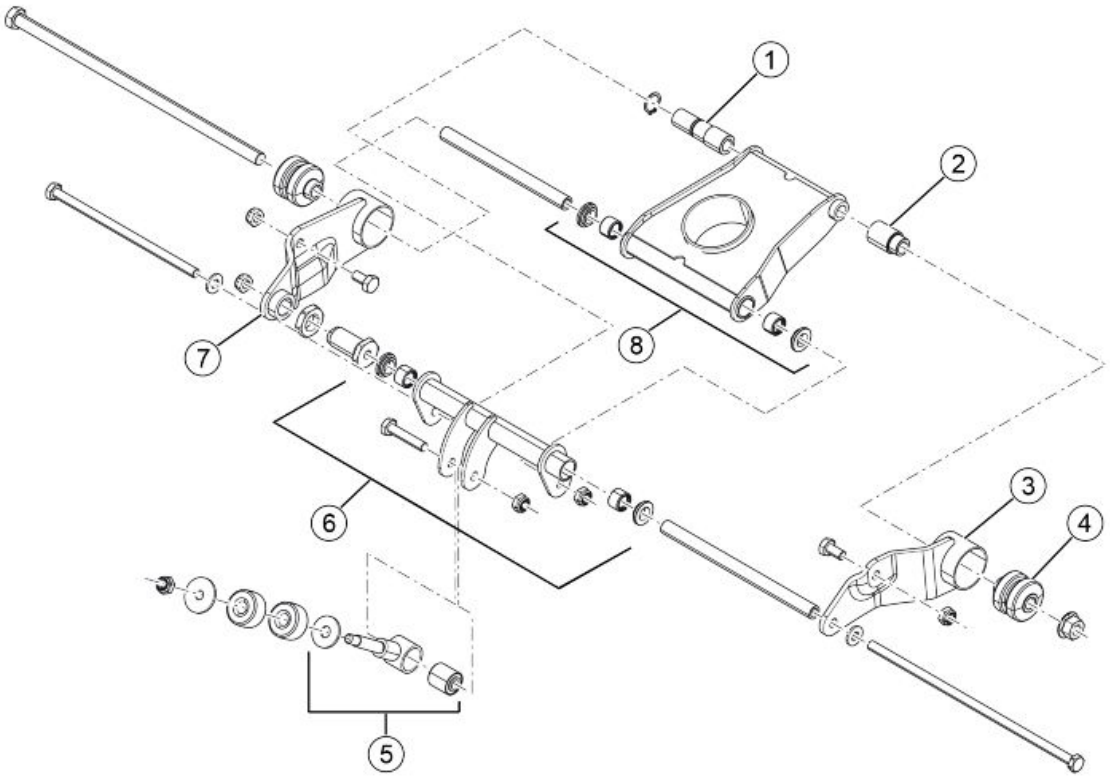
Refitting the rear wheel

Eseguire le operazioni in senso inverso allo smontaggio rispettando la coppia prescritta.

Locking torques (N*m)

Rear wheel axle nut 102 - 123

Swing-arm



LEGENDA:

1. Distanziale

2. Distanziale

3. Piastra supporto silent-block sinistra con p.i.

4. Silent block

5. Tirante completo

6. Braccio oscillante completo lato telaio

7. Piastra supporto silent-block destra con p.i.

8. Braccio oscillante completo lato motore

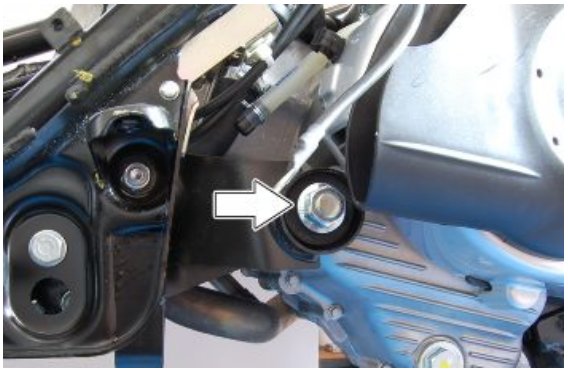
Removal

- Allentare il dado di collegamento del tirante al telaio.

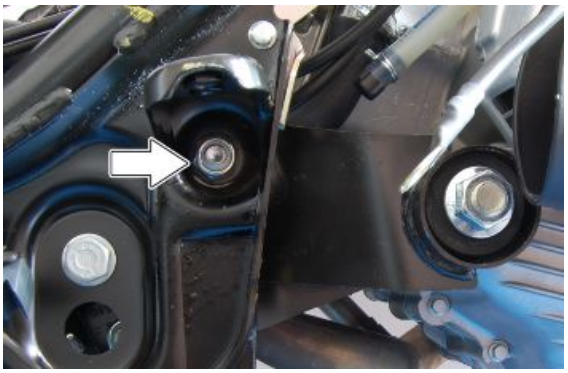
CAUTION

SUPPORT THE VEHICLE ADEQUATELY.

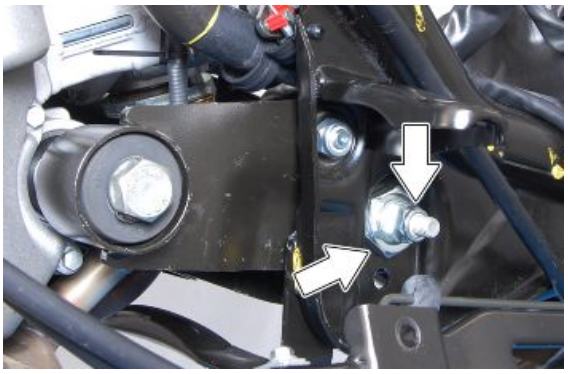
- Rimuovere il dado del perno lato motore ed estrarre il perno.



- Rimuovere i dadi di fissaggio delle staffe di supporto silentblock al telaio.



- Rimuovere il dado del perno di collegamento del braccio oscillante lato telaio alle staffe di supporto silentblock e al telaio e sfilare il perno.
- Rimuovere la ghiera di bloccaggio della bussola di registrazione.



- Rimuovere il perno di collegamento del braccio oscillante lato telaio al braccio oscillante lato motore.

- Rimuovere il perno di collegamento del braccio oscillante lato telaio al tirante.

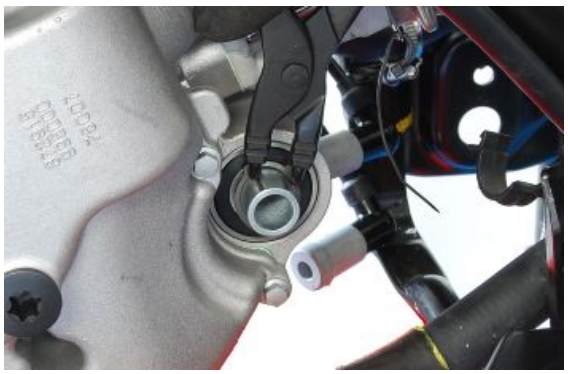
Overhaul

- Contollare che i silentblock del tirante non risultino usurati o deformati, in tal caso procedere con la sostituzione.

- Utilizzando la specifica pinza rimuovere l'anello elastico sul distanziale lato destro dell'attacco del braccio oscillante sul motore e rimuovere il distanziale dall'interno.

Specific tooling

002465Y Pliers for circlips

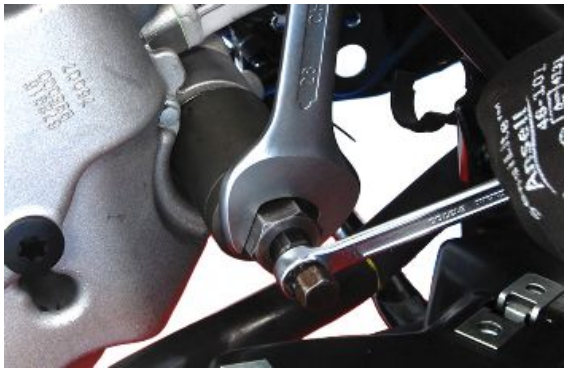


- Mediante apposita attrezzatura rimuovere il cuscinetto.
- Verificare che il cuscinetto non presenti anomalie o impuntamenti. In caso contrario procedere con la sostituzione.

Specific tooling

001467Y009 Bell for OD 42-mm bearings

001467Y006 Pliers to extract 20 mm bearings



- Mediante manico, adattatore e guida inserire il cuscinetto nella propria sede.
-Inserire il distanziale e bloccarlo con l'anello elastico.

Specific tooling

020359Y 42x47-mm Adaptor

020363Y 20-mm guide

020376Y Adaptor handle

002465Y Pliers for circlips

- Rimuovere il distanziale sul lato sinistro dell'attacco del braccio oscillante sul motore dall'interno.

- Mediante apposita attrazzatura rimuovere il cuscinetto.
- Verificare che il cuscinetto non presenti anomalie o impuntamenti. In caso contrario procedere con la sostituzione.

Specific tooling

001467Y009 Bell for OD 42-mm bearings

001467Y006 Pliers to extract 20 mm bearings

- Mediante manico, adattatore e guida inserire il cuscinetto nella propria sede.
-Inserire il distanziale.

Specific tooling

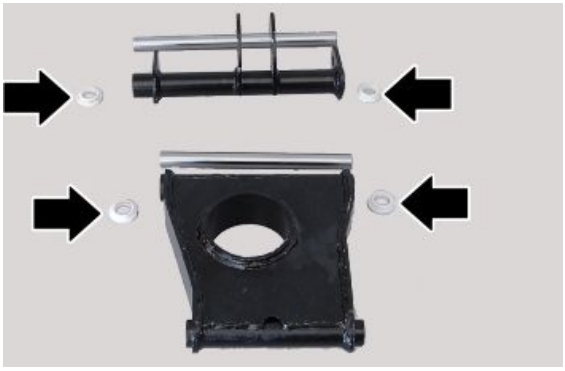
020359Y 42x47-mm Adaptor

020363Y 20-mm guide

020376Y Adaptor handle

- Controllare che i silentblock non risultino usurati i deformati, in tal caso procedere con la sostituzione.

- Controllare che le bussole in materiale plastico del braccio oscillante lato motore e lato telaio non siano usurate o deformate.
- Estrarre i distanziali interni dei bracci oscillanti lato motore e lato telaio.



- Utilizzando l'apposito estrattore e la relativa campana rimuovere le rulliere dal braccio oscillante lato motore.
- Verificare che le rulliere non presentino anomalie o impuntamenti. In caso contrario procedere con la sostituzione.

Specific tooling

001467Y013 Pliers to extract ø 15-mm bearings

001467Y010 Driver for OD 25 mm bearings

- Mediante pistola termica riscaldare le sedi delle rulliere del braccio oscillante lato motore.

Specific tooling

020151Y Air heater

- Mediante manico e guida inserire le rulliere nelle proprie sedi.

CAUTION

LE RULLIERE DEVONO ESSERE INSERITE CON LA FACCIA CON LE SCRITTE RIVOLTA VERSO L'ESTERNO DEL BRACCIO OSCILLANTE.

Specific tooling

020412Y 15-mm guide

020376Y Adaptor handle

- Utilizzando l'apposito estrattore e la relativa campana rimuovere le rulliere dal braccio oscillante lato telaio.
- Verificare che le rulliere non presentino anomalie o impuntamenti. In caso contrario procedere con la sostituzione.

Specific tooling

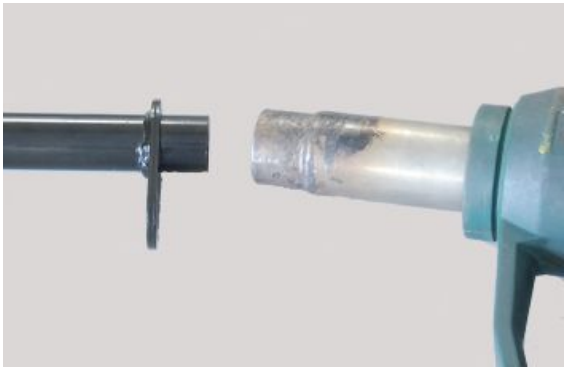
001467Y013 Pliers to extract ø 15-mm bearings

001467Y010 Driver for OD 25 mm bearings

- Mediante pistola termica riscaldare le sedi delle rulliere del braccio oscillante lato telaio.

Specific tooling

020151Y Air heater



- Mediante manico e guida inserire le rulliere nelle proprie sedi.

Specific tooling

020412Y 15-mm guide

020376Y Adaptor handle

- Inserire i distanziali interni lubrificandoli con prodotto apposito.

Recommended products

AGIP GREASE PV2 Ivory smooth-textured, slightly-stringy anhydrous calcium-base grease.

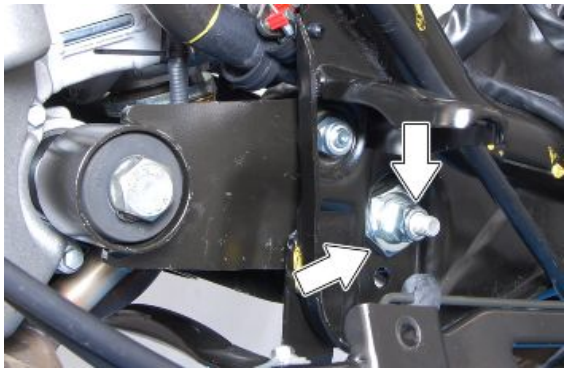
TL 9150 066, symbol NATO G 460

Refitting

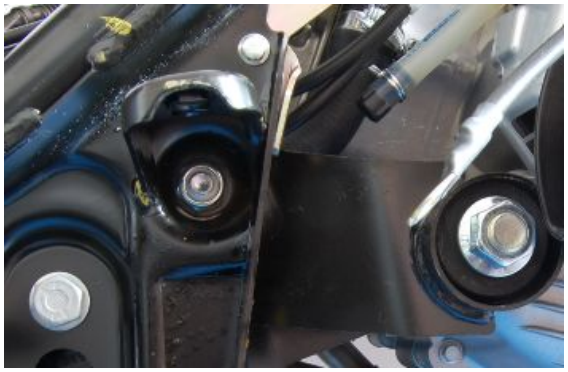
- Posizionare la staffa di supporto silent block al telaio con installata la bussola di centraggio avvitando senza serrare.

