GILERA®

MANUALE STAZIONE DI SERVIZIO

638540

Stalker 50

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Stalker 50

PIAGGIO & C. S.p.A. - After-Sales
V.le Rinaldo Piaggio, 23 - 56025 PONTEDERA (Pi)

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Stalker 50

Questo manuale per stazioni di servizio è stato realizzato da Piaggio & C. Spa per essere utilizzato dalle officine dei concessionari e sub-agenzie Piaggio-Gilera. Si presuppone che chi utilizza questa pubblicazione per la manutenzione e la riparazione dei veicoli Piaggio, abbia una conoscenza base dei principi della meccanica e dei procedimenti inerenti la tecnica della riparazione dei veicoli. Le variazioni importanti nelle caratteristiche dei veicoli o nelle specifiche operazioni di riparazione verranno comunicate attraverso aggiornamenti di questo manuale. Non si può comunque realizzare un lavoro completamente soddisfacente se non si dispone degli impianti e delle attrezzature necessarie, ed è per questo che vi invitiamo a consultare le pagine di questo manuale riguardanti l'attrezzatura specifica e il catalogo degli attrezzi specifici.

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

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

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

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

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

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

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INDEX OF TOPICS

Rules

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

Safety rules

- If work can only be done on the vehicle with the engine running, make sure that the premises are well-ventilated, using special extractors if necessary; never let the engine run in an enclosed area. Exhaust fumes are toxic.
- 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 produces hydrogen, a gas that can be highly explosive. Do not smoke and avoid sparks or flames near the battery, especially when charging it.
- Fuel is highly flammable and it can be explosive given some conditions. Do not smoke in the working area, and avoid naked flames or sparks.
- Clean the brake pads in a well-ventilated area, directing the jet of compressed air in such a way that you do not breathe in the dust produced by the wear of the friction material. Even though the latter contains no asbestos, inhaling dust is harmful.

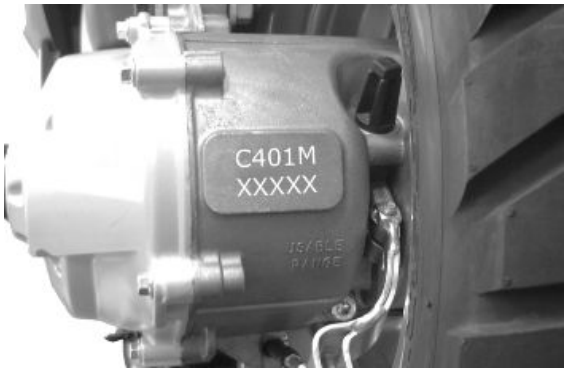
Maintenance rules

- Use original PIAGGIO spare parts and lubricants recommended by the Manufacturer. Non-original or non-conforming spares may damage the vehicle.
- Use only the appropriate tools designed for this vehicle.
- Always use new gaskets, sealing rings and split pins upon refitting.
- After removal, clean the components using non-flammable or low flash-point solvents. Lubricate all the work surfaces, except tapered couplings, before refitting these parts.
- After refitting, make sure that all the components have been installed correctly and work properly.
- For removal, overhaul and refit operations use only tools with metric measures. Metric bolts, nuts and screws are not interchangeable with coupling members with English sizes. Using unsuitable coupling members and tools may damage the scooter.
- When carrying out maintenance operations on the vehicle that involve the electrical system, make sure the electric connections have been made properly, particularly the ground and battery connections.

Vehicle identification

Chassis prefix ZAPC40100 xxxx xxxxxxx

Engine prefix C401M xxxx



Dimensions and mass

WEIGHTS AND DIMENSIONS

Specification	Desc./Quantity
Overall length	1760 mm.
Overall width	720 mm.
Maximum height	810 mm.
Wheelbase	1230 mm.
Kerb weight	87 kg

Engine

ENGINE

Specification	Desc./Quantity
Engine type	Two-stroke, single cylinder Piaggio Hi-PER2
Bore x stroke	40 X 39.3 mm
Cubic capacity	49.40 cc
Compression ratio	9.4 to 10.4 :1
Carburettor	DELL'ORTO PHVA 17.5 RD
CO adjustment	3.5% ± 0.5
Engine idle speed	1800 to 2000 r.p.m.
Air filter	Sponge impregnated with fuel mixture (50% SELENIA air filter oil and 50% unleaded petrol).
Starting system	electric starter/kickstarter
Lubrication	With blend and variable oil variable according to the engine revolutions and the throttle valve opening by means of a pump controlled by the driving shaft with toothed belt.
Fuel supply	With vacuum operated cock, lead-free gasoline (with 95 octane minimum) by means of the carburettor.
Cooling	Forced air circulation.

Transmission

TRANSMISSION

Specification	Desc./Quantity
Transmission	With automatic expandable pulley variator, torque server, V belt, automatic clutch, gear reduction unit.

Capacities

CAPACITY

Specification	Desc./Quantity
Fuel tank	Plastic, with a capacity of 6 litres (approximate value) including reserve of ~ 1.5 l.
Oil mixer tank	Plastic, with a capacity of ~ 1.2 l. (including a ~0.400 l reserve).
Rear hub oil	Quantity: approx. 75 cm^3

Electrical system

ELECTRICAL SYSTEM

Specification	Desc./Quantity
Type of ignition	Capacitive discharge type electronic ignition, with incorporated high voltage coil
Ignition advance (before TDC)	Fixed 17° ± 1
Recommended spark plug	CHAMPION RN2C
Battery	12V-4Ah
Main fuse	7.5 A
Generator	In alternate current with three output sections

Frame and suspensions

FRAME AND SUSPENSIONS

Specification	Desc./Quantity
Chassis type	Welded tubular steel chassis with stamped sheet reinforcements
Front suspension	upside-down hydraulic telescopic fork.
Front stroke	73 mm
Front suspension stroke	58 mm
Rear suspension	With coaxial spring and hydraulic shock absorber. Chassis to engine support with swinging arm.

Brakes

BRAKES

Specification	Desc./Quantity
Front brake	Disc D=190 mm with hydraulic control, operated by right brake lever on the handlebars.
Rear brake	Drum D=110 mm with expansion brake shoes, mechanically controlled by the left brake lever on the handlebars.

Wheels and tyres

WHEELS AND TYRES

Specification	Desc./Quantity
Front tyre	Tubeless 120/90 x -10"
Rear tyre	Tubeless 130/90 x -10"
Wheels	with 3.50x10" wheel rims in light alloy.

Carburettor

50cc Version

Dell'Orto

ORTO CARBURETTOR

Specification	Desc./Quantity
Type	PHVA 17.5 RD
Diffuser diameter	Ø 17.5
Regulation reference number	8423
Maximum nozzle:	53
Maximum air nozzle (on the body):	Ø 1.5
Tapered pin stamped code:	A22
Pin position (notches from above):	1
Diffuser:	209 HA
Minimum nozzle:	32
Minimum air nozzle (on the body):	Free
Secondary minimum air hole	Ø 2.5
Initial minimum mix screw opening:	1 1/2
Starter jet	50
Starter air nozzle (on the body):	Ø 1.5
Stroke of starter pin:	11 mm
Gasoline inlet hole	Ø 1.5

Tightening Torques

STEERING ASSEMBLY

Name	Torque in Nm
Upper steering ring nut (safety locks)	35 to 40 Nm
Lower steering ring nut (safety locks)	8 to 10 Nm
Handlebar fixing pin (safety locks)	45 to 50 Nm

FRAME ASSEMBLY

Name	Torque in Nm
Swinging arm-engine pin (safety locks)	33 to 41 Nm
Swinging arm-frame pin (safety locks)	64 to 72 Nm
Shock absorber - frame nut (safety locks)	20 to 25 Nm
Shock absorber-engine pin (safety locks)	33 to 41 Nm
Rear wheel axis (safety locks)	104 to 126 Nm
Bolt holding stand to the engine	18 to 19 Nm

FRONT SUSPENSION

Name	Torque in Nm
Front wheel axle nut (safety locks)	45 to 50 Nm
Wheel axle clamp screw	6 ÷ 7 Nm
Lower leg screw	15 to 20 Nm
Hydraulic cartridge stem nut	15 to 18 Nm

FRONT BRAKE

Name	Torque in Nm
Viti fissaggio coperchio pompa freno	1,5 ÷ 2 Nm
Brake pump support fixing screw	7 to 10 Nm
Brake fluid pump - hose fitting	13 to 18 Nm
Brake fluid tube - calliper fitting	20 to 25 Nm
Calliper tightening screw	20 to 25 Nm
Disc tightening screw (safety locks - lock with LOCTITE THREADLOCK MEDIUM TYPE 243)	6 ÷ 7 Nm
Oil bleed screw	7 to 10 Nm
Calliper coupling screw	20 to 25 Nm

ENGINE ASSEMBLY

Name	Torque in Nm
Clutch bell nut	40 to 44 Nm
Clutch lock ring nut	55 ÷ 60
nut locking driving pulley on the crankshaft	40 to 44 Nm
Start-up lever screw	12 ÷ 13
Flywheel nut	40 to 44 Nm
Flywheel fan screws	3 ÷ 4
Half-crank case joint bolts	12 ÷ 13
Bolts holding exhaust pipe to the crankcase	22 ÷ 24
Screws holding the filter box to the crank case	4 ÷ 5
Head nuts	10 ÷ 11
Starter screws	12 ÷ 13
Ignition spark plug	25 ÷ 30
Hub oil drainage cap	3 ÷ 5
Oil hub level dipstick	Manual
Rear hub cap screws	12 ÷ 13
Transmission cover screws	12 ÷ 13
Inlet manifold screws	8 ÷ 9
Flywheel hood fixing screws	1 ÷ 2
Cylinder hood fixing screws	3.5 ÷ 5
Stator clamping screws	3 ÷ 4
Pick-Up clamping screw	4 ÷ 5
Mixer clamping screws	3 ÷ 4
Screw fixing brake lever to the journal on the engine	12 ÷ 13

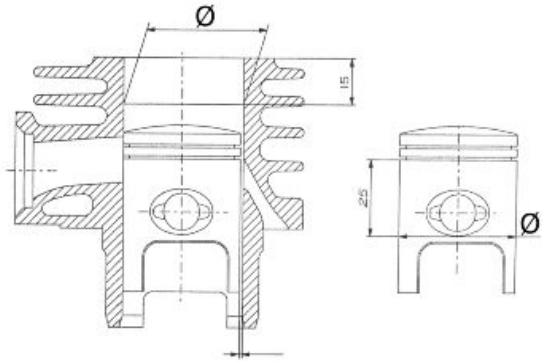
Overhaul data

Assembly clearances

Cylinder - piston assy.

COUPLING BETWEEN PISTON AND CYLINDER

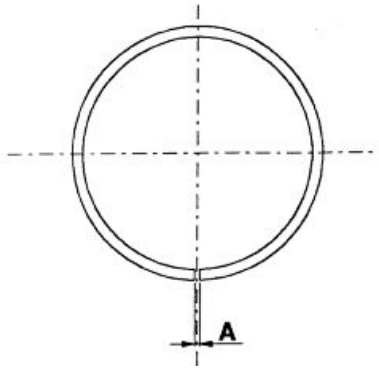
Name	Initials	Cylinder	Piston	Play on fitting
Standard coupling	M	40.005 - 40.012	39.943 - 39.95	0.055 - 0.069
Standard coupling	N	40.012 - 40.019	39.95 - 39.957	0.055 - 0.069
Standard coupling	O	40.019 - 40.026	39.957 - 39.964	0.055 - 0.069
Standard coupling	P	40.026 - 40.033	39.964 - 39.971	0.055 - 0.069
coupling 1st oversize	M1	40.205 - 40.212	40.143 - 40.15	0.055 - 0.069
coupling 1st oversize	N1	40.212 - 40.219	40.15 - 40.157	0.055 - 0.069
coupling 1st oversize	O1	40.219 - 40.226	40.157 - 40.164	0.055 - 0.069
coupling 1st oversize	P1	40.226 - 40.233	40.164 - 40.171	0.055 - 0.069
Coupling 2nd oversize	M2	40.405 - 40.412	40.343 - 40.35	0.055 - 0.069
Coupling 2nd oversize	N2	40.412 - 40.419	40.35 - 40.357	0.055 - 0.069
Coupling 2nd oversize	O2	40.419 - 40.426	40.357 - 40.364	0.055 - 0.069
Coupling 2nd oversize	P2	40.426 - 40.433	40.364 - 40.371	0.055 - 0.069



Piston rings

SEALING RINGS

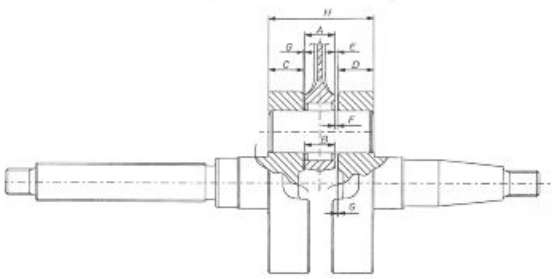
Name	Description	Dimensions	Initials	Quantity
Compression ring		40	A	0.10 to 0.25
Compression ring 1st oversize		40.2	A	0.10 to 0.25
Compression ring 2nd Oversize		40.4	A	0.10 to 0.25



Crankcase - crankshaft - connecting rod

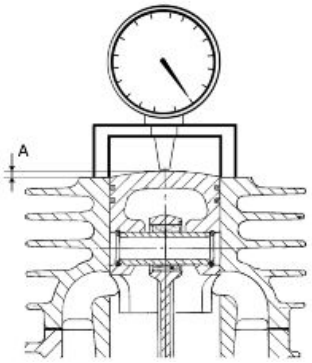
AXIAL CLEARANCE BETWEEN CRANKCASE, CRANKSHAFT AND CONNECTING ROD

Name	Description	Dimensions	Initials	Quantity
Connecting rod		11.750-0.05	A	clearance E = 0.25 to 0.50
shoulder washer		0.5 ± 0.03	G	clearance E = 0.25 to 0.50 - clearance F = 0.20 to 0.75
Half-shaft, transmission side		13.75+0.040	C	clearance E = 0.25 to 0.50 - clearance F = 0.20 to 0.75
Flywheel-side half-shaft		13.75+0.040	D	clearance E = 0.25 to 0.50 - clearance F = 0.20 to 0.75
Lining between the shoulders		40.64	H	clearance E = 0.25 to 0.50 - clearance F = 0.20 to 0.75
Cage		11.800-0.35	B	clearance F = 0.20 to 0.75



Slot packing system

- Fit the cylinder without installing the basic gasket.
- Apply a centimetre dial gauge on the special tool and zero it on the ground plane
- Fit the tool to the top of the cylinder fixing it with two nuts to the studbolts and take the piston to the T.D.C.
- The thickness of the gasket to fit will change depending on the value detected. For this purpose, there are three with different thicknesses



Specific tooling

020272Y Piston position check tool

SHIMMING SYSTEM

Name	Measure A	Thickness
Shimming	2.80 ÷ 3.04	0,4
Shimming	3.04 ÷ 3.24	0,6
Shimming	3.25 ÷ 3.48	0,8

Products

RECOMMENDED PRODUCTS TABLE

Product	Description	Specifications
AGIP ROTRA 80W-90	Rear hub oil	SAE 80W/90 Oil that exceeds the requirements of API GL3 specifications
AGIP FILTER OIL	Oil for air filter sponge	Mineral oil with specific additives for increased adhesiveness
AGIP CITY TEC 2T	Mixer oil	synthetic oil for 2-stroke engines: JASO FC, ISO-L-EGD
AGIP GP 330	Grease for brake levers, throttle	White calcium complex soap-based spray grease with NLGI 2; ISO-L-XBCIB2
AGIP GREASE SM 2	Grease for the tone wheel revolving ring	Soap-based lithium grease containing NLGI 2 Molybdenum disulphide; ISO-L-XBCHB2, DIN KF2K-20
AGIP BRAKE 4	Brake fluid	FMVSS DOT 4 Synthetic fluid
MONTBLANC MOLYBDENUM GREASE	Grease for driven pulley shaft adjusting ring and movable driven pulley housing	Grease with molybdenum disulphide

Product	Description	Specifications
AGIP GREASE PV2	Grease for the steering bearings, pin seats and swinging arm	White anhydrous-calcium based grease to protect roller bearings; temperature range between -20 C and +120 C; NLGI 2; ISO-L-XBCIB2.

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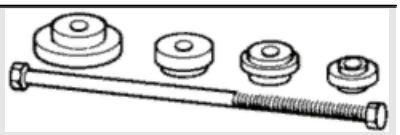
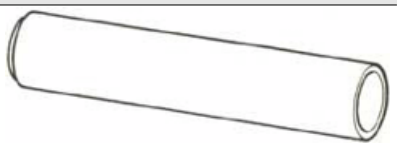
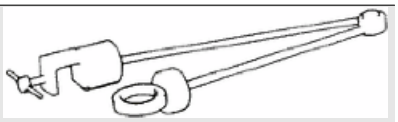
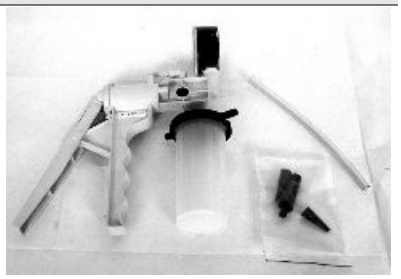
TOOLS

Stores code	Description	
001330Y	Tool for fitting steering seats	
001467Y006	Pliers to extract 20 mm bearings	
001467Y007	Driver for OD 54 mm bearing	
001467Y009	Driver for OD 42-mm bearings	
001467Y013	Pliers to extract ø 15-mm bearings	
001467Y014	Pliers to extract ø 15-mm bearings	

Stores code	Description	
001467Y017	Bell for bearings, OD 39 mm	
001467Y021	Extraction pliers for ø 11 mm bearings	
002465Y	Pliers for circlips	
006029Y	Punch for fitting fifth wheel seat on steering tube	
020004Y	Punch for removing fifth wheels from headstock	
020055Y	Wrench for steering tube ring nut	
020150Y	Air heater support	

Stores code	Description	
020151Y	Air heater	
020162Y	Flywheel extractor	
020163Y	Crankcase splitting plate	
020164Y	Driven pulley assembly sheath	
020165Y	Start-up crown lock	
020166Y	Pin lock fitting tool	

Stores code	Description	
020261Y	Starter spring fitting	
020262Y	Crankcase splitting strip	
020265Y	Bearing fitting base	
020325Y	Brake-shoe spring calliper	
020329Y	MityVac vacuum-operated pump	
020330Y	Stroboscopic light to check timing	

Stores code	Description	
020331Y	Digital multimeter	
020332Y	Digital rev counter	
020334Y	Multiple battery charger	
020335Y	Magnetic support for dial gauge	

Stores code	Description	
020350Y	Electrical system check instrument	
020357Y	32 x 35 mm adaptor	
020359Y	42x47-mm adaptor	
020376Y	Adaptor handle	
020412Y	15 mm guide	
020456Y	Ø 24 mm adaptor	

Stores code	Description	
020483Y	30 mm guide	
020565Y	Flywheel lock calliper spanner	
020625Y	Kit for sampling gas from the exhaust manifold	

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Maintenance chart

MAINTENANCE TABLE

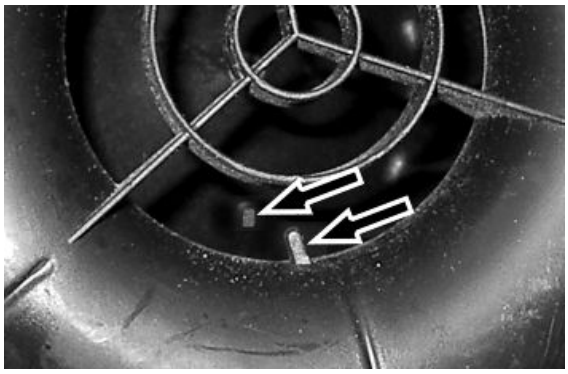
I: *CHECK AND CLEAN, ADJUST, LUBRICATE OR REPLACE, IF NECESSARY*
C*. CLEAN,* ***R****:REPLACE,* ***A****:ADJUST,* ***L****:LUBRICATE*
Clean the SAS air filter every 2 years
*** Replace every 2 years*

km x 1,000	1	5	10	15	20	25	30	35	40	45	50
SAS filter			I		I		I		I		I
Steering	A		A		A		A		A		A
Odometer gear			L								L
Idle speed	A		A		A		A		A		A
Vehicle road test	I	I	I	I	I	I	I	I	I	I	I
Sliding blocks / variable speed rollers		I	I	I	R	I	I	I	R	I	I
Tyre pressure and wear	I	I	I	I	I	I	I	I	I	I	I
Brake Pads/Shoes	I	I	I	I	I	I	I	I	I	I	I
Headlight aiming adjustment			A		A		A		A		A
Hub oil	R	I	I	I	R	I	I	I	R	I	I
Brake fluid **	I	I	I	I	I	I	I	I	I	I	I
Brake control levers	L		L		L		L		L		L
Electrical system and battery	I	I	I	I	I	I	I	I	I	I	I
Air filter		C	C	C	C	C	C	C	C	C	C
Throttle control - mixer	A		A		A		A		A		A
Driving belt		I	R	I	R	I	R	I	R	I	R
Spark plug		I	R	I	R	I	R	I	R	I	R
Safety locks	I		I		I		I		I		I
Driven pulley roller casing			L		L		L		L		L
Suspensions			I		I		I		I		I
Transmissions			L		L		L		L		L

Checking the spark advance

-Check to be made at over 4000 rpm with stroboscopic gun. The advanced ignition measured must be 17° before the TDC.

- This value is correct when the reference mark on the flywheel hood is aligned with the reference mark on the cooling fan and the phase shifter on the stroboscopic gun is set on 17°.



N.B.

IN CASE OF MALFUNCTION, CARRY OUT THE CHECKS PROVIDED FOR IN THE ELECTRICAL SYSTEM CHAPTER.

CAUTION

BEFORE CARRYING OUT THE ABOVE CHECKS, CHECK THE CORRECT KEYING OF THE FLYWHEEL ON THE CRANKSHAFT.

Specific tooling

020330Y Stroboscopic light to check timing

Spark plug

Place the vehicle on its central stand

- Remove the cap on the central cover, loosening the fixing screws shown in the figure;

- Disconnect spark plug HV wire hood;

-Undo the spark plug using the socket wrench;

-Examine the condition of the spark plug, check that the insulating material is whole and measure the distance between the electrodes using a thickness gauge.

-Adjust the distance if necessary by bending the side electrode very carefully.

In the case of defects, replace the spark plug with one of the specified type;

- Engage the spark plug with the due inclination and screw it right down by hand, then do it up with the wrench at the prescribed torque;

-Put the hood on the sparking plug as far as it will go;

- Refit the central flap.

CAUTION

THE SPARK PLUG MUST BE REMOVED WHEN THE MOTOR IS COLD. THE SPARK PLUG MUST BE REPLACED EVERY 5000 KM. USE OF STARTERS NOT CONFORMING OR SPARK PLUGS NOT THOSE DESCRIBED CAN SERIOUSLY DAMAGE THE ENGINE.

Characteristic

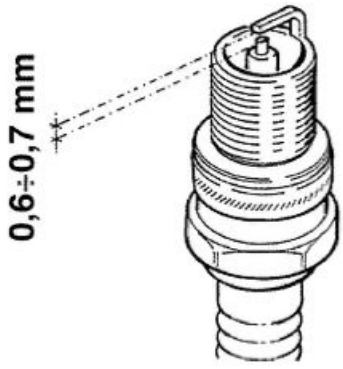
Recommended spark plug

CHAMPION RN2C

Electric characteristic

Electrode gap

0.6 to 0.7 mm.



Locking torques (N*m)

Spark plug 25 - 30 Nm

Hub oil

Check

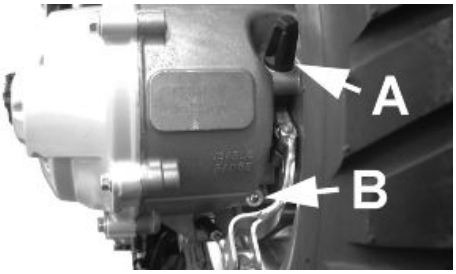
Do the following to check the correct level:

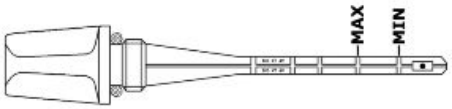
1) Stand the vehicle on the centre-stand on flat ground;

2) Remove the dipstick «**A**», and dry it with a clean cloth. Reinsert it, screwing it in all the way;

3) Remove the stick and check that the oil level is slightly over the second notch starting from the lower end;

4) Screw the dipstick back in, checking that it is locked in place.





Recommended products

AGIP ROTRA 80W-90 Rear hub oil

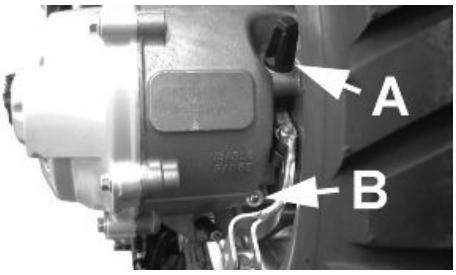
SAE 80W/90 Oil that exceeds the requirements of API GL3 specifications

Replacement

-Remove the oil filler cap «**A**».

- Unscrew the oil drainage cap "**B**" and drain out all the oil.

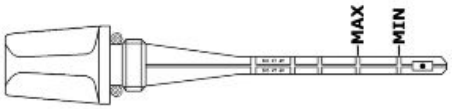
- Screw in the drainage cap again and fill the hub with the prescribed oil.



Characteristic

Rear hub oil

Quantity: approx. 80 cm³



Air filter

- Remove the left side panel.
- Remove the cap of the purifier, unscrewing the six clamping screws and removing the filter.

Cleaning:

- Wash with water and neutral soap.
- Dry with a clean cloth and short blasts of compressed air.
-Saturate with a 50% mixture of gasoline and oil.
-Drip dry the filter and then squeeze it between the hands without wringing.
-Let it dry and refit it again.

CAUTION

NEVER RUN THE ENGINE WITHOUT THE AIR FILTER, THIS WOULD RESULT IN AN EXCESSIVE WEAR OF THE PISTON AND CYLINDER.

Recommended products

AGIP FILTER OIL Oil for air filter sponge

Mineral oil with specific additives for increased adhesiveness

transmissions

Odometer driving pinion connection

Remove the odometer cable and grease with the recommended product.

Recommended products

AGIP GP 330 Grease for brake levers, throttle

White calcium complex soap-based spray grease with NLGI 2; ISO-L-XBCIB2

During this stage, the engine must be fed with a 2% mixture (at least 0.5 litres if the tank is empty).

- Remove the left side panel.
- Remove the front handlebar cover.
- Put the scooter in gear and adjust the idle speed by turning the set screw on the carburettor.
- Adjust the control cables:

Handlebar control: remove the rubber hood and regulate the cable adjustment in such a way that it causes a minimum backlash on the throttle.

Carburettor control: remove the rubber hood and regulate the cable adjustment in such a way that the sheath has a minimum backlash.

Oil mixer control: remove the cap on the engine crankcase and regulate the adjustment in such a way that with the throttle released, the reference mark on the rotating plate is lined up with the reference mark on the mixer body as indicated in the figure.

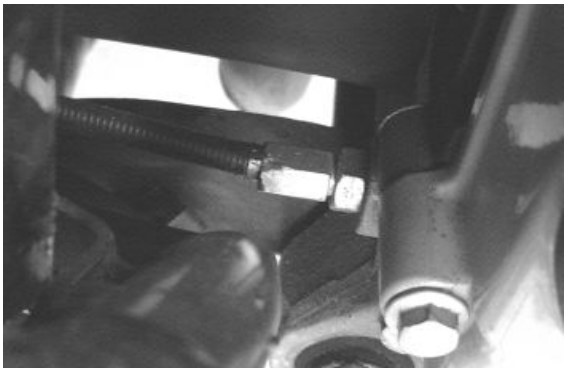
- Twist the throttle to the end of the stroke a couple of times and check that the adjustments have been made properly, then lock all the adjustments.

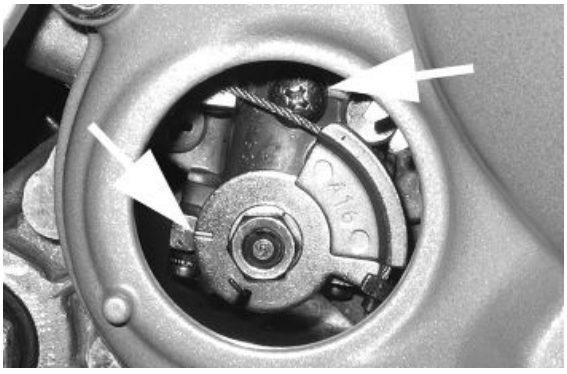
N.B.

TO VERIFY THE CORRECT TIMING OF THE MIXER IT IS NECESSARY TO REMOVE THE AIR CONDUIT OF THE TRANSMISSION COVER.

CAUTION

IN CASE OF DISMANTLING OR RUNNING OUT OF OIL IN THE RESERVOIR BLEED THE MIXER AS FOLLOWS: REFILL THE OIL RESERVOIR WHEN THE MIXER IS FITTED TO THE VEHICLE AND THE ENGINE IS OFF, UNDO THE MIXER PIPE FROM THE CARBURETTOR AND LOOSEN THE BLEED SCREWS (SEE THE ARROW IN THE FIGURE) UNTIL THE OIL BEGINS TO FLOW OUT. TIGHTEN THE SCREWS, START UP THE ENGINE AND WAIT FOR OIL TO FLOW OUT OF THE TUBE. RECONNECT THE DELIVERY PIPE TO THE CARBURETTOR AND FIX IT IN PLACE WITH THE RELEVANT METAL CLIP.





Recommended products

AGIP CITY TEC 2T Mixer oil

synthetic oil for 2-stroke engines: JASO FC, ISO-L-EGD

Braking system

Level check

Proceed as follows:

- Rest the vehicle on its centre stand with the handlebars perfectly horizontal;
- Check the level of liquid with the related warning light «**A**».

A certain lowering of the level is caused by wear on the pads.

Top-up

- Remove the tank cap by loosening the two screws, remove the gasket and top up using only the liquid specified without exceeding the maximum level.

CAUTION

ONLY USE DOT 4-CLASSIFIED BRAKE FLUID.

CAUTION

AVOID CONTACT OF THE BRAKE FLUID WITH YOUR EYES, SKIN, AND CLOTHING. IN CASE OF ACCIDENTAL CONTACT, WASH WITH WATER.

CAUTION

BRAKING CIRCUIT FLUID IS HIGHLY CORROSIVE; MAKE SURE THAT IT DOES NOT COME INTO CONTACT WITH THE PAINTWORK.

CAUTION

THE BRAKE FLUID IS HYGROSCOPIC, IN OTHER WORDS, IT ABSORBS MOISTURE FROM THE SURROUNDING AIR. IF THE CONTENT OF MOISTURE IN THE BRAKING FLUID EXCEEDS A CERTAIN VALUE, BRAKING WILL BE INEFFICIENT.
NEVER USE BRAKE LIQUID IN OPEN OR PARTIALLY USED CONTAINERS.
UNDER NORMAL CLIMATIC CONDITIONS, THE FLUID MUST BE CHANGED EVERY 20,000 KM OR ANYWAY EVERY TWO YEARS.

N.B.

SEE THE BRAKING SYSTEM CHAPTER WITH REGARD TO THE CHANGING OF BRAKE FLUID AND THE BLEEDING OF AIR FROM THE CIRCUITS.

Recommended products

AGIP BRAKE 4 Brake fluid

FMVSS DOT 4 Synthetic fluid

Headlight adjustment

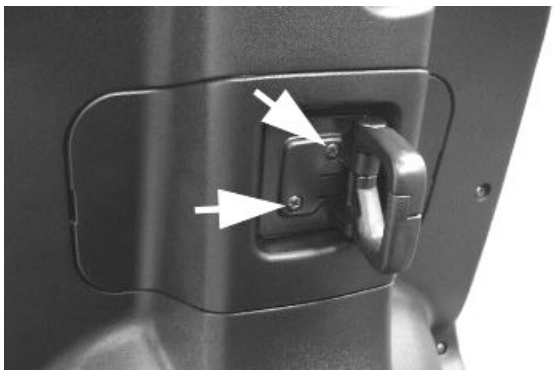
Proceed as follows:

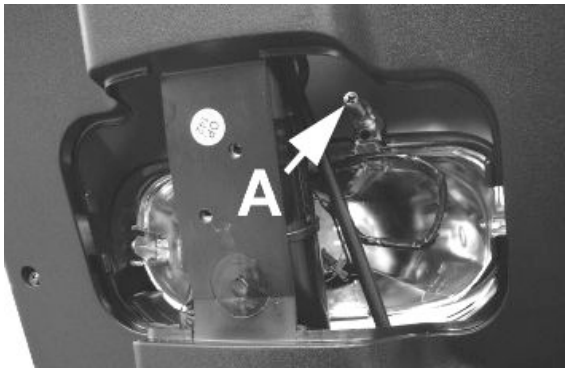
1. Place the vehicle in riding condition and with the tyres correctly inflated on a flat piece of ground at a distance of 10 m from a white screen situated in a shaded area, making sure that the scooter is perpendicular to the screen;

2. Turn on the headlight and check that the edge of the beam projected on the screen is not more than 9/10 of the height of the centre of the headlight from the ground, and not less than 7/10;

3. If this is not the case, remove the hook by turning the two screws, then remove the cover on the shield back plate.

Adjust the headlight by turning screw "**A**".





N.B.

THE ABOVE PROCEDURE COMPLIES WITH THE EUROPEAN STANDARDS REGARDING MAXIMUM AND MINIMUM HEIGHT OF LIGHT BEAMS. REFER TO THE STATUTORY REGULATIONS IN FORCE IN EVERY COUNTRY WHERE THE vehicle IS USED.

INDEX OF TOPICS

This section makes it possible to find the solutions to use in troubleshooting.

For each breakdown, a list of the possible causes and respective interventions is given.

Engine

Poor performance

POOR PERFORMANCE

Possible Cause	Operation
Defective fuel cock or vacuum hose damaged.	Replace the cock or the control hose.
Carburettor nozzles clogged or dirty	Dismantle, wash with solvent and dry with compressed air
Fuel filter on the tank outlet fitting dirty or clogged	Clean the fitting filter
Excess of encrustations in the combustion chamber	Remove the encrustations
Lack of compression wear of the piston rings or cylinder	Check the worn parts and replace them
Exhaust pipe clogged due to excessive encrustations	Replace the exhaust pipe and check the carburation and mixer timer
Air filter blocked or dirty	Clean according to the procedure
Starter inefficient (stays on)	Check the mechanical sliding, continuity of the circuit, the presence of power and electrical wiring
Clutch slipping	Check the centrifugal brake shoe assembly and /or clutch bell and replace if necessary
Defective mobile pulley sliding	Check the parts, change the faulty parts and lubricate the driven pulley using only Montblanc-Molibdenum Grease (dis. 498345) grease
Transmission belt worn	Replace
Roller wear; Presence of oil; Dirt	Clean the speed variator, replace the rollers if worn out

Rear wheel spins at idle

REAR WHEEL

Possible Cause	Operation
Idling rpms too high	Check the idling speed and, if necessary, adjust the C.O.
Clutch fault	Check the spring/friction mass and the clutch bell
Air filter housing not sealed	Correctly refit the filter housing and replace it if it is damaged

Starting difficulties

DIFFICULTY STARTING

Possible Cause	Operation
Carburettor nozzles clogged or dirty	Dismantle, wash with solvent and dry with compressed air
Defective fuel cock or vacuum hose damaged.	Replace the cock or the control hose.
Starter inefficient	Check: electric wiring, circuit continuity, mechanical sliding and power supply
Battery flat	Check the state of the battery. If it shows signs of sulphation replace it and bring the new battery into service charging it for eight hours at a current of 1/10 of the capacity of the battery itself
- Engine flooded.	Start up keeping the throttle fully open alternating approximately five seconds of turning it with five seconds still. If however it does not start, remove the spark plug, the engine over with the throttle open being careful to keep the cap in contact with the spark plug and the spark plug grounded but away from its hole. Refit a dry spark plug and start the vehicle.
Altered fuel characteristics	Drain off the fuel no longer up to standard; then, refill
Defective spark plug or with incorrect electrode gap	Remove the encrustation, restore the plug gap or replace being sure to use the types of spark plug recommended at all times.

