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# WORKSHOP MANUAL

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633257

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## NRG Power DT

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# **WORKSHOP MANUAL**

## **NRG Power DT**

The descriptions and illustrations given in this publication are not binding. While the basic features as described and illustrated in this manual remain unchanged, PIAGGIO - GILERA reserves the right, at any time and without being required to update this publication beforehand, to make any changes to components, parts or accessory supplies, which it considers necessary to improve the product or which are required for manufacturing or construction reasons.

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# WORKSHOP MANUAL

## NRG Power DT

This workshop manual has been drawn up by Piaggio & C. Spa to be used by the workshops of Piaggio-Gilera dealers. This manual is addressed to Piaggio service mechanics who are supposed to have a basic knowledge of mechanics principles and of vehicle fixing techniques and procedures. Any important changes made to the vehicles or to specific fixing operations will be promptly reported by updates to this manual. Nevertheless, no fixing work can be satisfactory if the necessary equipment and tools are unavailable. It is therefore advisable to read the sections of this manual relating to specific tools, along with the specific tool catalogue.

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

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

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



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



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



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

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## INDEX OF TOPICS

CHARACTERISTICS

CHAR

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## Rules

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

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### 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 open 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 solvent. Lubricate all the work surfaces except the tapered couplings before refitting.
  - 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 measurement. 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**

**Frame prefix:** ZAPC45300 ÷ 1001

**Engine prefix:** C453M



**Dimensions and mass**

**DIMENSIONS AND MASS**

<b>Specification</b>	<b>Desc./Quantity</b>
Max length	1790 mm.
Max width	850 mm.
Seat height	795 mm.
Wheelbase	1280 mm
Dry weight	95 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
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 the fuel pump in depression, lead-free gasoline (with 95 octane minimum) by means of the carburettor
Cooling system	forced coolant circulation system

## 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
Rear hub oil	Quantity : ~ 85 cc
Mixer oil	1.2 litres
Fuel tank capacity	6.5 litres (1.5 litres of reserve)

## 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 $17^{\circ} \pm 1$
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 suspension travel	75 mm
Rear suspension	With coaxial spring and hydraulic shock absorber. Chassis to engine support with swinging arm.

## Brakes

### BRAKES

Specification	Desc./Quantity
Front brake	$\varnothing$ 220 mm disc brake with hydraulic linkage (r.h. brake lever).

Specification	Desc./Quantity
Rear brake	(Ø 110 mm) drum brake with expanding shoes, mechanically controlled (lever on the handlebar left hand end).

## Wheels and tyres

### WHEELS AND TYRES

Specification	Desc./Quantity
Front tyre	Tubeless 120/70-13"
Rear tyre	Tubeless 140/60 x 13"
Wheels	With circles of 3.50 x 13" in light alloy.

## Secondary air

To clean the sponge filters of the secondary air system, proceed as follows:

Unscrew the two studs ( 2 ) of the aluminium lid of the secondary air box to access the polyurethane sponge contained inside the box; after cleaning with water and neutral soap, dry the sponge with a clean cloth and reassemble the system, checking that the steel blade is not warped and/or does not guarantee the seal on its strike surface; replace if necessary.



**N.B.**

**UPON REFITTING, MAKE SURE TO CORRECTLY FIT THE TAB IN ITS FITTING ON THE TWO PLASTIC AND ALUMINIUM COVERS.**

**CAUTION**

**DURING THE OPERATION, CHECK THE INTEGRITY AND SEAL OF THE TWO SLEEVES (3) IN RUBBER LOCATED AT THE ENDS OF THE SECONDARY AIR HOSE; IF NECESSARY, REPLACE THEM USING NEW CLAMPS TO FASTEN.**

## Carburettor

### 50cc Version

## Dell'Orto

**DELL'ORTO CARBURETTOR**

<b>Specification</b>	<b>Desc./Quantity</b>
Type	PHVA 17.5 RD
Diffuser diameter	Ø 17.5
Adjustments reference number	8440
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
Fuel inlet hole	Ø 1.0

**Tightening Torques****STEERING ASSEMBLY**

<b>Name</b>	<b>Torque in Nm</b>
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**

<b>Name</b>	<b>Torque in Nm</b>
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
Side stand fixing screw	12 ÷ 20
Side stand bracket fixing screw	15 ÷ 20
Rear rim fixing screw	20÷25

**FRONT SUSPENSION**

<b>Name</b>	<b>Torque in Nm</b>
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**

<b>Name</b>	<b>Torque in Nm</b>
Viti fissaggio coperchio pompa freno	1,5 ÷ 2 Nm

Name	Torque in 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**

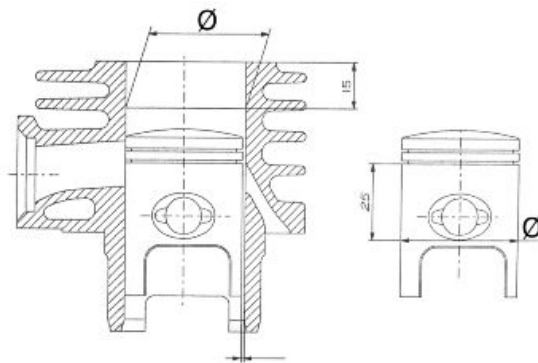
## **Assembly clearances**

### **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 over-size	M1	40.205 - 40.212	40.143 - 40.15	0.055 - 0.069

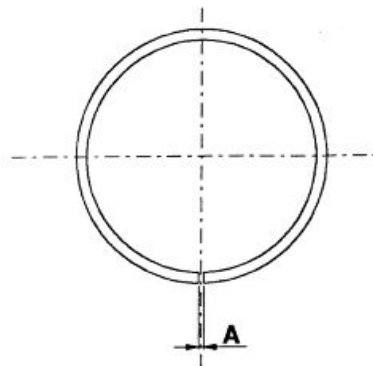
Name	Initials	Cylinder	Piston	Play on fitting
coupling 1st over-size	N1	40.212 - 40.219	40.15 - 40.157	0.055 - 0.069
coupling 1st over-size	O1	40.219 - 40.226	40.157 - 40.164	0.055 - 0.069
coupling 1st over-size	P1	40.226 - 40.233	40.164 - 40.171	0.055 - 0.069
Coupling 2nd over-size	M2	40.405 - 40.412	40.343 - 40.35	0.055 - 0.069
Coupling 2nd over-size	N2	40.412 - 40.419	40.35 - 40.357	0.055 - 0.069
Coupling 2nd over-size	O2	40.419 - 40.426	40.357 - 40.364	0.055 - 0.069
Coupling 2nd over-size	P2	40.426 - 40.433	40.364 - 40.371	0.055 - 0.069



**Piston rings**

**SEALING RINGS**

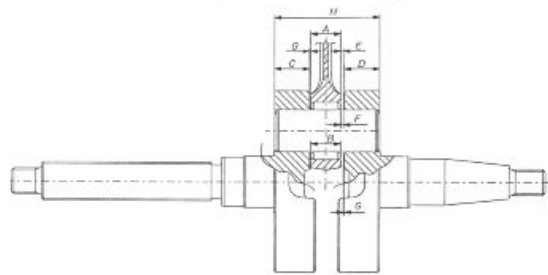
Name	Description	Dimensions	Initials	Quantity
Compression ring		40	A	0.10 to 0.25
Compression ring 1st oversize		40.2	A	0.10 to 0.25
Compression ring 2nd Oversize		40.4	A	0.10 to 0.25



## Crankcase - crankshaft - connecting rod

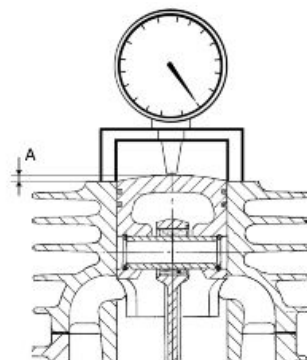
### AXIAL CLEARANCE BETWEEN CRANKCASE, CRANKSHAFT AND CONNECTING ROD

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**

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

**Products****TABLE OF RECOMMENDED PRODUCTS**

<b>Product</b>	<b>Description</b>	<b>Specifications</b>
AGIP ROTRA 80W-90	Rear hub oil	SAE 80W/90 Oil that exceeds the requirements of API GL3 specifications
AGIP CITY HI TEC 4T	Oil to lubricate flexible transmissions (brake, throttle control and mixer, odometer)	Oil for 2-stroke engines: SAE 5W-40, API SL, ACEA A3, JASO MA
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
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.



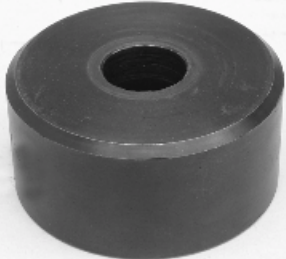





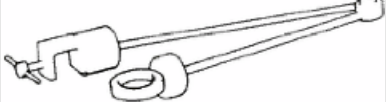
## INDEX OF TOPICS







TOOLING






TOOL

**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, outside Ø 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 for timing control	

**Stores code**  
020331Y

**Description**  
Digital multimeter



020332Y

Digital rev counter



020334Y

Multiple battery charger



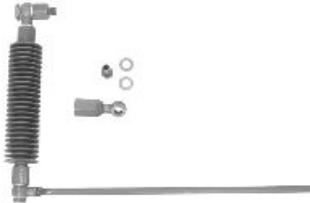



020335Y

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	
494929Y	Exhaust fumes analyser	

# INDEX OF TOPICS

**MAINTENANCE**

**MAIN**

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**Maintenance chart**
**EVERY 2 YEARS**
**Action**

Brake fluid - change
----------------------

**AFTER 1000 KM**

50'

**Action**

Hub oil - change
------------------

Oil mixer/throttle linkage - adjustment
---

Odometer cable - greasing
---------------------------

Steering - adjustment
-----------------------

Brake control levers - greasing
---------------------------------

Brake fluid level - check
---------------------------

Safety locks - check
----------------------

Electrical system and battery - check
---------------------------------------

Tyre pressure and wear - check
--------------------------------

Vehicle and brake test - road test
------------------------------------

**AFTER 5000 KM, 25000 KM, 35000 KM AND 55000 KM**

40'

**Action**

Hub oil level - check
-----------------------

Spark plug/electrode gap - replacement
--

Air filter - clean
--------------------

Oil mixer/throttle linkage - adjustment
---

Brake control levers - greasing
---------------------------------

Brake pads - check condition and wear
---------------------------------------

Brake fluid level - check
---------------------------

Electrical system and battery - check
---------------------------------------

Tyre pressure and wear - check
--------------------------------

Vehicle and brake test - road test
------------------------------------

**AFTER 10000 KM, 50000 KM**

95'

**Action**

Hub oil - change
------------------

Spark plug/electrode gap - replacement
--

Air filter - clean
--------------------

Idling speed (*) - adjustment
-------------------------------

Oil mixer/throttle linkage - adjustment
---

Variable speed rollers - replacement
--------------------------------------

Odometer cable - greasing
---------------------------

Driving belt - check
----------------------

Steering - adjustment
-----------------------

Brake control levers - greasing
---------------------------------

Brake pads - check condition and wear
---------------------------------------

Brake fluid level - check
---------------------------

Transmission elements - lubrication
-------------------------------------

Safety locks - check
----------------------

**Action**

Suspensions - check
Electrical system and battery - check
Headlight - adjustment
Tyre pressure and wear - check
Vehicle and brake test - road test

(\*) See regulations in the «Adjusting the idle speed» section

**AFTER 15000 KM AND 45000 KM**

65'

**Action**

Hub oil level - check
Spark plug/electrode gap - replacement
Air filter - clean
Oil mixer/throttle linkage - adjustment
Driving belt - replacement
Brake control levers - greasing
Brake pads - check condition and wear
Brake fluid level - check
Electrical system and battery - check
Tyre pressure and wear - check
SAS box (sponge) (**) - cleaning
Vehicle and brake test - road test

(\*\*) See regulations in the «Secondary air system» section

**AFTER 20000 KM AND 40000 KM**

110'

**Action**

Hub oil - change
Spark plug/electrode gap - replacement
Air filter - clean
Idling speed (*) - adjustment
Cylinder cooling system - check/cleaning
Oil mixer/throttle linkage - adjustment
Driving belt - check
Variable speed rollers - replacement
Mixer belt - replacement
Odometer cable - greasing
Steering - adjustment
Brake control levers - greasing
Brake pads - check condition and wear
Brake fluid level - check
Transmission elements - lubrication
Safety locks - check
Suspensions - check
Electrical system and battery - check
Headlight - adjustment
Tyre pressure and wear - check
Vehicle and brake test - road test

(\*) See section «Adjusting the idle speed»

**AFTER 30000 KM**

130'

**Action**

Hub oil - change
Spark plug/electrode gap - replacement
Air filter - clean
Idling speed (*) - adjustment
Oil mixer/throttle linkage - adjustment
Driving belt - replacement
Variable speed rollers - replacement
Odometer cable - greasing
Steering - adjustment
Brake control levers - greasing
Brake pads - check condition and wear
Flexible brake tubes - replacement
Brake fluid level - check
Transmission elements - lubrication
Safety locks - check
Suspensions - check
Electrical system and battery - check
Headlight - adjustment
Tyre pressure and wear - check
SAS box (sponge) (**) - cleaning
Vehicle and brake test - road test

(\*) See regulations in the «Adjusting the idle speed» section

(\*\*) See regulations in the «Secondary air system» section

**AFTER 60000 KM**

150'

**Action**

Hub oil - change
Spark plug/electrode gap - replacement
Air filter - clean
Idling speed (*) - adjustment
Cylinder cooling system - check/cleaning
Oil mixer/throttle linkage - adjustment
Driving belt - replacement
Variable speed rollers - replacement
Mixer belt - replacement
Odometer cable - greasing
Steering - adjustment
Brake control levers - greasing
Brake pads - check condition and wear
Flexible brake tubes - replacement
Brake fluid level - check
Transmission elements - lubrication
Safety locks - check
Suspensions - check
Electrical system and battery - check
Headlight - adjustment
Tyre pressure and wear - check
SAS box (sponge) (**) - cleaning
Vehicle and brake test - road test

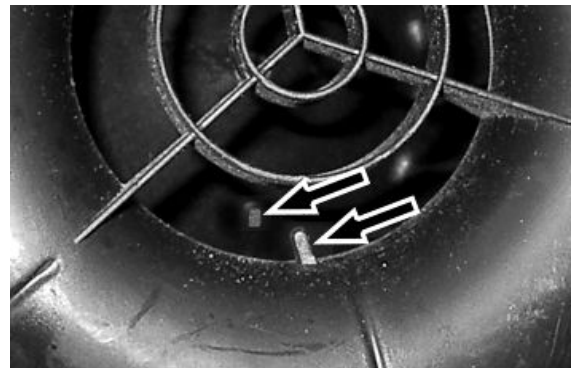
(\*) See regulations in the «Adjusting the idle speed» section

(\*\*) See regulations in the «Secondary air system» section

## Checking the spark advance

-Check to be made at over 4000 rpm with stroboscopic gun. The advanced ignition measured must be  $17^\circ$  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  $17^\circ$ .



**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 for timing control**

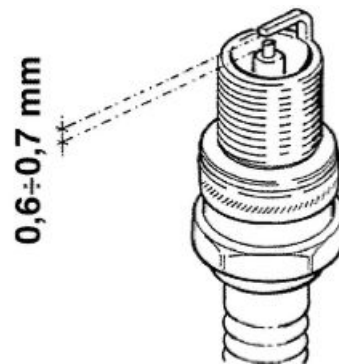
## Spark plug

Place the vehicle on its central stand

- Remove the central cover, indicated in the figure, by undoing the 2 fixing screws;
- 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

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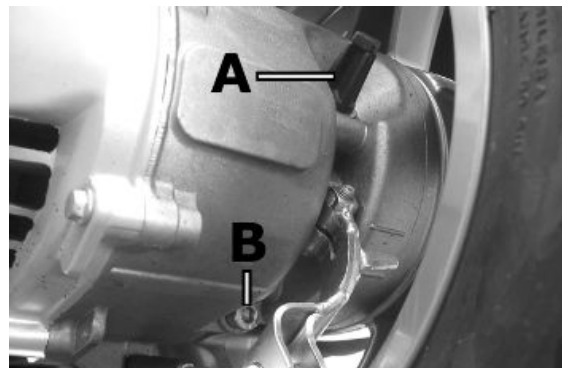
## Hub oil

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### Check

Do the following to check the correct level:

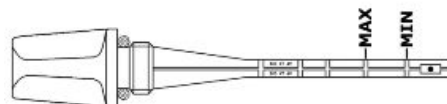
- 1) Stand the vehicle on the centre-stand on flat ground;
- 2) Remove the dipstick «A», and dry it with a clean cloth. Reinsert it, screwing it in all the way;
- 3) Remove the stick and check that the oil level is slightly over the second notch starting from the lower end;
- 4) Screw the dipstick back in, checking that it is locked in place.



**Recommended products**

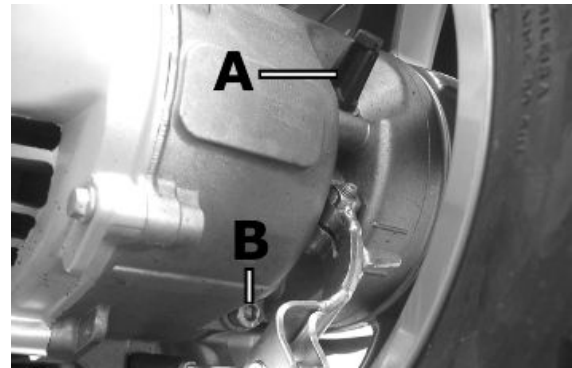
**AGIP ROTRA 80W-90 Rear hub oil**

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



## Replacement

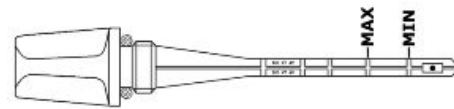
- Remove oil filler cap «A».
- Loosen oil draining cap «B» and allow for the system to drain completely.
- Refit the draining cap and refill the hub with the prescribed oil.



### Characteristic

#### Rear hub oil

~ 85 cc



## Air filter

- 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

## Checking the ignition timing

- Adjust the control cables:

Mix cable: see procedure indicated in "Mixer timing".

Throttle cable: adjust the set screw on the carburettor in such a way that the sheath has no backlash.

Splitter control cable: adjust set screw on the throttle control to the handlebar in such a way that there is no backlash on the throttle control.

Adjust all transmissions in such a way that their sheathings show no sign of backlash.

### Mixer Timing

- Using the transmission set screw on the crankcase, with throttle control untwisted, adjust the reference mark on the rotating plate so that it is lined up with the reference mark on the mixer body, as shown in the figure.

While doing this, the engine must be fuelled with a 2 % oil mixture (0.5 litre minimum if the reservoir is empty).

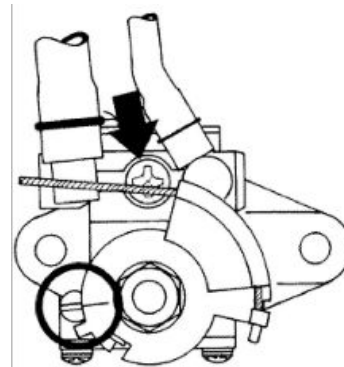
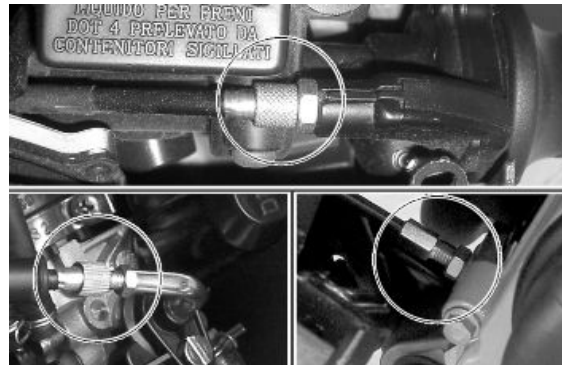
#### CAUTION

**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



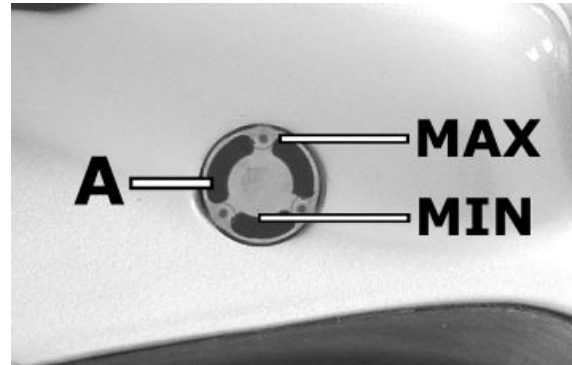
## Braking system

### 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

Proceed as follows:

- 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**

**MAKE SURE THE BRAKE FLUID DOES NOT GET INTO YOUR EYES OR ON YOUR SKIN OR CLOTHES. IF THIS HAPPENS ACCIDENTALLY, WASH WITH WATER.**

**CAUTION**

**BRAKE CIRCUIT FLUID IS VERY CORROSIVE; MAKE SURE THAT IT DOES NOT COME INTO CONTACT WITH THE PAINTWORK.**

**CAUTION**

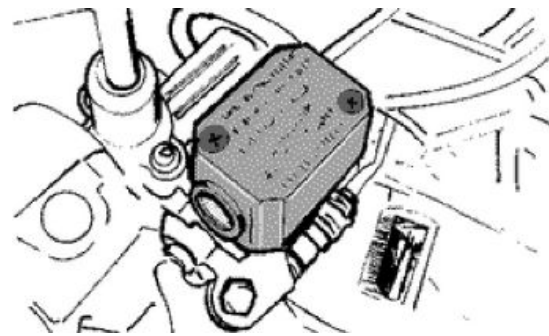
**THE BRAKE FLUID IS HYGROSCOPIC, IN OTHER WORDS, IT ABSORBS MOISTURE FROM THE SURROUNDING AIR. IF THE CONTENT OF MOISTURE IN THE BRAKING FLUID EXCEEDS A CERTAIN VALUE, BRAKING WILL BE INEFFICIENT.**

**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 FLU-**



## ID AND THE BLEEDING OF AIR FROM THE CIRCUITS.

### Recommended products

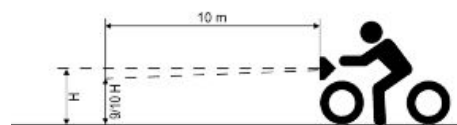
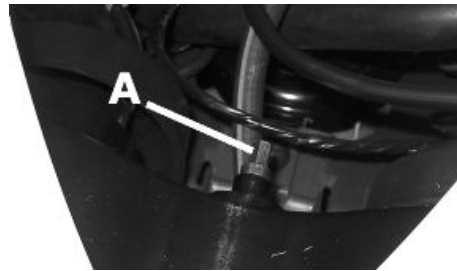
**AGIP BRAKE 4 Brake fluid**

FMVSS DOT 4 Synthetic fluid

## Headlight adjustment

Proceed as follows:

1. Place the vehicle in running order and with the tyres inflated to the prescribed pressure, on a flat surface 10 m away from a white screen situated in a shaded area, making sure that the longitudinal axis of the vehicle is perpendicular to the screen;
2. Turn on the headlight and check that the borderline of the projected light beam on the screen is not lower than 9/10 of the distance from the ground to the centre of vehicle headlamp and higher than 7/10;
3. Otherwise, regulate the headlight by adjusting the screw «A», after removing the front grille.



**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.**

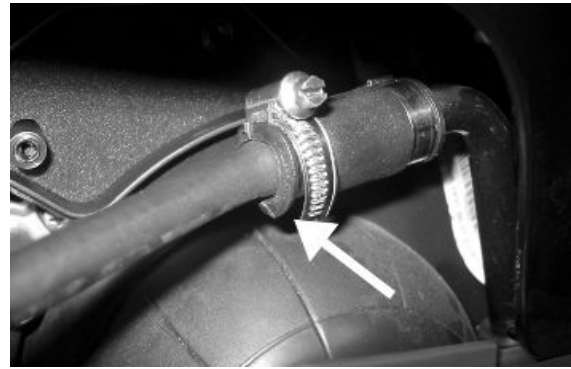
## CO check

In the event that the exhaust on the vehicle being tested does not have an exhaust gases collection port, proceed as follows:

- Remove the R.H. side fairing
- Remove the secondary air box cover with the aluminium cap by acting upon the clamp shown in the figure.



Attach the exhaust gas collection tube to the secondary air rubber manifold. Such joint must be sealed in order to guarantee accurate CO readings.



- Start the engine, adjust the idle speed to  $1,700 \pm 100$  rpm and check the CO value is equal  $3.5 \pm 1\%$
- If the parameters found do not agree with the above figures, act upon the idle adjusting screw. Otherwise, check the automatic choke device

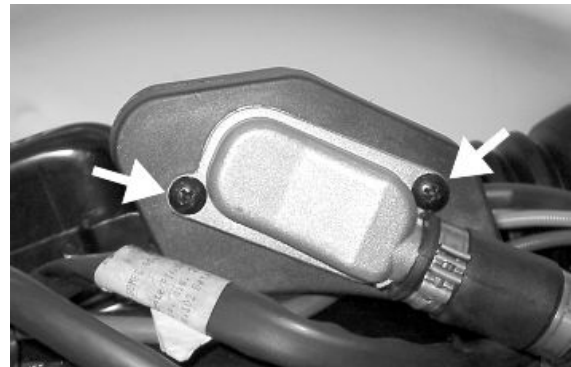
### Specific tooling

**020320Y Exhaust gases analyser**

**020332Y Digital rev counter**

The check must be carried out after having carefully cleaned all carburettor components, with the air filter clean, and the spark plug in good conditions.

- Remove the R.H. side fairing
- Warm-up the engine by riding the vehicle on the road for at least 10 minutes
- Shut down the engine
- Remove the 2 secondary air box screws shown in the figure



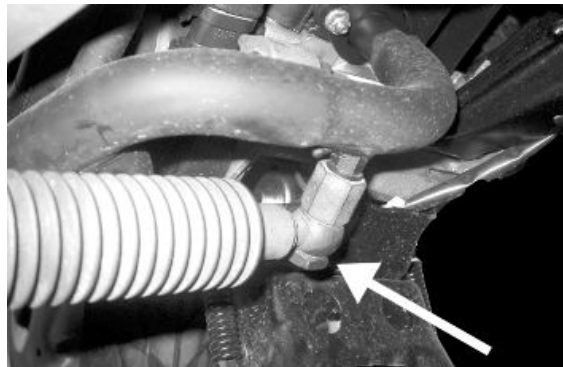
- Place a plastic sheet between the one-way valve and the aluminium outlet as shown in the figure



- Ensure the one-way valve packing properly seals the aluminium outlet fitting.
- Refit the aluminium outlet onto the SAS box as shown in the picture.



- Attach the special tool and move the joints as shown in the figure.
- Start the engine, adjust the idle speed to  $1,700 \pm 100$  rpm and check the CO value is equal  $3.5 \pm 1\%$
- If the parameters found do not agree with the above figures, act upon the idle adjusting screw. Otherwise, check the automatic choke device.



