WORKSHOP MANUAL

ZP682746

MADISON 300 (2019)

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WORKSHOP MANUAL

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Due to the continuous update of MALAGUTI products and specific technical training programs, only the official network mechanic of MALAGUTI has a comprehensive understanding of this model and has the specific tools required for correct maintenance and maintenance operation.
The reliability of the vehicle also depends on its mechanical conditions. Check the vehicle before riding, regular maintenance and use of the original MALAGUTI parts are essential factors. For information about the nearest official distributor and/or service center, please visit our website :
www.ksr-group.com
The purchase of products developed and tested during the actual vehicle design phase can only be guaranteed if MALAGUTI is required to provide the original spare parts. All MALAGUTI original components go through quality control procedures to ensure reliability and durability. The descriptions and images in this publication are illustrative only and are not binding. The basic features described and described in this manual remain unchanged, but MALAGUTI reserves the right to make any changes to the parts, parts or accessories that he thinks need improvement without prior update of this manual product or product required for manufacturing or construction purposes. Not all countries have all the editions/models shown in this publication. The availability of individual models should be confirmed with the official MALAGUTI sales network.
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KSR Solution GmbH Im Wirtschaftspark 15, 3494 Gedersdorf, Austria

WORKSHOP MANUAL
MADISON 300 (2019)

This manual provides essential information for regular maintenance operations on your vehicle. This manual is applicable to established MALAGUTI dealers and their qualified technicians; Several concepts are deliberately omitted because they are considered unnecessary. Since this manual cannot contain complete mechanical concepts, users should have basic mechanical knowledge or minimum knowledge of maintenance procedures. Without this knowledge, it may be inefficient or even dangerous to repair or inspect a vehicle. Since the vehicle's repair and inspection procedures are not described in detail, care must be taken to avoid damage to parts or personal injury. Established MALAGUTI is committed to continuously improving its products and related documents in order to make customers feel most satisfied when using our vehicles. Inform all established MALAGUTI sales outlets and their international subsidiaries of any major technical changes and changes to the maintenance procedures. These changes will be described in a later version of the manual. If you need or have any further questions about the maintenance and inspection procedures, please feel free to contact MALAGUTI customer department, which will be ready to provide any information on the subject and any further communication regarding updates and technical changes to the vehicle.

CAUTION Refers to the specific procedures taken to prevent damage to the vehicle.

WARNING Refers to specific procedures implemented to prevent injury to maintenance personnel

NOTE Provide key information to make the program easier to understand and execute.

Vehicle intactness Incomplete or non-compliance with these rules can result in the risk of serious damage to the vehicle and sometimes even invalidation of the warranty

Safeguarding the environment the part marked with this mark indicates the correct use of the vehicle to prevent damage to the environment.

Personal safety Failure to comply fully with these instructions carries a serious risk of personal injury

INDEX OF TOPICS

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This section describes the general specifications of the vehicle.

Rules

This section describes general safety rules for any maintenance operations performed on a vehicle.

Safety rules

- The fuel is highly flammable and can explode under certain conditions. Smoking is prohibited in the workplace to avoid open flames or sparks.
- The battery produces hydrogen, a highly explosive gas. Do not smoke near the battery, avoid sparks or flames, especially when charging. The battery electrolyte contains Sulphuric acid. Protect your eyes, clothes and skin. Sulphuric acid is highly corrosive; in the event of contact with your eyes or skin, rinse thoroughly with abundant water and seek immediate medical attention.
- The battery electrolyte contains sulfuric acid. Protect your eyes, clothes and skin. Sulfuric acid has strong corrosiveness; In case of contact with eyes or skin, wash thoroughly with plenty of water and seek medical attention immediately.
- Clean the brake pad in a well-ventilated place and guide the jet of compressed air to avoid inhaling dust caused by abrasion of friction materials. Even if the latter does not contain asbestos, inhaling dust is harmful.
- If the work can only be carried out on a vehicle with an engine running, please ensure that the vehicle is well ventilated, and if necessary, use a special oil extractor. Do not allow the engine to run in a closed area. The exhaust gas is poisonous.

Maintenance rules

- Use only the appropriate tools designed for this vehicle.
- Only metric tools can be used for disassembly, overhaul and modification. Metric bolts, nuts and screws cannot be interchanged with coupling parts measured in imperial system. Using improper connecting parts and tools may damage the vehicle.
- After removal, clean the assembly with nonflammable or low flash point solvents. Lubricate all working surfaces except tapered couplings before reinstalling these components.
- After reinstalling, make sure all components are installed correctly and working properly.
- When reinstalling, always use new washers, sealing rings and cotter pins.
- When the vehicle carries out maintenance work involving the power system, make sure the power connection is correct, especially the grounding and battery connection.
- Use original MALAGUTI spare parts and lubricants recommended by the manufacturer. Non - original or unqualified spare parts may damage the vehicle.

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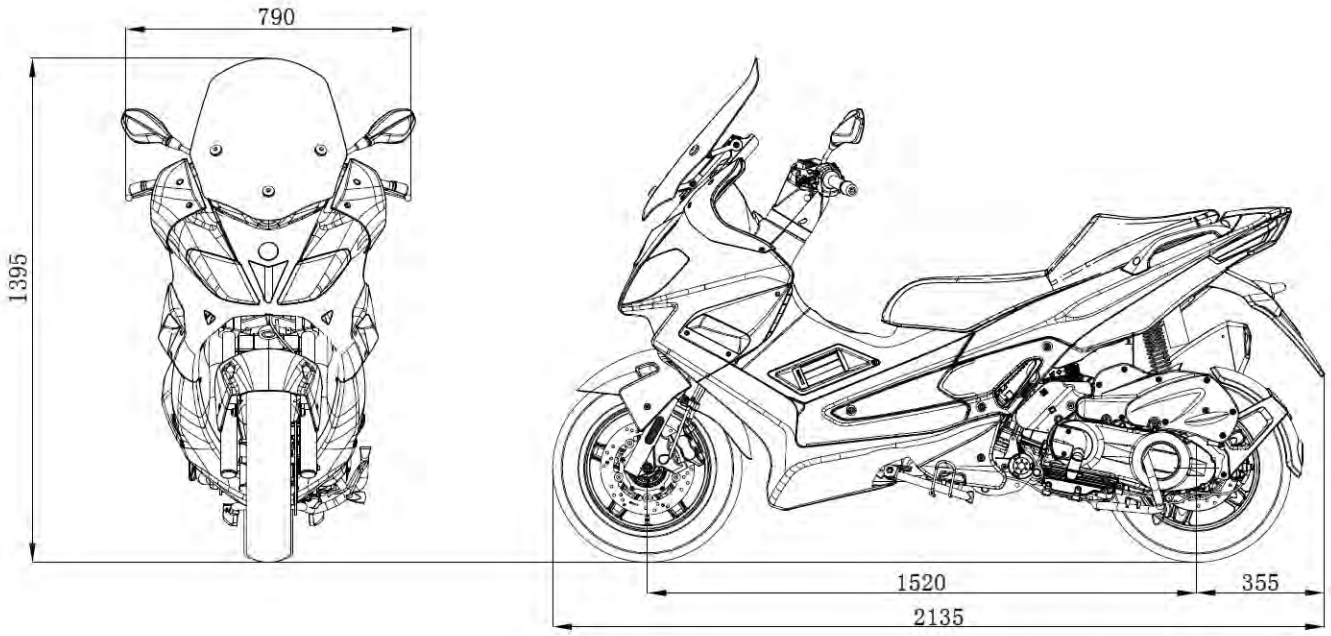
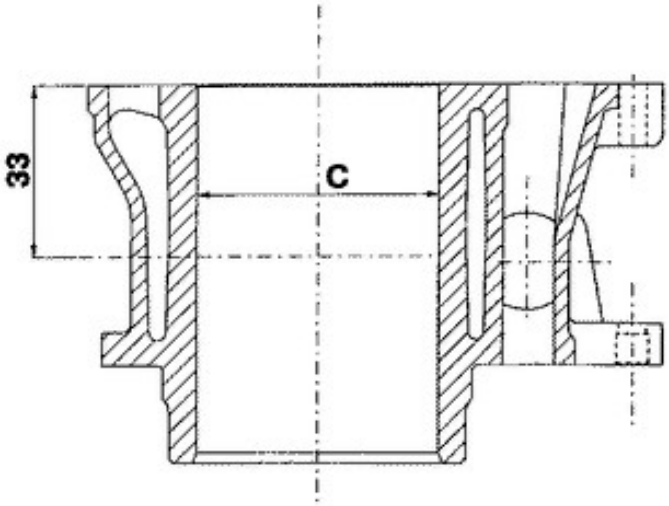
Dimensions and mass

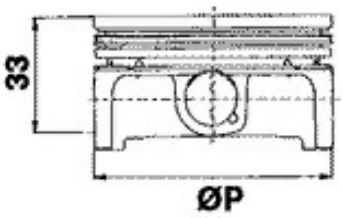
WEIGHTS AND DIMENSIONS

Specification	Desc./Quantity
Kerb weight	188± 5 kg
Maximum weight allowed	370 Kg



Cylinder - piston assy.





CYLINDER - PISTON

Specification	Desc./Quantity
Plunger diameter	74.967 +0.014 -0.014 mm
Cylinder diameter	75 +0.038 +0.01 mm

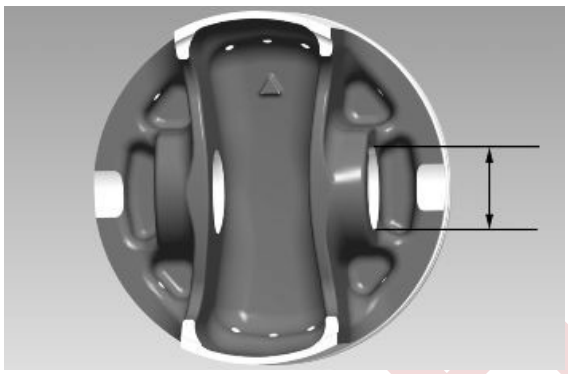
COUPLING CATEGORIES

Name	Initials	Cylinder	Piston	Play on fitting
cylinder-piston	M	75.01 ÷ 75.017	74.953 ÷ 74.960	0.050 ÷ 0.064
cylinder-piston	N	75.017 ÷ 75.024	74.960 ÷ 74.967	0.050 ÷ 0.064
cylinder-piston	O	75.024 ÷ 75.031	74.967 ÷ 74.974	0.050 ÷ 0.064
cylinder-piston	P	75.031 ÷ 75.038	74.974 ÷ 74.981	0.050 ÷ 0.064

NOTE

THE PISTON MUST BE FITTED WITH AN ARROW POINTING TO THE EXHAUST SIDE, AND THE PISTON RING MUST BE FITTED WITH《TOP》 OR A SEAL POINTING UPWARD.

- Measure the diameter of the bearing on one ton.



Characteristic

Standard diameter

16 +0.006 +0.001 mm

- Calculate the piston pin coupling clearance.

NOTE

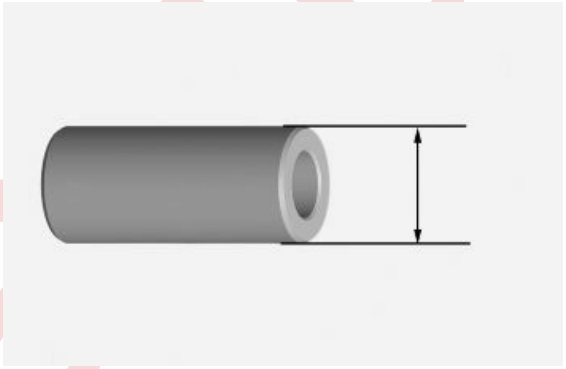
THE PIN CASE HAS TWO LUBRICATION CHANNELS. THEREFORE, THE PISTON SHAFT MUST BE MEASURED.

Characteristic

Standard clearance:

0.001 - 0.010 mm

-Measure the outer diameter of the gudgeon pin.



Characteristic

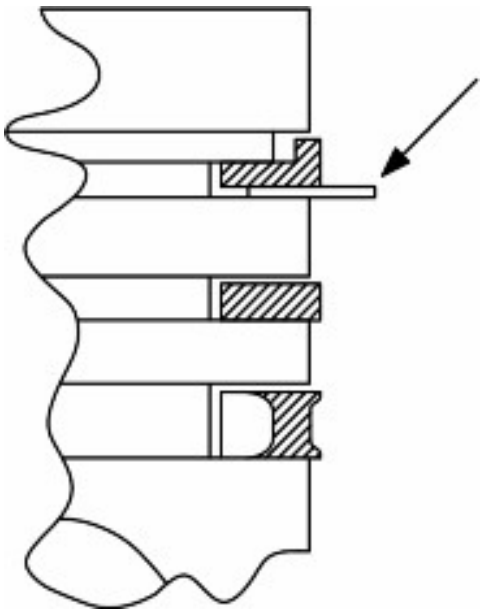
Pin outside diameter

16 +0 -0.004 mm

- If the clearance is greater than that shown in the table, replace the piston.
- Use appropriate sensors to measure the coupling gap between the sealing ring and the piston groove, as shown in the figure.
- carefully clean the sealed enclosure.

NOTE

THE CLEARANCE IS MEARSURED BY INSERTING A FEELER BLADE FROM THE SIDE OF THE SECOND SEALRING.



ASSEMBLING CLEARANCE

Top piston ring - standard coupling clearance
0.015- 0.06 mm upper piston ring
The maximum allowable cleanliness after use is 0.07 mm piston ring. The standard connection clearance is 0.015-0.06mm
Middle piston ring - maximum clearance al- lowed after use 0.07 mm oil scraper ring -standard coupling clearance
0.015 - 0.06 mm oil scraper ring - maximum clearance allowed after use0.07 mm

- piston and cylinder are classified by diameter.

Couplings must be connected to the same type of couplings (m-m, n-n, o-o, p-p).

- check whether the surface of the head coupling is worn or deformed.

Characteristic

Maximum allowable run-out:

0.05 mm

Cylinder head

Clean all connection surfaces thoroughly before performing the head service operation.

Pay attention to the spring and valve position, do not change the original position during the modification.

Use solid rods and feelers to check the surface of cylinder heads for wear or deformation

Characteristic

Maximum allowable run-out:

0.1 mm

- In case of faults, replace the head.
- Check the sealing surfaces for the intake and exhaust manifold.
- Check that the camshaft and the rocking lever pin capacities exhibit no wear.
- Check that the head cover surface is not worn.
- Check that the coolant seal plug exhibits no oxidation.
- Insert the valves into the cylinder head.
- Alternatively check the intake and exhaust valves.
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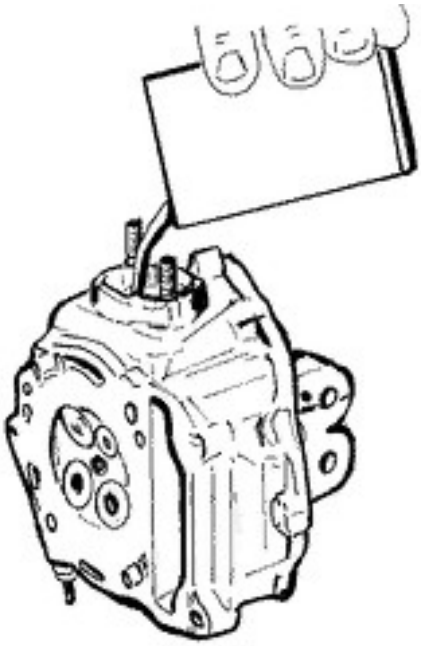
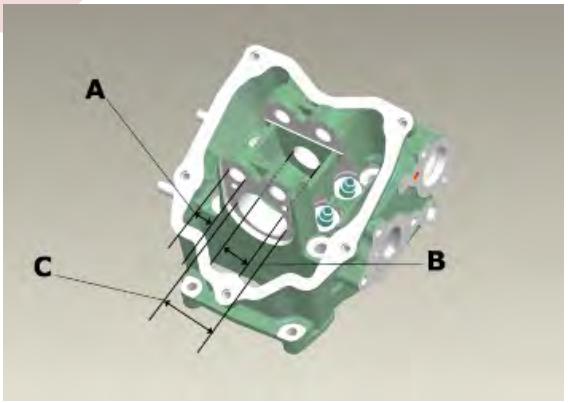
- The test is carried out by filling the manifold with petrol and checking that the head does not ooze through the valves when these are just pressed with the fingers.



Measure camshaft bearing seat and rocker rod support pin with inner diameter meter



HEAD BEARINGS

Specification	Desc./Quantity
bearing «A»	Ø 12.000 - 12.018 mm
bearing «B»	Ø 20.000 ÷ 20.021 mm
bearing «C»	Ø 37.000 - 37.025 mm

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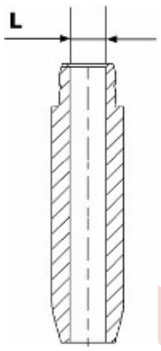
Measure the valve guide.

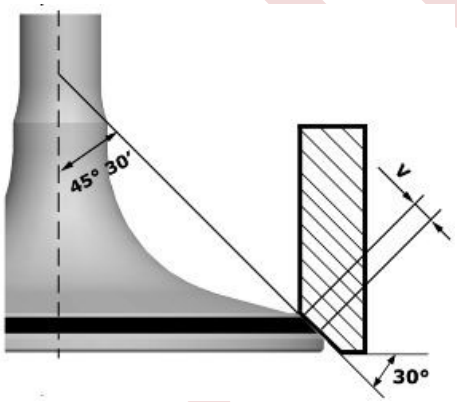


Characteristic

Valve guide:

5 +0.012 mm

- Clean any carbon residue on the seat.
- Check the width of indentation on seat "V" with Prussian blue.



Characteristic

Standard value:

1 - 1.3 mm

Admissible limit:

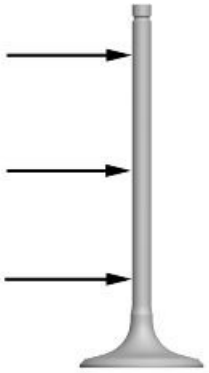
1.6 mm

- If the impression width on the valve seat is larger than the prescribed limits, true the seats with a45° mill and then grind.
- In case of excessive wear or damage, replace the head.

STANDARD VALVE LENGTH

Specification	Desc./Quantity
Valve check Standard length	Intake: 94.6 mm
Valve check Standard length	Exhaust: 94.4 mm

- Measure the diameter of the valve stems in the three positions indicated in the diagram.



STANDARD DIAMETER

Specification	Desc./Quantity
Intake:	4.987 - 4.972 mm
Exhaust:	4.975 - 4.960 mm

MINIMUM ADMISSIBLE DIAMETER

Specification	Desc./Quantity
Intake:	4.96 mm
Exhaust:	4.945 mm

- Calculate the clearance between valve and valve guide.
-

- After measuring the valve guide diameter and the valve stem diameter, check clearance between guide and stem.

INTAKE

Specification	Desc./Quantity
Standard clearance:	0.013 - 0.04 mm
Admissible limit:	0.08 mm

EXHAUST

Specification	Desc./Quantity
Standard clearance:	0.025 to 0.052 mm
Admissible limit:	0.09 mm

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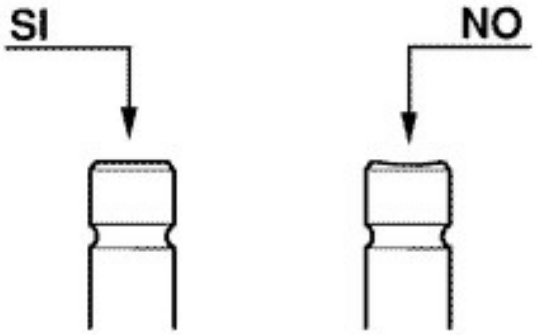
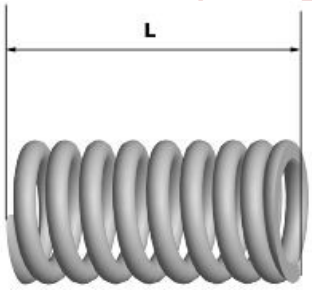
-Use hinged fixed screw terminals to check that the joint surface shows no signs of wear.



-Measure the unloaded spring length



Characteristic

Standard length

40.2 mm

Allowable limit after use:

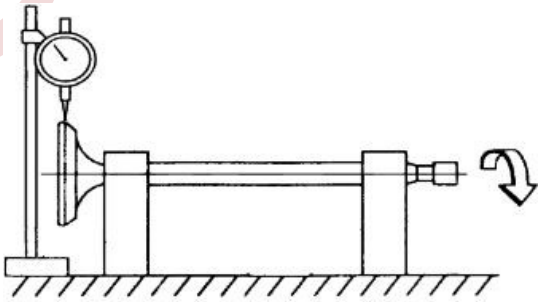
38.2 mm

- Place stem on v-table and measure concentricity of valve head at right angles with protractor, protractor and valve head.

Characteristic

Admissible limit:

0.03 mm

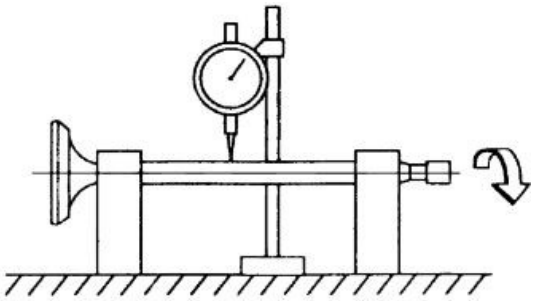


- Place stem on v-shaped abutment, measure deformation degree with dial, check stem deviation.

Characteristic

Limit values admitted:

0.1 mm



- If no fault is found during the above inspection, you may use the same valve. For better sealing performance, the seat needs to be ground and the valve gently ground with a fine-grained grinding hammer. During grinding, keep the cylinder head and valve shaft in horizontal position. This prevents abrasive composite residues from seeping between the stem and guide rail (as shown).

CAUTION

DO NOT ALWAYS ROTATE VALVE WITHOUT ABRASIVE RESIDUE TO AVOID SCRATCHING JOINT SURFACES.CAREFULLY CLEAN CYLINDER HEADS AND VALVES WITH PRODUCTS SUITABLE FOR THE TYPE OF ABRASIVE USED.

CAUTION

DO NOT REVERSE VALVE MOUNTING POSITION (LEFT AND RIGHT)

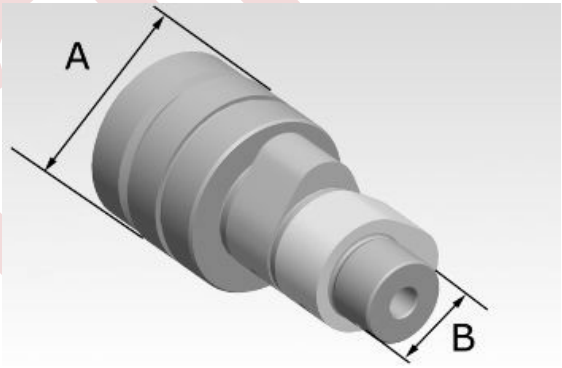
- Check camshaft bearing for scratches or abnormal wear.
- Measuring camshaft bearing with micrometer.

STANDARD DIAMETER

Specification	Desc./Quantity
Camshaft check: Standard diameter	Bearing A Ø: 36.95 ÷ 36.975 mm
Camshaft check: Standard diameter	Bearing B diameter: 19.959 ÷ 19.98 mm

MINIMUM ADMISSIBLE DIAMETER

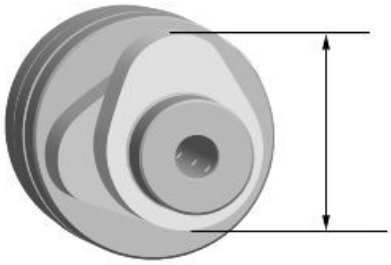
Specification	Desc./Quantity
Camshaft check: Minimum admissible diameter	Bearing A Ø: 36.94 mm
Camshaft check: Minimum admissible diameter	Bearing B diameter: 19.950 mm



- Measure the height of the CAM with a gauge.

STANDARD HEIGHT

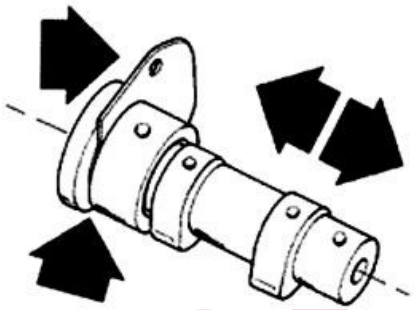
Specification	Desc./Quantity
Camshaft check: Standard height	Intake: 30.285 mm
Camshaft check: Standard height	Exhaust: 29.209 mm



Check camshaft axial clearance

CAMSHAFT AXIAL CLEARANCE

Specification	Desc./Quantity
Camshaft check: Standard axial clearance:	0.11 - 0.41 mm
Camshaft check: Maximum admissible axial clearance	0.42 mm



- Check that the rocker pin shows no signs of wear or scratch.

- Measure the inside diameter of each rocker rod.

- Measure outer diameter of rocker arm pin.

Check that there is no sign of wear on the slider in contact with the CAM and the adjustment plate connected.

ROCKING LEVERS AND PIN DIAMETER:

Specification	Desc./Quantity
Rocking lever inside diameter: Standard diameter	Diameter 12.000 - 12.011 mm
Rocking lever pin diameter: Standard diameter	Diameter 11.977 - 11.985 mm

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Brakes

BRAKES

Specification	Desc./Quantity
Front brake	Ø 260mm disc brake with hydraulic control activated by handlebar right-side lever.
Rear brake	Ø 240-mm disc brake with hydraulic control operated by the handlebar left-side lever.

Capacities

CAPACITY

Specification	Desc./Quantity
Engine oil	1.3 l
Transmission oil	250 cm³
Cooling system fluid	~ 1.8 l
Fuel tank (reserve)	approx.15.00 l (approx. 2.80 l)

Frame and suspensions

FRAME AND SUSPENSIONS

Specification	Desc./Quantity
Chassis	Tubular and steel sheets.
Front suspension	Hydraulic telescopic fork with Ø 35-mm stem
Rear suspension	Two rear shock absorbers with air bag.

Transmission

TRANSMISSION

Specification	Desc./Quantity
Main drive	Automatic expandable pulley variator with torque server, V-belt, automatic self-ventilating centrifugal dry clutch

Electrical system

ELECTRICAL COMPONENTS

Specification	Desc./Quantity
Starter	Electric
Ignition	Electronic inductive discharge ignition, high efficiency, with separate HV coil.
Ignition advance	α/N three-dimensional map managed by control unit
Spark plug	NGK CR8EKB
Battery	12V/10 Ah, sealed battery

Wheels and tyres

WHEELS AND TYRES

Specification	Desc./Quantity
Wheel rim type	Light alloy wheel rims.
Front type	Tubeless,120/70 – 15”56S
Rear tyre	Tubeless, 140/60 - 14" 64S
Front rim	15" x 3.00
Rear rim	14" x 3.50

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TYRE PRESSURE

Specification	Desc./Quantity
Front tyre pressure (with passenger)	2.3 bar (2.3)
Rear tyre pressure (with passenger)	2.3 bar (2.5)

NOTE

CHECK AND ADJUST TYRE PRESSURE WITH TYRES AT AMBIENT TEMPERATURE. THE POST- HEAT SETTING PRESSURE DEPENDS ON THE WEIGHT OF THE RIDER AND ACCESSORIES.

Engine

ENGINE TECHNICAL DATA

Specification	Desc./Quantity
Type	Single-cylinder, 4-stroke
Engine capacity	278 cm³
Bore x Stroke	75x63 mm
Compression ratio	11 ± 0.5 : 1
Idle speed	1700 ± 100 rpm
Timing system	4 valves, single overhead camshaft, chain-driven.
Valve clearance	Intake: 0.10 mm Exhaust: 0.15 mm
Max. power	16.1 kW at 7,250 rpm
MAX. torque	20 Nm at 6,000 rpm
Main drive	Automatic expandable pulley variator with torque server, V-belt, automatic self-ventilating centrifugal dry clutch
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.
Electric start-up	Oil-coated freewheel and torque limiter.
Ignition	Electronic inductive discharge ignition, high efficiency, with separate HV coil.
Ignition advance	α/N three-dimensional map managed by control unit
Spark plug	NGK CR8EKB
Fuel system	Electronic injection with electric fuel pump
Fuel	E5
Exhaust silencer	Absorption-type exhaust muffler with catalytic converter.
Emissions compliance	EURO 4

Assembly clearances

Overhaul data

Vehicle identification

To read the chassis prefix, remove the cover from the helmet compartment. As shown in figure A

The engine prefix is imprinted near the lower support of the left shock absorber. As shown in figure B

VEHICLE IDENTIFICATION

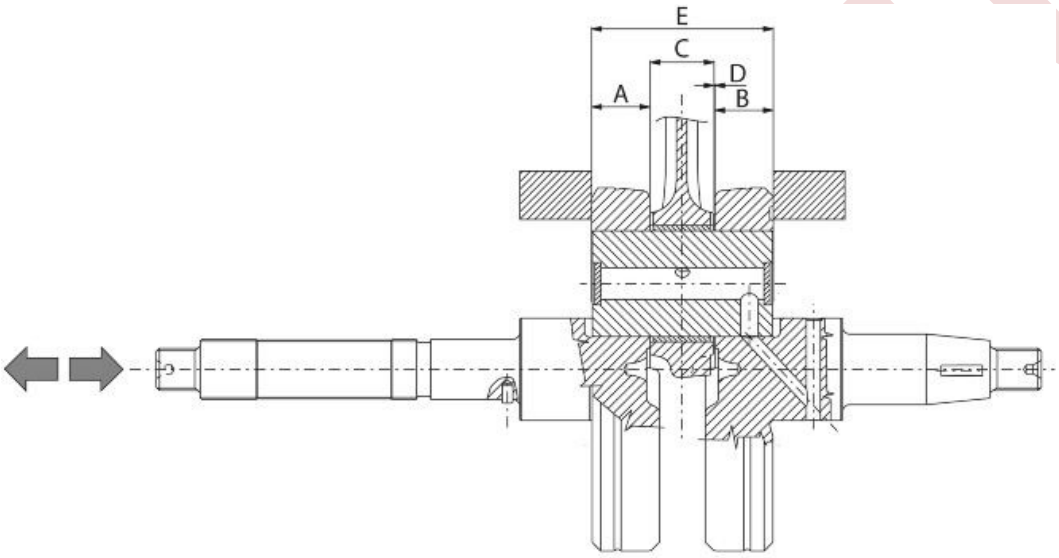
Specification	Desc./Quantity
Chassis prefix	VB4FC100**P******
Engine prefix	BMLIP75MN-A

Crankcase - crankshaft - connecting rod

CRANKSHAFT

Titolo	Durata/Valore	Testo Breve (< 4000 car.)	Indirizzo Immagine
Crankshaft		Axial clearance between crankshaft and connecting rod	

Axial clearance between crankshaft and connecting rod

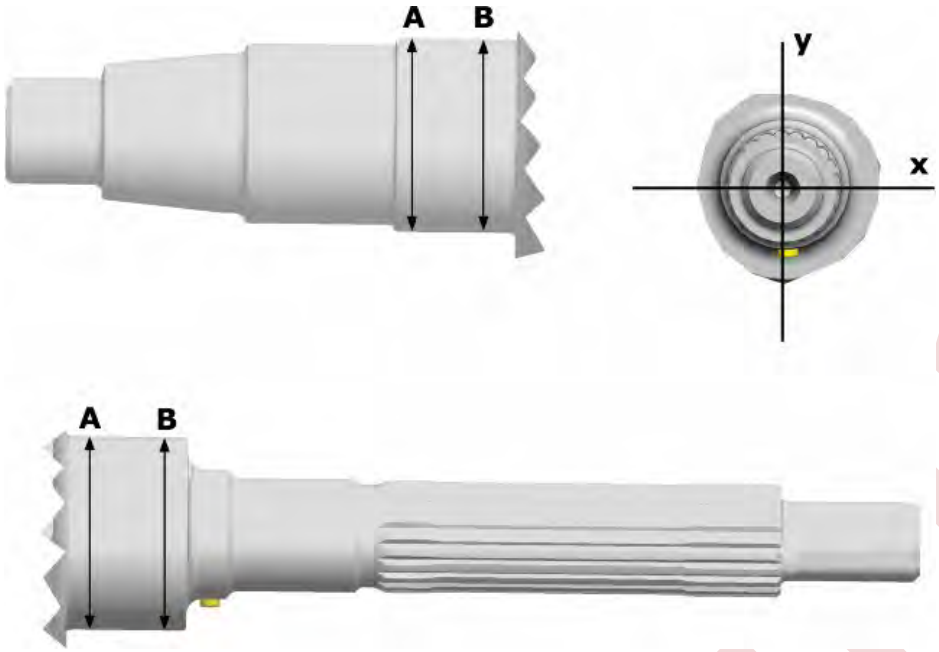


AXIAL CLEARANCE BETWEEN CRANKSHAFT AND CONNECTING ROD

Name	Description	Dimensions	Initials	Quantity
Transmissionside half-shaft		16.6 +0-0.05	A	D = 0.20 ÷ 0.50
Flywheel-side halfshaft		16.6 +0-0.05	B	D = 0.20 ÷ 0.50
Connecting rod		18 -0.10 -0.15	C	D = 0.20 ÷ 0.50
Spacer tool		51.4 +0.05	E	D = 0.20 ÷ 0.50

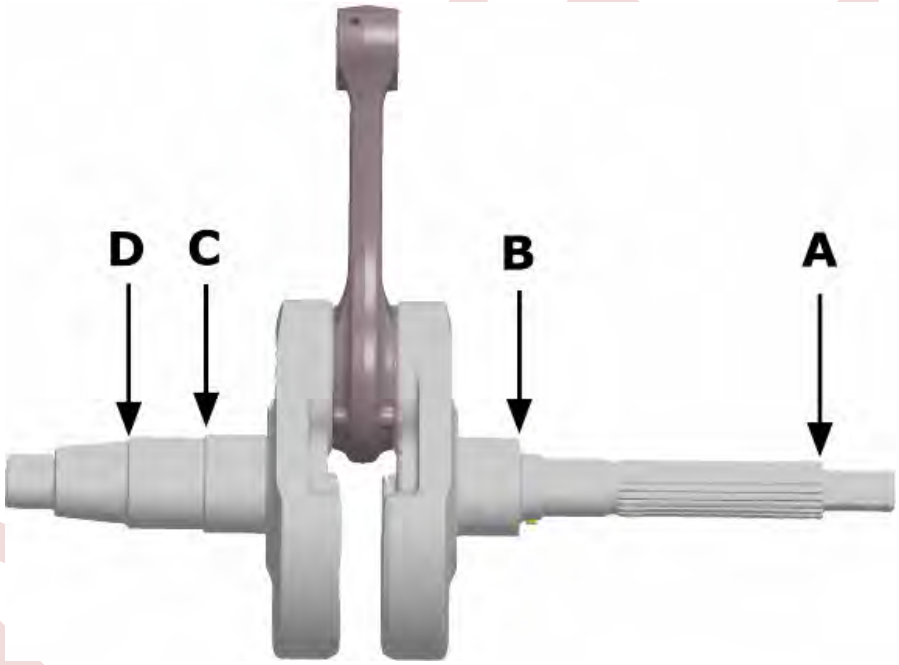
Diameter of crankshaft bearings.

Measure the bearings on both axes x-y.



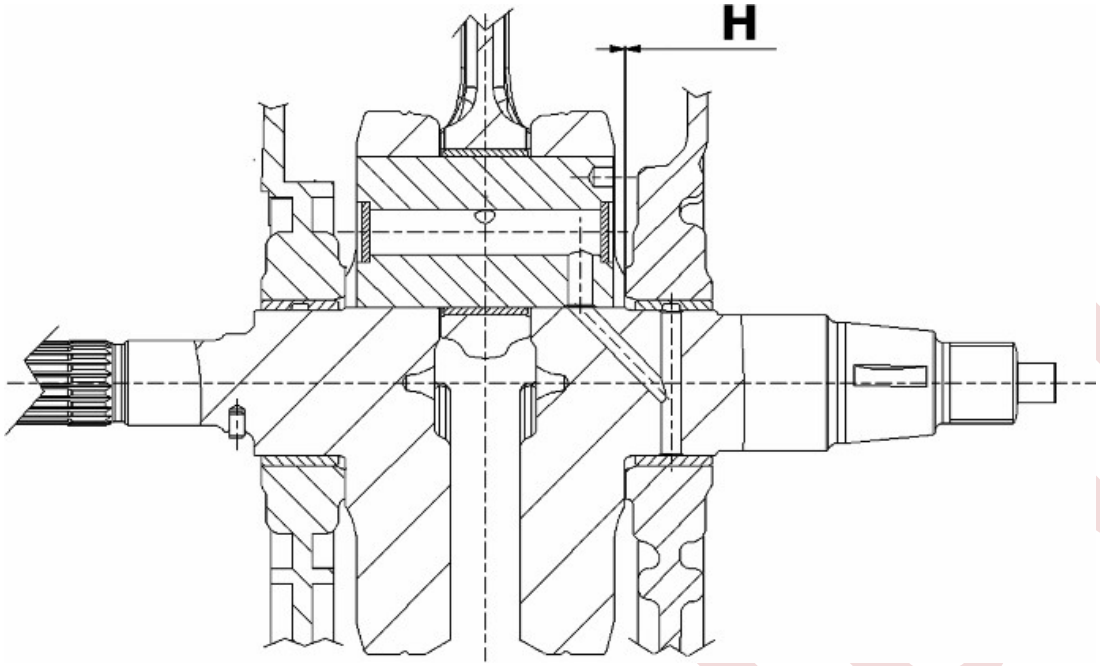
CRANKSHAFT

Specification	Desc./Quantity
Crankshaft bearings: Standard diameter: Cat. 1	28.998 ÷ 29.004 mm
Crankshaft bearings: Standard diameter: Cat. 2	29.004 ÷ 29.010 mm



MAX. ADMISSIBLE DISPLACEMENT

Specification	Desc./Quantity
A =	0.15 mm
B =	0.010 mm
C =	0.010 mm
D =	0.10 mm



Characteristic

Crankshaft-crankcase axial clearance (H)

0.15 ÷ 0.43 mm

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- Measure the diameter of the small end of the connecting rod with the caliper

NOTE

IF THE DIAMETER OF THE SMALLER END OF THE CONNECTING ROD EXCEEDS THE STANDARD DIAMETER AND THERE IS WEAR OR OVERHEATING, REPLACE THE CRANKSHAFT AS DESCRIBED IN THE CRANKCASE AND CRANKSHAFT SECTION.

Characteristic

Standard diameter

16 +0.025 +0.015 mm

- In order to obtain good bushing lubrication, it must have the best lubrication pressure and good oil flow; The bushing must be positioned correctly to avoid clogging the oil supply line.
- The spindle sleeve consists of two semi-bearings, one with a hole and a lubrication channel, and the other with a solid.
- The solid semi-bearings are designed to withstand thrust caused by combustion and are therefore arranged opposite the cylinder.
- To prevent shutters from appearing in the oil inlet channel, the mating surface of the two semi-bearings must be completely orthogonal to the cylinder shaft, as shown in the figure.
- The section of the oil delivery channel is also affected by the drive depth of the bushing, compared with the limit surface of the axial clearance of the crankshaft.
- Check the inner diameter of the main bushing in three directions as shown in the figure.
- Repeat the measurement of another bushing size. As shown in figure.
- Crankcase comes in three versions: blue, yellow and green.
- There is only one kind of spindle casing hole in the crankcase. The standard bush diameter after drive is variable depending on the coupling selection.
- The crankcase bushing shell is divided into two categories, Cat.1 and Cat.2, which are the same as the crankshaft bushing shell.
- There are three main thicknesses of bushing, indicated by color, as shown in the table below.

BUSHINGS

TYPE	IDENTIFICATION	CRANKSHAFT HALF-BEARING
B	BLUE	1.973 to 1.976
C	YELLOW	1.976 to 1.979
E	GREEN	1.979 to 1.982

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COUPLINGS

BUSHING CATEGORY	CRANKCASE HALVES CATEGORY	BUSHING INSIDE DIAMETER AFTER FITTING
B	2	29.024 ÷ 29.054
C	1	29.024 ÷ 29.054
	2	29.018 ÷ 29.048
E	1	29.018 ÷ 29.048

Combine the shaft with two category 1 crank webs with the category 1 crankcase (or cat. 2 with cat. 2). Furthermore a spare crankcase cannot be matched with a crankshaft with mixed categories. The spare crankshaft has half-shafts of the same category.

CATEGORIES

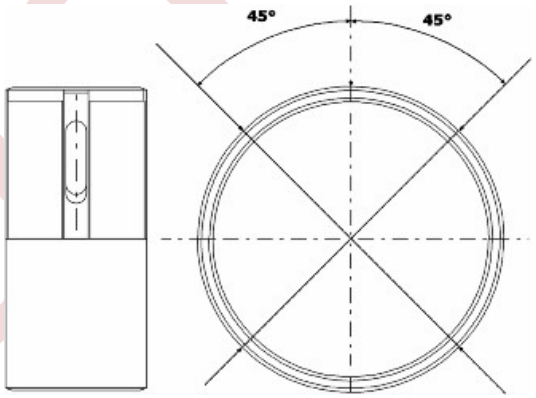
CRANKCASE HALVES	ENGINE HALF-SHAFT	BUSHING
Cat. 1	Cat. 1	E
Cat. 2	Cat. 2	B
Cat. 1	Cat. 2	C
Cat. 2	Cat. 1	C

NOTE

DO NOT MEASURE ON THE SURFACE OF TWO SEMI-SHELL COUPLINGS, AS THE ENDS ARE DESIGNED TO ALLOW BENDING DURING DRIVE OPERATION.

NOTE

THE CRANKCASE USED FOR REPLACEMENT SELECTS HALF OF THE CRANKCASE OF THE SAME CLASS AND IS EQUIPPED WITH THE TYPE C SHAFT SLEEVE (YELLOW) .



Characteristic

Crankshaft-bushing maximum clearance admitted:

0.08 mm

Diameter of crankcase without bushing

CAT. 1: 32.959 ÷ 32.965 mm

CAT. 2: 32.953 ÷ 32.959 mm

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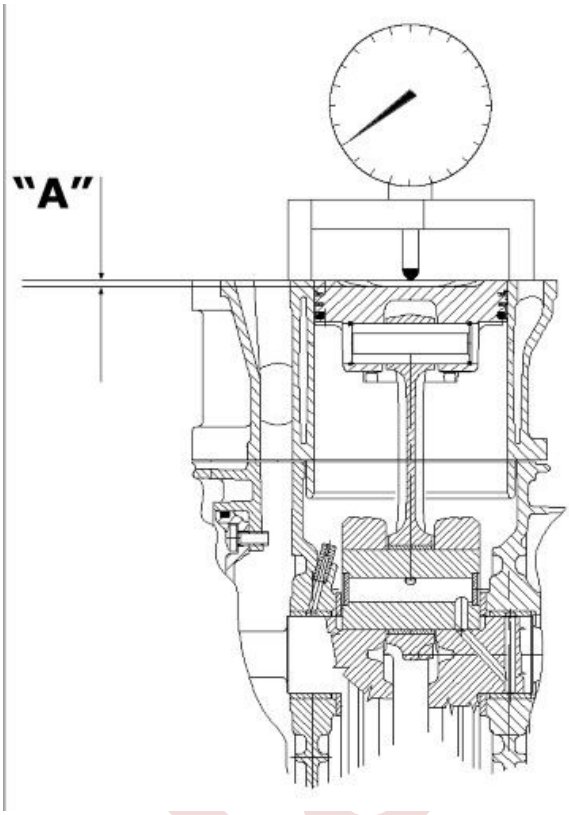
Slot packing system

Characteristic

Compression ratio

10.5 ÷ 11.5 : 1



The measurement of "A" is the reentry value of the piston, which indicates the degree to which the plane formed by the piston crown falls below the plane formed by the top of the cylinder.

The deeper the piston falls in the cylinder, the less the base gasket ACTS (to restore the compression ratio), and vice versa.

NOTE

MEASUREMENT "A" MUST BE CARRIED OUT WITHOUT GASKETS BETWEEN THE CRANKCASE AND THE CYLINDER AND AFTER THE DIAL WITH THE AUXILIARY PORT IS RESET ON THE GROUND.

ENGINE 300 SHIMMING

Name	Measure A	Thickness
SHIMMING	3.70 - 3.60	0.4 ± 0.05
SHIMMING	3.60 - 3.40	0.6 ± 0.05
SHIMMING	3.40 - 3.30	0.8 ± 0.05

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 springy 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 Pag. 9022 EM 25-89
eni i-Ride PG 5W-40	Synthetic based lubricant for high-performance four-stroke engines.	JASO MA, MA2 - API SL - ACEA A3
AGIP BRAKE 4	Brake fluid.	Synthetic fluid SAE J 1703 -FMVSS 116 - DOT 3/4 - ISO 4925 - CUNA NC 956 DOT 4
AGIP PERMANENT SPECIAL	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	Silencer cleaning paste	special product for cleaning and polishing stainless steel silencer
AGIP GREASE PV2	Ivory smooth-textured, slightly-stringy anhydrous calcium-base grease.	TL 9150 066, symbol NATO G 460
AGIP GREASE SM 2	Gray black smooth-textured lithium grease, containing molybdenum disulphide.	-

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TOOLING	TOOL

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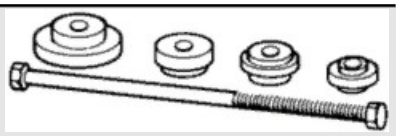
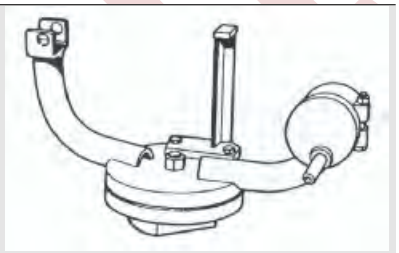
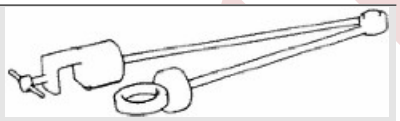
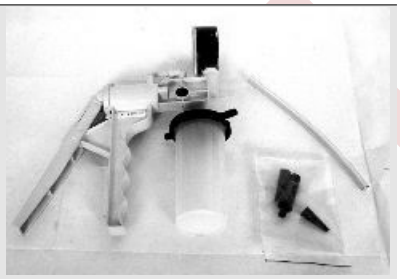
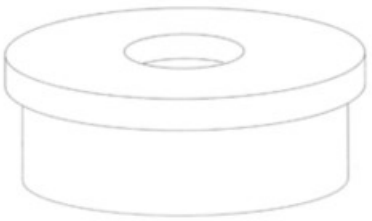
SPECIFIC TOOLS

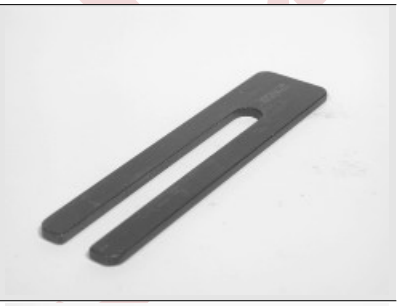
Stores code	Description	
001330Y	Tool for fitting steering seats	
001467Y014	Calliper to extract ø 15-mm bearings	
005095Y	Engine support	
002465Y	Caliper for circlips	
020459Y	Punch for fitting bearing on steering tube	
020004Y	Punch for removing steering bearings from headstock	
020055Y	Wrench for steering tube ring nut	

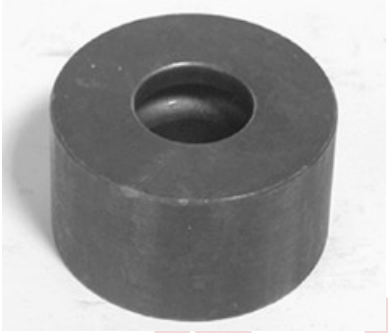
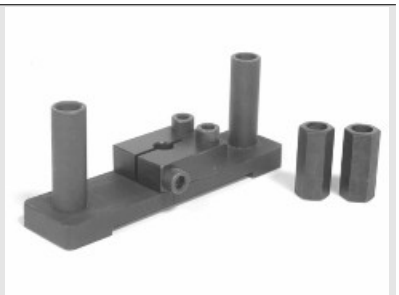
Stores code	Description	
020074Y	Support base for checking crankshaft alignment	
020150Y	Air heater mounting	
020151Y	Air heater	
020193Y	Oil pressure check gauge	
020262Y	Crankcase splitting plate	
020263Y	Driven pulley assembly sheath	

Stores code	Description	
020306Y	Punch for assembling valve seal rings	
020329Y	Vacuum pump Mity-Vac	
020330Y	Stroboscopic light to check timing	
020331Y	Digital multimeter	
020332Y	Digital rpm indicator	

Stores code	Description	
020648Y	Single battery charger	
020335Y	Magnetic mounting for dial gauge	
020357Y	32x35-mm Adaptor	
020359Y	42 x 47-mm adaptor	
020360Y	52x55-mm Adaptor	
020363Y	20-mm guide	

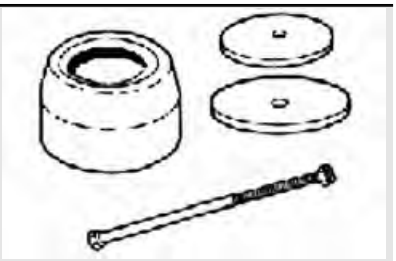
Stores code	Description	
020375Y	28 x 30 mm adaptor	
020376Y	Adapter handle	
020382Y	Valve cotters equipped with part 012 removal tool	
020382Y011	adapter for valve removal tool	
020393Y	Piston assembly band	
020412Y	15-mm guide	

Stores code	Description	
020423Y	Driven pulley lock wrench	
020424Y	Driven pulley roller casing fitting punch	
020426Y	Piston fitting fork	
020431Y	Valve oil seal extractor	
020434Y	Oil pressure check fitting	
020444Y	Tool for fitting/ removing the driven pulley clutch	

Stores code	Description	
020456Y	Ø 24 mm adaptor	
020477Y	37 mm adaptor	
020483Y	30 mm guide	
020489Y	Hub cover support stud bolt kit	
020428Y	Piston position check mounting	
020680Y	Diagnosis Tool	

Stores code	Description	
020621Y	HV cable extraction adaptor	
020481Y	Control unit interface wiring	
001467Y035	Bell for 47-mm outside diameter bearings	
020626Y	Driving pulley lock wrench	
001467Y013	Calliper to extract ø 15-mm bearings	
020627Y	Flywheel lock wrench	

Stores code	Description	
020454Y	Pin lock fitting tool	
020467Y	Flywheel extractor	
020622Y	Transmission-side oil seal punch	
020480Y	Petrol pressure check kit	
020244Y	15-mm diameter punch	
020115Y	Ø 18 punch	

Stores code	Description	
020271Y	Tool for removing-fitting silent bloc	
020469Y	Reprogramming kit for vehicle diagnostic tester	
020487Y	Fork oil seal extractor	

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Maintenance chart

SCHEDULED MAINTENANCE TABLE

__I__: CHECK AND CLEAN, ADJUST, LUBRICATE OR REPLACE IF NECESSARY.
__C__: CLEAN, __R__: REPLACE, __A__: ADJUST, __L__: LUBRICATE
Clean the SAS air filter every 2 years
** Replace every 2 years*

km x 1,000	1	6	12	18	24	30	36	42	48	54	60	66	72
Safety fasteners	I		I				I				I		I
Spark plug			R		R		R		R		R		R
Driving belt				R			R			R			R
Throttle control	A		A		A		A		A		A		A
Air filter			C		C		C		C		C		C
Belt compartment air filter			I		I		I		I		I		I
Oil filter	R		R		R		R		R		R		R
Oil filter (mesh)	C												
Valve clearance					A				A				A
Electrical system and battery	I		I		I		I		I		I		I
Brake fluid *	I		I		I		I		I		I		I
Coolant *	I		I		I		I		I		I		I
Engine oil	R	I	R	I	R	I	R	I	R	I	R	I	R
Hub oil	R		I		R		I		R		I		R
Brake pads	I	I	I	I	I	I	I	I	I	I	I	I	I
Sliding shoes / CVT rollers			R		R		R		R		R		R
Tyre pressure and wear	I		I		I		I		I		I		I
Vehicle road test	I		I		I		I		I		I		I
Suspension			I		I		I		I		I		I
Steering	A		A		A		A		A		A		A
Centre stand			L								L		
Timing chain						R					R		

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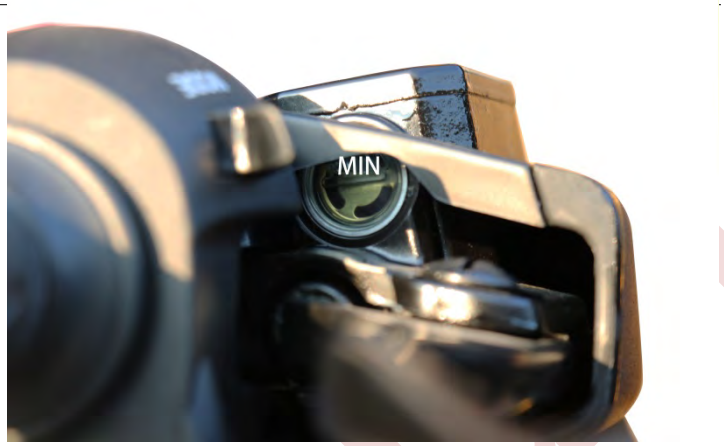
Braking system

Level check

- Place the vehicle on a flat and central support.
- Check brake fluid level through a special interface located on the pump.



NOTE

WHEN BRAKE PAD WEAR, THE LIQUID LEVEL IS EASY TO DROP, AT THIS TIME THE LIQUID LEVEL MUST NOT BE LOWER THAN THE LOWEST LEVEL. TF IT IS TOO LOW, CHECK AND SECURE SYSTEM SEALS, IF NECESSARY. IF NECESSARY, PLEASE FILL UP THE PUMP FILLING TANK AND "MAX". THE LEVEL MUET BE OBTAINED WITH A NEW PAD.

Top-up

CAUTION

ONLY USE DOT 4-CLASSIFIED BRAKE FLUID.

Just proceed as follows:

- Park the car on a flat surface and a bracket in the middle.
- Remove the tank cover and gasket by removing two screws and recharging only with the specified liquid, but not exceeding the maximum liquid level.

CAUTION

AVOID CONTACT WITH EYES, SKIN AND CLOTHING. IN CASE OF ACCIDENTAL CONTACT, PLEASE RINSE WITH WATER.

WARNING

BRAKING CIRCUIT FLUID IS HIGHLY CORROSIVE; PLEASE DO NOT COME INTO CONTACT WITH THE PAINT.

WARNING

THE BRAKE FLUID IS HYGROSCOPIC, WHICH MEANS IT ABSORCS MOISTURE FROM THE SURROUNDING AIR. WHEN THE HUMIDITY OF

BRAKE FLUID EXCEEDS A CERTAIN VALUE, THE BREAKING EFFCIENCI WILL BE LOW. WHEREFORE, DO NOT USE BRAKE FLUID THAT IS ALREADY ON OR PARTIALLY USED.

Recommended products

AGIP BRAKE 4 Brake fluid.

Synthetic fluid SAE J 1703 -FMVSS 116 - DOT 3/4 - ISO 4925 - CUNA NC 956 DOT 4

Replace coolant as indicated in the periodic maintenance schedule under standard weather conditions.

NOTE

FOR BRAKE FLUID REPLACEMENT AIR FLOW OUT OF THE CIRCUIT, SEE THE BRAKING SYSTEM CHAPTER.

Cooling system

If noise or liquid is detected leaking through the pump drain hole, it is necessary to replace the pump as described in the flywheel cover section.

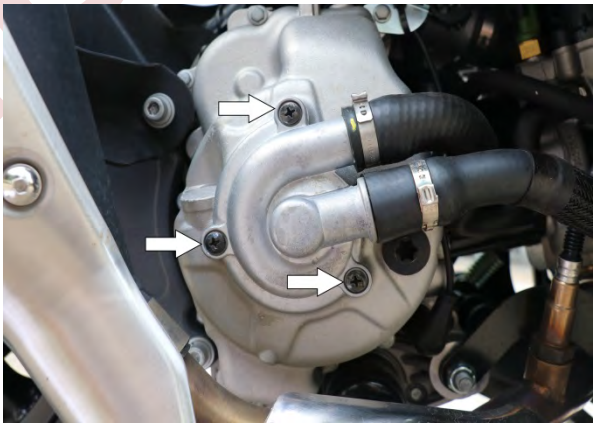
Take some basic steps as follows:

- Place the vehicle on its center frame and on the ground.
- Clear the cooling system by removing the coupling on the pump cover and the packing plug on the expansion tank.

CAUTION

THIS MUST BE DONE WHEN THE ENGINE IS COLD.

- Loosen 3 screws and remove the pump cover as shown.
- Partially drain the system and overhaul the pump according to the description in the "engine" section.
- Repair and reinstall the damaged parts, and then make up for the leakage of the system.



NOTE

FOR COOLANT AND SYSTEM REPLACEMENT, REFER TO THE “COOLING SYSTEM” SECTION.

Characteristic

Cooling system

approx. 1.8 litres

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Level check

When the engine is cold, check the liquid level of coolant according to the instructions in the planned maintenance table, as follows:

-Place the vehicle on its center frame and flat ground

-There is a long strip of observation port on the center cover.

-To view the coolant from the observation port, the liquid level must be between the highest and lowest calibration lines

CAUTION

DO NOT EXCEED THE MAX. KEEP THE LIQUID LEVEL WHEN FILLING OIL TO AVOID THE COOLANT ESCAPING FROM THE EXPANSION TANK WHEN VEHICLE IS IN USE.

NOTE

THE COOLANT CONSISTS OF DEIONIZED WATER AND A LIQUID MIXTURE THAT SEAL THE LOOP. THE MIXTURE TO OBTAIN LOWER FREEZING POINT OF COOLANT TO 40℃. THE MIXTURE PLUS 0.9 BAR PRESSURE, TO INCREASE THE BOILING POINT TO ABOUT 125℃. THE RECOMMENDED LIQUID ALSO HAS A PROTECTIVE EFFECT ON ALUMINUM ALLOYS. THIS TRAIT MAY DIMINISH OVER TIME; THIS IS WHY REGULAR COOLANT REPLACEMENT IS ESSENTIAL.

NOTE

REFER TO "COOLING SYSTEM" FOR COOLANT AND FLUSHING SYSTEM REPLACEMENT

Checking the ignition timing

- Remove the plastic cover from the flywheel cover.
- Rotate the flywheel until the reference mark «T» on the rotor matches the reference mark on the flywheel cover, as shown in figure (TDC).Ensure that the camshaft controls alignment of the 4V reference point on the pulley with the head reference point, as shown in figure 2.If the reference is contrary to the indicator on the head, turn the crankshaft again.

To use this reference mark, remove the spark plug and use the caliper wrench applied to the camshaft command pulley housing to turn the engine in the opposite direction from normal.

Oil pressure warning light

Warning light (low oil pressure)

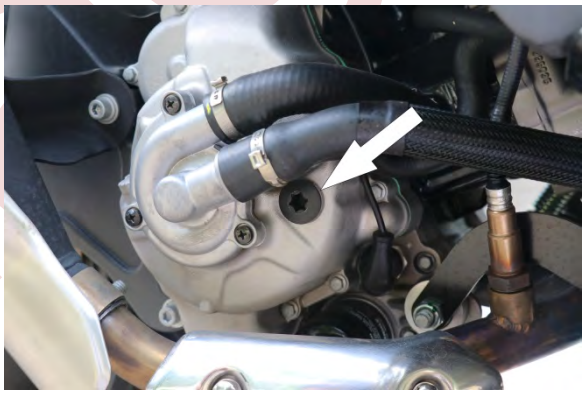
The vehicle has a warning light, its dashboard that lights up when the key is turned “ON”.

However, once the engine starts, the light goes out.

If the light comes on during braking, at idling speed or while turning, it is necessary to first switch off the engine and then to check the oil level and the lubrication system

Checking the spark advance

Ignition advance is determined electronically by parameters known to the control unit. For this reason, it is impossible to interpret reference values based on engine RPMS. Ignition advance values can be detected at any time with a diagnostic testing machine. Strobe light can be used to check whether the ignition advance determined by the injection system matches the ignition advance value actually started on the engine.



It goes as follows:

- Remove spark plugs.
- Remove transmission crankcase.
- Rotate the belt wheel fan to make the reference marks between the flywheel and the flywheel cover coincide, as shown in the figure.

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- .As shown in the figure, move the reference mark to the transmission side between the fan and the transmission cover.

- Reassemble the spark plugs.
- Let's reinstall the plastic cover on the flywheel cover.
- Let's adjust the spark gap to the contact position (no reference mark) and install it on the engine between the spark plug and the spark plug cover
- We connect the sensor clip to the spark gap cable, paying attention to the correct polarity (the arrow on the clip must point to the spark plug).

- Let's connect the diagnostic tester.
- Start the engine.
- Let's select the «Parameters» function in this menu.
- Frequency flash control is set to the traditional four-stroke engine position (1 spark, 2 RPM).
- Check whether the actual values of speed and ignition advance are consistent with those measured by the diagnostic tester.

If the values do not correspond, check:

- distribution timing
- revolution timing sensor
- injection control unit

Specific tooling

020680Y Diagnosis Tool

020330Y Stroboscopic light to check timing

020621Y HV cable extraction adaptor

Spark plug

Follow these steps:

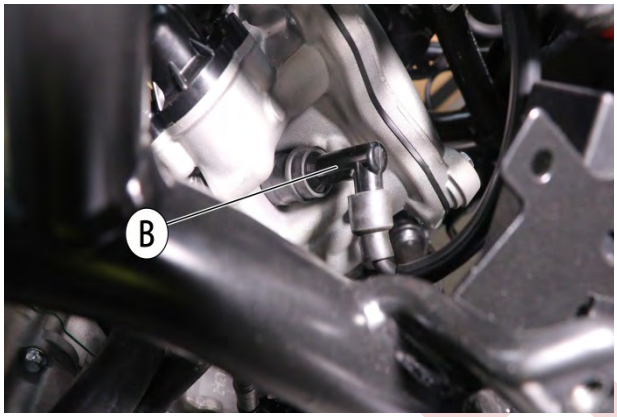
1. Remove the right cover and unscrew 3 screws as shown in the figure;
2. Disconnect the spark plug high voltage wire cover, as shown in the figure
3. Open the spark plug with a wrench.

4. When reassembling, put the spark plug into the hole at the appropriate inclination Angle, tighten the spark plug by hand until the finger is tightened;

5. Just use a wrench to lock it;

6. Press the hood fully over the spark plug. As shown in figure

7. Install the high pressure cap holder, install the 10 franc nut on the engine screw rod, tighten the screw, and put the high pressure cap into the bracket clamp to prevent loosening, as shown in the figure

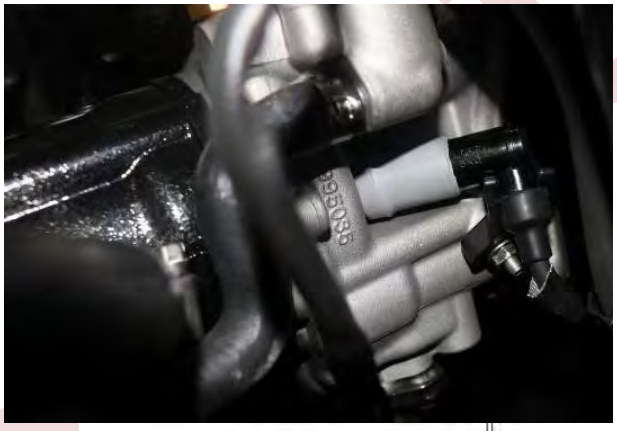


WARNING

THE USE OF SPARK PLUGS OTHER THAN THE RECOMMENDED OR AN UNSHIELDED SPARK PLUG CAP MAY INTERFERE WITH THE SYSTEM.

WARNING

WHEN THE SPARK PLUG IS COOLED, IT MUST BE REMOVED AND REPLACED ACCORDING TO THE MAINTENANCE SCHEDULE. THE USE OF ELECTRONIC CENTRAL DEVICES AND NON-CONFORMING ELECTRONIC IGNITION DEVICES OR SPARK PLUGS (EXCEPT THOSE SPECIFIED) MAY SERIOUSLY DAMAGE THE ENGINE.