Possible Cause	Operation
	Bear in mind that many problems engines have, derive from the use of the wrong spark plug
Intake joint cracked or with a bad seal	Replace the intake joint and check its tightness on the crankcase and on the carburettor
Purifier-carburettor fitting damaged	Replace

Excessive oil consumption/Exhaust smoke

EXCESSIVE OIL CONSUMPTION/SMOKEY EXHAUST

Possible Cause	Operation
Excess of encrustations in the combustion chamber	Remove the encrustations

Engine tends to cut-off at full throttle

ENGINE STOP FULL THROTTLE

Possible Cause	Operation
Maximum nozzle dirty - lean mixture	Wash the nozzle with solvent and dry with compressed air
Dirty carburettor	Wash the carburettor with solvent and dry with compressed air
Water in the carburettor	Empty the tank through the appropriate bleed nipple.
Air filter dirty	Clean or replace
Defective floating valve	Check the proper sliding of the float and the functioning of the valve
Tank breather hole obstructed	Restore the proper tank aeration

Engine tends to cut-off at idle

ENGINE STOP IDLING

Possible Cause	Operation
Minimum nozzle dirty	Wash the nozzle with solvent and dry with compressed air
Starter that stays open	Check: electric wiring, circuit continuity, mechanical sliding and power supply
Reed valve does not close	Check / replace the reed pack
Wrong idling adjustment	Correctly adjust the engine idling and check the level of the C.O.
Spark plug defective or faulty	Replace the spark plug with one with the specified degree and check the plug gap

Excessive exhaust noise

INCREASED NOISINESS

Possible Cause	Operation
Secondary metal air pipe deteriorated	Check the seal of the piping on the crankcase and on the housing, check the piping between the housing and the muffler.
Good condition of the missing secondary air circuit components	Check the individual components and the piping, check the precision of the fitting. Replace the damaged components

High fuel consumption

HIGH FUEL CONSUMPTION

Possible Cause	Operation
Air filter blocked or dirty.	Clean according to the procedure

Possible Cause	Operation
Starter inefficient	Check: electric wiring, circuit continuity, mechanical sliding and power supply

SAS malfunctions

SLACKENING OF THE RUBBER JOINT OF THE SECONDARY AIR PIPE ON THE MUFFLER

Possible Cause	Operation
Secondary air reed blocking	Replace
Secondary air filter clogging	Clean the filter and the housing
Blockage of the secondary air fitting on the muffler	Remove the encrustations from the joint being careful not to let the debris fall into the muffler

Transmission and brakes

Clutch grabbing or performing inadequately

CLUTCH

Possible Cause	Operation
Tear or irregular functioning	Check that the masses open and return normally Check that there is no grease on the masses Check that the clutch masses' contact surface with the clutch bell is mainly in the middle with characteristics equivalent on the three masses Check that the clutch bell is not scored or worn abnormally Never operate the engine without the clutch bell

Insufficient braking

BRAKING SYSTEM MALFUNCTION

Possible Cause	Operation
Poor braking	The rear (drum type) brake is adjusted by regulating the special adjustment (on the wheel) bearing in mind that, with the control levers in the rest position, the wheels must turn freely. The braking action should begin when the brake levers are pressed by about a third. Check the brake pad wear. If it is not possible to remove any problems by simply adjusting the transmissions, check the brake pads and front brake disc, the brake shoes and the rear drum. If you encounter excessive wear or scoring, make the necessary replacements.
Air bubbles inside the hydraulic braking system	Carefully bleed the hydraulic braking system, (there must be no flexible movement of the brake lever).
Fluid leakage in hydraulic braking system	Elastic fittings, piston seals or brake pump breakdown, replace
The brake fluid has lost its properties	Replace the front brake fluid and top up to the correct level in the pump
Defective sliding of the cables in their sheathes	Lubricate or substitute
Brake noise	Check the wear of the brake pads and/or shoes

Brakes overheating

BRAKES OVERHEATING

Possible Cause	Operation
Defective piston sliding	Check calliper and replace any damaged part.
Brake disc or drum deformed	Using a dial gauge, check the planarity of the disk with the wheel correctly fitted or the concentricity of the rear drum.

Electrical system

Battery

BATTERY

Possible Cause	Operation
Battery	The battery is the electrical device in the system that requires the most frequent inspections and thorough maintenance. If the vehicle is not used for some time (1 month or more) the battery needs to be recharged periodically. The battery runs down completely in the course of 5 ÷ 6 months. If the battery is fitted on a motorcycle, be careful not to invert the connections, keeping in mind that the black ground wire is connected to the negative terminal while the red wire is connected to the terminal marked+. Follow the instructions in the ELECTRICAL SYSTEM chapter for the recharging of the batteries.

Steering and suspensions

Rear wheel

POOR ROAD HOLDING

Possible Cause	Operation
Faulty suspension	Check that the rear shock absorber and/or the front fork is/are in good working order. Replace or overhaul the front fork and/or replace the rear shock absorbers in case of malfunction
Tyres deflated or damaged	Check the correct pressure of the tyres and the condition of the tread. Inflate to the correct pressure or replace.
Loosen the anchorage points of the front and/or rear suspension unit.	Check the tightness between the frame, swinging arm and engine and the fixing of the wheels to the hub and/or the axle. Check the correct tightening of the steering ring nut.

Heavy steering

STEERING HARDENING

Possible Cause	Operation
Torque not conforming	Check the tightening of the top and bottom ring nuts. If irregularities continue in turning the steering even after making the above adjustments, check the seats in which the ball bearings rotate: replace if they are recessed.

Excessive steering play

EXCESSIVE STEERING CLEARANCE

Possible Cause	Operation
EXCESSIVE STEERING CLEARANCE	Check the tightening of the top and bottom ring nuts. If irregularities continue in turning the steering even after making the above adjustments, check the seats in which the ball bearings rotate: replace if they are recessed.

Noisy suspension

NOISY SUSPENSION

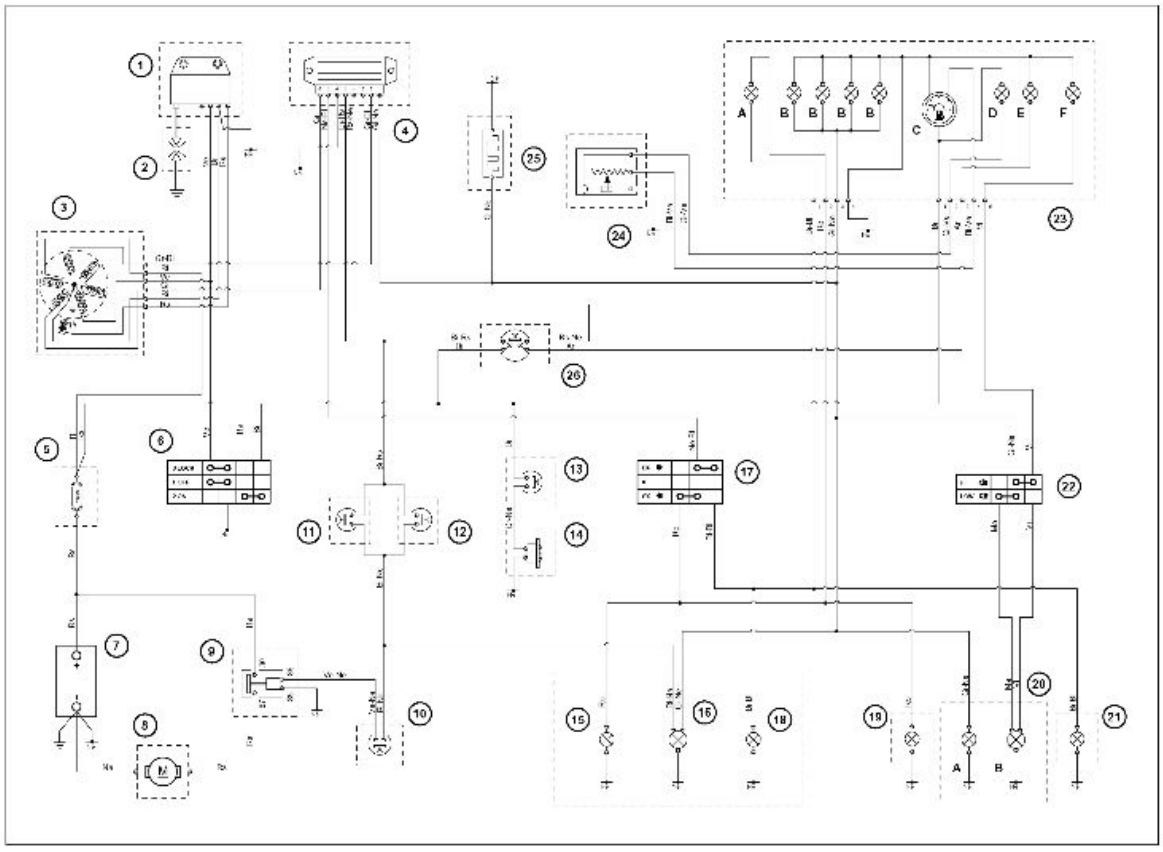
Possible Cause	Operation
Components of the front suspension damaged.	Check the quiet operation in the compression or release phases of the fork and if necessary overhaul it. Check that there is no noise or seizing during the wheel rotation; if there is, change the wheel bearing.
Components of the rear suspension damaged.	Check the absence of noise in the compression or release of the suspension, if necessary check the proper tightness to the swinging arm unit and the absence of rust or replace the entire shock absorber. Check that there is no noise or seizing during the wheel rotation; if there is noise or seizing overhaul the final reduction assembly.

Suspension oil leakage

OIL LEAKAGE FROM SUSPENSION

Possible Cause	Operation
Shock absorbers malfunctioning	Replace the complete shock absorption unit
Hydraulic cartridge in the fork damaged.	Replace the hydraulic cartridge

INDEX OF TOPICS



LEGEND:

1. Electronic ignition device

2. Spark plug

3. Magneto flywheel

4. Voltage regulator

5. Main fuse

6. Key switch

7. Battery

8. Starter motor

9. Starter remote control

10. Starter button

11. STOP button on rear brake

12. STOP button on front brake

13. Horn button

14. Horn

15. Left turn rear indicator lamp

16. Tail light/stop light lamp

17. Turn indicator switch

18. Right turn rear indicator lamp

19. Left turn front indicator lamp

20. Front headlight assembly

A. Tail light

B. High beam/low beam lamp

21. Right turn front indicator lamp

22. Light switch

23. Instrument panel

A. Flashing warning light

B. Instrument panel lamp and lights warning light

C. Fuel gauge

D. Low fuel warning light

E. Mixer oil warning light

F. High-beam warning light

24. Fuel level transmitter

25. Automatic starter

26. Oil warning light control

COLOUR CODES:

Or: Orange **Lb:** Light Blue **Wh**: White **Bl**: Blue **Ye:** Yellow **Gr:**Grey

Br:Brown **Bl:** Black **Pi**: Pink **Re:** Red **Gre**: Green **Pu:** Purple

Components arrangement

Voltage regulator

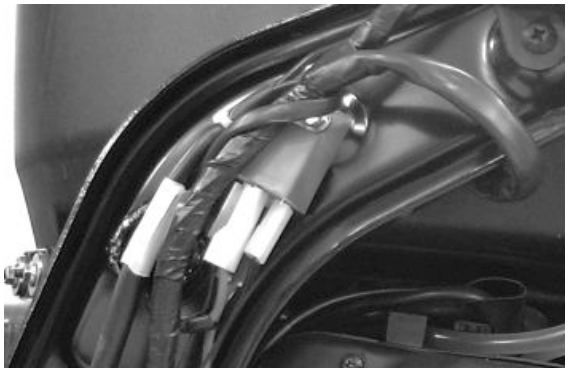
In order to access the voltage regulator it is necessary to remove the shield back plate.

H.V. coil

In order to access the H.V. coil it is necessary to remove the central chassis cover.

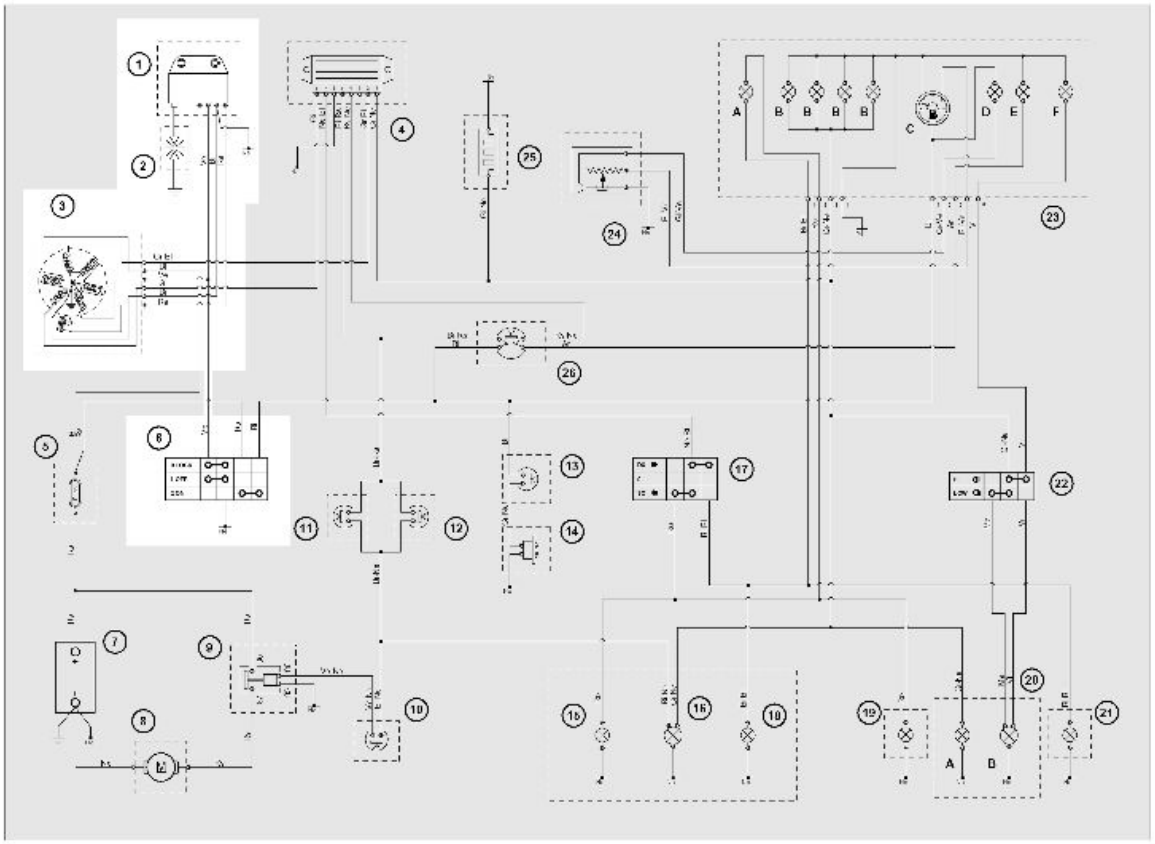
Starter remote control

In order to access the starter remote control it is necessary to remove the left side panel.



Conceptual diagrams

Ignition



LEGEND:

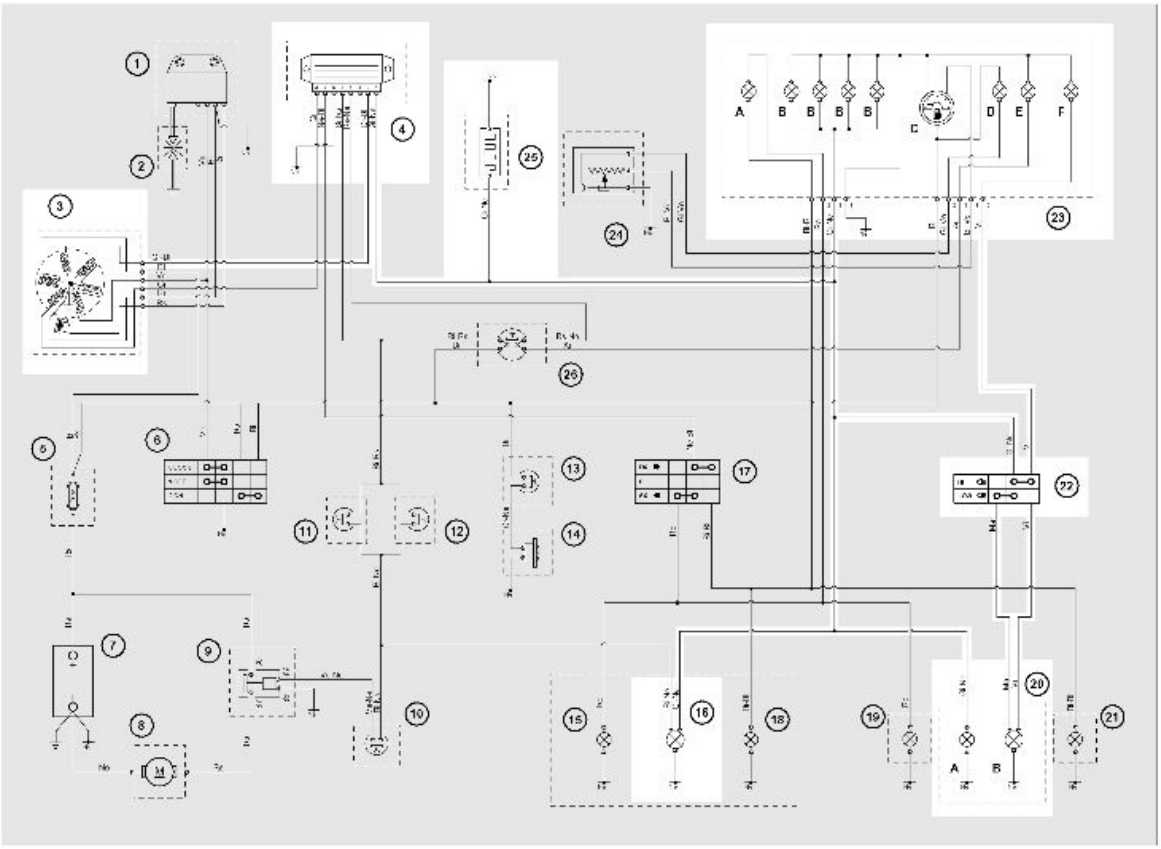
1. Electronic ignition device

2. Spark plug

3. Magneto flywheel

6. Key switch

Headlights and automatic starter section



LEGEND:

3. Magneto flywheel

4. Voltage regulator

16. Tail light/stop light lamp

20. Front headlight assembly

A. Tail light

B. High beam/low beam lamp

22. Light switch

23. Instrument panel

A. Flashing warning light

B. Instrument panel lamp and lights warning light

C. Fuel gauge

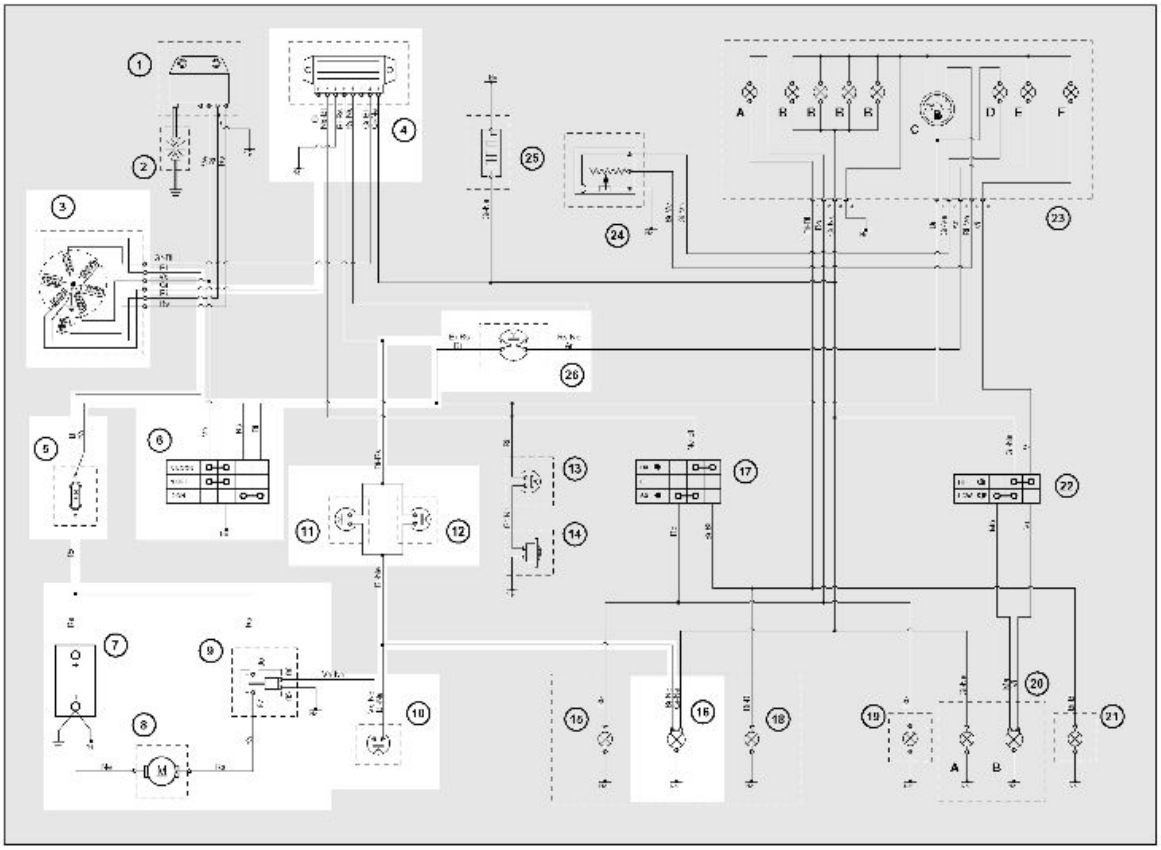
D. Low fuel warning light

E. Mixer oil warning light

F. High-beam warning light

25. Automatic starter

Battery recharge and starting



LEGEND:

3. Magneto flywheel

4. Voltage regulator

5. Main fuse

6. Key switch

7. Battery

8. Starter motor

9. Starter remote control

10. Starter button

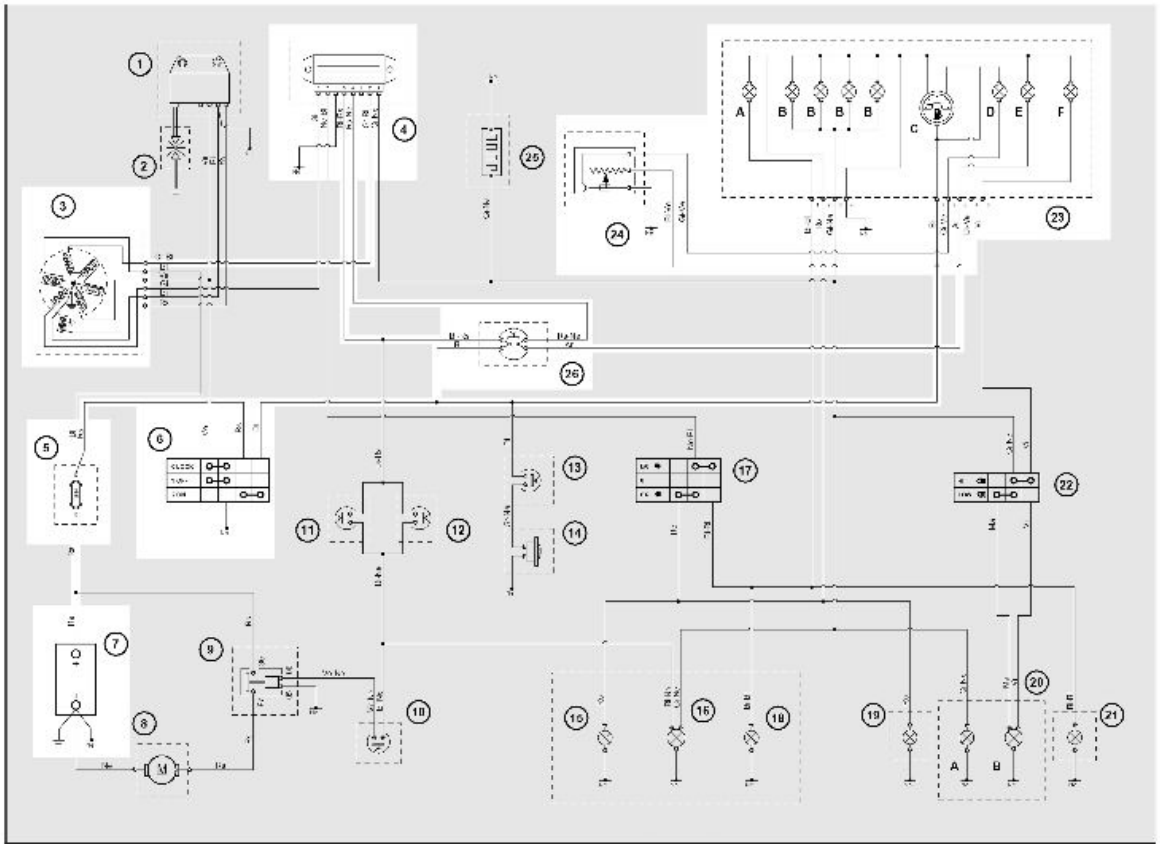
11. STOP button on rear brake

12. STOP button on front brake

16. Tail light/stop light lamp

26. Oil warning light control

Level indicators and enable signals section



LEGEND:

3. Magneto flywheel

4. Voltage regulator

5. Main fuse

6. Key switch

7. Battery

23. Instrument panel

A. Flashing warning light

B. Instrument panel lamp and lights warning light

C. Fuel gauge

D. Low fuel warning light

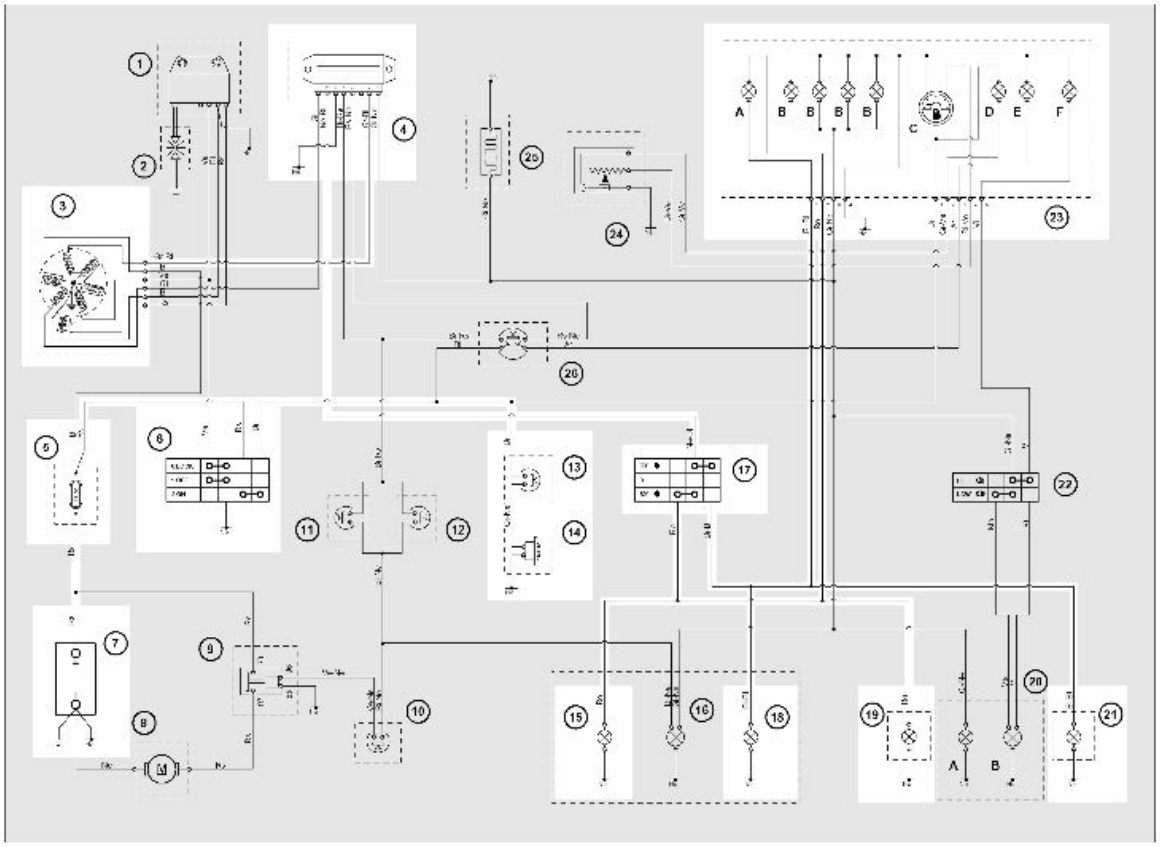
E. Mixer oil warning light

F. High-beam warning light

24. Fuel level transmitter

26. Oil warning light control

Turn signal lights



LEGEND:

3. Magneto flywheel

4. Voltage regulator

5. Main fuse

6. Key switch

7. Battery

13. Horn button

14. Horn

15. Left turn rear indicator lamp

17. Turn indicator switch

18. Right turn rear indicator lamp

19. Left turn front indicator lamp

21. Right turn front indicator lamp

23. Instrument panel

A. Flashing warning light

B. Instrument panel lamp and lights warning light

C. Fuel gauge

D. Low fuel warning light

E. Mixer oil warning light

F. High-beam warning light

Instruments and warning lights control board

LEGEND:

A= Speedometer

B= Odometer

C= Headlight warning light

D= Turn indicator warning light;

E= Digital clock

F= Clock setting buttons

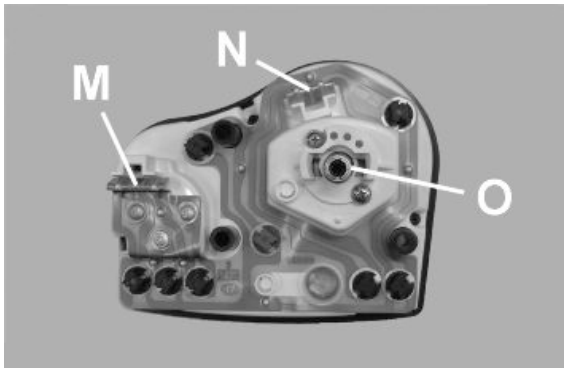
G= Low fuel warning light

H= Oil mix reserve warning light

I= High-beam headlight warning light

L= Fuel gauge

To remove the instrument, loosen the three screws, disconnect the odometer cable joint **O**, and connectors **M** and **N**.



Checks and inspections

Checks to be made in the case of ignition irregularities and/or no spark on the spark plug

1. Check the condition of the spark plug (clean it with a metal brush, remove the encrustations, blast it with compressed air and, if necessary, replace it).

2. Without removing the stator, carry out the following checks:

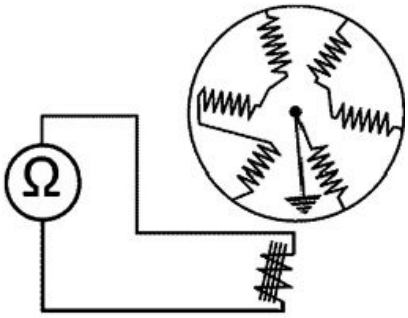
After visually checking the electrical wiring, perform measurements on the loading reel, the pickup (see chart) and the continuity using the appropriate tester.
If checks on the loading reel, pickup and continuity show abnormalities, replace the stator; otherwise replace the central unit. Remember that disconnections due to replacement of the central unit must be done with the engine off.

Specific tooling

020331Y Digital multimeter

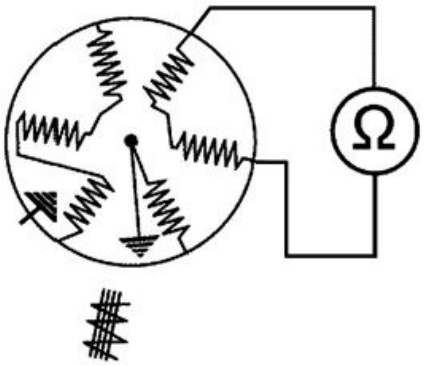
CHECK ON THE PICK UP

	Specification	Desc./Quantity
1	Red and white cable	90±140 ohm



RECHARGE COIL CHECK UP

	Specification	Desc./Quantity
1	Yellow and blue cable	800±1100 ohm

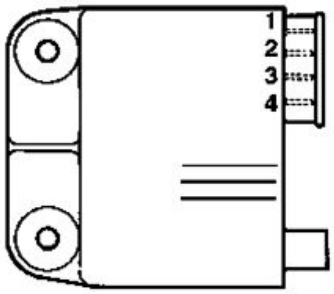


CHECK CONTINUITY

	Specification	Desc./Quantity
1	White cable-frame	continuity
2	White cable-engine	continuity

Ignition circuit

All the control operations of the system that require the disconnection of cables (checks of the connections and the devices making up the ignition circuit) must be done with the engine off: if this is not done, the controls might be irreparably damaged.

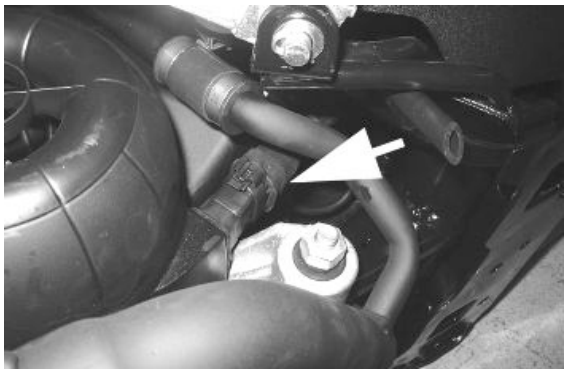


Stator check

- Using a tester, check the resistance between the red-ground and green-ground terminal.

N.B.

VALUES ARE STATED AT AMBIENT TEMPERATURE. A CHECK WITH THE STATOR AT OPERATING TEMPERATURE LEADS TO VALUES HIGHER THAN THOSE STATED.



Electric characteristic

Stator : green - ground

~ 1 Ω (Stator)

Pick-Up: red - ground

approx. 170 Ω (Pick-Up)

Voltage regulator check

The malfunctioning of the voltage regulator might cause the following problems depending on the type of fault:

1. The lighting system bulbs burn out.

2. The lighting system bulbs stop working.

3. The battery overcharges (the main fuse blows).

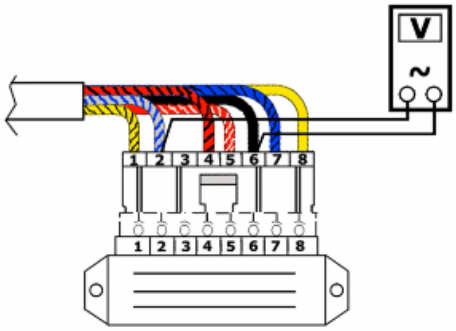
4. Non-recharging of the battery.

5. Non functioning of the turn indicators.

Measures

FAULT 1

Replace the regulator because it is certainly inefficient.



FAULT 2

Check the efficiency of the bulbs.

With the vehicle in gear, check the battery voltage on the yellow-black cable of the light switch. If there is no voltage check the presence of voltage between the yellow-black cable on the regulator and ground. If there is voltage here, the fault needs to be sought in the wiring from the regulator to the light switch or the correct supply of voltage to the stator is to be checked: without disconnecting the regulator connector and with the vehicle in gear, using the tester for alternate voltage readings check that the voltage supplied between the connection of the grey-blue cable (pin 2) and the black cable (pin 6) is within the values indicated. If faults are detected, replace the stator.

If no faults are detected in the controls carried out, replace the regulator.

If functioning is still not correct even when the regulator is replaced, check the connections of the electrical system.

Specific tooling

020331Y Digital multimeter

Characteristic

Voltage distributed at 3000 rpms

25 to 30V

FAULT 3

After checking that there are no short circuits in the system towards the earth, replace the regulator because it is certainly inefficient and replace it with a protective fuse.

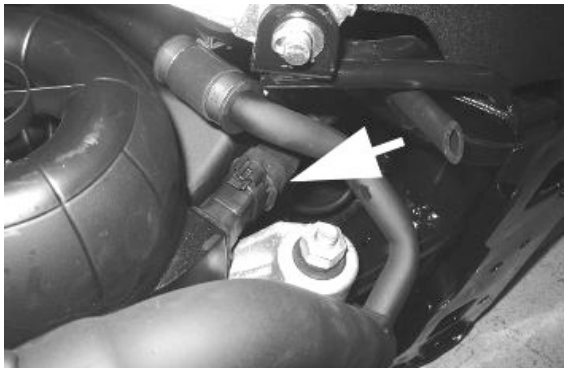
Following the replacement, measure the current and the recharging voltage on the battery end.

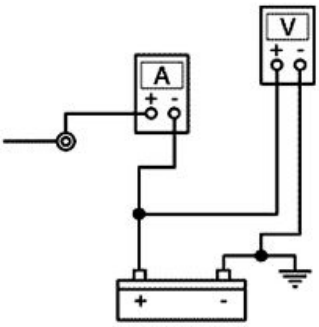
FAULT 4

Put the vehicle in gear and check when the tester for the detection of alternate voltages put between the blue cable connection and the yellow cable connection on the stator, the voltage distributed by the generator is within the values indicated. In the case of malfunction, check the continuity of the stator or continue with the tests.

Insert an ammeter between the stator (blue cable) and the battery and check, with the tester, that the current is properly distributed at 3000 rpm and the battery is kept between 12 and 13V as indicated.

If the values detected are lower than those specified, replace the regulator; otherwise replace the battery.





N.B.

