SERVICE STATION MANUAL

664787-664795 (IT-EN-FR-DE-ES-PT-NL-EL)

Vespa S 50 2T

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

SERVICE STATION MANUAL
Vespa S 50 2T

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

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

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

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

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

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

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

INDEX OF TOPICS

INDEX OF TOPICS

Rules

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

Safety rules

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

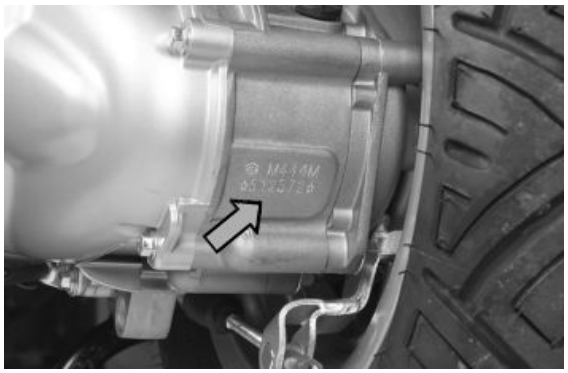
Maintenance rules

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

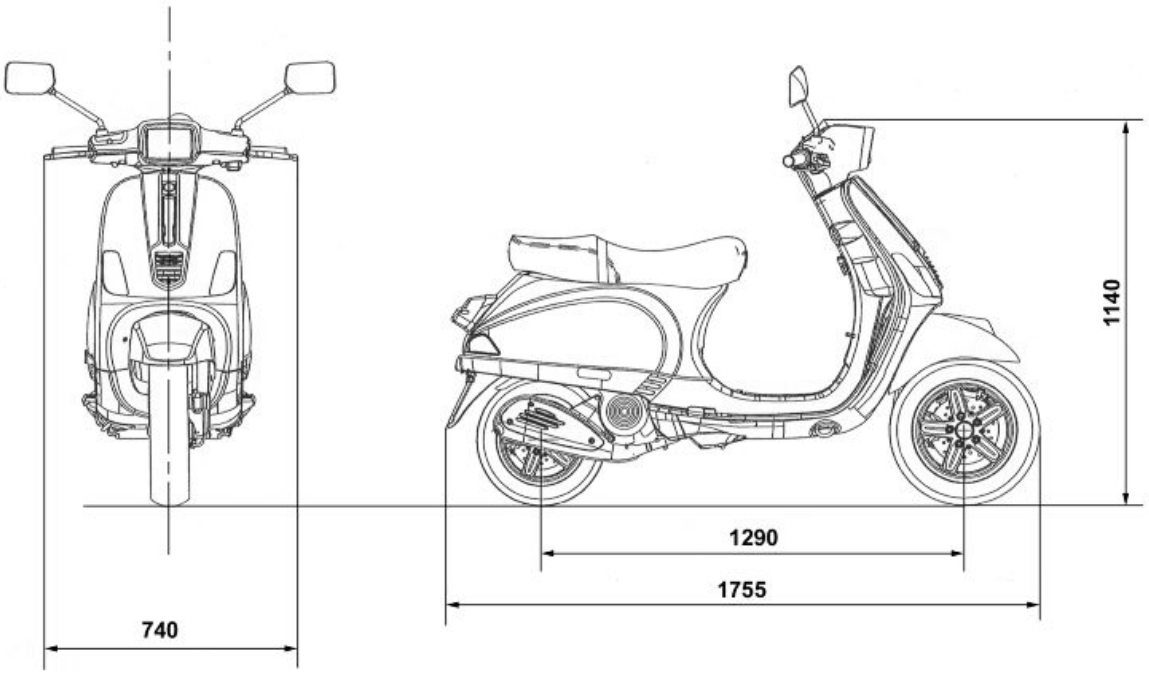
Vehicle identification

Chassis prefix: ZAPC38103

Engine prefix: C381M



Dimensions and mass



WEIGHTS AND DIMENSIONS

Specification	Desc./Quantity
Kerb weight	96 ± 4 kg
Maximum weight allowed	290 kg
Maximum height	1.140 mm
Width	740 mm
Wheelbase	1.290 mm
Length	1.755 mm

Engine

ENGINE

Specification	Desc./Quantity
Type	single-cylinder, two-stroke
Cubic capacity	49 cm³
Bore x stroke	40 X 39.3 mm
Compression ratio	9.9 ± 0.5 : 1
Engine idle speed	1,800 ± 100 rpm
Timing system	-
Valve clearance	-
Max. Power	3.2 kW at 7,500 rpm
MAX. torque	4.4 Nm at 6,500 rpm
LUBRICATION	Engine lubrication carried out by fuel mixture oil.
Lubrication pressure	-
Minimum lubrication pressure (100° C)	-
Fuel supply	Carburettor: DELL'ORTO PHVA 17.5 RD
Cooling	Forced-air circulation cooling.
Fuel	Unleaded petrol (95 RON)
Exhaust muffler	absorption-type exhaust muffler with catalytic converter.
Emissions	EURO 2

Transmission

TRANSMISSION

Specification	Desc./Quantity
Transmission	Automatic expandable pulley variator with torque server, V belt, automatic centrifugal dry clutch.
Final reduction	Gear reduction unit in oil bath.

Capacities

CAPACITY

Specification	Desc./Quantity
Cooling system fluid	-
Transmission oil	80 cm3
Fuel tank (reserve)	~ 8.5 l (2 l)
Mixer oil reservoir (reserve)	~ 1.5 l (0.5 l)

Electrical system

ELECTRICAL SYSTEM

Specification	Desc./Quantity
Start-up	Electrical and kick start

Specification	Desc./Quantity
Ignition	Capacitive discharge ignition, with variable advance and separate HV coil.
Ignition advance	17º at 4,000 rpm
Spark plug	CHAMPION RN3C
Alternative spark plug	-
Battery	12V/9 Ah
Generator	-

Frame and suspensions

FRAME AND SUSPENSIONS

Specification	Desc./Quantity
Frame	Stamped plate body with welded structural reinforcements.
FRONT SUSPENSION	Single arm with helicoidal spring and single double-acting hydraulic shock absorber.
Front suspension travel	70.3 mm
Rear suspension	Double-acting shock absorber, adjustable to four positions at preloading.
Rear suspension travel	83 mm

Brakes

BRAKES

Specification	Desc./Quantity
Front brake	Ø 200 mm disc brake with hydraulic control activated by handlebar right-side lever.
Rear brake	Ø 110 mm drum brake with mechanical control activated by the handlebar left-side lever.