Characteristic

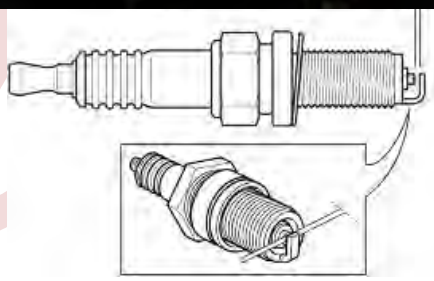
Spark plug

NGK CR8EKB

Electric characteristic

Electrode gap

0.7 to 0.8 mm



Locking torques (N*m)

Spark plug 12 ÷ 14

Air filter

Follow these steps:

Unscrew the 9 fixing screws as shown in «A»;

Remove the air filter

CAUTION

IF THE VEHICLE IS TRAVELING ON A DUSTY ROAD, AIR FILTERS MUST BE CHECKED REGULARY TO AVOID DAMAGE TO THE ENGINE.

1. Wash sponge with water and soap.

2. Dry with a clean cloth and a small amount of compressed air.

3. Soak the sponge in a mixture of 50% gasoline and 50% designated oil.

4. Gently squeeze the filter element, do not twist, let the filter element drip, and then reinstall.

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

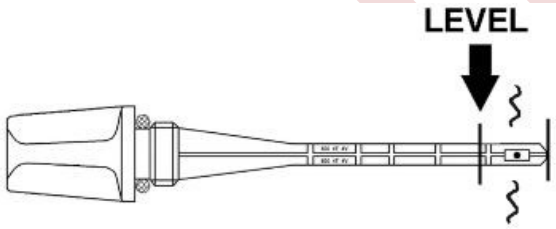
AGIP FILTER OIL Special product for the treatment of foam filters.

Hub oil

Check

- place the vehicle in the centre and stand on a level ground;

-Remove the oil ruler, dry it with a clean cloth, put it back in the hole, and tighten it completely，as shown in A.



-Remove the oil gauge and check whether the oil level is slightly higher than the second groove from the bottom; If the level is below the maximum. Record, it needs to add the right amount of hub oil.

- Tighten the oil gauge again to ensure that the lock is in place

Replacement

-Remove the oil filler cap «**A**».

♦ Unscrew the oil drainage cap «**B**» and drain out all the oil.

♦ Screw the drain cap again and put the specified oil into the hub.

Recommended products

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

API GL-4

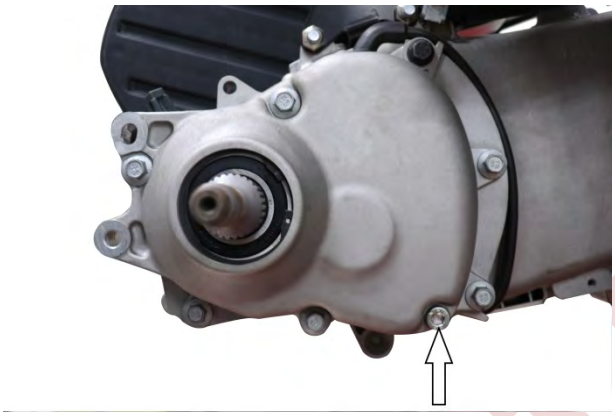
Characteristic

Rear hub oil

Capacity approximately 250 cc

Locking torques (N*m)

Hub oil drainage screw 15 to 17 Nm

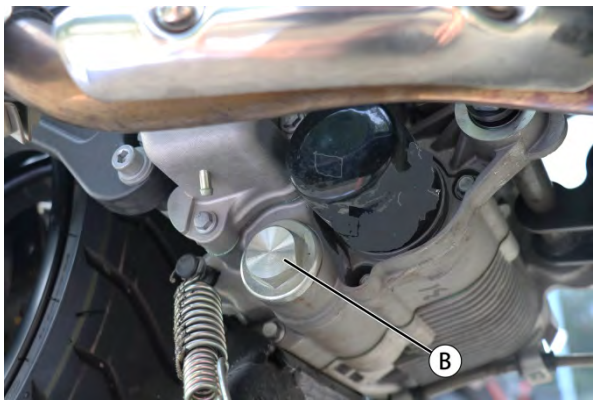


Engine oil

In four-stroke engines, oil is used to lubricate distribution elements, bench bearings, and hot sets.
Insufficient oil can cause serious damage to the engine.
In all four-stroke engines, deterioration of oil characteristics or a certain consumption should be considered normal, especially during run-in.
Consumption levels are particularly affected by conditions of use (e.g., increased fuel consumption at full power).

Replacement

Replace oil and strainer according to regular maintenance schedule. Drain the oil from the engine through the drain plug, as shown in figure B



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To facilitate oil displacement, loosen the oil cap/gauge as shown in figure A.

When all the oil is discharged through the oil drain hole, unscrew and remove the oil filter element, as shown in figure C.

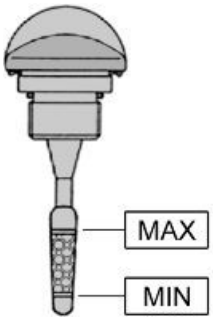
Ensure that the pre-filter and drain plug O-rings are in good condition.

Lubricate, reinstall strainer and drain plug, tighten to specified torque.

Reinstall the new filter element and lubricate the O-ring carefully before installation.

Change the engine oil.

Since there is still a certain amount of oil left in the circuit, the oil must be added through the plug “A”. Then start the scooter and let it run for a few minutes, then turn it off: check the liquid level after five minutes, and if necessary, fill it up without exceeding the **MAX** liquid level. The filter element must be replaced each time the oil is changed. Fill and replace with the recommended type of new oil.



NOTE

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.

Malaguti

JASO MA, MA2 - API SL - ACEA A3

Locking torques (N*m)

Oil filter 4 to 6 Engine oil drainage plug 24 to 30

Check

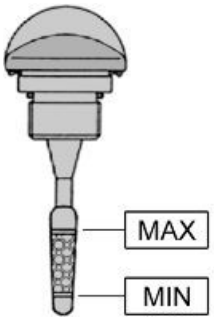
This operation must be carried out under the condition of engine cooling and follow the following steps:

- Place the vehicle on its center frame and on the ground.
- Unscrew the cap/caliper «A», dry it with A clean cloth, re-insert and unscrew all the way down.
- Remove the cap/gauge again to check whether the liquid level is between the minimum and maximum reference mark; Recharge, if necessary.

If the inspection is carried out after the use of the vehicle, the liquid level line will be lowered when the engine heats up. To recheck, wait at least 10 minutes after stopping to get to the right level.

Oil top up

After checking the oil level, fill it with oil. In any case, do not exceed the upper limit of oil level when refueling.
It takes about 10 minutes, 400 cubic meters of oil, to get the level back from the minimum to the maximum.



Engine oil filter

The filter element must be replaced each time the oil is changed. Fill and replace with the recommended type of new oil.

Ensure that the pre-filter and drain plug O-rings are in good condition. Lubricate and reinstall the strainer and drain plug to achieve the required torque. Reinstall the new filter element and lubricate the O-ring carefully before installation. An oil change.

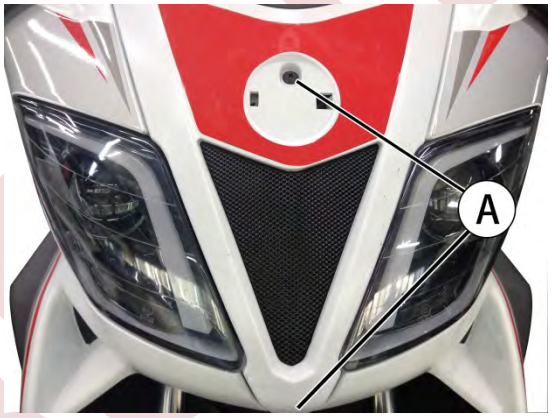
Recommended products

Malaguti

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

JASO MA, MA2 - API SL - ACEA A3

Front light group



To access the bulbs, proceed as follows:

1. Use a screwdriver to pull out the MALAGUTA sticher

2. If the diagram is shown, remove the screws in the “A”, and pull the front lid out.

3. Remove the fixed screw in front of the front of the headlights 4 “B”.

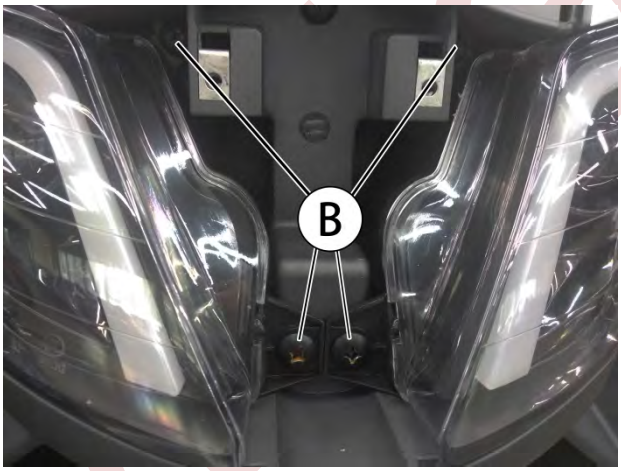
4. Remove the fixed screw at the back of the front of the headlights 2 .

5. Take out the headlights.

6. Because the headlights are LED assembly lamps, if the headlights are out of order, the headlamp assembly must be replaced.

7. Headlamp height adjustment, the need to take out the headlamp, screwdriver screw out the adjustment screw ”D”, clockwise low, anti-clockwise high.

If you want to reassemble, follow the above steps.

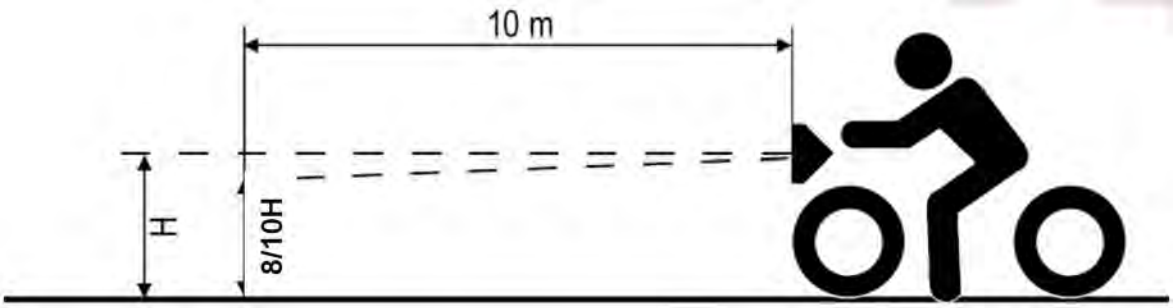


Headlight adjustment

1. Put the vehicle in running order, with the tyres inflated to the prescribed pressure, onto a flat surface 10m away from a half-lit while screen, ensure that the longitudinal axis of the vehicle is perpendicular to the screen.

2. Switch on the front light, turn to the low beam, check the light on the screen, make sure that the light between 6/10H and 8/10H.

3. Otherwise, loose the light from the vehicle, adjust the screw “A”, till to it can reach the standard. Turn the screw ”A” clockwise to lower the light beam, turn the screw “A” anticlockwise to raise the light beam.



NOTE

THE ABOVE PROCEDURE COMPLIES WITH EURO- PEAN STANDARDS REGARDING MAXIMUM AND MINI- MUM HEIGHT OF LIGHT BEAMS. REFER TO THE STATU- TORY REGULATIONS IN FORCE IN EVERY COUNTRY WHERE THE VEHICLE IS USED.

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This chapter is the description of Tire Pressure Monitoring System, TPMS.

Characteristic

1. Normal tire pressure value range of front wheel: **1.8bar-2.8bar**
2. Normal tire pressure value range of rear wheels: **2.1bar-3.0bar**

pressure (bar) / Tire position	Low pressure alarm value (bar)	Return value (bar)	High voltage alarm value (bar)
front wheel	＜1.8	2.3	＞2.8
rear wheel	＜2.1	2.4	＞3.0

Fast air leakage alarm

When the tire in rapid air leakage, the meter will show "fast air leakage" alarm.

Low power alarm

When the power of tire pressure sensor is insufficient, the meter will show "low power" alarm.

Sensor fault

When the tire pressure host can not receive the sensor signal, the meter will display "tire pressure fault" alarm.

Tire pressure to study

When replacing the tire pressure sensor or the tire pressure host, it is necessary to relearn: the learning steps are as follows:

-Switch the electric door lock for 5 times within 5S, when the instrument appears "front tire learning", use the tire pressure activator to activate the front wheel sensor.

-After successful activation, the instrument will appear "front tire learning success" and then enter "rear wheel learning". At this time, the tire pressure activator will be used to activate the rear wheel sensor.

-After successful activation, the instrument will show "rear tire learning success". If the instrument shows "learning failure", it needs to switch the electric door lock again to enter the first step.

NOTE

IF THERE IS NO TIRE PRESSURE ACTIVATOR CAN ACTIVATE THE SENSOR BY DEFLATING (ABOUT 10S), WHEN THE TIRE PRESSURE SENSOR IS ACTIVATED BY DEFLATING, THE INSTRUMENT MAY SHOW"LOW PRESSURE","FAST AIR LEAKAGE" AS LONG AS IT DOES NOT SHOW "LEARNING FAILURE", IT INDICATES THAT THE HOST MACHINE HAS SUCCEEDED IN LEARNING.

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This section enables you to find solutions to apply when troubleshooting. For each, a list of possible causes and associated actions is given.

Poor performance

POOR PERFORMANCE

Possible Cause	Operation
Fuel pump	Check the injection load relay
Excess of scales in the combustion chamber	Descale the cylinder, the piston, the head and the valves
Incorrect timing or worn timing system elements	Time the system again or replace the worn parts
Obstructed muffler	Replace
Filtro aria otturato o sporco	Smontare la spugna, lavare con acqua e shampoo, quindi impregnarla con una miscela al 50% di benzina e olio specifico, successivamente spremerla tra le mani senza strizzarla, lasciarla sgocciolare e rimontarla.
Oil level exceeds maximum	Check for causes and fill to reach the correct level
Lack of compression: parts, cylinder and valves worn	Replace the worn parts
Drive belt worn	Replace
Inefficient automatic transmission	Check the rollers, the pulley movement and make sure the drive belt is in good conditions; replace the damaged parts and lubricate the moveable driven pulley with specific grease.
Clutch slipping	Check the clutch system and/or the bell and replace if necessary
Overheated valves	Remove the head and the valves, grind or replace the valves
Wrong valve adjustment	Adjust the valve clearance properly
Valve seat distorted	Replace the head unit

Noisy suspension

NOISY SUSPENSION

Possible Cause	Operation
Faults in the suspension system	If the front suspension is noisy, check: tightening torques, headstock components, inspect forks.

Suspension oil leakage

OIL LEAKAGE FROM SUSPENSION

Possible Cause	Operation
Faulty or broken seals	Replace the shock absorber

Insufficient lubrication pressure

LOW LUBRICATION PRESSURE

Possible Cause	Operation
By-Pass remains open	Check the By-Pass and replace if required. Carefully clean the By-Pass area.
Oil pump with excessive clearance	Perform the dimensional checks on the oil pump components
Oil filter too dirty	Replace the cartridge filter
Oil level too low	Restore the level adding the recommended oil type

Clutch grabbing or performing inadequately

IRREGULAR CLUTCH PERFORMANCE OR SLIPPAGE

Possible Cause	Operation
Faulty clutch	Check that there is no grease on the masses. Check that the clutch mass faying surface with the bell is mainly in the centre with equivalent characteristics on the three masses. Check that the clutch housing is not scored or worn in an anomalous way

Insufficient braking

INEFFICIENT BRAKING SYSTEM

Possible Cause	Operation
Inefficient braking system	Check the pad wear (1.5 min). Check that the brake discs are not worn, scored or warped. Check the correct level of fluid in the pumps and change brake fluid if necessary. Check there is no air in the circuits; if necessary, bleed the air. Check that the front brake caliper moves in axis with the disc.
Fluid leakage in hydraulic braking system	Failing elastic fittings, plunger or brake pump seals, replace
Brake disc slack or distorted	Check the brake disc screws are locked; measure the axial shift of the disc with a dial gauge and with wheel mounted on the vehicle.

Brakes overheating

BRAKE OVERHEAT

Possible Cause	Operation
Defective plunger sliding	Replace the caliper.
Brake disc slack or distorted	Check the brake disc screws are locked; use a dial gauge and a wheel mounted on the vehicle to measure the axial shift of the disc.
Clogged compensation holes on the pump	Clean carefully and blast with compressed air
Swollen or stuck rubber gaskets	Replace the caliper.

Excessive oil consumption/Exhaust smoke

EXCESSIVE CONSUMPTION

Possible Cause	Operation
Wrong valve adjustment	Adjust the valve clearance properly
Overheated valves	Remove the head and the valves, grind or replace the valves
Misshapen/worn valve seats	Replace the head unit
Worn cylinder, Worn or broken piston rings	Replace the piston cylinder assembly or piston rings
Worn or broken piston rings or piston rings that have not been fitted properly	Replace the piston cylinder unit or just the piston rings
Oil leaks from the couplings or from the gaskets	Check and replace gaskets or restore the coupling seal
Worn valve oil seal	Replace the valve oil seal
Worn valve guides	Check and replace the head unit if required

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Steering and suspensions

Heavy steering

STEERING HARDENING

Possible Cause	Operation
Steering hardening	Check the tightening of the top and bottom ring nuts. If irregu- larities continue in turning the steering even after making the above adjustments, check the rotation seats and the steering fifth wheels.

Excessive steering play

EXCESSIVE STEERING CLEARANCE

Possible Cause	Operation
Torque not conforming	Check the tightening of the top and bottom ring nuts. If irregu- larities continue in turning the steering even after making the above adjustments, check the rotation seats and the steering fifth wheels.

Engine

Transmission and brakes

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This section describes the operations performed on the engine and the tools to be used.

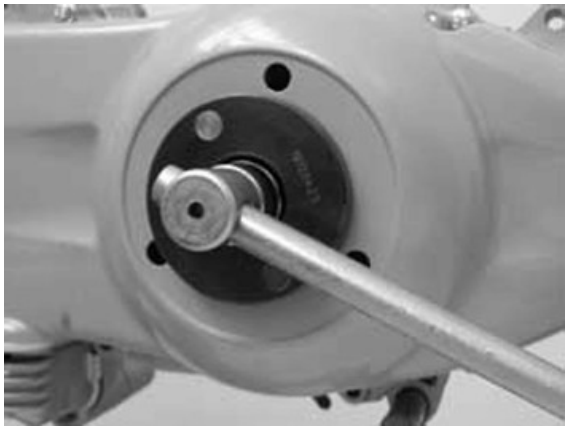
Automatic transmission

Transmission cover

- To remove the drive cover, remove the plastic cover and insert the screwdriver into the slot.
- Remove the lock nut and washer from the driven wheel shaft using the clutch housing lock wrench as shown.

Specific tooling

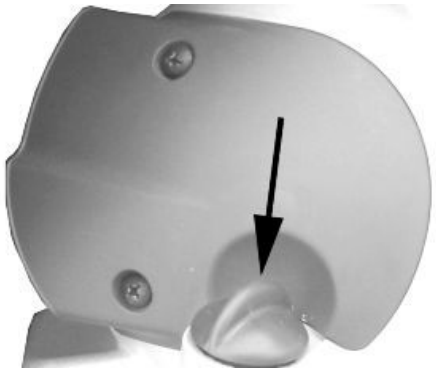
020423Y Driven pulley lock wrench



- Remove the oil cap/gauge from the oil injection hole.
- Remove 10 screws.
- Remove the gearbox cover.

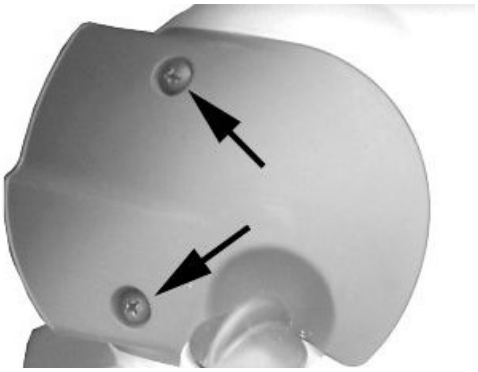
NOTE

WHEN YOU REMOVE THE GEARBOX COVER, YOU MUST BE CAREFUL NOT TO REMOVE THE CLUTCH HOUSING.

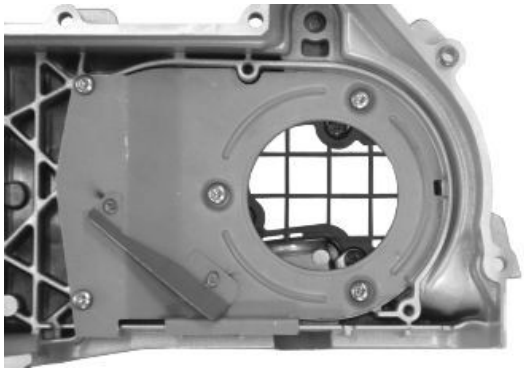


Air duct

- Remove the inlet cover of the transmission chamber as shown.

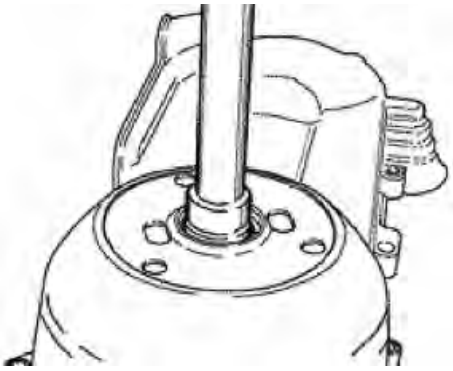


- Remove the five screws from the two different heights and the five screws from the small box.



Removing the driven pulley shaft bearing

- Take the clamp out of the cover.
- Remove the bearing from the crankcase in the following manner:



Specific tooling

020376Y Adapter handle

020375Y 28 x 30 mm adaptor

020412Y 15-mm guide

Refitting the driven pulley shaft bearing

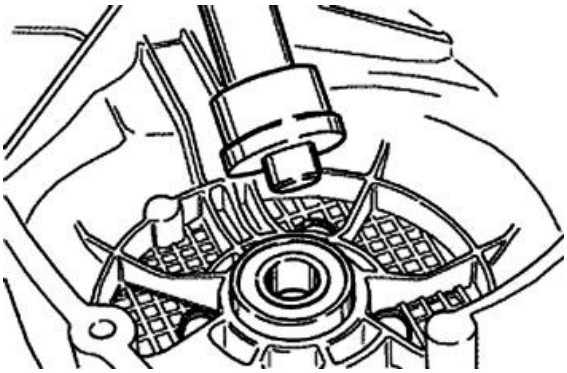
- Heat the crankcase a little from the inside to avoid damage to the paint.
- Insert the bearing into its seat.
- Reinstall the siegel ring.

CAUTION

USE PROPER REST SURFACES TO AVOID AGEING OF THE DAM`S COVERING PAINT.

NOTE

BE SURE TO REPLACE THE BEARINGS WHEN REINSTALLING.



Specific tooling

020376Y Adapter handle

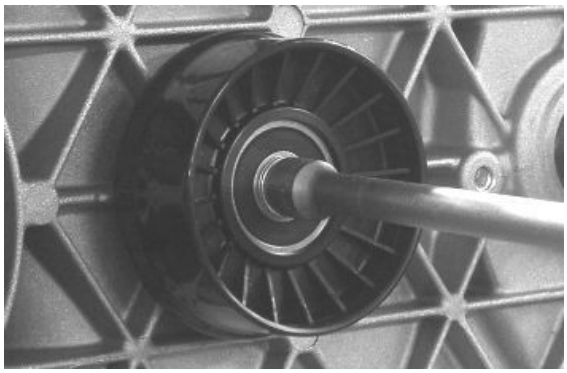
020357Y 32x35-mm Adaptor

020412Y 15-mm guide

Baffle roller

Plastic roller

-Check the rollers for signs of wear and freedom of movement.
- Remove the special clamping screws as shown
- Check the outer diameter of the roller for defects that may affect the operation of the belt
- When refitting, put the roller with sealing edge on the side of engine crankcase
- Tighten the wrench to the specified torque.



Locking torques (N*m)

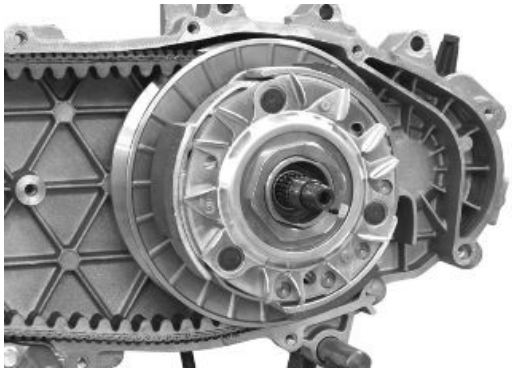
Anti-flapping roller 12 - 16

Removing the driven pulley

- Remove clutch housing and slave pulley assembly.

NOTE

THE DEVICE CAN ALSO BE REMOVED WITH THE DRIVING PULLEY MOUNTED.



Inspecting the clutch drum

- Check the clutch clock for wear or damage.
- Measure the inside diameter of the clutch bell.

Characteristic

Max. value clutch bell

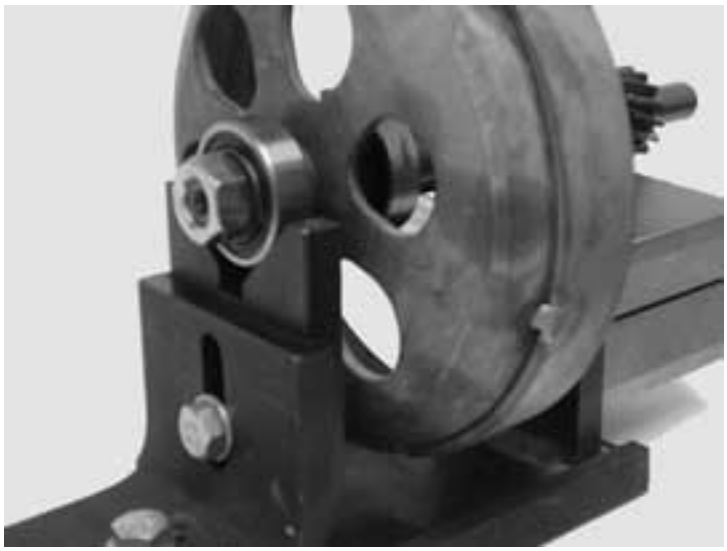
Max. value: Ø 134.5 mm

clutch housing standard value

Standard value: Ø 134 - 134.2 mm

Checking the bell working surface eccentricity

- Install the bell on a driven pulley shaft using 2 bearings (inside diameter: 15 and 17 mm).
- Lock with the original spacer and nut.
- Place the bell/shaft unit on the support to check the crankshaft alignment.



- .Measure the eccentricity of the clock with a feeler and a magnetic base.
- Let's repeat the measurements at three locations (center, inside, and outside).
- If a fault is found, replace the bell.

Specific tooling

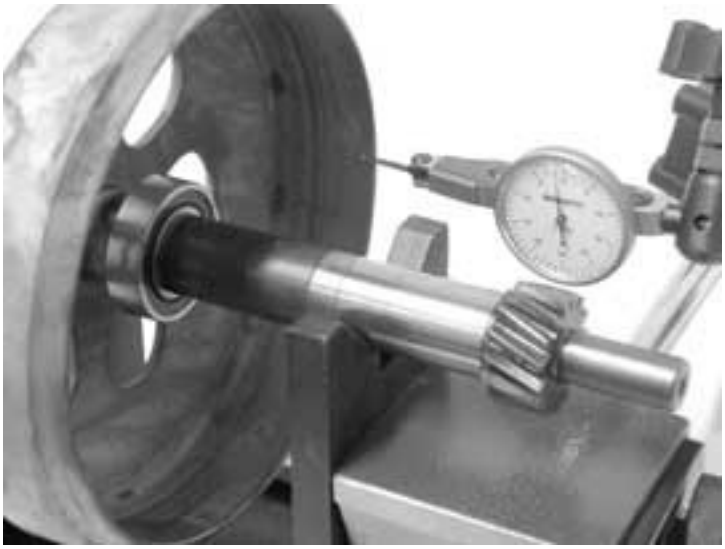
020074Y Support base for checking crankshaft alignment

020335Y Magnetic mounting for dial gauge

Characteristic

clutch bell inspection: Limit eccentricity.

Admissible limit eccentricity: 0.15 mm



Inspecting the clutch

- Check the quality of the clutch and the thickness of the friction material.
- The masses shall not bear traces of lubricants; Otherwise, check the driven pulley unit seal.

NOTE

IN RUNNING-IN, THE MASSES MUST SHOW A CENTRAL INTERFAVE AND MUST NOT DIFFER FROM ONE ANOTHER.

ANY NUMBER OF CONDITIONS CAUSE THE CLUTCH TO TEAR.

CAUTION

DO NOT USE TOOLS TO OPEN HEAVY OBJECTS TO PREVENT SPRING LOAD CHANGES.

Characteristic

Check minimum thickness

1 mm

Removing the clutch

- Screw the medium length pin of the special tool for the driven pulley spring compressor in the proper position «C» within the tool.

- Introduces adapter ring 11 with chamfering facing inside the tool.
- Install the driven wheel device on the tool, so that the three pins in the air holes of the mass clamping bracket are installed in place.
- Make sure the clutch is fully inserted into the adapter ring before loosening/tightening the clutch nut.

- Remove the nuts holding the clutch in place using the special 46x55 wrench assembly 9.
- Remove driven wheel assembly (clutch and spring and plastic support)

CAUTION

THE TOOL MUST BE FIRMLY FIXED TO THE FIXYURE AND THE CRNTER SCREW MUST BE USED IN CONJUNCTION WITH THE TOOL. EXCESSIVE TORQUE WILL CAUSE THE BUCKLE OF A PARTICULAR TOOL TO BUCKLE.

Specific tooling

020444Y011 adapter ring

020444Y009 wrench 46 x 55

020444Y Tool for fitting/ removing the driven pulley clutch

Pin retaining collar

- Manually rotate and pull collar down at the same time.

NOTE

USE TWO SCREWDRIVERS IF YOU HAVE ANY DIFFICULTY.

NOTE

BE CAREFUL NOT TO PUSH THE SCREWDRIVERS IN TOO FAR TO AVOID DAMAGE THAT COULD COMPROMISE THE O-RING SEAL.

- Remove 4 torque servo pins and split the pulley in half.

Removing the driven half-pulley bearing

- Check for no signs of wear and/or noise;
- If there is a new one, replace it with a new one.
- Remove the retainer ring using two flat blade screwdrivers.
- Use a wooden surface to fully support the pulley bushing from the threaded side.
- Hammer and pin out the ball bearing as shown.

- Support the pulley properly with the bell as shown in the picture.

Specific tooling

001467Y035 Bell for 47-mm outside diameter bearings

- Remove the roller bearing with a combination punch.

Specific tooling

020376Y Adapter handle

020456Y Ø 24 mm adaptor

020363Y 20-mm guide

Inspecting the driven fixed half-pulley

- Measure the outside diameter of the pulley bush.
- Check the contact surface with the belt to make sure there are no defects.
- Check the function of the riveted joint.

- Check whether the belt contact surface is smooth.

Characteristic

Half-pulley minimum diameter

Minimum admissible diameter: Ø 40.96 mm

Half-pulley standard diameter

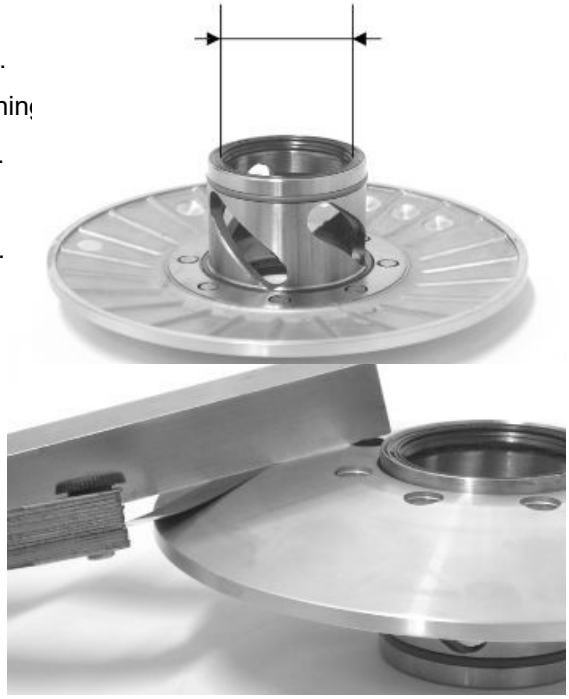
Standard diameter: Ø 40.985 mm

Wear limit

0.3 mm

Inspecting the driven sliding half-pulley

- Remove the two sealing rings and the two o-rings.
- Ensure inner diameter of movable half pulley bushing
- Check joint surface with belt to ensure no defects.
- Check whether the riveted joint is normal.
- Check whether the belt contact surface is smooth.



MOVABLE DRIVEN HALF-PULLEY DIMENSIONS

Specification	Desc./Quantity
Wear limit	0.3 mm
standard diameter	Ø 41.000 - 41.035 mm
maximum allowable diameter	Ø 41.08 mm

Refitting the driven half-pulley bearing

- Use a wooden surface to fully support the pulley bushing from the threaded side.

- Install new roller bearings as shown.

- For the assembly of new ball bearings, use the modular punch as shown in the figure.

Install the retainer

WARNING

NOTE

FIT THE BALL BEARING WITH THE VISIBLE SHIELDING

Specific tooling

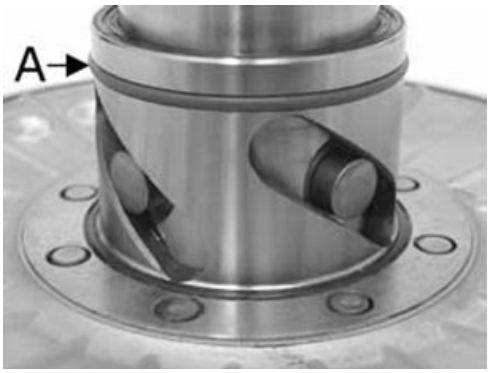
020376Y Adapter handle

020375Y 28 x 30 mm adaptor

020424Y Driven pulley roller casing fitting punch

Refitting the driven pulley

- Insert the new oil seal and O-ring into the removable half pulley.
- Lightly oil the -ring «A» as shown in the figure.
- Install the half pulley on the bushing using a special tool.
- Check for pin wear and reinstall in groove.
- Reinstall torque server to close collar.
- Use the elbow grease gun and lubricate the driven gear with approximately 6 g of grease. Grease one of the holes. Until the casing is perforated through the hole on the other side. This operation is necessary to avoid the presence of grease outside the O-ring. Using a curved-spout grease gun, lubricate the driven pulley unit with approximately 6 grams of grease.



Apply grease through one of the holes in the bushing until it comes out through the hole on the opposite side. This operation is necessary to avoid the presence of grease beyond the O-rings.

NOTE

THE TORQUE SERVER CAN BE GREASED WHETHER WITH BEARINGS FITTED OR WHEN THEY ARE BEING RE-PLACED; UNDERTAKING THE OPERATION WHEN THE BEARINGS ARE BEING SERVICED MIGHT BE EASIER.

Specific tooling

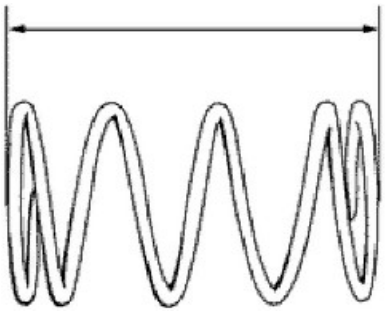
020263Y Driven pulley assembly sheath

Recommended products

AGIP grease SM 2 grey-black smooth Tex type lithium grease, containing molybdenum disulfide.

Inspecting the clutch spring

- Measure the length of the spring when it is reset.



Characteristic

Standard length

123 mm

Acceptable limit after use:

118 mm

Refitting the clutch

- Support the special tool for driven pulley spring compressor with the control screw on the vertical shaft.
- Let's screw the medium length pin into the "C" position inside the tool.
- Let's take a look at the no. 11 adapter ring with the top chamfer.
- Let's insert the clutch into the adapter ring.
- S lubricates the end of the spring close to the torque server closing ring. .

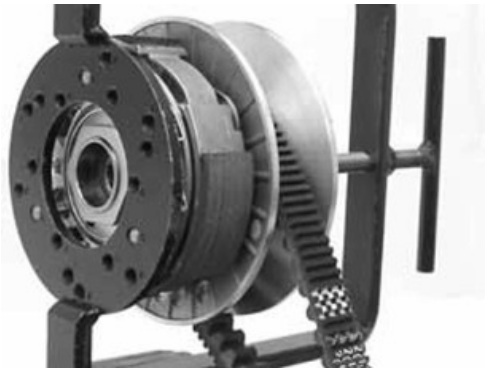
- Insert the spring with its plastic support in contact with the clutch.
- Insert the driving belt into the belt pulley block according to its rotation direction.
- Insert the pulley unit into the tool.
- Slightly pre-loaded spring.
- Before tightening the clutch nut, ensure that the clutch is fully inserted into the adapter ring.
- Use the control screw on the horizontal axis to insert the cutter into the jig.
- Spring pretensioning.
- Tighten the clutch retaining nut to the required torque using a special 46x55 wrench.
- Loosen the tool holder and insert in the direction of belt rotation.
- Use the special tool to lock the driven wheel again.
- The belt is placed in a rolling position with a smaller diameter through the traction/rotation combined action of the preloaded clutch return spring.
- Remove the pulley/belt device from the tool.

NOTE

BE CAREFUL NOT TO DAMAGE PLASTIC SPRING STOPS AND BUSHING THEADS DURING THE SPING PRELOAD PHASE.

NOTE

FOR DESIGN REASONS, THE NUT IS SLIGHTLY ASYMMETRIC; THE FLATTEST SURFACE SHOULD BE MOUNTED IN CONTACT WITH THE CLUTCH.



Specific tooling

020444Y Tool for fitting/ removing the driven pulley clutch

020444Y011 adapter ring

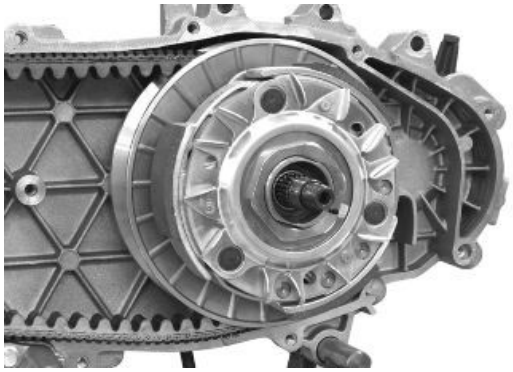
020444Y009 wrench 46 x 55

Locking torques (N*m)

Clutch unit nut on driven pulley 45 to 50

Refitting the driven pulley

- Refit the clutch bell.



Drive-belt

- Check that the driving belt is not damaged.
- Check the width of the belt.

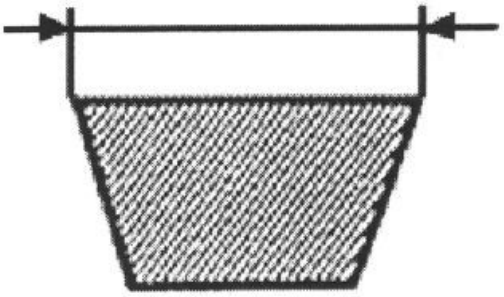
Characteristic

Driving belt - minimum width

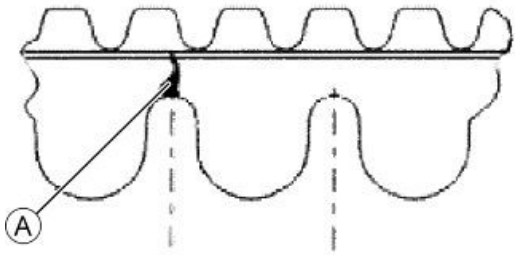
19.5 mm

Driving belt - standard width

21.3 ± 0.2 mm



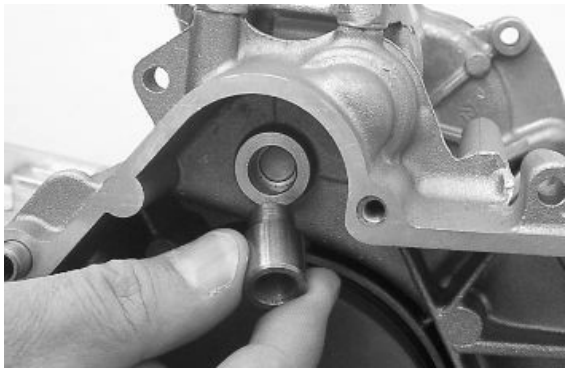
During the wear inspection as foreseen in the "detailed maintenance plan", it is recommended that you check whether there are no incisions or cracks at the bottom edge of the tooth (see figure): no incisions or cracks at the bottom edge of the tooth; If so, change a belt.



Removing the driving pulley

- Rotate the crankshaft until the rope of the pulley is on the horizontal shaft.

- Insert the adapter sleeve of the appropriate tool into the hole shown in the figure.

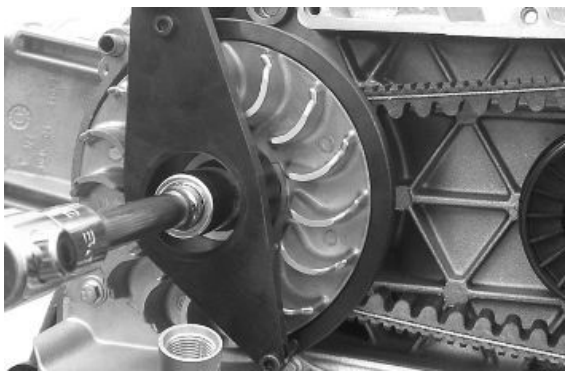


- Insert tool into groove, then use reinforcing ring
- Introduce ring clamp screw while retaining tool support pulley

Specific tooling

020626Y Driving pulley lock wrench

- Remove retaining nut and washer
- Remove half of retaining drive pulley.



Inspecting the rollers case

- Check the inner bushing shown in the figure for abnormal wear and measure the inner diameter A.
- Measure outside diameter B(shown in figure) of pulley sliding bushing.
- Check roll for damage or wear.
- Check and guide the shoe transmission after loose do not wear.
- Check through the roller box with pulley half joint surface.
- Check that the fixed drive pulley shows no signs of abnormal wear and tear on the edge of the groove and the surface contact belt.
- Check that the O-ring is not deformed.

CAUTION

DO NOT LUBRICATE OR CLEAN SINTERED BUSHINGS

Characteristic

Loose half pulley bushing: standard diameter

26.000 - 26.021 mm

Movable half pulley bushing: maximum allowable diameter

Ø 26.12 mm

Sliding bushing: Standard Diameter

Ø 25.959 ÷ 25.98 mm

Sliding bushing: Minimum admissible diameter

Ø 25.95 mm

Roller: Standard Diameter

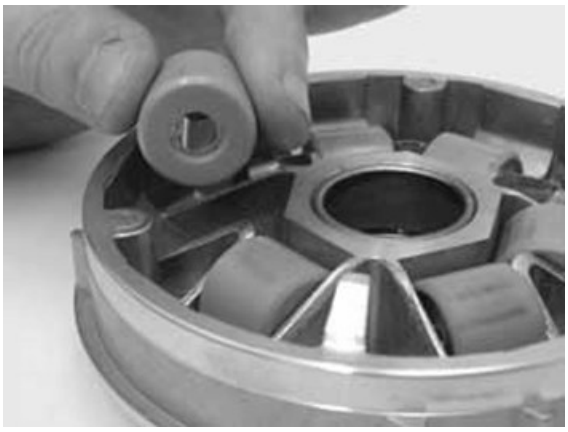
Diameter 20.5 - 20.7 mm

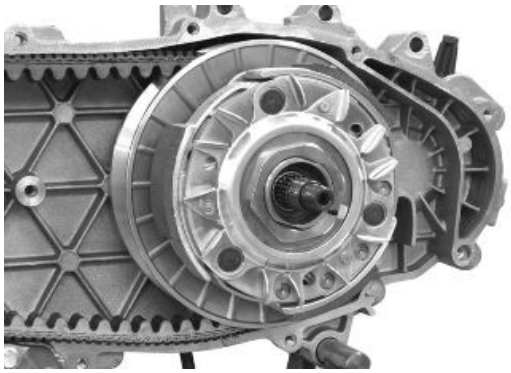
Roller: Minimum diameter permitted

Ø 20 mm

Refitting the driving pulley

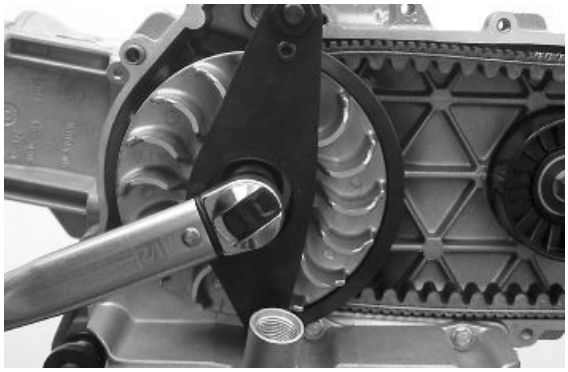
- Move the half pulley and the roller contrast plate preassembled, put the roller into the housing, the larger supporting surface contacts the roller according to the direction of rotation.
- Check roller contact plate for defects and groove edges for damage.
- Complete bushing of crankshaft.
- Mounting the driven pulley/clutch/belt device on the engine.





-Install the steel gasket in contact with the bushing and the stationary driving pulley

- Install the appropriate tools as described in the reinstall phase.
- Tighten nut to specified position with washer.



Specific tooling

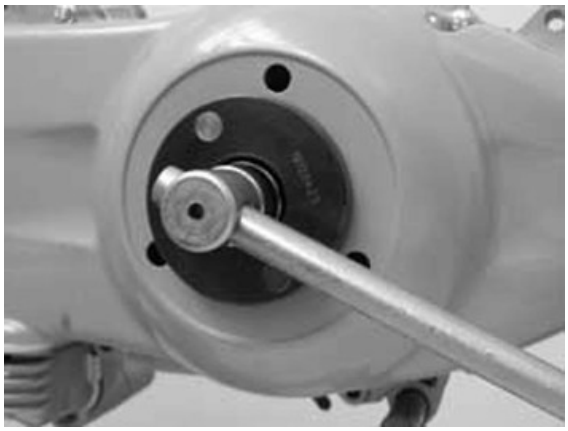
020626Y Driving pulley lock wrench

Locking torques (N*m)

Drive pulley nut 75 - 83

Refitting the transmission cover

- Inspection has two location pin, gasket oil - shell - task cover installation.
- Draw a line between oneself and another.
- Dress up your hat/bar.
- Modified steel gasket and drive pulley nut.σ tighten the lock nut use to specified torque wrench, torque wrench tool.
- Plastic cover in disguise.



Specific tooling

020423Y Driven pulley lock wrench

Locking torques (N*m)

Transmission cover screws 11 to 13 Driven pul- ley shaft nut 54 ÷ 60

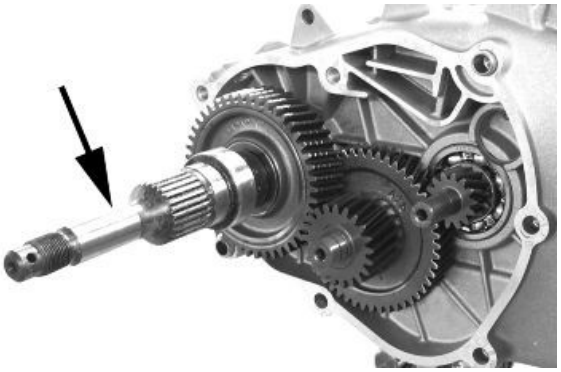
End gear

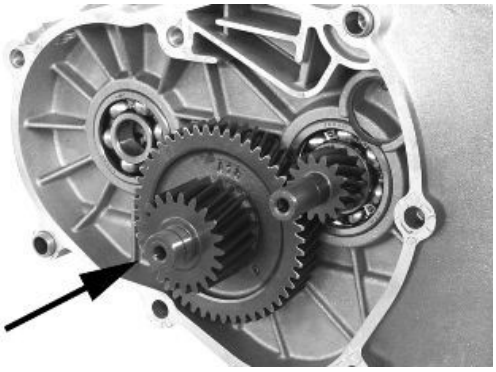
Removing the hub cover

- Everything comes to him who waits.
- Delete the 7 screws shown in the figure.
- Remove hubcap and gasket.

Removing the wheel axle

- Remove axle with gear.
- Remove intermediate gear.





Removing the hub bearings

- Check the condition of the bearing being inspected (wear, clearance and noise).If a failure is detected, do the following.
- Remove three 15mm bearings (2 crankcases, 1 hub cover) using a dedicated bearing puller.

Specific tooling

001467Y013 Caliper to extract ø 15-mm bearings

Removing the wheel axle bearings

- Remove the clamp outside the hub cover.

- Support hub cover and discharge bearing. Remove the oil shield using appropriate tools as shown.

Specific tooling

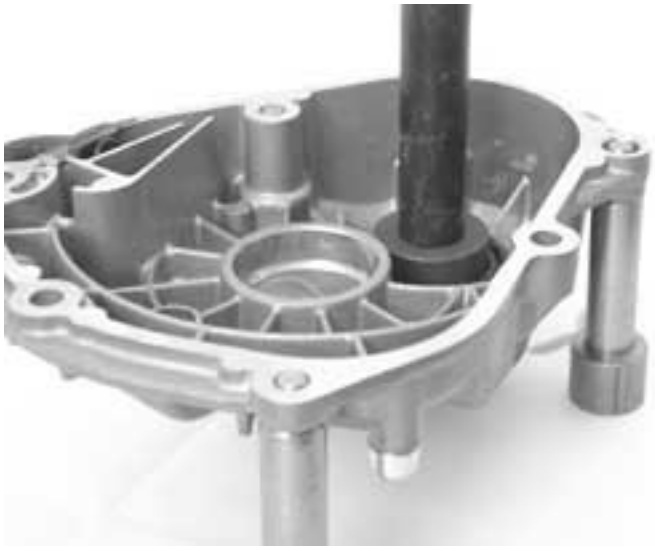
020376Y Adapter handle

020477Y 37 mm adaptor

020483Y 30 mm guide

020359Y 42 x 47-mm adaptor

020489Y Hub cover support stud bolt kit



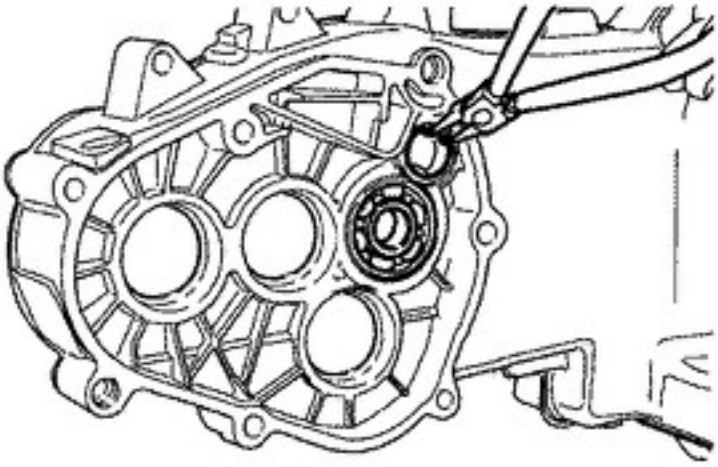
Removing the driven pulley shaft bearing

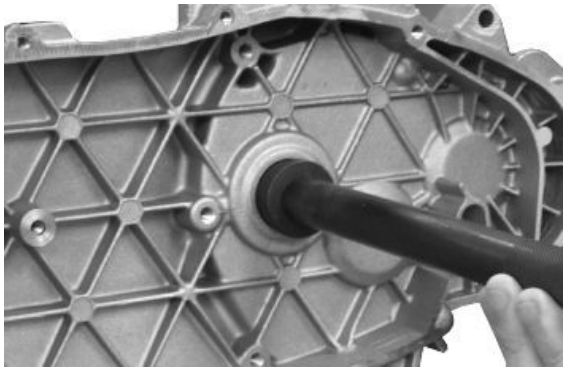
- When you need to remove the driven belt pulley shaft and its bearing and oil seal, please remove the transmission cover as required above.
- Remove the belt pulley shaft from the bearing.
- Remove the oil seal with a screwdriver and work from inside the bearing, taking care not to damage the housing to remove it from the belt drive side.
- Remove the sigmoid ring shown in the figure
- Remove the driven wheel shaft bearing using a combination punch. Specific tooling

020376Y Adapter handle

020375Y 28 x 30 mm adaptor

020363Y 20-mm guide





Inspecting the hub shaft

- Check the wear or deformation of the tooth surfaces, bearing seats and oil seal seats of the three shafts.
- If a fault is found, replace the damaged parts

Inspecting the hub cover

- Check whether the fitting surface is dented or deformed.
- Check the bearing.
- Replace damaged parts in case of failure.

Refitting the wheel axle bearing

- Support the hub cover on a wooden surface.

- Heat the crankcase cover with a specific heat gun.

- Install a modular punch on the axle bearing as shown.

- Put on the seager ring.

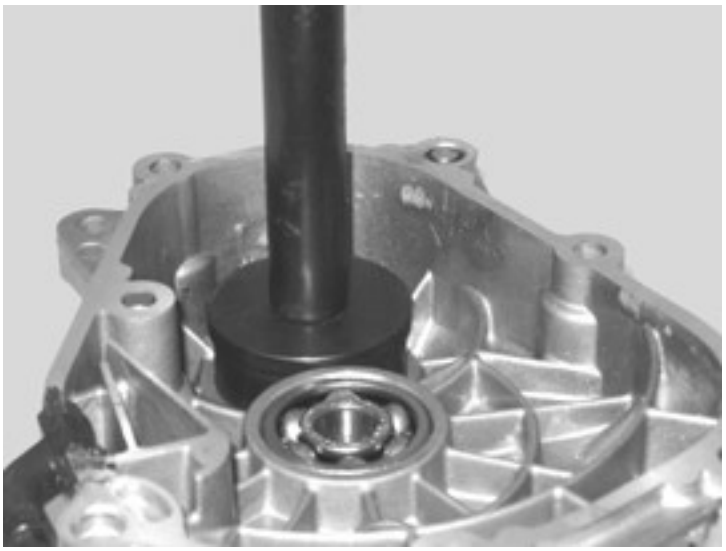
- Install the oil shield with sealing lip on the inner side of the hub and flush it with the inner surface using the appropriate tool on the 52mm side. Adapter 52mm side must be steering bearing.

Specific tooling

020376Y Adapter handle

020360Y 52x55-mm Adaptor

020483Y 30 mm guide



Refitting the hub cover bearings

In order to fit the hub box bearing, the engine crankcase and cover must be heated with a special hot gun.

- Three 15mm bearings must be installed using the appropriate tool :
- Adapter's 42mm side must be steering bearing.

Specific tooling

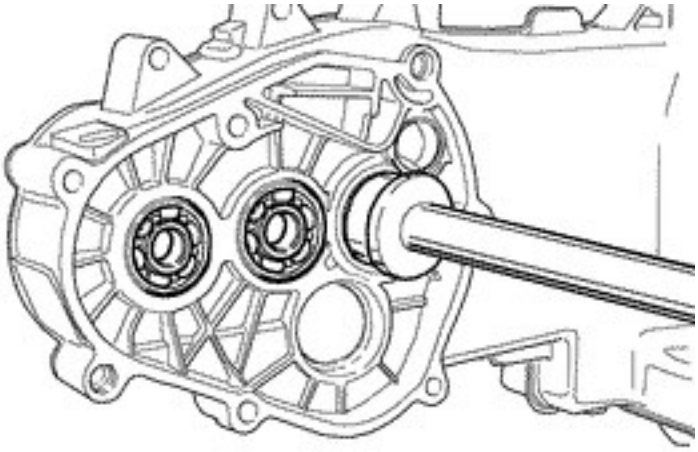
020150Y Air heater mounting

020151Y Air heater

020376Y Adapter handle

020359Y 42 x 47-mm adaptor

020412Y 15-mm guide



NOTE

TO INSEALL THE BEARING ON THE BONNET, FULLY SUPPORT THE BONNET WITH A STUD ASSEMBLY.

- Modify driven wheel shaft bearing with modular punch as shown.

NOTE

IF THE BEARING HAS AN ASYMMETRICAL BALL RETAINER, PLACE IT SO THAT THE BALLS ARE VISIBLE FROM THE HUB INNER SIDE.

Specific tooling

020376Y Adapter handle

020359Y 42 x 47-mm adaptor

020363Y 20-mm guide

NOTE

WHEN FITTING THE BEARINGS ON THE ENGINE CRANKCASE, SUPPORT THE CRANKCASE PREFERABLY ON A SURFACE TO ALLOW THE BEARINGS TO BE DRIVEN VERTICALLY.

- Reinstall the sigar ring with the open facing bearing and fit a new oil seal flush crankcase from the pulley side.

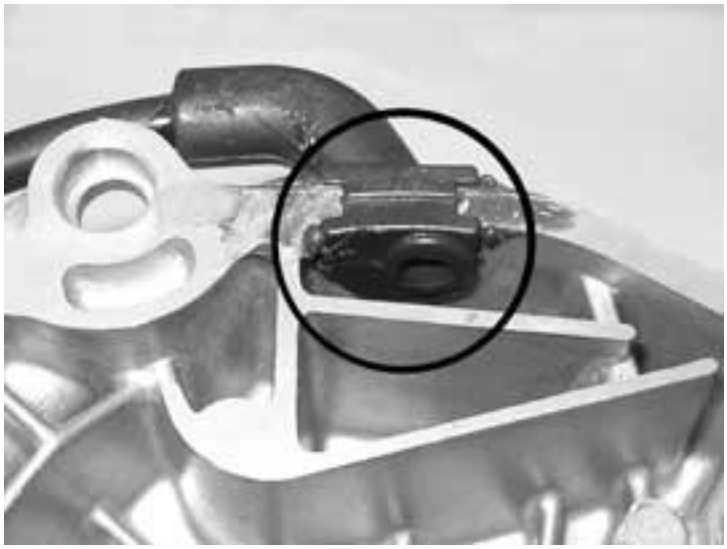
Refitting the hub bearings

- Install three shafts in the engine crankcase as shown.

Refitting the ub cover

- Install a new washer with dowel pins.
- -Seal gasket of breathing tube with black silicone sealant.
- Install the gearbox cover to ensure the breathing tube is in the correct position.
- Screws with shorter position can also be identified from different colors, as shown in the figure.
- Fit a new gasket together with the alignment dowels.

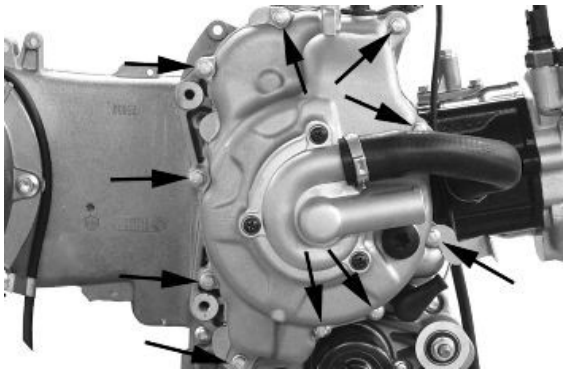
- Use the lower screw to secure the breathing tube holder.
- Install the remaining screws and tighten the seven screws according to the specified torque.



Flywheel cover

Removing the hub cover

- Remove clamp holding sleeve to cylinder.
- Remove the 10 clamps
- Remove the flywheel cover.



Removing the stator

- Remove the two pickup screws and the screws supporting the wiring support as shown in the picture, as well as the three stator clamping screws.
- Remove the stator and its wiring.

.

Refitting the stator

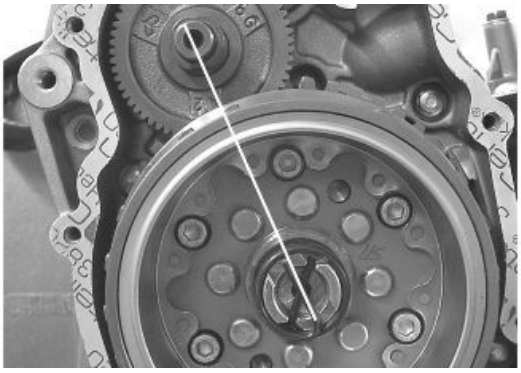
- Reinstall the stator and flywheel for reverse motion and tighten the retainer to the specified torque.

Locking torques (N*m)

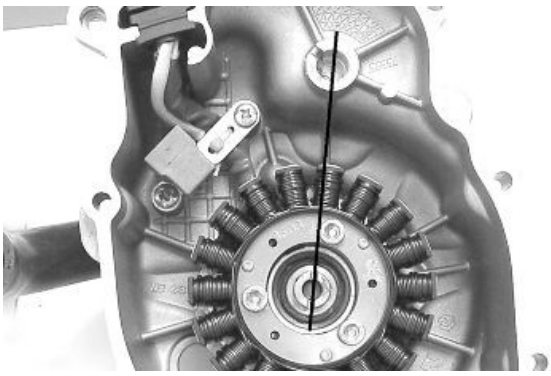
Stator assembly screws (°) **3 to 4**

Refitting the flywheel cover

- Position the spline clamp on the crankshaft, the end of which is shown in the figure below.



- The pump shaft shall be positioned according to the driving gear seat shown in the drawing..



- Replace the engine cover and tighten the screws to the required torque.
- Disassemble in reverse order.

CAUTION

TAKE CARE TO CORRECTLY POSITION THE FLYWHEEL CONNECTOR. MAKE SURE THE CENTRING DOWELS ARE PRESENT.

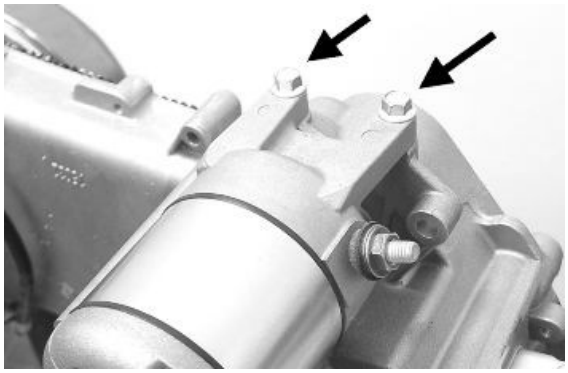
Locking torques (N*m)

Flywheel cover screws 11 - 13

Flywheel and starting

Removing the starter motor

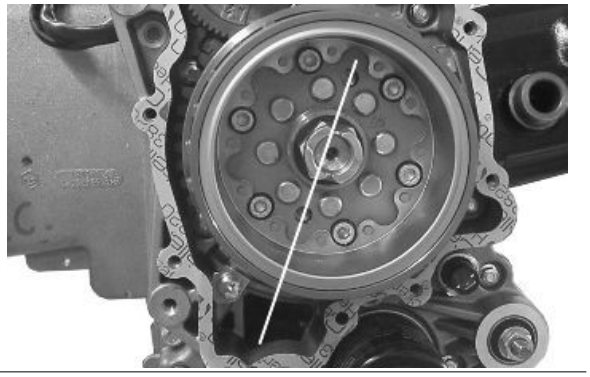
- Remove the two screws shown in the drawing
- Remove the starter motor from the seat



Removing the flywheel magneto

- Remove the pump shaft and crankshaft spline clamp

- Align the two holes on the flywheel as shown



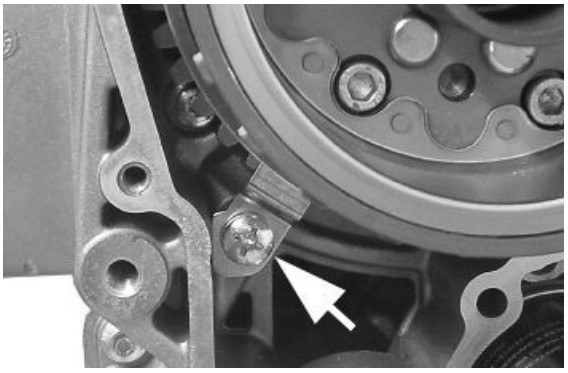
- As shown in the figure, tighten the screw rod on part of the guide bush of the special flywheel stop tool on the flywheel

- Insert the special flywheel stop tool into the flywheel as shown

Specific tooling

020627Y Flywheel lock wrench

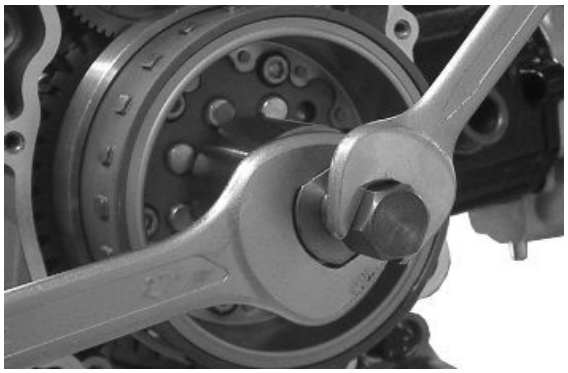
Remove the plate shown in the picture.