BEFORE CARRYING OUT THE CHECKS ON THE REGULATOR AND RELATIVE SYSTEM, IT IS ALWAYS GOOD PRACTICE TO CHECK THAT THERE IS CONTINUITY BETWEEN THE BLACK CABLE AND THE GROUND.

N.B.

TO KEEP THE BATTERY BETWEEN 12 AND 13V, CAUSING CURRENT ABSORPTION BY THE SYSTEM, A 12V - 35W BULB CONNECTED BETWEEN THE + BATTERY AND GROUND CAN BE USED.

Specific tooling

020331Y Digital multimeter

Characteristic

Distributed current

1.5 to 2A

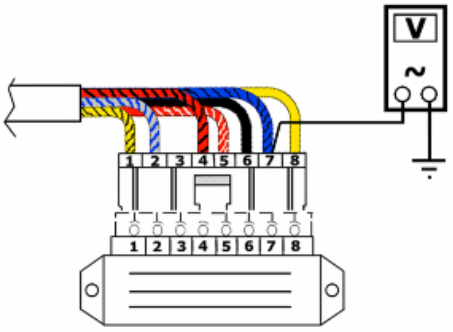
Voltage distributed at 3000 rpms

25 to 30V

FAULT 5

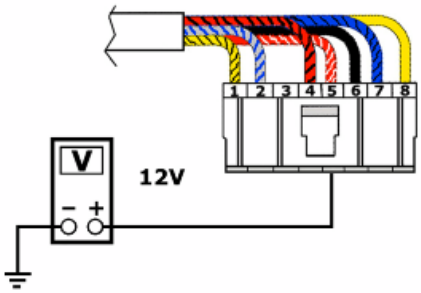
If the turn indicators do not work, do the following:

- Without removing the connector from the voltage regulator, move the key-controlled switch to ON and verify the presence of intermittent voltage between contact 7 and the ground. If there is voltage, the failure must be attributed to the flashing indicator switch

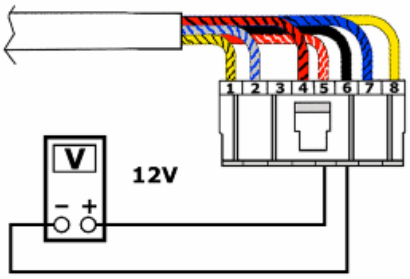


or the wiring, otherwise carry on with tests.

- With the engine off, remove the regulator connector, and insert the ends of the tester between contact 5 and the ground.
- Move the key controlled switch to ON and check there is battery voltage. If no voltage is detected, check the wiring and the contacts on the key switch and on the battery.



- Repeat the same procedure with the ends of the tester inserted between contact 5 (+) and 6 (-) and check the presence of the battery voltage with the key switch at on. If this does not happen, check the regulator's ground cable harness.



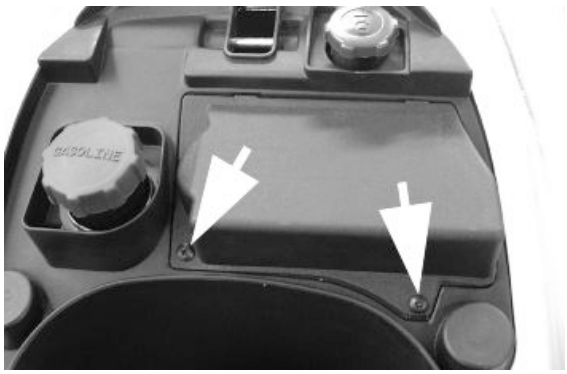
- If these last two tests have a positive result replace the regulator because it is certainly not functioning properly.

Specific tooling

020331Y Digital multimeter

Fuses

The electrical system is protected by a fuse connected on the left-hand side of the helmet compartment next to the battery. For access it is necessary to remove the battery cover and the transparent protection over the fuse block. The ignition system, headlight and the rear tail light are not fuse-protected.



CAUTION

BEFORE REPLACING THE BLOWN FUSE, SEARCH AND ELIMINATE THE BREAKDOWN THAT HAS LED TO THE BLOW OUT.
NEVER TRY TO REPLACE A FUSE USING DIFFERENT MATERIAL (FOR EXAMPLE A PIECE

OF ELECTRIC WIRE) OR A FUSE FOR A HIGHER AMPERAGE THAN THE INDICATED ONE.

Electric characteristic

Fuse

7.5 A

Sealed battery

Using the sealed battery for the first time

INSTRUCTIONS FOR REFRESHING THE STOCK CHARGE OF AN OPEN CIRCUIT

1) Voltage check

Before installing the battery on the vehicle, check the open circuit voltage with a normal tester.

- If the voltage exceeds 12.60 V, the battery may be installed without any renewal recharge.

- If voltage is below 12.60 V, a renewal recharge is required as explained in 2).

2) Constant voltage battery charge mode

-Constant voltage equal to 14.40÷14.70V

-Initial charge voltage equal to 0.3÷0.5 for nominal capacity

-Duration of the charge: 10 to 12 h recommended

Minimum 6 h

Maximum 24 h

3) Constant current battery charge mode

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

-Duration of the charge: 5 h

WARNING

-WHEN THE BATTERY IS REALLY FLAT (WELL BELOW 12.6V) IT MIGHT BE THAT 5 HOURS OF RECHARGING ARE NOT ENOUGH TO ACHIEVE OPTIMAL PERFORMANCE.
IN THESE CONDITIONS IT IS HOWEVER ESSENTIAL NOT TO EXCEED EIGHT HOURS OF CONTINUOUS RECHARGING SO AS NOT TO DAMAGE THE BATTERY ITSELF.

Dry-charge battery

WARNING

THE BATTERY ELECTROLYTE IS POISONOUS AS IT MAY CAUSE SERIOUS BURNS. IT CONTAINS SULPHURIC ACID. AVOID CONTACT WITH THE EYES, THE SKIN AND CLOTHING. IF COMING INTO CONTACT WITH EYES OR SKIN, WASH ABUNDANTLY WITH WATER FOR APPROX. 15 MIN. AND SEEK IMMEDIATE MEDICAL ATTENTION.
IN THE EVENT OF ACCIDENTAL INGESTION OF THE LIQUID, IMMEDIATELY DRINK LARGE QUANTITIES OF WATER OR MILK, MAGNESIUM MILK, BATTERED EGG OR VEGETABLE OIL. SEEK IMMEDIATE MEDICAL ATTENTION.
THE BATTERIES PRODUCE EXPLOSIVE GAS; KEEP CLEAR OF NAKED FLAMES, SPARKS OR CIGARETTES; VENTILATE THE AREA WHEN RECHARGING INDOORS.

ALWAYS WEAR EYE PROTECTION WHEN WORKING IN THE PROXIMITY OF BATTERIES. KEEP OUT OF REACH OF CHILDREN

Use of dry-cell batteries :

1. Having removed the short, closed tube and removed the caps, put into the elements sulphuric acid of the type for specific weight 1.26 accumulators corresponding to 30° Bé at a temperature of no less than 15°, until you reach the upper level.
2. Leave to stand for at least 2 hours; afterwards top-up to the level with sulphuric acid.
3. Within twenty four hours, recharge with the special (single or multiple) battery charger that re-charges at an intensity the same as approximately 1/10 the rated capacity of the said battery. At the end of the charge, make sure that the density of the acid is around 1.27, corresponding to 31° Bé and that these values are stabilised.
4. Once the charge is over, level the acid (by adding distilled water). Close and clean carefully.
5. Once the above operations have been performed, install the battery in the vehicle ensuring that it is wired up properly..

WARNING

- ONCE THE BATTERY HAS BEEN INSTALLED IN THE VEHICLE IT IS NECESSARY TO REPLACE THE SHORT TUBE (WITH CLOSED END) NEAR THE + POSITIVE TERMINAL WITH THE CORRESPONDING LONG TUBE (WITH OPEN END), THAT YOU FIND FITTED TO THE VEHICLE, TO ENSURE THAT THE GASES THAT FORM CAN ESCAPE PROPERLY.

Specific tooling

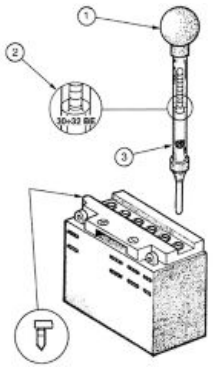
020333Y Single battery charger

020334Y Multiple battery charger

1 Hold the vertical tube

2 Look at the level

3 The float must be freed



Battery maintenance

The battery is an electrical device which requires careful monitoring and diligent maintenance. The maintenance rules are:

1) Check the level of the electrolyte

The electrolyte level must be checked frequently and must reach the upper level. Only use distilled water, to restore this level. If it is necessary to add water too frequently, check the vehicle's electrical system: the battery works overcharged and is subject to quick wear.

2)Load status check

After restoring the electrolyte level, check its density using an appropriate densitometer (see the figure).

When the battery is charged, you should detect a density of 30 to 32 Bé corresponding to a specific weight of 1.26 to 1.28 at a temperature of no lower than 15° C.

A density reading of less than 20° Bé indicates that the battery is completely flat and it must therefore be recharged.

If the scooter is not used for a given time (1 month or more) it will be necessary to periodically recharge the battery.

The battery runs down completely in the course of three months. If it is necessary to refit the battery in the vehicle, be careful not to reverse the connections, remembering that the ground wire (**black**) marked (-) must be connected to the **-negative** clamp while the other two **red** wires marked (+) must be connected to the clamp marked with the **+positive** sign.

3) Recharging the battery

Remove the battery from the vehicle removing the negative clamp first.

The normal bench charging must be carried out with the specific (single or multiple) battery charger, placing the battery charger selector on the type of battery to be recharged. The connections to the power supply must be made by connecting to the corresponding poles (+ with+ and -with -).

4) Battery cleaning

The battery should always be kept clean, especially on its top side, and the terminals should be coated with Vaseline.

WARNING

BEFORE RECHARGING THE BATTERY, REMOVE THE PLUGS OF EACH CELL. KEEP SPARKS AND NAKED FLAMES AWAY FROM THE BATTERY WHILE RECHARGING.

CAUTION

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

CAUTION

ORDINARY AND DRINKING WATER CONTAINS MINERAL SALTS THAT ARE HARMFUL FOR THE BATTERY. FOR THIS REASON, YOU MUST ONLY USE DISTILLED WATER.

CAUTION

CHARGE THE BATTERY BEFORE USE TO ENSURE OPTIMUM PERFORMANCE. INADEQUATE CHARGING OF THE BATTERY WITH A LOW LEVEL OF ELECTROLYTE BEFORE IT IS FIRST USED SHORTENS THE LIFE OF THE BATTERY.

Specific tooling

020334Y Multiple battery charger

020333Y Single battery charger

INDEX OF TOPICS

Removal of the engine from the vehicle

1) Disconnect the battery

2) Remove the full muffler.

3) Remove the rear wheel.

4) Remove the rear brake mechanical transmission.

5) Disconnect the electrical system connector from the magneto flywheel, from the starter and from the automatic starter.

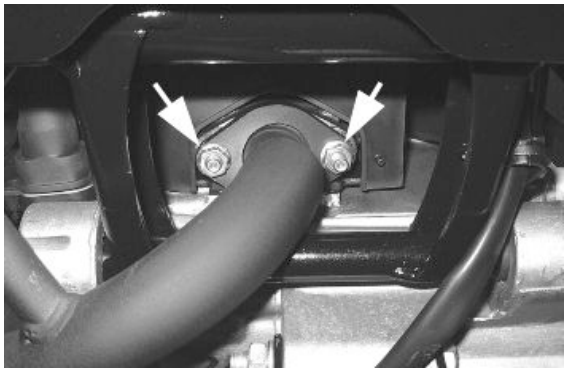
6) Disconnect the accelerator and mixer control transmissions.

7) Disconnect the mixer oil, fuel pipes and vacuum pump control on the carburettor.

8) Disconnect the high-voltage cable from the spark plug.

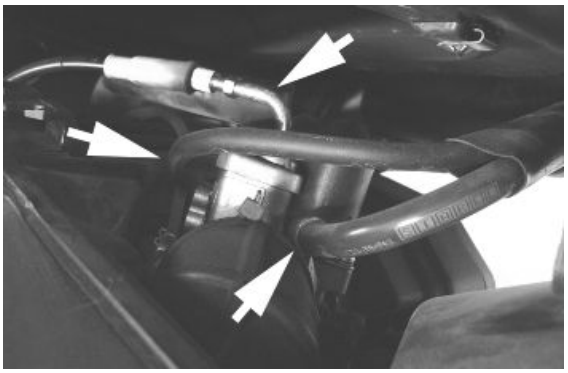
9) Remove the bolt fixing the rear shock absorber from the engine.

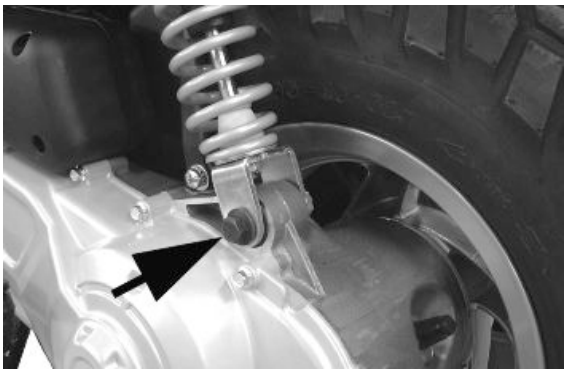
10) Undo the nut on the right-hand side then remove the engine-swinging arm fixing pin from the left-hand side.



Locking torques (N*m)

Engine-swinging arm bolt 33 ÷ 41 **Shock absorber-engine pin** 33 to 41 Nm **Rear wheel axle nut** 104 ÷ 126





INDEX OF TOPICS

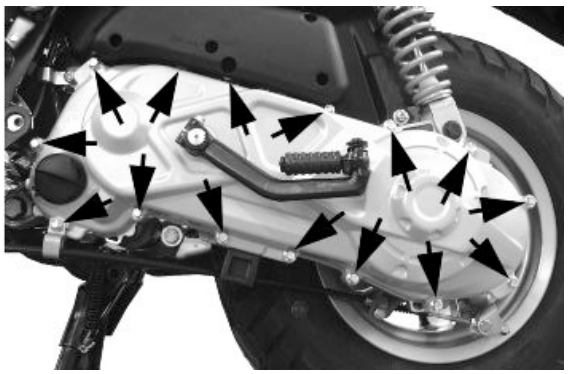
Automatic transmission

Transmission cover

- Loosen the 15 screws and remove the transmission cover with the aid of a mallet.

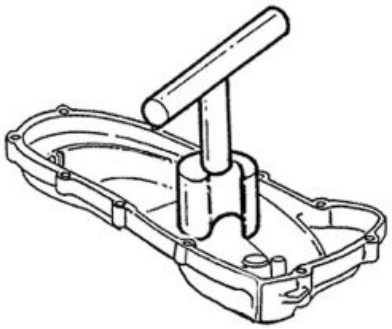
N.B.

THE CRANKCASE IS SLIGHTLY BLOCKED BY THE TIGHT FIT BETWEEN THE SHAFT OF THE DRIVEN HALF-PULLEY AND THE BEARING HOUSED ON THE CRANKCASE.



Kickstart

- Upon refitting, apply the recommended grease to the bushing, to the spring and along the toothed sector.
- Use the special tool for the charging of the spring, as shown in the figure.
- Refit the seeger ring after checking that it is in good condition.



Specific tooling

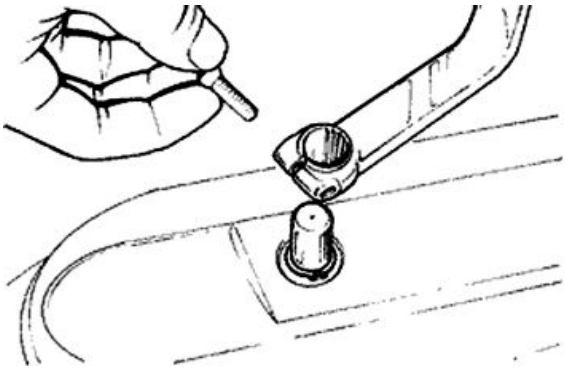
020261Y Starter spring fitting

Recommended products

AGIP GREASE MU3 Grease for odometer transmission gear case

Soap-based lithium grease with NLGI 3; ISO-L-XBCHA3, DIN K3K-20

- Remove the screws shown in the figure and remove the engine starting lever.
- For the assembly, work in reverse and tighten the screws to the prescribed torque..



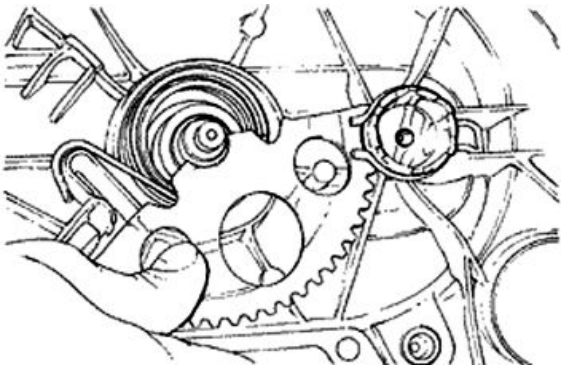
Locking torques (N*m)

Starter lever replacement **12 to 13 Nm**

- Remove the seeger ring located on the exterior of the crankshaft.
- Dismantle the dog gear from its seat, slackening the tension that the toothed sector applies to it by means of the spring; to do this, it is necessary to rotate the toothed sector slightly (see the figure).

CAUTION

WHILE REMOVING THE TOOTHED SECTOR, BE VERY CAREFUL OF THE SPRING TENSION: IT COULD CONSTITUTE A HAZARD FOR THE OPERATOR.

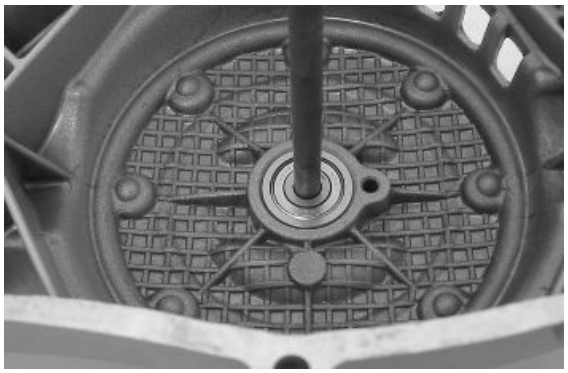


Removing the driven pulley shaft bearing

- Slightly heat the crankshaft from the inside side to avoid damaging the coated surface and use the driven pulley shaft or a pin of the same diameter to remove the bearing.

N.B.

IN CASE OF DIFFICULTY A STANDARD 8MM-INSIDE DIAMETER EXTRACTOR CAN BE USED.



Refitting the driven pulley shaft bearing

-Refit the bearing with the aid of a bushing with the same diameter as the external plate of the bearing after slightly heating the crankcase from the inside.

N.B.

WHEN REFITTING, ALWAYS REPLACE THE BEARING WITH A NEW ONE.

CAUTION

WHEN REMOVING/REFITTING THE BEARING, TAKE CARE NOT TO DAMAGE THE PAINTED SURFACE.

Removing the driven pulley

- Lock the clutch bell housing with the specific tool.
- Remove the nut, the clutch bell housing and the whole of the driven pulley assembly.

N.B.

THE UNIT CAN ALSO BE REMOVED WITH THE DRIVE PULLEY MOUNTED.

Specific tooling

020565Y Flywheel lock calliper spanner

Inspecting the clutch drum

- Check that the clutch bell is not worn or damaged.
- Measure the inner diameter of the clutch bell.

Characteristic

Clutch bell diameter/standard value

Ø 107+0.2 +0 mm

Clutch bell diameter/max. value allowed after use

Ø 107.5 mm

Eccentricity measured /max.

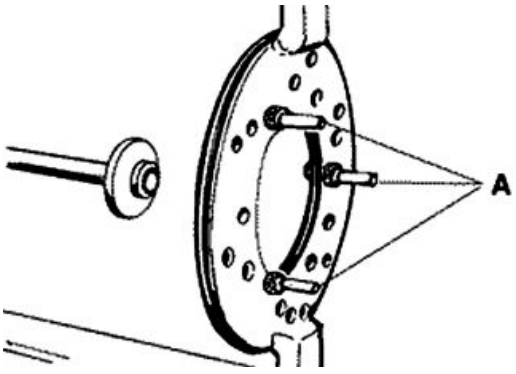
0.20 mm

Removing the clutch

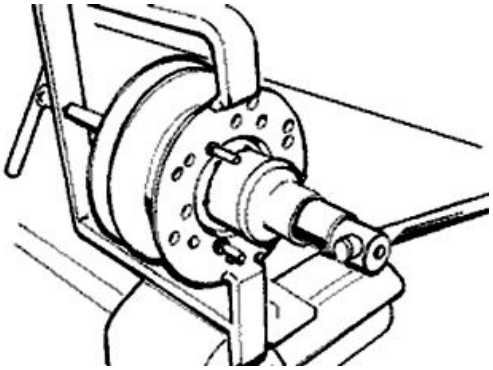
- Equip the tool with long pins screwed into position «**A**» from the outside, insert the entire driven pulley in the tool and put the central screw under stress.

CAUTION

THE TOOL WILL BE DEFORMED IF THE CENTRAL SCREW IS TIGHTENED UP TOO FAR.



- Using a 34 mm socket wrench remove the clutch locking nut.
- Loosen the central screw thereby undoing the driven pulley unit
- Separate the components.



Specific tooling

020444Y Tool for fitting/ removing the driven pulley clutch

Inspecting the clutch

- Check the thickness of the clutch mass friction material.
- The masses must not show traces of lubricants; otherwise, check the driven pulley unit seals.

N.B.

UPON RUNNING-IN, THE MASSES MUST EXHIBIT A CENTRAL CONTACT SURFACE AND MUST NOT BE DIFFERENT FROM ONE ANOTHER.
VARIOUS CONDITIONS CAN CAUSE THE CLUTCH TO TEAR.

CAUTION

DO NOT OPEN THE MASSES USING TOOLS TO PREVENT A VARIATION IN THE RETURN SPRING LOAD.

Characteristic

Check minimum thickness

1 mm

Pin retaining collar

- Remove the collar with the aid of 2 screwdrivers.

- Remove the three guide pins and the mobile half pulley.

Removing the driven half-pulley bearing

- Remove the roller bearing with the special extractor inserted from the bottom of the fixed half-pulley.

CAUTION

POSITION THE HOLDING EDGE OF THE EXTRACTION PLIERS BETWEEN THE END OF THE BEARING AND THE BUILT IN SEALING RING.

Specific tooling

001467Y029 Bell for bearings, O.D. 38 mm

- Remove the ball bearing retention snap ring.
- Expel the ball bearing from the side of the clutch housing by means of the special tool.

N.B.

PROPERLY SUPPORT THE HALF-PULLEY SO AS NOT TO DEFORM THE SLIDING SURFACE OF THE DRIVING BELT

Specific tooling

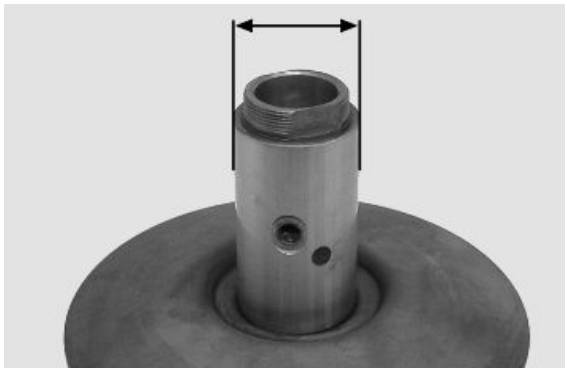
020376Y Adaptor handle

020363Y 20 mm guide

Inspecting the driven fixed half-pulley

- Check that there are no signs of wear on the work surface of the belt. If there are, replace the half-pulley..
- Make sure the bearings do not show signs of unusual wear.
- Measure the external diameter of the pulley bushing.

Characteristic



Stationary driven half-pulley/Standard diameter

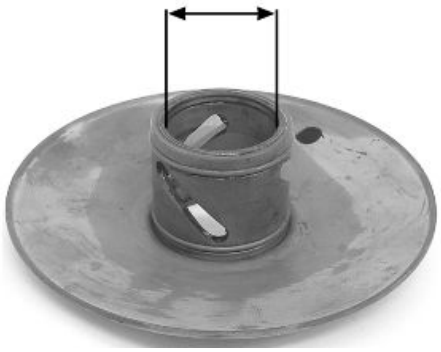
Ø 33.965 to 33.985 mm

Stationary driven half-pulley / Minimum diameter admitted after use

Ø 33.96 mm

Inspecting the driven sliding half-pulley

- Remove the 2 inner sealing rings and the two O-rings.
- Measure the inside diameter of the mobile half-pulley bushing.



Characteristic

Mobile driven half-pulley/ Maximum diameter allowed

Ø 34.08 mm

- Check the belt contact surfaces.
- Insert the new oil seal and O-rings on the mobile half-pulley.
- Fitting the half-pulley on the bushing.

Recommended products

AGIP GREASE SM 2 Grease for the tone wheel revolving ring

Soap-based lithium grease containing NLGI 2 Molybdenum disulphide; ISO-L-XBCHB2, DIN KF2K-20

- Make sure the pins and collar are not worn, reassemble the pins and collar.
- Use a greaser with a curved spout to lubricate the driven pulley unit with around 6 gr. of grease. This operation must be done through one of the holes inside the bushing until grease comes out of the opposite hole. This procedure is necessary to prevent the presence of grease beyond the O-ring.

Recommended products

AGIP GREASE SM 2 Grease for the tone wheel revolving ring

Soap-based lithium grease containing NLGI 2 Molybdenum disulphide; ISO-L-XBCHB2, DIN KF2K-20

Refitting the driven half-pulley bearing

- Fit a new ball bearing with the specific tool.
- Fit the ball bearing retention snap ring.
- Fit the new roller bearing with the wording visible from the outside.

CAUTION

PROPERLY SUPPORT THE HALF-PULLEY TO PREVENT DAMAGE TO THE THREADED END WHILE THE BEARINGS ARE BEING FITTED.

Specific tooling

020376Y Adaptor handle

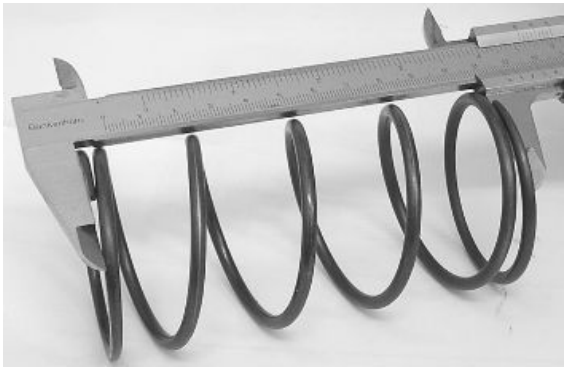
020456Y Ø 24 mm adaptor

020362Y 12 mm guide

020171Y Punch for Ø 17 mm roller case

Inspecting the clutch spring

- Check that the contrast spring of the driven pulley does not show signs of deformation
- Measure the free length of the spring



Characteristic

Standard length

118 mm

Minimum length allowed after use

113 mm

Refitting the clutch

- Preassemble the driven pulley group with spring, sheath and clutch.
- Position the spring with the sheath
- Insert the components in the tool and preload the spring being careful not to damage the plastic sheath and the end of the threaded bar.

- Reassemble the nut securing the clutch and tighten to the prescribed torque.

CAUTION

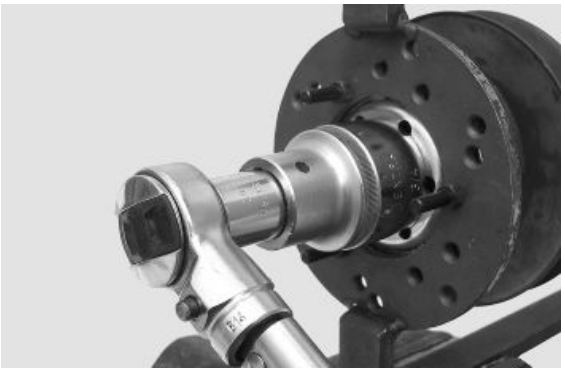
SO AS NOT TO DAMAGE THE CLUTCH NUT USE A SOCKET WRENCH WITH SMALL CHAMFER.

CAUTION

POSITION THE NON-CHAMFERED SURFACES OF THE NUT IN CONTACT WITH THE CLUTCH

Locking torques (N*m)

Nut locking clutch unit on pulley **55 ÷ 60 Nm**



Refitting the driven pulley

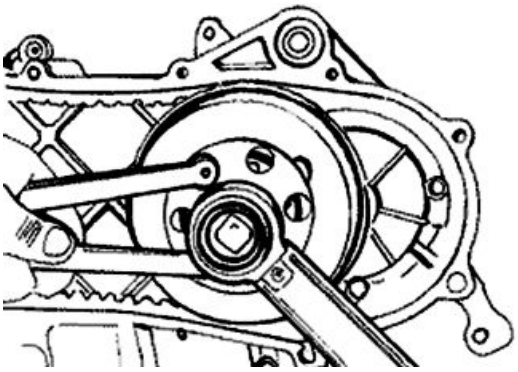
-Refit the driven pulley assembly, the clutch bell and the nut, using the specific tool.

Specific tooling

020565Y Flywheel lock calliper spanner

Locking torques (N*m)

Driven pulley shaft nut **40 to 44 Nm**



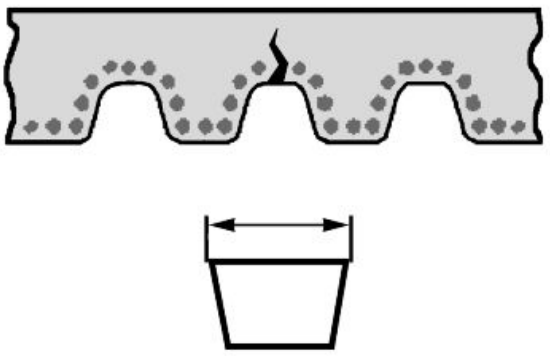
Drive-belt

- Make sure the driving belt is not damaged and does not have cracks in the toothed grooves.
- Check the width of the belt.

Characteristic

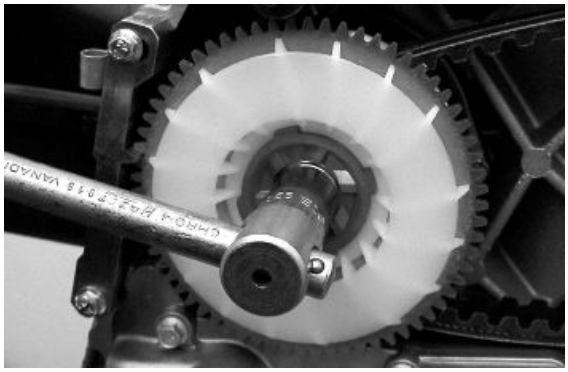
Transmission belt/Minimum width

17.5 mm



Removing the driving pulley

- Lock the driving pulley using the appropriate tool.
- Remove the central nut with the related washer, then remove the drive and the plastic fan.
- Remove the stationary half-pulley.



- Remove the belt, washer and remove the mobile half-pulley with its bushing, being careful that the rollers and contrast plate fitted loosely on it do not come off.

Specific tooling

020451Y Starting ring gear lock

Mixer gears and belt

- Remove gear and belt.

CAUTION

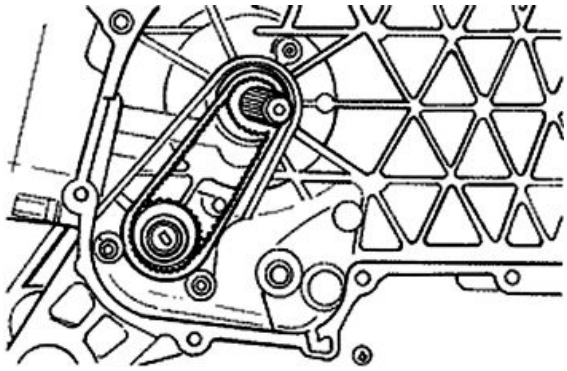
PAY PARTICULAR ATTENTION TO NOT TOUCHING OR BENDING THE BELT BECAUSE THIS COULD BREAK SUDDENLY DURING OPERATION.

CAUTION

ON REFITTING, MAKE SURE THAT DIRT DOES NOT GET INTO THE INNER BUSHING OF THE MIXER CONTROL GEAR AND THAT IT DOES NOT EXERT ANY STRESS ON THE CRANKCASE PIN.

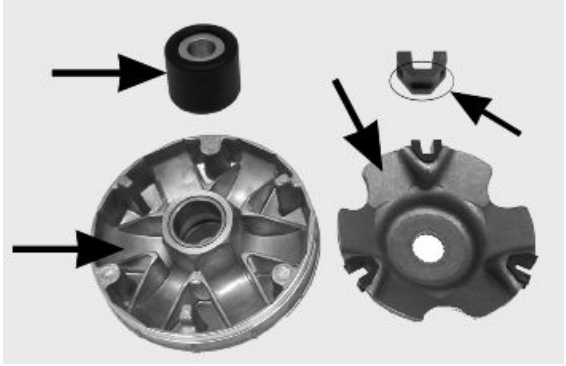
N.B.

REPLACE THE BELT EVERY 20000 KM.



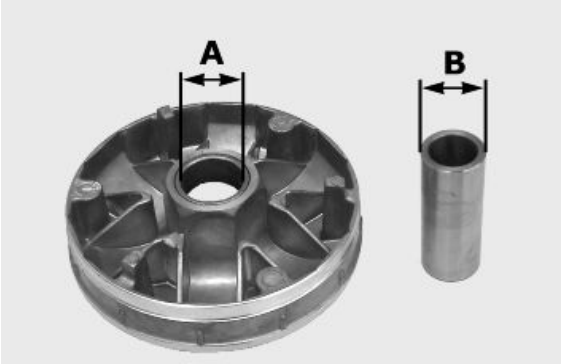
Inspecting the rollers case

1) Check that the bushing and the sliding rings of the mobile pulley do not show signs of scoring or deformation.
2) Check the roller running tracks on the contact pulley; there must not be signs of wear and check the condition of the contact surface of the belt on the half-pulleys (mobile and stationary).
3) Check that the rollers do not show signs of marked facetting on the sliding surface and that the metallic insert does not come out of the plastic shell borders.



4) Check the integrity of the sliding blocks of the contact plate.

- Check that the internal bushing shown in the figure is not abnormally worn and measure inside diameter «**A**».
- Measure outside diameter «**B**» of the pulley sliding bushing shown in the figure.



CAUTION

DO NOT LUBRICATE OR CLEAN THE BUSHING.

Characteristic

Driving pulley / Maximum diameter:

20.12 mm

Driving pulley/ Standard diameter:

20.021 mm

Driving pulley bushing/ Diameter maximum:

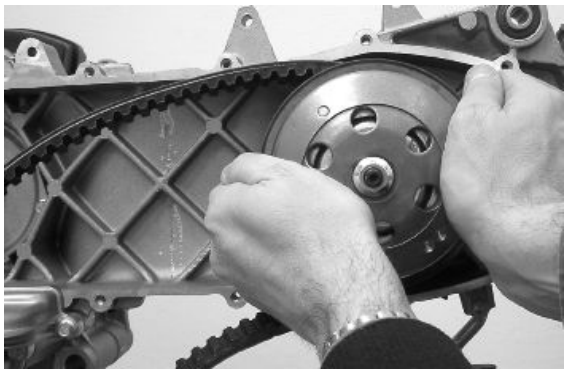
XXX mm

Driving pulley bushing/ Standard diameter:

20 -0.020/-0.041mm

Refitting the driving pulley

- Manually move the movable driven half-pulley away by pulling it towards the clutch unit and insert the belt observing the direction of rotation of the first fitting.



N.B.

IT IS GOOD PRACTICE ALWAYS TO FIT THE BELT SO THAT THE WORDS CAN BE READ IN CASE IT DOES NOT SHOW A FITTING SIDE.

- Refit the components of the assembly (roller container assembly with bushing, limiting washer, stationary half-pulley, cooling fan belt with drive, washer and nut).
- With the specific tool, tighten the lock nut to 20 Nm and then perform a final 90° locking in order to prevent the rotation of the driving pulley.

N.B.

REPLACE THE NUT WITH A NEW ONE AT EVERY REFIT

CAUTION

UPON FITTING THE DRIVING PULLEY UNIT IT IS OF UTMOST IMPORTANCE THAT THE BELT IS FREE INSIDE IN

ORDER TO AVOID WRONG TIGHTENING AND CONSE-QUENTLY DAMAGING THE CRANKSHAFT KNURLING.

Specific tooling

020451Y Starting ring gear lock

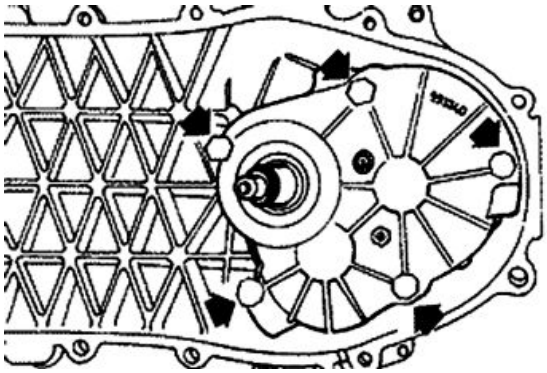
Locking torques (N*m)

Crankshaft pulley nut **18 to 20 + 90° Nm**

End gear

Removing the hub cover

- Remove the transmission cover
- Remove the clutch assembly
- Discharge the rear hub oil.
- Remove the 5 screws indicated in the figure.
- Remove the hub cover with driven pulley shaft.