### Specific tooling

020320Y Exhaust gases analyser

020332Y Digital rev counter

020625Y Kit for sampling gas from the exhaust manifold

## INDEX OF TOPICS

TROUBLESHOOTING

TROUBL

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 pump or damaged depression line Carburettor nozzles clogged or dirty	Replace the pump or control lines 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 pump or damaged depression line	Replace the pump or control lines

Possible Cause	Operation
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. 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
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	<p>Check the tightening of the top and bottom ring nuts.</p> <p>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.</p>

## 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

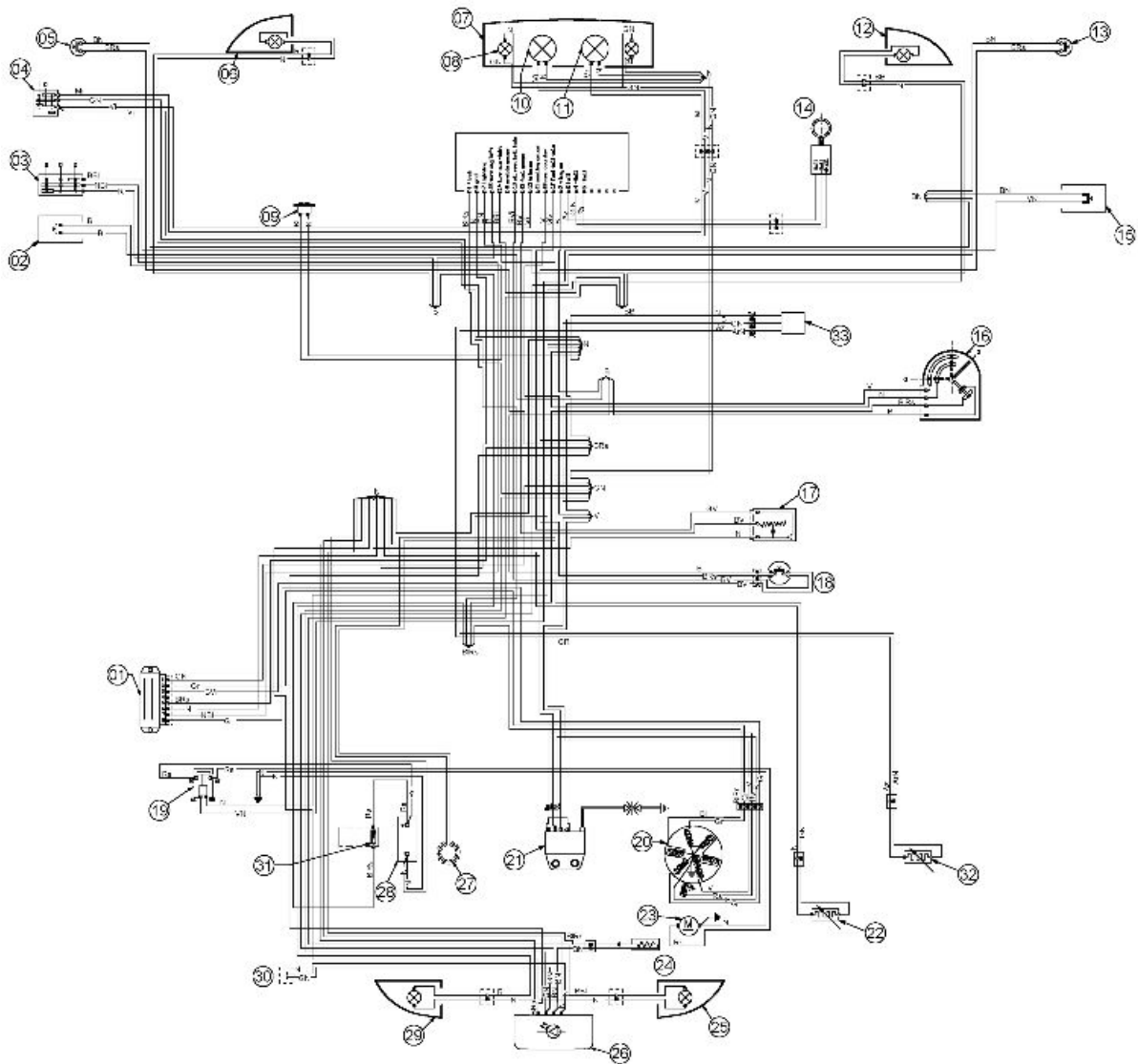
Possible Cause	Operation
Shock absorbers malfunctioning	Replace the complete shock absorption unit
Hydraulic cartridge in the fork damaged.	Replace the hydraulic cartridge



## INDEX OF TOPICS

ELECTRICAL SYSTEM

ELE SYS



**LEGEND**

	Specification	Desc./Quantity
1	Voltage regulator	
2	Horn button	
3	Turn signal switch	
4	Light switch	
5	Rear brake stop button	
6	Front L.H. turn signal light	
7	Front headlight	
8	Two rear parking light bulbs	12V - 3W
9	Horn	
10	Light bulb 12V - 35W for high-beam lamp	
11	Light bulb 12V - 35W for low-beam lamp	
12	Front R.H. turn signal light	
13	Front brake stop light switch	
14	Wheel rpm sensor	
15	Starter button	
16	Ignition key-switch	
17	Fuel level sender	

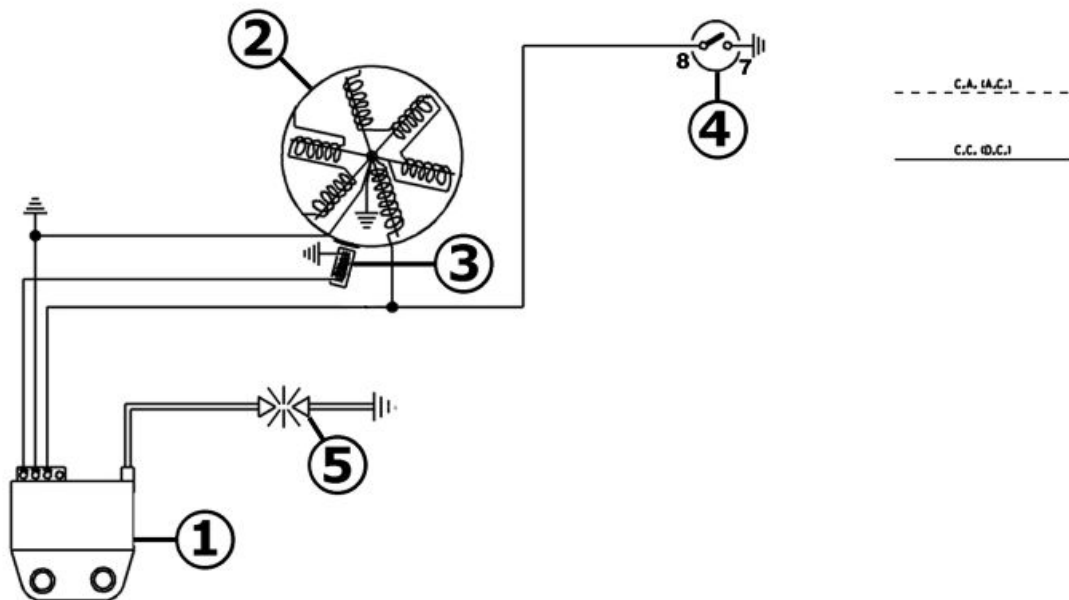
	Specification	Desc./Quantity
18	Mixture oil warning light switch	
19	Starter remote control	
20	Magneto flywheel	
21	Control device ignition	
22	Automatic starter	
23	Starter motor	
24	Taillight resistor	
25	Rear R.H. turn signal light	
26	Taillight assembly	
27	Choke device continuity check light	
28	Battery	12V - 4Ah
29	Rear L.H. turn signal light	
30	License plate light pre-wiring	
31	Fuse	7,5A
32	Carburettor heater	
33	Carburettor heater control device	

**Electrical cables color:**

**B** = White, **Bl** = Blu, **G** = Yellow, **Mr** = Brown, **N** = Black, **Gr** = Gray,  
**Rs** = Pink, **R** = Red, **Vi** = Purple, **V** = Green

**Conceptual diagrams**

**Ignition**

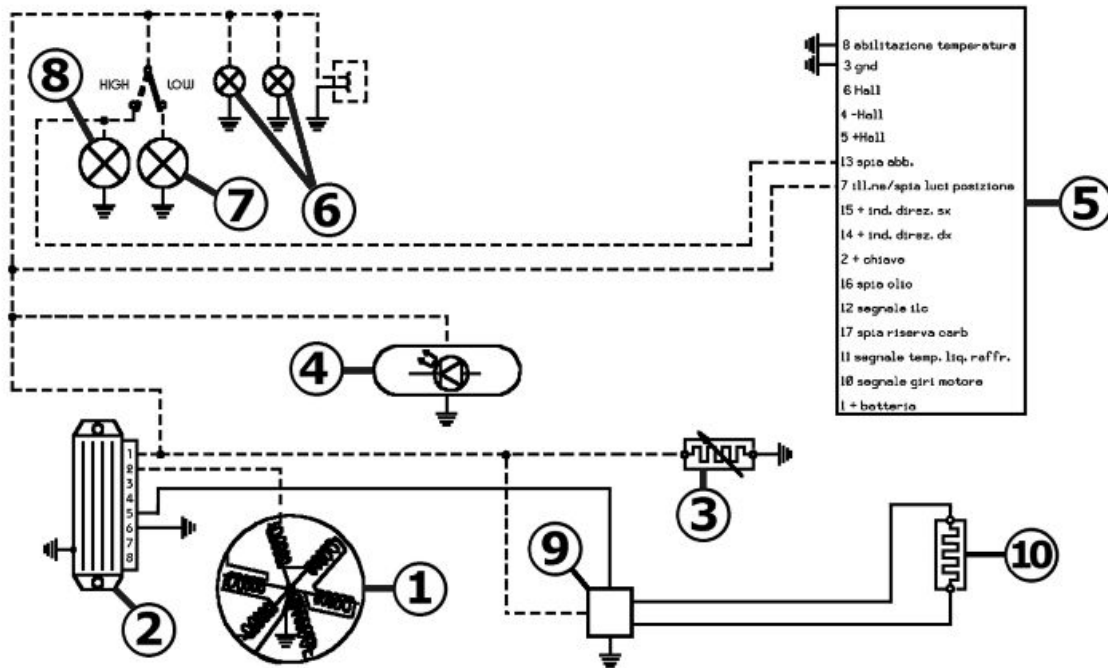


**IGNITION**

	Specification	Desc./Quantity
1	Electronic control unit	
2	Magneto flywheel	

	Specification	Desc./Quantity
3	Pick - up	
4	Key switch	
5	Spark plug	

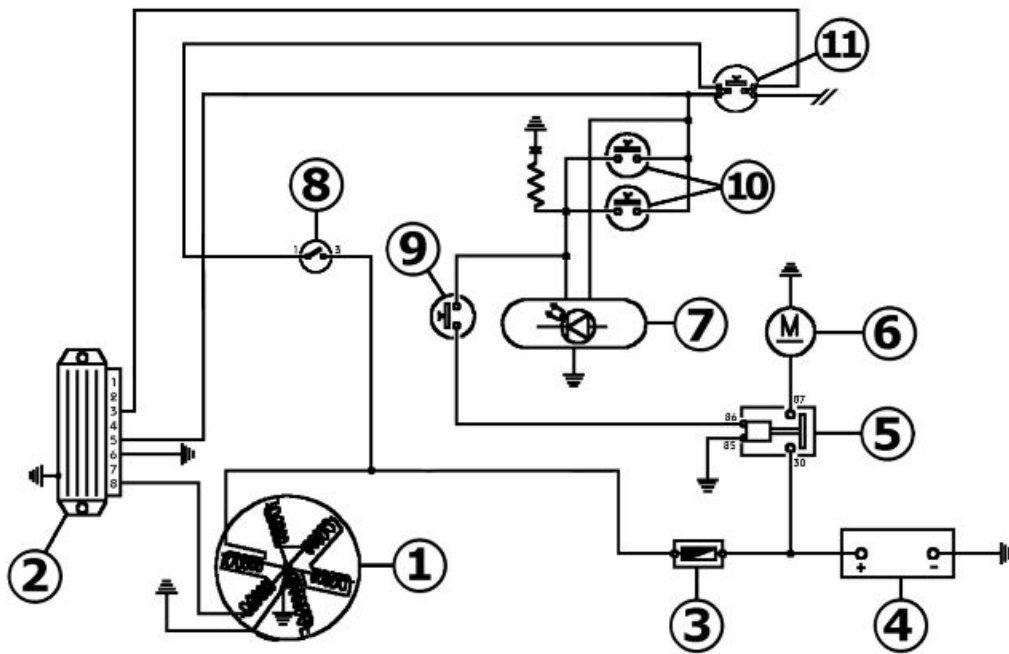
**Headlights and automatic starter section**



**HEADLIGHTS AND AUTOMATIC STARTER SECTION**

	Specification	Desc./Quantity
1	Flywheel magneto	
2	Voltage regulator	
3	Automatic starter	
4	LED taillight	
5	Digital instrument unit	
6	Headlamp sidelight bulbs	
7	Headlamp low-beam light bulb	
8	Headlamp high-beam light bulb	
9	Heating control device	
10	Carburettor heater	

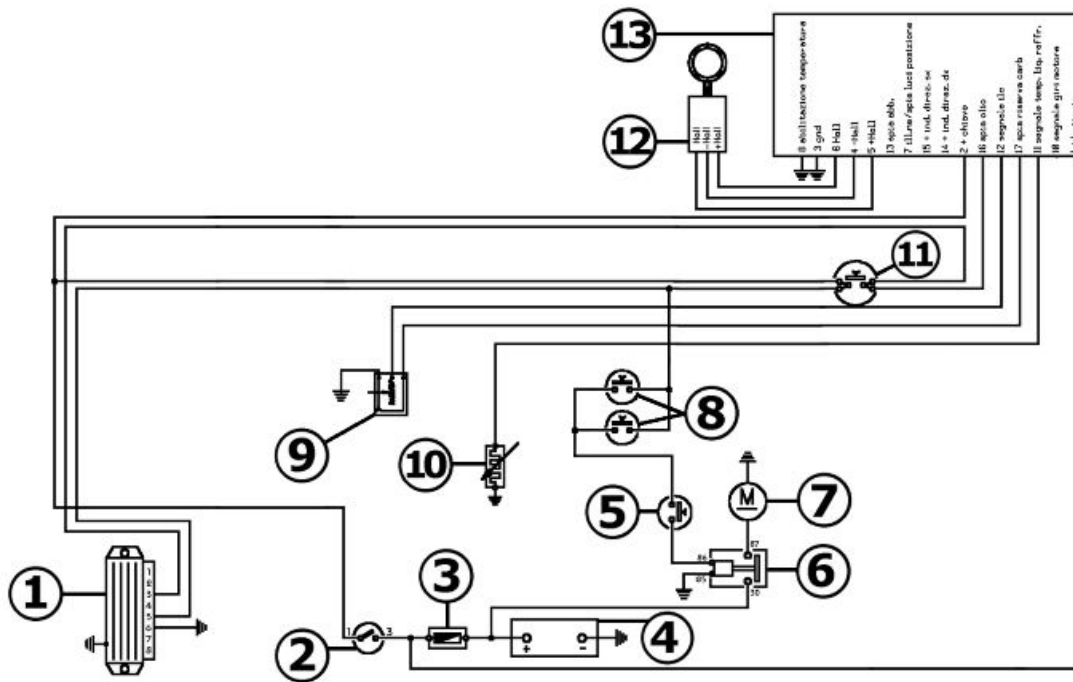
Battery recharge and starting



**BATTERY RECHARGE AND STARTING**

	Specification	Desc./Quantity
1	Flywheel magneto	
2	Voltage regulator	
3	Fuse 7,5A	
4	Battery 12V-14Ah	
5	Starter remote control	
6	Starter motor	
7	LED taillight	
8	Ignition key-switch	
9	Start up button	
10	Stoplight switches	
11	Mixture oil level sender	

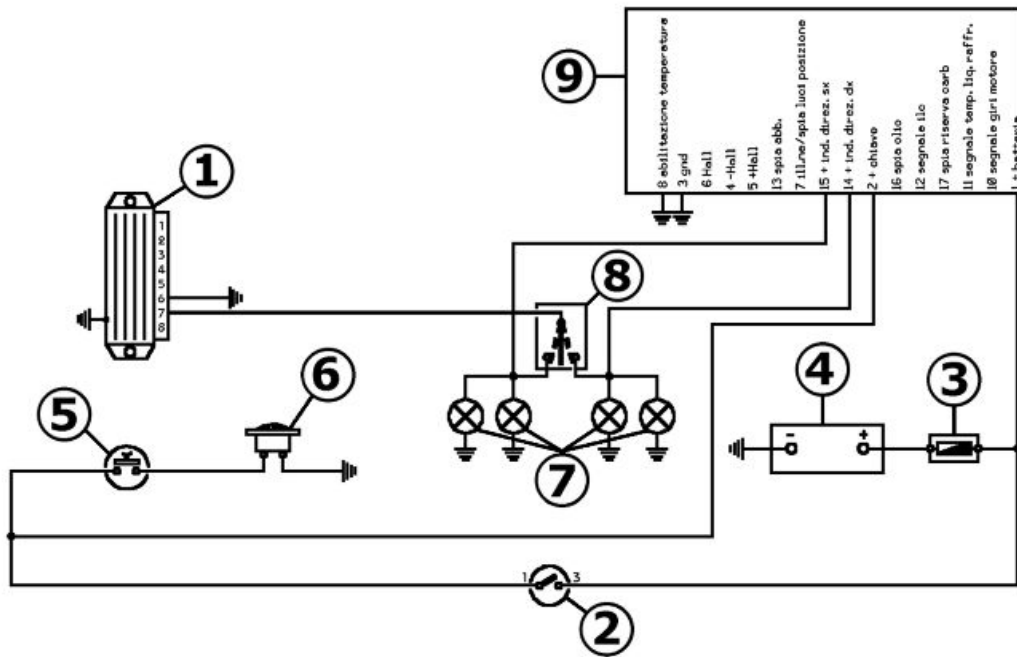
Level indicators and enable signals section



**SAFETY SWITCHES AND LEVEL GAUGES**

	Specification	Desc./Quantity
1	Voltage regulator	
2	Ignition key-switch	
3	Fuse 7,5A	
4	Battery 12V-14Ah	
5	Starter button	
6	Starter remote control	
7	Starter motor	
8	Stoplight switches	
9	Fuel level sender	
10	Coolant temperature sensor	
11	Mixture oil level sender	
12	Phonic wheel	
13	Digital instrument unit	

Turn signal lights



**TURN SIGNALS AND HORN**

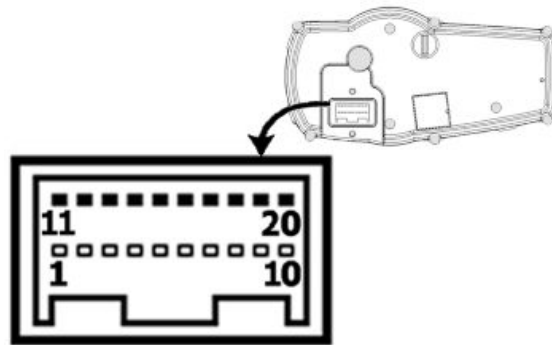
	Specification	Desc./Quantity
1	Voltage regulator	
2	Ignition key-switch	
3	Fuse 7,5A	
4	Battery 12V-14Ah	
5	Horn button	
6	Horn	
7	Turn signal lights	
8	Turn signal switch	
9	Digital instrument unit	

Digital instrument panel

**DASHBOARD CONNECTOR**

	Specification	Desc./Quantity
1	+ Battery	
2	+ permanent power supply	
3	Earth	
4	Grounding for phonic wheel	
5	Power supply to phonic wheel	
6	Phonic wheel signal	
7	Instrument light and parking light indicator	
8	Not connected (temperature tool earth)	
9	Not connected	
10	Rpm indicator signal	
11	Not connected (temperature tool signal)	
12	Fuel level sensor	
13	High-beam warning light	

	Specification	Desc./Quantity
14	+ Right direction indicator	
15	+ Left direction indicator	
16	Low-oil warning light	
17	Low-fuel warning light	
18	Not connected	
19	Not connected	
20	Not connected	



## Checks and inspections

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

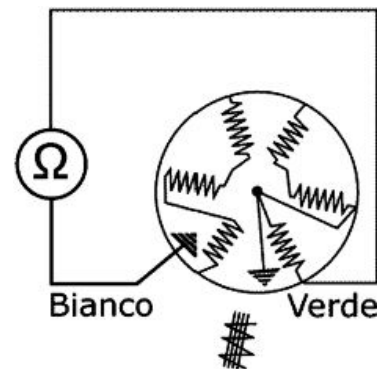
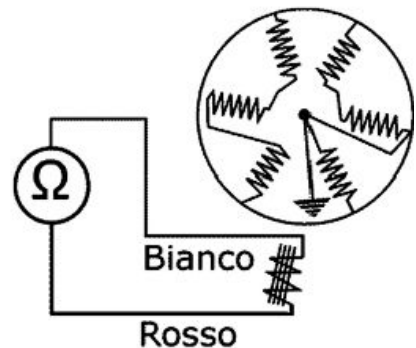
1. Check the condition of the spark plug (clean it with a metal brush, remove the encrustations, blast it with compressed air and, if necessary, replace it).
2. Without removing the stator, carry out the following checks:

#### CHECK ON THE PICK UP

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

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****CHECKING THE RECHARGE COIL**

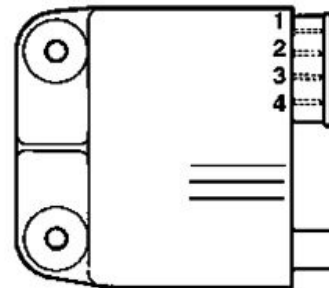
	<b>Specification</b>	<b>Desc./Quantity</b>
1	White/green cable	800±1100 ohm

**CHECK CONTINUITY**

	<b>Specification</b>	<b>Desc./Quantity</b>
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 brown-earth and black-earth terminal.

**N.B.**

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

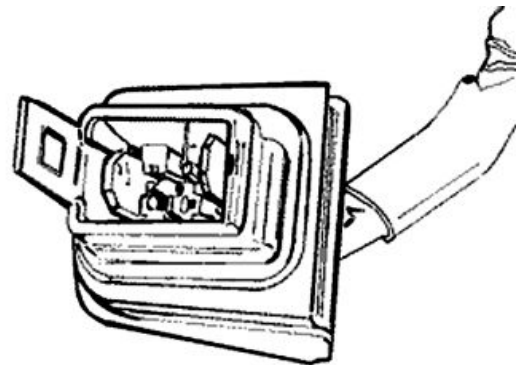
**Electric characteristic**

**Stator : Brown-earth**

approx. 170 Ω (Pick-Up)

**Stator : Black-earth**

~ 1 Ω (Stator)

**Voltage regulator check**

The fault to the voltage regulator may cause, according to the type of fault, the following inconvenients:

1. Bursting of head and taillight bulbs.
2. Head and taillight not operational.
3. Excessive battery recharge (bursting of main fuse).

4. Battery not recharging.
5. Turn signals not operational.
6. Dashboard check not operational.

### Interventions

#### FAULT 1

Replace the regulator as definitely faulty.

#### FAULT 2

a) Check the output from the stator gives the correct voltage: detach the stator connector, interpose an AC tester between the grey-blue and black cables, and check the output voltage is within the prescribed limits. If anomalies are found, replace the stator.

b) If no anomalies are identified, replace the regulator.

c) If the replacement of the regulator does not solve the fault, check the electric connections.

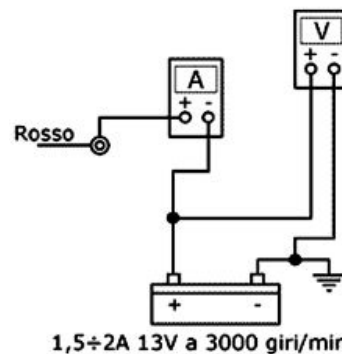
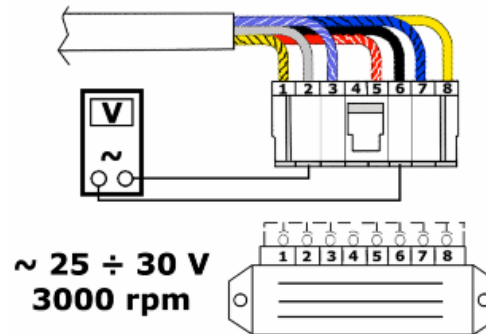
### Specific tooling

020331Y Digital multimeter

### Characteristic

Voltage distributed at 3000 rpms

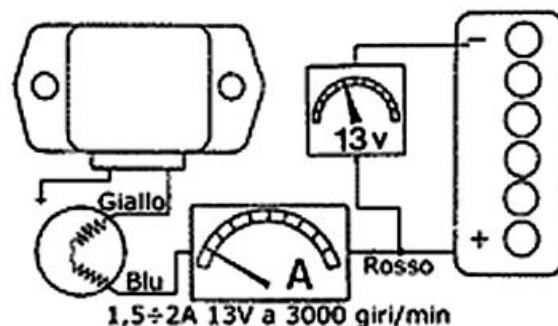
25 to 30V



#### FAULT 3

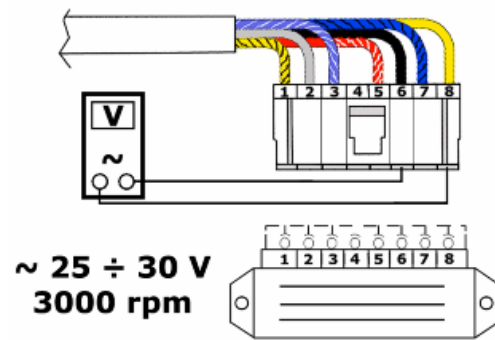
After checking that there are no short circuits in the system towards the earth, replace the regulator because it is certainly inefficient and replace it with a protective fuse.

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



**FAULT 4**

- a) Interposing the AC tester between the black and yellow cables on the regulator, check the generator output voltage is within the prescribed values (this measurement must be carried out with the battery detached). In the event of anomalies, replace the stator; otherwise proceed to point b).
- b) Insert an ammeter between the stator (blue cable) and the battery and check with the tester that the current output, at 3,000 rpm and with the battery kept between 12 and 13V, is as shown. If the values thus obtained are lower than prescribed, proceed by replacing the regulator.



**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**

**Voltage output at 300 rpm**

26÷30V

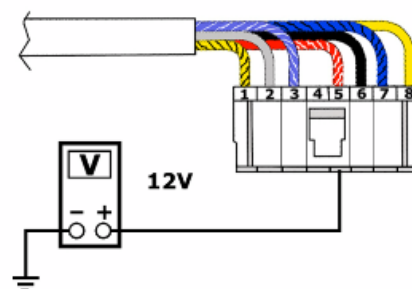
**Distributed current**

1.5 to 2A

**FAULT 5**

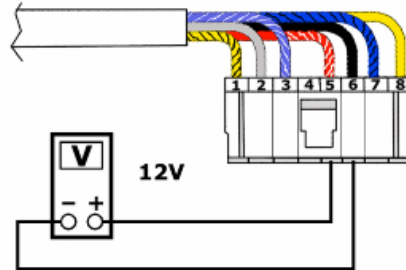
In the event that the turn signal lights are not operational, proceed as follows:

- Remove the regulator connector and insert the tester terminals between pin 5 and ground.
- Turn the ignition switch onto ON and check for battery voltage. If no voltage

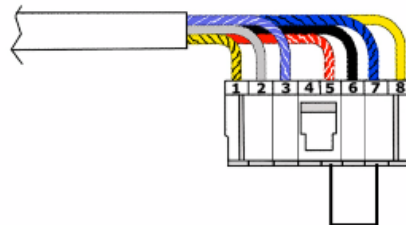


is found, check wiring and terminals on key-switch and battery.

- 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.



- If the checks given above are unsuccessful, jump pins 5 and 7 on the connector, turn the key-switch onto ON and turn the turn signal switch alternately from left to right to visualize the continuous operation of the lights (as powered directly by the battery). If the lights do not go on, check the switch and its cable, if these are not damaged or faulty; replace the regulator as definitely faulty.



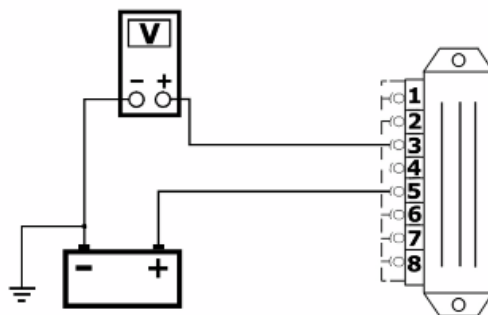
### Specific tooling

#### 020331Y Digital multimeter

#### FAULT 6

Dashboard check light does not go on. Detach the connector to the voltage regulator.

- Apply a tension of 12V to the pin marked with the number 5, check, using the digital tester; there is an equivalent output (12V) from pin 3 for at least 5 seconds.
- If pins no. 4 and/or no. 3 give no output voltage, replace the regulator.
- If pin no. 3 gives output voltage, check the system and the low-oil or low-fuel warning lights.



### Specific tooling

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**020331Y Digital multimeter**

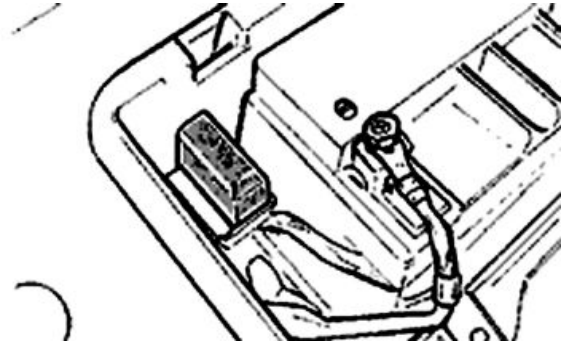
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**Fuses**

The electrical system is protected by a fuse located on the r.h.s. of the battery bay. To replace it, lift the seat, remove the battery access door and then the transparent fuse cover. Ignition system, headlight, and taillight are not protected by the fuses.