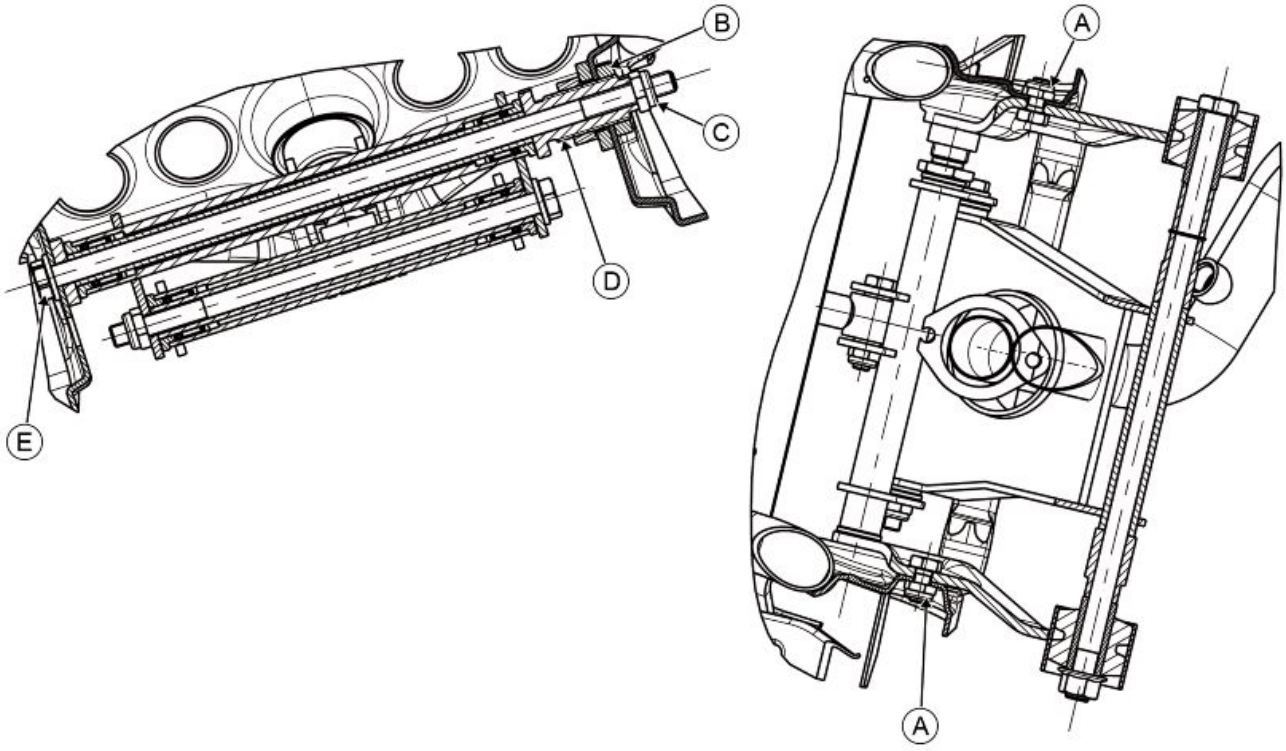
- Posizionare il braccio oscillante inserendo l'asse lato telaio.
- Serrare a coppia i puntoni del leveraggio sospensione posteriore.
- Serrare la bussola di centraggio.

- Avvitare e serrare a coppia la ghiera esterna della bussola di centraggio.
- Avvitare e serrare a coppia il dado dell'asse lato telaio.



- Serrare a coppia i dadi di fissagio della staffa supporto silentblock al telaio
- Avvitare e serrare l'asse lato motore.





SEQUENZA DI SERRAGGIO BRACCIO OSCILLANTE E PUNTONI:

1. Posizionare la staffa supporto silent-block, con pre-inserito il part. «**D**», avvitando senza serrare il part. «**A**».

2. Posizionare il braccio oscillante inserendo il part. «**E**».

3. Serrare a coppia i puntoni destro e sinistro lato motore e lato leveraggio.

4. Serrare a coppia il part. «**D**».

5. Avvitare e serrare a coppia il part. «**B**».

6. Avvitare e serrare a coppia il part. «**C**».

7. Serrare a copia il part. «**A**».

SWINGING ARM

Name	Torque in Nm
Frame side pin adjustment ring nut	88.5 ÷ 108
Self locking nut fastening pin chassis side	50 to 55
Retainer nut of silent block support bracket on bushing	98 ÷ 117
Lower pin bushing	5 - 7
Self locking nut pin fastening engine side	40 to 45
Self locking nut of fixing silent block support bracket	67 - 75
Rod fixing nut	40 to 45
Rod pin fixing nut	40 to 45

Removal

SMONTAGGIO AMMORTIZZATORE POSTERIORE COMPLETO DI DIPOSITIVO ELETTRICO

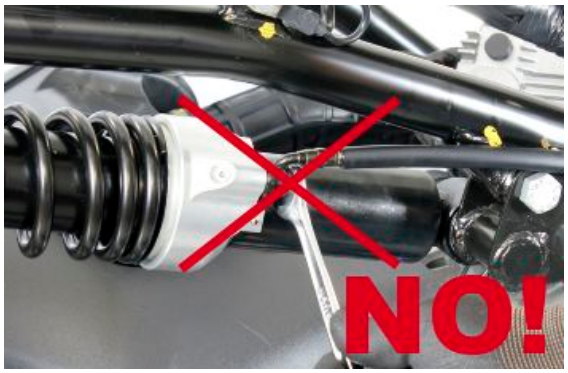
- Rimuovere la fiancata laterale destra.
- Rimuovere il vano portacasco.
- Rimuovere la pedana poggiapiedi destra.
- Rimuovere lo scudo anteriore.

CAUTION

SOSTENERE ADEGUATAMENTE LA PARTE POSTERIORE DEL VEICOLO.

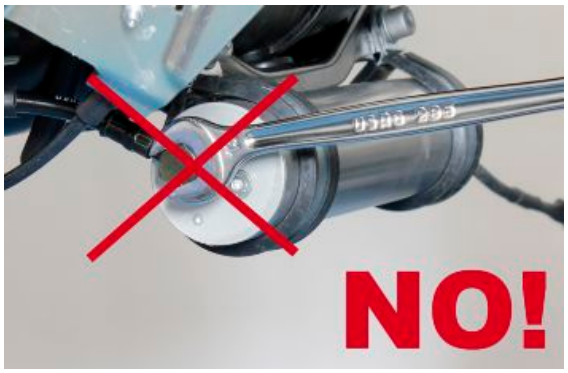
CAUTION

NON SMONTARE I RACCORDI DELLA TUBAZIONE ONDE EVITARE IL NON FUNZIONAMENTO DELL'AMMORTIZZATORE. LO SPURGO DELL'AMMORTIZZATORE POSTERIORE E DI TUTTO IL SISTEMA DI REGOLAZIONE ELETTRONICA DEL PRECARICO È STATO ESEGUITO IN ATMOSFERA PROTETTA.



CAUTION

IL GRUPPO AMMORTIZZATORE POSTERIORE COMPLETO DI TUBAZIONE E DIPOSITIVO ELETTRICO È UNICO, NON SPURGABILE E NON REVISIONABILE. QUALSIASI MANOMISSIONE NE COMPROMETTE IL FUNZIONAMENTO E LA SICUREZZA. IN CASO DI PERDITA DI LIQUIDO DEVE ESSERE SOSTITUITO.



- Svitare la vite posteriore di fissaggio dell'ammortizzatore al leveraggio sospensione.

- Estrarre la vite prestando attenzione all'abbassamento della parte posteriore del veicolo.

- Allentare preventivamente il dado di fissaggio anteriore dell'ammortizzatore sulla staffa di attacco.

- Svitare i dadi di fissaggio della staffa di attacco ammortizzatore al telaio.

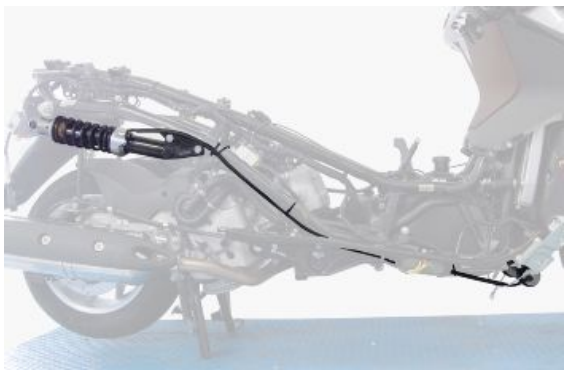
- Rimuovere l'ammortizzatore completo di staffa di attacco e tubazione, posizionandolo su un piano.

- Staccare la connessione dal dispositivo elettrico.

- Svitare le viti di fissaggio delle fascette al dispositivo elettrico.

- Rimuovere il dispositivo elettrico completo di fascette e tubazione.

- Liberare la tubazione dalle fascette di ritegno al telaio.



- Rimuovere la staffa della pedana poggiapiedi svitando le viti indicate.

- Estrarre la sospensione completa di ammortizzatore, tubazione e dispositivo elettrico.

- Al banco da lavoro rimuovere il dado di fissaggio dell'ammortizzatore alla staffa.

SMONTAGGIO LEVERAGGIO SOSPENSIONE

- Rimuovere la fiancata laterale destra.
- Rimuovere la fiancata laterale sinistra.
- Rimuovere il vano portacasco.
-Rimuovere il silenziatore.

CAUTION

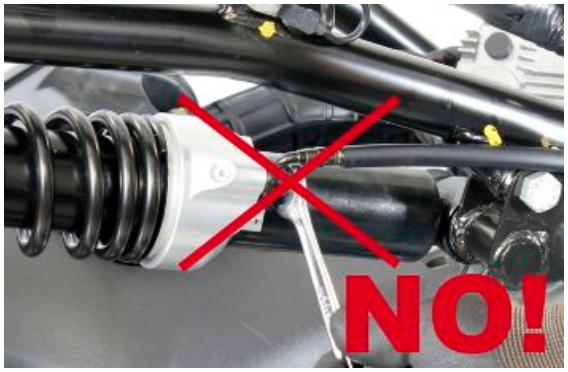
SOSTENERE ADEGUATAMENTE LA PARTE POSTERIORE DEL VEICOLO.

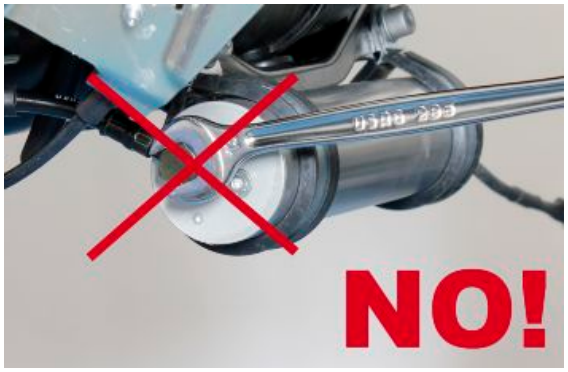
CAUTION

NON SMONTARE I RACCORDI DELLA TUBAZIONE ONDE EVITARE IL NON FUNZIONAMENTO DELL'AMMORTIZZATORE. LO SPURGO DELL'AMMORTIZZATORE POSTERIORE E DI TUTTO IL SISTEMA DI REGOLAZIONE ELETTRONICA DEL PRECARICO È STATO ESEGUITO IN ATMOSFERA PROTETTA.

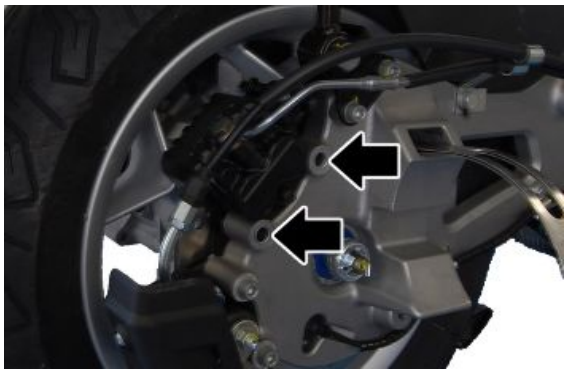
CAUTION

IL GRUPPO AMMORTIZZATORE POSTERIORE COMPLETO DI TUBAZIONE E DIPOSITIVO ELETTRICO È UNICO, NON SPURGABILE E NON REVISIONABILE. QUALSIASI MANOMISSIONE NE COMPROMETTE IL FUNZIONAMENTO E LA SICUREZZA. IN CASO DI PERDITA DI LIQUIDO DEVE ESSERE SOSTITUITO.

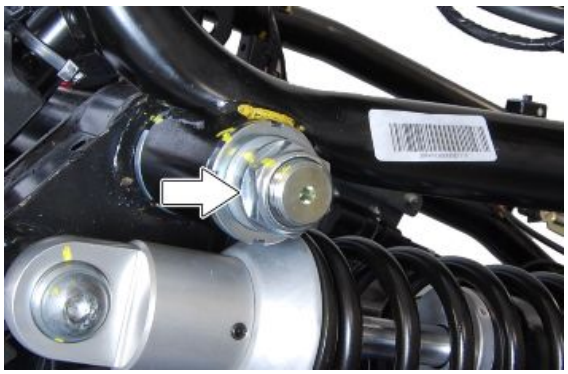




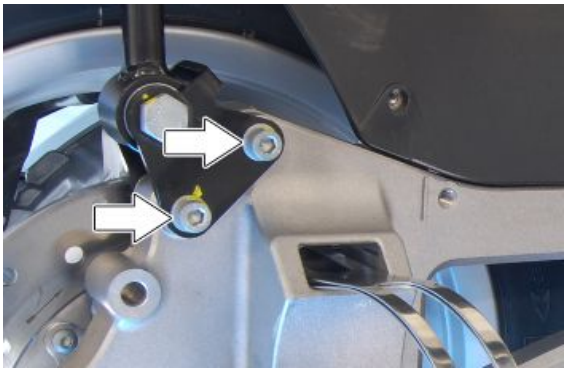
- Rimuovere la pinza freno posteriore.



- Allentare il dado di bloccaggio del asse del leveraggio bloccandolo dal lato opposto.

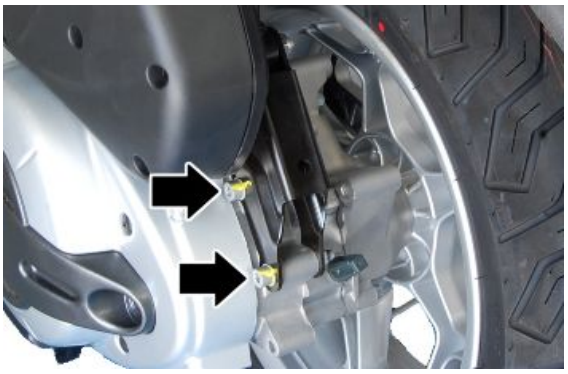


- Rimuovere le viti di fissaggio della staffa supporto puntone destro alla staffa supporto marmitta e sfilare la staffa supporto puntone destro dalla staffa supporto marmitta.



- Rimuovere la vite di fissaggio dell'ammortizzatore posteriore al leveraggio.

- Rimuovere le viti di fissaggio della staffa supporto puntone sinistro al carter.



- Rimuovere l'asse del leveraggio svitando il dado in figura e bloccando l'asse dal lato opposto.

- Rimuovere la bussola di centraggio del leveraggio svitando le ghiere di regolazione.

- Rimuovere il leveraggio completo di puntoni facendo attenzione al distanziale nel lato sinistro del telaio.

See also

Side fairings

Refitting

REVISIONE LEVERAGGIO SOSPENSIONE

- Rimuovere le staffe dai puntoni.
- Rimuovere i puntoni dal leveraggio.
- Controllare che i silent-block, i giunti sferici e le rulliere non abbiano anomalie o gioco eccessivo, in caso contrario sostituire i puntoni.

- Rimuovere il perno interno dal leveraggio.

- Rimuovere l'anello elastico con l'apposita pinza.

Specific tooling

002465Y Pliers for circlips

- Con l'ausilio dell'apposito estrattore e della relativa campana rimuovere i cuscinetti a sfere.

Specific tooling

001467Y009 Bell for OD 42-mm bearings

001467Y006 Pliers to extract 20 mm bearings

- Mediante l'utilizzo del manico, del adattatore e della relativa guida con l'ausilio di un mazzuolo rimuovere la rulliera dal lato sinistro del leveraggio.
- Verificare che i cuscinetti e la rulliera non presentino anomalie o impuntamenti. In caso contrario procedere con la sostituzione

Specific tooling

020376Y Adaptor handle

020364Y 25-mm guide

020375Y 28 x 30 mm adaptor

- Mediante pistola termica riscaldare la sede della rulliera.
- Utilizzando l'attrezzo specifico inserire la rulliera nella propria sede.

Specific tooling

020151Y Air heater

- Mediante pistola termica riscaldare la sede dei cuscinetti a sfera.
- Utilizzando l'attrezzo specifico inserire i cuscinetti, uno alla volta, nella propria sede.
- Con l'apposita pinza rimontare l'anello elastico di bloccaggio dei cuscinetti.