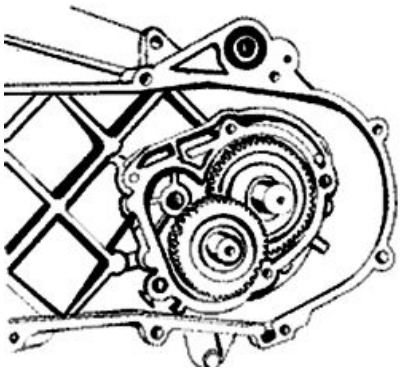


See also

Refitting the clutch

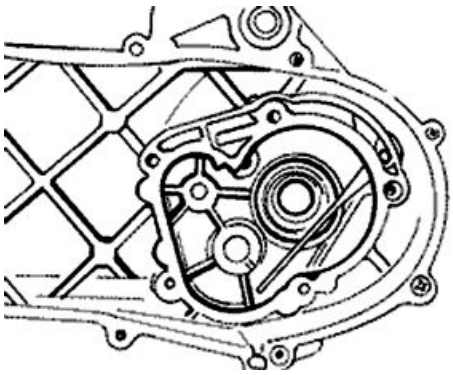
Removing the wheel axle

- Remove the intermediate gear and the complete gear wheel axle.
- When removing the intermediate gear pay attention to the various shim adjustments.



Removing the wheel axle bearings

- Remove the oil seal and the seeger ring.
- Remove the bearing by pushing from the outside towards the inside of the gear compartment, using the appropriate punch.



Specific tooling

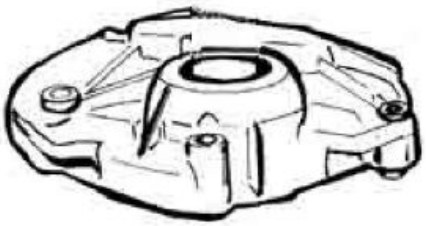
020363Y 20 mm guide

020376Y Adaptor handle

020358Y 37x40-mm adaptor

Removing the driven pulley shaft bearing

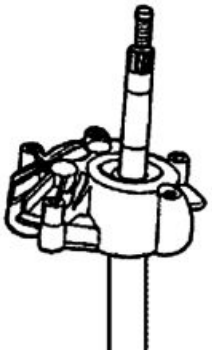
- Remove the seeger ring inside the cover.
- Remove the oil seal from the outside.
- Remove the centring dowels and position the cover on a plane.
- Position the special tool on the internal track of the bearing and remove said bearing with the aid of a press.



Specific tooling

020452Y Tube for removing and refitting the driven pulley shaft

- Position the special tube on the internal raceway of the bearing and from the shaft toothed side as indicated in the figure. Expel the driven pulley shaft with the aid of a press.



Specific tooling

020452Y Tube for removing and refitting the driven pulley shaft

Inspecting the hub shaft

- Check that the three shafts exhibit no wear or deformation on the toothed surfaces, at the bearing housings and at the oil guards.
- In case of anomalies, replace the damaged components.
- Check that the fitting surface is not dented or distorted.
- If faults are found, replace the hub cover.

Inspecting the hub cover

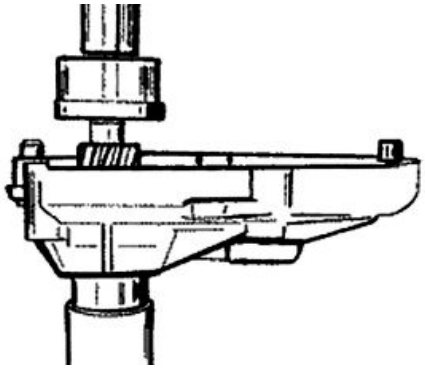
- Check that the fitting surface is not dented or distorted.
- If faults are found, replace the hub cover.

Refitting the driven pulley shaft bearing

- Support the inner track of the bearing from the outside of the hub cover with the specific tool positioned under the press and insert the driven pulley axle.
- Refit the oil seal flush with the cover.

Specific tooling

020452Y Tube for removing and refitting the driven pulley shaft

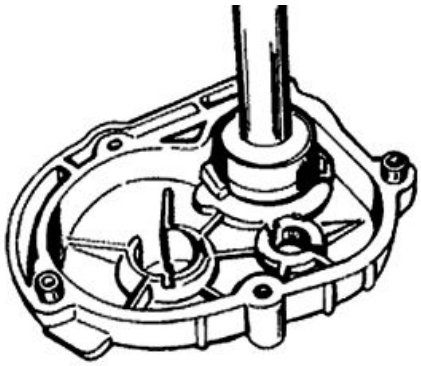


• Heat the hub cover and insert the bearing with the specific punch.

• Fit the snap ring with the concave or radial part on the bearing side.

N.B.

FIT THE BALL BEARING WITH THE SHIELD FACING THE OIL SEAL.



Specific tooling

020151Y Air heater

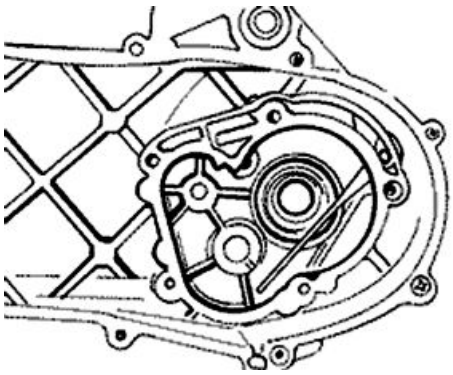
020376Y Adaptor handle

020439Y 17 mm guide

020358Y 37x40-mm adaptor

Refitting the wheel axle bearing

- Heat the half crankcase on the transmission side using a thermal gun.
- After lubricating its outer strip, insert the bearing with the special adapter with the aid of a hammer.
- Refit the seeger ring and the oil seal using the 42 x 47 mm adapter and the handle.



Specific tooling

020151Y Air heater

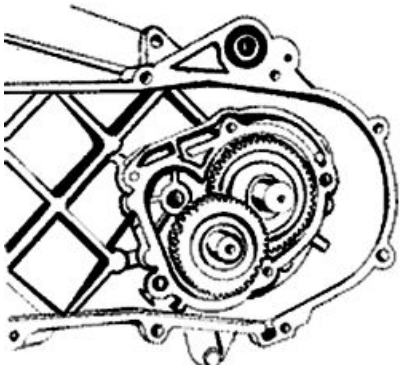
020376Y Adaptor handle

020363Y 20 mm guide

020359Y 42x47-mm adaptor

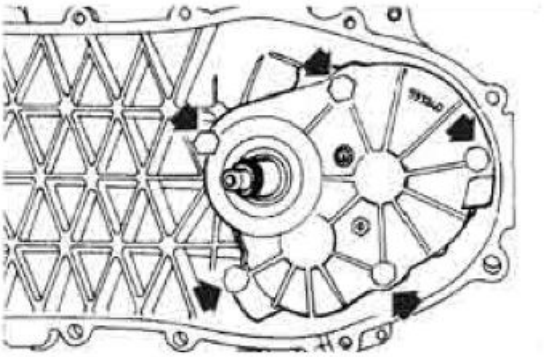
Refitting the ub cover

- Refit the whole wheel axle.
- Refit the intermediate gear paying attention to the two shim thicknesses.
- Apply LOCTITE 510 for surfaces to the hub covers and refit the same with driven pulley shaft.
- Refit the 5 screws and tighten them to the specified torque.



N.B.

CLEAN THE CONTACT SURFACES OF THE HUB COVER AND THE HALF CRANKCASE OF RESIDUE FROM PREVIOUS GASKETS BEFORE APPLYING A NEW ONE.



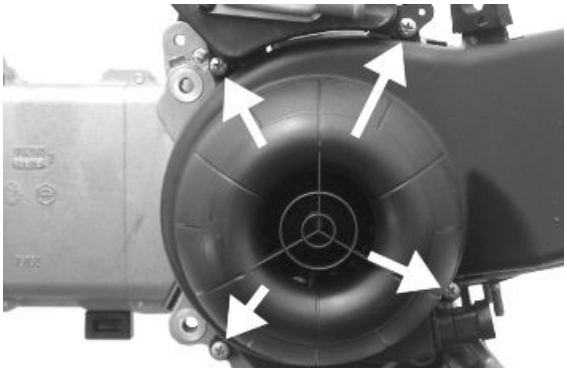
Locking torques (N*m)

Locking torque: 11 to 13 Nm

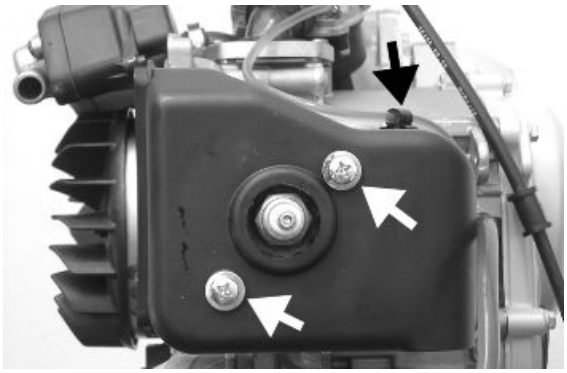
Flywheel cover

Cooling hood

- Remove the four fixings shown in the figure.
- Remove the fan cover

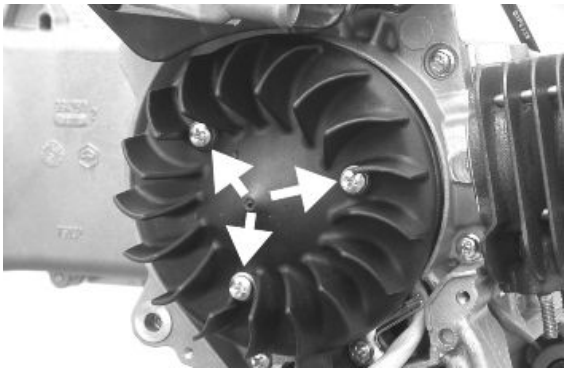


- Remove the oil piping retention band from the hood
- Remove the 2 screws shown in the figure



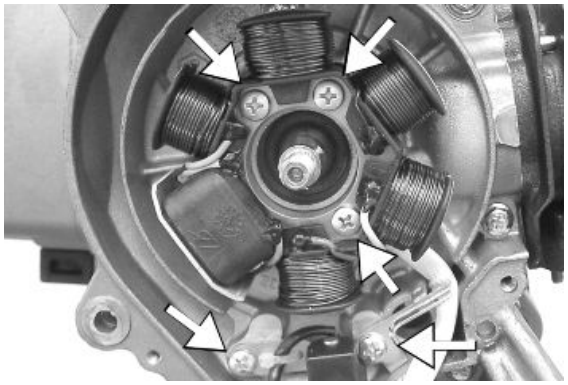
Cooling fan

- Remove the cooling fan by acting on the three fixings indicated in the figure.



Removing the stator

- Remove the three stator fixings shown in the photo
- Remove the two pick-up fixings shown in the photo
- Remove the stator with the wiring



Refitting the stator

- Refit the stator and flywheel carrying out the removal procedure in reverse, tightening the retainers to the specified torque.

N.B.

THE PICK-UP CABLE MUST BE POSITIONED ADHERING TO THE FUSION TONGUE ON THE CRANKSHAFT IN SUCH A WAY AS TO AVOID BEING CRUSHED BY THE FAN COVER ASSEMBLY.

Locking torques (N*m)

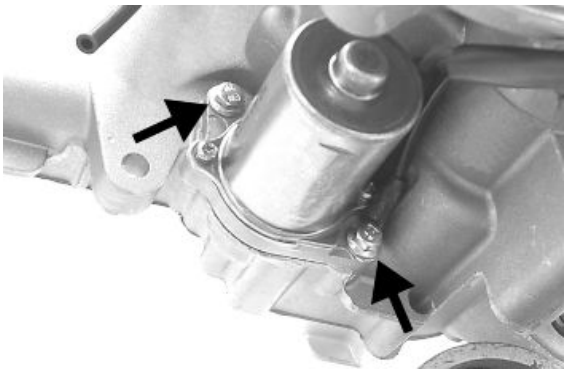
Pick-up screws 3 ÷ 4 Stator screws 3 ÷ 4

Flywheel and starting

Removing the starter motor

- Remove the center stand by unscrewing the four clamping screws (two per side) of the engine block
- R

emove the two clamps shown in the figure



Removing the flywheel magneto

- Lock the rotation of the flywheel using the calliper spanner.
- Remove the nut.

CAUTION

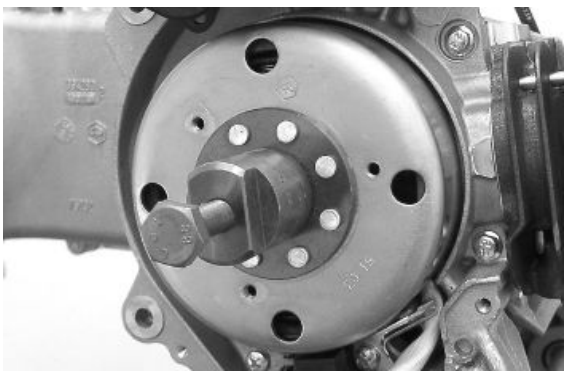
THE USE OF A CALLIPER SPANNER OTHER THAN THE ONE SUPPLIED COULD DAMAGE THE STATOR COILS

- Extract the flywheel with the extractor.

Specific tooling

020565Y Flywheel lock calliper spanner

020162Y Flywheel extractor



Inspecting the flywheel components

- Check the condition of the flywheel and any distortions that might cause rubbing on the stator and on the Pick-Up.

Refitting the flywheel magneto

- Fit the flywheel being careful to insert the key properly.
- Lock the flywheel nut at the prescribed torque
- Check the Pick-Up air gap.
- The air gap may not be modified in the fitting of the Pick-Up.
- Other values derive from deformations visible on the Pick-Up support.

N.B.

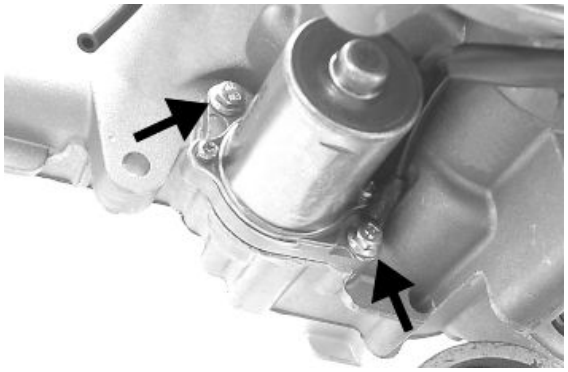
A VARIATION OF THE AIR GAP DISTANCE CAN LEAD TO A VARIATION IN THE IGNITION ADVANCE SUCH AS TO CAUSE PINGING, KNOCKING ETC.

Locking torques (N*m)

Flywheel nut **40 to 44 N.m**

Refitting the starter motor

- Fit a new O-ring on the starter and lubricate it.
- Fit the starter on the crankcase, locking the two screws to the prescribed torque.



N.B.

REFIT THE REMAINING PARTS AS DESCRIBED IN THE CYLINDER HEAD, TIMING, LUBRICATION, FLYWHEEL AND TRANSMISSION CHAPTERS.

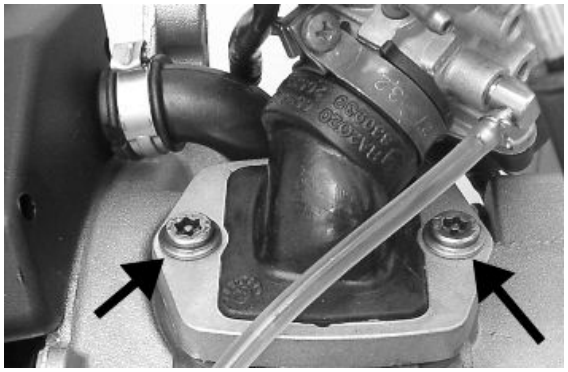
Locking torques (N*m)

Starter motor screws **11 ÷ 13**

Cylinder assy. and timing system

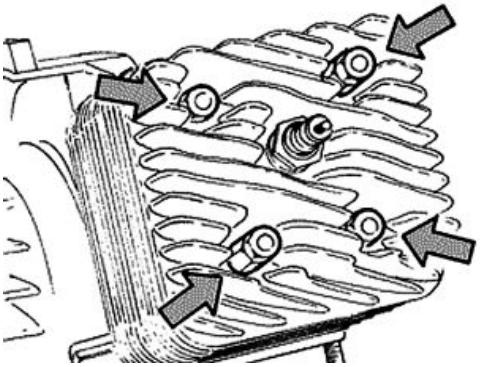
Removing the intake manifold

Use an anti-tampering TORX spanner to remove the two clamping screws of the intake manifold



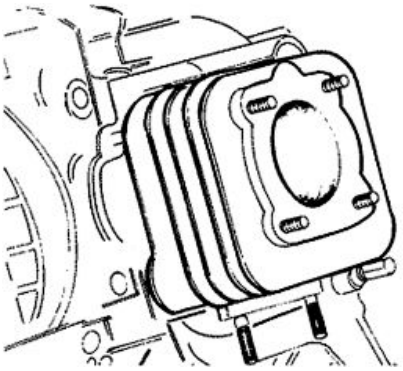
Removing the cylinder head

Remove the 4 screws shown in the figure



Removing the cylinder - piston assy.

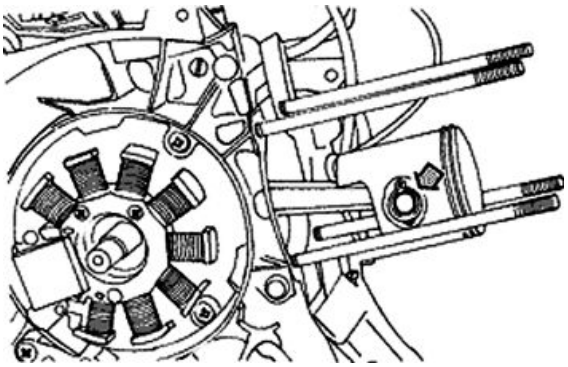
Remove the cylinder very carefully



Remove the snap rings and remove the pin

CAUTION

AFTER EACH REMOVAL OPERATION REPLACE THE PIN RETENTION SNAP RINGS

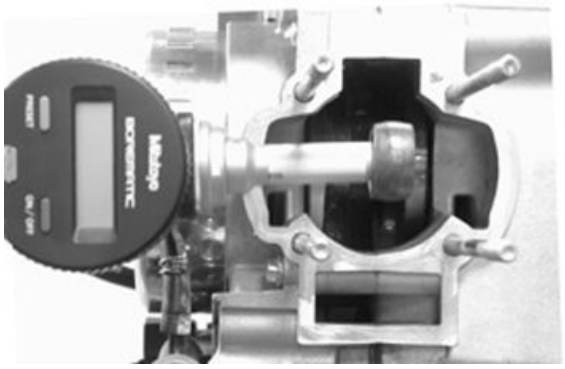


Inspecting the small end

- Measure the internal diameter of the small end using an internal micrometer.

N.B.

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



Characteristic

Rod small end: standard diameter

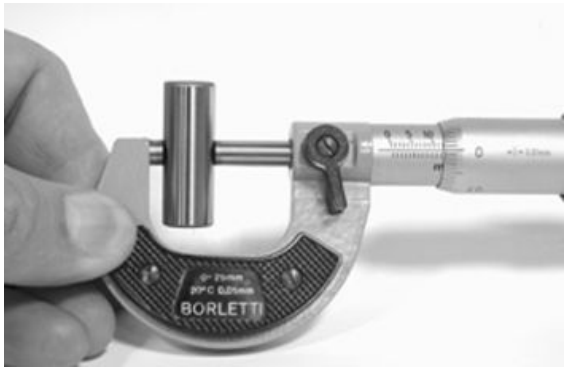
17 +0.011-0.001

Rod small end: maximum allowable diameter

17,060 mm

Inspecting the wrist pin

- Check the wrist pin external diameter using a micrometer



Characteristic

Wrist pin: standard diameter

12 +0.005 +0.001 mm

Inspecting the piston

- Measure the bearings on the piston using a bore meter
- Calculate the piston-pin coupling clearance.

Characteristic

Wrist pin housing: standard diameter

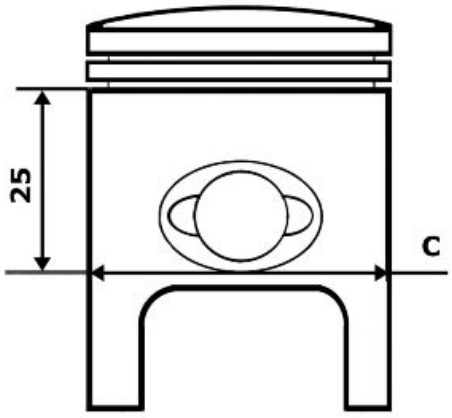
12 +0.007 +0.012

Wrist pin housing: standard clearance

0.002 ÷ 0.011 mm

- Measure the outer diameter of the piston, perpendicular to the pin axis.
- Take the measurement in the position shown in the figure

To classify the cylinder-piston fitting, check the appropriate table



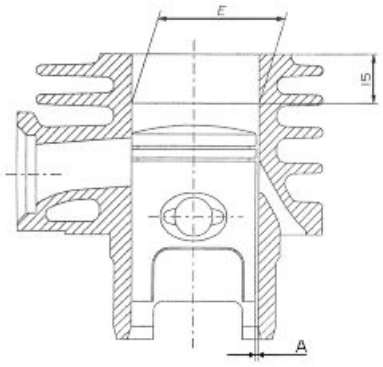
See also

Cylinder - piston assy.

Inspecting the cylinder

- Check that the cylinder does not show seizures. Otherwise, replace it or adjust it respecting the allowable increases
- Measure the internal diameter of the cylinder with a bore meter, according to the directions given in the figure
- Check that the fitting surface with the head is not dented or distorted.

To classify the cylinder-piston fitting, check the appropriate table



See also

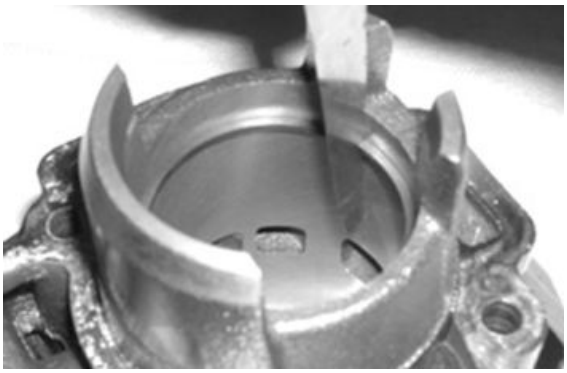
Cylinder - piston assy.

Inspecting the piston rings

- Alternatively insert the two sealing rings in the cylinder

Using the piston, insert the seals perpendicularly to the cylinder axis.

- Measure the opening of the sealing rings using a thickness gauge as shown in the photograph
- If the values are higher than the values prescribed in the chart, substitute the rings



Removing the piston

- Position the snap ring in detail 1 with the opening straddling the arrow printed on the tool.

-Push detail 2 into detail 1 until the stop and extract detail 2.

- Insert detail 3 into detail 1, position the assembly in the snap ring assembly area, and push detail 3 all the way in.

N.B.

REFIT THE REMAINING PARTS FOLLOWING THE OPERATIONS IN REVERSE ORDER FROM THE REMOVAL OPERATIONS

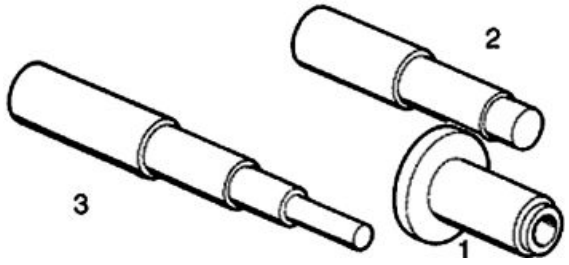
Specific tooling

020166Y Pin lock fitting tool

Locking torques (N*m)

Locking head nuts: 10 to 11 N·m

- Use new wrist pin snap rings.
- Use new cylinder base gasket.
- Before refitting carefully clean all the surfaces.
- Use oil to be mixed during the fitting of the piston and the cylinder.



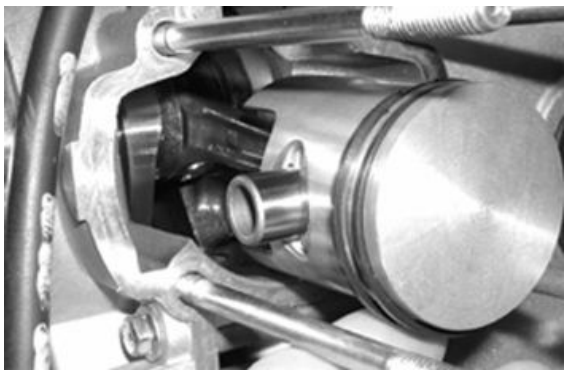
CAUTION

POSITION THE ARROW PRINTED ON THE PISTON CROWN TOWARDS THE EXHAUST OPENING.
THE WRIST PIN SNAP RINGS MUST BE POSITIONED ON THE PISTON WITH THE SPECIFIC TOOL

Recommended products

AGIP CITY TEC 2T Oil

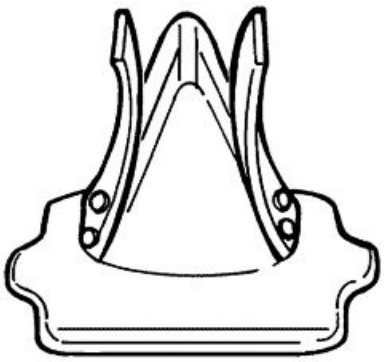
Recommended oil



Inspecting the timing system components

CAUTION

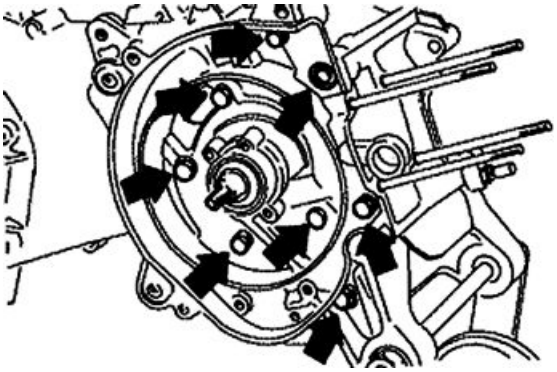
CHECK THE CORRECT REED UNIT SEAL; NO LIGHT MUST PASS BETWEEN THE SUPPORT AND LAMELLA.



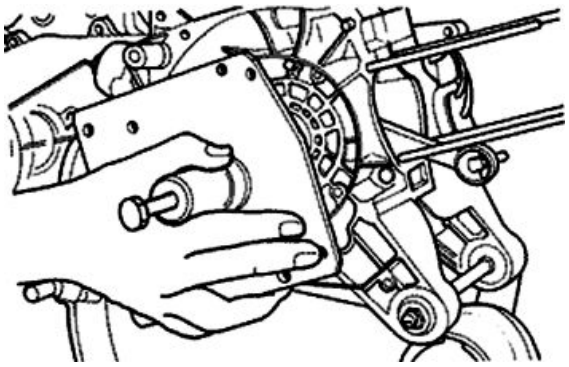
Crankcase - crankshaft

Splitting the crankcase halves

Remove the eight crankcase union fasteners.



Install the special strip on the half crankcase on the flywheel side and separate the half crankcase on the flywheel side from the transmission side

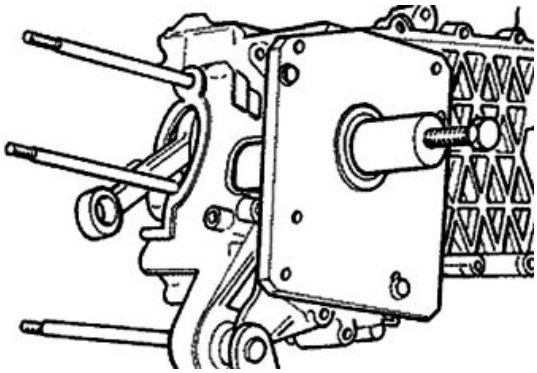


Specific tooling

020163Y Crankcase splitting plate

Removing the crankshaft

- Install the specific tool on the half crankcase on the transmission side using four M6 screws of an adequate length.
- Remove the crankshaft from the transmission side half crankcase



Specific tooling

020163Y Crankcase splitting plate

Removing the crankshaft bearings

The bearings can stay on either the half crankcase or the crankshaft indifferently

- Using the special tool, remove any bearings that have been left on the crankshaft

N.B.

The half rings must be inserted on the bearings with a few mallet blows.

Specific tooling

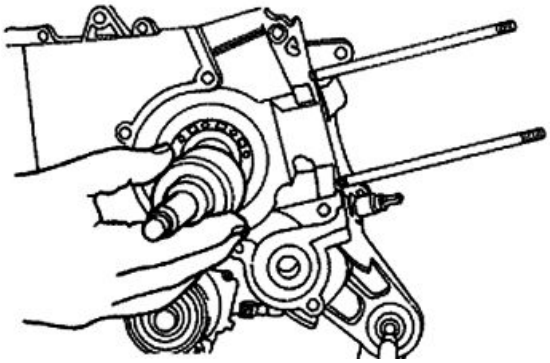
004499Y001 Bearing extractor bell

004499Y006 Bearing extractor ring

004499Y002 Bearing extractor screw

004499Y007 Half rings

- Using the specific tool remove any bearings left on the half crankcase



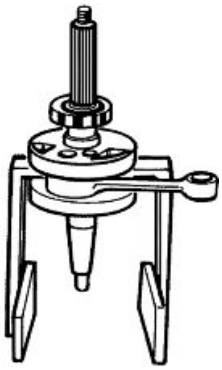
Specific tooling

001467Y007 Driver for OD 54 mm bearing

001467Y006 Pliers to extract 20 mm bearings

Refitting the crankshaft bearings

Heat the bearings in an oil bath at around 150°C and fit them on the crankshaft, if necessary using a section of tube that acts on the bearing's inner track

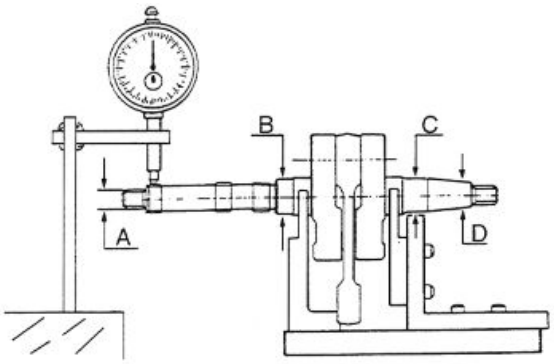


Specific tooling

020265Y Bearing fitting base

Inspecting the crankshaft alignment

With the specific tool shown check that the eccentricity of the surfaces of diam. «**A**»-«**B**»-« **C**» are within 0.03 mm. (reading limit on the dial gauge); in addition, check the eccentricity of diam. «**D**», for which a maximum reading of 0.02 mm is permitted. In the case where eccentricity is not much above prescribed levels, **straighten** the shaft by acting on the counterweights with a shim or tighten them in a clamp (with an aluminium bushing) as required..



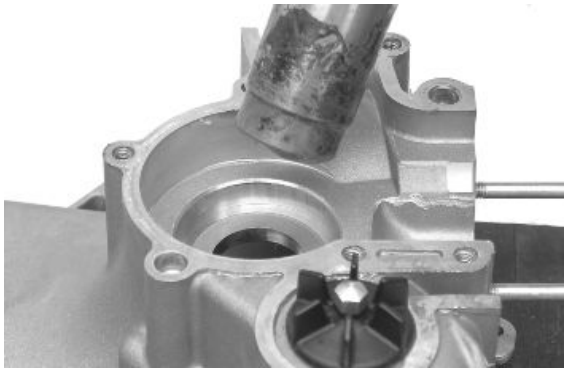
Specific tooling

020335Y Magnetic support for dial gauge

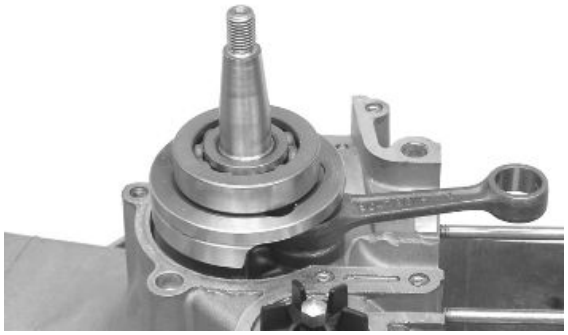
020074Y Support base for checking crankshaft alignment

Refitting the crankshaft

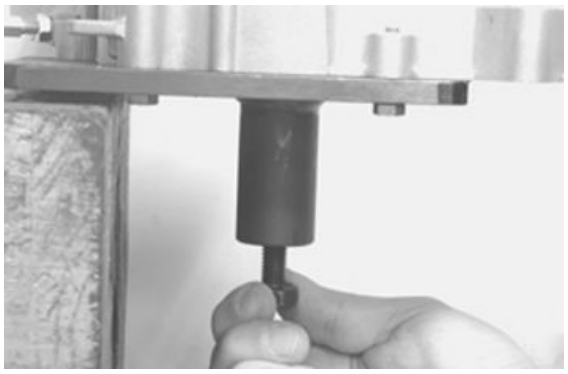
- Position the transmission side half crankcase on two wooden supports
- Using a thermal gun, heat the bearing seat to about 120°



- Firmly insert the crankshaft until the bearing reaches the end-of-stroke stop



- Let the temperature of the half crankcase settle at the temperature of the crankshaft.
- Again install the special crankcase separation plate **NOT** installing the crankshaft protection
- During the assembly phase keep the central thrust screw loose.
- Take the four clamping screws to the end of the stroke and loosen them again with the same angle (e.g. 90°)
- When the temperature has settled, preload the thrust screw of the tool manually until the ball bearing clearance is cancelled out.

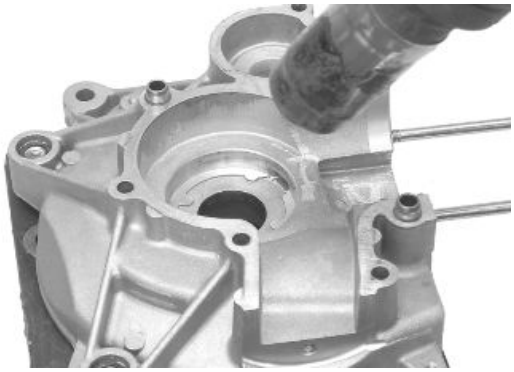


Specific tooling

020163Y Crankcase splitting plate

Refitting the crankcase halves

- Prepare the coupling surface with LOCTITE 510 applying a thin layer of it after degreasing the surface using a suitable solvent (e.g. trichloroethylene)
- Heat the flywheel-side half crankcase with a thermal gun.

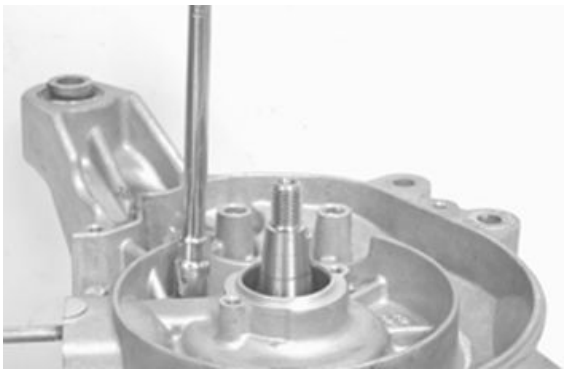


Recommended products

Loctite 510 Liquid sealant

Gasket

- Keeping the half crankcase on the transmission side, insert the flywheel side half crankcase with a clean precise movement
- Insert at least three clamping screws and tighten up rapidly
- Insert the other 5 screws and tighten them to the specified torque.

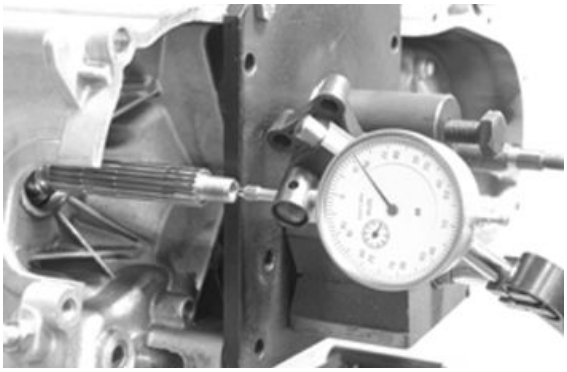


Locking torques (N*m)

crankcase coupling screws **11 - 13**

- Move the crankcase separation plate in a position back from the one indicated in the figure
- Install the special magnetic support with dial gauge at the end of the crankshaft
- Check the axial clearance of the crankcase

If this is not within the maximum limit allowed, repeat the crankcase coupling procedure



Specific tooling

020335Y Magnetic support for dial gauge

Characteristic

Axial clearance with warm crankcase

0.10 ÷ 0.12 mm

Axial clearance with cold crankcase

0.06 to 0.08 mm

Limit value with cold crankcase

0.02 ÷ 0.03 mm

Lubrication

Crankshaft oil seals

Refitting

- Install a new flywheel-side oil seal only with the special tool's punch

The flywheel-side oil seal is recognised by its smaller diameter

N.B.