- Remove flywheel nut with washer
- Tighten flywheel nut with three or four threads to avoid accidental flywheel shedding at tooth extraction
- Crew extractor onto flywheel as shown

Specific tooling

020467Y Flywheel extractor



Inspecting the flywheel components

- Check the integrity of the plastic parts inside the flywheel and the pickup control panel.

Refitting the free wheel

- Ensure that the flywheel interface is in good condition.
- Thoroughly clean the liberty wheel to remove the residue of rotai.
- Remove holes in the free wheel and threads of clamping screws.
- Apply the recommended product to the end of the screw.

Recommended products

Loctite 243 Medium strength threadlock

Medium Loctite 243 threadlock

- Install the flywheel on the magneto flywheel to ensure that the grounding side is in contact with the flywheel itself, i.e., the west grille ring of the flywheel is visible.
- Tighten the six cross locking screws to the specified torque.

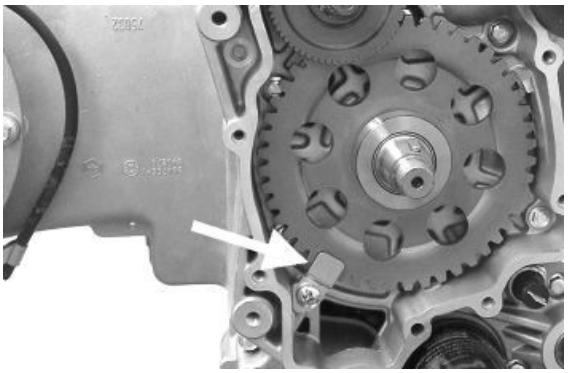
Locking torques (N*m)

Screw fixing freewheel to flywheel 13 - 15

- Oil the freedom wheel.

Refitting the flywheel magneto

- Remove the flywheel mounting plate shown in the drawing
- Remove the transmission gear and flywheel



- Insert the free wheel into the flywheel as shown
- Then modify the flywheel with the free wheel and gearbox gears

- Use a special flywheel lock wrench and tighten the flywheel retaining nut to the required torque
- Reinstall the retaining plate

Specific tooling

020627Y Flywheel lock wrench

Locking torques (N*m)

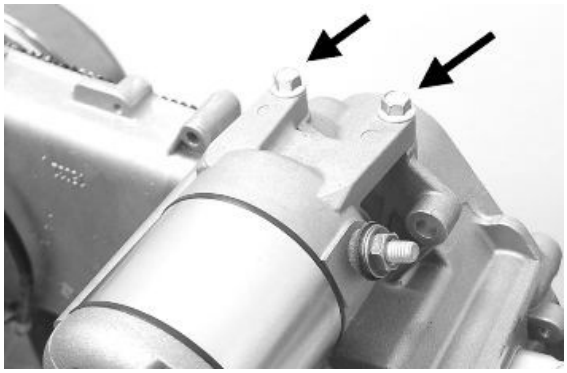
Flywheel nut 94 - 102

Refitting the starter motor

- Install a new O-ring on the starter motor and lubricate it.
- Mount the starter motor on the crankcase and lock the two screws to the specified torque.

Locking torques (N*m)

Starter motor screws 11 ÷ 13



Cylinder assy. and timing system

Removing the intake manifold

Loosen 3 screws and remove intake manifold.

- Ensure specified torque is achieved when reinstalling.

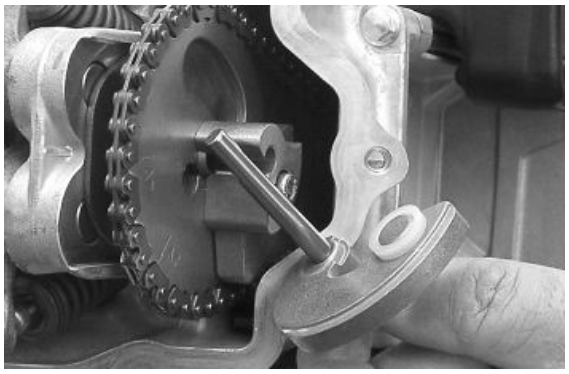
Removing the rocker-arms cover

- Remove the 5 screws shown in the drawing

Removing the timing system drive

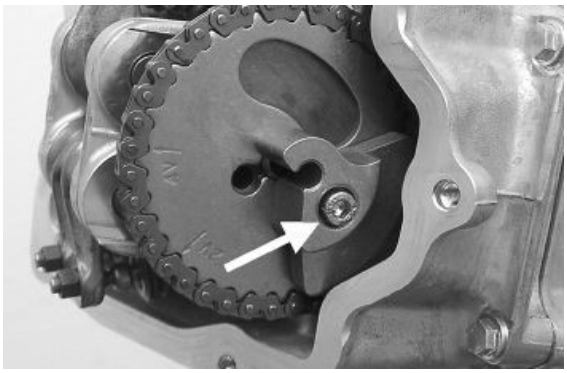
- First remove the following components: transmission cover, belted drive wheel, oil sump with spring and bypass piston, oil pump pulley cover, O-ring on crankshaft and sprocket separation washer
- Remove tappet cover.
-Remove center screw fasteners and automatic lift valve cover as shown.

- Remove the return spring and end of the travel washer of the automatic valve lifter and the automatic valve lifter.



- First loosen the center screw on the tensioner.
- Remove the two fixtures shown in the figure.
- Remove tensioner with washer.

- Remove the hexagon socket screws and weights shown in the drawing.



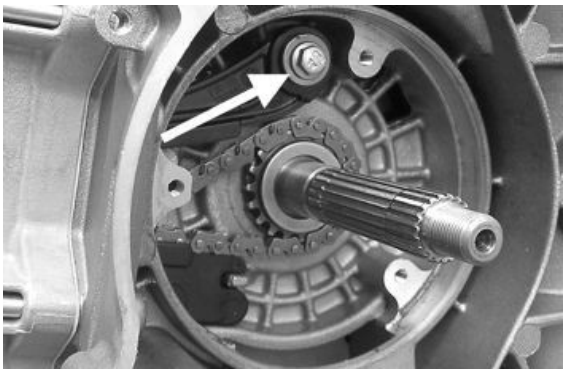
- Remove camshaft control pulley and its washer.

Remove the control sprocket and Tim chain.

- remove screws, spacers and tensioning slides as shown in the drawing.

The chain tensioner slider must be removed from the drive side.

For the lower chain guide slider, it can only be removed after the magnetic head is removed.



NOTE

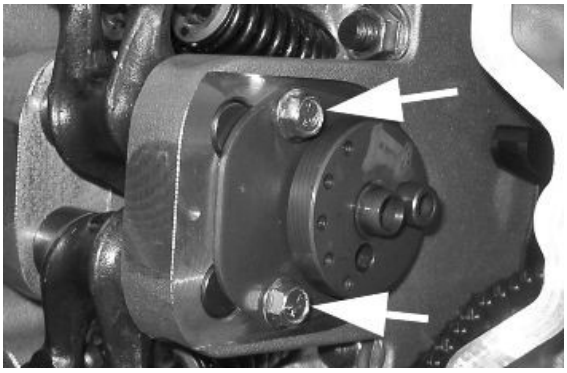
IT IS ADVISABLE TO MARK THE CHAIN IN ORDER TO ENSURE THAT THE INITIAL DIRECTION OF ROTATION IS MAINTAINED.

Removing the cam shaft

- Remove the two screws and camshaft retainer shown in the drawing.

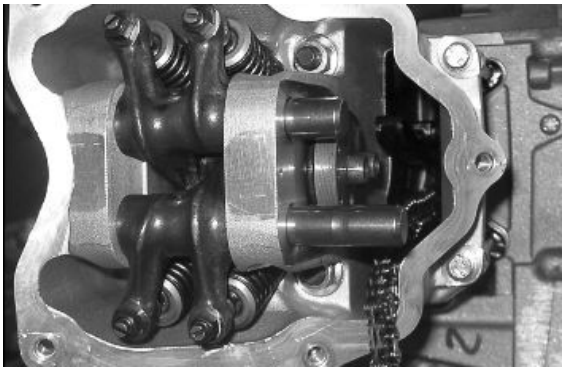
- Remove the camshaft.

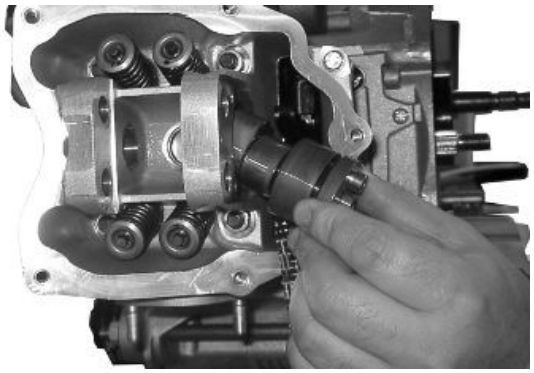
- Remove the pin and rocker from the flywheel side hole.



NOTE

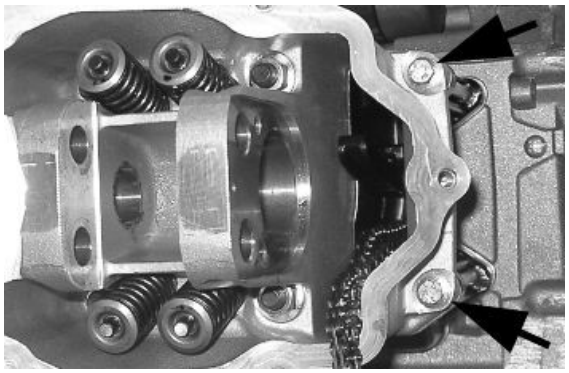
REMOVE THE HEAD WITH CAMSHAFT, ROCKER PIN, AND MOUNTING BRACKET IF REQUIRED. THE MAGNETIC CAN ALSO BE REMOVED WITHOUT REMOVING THE CHAIN AND CRANKSHAFT CHAIN AND CRANKSHAFT CHAIN TRNSIONER.





Removing the cylinder head

- Remove the spark plug
- Remove the two side fixers shown in the figure.
- Tighten the 4-head cylinder fastening nut in two or three stages and in the shape of a cross.
- Remove the magnetic head, two locating pins and washers.



NOTE

THE MAGNETIC HEAD CAN BE REMOVED WITH THE CAMSHAFT, ROCKER PIN, AND MOUNTING BRACKET IF REQUIRED. THE MAGNETIC HEAD CAN ALSO BE REMOVED WITHOUT REMOVING THE CHAIN AND CRANKSHAFT CHAIN TENSIONER.

Removing the valves

- Remove knife, bonnet, spring and valve using appropriate adapter-mounted tools.
- Remove the oil shield with appropriate tools.
- Remove spring bracket.

CAUTION

REPLACE THE VALVES IN SUCH A WAY AS TO RECOGNISE THEIR ORIGINAL POSITION ON THE HEAD.

Specific tooling

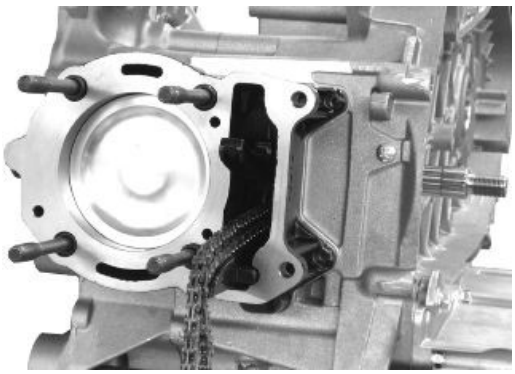
020382Y011 adapter for valve removal tool

020382Y Valve cotters equipped with part 012 removal tool

020431Y Valve oil seal extractor

Removing the cylinder - piston assy.

Remove cylinder and piston
- Remove chain guide slide.
- Remove 4 o rings on stud bolts.
- Pull out the cylinder.
- Remove cylinder base washer.
- Remove the two stop rings, wrist pins and pistons.
- Remove piston seal.

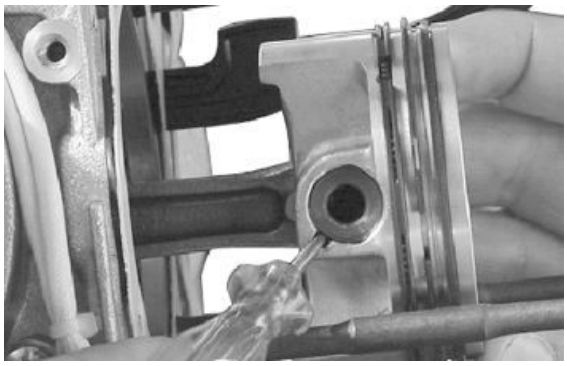


CAUTION

TO AVOID DAMAGING THE PISTON, SUPPORT IT WHILE REMOVING THE CYLINDER.

NOTE

BE CAREFUL NOT TO DAMAGE THE SEALING RINGS DURING REMOVAL.



Inspecting the small end

NOTE

TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

See also

Inspecting the wrist pin

NOTE

TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

See also

Inspecting the piston

NOTE

TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

See also

Inspecting the cylinder

NOTE

TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

See also

Inspecting the piston rings

NOTE

TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

See also

Interventions rules

Removing the piston

- Install piston and wrist pin onto the connecting rod, aligning the piston arrow the arrow facing towards the exhaust.
- Fit the wrist pin retainer ring onto the appropriate tool
- With opening in the position indicated on the tool
S = left
D= right
- Place the wrist pin retainer ring into position using a punch
- Fit the wrist pin snap ring using the plug as shown in the figure

NOTE

THE TOOL FOR INSTALLING THE RETAINER RINGS MUST BE USED MANUALLY.

CAUTION

USING A HAMMER MIGHT DAMAGE THE STOPS' HOUSING.

Specific tooling

020454Y Pin lock fitting tool

Choosing the gasket

- Provisionally fit the piston into the cylinder, without any base gasket.
- Assemble a dial gauge on the specific tool.

Specific tooling

020428Y Piston position check mounting

- Using an abutment plane, reset the dial gauge with a preload of a few millimetres.
- Finally fix the dial gauge.
- Check the perfect sliding of the feeler pin.
- Install the tool on the cylinder without changing the dial gauge position.
- Lock the tool using the original head fixing nuts.
- Rotate the crankshaft up to the TDC (the inversion point of the dial gauge rotation)
- Measure the deviation from the reset value.

- By means of the table, see the Specifications chapter identify the cylinder base gasket thickness to be used for refitting. Correctly identify the cylinder base gasket thickness to keep the correct compression ratio.

- Remove the special tool and the cylinder.

NOTE

IF DEVIATIONS (OR RECESSES OR PROJECTIONS) CLOSE TO THE CHANGE OF CATEGORY ARE MEASURED, REPEAT THE MEASUREMENT AT THE OPPOSED SIDE. TO DO SO, REPEAT THE TOOL INSTALLATION BY INVERTING ITS POSITION.

See also

Refitting the piston rings

- Place the scraper ring spring on the piston.
- Install the scraper ring keeping the opening opposed to the spring junction and with the writing "top" facing the piston crown. The chamfered side of the oil scraper ring should always be facing the piston crown.
- Fit the second lining with the identification letter or the writing "top" facing the piston crown. In any case, the step must be facing opposite the piston crown.
- Install the first compression lining in the direction imposed by the housing.
- It is advisable to use a fitter to facilitate the installation of the linings.

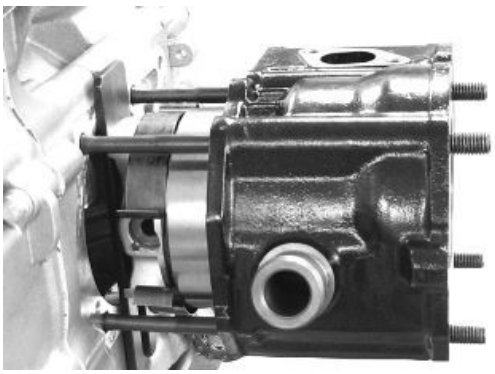
NOTE

THE TWO PISTON RINGS ARE MADE WITH A TAPERED CYLINDRICAL CONTACT CROSS-SECTION. THIS IS TO ACHIEVE A BETTER BEDDING.

- Misalign the lining openings at 120° as shown in the figure.
- Lubricate the components with engine oil.
- The engine uses the first compression lining with an L section.

Refitting the cylinder

- Insert the cylinder base gasket with the thickness determined above.
- Using the fork support and the piston ring retaining band, refit the cylinder as shown in the figure.



NOTE

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

Specific tooling

020426Y Piston fitting fork

020393Y Piston assembly band

Inspecting the cylinder head

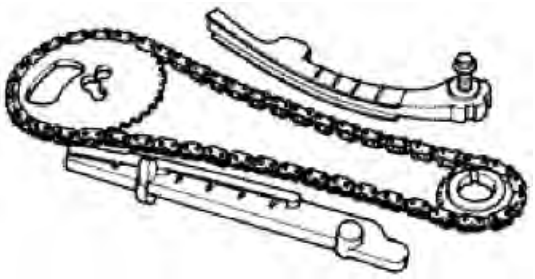
NOTE

TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

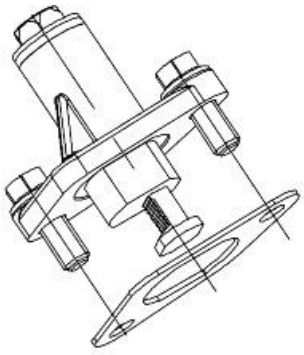
See also

Inspecting the timing system components

- Check that the guide slider and the tensioner slider are not worn out.
- Ensure that the camshaft control pulley chain assembly and the sprocket wheel are not worn.
- If you detect wear, replace the parts or, if the chain, sprocket wheel and pulley are worn, replace the whole unit.



- Remove the centre screw with the washer and the tensioner spring. Check that the one-way mechanism is not worn.
- Check the condition of the tensioner spring.
- If examples of wear are found, replace the whole unit.



Inspecting the valve sealings

NOTE

TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

See also

Inspecting the valves

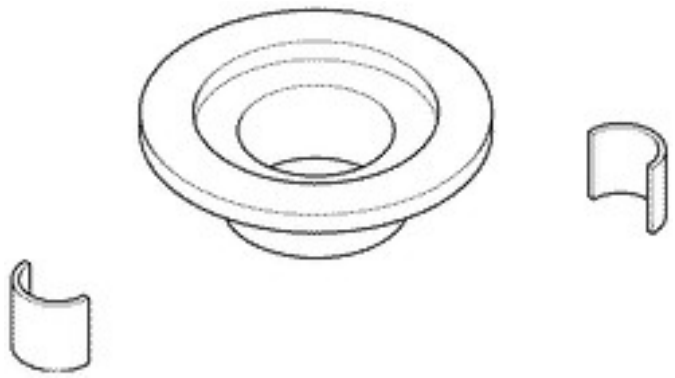
NOTE

TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

See also

Inspecting the springs and half-cones

- Check that the upper and lower supporting spring washers, the cotters and the oil seal show exhibit no signs of abnormal wear. Replace a component when worn.



- Measure the unloaded spring length.

NOTE

TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

See also

Refitting the valves

- Lubricate the valve guides with engine oil.
- Place the valve spring supports on the head.
- Using the special punch, fit the four valve seal rings.
- Fit the valves, the springs and the caps. Using the appropriate tool with adapter, compress the springs and insert the cotters in their seats.

NOTE

DO NOT CHANGE THE VALVE FITTING POSITION. FIT THE VALVE SPRINGS WITH THE REFERENCE COLOUR ON COTTER SIDE (TURNS WITH GREATER PITCH).

Specific tooling

020306Y Punch for assembling valve seal rings

020382Y Valve cotters equipped with part 012 removal tool

020382Y011 adapter for valve removal tool

Inspecting the cam shaft

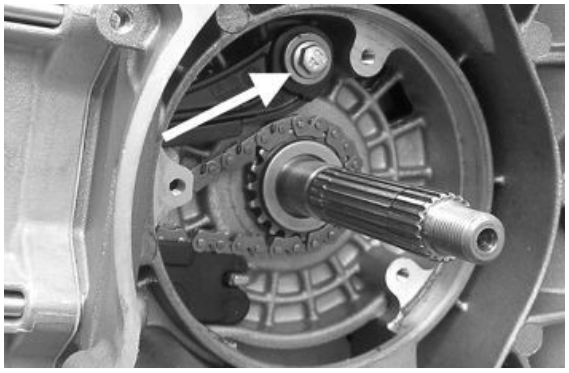
NOTE

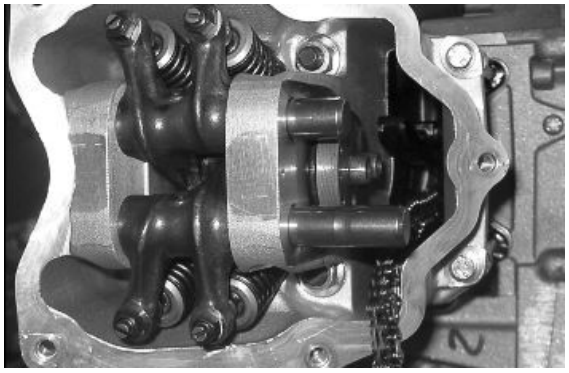
TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

See also

Refitting the head and timing system components

- Refit the lower timing chain sprocket wheel on the crankshaft, with the chamfer facing the insertion side.
- Loop the timing chain around the sprocket on the crankshaft.
- Fit the chain tensioner slider from the cylinder head side.
- Fit the spacer and the screw fastener.
- Tighten the screws to the prescribed torque.
- Fit the pins and rocking levers.
- Lubricate the two rocking levers through the holes at the top.
- Lubricate the 2 bearings and insert the camshaft in the cylinder head with the cams corresponding to the rocking levers.
- Insert the retention plate and tighten the two screws shown in the figure to the prescribed torque.
- Refit the spacer on the camshaft.
- Rotate the engine so that the piston is at top dead centre, using the reference marks on the flywheel and the crankcase.
- Holding this position insert the chain on the camshaft control pulley.
- Insert the pulley on the camshaft while keeping the reference **4V** in correspondence with the reference mark on the head.
- Fit the counterweight and tighten the clamping screw to the prescribed torque.
-Fit the end-stop ring on the automatic valve-lifter cam and fit the automatic valve-lifter cam to the camshaft.
- Fit the automatic valve lifter return spring.
- During this operation the spring must be loaded by approximately 180°.



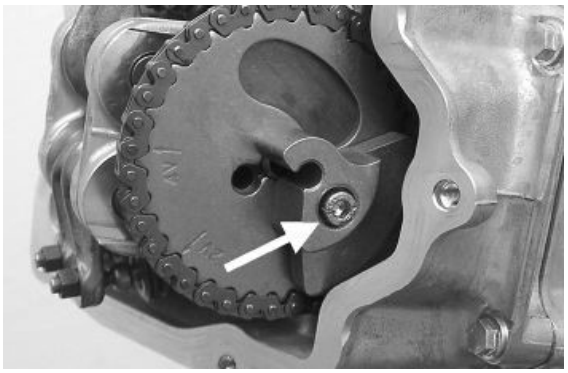


- Fit the automatic valve-lifter retaining dish, using the counterweight screw fastener as a reference.
- Tighten the clamping screw to the prescribed torque.
- Set the tensioner cursor in the rest position.
- Fit the chain tensioner on the cylinder, using a new gasket, and tight the two screws to the prescribed torque.
- Insert the chain tensioning screw, together with the spring and washer, tightening it to the prescribed torque.
- Adjust the valve clearance.
- Fit the spark plug.

Electrode distance 0.8 mm

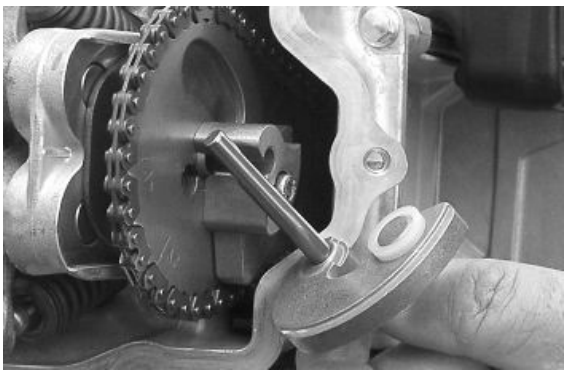
NOTE

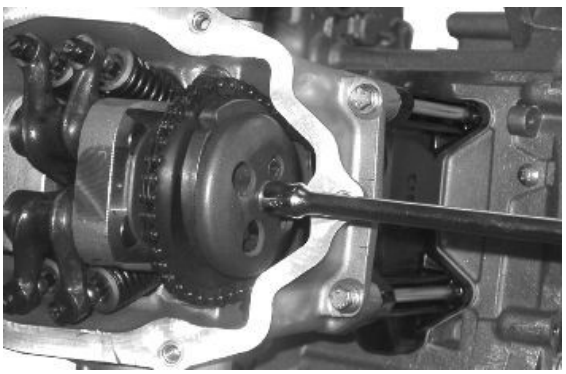
GREASE THE END STOP RING TO PREVENT IT COMING OUT AND FALLING INTO THE ENGINE.



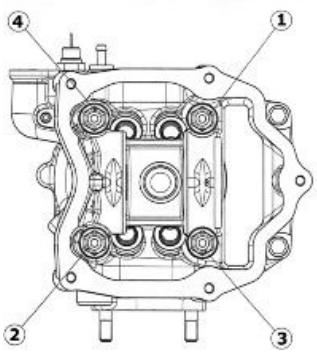
Locking torques (N*m)

Timing chain tensioner support screw 11 to 13 Spark plug 12 to 14 Starter ground screw 7 to 8.5 Timing chain tensioner slider screw 10 to 14 Starter counterweight support screw 11 to 15 Timing chain tensioner central screw 5 to 6 Camshaft retention plate screw 4 to 6





- Fit the timing chain guide slider.
- Insert the centring dowel between the cylinder head to the cylinder, fit the cylinder head gasket and the cylinder head.
- Lubricate the stud bolt threading.
- Tighten up the nuts to an initial pre-torque of 7±1 N·m
- Tighten up the nuts to a second pre-torque of 10 ±1 N·m
- Rotate by an angle of 270°
- To carry out the operations described above, follow the tightening sequence in the figure.
- Fit the two screws on the outside of the timing chain side and tighten them to the specified torque.



NOTE

BEFORE INSTALLING THE HEAD, MAKE SURE THAT THE LUBRICATION CHANNEL IS CLEAN USING A COMPRESSED AIR JET.

Locking torques (N*m)

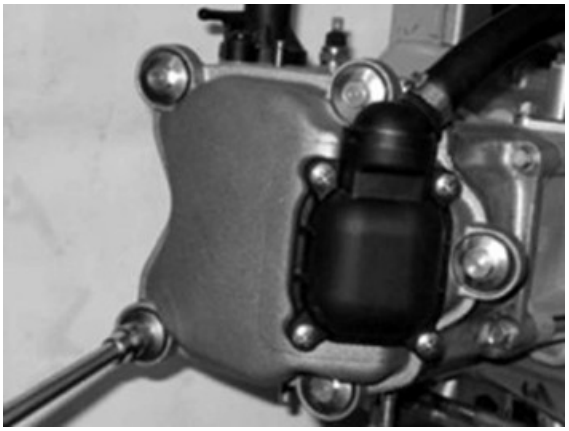
Timing chain tensioner support screw 11 to 13

Refitting the rocker-arms cover

- Refit the cylinder head cover and tighten the 5 clamping screws to the prescribed torque.
- Make sure the gasket is positioned properly.

Locking torques (N*m)

Tappet cover screws 6 - 7 Nm

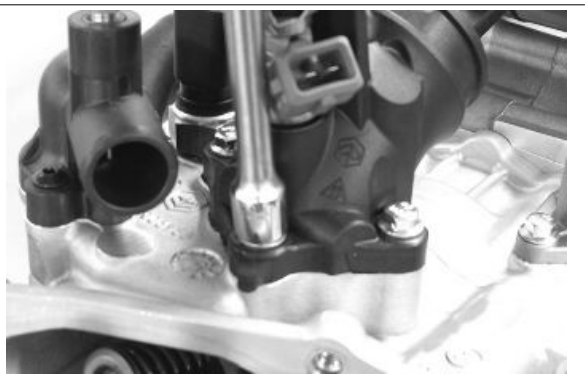


Refitting the intake manifold

- Fit the intake manifold and do up the three screws.

Locking torques (N*m)

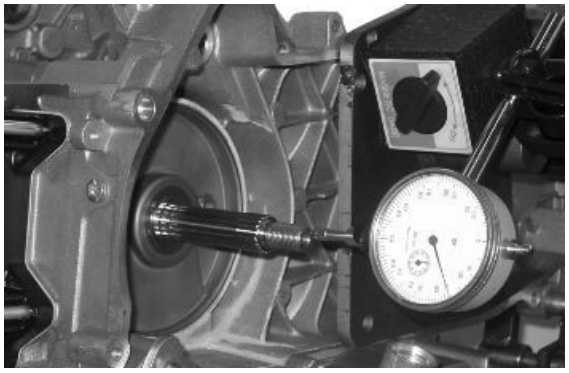
Intake manifold screws 11 to 13



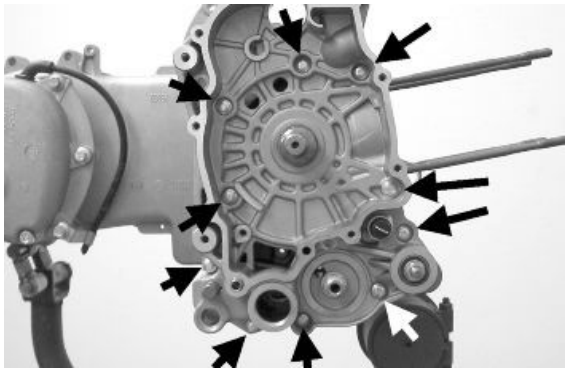
Crankcase - crankshaft

Splitting the crankcase halves

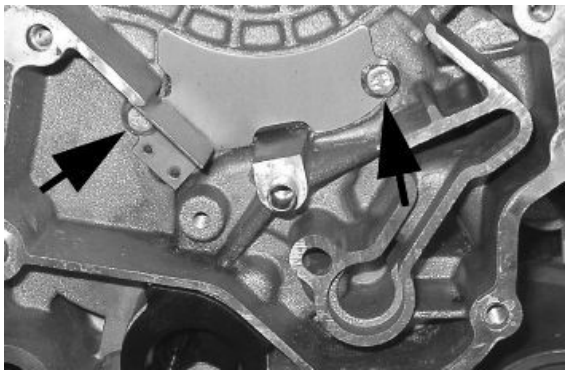
- Before opening the crankcase, it is advisable to check the axial clearance of the crankshaft. To do this, use a plate and a support with appropriate tool dial gauge.



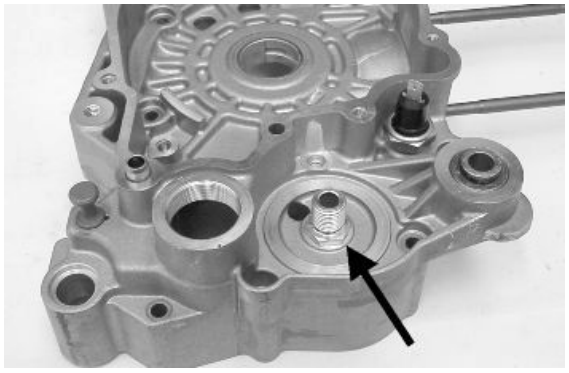
- Upper clearances are an indication of wear on the surfaces of the crankshaft casing support.
- Remove the 10 crankshaft coupling screws.
- Separate the crankcase while keeping the crankshaft in one of the two halves of the crankcase.
- Remove the crankshaft.
- Remove the half crankcase coupling gasket.
- Remove the two screws and the internal cover shown in the diagram.



- Remove the oil guard on the flywheel side.
- Remove the oil filter fitting shown in the diagram.
- Check the axial clearance on the connecting rod.
- Check the radial clearance on the connecting rod.
-Check the surfaces that limit the axial free-play are not scored and measure the width of the crankshaft between these surfaces, as shown in the diagram.



- If the axial clearance between crankshaft and crankcase is exceeding and the crankshaft does not have any defect, the problem must be due to either excessive wear or wrong machining on the crankcase.
- Check the diameters of both the bearings of the crankshaft in accordance with the axes and surfaces shown in the figure. The half-shafts are classified in two categories Cat. 1 and Cat. 2 as shown the chart below.



CAUTION

THE CRANKSHAFT CAN BE REUSED WHEN THE WIDTH IS WITHIN THE STANDARD VALUES AND THE SURFACES SHOW NO SIGNS OF SCORING.

CAUTION

WHILE OPENING THE CRANKCASES AND REMOVING THE CRANKSHAFT, CHECK THAT THE THREADED SHAFT ENDS DO NOT INTERFERE WITH THE MAIN BUSH-

INGS. FAILURE TO OBSERVE THIS PRECAUTION CAN DAMAGE THE MAIN BUSHINGS.

CAUTION

KEEP THE CRANKSHAFT IN ONE OF THE TWO HALVES OF THE CRANKCASE WHEN SEPARATING IT. IF YOU FAIL TO DO THIS, THE CRANKSHAFT MIGHT ACCIDENTALLY FALL.

NOTE

WHEN MEASURING THE WIDTH OF THE CRANKSHAFT, MAKE SURE THAT THE MEASUREMENTS ARE NOT MODIFIED BY THE RADIUSES OF FITTINGS WITH THE CRANKSHAFT BEARINGS.

NOTE

TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

See also

Inspecting the crankshaft alignment

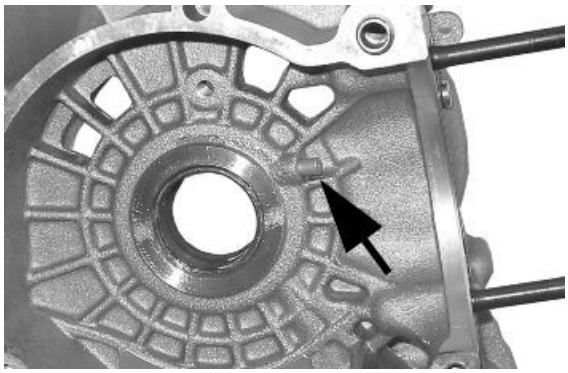
NOTE

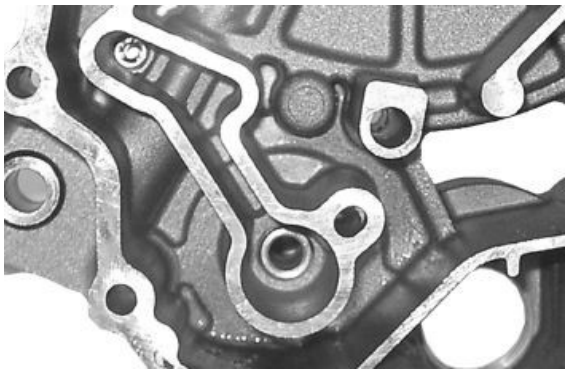
TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

See also

Inspecting the crankcase halves

- Before proceeding to check the crankcase halves, thoroughly clean all surfaces and oil ducts.
- On the transmission-side crankcase half, take particular care when handling the oil pump compartment and the oil ducts, the by-pass duct, the main bushings and the cooling jet on the transmission side (see diagram).
- Take particular care, also, that there are no signs wear in the oil by-pass valve housing (see Chapter Lubrication), as this could prevent a good seal in the piston, which regulates the oil pressure.
- On the flywheel side crankcase half, take particular care cleaning the oil ducts for the main bushings, the oil duct for the jet that lubricates the cylinder head and the oil drainage duct at the flywheel side oil seal.
- Inspect the coupling surfaces on the crankcase halves for scratches or deformation, taking partic-

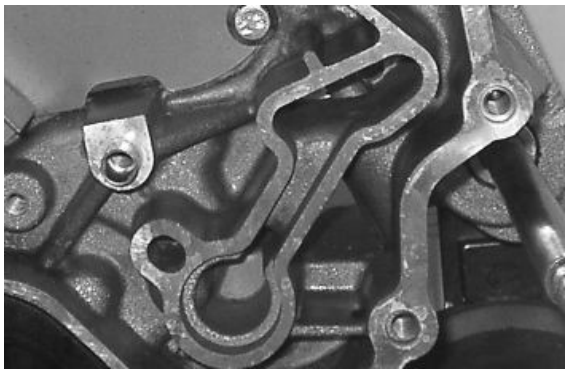




ular care with the cylinder/crankcase surfaces and the crankcase halves surfaces.

- Defects in the crankcase coupling gasket between the crankcase halves or the mating surfaces shown in the diagram, could cause a drop in the oil pressure lubricating the main bushings and connecting rod.

- Check the main bearing seats that limit axial clearance in the crankshaft show no signs of wear. The dimension between these seats is measured by way of the procedure described previously for measuring the crankshaft axial clearance and dimensions.



NOTE

THE JET IS FED THROUGH THE MAIN BUSHINGS. PROPER OPERATION OF THIS COMPONENT IMPROVES PISTON CROWN COOLING. CLOGGING HAS EFFECTS THAT ARE DIFFICULT TO DETECT (PISTON TEMPERATURE INCREASE). FAILURE OR LEAKS CAN CAUSE A CONSIDERABLE DROP IN THE LUBRICATION PRESSURE FOR MAIN BUSHINGS AND CONNECTING ROD.

NOTE

THE HEAD LUBRICATION CHANNEL IS PROVIDED WITH A SHUTTER JET; THIS GIVES A "LOW PRESSURE" HEAD LUBRICATION; THIS CHOICE WAS MADE TO REDUCE THE OIL TEMPERATURE IN THE SUMP. THE JET CLOGGING IMPAIRS THE HEAD LUBRICATION AND THE TIMING MECHANISMS. A JET FAILURE CAUSES A DECREASE OF THE MAIN BUSHING AND CONNECTING ROD LUBRICATION PRESSURE.

Inspecting the crankshaft plain bearings

- To obtain a good bushing lubrication it is necessary to have both an optimal lubricating pressure and a good oil flow rate; the bushings must be correctly positioned so as not to obstruct the oil supply channels.

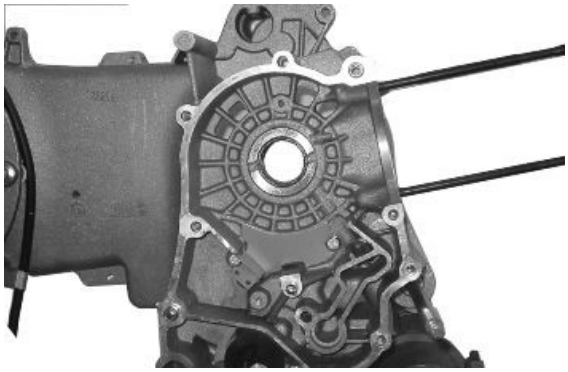
- The main bushings are comprised of two half-bearings, one with holes and channels for lubrication whereas the other is solid.

Characteristic

Lubrication pressure

3.5 to 4 bar

- The solid half-bearing is intended to stand the thrusts caused by combustion, and for this reason it is arranged opposed the cylinder.
- To prevent shutters in the oil feeding channels, the matching surface of the two half-bearings must be perfectly orthogonal to the cylinder axis, as shown in the figure.
- The oil feeding channel section is also affected by the bushings driving depth compared with the crankshaft axial clearance of the limiting surface.



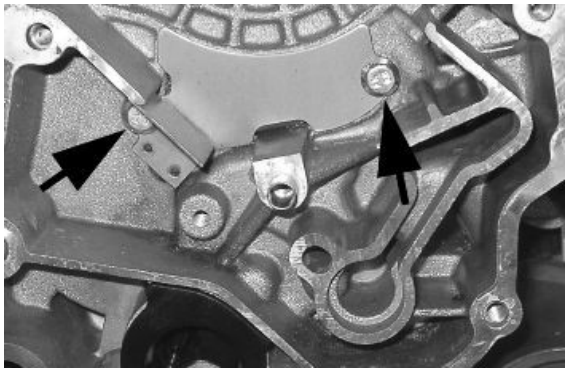
NOTE

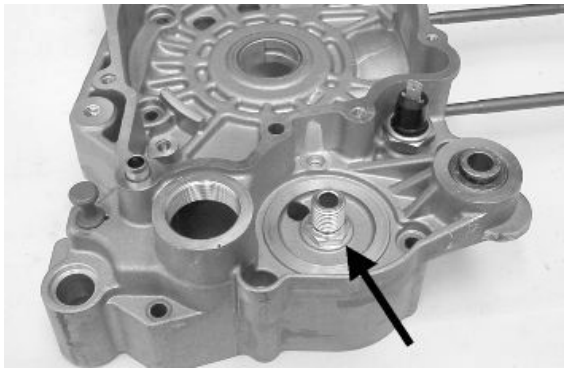
TO MEASURE WEAR LIMITS AND COUPLING CLEARANCES, SEE THE SPECIFICATIONS CHAPTER.

See also

Refitting the crankcase halves

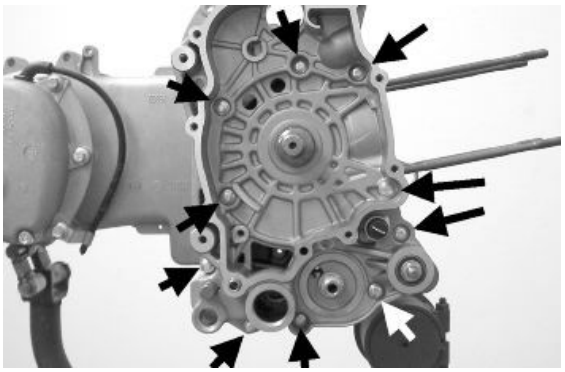
- Fit the internal shield by locking the two screws to the prescribed torque.
- Fit the oil filter fitting and tighten it to the prescribed torque.
- Position the oil pre-filter element as shown in the picture.
- Place a new gasket on one of the crankcase halves, preferably on the transmission side, together with the alignment dowels.
- Lubricate the main bushings and insert the crankshaft in the transmission side crankcase half.
- Reassemble both crankcase halves.
- Fit the 10 screws and tighten them to the specified torque.
- Fit a new O-ring on the pre-filter and lubricate it.
- Insert the filter on the engine with the relative cap. Tighten to the prescribed torque.





Locking torques (N*m)

Internal engine crankcase bulkhead (transmission-side half shaft) screws 4 to 6 Engine-crank- case coupling screws 11 to 13 Oil filter on crankcase fitting 27 to 33 Engine oil drainage plug/ mesh filter 24 to 30

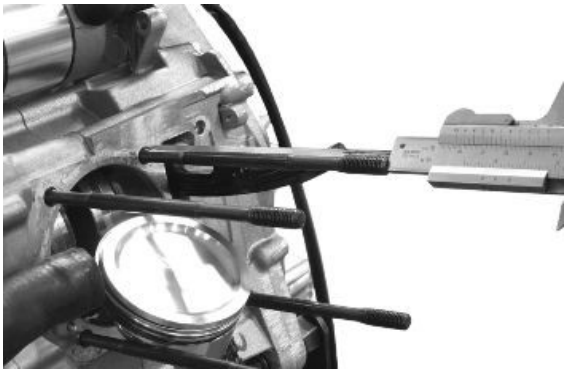


Studs

Check that the stud bolts have not worked loose from their seat in the crankcase.

Check the depth of stud bolt driving with a gauge, as indicated in the picture. If it varies significantly from the driving depth indicated, it means that the stud bolt has yielded.

In this case, replace it.

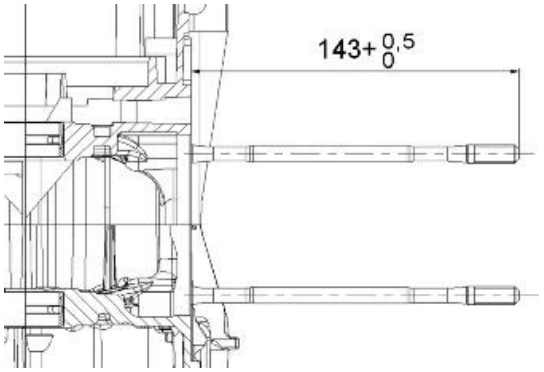


By working on two fitted cylinder head fixing nuts, nut and lock nut, as shown in the picture, remove the stud bolt from its seat.

Clean the threaded seat on the carter thoroughly.

Refit a new stud bolt and apply the special product on the threading crankcase side.

Tighten up to the depth of the driving indicated.



Recommended products

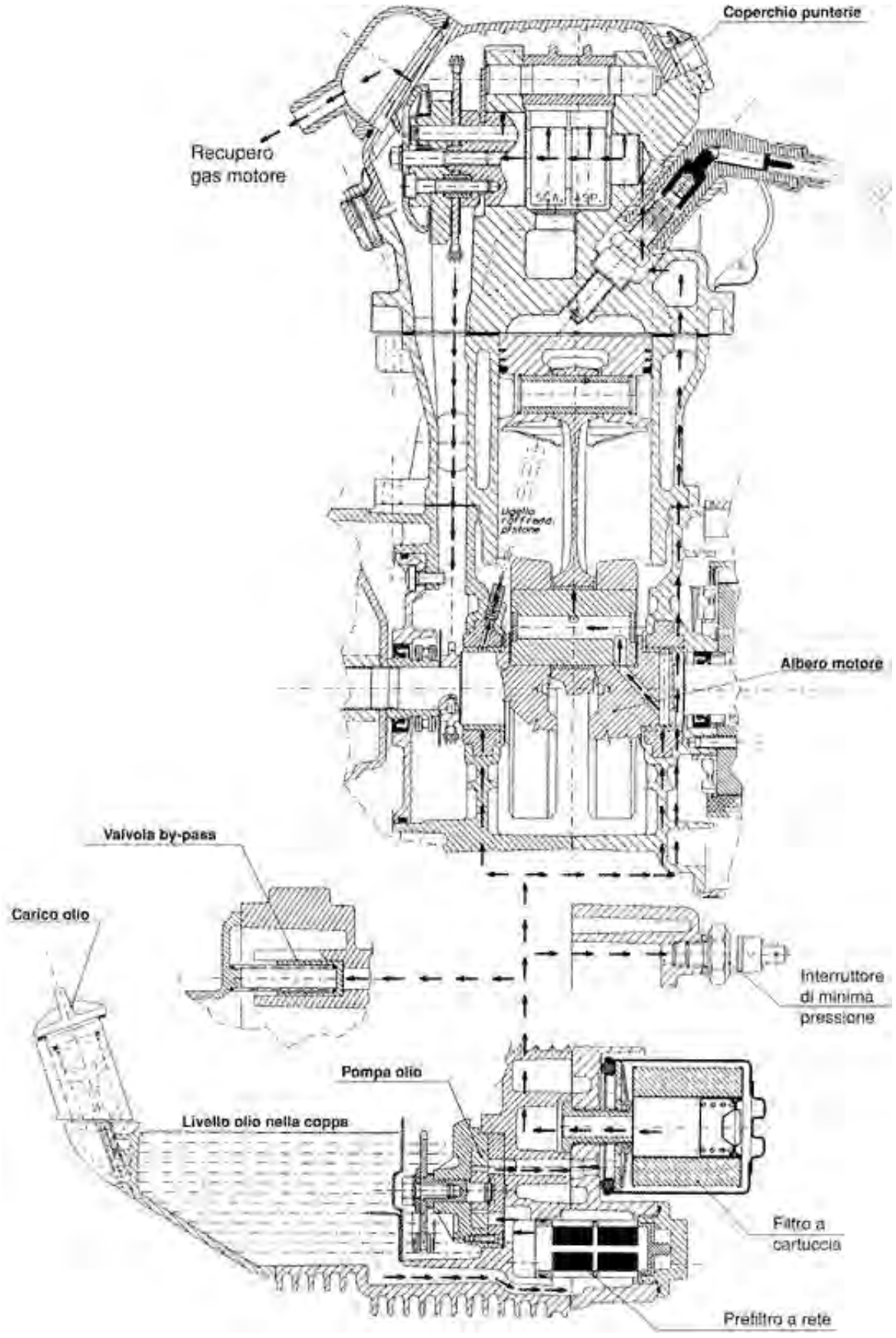
Loctite Quick Set Loctite 270 high strength threadlock

Loctite 270 high strength threadlock

Lubrication

Conceptual diagrams

LUBRICATION CIRCUIT


Coperchio punterie
Recupero
gas motore
Albero motore
Valvola by-pass
Carico olio
Interruttore
di minima
pressione
Pompa olio
Livello olio nella coppa
Filtro a
cartuccia
Prefiltro a rete

Oil pressure check

- Remove the electrical minimum oil pressure switch connection and remove the switch.
- Check that the oil pressure reading is between 0.5 and 1.2 atm with the engine idling at 1650 rpm and the oil at the required temperature (wait for at least one electric ventilation).
- Check that the oil pressure is between 3.2 and 4.2 atm with the engine running at 6000 rpm and the oil at the required temperature.
- Remove the appropriate tools once the measurement is complete, refit the oil pressure switch and washer, tightening it to the specified torque and fit the flywheel cover.
- If the oil pressure is not within the specified limits, in the following order, check: the oil filter, the oil by-pass valve, the oil pump and the crankshaft seals.

NOTE

THE CHECK MUST BE CARRIED OUT WITH OIL AT THE CORRECT LEVEL AND WITH AN OIL FILTER IN PROPER CONDITION.

Characteristic

Oil pressure

Minimum pressure admitted at 6000 rpm: 3.2 atm.

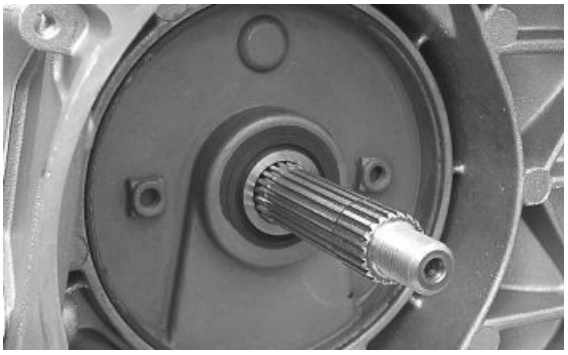
Locking torques (N*m)

Minimum oil pressure sensor 12 to 14

Crankshaft oil seals

Removal

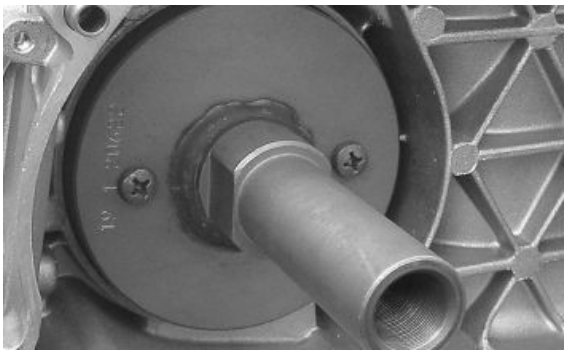
- Remove the transmission cover and the complete drive pulley beforehand



- Install the base of the appropriate tool on the oil seal using the screws provided.

Specific tooling

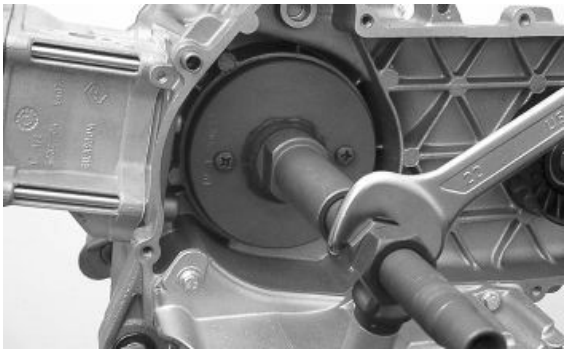
020622Y Transmission-side oil seal punch



- Screw the threaded bar onto the base of the tool and extract the oil seal.

Specific tooling

020622Y Transmission-side oil seal punch



Refitting

- Always use a new oil seal upon refitting
- Prepare the new oil guard by lubricating the sealing lip.
- Preassemble the oil seal with the appropriate tool by positioning the screws.
- Insert the sheath over the crankshaft.
- Insert the tool with the oil seal on the crankshaft until it comes into contact with the crankcase.
- Insert the adaptor bushing of the tool in the hole on the crankcase.

- Orientate the oil seal by inserting the bracket which is part of the appropriate tool.
- Tighten the threaded bar onto the crankshaft as far as it will go.
- Use the nut to move the base of the tool until you can see the end of the oil seal driving stroke
- Remove all the tool components following the procedure but in reverse order

CAUTION

DO NOT LUBRICATE THE KEYING SURFACE ONTO THE ENGINE CRANKCASE.

CAUTION

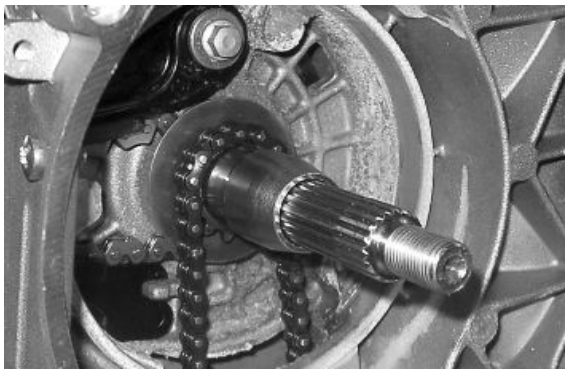
ORIENT THE OIL SEAL BY POSITIONING THE CHAIN HOUSING CHANNEL FACING DOWNWARDS. WHEN THE POSITION IS REACHED, DO NOT RETRACT THE OIL SEAL. FAILURE TO COMPLY WITH THIS RULE CAN CAUSE A WRONG POSITIONING OF THE OIL SEAL SHEATH.

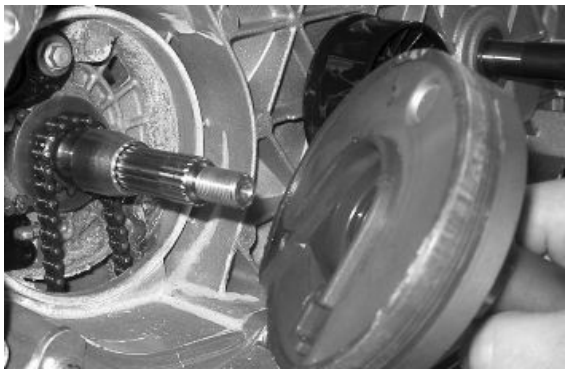
CAUTION

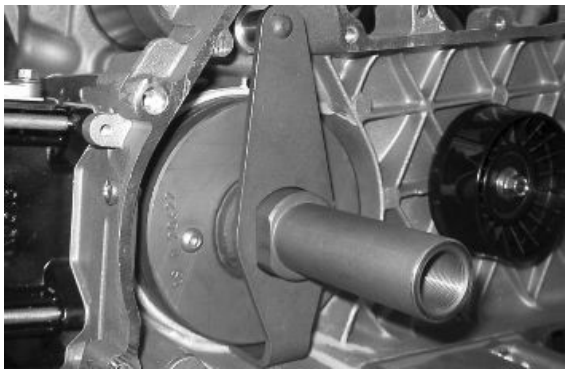
FAILURE TO COMPLY WITH THIS ASSEMBLY PROCE-DURE CAN SERIOUSLY DAMAGE THE ENGINE DUE TO THE WRONG TENSIONING OF THE OIL PUMP CONTROL CHAIN.

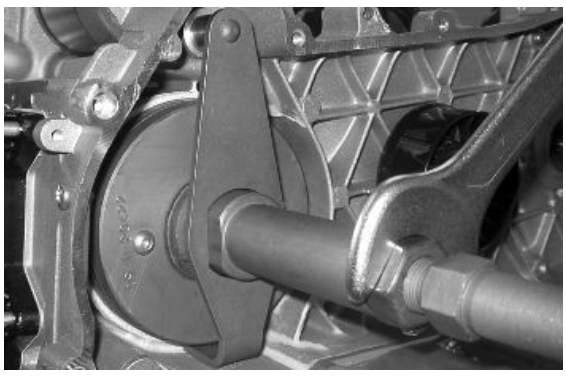
Specific tooling

020622Y Transmission-side oil seal punch





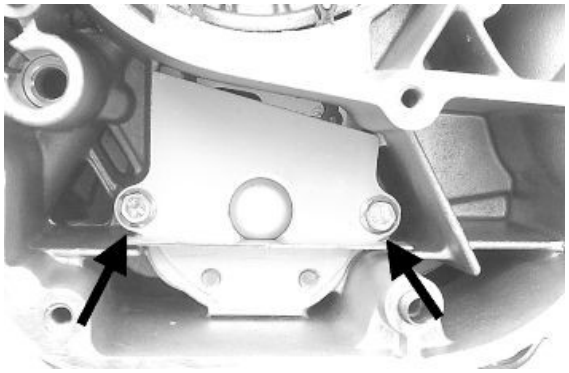




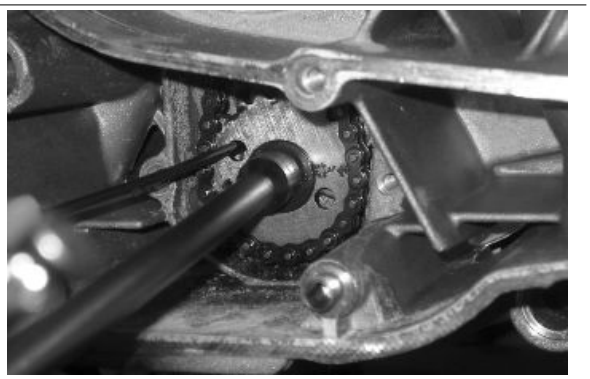
Oil pump

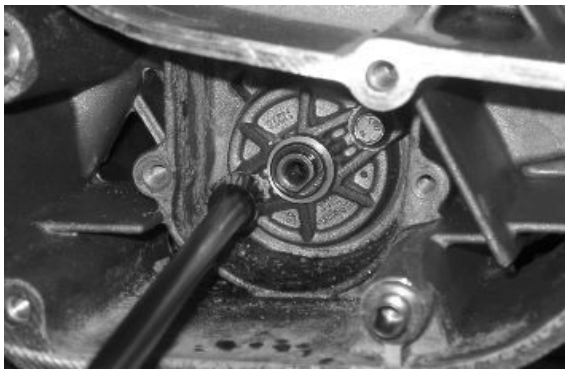
Removal

- Undo the two clamping screws in the figure and remove the cover over the pump control sprocket.



- Block the rotation of the oil pump control pulley with a screwdriver inserted through one of its two holes.
- Remove the central screw with Belleville washer, as shown in the diagram.
- Remove the chain with the crown.
- Remove the control sprocket wheel with relative O-ring.
- Remove the oil pump by undoing the two screws in the figure.
- Remove the oil pump seal.



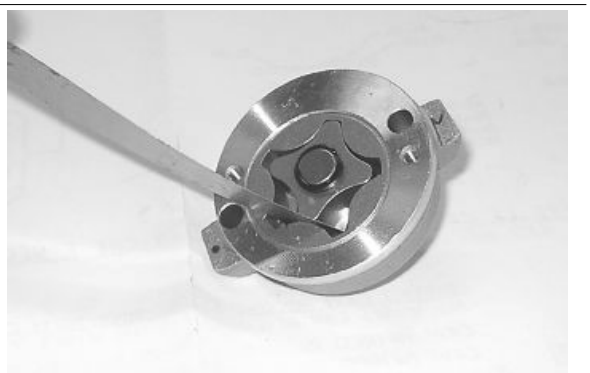


NOTE

IT IS ADVISABLE TO MARK THE CHAIN IN ORDER TO ENSURE THAT THE INITIAL DIRECTION OF ROTATION IS MAINTAINED.

Inspection

- Remove the two screws and the oil pump cover.
- Remove the circlip retaining the innermost rotor.
- Remove and wash the rotors thoroughly with petrol and compressed air.
- Reassemble the rotors in the pump body, keeping the two reference marks visible Replace the retainer ring.



- Check the clearance between the rotors in the position shown in the diagram using a feeler gauge.
Measure the distance between the outer rotor and the pump body (see figure).
- Check the axial clearance of the rotors using a trued bar as shown in the figure.

Characteristic

Axial rotor clearance

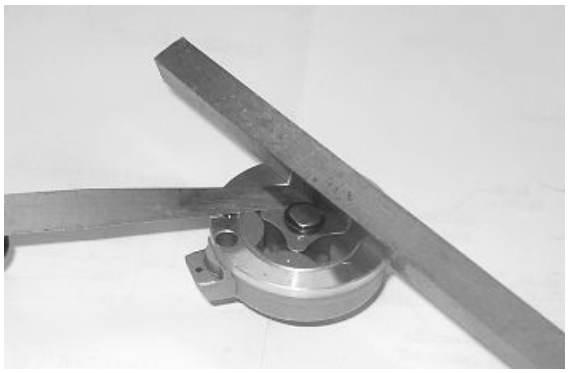
Limit values admitted: 0.09 mm

Distance between the outer rotor and the pump body

Admissible limit clearance: 0.20 mm

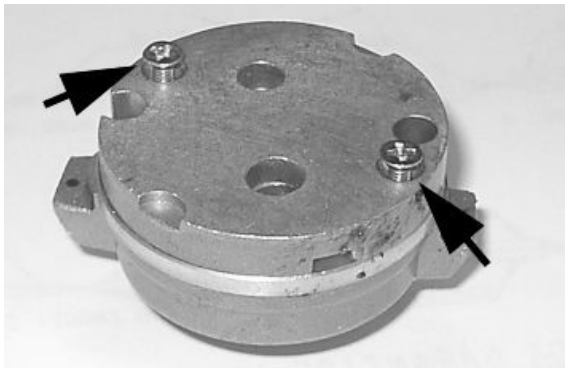
Distance between the rotors

Admissible limit clearance: 0.12 mm



Refitting

- Check there are no signs of wear on the oil pump shaft or body.
- Check there are no signs of scoring or wear on the oil pump cover.
- If you detect non-conforming measurements or scoring, replace the faulty parts or the unit.
- Fit the pump cover in the position that permits the crankcase clamping screws to be aligned.



- Make sure the gasket is positioned properly and refit the pump on the engine crankcase. The pump can only be fitted in one position. - Tighten the screws to the prescribed torque.
- Fit the sprocket wheel with a new O-ring.
- Fit the chain.
- Fit the central screw and the cup washer. Tighten to the prescribed torque.
-Fit the oil pump cover, by tightening the two screws to the prescribed torque.

NOTE

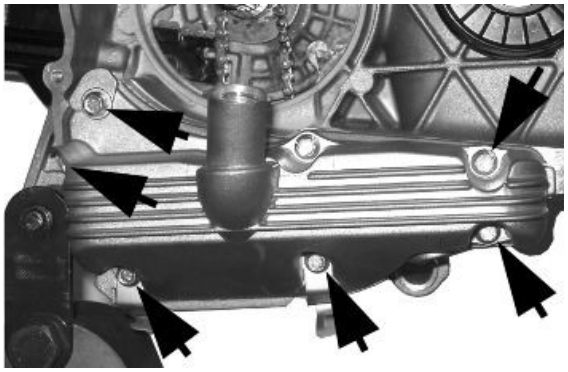
FIT THE CUP WASHER SO THAT ITS OUTER RIM TOUCHES THE PULLEY. MAKE SURE THAT THE PUMP TURNS FREELY.

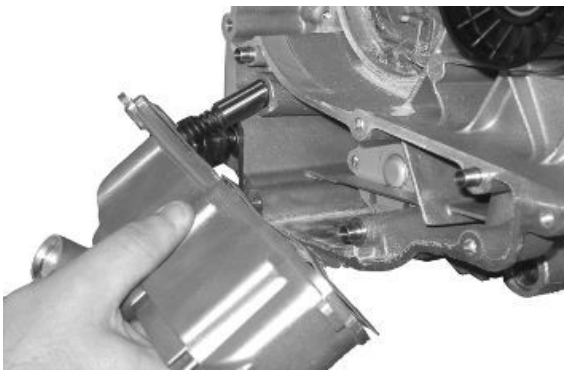
Locking torques (N*m)

Screws fixing oil pump to the crankcase 5 to 6 Oil pump command sprocket screw 10 to 14 Oil pump cover screws 0.7 - 0.9

Removing the oil sump

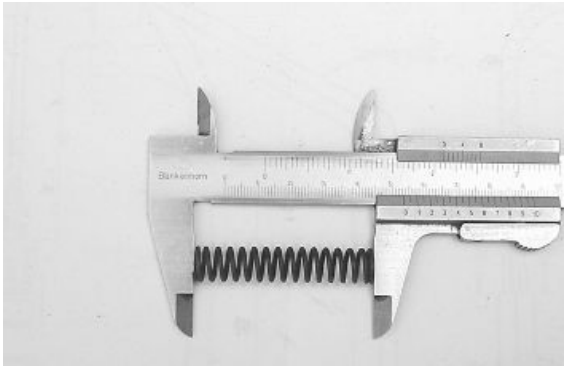
- Remove the oil filler plug, the transmission cover, the complete driving pulley assembly with belt and the sprocket wheel, as described in the "Transmission" chapter.
- Drain the oil as described above.
- Remove the 7 screws, shown in the diagram, and the 2 rear brake fluid pipe fixing brackets.
- Remove the screw, the by-pass piston, the gasket and the centring dowels shown in the figure.