**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****Commissioning of sealed battery**

---

**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.**

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**IN THESE CONDITIONS IT IS HOWEVER ESSENTIAL NOT TO EXCEED EIGHT HOURS OF CONTINUOUS RECHARGING SO AS NOT TO DAMAGE THE BATTERY ITSELF.**

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## **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 recharges 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**

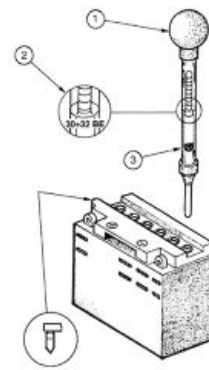
**- ONCE THE BATTERY HAS BEEN INSTALLED IN THE VEHICLE IT IS NECESSARY TO REPLACE THE SHORT TUBE (WITH CLOSED END) NEAR THE + POSITIVE TERMINAL WITH THE CORRESPONDING LONG TUBE (WITH OPEN END), THAT YOU FIND FITTED TO THE VEHICLE, TO ENSURE THAT THE GASES THAT FORM CAN ESCAPE PROPERLY.**

### **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**

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## INDEX OF TOPICS

ENGINE FROM VEHICLE

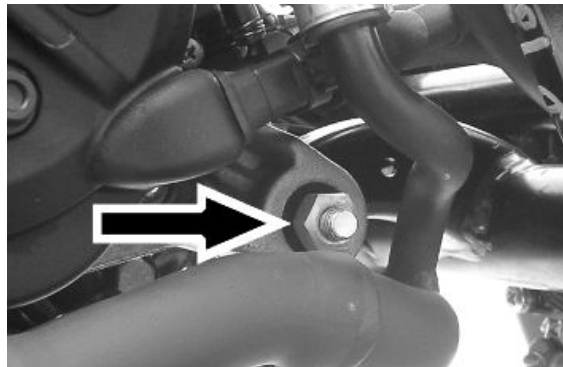
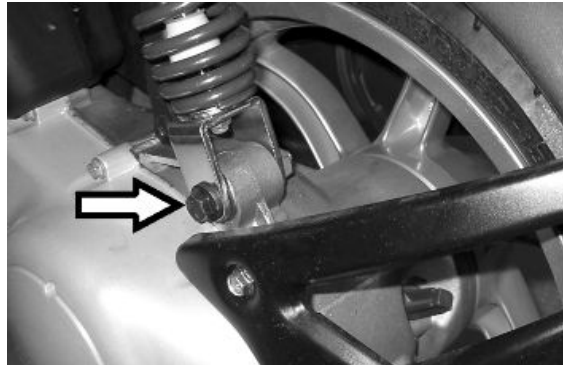
ENG VE

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## Removal of the engine from the vehicle

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1. Detach the battery.
2. Remove the exhaust assy.
3. Remove the rear wheel.
4. Remove the rear brake cable.
5. Detach the electrical connection to the fly-wheel.
6. Detach the throttle and mixer cables.
7. Detach the mixture oil, fuel, and vacuum pump outlet tubing.
8. Detach the H.T. cable from the spark plug.
9. Remove the rear shock-absorber fixing bolt from the engine.
10. Remove the nut on the l.h.s., and hence remove the engine - swing-arm fixing bolt.



### 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

ENGINE

ENG

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## Automatic transmission

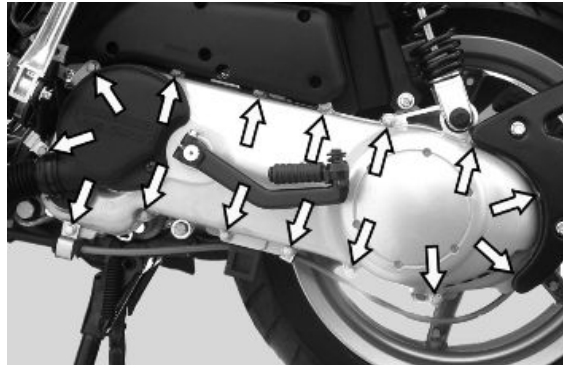
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### Transmission cover

- 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.**



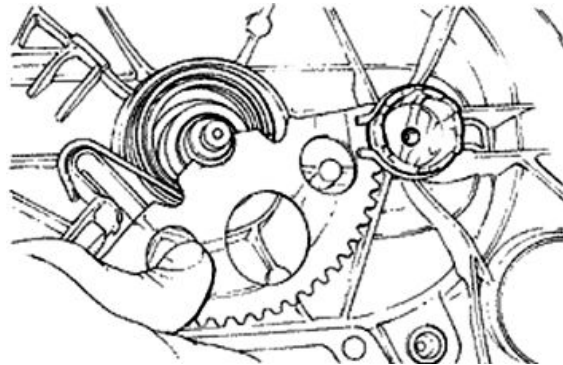

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### Kickstart

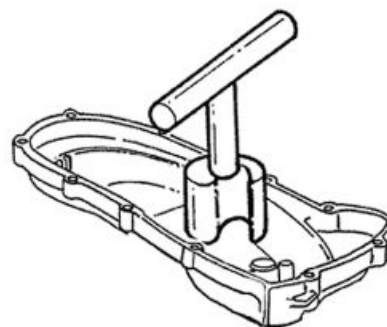
- Remove the seeger ring located on the exterior of the crankshaft.
- Dismantle the dog gear from its seat, slackening the tension that the toothed sector applies to it by means of the spring; to do this, it is necessary to rotate the toothed sector slightly (see the figure).

**CAUTION**

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



- 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

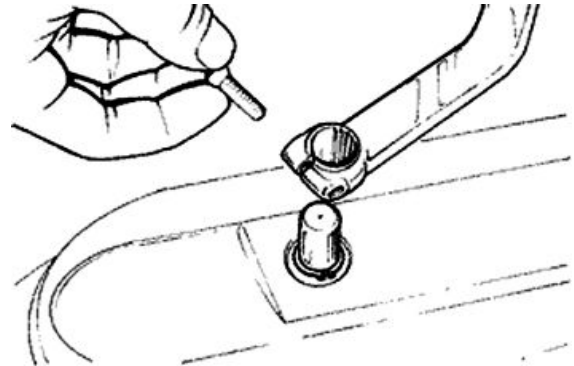
**AGIP GREASE MU3 Grease for odometer transmission gear case**

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

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- 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**

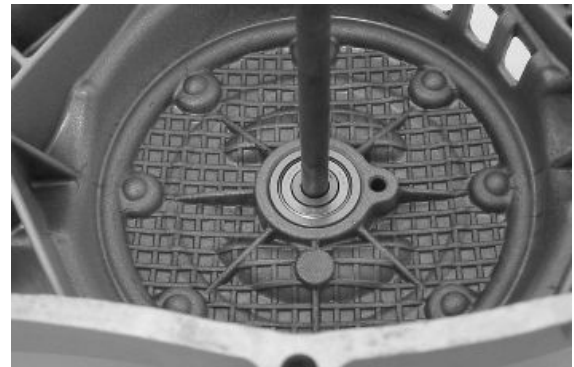
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## Removing the driven pulley shaft bearing

- 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

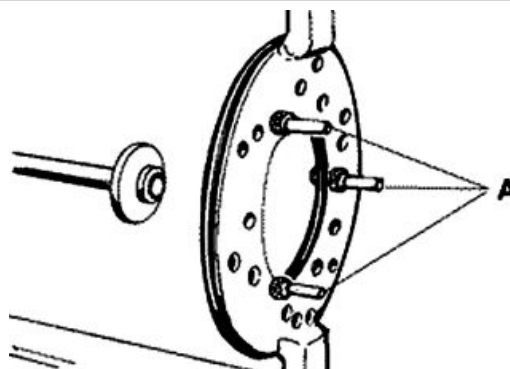


## Removing the clutch

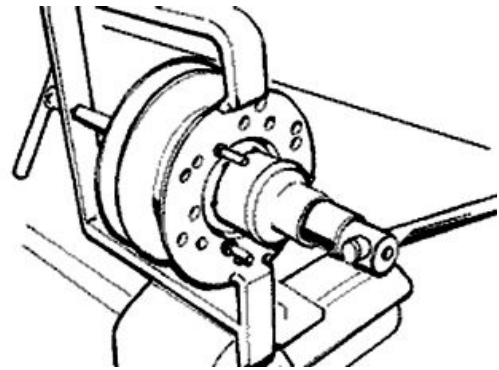
- Equip the tool with long pins screwed into position «A» from the outside, insert the entire driven pulley in the tool and put the central screw under stress.

**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

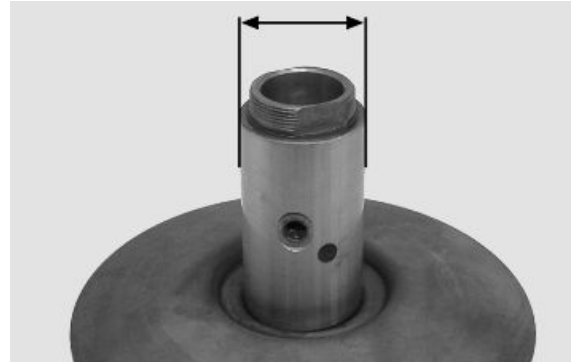
**020376Y Adaptor handle**

**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

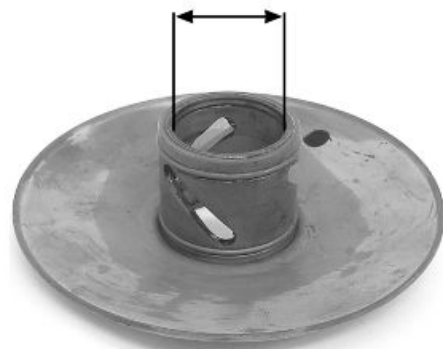
Ø 33.965 to 33.985 mm

#### 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

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## 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



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## Inspecting the clutch spring

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

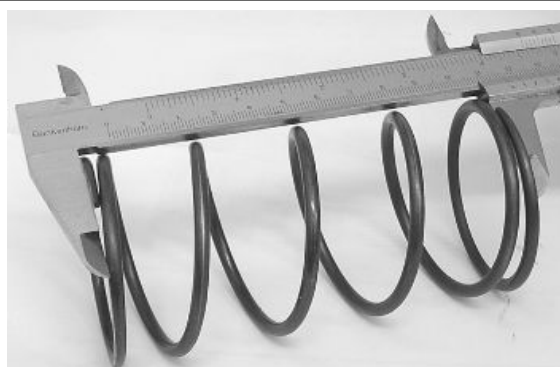
### Characteristic

#### Standard length

118 mm

#### Minimum length allowed after use

XXXX



## 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.



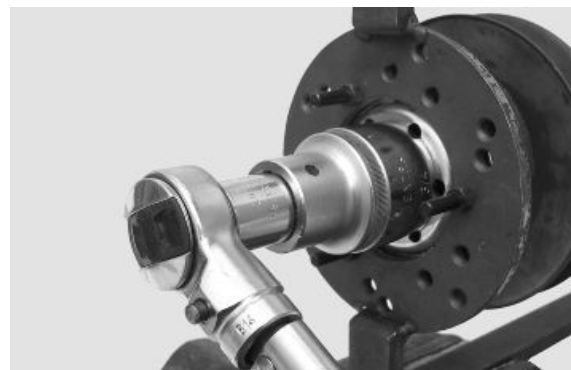
- Reassemble the nut securing the clutch and tighten to the prescribed torque.

**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

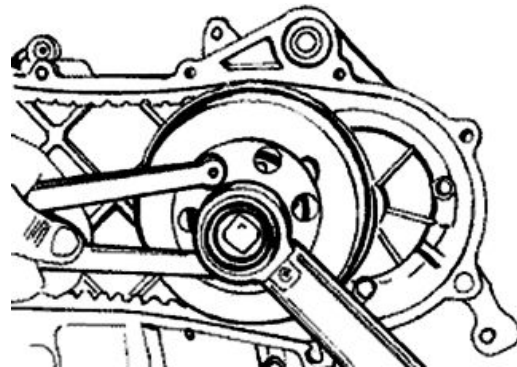
- Refit the driven pulley assembly, the clutch bell and the nut, using the specific tool.

**Specific tooling**

**020565Y Flywheel lock calliper spanner**

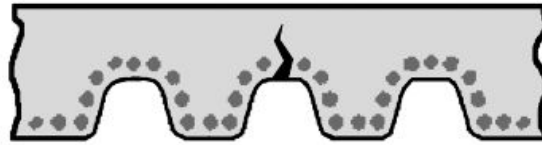
**Locking torques (N\*m)**

**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

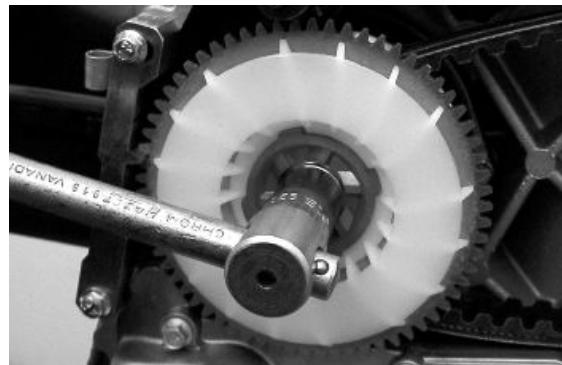
Transmission belt/Minimum width

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 Start-up crown lock

## Mixer gears and belt

- Remove gear and belt.

#### CAUTION

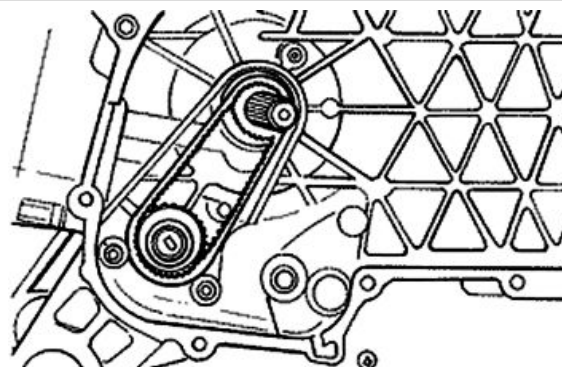
**PAY PARTICULAR ATTENTION TO NOT TOUCHING OR BENDING THE BELT BECAUSE THIS COULD BREAK SUDDENLY DURING OPERATION.**

#### 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 CRANK-CASE PIN.**

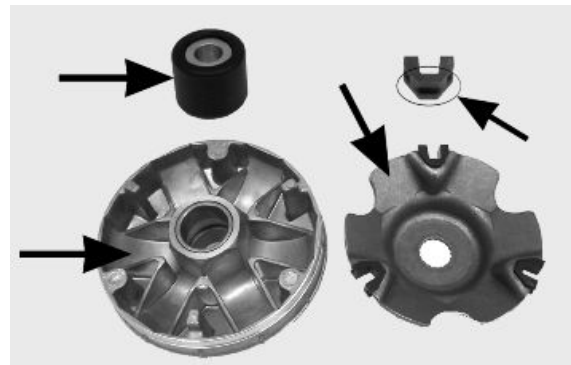
#### N.B.

**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:**

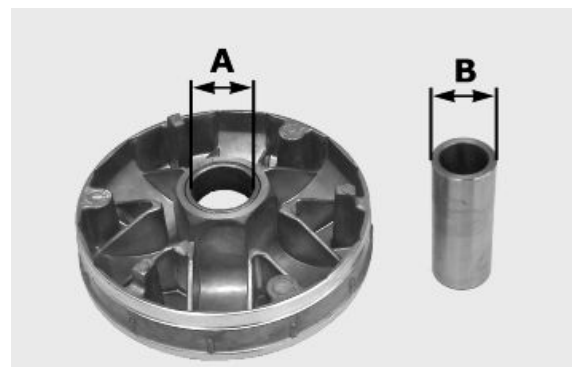
20.021 mm

**Driving pulley bushing/ Diameter maximum:**

XXX mm

**Driving pulley bushing/ Standard diameter:**

20 -0.020/-0.041mm



## Refitting the driving pulley

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

**N.B.**

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



- Refit the particular components of the assembly (roller container assembly with bushing, limiting washer, stationary half-pulley, cooling fan belt with drive, washer and nut).
- Tighten the lock nut to torque 20 Nm and then perform a final 90° lock preventing the rotation of the drive pulley with the specific tooling.

**N.B.**

**REPLACE THE NUT WITH A NEW ONE AT EVERY REFIT**

**CAUTION**

**IT IS MOST IMPORTANT WHEN FITTING THE DRIVING PULLEY UNIT THAT THE BELT IS FREE INSIDE IN ORDER TO AVOID MAKING A WRONG TIGHTENING WITH THE POSSIBLE LATER DAMAGE OF THE CRANKSHAFT KNURLING.**

### Specific tooling

020451Y Start-up crown lock

### Locking torques (N\*m)

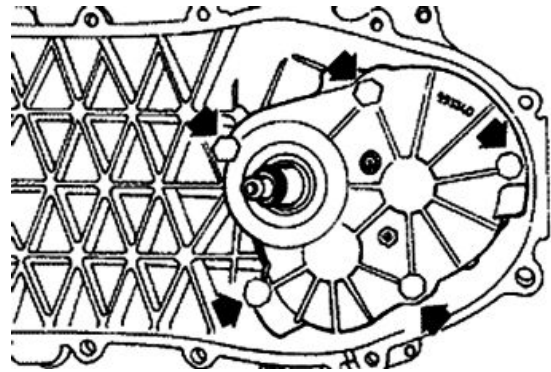
Crankshaft pulley nut 18 to 20 + 90° N.m



## 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.

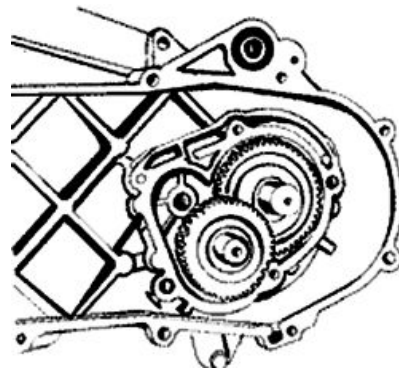


### See also

[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

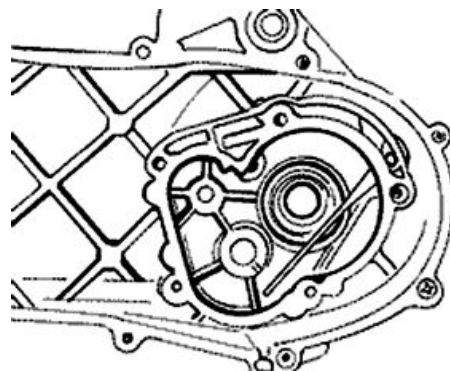
- Remove the oil seal and the seeger ring.
- Remove the bearing by pushing from the outside towards the inside of the gear compartment, using the appropriate punch.

### Specific tooling

**020363Y 20 mm guide**

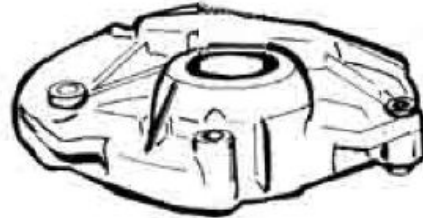
**020376Y Adaptor handle**

**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.

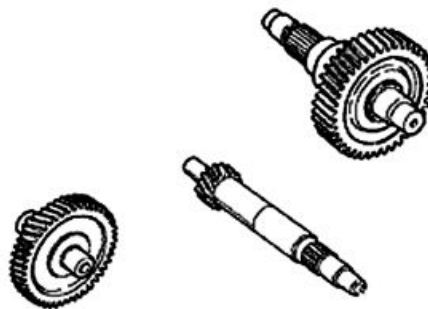


### Specific tooling

#### 020452Y Tube for removing and refitting the driven pulley shaft

## Inspecting the hub shaft

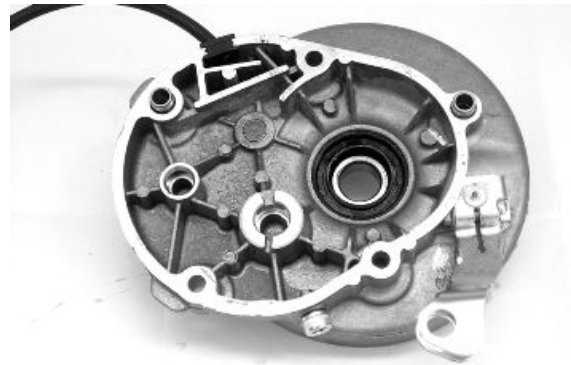
- Check that the three shafts exhibit no wear or deformation on the toothed surfaces, at the bearing housings and at the oil guards.
- In case of anomalies, replace the damaged components.
- Check that the fitting surface is not dented or distorted.
- If faults are found, replace the hub cover.



---

## 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.**

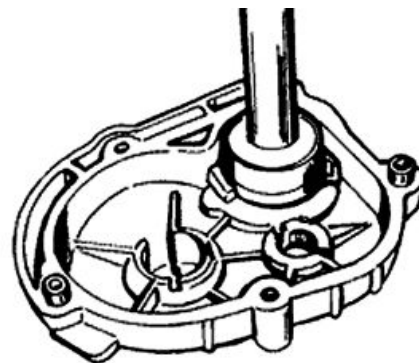
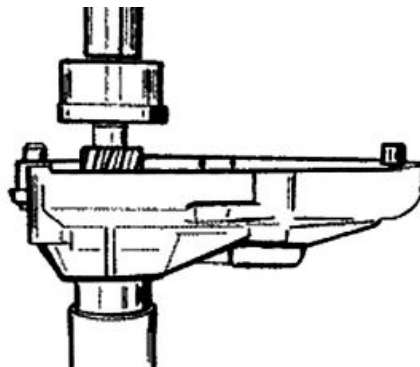
### Specific tooling

020151Y Air heater

020376Y Adaptor handle

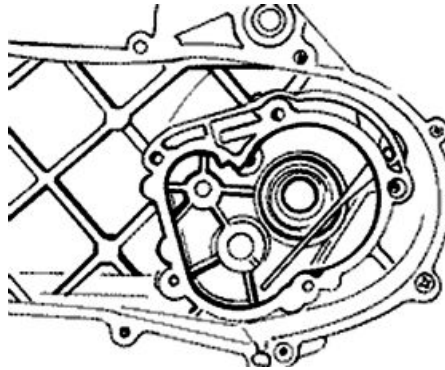
020439Y 17 mm guide

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 hub bearings

- Remove the wheel axle on the cover and pay attention not to damage the sealing lip of the oil seal
- Apply a thin layer of grease on the two shim washers of the intermediate gear and fit one on the cap so that it does not interfere with the wheel axle gear when placing the transmission shaft



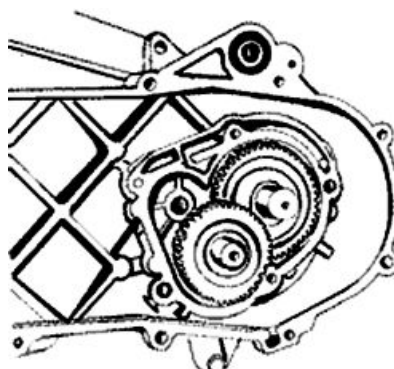
## Refitting the hub cover

- Refit the complete wheel axis.
- Refit the intermediate gear being careful of the two shim adjustments.
- Apply LOCTITE 510 for surfaces on the hub cover and refit it with the complete pulley shaft.
- Insert the 5 screws and tighten them to the prescribed torque.

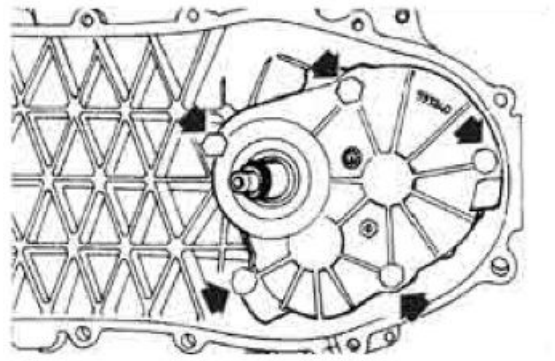
**N.B.**

**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)**



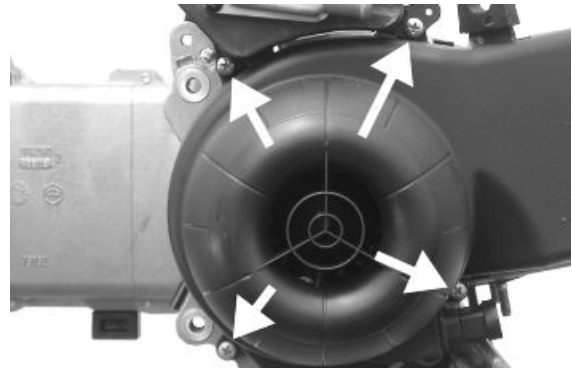
Locking torque: 11 to 13 Nm



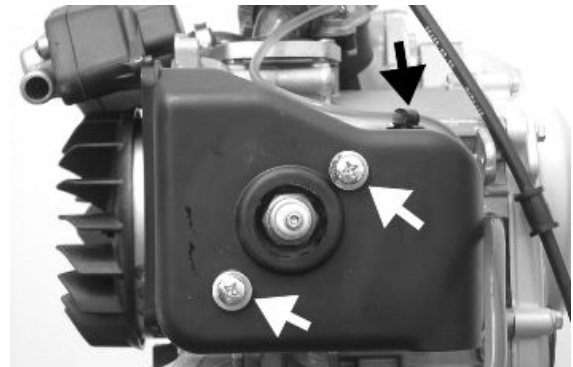
## Flywheel cover

## Cooling hood

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



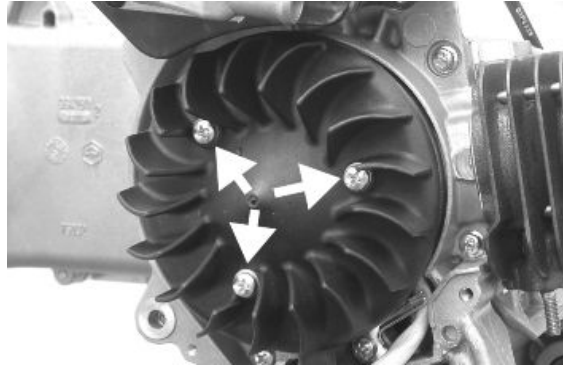
- Remove the oil piping retention band from the hood
- Remove the 2 screws shown in the figure



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## Cooling fan

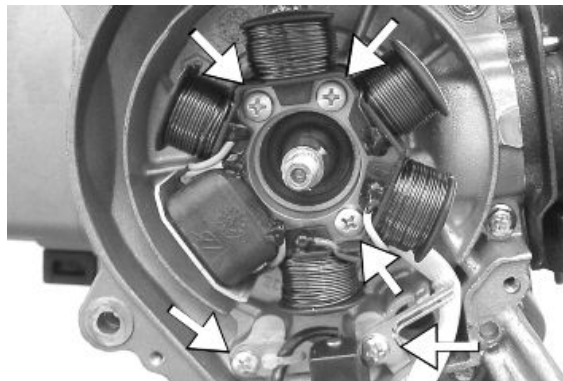
- Remove the cooling fan by acting on the three fixings indicated in the figure.



---

## 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



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## 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

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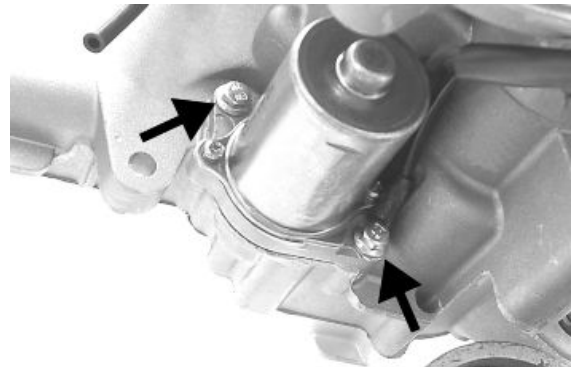
## Flywheel and starting

---

## Removing the starter motor

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

Remove 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

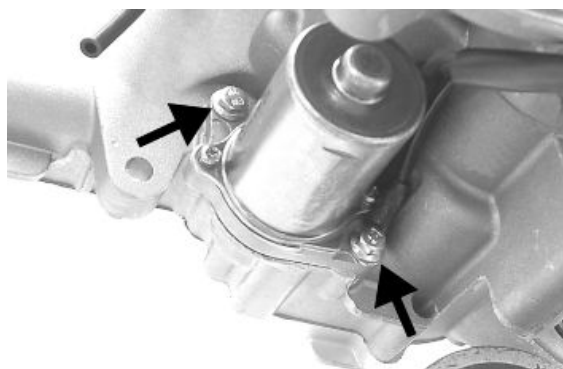
- Fit a new O-ring on the starter and lubricate it.
- Fit the starter on the crankcase, locking the two screws to the prescribed torque.