Specific tooling

020151Y Air heater

020376Y Adaptor handle

020364Y 25-mm guide

020357Y 32x35-mm Adaptor

002465Y Pliers for circlips

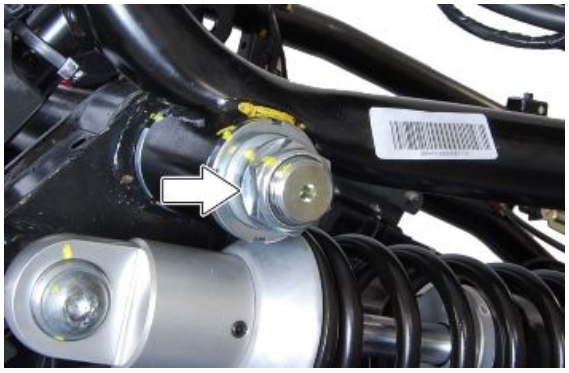
MONTAGGIO LEVERAGGIO SOSPENSIONE

- Posizionare la bussola di centraggio nella boccola lato destro del telaio insieme alle relative ghiere senza serrare.
- Posizionare il distanziale nella boccola sinistra del telaio.

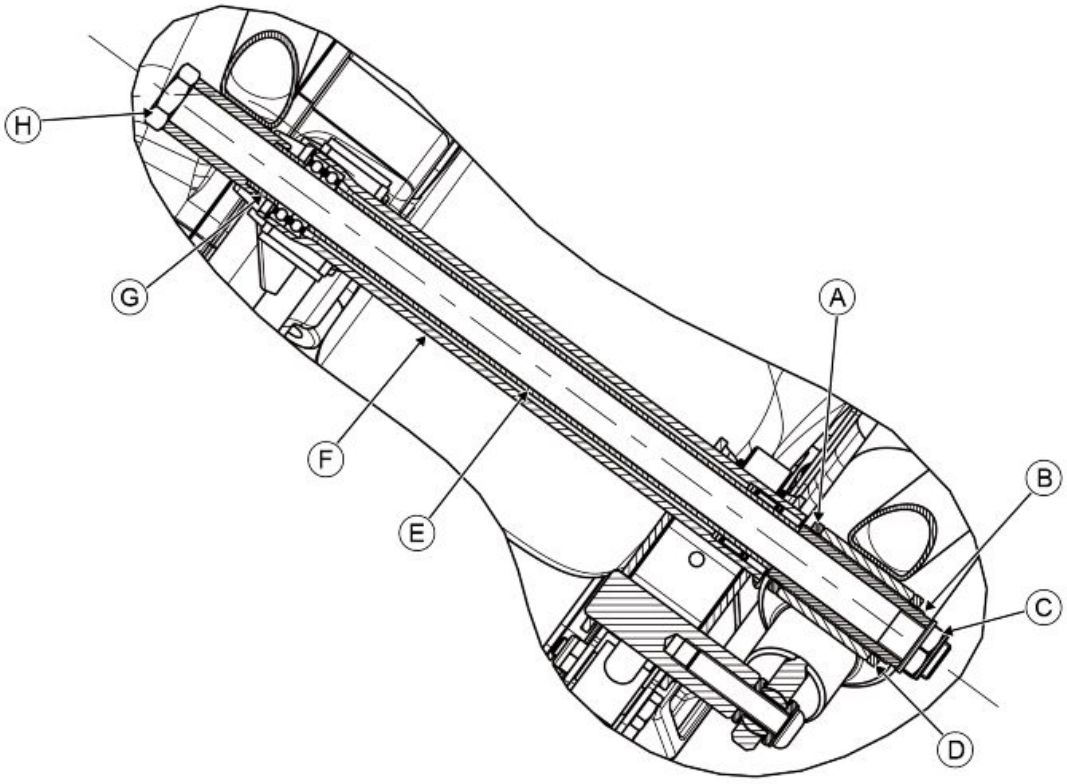
- Inserire il leveraggio completo di distanziale interno.
- Inserire l'asse.

- Tenendo ferma la bussola mantenere la traccia orizzontale e azzerare i giochi serrando la ghiera interna.
- Serrare la ghiera esterna tenendo ferma la bussola.

- Serrare il dado tenendo fermo l'asse del perno.



- Riavvitare i puntoni al leveraggio.
- Riavvitare le staffe dei puntoni al carter e al supporto marmitta.
- Riavvitare l'ammortizzatore al leveraggio.



SEQUENZA DI SERRAGGIO LEVERAGGIO SOSPENSIONE POSTERIORE:

1. Posizionare la bussola filettata «**B**» nella boccola destra del telaio, insieme alle ghiere «**A**» e «**D**» avvitandole senza serrare.

2. Posizionare il distanziale «**G**» nella boccola sinistra del telaio.

3. Inserire il leveraggio «**F**» completo di distanziale «**E**» nel telaio.

4. Inserire l'asse «**H**».

5. Tenendo ferma la bussola «**B**», mantenere la traccia orizzontale (± 5°); azzerare i giochi serrando la ghiera «**A**».

6. Serrare la ghiera «**D**» tenendo ferma la bussola «**B**».

7. Serrare il dado «**C**» tenendo fermo l'asse «**H**».

LEVERAGGIO SOSPENSIONE POSTERIORE

Name	Torque in Nm
Rear shock absorber - Suspension linkage	130 ÷ 140
Right strut screw - Rear suspension linkage	45 ÷ 50
Left strut screws - Right strut bracket	45 ÷ 50
Right strut bracket screws - Silencer support	24 ÷ 27
Left strut screw - Linkage	45 ÷ 50
Left strut bracket screws - Crankcase	24 ÷ 27
Linkage axis nut	110 ÷ 115
Linkage axis internal ring nut	5 - 7
Linkage axis external ring nut	57 ÷ 63

MONTAGGIO AMMORTIZZATORE POSTERIORE COMPLETO DI DIPOSITIVO ELETTRICO

- Al banco montare la staffa di attacco all'ammortizzatore avvitando leggermente il dado di fissaggio.

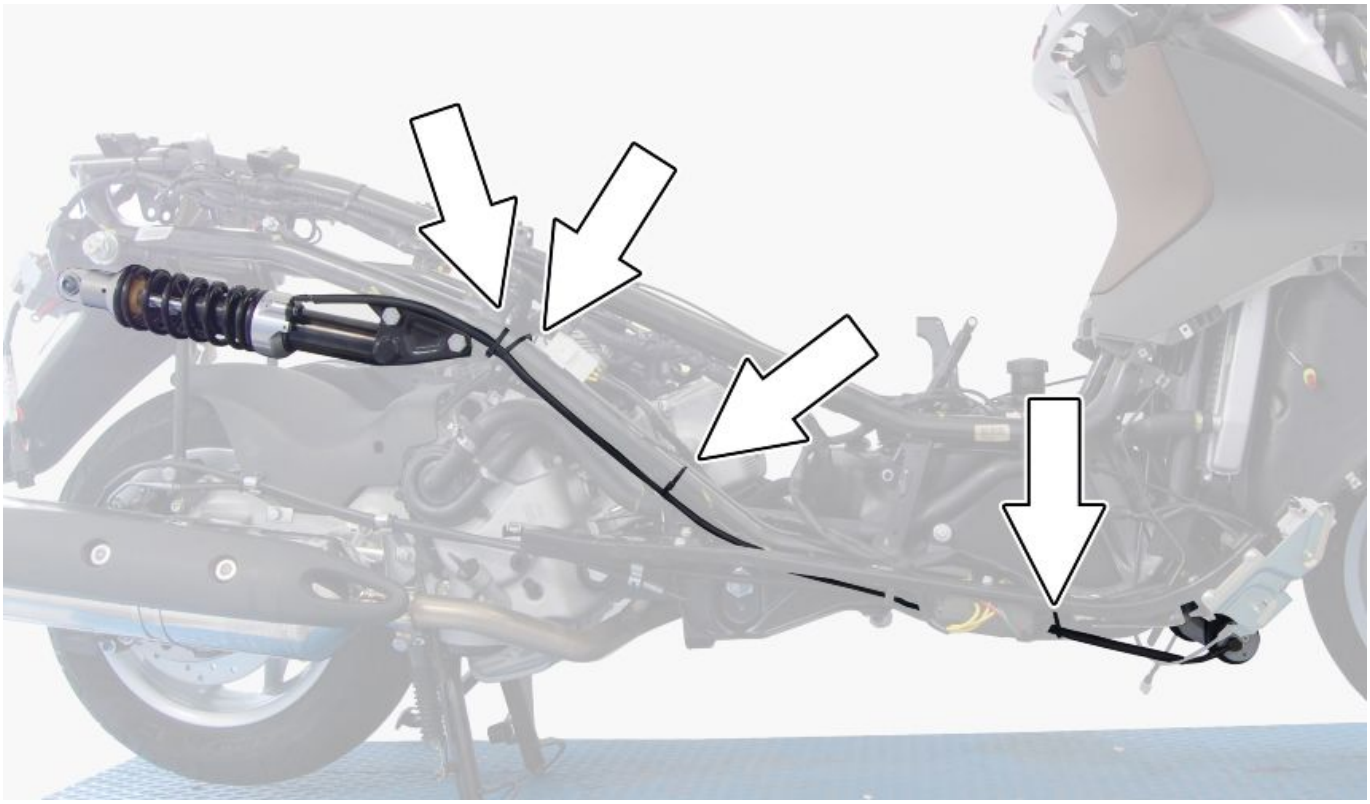
- Riposizionare il dispositivo elettrico completo delle fascette di fissaggio e serrare alla coppia prescritta le viti di fissaggio al telaio.

CAUTION

PREDISPORRE IL DISPOSITIVO ELETTRICO CON I RIFERIMENTI INDICATI IN FIGURA IN VERTICALE.

- Montare la staffa di attacco completa di ammortizzatore sul telaio.
- Avvitare i dadi di fissaggio della staffa.
- Serrare definitivamente a coppia il dado di fissaggio dell'ammortizzatore alla staffa.
- Allineare il foro presente sul leveraggio sospensione con quello posteriore dell'ammortizzatore, abbassando eventualmente il veicolo agendo sull'assieme puntone destro.

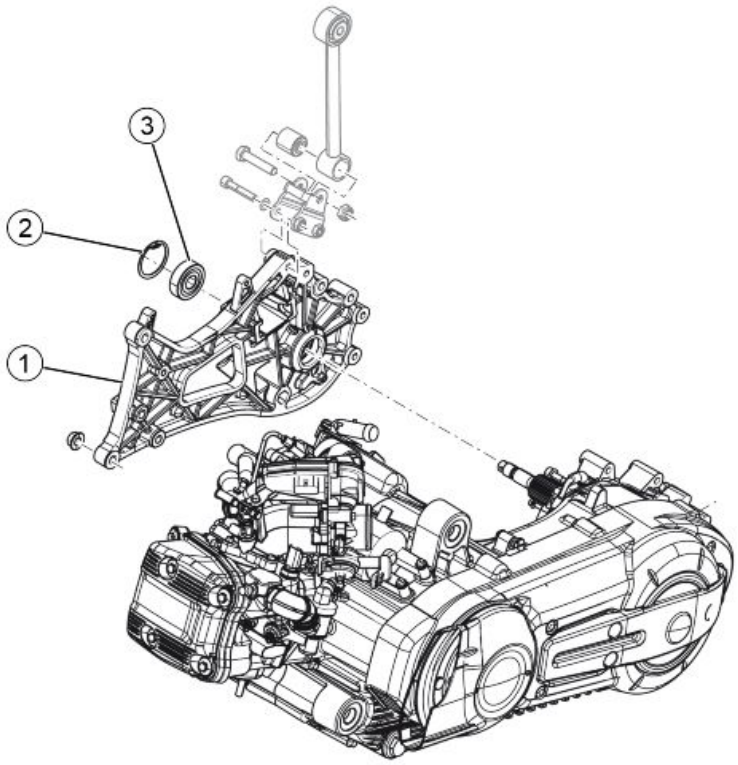
- Avvitare la vite di fissaggio posteriore dell'ammortizzatore
- Fissare la tubazione al telaio con fascette di ritegno, assicurandosi di posizionarla correttamente come in figura.
- Avvitare la staffa della pedana poggiapiedi.



AMMORTIZZATORE POSTERIORE

Name	Torque in Nm
Shock absorber attachment bracket - Frame	110 - 120
Rear shock absorber - Attachment bracket	130 ÷ 140
Rear shock absorber - Suspension linkage	130 ÷ 140

Exhaust bracket



LEGENDA:

1. Staffa supporto marmitta (Braccio sospensione)

2. Anello seeger

3. Cuscinetto a sfere

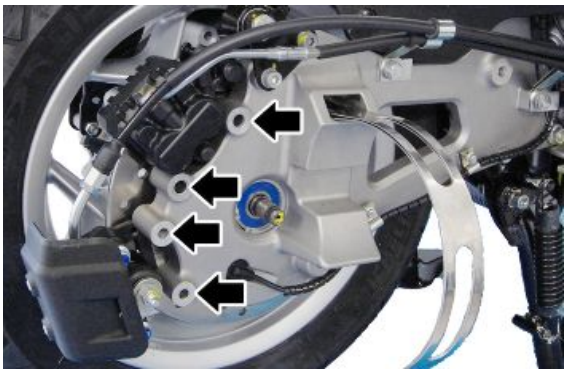
Removal

- Rimuovere il silenziatore.
- Posizionare il mezzo sul cavalletto centrale.

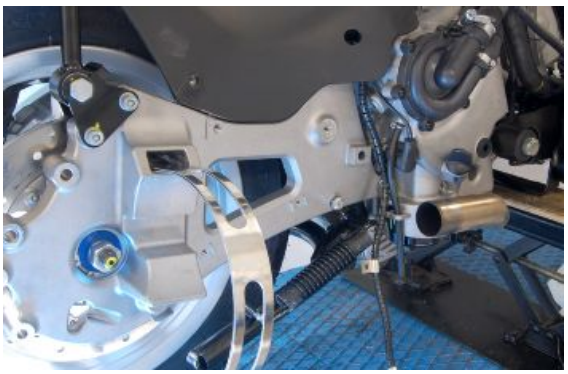
- Rimuovere la coppiglia e la copertura del dado.

- Con cavalletto laterale abbassato rimuovere il dado di fissaggio della ruota posteriore e il relativo distanziale.

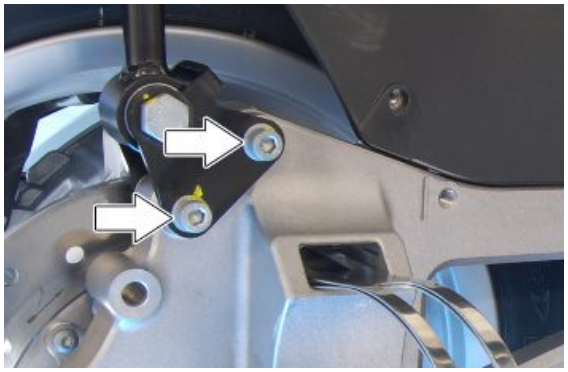
- Rimuovere il freno posteriore e il freno di stazionamento svitando le viti indicate.



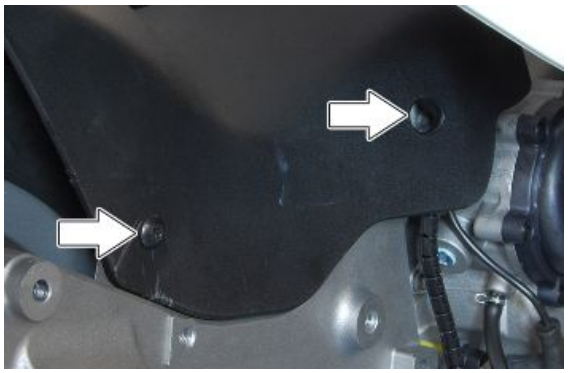
- Rimuovere le staffe della tubazione del freno posteriore e del cavo del freno di stazionamento, le staffe del cavo del sensore ruota fonica ed il sensore stesso.