Inspecting the by-pass valve

- Check the unloaded spring length.
- Check that the small piston is not scored.
- Ensure that it slides freely on the crankcase and that it guarantees a good seal.
- If not, eliminate any impurities or replace defective parts.



Characteristic

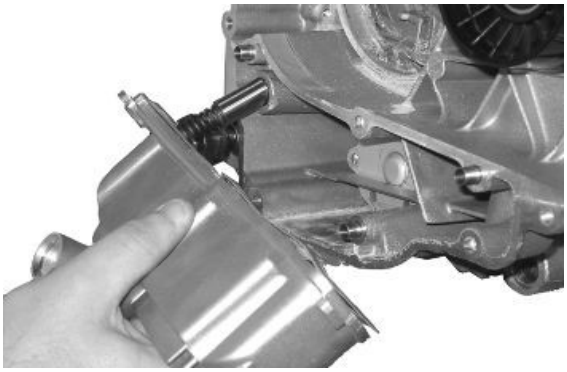
By-pass check up: Standard length

54.2 mm

Refitting the oil sump

- Refit the by-pass piston in its housing.
- Insert the pressure-regulating spring.
- Fit a new sump seal.
- Refit the two centring dowels.
- Refit the sump, taking care to locate the spring in the appropriate recess machined into the inside of the sump.
- Refit the rear brake cable brackets and the screws in the reverse order from which they were removed.
- Tighten the screws to the prescribed torque.
- Refit the driving pulley assembly, the drive belt, the sprocket wheel and the transmission cover, as described in the "Transmission" chapter.

- When testing the lubrication system, refer to chapter "Crankcase and Crankshaft", regarding lubrication of the crankshaft and connecting rod



Locking torques (N*m)

Oil sump screws 10 to 14

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Malaguti

This section describes the steps for removing an engine from a vehicle.

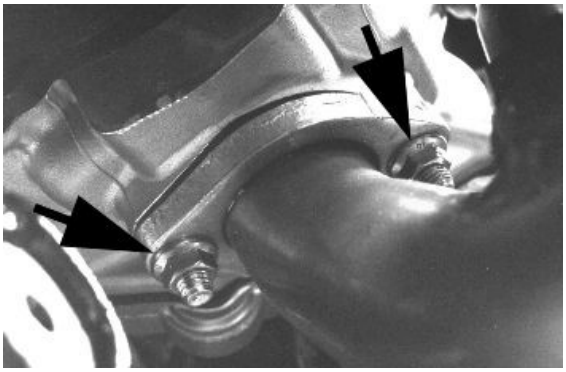
Exhaust assy. Removal

-Remove the Lambda probe from support and disconnect.
-Remove holder clip.

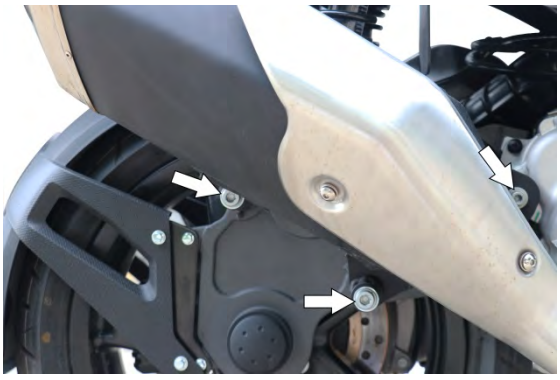
- Unfasten the two exhaust manifolds and fasten them to the head.

In order to properly unscrew the nut that holds the muffler flange to the head, use a connecting spanner, which can also be screwed to the right nut according to the direction of movement.

This is hard to do with a traditional straight wrench.



-Loosen the three screws holding the muffler to the support arm.
- Remove the complete muffler unit.



Remove the lambda probe from the manifold.

CAUTION: IF ONLY THE MUFFLER HEAD NEEDS TO BE REMOVED, ALWAYS REPOSITION THE GRAPHITE GASKET BETWEEN THE SHORT END AND THE HEAD.

Removal of the engine from the vehicle

CAUTION

SUPPORT THE VEHICLE ADEQUATELY.

Disconnect the battery.

- Remove the side fairings.
- Remove the helmet compartment.

Remove the full muffler unit.

- Remove the air filter.
- Release the blow-by return pipe from the clamp and disconnect it from the head.

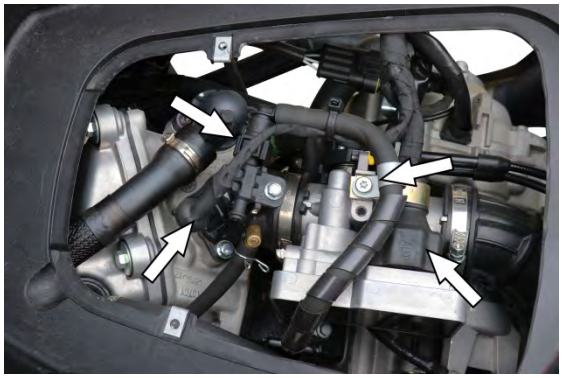
CAUTION

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

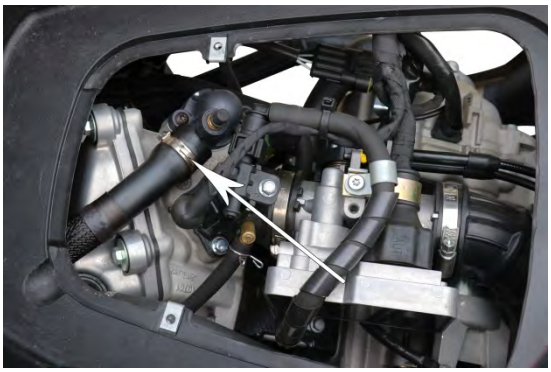
- Remove the rear brake calipers and loosen the rear brake line from the four clips.

- Let's take a + 2l container to collect the coolant and put it under the vehicle.
- Let's remove the pipe as shown in the picture that carries the coolant into the pump and then empty the system.
- Remove the engine coolant outlet pipe.

- Disconnect:
- Fuel line and retainer clamp.
- Syringe connector.
- Control unit connector..

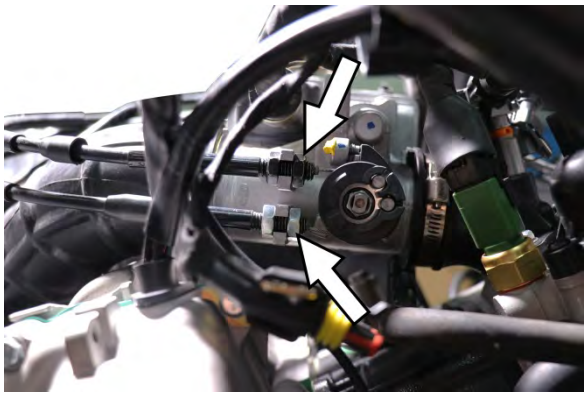


- Remove coolant outlet pipe from engine as directed.



- Remove the spark plug cover.
- Remove the coolant temperature sensor as shown in the drawing.

- Remove the throttle cable from the throttle body by loosening the nut shown in the picture.
- Remove the throttle cable clamp from the manifold.



- As shown in the figure, remove the positive and negative wiring from the starting motor.

- Disconnect the flywheel wiring connector.
- Remove the clamp indicated.

Remove lower screws for left and right shock absorbers.

When reinstalling the engine to the vehicle remove the engine, but in reverse order, and respect the tightening torque shown in the specification section.

- - Check the oil level. If necessary, fill up the oil according to the recommended model.

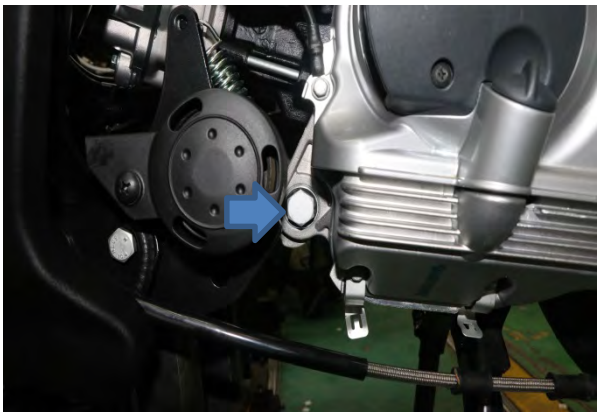
- - Fill the cooling loop and drain.

- - Check whether the accelerator and electrical appliances work properly.

CAUTION

PAY PARTICULAR ATTENTION TO POSITIONING THE THROTTLE CONTROL TRANSMISSION PROPERLY SPECIAL ATTENTION SHOULD BE PAID TO THE CORRECT POSITIONING OF THROTTLE CONTROL GEARBOX.

After the engine is refitted to the vehicle, the removal operation is performed in reverse order and the tightening torque shown in the « specification » section is respected.



- Check for small clearance when valve is against set screw on abutment.

- Check the oil level. If necessary, fill up the oil according to the recommended model.

- Fill the cooling loop and drain.

- Check whether the accelerator and electrical appliances work properly.
- Pay special attention to the sleeve and carefully position the throttle body reference mark as shown in the picture.

CAUTION

SPECIAL ATTENTION SHOULD BE PAID TO THE CORRECT POSITIONING OF THROTTLE CONTROL GEARBOX.

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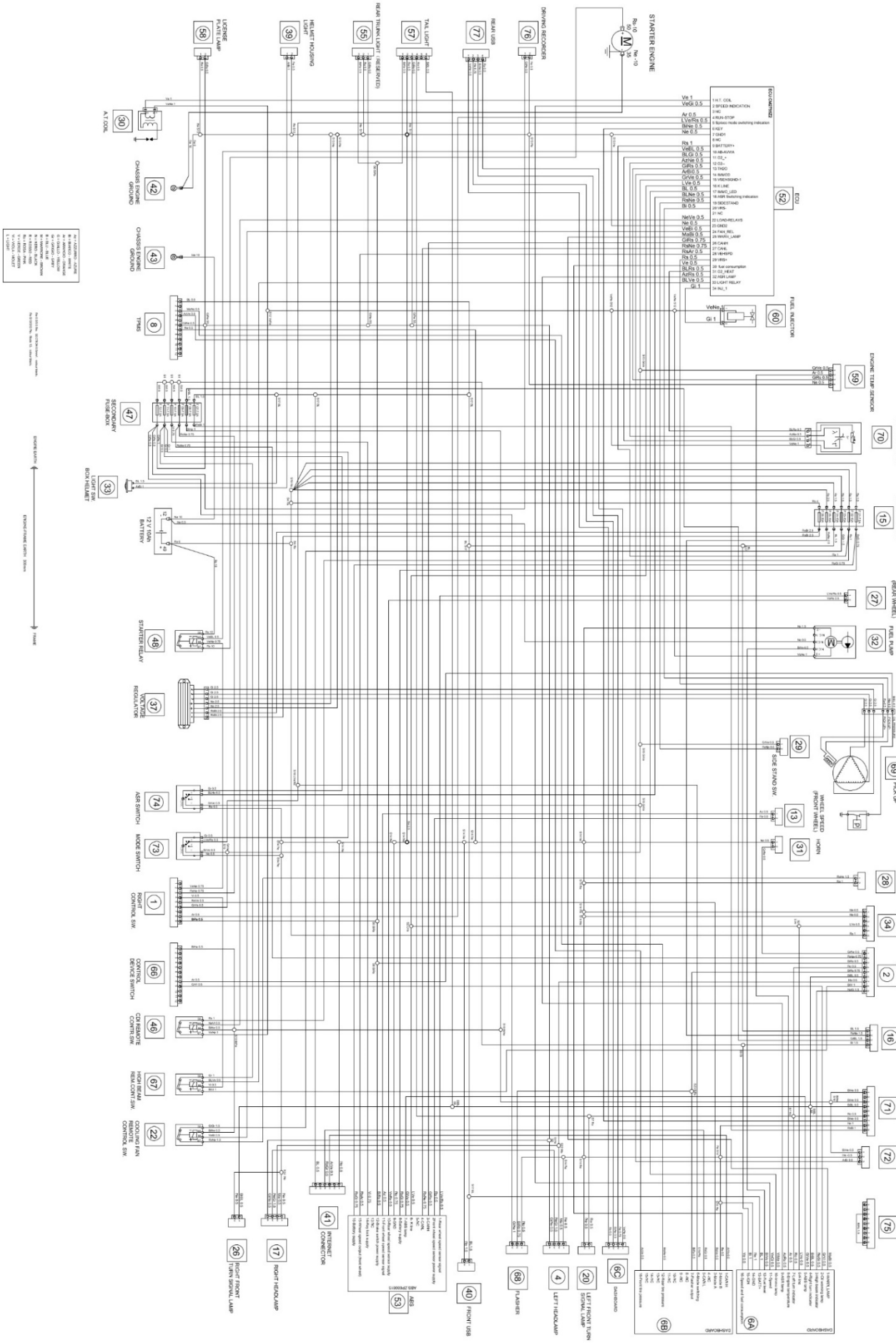
STARTER ENGINE
ECU
FUEL INJECTOR
ENGINE TEMP. SENSOR
LAMBDA SENSOR
MAIN FUSE-BOX
WHEEL SPEED (REAR WHEEL)
FUEL PUMP
PICK UP
SIDE STAND SW.
WHEEL SPEED (FRONT WHEEL)
HORN
FAN MOTOR
DIAGNOSIS 1
LEFT CONTROL SW.
KEY SW.
ALARM CONNECTOR 1
ANTENNA
ALARM CONNECTOR 2
DRIVING RECORDER
REAR USB
TAIL LIGHT
REAR TRUNK LIGHT (RESERVED)
HELMET HOUSING LIGHT
LICENSE PLATE LAMP
A.T.COIL
CHASSIS ENGINE GROUND
CHASSIS ENGINE GROUND
TPMS
SECONDARY FUSE-BOX
12 V 10Ah BATTERY
STARTER RELAY
VOLTAGE REGULATOR
ASR SWITCH
MODE SWITCH
RIGHT CONTROL SW.
CONTROL DEVICE SWITCH
CDI REMOTE CONTR.SW.
HIGH BEAM REM.CONT.SW.
COOLING FAN REMOTE CONTROL SW.
INTERNET CONNECTOR
ABS
FRONT USB
FLASHER
LEFT HEADLAMP
LEFT FRONT TURN SIGNAL LAMP
DASHBOARD
RIGHT FRONT TURN SIGNAL LAMP
RIGHT HEADLAMP

KEY

1. RIGHT CONTROL SW.
2. LEFT CONTROL SW.
3. LEFT HEADLAMP
6A. DASHBOARD
6B. DASHBOARD
6C. DASHBOARD
8. TPMS
12. BATTERY NEGATIVE
13. WHEEL SPEED (FRONT WHEEL) 15.MAIN FUSE-BOX
16 KEY SW.
17. RIGHT HEADLAMP
20. LEFT FRONT TURN SIGNAL LAMP
22. COOLING FAN REMOTE CONTROL SW.
26. RIGHT FRONT TURN SIGNAL LAMP
27. WHEEL SPEED (REAR WHEEL)
28. FAN MOTOR 29.SIDE STAND SW.
30. A.T.COIL
31. HORN
32. FUEL PUMP
33. LIGHT SW. BOX HELMET
34. DIAGNOSIS 1
35. STARTER ENGINE NEGATIVE 37.VOLTAGE REGULATOR
39. HELMET HOUSING LIGHT
40. FRONT USB
41. INTERNET CONNECTOR
42. CHASSIS ENGINE GROUND
43. CHASSIS ENGINE GROUND
46. CDI REMOTE CONTR.SW.
47. SECONDARY FUSE-BOX
48. STARTER RELAY
49. BATTERY POSITIVE
50. STARTER ENGINE
52. ECU
53. ABS
55. REAR TRUNK LIGHT (RESERVED)
57. TAIL LIGHT
58. LICENSE PLATE LAMP
59. ENGINE TEMP.SENSOR
60. FUEL INJECTOR
66. CONTROL DEVICE SWITCH
67. HIGH BEAM REM.CONT.SW.
68. FLASHER
69. PICKUP
70. LAMBDASENSOR
71. ALARM CONNECTOR 1
72. ANTENNA
73. MODE SWITCH
74. ASR SWITCH
75. ALARM CONNECTOR 2
76. DRIVING RECORDER
77. REAR USB

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Components arrangement

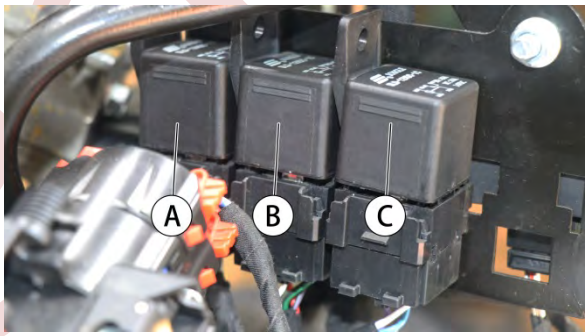
1. Remote controls

Remove the legshield to reach it.

A. Injection load remote control

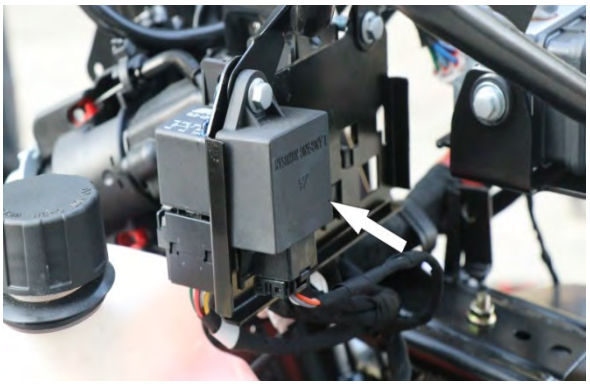
B. High-beam light remote control

C. Electric fan remote control



2. Electrical control device

Remove the legshield to reach it.

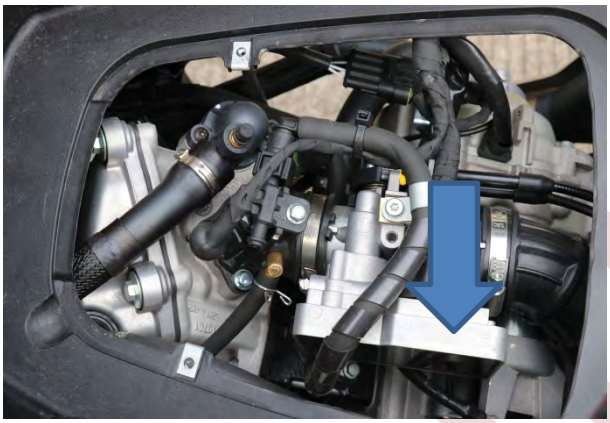


3. Main fuses

In order to reach it, remove the battery cover placed in the helmet compartment.

4. Injection ECU

To reach it, remove the inspection compartment placed in the helmet compartment.



5. Auxiliary fuses

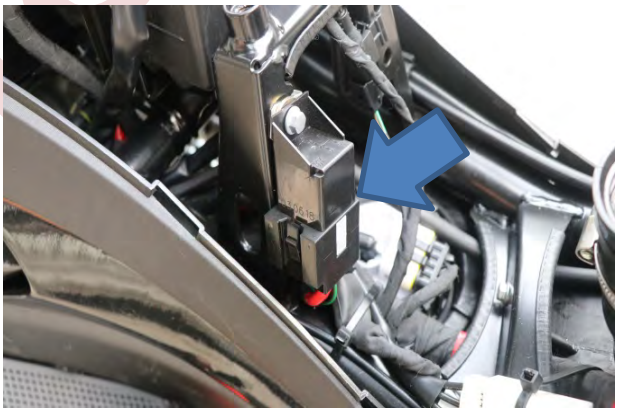
Located in the helmet compartment.

6. Starter motor

To reach it, remove the helmet compartment.

7. Starter remote control

To reach it, remove the central chassis cover.



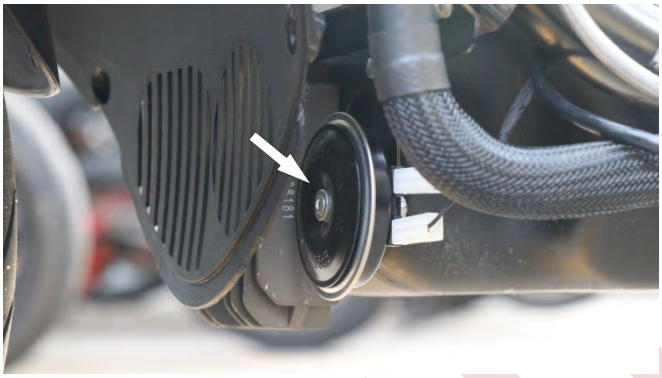
8. Stand button

To reach it, remove the left footrest.

9. Horn

Remove the lower cover to reach it.

.



10-11. Key switch/Immobilizer aerial

To reach it, remove the shield back plate.

Malaguti

12. Battery

Remove the battery cover placed in the helmet compartment to reach it..

13. HV coil

To reach it, remove the right side fairing.

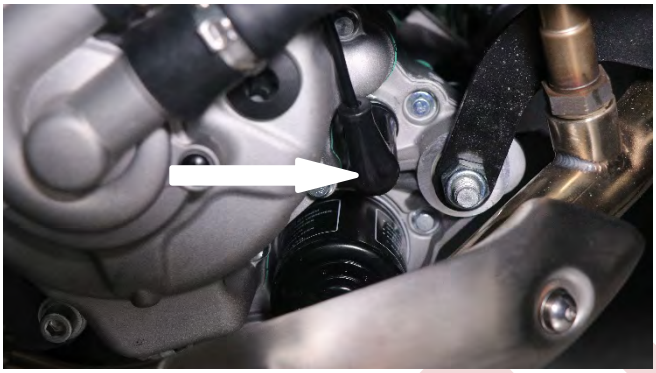
14. Magneto flywheel

The connector is located near the fuel pump.

Remove the central chassis cover to reach it.

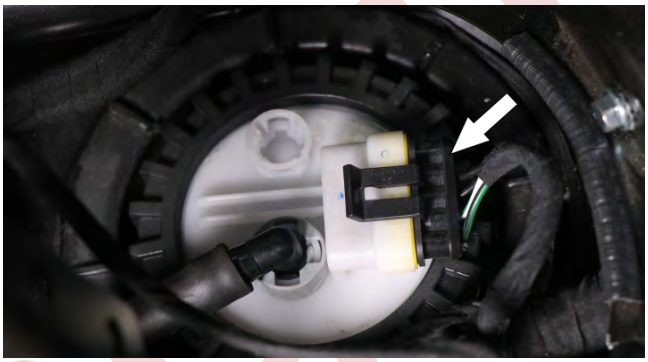
Malaguti

15. Oil pressure sensor



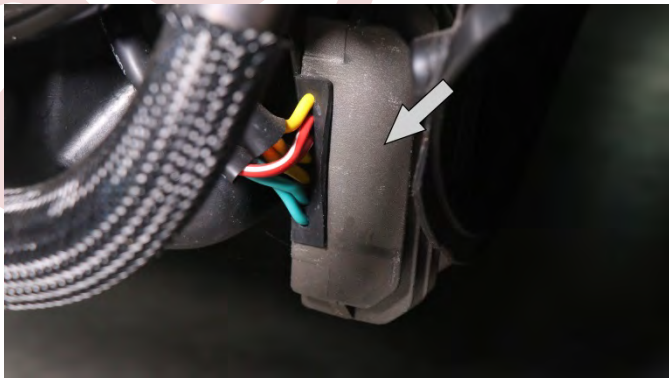
16. Fuel level transmitter

To reach it, remove the case's center cover. The transmitter is connected to the fuel pump.



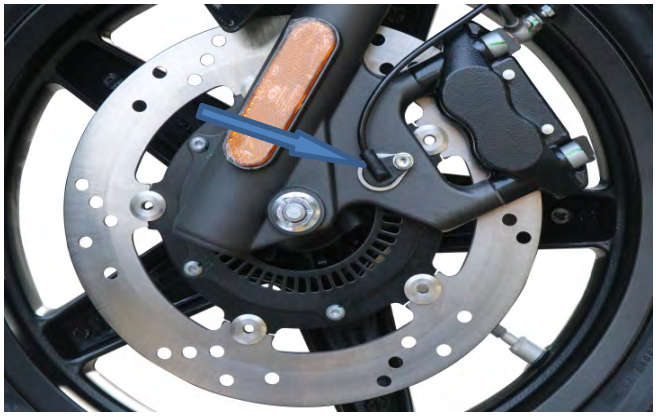
17. Voltage regulator

Remove the lower cover to reach it.



18.Wheel turning sensor

In the front wheel, on the left.

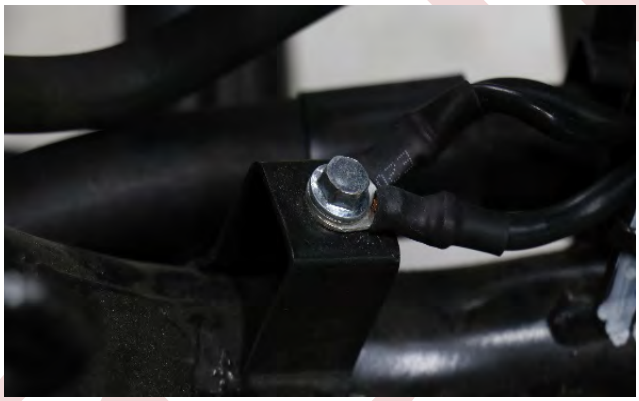


Malaguti

Ground points

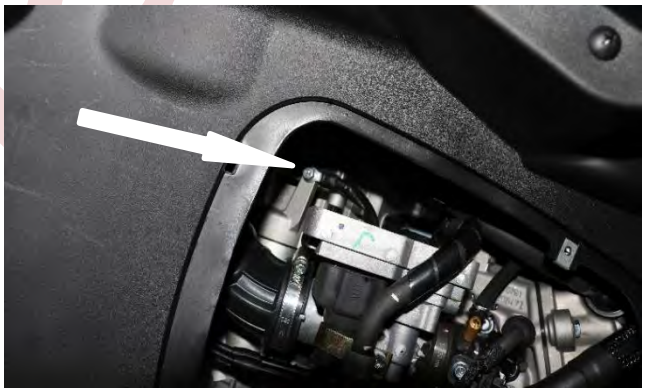
A. Ground points on the chassis

Remove the right footrest to reach them.



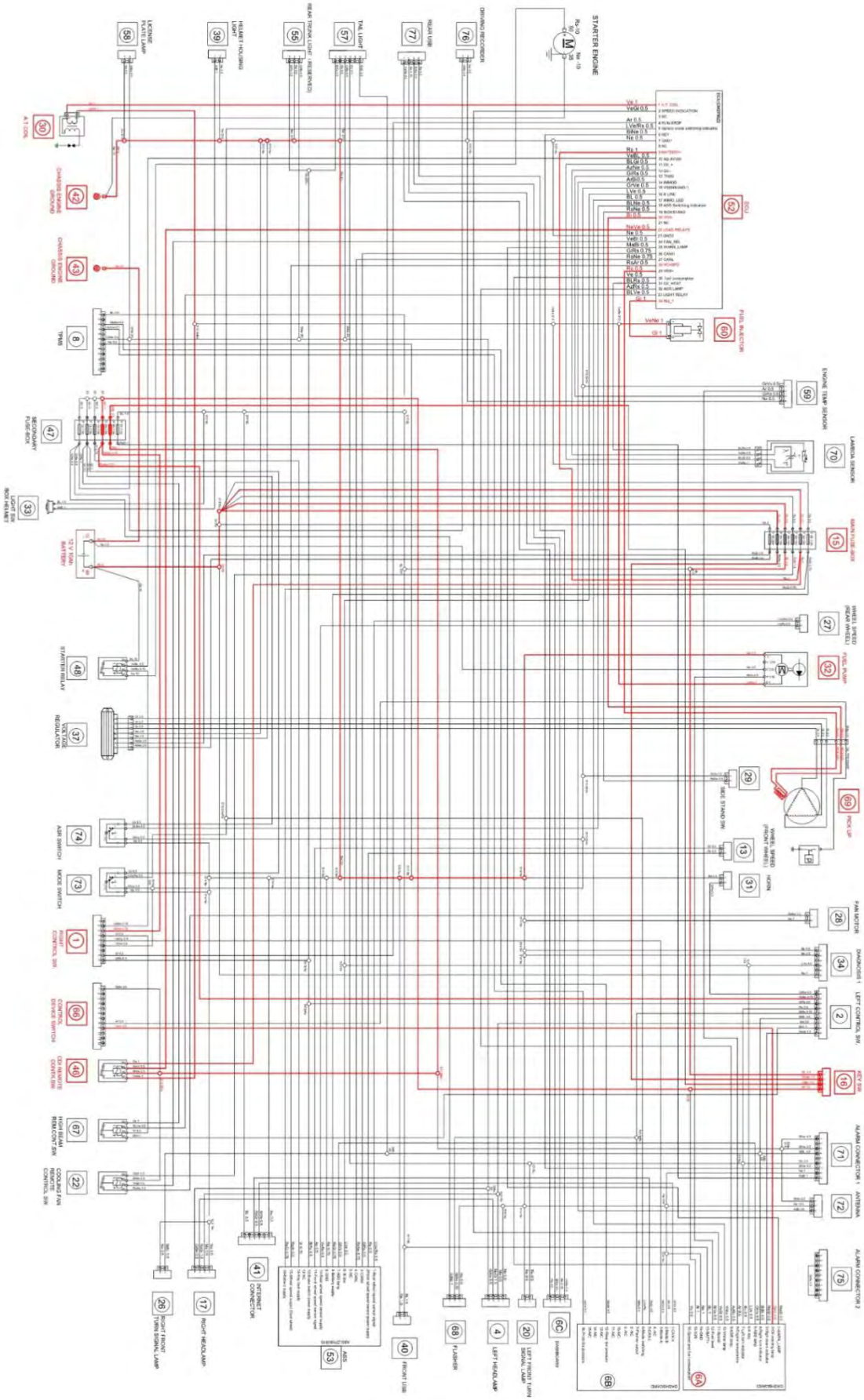
B. Ground point on the engine

Remove the inspection compartment placed in the helmet compartment to reach it.



Conceptual diagrams

Ignition


STARTER ENGINE
DRIVING RECORDER
REAR USB
TAIL LIGHT
REAR TRUNK LIGHT (RESERVED)
HELMET HOLDING LIGHT
FUEL INJECTOR
ENGINE TEMP SENSOR
LAMBDA SENSOR
SEAT LOCK (REAR WHEEL)
FUEL PUMP
SIDE STAND SW
PICK UP
WHEEL SPEED (FRONT WHEEL)
HORN
FAN MOTOR
DIAGNOSIS 1
LEFT CONTROL SW
KEY SW
ALARM CONNECTOR 1
ANTENNA
ALARM CONNECTOR 2
INTERFACE CONNECTOR
ABS
FRONT USB
FLASHER
LEFT HEAD LAMP
LEFT FRONT TURN SIGNAL LAMP
RIGHT FRONT TURN SIGNAL LAMP
RIGHT HEADLAMP
TPMS
SECONDARY FUSE BOX
LIGHT SW (BOX HELMET)
12 V 51AH BATTERY
STARTER RELAY
REGULATOR
AIR SWITCH
MODE SWITCH
RIGHT CONTROL SW
CONTROL DEVICE SWITCH
OBJ REMOTE CONTROL SW
HIGH BEAM RELAY CONTROL SW
COOLING FAN CONTROL SW
CHASSIS ENGINE GROUND
A.T. COIL

KEY

6A.DASHBOARD
12.BATTERY NEGATIVE
15.MAIN FUSE-BOX
16.KEY SW.
30.A.T.COIL
32.FUEL PUMP
42.CHASSIS ENGINE GROUND
43.CHASSIS ENGINE GROUND
46.CDI REMOTE CONTR.SW.
49.BATTERY POSITIVE
52.ECU
60.FUEL INJECTOR
66.CONTROL DEVICE SWITCH
69.PICK UP

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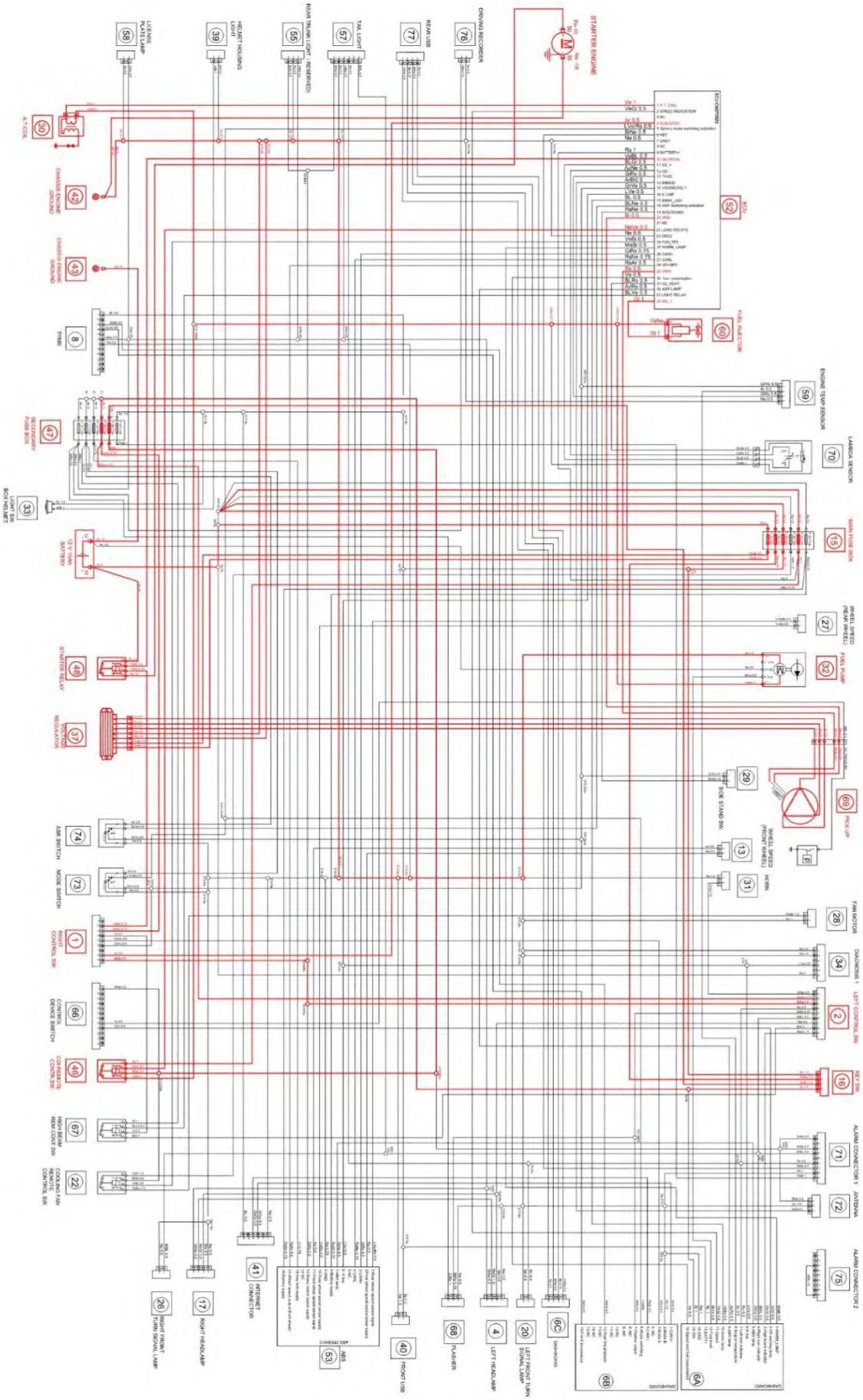
Battery recharge and starting



KEY

1. RIGHT CONTROL SW.
2. LEFT CONTROL SW.

12. BATTERY NEGATIVE

15. MAIN FUSE-BOX

16. KEY SW.

30 .A.T.COIL

32. FUEL PUMP

35. STARTER ENGINE NEGATIVE

37. VOLTAGE REGULATOR

42. CHASSIS ENGINE GROUND

43. CHASSIS ENGINE GROUND

46. CDI REMOTE CONTR.SW.

47. SECONDARY FUSE-BOX

48. STARTER RELAY

49. BATTERY POSITIVE

50. STARTER ENGINE

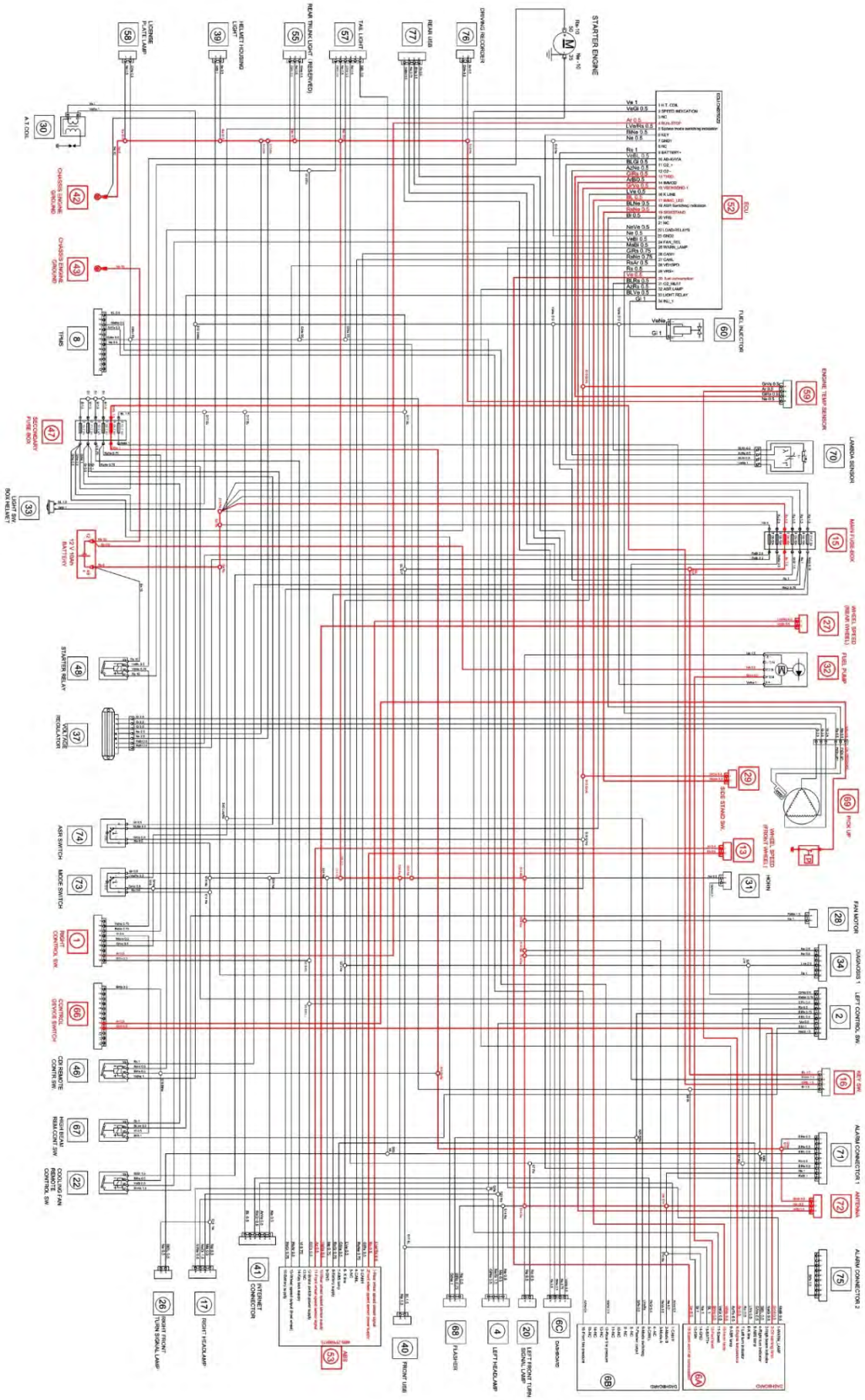
52. ECU

60. FUEL INJECTOR

69. PICK UP

Malaguti

Level indicators and enable signals section

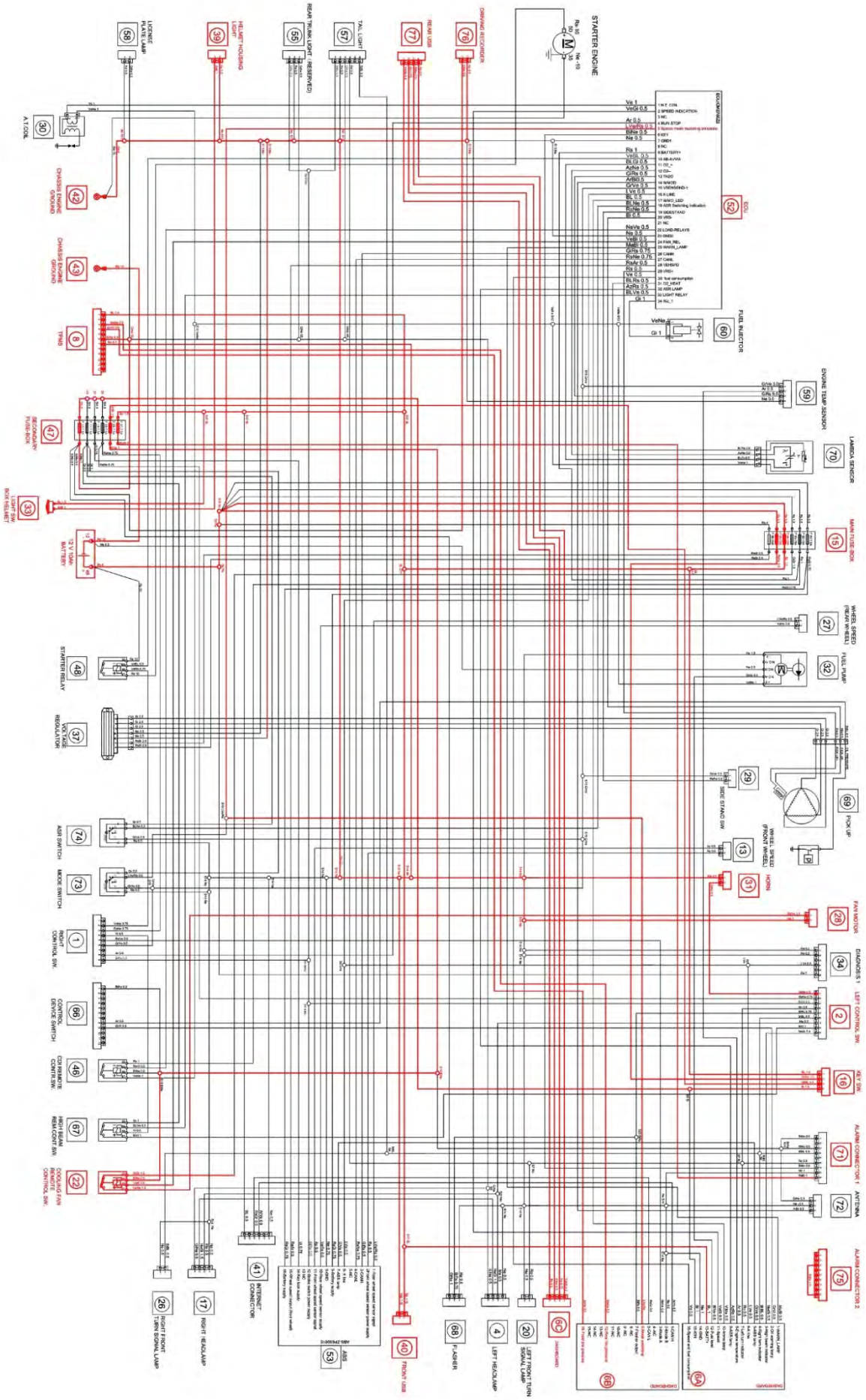


KEY

1.RIGHT CONTROL SW.
6A.DASHBOARD
12.BATTERY NEGATIVE
13.WHEEL SPEED (FRONT WHEEL)
15.MAIN FUSE-BOX
16.KEY SW.
27.WHEEL SPEED (REAR WHEEL)
29.SIDE STAND SW.
32.FUEL PUMP
42.CHASSIS ENGINE GROUND
43.CHASSIS ENGINE GROUND
47.SECONDARY FUSE-BOX
49.BATTERY POSITIVE
52.ECU
53.ABS
59.ENGINE TEMP.SENSOR
66.CONTROL DEVICE SWITCH
69.PICK UP
72.ANTENNA

Malaguti

Devices and accessories

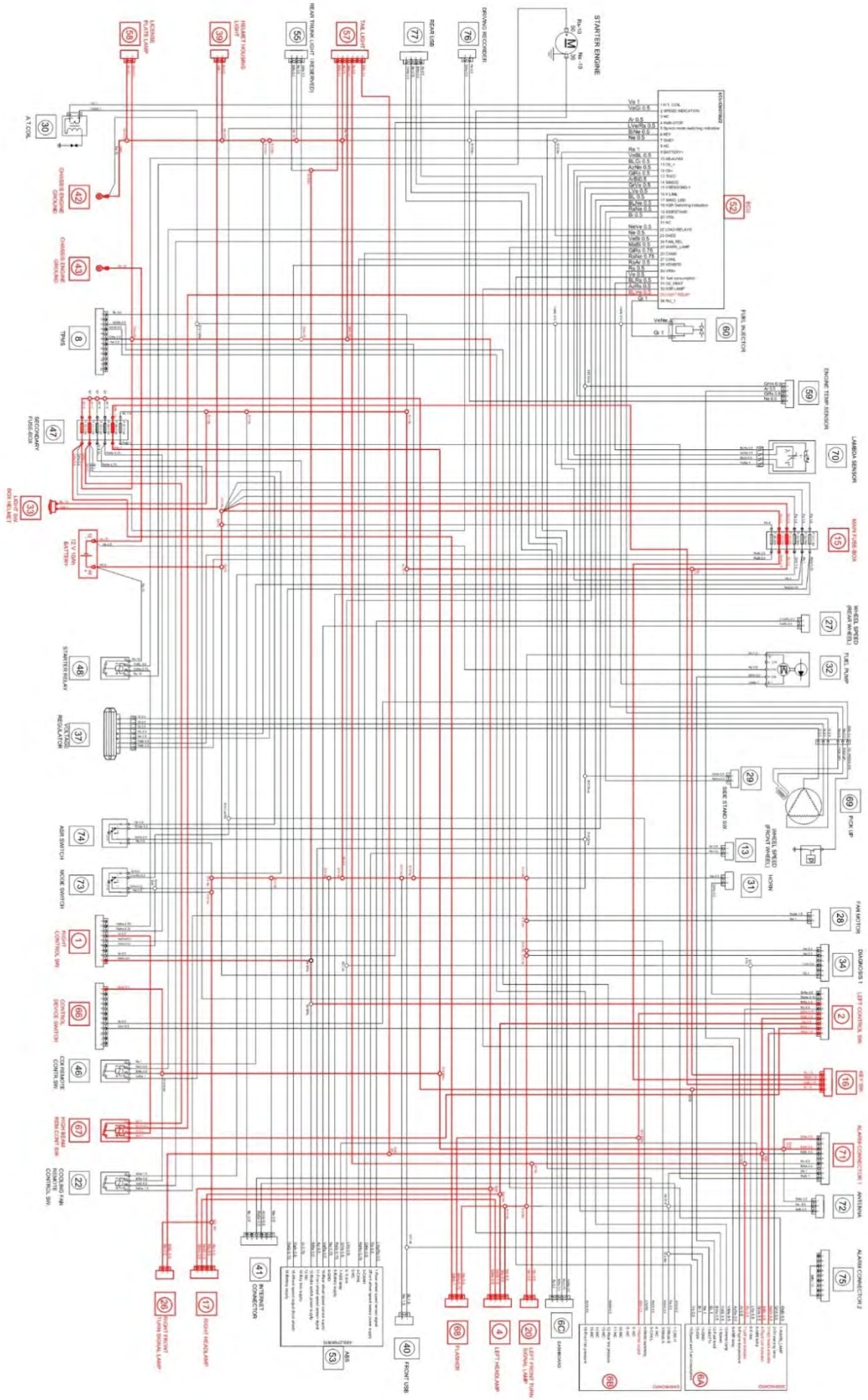


KEY

2.LEFT CONTROL SW.
6A.DASHBOARD
6B.DASHBOARD
6C.DASHBOARD
8.TPMS
12.BATTERY NEGATIVE
15.MAIN FUSE-BOX
16.KEY SW.
22.COOLING FAN REMOTE CONTROL SW.
31.HORN
33.LIGHT SW. BOX HELMET
39.HELMET HOUSING LIGHT
40.FRONT USB
41.INTERNET CONNECTOR
42.CHASSIS ENGINE GROUND
43.CHASSIS ENGINE GROUND
47.SECONDARY FUSE-BOX
49.BATTERY POSITIVE
52.ECU
71.ALARM CONNECTOR 1
75.ALARM CONNECTOR 2
76.DRIVING RECORDER
77.REAR USB

Manuguti

Lights and turn indicators



KEY

1.RIGHT CONTROL SW.
2.LEFT CONTROL SW.
4.LEFT HEADLAMP
6A.DASHBOARD
6B.DASHBOARD
12.BATTERY NEGATIVE
15.MAIN FUSE-BOX
16.KEY SW.
17.RIGHT HEADLAMP
20.LEFT FRONT TURN SIGNAL LAMP
26.RIGHT FRONT TURN SIGNAL LAMP
33.LIGHT SW. BOX HELMET
39.HELMET HOUSING LIGHT
42.CHASSIS ENGINE GROUND
43.CHASSIS ENGINE GROUND
47.SECONDARY FUSE-BOX
49.BATTERY POSITIVE
52.ECU
57.TAIL LIGHT
58.LICENSE PLATE LAMP
66.CONTROL DEVICE SWITCH
67.HIGH BEAM REM.CONT.SW.
71.ALARM CONNECTOR 1

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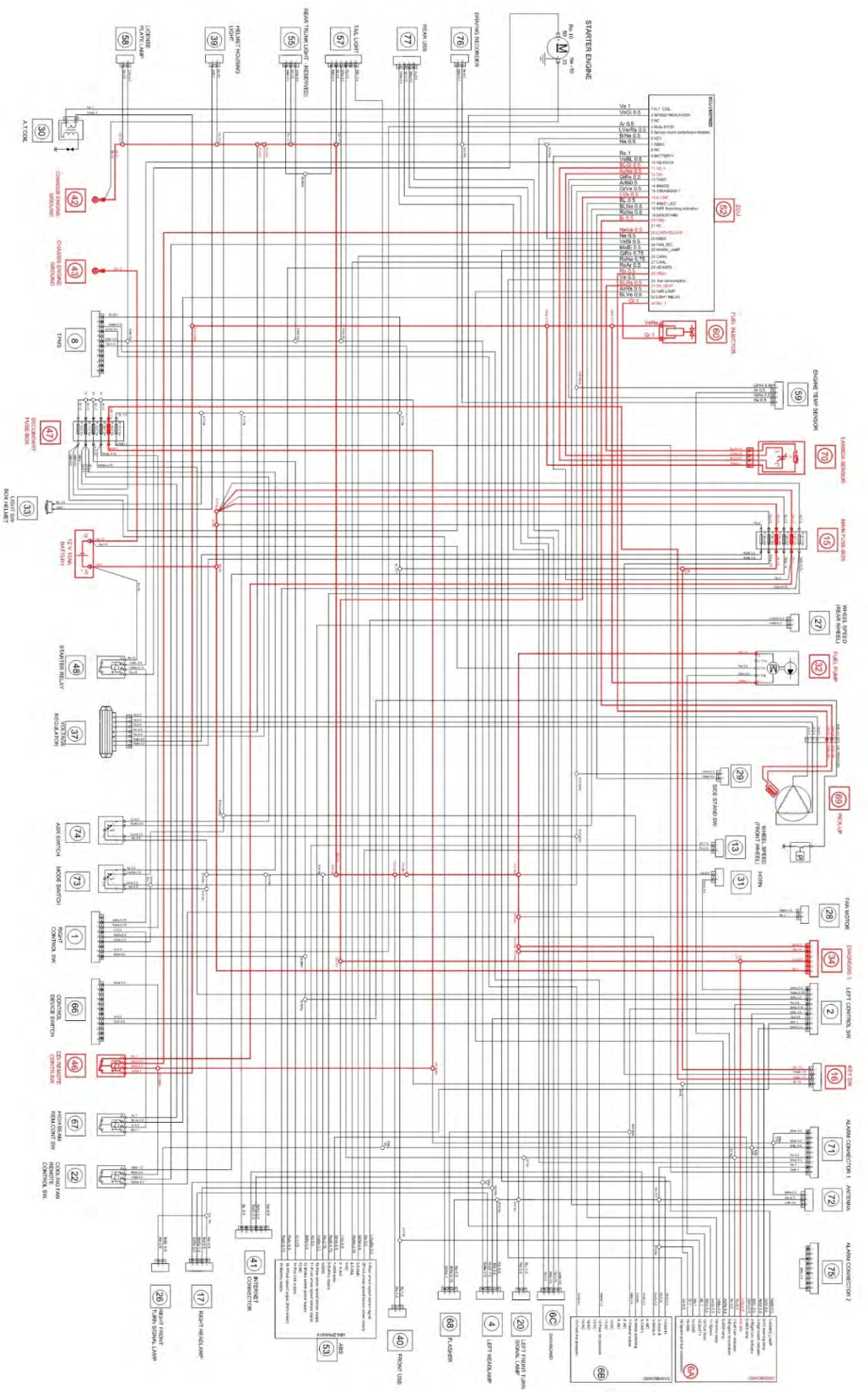
Injection


STARTER ENGINE
ECU
FUEL INJECTION
ENGINE TEMP SENSOR
MAIN FUSE-BOX
WHEEL SPEED (REAR WHEEL)
FUEL PUMP
SIDE STAND SW.
WHEEL SPEED (FRONT WHEEL)
HORN
FAN MOTOR
LEFT CONTROL SW.
ALARM CONNECTOR 1
ANTENNA
ALARM CONNECTOR 2
LEFT HEADLAMP
LEFT FRONT TURN SIGNAL LAMP
FLASHER
FRONT SIDE
INTERNET CONNECTION
RIGHT HEADLAMP
RIGHT FRONT TURN SIGNAL LAMP
ABS
STARTER RELAY
RIGHT CONTROL SW.
HIGH BEAM REM.CONT.SW
COOLING FAN REMOTE CONTROL SW.
ABS SWITCH
MODE SWITCH
CONTROL DEVICE SWITCH
DS REMOTE CONTR.SW.
TPMS
12 V MAIN BATTERY
SECONDARY FUSE BOX
LOWER PART TL LAMP
HELMET HOUSING LIGHT
REAR TRUNK LIGHT (RESERVED)
TAIL LIGHT
REAR USB
DRIVING RECORDER
CHASSIS ENGINE GROUND
CHASSIS ENGINE GROUND
A.T.CDE

KEY

6A.DASHBOARD
12.BATTERY NEGATIVE
15.MAIN FUSE-BOX
16.KEY SW.
32.FUEL PUMP
34.DIAGNOSIS 1
42.CHASSIS ENGINE GROUND
43.CHASSIS ENGINE GROUND
46.CDI REMOTE CONTR.SW.
47.SECONDARY FUSE-BOX
49.BATTERY POSITIVE
52.ECU
60.FUEL INJECTOR
69.PICK UP
70.LAMBDA SENSOR

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Checks and inspections

This section is dedicated to the checks on the electrical system components.

Immobiliser

The electronic ignition system is controlled by a control unit and an integrated fixer system. The "fixer" is an anti-theft system that works only when activated by a code key identified by the control unit. The code is integrated into the transponder in the key block. This allows the driver to clear operations without doing anything other than turning the key. The fixator system consists of the following components:

- Electronic control device
- Anti-theft control system antenna
- Primary key with combined transponder (brown key)
- Service key with composite repeater (black key)
- High voltage coil
- Diagnostic leadership

The diagnostic LED also ACTS as an anti-theft flash. This function is activated each time the ignition switch is switched to the off position or the emergency stop switch is switched to the off position. It can be activated for up to 48 hours without affecting the charge of the battery. When the ignition switch turns ON the "ON" position, the function of anti-theft flash lamp fails. The flash then confirms to switch to the "ON" state. The duration of the flash depends on the programming of the electronic control unit. If the LED light is turned off regardless of the position of the ignition key switch, and/or the dashboard is not started, please check:

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1. Fuse 2, 5, 10, 11 are in working state.

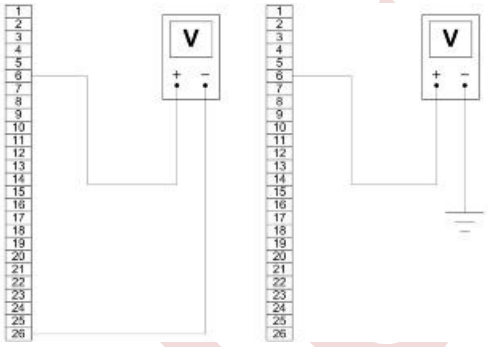
2. The control unit has the following power supply:

3. Remove the connector mounting bracket shown in the photo and disconnect the connector from the control unit.

Check the following:

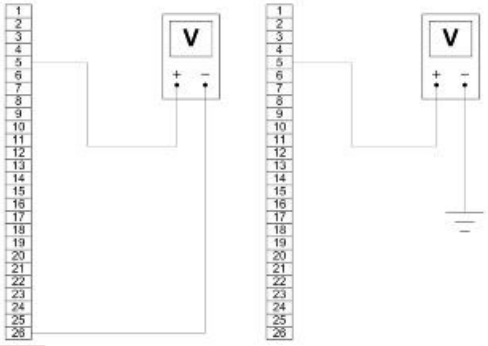
With the key switch set to OFF:

- If there is battery voltage between terminals 6-26 and terminal 6-chassis grounding (fixed power supply).If there is no voltage check, fuse 12 and its cable are in working condition.
-



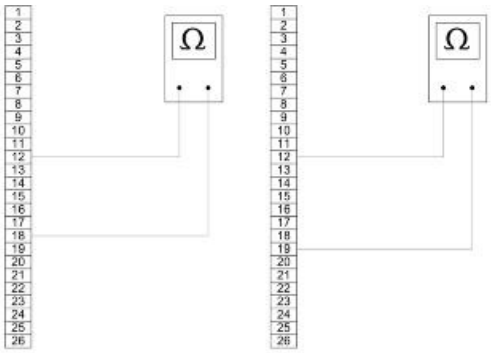
With the key switch in the ON position:

- There is battery voltage between termi-nals 5-26 and terminal 5 frame grounding (fixed power supply).If there is no volt age, check that ignition switch contacts and fuses no. 2 and no. 11 and their cable are working properly.



With the key switch as RUN

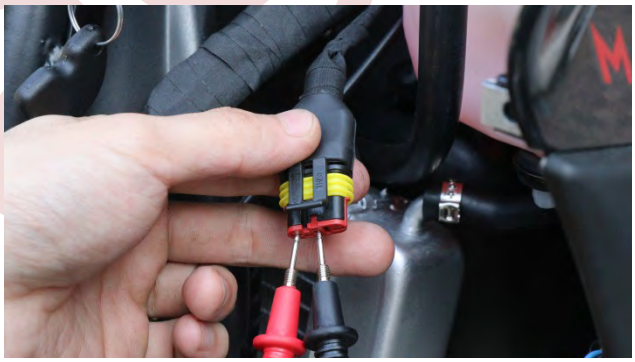
- There is continuity between the wiring terminals, the emergency cut-off switch is set as "RUN", and the side frame is folded. If there is no continuity, check for contact with the latter.



After removing the rear plate of the leg cover, remove the electrical connection from the antenna as shown.

Remove the protective base from the connector.

With the ignition key switch set to ON, check if there is battery voltage between the White-Black and Black cables.

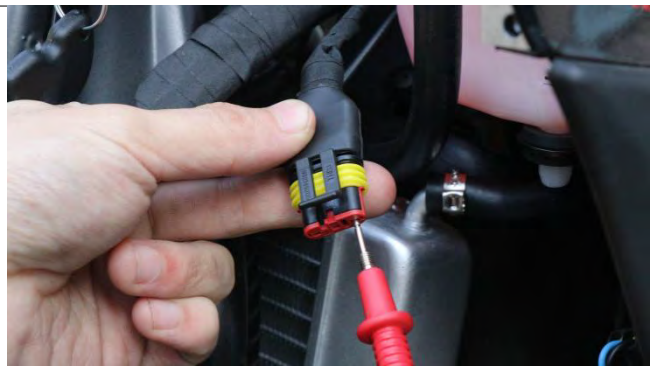


With MIU connector disconnected, check the con- tinuity between the Orange-White cable and pin 7 of the interface wiring.

Specific tooling

020481Y Control unit interface wiring

020331Y Digital multimeter



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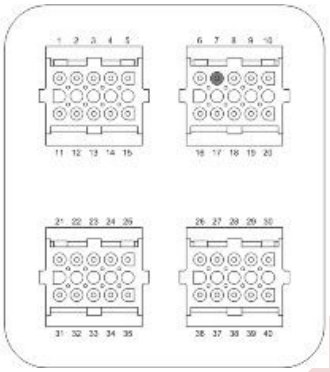

Virgin circuit

Ignition system unencrypted, any key will start the engine, but the limit is 2000 RPM. The key can be identified only if the program in the control unit is correct. Data storage pro - the unprogrammed control unit provides the first key storage memory to identify the owner before it comes out: this becomes particularly important because it is the only key that allows the control unit to wipe clean and reprogram the recitation service key. The primary key and service key must be used to encode the system as follows:

- Insert the primary key, open «ON» and hold the position for 2 seconds (limit 1 to 3 seconds).
- Insert the service key and open «ON» for 2 seconds.
- If you have a copy of the key, repeat with each key.
- Insert the primary key again and open «ON» for 2 seconds. The maximum time to change keys is 10 seconds.

Up to 7 service keys can be programmed at a time.

It is important to stick to time and procedure. If not, start from scratch. Once the system is programmed, the master key transponder matches the control unit exactly. With this link, you can now encode the new service key in case of loss, replacement, and so on. Each new program deletes the previous one, so in order to add or remove keys, you must repeat the process with all keys you want to continue using .If the service key is unencoded, the efficiency of high voltage circuit shielding must be thoroughly checked: in any case, the use of resistance spark plugs is recommended.

Characteristic

MASTER key:

BROWN KEY

SERVICE key.

BLACK KEY

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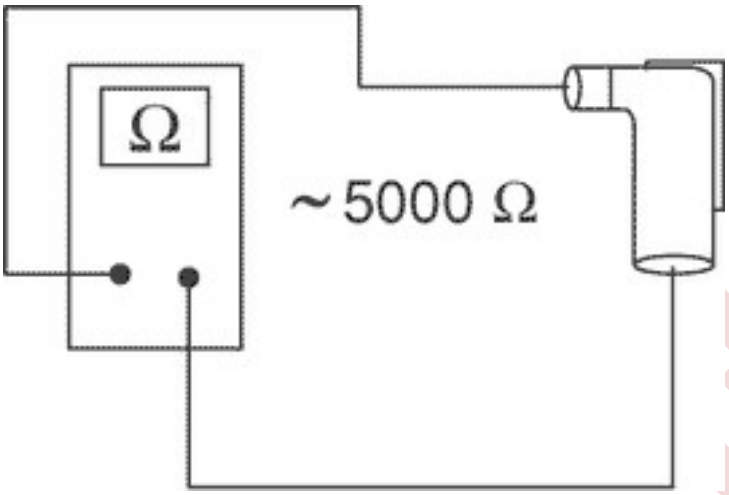
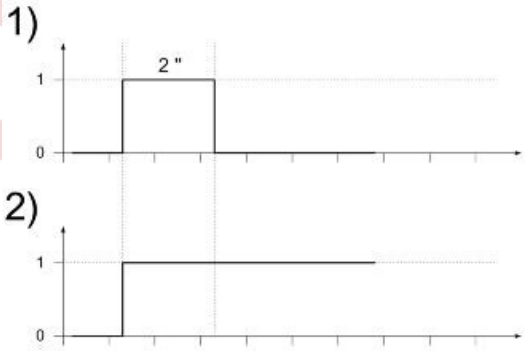


Diagnostic codes

The fixture system is tested each time the ignition key is transferred from «OFF» to «ON». During this diagnostic phase, the state of some control units can be identified and various light code displays can be made. Regardless of the code being transferred, if the LED remains off at the end of the diagnosis, the ignition is activated. However, if the LED remains on, that means the ignition is suppressed:



1. Previously unused control unit key insertion: displays a 2-second flash after which the LED will be permanently closed.Keys can be stored in memory, and vehicles can be star-shaped, but with a speed limit.