THE USE OF THE SPECIFIC TOOL IS NOT COMPATIBLE WITH THE FITTED WRENCH

Specific tooling

020340Y Flywheel and transmission oil seals fitting punch

- Install a new transmission side oil seal using the special tool with adapter ring.

The transmission-side oil seal is recognised by the larger diameter

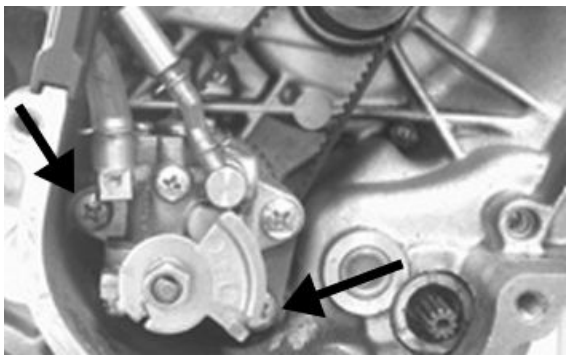
Specific tooling

020340Y Flywheel and transmission oil seals fitting punch

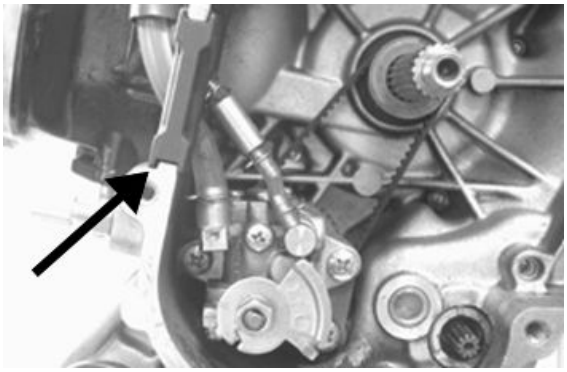
Oil pump

Removal

- Remove the 2 screws shown in the figure



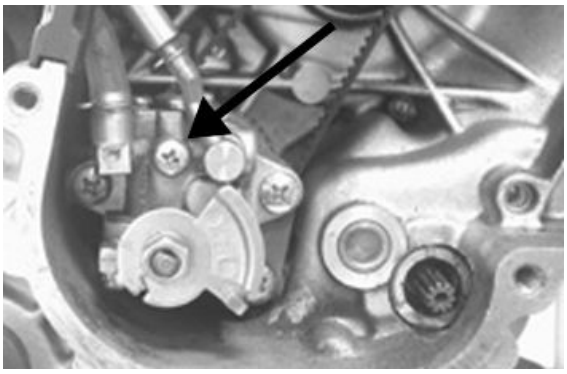
Remove the tube passage seal from the crankcase shown in the figure



Refitting

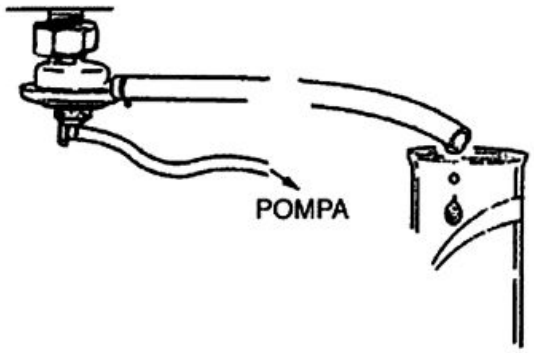
To refit, perform the steps in the reverse direction to disassembly

Remember to drain after refitting using the screw shown in the figure



Fuel supply

- Disconnect the fuel supply and the suction taking pipe from the carburettor.
- Check that there are no fuel leaks between the two tubes.
- Close the fuel outlet pipe.
- By means of the MITIVAC pump apply 0.1 bar of suction to the tap.
- Make sure that the suction is kept stable and that and that there are no fuel leaks.
- Reconnect the suction pipe to the manifold.
- Position the fuel pipe with the outlet at the point of the tap.
- Turn the engine by using the starter for five seconds with the carburettor at minimum.
- Take up the fuel by means of a graded burette.



N.B.

THE MEASUREMENT MAY BE FALSIFIED BY THE INCORRECT NUMBER OF REVS OR BY THE WRONG POSITION

OF THE TUBE.. IN THIS CASE, THE TENDENCY IS TO OBTAIN A REDUCED FUEL FLOW RATE. THE SUCTION OUTLET ON THE MANIFOLD HAS A SECTION INTENTIONALLY REDUCED FOR THE PURPOSE OF ENHANCING THE SUCTION PULSATION AND THEREBY GUARANTEE A CONSTANT TAP FLOW RATE.

Specific tooling

020329Y MityVac vacuum-operated pump

Characteristic

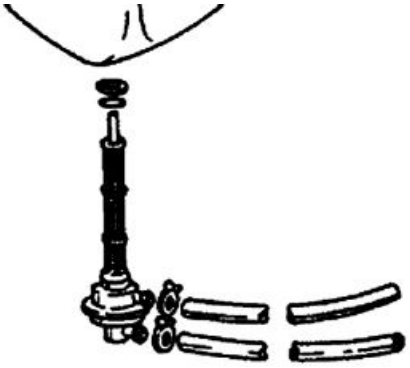
Minimum flow rate

20 cc

- Completely empty the gas tank.
- Remove the petrol delivery tube and the suction tube.
- Loosen the clip and remove the tap.
- Clean the tank and the filter of the tap with a specific solvent.
- Refit the tap making sure that there is an O-Ring.
- Turn the tap to the direction it had before it was removed and block the clip.

N.B.

THE FILTER CAN BE UNSCREWED FROM THE COCK TO FACILITATE CLEANING.



INDEX OF TOPICS

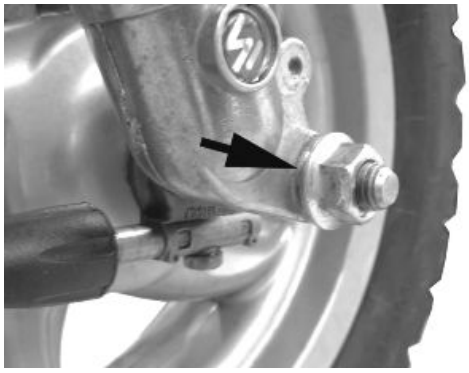
Front suspension

This section is devoted to operations that can be carried out on the suspension.

Front

Removing the front wheel

- Support the vehicle in such a way that the front wheel is raised.
- Using two 18 mm hexagonal wrenches remove the front wheel axle.

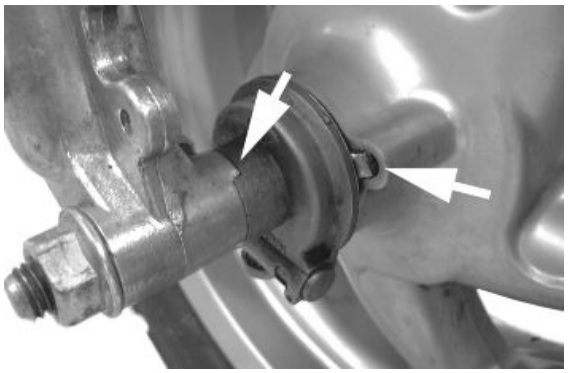


Refitting the front wheel

- When refitting, pay attention in repositioning the odometer drive correctly.

Locking torques (N*m)

Wheel fixing nut **40 to 50 N.m**



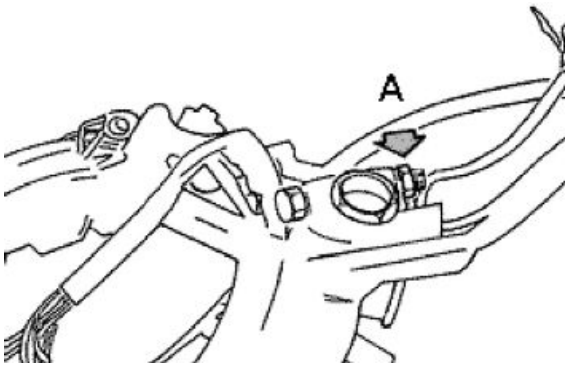
Handlebar

Removal

- Remove the front handlebar cover.
- Remove the rear handlebar cover.
- After removing the transmissions and disconnecting the electrical terminals, remove the bolt «A» and the handlebar
- Check all components and replace faulty parts.

N.B.

IF THE HANDLEBAR IS BEING REMOVED TO REMOVE THE STEERING, TILT THE HANDLEBAR FORWARD TO AVOIDING DAMAGING THE TRANSMISSIONS.



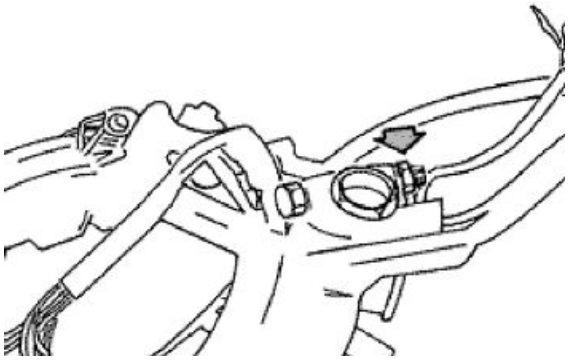
Refitting

When refitting, tighten to the prescribed torque and apply the recommended grease to the threaded cone.

Recommended products

AGIP GREASE PV2 Grease for control levers on the engine

White anhydrous-calcium based grease to protect roller bearings; temperature range between -20 ° C and +120 °C; NLGI 2; ISO-L-XBCIB2



Locking torques (N*m)

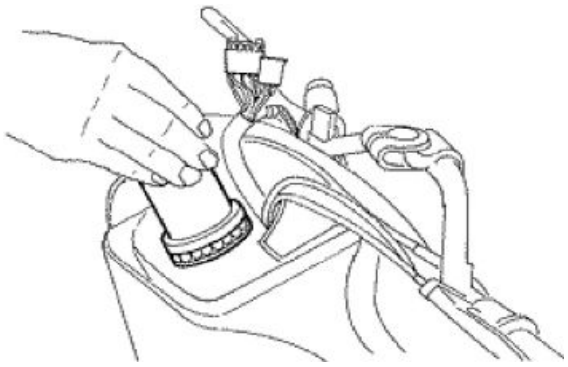
Locking torque: 65 to 70 N•m

Front fork

Removal

- Remove the front brake calliper.
- Remove the odometer cable from the reduction gear box.
- Remove the front mudguard.
- Remove the handlebar.

After removing the steering ring-nut using the special tool, lean the vehicle on one side and extract the steering tube.



Specific tooling

020055Y Wrench for steering tube ring nut

See also

Front
brake calliper
Handlebar

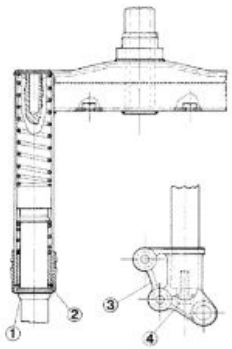
Overhaul

Stem removal

- Remove the dust guard (1) using a screwdriver to prise it out.
- Remove the seeger (2) and remove the power pipe.

N.B.

GREASE THE SPRINGS AND THE BUSHINGS BEFORE REFITTING, WITH A SMALL QUANTITY OF GREASE (AROUND 3 GR.)



Recommended products

AGIP GREASE MU3 Grease for odometer transmission gear case

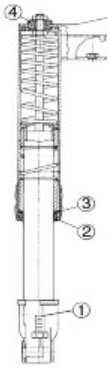
Soap-based lithium grease with NLGI 3; ISO-L-XBCHA3, DIN K3K-20

Removing damper

- Remove screw 1 fixing the screw to the stem and remove the stanchion heating it if necessary with the specified heater, then remove sealing ring 2 and seeger 3.
- Using nut 4, remove the spring stem and bushing.

The damper is an integral part of the stem and cannot therefore be overhauled, so if you need to work on the damper (loss of fork oil), carry out the operations mentioned above and replace the shock absorber-stem unit.

When refitting, tighten to the prescribed torque and apply the recommended grease to the threadlock nut.



Specific tooling

020150Y Air heater support

020151Y Air heater

Recommended products

Loctite 243 Medium strength threadlock

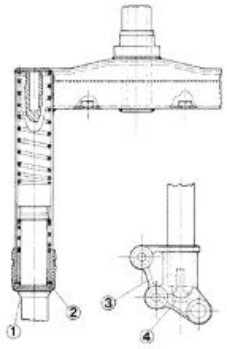
Loctite 243 medium-strength threadlock

Locking torques (N*m)

Stud-stanchion fixing screw **20 to 25 N•m** **Nut tightening torque** **20 to 25 N•m**

Replacing sealing ring

- Remove the wheel axle.
- Remove the screw (4).
- Remove the stanchion (3).
- Remove the dust guard (1).
- Insert the new sealing ring after lubricating the inside parts of the ring and paying attention not to damage it.
- Insert the stanchion applying the recommended product to the clean surface.
- Lock the screw (4).



Recommended products

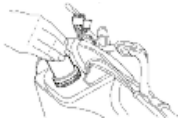
Loctite 243 Medium strength threadlock

Loctite 243 medium-strength threadlock

Refitting

Lubricate the seats and the balls with the grease recommended.

- Lock at the prescribed torque and turn the key anticlockwise by 90° to 100°.



Specific tooling

020055Y Wrench for steering tube ring nut

Recommended products

AGIP GREASE PV2 Grease for control levers on the engine

White anhydrous-calcium based grease to protect roller bearings; temperature range between -20 ° C and +120 °C; NLGI 2; ISO-L-XBCIB2

Locking torques (N*m)

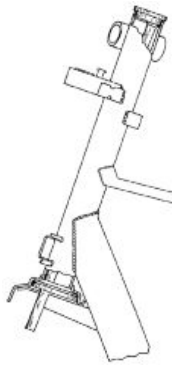
Locking torque: **50 to 60 Nm**

Steering column

Removal

Removal of the upper and lower frame seat

- Only remove the seats if it is strictly necessary.
- Using the special tool remove the upper fifth wheel seat by putting the special tool into the lower part of the headstock as indicated in the figure.
- By inserting the punch into the top of the tube, remove the lower fifth wheel seat from the head-stock.



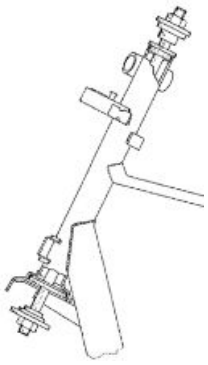
Specific tooling

020004Y Punch for removing fifth wheels from headstock

Refitting

Refitting the lower and upper seat on the frame

- Using the special tool, refit the upper and lower bearing seats on the headstock.



Specific tooling

001330Y Tool for fitting steering seats

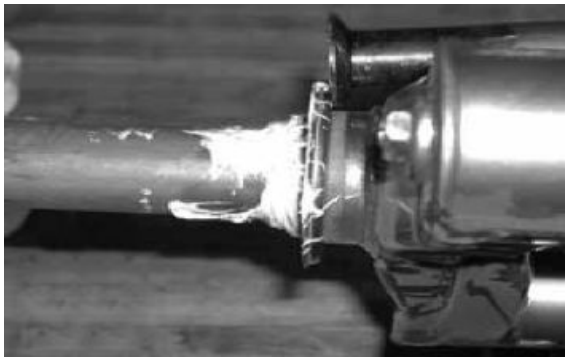
Steering bearing

Removal

Overhauling the fifth wheel seat on the fork

Check the condition of the fifth wheel and the fifth wheel seat on the fork (steering tube). Replace if there are faults.

- Support the fork properly.
- Using the special tool, remove the fifth wheel seat on the steering tube as shown in the photograph by applying small mallet blows.



Specific tooling

020004Y Punch for removing fifth wheels from headstock

Always use a new fifth wheel seat on refitting.

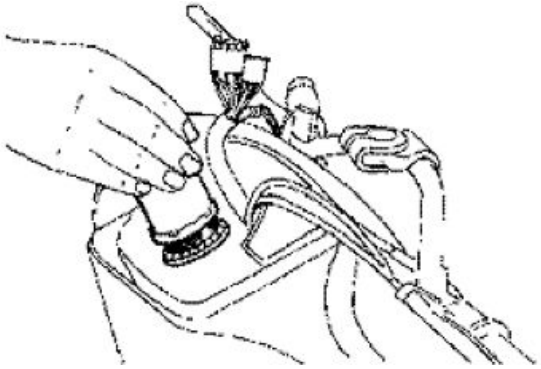
- Using the special tool, refit the fifth wheel seat with the aid of a few mallet blows and bring it as far as the stop shown in the photo.

Specific tooling

006029Y Punch for fitting fifth wheel seat on steering tube

Removing steering lock nut

- Remove the handlebar.
- Remove the bearing of steering ring nut using the specific tool.



Specific tooling

020055Y Wrench for steering tube ring nut

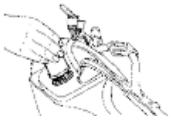
See also

Handlebar

Refitting

Refitting steering lock ring nut

- After locking the first ring nut in place, lock the second ring nut using a specific tool.



Specific tooling

020055Y Wrench for steering tube ring nut

Locking torques (N*m)

Locking torque: 30 to 40 Nm

Rear

Removing the rear wheel

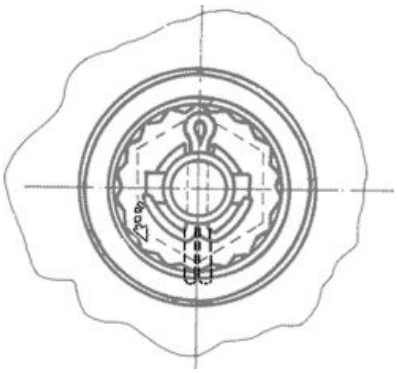
- Use a screwdriver as a lever between the drum and the cover.

-Straighten the split pin and remove the cap.

-Remove the wheel acting on the central fixing point.

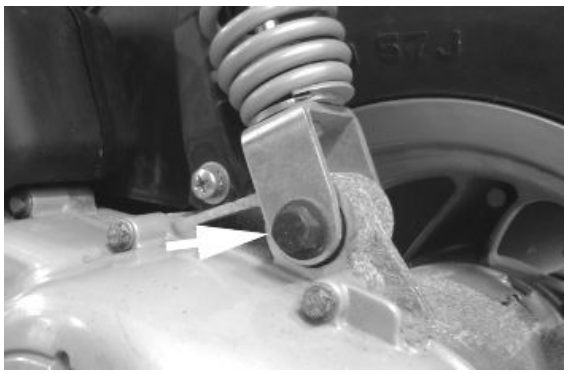
WARNING

-ALWAYS USE NEW SPLIT PINS FOR REFITTING.



Removal

To replace the shock absorber you just need to remove the battery access flap to get and remove the shock absorber/ frame anchorage nut. Then remove the shock absorber/engine anchorage nut.



Refitting

When refitting, tighten the shock absorber/frame anchorage nut and the shock absorber/engine pin at the prescribed torque.

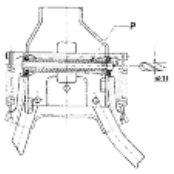
Locking torques (N*m)

Shock absorber/frame nut torque 20 to 25 Nm Shock absorber/engine pin torque 33 to 41 N·m

Centre-stand

Expulsion of stand fastening pin to the bracket

- Remove the stand support bracket from the engine.
- Drill a 5 mm hole in the bracket so that the pin «P» can come out.

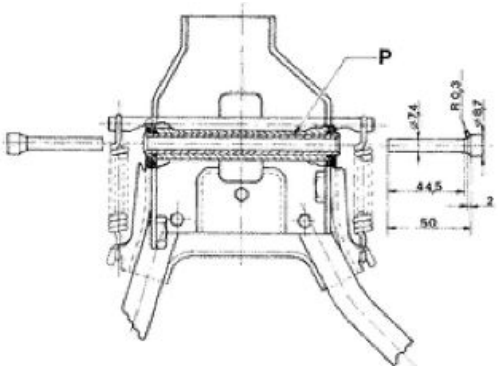


Fitting and caulking the stand pin to the bracket

- Caulk the end of the pin «P» between the two punches shown in the figure.
- After caulking it must be possible for the stand to turn freely.

N.B.

UPON REFITTING USE NEW O-RING AND PIN, GREASE THE SPRING ATTACHMENTS AND THE PIN.

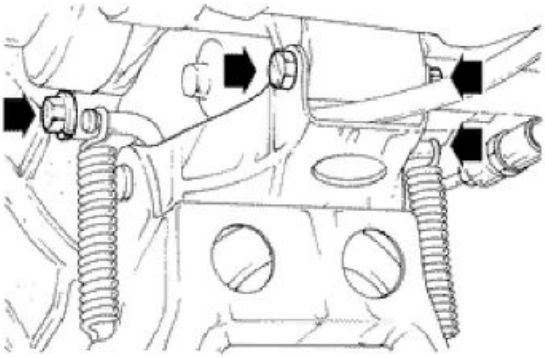


Replace complete stand

- Work on the screws shown in the figure.
- When refitting, secure to the prescribed torque.

Locking torques (N*m)

Stand screw torque 18.5 to 19 Nm



INDEX OF TOPICS

Front brake calliper

Removal

- Check that the brake piping, gasket and fitting are in good condition. If you see any oil on the brake calliper and/on the components of the system, it is necessary to replace them.
- - Disconnect the oil line from the calliper, collecting the oil in a container.
- - Remove the two clamps highlighted in the diagram.

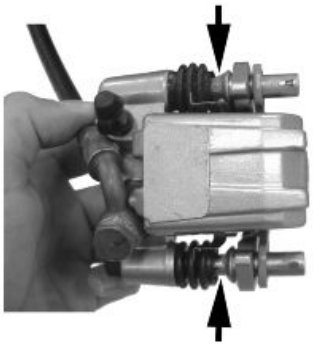
Overhaul

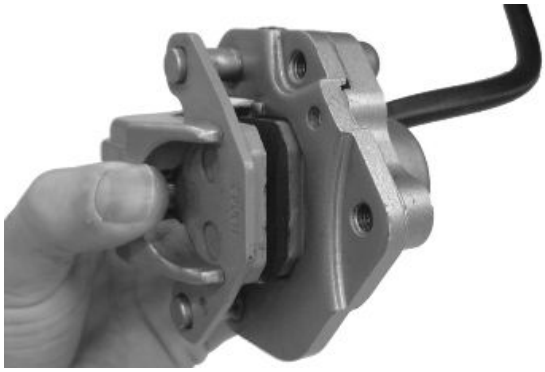
- Disconnect the oil line from the calliper and collect the brake fluid in a suitable container.
- Remove the brake calliper from the fork.
- Exerting leverage on the floating body, remove the external brake pad, then the internal one, and lastly the retention spring.
- Remove the piston and make sure that there is no scoring or erosion. If there is, replace the pincer.

CAUTION

ALL THE INTERNAL COMPONENTS MUST BE REPLACED EVERY TIME THE CALLIPER IS SERVICED.

- Insert the sealing rings and the pistons in the calliper body
- Check the state of the floating body seats and grease them.
- Refit the pads
- - Position the calliper on the disc and lock to the mounting by tightening the bolts.
- Lock the piping fitting on the calliper at the prescribed torque and bleed the air from the system.





Before fitting, the parts must be perfectly clean and **free of traces of oil, diesel fuel, grease,** etc.. They should be washed thoroughly in denatured alcohol before proceeding.

The sealing rings must be immersed in the operating liquid; the use of the **PRF1** protection is tolerated.

CAUTION

RUBBER PARTS SHOULD NEVER BE LEFT IN ALCOHOL FOR LONGER THAN 20 SECONDS. AFTER WASHING, THE PIECES MUST BE DRIED WITH A BLAST OF COMPRESSED AIR AND A CLEAN CLOTH.

Locking torques (N*m)

Calliper coupling screw 20 to 25 Nm Oil bleed screw 7 to 10 Nm

Refitting

- Refit the pincer on the support and tighten the screws at the prescribed torque.
- Refit the tube complete with fitting with new copper gaskets.
- Bleed the air from the system.

Locking torques (N*m)

Brake fluid tube calliper 20 ÷ 25 Nm Fastening screws calliper to the crankcase 20 - 25 Oil bleed screw 7 to 10 Nm

Front brake disc

Removal

Proceed as follows:

- Remove the front wheel
- Undo the three disc clamping screws.

Refitting

-When refitting, position the disc correctly making sure that it rotates in the right direction.

Locking torques (N*m)

Disc tightening screw 8 - 12

Disc Inspection

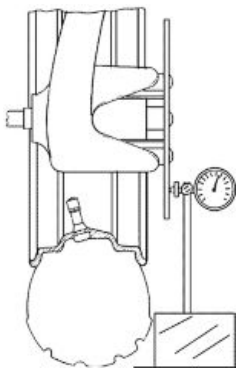
- Use the micrometer to check the thickness of the disc as shown in the photograph

Characteristic

Standard thickness:

4 +02-01mm

- Using the appropriate tool, measure how much the disc protrudes when the wheel is fitted properly. The protrusion, measured near the external edge of the disc, must be less than 0.1 mm.
- If a value is measured other than the specified value, remove the front wheel (Front/Rear Suspension chapter) and check the protrusion of the disc. Maximum permissible out of true is 0.1 mm.



If the value measured is greater, replace the disc and repeat the check.

- If the problem persists, check and replace the wheel hub if necessary.

Specific tooling

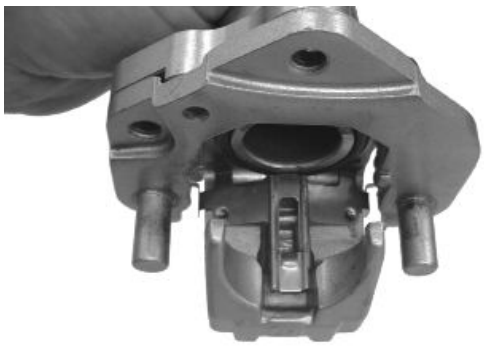
020335Y Magnetic support for dial gauge

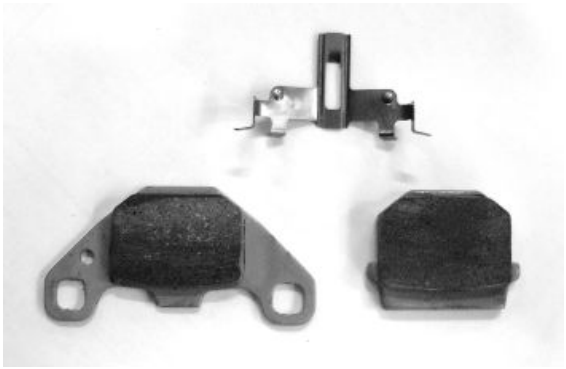
Front brake pads

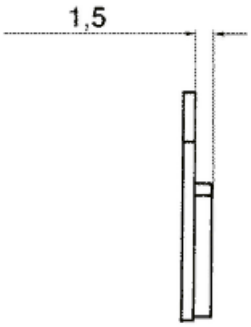
Removal

- Remove the brake calliper from the fork.
- Exert leverage on the floating body and remove the outer pad.
- Then remove the internal pad by exerting pressure on the retention spring.

The pads must be replaced if the friction material lining is less than 1.5 mm

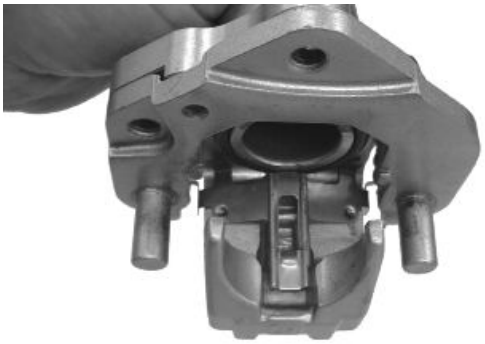


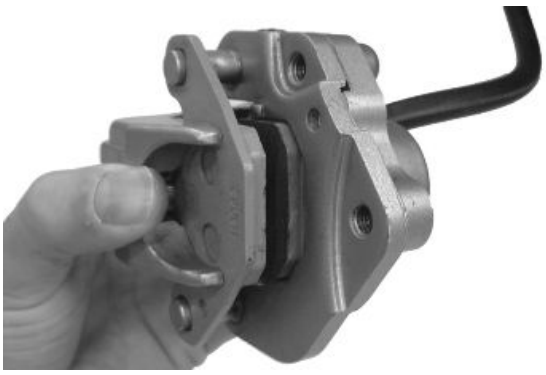




Refitting

Follow the steps in the opposite order from the removal, making sure the retention spring is inserted properly.





Fill

Front

-Once the bleed valve is closed, fill the system with brake liquid to the maximum level.

-Undo the bleed screw.

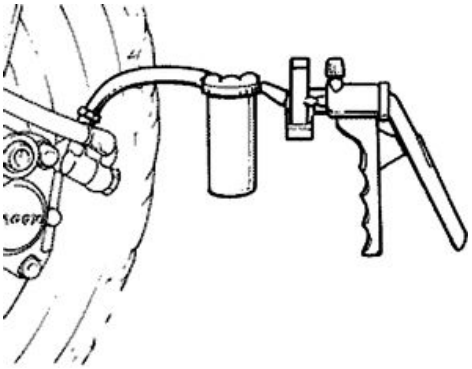
-Apply the tube of the special tool to the bleed screws.

When bleeding it is necessary to fill the oil tank in continuation while working with a MITYVAC pump on the bleed screws until no more air comes out of the system.

The operation is finished when just oil comes out of the bleed screws.

-Do up the bleed screw.

-When the operation is over, tighten up the oil bleed screw to the prescribed torque.



N.B.

**IF AIR CONTINUES TO COME OUT DURING PURGING, EXAMINE ALL THE FITTINGS:
IF SAID FITTINGS DO NOT SHOW SIGNS OF BEING FAULTY, LOOK FOR THE AIR INPUT AMONG THE VARIOUS SEALS ON THE PUMP AND CALLIPER PISTONS.**

CAUTION

- DURING THE OPERATIONS, THE VEHICLE MUST BE ON THE STAND AND LEVEL.

N.B.

DURING PURGING FREQUENTLY CHECK THE LEVEL TO PREVENT AIR GETTING INTO THE SYSTEM THROUGH THE PUMP.

WARNING

**- BRAKING CIRCUIT FLUID IS HYGROSCOPIC. IT ABSORBS HUMIDITY FROM THE SUR-ROUNDING AIR.
IF THE LEVEL OF HUMIDITY IN THE BRAKING FLUID EXCEEDS A GIVEN VALUE, BRAKING EFFICIENCY WILL BE REDUCED.
THEREFORE, ALWAYS USE FLUID FROM SEALED CONTAINERS.
UNDER NORMAL DRIVING AND CLIMATIC CONDITIONS YOU SHOULD CHANGE THIS LIQUID EVERY TWO YEARS.
IF THE BRAKES ARE USED INTENSELY AND/ OR IN HARSH CONDITIONS, CHANGE THE FLUID MORE FREQUENTLY.**

CAUTION

WHEN CARRYING OUT THE OPERATION, BRAKE FLUID MAY LEAK FROM BETWEEN THE BLEED SCREW AND ITS SEAT ON THE CALLIPER.

CAREFULLY DRY THE CALLIPER AND DE-GREASE THE DISC SHOULD THERE BE OIL ON IT.

Specific tooling

020329Y MityVac vacuum-operated pump

Recommended products

AGIP BRAKE 4 Brake fluid

FMVSS DOT 4 Synthetic fluid

Locking torques (N*m)

Oil bleed screw 8÷12

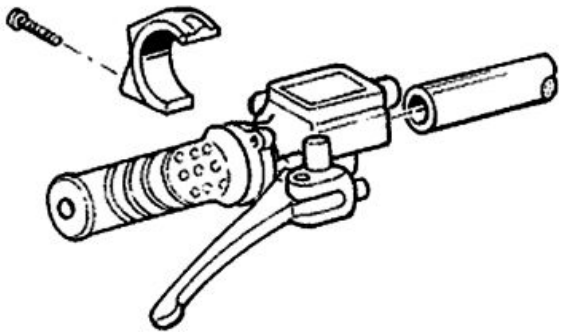
Front brake pump

-After removing the front and rear handlebar covers, act on the two stand fixing points (see the figure).

- Disconnect the tube, collecting the brake oil in a container.

- On refitting, perform the operation in reverse.

- Tighten the hydraulic line to the prescribed torque and bleed the system.



Locking torques (N*m)

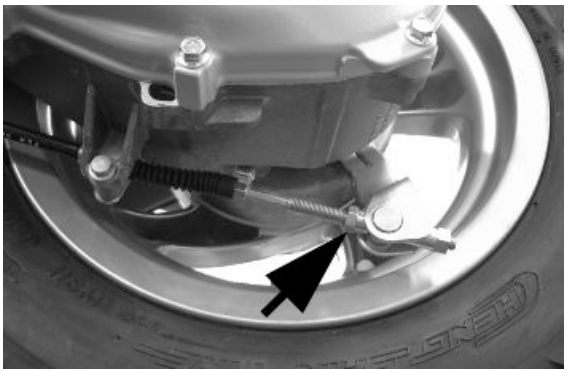
Brake fluid pump - hose fitting 20 ÷ 25 Nm

Rear drum brake

Drum brake adjustment

Regulate the point where the rear drum brake intervenes, using the adjustment indicated in the figure.

With the brake lever at rest, the wheel must turn freely.



Drum brake removal

After removing the muffler and the rear wheel do the following:

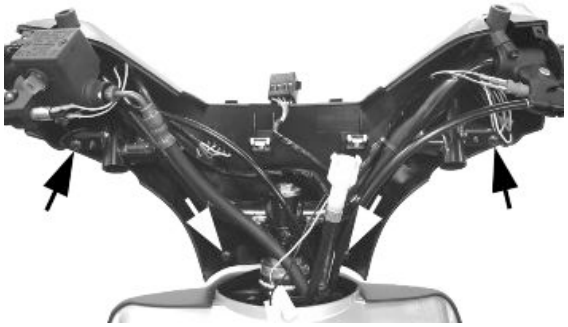
1. Remove the shoe spring with the special tool
2. Remove the shoe with the aid of a lever
3. Refit the new shoes giving a few taps with the mallet
4. Fasten the spring using the special tool.

INDEX OF TOPICS

Rear handlebar cover

- Remove the front handlebar cover.
- - Remove the four screws indicated in the figure.
- Disconnect the connections to the switches.

For installation, reverse the removal sequence.



Instrument panel

- Remove the three screws indicated in the figure.
- Disconnect the joint of the odometer cable.
- Disconnect the two electrical connections.

Front handlebar cover

- Remove the instrument panel.
- - Remove the four screws indicated in the figure.
- Prise upwards at the lateral fittings and separate the front cover from the rear cover.
- Disconnect the cable harness of the tail light.

For installation, reverse the removal sequence, paying attention to the correct assembly of the fittings.

Headlight assy.

- - Remove the front shield.
- Turn the two screws indicated in the figure to remove the headlight assembly.

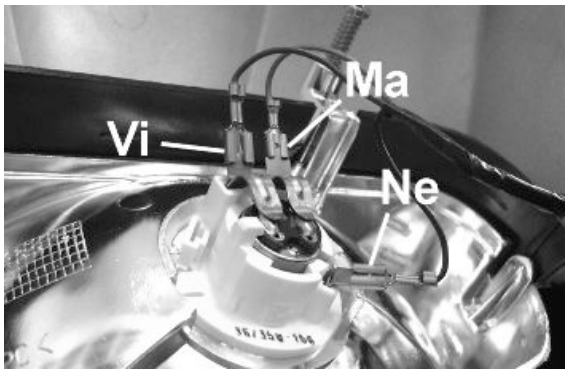
During assembly, pay attention to the correct connection of the cables to the lamp support.

LEGEND:

Bl= black

Vi= violet

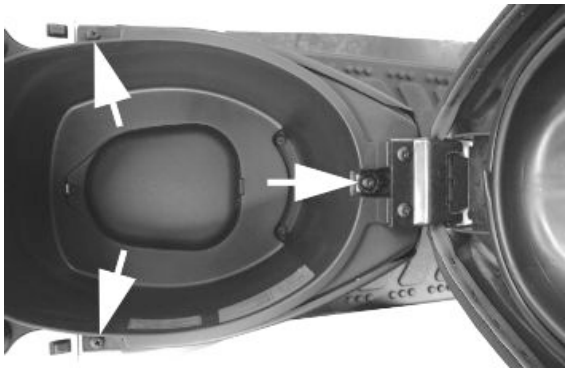
Br= brown



Frame central cover

- Remove the 3 fixing screws located under the saddle as shown in the figure.
- Remove the cover by pulling it off the lower fittings.