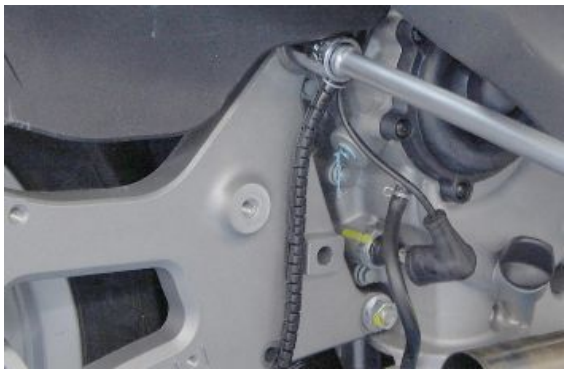
- Rimuovere le viti della staffa del leveraggio della sospensione posteriore e disaccoppiare la staffa dal supporto della marmitta.



- Rimuovere le viti di fissaggio del parafango posteriore alla staffa supporto marmitta.



- Rimuovere i dadi di fissaggio del supporto marmitta al carter disimpegnandolo dal parafango posteriore.



- Rimuovere il supporto marmitta disimpegnandolo dal parafango posteriore.

Overhaul

- Mediante le apposite pinze rimuovere l'anello elastico.

Specific tooling

002465Y Pliers for circlips

- Poggiare il supporto marmitta su supporti di legno per poter lavorare in piano con la parte interna rivolta verso l'alto.
- Con l'ausilio del manico, dell'adattatore e della guida battendo con un mazzuolo rimuovere il cuscinetto.
- Verificare che il cuscinetto non presenti anomalie o impuntamenti, in caso contrario provvedere alla sostituzione.

Specific tooling

020477Y 37 mm adaptor

020439Y 17-mm guide

- Mediante pistola termica riscaldare la sede del cuscinetto.
- Con l'utilizzo del apposito manico, dell'adattatore e della guida, con alcuni colpi di mazzuolo, posizionare il cuscinetto nella propria sede.
- Con l'apposita pinza riposizionare l'anello elastico di bloccaggio.

Specific tooling

020151Y Air heater

002465Y Pliers for circlips

020359Y 42x47-mm Adaptor

020439Y 17-mm guide

Refitting

Eseguire le operazioni in senso inverso allo smontaggio rispettando le coppie prescritte.

- Installare il sensore ruota fonica con la relativa rondella.
- Rilevare la quota «**K**» mediante l'ausilio di uno spessimetro e verificarne il corretto valore:

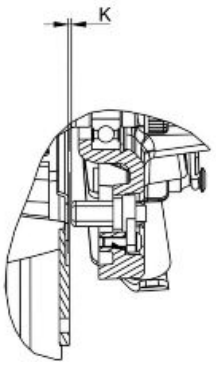
K= (1,05÷1.85) mm

Rilevare la quota «**K**» mediante l'ausilio di uno spessimetro e verificarne il corretto valore.

Characteristic

Distanza sensore ruota fonica

K= 1,05÷1.85 mm



STAFFA SUPPORTO MARMITTA

Name	Torque in Nm
Rear wheel axle nut	102 - 123
Silencer bracket screws - Crankcase	34 ÷ 42 (**)
Right strut bracket screws - Silencer support	24 ÷ 27
Screw fixing parking brake calliper to supporting plate	24 ÷ 27 (*)
Rear brake calliper fixing screws	41 - 51
Central stand bracket bolts	19,5-24,5

(*) with Loctite 243

(**) after tightening the rear wheel axle nut

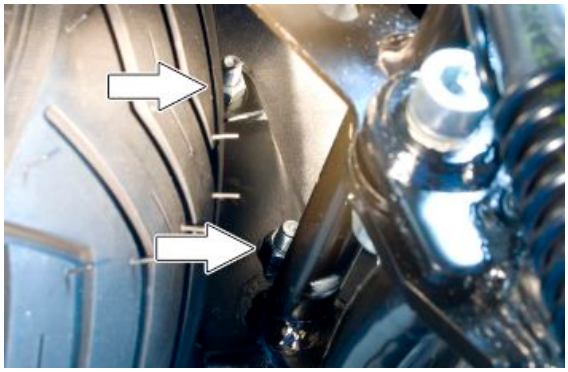
Centre-stand

- Sostenere adeguatamente il veicolo.
- Rimuovere il silenziatore.
- Con cavalletto centrale sollevato svitare le viti di fissaggio della staffa di supporto del cavalletto centrale alla staffa supporto marmitta.
- Svitare i dado di fissaggio della staffa di supporto del cavalletto centrale al carter.
- Rimuovere il cavalletto.
- In fase di rimontaggio, serrare il dado alla coppia di bloccaggio prescritta.

CAUTION

SUPPORT THE VEHICLE ADEQUATELY.

- Svitare i dadi di fissaggio della staffa supporto del cavalletto centrale al telaio.
- Rimuovere il cavalletto centrale completo di staffa supporto.



- Al banco, sganciare la molla, svitare i relativi bulloni di fissaggio e separare il cavalletto centrale alla staffa di supporto. Prestare attenzione alle boccole presenti.
- Prima di procedere al rimontaggio, verificare l'integrità dei componenti.
- In fase di rimontaggio, serrare i dadi di fissaggio della staffa di supporto cavalletto al telaio alla coppia prescritta.

CAUTION

TO PREVENT INJURY AND DAMAGE THE SPRING MUST BE REMOVED WITH THE CENTRE STAND UP.

Locking torques (N*m)

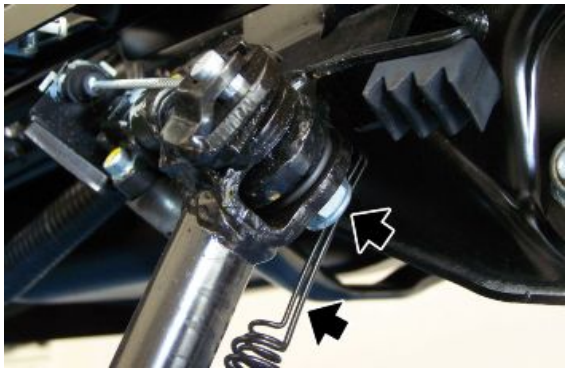
Central stand bracket bolts 19,5-24,5

Side stand

- Posizionare il veicolo sul cavalletto centrale.

Smontaggio cavalletto laterale

- Sganciare la molla.
- Svitare e togliere la vite, recuperando posteriormente il dado.
- Rimuovere il cavalletto laterale, liberandolo dal cavo metallico.



Montaggio cavalletto laterale

- Eseguire le precedenti operazioni in ordine inverso.

CAUTION

LOWERING THE SIDE STAND SIMULTANEOUSLY MOVES THE PARKING BRAKE. BEFORE LEAVING BE SURE TO HAVE STORED IT.

Locking torques (N*m)

Side stand fixing bolt 40 to 45

See also

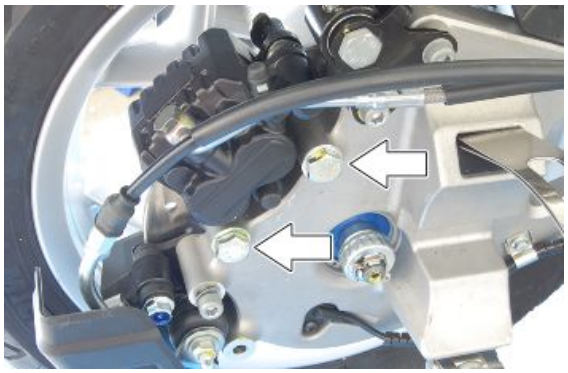
Parking
brake

INDEX OF TOPICS

BRAKING SYSTEM	BRAK SYS

Removal

- Rimuovere il silenziatore.
- Rimuovere i due fissaggi pinza freno posteriore al supporto come indicato in foto.

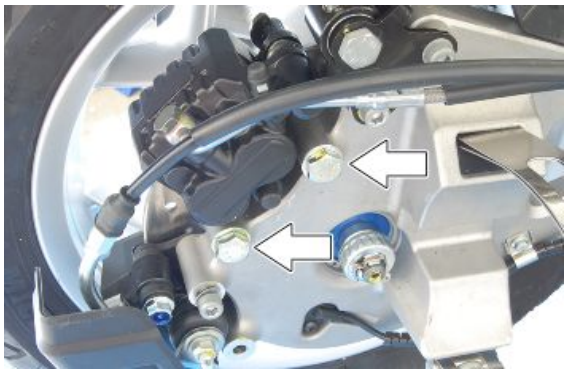


N.B.

IF IT IS NECESSARY TO REPLACE OR SERVICE THE BRAKE CALLIPER, BEFORE REMOVING THE FITTINGS FIXING THE CALLIPER TO THE SUPPORT BRACKET, FIRST LOOSEN THE OIL HOSE FITTING AFTER HAVING EMPTIED THE SYSTEM OF THE CIRCUIT BEING EXAMINED.

Refitting

- Follow the removal procedures but in reverse order and tighten to the prescribed torques with the recommended product.



Locking torques (N*m)

Rear brake calliper fixing screws 41 - 51

Se è stata sostituita la pinza:

CAUTION

ONCE REFITTING IS FINISHED, BLEED THE SYSTEM.

CAUTION

ALWAYS USE NEW COPPER WASHERS.

Locking torques (N*m)

Rear brake calliper-pipe fitting 20 ÷ 25

FITTING BRAKING DISTRIBUTION VALVE

- To fit the valve, follow the above operations but in reverse order.

CAUTION

ALWAYS USE NEW COPPER WASHERS.

N.B.

ONCE REFITTING IS FINISHED, BLEED THE SYSTEM.

Locking torques (N*m)

Screws fixing the distribution mechanism 10 to 11 **Brake fluid pipe-calliper fitting** 20 ÷ 25

See also

Rear - combined

Refitting

- Per il montaggio della pinza ripetere in senso inverso le operazioni precedentemente descritte.

Locking torques (N*m)

Screw tightening calliper to support 20 ÷ 25

If the calliper is replaced:

CAUTION

ALWAYS USE NEW COPPER WASHERS.

CAUTION

ONCE REFITTING IS FINISHED, BLEED THE SYSTEM.

Locking torques (N*m)

Brake fluid pipe-calliper fitting 20 ÷ 25

See also

Front

Removal

- Rimuovere la ruota anteriore.
- Svitare le cinque viti di fissaggio disco e rimuoverle, unitamente alle relative bussole e molle a tazza.
- Pulire bene le sedi sul mozzo ruota anteriore e sul disco.

Refitting

Per il montaggio operare come descritto di seguito:

- Inserire le due pastiglie all'interno della pinza.
- Avendo cura di posizionare correttamente la molla di ritegno, avvitare il perno di bloccaggio pastiglie alla giusta coppia di bloccaggio applicando il prodotto consigliato.
- Procedere con il montaggio della pinza sul proprio supporto serrando le due viti alla coppia prescritta.

N.B.

IF IT IS NOT POSSIBLE TO CORRECTLY POSITION THE CALLIPER ON THE DISC DURING FITTING, GENTLY EXPAND THE PADS.

Recommended products

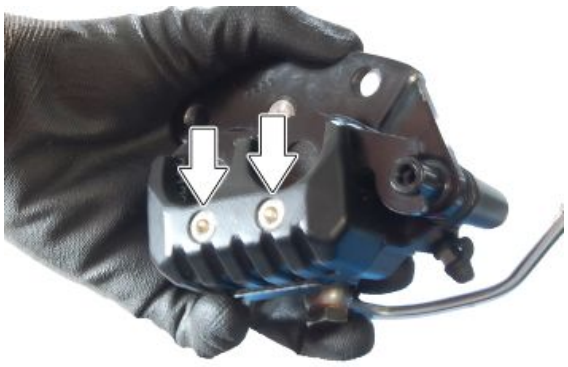
Loctite 243 Medium-strength threadlock

Medium Loctite 243 threadlock

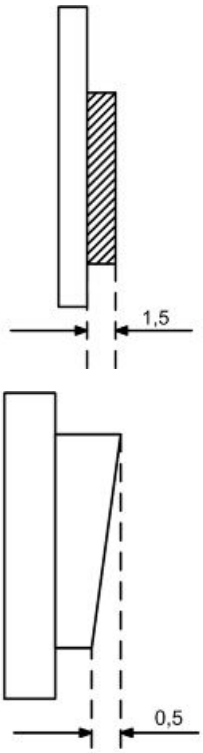
Locking torques (N*m)

Screw tightening calliper to support **20 ÷ 25** **Pad fastening pin** **19.6 to 24.5**

Removal



- Remove the rear brake calliper
- Loosen the two pins shown in the figure that lock the two pads; be careful with the pad spring clamp.
- Remove the brake pads and check there are no faults or warping. Replace it if such anomalies are present.
- Check the thickness of the friction material is more than 1.5 mm. If it is not, replace it
- The replacement must be made with greater residual thickness if the brake pad has not worn evenly. A 0.5 mm thickness difference in the residual friction material is permitted.



See also

Removal

Refitting

To fit, proceed as follows:

- Insert the two pads in the callipers.

- Screw the two pad lock pins to the correct torque, and apply the recommended product.

- Fit the calliper on its support, tightening the two screws to the prescribed torque.

N.B.

IF IT IS NOT POSSIBLE TO CORRECTLY POSITION THE CALLIPER ON THE DISC DURING FITTING, GENTLY EXPAND THE PADS.

Recommended products

Loctite 243 Medium-strength threadlock

Medium Loctite 243 threadlock

Locking torques (N*m)

Rear brake calliper fixing screws 41 - 51 Pad fastening pin 19.6 to 24.5

Rear - combined

- Remove the rubber cap from the bleed screw.
- Insert a rubber pipe in the bleed screw to permit the brake fluid to be recovered.
- With the brake lever, load the system and bring it up to the required pressure.
- Keeping the brake lever pulled, loosen the bleed screw to purge the air in the system. Then tighten the bleed screw
- Ripetere l'operazione fino a quando dal tubo in gomma non fuoriesce solamente liquido freni.
- Rimuovere il tubo recupero liquido e rimontare il cappuccio in gomma sulla vite di spurgo.
- Ripristinare il livello liquido freni in vaschetta.

In caso di necessità è possibile eseguire lo spurgo anche mediante pompa a depressione specifica

THE BLEEDING OPERATIONS OF THE BRAKING SYSTEM, EVEN FOR THE VERSION EQUIPPED WITH ABS SYSTEM, DO NOT ALLOW THE USE OF DIAGNOSTIC TESTER, AND ARE THEREFORE EQUAL TO THOSE DESCRIBED FOR THE STANDARD BRAKE SYSTEM.

N.B.

DURING THE BLEEDING OPERATIONS, MAKE SURE THE BRAKE FLUID DOES NOT COME INTO CONTACT WITH THE BODYWORK SO AS NOT TO DAMAGE IT. FURTHERMORE, DURING THE BLEEDING OPERATIONS REGARDING THE BRAKE CALLIPERS, MAKE SURE THE BRAKE FLUID DOES NOT COME INTO CONTACT WITH THE DISC BRAKES AND WITH THE BRAKE PADS. FAILURE TO OBSERVE THIS PRECAUTION WILL ENDANGER THE PROPER WORKING AND EFFICIENCY OF THE BRAKING SYSTEM

Specific tooling

020329Y Mity-Vac vacuum-operated pump

Locking torques (N*m)

Oil bleed screw 12 - 16

Front

- Remove the rubber cap from the bleed screw.
- Insert a rubber pipe in the bleed screw to permit the brake fluid to be recovered.
- With the brake lever, load the system and bring it up to the required pressure.
- Keeping the brake lever pulled, loosen the bleed screw to purge the air in the system. Then tighten the bleed screw
- Ripetere l'operazione fino a quando dal tubo in gomma non fuoriesce solamente liquido freni.
- Rimuovere il tubo recupero liquido e rimontare il cappuccio in gomma sulla vite di spurgo.