Wheels and tyres

WHEELS AND TYRES

Specification	Desc./Quantity
Wheel rim type	Light alloy rims.
Front rim	11" x 2.50
Rear rim	10" x 3.00
Front tyre	Tubeless, 110/70 - 11" 45L
Rear tyre	Tubeless, 120/70 - 10" 54L
Front tyre pressure (with passenger)	1.4 bar (-)
Rear tyre pressure (with passenger)	2.0 bar (-)

N.B.

CHECK AND ADJUST TYRE PRESSURE WITH TYRES AT AMBIENT TEMPERATURE. ADJUST PRESSURE ACCORDING TO THE WEIGHT OF RIDER AND ACCESSORIES.

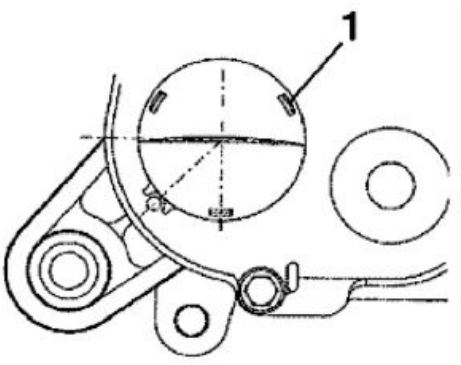
Secondary air

Follow these steps to clean the sponge filters of the secondary air system:

1) Remove the snap-on plastic cover (**1**) on the transmission cover using a small screwdriver as a lever on the retaining tongues in order to insert one of the three slots found on that cap.

2) Wash the polyurethane sponge with water and soap, dry all components with compressed air and refit to place. Refit the intake cap respecting the angle reference.

3) Undo the two fixing screws (**2**) on the aluminium cover of the secondary air housing in order to reach the polyurethane sponge inside that housing; clean as indicated in point 2) and refit all elements after checking the steel tab is not deformed and/or does not guarantee correct tightness at its fitting; 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

WHILE CARRYING OUT OPERATION 3), ALWAYS CHECK THE TWO RUBBER COUPLINGS (3) ON ONE END OF THE SECONDARY AIR PIPE FOR CORRECT TIGHTNESS AND CONTINUITY; IF NECESSARY, REPLACE THEM AND USE NEW CLAMPS TO FIX THEM.

Carburettor

50cc Version

Dell'Orto

DELLORTO CARBURETTOR

Specification	Desc./Quantity
Type	PHVA 17.5 RD
Diffuser diameter	Ø 17.5
Regulation reference number	8423
Maximum nozzle:	53
Maximum air nozzle (on the body):	Ø 1.5
Tapered pin stamped code:	A22
Pin position (notches from above):	1
Diffuser:	209 HA

Specification	Desc./Quantity
Minimum nozzle:	32
Minimum air nozzle (on the body):	Free
Initial minimum mix screw opening:	1 1/2
Starter jet	50
Starter air nozzle (on the body):	Ø 1.5
Stroke of starter pin:	11 mm
Gasoline inlet hole	Ø 1.5

Tightening Torques

FRONT BRAKE

Name	Torque in Nm
Brake fluid pump-hose fitting	8 ÷ 12
Brake fluid pipe-calliper fitting	20 ÷ 25
Screw tightening calliper to the support	20 ÷ 25
Brake disc screws	8 ÷ 10
Circuit bleed calliper fitting	20 ÷ 25
Handlebar pump	7 ÷ 10

FRONT SUSPENSION

Name	Torque in Nm
Upper shock absorber fixing nut	20-30
Front wheel axle nut	75 ÷ 90
Shock absorber upper bracket bolts	20 ÷ 25
Wheel rim screws	20 ÷ 25
Lower shock absorber clamping screw	20 - 27

STEERING ASSEMBLY

Name	Torque in Nm
Steering upper ring nut	35 ÷ 40
Steering lower ring nut	8 ÷ 10
Handlebar fixing screw	50 ÷ 55

ENGINE ASSEMBLY

Name	Torque in Nm
Clutch bell nut (**)	40 ÷ 44
Clutch lock ring nut	55 ÷ 60
Nut locking driving pulley on crankshaft (**)	40 ÷ 44 Nm
Start-up lever screw	12 ÷ 13
Flywheel nut (**)	40 ÷ 44
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

FRAME ASSEMBLY

Name	Torque in Nm
Swinging arm to engine pin locknut	33 ÷ 41
Swinging arm to chassis pin locknut	44 ÷ 52
Shock absorber to chassis fixing nut	20 ÷ 25
Swinging arm plate to chassis screw	33 ÷ 41
Shock absorber to engine fixing nut	33 ÷ 41
Rear wheel nut	137 ÷ 152
Stand screw torque	18.5 to 19 Nm
Side stand fixing screw	12 ÷ 20
Side stand bracket fixing screw	15 ÷ 20

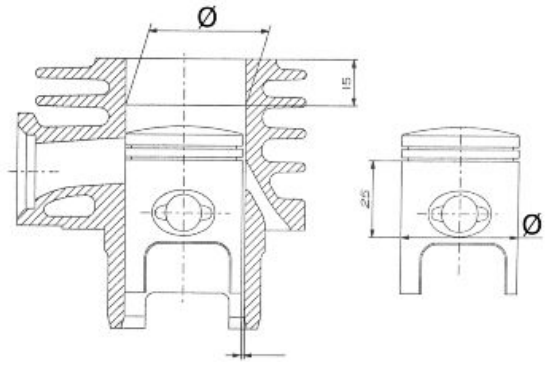
Overhaul data

Assembly clearances

Cylinder - piston assy.