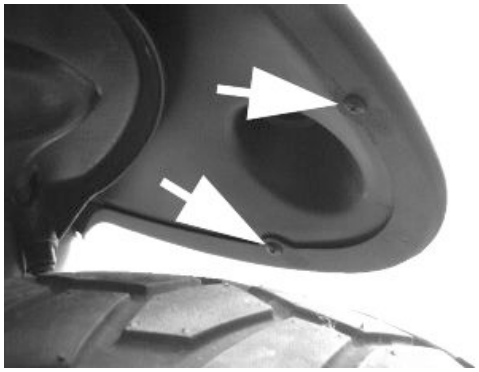
For installation, reverse the removal sequence.

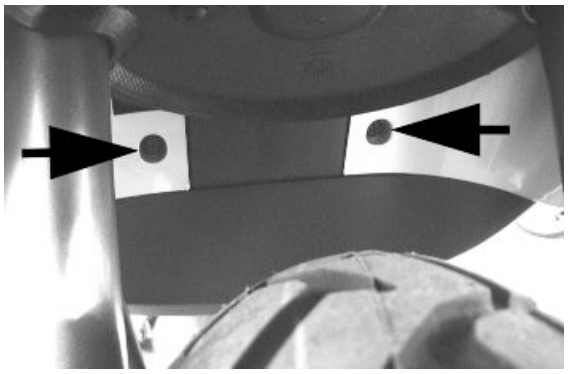


Legshield

- Remove the shield back plate
- Remove the four screws from the front wheel housing.
- Remove the three screws from the front shield.
- Pull the shield from its seat and disconnect the turn indicators and front headlight connectors.

For installation, reverse the removal sequence, paying attention to the correct assembly of the lower fittings.





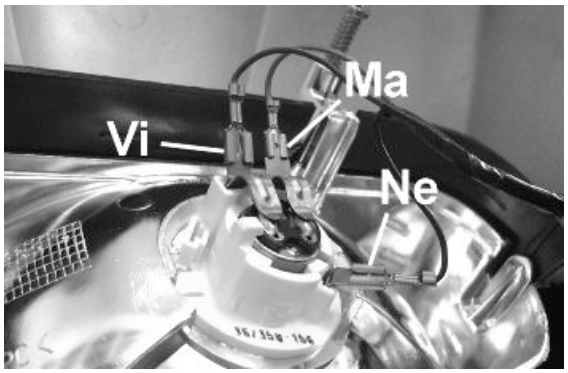
During assembly, pay attention to the correct connection of the cables to the lamp support.

LEGEND:

Bl= black

Vi= violet

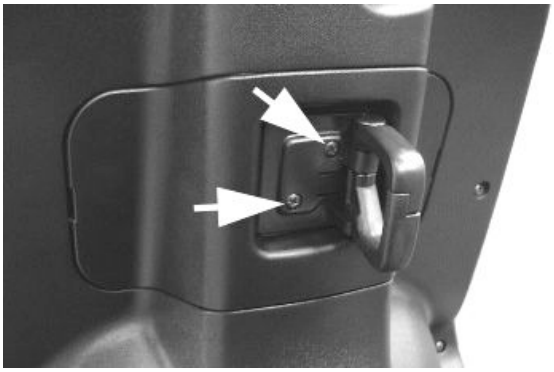
Br= brown



Knee-guard

- Remove the central chassis cover.
- Remove the footrest.
- Remove the eight screws shown in the figure (four on each side).
- Remove the luggage rack hook by turning the two screws.
- Pull the shield back plate down.

For installation, reverse the removal sequence, paying attention to the correct assembly of the lower fittings.



Taillight assy.

To replace the bulbs it is sufficient to remove the two screws shown in the figure and to then pull off the glass of the rear headlight.

During assembly, pay attention to correctly install the glass of the turn indicators.

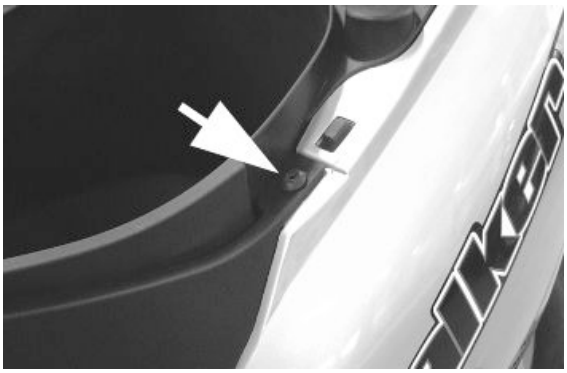
Footrest

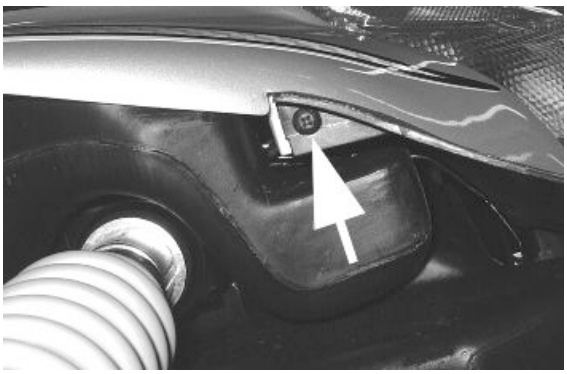
- Remove the central chassis cover.
- Remove the 6 screws indicated in the figure and remove the footrest by prising at the fittings.

Side fairings

- Remove the rear spoiler by loosening the 4 retaining screws.

- Remove the central chassis cover.
- Remove the 8 retaining screws (4 each side) indicated in the figure.





Rear mudguard

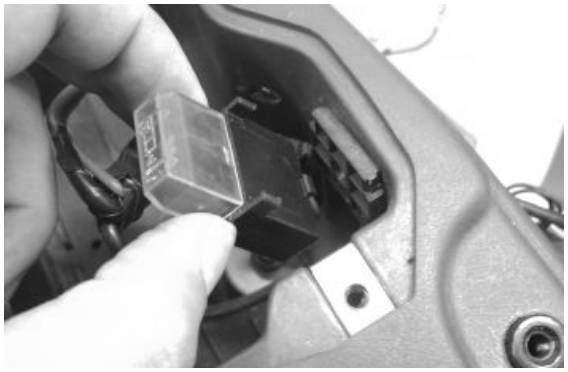
- Remove the side panels
- Remove the 3 screws indicated in the figure.
- Disconnect the electrical connection of the tail light assembly and then pull off the mudguard.

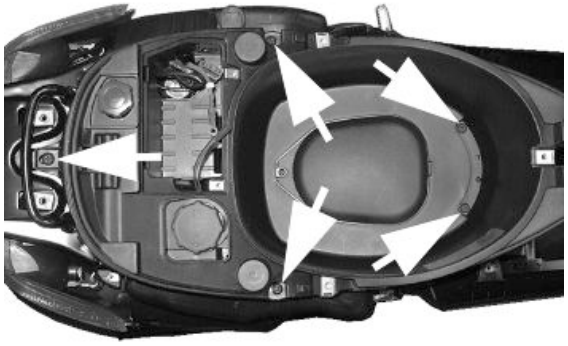
During assembly, position the connectors in the correct housings.

Helmet bay

- Remove the saddle.
- Remove the central cover.
- Remove the side panels
- Remove the battery and pull out the fuseholder from its seat.
- Remove the fuel tank cap and the oil tank cap.
- Remove the five screws and pull off the helmet compartment.

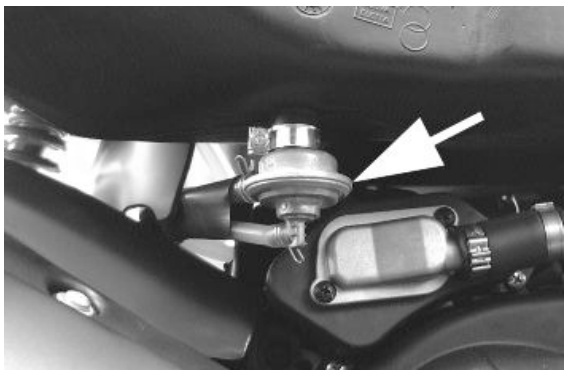
For installation, reverse the removal sequence.

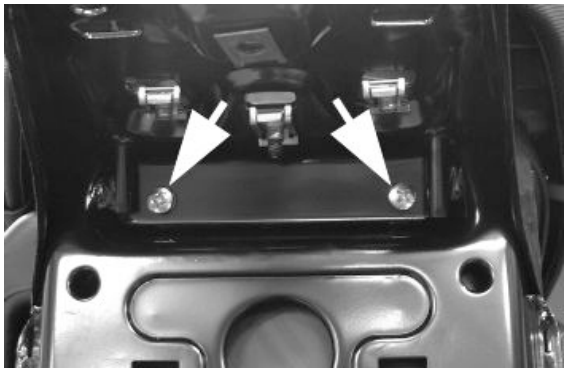




Fuel tank

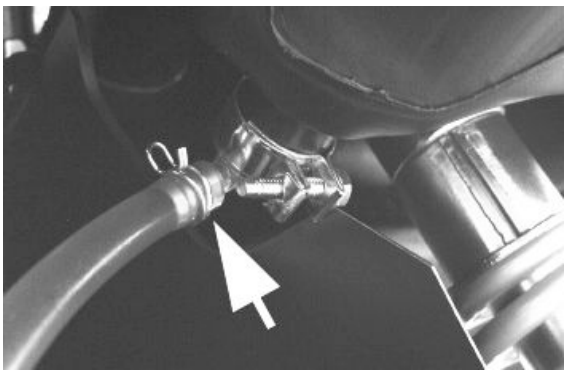
- Remove the side panels
- Remove the rear mudguard.
- Disconnect the fuel hose and the vacuum hose for the fuel valve.
- Disconnect the electric cable harness of the fuel gauge.
- Remove the three screws indicated in the figure and the tank down from the chassis.



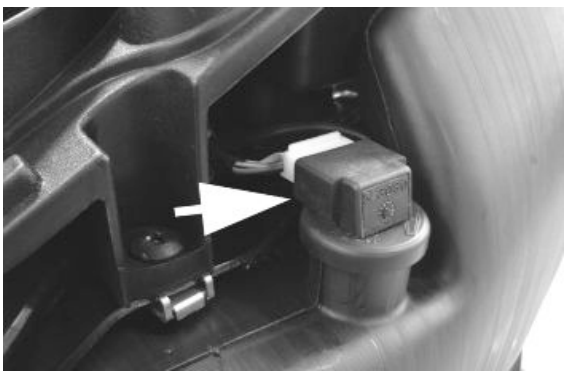


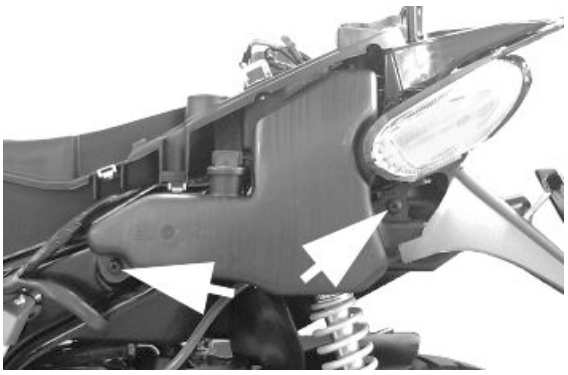
Mixture oil tank

- Remove the left side panel.
- Disconnect the oil hose, paying attention to collect the oil remaining in the tank in a suitable container.
- Disconnect the electric cable harness from the oil level sensor.
- Remove the 2 fixing screws of the oil tank.



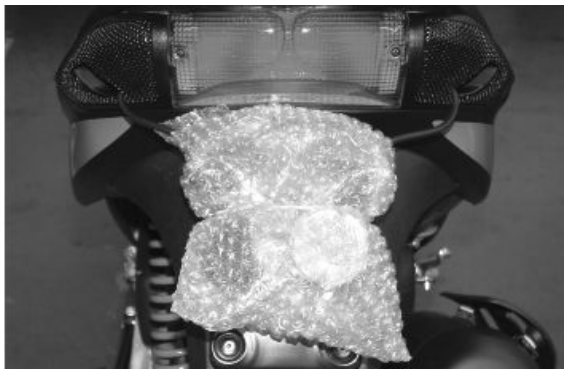
For installation, reverse the removal sequence.





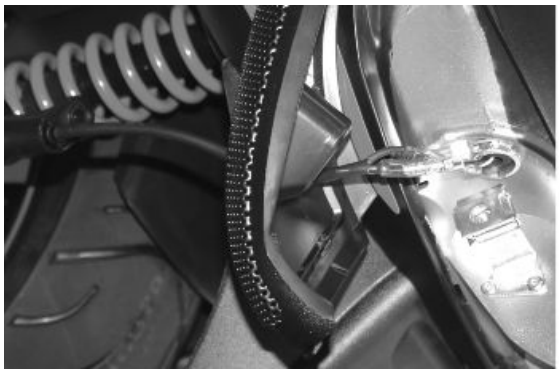
INDEX OF TOPICS

For the NAKED model, the rear turn indicators should not be mounted on the vehicle when it is taken to the dealer's. To fit the turn indicators, proceed as follows:
Take the turn indicators out of the package



To facilitate removing the supporting grilles, remove the glass of the rear light unit

Remove the supporting grille of the turn indicators



Slide the cable harness of the turn indicators into its fitting

Place the turn indicator unit into its fitting and lock it using the specific screw as indicated in the photograph

Refit the glass of the rear light unit.

Aesthetic inspection

Appearance check:

- Paintwork
- Fitting of plastics
- Scratches
- Dirt

Tightening torques inspection

Lock check

- Safety locks
- clamping screws

Safety locks

Rear shock absorber upper fixing
Rear shock absorber lower fixing
Front wheel axle nut
Wheel hub nut
Frame - swinging arm bolt *
Swinging arm bolt - Engine
Engine arm pin - Frame arm
Handlebar lock nut
Steering lower ring nut
Upper steering ring nut

Electrical system

Electrical system:

- Main switch
- Headlamps: high beam, low beam, position and parking lights and the respective warning lights
- Adjusting the headlights according to the regulations currently in force
- Rear light, parking light, stop light
- Front and rear stop light switches
- Turn indicators and their warning lights
- Instrument panel lights
- Instrument panel: fuel and temperature indicator
- Instrument panel warning lights
- Horn
- Starter

CAUTION

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

WARNING

BEFORE RECHARGING THE BATTERY, REMOVE THE CAPS OF EACH CELL.
KEEP THE BATTERY AWAY FROM NAKED FLAMES OR SPARKS WHILE IT IS CHARGED.
REMOVE THE BATTERY FROM THE SCOOTER, DISCONNECTING THE NEGATIVE TERMINAL FIRST.

CAUTION

WHEN INSTALLING THE BATTERY, ATTACH THE POSITIVE LEAD FIRST AND THEN THE NEGATIVE LEAD.

WARNING

BATTERY ELECTROLYTE IS TOXIC AND IT MAY CAUSE SERIOUS BURNS. IT CONTAINS SULPHURIC ACID. AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
IN CASE OF CONTACT WITH EYES OR SKIN, RINSE WITH ABUNDANT WATER FOR ABOUT 15 MINUTES AND SEEK MEDICAL ATTENTION AT ONCE.
IF IT IS SWALLOWED, IMMEDIATELY DRINK LARGE QUANTITIES OF WATER OR VEGETABLE OIL. SEEK IMMEDIATE MEDICAL ATTENTION.

BATTERIES PRODUCE EXPLOSIVE GAS; KEEP THEM AWAY FROM NAKED FLAMES, SPARKS AND CIGARETTES. IF THE BATTERY IS CHARGED IN A CLOSED PLACE, TAKE CARE TO ENSURE ADEQUATE VENTILATION. ALWAYS PROTECT YOUR EYES WHEN WORKING CLOSE TO BATTERIES.
KEEP OUT OF THE REACH OF CHILDREN

CAUTION

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

Levels check

Level check:

- Hydraulic brake system fluid level.
- Rear hub oil level
- Engine oil level

Road test

Test ride

- Cold start
- Instrument operations
- Response to the throttle control
- Stability on acceleration and braking
- Rear and front brake efficiency
- Rear and front suspension efficiency
- Abnormal noise

Static test

Static control after the test ride:

- Starting when warm
- Starter operation
- Minimum hold (turning the handlebar)
- Uniform turning of the steering
- Possible leaks

CAUTION

CHECK AND ADJUST TYRE PRESSURE WITH TYRES AT AMBIENT TEMPERATURE.

CAUTION

NEVER EXCEED THE RECOMMENDED INFLATION PRESSURES OR TYRES MAY BURST.

Functional inspection

Functional check up:

Braking system (hydraulic)

- Lever travel

Braking system (mechanical)

- Lever travel

Clutch

- Proper functioning check

Engine

- Throttle travel check

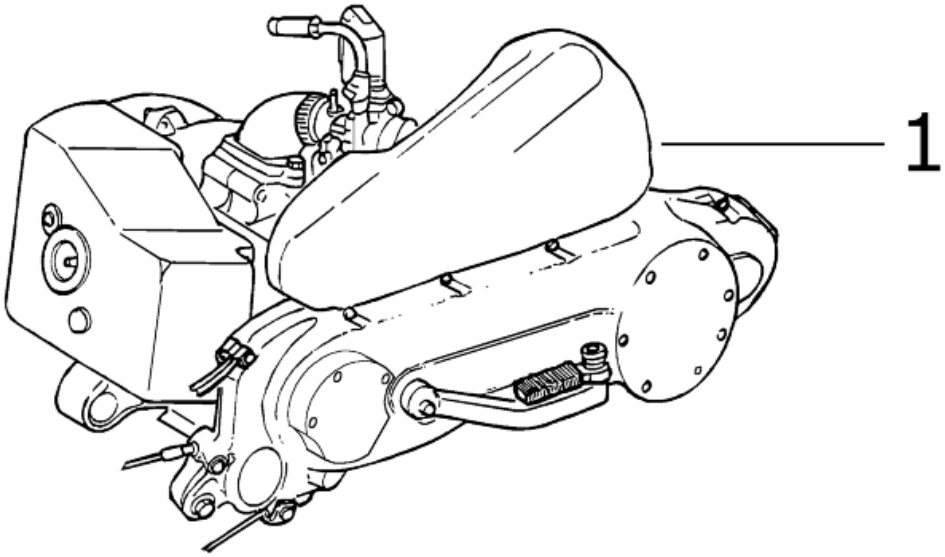
Others

- Check documentation
- Check the frame and engine numbers
- Tool kit
- License plate fitting
- Check locks
- Check tyre pressures
- Installation of mirrors and any accessories

INDEX OF TOPICS

This section is devoted to the time necessary to carry out repairs.
The description and code for each operation is indicated.

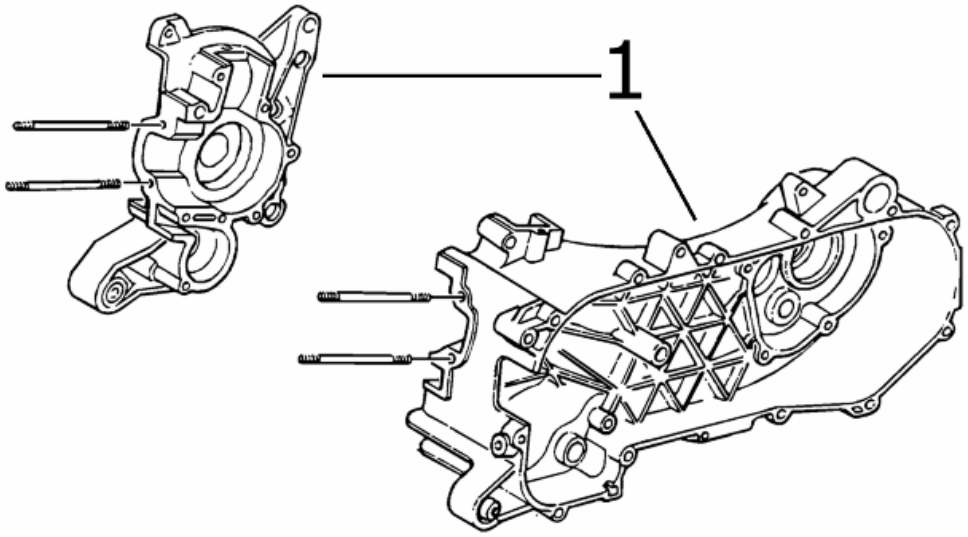
Engine



ENGINE

	Code	Action	Duration
1	001001	Engine to chassis - Replacement	

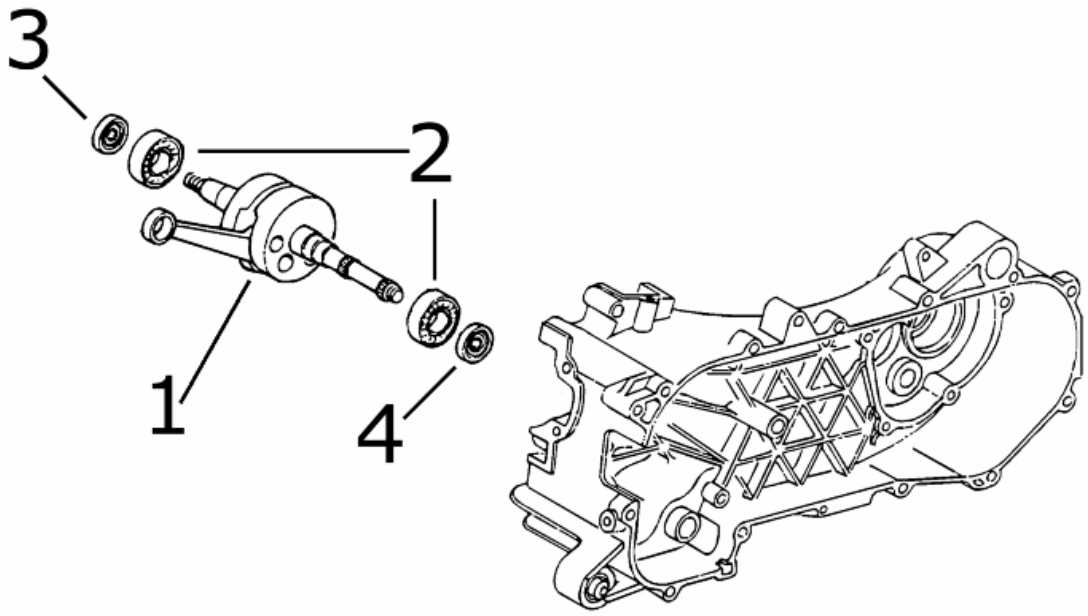
Crankcase



CRANKCASE

	Code	Action	Duration
1	001133	Engine crankcase - Replacement	

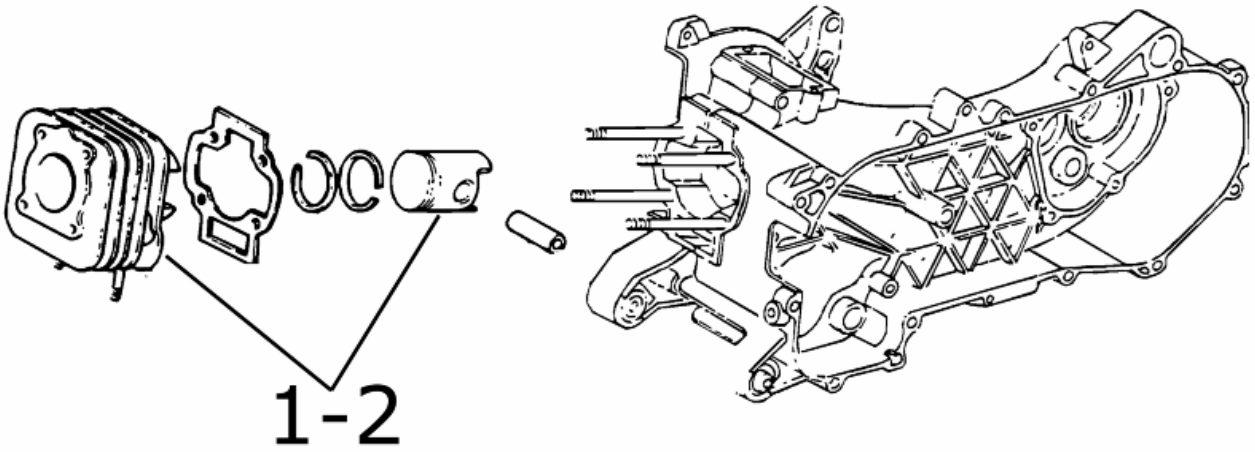
Crankshaft



CRANKSHAFT

	Code	Action	Duration
1	001117	Crankshaft - Replacement	
2	001118	Main bearings - Replacement	
3	001099	Oil seal, flywheel side - Replacement	
4	001100	Oil seal, clutch side - Replacement	

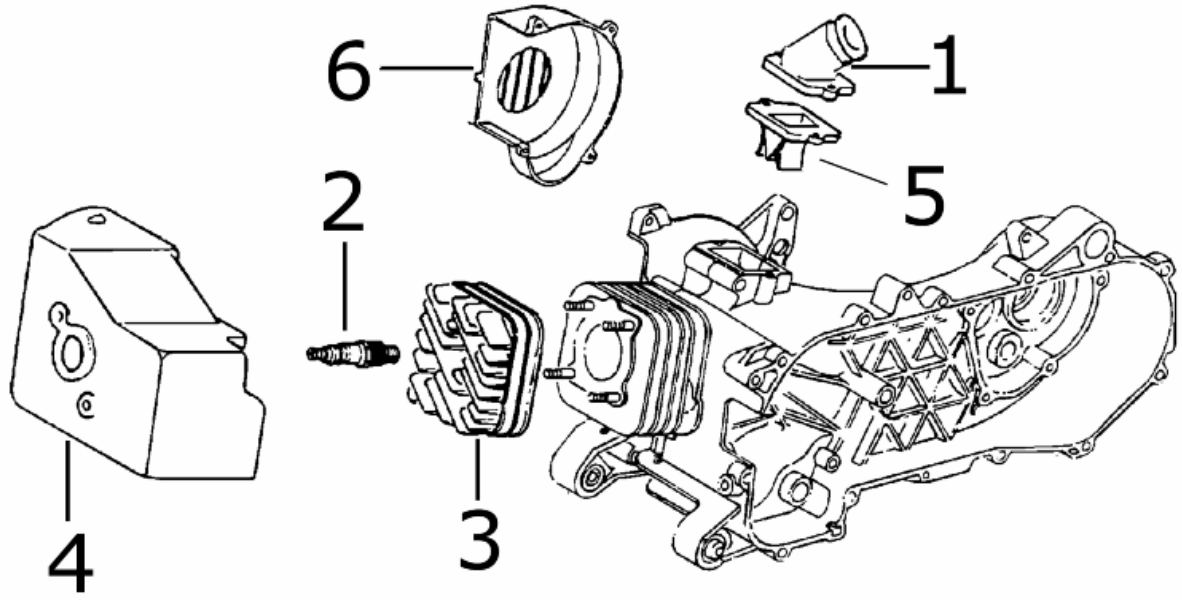
Cylinder assy.



CYLINDER / PISTON

	Code	Action	Duration
1	001002	Cylinder piston - Replacement	
2	001107	Cylinder / piston - Inspection / clean-ing	

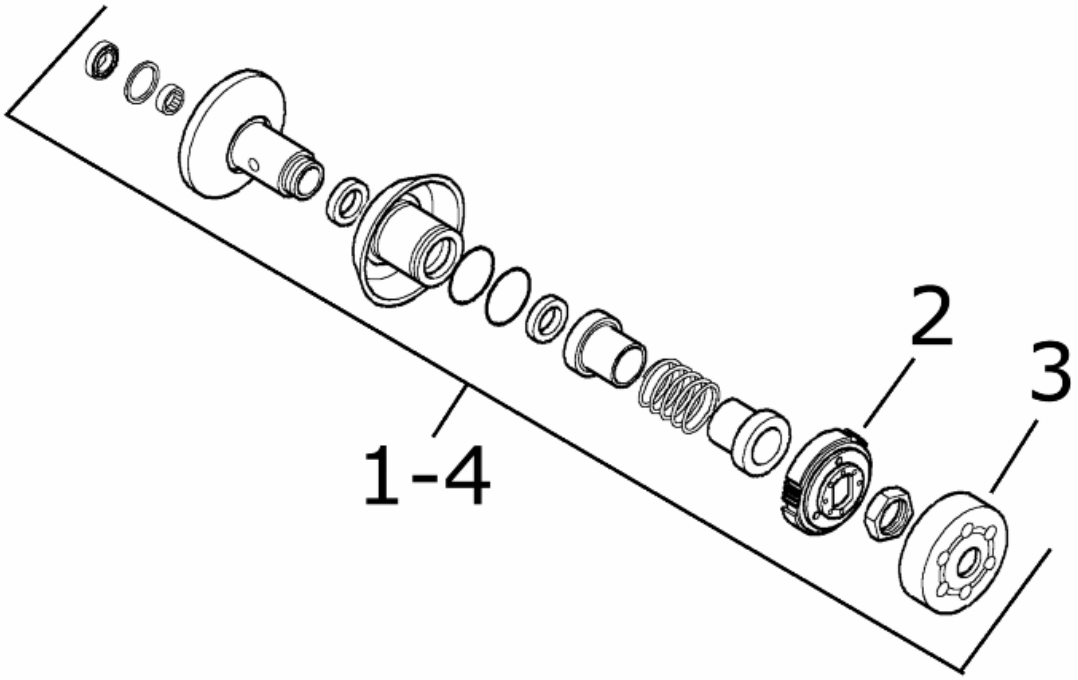
Cylinder head assy.



CYLINDER HEAD ASSEMBLY

	Code	Action	Duration
1	001013	Intake manifold - Replacement	
2	001093	Spark plug - Replacement	
3	001126	Head - Replacement	
4	001097	Cooling hood - Replacement	
5	001178	Disc pack - Replacement	
6	001087	Flywheel cover - Replacement	

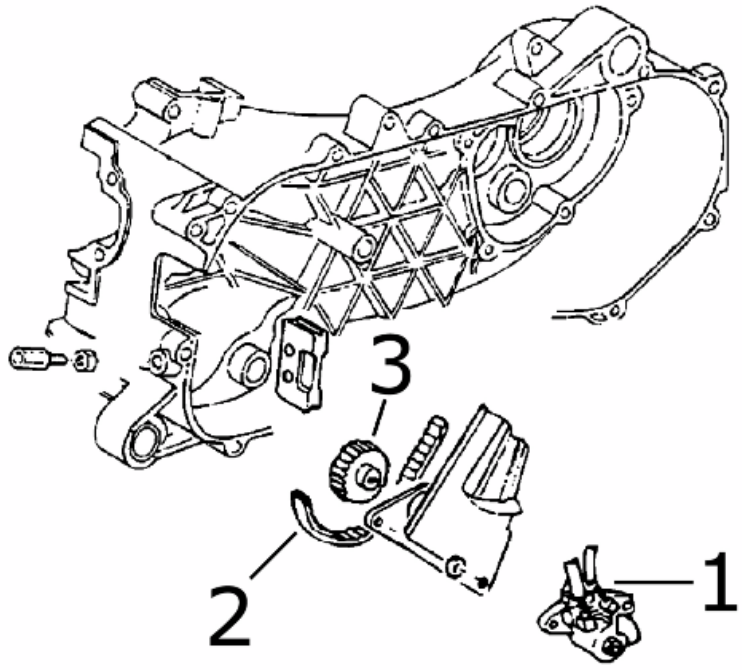
Driven pulley



DRIVEN PULLEY

	Code	Action	Duration
1	001110	Driven pulley - Replacement	
2	001022	Clutch - Replacement	
3	001155	Clutch bell housing - Replacement	
4	001012	Driven pulley - Service	

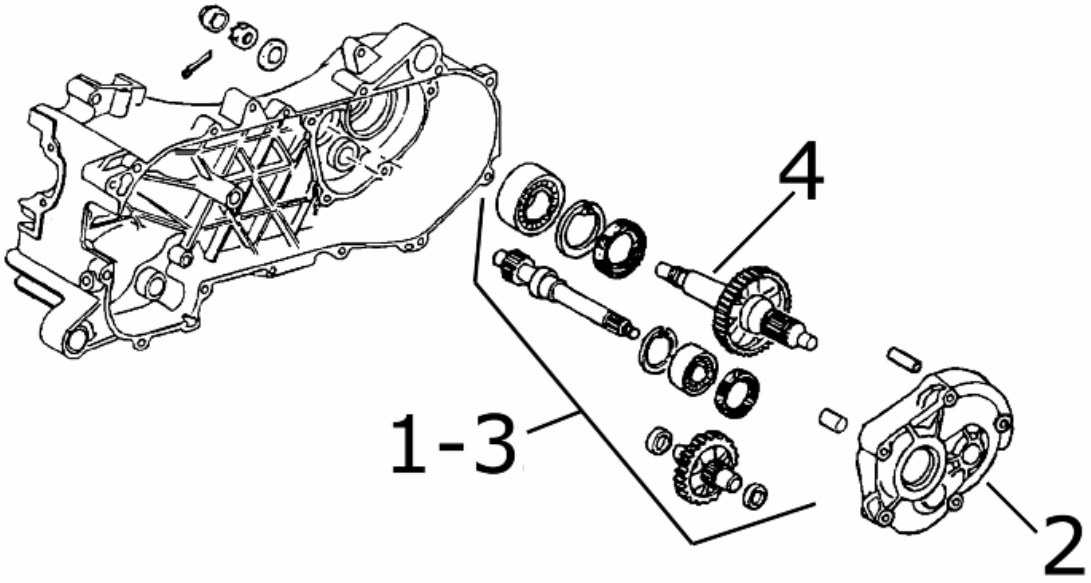
Oil pump



OIL MIX PUMP

	Code	Action	Duration
1	001018	Mixer - Replacement	
2	001019	Mixer belt - replacement	
3	001028	Mix movement gear socket - Replacement	

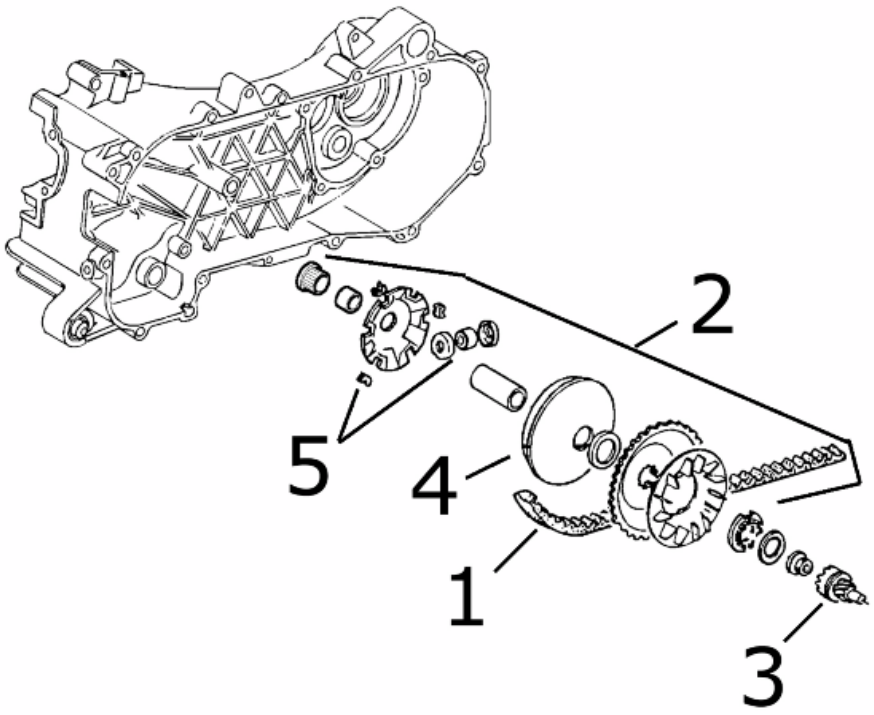
Final gear assy.