- Ripristinare il livello liquido freni in vaschetta.

In caso di necessità è possibile eseguire lo spurgo anche mediante pompa a depressione specifica

THE BLEEDING OPERATIONS OF THE BRAKING SYSTEM, EVEN FOR THE VERSION EQUIPPED WITH ABS SYSTEM, DO NOT ALLOW THE USE OF DIAGNOSTIC TESTER, AND ARE THEREFORE EQUAL TO THOSE DESCRIBED FOR THE STANDARD BRAKE SYSTEM.

N.B.

DURING THE BLEEDING OPERATIONS, MAKE SURE THE BRAKE FLUID DOES NOT COME INTO CONTACT WITH THE BODYWORK SO AS NOT TO DAMAGE IT. FURTHERMORE, DURING THE BLEEDING OPERATIONS REGARDING THE BRAKE CALLIPERS, MAKE SURE THE BRAKE FLUID DOES NOT COME INTO CONTACT WITH THE DISC BRAKES AND WITH THE BRAKE PADS. FAILURE TO OBSERVE THIS PRECAUTION WILL ENDANGER THE PROPER WORKING AND EFFICIENCY OF THE BRAKING SYSTEM

Specific tooling

020329Y Mity-Vac vacuum-operated pump

Locking torques (N*m)

Oil bleed screw 12 - 16

Refitting

- Al rimontaggio eseguire l'operazione in senso inverso.

- Bloccare la tubazione idraulica alla coppia prescritta ed effettuare lo spurgo dell'impianto.

Ad operazione conclusa serrare la vite di spurgo olio alla coppia prescritta.

N.B.

WHILE REFITTING, REPLACE THE COPPER GASKETS ON THEIR FITTINGS.

WARNING

BRAKE FLUID IS HYGROSCOPIC; THAT IS, IT ABSORBS MOISTURE FROM THE SURROUNDING AIR. IF THE LEVEL OF MOISTURE IN THE FLUID EXCEEDS A GIVEN VALUE, BRAKING WILL BE INEFFICIENT. THEREFORE, ALWAYS USE FLUID FROM SEALED CONTAINERS. UNDER NORMAL DRIVING AND CLIMATIC CONDITIONS YOU SHOULD CHANGE THIS FLUID EVERY TWO YEARS. IF 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 BRAKE FLUID ON IT.

Locking torques (N*m)

Oil bleed screw 12 - 16 Raccordo olio pompa-tubo 13÷18 Fixing screws for the handlebar control unit U-bolts 7 ÷ 10

See also

Front

Refitting

- Al rimontaggio eseguire l'operazione in senso inverso.

- Bloccare la tubazione idraulica alla coppia prescritta ed effettuare lo spurgo dell'impianto.

Ad operazione conclusa serrare la vite di spurgo olio alla coppia prescritta.

N.B.

WHILE REFITTING, REPLACE THE COPPER GASKETS ON THEIR FITTINGS.

WARNING

BRAKE FLUID IS HYGROSCOPIC; THAT IS, IT ABSORBS MOISTURE FROM THE SURROUNDING AIR. IF THE LEVEL OF MOISTURE IN THE FLUID EXCEEDS A GIVEN VALUE, BRAKING WILL BE INEFFICIENT. THEREFORE, ALWAYS USE FLUID FROM SEALED CONTAINERS. UNDER NORMAL DRIVING AND CLIMATIC CONDITIONS YOU SHOULD CHANGE THIS FLUID EVERY TWO YEARS. IF 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 BRAKE FLUID ON IT.

Locking torques (N*m)

Oil bleed screw 12 - 16 Raccordo olio pompa-tubo 13÷18 Fixing screws for the handlebar control unit U-bolts 7 ÷ 10

See also

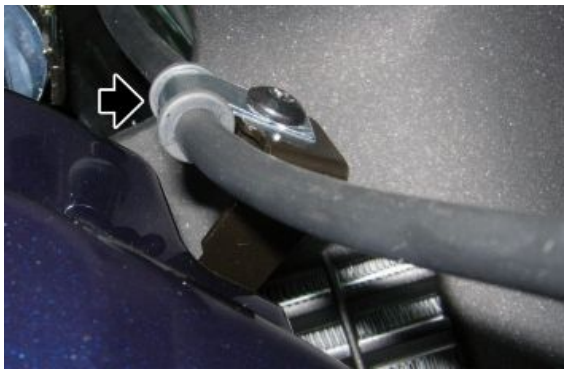
Rear - combined

Brake pipes

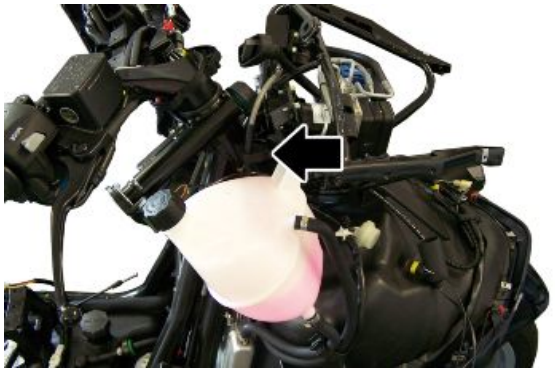
FRONT BRAKE PIPES REMOVAL

- Remove all the front plastics of the bodywork, including the handlebar.
- Disconnect the brake pipes from the left front caliper and drain the system collecting the fluid.

- Remove the metal clamp placed inside the front wheel housing.

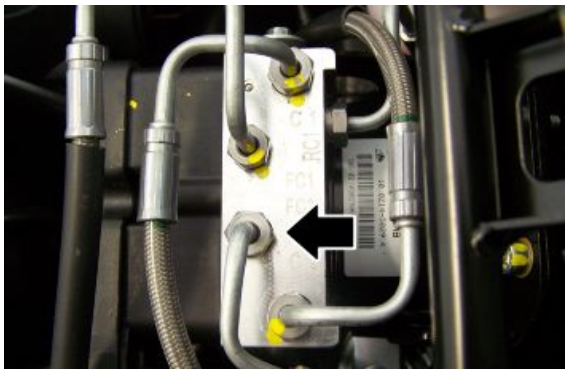


- Release the pipes from the spring.

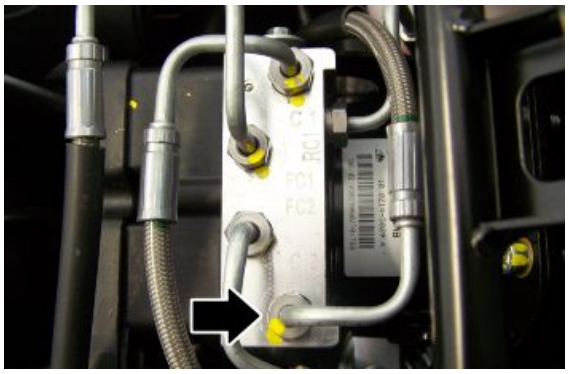


- Disconnect the front left brake caliper line from the ABS unit.

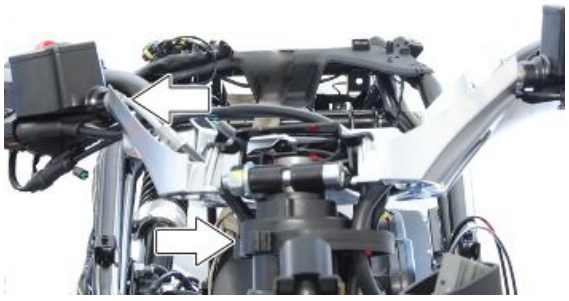
The first section of the line is now free.



- Disconnect the right hand brake master line from the ABS unit.



- Release the pipes from the collar.
- Disconnect the pipes from the right brake pump.

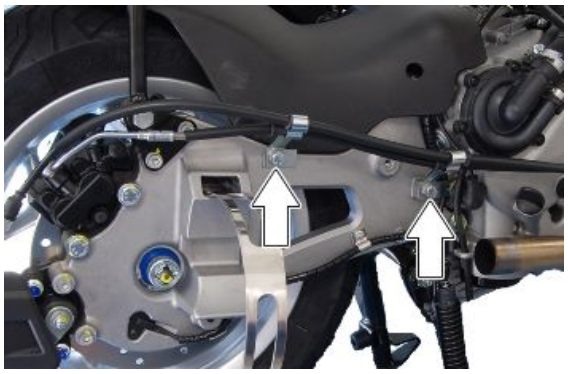


INTEGRAL REAR BRAKE PIPES REMOVAL

- Remove all the plastics of the bodywork, including the handlebar.
- Disconnect the brake pipes from the rear calliper and drain the system collecting the fluid.

- Disconnect the brake pipes from the right front calliper and drain the system collecting the fluid.

- Remove the metal clamp.

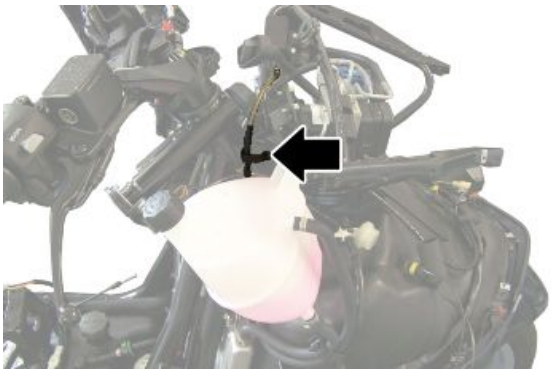


- Remove the metal clamp and release the pipes from the spring.

- Release the pipes from the springs.

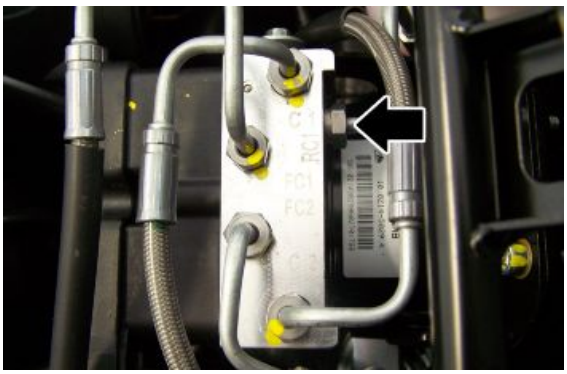
- Rimuovere le fascette di fisaggio della tubazione al telaio.

- Release the pipes from the spring.



- Disconnect the rear hand brake caliper line from the ABS unit.

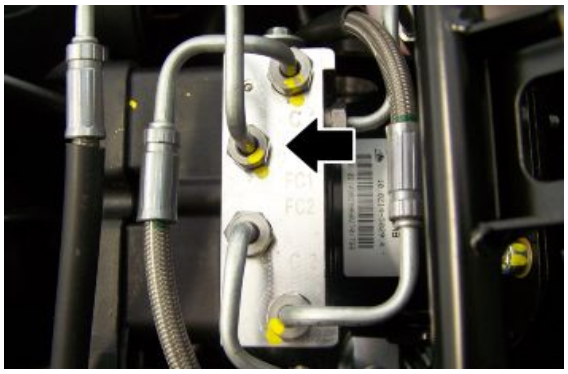
The first section of the line is now free.



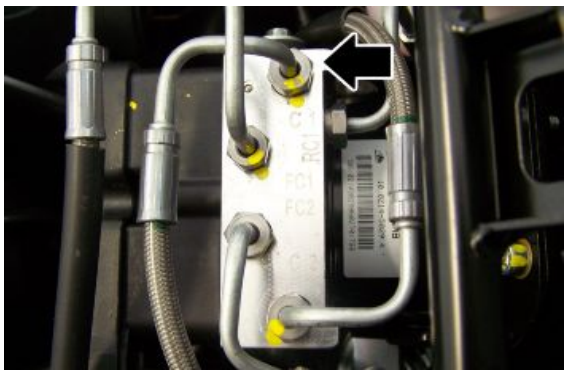
- Remove the metal clamp placed inside the front wheel housing.

- Disconnect the pipes from the distribution valve.

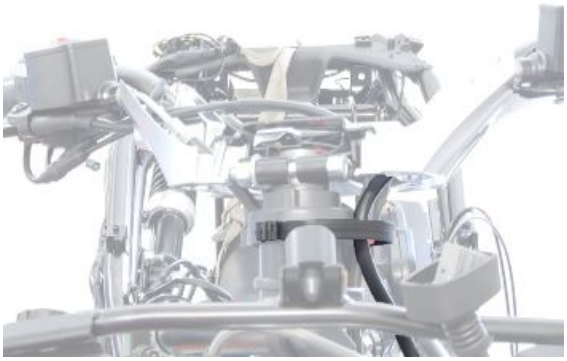
- Disconnect the front right brake caliper line from the ABS unit.
The second section of the line is now free.



- Disconnect the left hand brake master line from the ABS unit.



- Release the pipes from the collar.



- Disconnect the pipes from the left brake pump.

INSTALLAZIONE TUBAZIONI FRENO

- Per il montaggio eseguire le operazioni di smontaggio in senso inverso.

THE CONTROL UNIT, SUPPLIED AS A SPARE, IS SEALED AND COMES WITH BRAKE FLUID. ANY LOSS OF FLUID DUE TO INSTALLATION OPERATIONS CAN BE RESET BY TOPPING UP THE SYSTEM.

CAUTION

ONCE REFITTING IS FINISHED, BLEED THE SYSTEM.

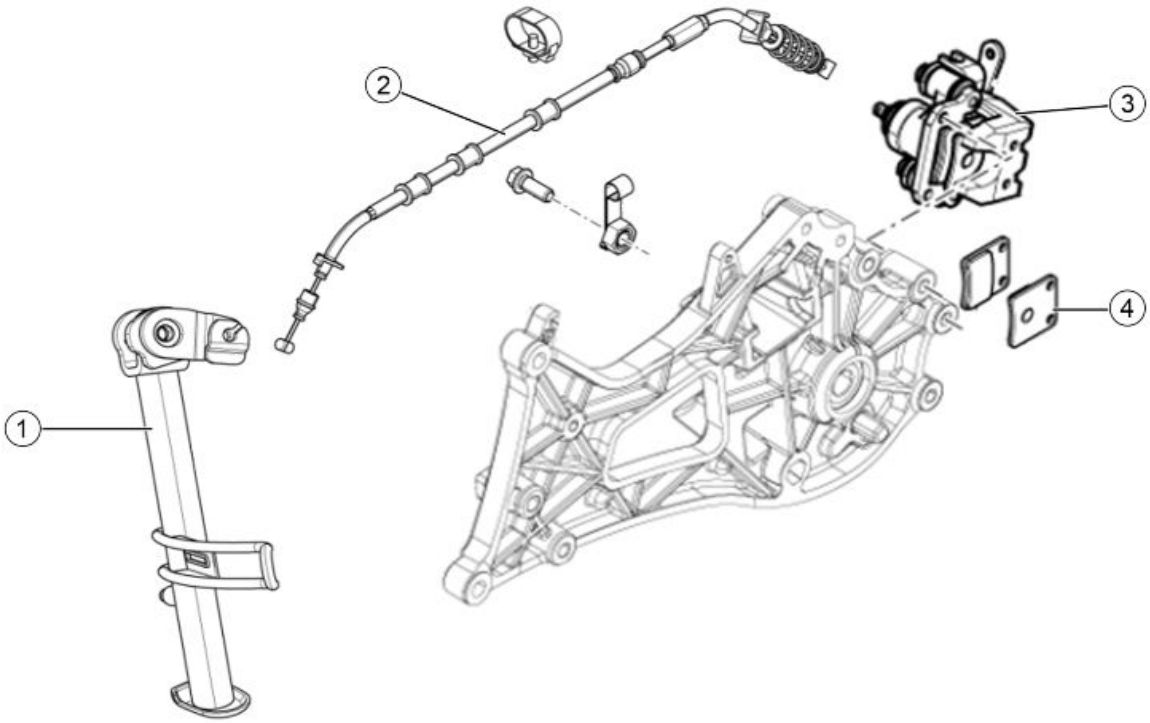
Locking torques (N*m)

Raccordo olio pompa-tubo 13÷18 Brake fluid pipe-calliper fitting 20 ÷ 25 Front calliper pipe tightening - distribution mechanism 20 ÷ 25 Brake pipes fixing screw at the distribution mechanism 20 ÷ 25 Pump pipe grommet screw - clamp 6 - 10 Pipe fittings - ABS control unit 13 - 18 Rear brake calliper-pipe fitting 20 ÷ 25

Parking brake

CAUTION

LOWERING THE SIDE STAND SIMULTANEOUSLY MOVES THE PARKING BRAKE. BEFORE LEAVING BE SURE TO HAVE STORED IT.