2. Previously unused control unit - the repeater is absent or unavailable: LED is permanently turned on.In this case, no action is possible, including starting the vehicle. .

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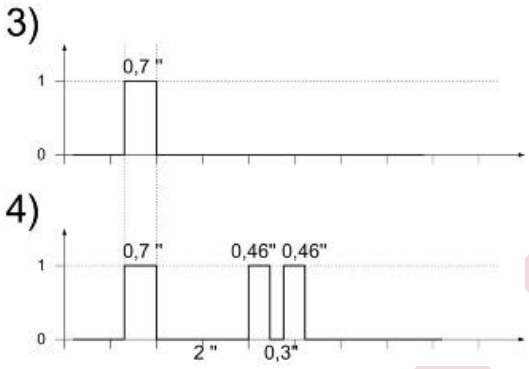
3. Program control unit -- service key in normal use: a 0.7-second flash is displayed, after which the LED is turned off stably. The engine is ready to start.

4. Program control unit - primary key entry: display a 0.7-second flash, then the LED redivides for 2 seconds, then a short 0.46-second flash, the same number of times as the key stored in memory (including the primary key).When the diagnosis is complete, the LED will be turned off permanently. The engine can start.

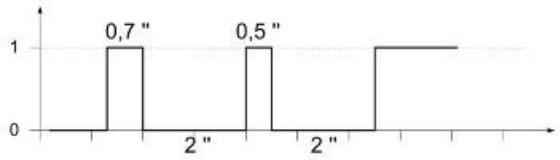


5. Program-controlled unit -- fault detection: according to the detected fault light code, the LED light will turn on after the light code. The engine won't start. The code that can be converted is:

- 1-flash code
- 2-flash code
- 3-flash code

Diagnostic code - 1 flash

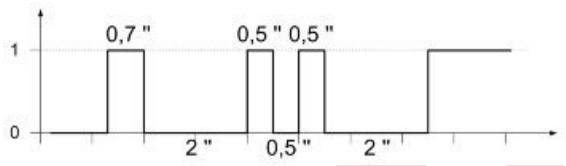
A one-flash code indicates a system in which the serial line does not exist or is not detected. Check the antenna wiring of the retainer and replace it if necessary.



Diagnostic code - 2 flashes

A two-flash code shows a system where the control unit does not show the transponder signal. This might depend on the inefficiency of the immobiliser aerial or the transponder.

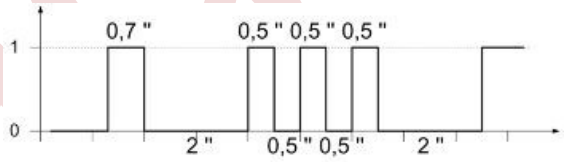
Turn the switch to ON using several keys: if the code is repeated even with the Master key, check the aerial wiring and change it if necessary. If this is not the case, replace the defective key and/or reprogram the control unit. Replace the control unit if the problem continues.



Diagnostic code - 3 flashes

A three-flash code shows a system in which the control unit does not display the transponder signal. This may depend on the inefficiency of fixed antennas or transponders.

Use several keys to turn on the switch: if the code reuses the primary key, check the antenna wiring and make changes if necessary. If not, replace the defective key and/or reprogram the control unit. If the problem continues, replace the control unit.



Ignition circuit

No spark plug

WARNING

ALL CONTINUITY TESTS MUST BE PERFORMED WHEN THE APPROPRIATE CONNECTOR IS DISCONNECTED.

HV coil primary resistance value:

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

Characteristic

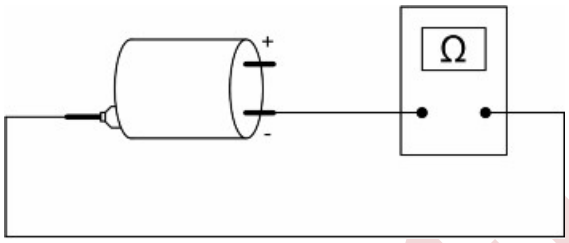
HV coil resistance primary value:

~ 0.9 Ω

HV coil secondary resistance value:

1) Disconnect the high voltage cable from the spark plug and measure the resistance between the spark plug cover and the negative pole of the high voltage coil.

2) Disconnect the spark plug cover of the high voltage cable and measure the resistance between the end of the high voltage cable and the negative pole of the high voltage coil (see figure).



3) Measure the resistance between the two ends of spark plug cover.

Characteristic

HV coil secondary resistance value with spark plug cap

~ 8.4 kΩ

HV coil secondary resistance value:

~ 3.4 kΩ

Spark plug cap resistance value

~ 5 kΩ

Battery recharge circuit

The charging circuit consists of a three-phase alternator and a permanent magnet flywheel. The generator is directly connected to the voltage regulator.

In turn, the regulator is directly connected to the ground and through the 30A protection fuse (No. 1) of the positive terminal of the battery.

Three-phase alternator provides good charging power. At low speed, it finds a good balance between generating power and no-load stability.

Stator check

Checking the stator windings

WARNING

THIS CHECK-UP CAN BE MADE WITH THE STATOR PROPERLY INSTALLED.

1) Remove the center chassis cover.

2) Disconnect the connector between stator and regulator with three yellow cables.

3) Measure the resistance between the yellow terminal and the other two terminals.

Electric characteristic

Resistance:

0.2 - 1 Ω

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4) Check whether each yellow cable is insulated from the ground.

5) If the value is incorrect, the stator should be replaced.

Recharge system voltage check

Look for any leakage

1) Remove the battery cover under the saddle and enter the battery.

2) Before checking the output voltage, check whether there is liquid leakage in the battery.

3) Turn off the ignition key, connect the terminal of the tester to the battery negative pole (-) and the black cable, and then disconnect the black cable from the battery negative pole (-).

4) With ignition keys always read by ammeter must be less than or equal to 0.5 mA.

Charging current check

WARNING

MAKE SURE THE BATTERY IS IN GOOD WORKINGCONDITION BEFORE CHECKING.

1) Place the vehicle on the central bracket

2) After the battery is properly connected with the circuit, place the multimeter lead between the battery terminals.

3) Turn on the engine, increase the engine speed, and measure the voltage at the same time.

Electric characteristic

The voltage range is 14.0 ~ 15.0V at 5000 RPM.

Maximum current output check.

- - Turn off the engine, « ON» the panel, turn on the light and allow the battery voltage to stop at 12V.

- - Connect the ammeter pliers to the two charging positive poles output by the regulator.

- - Sart the engine to achieve a higher engine speed and read the value on the clamp. For efficient batteries, a value must be detected :> 20A

VOLTAGE REGULATOR/RECTIFIER

Specification	Desc./Quantity
Type	Non-adjustable three-phase transistor
Voltage	14 to 15V at 5000 rpm with lights off

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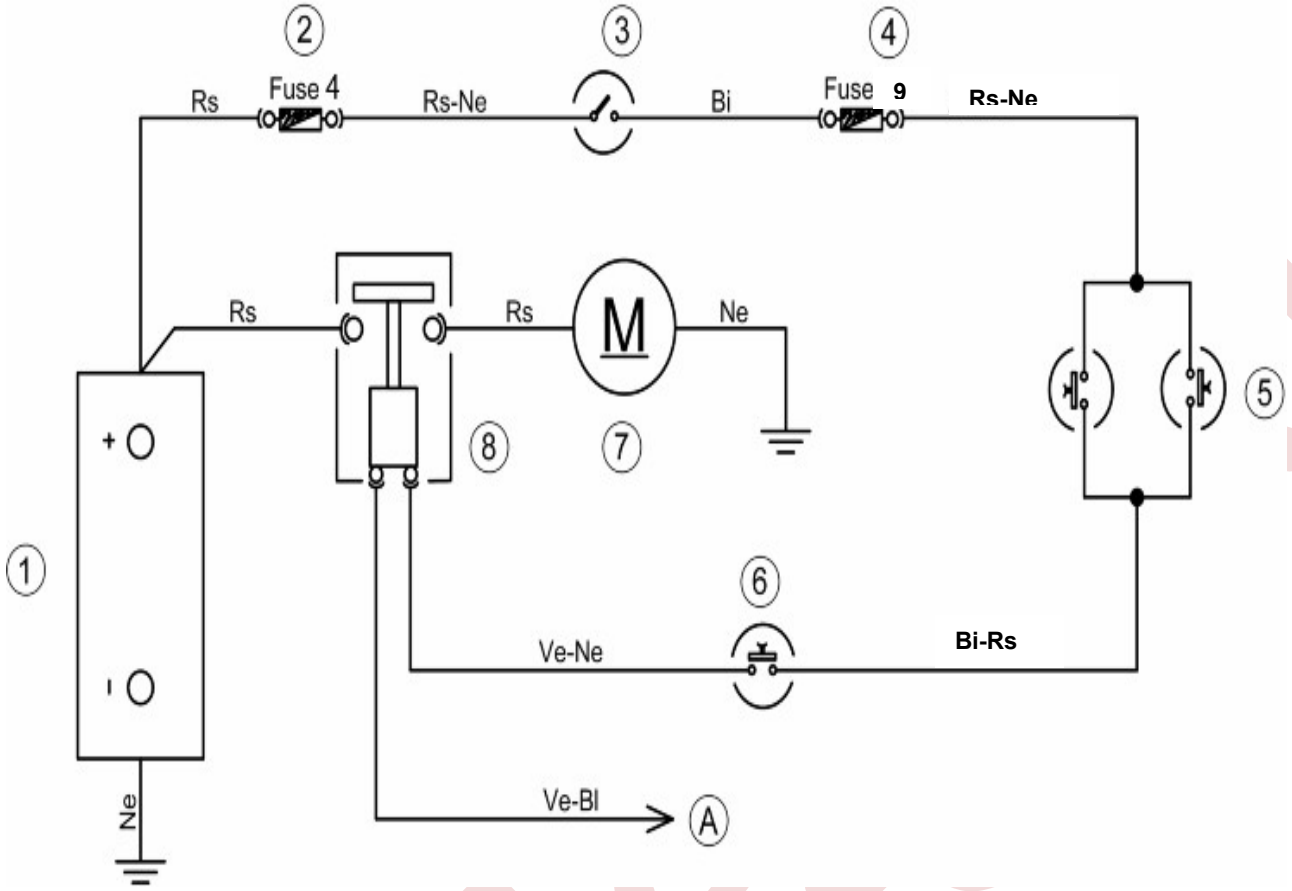
Start up system check



KEY

1. Battery

2. Fuse No. 4

3. ignition key contacts

4. Fuse No. 8

5. Stop buttons

6. Starter button

7. Starter motor

8. Starter solenoid

A. To the Injection ECU

WARNING

ALL CONTINUITY TESTS MUST BE PERFORMED WHEN THE QAPPROPRIATE CONNECTORS IS DISCONNECTED.

Check fuses No. 4 and 9, and the key switch contacts.

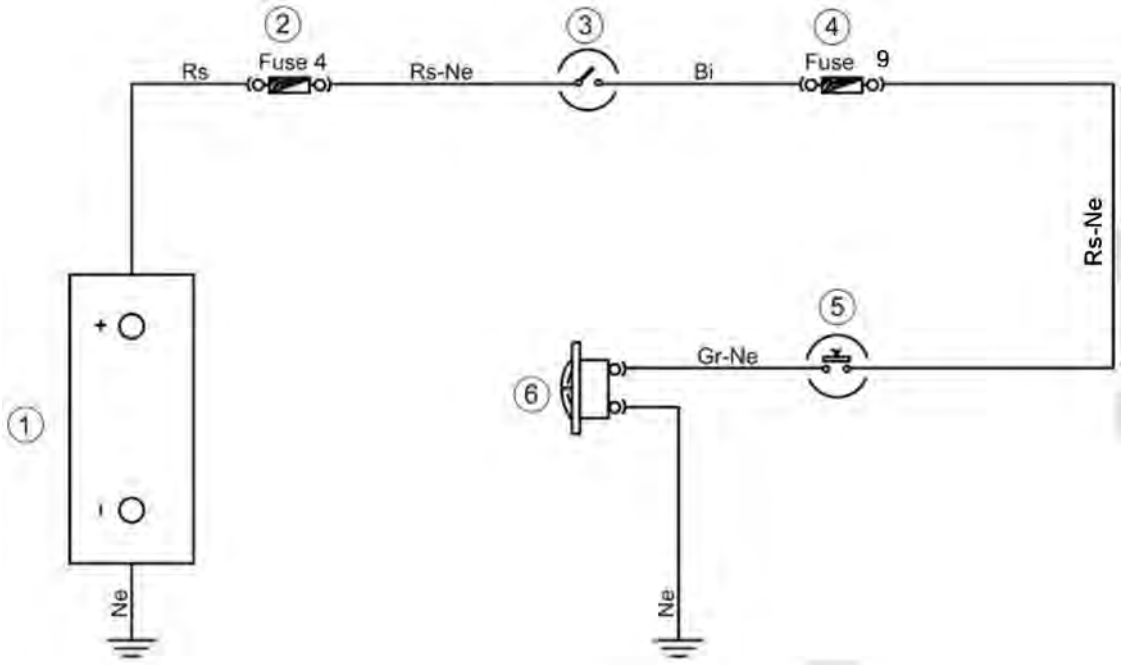
1) Check the contact points of stop button and start button.

2) Check and start the remote control switch.

3) Check the connection continuity between the remote control of starter and the blue-green cable of the injection electronic control unit (pin 10).

4) Check the grounding connection of the starting motor.

Horn control



KEY

1. Battery

2. Fuse No. 4

3. ignition key contacts

4. Fuse No. 9

5. Horn button

6. Horn

WARNING

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

1) Check fuses No.4 and No.9, and check key switch contacts.

2) Check the contact point of horn button.

3) Check wiring continuity.

4) Check the grounding of the horn.

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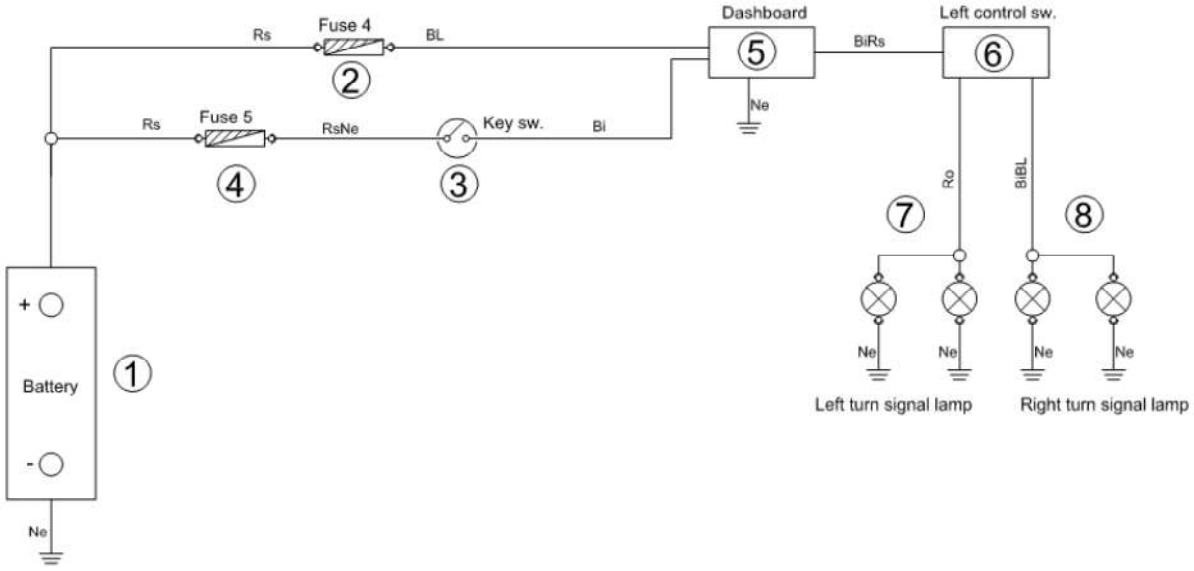
Turn signals system check



KEY
1.Battery
2.Fuse 4(15A)
3.Ignition key contacts
4.Fuse 5(15A)
5.Dashboard
6.Left control sw.
7.Left turn signal lamp
8.Right turn signal lamp

WARNING

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

1) Check that the bulb is working properly.

2) Check fuse no. 4, fuse no. 5 and key switch contacts.

3) Check whether there is voltage or continuity of wiring between red and black cables in the control device of rotating indicator light and black cables.

3) When the key switch is set to «ON», check again between the black and white line and the black line.

4) Check the switch contact of the rotary indicator light.

5) Check the continuity between the red black cable (pin 3) and the white blue cable (pin 2) of the electronic control device.

6) Check Blue cable (pin 5) and Pink cable (pin 4) repeatedly.

7) Use the turn indicator light control device to check the continuity of bulb wiring.

Level indicators

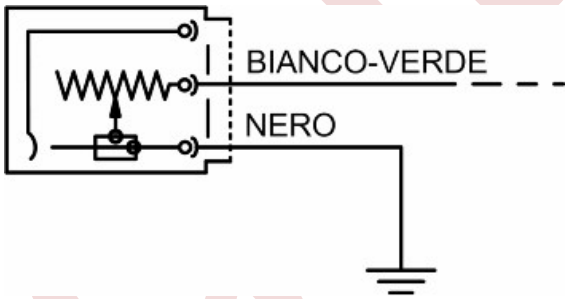
WARNING

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

If faults are detected:

1) With a multimeter, check the resistance between the white and green cables and the black cables of the oil level transmitter under different conditions.

2) If the transmitter works normally, but the instructions on the dashboard are not accurate, check whether the wiring harness between them is interrupted.



Electric characteristic

Resistance value when the tank is full

<18 Ω

Resistance value when the tank is empty

=92.4 Ω

Lights list

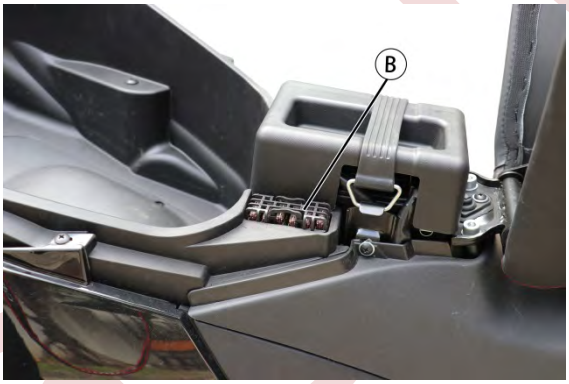
BULBS

	Specification	Desc./Quantity
1	High/low beam light bulb	**Type**: LED **Power**: 12V – 15/7W **Quantity**: 2
2	Front headlights bulb	**Type:** LED **Power:** 12V – 1.2W **Quantity:** 2
3	Rear turn indicator bulbs	**Type:** LED **Power:** 12V-3.4W **Quantity:** 2
4	Front turn indicator bulbs	**Type:** LED **Power:** 12V-3.3W **Quantity:** 2
5	Tail light and stop light bulb	**Type**: LED **Power**: 12V – 1/6W **Quantity**: 1
6	License plate light bulb	**Type**: Incandescent (W2.1 x 9.5 D) **Power**: 12V - 5W **Quantity**: 1
7	Helmet compartment light bulb	**Type**: LED **Power**: 12V – 0.48W **Quantity**: 1

Fuses

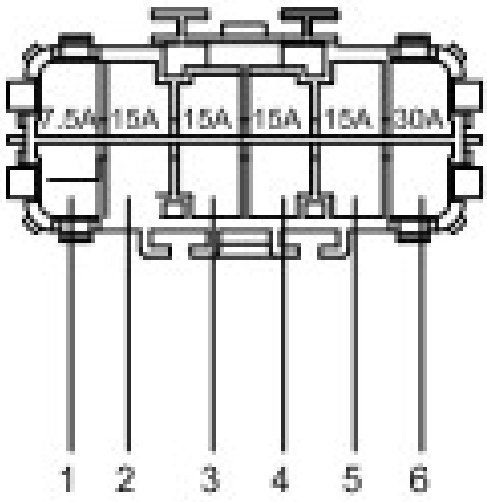
The electrical system is equipped with 2 fuse boxes:

1. The fuse box «A» in the helmet near the battery. Left side main fuse box
2. Fuse box «B» in the helmet near the battery. Right side deputy fuse box.

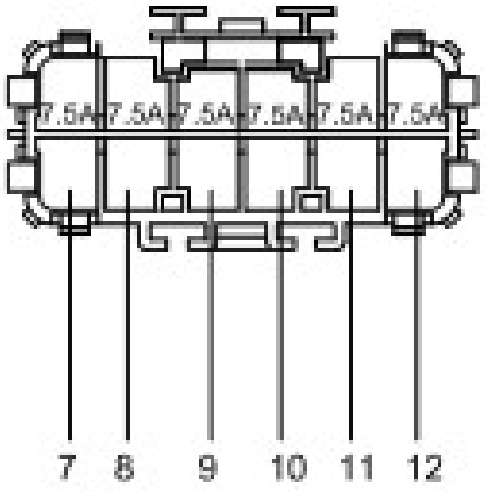


CAUTION

BEFORE REPLACING A BLOWN FUSE, FIND AND SOLVE THE FAILURE THAT CAUSED IT TO BLOW. NEVER TRY TO REPLACE THE FUSE WITH ANY OTHER MATERIAL (E.G., A PIECE OF ELECTRIC WIRE).



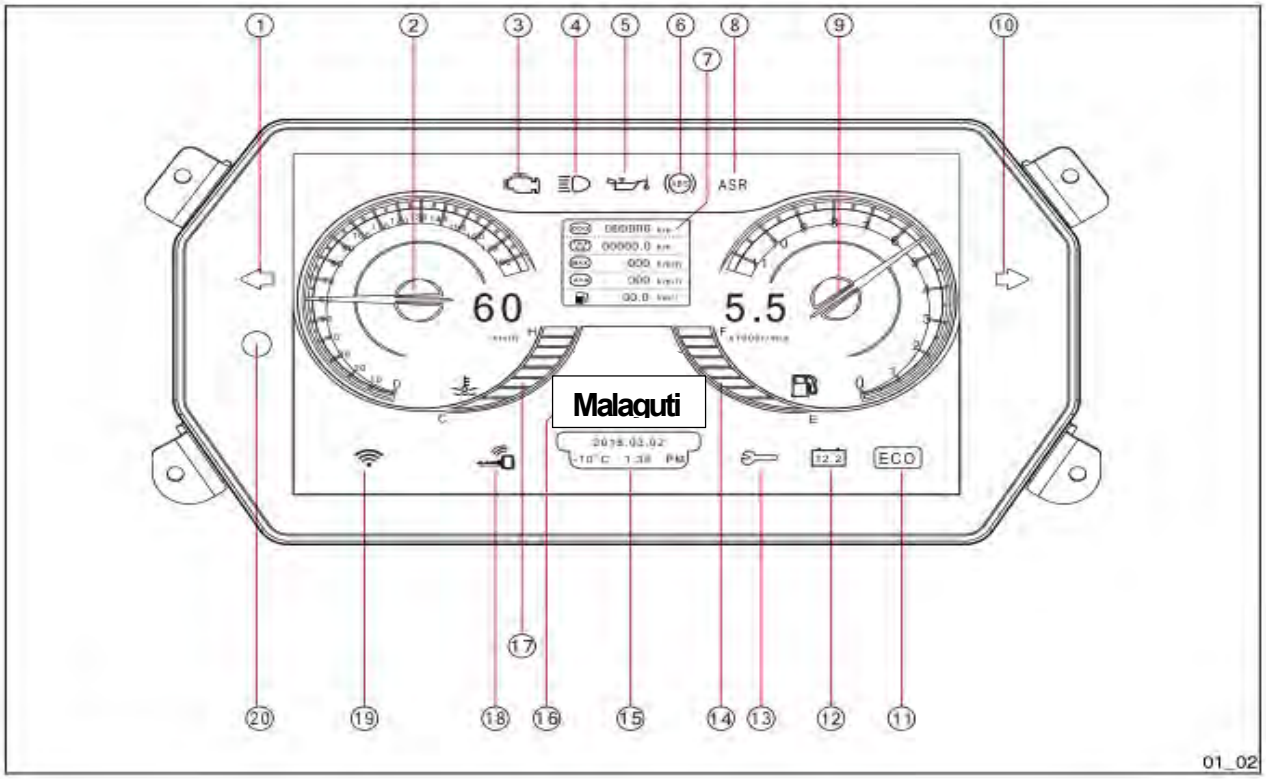
Fuse no. 1	**Capacity:** 7.5 A **Protected circuits:** ABS
Fuse no. 2	**Capacity:** 15 A **Protected circuits:** ECU relay /ECU
Fuse no. 3	**Capacity:** 15 A **Protected circuits:** Fan r-elay
Fuse no. 4	**Capacity:** 15 A **Protected circuits:** USB, Sub insurance，Main ins-urance，Tire pressure se-nsor，GPS，Electric door lock，Meter，Helmet mo-unted lamp switch
Fuse no. 5	**Capacity:** 15 A **Protected circuits:** Elect-ric door lock
Fuse no. 6	**Capacity:** 30 A **Protected circuits:** Recti-fier



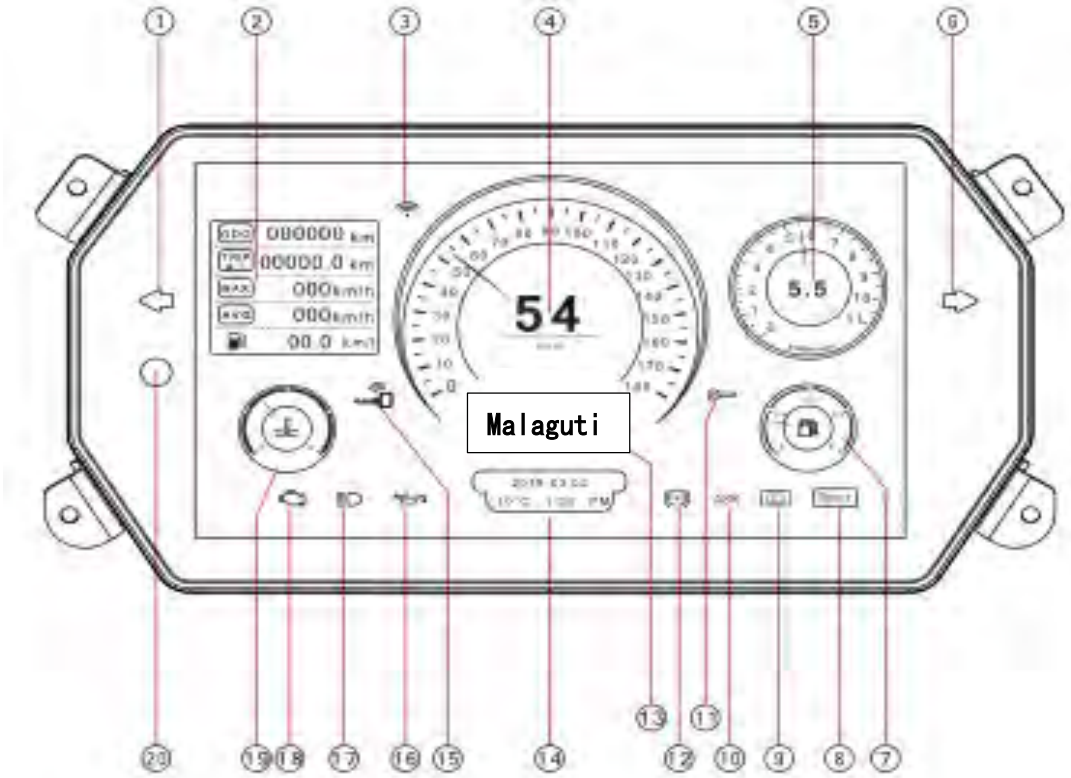
Fuse no. 7	**Capacity:** 7.5 A **Protected circuits:** Burgl-ar alarm
Fuse no. 8	**Capacity:** 7.5 A **Protected circuits:** Induc-tion coil, Burglar alarm, El-ectrical equipment switch, Fan relay, EFI system rela-y
Fuse no. 9	**Capacity:** 7.5 A **Protected circuits:** Left a-nd right handheld switch
Fuse no. 10	**Capacity:** 7.5 A **Protected circuits:** ABS
Fuse no. 11	**Capacity:** 7.5 A **Protected circuits:** Light-ing relay mode，Switch, ASR switch
Fuse no. 12	**Capacity:** 7.5 A **Protected circuits:** Flash lamp,Traffic recorder,Tire pressure sensor,License plate lamp.Taillight, Rear box light (standby).Left fr-ont headlight, Right front headlight.

Dashboard

Scooter dashboard is divided into three parts: digital instrument with LCD and analog speedometer, analog speed counter and warning light set.



1 = Left turn lamp
2 = Speed meter display (0-180Km/h)
3 = System fault warning light
4 = High beam indicator
5 = Oil pressure
6 = ABS alarm lamp
7 = The multi-function display area (when the fault appears, the MODE key of the right switch can temporarily shut down the display mode, for example, the failure will reappear when the next opening is not resolved).
8 = ASR lamp
9 = Tachometer display (0-11 × 1000r/min)
10 = Right turn lamp
11 = Economic model
12 = Battery voltage
13 = Maintenance Tips (Elimination: Turn off the door lock, press the MODE key on the right switch, then open the door lock until the maintenance symbol disappears, and then release the MODE key)
14 = Fuel (please close the door lock when refueling and putting oil)
15 = Date, outside temperature, time display
16 = Brand
17 = Eater temperature
18 = Key hints
19 = WIFI signal display
20 = Burglar lamp



1 = Left turn lamp

2 = The multi-function display area (when the fault appears, the MODE key of the right switch can temporarily shut down the display mode, for example, the failure will reappear when the next opening is not resolved).

3 = WiFi signal display

4 = Speed meter display (0-180Km/h)

5 = Tachometer display (0-11 × 1000r/min)

6 = Right turn lamp

7 = Oil (please close the door lock when refueling and putting oil)

8 = Motion pattern

9 = Battery voltage

10 = ASR lamp

11 = Maintenance Tips (Elimination: Turn off the door lock, press the MODE key on the right switch, then open the door lock until the maintenance symbol disappears, and then release the MODE key)

12 = ABS alarm lamp

13 = Brand

14 = Date, outside temperature, time display

15 = Key hints

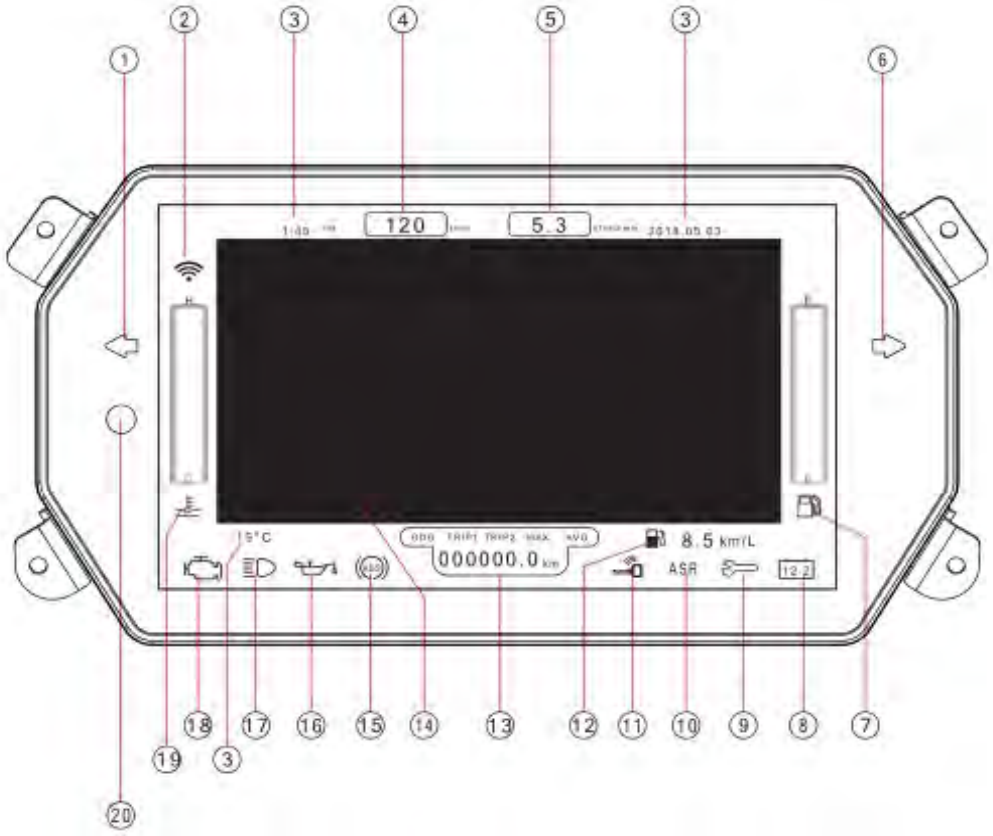
16 = Oil pressure

17 = High beam indicator

18 = System fault warning light

19 = Water temperature

20 = Burglar lamp



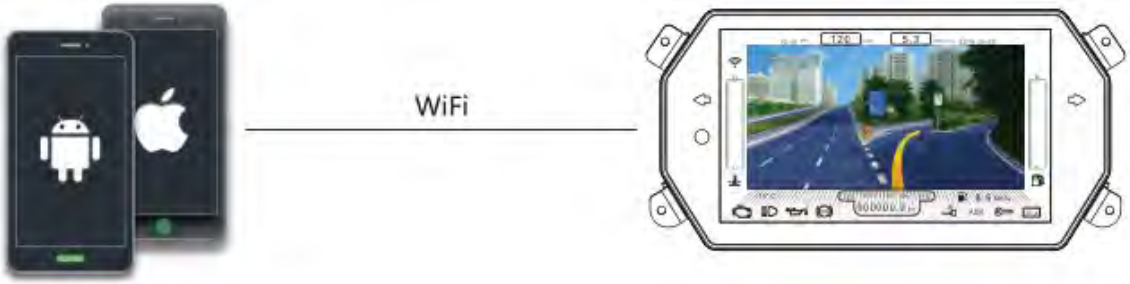
1 = Left turn lamp
2 = WiFi signal display
3 = Date, outside temperature, time display
4 = Speed character display (0~180km/h)
5 = Speed character display (0~11x1000r/min)
6 = Right turn lamp
7 = Oil (please close the door lock when refueling and putting oil)
8 = Battery voltage
9 = Maintenance hint
10 = ASR lamp
11 = Key hints
12 = Instantaneous oil consumption display
13 = Multifunction display area
14 = Mapped display area
15 = ABS alarm lamp
16 = Oil pressure
17 = High beam indicator
18 = System fault warning light
19 = Water temperature
20 = Burglar lamp

Please choose connection mode

In the first mirror connection, WIFI will automatically generate the WIFI name. The red label part "87495" is generated randomly. Android mobile will change the hot name to the automatically generated name. The password will be changed to"88888888". The mobile phone will automatically connect, and automatically complete the mirror after the connection is completed. Remarks: after turning off the machine, it will automatically connect without changing the mobile phone state, without entering the hot name and password again. (Change the cell phone to the end of the process Modification)

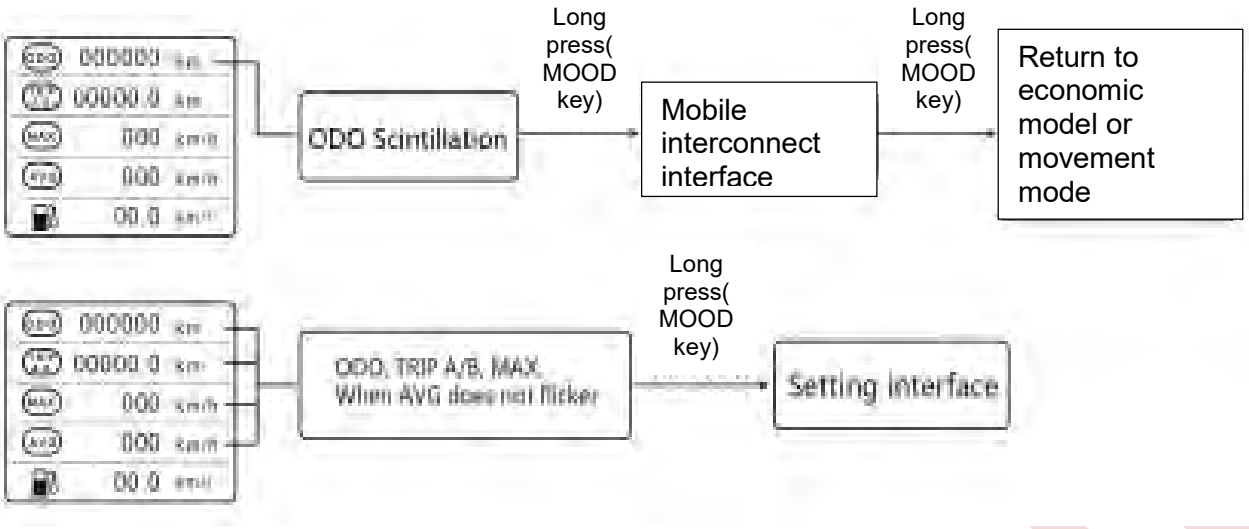
Connection mode

Reliable Wi-Fi connection, which allows users to experience driving pleasure easily and quickly, and make driving safer.



Android system interconnection operation description

The MODE button is pressed on the right handle, and the switch mode shows that the switching sequence is as follows: less than 3 seconds for the "short press" function, more than 3 seconds for the "long press" function.



Android mobile phone download and install APP mobile phone interconnected APP. Download the Internet APP by scanning the current two-dimensional code.

Before completing the above functions, please enter the setup interface first and set it to Android system.

As shown in figure 07_07, open the "mobile network share" will "Username: BYQXXXXX. Connection password: 88888888.

Open the mobile terminal APP and keep the APP at the front end of the phone. The mobile phone that has not been connected is the first time to open the "driving companion" on the cell phone. The host prompt is "getting permission with the mobile phone communication", and the mobile phone pops up on it. "The discovery of interconnected navigator EC-MIR-ROR-X, whether to enter the matching connection selection" is "successful after the connection."

NOTE

1. After connecting successfully, if you listen to music or navigation, please connect your mobile phone to the external Bluetooth source device.

2. Mirror connection, please keep the mobile network "mobile data" open and maintain network status

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IOS system interconnection operation description

Apple system mobile scan code download and install APP mobile Internet APP. Download the Internet APP by scanning the current two-dimensional code. Before completing the above functions, please set the interface first and set it to Apple system.

NOTE

Refer to the above Android operation process.

Please choose connection mode

In the first mirror connection, WIFI will automatically generate the WIFI name. The red label part "87495" is generated randomly. Apple Mobile will change the hot name to the automatically generated name. The password will be changed to "88888888". The mobile phone will

automatically connect, and automatically complete the mirror after the connection is completed. Remarks: after turning off the machine, it will automatically connect without changing the mobile phone state, without entering the hot name and password again. (Change the cell phone to the end of the process Modification).

Open the "set" function of the mobile phone

Remarks:

1. When the mirror connection is, please keep the mobile phone out of the net nest bee data open and maintain network status.
2. Introducing mobile phone interconnection in IOS system: you must enter the "personal hotspot" interface every time, keep it open.

In addition, if you are unable to access the Internet in APP after the mirror, please refer to the following operation to improve it.

When prompted to connect to a device above the mobile phone screen, click the APP on your cell phone and keep the APP at the front end of the phone. Instrument will automatically connect with the mobile phone to complete the image.

NOTE

1. After connecting successfully, if you listen to music or navigation, please connect your mobile phone to the external Bluetooth source device.

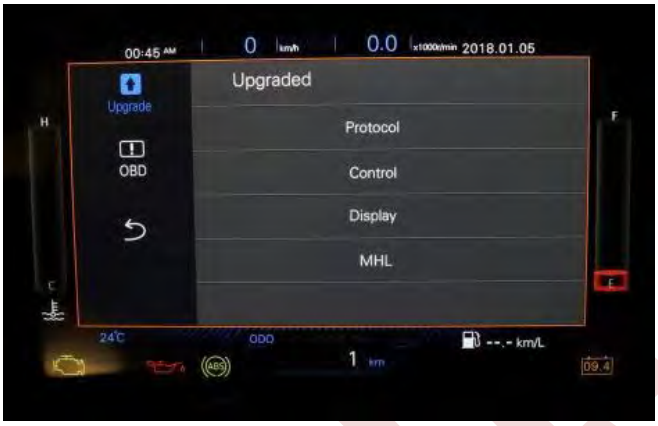
2. Mirror connection, please keep the mobile network "mobile data" open and maintain network status.

Setting up a menu

Long press MODE key more than 3S above into

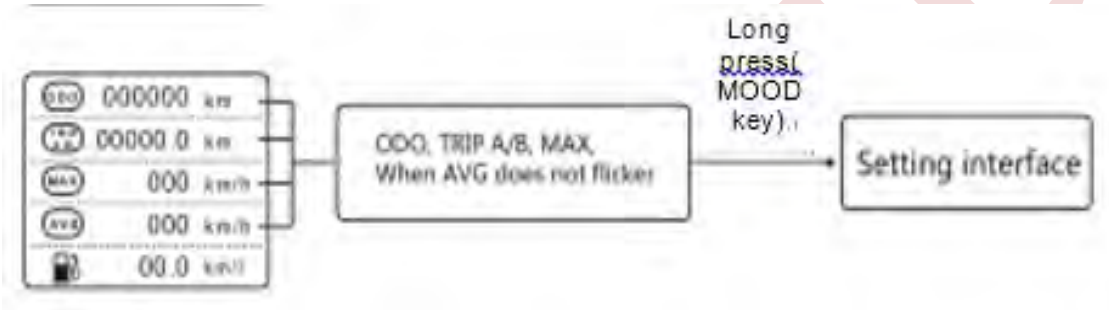
the interface, short press [MODE key] cycle switch selection version display, display, date / time, mobile phone. Interconnect, upgrade, OBD fault display, and highlight, press MODE

key to execute the current selection function. The following logic flow chart can be referred to: less than 3 seconds for the "short press" function, more than 3 seconds for the "long press" function".



NOTE
You can't enter the setup menu at the speed of the car.

NOTE
In the setup interface, press ECO/SPORT key to save and exit at any time.



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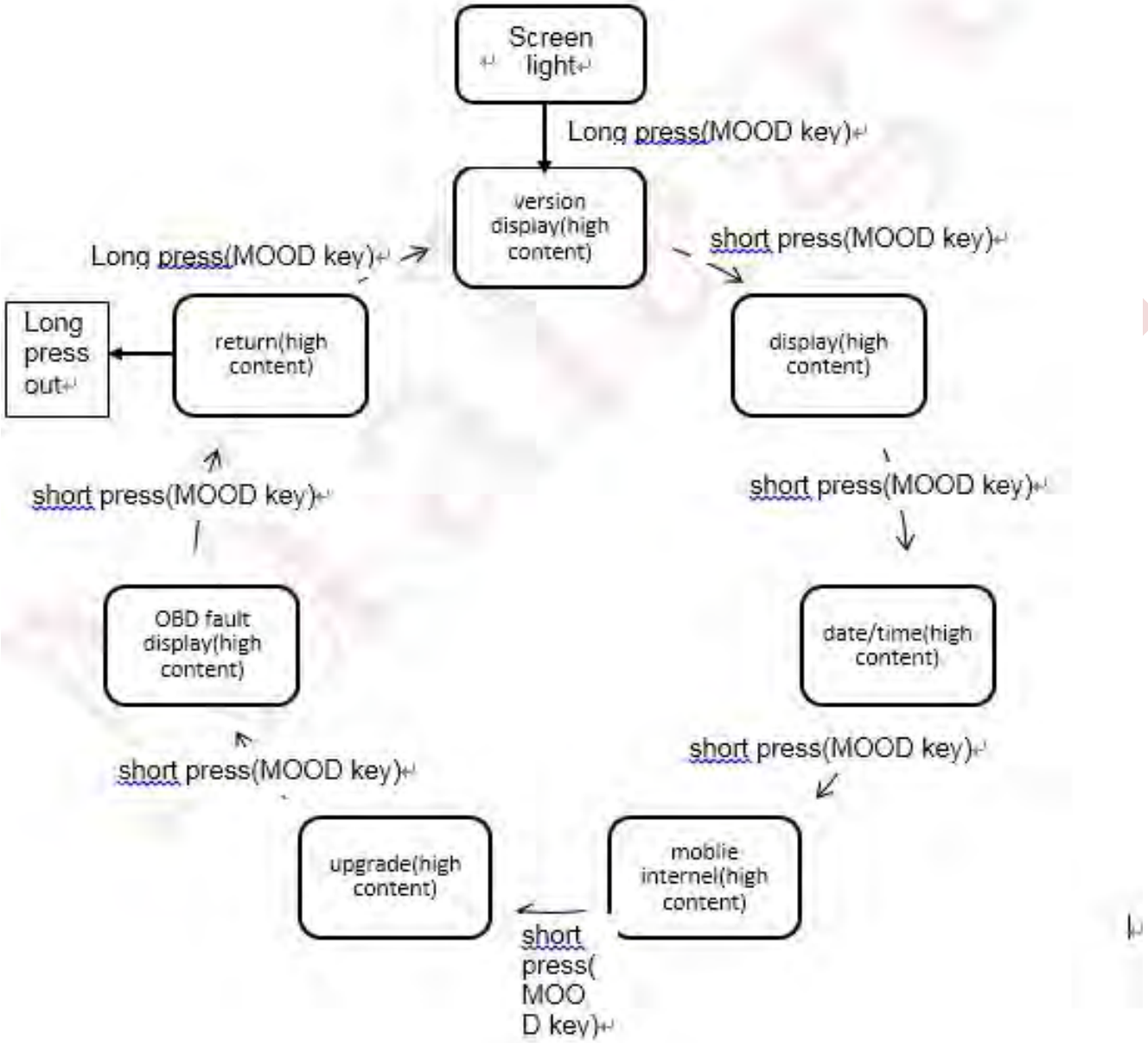
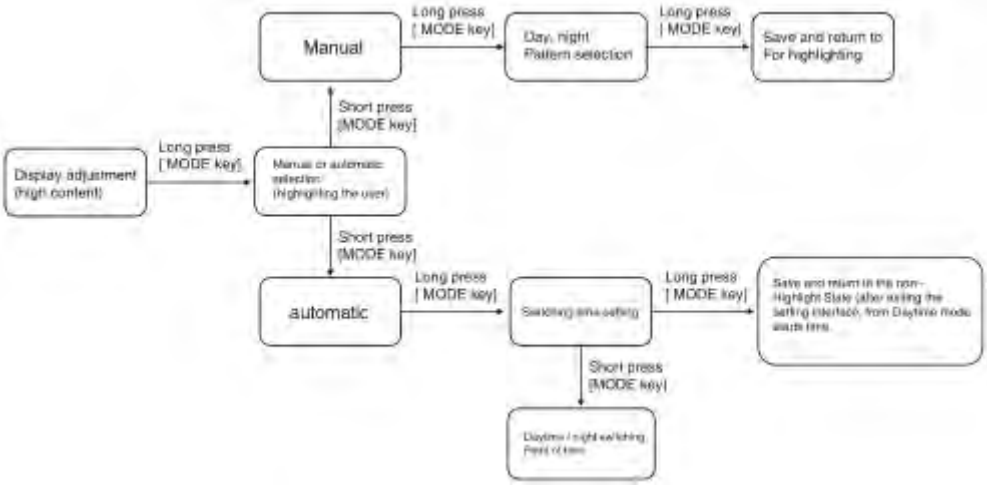


Version display

Short press [MODE key] choose settings menu [version display], protocol version number, control panel version number, display panel version number, and mobile Internet version number.

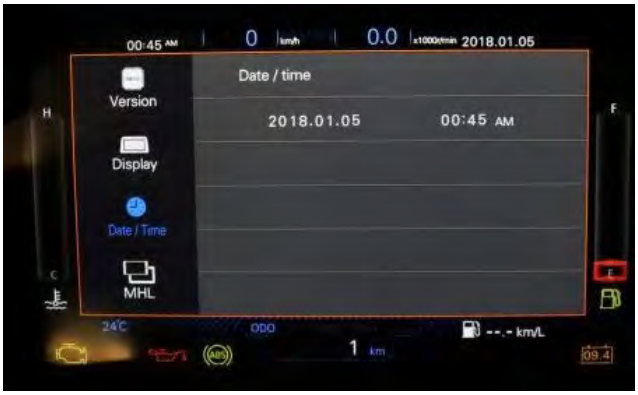
Display (daytime / night mode)

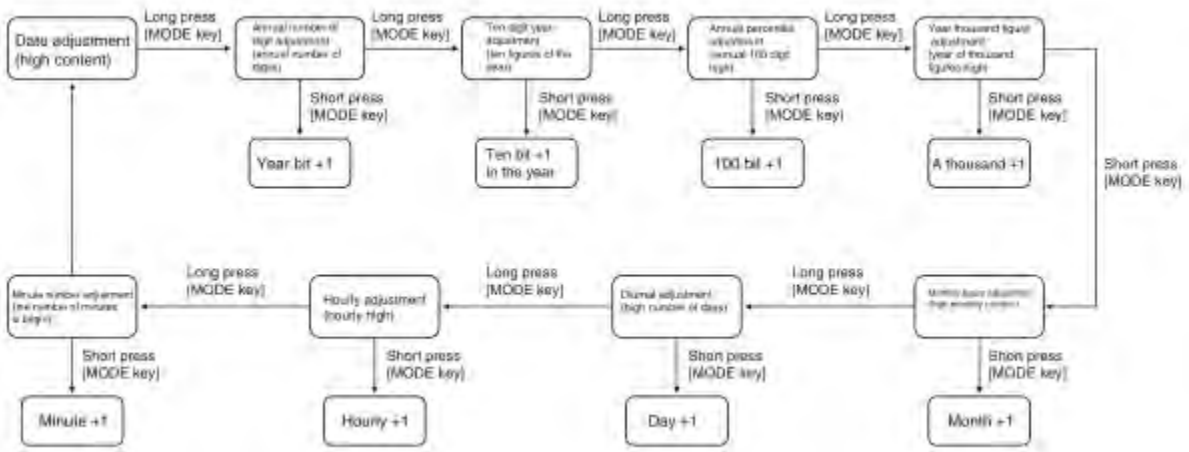
The day / night mode can be referenced by the following logic block diagram: [less than 3 seconds for the "short press" function, more than 3 seconds for the "long press" function).



Date / time adjustment

The time setting can be referred to the following logic flow chart flow: [less than 3 seconds for the
"short press" function, more than 3 seconds for the "long press" function).





Mobile Internet

The mobile phone system can be set up according to the flow chart of the following logic block diagram: [less than 3 seconds for the "short press" function, more than 3 seconds for the "long press" function).

Upgrade

Individuals are not allowed to upgrade to avoid instrument damage if there is a new version of the update, please look for after-sales service.

OBD fault display

OBD display switch can refer to the following logic block diagram flow:

[less than 3 seconds

for the "short press" function, more than 3 seconds for the "long press" function).

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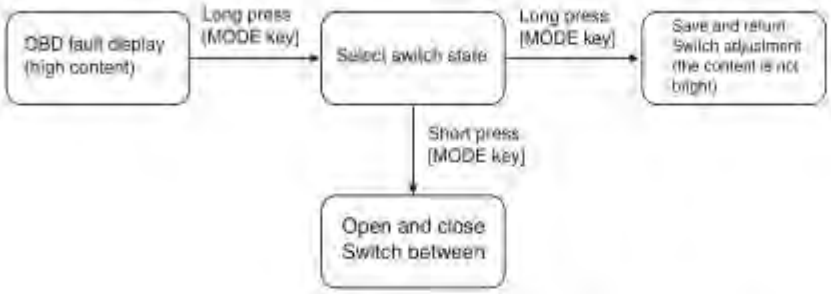

Note: If the instrument does not need to display OBD failure, the display can be turned off.Please close the display when using the OBD diagnostic instrument to diagnose the whole vehicle.

Exit setting

Short press [MODE key] choose settings menu [long press [MODE key] quit mobile Internet settings.

Sealed battery

Commissioning sealed batteries

If the vehicle is equipped with a sealed battery, the only maintenance required is to check its charging condition and charge it if necessary.

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These operations should be performed prior to delivery of the vehicle and every six months when the vehicle is in an open road state.

In addition, it is necessary to check the charging condition of the battery before delivery, and charge the vehicle every six months before and after storage, if necessary.

INSTRUCTIONS FOR BATTERY CHARING AFTER OPEN CIRCUIT STORAGE.

Voltage check

Check the open circuit voltage with a conventional tester before installing the battery on the vehicle.

- If the voltage exceeds 12.60v, the battery may not be recharged and installed.
- If the voltage is lower than 12.60v, it needs to be recharged, as shown in 2).

1) Constant voltage battery charge mode

- Constant voltage charging is equal to 14.40 divided by 14.70 v

The initial charging voltage for the rated capacity is equal to 0.3 divided by 0.5

Charging time:

Suggest 10 to 12 hours

Minimum 6 hours

Maximum 24 hours

2) Constant current battery charge mode

-Charge current equal to 1/10 of the nominal capacity of the battery

- Charge time: 5 h

Specific tooling

020333Y Single battery charger

020334Y Multiple battery charger

Cleaning the battery

Batteries should always be kept clean, especially at the top, and terminals should be coated with Vaseline.

CAUTION

DO NOT USE FUSES WITH A CAPACITY HIGHER THAN THE RECOMMENDED VALUE. THE FUSE WITH IMPROPER MAY CAUSE SERIOUS DAMAGE TO THE WHOLE FUSE AND EVEN CAUSE FIRE.

CAUTION

CHARGE THE BATTERY BEFORE USE TO ENSURE OPTIMUM PERFORMANCE. FAILURE TO CHARGE THE BATTERY ADEQUATELY BEFORE BEING PUT INTO OPERATION WILL LEAD TO A PREMATURE FAILURE OF THE BATTERY.

If the motorcycle is not used for a given period of time (one month or more), the battery needs to be charged regularly.

The battery completely ran out in three months.

If it is necessary to modify the battery of the vehicle, be careful not to connect it in reverse.

Remember that the ground line (black) mark (-) must be connected to the negative clamp and the other two red line marks (+) must be connected to the clamp mark + positive signs.

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Dry-charge battery

COMMISSIONING A NEW DRY-CHARGED BATTERY

- Remove the battery air pipe stop cap and each battery cap.
- Fill the battery electrolyte was 1.270 + / - 0.01 kg/l density (corresponding to the 31 + / - 1 Bé) and a ambient temperature not less than 15 ° C, until it reaches the executive said.
- Tilt the battery slightly to remove bubbles formed during filling.
- Put the bottle cap on the filling hole of each battery, do not screw the bottle cap, and let the battery rest.

At this stage, the battery will appear gasification phenomenon, temperature rise.

- Set to ambient temperature (this stage takes 60 minutes).
- Gently tilt the battery to remove bubbles; Use the same filled electrolyte to restore the liquid level

Note: this is the last time to add electrolytes. After recharging only distilled water;

- 24 hours ago, charge the battery according to the following steps:
- Connect the battery charger terminal and observe the correct polarity;
- With the battery charger DRW.020333 y and/or DRW.020334Y operates the battery charger control by selecting a position corresponding to the capacity;
- Otherwise, charge the battery for about 4-6 hours with A direct current equal to 1/10 of the rated capacity (for example, 9Ah rated capacity battery, charging current should be 0.9-1.0a).

  Note: long battery storage time, long charging time. Battery charger DRW.020333 y and DRW.020334Y has automatic protection, and automatically stops charging after 12 hours to avoid harmful heating of the battery. In this case, a green LED will light up, indicating that the safety system has started, rather than that the charging has finished.
- Let the open circuit battery rest for about 4-6 hours; Then use a standard tester to check the unloading voltage.
- If the open circuit voltage is higher than or equal to 12.6v, the battery is fully charged. Gently shake or tilt the battery to remove bubbles formed during charging.
- Check the electrolyte level again, fill the upper water level with distilled water if necessary, clean the battery correctly, fasten each battery cover and install it on the vehicle.
- If the indicating voltage is low, charge the battery for 4-6 hours according to the above method.
- **Note**: DRW with battery charger.020334Y, you can **check** the battery power with the check function. The value displayed on the display must be higher than the value displayed on the chart; Otherwise, charge the battery again as described above.

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Battery installation

To access the battery, follow these steps:
1. Place the scooter on the middle bracket;
2. Open the saddle according to the above instructions and see the "saddle" section;
3. Remove the piston ring «A» and remove the battery cover.

Batteries are electrical equipment that requires the most frequent inspection and the most diligent maintenance.

The most relevant maintenance rules are as follows:

Electric characteristic

Battery

12V-10Ah

- As shown in the figure, insert the battery by connecting the battery breathing tube.

NOTE

TO PROPERLY INSTALL THE CABLE ON THE BATTERY TERMINAL, PLACE THE LOWER END OF THE BATTERY TERMINAL SIDE ON THE BATTERY EDGE..

- Using a screwdriver, tighten the battery terminals as tightly as possible and place the special grid washer between the screw head and the cable terminals.

NOTE

DO NOT TIGHTEN THE SCREWS THAT HOLD THE BATTERY TERMINALS TOGETHER WITH A WRENCH .

- Reinstall the battery cover

Make sure the terminal connection is correct. When installing a new battery, you must reset the correct time and date on the digital dashboard (" clock "and" mode button "sections).

CAUTION

DO NOT REVERSE THE POLARITY: THERE IS A RISK OF SHORT CIRCUIT AND DAMAGE TO THE POWER SYSTEM.

The electrolyte level that should be checked periodically must always be at the maximum level.

To reach this height, only distilled water is used. Whether it is necessary to refill the battery with water frequently, check the power system of the scooter, because the battery is overloaded, resulting in a quick power failure of the battery. Too frequently, check the scooter's electrical system because the battery is being overloaded, causing it to lose power quickly.

NEVER DISCONNECT THE BATTERY CABLES WHILE THE ENGINE IS RUNNING; THIS CAN CAUSE PERMANENT DAMAGE TO THE VEHICLE ELECTRONIC CONTROL UNIT.

CAUTION

ELECTROLYTE CONTAINS SULPHURIC ACID: AVOID CONTACT WITH EYES, SKIN AND CLOTHES. IN CASE OF ACCIDENTAL CONTACT, RINSE WITH ABUNDANT WATER AND CONSULT A DOCTOR.

WARNING

WASTE BATTERIES ARE HARMFUL TO THE ENVIRONMENT. COLLECTION AND DISPOSAL SHALL BE CONDUCTED IN ACCORDANCE WITH EXISTING REGULATIONS.