**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**



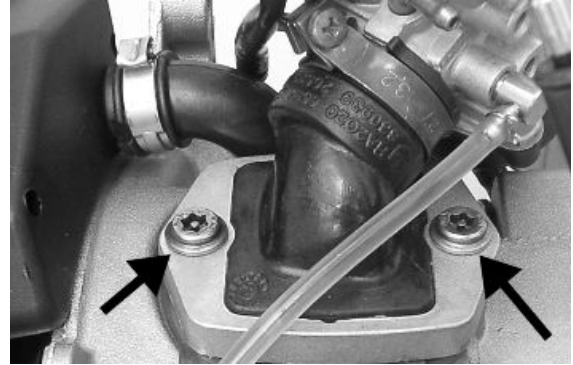
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## Cylinder assy. and timing system

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### Removing the intake manifold

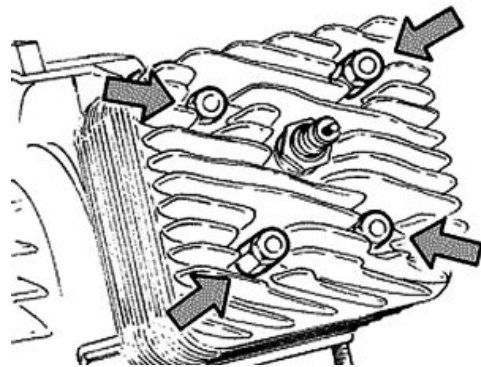
Use an anti-tampering TORX spanner to remove the two clamping screws of the intake manifold



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### Removing the cylinder head

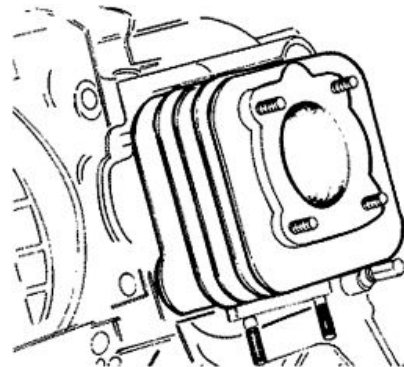
Remove the 4 screws shown in the figure



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### Removing the cylinder - piston assy.

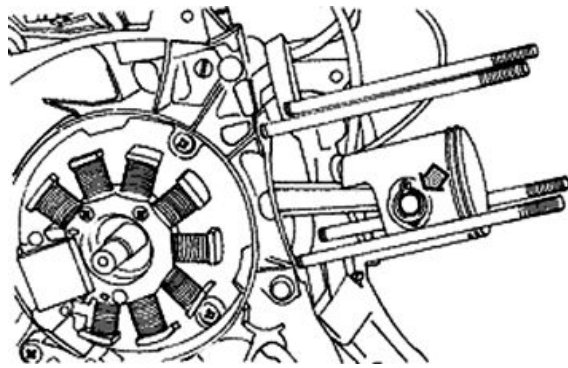
Remove the cylinder very carefully



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 CRANKSHAFT" CHAPTER".**

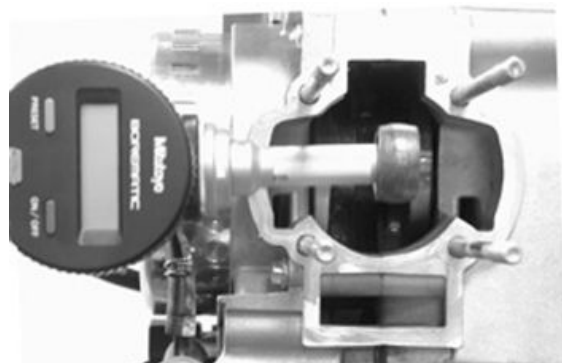
**Characteristic**

**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**

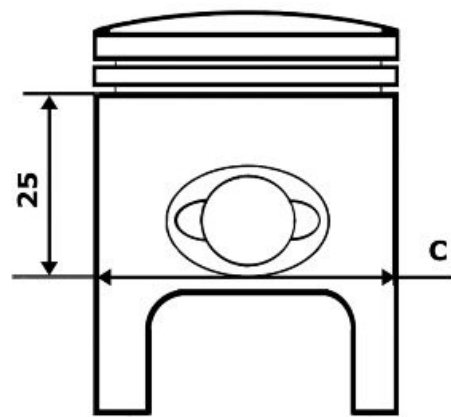
12 +0.007 +0.012

**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



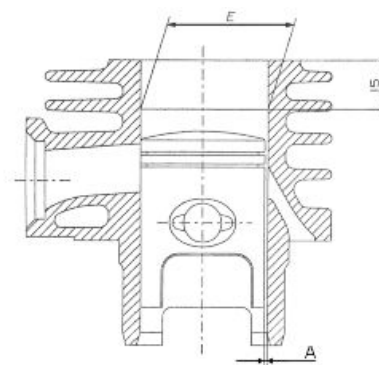
### See also

[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

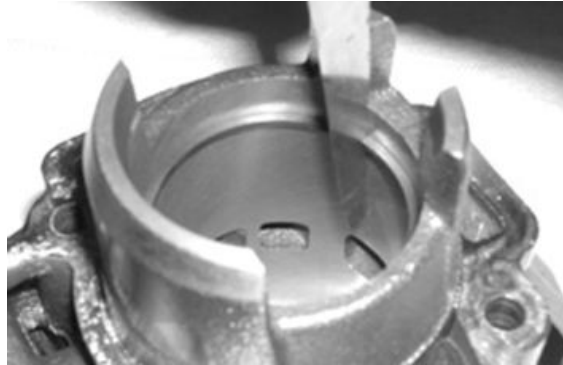


### See also

[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**

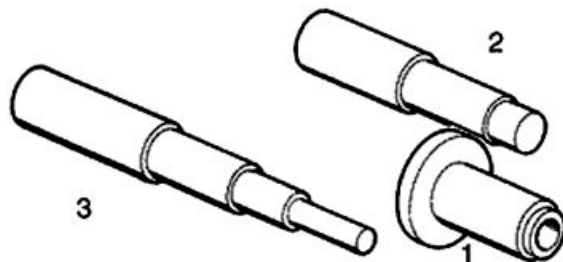
**POSITION THE ARROW PRINTED ON THE PISTON CROWN TOWARDS THE EXHAUST OPENING.**

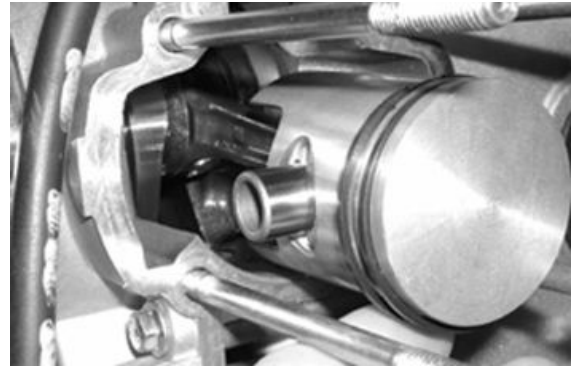
**THE WRIST PIN SNAP RINGS MUST BE POSITIONED ON THE PISTON WITH THE SPECIFIC TOOL**

**Recommended products**

**AGIP CITY TEC 2T Oil**

Recommended oil



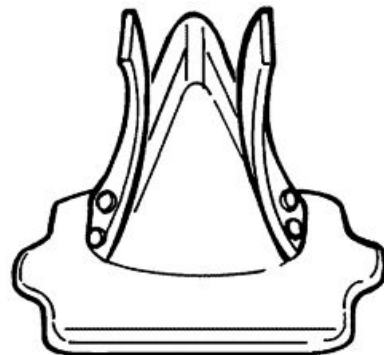


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### Inspecting the timing system components

**CAUTION**

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



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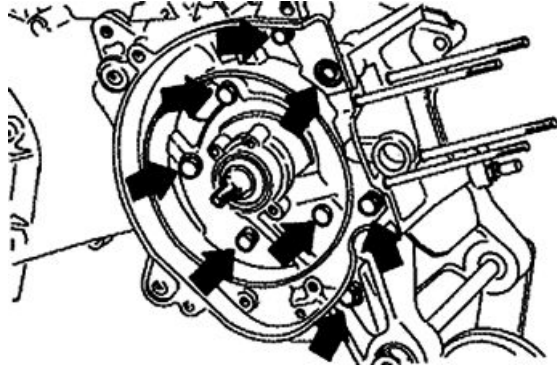
### Crankcase - crankshaft

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## Splitting the crankcase halves

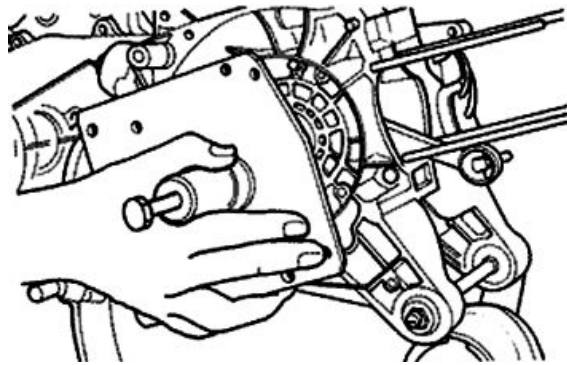
Remove the eight crankcase union fasteners.



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



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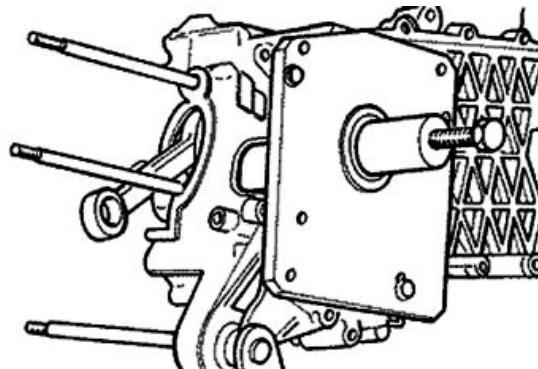
## Removing the crankshaft

- 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



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## Removing the crankshaft bearings

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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**

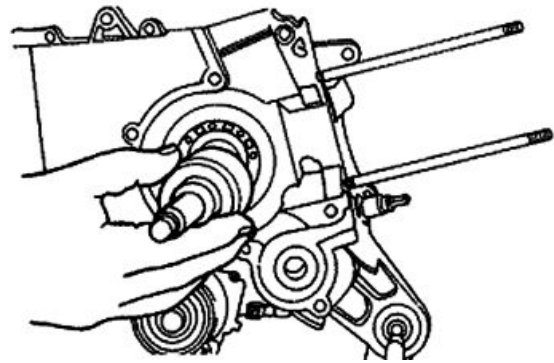
**004499Y007 Half rings**

- 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**



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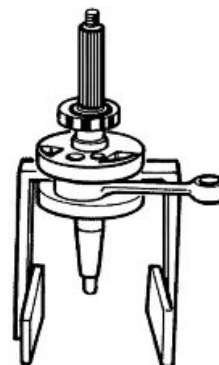
## Refitting the crankshaft bearings

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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

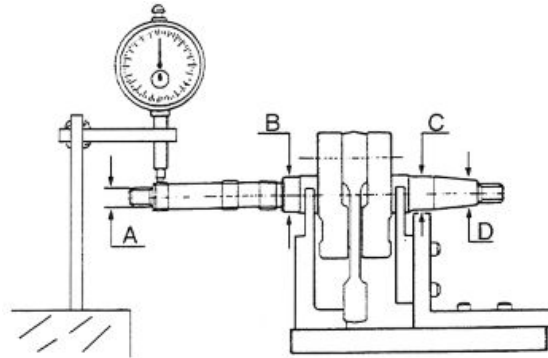
### Specific tooling

**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..



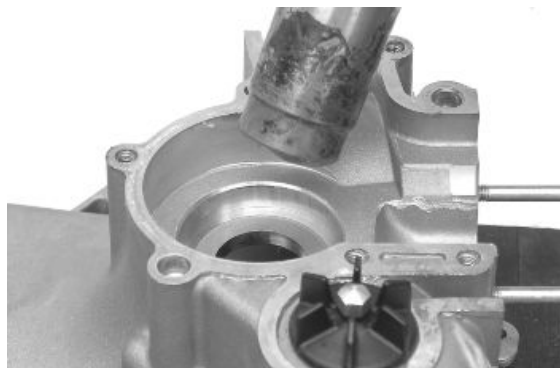
### Specific tooling

020335Y Magnetic support for dial gauge

020074Y Support base for checking crankshaft alignment

## Refitting the crankshaft

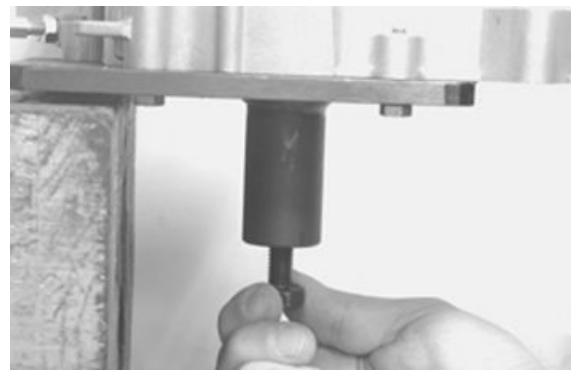
- Position the transmission side half crankcase on two wooden supports
- Using a thermal gun, heat the bearing seat to about 120°



- 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.

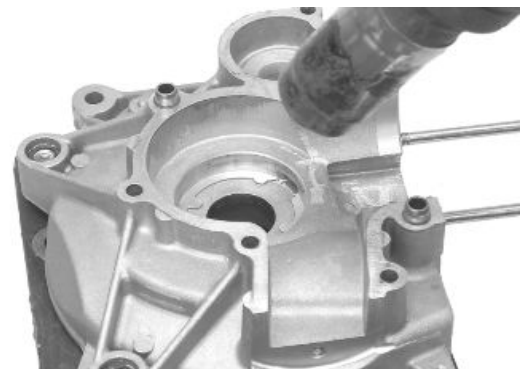


### Specific tooling

**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

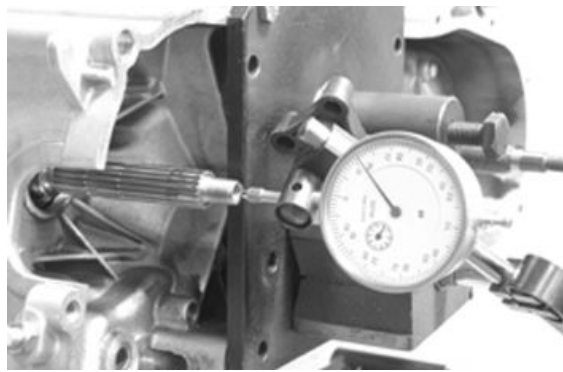
- Keeping the half crankcase on the transmission side, insert the flywheel side half crankcase with a clean precise movement
- Insert at least three clamping screws and tighten up rapidly
- Insert the other 5 screws and tighten them to the specified torque.



### 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



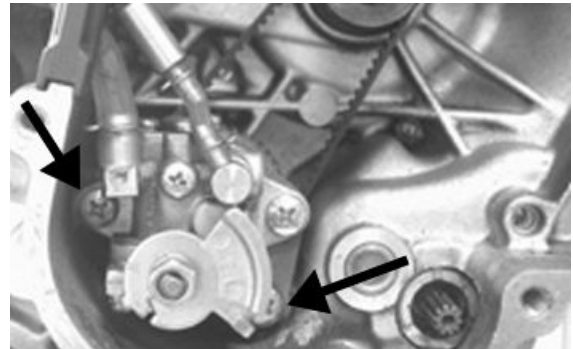
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## Oil pump

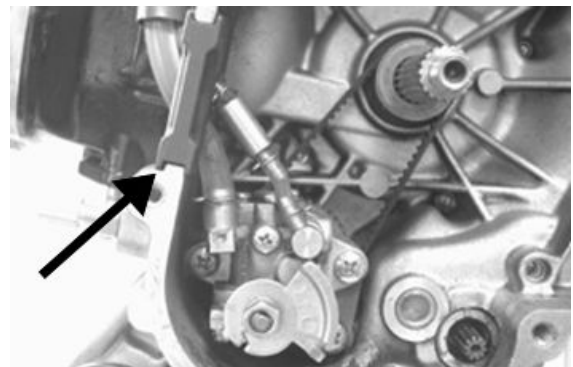
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### Removal

- Remove the 2 screws shown in the figure



Remove the tube passage seal from the crank-case shown in the figure

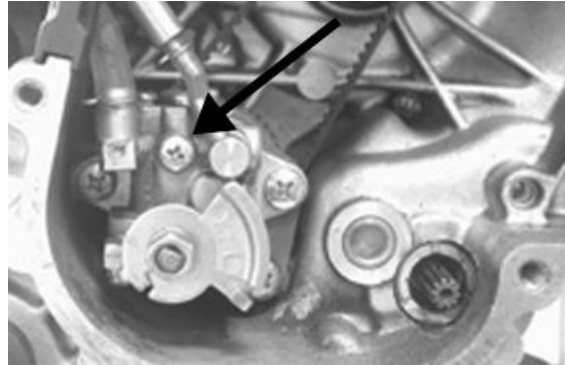


---

## 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

The vehicle comes with a membrane pump controlled by the depression that is generated in the intake manifold. Therefore, the tank has an intake in the lowest point that sends the fuel to the pump and from here to the carburettor.

To determine the correct functioning of the pump, the following measurements can be made on the amounts distributed:

- 1) Start up the engine, bring it to normal operating temperature and then shut it off.
- 2) Disconnect the fuel adduction line on the carburettor and insert it into a graduated tube.
- 3) Start up the engine without the accelerator and keep it idle.
- 4) After the engine is started, count to 10 and then turn it off.
- 5) Check that the quantity of fuel is not less than the prescribed value.



### Characteristic

#### Fuel distributed

~100cc X 10"

## INDEX OF TOPICS

**S**SUSPENSIONS

**SUSP**

---

## Sospensioni anteriore

---

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

---

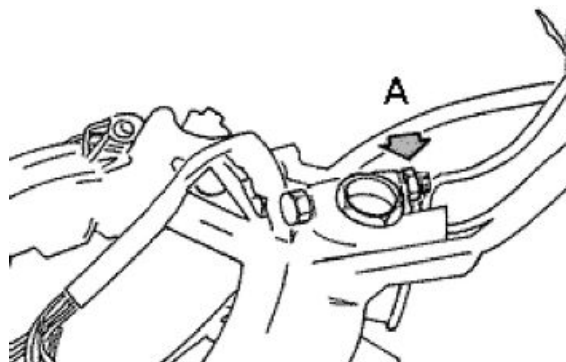
### Removal

---

- 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.**



---

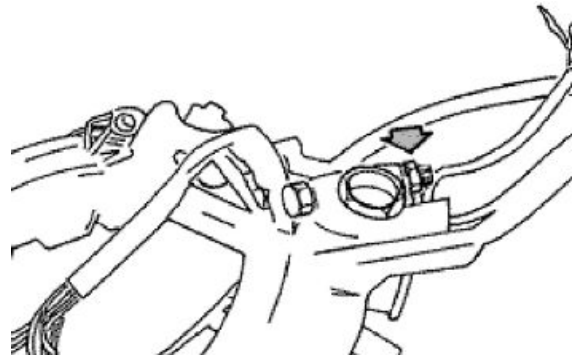
## Refitting

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

---

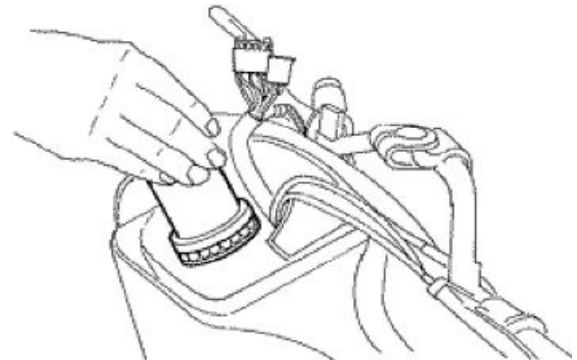
## Front fork

---

### 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](#)

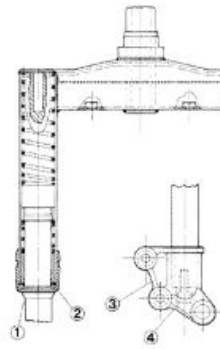
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## Overhaul

### Replacing the seal 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

### Removing the stanchion

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

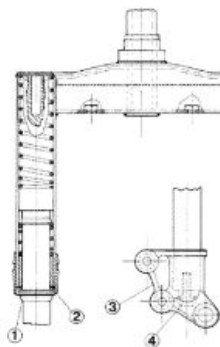
**N.B.**

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

### Recommended products

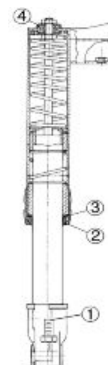
#### AGIP GREASE MU3 Grease for odometer transmission gear case

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



### Removing the 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**

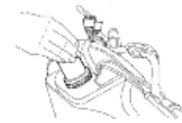
---

## **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**

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## **Steering column**

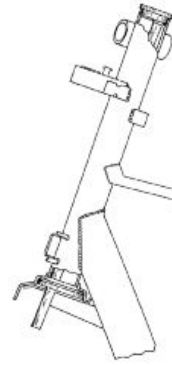
---

## **Removal**

**Removing the top and bottom frame housings**

---

- 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 headstock.



### Specific tooling

**020004Y Punch for removing fifth wheels from headstock**

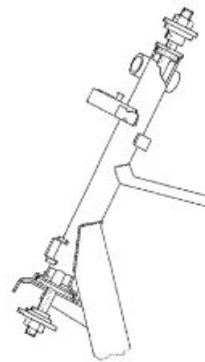
## Refitting

### Refitting the top and bottom frame housings

- 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 bearing housing 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**



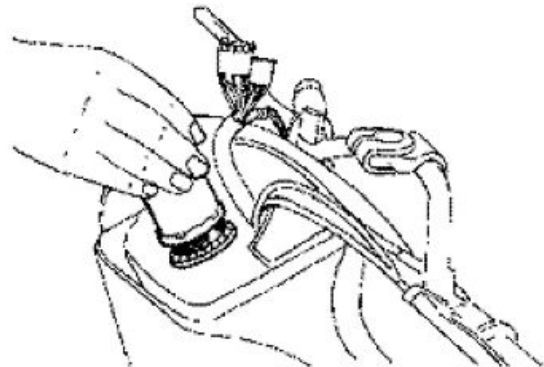
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### Removing the steering ring nut

- 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 the steering ring-nut

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

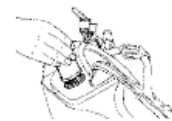
### Specific tooling

**020055Y Wrench for steering tube ring nut**

### Locking torques (N\*m)

**Locking torque: 30 to 40 Nm**

---

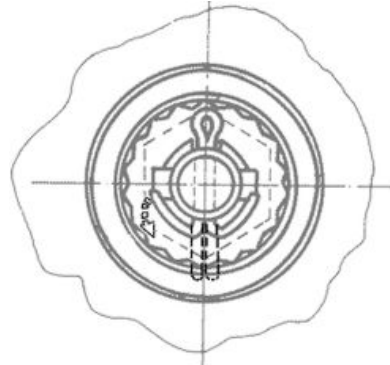


## Removing the rear wheel

- 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

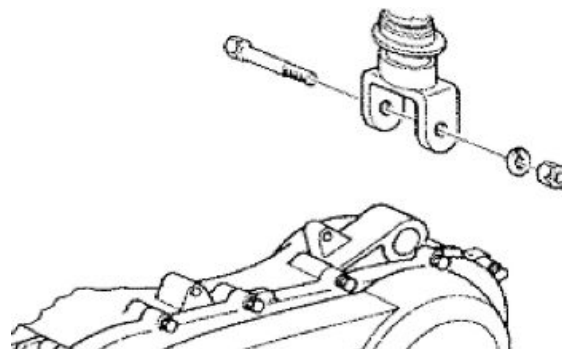
**-ALWAYS USE NEW SPLIT PINS FOR REFITTING.**



## Shock absorbers

### 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.

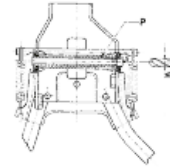
### Locking torques (N\*m)

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

## Centre-stand

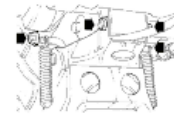
### Removal of stand bolt from bracket

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



### Replacing the centre-stand assy

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



### Locking torques (N\*m)

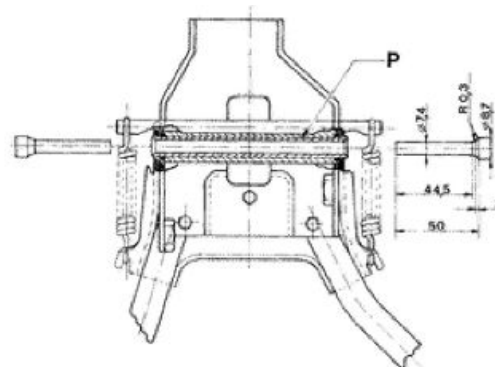
Stand screw torque 18.5 to 19 Nm

### Calking and fitting of stand bolt to 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.**





## INDEX OF TOPICS

**B**RAKING SYSTEM

**BRAK SYS**

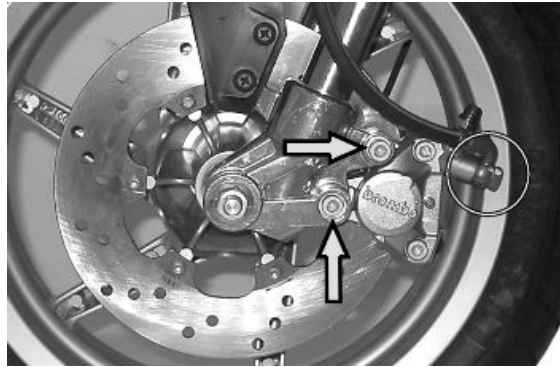
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## Front brake calliper

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### 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

- Remove the calliper assembling bolts and take out the internal bodies and components. If necessary, in order to make it easier to take out the plungers, inject (shorts blasts of) compressed air through the brake fluid pipe.
- Check that the cylinders of the internal and external body of the calliper do not show scratches or signs of erosion; otherwise, replace the entire calliper.

#### CAUTION

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

Insert the following: - sealing rings (1-2);

- pistons (3);
- locate the OR seal inside a calliper body (4).
- Join the inner and outer bodies via fixing bolts. Refit the pads and breathe any air inside the circuit (see previous paragraphs).
- Locate the calliper on the disc and secure to the supporting bracket tightening the fixing bolt.
- Tighten the tube joint on the calliper at the prescribed torque.
- When refitting the components, they must be perfectly clean and free from any trace of oil, fuel, grease, etc... It is therefore necessary to carefully clean them with denatured alcohol.

**The seal rings must be immersed in the operating liquid;** Protective solution **PRF1** may be used.

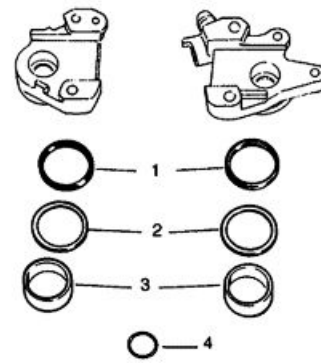
#### CAUTION

**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)

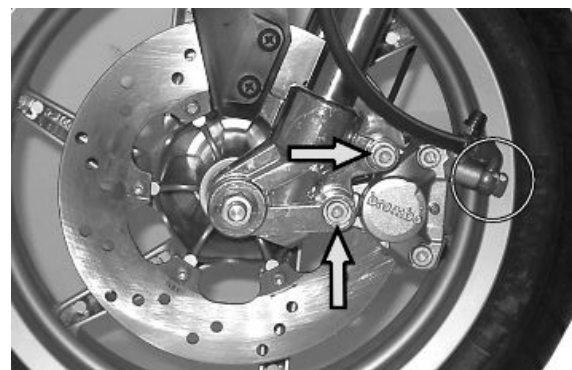
**Calliper coupling screw 20 to 25 Nm Oil bleed screw 7 to 10 Nm**

- 1 DUST GUARDS
- 2 SEALING RINGS
- 3 PLUNGERS
- 4 O-RING GASKET



### 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.



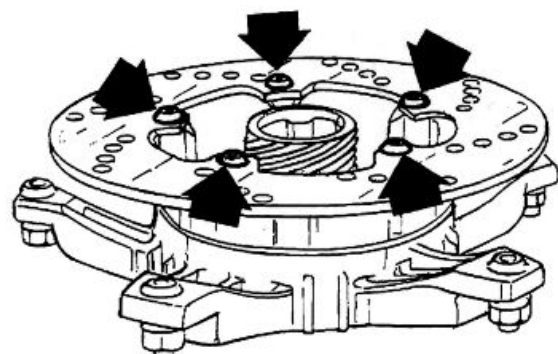
#### Locking torques (N\*m)

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

### Front brake disc

#### Removal

- Remove the front wheel loosening the axle clamp.
- Remove the six fastenings of the disc.