LEGENDA:

1. Cavalletto laterale

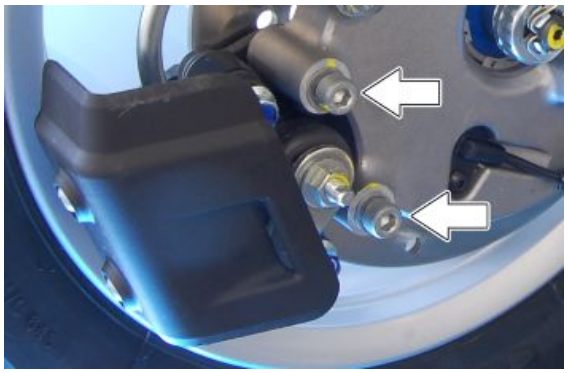
2. Trasmissione comando freno di stazionamento

3. Pinza freno di stazionamento

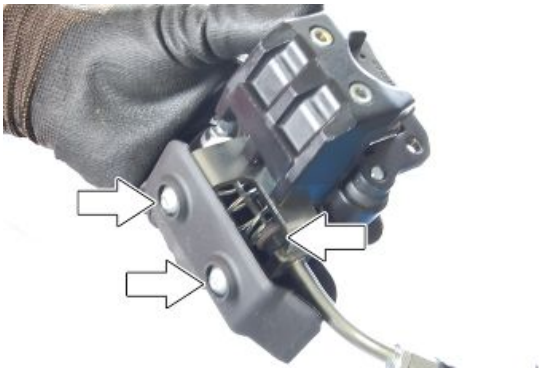
4. Coppia pasticche freno

PARKING BRAKE CALLIPER REMOVAL

- Undo the two screws indicated and remove the calliper from the silencer support bracket.



- Unscrew the two screws indicated to remove the protection, then loosen the indicated nut to remove the transmission.



- Per il rimontaggio eseguire le operazioni in senso inverso. Dopo aver effettuato la registrazione serrare il dado indicato alla coppia prescritta.

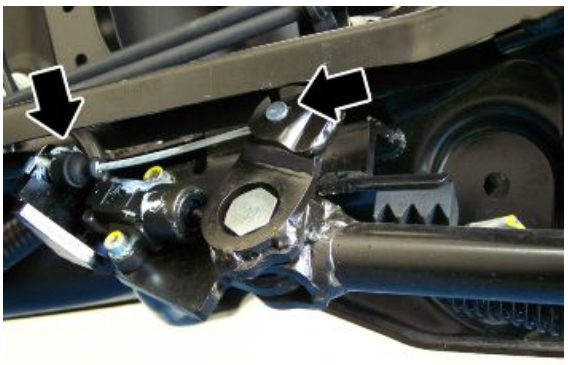
Locking torques (N*m)

Parking brake adjusting nut 10 Screw fixing parking brake calliper to supporting plate 24 ÷ 27 (*)

(*) with Loctite 243

PARKING BRAKE CONTROL REMOVAL

- Remove the left footrest.
- Disconnect the transmission cable and release the pipe from the indicated retainer.



BRAKE PAD REPLACEMENT

- Remove the brake calliper.
- Unscrew the two retaining pins and slide off the pads.
- To refit, carry out the previous operations but in reverse order.

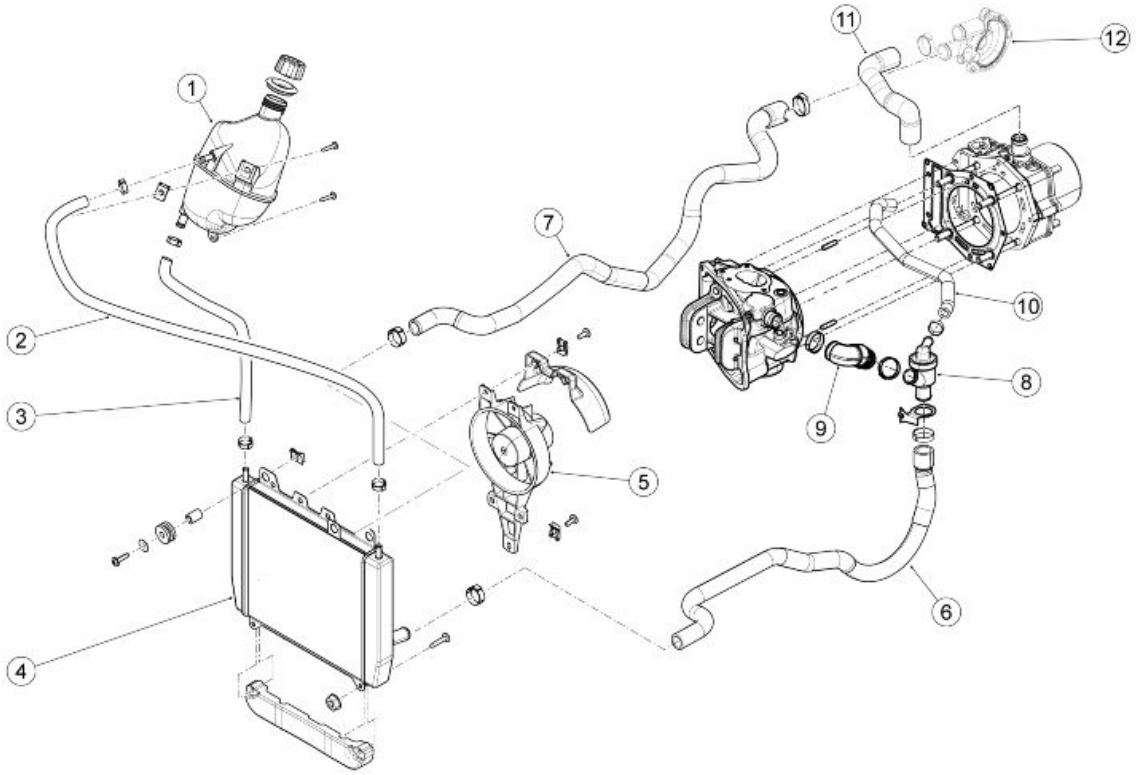
Locking torques (N*m)

Pin fixing parking brake pads 15 to 20

INDEX OF TOPICS

COOLING SYSTEM	COOL SYS

Circuit diagram



1. Vaso di espansione

2. Tubo ritorno vaso espansione

3. Tubo mandata vaso espansione

4. Radiatore

5. Elettroventola

6. Tubazione collegamento termostato-radiatore

7. Tubazione collegamento radiatore-pompa acqua

8. Termostato

9. Tubazione collegamento testa-termostato

10. Tubo by-pass termostato-pompa acqua

11. Tubazione collegamento pompa acqua-cilindro

12. Coperchio pompa acqua

DATI CARATTERISTICI

Specification	Desc./Quantity
Cooling system fluid	1.75 l
Recommended fluid	AGIP PERMANENT SPEZIAL (ready for use)
Sealing pressure	Cap calibrated at 0.9 bar

THERMOSTAT

Specification	Desc./Quantity
Type	Wax-type, with deviator

Specification	Desc./Quantity
Starts opening	90 ± 2°C

ELECTRIC VENTILATION

Specification	Desc./Quantity
Electric ventilation starts at	100° C
Electric ventilation stops at	90° C

WATER PUMP

Specification	Desc./Quantity
Type	Centrifugal
Control	Coaxial to crankshaft

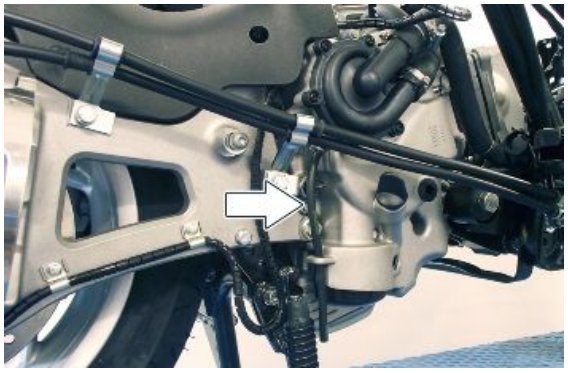
RADIATOR

Specification	Desc./Quantity
Type	Aluminium, with horizontal circulation

EXPANSION TANK

Specification	Desc./Quantity
Calibration	Automatic bleeding, in parallel with the radiator

System sealing check

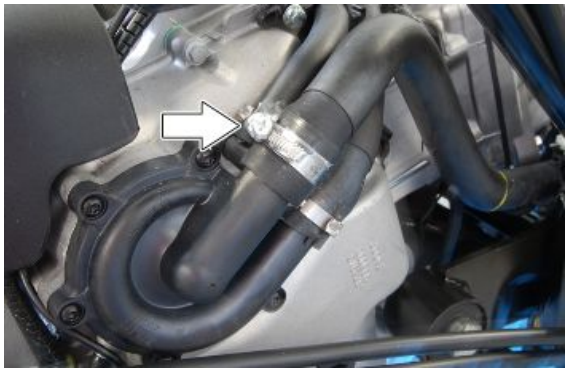


- Verificare la buona tenuta del circuito quando questo è in pressione ed in temperatura.
- Per un controllo più completo attendere che l'impianto sia raffreddato perché piccoli trafilamenti potevano risultare non visibili a causa di fenomeni di evaporazione.
- La pompa acqua prevede un tubo di drenaggio per eventuali trafilamenti da parte della tenuta meccanica dell'impianto di raffreddamento oppure dal paraolio di tenuta dell'alberino.
- Rivelando trafilamenti di liquido di raffreddamento procedere con la revisione della pompa: controllare e sostituire la tenuta meccanica in caso di perdite di liquido oppure il paraolio sull'alberino della girante pompa in caso di perdite di olio.

Coolant replacement

Rimuovere preventivamente:

- il gruppo ottico anteriore
- le fiancate laterali destre e sinistre
- la copertura inferiore
- la pedana poggiapiedi destra.

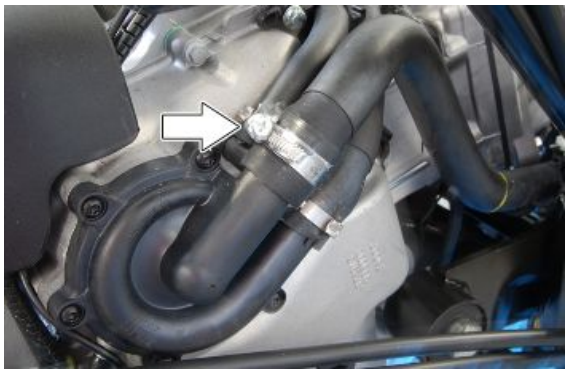


SVUOTAMENTO IMPIANTO DI RAFFREDDAMENTO

Allentare la fascetta e dopo aver sfilato il tubo di mandata alla pompa acqua, lasciar defluire il liquido in un contenitore di capacità adeguata precedentemente posizionato sotto al veicolo.

Per completare lo svuotamento del liquido, aprire anche il tappo del vaso di espansione, situato nel portello plancia destro.

RIPRISTINO IMPIANTO DI RAFFREDDAMENTO



Riposizionare il tubo di mandata alla pompa acqua e fissare con una nuova fascetta.

Attraverso l'imboccatura del vaso di espansione, riempire l'impianto di raffreddamento con liquido consigliato, fino al raggiungimento del livello massimo ed effettuare lo spurgo dell'impianto.

Serrare il tappo del vaso di espansione.

Recommended products

AGIP PERMANENT SPEZIAL Ethylene glycol-based antifreeze fluid with organic inhibition additives. Red, ready to use.

ASTM D 3306 - ASTM D 4656 - ASTM D 4985 - CUNA NC 956-16

Characteristic

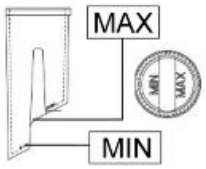
Cooling system fluid

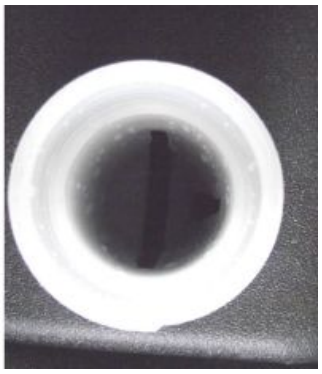
1.75 l

System bleed

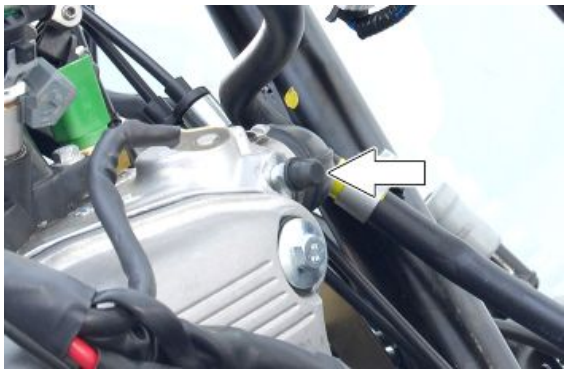
Sollevare la sella e svitare le viti di fissaggio del portello di accesso corpo farfallato.

Assicurarsi che il livello del liquido di raffreddamento sia compreso tra i riferimenti di «**MIN**» e «**MAX**» del vaso di espansione.





Avviare il motore fino a raggiungere la temperatura di funzionamento.
Rimuovere il cappuccio in gomma sulla valvola di spurgo. Applicare un'estremità di un tubo di gomma trasparente sulla vite di spurgo e inserire l'altra in un contenitore idoneo.
Allentare la vite di spurgo e prestare attenzione che dal tubo in gomma fuoriesca esclusivamente liquido di raffreddamento al fine di eliminare eventuali bolle d'aria all'interno del circuito.



Serrare la valvola di spurgo rispettando la coppia prescritta. Ripristinare il livello del liquido di raffreddamento all'interno del vaso di espansione.

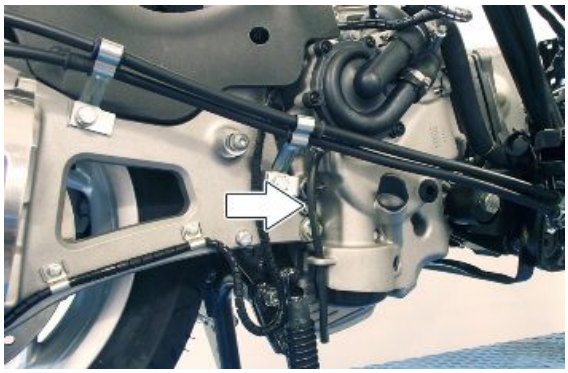
Locking torques (N*m)

Bleed screw 3

Water pump

Water pump

Rilevando rumosità o perdite di liquido dal tubo di drenaggio della pompa acqua, è necessario procedere alla revisione della pompa acqua, come descritto nel Capitolo Motore.