COUPLING BETWEEN PISTON AND CYLINDER

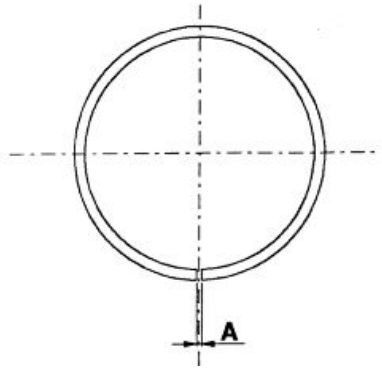
Name	Initials	Cylinder	Piston	Play on fitting
Standard coupling	M	40.005 - 40.012	39.943 - 39.95	0.055 - 0.069
Standard coupling	N	40.012 - 40.019	39.95 - 39.957	0.055 - 0.069
Standard coupling	O	40.019 - 40.026	39.957 - 39.964	0.055 - 0.069
Standard coupling	P	40.026 - 40.033	39.964 - 39.971	0.055 -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



Piston rings

SEALING RING

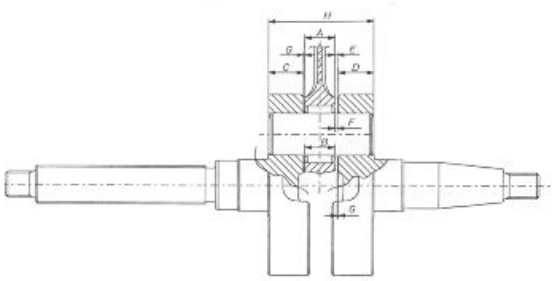
Name	Description	Dimensions	Initials	Quantity
Compression ring		40	A	0.10 to 0.25
Compression ring 1st oversize		40.2	A	0.10 to 0.25
Compression ring 2nd Oversize		40.4	A	0.10 to 0.25



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

This type of engines foresees the use of one size of basic gaskets.

Products

RECOMMENDED PRODUCTS TABLE

Product	Description	Specifications
AGIP ROTRA 80W-90	Rear hub oil	SAE 80W/90 Oil that exceeds the requirements of API GL3 specifications
AGIP 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 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.
AGIP GREASE SM 2	Grease for odometer transmission gear case	Lithium grease with NLGI 2 molybdenum disulphide; ISO-L-XBCHB2, DIN KF2K-20
AGIP GP 330	Grease for brake control levers, throttle, stand	White calcium complex soap-based spray grease with NLGI 2; ISO-L-XBCIB2

UNIT OF MEASUREMENT - CONVERSION - ENGLISH SYSTEM AND INTERNATIONAL SYSTEM (IS).

Specification	Desc./Quantity
1 Inch (in)	25.4 Millimetres (mm)
1 Foot (ft)	0.305 Meter (m)
1 Mile (mi)	1.609 Kilometre (km)
1 US Gallon (US gal)	3.785 Litre (l)
1 Pound (lb)	0.454 Kilogram (Kg)
1 Cubic inch (in^3)	16.4 Cubic centimetres (cm^3)
1 Foot pound (ft lb)	1.356 Newton meter (Nm)
1 Miles per hour (mi/h)	1.602 Kilometres per hour (km/h)
1 Pound per square inch (PSI)	0.069 (bar)
1 Fahrenheit (°F)	32+(9/5) Celsius (°C)

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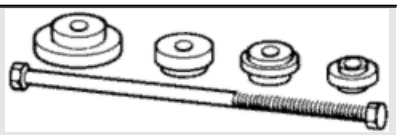
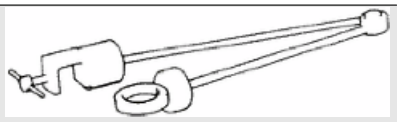
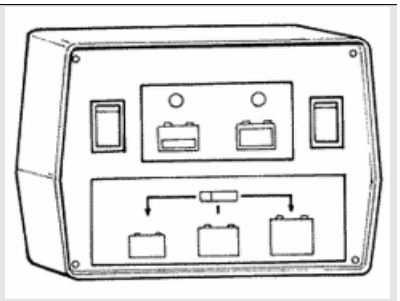
TOOLS

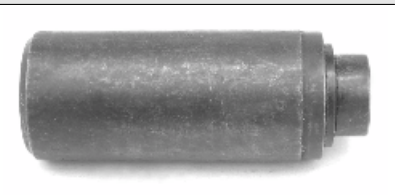
Stores code	Description	
001330Y	Tool for fitting steering seats	
001467Y006	Pliers to extract 20 mm bearings	
001467Y009	Driver for OD 42-mm bearings	
001467Y013	Pliers to extract ø 15-mm bearings	
001467Y014	Pliers to extract ø 15-mm bearings	
001467Y017	Bell for bearings, OD 39 mm	
002465Y	Pliers for circlips	

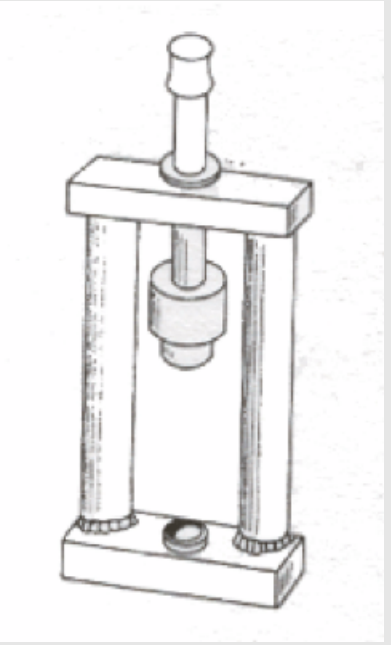
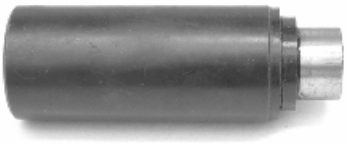
Stores code	Description	
006029Y	Punch for fitting fifth wheel seat on steering tube	
020004Y	Punch for removing fifth wheels from headstock	
020055Y	Wrench for steering tube ring nut	
020150Y	Air heater support	
020151Y	Air heater	
020162Y	Flywheel extractor	
020163Y	Crankcase splitting plate	

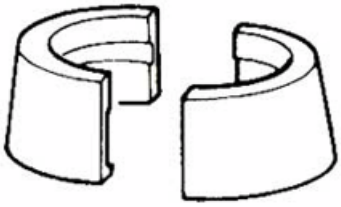
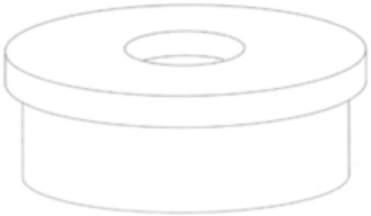
Stores code	Description	
020166Y	Pin lock fitting tool	
020261Y	Starter spring fitting	
020265Y	Bearing fitting base	
020325Y	Brake-shoe spring calliper	
020329Y	MityVac vacuum-operated pump	
020330Y	Stroboscopic light to check timing	

Stores code	Description	
020331Y	Digital multimeter	
020332Y	Digital rev counter	
020333Y	Single battery charger	
020334Y	Multiple battery charger	

Stores code	Description	
020335Y	Magnetic support for dial gauge	
020350Y	Electrical system check instrument	
020359Y	42x47-mm adaptor	
020376Y	Adaptor handle	
020412Y	15 mm guide	