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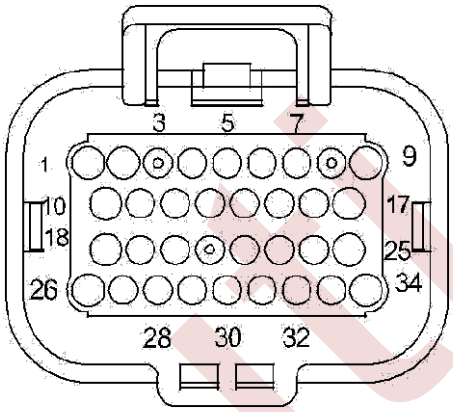
Connectors

INJECTION ELECTRONIC CONTROL UNIT



1.A.T.COIL negative terminal(Green)
2.Vehicle Speed (Green-Yellow)
3.Not connected
4.Run-stop switch(Orange)
5.Sport/Eco switch(Light Green-Red)
6.Key supply(White-Black)
7.Ground(Black)
8.Not connected
9.Battery Supply(Red)
10.Starter relay control(Green-Blue)
11.Positive input for lambda sensor(Blue-Yellow)
12.Negative input for lambda sensor(Light Blue-Black)
13.Input for engine temperature sensor(Yellow-pink)
14.Immobilizer communication(Orange-White)
15.Ground for external sensor(Grey-Green)
16.K-line(Light Green)
17.Output for immobilizer led(Blue-White)
18.ASR Switch button(Blue-Black)
19.Positive for side stand switch(Red-Black)
20.Negative input for engine speed sensor(White)
21.Not connected
22.Output for engine loads(Black-Viloet)
23.Ground(Black)
24.Output for fan relay(Green-White)
25.Output for warning lamp(Blown-White)
26.CANH(Grey-Red)
27.CANL(Red-Black)
28.Input for vehicle speed(Red-Yellow)
29.Positive input for engine speed sensor(Red)
30.Output for engine speed repetition and fuel consumi
31.Output for lambda sensor heater(Blue-Red)
32.ASR lamp output（Light Blue-Red)
33.Light relay output(Blue-Green)
34.Output for injector(Yellow)

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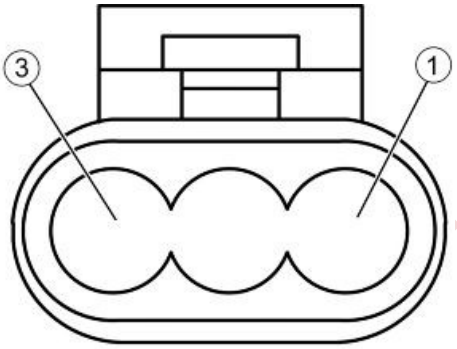
IMMOBILIZER AERIAL CONNECTOR

1. Injection ECU (Orange-White)

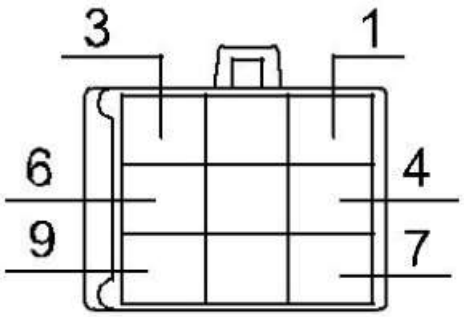
2. Ground (Black)

3. Live supply (White-Black)



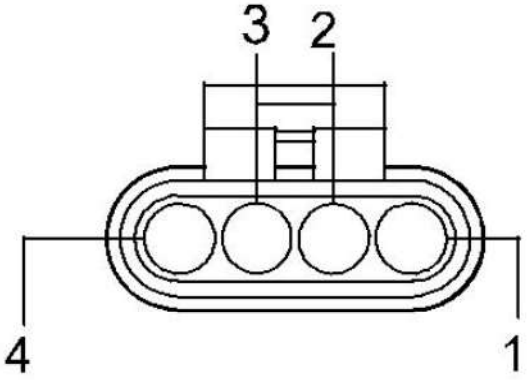
ANTITHEFT DEVICE PRE-INSTALLATION CONNECTOR

1.Key supply(White-Black)
2.Not connected
3.Key supply(White-Black)
4.Left turn signal lamp(Pink)
5.Not connected
6.Right turn signal lamp(White-Blue)
7.Battery supply(Red-White)
8.Ground(Black)
9.Key supply for ECU(White-Black)



LAMBDA PROBE CONNECTOR

1.Positive input for lambda sensor(Blue-Yellow)
2.Negative input for lambda sensor(Light Blue-Black)
3.Output for lambda sensor heater(Blue-Red)
4.Live supply(Green-Black)

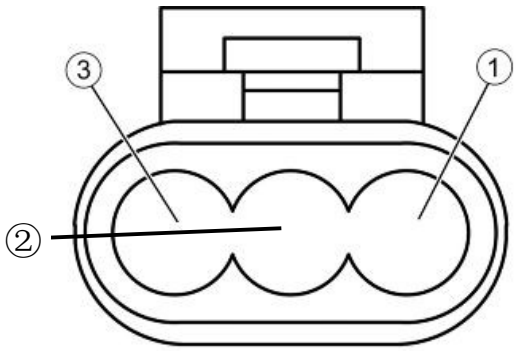


PICK-UP CONNECTOR

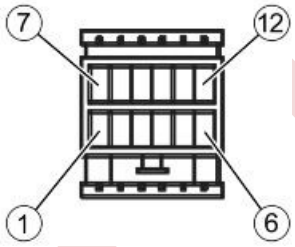
1. Positive from injection ECU (Red)

2. Negative from injection ECU (White)

3. Oil pressure sensor (Orange)



CONNECTOR FOR ELECTRICAL CONTROL MANAGEMENT DEVICE



1. Live supply (White-Black)

2. Not connected.

3. Not connected

4. Not connected

5. Not connected

6. Not connected

7. Not connected

8. Oil pressure sensor (Orange)

9. Oil pressure sensor signal (Grey-Violet)

10. Not connected

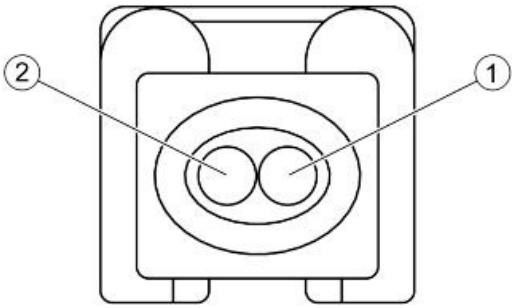
11. Not connected

12. Not connected

FUEL INJECTOR CONNECTOR

1. Positive from remote control (Black-Green)

2. Negative from injection ECU (Yellow)



Malaguti

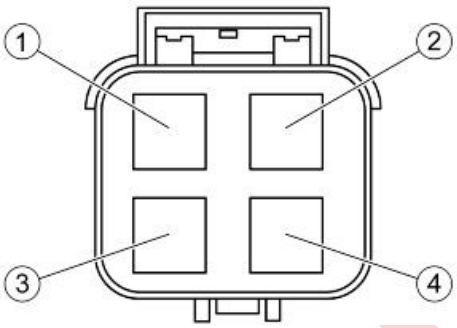
ENGINE TEMPERATURE SENSOR CONNECTOR

1. ECU temperature signal ground (Grey-Grean)

2. Indicator temperature on dashboard (Orange)

3. ECU temperature signal (Yellow-Pink)

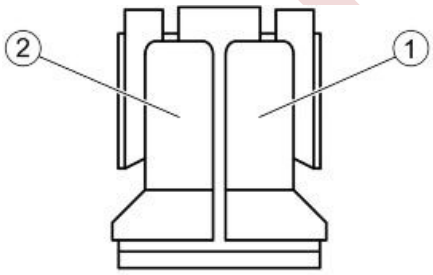
4. Ground (Black)



ELECTRIC FAN CONNECTOR

1. Ground (Black)

2. Positive from remote control (Red-Black)



STAND BUTTON CONNECTOR

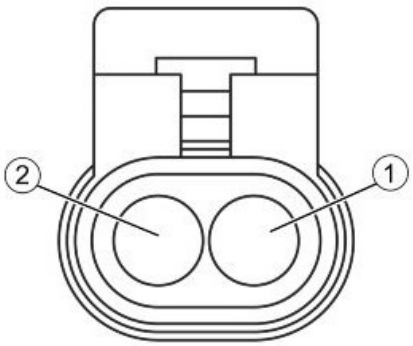
1. Ground (Grey-Green)

2. Injection ECU signal (Red-Black)

HV COIL CONNECTOR

1. Positive from remote control (Green-Black)

2. Negative from injection ECU (Green)



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FUEL PUMP CONNECTOR AND FUEL LEVEL TRANSMITTER

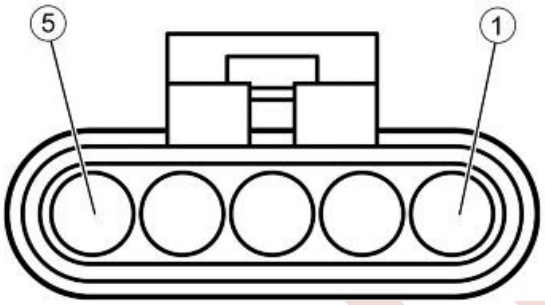
1. Not connected

2. Ground (Black)

3. Ground (Black)

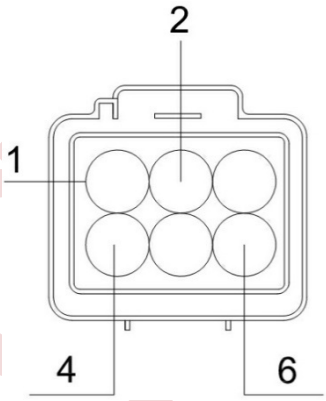
4. Fuel level indicator (White-Green)

5. Positive from remote control (Green-Black)



DIAGNOSIS CONNECTOR

1.Ground(Black)
2.Ground(Black)
3.Not connected
4.K-line(Light Green)
5.Not connected
6.Battery supply(Red)



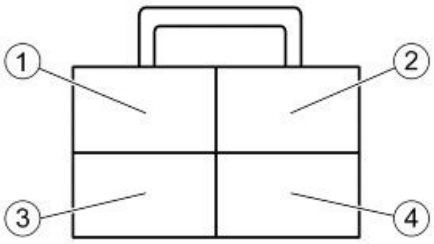
VOLTAGE REGULATOR CONNECTOR

1. Battery positive terminal (Red-White)

2. Ground lead (Black)

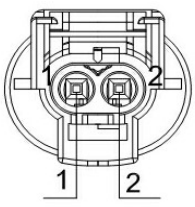
3. Battery positive terminal (Red-White)

4. Ground lead (Black)



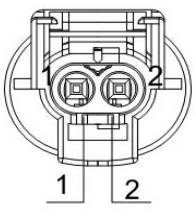
WHEEL TURNING SENSOR CONNECTOR

WHEEL SPEED (FRONT WHEEL)



1.Front wheel speed signal(Light Blue)
2.Front wheel supply(Red)

WHEEL SPEED(REAR WHEEL)

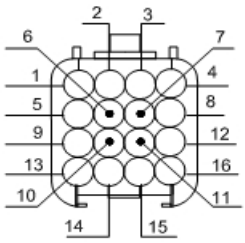


1.Rear wheel speed signal(Light Green-Red)
2.Rear wheel supply(Green-Red)

INSTRUMENT PANEL CONNECTOR

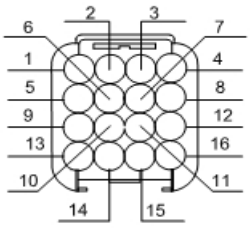
1.Battery supply(Blue)
2. ASR light(Light Blue-Red)
3.ABS light(Yellow-Green)
4.Warning lamp(Brown-White)
5.Ground(Black)
6.Immobilizer light(Violet Blown)
7.OBD(Light Green)
8.Engine oil pressure(Grey-Violet)
9.Key supply(White)
10.Speed(Green-Yellow)
11.Left turn tell light(Pink)
12.High beam tell light(Black-Yellow)
13.RPM/Fuel consumption(Green)
14.Fuel lever(White-Green)
15.Engine Temperature(Orange)
16.Right turn tell light(White Blue)

6A-DASHBOARD



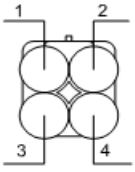
1.Front tyre pressure signal(Light Blue-Green)
2. Not connected
3.Not connected
4.Not connected
5.Rear tyre pressure signal(Brown-Black)
6.Not connected
7.Not connected
8.Not connected
9.Not connected
10.Flasher output（White-Red)
11.Sport/Eco setting(Light Green-Red)
12.GPS CANL Output(Red-Grey)
13.Not connected
14.Mode setting A(Black-Green)
15.Mode setting B(Black)
16.GPS CANH Output(Orange-Green)

6B-DASHBOARD



1.Data-(White-Black)
2.Supply(Red)
3.Data+(Green-Black)
4.Ground (Black)

6C-DASHBOARD



INDEX OF TOPICS

Malaguti

This section is devoted to the components of the braking system.

Rear brake caliper

Removal

- Remove rear wheel.

- Remove and fasten the two rear brake calipers to the bracket as shown.

NOTE

REPLACE OR REPAIR AS NECESSARY BRAKE CALLIPER, FIRST LOOSEN TUBING FITTING BEFORE REMOVING THE FITTING THAT HOLDS THE CALIPER TO THE SUPPORT BRACKET AND AFTER EMPTYING THE SYSTEM OF THE CIRCUIT BEING INSPECTED.

Overhaul

- Remove the brake calipers.
- Properly support the brake calipers in the vise
- Remove the two gasket mounting screws.
- Be careful to stop the spring when removing the gasket.

- Remove the retaining plate and loosen the screws shown in the picture.

- Blast with compressed air for a short time through the brake fluid tube, and remove the internal parts from the floating body to facilitate the removal of the pressure plate.

- Check:
  - • Plates and body intact;
  - • The caliper cylinder is floating

  No scratches or signs of corrosion on the valve body, otherwise replace the entire caliper:

  - • Fixed plate guide is not

  Scrape or corrode, otherwise reposition the entire board;

  - • Check the spring on the brake pad

CAUTION

ALL THE SEALS AND GASKETS MUST BE REPLACED EVERY TIME THE PUMP IS SERVICED.

Refitting

- Insert the O-ring and small piston into the float and lubricate all parts with brake fluid.

- Install retaining plate as shown, lubricate guide rail.

- install the pad to hold the spring
- install the gasket and tighten the corresponding clamping screw according to the specified torque

- Fix the gasket in the correct position and insert the calipers into the brake disc.
- Secure the support calipers to the specified torque with two screws
- Fix the pipe fitting on the caliper according to the specified torque.
- Exhaust air from the system.

Locking torques (N*m)

Rear brake caliper fixing screws 20 to 25 Engine- caliper support plate fixing screws 48 ÷ 52

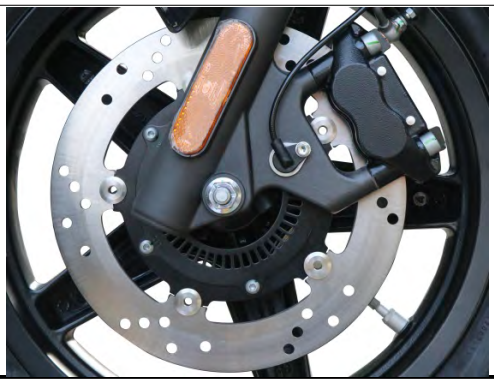
Front brake caliper

Removal

- Remove and fasten the two front brake calipers to the bracket as shown.

NOTE

WHEN A PROCEDURE IS PLANNED INCLUDING THE SERVICE OR REPLACEMENT OF THE CALLIPER, FIRST LOOSEN THE FITTING CONNECTING THE PIPE TO THE BRAKE CALLIPER



Overhaul

- Remove the brake calipers.
- Properly support the brake calipers in the vise
- Remove the two gasket mounting screws.
- Be careful to stop the spring when removing the gasket.

- Remove the retaining plate and loosen the screws shown in the picture.

- Blast with compressed air for a short time through the brake fluid tube, and remove the internal parts from the floating body to facilitate the removal of the pressure plate.

  - Check:
    - • Plates and body intact;
    - • The caliper cylinder is floating

      No scratches or signs of corrosion on the valve body, otherwise replace the entire caliper:
    - • Fixed plate guide is not

      Scrape or corrode, otherwise reposition the entire board;
    - • Check the spring on the brake pad correct

CAUTION

ALL THE SEALS AND GASKETS MUST BE REPLACED EV- ERY TIME THE PUMP IS SERVICED.

Refitting

- Insert the O-rings and small piston into the float and lubricate all parts with brake fluid.

- Install retaining plate as shown, lubricate guide rail.

- Mounting pad retaining spring
- Mounting gasket, and tighten the corresponding clamping screw according to the specified torque

- Fix the gasket in the correct position and insert the calipers into the brake disc.
- Secure the support calipers to the specified torque with two screws
- Fix the pipe fitting on the caliper according to the specified torque.
- Exhaust air from the system.

Locking torques (N*m)

Screw tightening caliper to support 24 to 27 Pad fastening pin 19.6 ÷ 24.5 Caliper support plate - fork fixing screws 41 ÷ 51

Rear brake disc

Removal

- Remove rear wheel.
- Remove the brake calipers.
- Remove disc from axle.

- Loosen five screws to remove disc from hub.

Refitting

For installation, use the embossed arrow on the disc as a reference to position the disc correctly.
- Tighten the screws according to the specified torque and use the recommended products

NOTE

THE ARROW STAMPED ON THE DISC INDICATING THE RUNNING DIRECTION MUST BE FITTED TOWARDS THE OUTSIDE OF THE VEHICLE.

Recommended products

Loctite 243 Medium strength threadlock

Medium Loctite 243 threadlock

Locking torques (N*m)

Brake disc screws 8 to 10

Disc Inspection

- Remove rear brake calipers.

- Check disc thickness with micrometer

Characteristic

Standard thickness:

5 +0.2-0.1 mm

Disc thickness at wear limit

4.5 mm

- Repeat measurements at least 6 points on the disk.

- Check the rotation of the brake disc assembly using the appropriate tools as shown on the brake calipers.

- In order to be able to anchor the appropriate tool, properly use the M8 threaded whole metal plate and secure it at one of the two rear brake caliper joint points.

- Appropriate repair flange axle and bearing nut and pads and an Æ 17 mm.

NOTE

SO AS NOT TO GET A DISTORTED READING, CAUSE THE DRIVEN PULLEY SHAFT TO TURN IN ORDER TO ROTATE THE DISC.

Specific tooling

020335Y Magnetic mounting for dial gauge

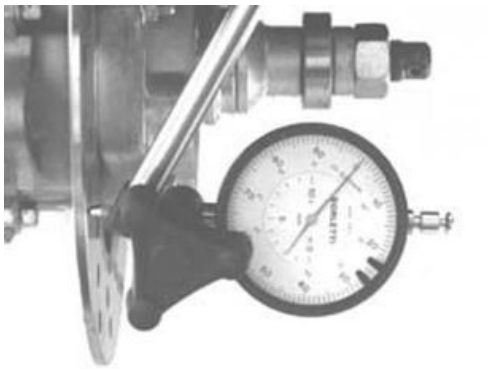
Characteristic

Max. Deviation allowed:

0.1 mm

- If incorrect values are detected, replace the disc.

- If the anomaly persists, replace the hub.



Front brake disc

Removal

- Remove front wheel.
- Unscrew the 5 locking screws in the photo

Refitting

For installation, use the embossed arrow on the disc as a reference to position the disc correctly.

- Tighten the screws according to the specified torque and use the recommended products

NOTE

THE ARROW STAMPED ON THE DISC INDICATING THE RUNNING DIRECTION MUST BE FITTED TOWARDS THE OUTSIDE OF THE VEHICLE.

Recommended products

Loctite 243 Medium strength threadlock

Medium Loctite 243 threadlock

Locking torques (N*m)

Brake disc screws 8 to 10

Disc Inspection

Checking disks is important;

It must be completely clean and free from any signs of rust, oil or grease or any other dirt, and must be free from signs of deep cuts.

Characteristic

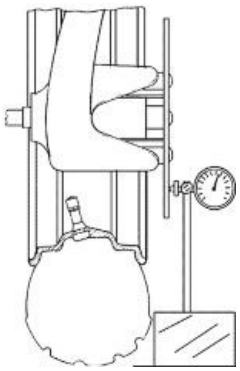
Standard thickness:

5 +0.2-0.1 mm

Disc thickness at wear limit

4.5 mm

- Use appropriate tools to measure disc protrusion when wheels are properly mounted. The herniation measured near the outer edge of the disc must be less than 0.1mm.
- If the measured value is not, remove front wheel (front/rear suspension section) and check disc protrusion. The maximum allowable deviation is 0.1mm.If measurements are large, reposition disc and repeat inspection.
- If the problem persists, check and recheck Place the hub if necessary.



Specific tooling

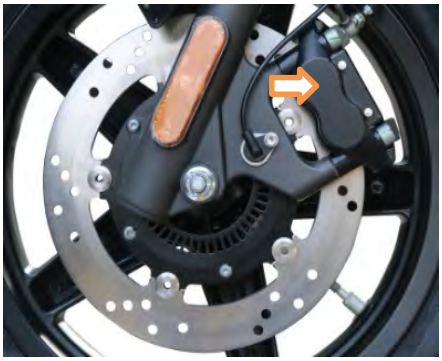
020335Y Magnetic mounting for dial gauge

Front brake pads

Removal

Proceed as follows:

- Remove front brake calipers.

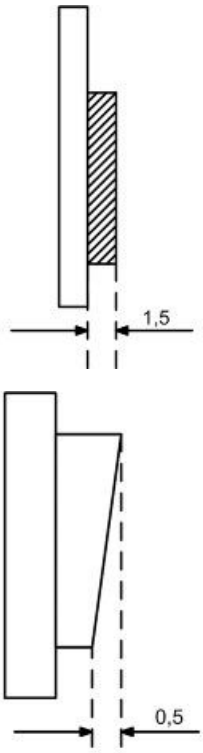


- Remove the snap spring.
- Unscrew the bolt
- Release the two pins that lock the two gaskets in the drawing.
- Remove the gasket and use the gasket spring clip with care.
- Check the thickness of the gasket.

Characteristic

Minimum value

1.5 mm



See also

Refitting

For cooperation, the following operations are carried out:

- Insert two spacers into the calipers.
- Screw the two pad lock pins to the correct torque and use the recommended product.
- Install the calipers on the bracket and tighten the two screws according to the specified torque.

NOTE

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 caliper to support 24 to 27 Pad fastening pin 19.6 ÷ 24.5

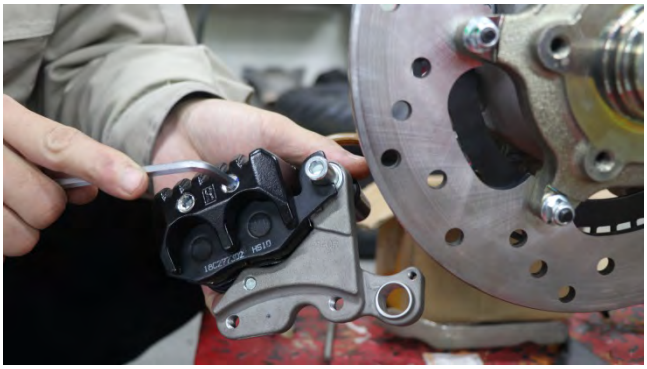
Rear brake pads

Removal

Proceed as follows:

- Remove the rear brake caliper.

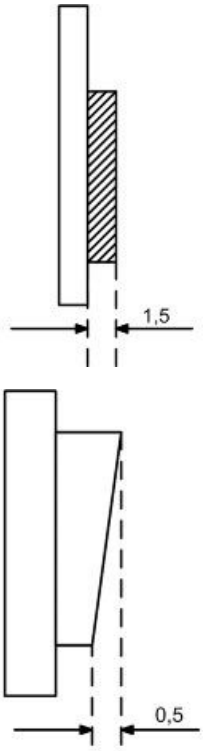
- Release the two pins that lock the two gaskets in the drawing.
- Remove the gasket and use the gasket spring clip with care.
- Check the thickness of the gasket.



Characteristic

Minimum value

1.5 mm



See also

Refitting

For cooperation, the following operations are carried out:

- Insert two spacers into the calipers.
- Screw the two pad lock pins to the correct torque and use the recommended product.
- Install the calipers on the bracket and tighten the two screws according to the specified torque.

NOTE

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 caliper to support 24 to 27 Pad fastening pin 19.6 ÷ 24.5

Fill - Bleeding the braking system

Rear - combined

- Remove rubber cover from vent screw.
- Insert a rubber hose into the exhaust screw to recover the brake fluid.
- Load the system with the left brake lever to achieve the required pressure.
- Maintain the tension of the left hand brake rod, loosen the exhaust screw, and let the air in the system escape. Then tighten the exhaust screw

- Repeat until only brake fluid is released from the rubber hose.
- remove the fluid recovery tube and reinstall the rubber cover on the vent screw.
- fill the brake fluid to the correct position of the tank.

If necessary, a special vacuum pump can be used for pumping oil

NOTE

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 Vacuum pump Mity-Vac

Locking torques (N*m)

System bleed caliper fitting: 12 ÷ 16 Nm

Front

- Remove rubber cover from vent screw.

- Insert a rubber hose into the exhaust screw to recover the brake fluid.
- Use the right hand brake lever to load the system to the required pressure.
- Maintain the tension of the right hand brake rod and loosen the exhaust screw to purify the air. Then tighten the exhaust screw
  - Repeat until only brake fluid is released from the rubber hose.
  - Remove the fluid recovery tube and reinstall the rubber cover on the vent screw.
  - Fill the brake fluid to the correct position of the tank.

  If necessary, a special vacuum pump can be used for pumping oil

NOTE

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 Vacuum pump Mity-Vac

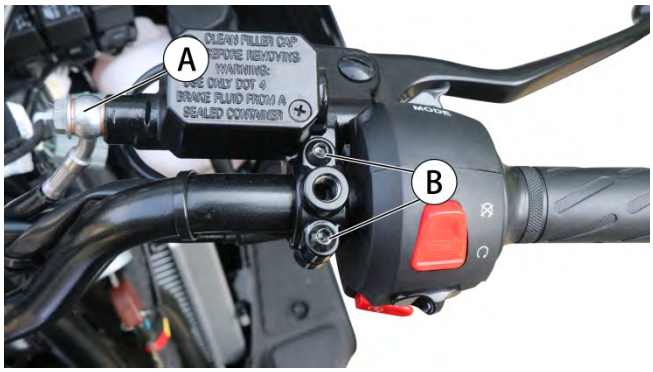
Locking torques (N*m)

System bleed caliper fitting: 12 ÷ 16 Nm

Front brake pump

Removal

This procedure is suitable for two brake pumps.



- Remove front and rear handlebars.
- Place the appropriate container to collect the oil, remove the tubing from the calipers, and operate the brake rod until the oil does not come out.
- Disconnect the tubing «A» from the pump, then unscrew the two holders «B» from the U-bolt and

remove the pump.

- Tighten connectors to specified torque and drain system during reinstallation.

CAUTION

ALWAYS USE NEW COPPER WASHERS.

Locking torques (N*m)

Brake fluid pump-hose fitting	**16 - 20**
Fixing screws for the handlebar control unit U-bolts	**7 to 10**

INDEX OF TOPICS

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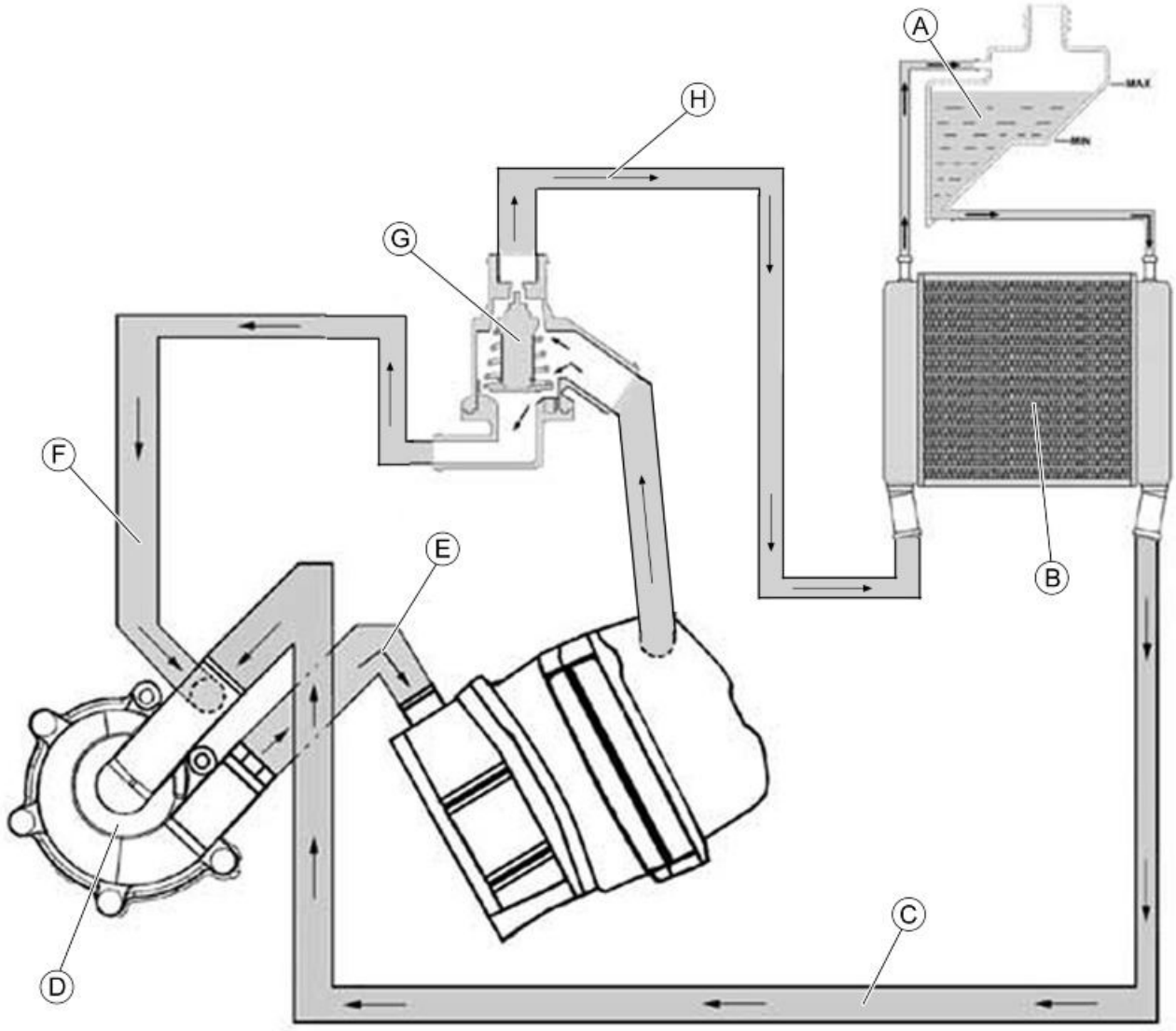
Circuit diagram



KEY

A = Expansion tank

B = Radiator

C = Radiator intake pipe

D = Water pump

E = Delivery pipe to cylinder

F = By-Pass pipe

G = Thermostat

H = Radiator delivery pipe

Electric fan check

- Check and restore the correct battery voltage if necessary.

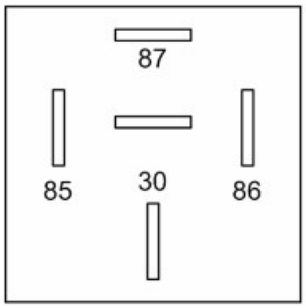
Characteristic

Battery voltage

12V

- Check whether the electrical ventilation relay is working normally.

- If the relay does not work, replace it.
- If the relay works, remove the relay and jump the White-Black, Green-White wires (85-86); the electrical ventilation of all components shall start normally under proper operating conditions.



- For checking coolant temperature sensors, refer to the chapter on **“Injection”**.

See also

System bleed

- Start the engine until the operating temperature is reached.
- Remove rubber cover from vent valve
- Take a rubber hose of suitable length and connect the valve to the tank
- Place one end of the pipe on the relief valve and the other end in the expansion tank
- Unscrew the screw twice until the head is exposed
- Wait for only coolant to come out of the rubber hose to remove bubbles from the circuit.

- Tighten the exhaust valve according to the maximum torque.
- Lift the coolant to the correct position in the expansion tank

Locking torques (N*m)

Bleed screw 3

Thermostat

Removal

- Remove the helmet room inspection cover.
- Place a + 2.0l container underneath the vehicle to collect coolant.
- Loosen two screws indicating lift bonnet and remove thermostat.

Check

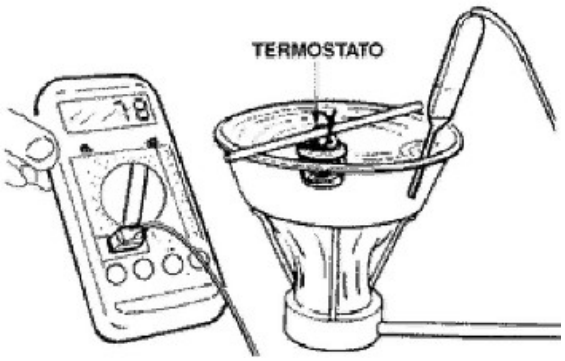
1) Visually check the thermostat for moisture resistance.

2)

Fill the metal container with approximately x. 1 liter of watt. Immerse the thermostat in the container and place it in the center of the container. Immerse the multimeter temperature probe in water and bring it close to the thermostat. Heat the container with a hot gun. Check the temperature when the thermostat starts to open:

Heat until the thermostat is fully turned on.

3) When the thermostat is not working properly, replace the thermostat.



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 at	85±2°C

Refitting

- Follow relocation steps, but in reverse order; carefully tighten the screw to the specified torque.

Locking torques (N*m)

Thermostat cover screws 3 to 4

- When the cooling circuit is restored, refill and clean the circuit with the recommended product as specified in the cooling system section.

INDEX OF TOPICS

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INJECTION COMPONENTS

	Specification	Desc./Quantity
1	Throttle body and electronic injection control unit (MIU)	
2	Fuel injector	
3	Injection load remote control	
4	Diagnostics socket connector	
5	Electric fan	
6	Fuel pump	
7	Lambda Probe	
8	Engine Speed sensor	
9	HV coil	
10	Water temperature sensor	

MIU injection system

The car is fitted with an integrated injection and ignition system. Injection is indirect injection into the manifold through an electric injector. The injection and ignition are timed over a four-stroke cycle by means of a tuning wheel on the crankshaft (24-2 teeth) and pickup sensors. Combustion and ignition are managed on the basis of engine speed and throttle opening. Further modifications are made according to the following parameters: coolant temperature. - Inlet temperature - lambda probe - this system provides cold engine idle feed correction via a stepper motor on the circuit adjacent to the throttle valve. The control unit manages the start time of the stepper motor and fuel injector to ensure steady idling and proper combustion.

In all service conditions, the preparation of the mixture was performed by modifying the opening time of the injector. Fuel system pressure remains constant according to ambient pressure. Fuel supply circuits include:

- Fuel pump
-Fuel filter
-Injector
-Pressure regulator

The pump, strainer and regulator are mounted on a single stand in the fuel tank. The injector is connected by a tube with a quick release joint. The pressure regulator is located at the beginning of the circuit. Fuel pump is controlled by MIU control unit; this ensures the safety of the scooter and the ignition circuit includes:

- HV coil
- HV cable
- Shielded cap
- MIU control unit
- Spark plug

The MIU control unit manages the ignition in the most advanced manner, while ensuring four-stroke timing (ignition during compression only).The MIU jet ignition system controls the engine operation through a preset program. If any of the input signals fail, ensure that the engine is working properly so that the user can reach the service station. Of course, this is not possible when RPM timing signals are lost or control circuits fail:

- Fuel pump
- HV coil
- Injector

The control unit has a self-diagnostic system connected to an indicator light in the structure panel.

Faults are detected and recovered by diagnostic testers. In any event, the data store will be automatically purged after 16 USES (cold start, run at normal engine temperature, stop) when the failure no longer exists.

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The diagnostic tester also needs to adjust the idle mixture.

Specific tooling

020680Y Diagnosis Tool

The MIU jet ignition system checks the radiator speed indicator and fan. The MIU control unit has a decoder for an anti-theft fixer system. The MIU control unit is connected to a diagnostic LED on the dashboard, which also has a stop-flash function. Power supply of MIU control unit is controlled by emergency switch; this is to provide further safety for the vehicle.

Precautions

Troubleshooting hints

1. A MIU failure is more likely to be due to the connections than to the components.

Before troubleshooting the MIU system, carry out the following checks:

A: Electrical power supply

a. Battery voltage

b. Blown fuse

c. Remote controls

d. Connectors

B: Chassis ground

C: Fuel system

a. Broken fuel pump

b. Dirty fuel filter

D: Ignition system

a. Faulty spark plug

b. Broken coil

c. Broken shielded cap

E: Intake circuit

a. Dirty air filter

b. Dirty by-pass circuit

c. Faulty Stepper motor

F: Other

a. Incorrect distribution timing

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b. Wrong idle mixture

c.Incorrect reset of the throttle valve position sensor

2. MIU system faults may be caused by loose connectors. Make sure that all connections have been correctly made.

Check the connections as follows:

A check that the terminals are not bent.

B check that the connectors have been properly connected.

C check whether the malfunction can be fixed by shaking the connector slightly.

3. Check the whole system before replacing miuu. If the fault is repaired by replacing MIU control unit, reinstall the original control unit and check whether the fault occurs again.

4. Use a multimeter with an internal resistance greater than 10K ohm /V for troubleshooting. Improper equipment at instraw could damage the MIU central control unit. With instruments defined to be greater than 0.1v and 0.5w, accuracy must be greater than 2%.

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1. Check for registered faults before fixing any part of the injected system. Do not disconnect the battery before checking the failure.

2. The fuel supply system is pressurized at 250 kPa (2.5 BAR).Check for open flame before disconnecting the fuel supply line quick release connector. Don't smoke. Take care not to spray fuel into your eyes.

3. When fixing electrical components, use the battery only when actually needed.

4. When performing the function check, check whether the battery voltage exceeds 12V.

5. Check the tank for at least 2 liters of fuel before attempting to start the vehicle. Failure to comply with this specification will damage the fuel pump.

6. If the vehicle is not expected to be used for a long time, please fill the tank with a little more than half. This will ensure that the pump will be covered with fuel.

7. When cleaning vehicles, please use electrical appliances and wires carefully.

8. When ignition problems are found, check the connection between the battery and the injection system.

9. Before disconnecting the MIU control unit connector, perform the following steps in the following order: - set the switch to «OFF»- disconnect the battery failure to comply with this specification may damage the control unit.

10. Do not invert the polarity when installing the battery.

11. To avoid damage, disconnect and reconnect the MIU system connectors only when necessary. Before reconnecting, check that the connector is dry.

12. Do not force the detector probe to contact the connector when performing electrical checks. Do not take steps not explicitly foreseen in the manual. Before fixing any part of the injection system, check to see if there are any registered faults. Do not disconnect the battery before checking for faults.

1. Protect the system connector with its cover at the end of each inspection with the diagnostic tester. Failure to follow this precaution may damage the MIU control unit.

2. Before reconnecting the fast coupler of the power supply system, check that the terminals are completely clean.

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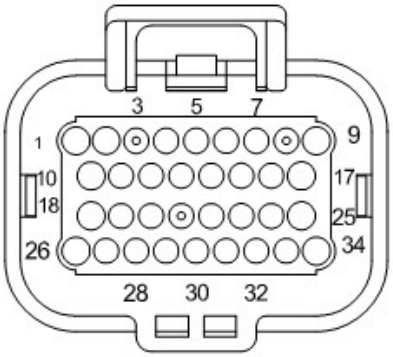
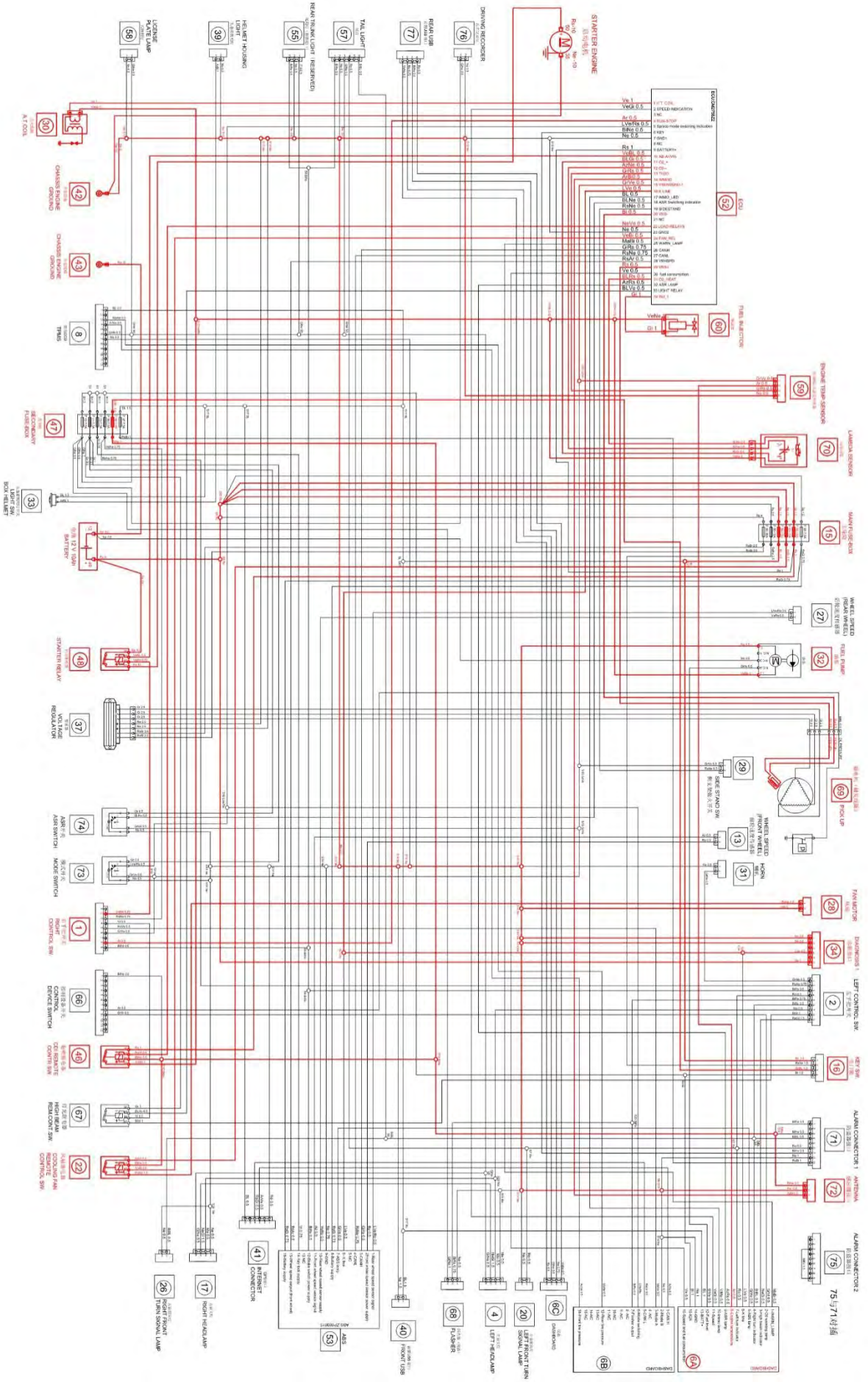


1.A.T.COIL negative terminal(Green)
2.Vehicle Speed (Green-Yellow)
3.Not connected
4.Run-stop switch(Orange)
5.Sport/Eco switch(Light Green-Red)
6.Key supply(White-Black)
7.Ground(Black)
8.Not connected
9.Battery Supply(Red)
10.Starter relay control(Green-Blue)
11.Positive input for lambda sensor(Blue-Yellow)
12.Negative input for lambda sensor(Light Blue-Black)
13.Input for engine temperature sensor(Yellow-pink)
14.Immobilizer communication(Orange-White)
15.Ground for external sensor(Grey-Green)
16.K-line(Light Green)
17.Output for immobilizer led(Blue-White)
18.ASR Switch button(Blue-Black)
19.Positive for side stand switch(Red-Black)
20.Negative input for engine speed sensor(White)
21.Not connected
22.Output for engine loads(Black-Viloet)
23.Ground(Black)
24.Output for fan relay(Green-White)
25.Output for warning lamp(Blown-White)
26.CANH(Grey-Red)
27.CANL(Red-Black)
28.Input for vehicle speed(Red-Yellow)
29.Positive input for engine speed sensor(Red)
30.Output for engine speed repetition and fuel consumption(Green)
31.Output for lambda sensor heater(Blue-Red)
32.ASR lamp output（Light Blue-Red)
33.Light relay output(Blue-Green)
34.Output for injector(Yellow)

Terminals setup

EMS circuit diagram



KEY

1.RIGHT CONTROL SW.
6A.DASHBOARD
12.BATTERY NEGATIVE
15.MAIN FUSE-BOX
16.KEY SW.
22.COOLING FAN REMOTE CONTROL SW.
28.FAN MOTOR
30.A.T.COIL
32.FUEL PUMP
34.DIAGNOSIS 1
35.STARTER ENGINE NEGATIVE
42.CHASSIS ENGINE GROUND
43.CHASSIS ENGINE GROUND
46.CDI REMOTE CONTR.SW.
47.SECONDARY FUSE-BOX
48.STARTER RELAY
49.BATTERY POSITIVE
50.STARTER ENGINE
52.ECU
59.ENGINE TEMP.SENSOR
60.FUEL INJECTOR
69.PICK UP
70.LAMBDA SENSOR
72.ANTENNA

Troubleshooting procedure

Engine does not start

ENGINE DOES NOT START IF ONLY PULLED

Possible Cause	Operation
Immobiliser enabling signal	System not encoded System not efficient, repair according to the indications of the self-diagnosis
Presence of faults detected by the self diagnosis	Pump relay HV coil Injector Revolution timing sensor
Fuel system	Fuel in the tank Fuel pump activation Fuel pressure (low) Injector capacity (low)
Power to the spark plug	Shielded spark plug cap HV coil (secondary insulation)
Parameter reliability	Coolant temperature Distribution timing - injection ignition Intake air temperature
End of compression pressure	End of compression pressure

Starting difficulties

ENGINE STARTER PROBLEMS

Possible Cause	Operation
Presence of faults detected by the self-diagnosis	Pump relay HV coil Injector Revolution timing sensor Air temperature Coolant temperature
Starter speed	Starter motor and solenoid Battery Ground connections
End of compression pressure	End of compression pressure
Power to the spark plug	Spark plug Shielded cap HV coil

Possible Cause	Operation
	Speed-timing sensor Ignition advance
Fuel system	Fuel pressure (low) Injector capacity (low) Injector sealing (poor)
Correctness of the parameters	Coolant temperature Stepper throttle valve position intake air temperature (steps and actual opening) Cleaning of the auxiliary air pipe and throttle valve; air filter efficiency

Engine stops at idle

ENGINE DOES NOT IDLE/ IDLING IS UNSTABLE/ IDLING TOO LOW

Possible Cause	Operation
Presence of faults detected by the self-diagnosis	Pump relay HV coil Injector Revolution timing sensor Air temperature Coolant temperature
Ignition efficiency	Spark plug Ignition timing
Correctness of the parameters	Throttle valve position sensor Stepper Coolant temperature sensor Intake air temperature sensor
Intake system cleaning	Air filter Diffuser and throttle valve Additional air pipe and Stepper
Intake system sealing (infiltrations)	Intake manifold - head Throttle body - manifold Intake sleeve Filter box
Fuel system (low pressure)	Fuel pump Pressure regulator Fuel filter Injector capacity

Engine does not rev down

ENGINE DOES NOT RETURN TO IDLING SPEED/IDLING SPEED TOO HIGH

Possible Cause	Operation
Presence of faults detected by the self-diagnosis	Pump relay HV coil Injector Revolution timing sensor Air temperature Coolant temperature
Ignition efficiency	Ignition timing
Correctness of the parameters	Throttle valve position sensor Stepper Coolant temperature sensor Intake air temperature sensor
Intake system sealing (infiltrations)	Intake manifold - head Throttle body - manifold Intake sleeve Filter box
Fuel system (low pressure)	Fuel pump Pressure regulator Fuel filter Injector capacity

Exhaust backfires in deceleration

EXHAUST BACKFIRES WHEN DECELERATING

Possible Cause	Operation
Presence of faults detected by the self-diagnosis	Pump relay HV coil Injector Revolution timing sensor Air temperature Coolant temperature Lambda probe
Correctness of the parameters	Throttle valve position sensor Stepper Coolant temperature sensor Intake air temperature sensor
Intake system sealing (infiltrations)	Intake manifold - head Throttle body - manifold Intake sleeve Filter box
Fuel system (low pressure)	Fuel pump Pressure regulator Fuel filter Injector capacity
Exhaust system sealing (infiltrations)	Manifold - head Manifold - silencer silencer welding

Engine revs irregularly

ENGINE IRREGULAR PERFORMANCE WITH VALVE SLIGHTLY OPEN

Possible Cause	Operation
Intake system cleaning	Air filter Diffuser and throttle valve Additional air pipe and Stepper
Intake system sealing	Intake sleeve Filter box
Ignition system	Spark plug wear check
Parameter reliability	Throttle valve position signal Coolant temperature indicator Intake air temperature indicator Ignition advance
TPS reset successful	TPS reset successful
Presence of faults detected by the self-diagnosis	Pump relay HV coil Injector Revolution timing sensor Air temperature Coolant temperature Lambda probe

Poor performance at full throttle

POOR ENGINE PERFORMANCE AT FULL POWER/ ENGINE IRREGULAR PERFORMANCE ON PICKUP

Possible Cause	Operation
Presence of faults detected by the self diagnosis	Pump relay HV coil Injector

Possible Cause	Operation
	Air temperature Coolant temperature Lambda probe
Spark plug power supply	Spark plug Shielded cap HV cable HV coil
Intake system	Air filter Filter box (sealing) Intake sleeve (sealing)
Parameter reliability	Throttle valve position signal Coolant temperature indicator Intake air temperature indicator Ignition advance
Fuel system	Fuel level in the tank Fuel pressure Fuel filter Injector capacity

Engine knocking

PRESENCE OF KNOCKING (COMBUSTION SHOCKS)

Possible Cause	Operation
Presence of faults detected by the self-diagnosis	Pump relay HV coil Injector Revolution timing sensor Air temperature Coolant temperature Lambda probe
Ignition efficiency	Spark plug
Parameter reliability	Throttle valve position signal Coolant temperature indicator Intake air temperature indicator Ignition advance
Intake system sealing	Intake sleeve Filter box
TPS reset successful	TPS reset successful
Fuel system	Fuel pressure Fuel filter Injector capacity Fuel quality
Selection of the cylinder base gasket thickness	Selection of the cylinder base gasket thickness

Fuel supply system

The fuel system circuit includes an electric pump, a filter, a pressure regulator, an electric fuel injector, and a fuel delivery pipeline. An electric pump is located in the tank from which fuel is pumped and fed through a filter to the injector. Pressure is controlled by a pressure regulator located in the fuel tank of the pump assembly.

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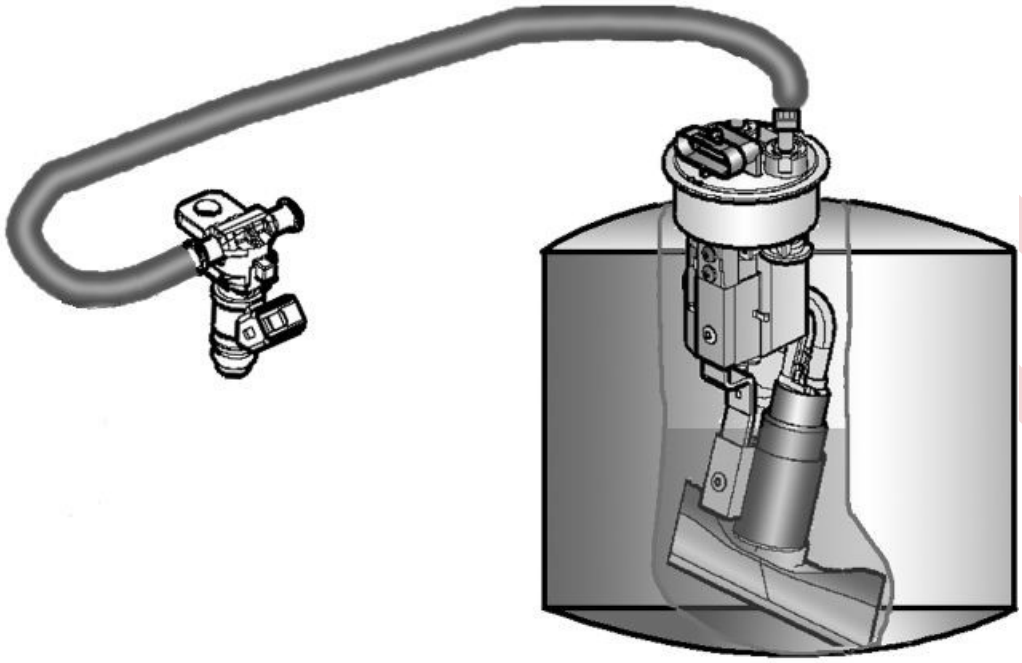
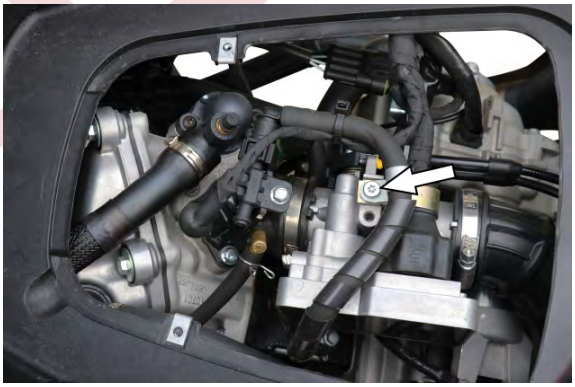


Removing the butterfly valve

Remove the helmet compartment.
Remove the fuel line clamp screw shown in the drawing.



Remove the quick release device from the fuel injector holder.

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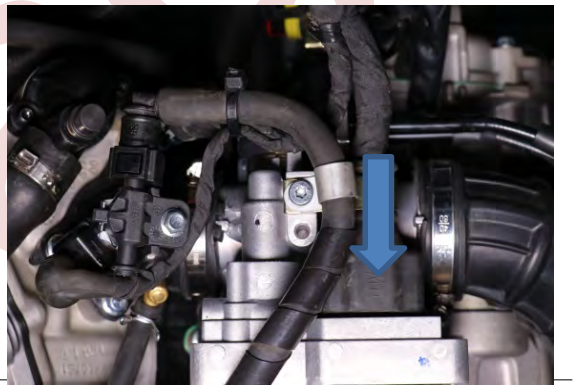
Remove the injector connector.

Remove the three screws holding the manifold to the cylinder head and the clamp holding the throttle body to the manifold.

Remove the MIU ECU connector.



Remove clamp on throttle body fixed to air filter bellows.

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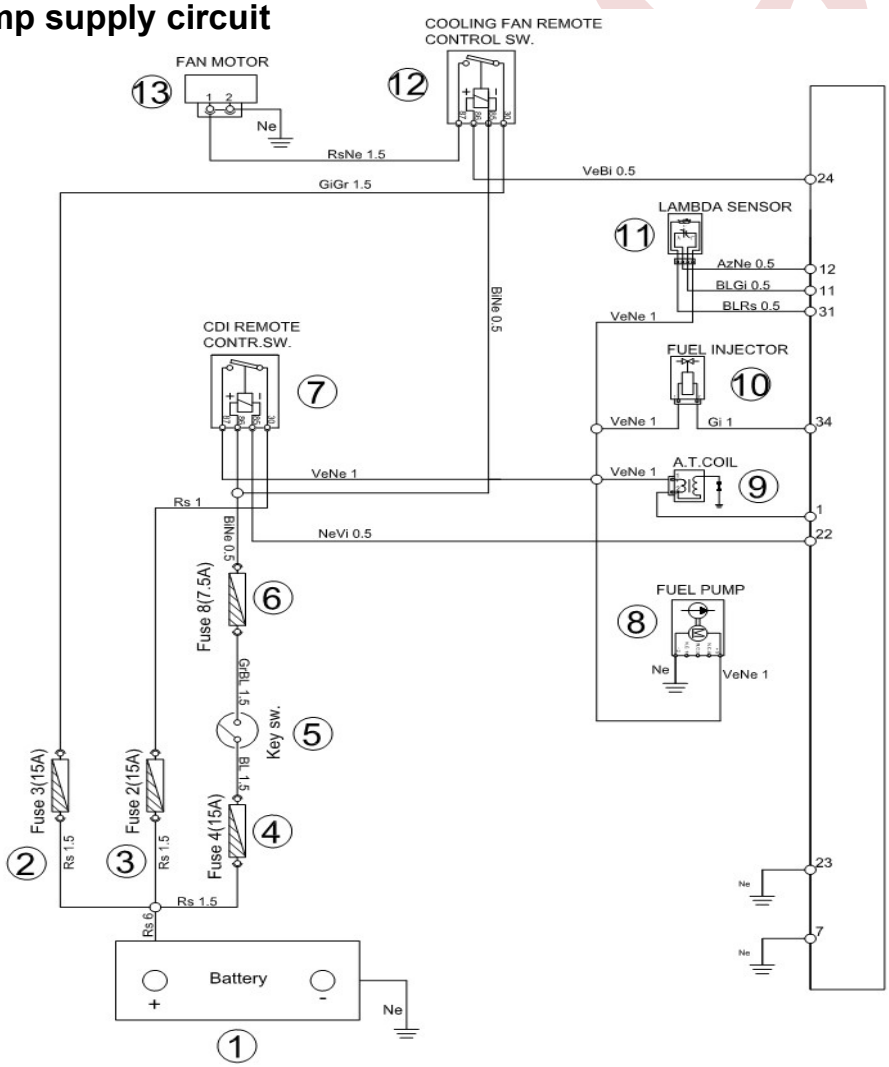
Remove the throttle control retainers as indicated in the photograph.

Refitting the butterfly valve

When refitting, disassemble in reverse order, but pay special attention to placing the reference mark of the air filter sleeve shown in the photo on the throttle valve body.

Pump supply circuit



INJECTION LOADS

	Specification	Desc./Quantity
1	Battery	12V-10Ah
2	Fuse 3	15 A
3	Fuse 2	15 A
4	Fuse 4	15A
5	Key sw.	
6	Fuse 8	7.5A
7	CDI Remote control sw.	
8	Fuel pump	
9	A.T. coil	
10	Fuel injector	
11	Lambda sensor	
12	Cooling fan Remote Control sw.	
13	Fan motor	

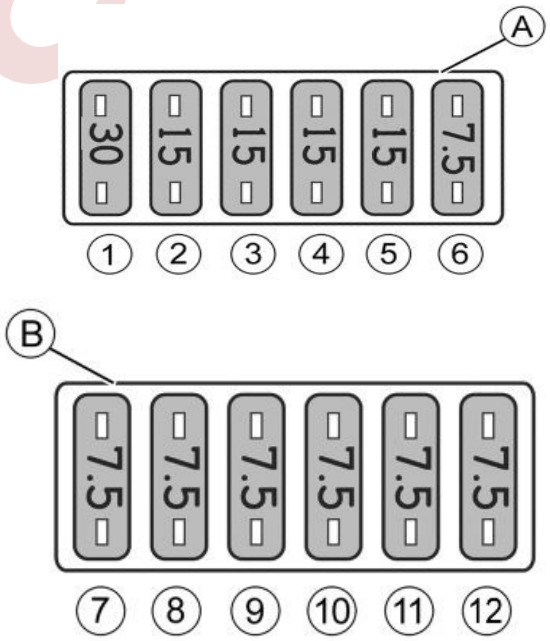
When "ON" is turned on, the oil pump starts to rotate for 2 seconds and stops. When the engine starts, the pump is continuously supplied in the case of a rev timing signal.

ELECTRICAL DATA

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

Check the injection load 15A no. 3 fuse is working normally.

Check whether the 7.5a fuse 12 of the power supply of the live control unit is working normally.



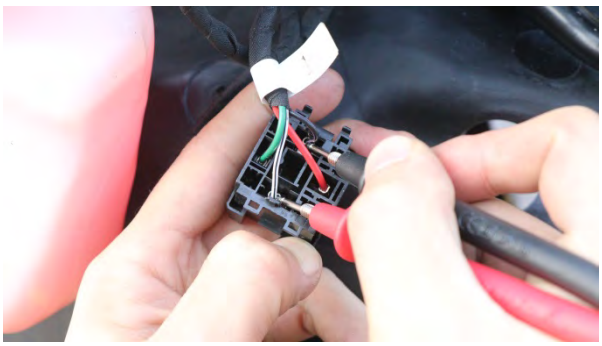
Malaguti

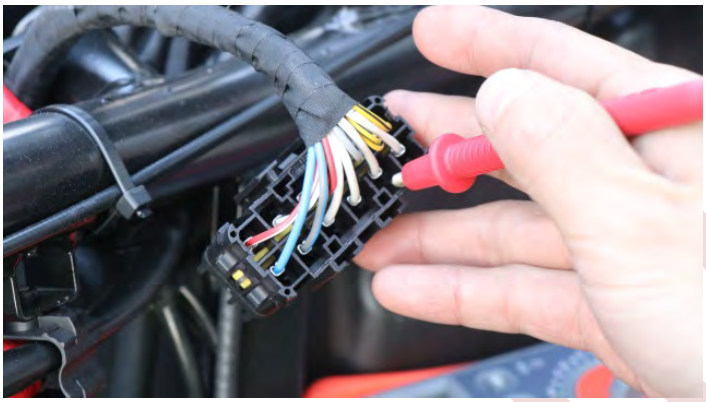
Check the efficiency of the loaded solenoid valve. Check the resistance between pins 86 and 85 of the excitation coils: apply a voltage of 12V to pins 86 and 85 from 40 to 80 ohms; Ensure that the remote control pins 30 and 87 are continuous.

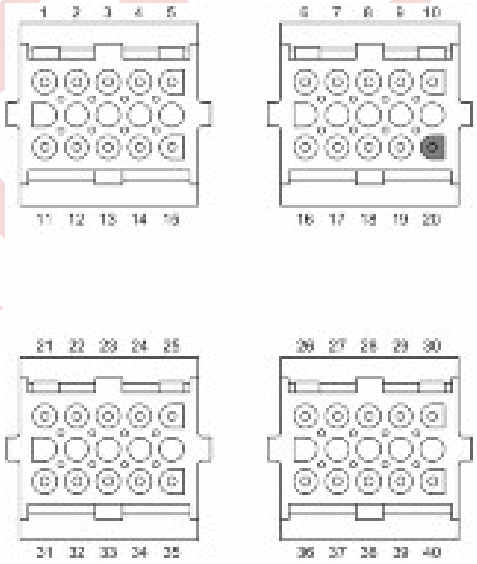
Check the power supply line of the remote charging coil of the injection load: after "ON" is connected, make sure there is a battery voltage between the black/white cable and the black/purple cable of the remote control base, lasting for 2 seconds. If not, check the continuity of the black/white cable between the fuse box and the base of the remote control and the black/purple cable between the control units pin 20 and the base of the remote control.

NOTE

CONTINUITY TESTS MUST BE CARRIED OUT WITH THE COMPONENTS DISCONNECTED. (REMOTE CONTROLS, ELECTRONIC CONTROL UNIT, FUSES, ETC.).





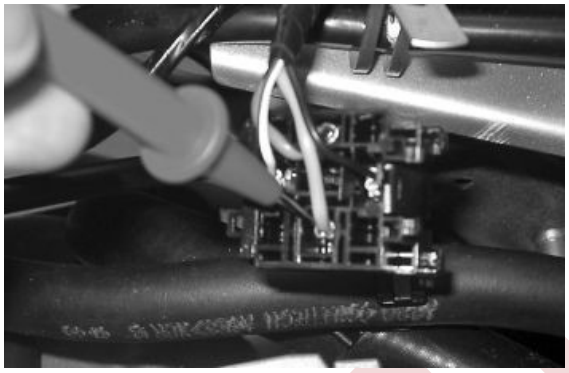

1 2 3 4 5
11 12 13 14 15
6 7 8 9 10
16 17 18 19 20
21 22 23 24 25
31 32 33 34 35
26 27 28 29 30
36 37 38 39 40

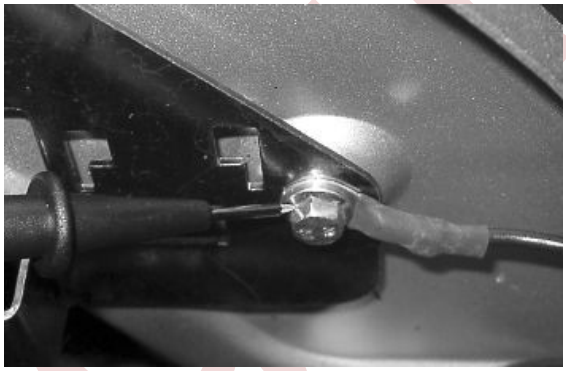
Malaguti

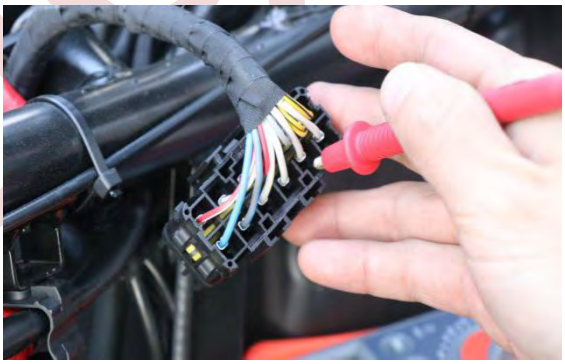
Check the presence of fixed voltage between the red/blue cable of the remote control base and earth. If not, check the continuity of the red/blue cable between the fuse box (No. 3 15A) and the remote control base.

NOTE

CONTINUITY TESTS MUST BE CARRIED OUT WHEN THE PARTS ARE DISCONNECTED. (REMOTE CONTROLS, ELECTRONIC CONTROL DEVICE, FUSES, ETC.).







Pump circuit 6

About 2 seconds after switching to «ON», check whether there is battery voltage between the dark green cable of the pump connector and the ground wire of the disconnected pump connector. Otherwise, check the continuity of the black-green cable between the pump adapter and the remote control base. Check the efficiency of grounding wire of oil pump by measuring the continuity between black cable of oil pump joint, system side and ground.

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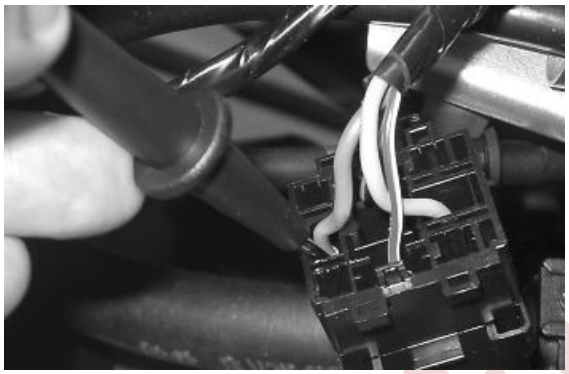
When switching to "ON", if the pump continues to turn after activation for two seconds, check whether the control unit is disconnected, the injection load control is disconnected, and whether the black and purple cable (pin 20 ON the interface wiring) is insulated from the ground.



Specific tooling

020331Y Digital multimeter

Circuit leak test

Install special tools for fuel pressure control, and install pressure gauges in designated piping.

During normal operation, check by placing proper tools between pump and injector. Use the battery voltage > 12v to check that the fuel pressure is 2.5 BAR and the input current is
1.4 to 1.8 A

When the battery voltage is > 12v, disconnect the pipeline with the corresponding tool's pressure gauge from the fuel injector to check the pump flow. Obtain a graduated burette with a flow rate of about 1l.Active diagnosis of rotary pumps using a handheld computer. Using a pair of long flat needle-nosed pliers, plug the fuel line and stabilize the pressure at approximately x. Article 2.5.Check that the pump flow in 15 seconds is about x.110 centimeters cubed.

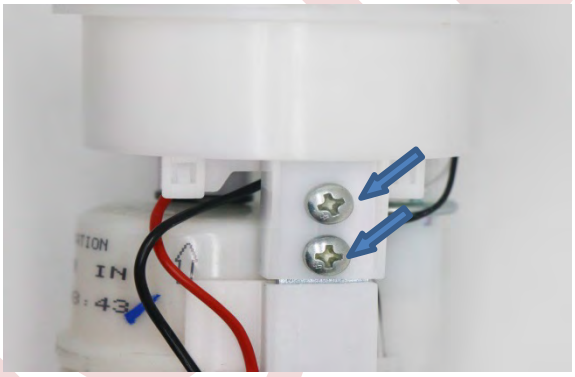
Specific tooling

020480Y Petrol pressure check kit

Fuel filter check

Disconnect the terminals from the electric pump

Remove the screws shown in the drawing



Remove clamp holding pipe to filter
Shown in figure

As shown, separate the lower part of the pump installation.