Procedere con alcune operazioni preliminari descritte di seguito:

- Porre il veicolo sul cavalletto centrale e su di un terreno piano.
- Rimuovere i componenti della carrozzeria operando come descritto nel Capitolo Carrozzeria.
- Svuotare l'impianto di raffreddamento, rimuovendo i manicotti posti sul coperchio pompa acqua e il tappo di carico posto sul vaso di espansione.

CAUTION

THIS OPERATION MUST BE CARRIED OUT WHEN THE ENGINE IS COLD.

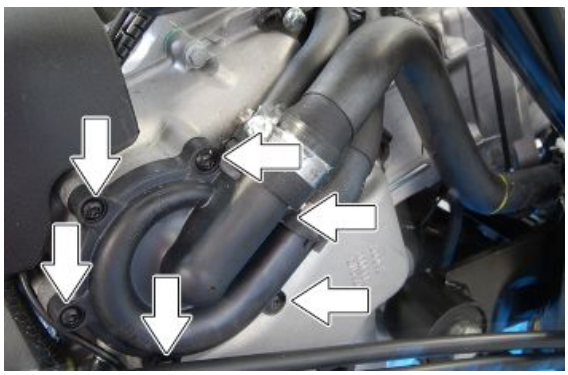
Characteristic

Cooling system fluid

1.75 l

Smontaggio coperchio pompa acqua:

- Rimuovere il coperchio pompa acqua svitando le viti di fissaggio.



- Verificare che il coperchio pompa acqua non presenti deformazioni o crettature.
- Verificare le buone condizioni dell'O-Ring di tenuta.
- In caso contrario sostituire il componente.

- Adequately fit a new O-ring, be careful to lubricate it with petroleum jelly grease.

N.B.

TO AVOID DEFORMATION, DO NOT LUBRICATE THE O-RING WITH PETROLEUM GREASE.

CAUTION

FAILURE TO OBSERVE THIS PRECAUTION WILL IRRETRIEVABLY DEFORM THE O-RING.

- Rimontare il coperchio pompa acqua, bloccando le viti di fissaggio alla coppia prescritta.

N.B.

FOR CHANGING THE COOLANT AND BLEEDING THE SYSTEM, SEE THE "COOLANT CHANGE" SECTION.

Locking torques (N*m)

Water pump cover screws 3 ÷ 4

See also

Water pump

Removal

Effettuare lo svuotamento dell'impianto di raffreddamento.

Allentare le fascette, togliere le tubazioni e rimuovere il termostato.

Check

1) Visually inspect that the thermostat is not damaged.

2) Fill a metal container with approx. 1 litre of water.

Immerse the thermostat, and keep it in the centre of the container.

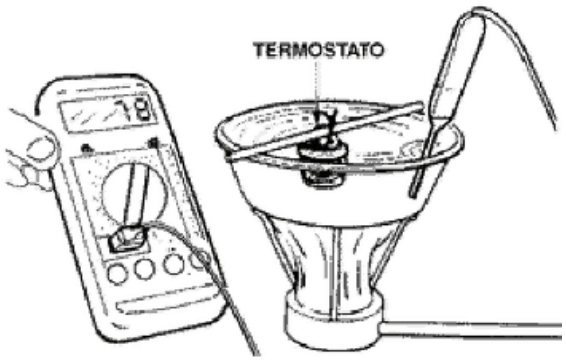
Immerse the multimeter temperature probe, and keep it close to the thermostat.

Heat up the container using the thermal gun.

Check the temperature at which the thermostat starts to open:

Heat up until the thermostat is completely open.

3) Replace the thermostat if it is not working properly.



CAUTION

TO EXECUTE THE TEST CORRECTLY, MAKE SURE NEITHER THE THERMOSTAT NOR THE THERMOMETER TOUCHES THE CONTAINER.

Specific tooling

020331Y Digital multimeter

020151Y Air heater

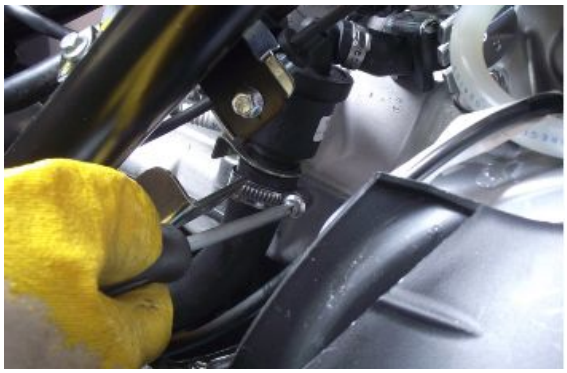
THERMOSTAT

Specification	Desc./Quantity
Type	Wax-type, with deviator
Starts opening	90 ± 2°C

Refitting

Eseguire in ordine inverso le operazioni di smontaggio.

Ripristinato il circuito di raffreddamento rifornire con il prodotto consigliato.



Recommended products

AGIP PERMANENT SPEZIAL Ethylene glycol-based antifreeze fluid with organic inhibition additives. Red, ready to use.

ASTM D 3306 - ASTM D 4656 - ASTM D 4985 - CUNA NC 956-16

Characteristic

Cooling system fluid

1.75 l

INDEX OF TOPICS

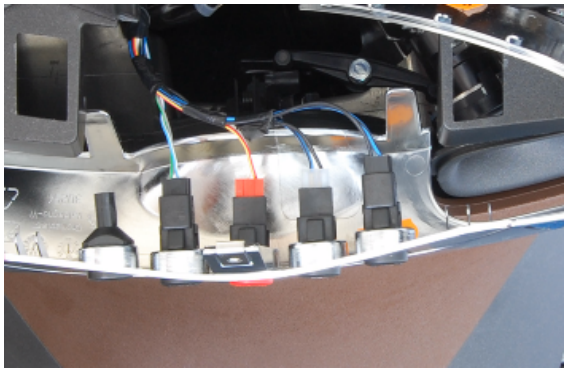
CHASSIS	CHAS

Rear handlebar cover

- To remove the dashboard, first remove the handlebar cover.
- Then undo the central screw.

- Operating from both sides, unscrew the two screws inside the glove-box of the dashboard.

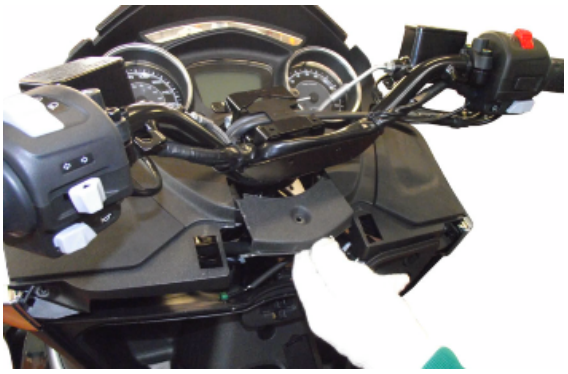
- Remove the moulding switches and disconnect the connectors.



- Unscrew and remove the two side screws.

- Unscrew and remove the two central screws.

- Remove the central cover.



- Remove the expansion tank cap by unscrewing it and temporarily close it with a clean cloth so that no dust or other impurities get into the coolant.

- Remove the internal cover of the dashboard glove-box.
- Working inside the left compartment, disconnect the USB socket connector.

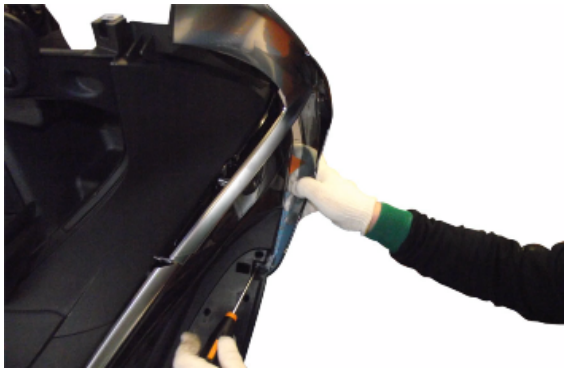
- Disconnect the instrument panel connector.
- Remove the dashboard.
- Remove the cloth and insert the cap in the expansion tank.

FRONT MOULDING REMOVAL

- Remove the moulding switches as described in the dashboard removal

- Remove the front mat by lifting it.

- Undo and remove the screw.



- Remove the side moulding by sliding it off the fittings.

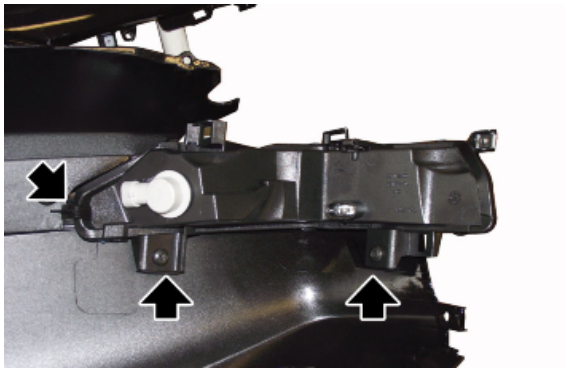
See also

Front handlebar cover

Taillight assy.

First remove the rear centre cover and the side fairing on the affected side.

- Operating on the inside and rear of the fairing, unscrew and remove the two lower screws and remove the relative rear light unit, sliding it from the left fitting fins.



See also

Lower cover
Side fairings

Footrest

Le seguenti operazioni di rimozione sono riferita a una pedana ma valgono per entrambe.

Rimuovere preventivamente la copertura inferiore.

- Svincolare e rimuovere il tappeto anteriore.

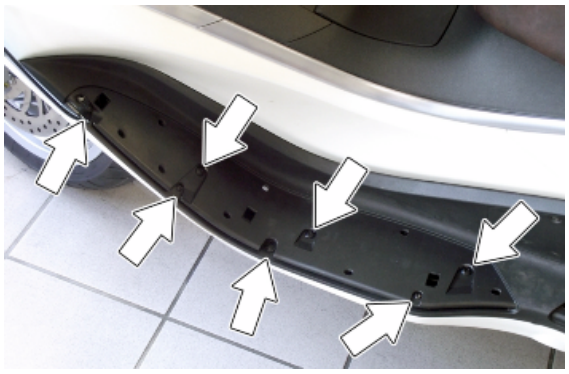
Svitare e togliere le due viti, superiore ed inferiore, e rimuovere la copertura della pedana passeggero.

Svitare la vite di fissaggio della pedana poggiapiedi passeggero.

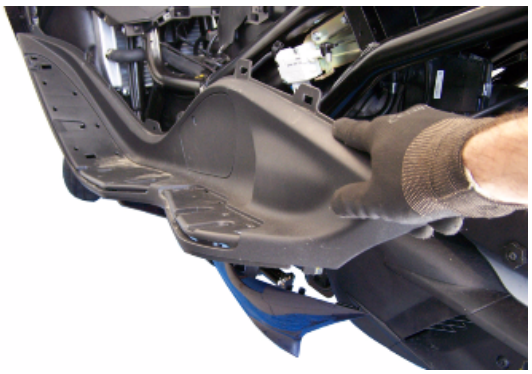
Rimuovere la pedana poggiapiedi passeggero, prestando attenzione alle linguette di incastro.

Svitare le viti di fissaggio della parte posteriore della pedana.

Svitare le viti di fissaggio della parte anteriore della pedana.



Estrarre la pedana poggiapiedi.



- Remove the lower cover of the footrest, being careful not to damage it.

Locking torques (N*m)

Footrests central fixing screws 4.5 to 7 **Footrests rear fixing screws** 4.5 to 7 **Passenger footrest fixing screws** 4.5 to 7 **Passenger footrest rubber fixing screws** 4.5 to 7

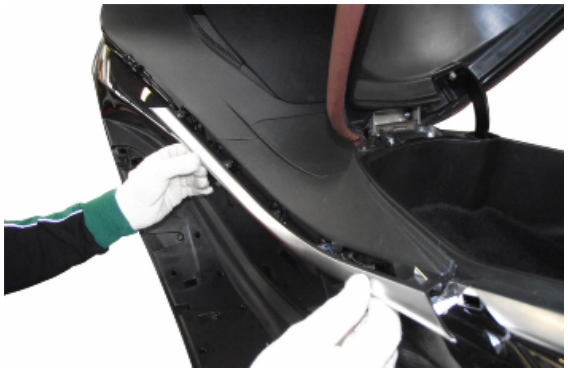
See also

Lower cover

Side fairings

CENTRAL MOULDINGS

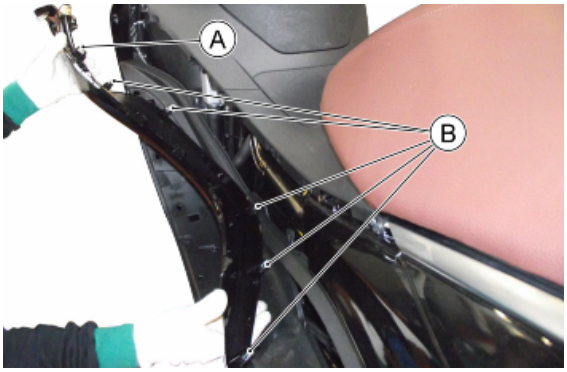
- The right and left central mouldings are removed in the same way, by extracting them with caution from the six fittings that secure to the parts of the bodywork.



REMOVAL OF CENTRAL FAIRINGS

- Remove the front moulding and the central one. Unscrew and remove the 4 screws.

- Remove the side paying close attention and pulling it out from the five side retainers and from the front one.
The operations for the removal of the side are described for one but apply to both.



REMOVAL OF SIDE FAIRINGS

- Remove the saddle.
- Remove the battery.
- Undo the rear fixing screws of the side frame.
- Repeat the operations also for the other side of the vehicle.

- Undo the fixing screws of the rear upper cover.

- Remove the upper cover towards the rear part of the vehicle.

- Remove the central moulding, pulling it outwards.

- Undo the rear fixing screws of the side frame.

- Remove the side frame.
- Repeat the operations also for the other side of the vehicle.

CAUTION

MAKE SURE THAT CLIPS ARE PRESENT ON THE SIDE COVERS

- Undo the fixing screws of the central rear protection.

- Remove the central rear protection.

- Remove the rear lower cover.

- Undo the fixing screws of the central fairing.

- Using a screwdriver deviate the central fairing, detaching the clips and loosen the screw below the side fairing.

- Undo the rear fixing screw of the side fairing.

- Undo the screw fixing the side fairing to the foot-rest.

- Undo the screw fixing the rear light unit to the battery compartment.

- Undo the fixing screws of the fairing.

- Disconnect the electrical connectors of the rear light unit.

Remove the side fairing complete with taillight.

- Repeat the operations also for the other side of the vehicle.

CAUTION

PAY ATTENTION TO THE PRESENCE OF THE PLATES.

REFITTING OF SIDE FAIRINGS

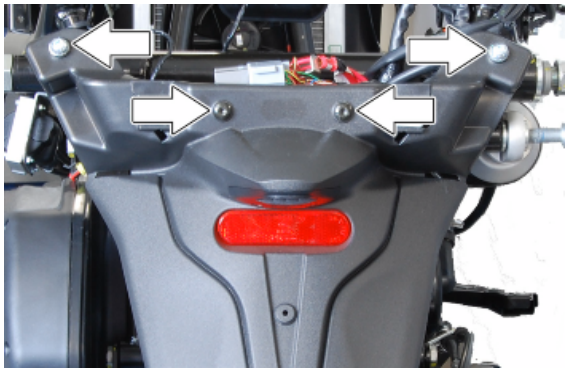
Perform the steps in reverse order described for the dismantling, if necessary tightening the fixing screws to torque.

See also

Rear handlebar cover

License plate holder

- To remove the plate, you must first remove the side fairings.
- Unscrew and remove the four screws.



- Disconnect the license plate light connector and remove the license plate support.