FINAL REDUCTION GEAR

	Code	Action	Duration
1	001010	Geared reduction unit - Service	
2	001156	Gear reduction unit cover - Replacement	
3	003065	Gear box oil - Replacement	
4	004125	Rear wheel axle - Replacement	

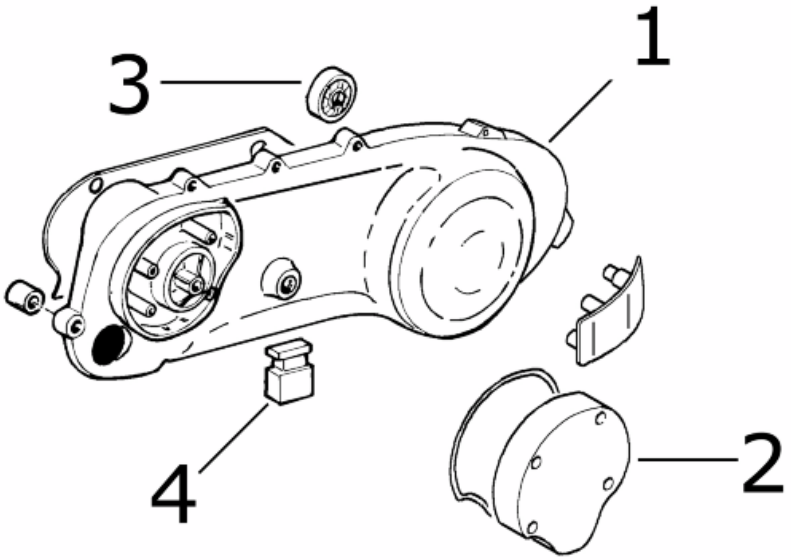
Driving pulley



DRIVING PULLEY

	Code	Action	Duration
1	001011	Driving belt - Replacement	
2	001066	driving pulley - Replacement	
3	001017	Starter sprocket wheel - Replacement	
4	001086	Driving half-pulley - replace	
5	001177	Variator rollers / shoes - Replacement	

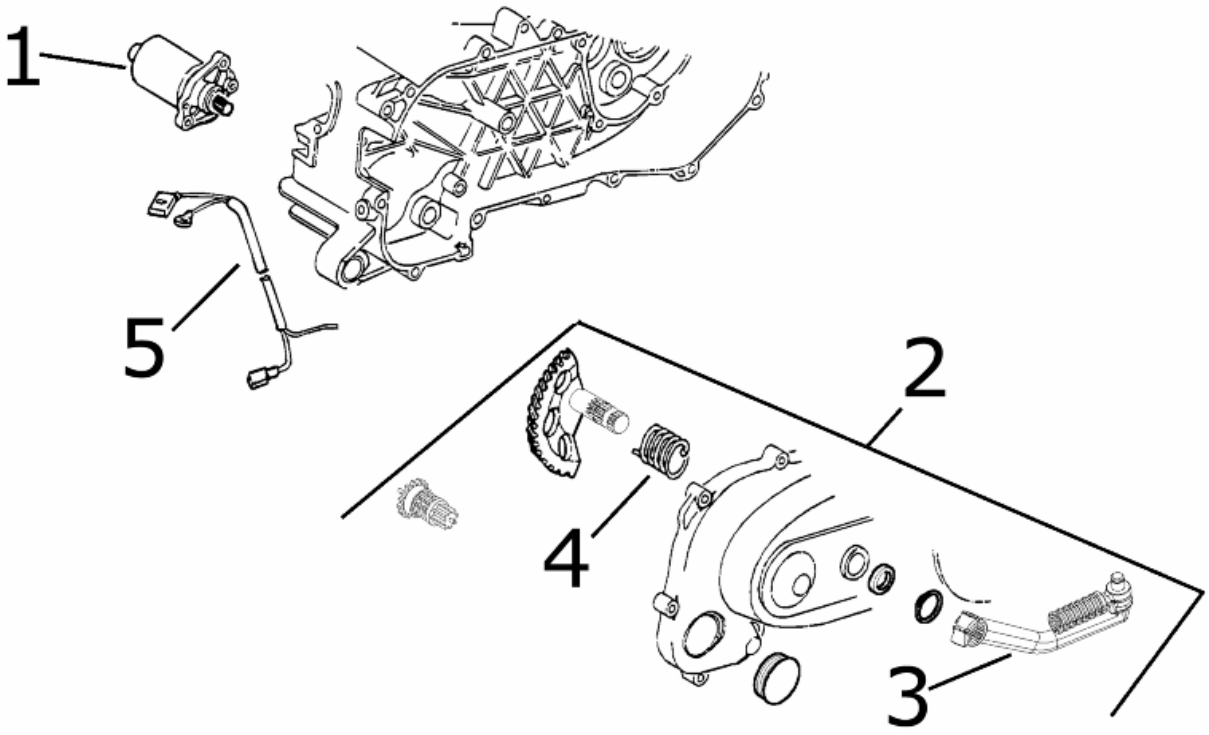
Transmission cover



TRANSMISSION COVER

	Code	Action	Duration
1	001096	Transmission crankcase cover - Replacement	
2	001131	Transmission air intake - Replacement	
3	001135	Transmission cover bearing - Replacement	
4	004179	Stand buffer - Replacement	

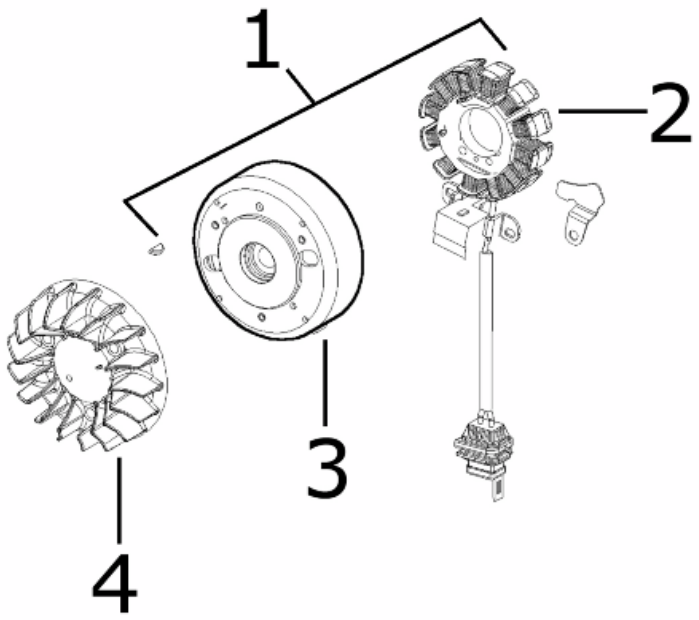
Starter motor



STARTER MOTOR AND KICK STARTER

	Code	Action	Duration
1	001020	Starter motor - Replacement	
2	001021	Kick starter - Inspection	
3	001084	Starter lever - Replacement	
4	008008	Starter spring pack - Replacement	
5	005045	Starter motor cable harness - Replacement	

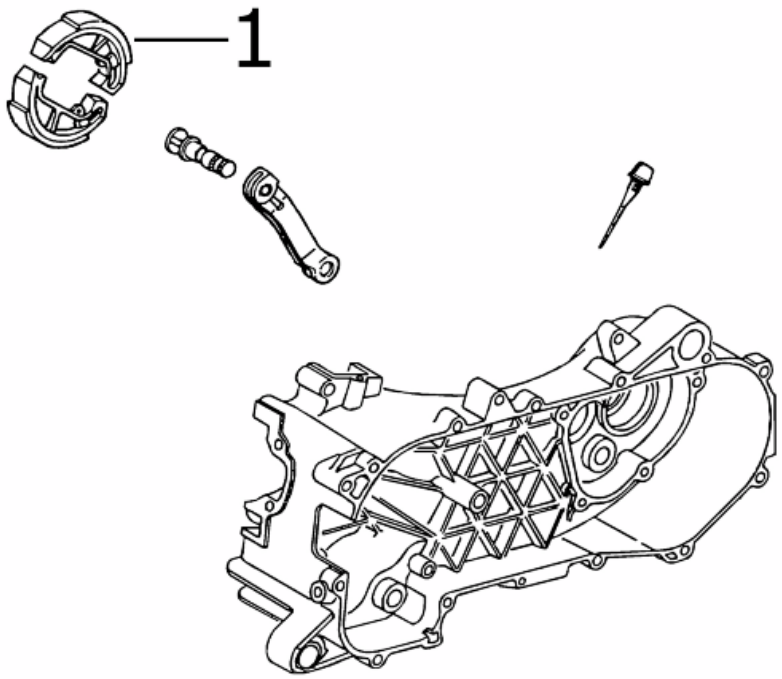
Flywheel magneto



MAGNETO FLYWHEEL

	Code	Action	Duration
1	001058	Flywheel - Replacement	
2	001067	Stator - Replacement	
3	001173	Rotor - Replacement	
4	001109	Cooling fan - Replacement	

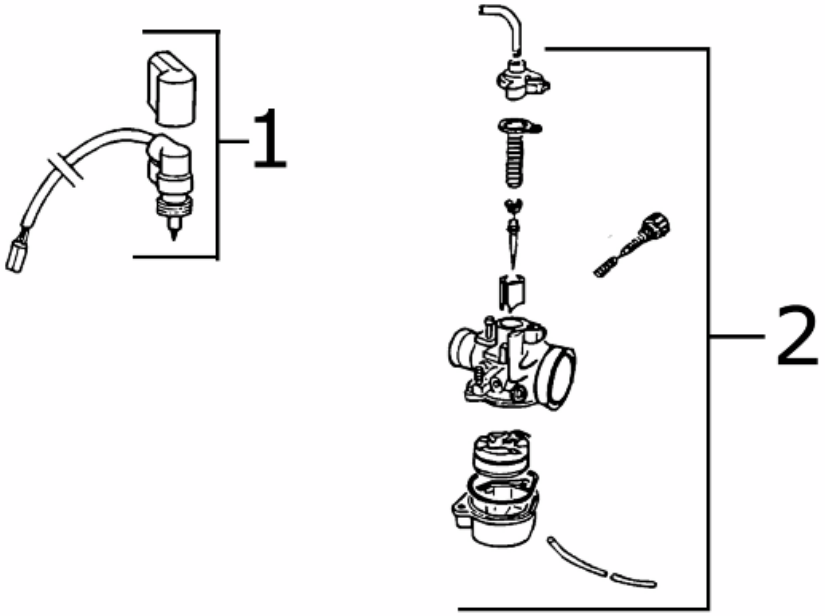
Brake shoes



BRAKE SHOES

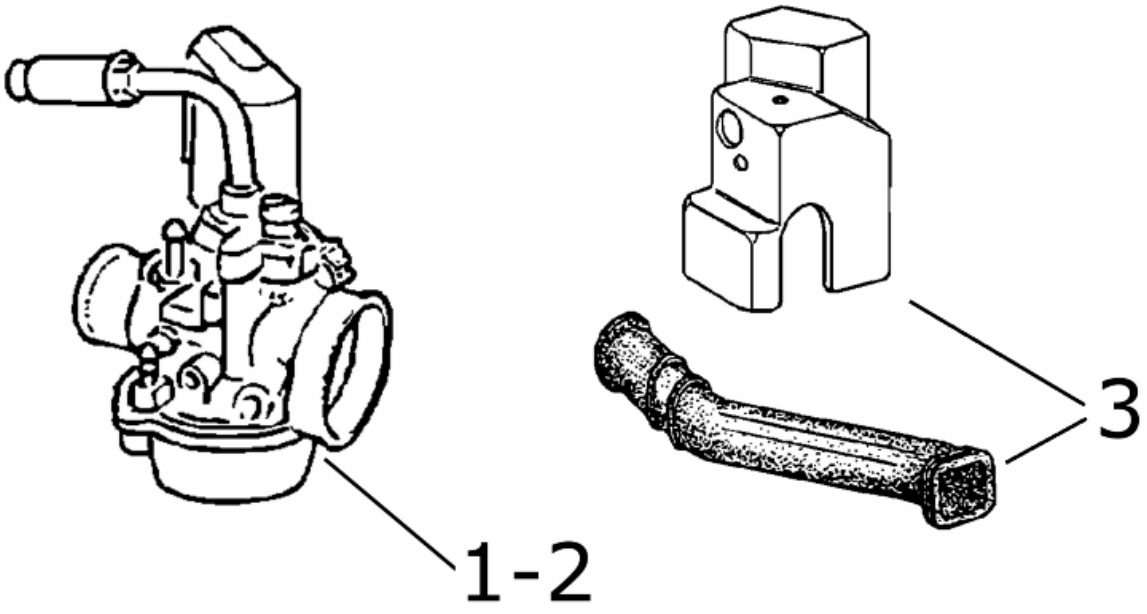
	Code	Action	Duration
1	002002	Rear brake shoe(s) - Replacement	

Carburettor



CARBURETTOR INSPECTION

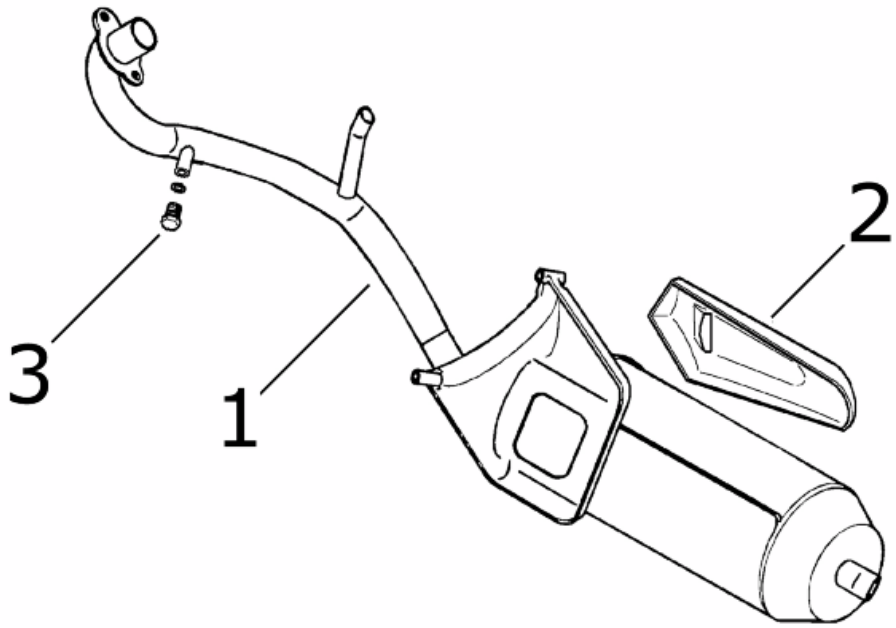
	Code	Action	Duration
1	001081	Automatic choke - Replacement	
2	001008	Carburettor - Inspection	



CARBURETTOR

	Code	Action	Duration
1	001063	Carburettor - Replacement	
2	003058	Carburettor - Adjustment	
3	004177	Heating hood - Replacement	

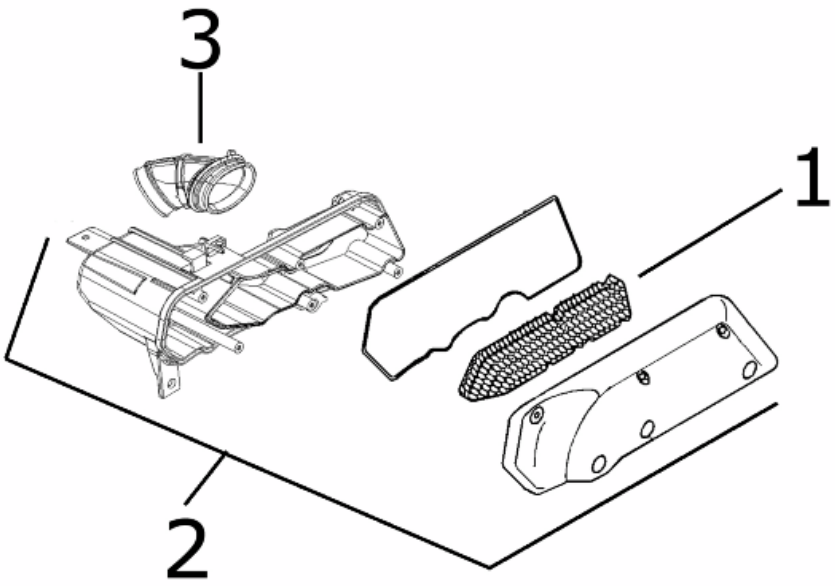
Exhaust pipe



MUFFLER

	Code	Action	Duration
1	001009	Muffler - Replacement	
2	001095	Muffler guard - Replacement	
3	001136	Exhaust emissions - Adjustment	

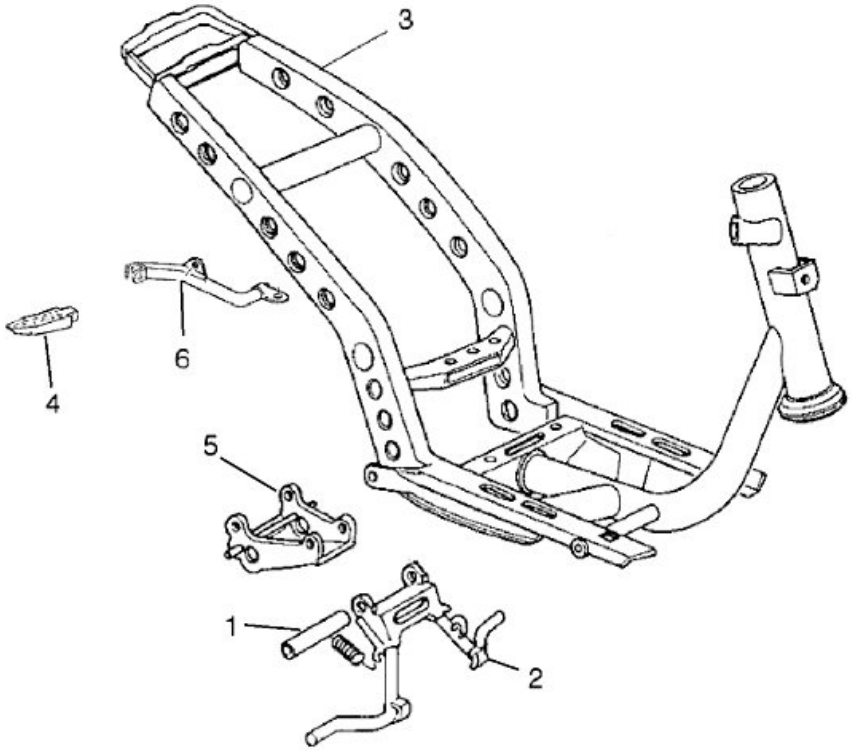
Air cleaner



AIR FILTER

	Code	Action	Duration
1	001014	Air filter - Replacement / cleaning	
2	001015	Air filter box - Replacement	
3	004122	Air cleaner carburettor fitting - Replacement	

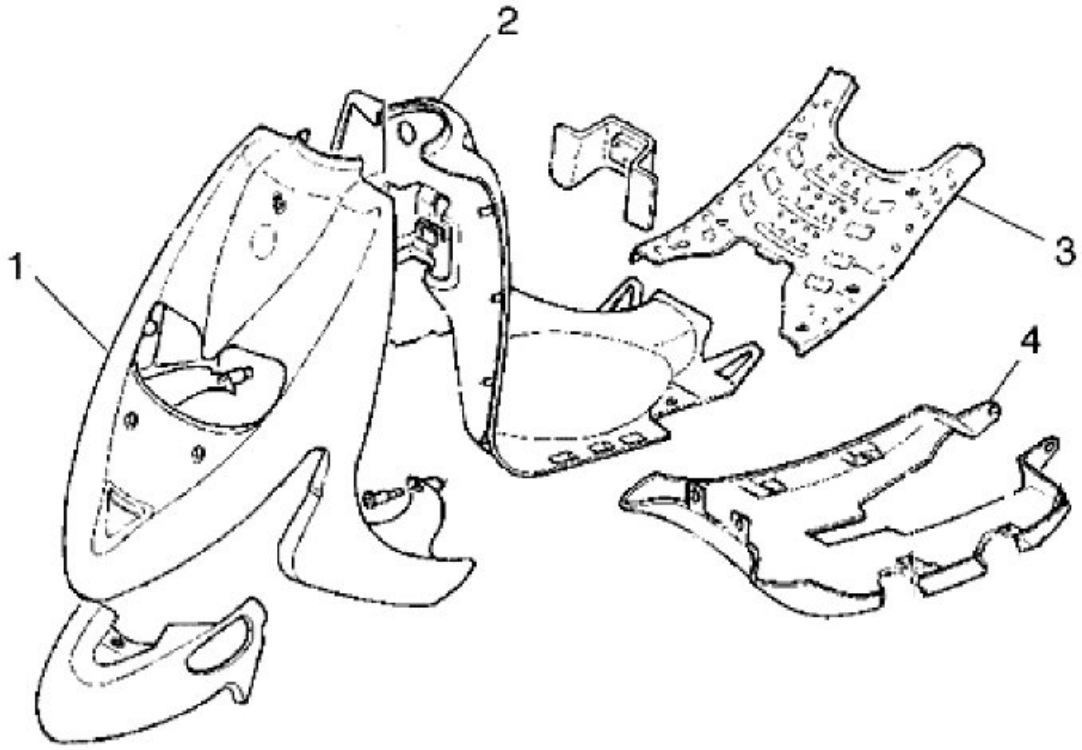
Frame



CHASSIS

	Code	Action	Duration
1	001053	Stand bolt - Replacement	
2	004004	Stand - Replacement	
3	004001	Frame - replace	
4	004015	Footrest - Replacement	
5	004171	Stand support plate - Replacement	
6	004143	Footrest support - replace	

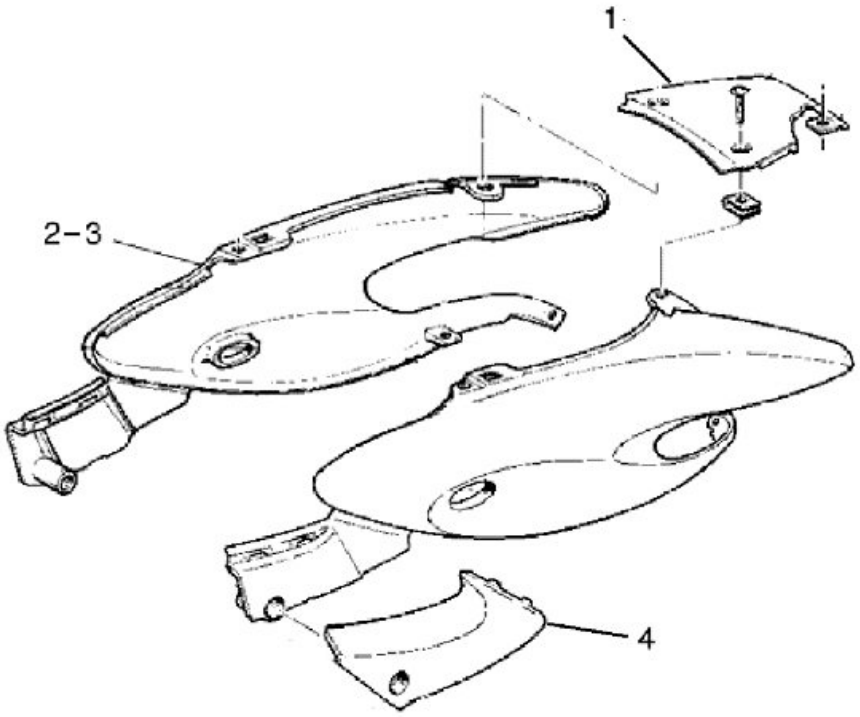
Legshield spoiler



FRONT SHIELD

	Code	Action	Duration
1	004064	Front shield - Replacement	
2	004065	Front shield rear section - Replacement	
3	004178	Footrest - Replacement	
4	004053	Spoiler - Replacement	

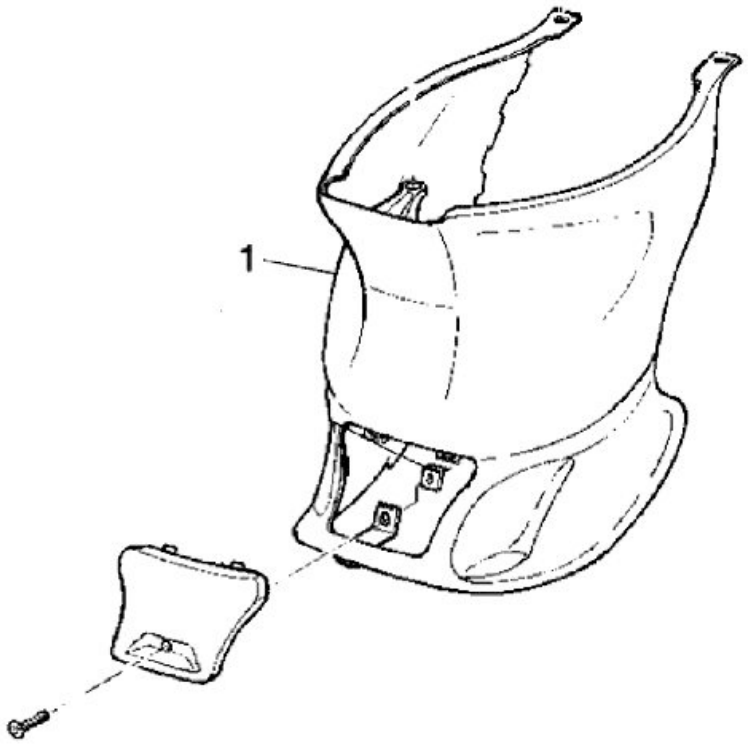
Side fairings



REAR COVERS

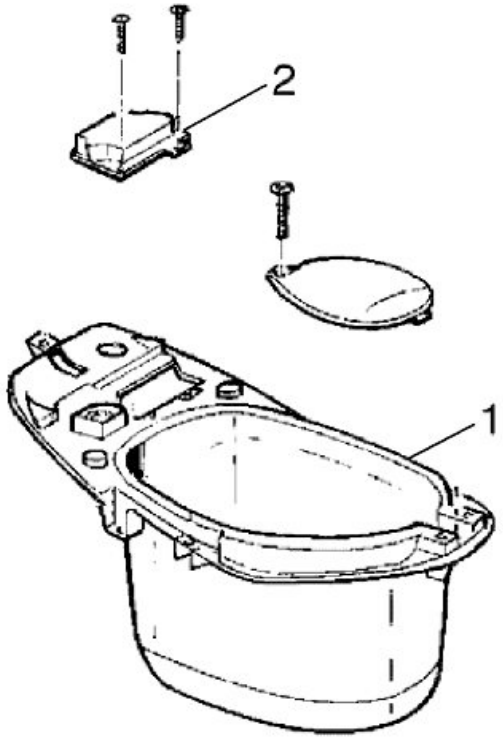
	Code	Action	Duration
1	xxxx	Rear spoiler - Replacement	
2	004085	Fairing (1) - Replacement	
3	004012	Rear side panels (2) - Replacement	
4	xxxxx	Lower cover side panel - Replacement	

Underseat compartment



CENTRAL FRAME COVER

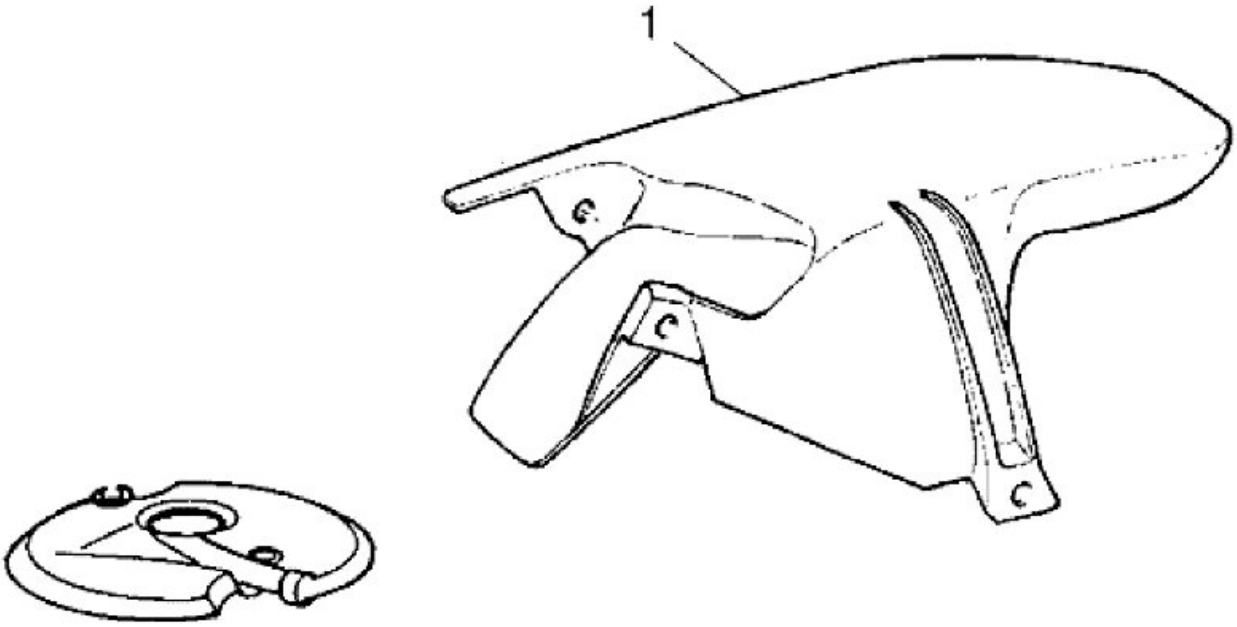
	Code	Action	Duration
1	004011	Central chassis cover - Replacement	



HELMET COMPARTMENT

	Code	Action	Duration
1	004016	Helmet compartment - Replacement	
2	005046	Battery cover - Replacement	

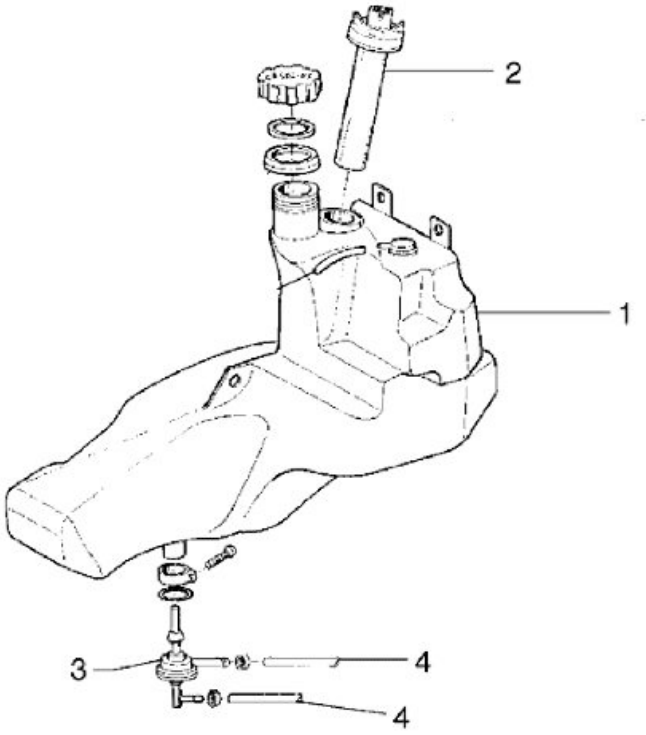
Mudguard



REAR MUDGUARD

	Code	Action	Duration
1	004009	Rear mudguard - Replacement	

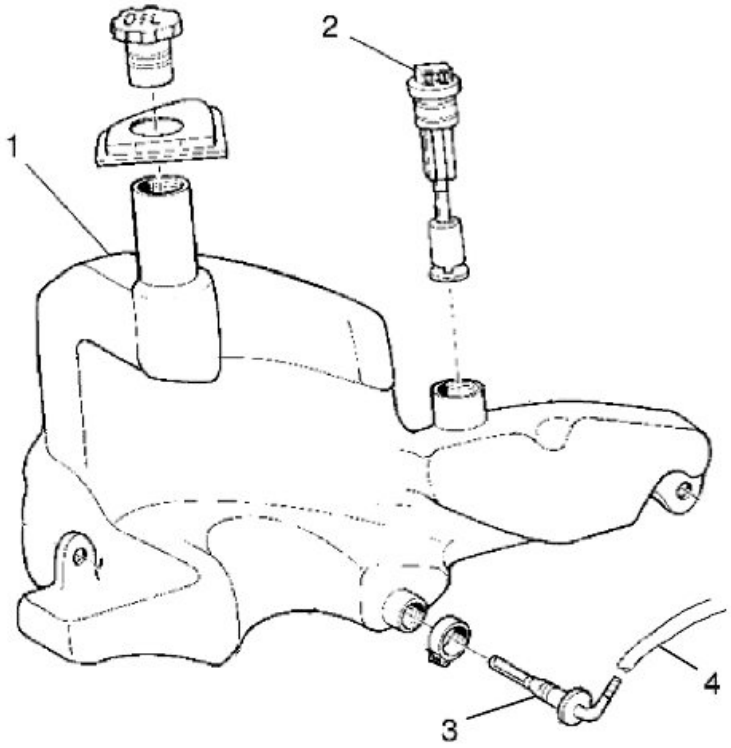
Fuel tank



FUEL TANK

	Code	Action	Duration
1	004005	Fuel tank - Replacement	
2	005010	Tank float - Replacement	
3	004072	Fuel filter - Replacement	
4	004112	Cock / carburettor hose - Replacement	

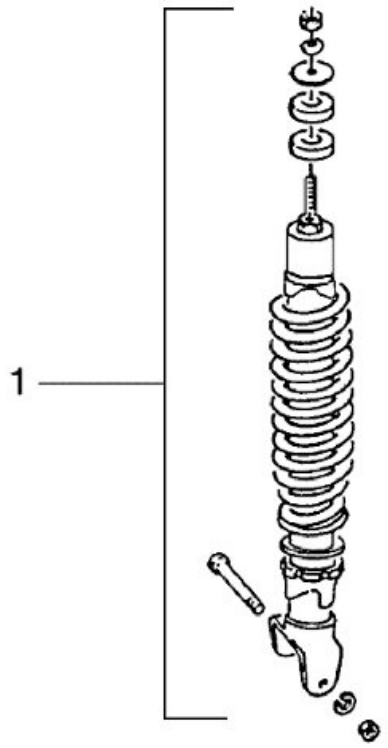
Tank oil



OIL TANK

	Code	Action	Duration
1	004017	Oil reservoir - Replacement	
2	005018	Oil reservoir float - Replacement	
3	004095	Oil reservoir cock - Replacement	
4	004091	Oil reservoir hose - Replacement	

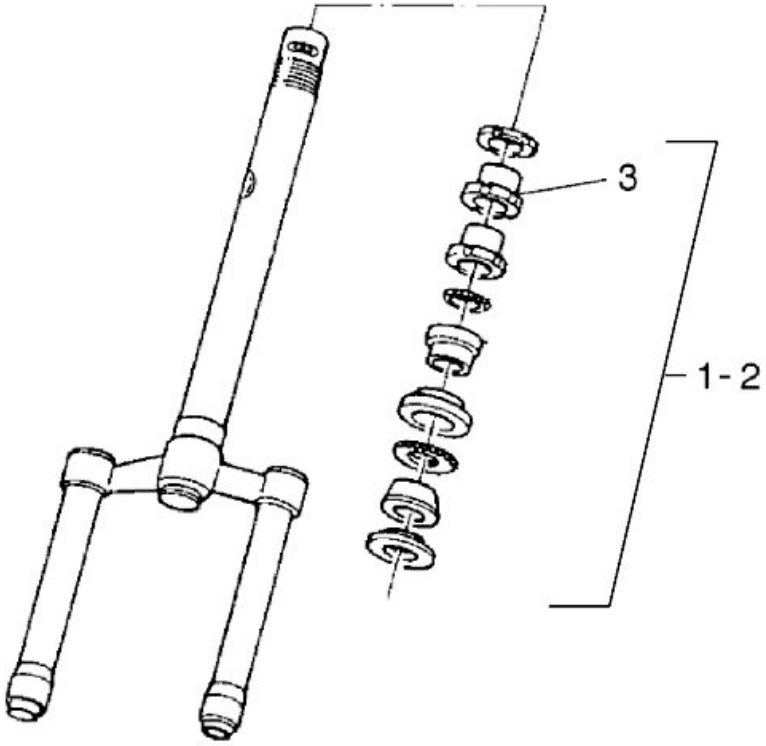
Rear shock-absorber



REAR SHOCK ABSORBER

	Code	Action	Duration
1	003007	Rear shock absorbers - Replacement	

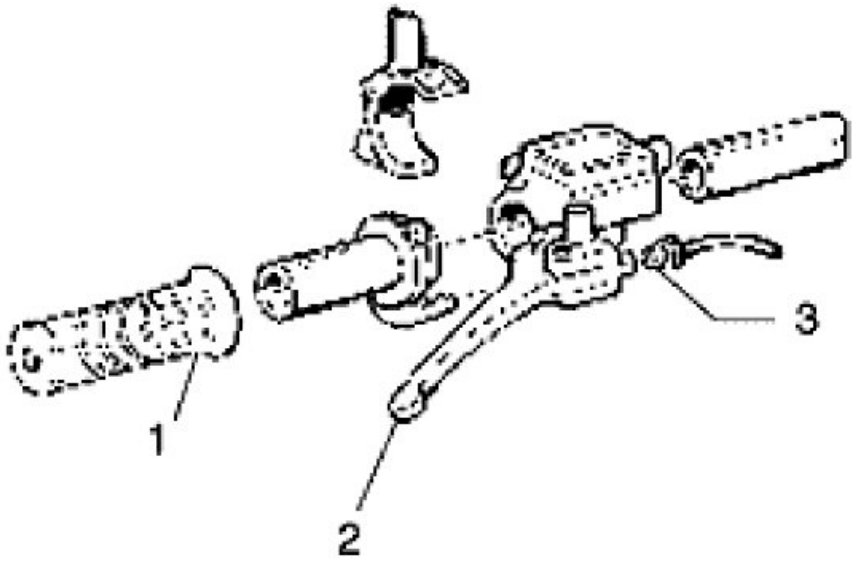
Steering column bearings



STEERING FIFTH WHEELS

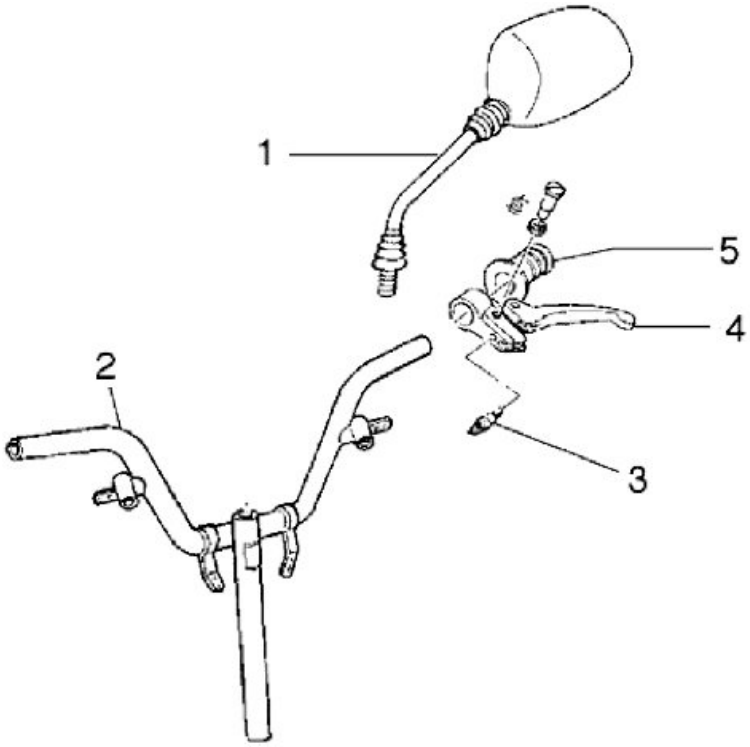
	Code	Action	Duration
1	003002	Steering fifth wheel - Replacement	
2	003073	Steering clearance - Adjustment	
3	004119	Bearing / upper steering fifth wheel - Replacement	