Stores code	Description	
020456Y	Ø 24 mm adaptor	
020565Y	Flywheel lock calliper spanner	
001467Y029	Bell for bearings, O.D. 38 mm	
020037Y	Punch	
020036Y	Punch	

Stores code	Description	
020021Y	Front suspension service tool	
020038Y	Punch	
020074Y	Support base for checking crankshaft alignment	
004499Y001	Bearing extractor bell	
004499Y006	Bearing extractor ring	

Stores code	Description	
004499Y002	Bearing extractor screw	
004499Y007	Half rings	
020171Y	Punch for driven pulley roller bearing	
020340Y	Flywheel and transmission oil seals fitting punch	
020360Y	Adaptor 52 x 55 mm	
020358Y	37x40-mm adaptor	
020362Y	12 mm guide	

Stores code	Description	
020363Y	20 mm guide	
020365Y	22 mm guide	
020439Y	17 mm guide	
020441Y	26 x 28 mm adaptor	
020452Y	Tube for removing and refitting the driven pulley shaft	

Stores code	Description	
020451Y	Starting ring gear lock	
020444Y	Tool for fitting/ removing the driven pulley clutch	

INDEX OF TOPICS

Maintenance chart

EVERY 2 YEARS

Action
Brake fluid - change

AFTER 1,000 KM

50'

Action
Hub oil - change
Oil mixer/throttle linkage - adjustment
Odometer gear - greasing
Steering - Check
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 5,000 KM; 25,000 KM; 35,000 KM AND 55,000 KM

40'

Action
Hub oil - 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 - check
Electrical system and battery - check
Tyre pressure and wear - check
Vehicle and brake test - road test

AFTER 10,000 KM; 50,000 KM

95'

Action
Hub oil - change
Spark plug - replacement
Air filter - clean
Idling speed (*) - adjustment
Oil mixer/throttle linkage - adjustment
Variable speed rollers - replacement
Odometer gear - greasing
Driving belt - checking
Steering - Check
Brake control levers - greasing
Brake pads - check condition and wear
Brake fluid - 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 the «Idle speed adjustment» section

AFTER 15,000 KM AND 45,000 KM

Action
Hub oil - check
Spark plug - replacement
Air filter - cleaning
Oil mixer/throttle linkage - adjustment
Driving belt - replacement
Brake control levers - greasing
Brake pads - check condition and wear
Brake fluid - check
Electrical system and battery - check
Tyre pressure and wear - check
Secondary air filter - cleaning
Vehicle and brake test - road test

AFTER 20,000 KM AND 40,000 KM

Action
Hub oil - change
Spark plug - replacement
Air filter - clean
Idling speed (*) - adjustment
Cylinder cooling system - check/cleaning
Oil mixer/throttle linkage - adjustment
Driving belt - checking
Variable speed rollers - replacement
Mixer belt - replacement
Odometer gear - greasing
Steering - Check
Brake control levers - greasing
Brake pads - check condition and wear
Brake fluid - 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 the «Idle speed adjustment» section

AFTER 30,000 KM

Action
Hub oil - change
Spark plug - replacement
Air filter - clean
Idling speed (*) - adjustment
Oil mixer/throttle linkage - adjustment
Driving belt - replacement
Variable speed rollers - replacement
Odometer gear - greasing
Steering - Check
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
Secondary air filter - cleaning
Vehicle and brake test - road test

(*) See the «Idle speed adjustment» section

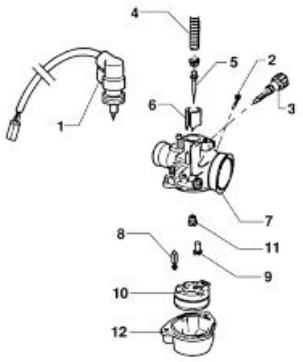
AFTER 60,000 KM

Action
Hub oil - change
Spark plug - 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 gear - greasing
Steering - Check
Brake control levers - greasing
Brake pads - check condition and wear
Brake fluid - check
Transmission elements - lubrication
Safety locks - check
Suspensions - check
Electrical system and battery - check
Headlight - adjustment
Tyre pressure and wear - check
Secondary air filter - cleaning
Vehicle and brake test - road test

(*) See the «Idle speed adjustment» section

Carburettor

- Disassemble the carburettor in its parts, wash all of them with solvent, dry all body grooves with compressed air to ensure adequate cleaning.
- Check carefully that the parts are in good condition.
-The **throttle valve** should move freely in the chamber. Replace valve in case of wear due to excessive clearance.
- If there are wear marks in the chamber causing inadequate tightness or a free valve slide (even if it is new), replace the carburettor.
- It is advisable to replace the gaskets at every refit.



WARNING

PETROL IS HIGHLY EXPLOSIVE ALWAYS REPLACE THE GASKETS TO AVOID PETROL LEAKS

1. Automatic starter - **2**. Idle air set screw - **3**. Idle speed set screw - **4**. Throttle valve spring - **5**. Throttle valve tapered pin - **6**. Throttle valve - **7**. Carburettor body - **8**. Pin - **9**. Min. jet - **10**. Float - **11**. Max. jet - **12**. Float chamber

Checking the spark advance

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

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

N.B.

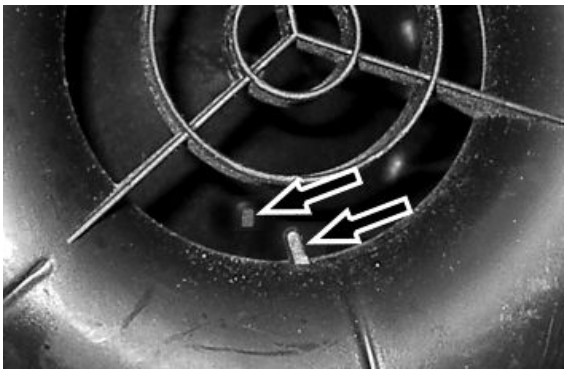
IN CASE OF MALFUNCTION, CARRY OUT THE CHECKS PROVIDED FOR IN THE ELECTRICAL SYSTEM CHAPTER.

CAUTION

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

Specific tooling

020330Y Stroboscopic light to check timing



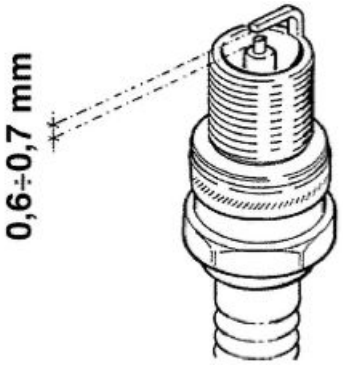
Spark plug

Place the vehicle on its central stand

- Remove the central cover, indicated in the figure, by undoing the 2 fixing screws;
- Disconnect the spark plug HV wire cap;
-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;
-Fit the cap on the sparking plug as far as it will go;
- Refit the central flap.