#### 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

Checking the disc is important; it must be perfectly clean, with no sign of rust, oil or grease or other dirt and must not show signs of deep scoring.

### Characteristic

#### New rear disc thickness

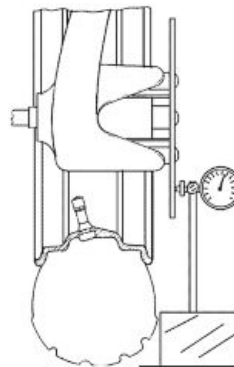
4.0 mm

#### Disc thickness at wear limit (front)

3.5 mm



- 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

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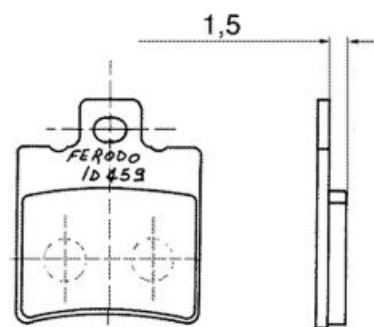
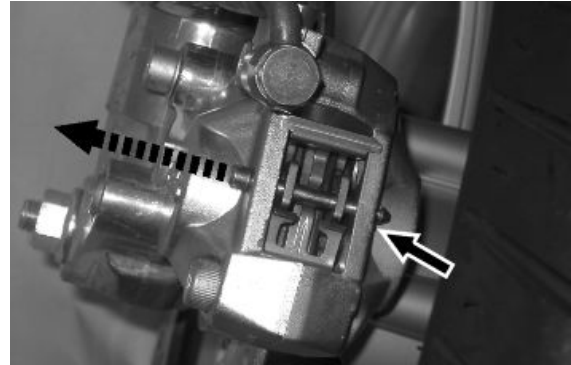
## Front brake pads

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## Removal

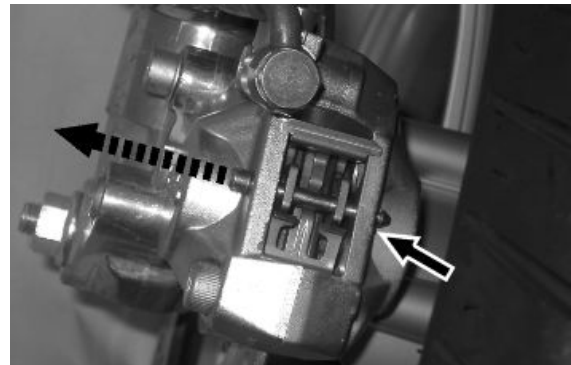
- Remove the pin split ring located at the back of the calliper body.
- Remove the pin, paying attention in recovering the spring, hence remove the pads.
- The pads must be replaced if the working thickness is less than 1.5 mm



---

## Refitting

- To reassemble perform the above steps in reverse order. Position the leaf spring with the arrow facing up.



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## 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 SURROUNDING AIR.**

**IF THE LEVEL OF HUMIDITY IN THE BRAKING FLUID EXCEEDS A GIVEN VALUE, BRAKING EFFICIENCY WILL BE REDUCED.**

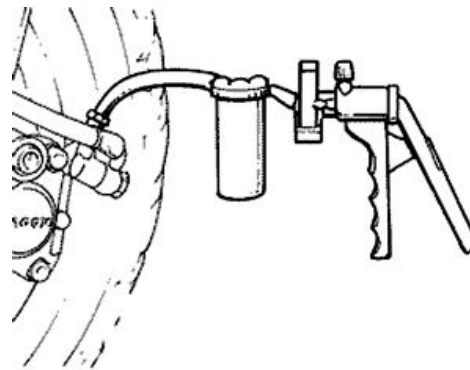
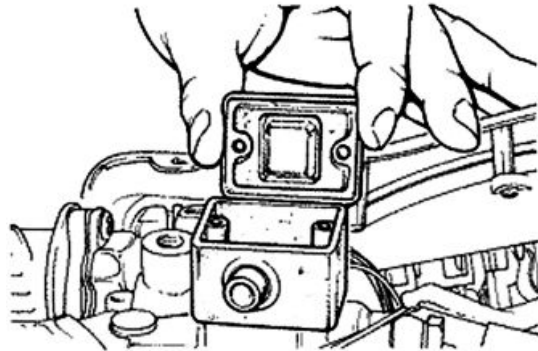
**THEREFORE, ALWAYS USE FLUID FROM SEALED CONTAINERS.**

**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

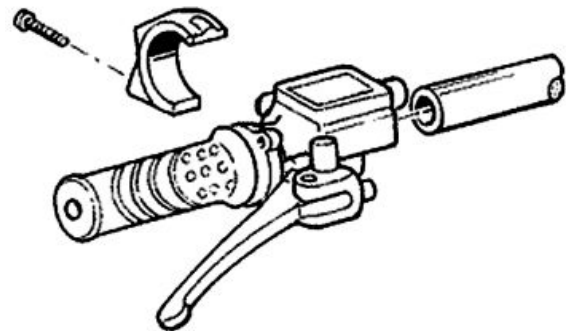
### Locking torques (N\*m)

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.



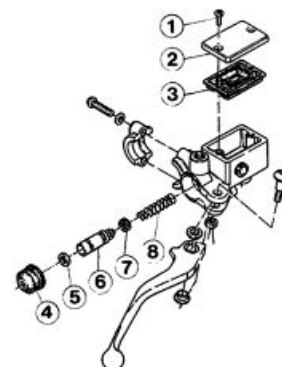
### Locking torques (N\*m)

Brake fluid pump - hose fitting 20 ÷ 25 Nm

## Removal

- Bleed the circuit and drain the brake fluid through the bleeding screw located on the calliper and actuate the brake lever until no more fluid flows out.
- Remove the oil pump from the handlebar; remove the brake lever and then remove the wheel cylinder.

- 1 - Tank cap screw.
2. Tank cover.
3. Diaphragm.
4. Bellows.
5. Sealing ring.
6. Piston.



7. Gasket.

8 - Spring

**CAUTION**

**- THE PRESENCE OF BRAKE FLUID ON THE DISC OR BRAKE PADS REDUCES THE BRAKING EFFICIENCY.**

**IN THIS CASE, REPLACE THE PADS AND CLEAN THE DISC WITH A HIGH-QUALITY SOLVENT.**

**CONTACT WITH BRAKE FLUID WILL DAMAGE PAINTED SURFACES.**

**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.**

**THE SEALING RINGS MUST BE IMMERSSED IN THE OPERATING LIQUID.**

## Refitting

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.

- Reinstall the individual parts in the reverse order to the removal, paying attention to the correct positioning of the rubber parts in order to ensure leak tightness.

1 - Tank cap screw.

2. Tank cover.

3. Diaphragm.

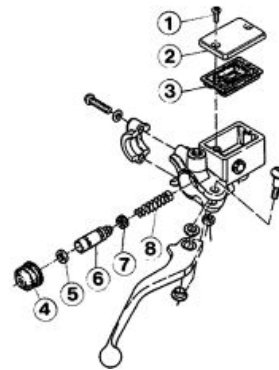
4. Bellows.

5. Sealing ring.

6. Piston.

7. Gasket.

8. Spring.



**Rear drum brake**

---

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

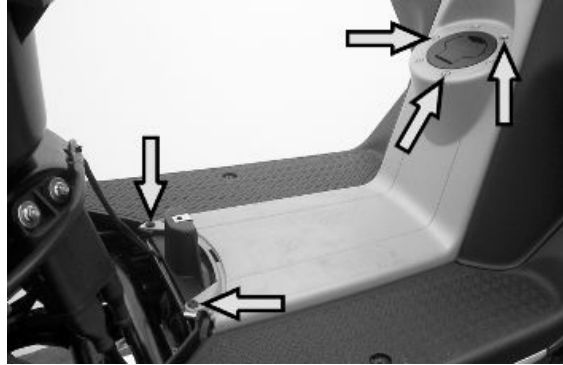
**CHASSIS**

**CHAS**

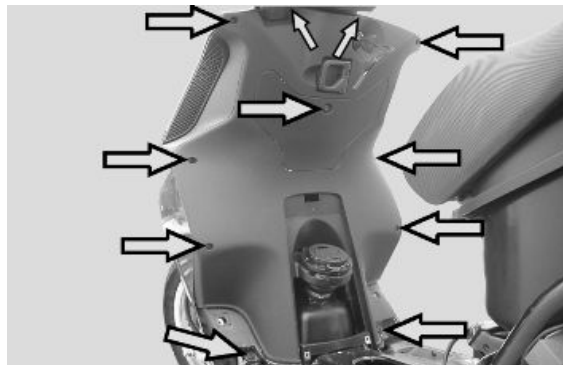
## Carrozzeria

**Frame central cover**

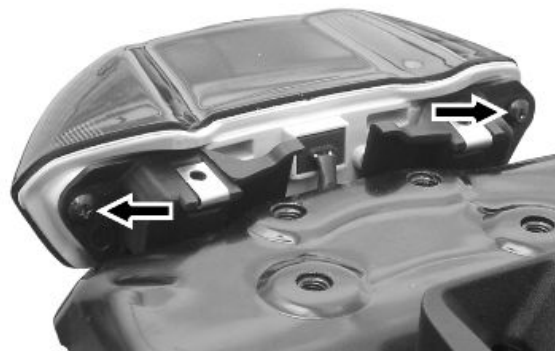
- Remove the top and bottom fairings.
- Remove the 2 Philips screws fixing the footrest.
- Remove the 3 Allen screws located around the fuel filler cap.
- Remove the fuel filler cap.

**See also**[Side fairings](#)**Knee-guard**

- Remove the footrest and its side fairings.
- Remove the expansion tank and the fuel filler cap.
- Remove the 11 fixing screws, and hence release the knee-guard.

**See also**[Footrest](#)**Taillight assy.**

- Remove the top joining element of the fairings located behind the taillight.
- Remove the two top fairings.
- Remove the 2 fixing screws; hence remove the taillight after disconnecting the connector to the vehicle system.

**See also**

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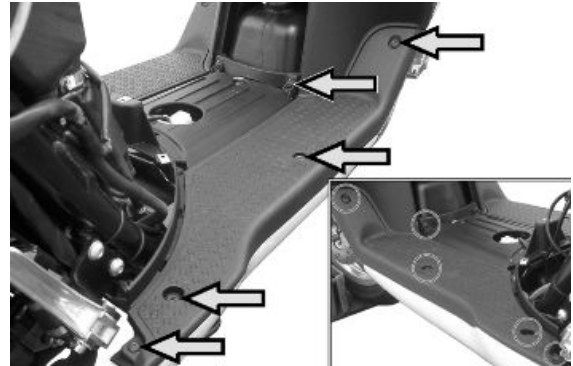
[Side fairings](#)

---

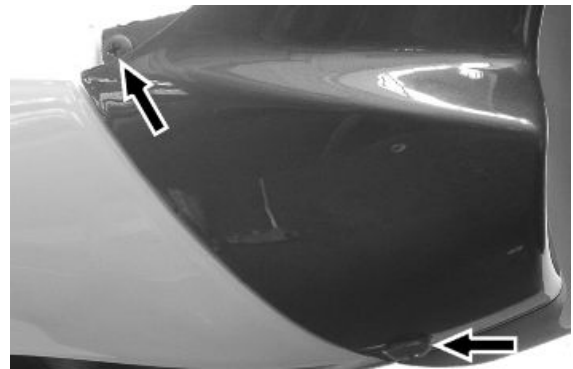
**Footrest**

---

- Remove the centre frame cover.
- Remove the 10 screws (5 for each side), hence remove the footrest.



- Remove the side fairing from the footrest, by removing the two screws joining this to the spoiler and the knee-guard.

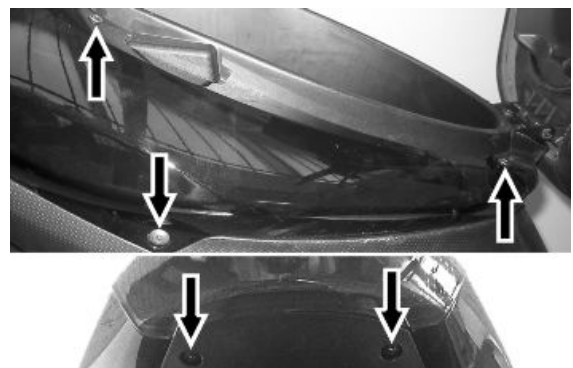
**See also**[Frame central cover](#)

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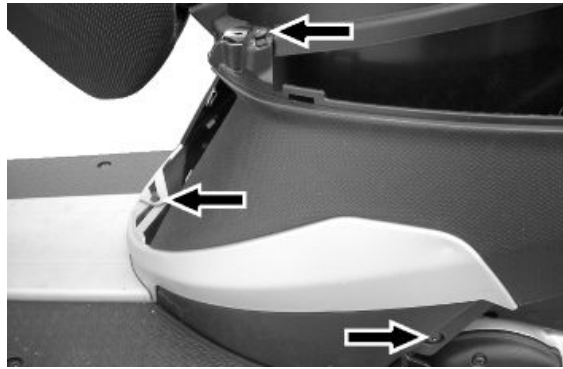
**Side fairings**

---

- Remove the top l.h.s. and r.h.s. fairings, by removing the 3 side screws and the screw located underneath the taillight

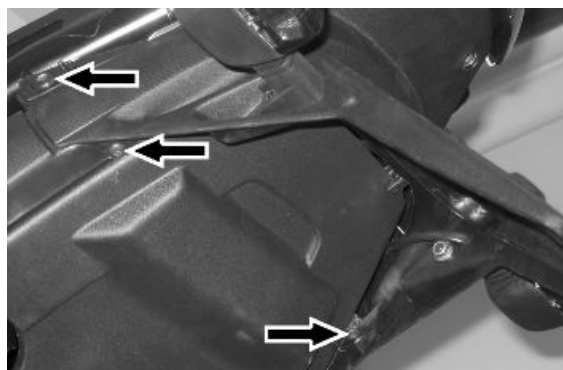


- Remove the lower fairings, removing the 2 side screws and the central joining screw located underneath the spark plug cover.



### License plate holder

- Remove the top fairing joining element located behind the taillight.
- Remove the 2 screws joining the top side fairings.
- Remove the 4 lower screws joining the front wheel housing cover with the lower side fairings.

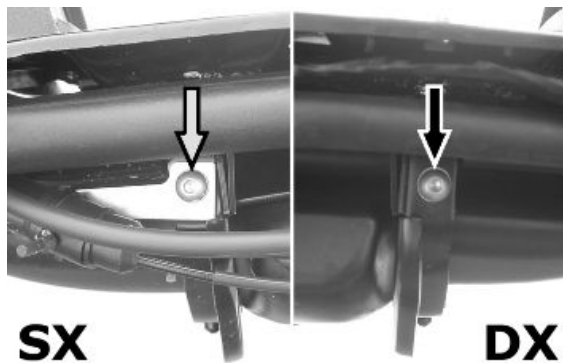


### See also

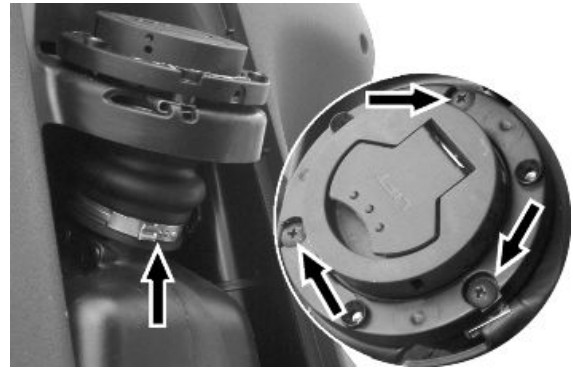
[Side fairings](#)

### Fuel tank

- Remove the footrest and its side fairings.
- Remove the 2 Allen screws fixing the fuel support cross member, and remove the bracket



- Remove the metallic clip joining the rubber bellow to the tank and loosen the 3 screws fixing to the knee-guard



- Remove the 2 top screws fixing the tank to the frame and lower the tank so to disconnect the inlet and outlet fuel hoses from the pump.
- Remove the tank completely paying attention to avoid fuel spillage.



### See also

[Footrest](#)



# INDEX OF TOPICS

**P**RE-DELIVERY

**P**RE DE

---

## 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
  - Tail light, parking light, stop light
  - Front and rear stop light switches
  - Turn indicators and their warning lights
  - Instrument lighting
  - 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 THE LIFE OF THE BATTERY.**

**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.**

**THE 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 braking system fluid level.
  - Rear hub oil level
  - Engine coolant 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

TIME

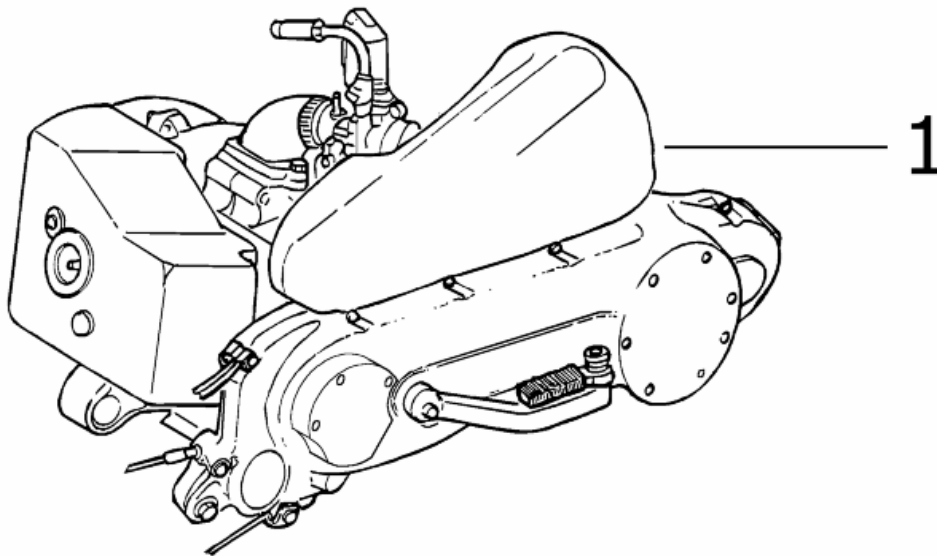
TIME

This section is devoted to the time necessary to carry out repairs.

The description and code for each operation is indicated.

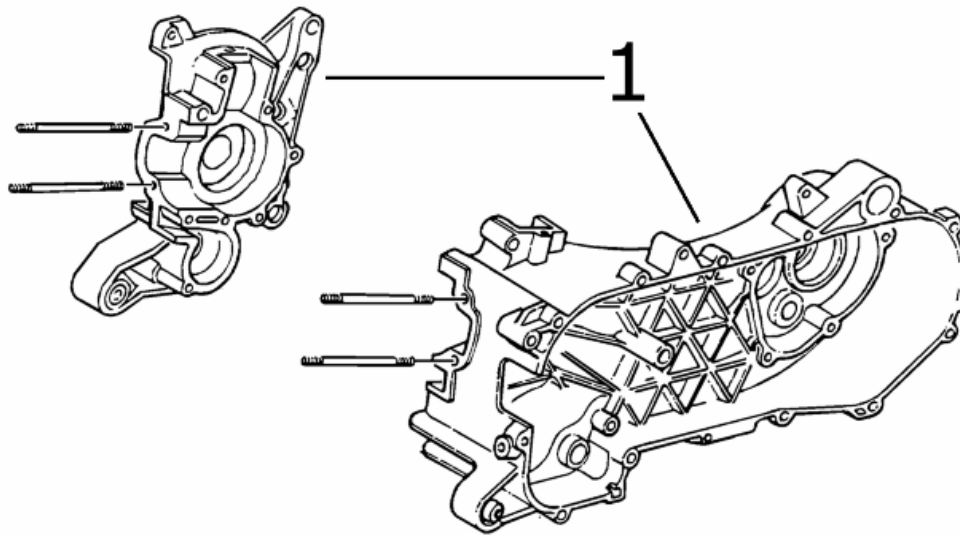


## Engine



<u>ENGINE</u>			
	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	001001	Engine to chassis - Replacement	

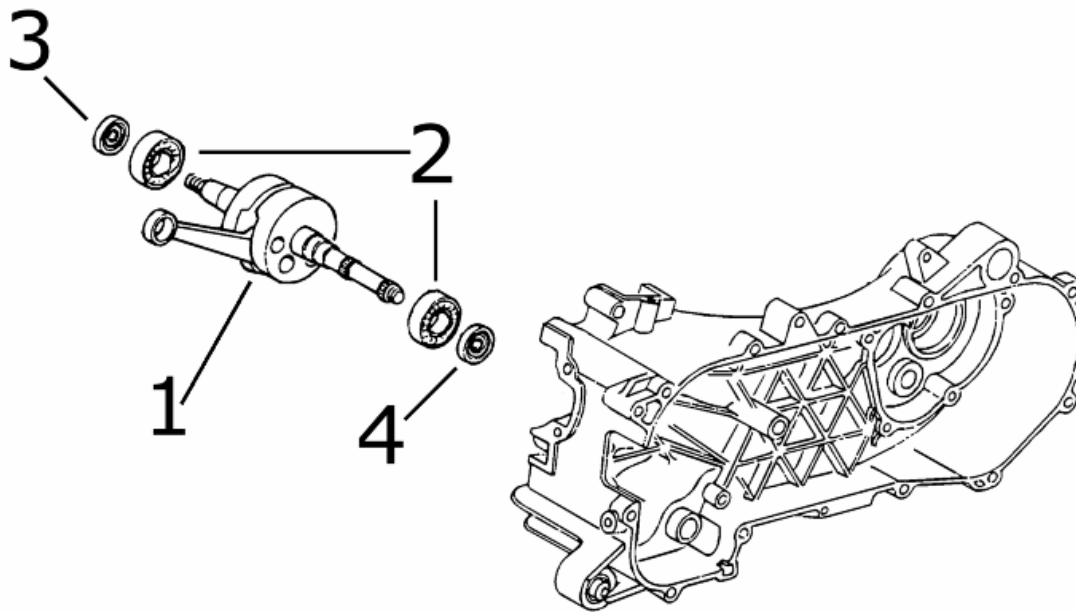
**Crankcase**



**CRANKCASE**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	001133	Engine crankcase - Replacement	

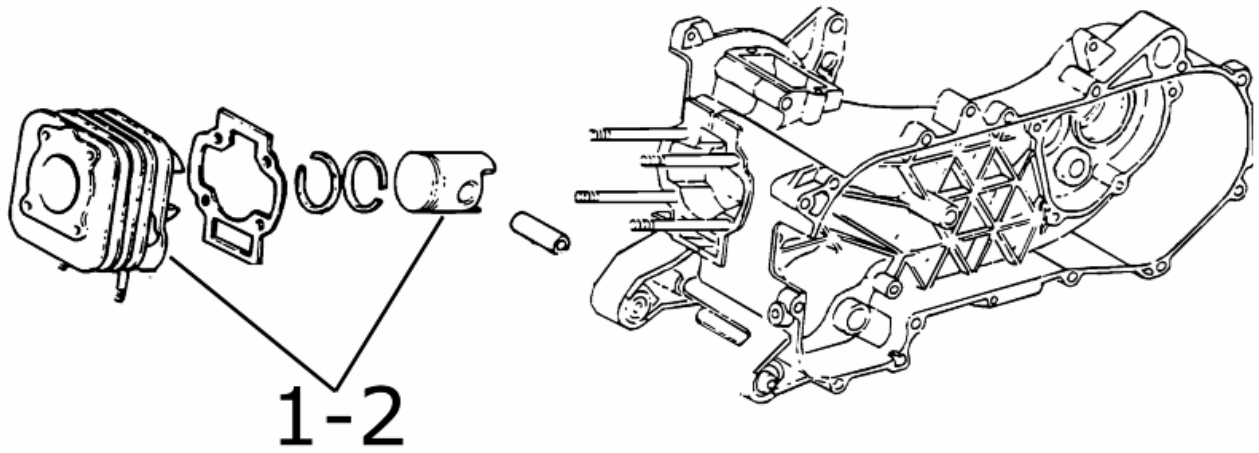
## Crankshaft



### CRANKSHAFT

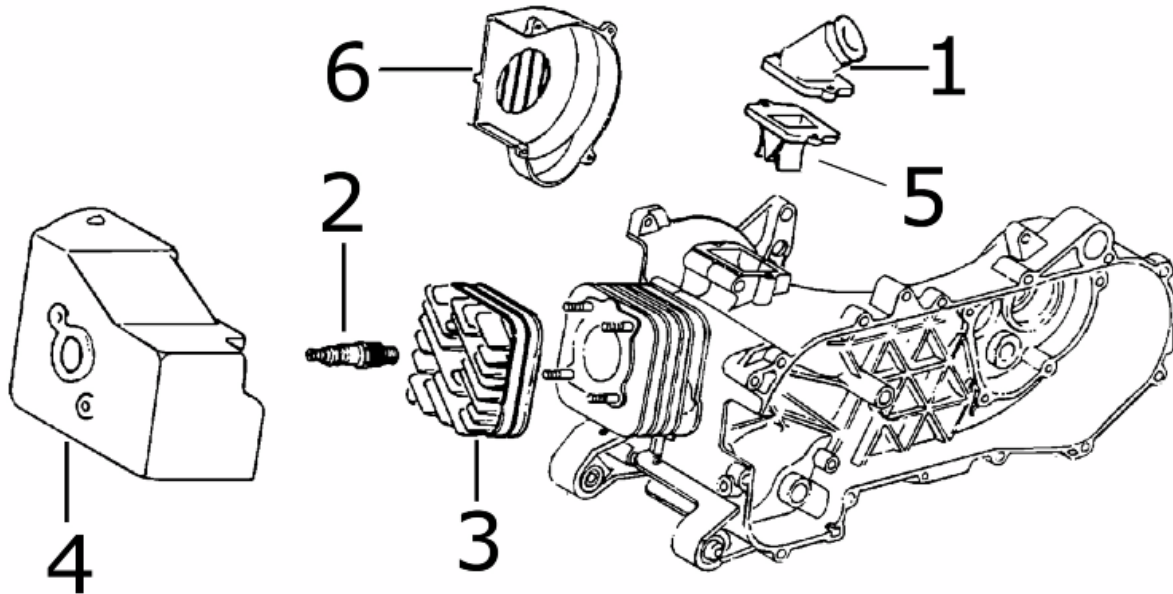
	Code	Action	Duration
1	001117	Crankshaft - Replacement	
2	001118	Main bearings - Replacement	
3	001099	Oil seal, flywheel side - Replacement	
4	001100	Oil seal, clutch side - Replacement	

Cylinder assy.