Locking torques (N*m)

Splash guard fixing screws 4.5 to 7

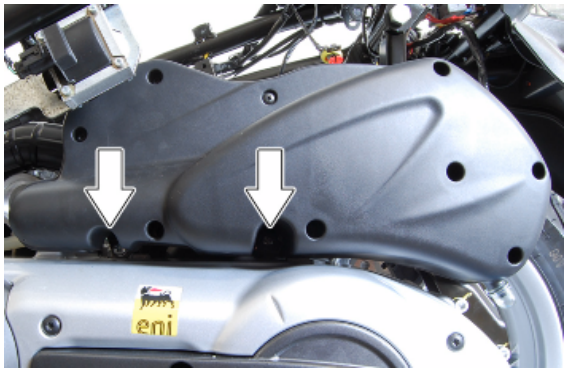
See also

Side fairings

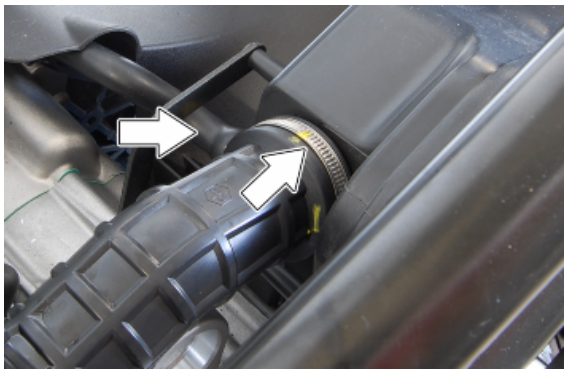
Air filter

To remove the filter box it is first necessary to remove the left side panel.

- Unscrew and remove the two filter box fixing screws.



- Loosen the clamps and remove the pipes.
- Remove the filter box.



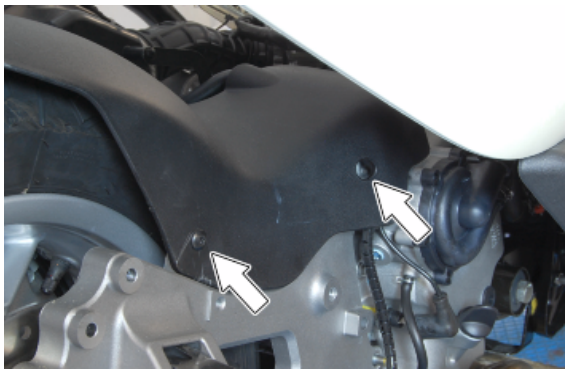
See also

Side fairings

Rear mudguard

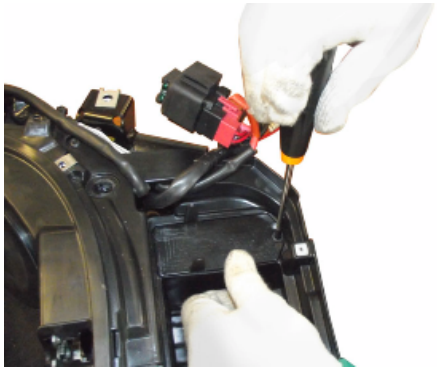
- Working on the left side of the vehicle, undo and remove the two screws fixing the filter box and the rear mudguard.

- Undo and remove the two fixing screws on the right side of the vehicle and release the vapour bleeding pipe of the filter box from the pipe grommet.
- Remove the rear mudguard.

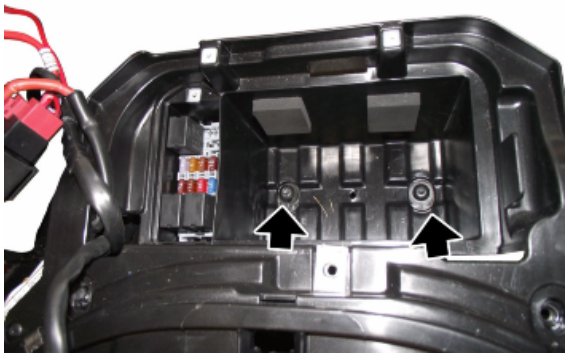


Helmet bay

First remove the saddle, battery, the side fairings and the rear centre cover.
- Unscrew and remove the screw and remove the fuse-box cover.



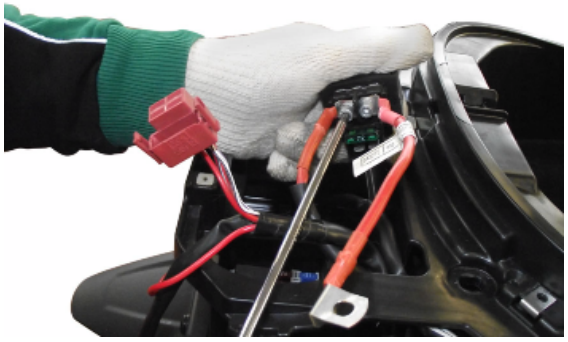
- Undo and remove the two screws from the battery compartment.



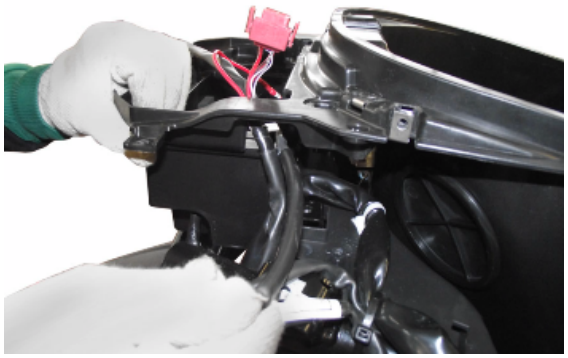
- Working from both sides, unscrew and remove the upper fixing screws.

- Remove the main fuse cover.

- Undoing the screw, disconnect the positive from the cable.



- Release the cabling from the helmet compartment, moving the cables from below, through the opening.

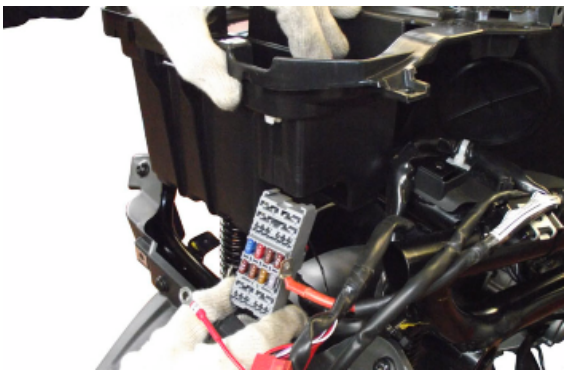


- Undo and remove the two screws from inside the helmet compartment and release the saddle lock.

- Disconnect the two connectors of the helmet compartment light bulb switch.

- Remove the Seeger ring and, retrieving the washer, remove the saddle lifting piston from the linkage.

- Remove the three relays and remove the fuse box from below.



- Remove the helmet compartment paying attention to the saddle linkage.
- Unscrew the clamp if necessary.

Locking torques (N*m)

Helmet compartment fixing screws 4.5 to 7

See also

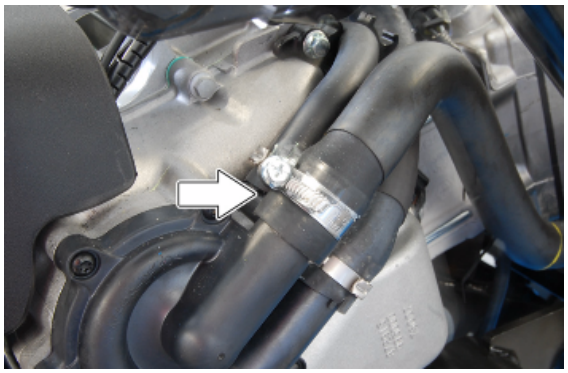
Seat
Side fairings
Rear central cover

Radiator fan

First remove the front headlight assembly, the left and right side fairings, the lower cover, the right footrest.
First drain off the system.

DRAINING THE COOLING SYSTEM

- Loosen the clamp and after taking out the delivery tube to the water pump, drain the fluid into a container of suitable capacity previously placed under the vehicle.
- To complete the draining of the liquid, also open the cap of the expansion tank, located in the right dashboard door.



Recommended products

AGIP PERMANENT SPEZIAL Ethylene glycol-based antifreeze fluid with organic inhibition additives. Red, ready to use.

ASTM D 3306 - ASTM D 4656 - ASTM D 4985 - CUNA NC 956-16

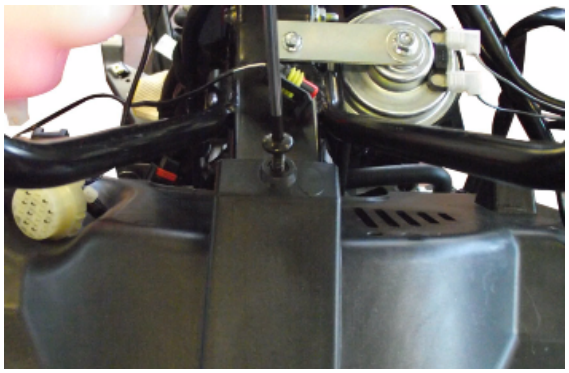
Characteristic

Cooling system fluid

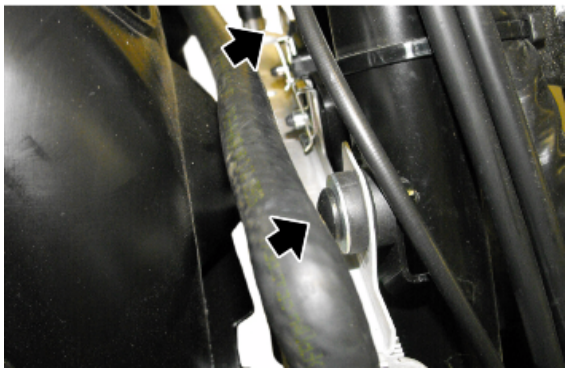
1.75 l

RADIATOR REMOVAL

- Undo the central screw and pull the wheel housing.



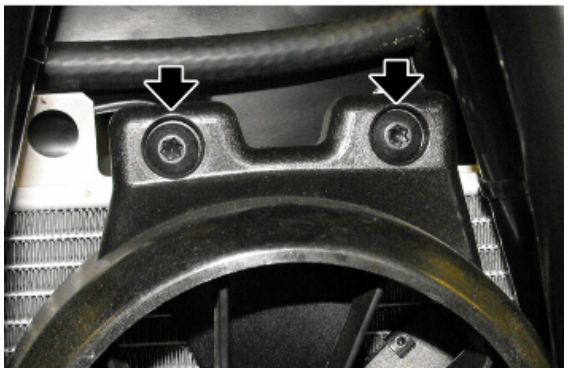
- Unscrew and remove the two fixing screws and collect their washers.



- Remove the pipe from the pipe grommet.

- Unscrew and remove the lower screws.

- Remove the fan cover by unscrewing and removing the two fixing screws.



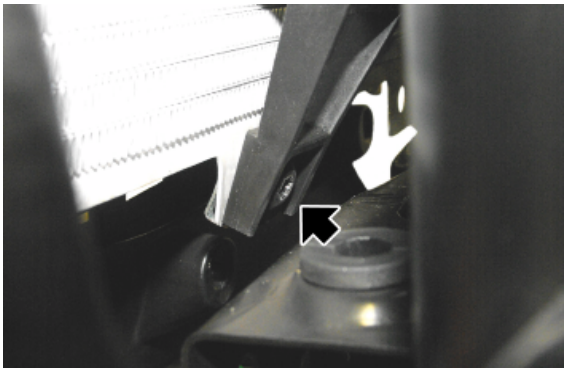
- working from the right side, unhook the two clamps.

- working from the left side, unhook the two clamps.

- Remove the clamp and release the electric fan connector.

- Remove the radiator from its lower fittings.

- If it is necessary to remove the electric fan unscrew and remove the fixing screw.



See also

Headlight assy.
Side fairings
Footrest

Handles and top side fairings

REMOVAL OF SIDE HANDLES

The following operations only refer to one handle, but they apply to both.

- Undo the lower fixing screws of the cover of the handle.

- Disengage the tabs.

- Pull upward on the handle cover, making sure of the presence of the clips on the relative pins.

- Undo the fixing screws of the handle, retrieving the washers.

- Remove the handle.

REFITTING OF REAR HANDLES

Perform the steps in reverse order described for the dismantling, tightening the fixing screws of the handle on the frame to torque.

Locking torques (N*m)

Handgrips fixing screws **15 to 20**

Battery

- Undo the fixing screws of the rear frame.

- Remove the rear frame complete with battery door.
- Remove the battery after disconnecting its clamps.

INDEX OF TOPICS

PRE-DELIVERY	PRE DE

Tightening torques inspection

- Lower fixing of the rear shock absorber struts to the brackets
- Fixing of the shock absorber strut left bracket to the crankcase
- Fixing of the right strut shock absorber to the exhaust support bracket
- Brake calliper fixing
- Brake calliper brake piping fixing nuts
- Parking brake calliper fixing nuts
- Front wheel fixing pin
- Front wheel axle nut
- Rear wheel axle nut
- Chassis swinging arm fixings - engine
- Engine fixing - chassis
- Side stand fixing nut
-Central stand fixing nuts
- Side stand sensor fixing screws
- Exhaust support bracket fixing screws

Electrical system

- Battery.
- Main switch.
- Headlamps: high beam, low beam, position lights (front and rear) and their warning lights.
- Headlight adjustment according to the current regulations.
- Front and rear stop light buttons and their bulbs.
- Turn indicators and their warning lights.
- Instrument light.
- Instrument panel: petrol and temperature indicator.
- Warning lights to instrument panel.
- Horn.
- Electric starter.
- Switch off engine with emergency stop switch.
- Switch off engine with side stand.
- Electric saddle opening with button.

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.

WARNING

BATTERY ELECTROLYTE IS TOXIC AND IT MAY CAUSE SERIOUS BURNS. IT CONTAINS SULPHURIC ACID. AVOID CONTACT WITH YOUR EYES, SKIN AND CLOTHING.
IN CASE OF CONTACT WITH YOUR EYES OR SKIN, RINSE WITH ABUNDANT WATER FOR ABOUT 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.
IF IT ACCIDENTALLY SWALLOWED, IMMEDIATELY DRINK LARGE QUANTITIES OF WATER OR VEGETABLE OIL. SEEK IMMEDIATE MEDICAL ATTENTION.
BATTERIES PRODUCE EXPLOSIVE GASES; KEEP THEM AWAY FROM NAKED FLAMES, SPARKS AND CIGARETTES. IF THE BATTERY IS CHARGED IN A CLOSED PLACE, TAKE CARE TO ENSURE ADEQUATE VENTILATION. ALWAYS PROTECT YOUR EYES WHEN WORKING CLOSE TO BATTERIES.
KEEP OUT OF THE REACH OF CHILDREN

CAUTION

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

Road test

Test ride

- Cold start
- Instrument operations
- Response to the gas command
- Stability on acceleration and braking
- Rear and front brake efficiency
- Front and rear suspension efficiency
- Abnormal noise

N.B.

DURANTE LA PROVA SU STRADA ESEGUIRE LA PROCEDURA DI CALIBRAZIONE DEL SISTEMA ASR.

See also

System ASR

A

ABS: *65*
Air filter: *30*, *212*

B

Battery: *63*, *83*, *221*
Brake: *174*, *182*, *187*
Bulbs:

C

Coolant: *136*, *193*

E

Electric:
Engine oil: *31*

F

Fuses: *78*

H

Headlight: *219*

I

Identification: *7*

M

Maintenance: *26*

O

Oil filter: *33*

R

Recommended products:

S

Spark plug: *28*, *71*
Stand: *173*
Start-up:
Suspension: *37*
Switch:

T

Tank:
Transmission:
Turn indicators: *70*

V

Vehicle: *7*, *110*, *113*