CAUTION

THE SPARK PLUG MUST BE REMOVED WHEN THE ENGINE IS COLD. REPLACE THE SPARK PLUG AS INDICATED IN THE SCHEDULED MAINTENANCE TABLE. USING NON-COMPLYING IGNITION CONTROL UNITS OR SPARK PLUGS OTHER THAN THOSE PRESCRIBED MAY SERIOUSLY DAMAGE THE ENGINE.

Characteristic

Spark plug

CHAMPION RN3C

Electric characteristic

Electrode gap

0.6 to 0.7 mm.

Locking torques (N*m)

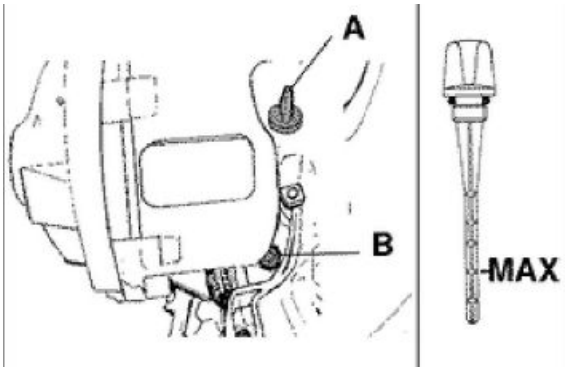
Spark plug **25 - 30 Nm**

Hub oil

Check

Do the following to check the correct level:

- Park the vehicle on its centre stand on flat ground;
- Unscrew the oil dipstick «**A**» and dry it with a clean cloth; then reinsert it, screwing it in all the way;
- Remove the dipstick and check that the oil level is slightly over the second notch starting from the lower end;
- Screw up the oil dipstick back in and make sure it is locked properly in place.

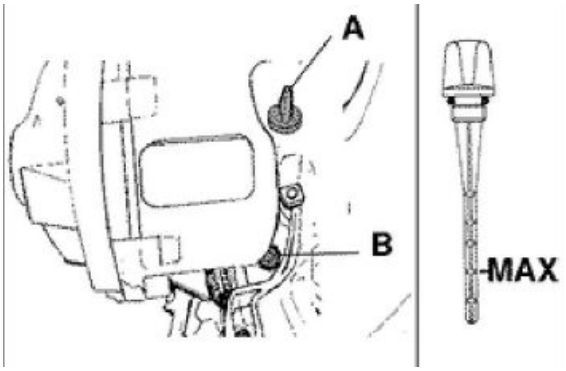


Replacement

-Remove the oil filler cap «**A**».

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

- Screw the drainage plug again to the prescribed torque and refill the hub with the recommended oil.



Recommended products

AGIP ROTRA 80W-90 Rear hub oil

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

Characteristic

Transmission oil

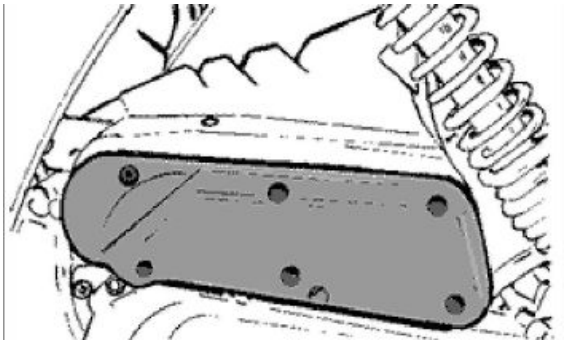
80 cm^3

Locking torques (N*m)

Hub oil drainage cap **3 ÷ 5**

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

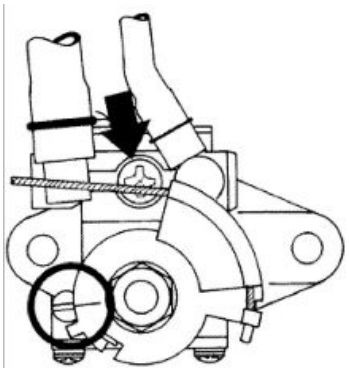
NEVER RUN THE ENGINE WITHOUT THE AIR FILTER, THIS WOULD RESULT IN AN EXCESSIVE WEAR OF THE PISTON AND CYLINDER.

Recommended products

AGIP FILTER OIL Oil for air filter sponge

Mineral oil with specific additives for increased adhesiveness

transmissions



- 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

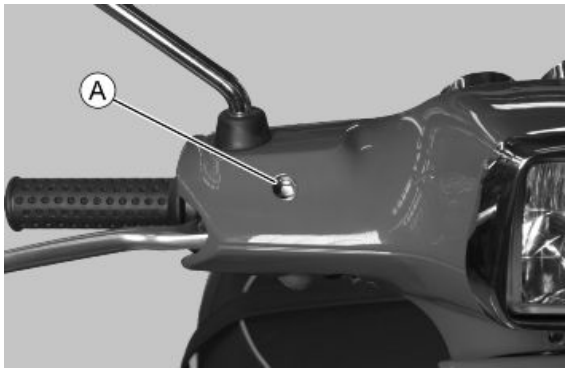
AGIP CITY TEC 2T Mixer oil

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

Braking system

Level check

- Rest the vehicle on its centre stand on flat ground.
- The brake fluid reservoir has a sight glass «**A**» made of transparent material; the quantity of liquid contained in the sight glass indicates the level of fluid in the reservoir.
- When the sight glass «**A**» is full, the level inside the reservoir is above the MIN level; when it is partially full, the level has dropped to the MIN level; when it is fully empty, the level of fluid in the reservoir is below the MIN level.



N.B.

THE LEVEL TENDS TO DROP AS THE BRAKE PADS GET WORN, A MINIMUM LEVEL SHOULD NOT BE REACHED. IF THE LEVEL IS TOO LOW, CHECK AND FIX THE SYSTEM SEALS, IF REQUIRED. TOP UP THE PUMP TANK, IF REQUIRED, CONSIDERING THAT THE "MAX." LEVEL MUST ONLY BE OBTAINED WITH NEW PADS.