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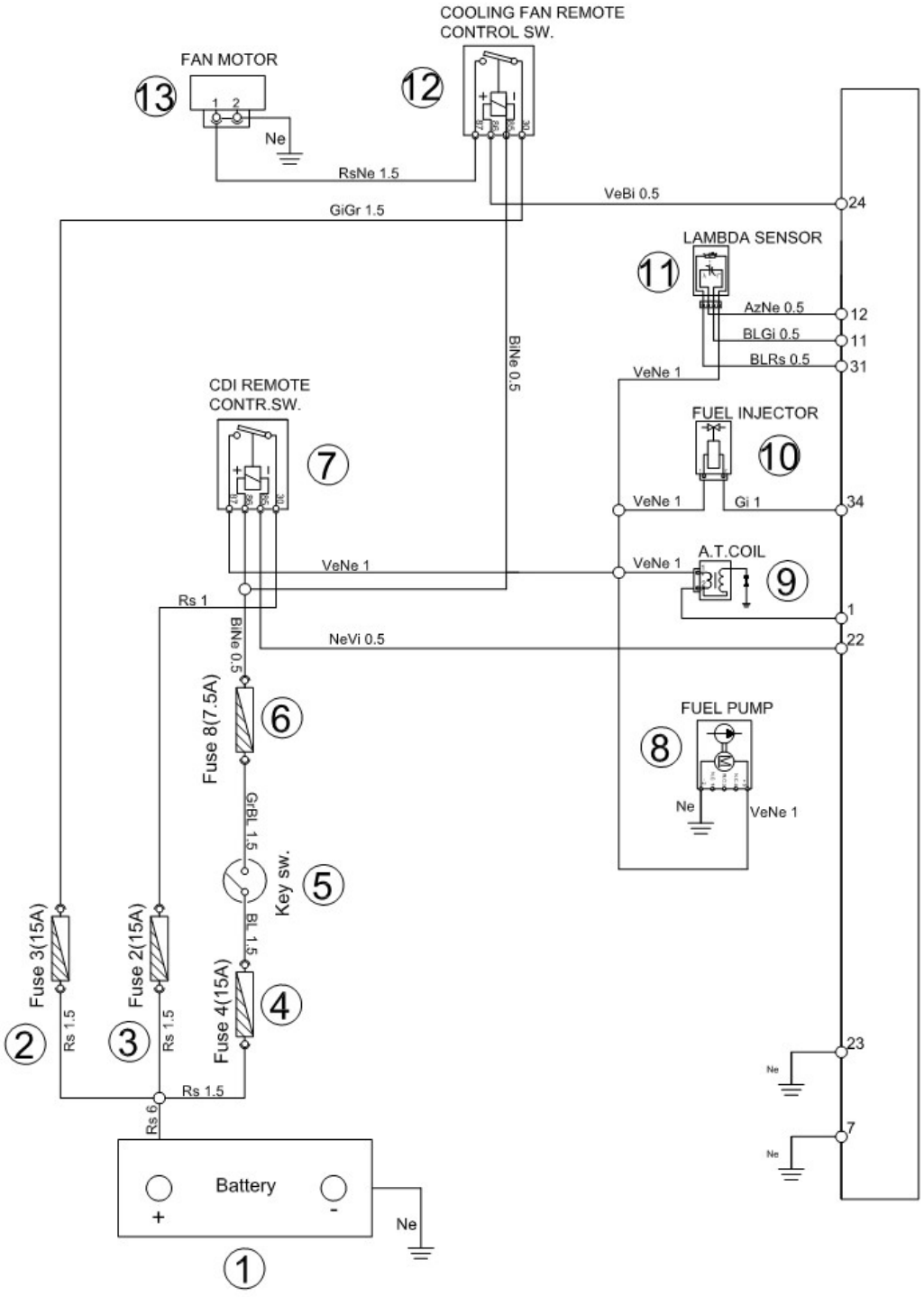
Remove the filter from the pump mounting

Inspecting the injector circuit



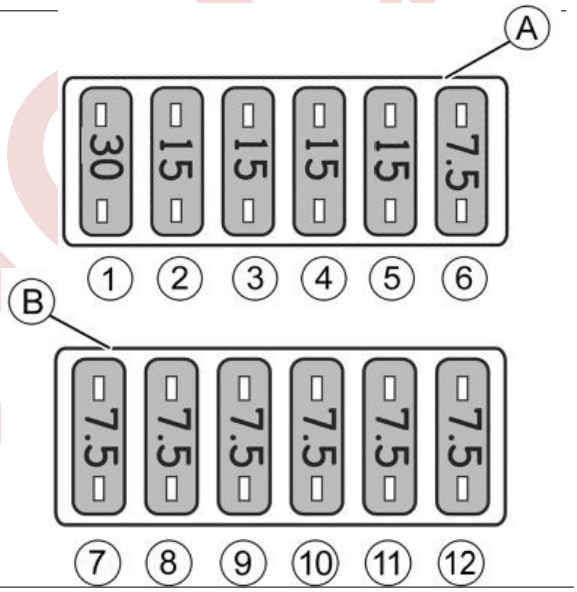
INJECTION LOADS

	Specification	Desc./Quantity
1	Battery	12V-10Ah
2	Fuse 3	15 A
3	Fuse 2	15 A
4	Fuse 4	15A
5	Key sw.	
6	Fuse 8	7.5A
7	CDI Remote control sw.	
8	Fuel pump	
9	A.T. coil	
10	Fuel injector	
11	Lambda sensor	
12	Cooling fan Remote Control sw.	
13	Fan motor	

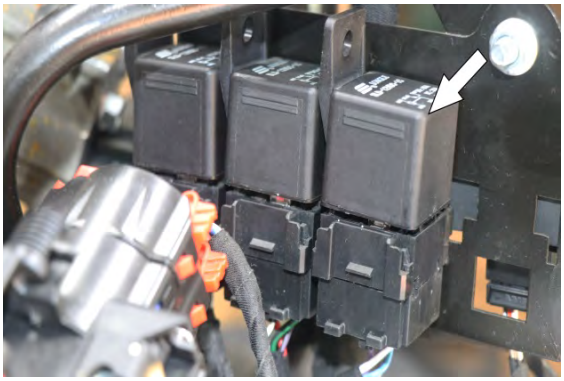
Checking the resistance at the injector ends: 14.5 ± 5% Ohm.

Check the injection load 15A no. 2 fuse is working normally.

Check whether the 7.5a fuse 8 of the power supply of the live control unit is working normally.



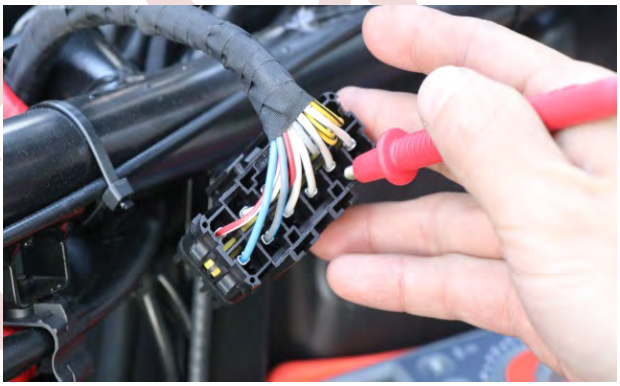
Check the efficiency of the loaded solenoid valve. Check the resistance between pins 86 and 85 of the excitation coils: apply a voltage of 12V to pins 86 and 85 from 40 to 80 ohms; Ensure that the remote control pins 30 and 87 are continuous.

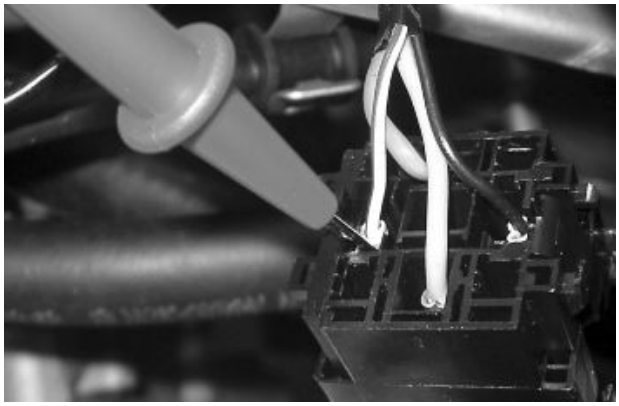


Check the power supply line of the remote charging coil of the injection load: after "ON" is connected, make sure there is a battery voltage between the black/white cable and the black/purple cable of the remote control base, lasting for 2 seconds. If not, check the continuity of the black/white cable between the fuse box and the base of the remote control and the black/purple cable between the control units pin 20 and the base of the remote control.

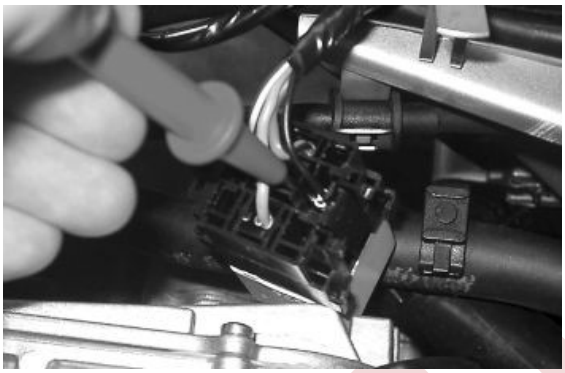
NOTE

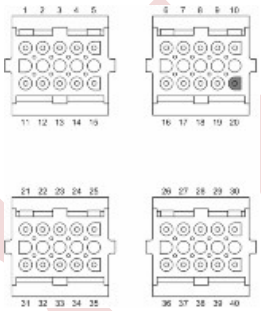
CONTINUITY TESTS MUST BE CARRIED OUT WITH THE COMPONENTS DISCONNECTED. (REMOTE CONTROLS, ELECTRONIC CONTROL UNIT, FUSES, ETC.).





Malaguti

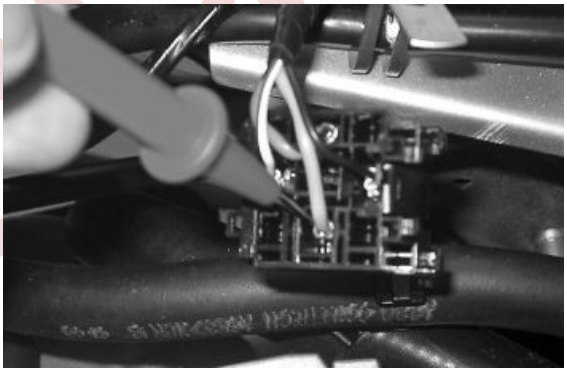


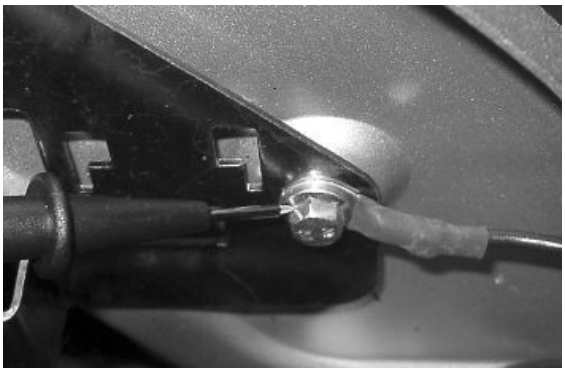


Check if there is a fixed voltage between the red/blue line of the remote control base and the ground. If not, check the continuity of the red/blue cable between the fuse box (no. 3 15A) and the base of the remote control.

NOTE

CONTINUITY TESTS MUST BE CARRIED OUT WITH THE COMPONENTS DISCONNECTED. (REMOTE CONTROLS, ELECTRONIC CONTROL UNIT, FUSES, ETC.).





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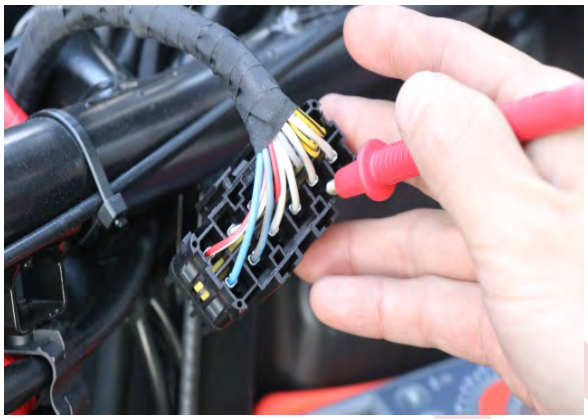
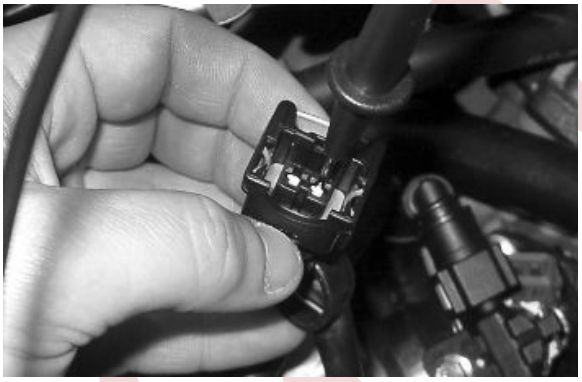


After the control unit is disconnected from the fuel injector, check the continuity of the red and yellow cables between the interface wiring pin 14 and the fuel injector connector



Switch to «ON» and check whether there is voltage between the black and green cable of the fuel injector connector and the ground wire after the connection of the fuel injector is disconnected and the control unit is connected

When the injector is disconnected and the injector load solenoid valve is disconnected, check the continuity of the black and green cable between the injector connector and the solenoid valve base.

Inspecting the injector hydraulics

For fuel injector inspection, when removing the intake manifold, remove the three head fastening screws and the clamp connecting the control unit to the manifold.

Install appropriate tools to check fuel pressure and place manifolds in containers of at least 100 cm. Connect the injector to the cable that forms the power supply for the injection tester. Attach the electric needle to the auxiliary battery. Activate fuel pump through active diagnosis. Check that within 15 seconds, about 40 cubic centimeters of fuel is not suitable for 2.5 bar pressure regulation.

Specific tooling

020480Y Petrol pressure check kit

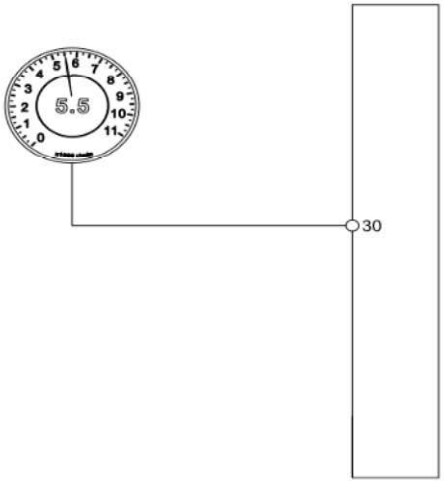
Perform injector seal test. Blow dry the ejector outlet with compressed air. Start the fuel pump. Wait one minute to make sure the syringe is not leaking. Slight water seepage is normal.
Value limit = 1 drop per minute

Components location

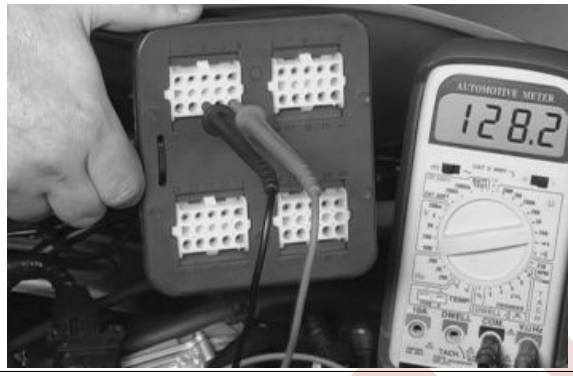
INJECTION COMPONENTS

	Specification	Desc./Quantity
1	Throttle body and electronic injection control unit (MIU)	
2	Fuel injector	
3	Diagnostics socket connector	
4	Injection load remote control	
5	Electric fan	
6	Fuel pump	
7	Lambda Probe	
8	Engine Speed sensor	
9	HV coil	
10	Water temperature sensor	

Tachometer



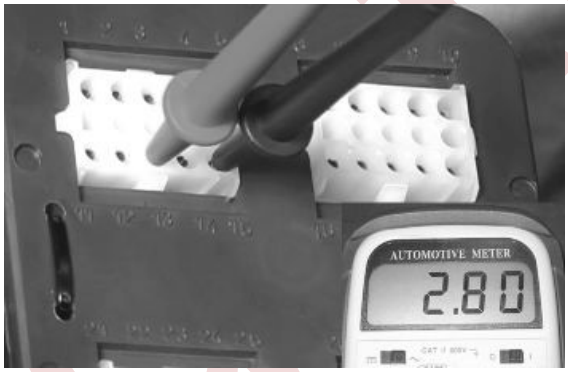
Disconnect the control unit and connected to the system, check the sensor resistance between pin 13-15 between 100 and 150 ohms engine temperature is 20 °



Disconnect fuel connections.

Start the engine and wait for it to stop.

The connection to the control unit and the system attempt to start the engine and check the voltage between pins 13 and 15, about 2.8v.



After the interface cable is disconnected from the control unit, check the continuity between the red cable of pin 13 and the rev sensor connector and the white cable of pin 15 and the rev sensor connector.

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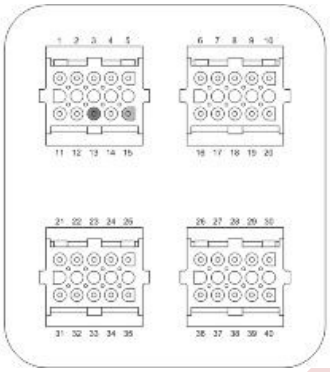
The connector of the rotary sensor is disconnected, and the interface connection and control unit are disconnected. Check whether the red and white cables (pins 13-15) are isolated from each other and are insulated from the ground.

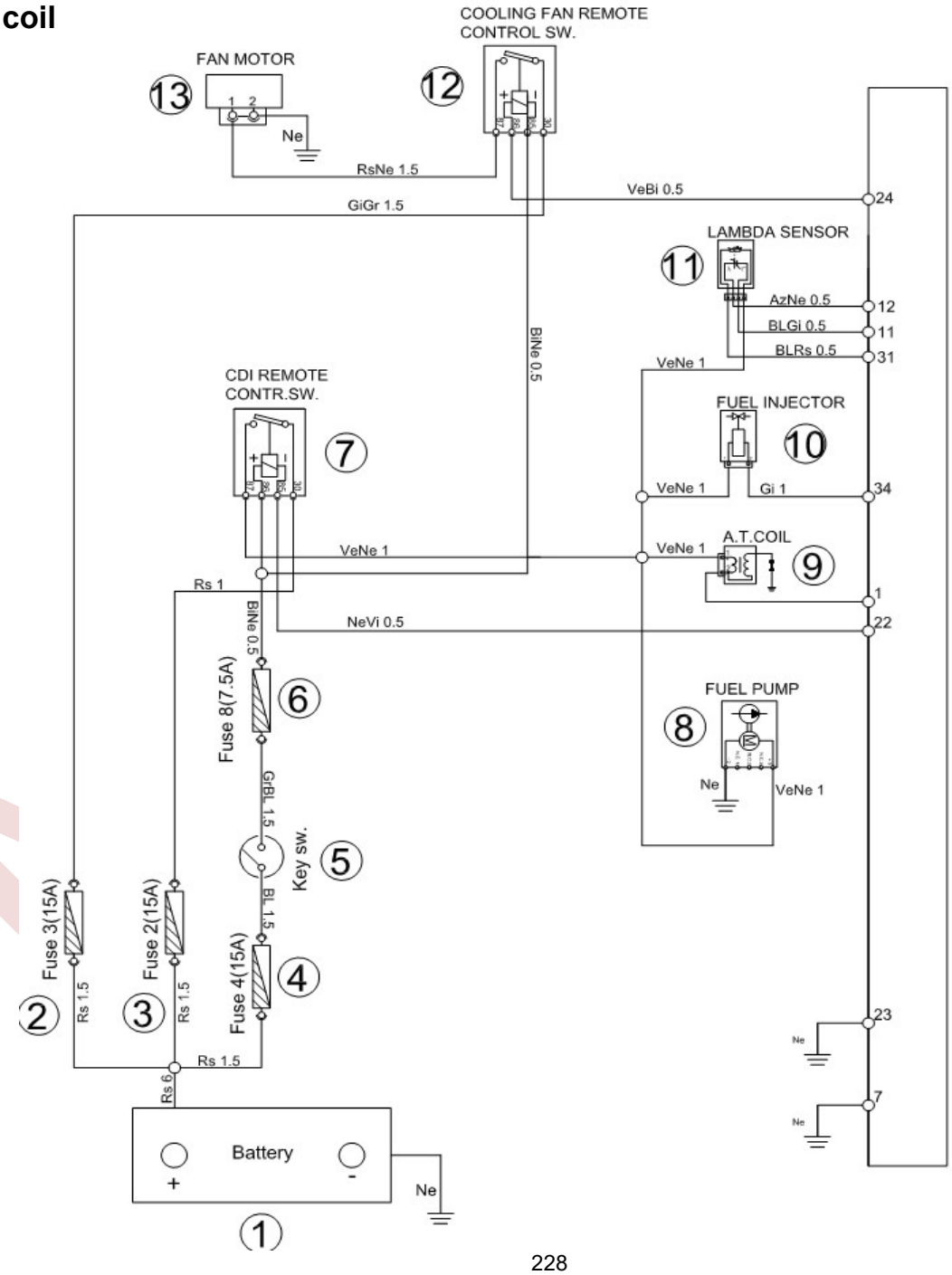


Specific tooling

020481Y Control unit interface wiring

020331Y Digital multimeter

HT coil



INJECTION LOADS

	Specification	Desc./Quantity
1	Battery	12V-10Ah
2	Fuse 3	15 A
3	Fuse 2	15 A
4	Fuse 4	15A
5	Key sw.	
6	Fuse 8	7.5A
7	CDI Remote control sw.	
8	Fuel pump	
9	A.T. coil	
10	Fuel injector	
11	Lambda sensor	
12	Cooling fan Remote Control sw.	
13	Fan motor	

The combined ignition/injection system is an efficient induction system.
The control unit manages two important parameters:
-- Ignition advance.

Immediate optimization based on engine speed, engine load, temperature and ambient pressure.

With the idling engine, the optimization obtained a stable speed of 1450 50 R / 1 ".

-- Magnetization time

The magnetization time of the coil is controlled by the control unit.

Ignition power is increased during engine start-up.

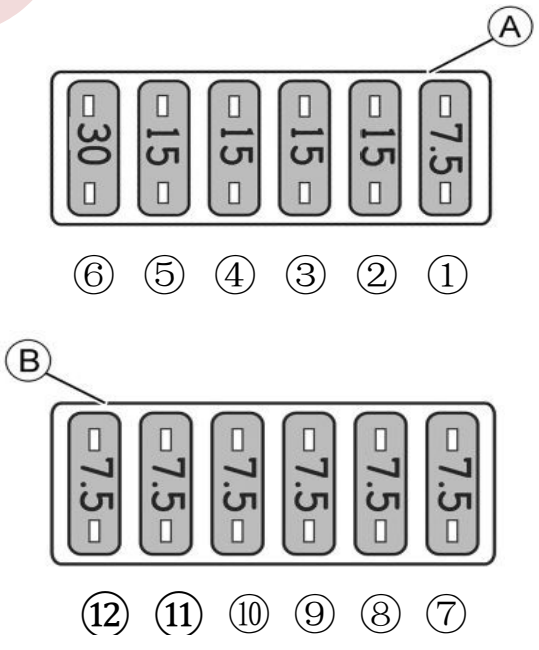
The injection system recognizes a 4-stroke cycle, so ignition occurs only during the compression phase.

Specific tooling

020331Y Digital multimeter

Check the injection load 15A no. 2 fuse is working normally.

Check whether the 7.5a fuse 8 of the power supply of the live control unit is working normally.



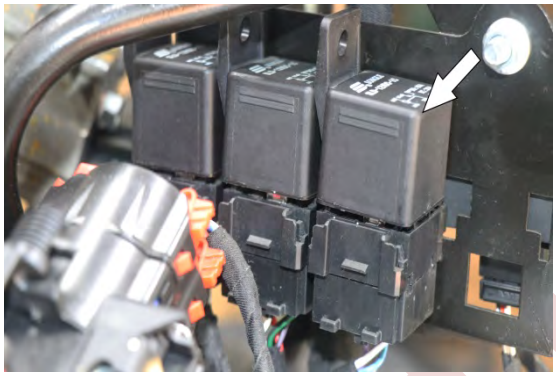
Malaguti

Check the efficiency of the loaded solenoid valve.

Check the resistance between pins 86 and 85 between the drive coils: 40 to 80 ohms

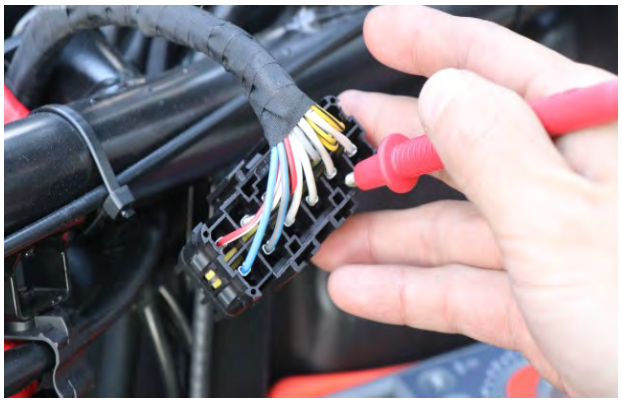
Apply 12V voltage to pins 86 and 85;

Ensure that the remote control pins 30 and 87 are continuous.



Check the power supply line of the remote charging coil of the injection load: after "ON" is connected, make sure there is a battery voltage between the black/white cable and the black/purple cable of the remote control base, lasting for 2 seconds.

If not, check the continuity of the black/white cable between the fuse box and the base of the remote control and the black/purple cable between the control units pin 20 and the base of the remote control.



NOTE

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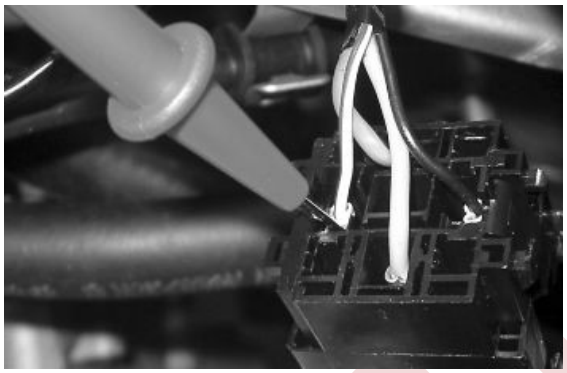
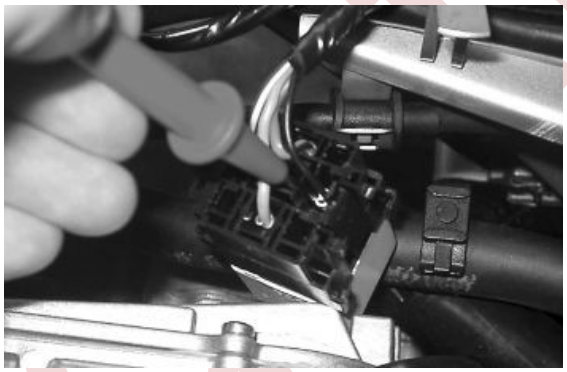
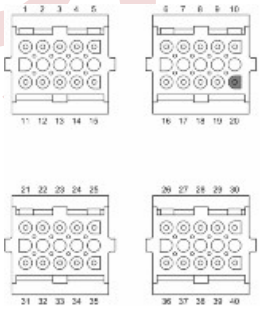
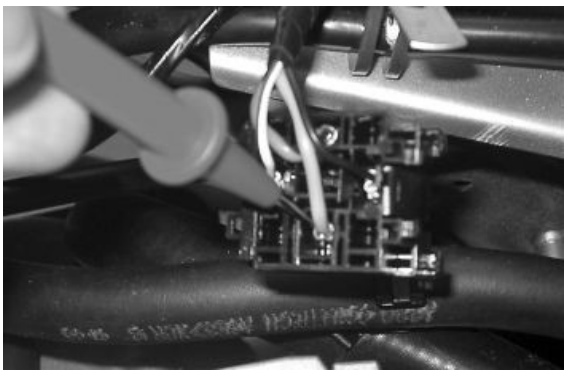






Check if there is a fixed voltage between the red/blue line of the remote control base and the ground.

If not, check the continuity of the red/blue cable between the fuse box (no. 3 15A) and the base of the remote control.



NOTE

CONTINUITY TESTS MUST BE CARRIED OUT WITH THE COMPONENTS DISCONNECTED. (REMOTE CONTROLS, ELECTRONIC CONTROL UNIT, FUSES, ETC.).

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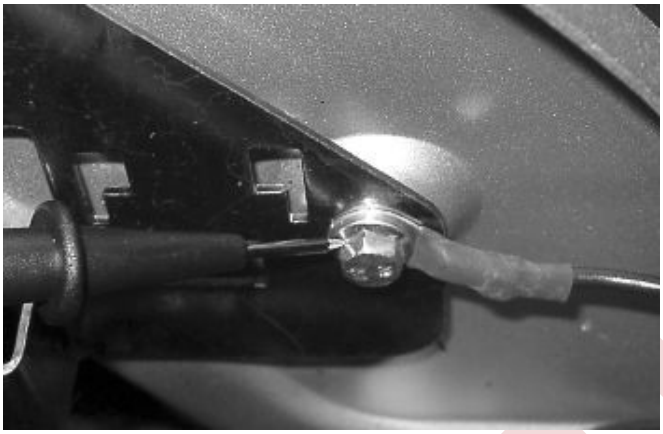
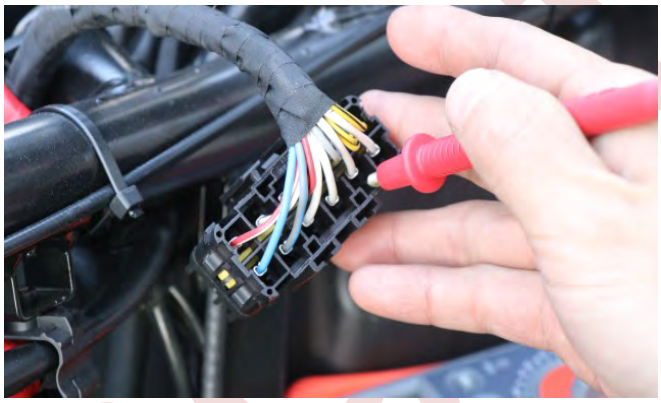
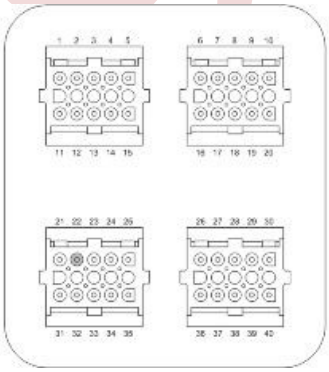


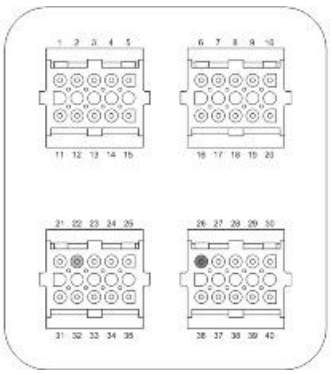


When switching to «ON», check for voltage between pins 22 and 26 of the interface wiring in about two seconds.



Check the primary coil resistance between the interface wiring pin 22 and the green and black cable at the base of the injection load solenoid valve. The control unit is disconnected and the solenoid valve is disconnected.

The main ohmic resistance is equal to 0.5 8%



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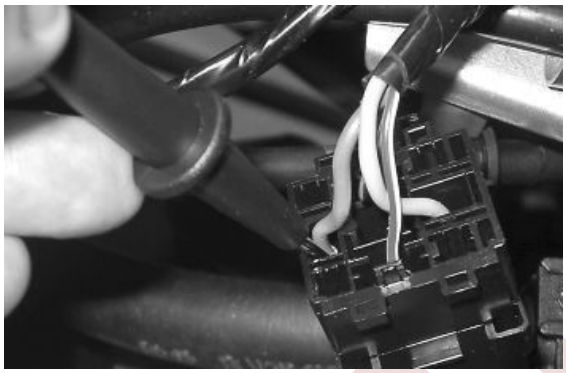
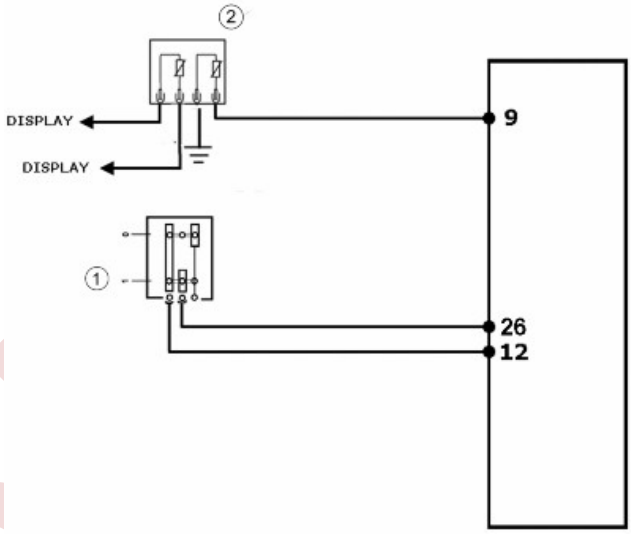


Coolant temperature sensor



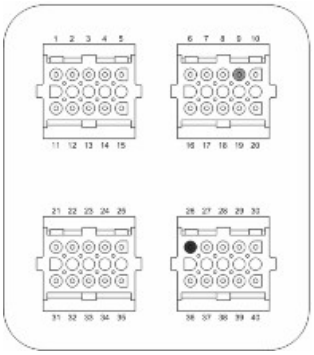
TEMPERATURE SENSOR 1

	Specification	Desc./Quantity
1	engine stop switch	
2	Water temperature sensor	

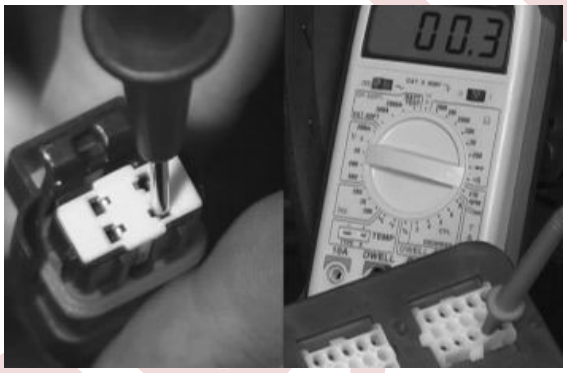
Disconnect the side connector of the control unit and connect the coolant temperature sensor connector to check the relationship between the resistance between pins 9 and 26 and the engine temperature.

20° = 2500 ± 100 Ω

80° = 308 ± 6 Ω



Disconnect control unit side connector, disconnect coolant temperature connector, and check insulation between two light blue/green and pink/yellow cables



Zeroing the throttle

Resetting the throttle valve position signal (TPS reset)

The MIU control unit has a pre-calibrated throttle valve position sensor.

Pre-calibration requires adjusting the minimum opening of the throttle to obtain a certain air flow under pre-set reference conditions.

This regulation must not be tampered with in any way whatsoever.

The injection system realizes idling management and ignition advance change by stepping motor.

The pre-calibrated throttle body has an open valve who's Angle can vary depending on the machining tolerance of the pipe and the valve itself.

The valve position sensor can also assume various mounting positions.

For these reasons, the mV of the sensor is free with the valve from one throttle body to another.

In order to obtain the best fuel mixture, especially at the small opening of the throttle valve, the throttle body must be matched to the control unit according to the TPS reset procedure.

In this operation, we inform the control unit, as the starting point, of the mV value corresponding to the pre-calibration position.

To reset, do the following.

Connect the diagnostic tester.

Switch to «**ON**».

Select the function of the diagnostic test program on «**TPS RESET**»

Specific tooling

020680Y Diagnosis Tool

Make sure the throttle valve with controls is supporting the stop screw.

To ensure that this position will remain, send confirmation of the TPS reset process.

Reset shall be carried out when:

- First try.

- If the injection control unit is replaced.

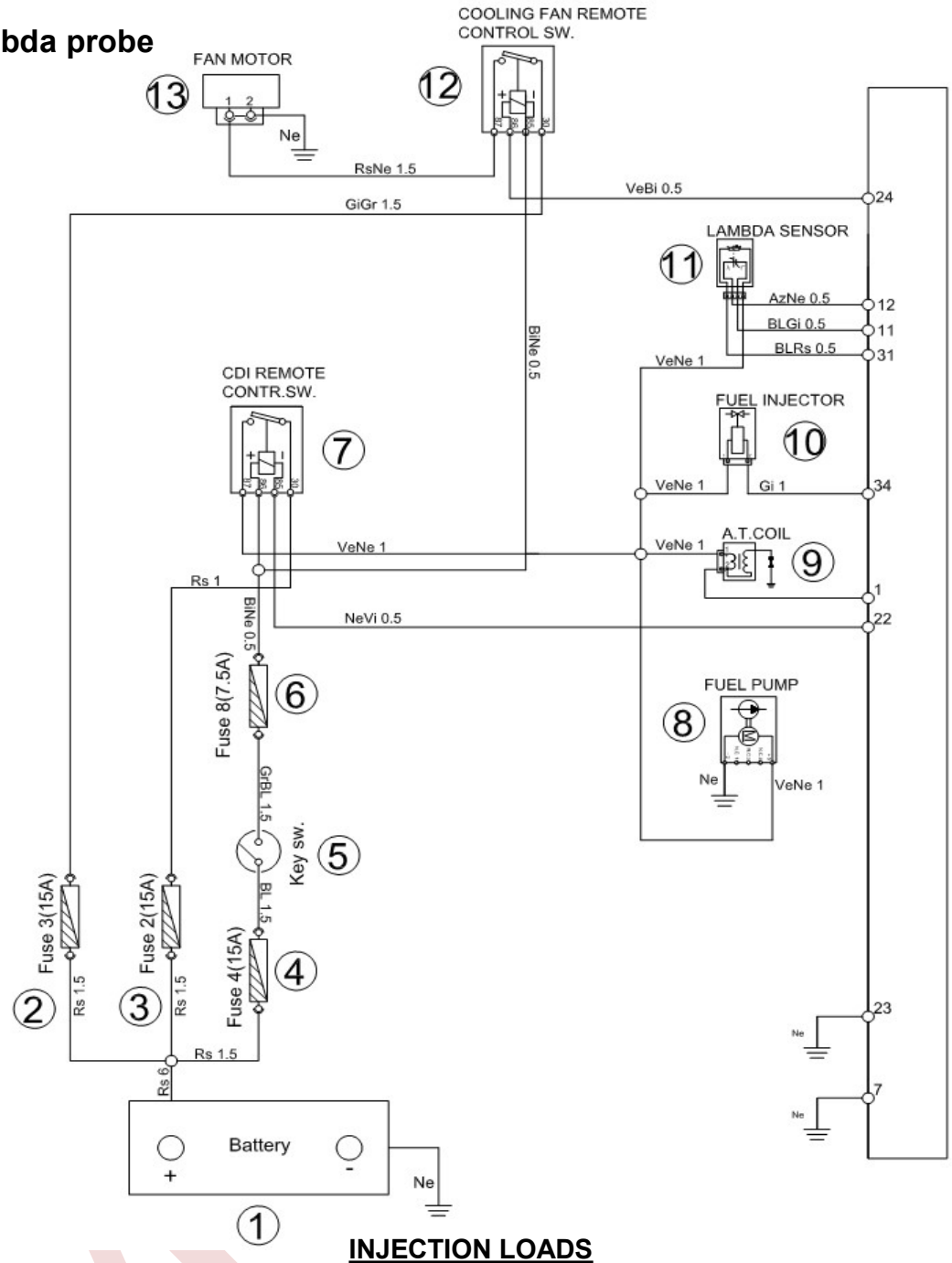
NOTE

THE TPS RESET PROCEDURE CANNOT BE PERFORMED WITH USED THROTTLE BODY BECAUSE POSSIBLE VALVE WEAR AND MINIMUM OPEN STOP WEAR MAKE THE AIR FLOW DIFFERENTLY FROM THE PRE-CALIBRATION.

Given the TPS reset also do change the control unit, control device, filter box corrugated pipe in 45 ° modified operation as shown in picture.

Malaguti

Lambda probe



INJECTION LOADS

	Specification	Desc./Quantity
1	Battery	12V-10Ah
2	Fuse 3	15 A
3	Fuse 2	15 A
4	Fuse 4	15A
5	Key sw.	
6	Fuse 8	7.5A
7	CDI Remote control sw.	
8	Fuel pump	
9	A.T. coil	
10	Fuel injector	
11	Lambda sensor	
12	Cooling fan Remote Control sw.	
13	Fan motor	

Lambda probes, or oxygen sensors, are sensors that provide information about the amount of oxygen in the exhaust gas.

The signals produced are not proportional, but of the on/off type, i.e., whether there is oxygen.

The probe is located on the exhaust manifold in front of the catalytic converter, and the gas temperature in this area is always higher.

Temperature probe to work at least 350 ° C to 600 ° C, it has a response time just 50 milliseconds.

The resulting signal passes from a high value to a low value, and the mixture =1.

Specific tooling

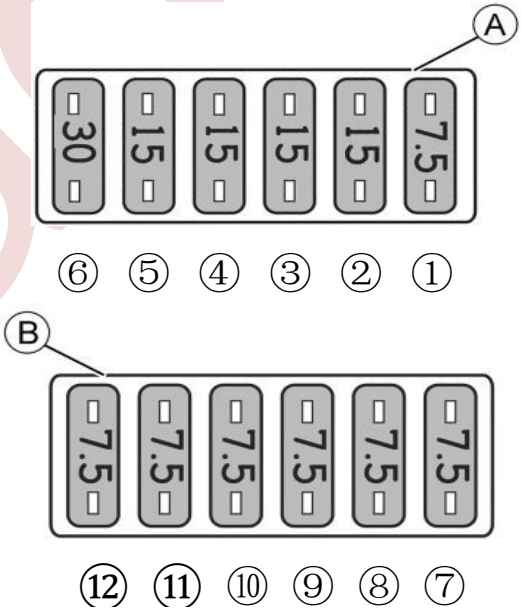
020481Y Control unit interface

wiring 020331Y Digital

multimeter

Check the injection load 15A no. 2 fuse is working normally.

Check whether the 7.5a fuse 8 of the power supply of the live control unit is working normally.

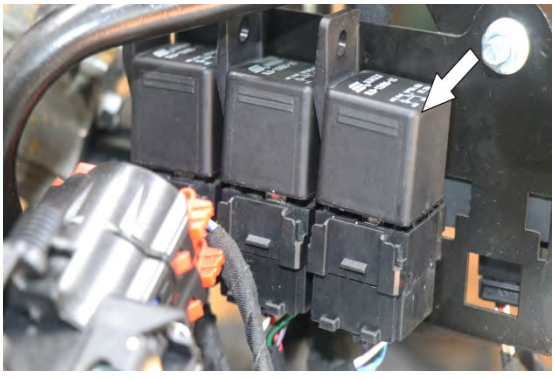


Check the efficiency of the loaded solenoid valve.

Check the resistance between pins 86 and 85 between the drive coils: 40 to 80 ohms

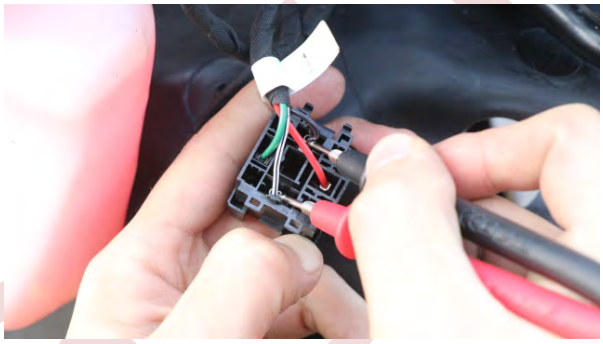
Apply 12V voltage to pins 86 and 85;

Ensure that the remote control pins 30 and 87 are continuous.



Malaguti

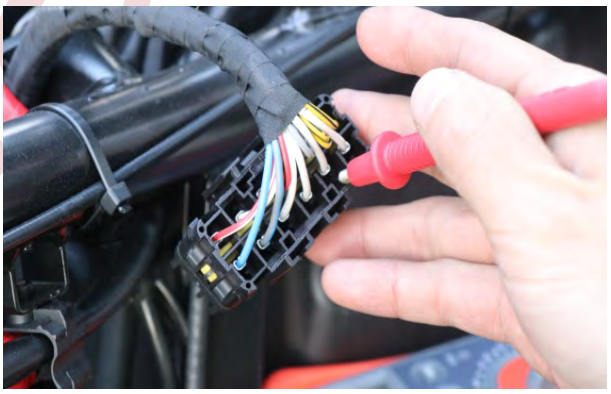
Check the power supply line of the remote charging coil of the injection load: after "ON" is connected, make sure there is a battery voltage between the black/white cable and the black/purple cable of the remote control base, lasting for 2 seconds.

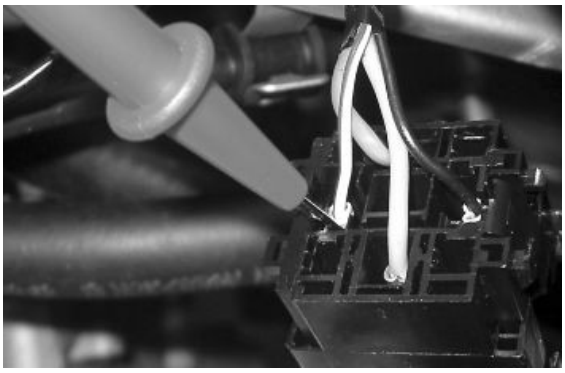


If not, check the continuity of the black/white cable between the fuse box and the base of the remote control and the black/purple cable between the control units pin 20 and the base of the remote control.

NOTE

CONTINUITY TESTS MUST BE CARRIED OUT WHEN THE PARTS ARE DISCONNECTED. (REMOTE CONTROLS, ELECTRONIC CONTROL UNIT, FUSES, ETC.).





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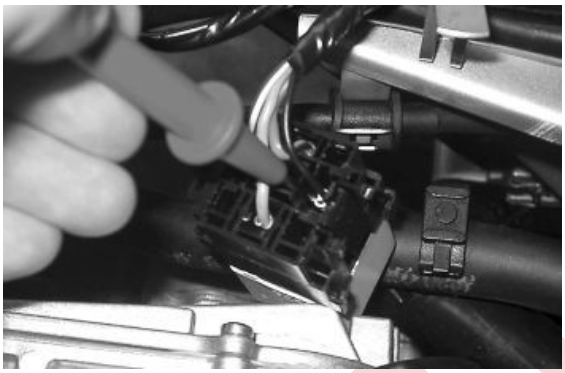
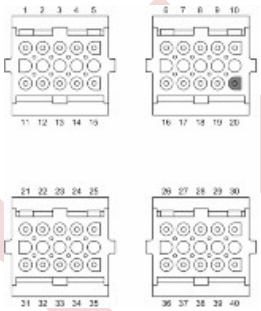


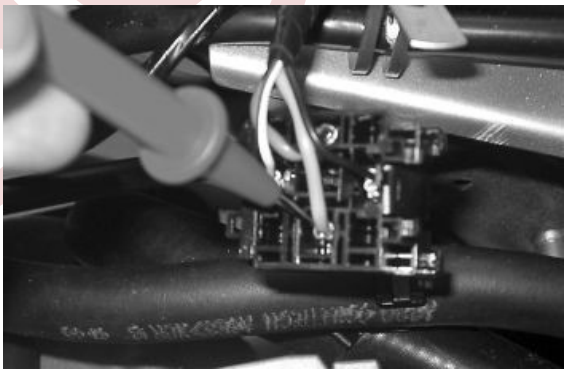


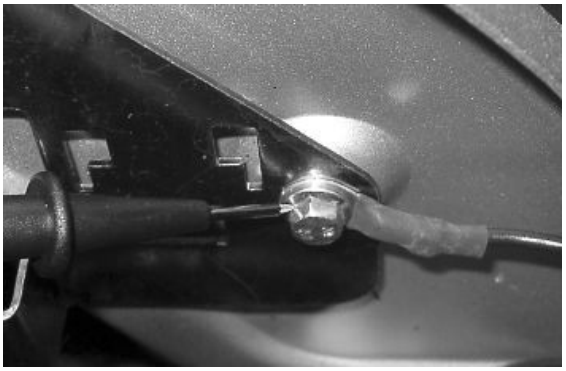
Check if there is a fixed voltage between the red/blue line of the remote control base and the ground.

If not, check the continuity of the red/blue cable between the fuse box (no. 3 15A) and the base of the remote control.

NOTE

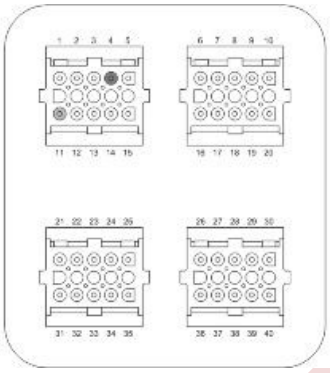
CONTINUOUS TESTING MUST BE CARRIED OUT WHEN PARTS ARE DISCONNECTED. (REMOTE CONTROLS, ELECTRONIC CONTROL UNIT, FUSES, ETC.).



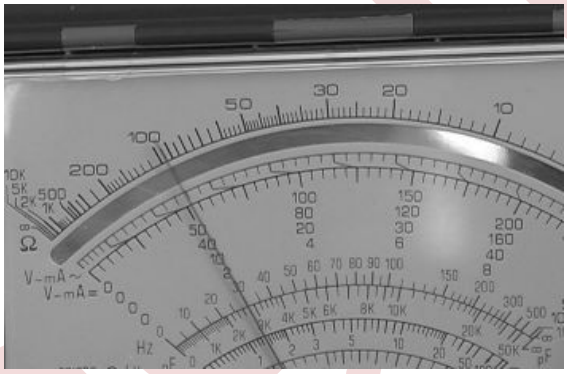


SIGNAL CONTROL

Install interface wiring of electronic control unit.
Start the engine and preheat it until the fan is turned on.
Using an analog multimeter, the dc voltage scale can be up to 2v.
Place the multimeter needle between 4(-) and 11(+)



When the engine is idling, check that the voltage oscillates between 0V and 1V
When the throttle valve is fully open, its voltage is approximately 1 v.
In the closed phase, the voltage is approximately 0 v.
If the voltage remains constant, the sensor may be damaged.
Remove the sensor and check for oil or carbon deposits



Malaguti

INDEX OF TOPICS

Malaguti

This section is devoted to operations that can be performed on a suspension.

Front

Removing the front wheel

- Remove retaining nut from axle on left side of vehicle.
- Loosen the two screws holding the wheel shaft clamp and remove the clamp.

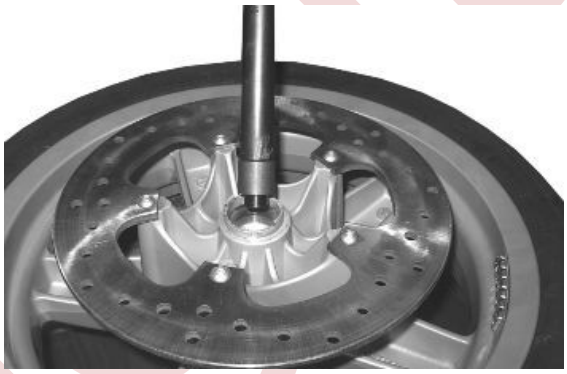
Front wheel hub overhaul

Check wheel bearings for signs of wear.

If you must replace the wheel bearings, follow these steps:

- Remove the two bearings on the side of the brake disc with pliers 14 and special bell 9.
- Remove the internal spacer.

- Support the front wheel with two wooden spacers to avoid scratches when touching the rim.
- Insert the punch (including adapter handle, 24mm adapter and 15mm guide rail) from the side of the brake disc to remove the opposite bearing and spacer bushing.



Specific tooling

020376Y Adapter handle

020456Y Ø 24 mm adaptor

020412Y 15-mm guide

- Heat the bearing seat opposite the brake disc with the hot gun.

- Insert the bearing with a punch consisting of adapter handle, 40x37mm adapter and 15mm guide rail and place it in a stop position.

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- Reinsert the spacer bushing into the side of the brake disc with the appropriate tool and bring it to a stop position.

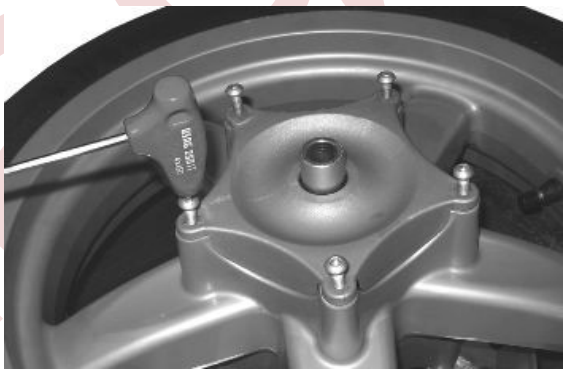
Specific tooling

020376Y Adapter handle

020359Y 42 x 47-mm adaptor

020412Y 15-mm guide

020201Y Spacer bushing driving tube



- Replace the lid and tighten the five retaining screws.

- Turn the wheels over and insert the internal gasket, on which the Seeger ring is mounted facing the bearing on the side of the brake disc.

- Use the hot gun to heat the bearing seat on the side of the brake disc.

2 - Using a punch consisting of an adapter handle, 32x35mm adaptor, and a 15mm guide rail, insert two bearings one at a time and move it to a stop position.

Specific tooling

020376Y Adapter handle

020357Y 32x35-mm Adaptor

020412Y 15-mm guide

Refitting the front wheel

- When refitting, please pay attention to correctly repositioning the odometer driver.

Locking torques (N*m)

Wheel axle nut 45 to 50 **Wheel axle clamp screws** 6 - 7 Nm

Handlebar

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Removal

- Remove the upper parts of the two handlebars and baffles as described in the « bodywork » section.

- Remove the handlebar wiring fixing belt and remove the electrical connector from the brake bar.
- Unscrew the fitting and remove the front and rear brake pump line.
- Remove the flexible gearbox on the throttle handle and remove the throttle control.
- Unscrew the indicating nut, collect the washer, and remove the retaining pin on the steering tube.
- Pull up to the handlebar

NOTE

TO REMOVE THE HANDLEBAR TO REMOVE THE STEERING GEAR, SIMPLY TILT THE HANDLEBAR FORWARD TO THE FRONT OF THE CAR WITHOUT REMOVING THE MOUNTED PARTS TO AVOID DAMAGING THE AXLE.

Refitting

Perform the teardown operation, but observe the specified tightening torque in reverse order.

Locking torques (N*m)

Handlebar fixing screw 50 ÷ 55

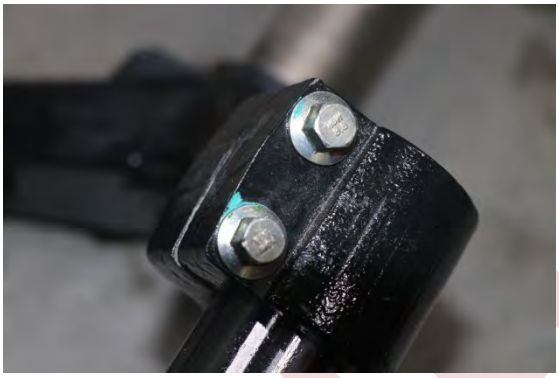
Front fork

Removal

See also

Overhaul

- Supports the fork in the vise.



- Loosen the two tightening screws on the stem support clip.
- Unscrew stem close cover and slide entire fork leg down from corresponding support

CAUTION

THE STEM CLOSING CAP KEEPS THE MAIN SPRING PRE-LOADED. KEEP THE CAP PROPERLY FITTED DURING THE REMOVAL FINAL STAGE TO AVOID ACCIDENTS.

- Correctly support the leg, remove the main spring, and drain the leg oil.

Remove the hydraulic rod retaining screw with the corresponding sealing gasket:

- Equipped with 19 mm hex wrench, lock hydraulic rod rotation.
- Loosen the retaining screw and collect the copper washer.

- Remove stem dust cover with screwdriver.

- Remove the ring clamp holding the oil seal.

- Take out the stem.
- Check that there is no sign of wear or bite between stem and fork leg. Otherwise, replace the damaged parts.

Characteristic

Maximum fork leg diameter

35.10 mm

Minimum stem diameter

34.90 mm

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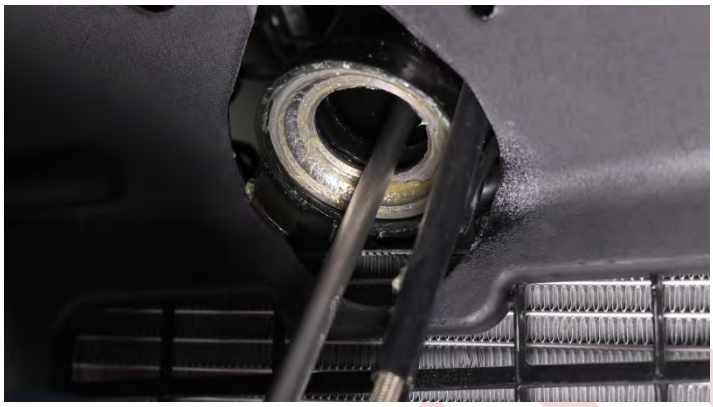
-Use appropriate tools to remove oil seals.



- Put the pull rod into the oil seal.

- Sequentially inserted into 2 half - rings/Ø 35 mm stalk.

Specific tooling

020487Y Fork oil seal extractor

- Manually hold the pull rod so that it does not fall into the forked leg and/or two half-rings are not in place.

- Ring the bell.

- - tighten the nut until stop.

- - apply to the tool until the oil seal is completely moving again.

Specific tooling

020487Y Fork oil seal extractor

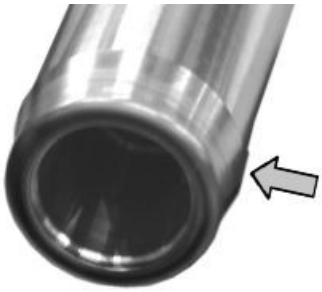
- Remove the hydraulic lever and corresponding sealing washer, spring and stop bushing.

COMPONENT CHECK

CAUTION

CLEAN ALL THE COMPONENTS THOROUGHLY.

- Check whether the forked leg of the attachment is broken.



- - check stem for nicks, dents, or damage.
- - check whether the hydraulic bar stop bushing is properly fixed through the caulking.

- Check whether the hydraulic rod's caulking, the unloading from the rebound force to the end of the stroke and the seal ring of the hydraulic rod are in good condition.

- Check that the main spring shows no signs of bending or abnormal wear

- Check that the stem shutoff bonnet o - ring is in good condition.

Refitting

- First apply oil to the separation chamber of the two sealing lips of the new oil seal.

- Attach the sealing ring to the stem so that identification is literally up.
- Use appropriate tools to drive the oil seals as much as possible.

Specific tooling

020376Y Adapter handle 020359Y 42 x 47-mm adaptor

- Preinstall the hydraulic lever, spring and stop bushing on the stem.
- Install preassembled parts into the forked legs.

- Match the hydraulic rod retaining screw with the copper seal washer and tighten it to the specified position using the recommended product.

CAUTION
ALWAYS USE NEW COPPER WASHER.

Locking torques (N*m)

Hydraulic rod fixing screw **25 ÷ 35***

(°) Apply LOCTITE 243 threadlock

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- Use a 19 mm hexagon wrench to lock the hydraulic rod for rotation.

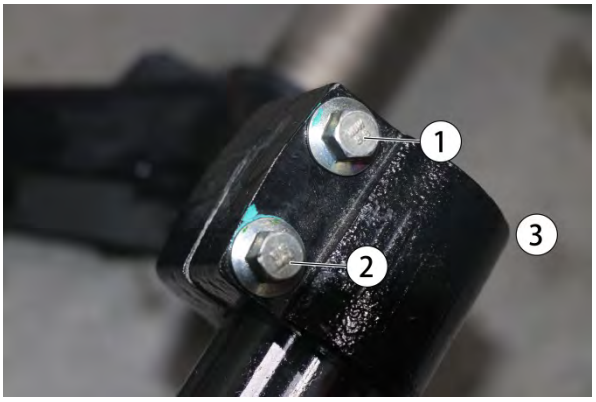
- Install oil seal fixing clamp.

- Grease and install new dust cover.

- Install the fork leg with the stem on the fork support clip until stopped.
- Tighten the two screws to the required torque in the order shown in the drawing.

Locking torques (N*m)

Stem support clamp tightening screws 20 to 25



- Refill the cross leg with the recommended product in the specified amount.

Recommended products

AGIP FORK 7.5 W Oil for fork.

-

Characteristic

Oil quantity per stem

133 ± 3 cm³

- Reactivate stem to vent hydraulic lever.
- Spring into stem

CAUTION

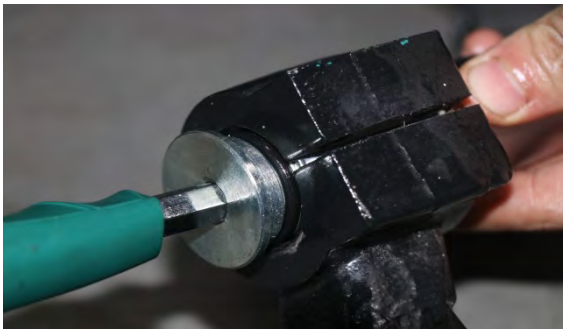
FIT THE SPRING WITH THE SMALLER PITCH TO THE UP- PER PART OF THE STEM.

- Insert bushing and bolts into spring loaded stem. Install the closing cover and tighten according to the specified torque

- O - Ring for shutoff cover of lubricated stem.

Locking torques (N*m)

Fork locking screws cap 15 ÷ 30



- Repeat with the other forked leg.

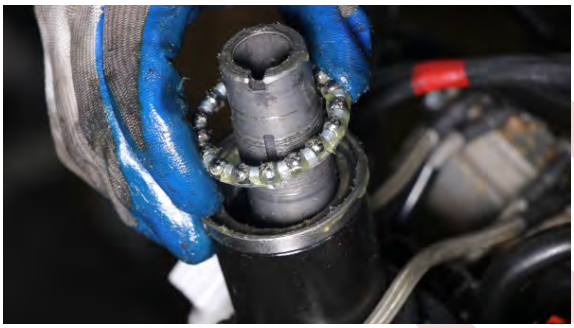
NOTE

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

Steering column

Refitting

- Install the lower steering bearing on the steering tube.
- Attach the fork to the spindle box with the lower steering bearing and hold it so that it does not fall off.
-



NOTE

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.

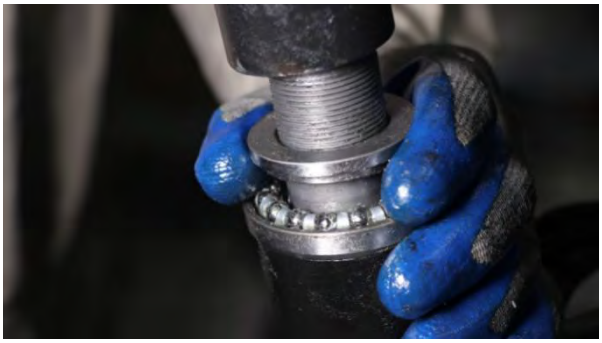
TL 9150 066, symbol NATO G 460

- Install steering bearings.

CAUTION

INSERT THE UPPER STEERING BEARING WITH THE CAGE FACING UPWARDS.

- Install steering bearing upper seat.



- Install cover plates.

- Insert gasket.

- Insert the lower tightening ring nut, tighten it to stop, and tighten it to predetermined torque with special tools.

Specific tooling

020055Y Wrench for steering tube ring nut

Locking torques (N*m)

Steering tube lower ring nut 14 ÷ 17

Malaw

- Install the spacer between the two ring nuts on the steering tube at the indicated position.

- Insert the upper tightening ring nut, tighten it until it stops, and tighten it to the specified torque with a special tool.

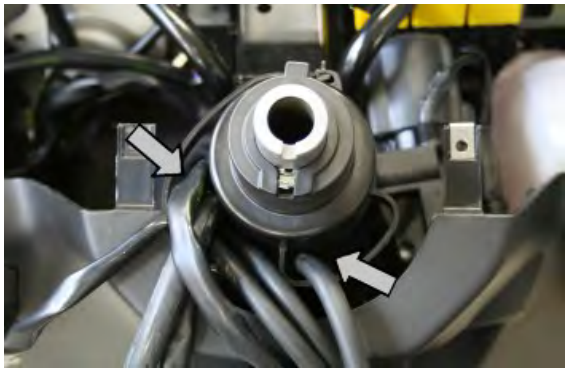
Specific tooling

020055Y Wrench for steering tube ring nut

Locking torques (N*m)

Steering tube upper ring nut 40 ÷ 45

Insert the coupling shown in the figure and restore the cable channel shown in the figure.



- Fit the front wheel.

Steering bearing

Removal

- Thoroughly clean and visually inspect components for good condition.
- Check the upper steering bearing for wear.

- Check steering bearing for wear.