Handlebar components



HANDLEBAR COMPONENTS

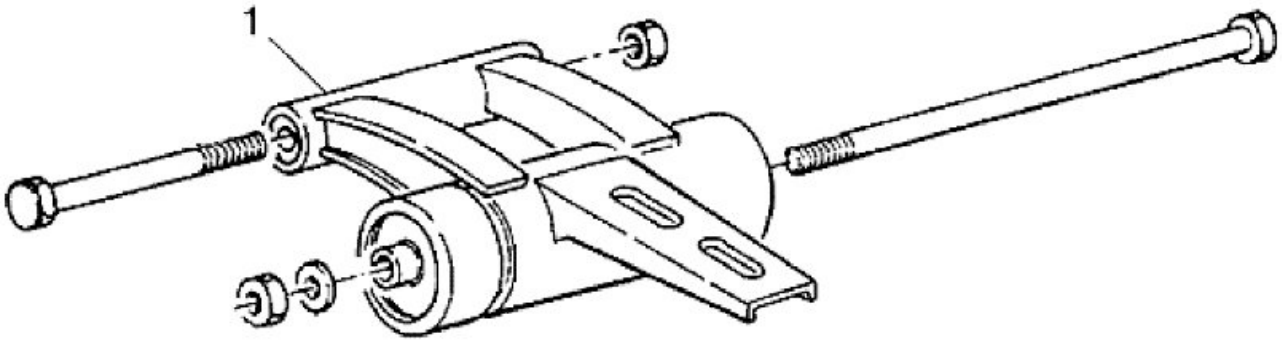
	Code	Action	Duration
1	002071	Left hand grip - Replacement	
2	002037	Brake or clutch lever - Replacement	
3	005017	Stop switch - Replacement	



HANDLEBAR COMPONENTS

	Code	Action	Duration
1	004066	Driving mirror - Replacement	
2	003001	Handlebar - Replacement	
3	005017	Stop switch - Replacement	
4	002037	Brake or clutch lever - Replacement	
5	002059	Right hand grip - Replacement	

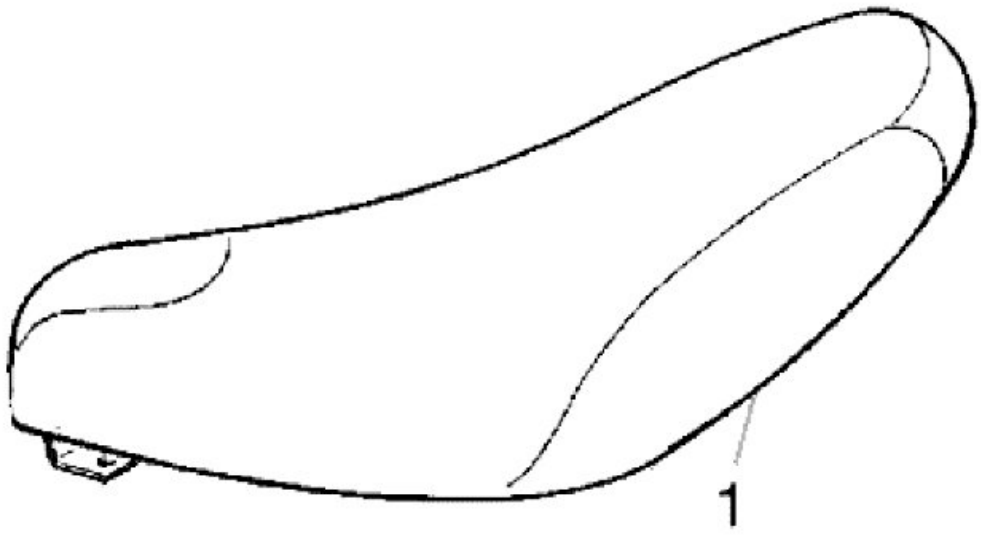
Swing-arm



SWINGING ARM

	Code	Action	Duration
1	001072	Engine / frame swinging arm fitting - Replacement	

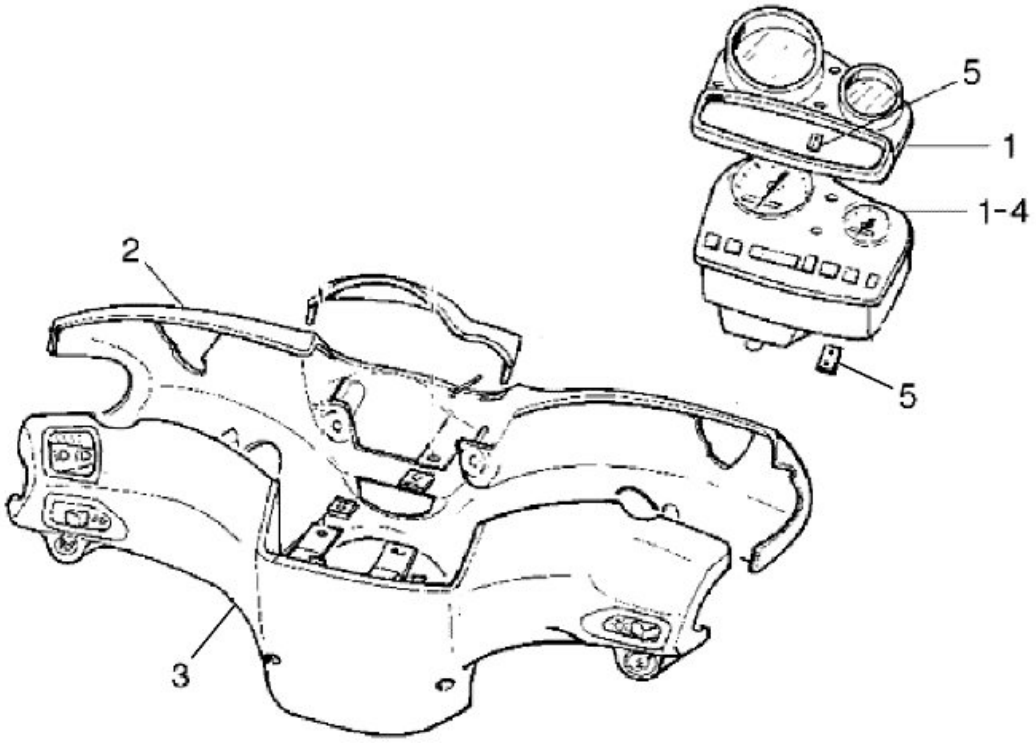
Seat



SADDLE

	Code	Action	Duration
1	004003	Saddle - Replacement	

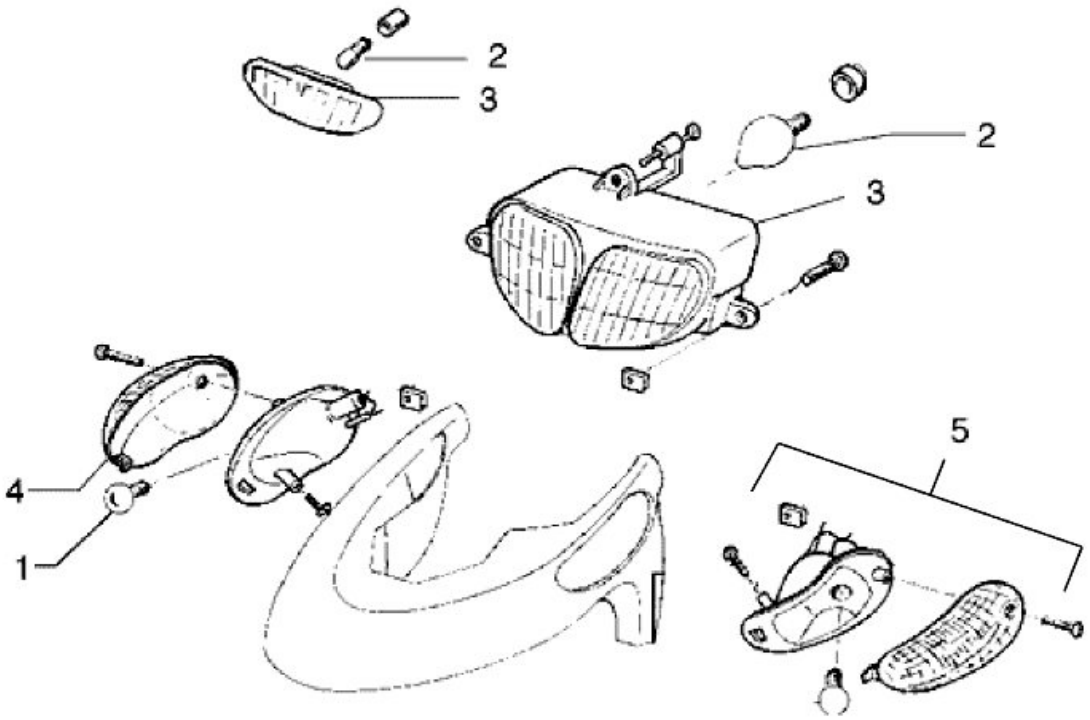
Instrument panel



INSTRUMENT PANEL AND HANDLEBAR COVER

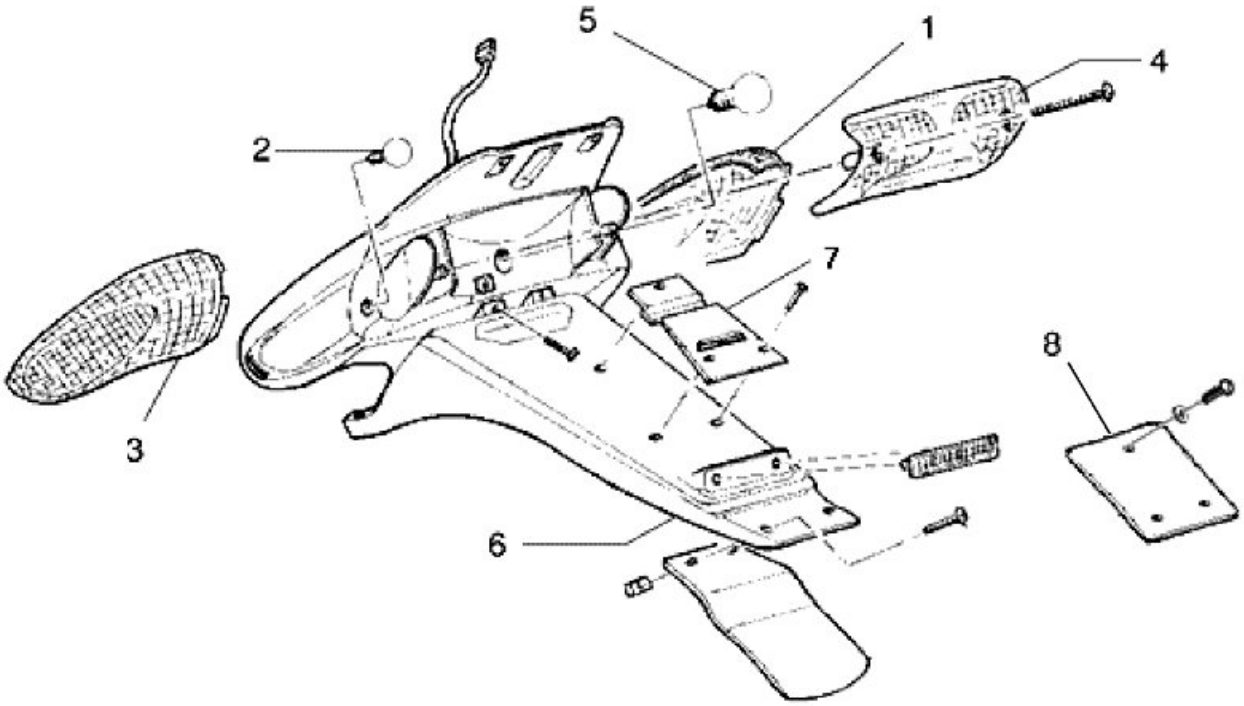
	Code	Action	Duration
1	005014	Odometer - Replacement	
2	004018	Handlebar front section - Replacement	
3	004019	Handlebar rear section - Replacement	
4	005078	Odometer glass - Replacement	
5	005076	Clock / Cell - Replacement	

Turn signal lights



FRONT HEADLAMP

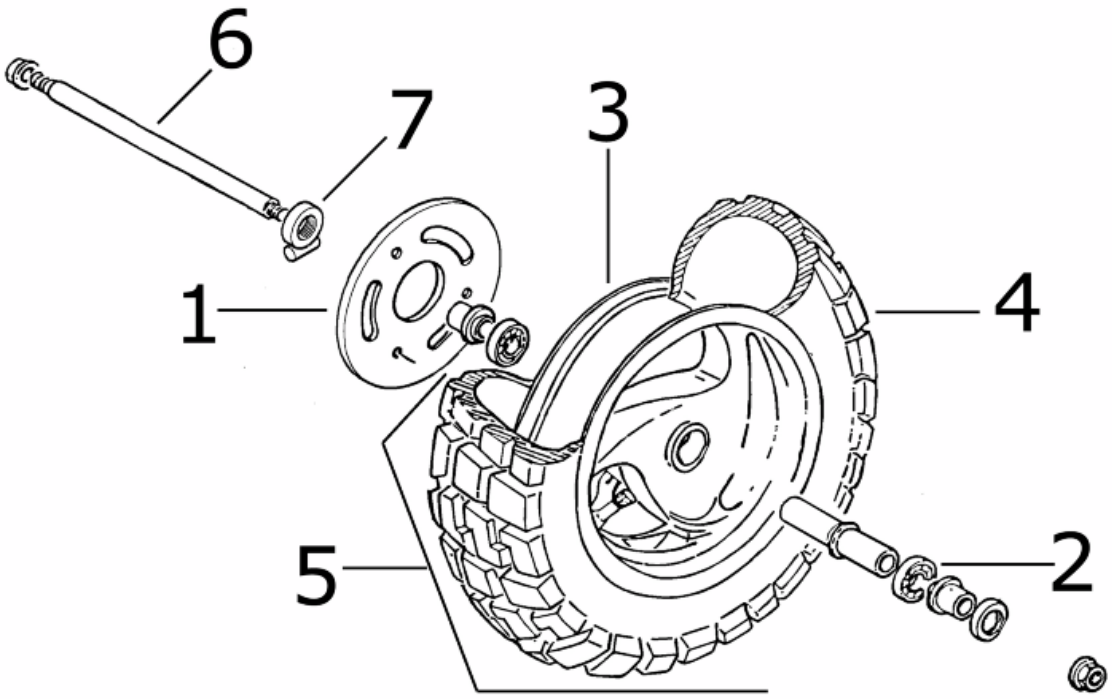
	Code	Action	Duration
1	005067	Front turn indicator bulb - Replacement	
2	005008	Front headlamp bulbs - Replacement	
3	005002	Front headlamp - Replacement	
4	005091	Turn indicator glass - Replacement	
5	005012	Front turn indicator - Replacement	



REAR LIGHTS

	Code	Action	Duration
1	005022	Rear turn indicators - Replacement	
2	005068	Rear turn indicator bulb - Replacement	
3	005091	Turn indicator glass - Replacement	
4	005028	Rear light assembly glass - Replacement	
5	005066	Rear light bulbs - Replacement	
6	004136	License plate support - Replacement	
7	004056	Upper rear light cover - Replacement	
8	005048	Licence plate holder - Replacement	

Front wheel



FRONT WHEEL

	Code	Action	Duration
1	002041	Front brake disc - Replacement	
2	003040	Front wheel bearings - Replacement	
3	003037	Front wheel rim- Replacement	
4	003047	Front tyre - replace	
5	004123	Front wheel - Replacement	
6	003038	Front wheel axle - Replacement	
7	002011	Odometer movement sensor - Replacement	

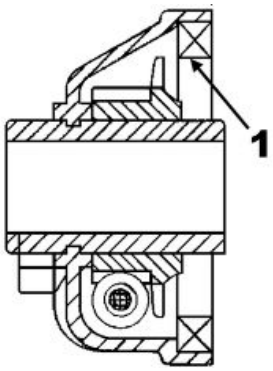
Grease tone wheel or drive

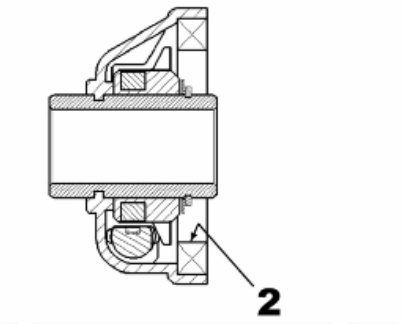
Please take note that the code has been introduced:

900001 - Tone wheel / drive greasing - 15'.

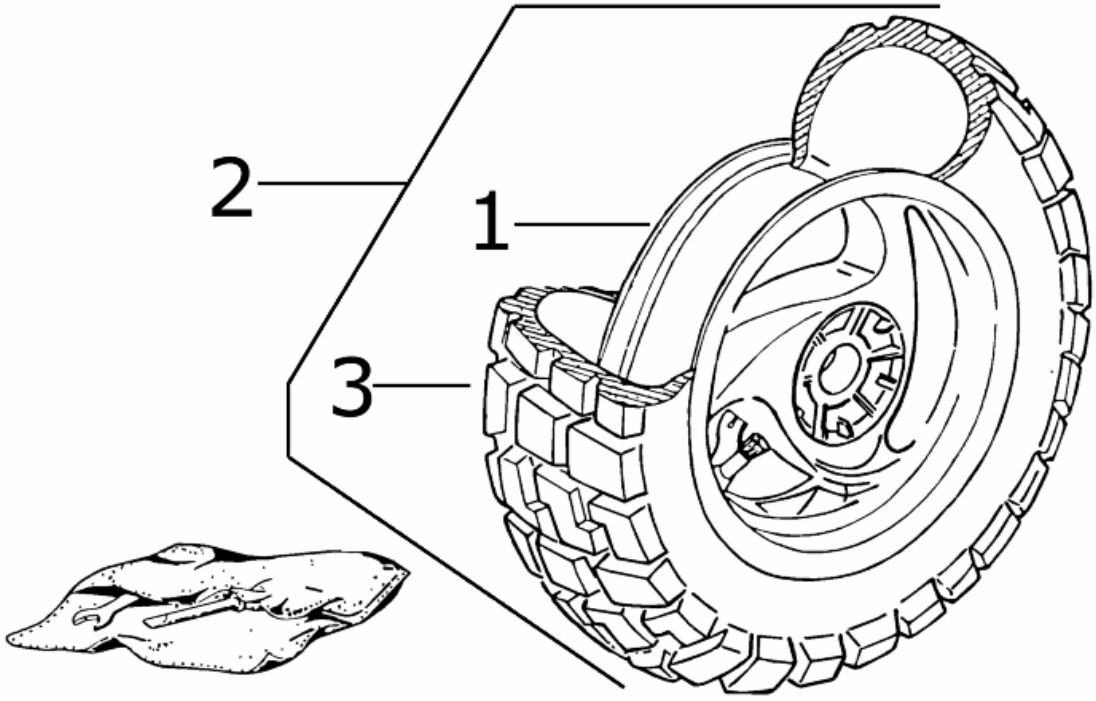
Never mistake the codes 002011 (movement sensor replacement) and 005089 (tone wheel replacement) in the event of noise of the indicated components. The grease recommended is TUTELA MRM 2 (soap-based lithium grease with Molybdenum disulphide).

In the following points we indicate with an arrow the area to be greased (1 - Drive, 2 - Tone wheel)





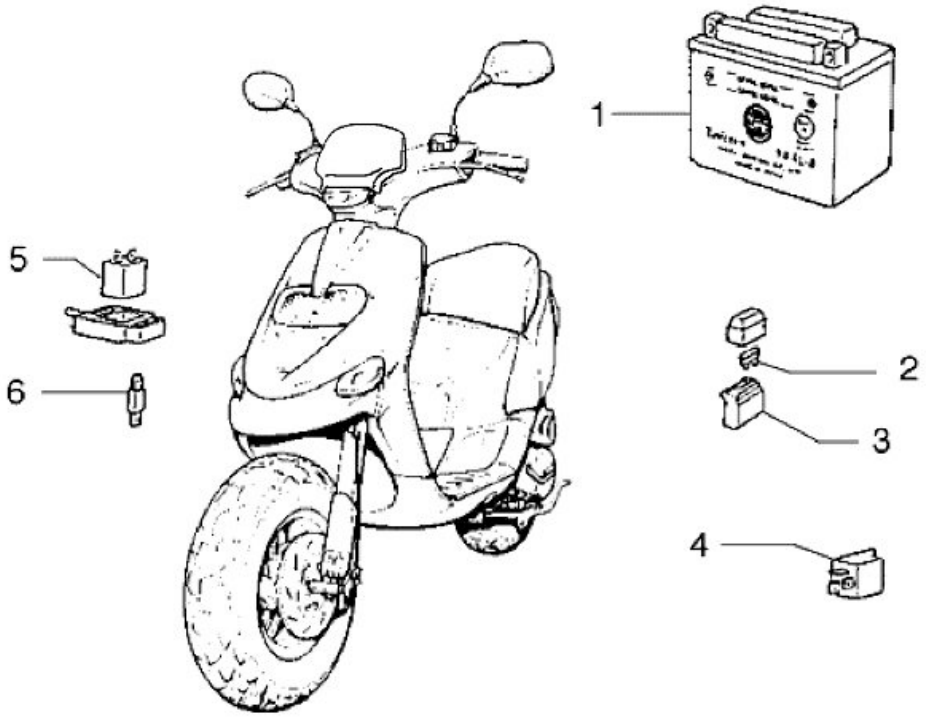
Rear wheel



REAR WHEEL

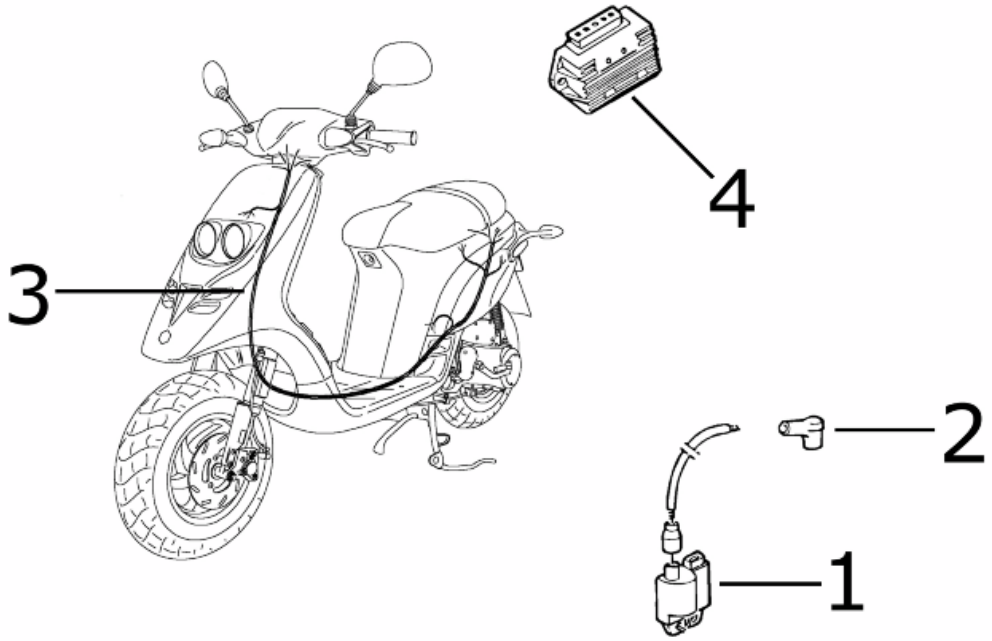
	Code	Action	Duration
1	001071	Rear wheel rim - Replacement	
2	001016	Rear wheel - Replacement	
3	004126	Rear wheel tyre - Replacement	

Electric devices



BATTERY

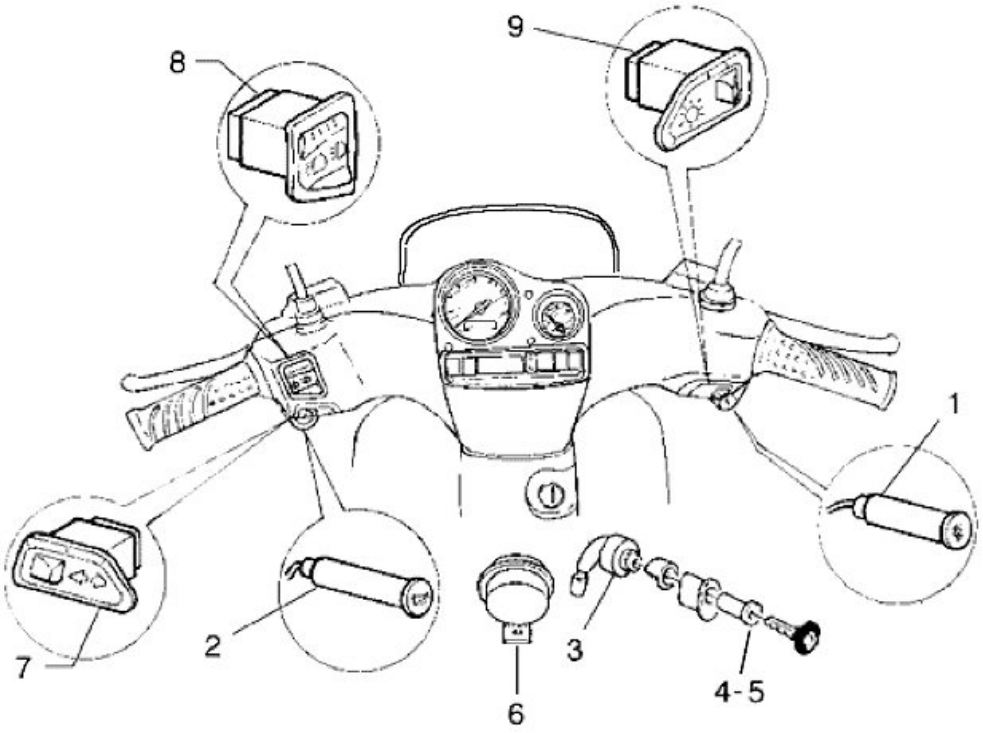
	Code	Action	Duration
1	005007	Battery - Replacement	
2	005024	Battery fuse - Replacement	
3	005025	Fuse holder - Replacement	
4	005011	Start-up remote control switch - Replacement	
5	xxxxxx	Turn indicator assembly - Replacement	
6	xxxxxxx	Diode - Replacement	



ELECTRICAL SYSTEM

	Code	Action	Duration
1	001023	Control unit - Replacement	
2	001094	Spark plug cap - Replacement	
3	005001	Electrical system - Replacement	
4	005009	Voltage regulator - Replacement	

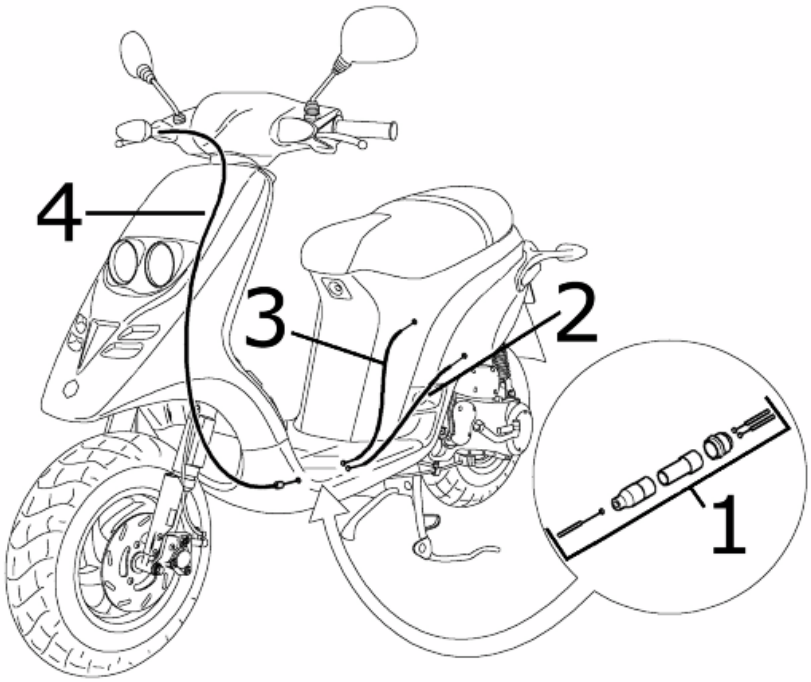
Electronic controls



ELECTRIC CONTROLS

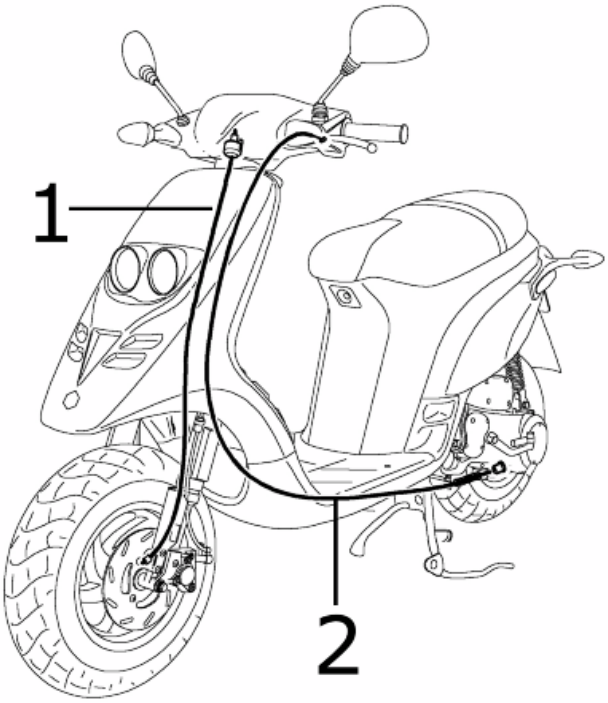
	Code	Action	Duration
1	005041	Starter button - Replacement	
2	005040	Horn button - Replacement	
3	005016	Key switch - Replacement	
4	004096	Lock series - Replacement	
5	004010	Antitheft lock - replace	
6	005003	Horn - Replacement	
7	005006	Light switch or turn indicators - Replacement	
8	005039	Headlight switch - Replacement	
9	005077	Emergency stop switch - Replacement	

Transmissions



SPLITTER

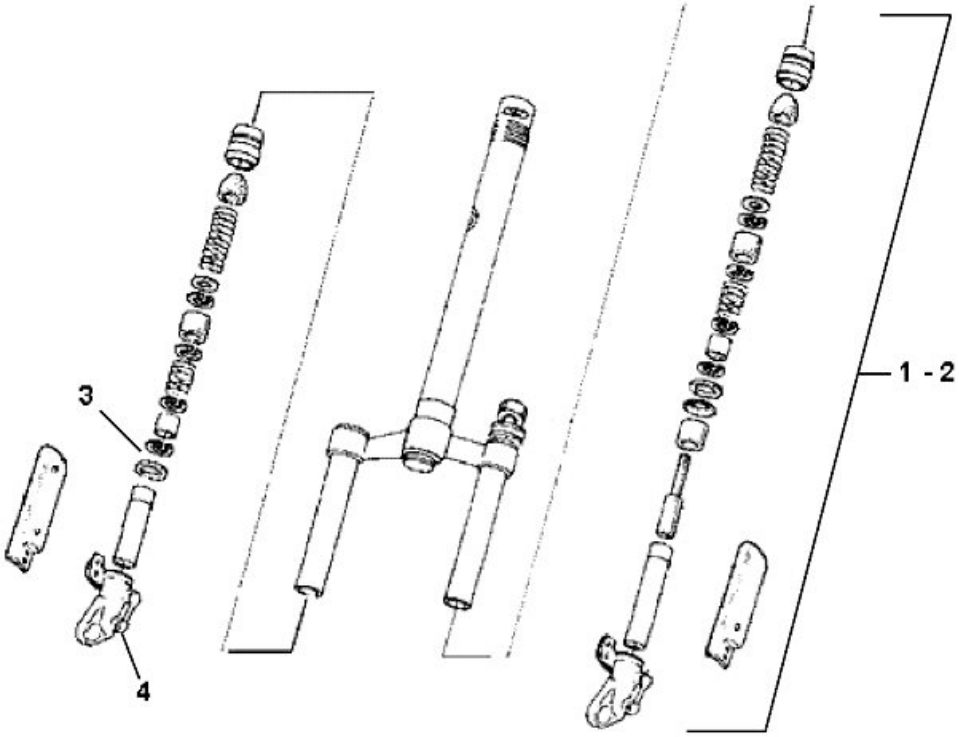
	Code	Action	Duration
1	002012	Splitter - Replacement	
2	002058	Mix / splitter transmission complete - Replacement	
3	002057	Carburettor / splitter transmission complete - Replacement	
4	002054	Throttle or splitter transmission complete - Replacement	



REAR BRAKE TRANSMISSION AND ODOMETER

	Code	Action	Duration
1	002051	Odometer transmission assembly - Replacement	
2	002053	Rear brake transmission complete - Replacement	

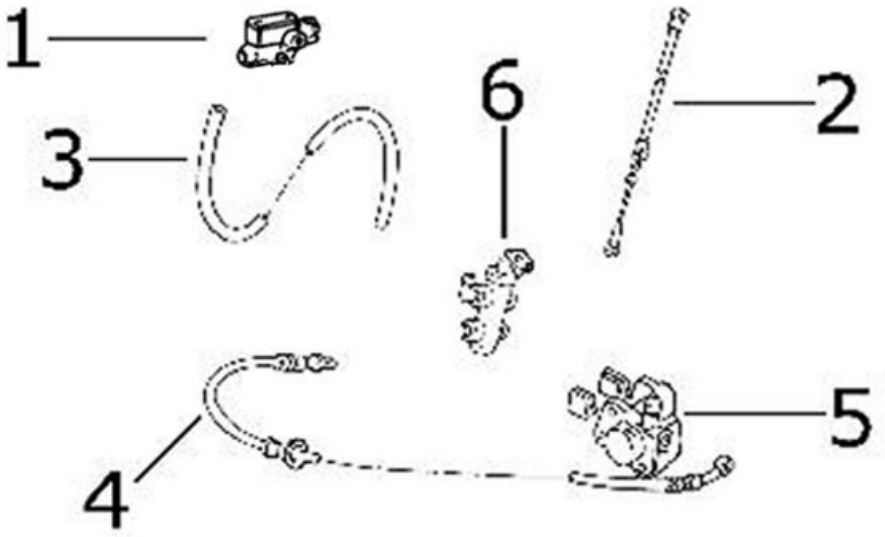
Front suspension



FORK

	Code	Action	Duration
1	003010	Front suspension - Service	
2	003051	Complete fork - replace	
3	003048	Fork oil seal - Replacement	
4	003041	Fork stanchion - Replacement	

Braking system



FRONT BRAKE

	Code	Action	Duration
1	002103	Brake fluid reservoir - Replacement	
2	002052	Front brake transmission - Replacement	
3	002025	Brake piping - Replacement	
4	002021	Front brake piping - Replacement	
5	002039	Front brake calliper - Replacement	
6	002024	Front brake pump - replace	