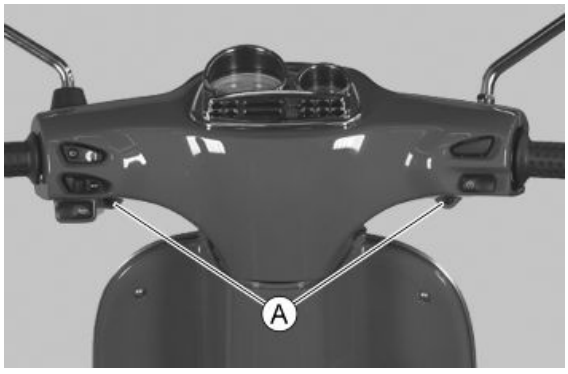
- Under standard climatic conditions, replace fluid as indicated in the scheduled maintenance table.

Top-up

Proceed as follows:

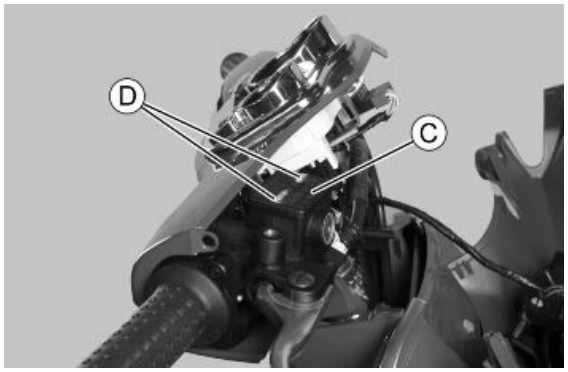
-Remove the rear-view mirrors.

- Undo the two screws «**A**».



- Undo the screw «**B**» and remove the front handlebar cover.

- Remove the reservoir cover «**C**» by loosening the two fixing screws «**D**» and refill with the prescribed brake fluid type only and without exceeding the maximum level.



CAUTION

ONLY USE DOT 4-CLASSIFIED BRAKE FLUID.

CAUTION

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

CAUTION

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

CAUTION

BRAKE FLUID IS HYGROSCOPIC; THAT IS, IT ABSORBS MOISTURE FROM THE SURROUNDING AIR. IF THE CONTENT OF MOISTURE IN THE BRAKE FLUID EXCEEDS A CERTAIN VALUE, BRAKING WILL BE INEFFICIENT.
NEVER USE BRAKE FLUID FROM OPEN OR PARTIALLY USED CONTAINERS.
UNDER NORMAL CLIMATIC CONDITIONS, REPLACE FLUID AS INDICATED IN THE SCHEDULED MAINTENANCE TABLE.

N.B.

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

Recommended products

AGIP BRAKE 4 Brake fluid

FMVSS DOT 4 Synthetic fluid

Headlight adjustment

Proceed as follows:

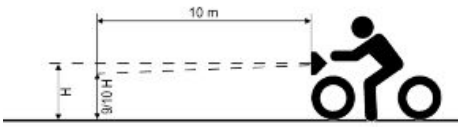
1. Place the vehicle in running order and with the tyres inflated to the prescribed pressure, on a flat surface 10 m away from a white screen situated in a shaded area, making sure that the longitudinal axis of the scooter is perpendicular to the screen;

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. If otherwise, adjust the right headlight with screw «**A**».

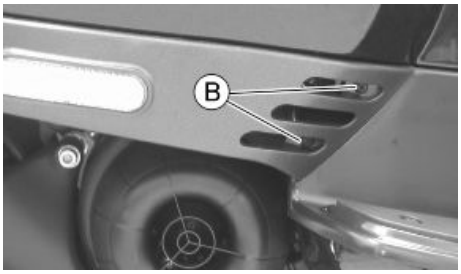
N.B.

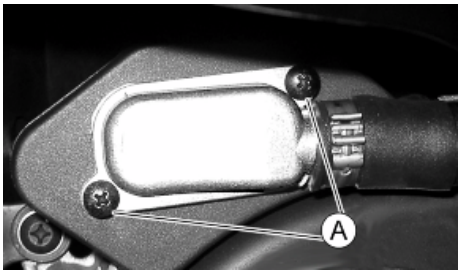
THE ABOVE PROCEDURE COMPLIES WITH THE EUROPEAN STANDARDS REGARDING MAXIMUM AND MINIMUM HEIGHT OF LIGHT BEAMS. REFER TO THE STATUTORY REGULATIONS IN FORCE IN EVERY COUNTRY WHERE THE vehicle IS USED.



SAS filters inspection and cleaning

Remove the right side fairing by undoing the 2 screws marked «**B**» indicated in the figure. Remove the two screws «**A**» from the aluminium SAS cover. Release the metal tube from the rubber housing on the cover without extracting the tube from the cover/sleeve. Remove the tab and plastic cover, extract the sponge and wash it in water and soap. Dry it with compressed air before refitting it, making sure to correctly fit the tab in the housing on the two plastic and aluminium covers. Every time you disassemble the filter, replace the O-ring seal located in the cover.





INDEX OF TOPICS

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

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

Engine

Poor performance

POOR PERFORMANCE

Possible Cause	Operation
Fuel nozzles or cock clogged or dirty	Dismantle, wash with solvent and dry with compressed air
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 all the parts, replace the faulty parts and lubricate only the driven pulley using recommended grease
Transmission belt worn	Replace
Carburettor nozzles clogged	Dismantle, wash with solvent and dry with compressed air
Fuel filter on vacuum operated cock blocked	Clean the cock filter
Roller wear; Presence of oil; Dirt	Check the cap with filter is fitted to the transmission cover; clean the speed variator, replace the rollers if worn out

Rear wheel spins at idle

REAR WHEEL

Possible Cause	Operation
Idling rpm too high	Adjust the idle speed
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
Faulty fuel cock	Check that, at ignition and with throttle untwisted, no petrol flows out the delivery pipe; otherwise, replace the vacuum-operated cock
Starter inefficient	Check: electric wiring, circuit continuity, mechanical sliding and power supply
Defective spark plug or with incorrect electrode gap	Check and if necessary replace the spark plug and the electrode gap
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

Possible Cause	Operation
	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
Faulty spark plug	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 intake joint and check for correct sealing on the head
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	Adequately adjust the engine idle speed
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 there are no leaks on the hoses on the crankcase and the housing, check that there is a cap with filter and it is correctly fitted to the transmission cover
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 BRAKES

Possible Cause	Operation
Slippage 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 Check the cap with filter is fitted to the transmission cover

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 sliding of pistons	Replace the calliper.
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