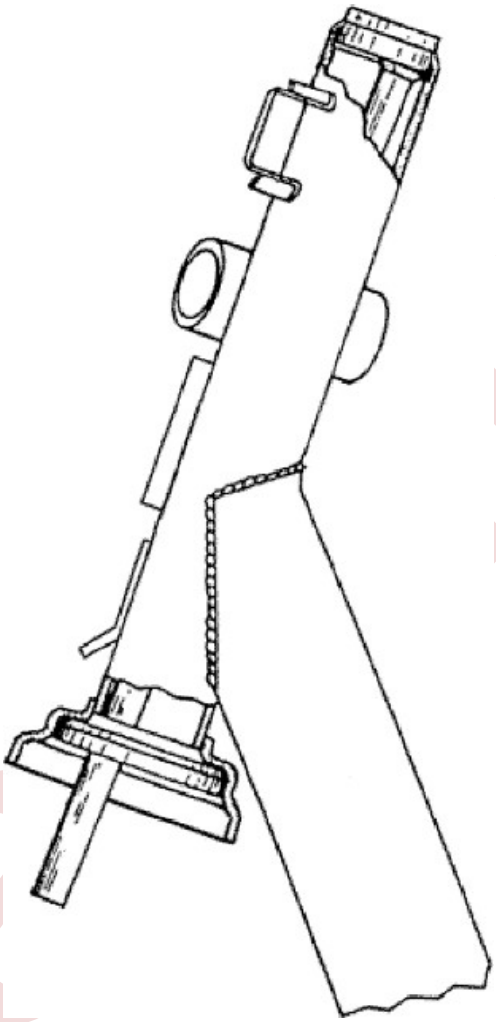
- Visually inspect the fifth wheel track, spindle box and steering pipe of the steering wheel for scratches or abnormal wear.
- Otherwise, replace them.

STEERING FIFTH WHEEL TRACK REMOVAL

- Remove the steering wheel fifth wheel track on the chassis with a special tool as directed.
- Install special tools from the lower part of the spindle box until it comes into contact with the upper track.
- Hit the special tool hard and place it on a different point relative to the diameter to eliminate the track above

Specific tooling

020004Y Punch for removing steering bearings from headstock



- Repeat the procedure for the lower steering bearing track.

- Remove the lower steering bearing housing on the steering tube using a special tool.

Specific tooling

020004Y Punch for removing steering bearings from headstock

Refitting

STEERING FIFTH WHEEL TRACK FITTING

- Thoroughly clean the track seats on the headstock and steering tube.
- Use specific tools to install new tracks for the headstock.
- Tighten the nut until the track is fully inserted.

NOTE

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

Specific tooling

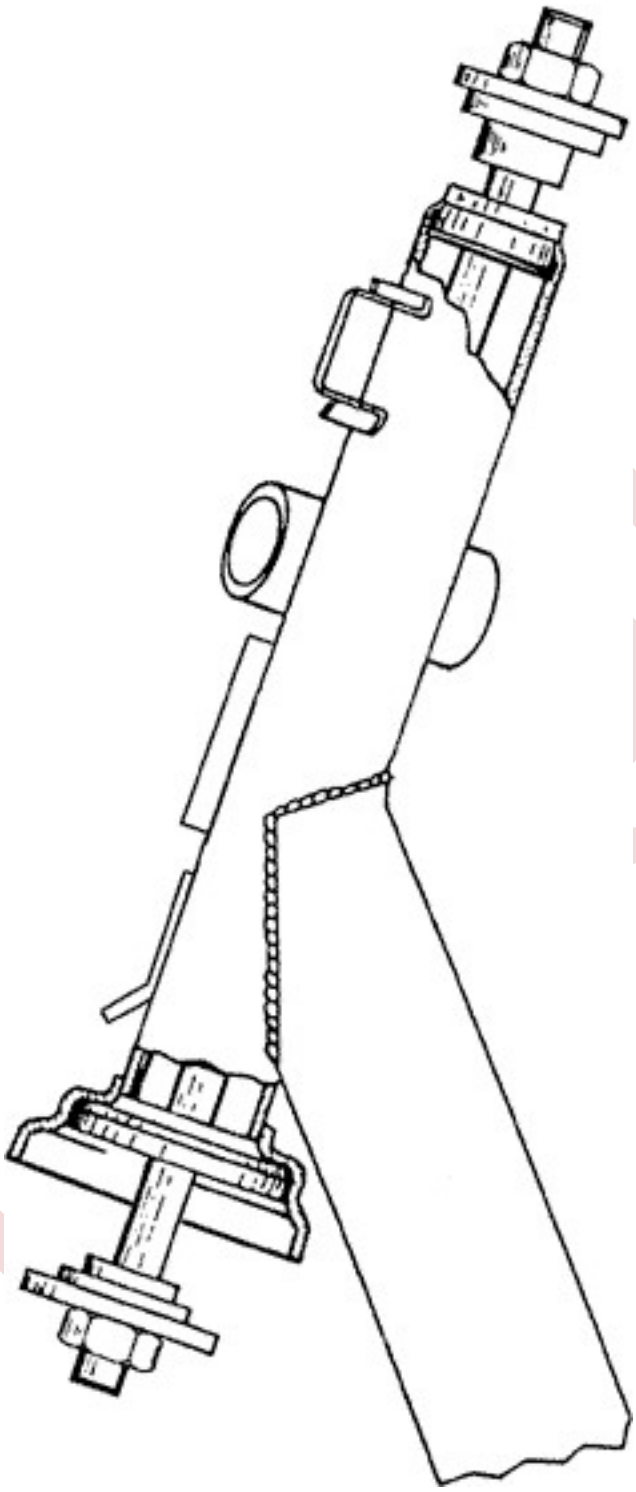
001330Y Tool for fitting steering seats

Recommended products

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

TL 9150 066, symbol NATO G 460

Malaguti



- Install the next five wheel seats on the steering tube.

- Use special tools to install the next five wheel seats on the steering tube

NOTE

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

Specific tooling

020459Y Punch for fitting bearing on steering tube

Recommended products

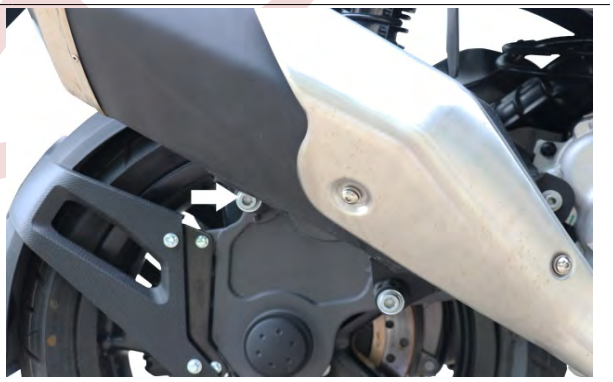
AGIP GREASE PV2 Ivory smooth-textured, slightly-stringy anhydrous calcium-base grease.

TL 9150 066, symbol NATO G 460

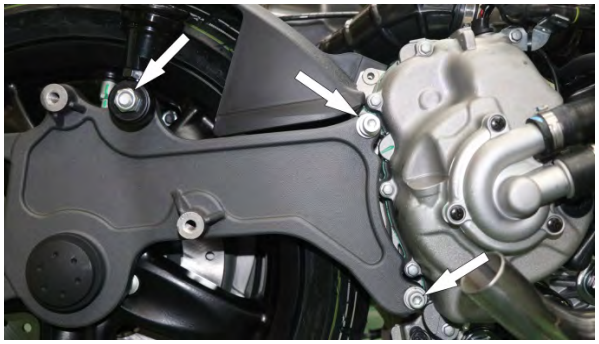
Rear

Removing the rear wheel

Remove the entire muffler assembly.



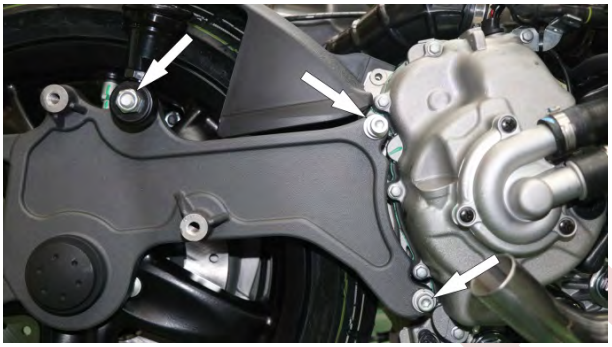
- Remove the outer part of the overhead, cover, axle retaining nut and one of the two spacers.



- Remove the two screws holding the fender to the bracket
- Remove the two screws holding the engine bracket in place

Malaguti

- Slide down the axle bracket and use the heat gun if necessary.



- Remove the 5 bolts on the wheels and remove

Refitting the rear wheel

To install, follow the disassembly steps, but in reverse order, carefully installing the shim on the axle as shown.

Locking torques (N*m)

Silencer arm clamping screws 27 - 30 Rear wheel axle nut 104 to 126 Shock absorber-crank- case attachment bracket 20 to 25 Lower shock absorber clamping screw 33 - 41 Nm Rear brake caliper fixing screws 25 - 30 Nm

Swing-arm

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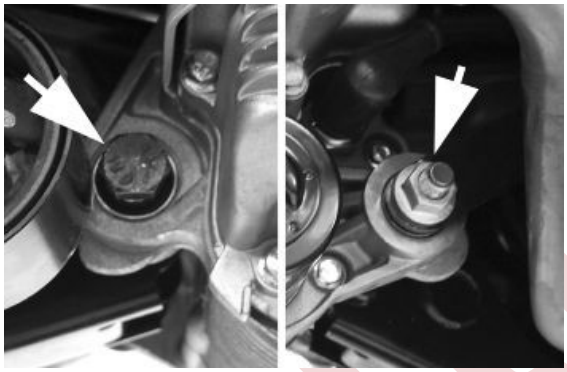
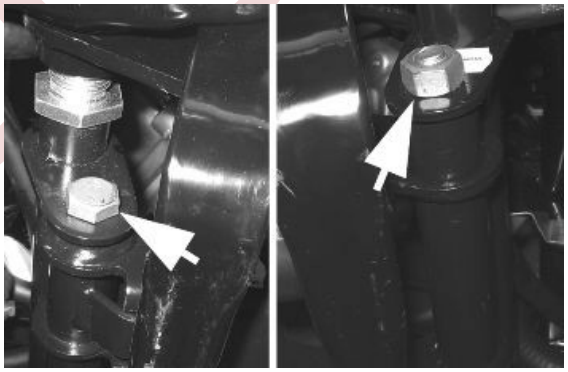
Removal

- Place the vehicle on its central support;
- Remove the swing arm/engine parts shown in the drawing
- Move the engine back



- Remove the spring holding the swing arm to the chassis as shown

- Remove the two screws holding the buffer bracket to the chassis



- Loosen the nut on the LHS as shown and remove the corresponding bolt from the other side.
- Remove the swinging arm.

Malaut

- Check the entire swing arm assembly.
- Check all centering bushing assemblies and mute block rubber bumpers.
- Replace working parts that cause excessive clearance of rear suspension.

Overhaul

- Check whether the engine side swing arm and chassis side swing arm are stuck.
- Use a feeler to check the axial clearance between the two swinging arms

Characteristic

Standard clearance

0.40 - 0.60 mm

Allowable limit after use:

1.5 mm

- To check the clearance of the swing arm on the side of the frame, prepare a retainer with the fixing pin of the swing arm on the frame and two rings of the special tool 020229Y.
- Another option is to use two washers with an inner diameter of 12 mm, an outer diameter of at least 30 mm and a thickness of at least 4 mm.

- Check the rotation process is not stuck.
- Check the axial clearance of the chassis side swing arm.

Characteristic

Standard clearance

0.40 - 0.60 mm

Allowable limit after use:

1.5 mm

- Separate the engine side swing arm from the vehicle side swing arm.
- Remove the plastic bushing and internal gasket as shown.

- Remove the roller housing using the appropriate pin as shown

- Install the new roller sleeve using the appropriate tool set and carefully position the bearing with the sealing ring facing outwards

Specific tooling

020244Y 15-mm diameter punch

020115Y Ø 18 punch

Characteristic

Length of the swinging arm tube on the engine side:

L 175.3 + 0.3 0

Length of the internal swinging arm spacer on the engine side:

L 183 + 0.3 0

Engine side swinging arm plastic bushing shim:

3.5 ± 0.05 mm

Chassis side swinging arm plastic bushing shim:

3.5 ± 0.05 mm

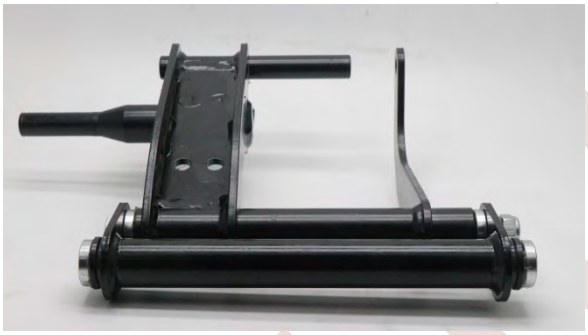
Length of the internal swinging arm spacer on the frame side:

290 ± 0.1 mm

Length of the swinging arm tube on the chassis side:

283 ± 0.1 mm

- Lubricate roller bushing and plastic bushing with grease



- Insert gasket
- Assemble the two arms with the relative bolts in the positions shown in the figure
- Adjust bolts as shown
- As shown in the figure, point the most prominent part of the chassis side swing arm to the side of the stationary block

Recommended products

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

TL 9150 066, symbol NATO G 460

-

- Make sure the silence group is not broken. If so, replace the coupling.
- Remove the Seeger ring shown in the picture

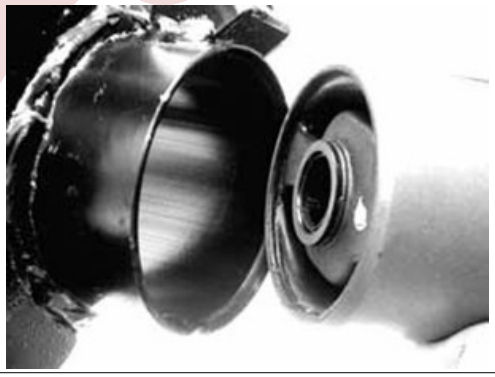
-

- Removes the entire silence zone bracket
- Unlock the ring of silence

Malaguti

- Hold the completely mute group bracket in the cla
- Remove the muffler block from the bracket on the corresponding side inside the vehicle using appropriate tools.
- This is to ensure that the tool is correctly centered on the holder

- Install a new silence group to ensure it is correctly aligned with the reference teeth.
- Install the mute block to ensure that the chamfering part of the mute block matches the chamfering part of the bracket



- Use appropriate tools to work with the silent areas shown in the diagram

Refitting

- To reinstall, reverse the delete operation.
- Lubricate bearings and rolling parts with the recommended grease.

- Assembly is accomplished by tightening the nuts on the relative bolts to the appropriate tightening Torque.

Locking torques (N*m)

Engine and vehicle side swinging arm junction bolt 33 ÷ 41 Nm Swinging arm pin - Engine 64 ÷ 72 Body shell - Swinging arm pin 76 ÷ 83 Screw fixing the silent-block support plate to the body 42 ÷ 52

Shock absorbers

Removal

Perform the following steps:

- Place the vehicle on its central support;
-
- Jack up the engine a bit to loosen the shock absorbers;
- Remove the muffler
- Remove the clamping screw of the shock absorber spring assembly from the bracket fixed on the engine at one end and the muffler at the other end;
- Unscrew the two upper nuts holding the shock absorber spring assembly to the frame (one on each side) and remove the shock absorber.

Refitting

Do the previous operations in reverse order.

Locking torques (N*m)

Shock absorber lower clamping 33 to 41 Shock absorber upper clamp 33 to 41

Centre-stand

REMOVAL

- Correctly support the vehicle with a jack.
- Remove the two return springs from the center bracket.
- Loosen the nut as shown.
- Remove the pin from the right side.
- Remove the intermediate support.

FITTING

- Tighten the nut to the specified torque when reinstalling.

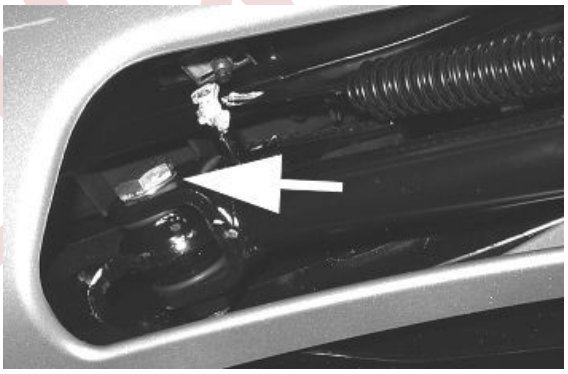
Locking torques (N*m)

Centre stand bolt 32 to 40

Side stand

REMOVAL

- Remove the center frame return spring;
- Remove the screws from the photograph



FITTING

When refitting, disassembly shall be carried out in the reverse order and the required torque shall be met.

Locking torques (N*m)

Side stand fixing bolt 35 to 40

Malaguti

INDEX OF TOPICS

Malaguti

This section is devoted to the operations that can be performed on the body of the vehicle.

Seat

- Remove the two mounting screws from the frame.
- Remove the control button of the under-saddle lamp.

Rear handlebar cover

- Use a screwdriver to loosen the three retaining plates on the rear baffle cover as shown, taking care not to damage the paint surface.

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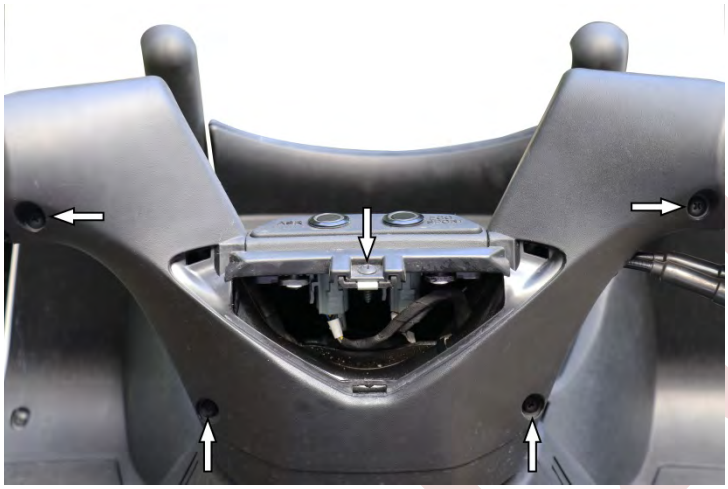
- Remove the five retaining screws from the

  Rear connecting rod cover.
- Remove back cover.

NOTE

WHEN INSTALLING, THE CENTRE SCREW IS A METAL SCREW, THE OTHER 4 ARE PLASTIC.



Malaguti

Instrument panel

- Remove the dashboard.
- Loosen the four retaining nuts on the instrument panel.

Front handlebar cover

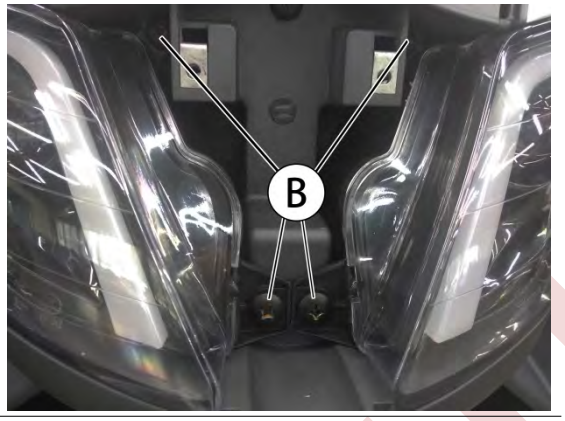
- Remove rear handlebar cover.
- Remove the left and right frames of the brake pump fixed with two fixed fins.

- The handlebar itself unscrews the four screws on the front cover of the handlebar.

- Disconnect the ASR and Sport/ECO connector.

Headlight assy.

- Remove the middle cover of the protective cover.
- Remove the 4 front retainers of the headlight assembly.



- To remove the right light assembly, remove the screws located near the expansion tank cover.

- To remove the left light assembly, remove the screws located in the left storage room.

Remove the lamp and disconnect the electrical connector from the lamp and the full lamp holder of the position lamp.

NOTE

THE REAR ADJUSTMENT SCREWS SHOWN IN THE FIGURE ARE ADJUSTED DURING ASSEMBLY OF THE LIGHT AND MUST NOT BE ALTERED.

Frame central cover

The chassis is centrally covered with a central passage and two side fairing as follows:

CENTRAL TUNNEL:

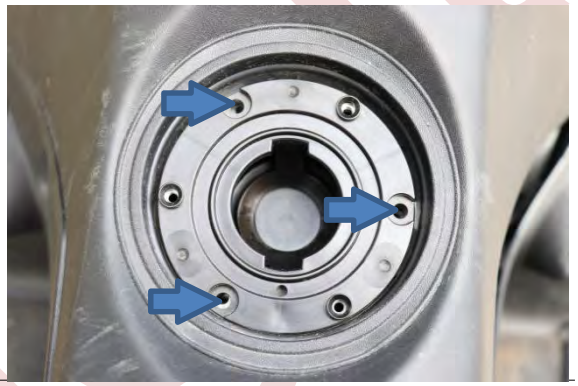
- Remove saddle with hinge.

- Open the tank lid.
- Loosen the screws shown in the drawing.

- Loosen the three screws shown in the figure.

NOTE

THE OTHER 3 SCREWS HAVE ONLY AN AESTHETIC FUNCTION

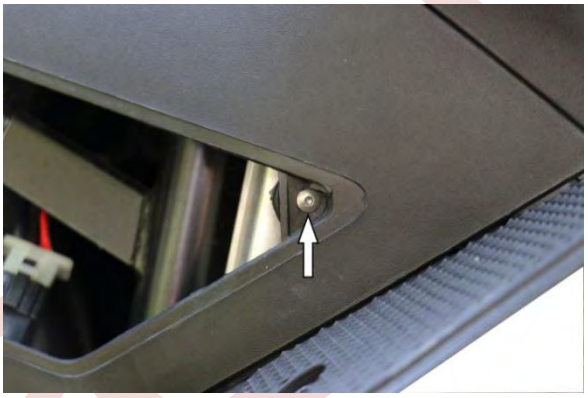


- Remove the screws shown in the drawing from both sides of the vehicle.

Malaguti

- Working from both sides, loosen indicator screws, loosen retaining tongue, and remove side air deflector.

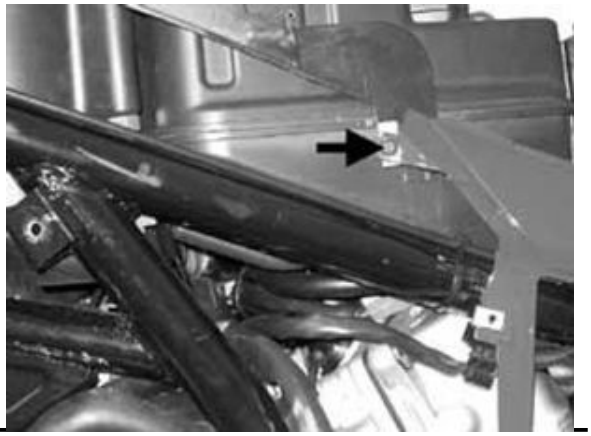
- Loosen both sides of the screw shown in the drawing.
- Remove the central tunnel and slide it over the tongue.



SIDE FAIRING:

- Demolition of the central tunnel.
- Remove side fairing.
- Remove handle and top side fairing.
- Remove left and right pedals (see pedals).

- Work from both sides and loosen the screws shown in the drawing.
- Remove side fairing and slide from tongue



Legshield

The anterior shield has many parts. The demolition procedure is as follows:

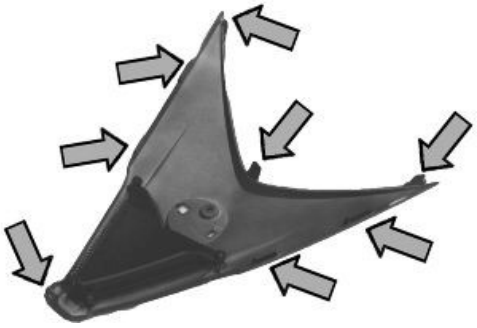
FRONT LOWER FRAME:

- Using a screwdriver, remove the clipped badge.

- Unscrew and remove the screws under the badge.

- Remove the screws «A».

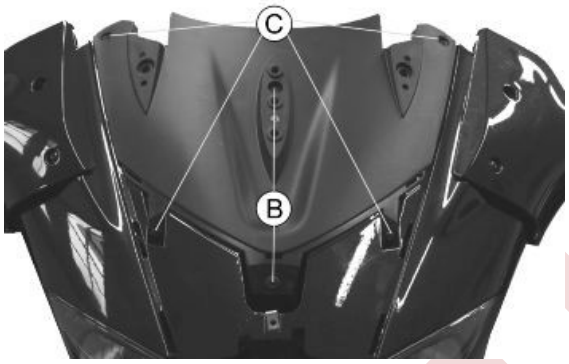
- Be careful not to damage the plastic tongue, remove the front lower frame and slide up from the bottom to the top.



FRONT UPPER FRAME:

- Remove the FRONT LOWER FRAME.
- Remove the windshield together with the supports.

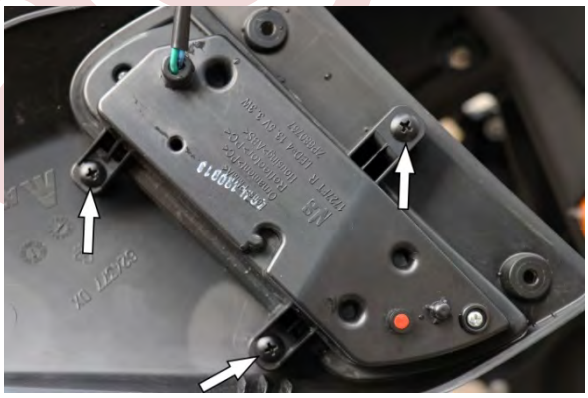
- Remove two screws «B» and four screws «C».
- Slide the frame off your tongue.



FRONT TURN INDICATORS:

- Loosen and remove the three screws indicated.

- Disconnect the front steering indicator connector.
- Loosen and remove the three screws and remove the light bulb holder from the holder.



FRONT SHIELD:

- Remove the front lower frame.
- Remove the front upper frame.
- Remove the front headlight assemblies.
- Remove the instrument panel (see SHIELD BACK PLATE).
- Remove the lower shield back plate (see SHIELD BACK PLATE).

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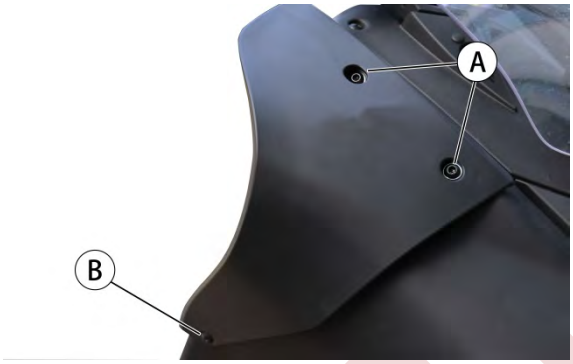
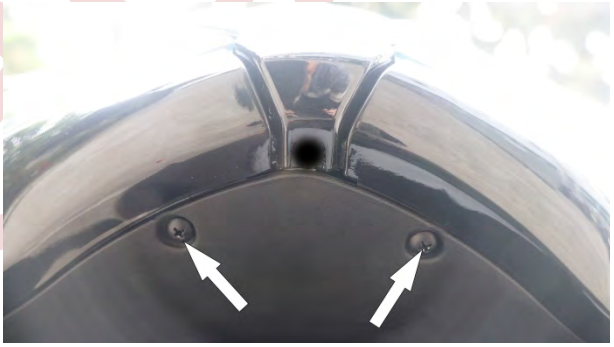
- Remove the hand guard and unscrew two screws «A» from both sides and collect the washer and screw «B» separately.

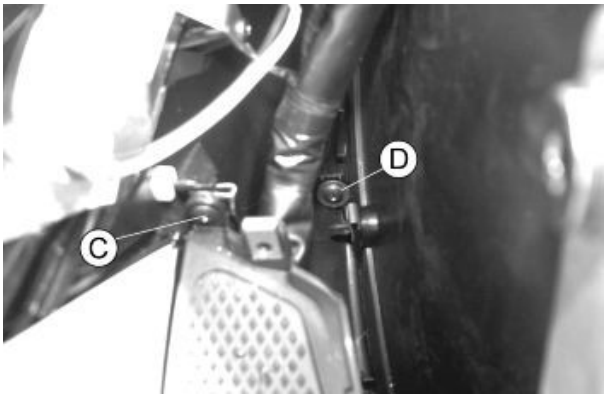


- Loosen center screw.

- Loosen the two screws indicated.



- Loosen the pedal mounting screws «C» and the spoiler mounting screws «D».
- Remove the front guard and loosen the different harness from the fixture.



Refit in the reverse order and secure the harness with the appropriate fixture.

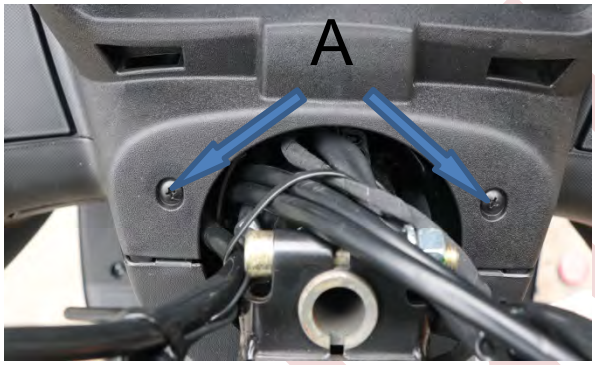
Knee-guard

The shielding backplane consists of two parts. The instrument panel is equipped with the instrument unit and the lower shielding back panel. The procedures for these two tasks are as follows:

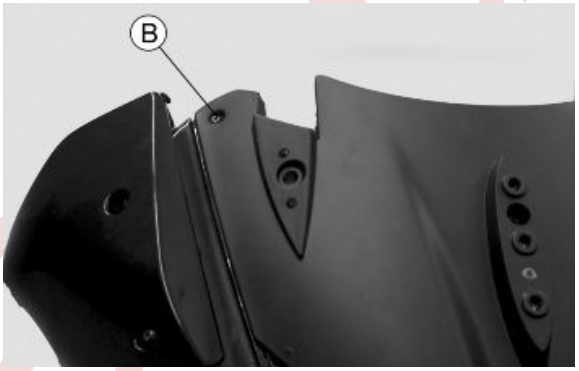
INSTRUMENT PANEL:

- Remove the windshield.
- Remove rear handlebar cover.
- Remove the front handlebars.
- Remove handlebars.

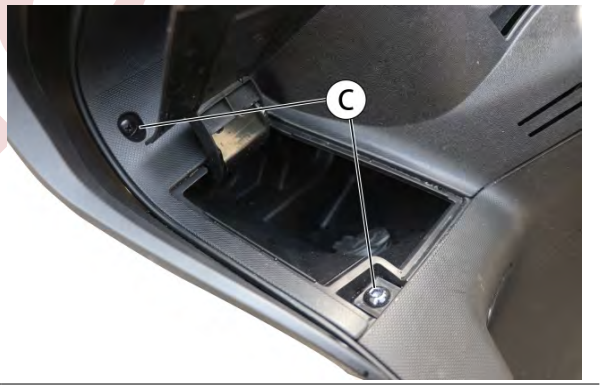
- Loosen and remove the two screws «A».



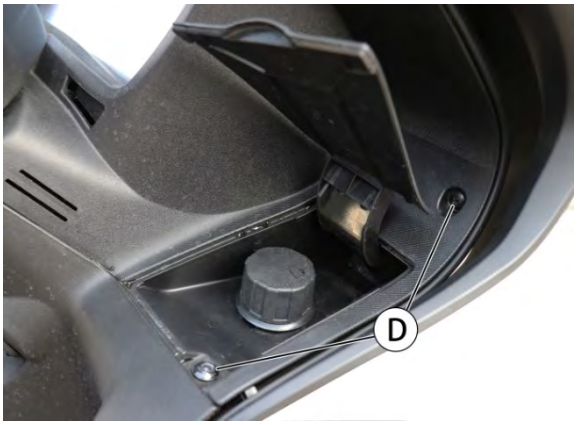
- Work from both sides of the vehicle, undo and re-move the screw «B».



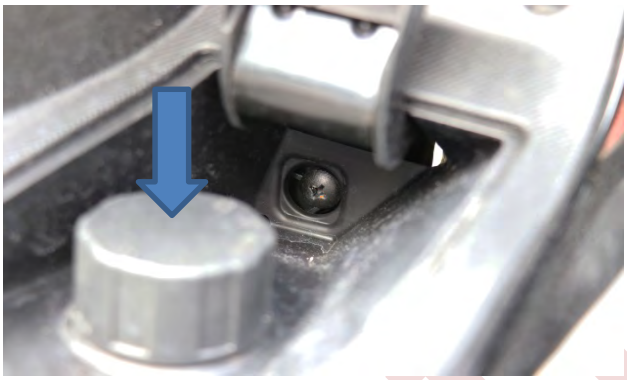
- Unscrew and remove the two screws «C» placed inside and outside the glove box.



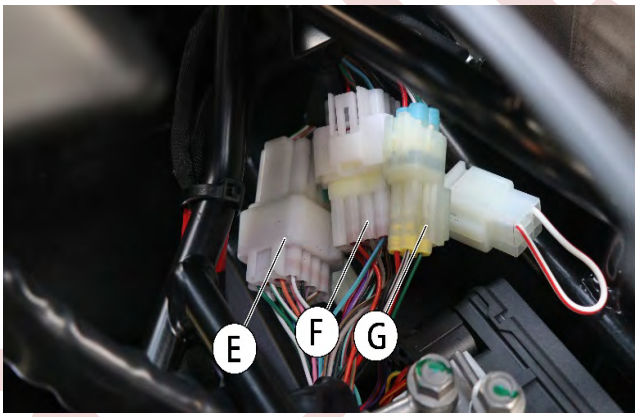
- Unscrew and remove the two screws «D» installed inside and outside the coolant loading compartment.



- Remove expansion tank cover and lower washer.



- Remove the dashboard and loosen the connector «E» and the dashboard lighting connector «F, G».
- Remove instrument panel.



LOWER SHIELD BACK PLATE:

- Remove the central tunnel (see CENTRAL CHASSIS COVER).
- Remove the instrument panel (see SHIELD BACK PLATE).

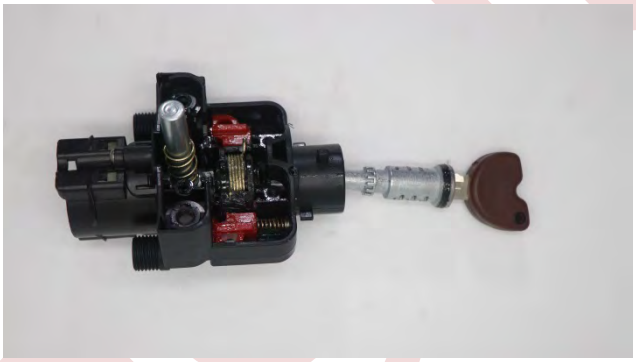
- Work from both sides of the vehicle, remove and re-move the two screws «A».

- Turn the key switch frame counterclockwise (pliers may be required) and loosen the clasp.

Removing the ignition key-switch when on *off*

- Remove the shielding backplane.

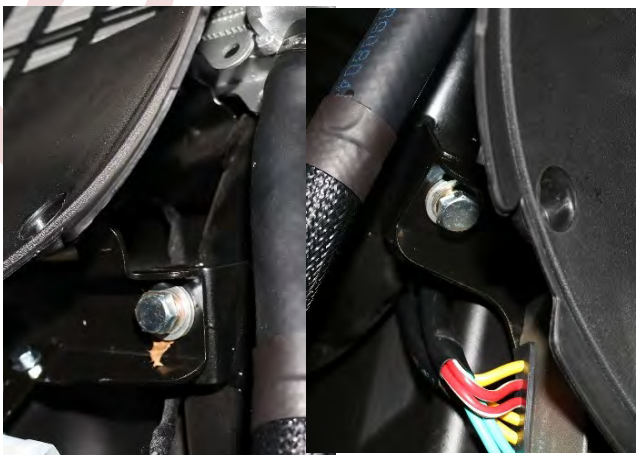
- Unscrew the seat to open the gearbox from the side.
- Remove the fixed antenna ring in advance.
- Loosen 2 hexadecimal digits. Socket head screws and reposition the entire switch.



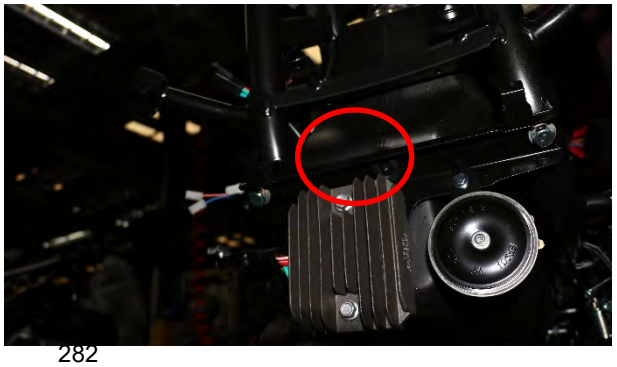
- You can loosen 3 screws from the underside, loosen 2 locking plates, and lift the mounting plate of the steering lock strut.
- The latter has a fixed label with cylindrical teeth that cannot be replaced.

Front wheel housing

To remove the front wheel housing, follow these steps:



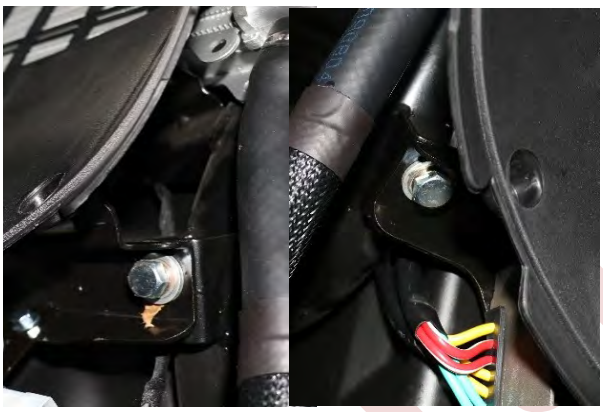
- Remove spoiler.
-
- Remove front fork.
- Loosen the two fixing screws shown in the figure,
- Remove the plate support bracket of the horn and the voltage regulator, and loosen the two lower fixers of the wheel housing.



- Remove the retaining screws from the wheel housing for easy movement.

- In order to remove the wheel housing, the front brake hose must be removed to the tank and combined with the splitter.

To remove the front wheel housing, follow these steps:

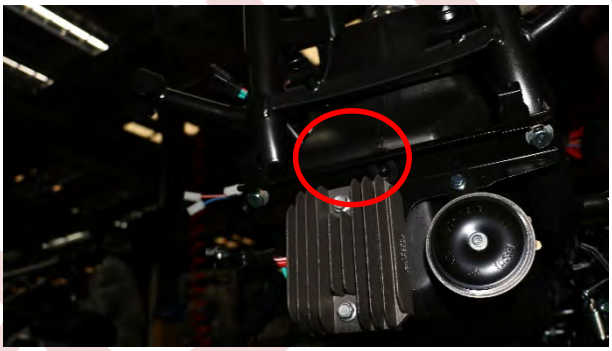


- - remove spoiler.

- - remove front fork.

- - loosen the two fixing screws shown in the figure, remove the plate support bracket of the horn and the voltage regulator, and loosen the two lower fixers of the wheel housing.

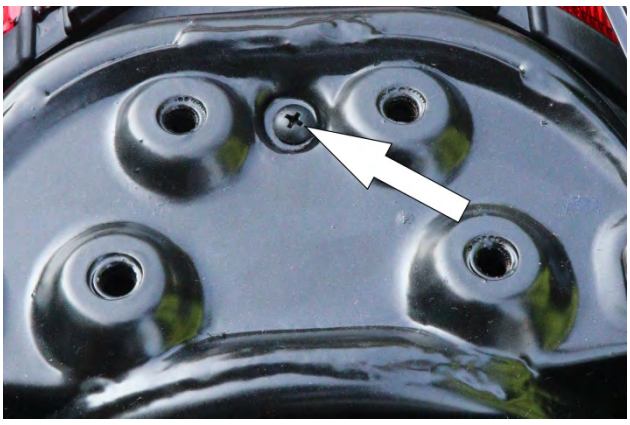
- Remove the retaining screws from the wheel housing for easy movement.



- In order to remove the wheel housing it is necessary to remove the front brake hose to the tank and combination with the splitter.

Taillight assy.

To remove the rear light assembly, follow these steps:



- - remove rear middle cover.

- - remove handle and upper guide.
- - loosen and remove center screws.

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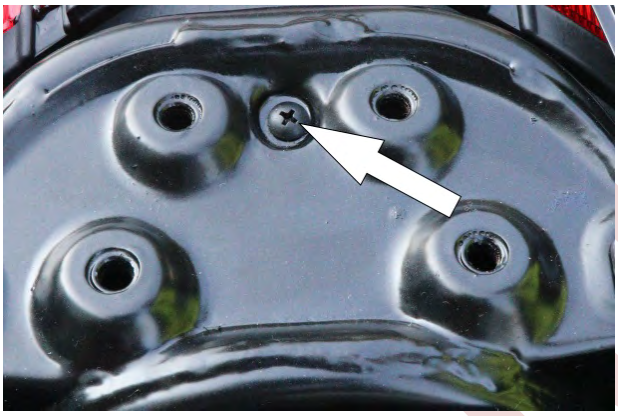
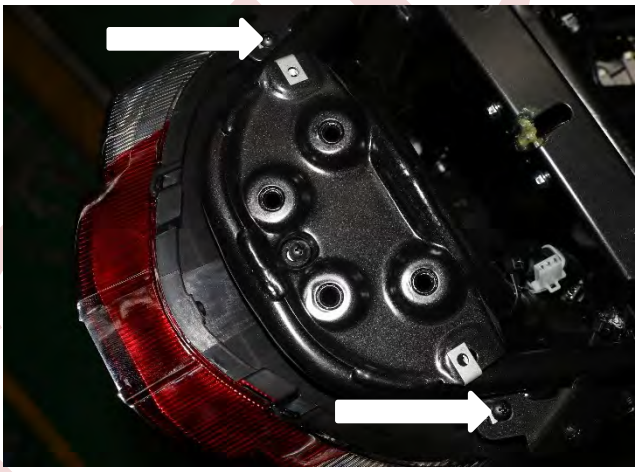
To remove the rear light assembly, follow these steps:

- Remove the rear upper middle cover.
- Remove handle and upper guide.
- Loosen and remove center screws.



- - using a wrench between the helmet assembly and the chassis duct, loosen the two rear retaining nuts and remove the light stud bolts from the support.
- - delete it light and disconnect the lamp holder by 30 ° anticlockwise.



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Footrest

The footrest comprises a right and left footrest, a passenger footrest and a rider footrest.

The whole procedure is described below:

PASSENGER FOOTREST:

- Remove the side fairings.
- Unscrew the screw 《A》 from both vehicle sides and release the
- Footrest.

RIGHT AND LEFT FOOTREST:

- Working from both vehicle sides, remove the mat.

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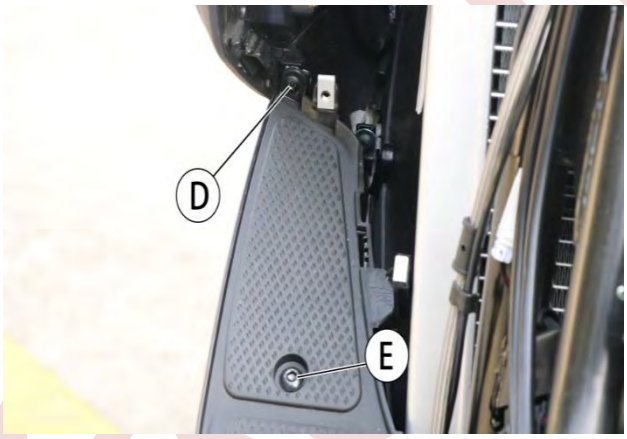
-Undo and remove the two screws «**B**» and the four screws «**C**».

- Remove the footers

RIDER FOOTREST:
To remove the rider footrest, proceed as follows:
- Remove the central cover.
- Remove the shield back plate.
- Remove the right and left footrest (see FOOTREST).

-Undo the screw «**D**» and the screw «**E**» and re- move the rider footrest.

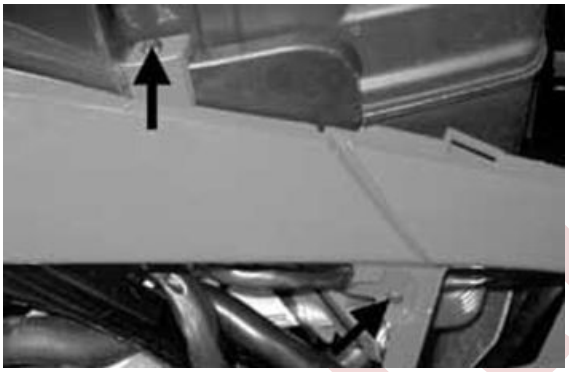


The footrest comprises a right and left footrest, a passenger footrest and a rider footrest. The whole procedure is described below:

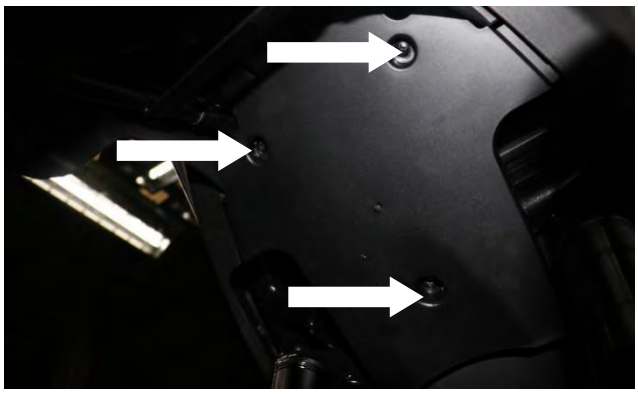
Malaguti

Side fairings

- - remove rear middle cover.
- - remove passenger handles.
- - remove the lower cover.



- - remove the lower side cover.
- - remove the 3 screws shown in the drawing.
- - pull out the fairing.



Malaguti

- Remove the three screws shown in the drawing.

License plate holder

- Remove rear lower middle cover.
- Remove the four mounting screws (two on each side) and disconnect the electrical connector.

Rear mudguard

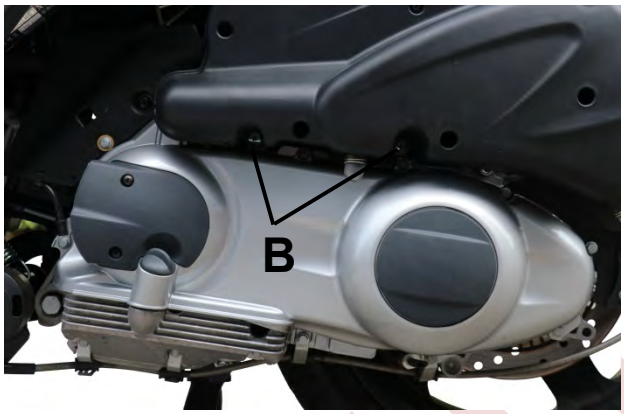
The steps to remove the rear fender are as follows:

- From the right side of the vehicle,

Loosen the screws «A».

Malaguti

- Remove the two screws «B» from the left side of the vehicle.
- Remove the rear fender.

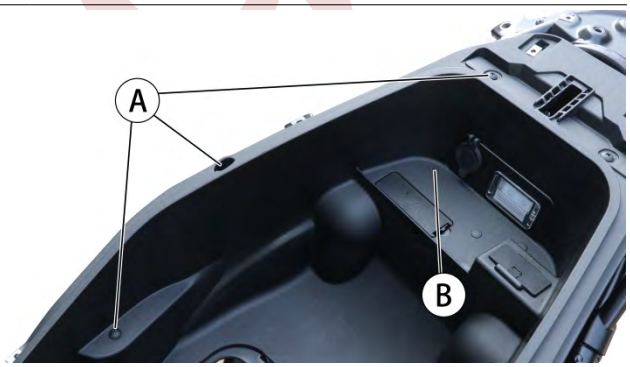


Helmet bay

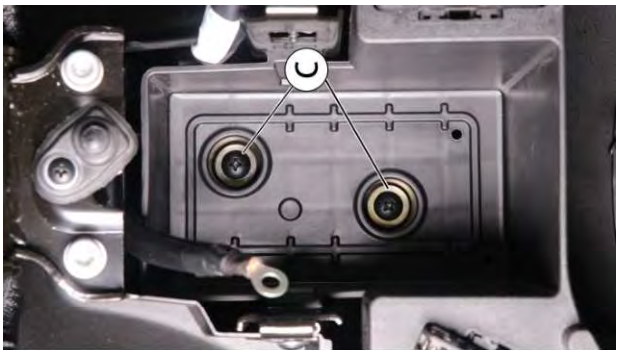
The steps to remove the helmet compartment are as follows:

- - remove the saddle.
- - remove the battery.
- - remove rear middle cover.
- - remove handle and top side fairing.

- Working from both sides of the vehicle, loosen the three screws «A» and «B».



- Unscrew and remove the two screws «C» in the battery compartment.
- Lift the helmet compartment from the rear and remove the saddle lock.



- - disconnect the connector between the power socket and the lamp under the base.
- - please unplug the socket due to interference with the chassis.
- - remove the fuse box and loosen the side hook teeth.
- - remove the entire helmet compartment.

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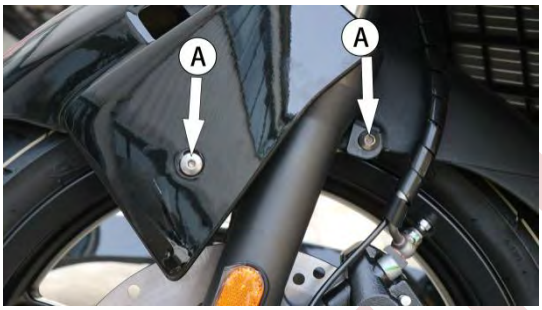
Front mudguard

- Work from both sides of the vehicle, remove and remove the two screws «A».

Slide the fender to the front of the vehicle.



CAUTION

WHEN REFITTING PAY ATTENTION TO THE CORRECT POSITION OF THE PIPE RETAINING STRAPS.

Fuel tank

To remove the tank, follow these steps:

NOTE

THIS OPERATION SHOULD PREFERABLY BE PERFORMED WITH THE TANK EMPTY.

- - remove the shielding backplane.
- - remove center frame cover.
- - remove footstool.
- - remove spoiler.

- Remove the packing and unscrew the tank holding straps.

- Remove the pipe.

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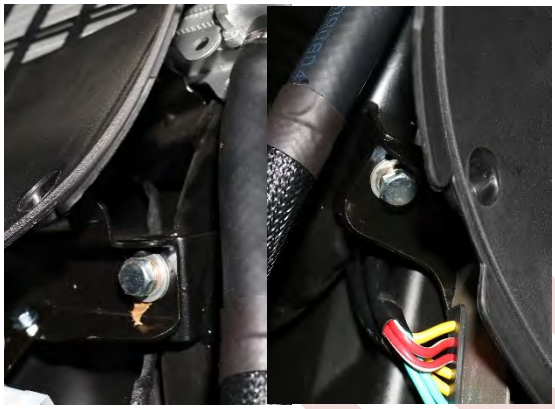
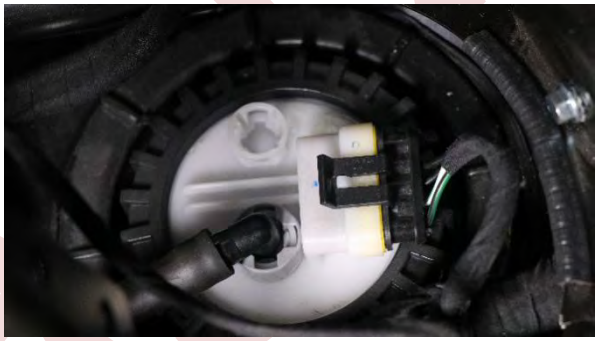
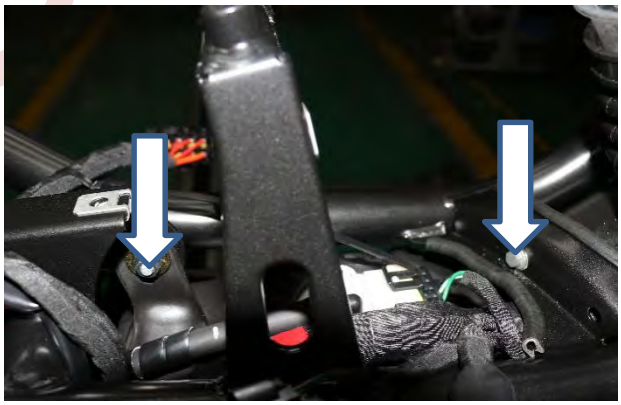
- Remove the horn plate support bracket and the voltage regulator, and loosen the two nuts as shown.



- Disconnect the fuel probe connector.



- Loosen the two water tank fixing screws.
- Remove the fuel tank through the lower front of the vehicle.



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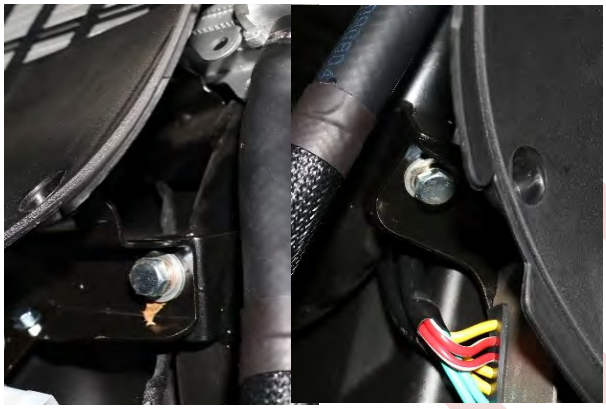
Radiator fan

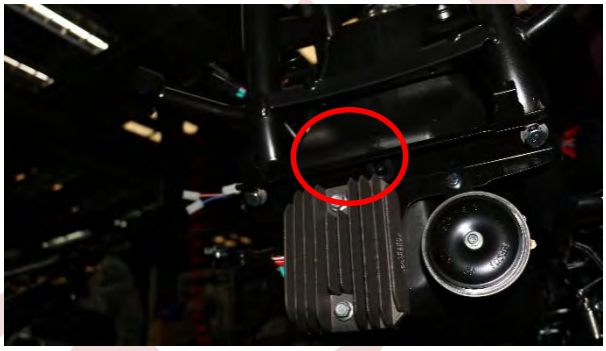
- - remove spoiler.

- - remove front fork.

- - loosen the two fixing screws shown in the figure, remove the plate support bracket of the horn and the voltage regulator, and loosen the two lower fixers of the wheel housing.



- Remove the retaining screws from the wheel housing for easy movement.



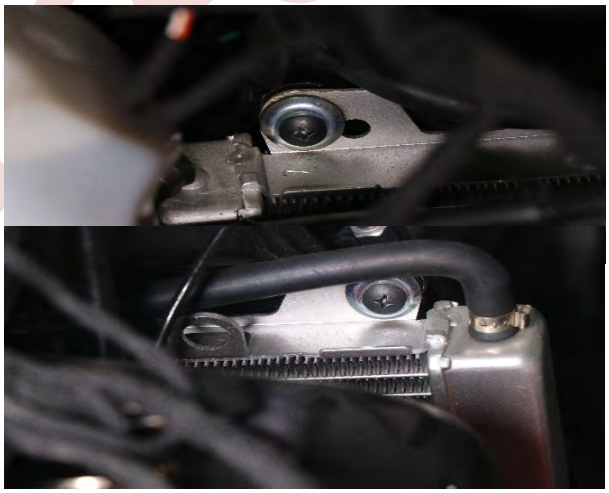
- - prepare a container to collect coolant.

- - remove feed and return hoses from front expansion tank.

- - remove coolant feed from radiator and return hose.

- - remove the radiator mounting screws to the frame as shown.

- - remove complete radiator and fan.



Flyscreen

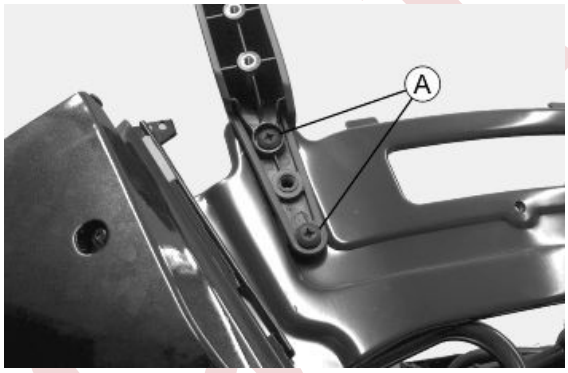
- Remove three hexadecimal digits.

- Hexagon socket screws, then remove windshield with rubber ring.

To remove the windshield bracket, follow these steps:

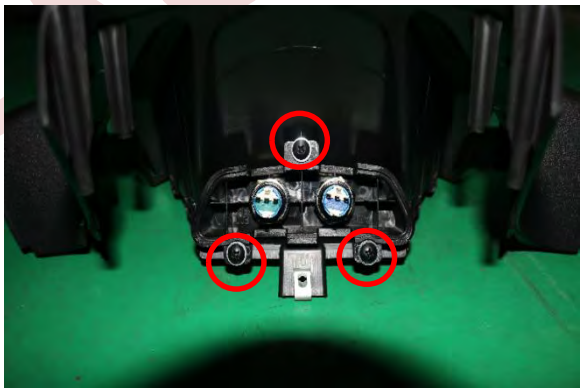
- - remove the caps and washers from the two windshield brackets.
- - remove the front upper frame.

- Work from both sides of the vehicle, remove and re-move the two screws «A».
- Remove bracket.



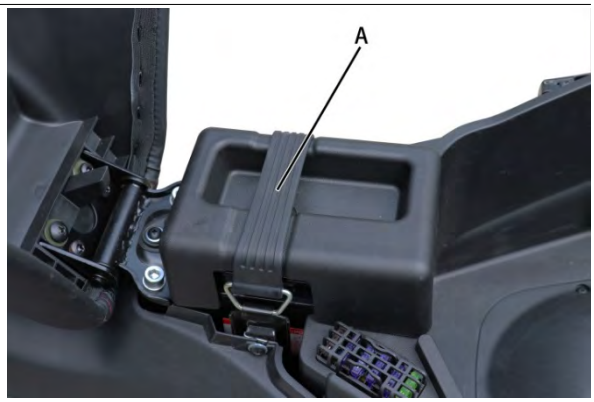
Pilot lights kit

- Remove the front handlebars.
- Remove the three screws shown in the drawing and slide the machine down from the front handle cover.



Battery

- Remove the elastic belt and battery cover.



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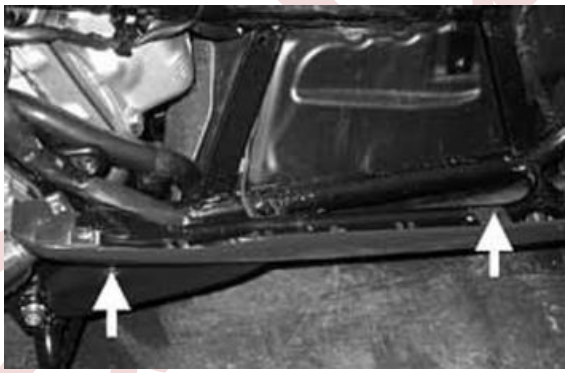
- First disconnect the negative «A» and then the positive «B».

- Remove the battery.

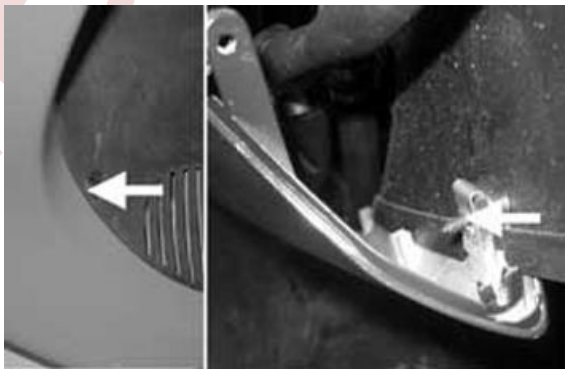
Lower cover

- Remove two screws of spoiler (long).
- Remove the two screws under the footplate.



- Remove 4 connecting screws from front wheel housing cover.

-Pull the spoiler from the lower part of the scooter.



INDEX OF TOPICS

Malaguti

Conduct the listed tests prior to delivery of the vehicle.

Warning - handle fuel with care.

Aesthetic inspection

Appearance check:

- Paintwork
- Fitting of plastics
- Scratches
- Dirt

Tightening torques inspection

- visually inspect the following fixtures for yellow marking:

FRONT WHEEL

• wheel pin retaining nut

• safety screws on left fork leg

FRONT BRAKE

• Connection between brake tube and brake caliper

• Caliper to caliper support set screws

• Caliper to fork support set screws

SWINGING ARM

• A nut that holds the rocker pin to the engine

COOLING SYSTEM

• Pump cover - pipe clamp

Pump cover - return pipe clamp

REAR WHEEL

• Screw the wheels to the hub

REAR BRAKE

• Brake pipe-brake caliper connection

• Caliper - caliper support set screws

• Engine caliper bracket mounting screws

REAR SUSPENSION

• Left shock absorber lower fixer

• Lower fixer for right shock absorber

MUFFLER SUPPORTING ARM

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• Muffler - support arm retaining screw
• Engine support arm mounting screws

Electrical system

Main switch,

• Light: strong light, weak light, taillight (front and rear) and relevant warning light

- adjust the headlights according to the regulations in force

• Front and rear stop light buttons and relative light • turn light and relative light

• Instrument lighting

• Instruments: fuel and temperature indicators

• Instrument panel lights

• Angle

• Electrical start

• Engine stop with emergency stop switch

• Electric saddle open button

CAUTION

To ensure maximum performance, the battery must be charged before use.

Before the battery is used for the first time, insufficient electrolyte will shorten the service life of the battery.

CAUTION

When installing a battery, connect the positive pole first, then the negative pole.

WARNING

Batteries have toxic electrolytes that can cause severe burns.

It contains thiocyanic acid.

Avoid contact with eyes, skin and clothing.

In case of contact with eyes or skin, rinse with plenty of water for about 15 minutes and seek medical advice immediately.

If swallowed, drink plenty of water or vegetable oil immediately.

Seek medical attention immediately.

Batteries produce explosive gases;

Stay away from open flames, sparks and cigarettes.

If the battery is charged in a closed area, make sure there is adequate ventilation.

Be sure to protect your eyes when working near a battery.

Please put it out of the reach of children

CAUTION

Do not use a fuse with a capacity higher than the recommended capacity.
Improper rating fuses can seriously damage vehicles and even cause fires.

Levels check

Level check:
- Level of hydraulic braking system.
- Oil level of rear wheel hub
- Engine coolant level

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- Engine oil level

Road test

Test ride
- Cold start
- Instrument operation
- Response to throttle control
- Acceleration and braking stability
- Front and rear braking efficiency
- Front and rear suspension efficiency
- Abnormal noise

Static test

Static control after the test ride:

• Hot engine restart

• Minimum seal (turning handlebar)

• Even steering

• Possible losses

• Radiator fan operation

CAUTION

CHECK AND ADJUST TYRE PRESSURE WITH TYRES AT AMBIENT TEMPERATURE.

CAUTION

NEVER EXCEED THE RECOMMENDED INFLATION PRESSURES OR TYRES MAY BURST.

Functional inspection

Function check:
• Hydraulic braking system: lever stroke
Clutch: check normal operation
• Engine: normally working normally without abnormal noise inspection
• others: document check, chassis and engine number check, tools and equipment, license plate accessories, lock check, tire pressure check, rearview mirror and any accessories

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Specific operations for the vehicle

Windshield fitting:

- remove the upper cover of the leg guard.

- attach the indicating nut to the seat behind the windshield support bracket.

- Attach the windshield bracket to the front rack with the supplied screws.

- Install the upper cover of the leg guard.

- remove the protective film from the windshield and install the rubber buffer in three holes.

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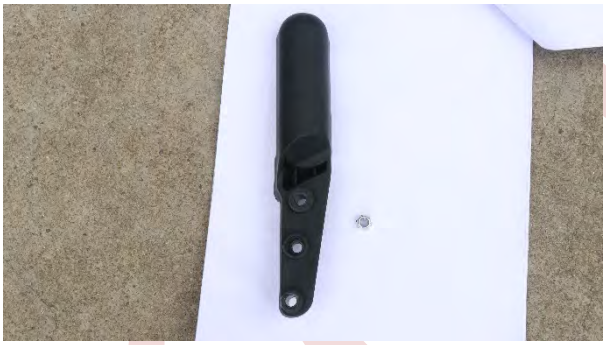
- Install three plastic gaskets in three rubber bumpers.

- Install central protection.



- Rubber protection mounted on the windshield support bracket to ensure that the fixture is properly clamped in the hole.

NOTE

THE WINDSHIELD CAN BE ADJUSTED TO THE FREE POSITIONS. HEIGHT MAY VARY DEPENDING ON THE RETAINER USED.

- Install the provided cap to cover unused holes.

- Install the windshield onto the vehicle with the three screws provided.

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