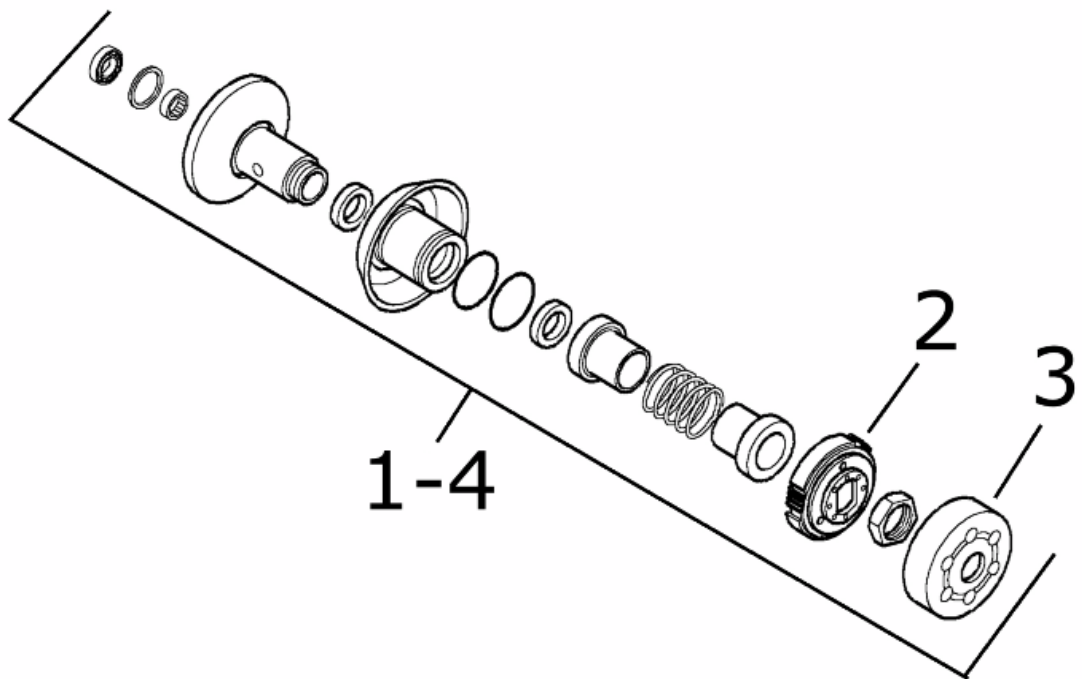
<u>CYLINDER / PISTON</u>			
	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	001002	Cylinder piston - Replacement	
2	001107	Cylinder / piston - Inspection / cleaning	

## Cylinder head assy.

CYLINDER HEAD ASSEMBLY

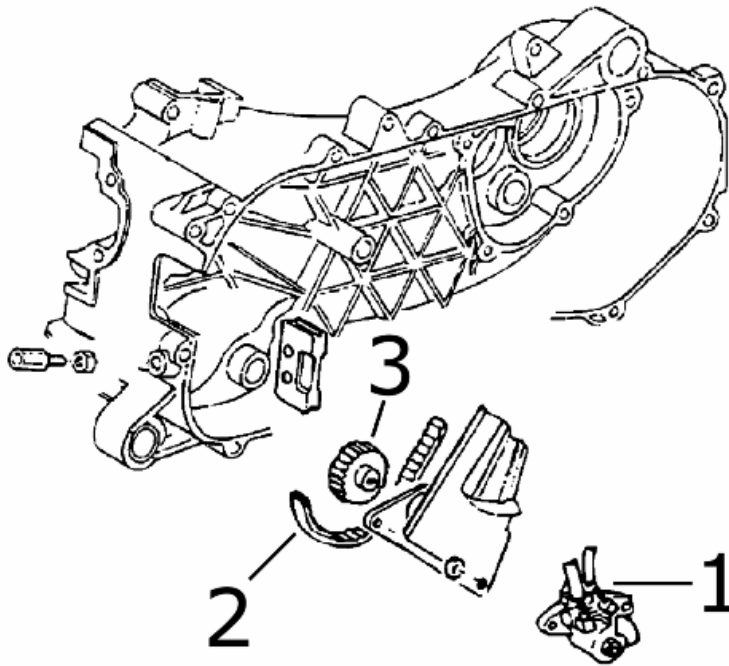
	Code	Action	Duration
1	001013	Intake manifold - Replacement	
2	001093	Spark plug - Replacement	
3	001126	Head - Replacement	
4	001097	Cooling hood - Replacement	
5	001178	Disc pack - Replacement	
6	001087	Flywheel cover - Replacement	

Driven pulley



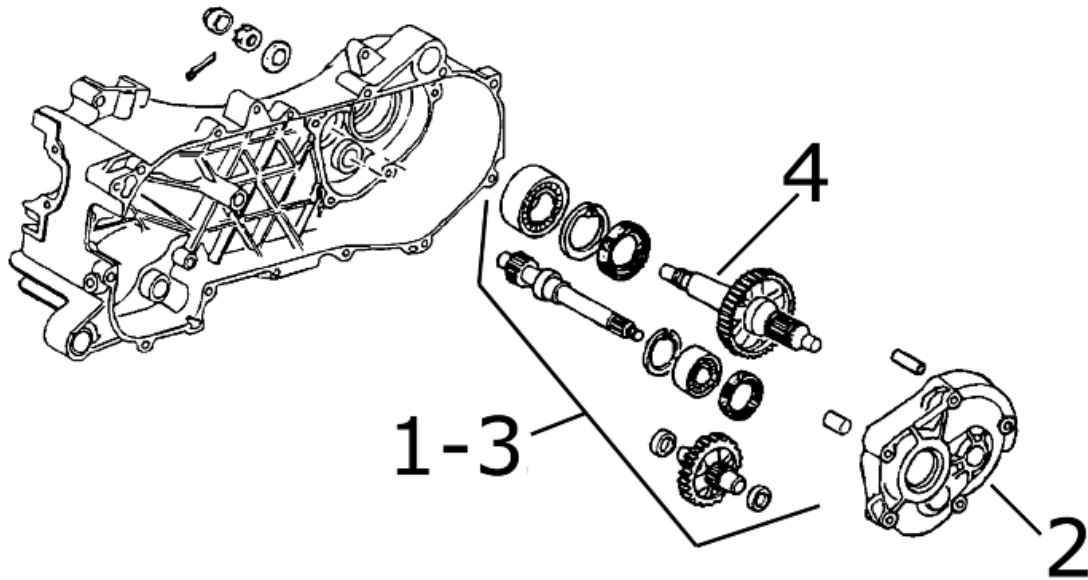
**DRIVEN PULLEY**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	001110	Driven pulley - Replacement	
2	001022	Clutch - Replacement	
3	001155	Clutch bell housing - Replacement	
4	001012	Driven pulley - overhaul	

**Oil pump****OIL MIX PUMP**

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

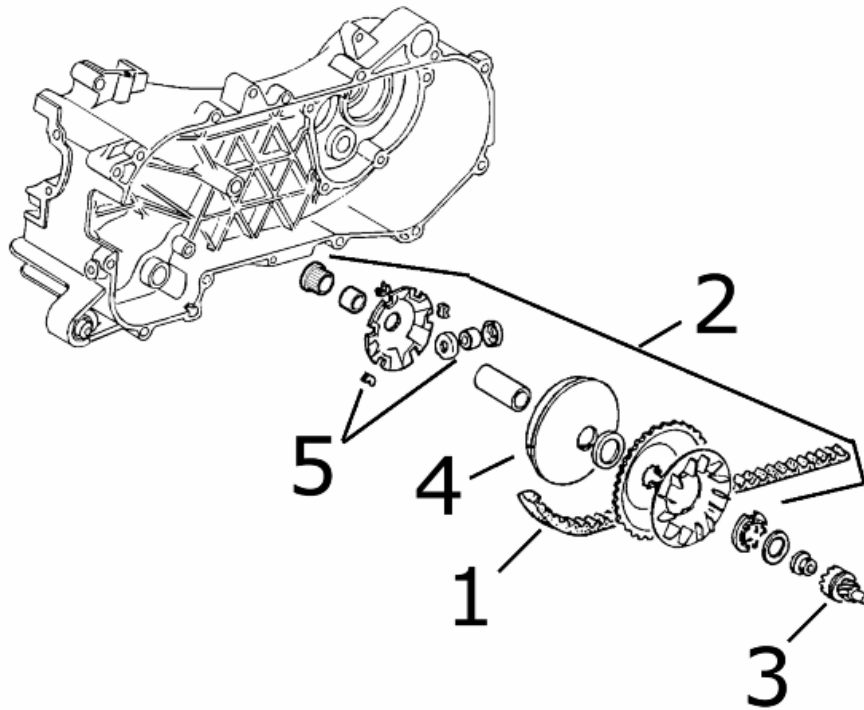
**Final gear assy.**



**FINAL REDUCTION GEAR**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	001010	Geared reduction unit - Service	
2	001156	Gear reduction unit cover - Replacement	
3	003065	Gearcase oil - Replacement	
4	004125	Rear wheel axle - Replacement	

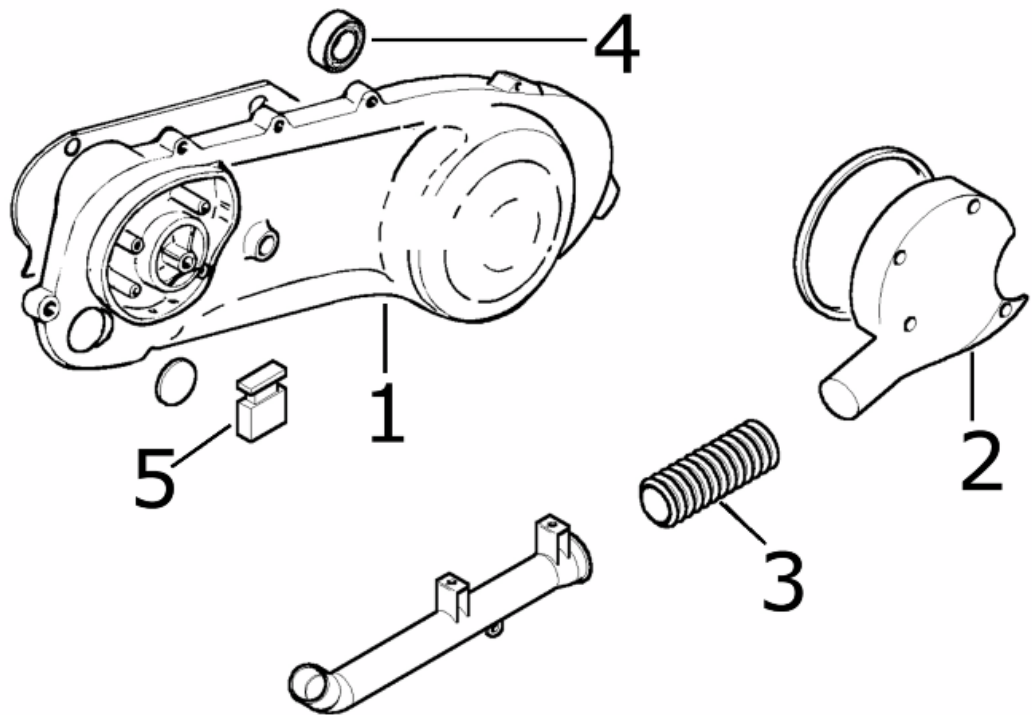
## Driving pulley



### 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	

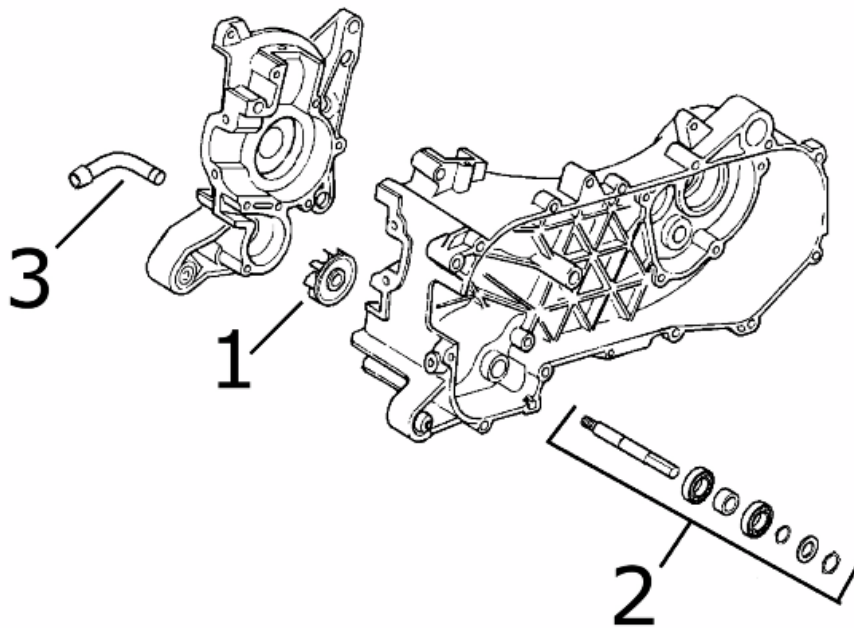
Transmission cover



TRANSMISSION COVER

	Code	Action	Duration
1	001096	Transmission crankcase cover - Replacement	
2	001131	Transmission air intake - Replacement	
3	001132	Transmission air inlet pipe - Replacement	
4	001135	Transmission cover bearing - Replacement	
5	004179	Stand buffer - Replacement	

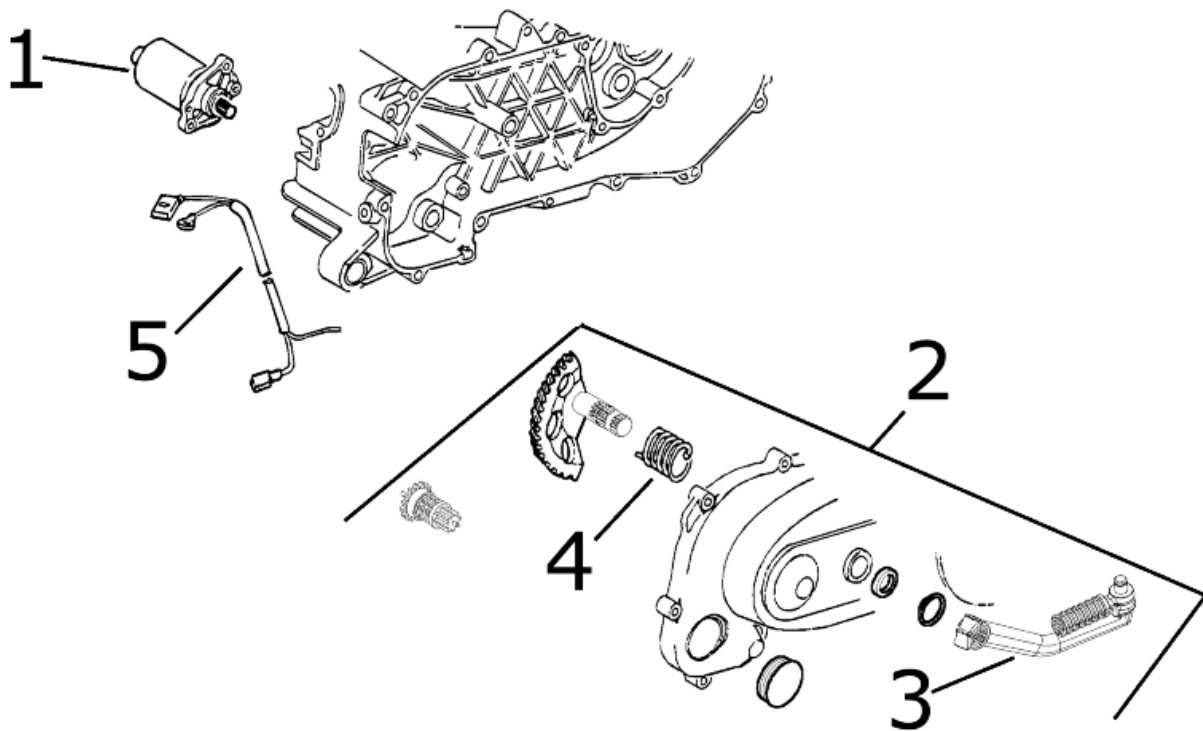
## Water pump



### WATER PUMP

	Code	Action	Duration
1	001113	Water pump - Replacement	
2	001062	Water pump command shaft - Replacement	
3	007019	Connection water pump pipe / return pipe - Replacement	

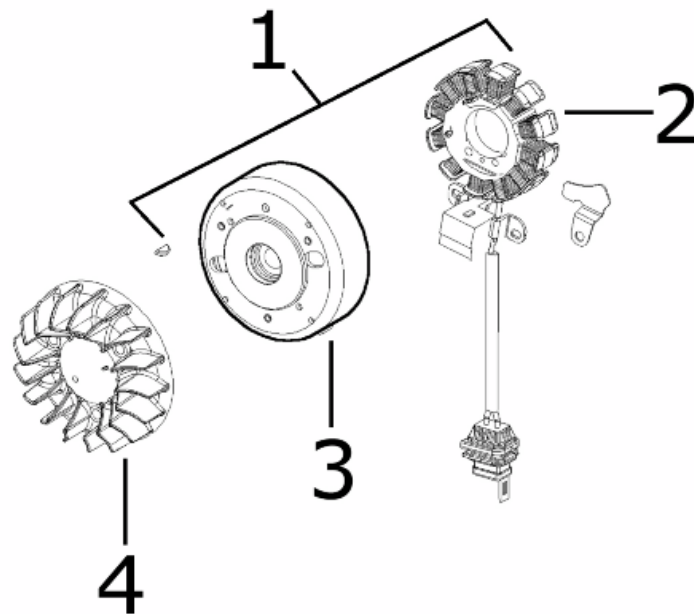
**Starter motor**



**STARTER MOTOR AND KICK STARTER**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
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	

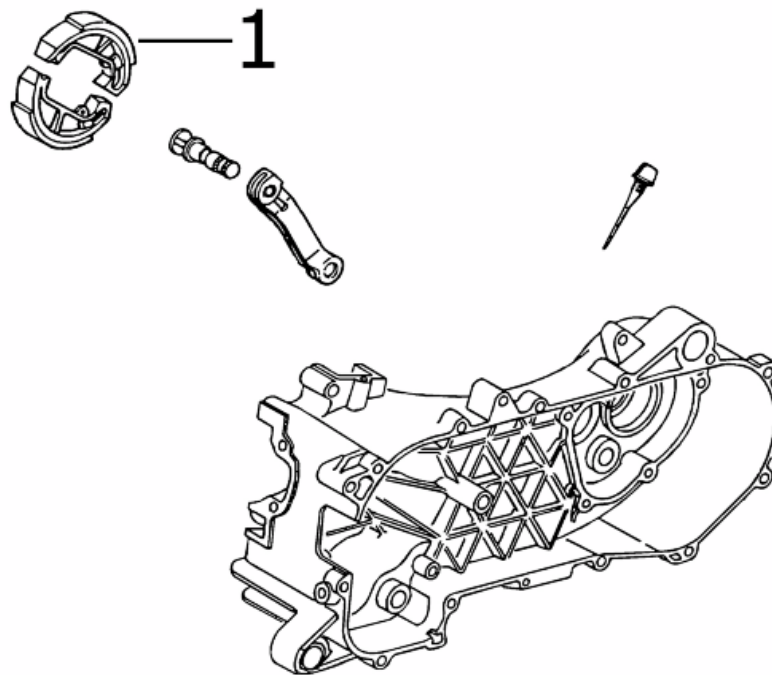
## Flywheel magneto



### MAGNETO FLYWHEEL

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

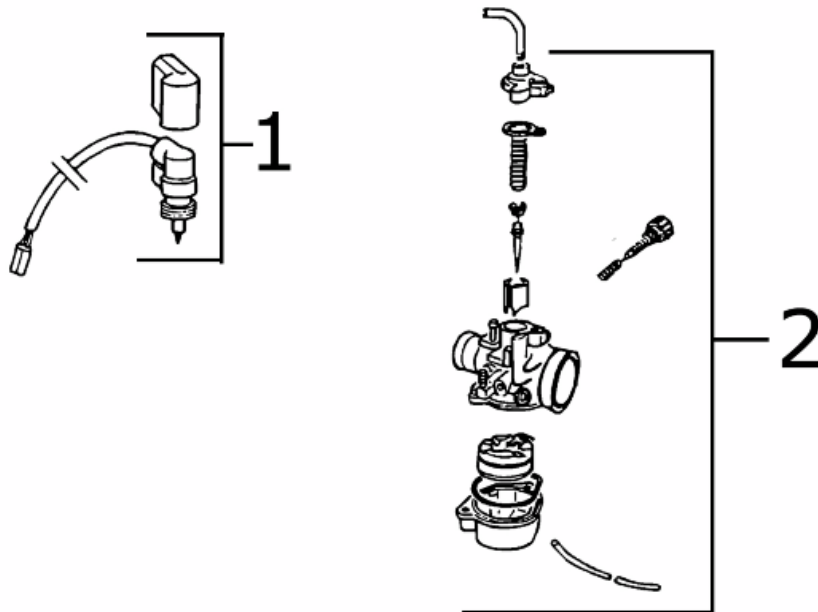
Brake shoes



**BRAKE SHOES**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	002002	Rear brake shoe(s) - Replacement	

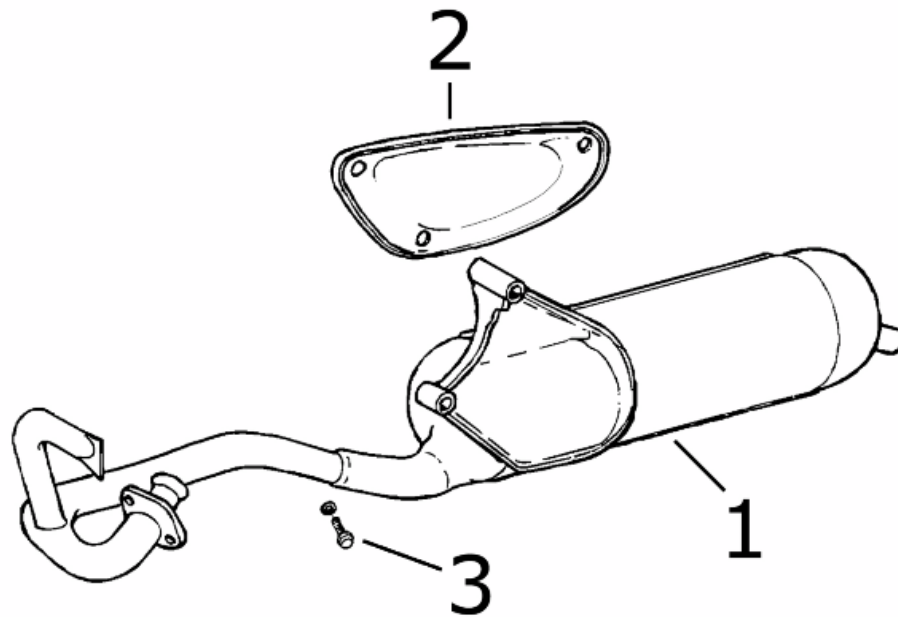
**Carburettor**



**CARBURETTOR INSPECTION**

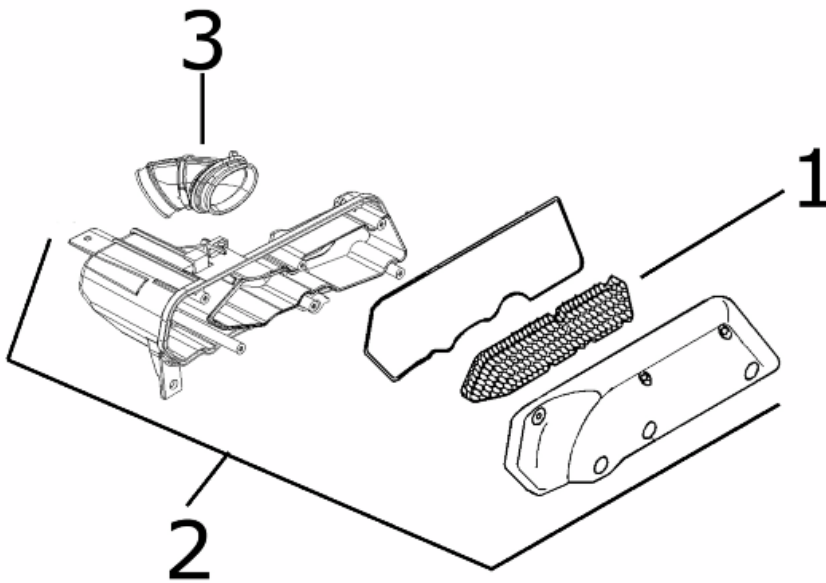
	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	001081	Automatic choke - Replacement	
2	001008	Carburettor - Inspection	

Exhaust pipe



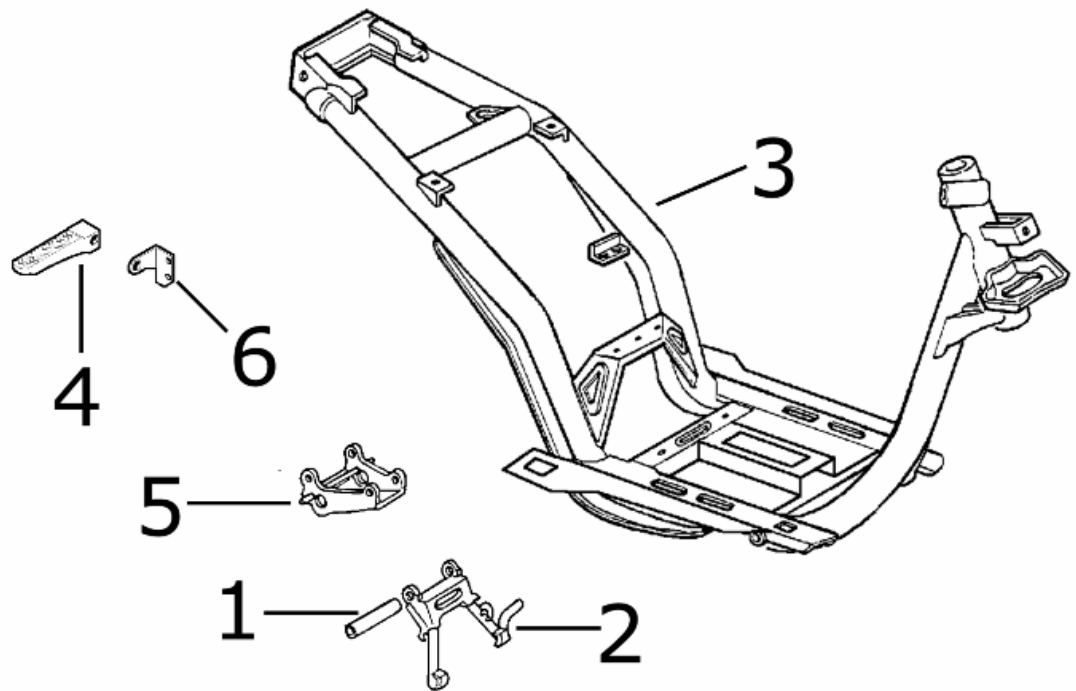
**MUFFLER**

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

**Air cleaner**

<u>AIR FILTER</u>			
	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	001014	Air filter - Replacement / cleaning	
2	001015	Air filter box - Replacement	
3	004122	Air cleaner carburettor fitting - Replacement	

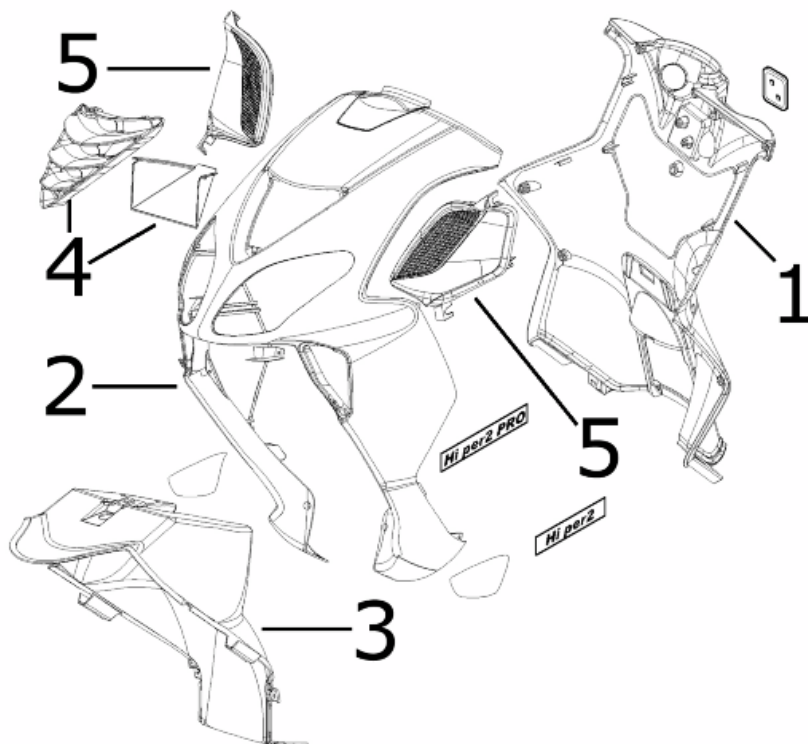
Frame



**CHASSIS**

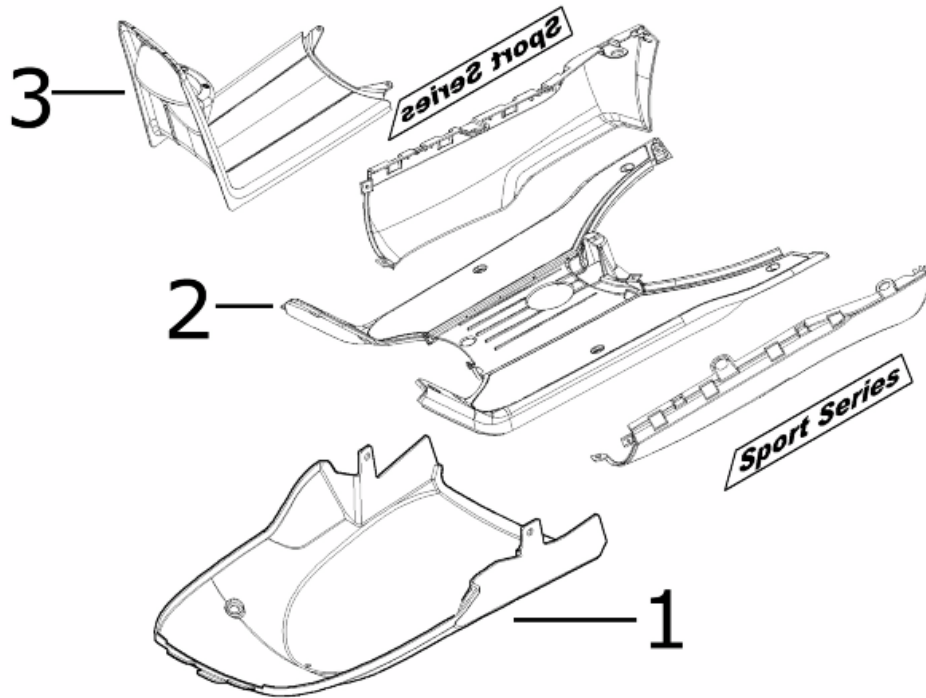
	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	001053	Stand bolt - Replacement	
2	004004	Stand - Replacement	
3	004001	Frame - replace	
4	004015	Footrest - Replacement	
5	004171	Stand support plate - Replacement	
6	004143	Footrest support - replace	