Heavy steering

STEERING HARDENING

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

Excessive steering play

EXCESSIVE STEERING CLEARANCE

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

Noisy suspension

NOISY SUSPENSION

Possible Cause	Operation
NOISY SUSPENSION	If the front suspension is noisy, check: the efficiency of the front shock absorbers; the condition of the ball bearings and relevant

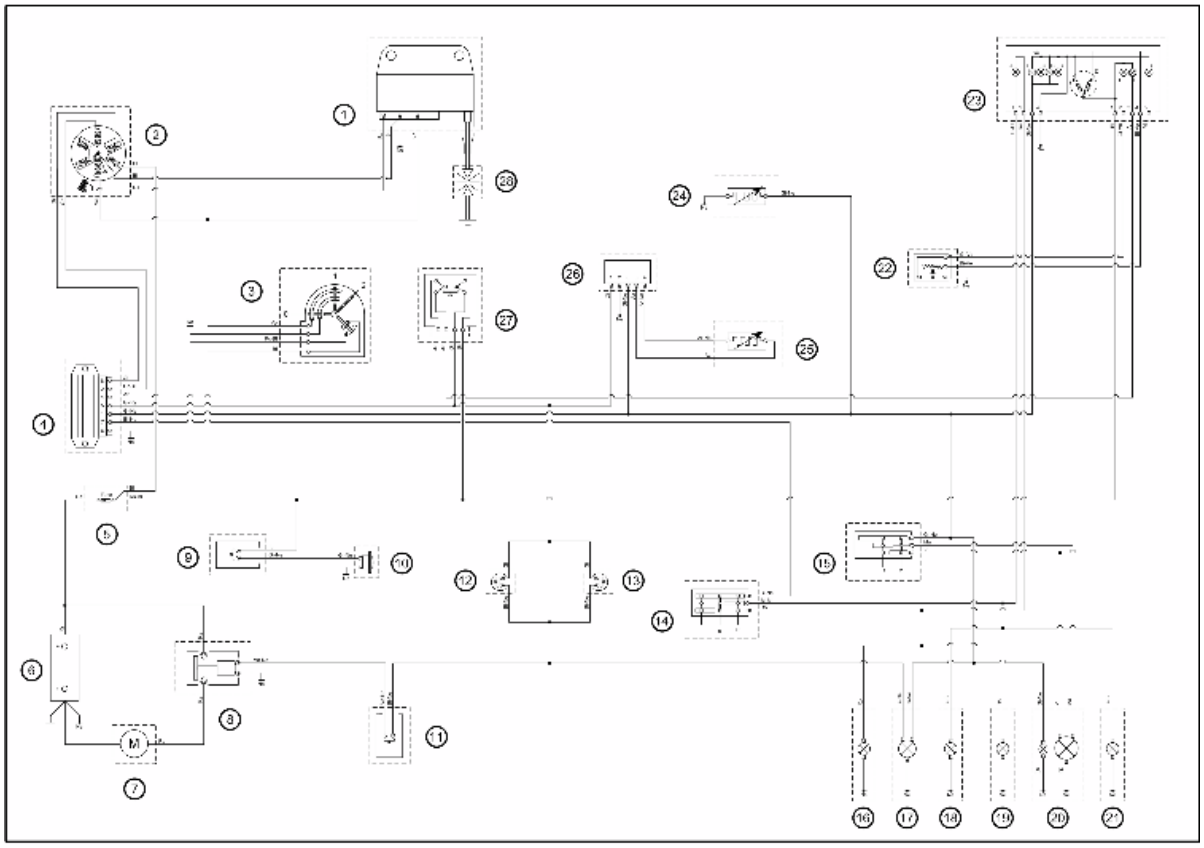
Possible Cause	Operation
	lock-nuts, the limit switch rubber buffers and the movement bushings.

Suspension oil leakage

OIL LEAKAGE FROM SUSPENSION

Possible Cause	Operation
Oil leakage from suspension	Service the pumping members and check the sleeves and sealing rings are in good conditions. Replace the damaged parts