## Legshield spoiler

**FRONT SHIELD**

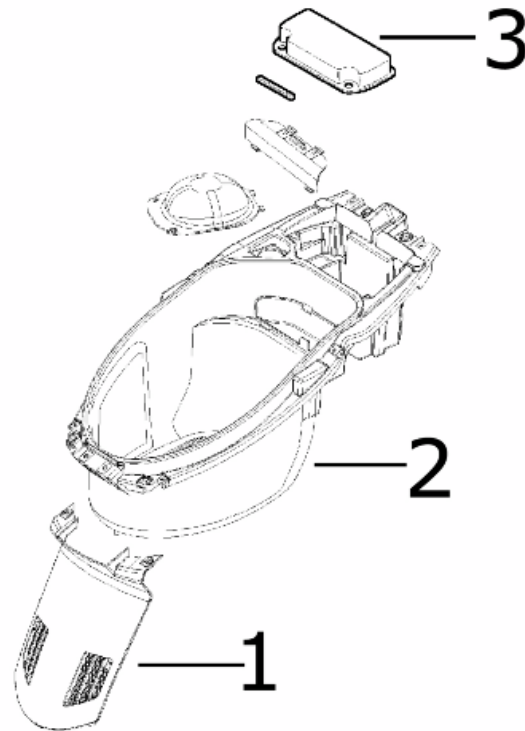
	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	004065	Front shield rear section - Replacement	
2	004064	Front shield - Replacement	
3	003087	Wheel housing - Replacement	
4	004167	Grill / radiator cover - Replacement	
5	004176	Air vent - Replacement	

Side fairings



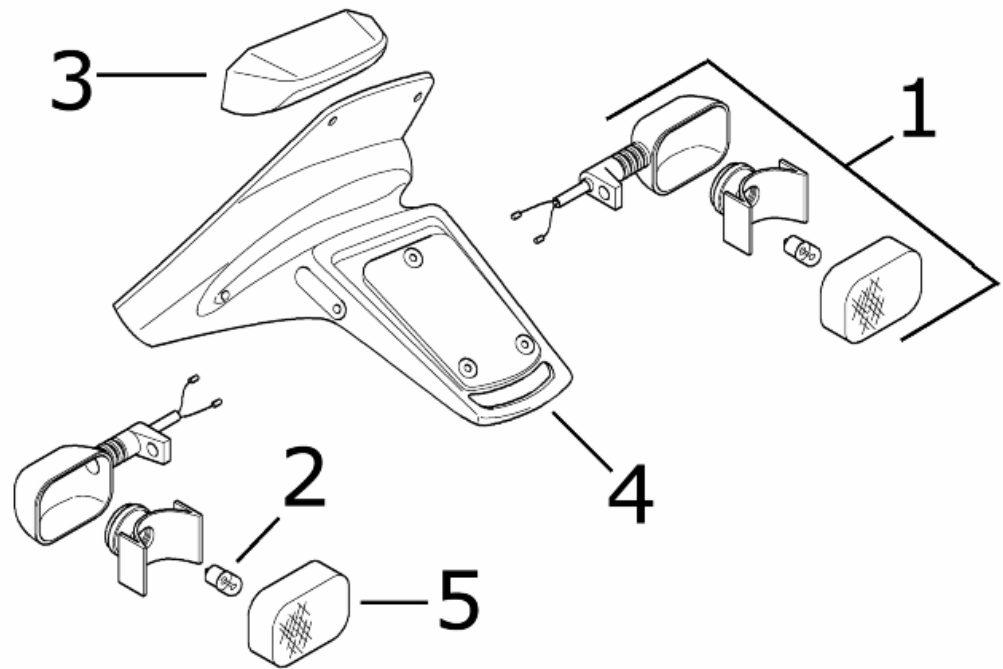
**CENTRAL COVER**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	004053	Spoiler - Replacement	
2	004178	Footrest - Replacement	
3	004011	Central chassis cover - Replacement	

**Underseat compartment****HELMET COMPARTMENT**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	004059	Spark plug inspection flap - Replacement	
2	004016	Helmet compartment - Replacement	
3	005046	Battery cover - Replacement	

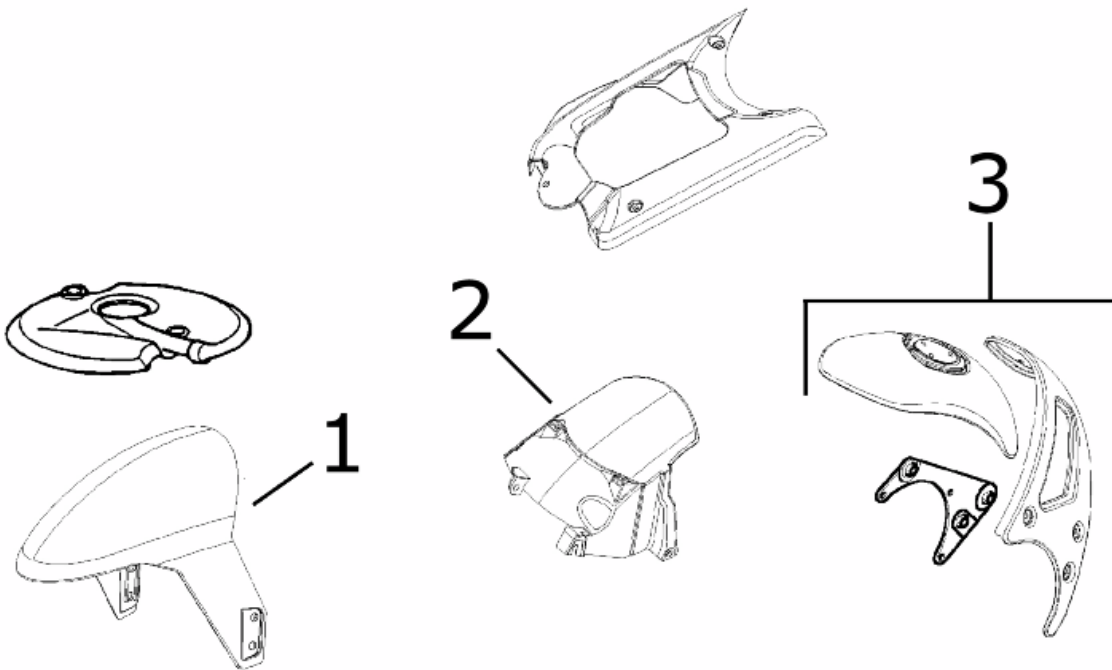
Plate holder



**LICENSE PLATE HOLDER**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	005022	Rear turn indicators - Replacement	
2	005068	Rear turn indicator bulb - Replacement	
3	005005	Taillight - Replacement	
4	005023	Rear tail light support - Replacement	
5	005091	Turn indicator glass - Replacement	

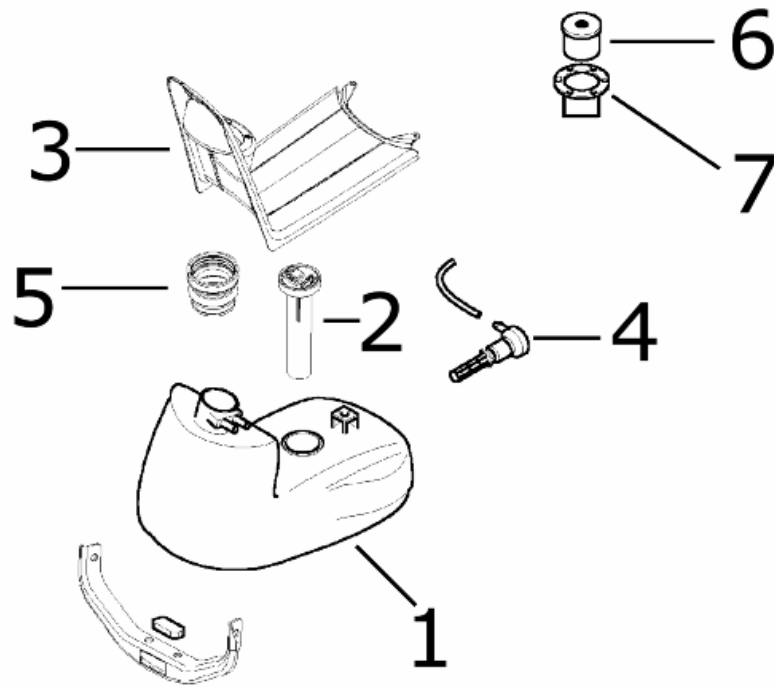
## Mudguard



### MUDGUARDS

	Code	Action	Duration
1	004009	Rear mudguard - Replacement	
2	004052	Bumper - Replacement	
3	004002	Front mudguard - Replacement	

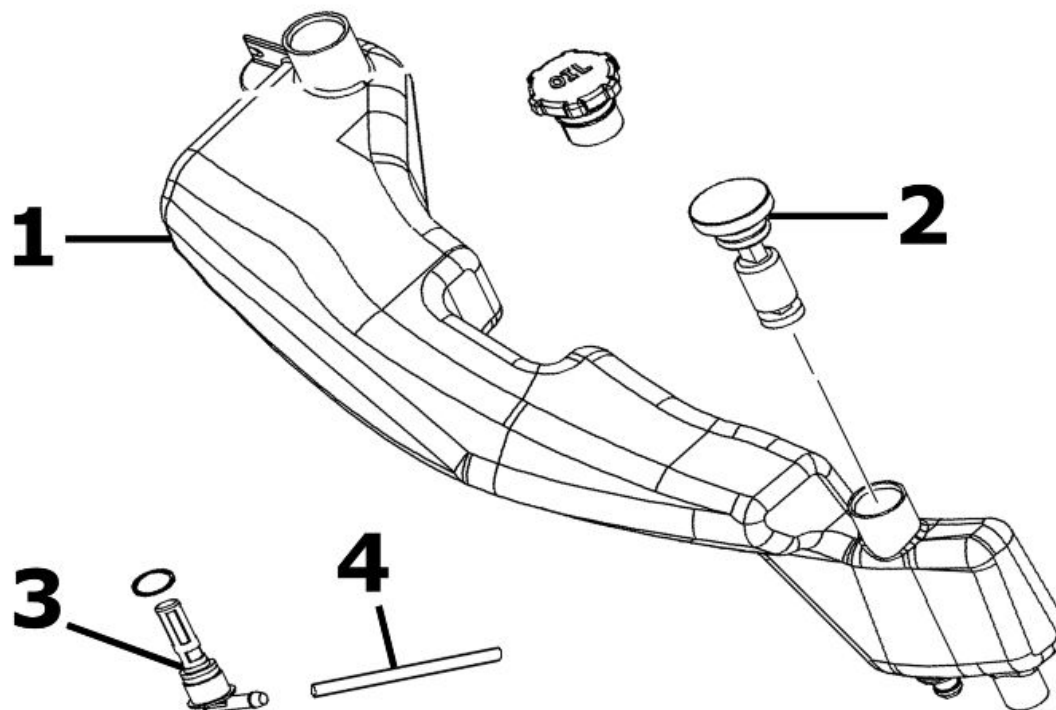
Fuel tank



**FUEL TANK**

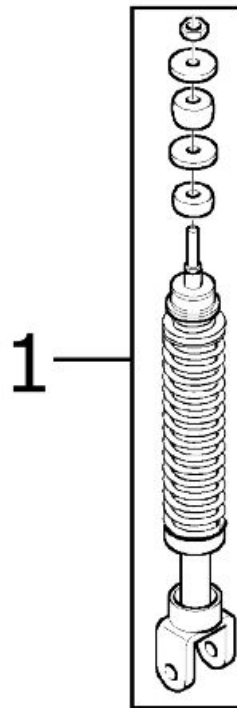
	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	004005	Fuel tank - Replacement	
2	005010	Tank float - Replacement	
3	004011	Central chassis cover - Replacement	
4	004072	Fuel filter - Replacement	
5	004110	Fuel tank hose - Replacement	
6	004168	Fuel tank cap - Replacement	
7	004170	Tank filler neck - Replacement	

## 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	

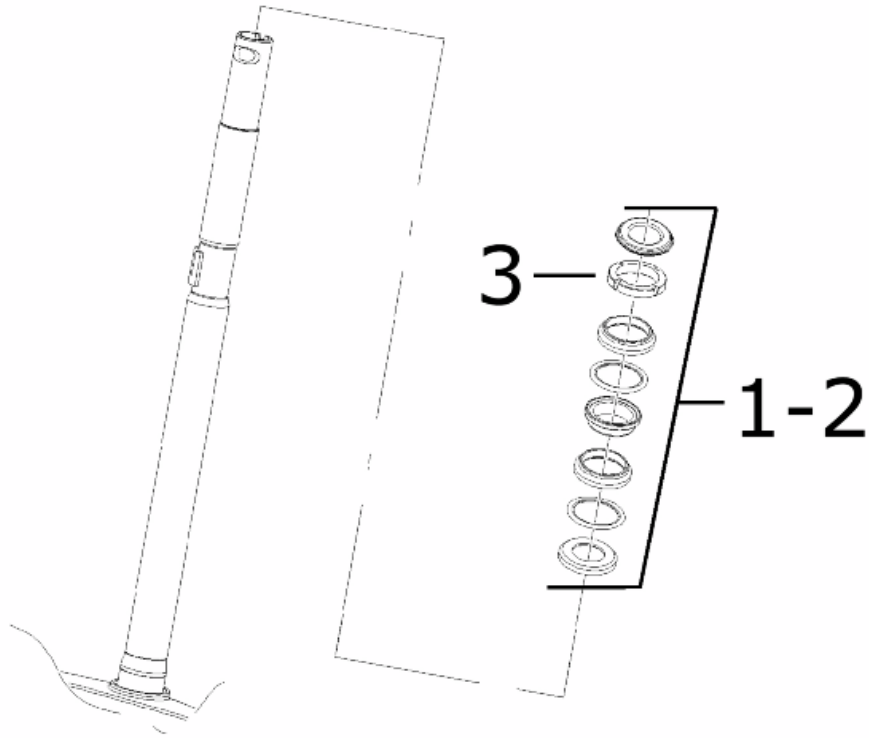
Rear shock-absorber



REAR SHOCK ABSORBER

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	003007	Rear shock absorbers - Replacement	

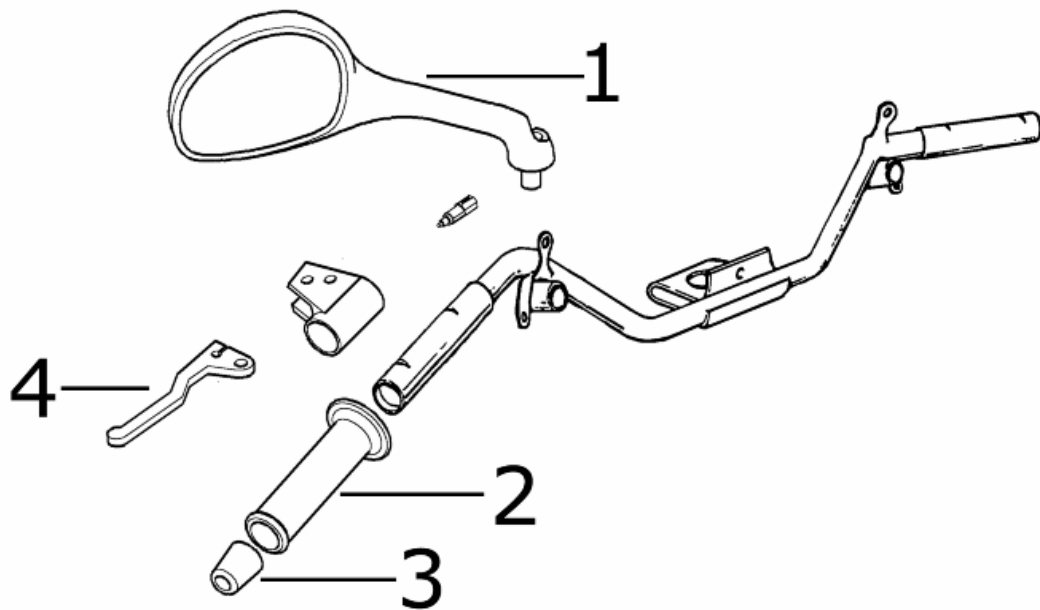
## Steering column bearings



### STEERING FIFTH WHEELS

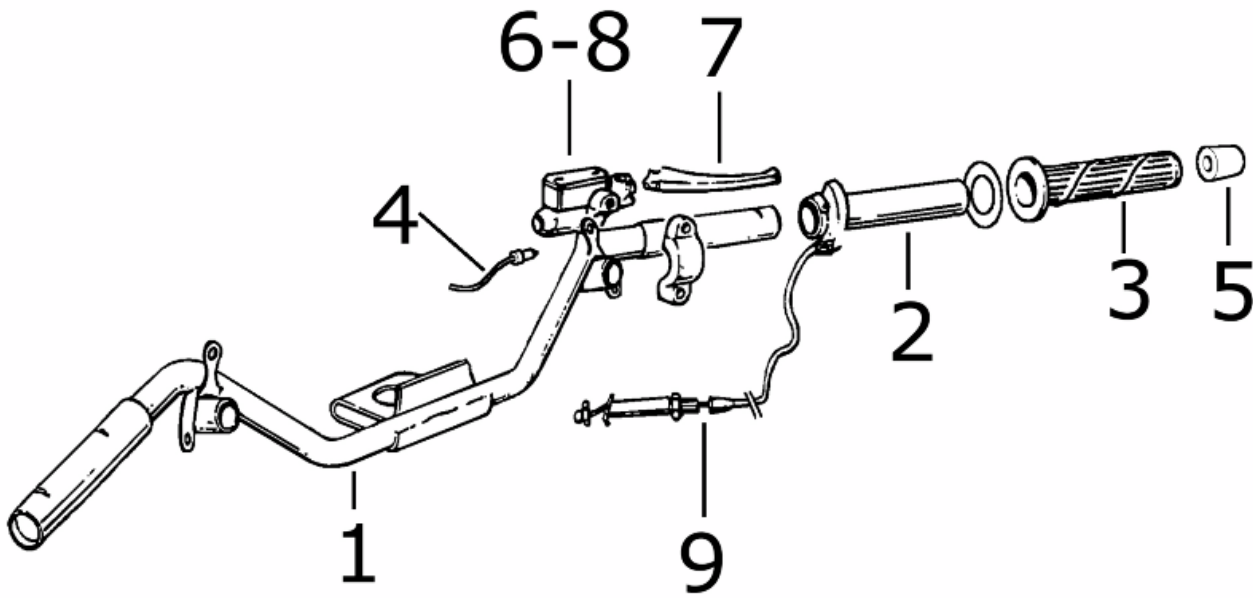
	Code	Action	Duration
1	003002	Steering fifth wheel - Replacement	
2	003073	Steering clearance - Adjustment	
3	004119	Bearing / upper steering fifth wheel - Replacement	

---

**Handlebar components****LHS HANDLEBAR COMPONENTS**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	004066	Rear-view mirror - Replacement	
2	002071	Left hand grip - Replacement	
3	003059	Counterweight - Replacement	
4	002037	Brake or clutch lever - Replacement	

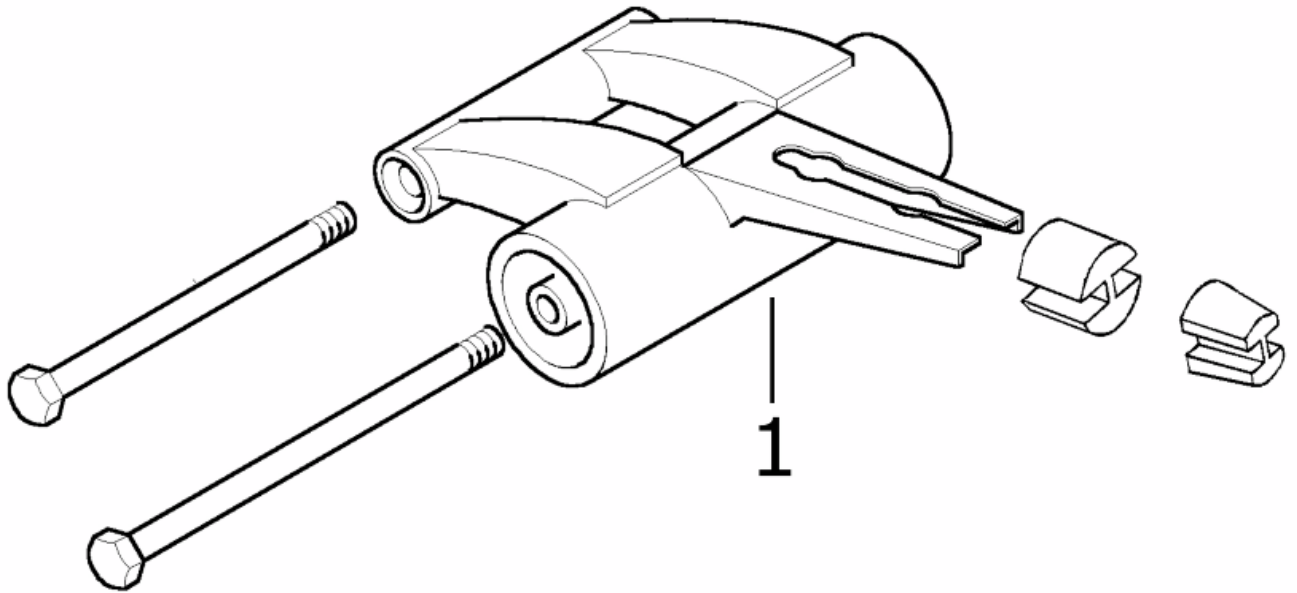
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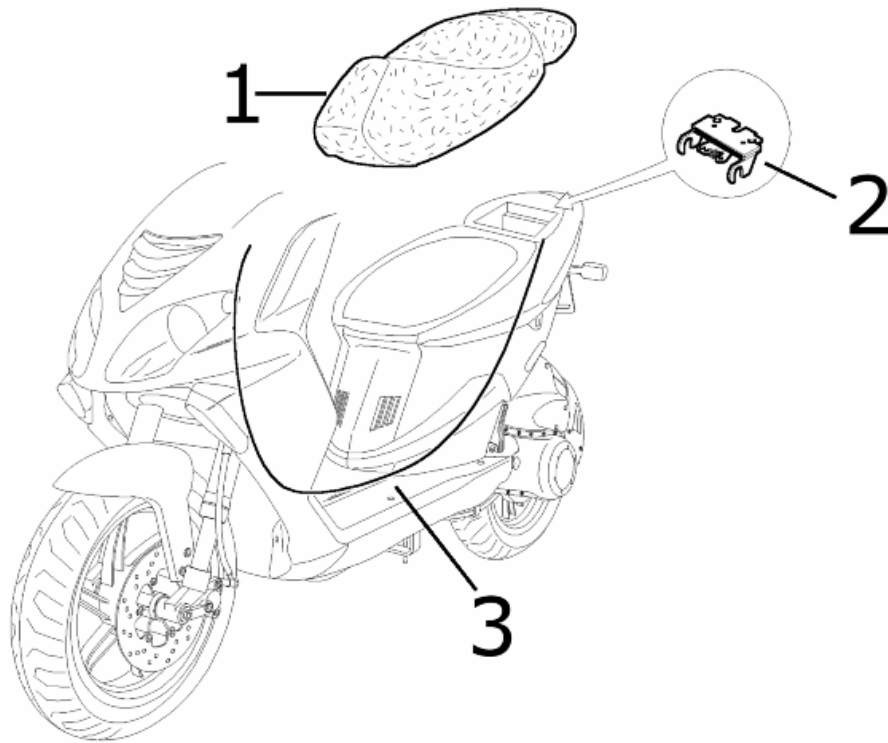
**HANDLEBAR COMPONENTS**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	003001	Handlebar - Replacement	
2	002060	Complete throttle control - Replacement	
3	002059	Right hand grip - Replacement	
4	005017	Stop switch - Replacement	
5	003059	Counterweight - Replacement	
6	002024	Front brake pump - replace	
7	002037	Brake or clutch lever - Replacement	
8	002047	Front brake fluid and air bleeding system - Replacement	
9	003061	Accelerator transmission - Adjustment	

Swing-arm

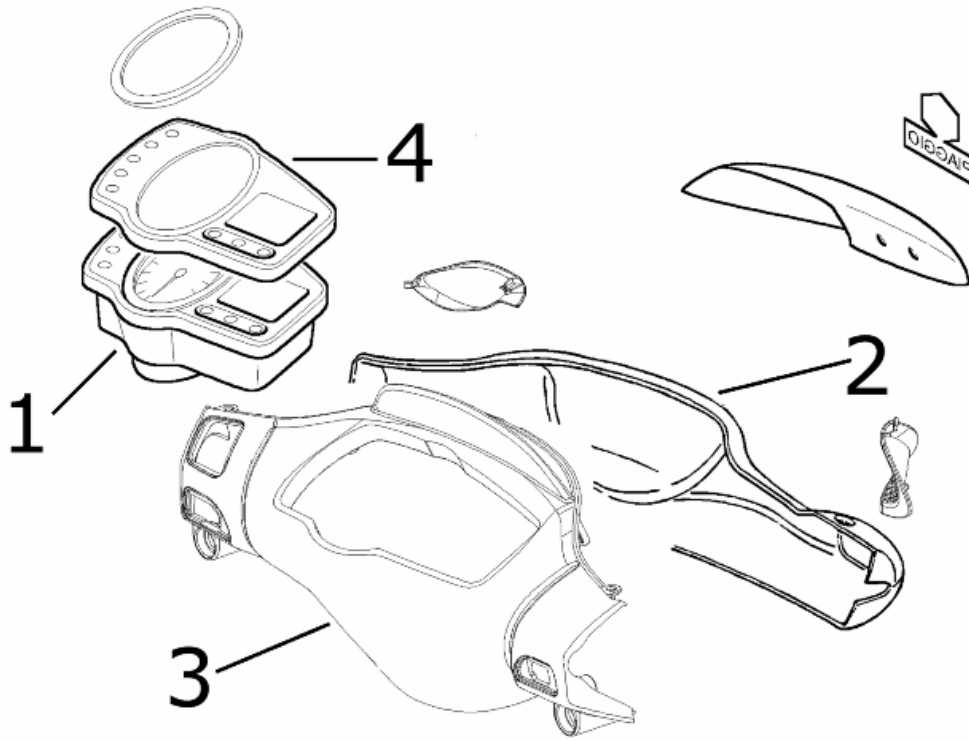


<u>SWINGING ARM</u>			
	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	001072	Engine / frame swinging arm fitting - Replacement	

**Seat**

<u>SEAT</u>			
	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	004003	Saddle - Replacement	
2	004054	Seat lock hook - Replacement	
3	002083	Saddle opening transmission - Replacement	

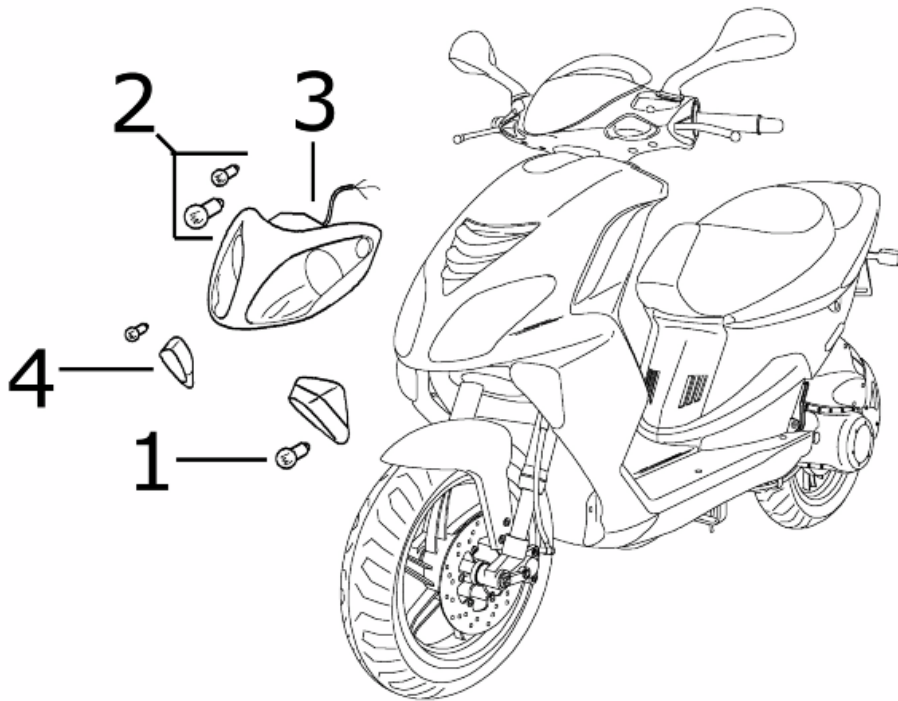
**Instrument panel**



**INSTRUMENT UNIT AND HANDLEBAR COVER**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	005014	Odometer - Replacement	
2	004018	Handlebar front section - Replacement	
3	004019	Handlebar rear section - Replacement	
4	005078	Odometer glass - Replacement	

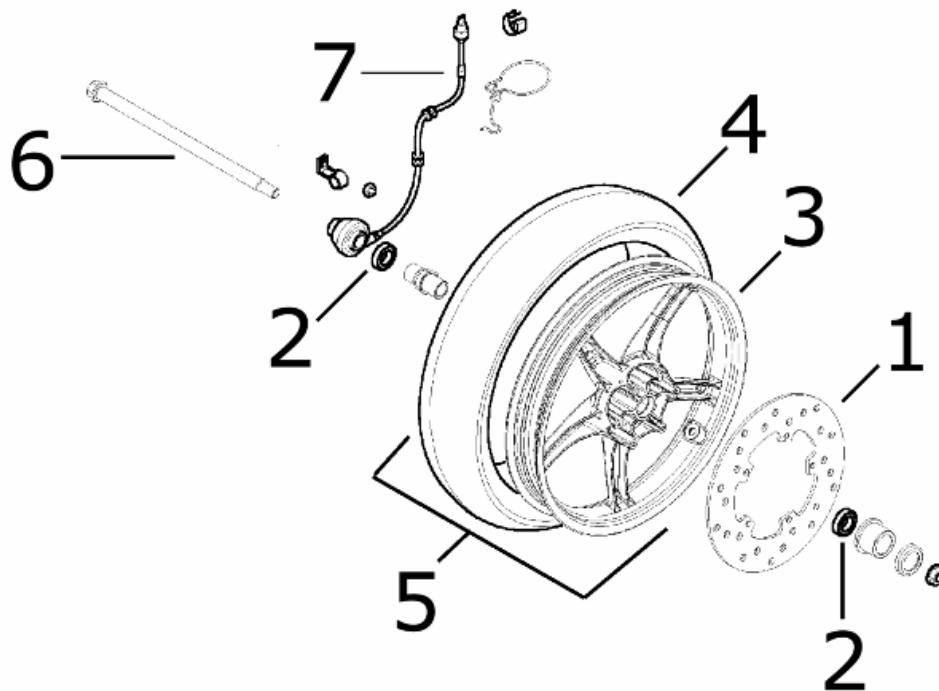
## Turn signal lights



### FRONT LIGHT

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	005067	Front turn indicator bulb - Replacement	
2	005008	Front headlamp bulbs - Replacement	
3	005002	Front headlamp - change	
4	005012	Front turn indicator - Replacement	

Front wheel



FRONT WHEEL

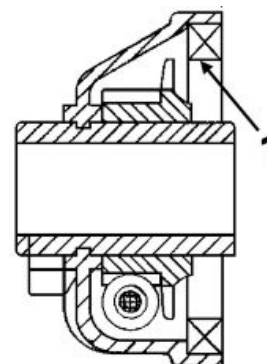
	Code	Action	Duration
1	002041	Front brake disc - Replacement	
2	003040	Front wheel bearings - Replacement	
3	003037	Front wheel rim- Replacement	
4	003047	Front tyre - Replacement	
5	004123	Front wheel - Replacement	
6	003038	Front wheel axle - Replacement	
7	005089	Tone wheel - Replacement	

**Grease tone wheel or drive**

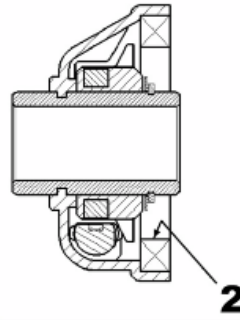
Please take note that the code has been introduced:

900001 - Tone wheel / drive greasing - 15'

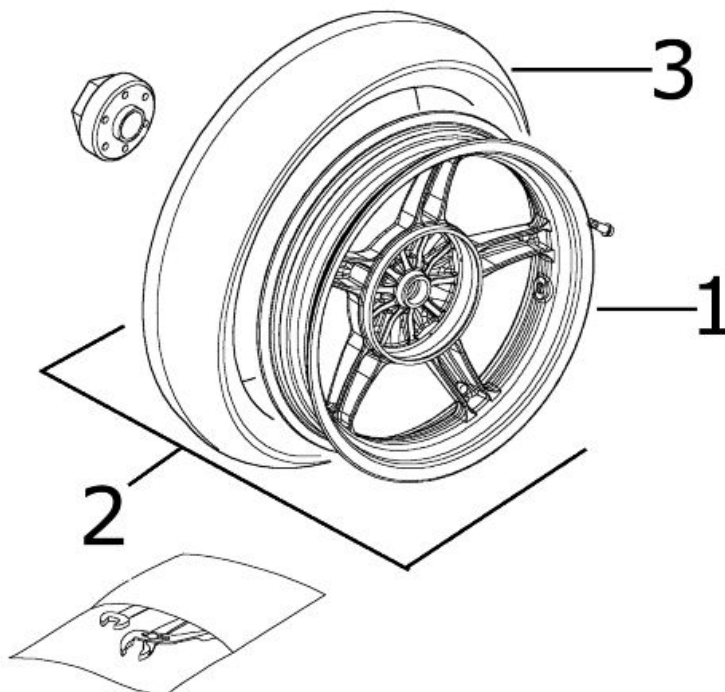
Never mistake the codes 002011 (movement sensor replacement) and 005089 (tone wheel replacement) in the event of noise of the indicated components. The grease recommended is TUTE-LA MRM 2 (soap-based lithium grease with Molybdenum disulphide).



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



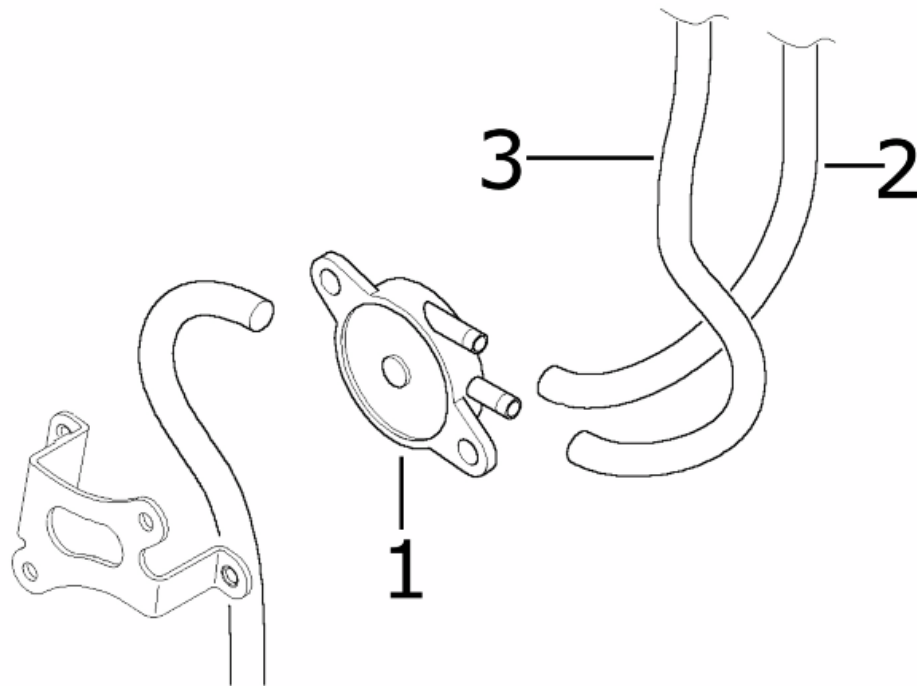
**Rear wheel**



**REAR WHEEL**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	001071	Rear wheel rim - Replacement	
2	001016	Rear wheel - Replacement	
3	004126	Rear wheel tyre - Replacement	

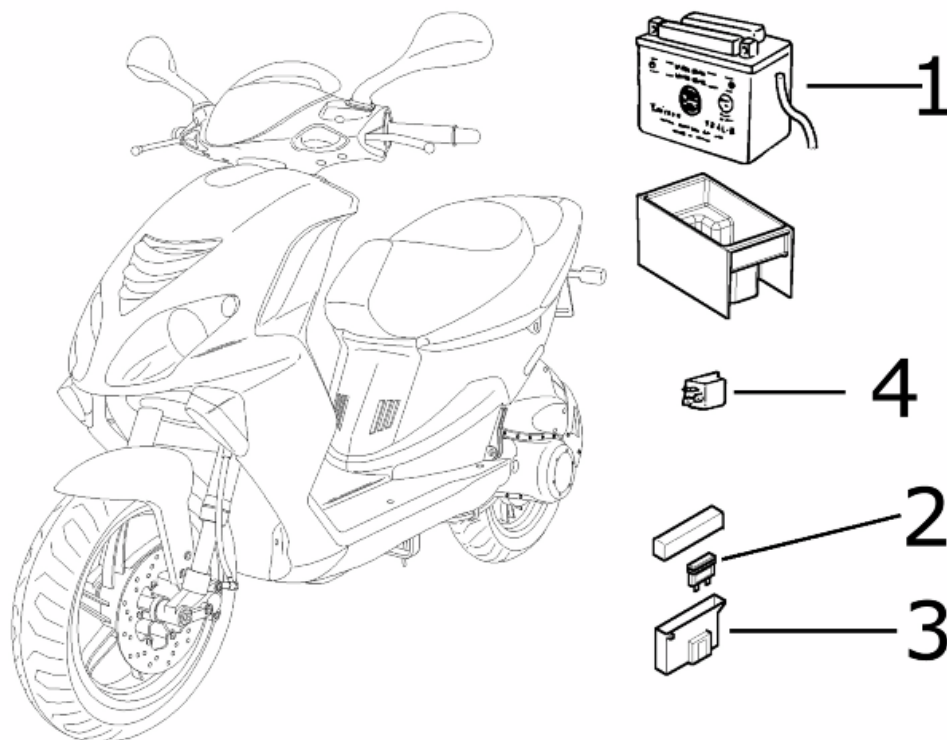
Fuel pump



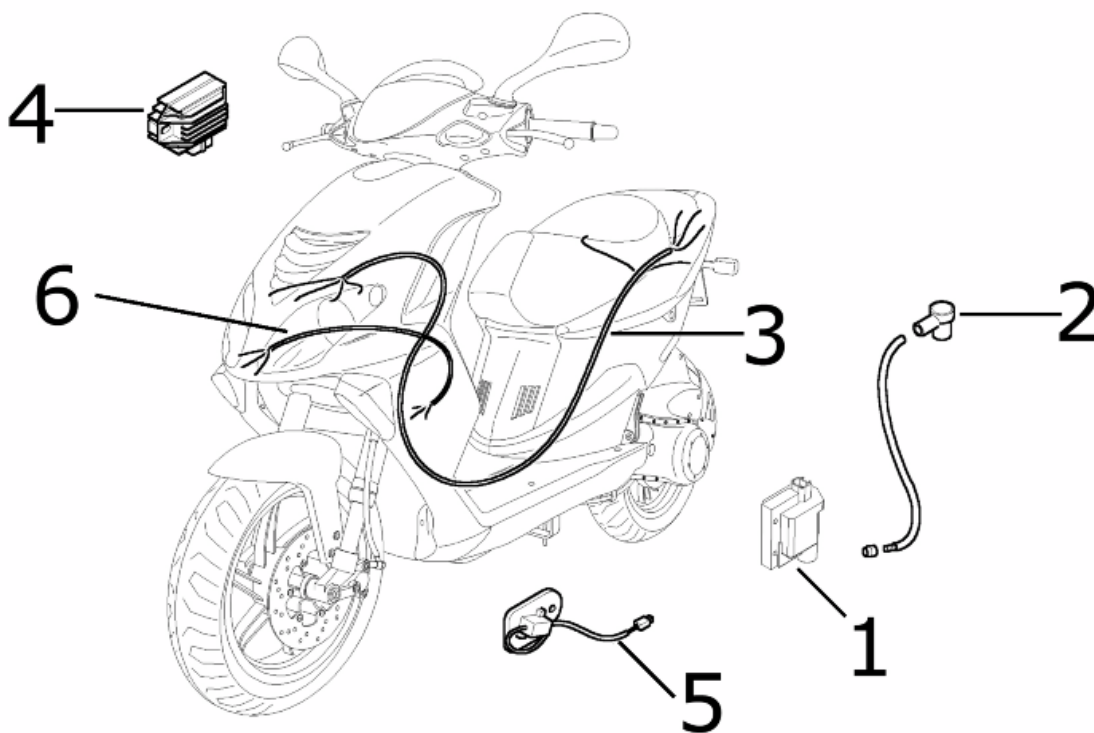
FUEL PUMP

	Code	Action	Duration
1	004073	Fuel pump - Replacement	
2	004137	Pump / carburettor hose - Replacement	
3	004086	Petrol pump depression tube - Replacement	

## Electric devices

**BATTERY**

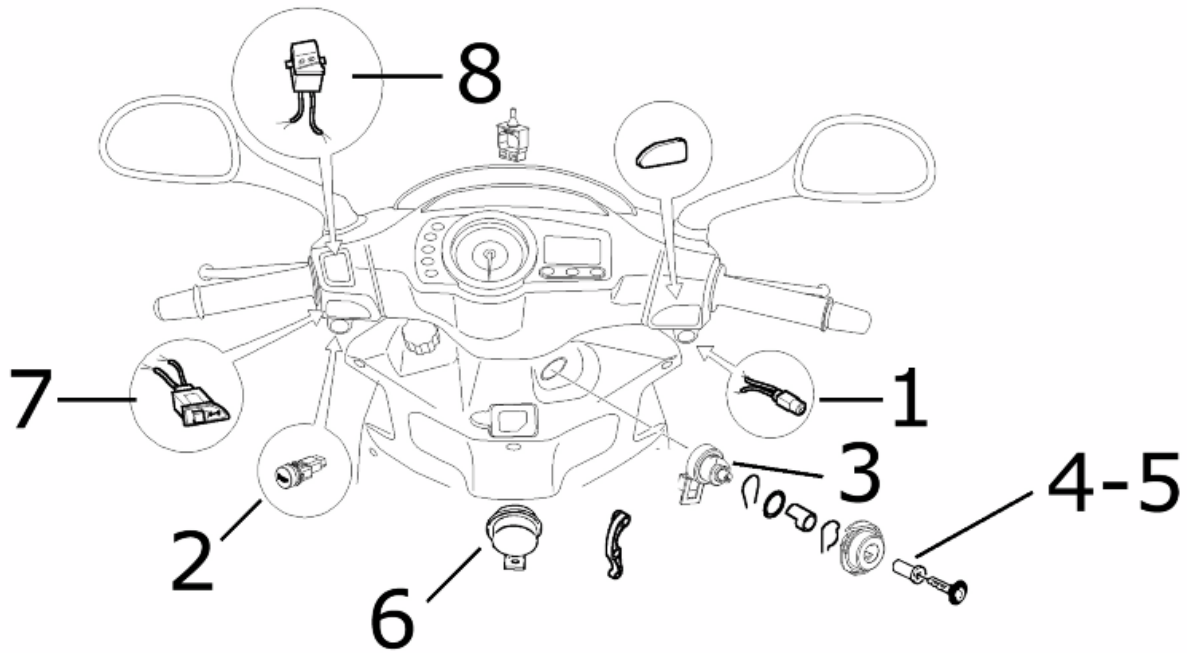
	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	005007	Battery - Replacement	
2	005024	Battery fuse - Replacement	
3	005025	Fuse holder - Replacement	
4	005011	Start-up remote control switch - Replacement	



**ELECTRICS**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	001023	Control unit - Replacement	
2	001094	Spark plug cap - Replacement	
3	005001	Electrical system - Replacement	
4	005009	Voltage regulator - replace	
5	005136	Resistance - Replacement	
6	005044	Front lights cable unit- Replacement	

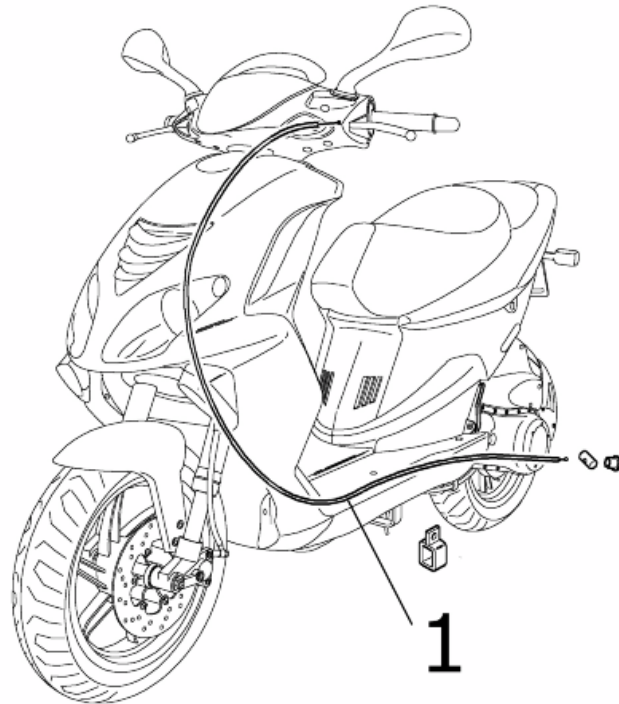
## Electronic controls



### ELECTRICAL COMMANDS

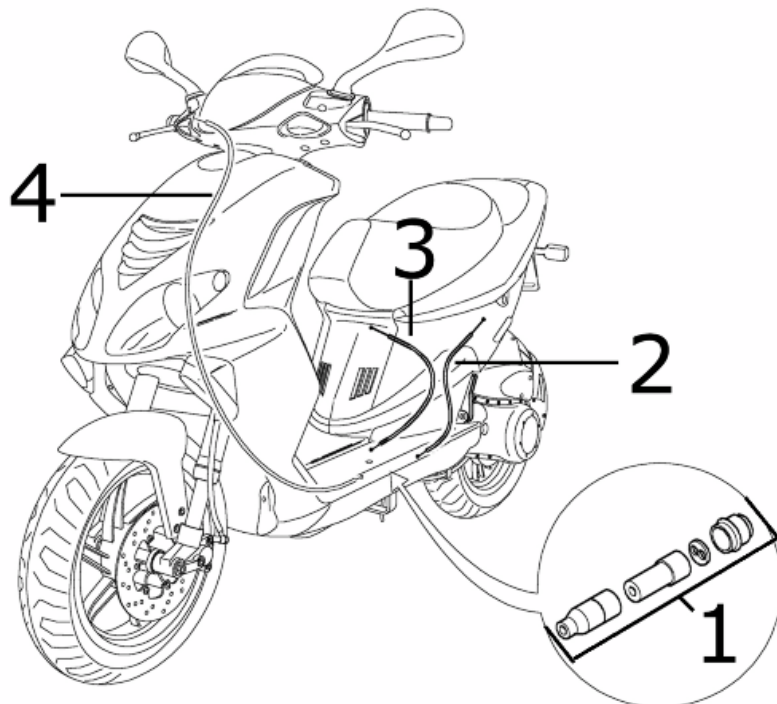
	Code	Action	Duration
1	005041	Starter button - Replacement	
2	005040	Horn button - Replacement	
3	005016	Key switch - Replacement	
4	004096	Lock series - Replacement	
5	004010	Antitheft lock - replace	
6	005003	Horn - Replacement	
7	005006	Light or turn indicator switch - Replacement	
8	005039	Headlight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

Transmissions



**REAR BRAKE TRANSMISSIONS AND ODOMETER**

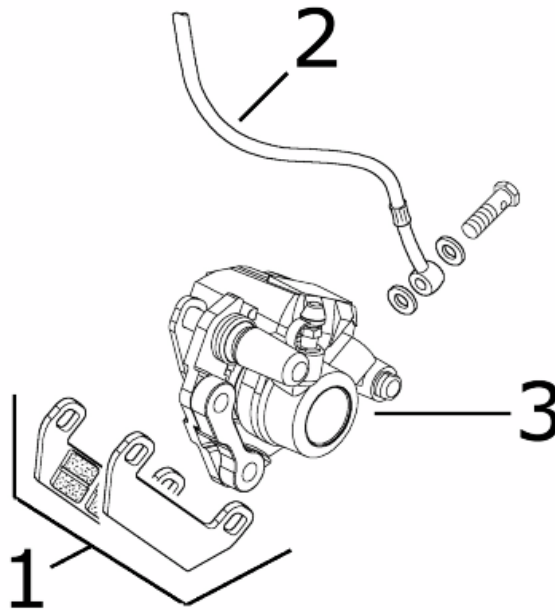
	Code	Action	Duration
1	002053	Rear brake transmission complete - Replacement	



**SPLITTER**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
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	

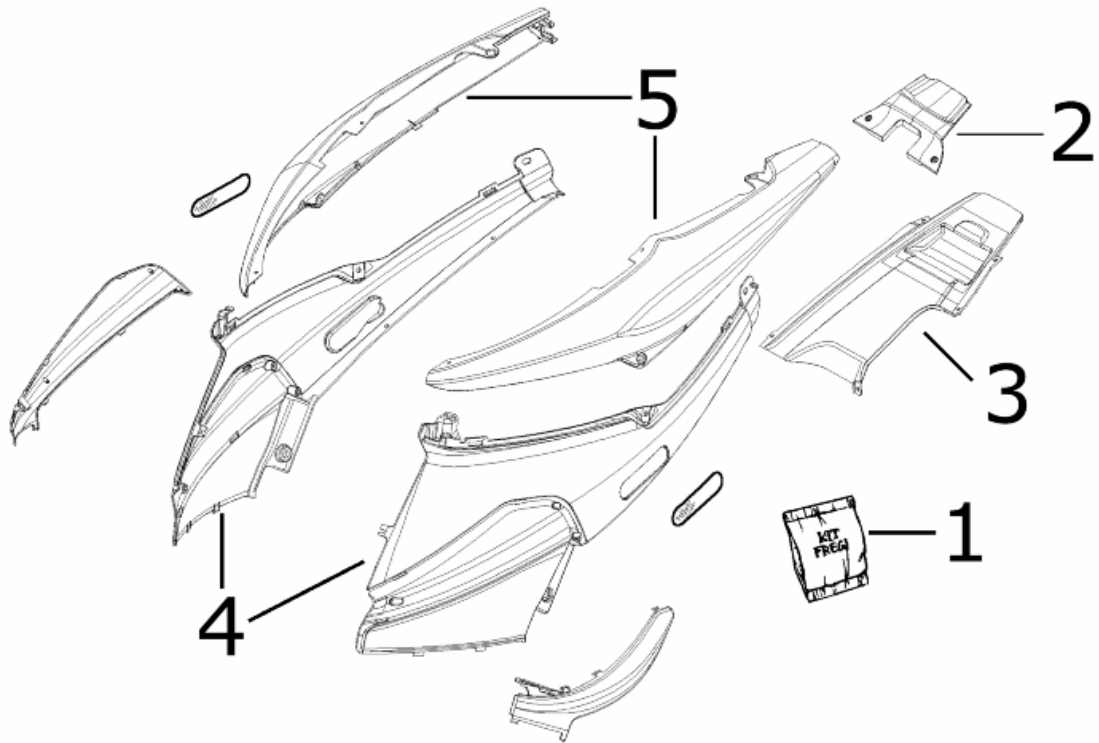
**Brake callipers**



**FRONT CALLIPER**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	002007	Front brake pads - Replacement	
2	002021	Front brake piping - Replacement	
3	002039	Front brake calliper - Replacement	

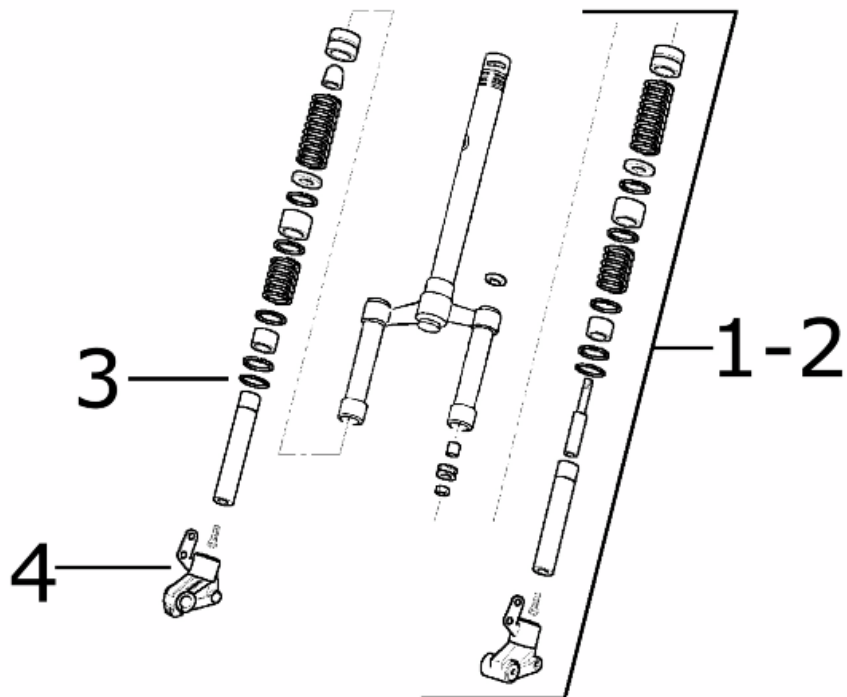
Rear side fairings



**REAR COVERS**

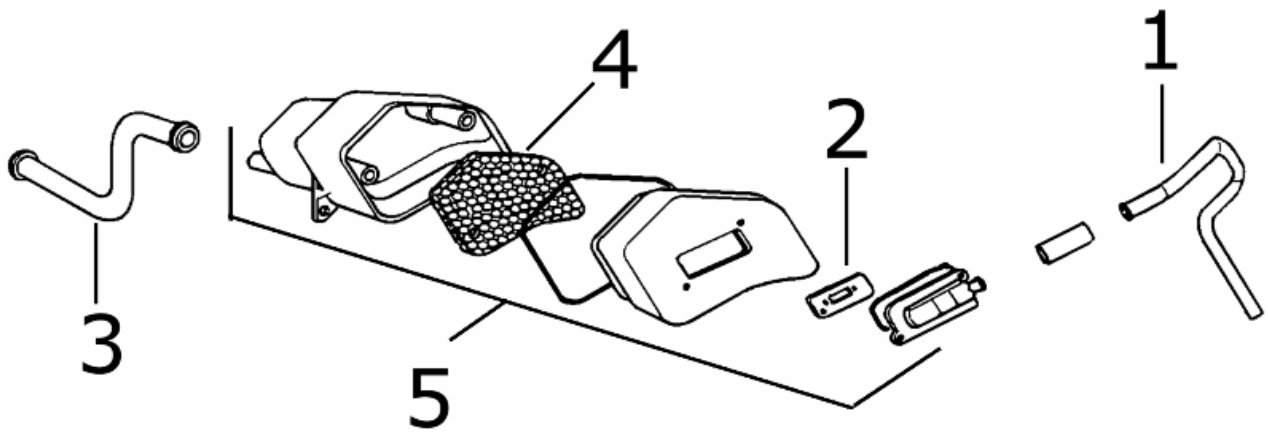
	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	004159	Plates / Stickers - Replacement	
2	004056	Upper rear light cover - Replacement	
3	004036	Lower chassis cover - Replacement	
4	004085	Fairing (1) - Replacement	
5	004129	Rear fairing - Replacement	

## Front suspension



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

**Secondary air box**



**SECONDARY AIR SYSTEM**

	<b>Code</b>	<b>Action</b>	<b>Duration</b>
1	001163	Muffler secondary air connection - Replacement	
2	001165	Secondary air reed - Replacement	
3	001164	Crankcase secondary air connection - Replacement	
4	001161	Secondary air filter - Replacement / Cleaning	
5	001162	Secondary air housing - Replacement	