INDEX OF TOPICS



KEY

1. Electronic ignition device

2. Magneto flywheel - Pick-up

3. Key switch

4. Voltage regulator

5. 7.5A Fuse

6. 12V - 9Ah Battery

7. Starter motor

8. Start-up remote control switch

9. Horn button

10. Horn

11. Starter button

12. Stop button on rear brake

13. Stop button on front brake

14. Turn indicator switch

15. Light switch

16. Rear left turn indicator

17. Rear light

18. Rear right turn indicator

19. Front left turn indicator

20. Front light

A. Tail light bulb

B. High-/low-beam light bulb

21. Front right turn indicator

22. Fuel level transmitter

23. Instrument panel

A. Turn indicator warning light

B. Headlight warning light

C. Instrument panel lighting bulbs

D. Fuel gauge

E. Low fuel warning light

F. Oil warning light

G. High-beam warning light

24. Automatic starter

25. Heater

26. Heater control device

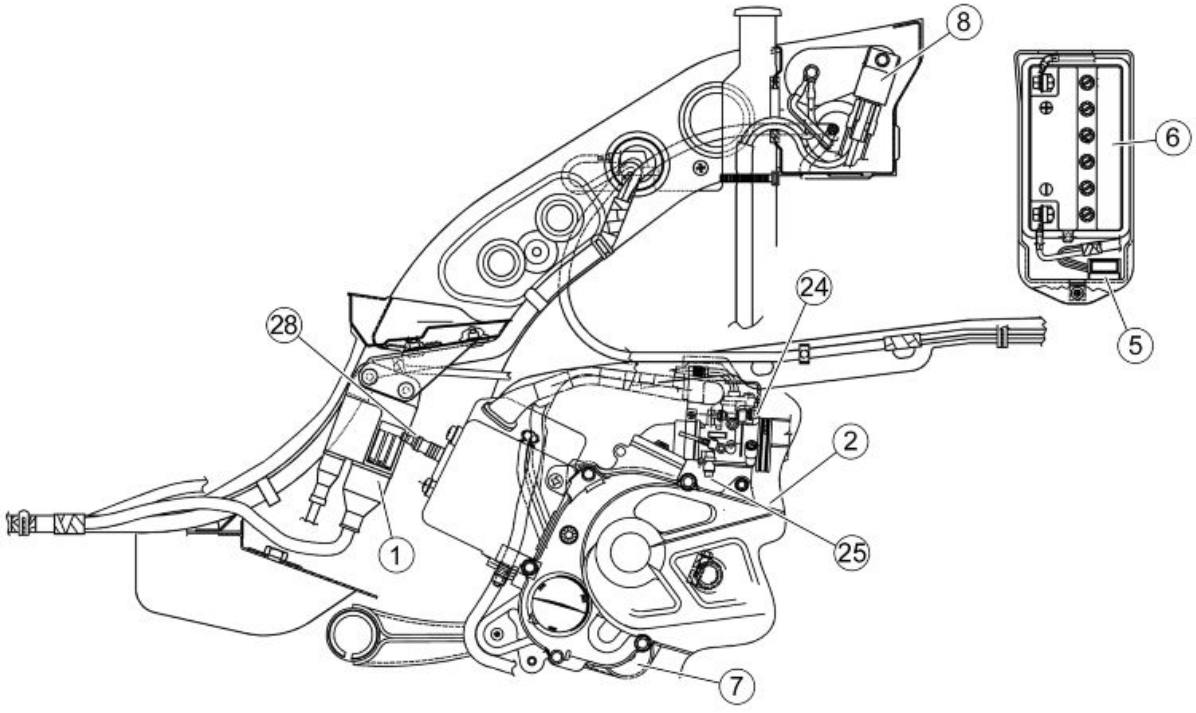
27. Oil reserve warning light

28. Spark plug

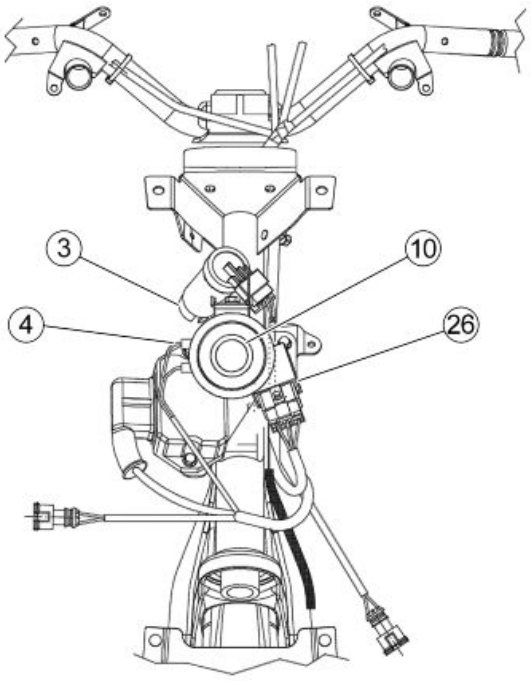
R = Red - B = White - Bl = Blue - N = Black - V = Green - Rs = Pink -Mr = Brown - Gr = Grey - Az = Sky Blue G = Yellow Vi = Purple A = Orange

Components arrangement

1 / 2 / 5 / 6 / 7 / 8 / 24 / 25 / 28 - Electronic ignition device / Magneto flywheel - Pick-Up / 7.5A Fuse/ 12V-9Ah Battery / Starter motor / Start-up remote control / Automatic starter/ Heater / Spark plug.

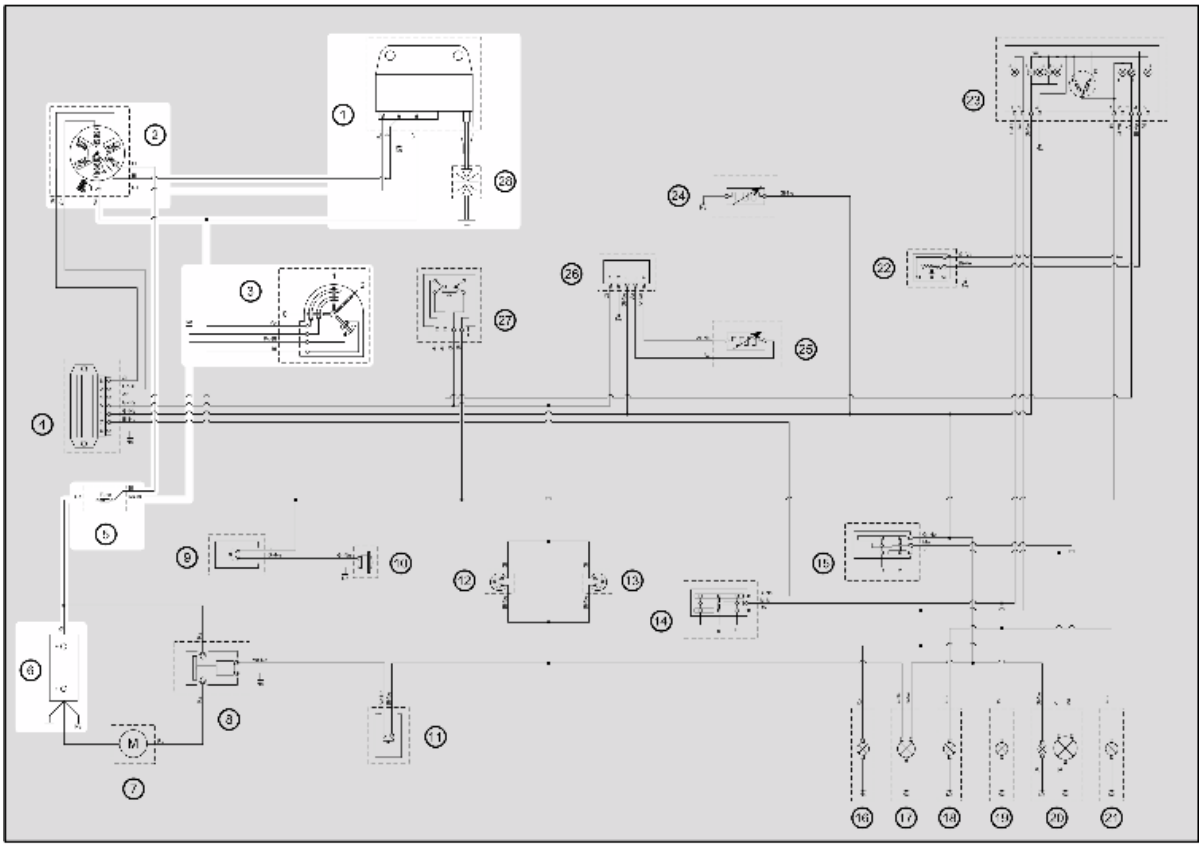


3 / 4 / 10 / 26 - Key switch / Voltage regulator / Horn / Heater control device.



Conceptual diagrams

Ignition



KEY

1. Electronic ignition device

2. Magneto flywheel - Pick-up

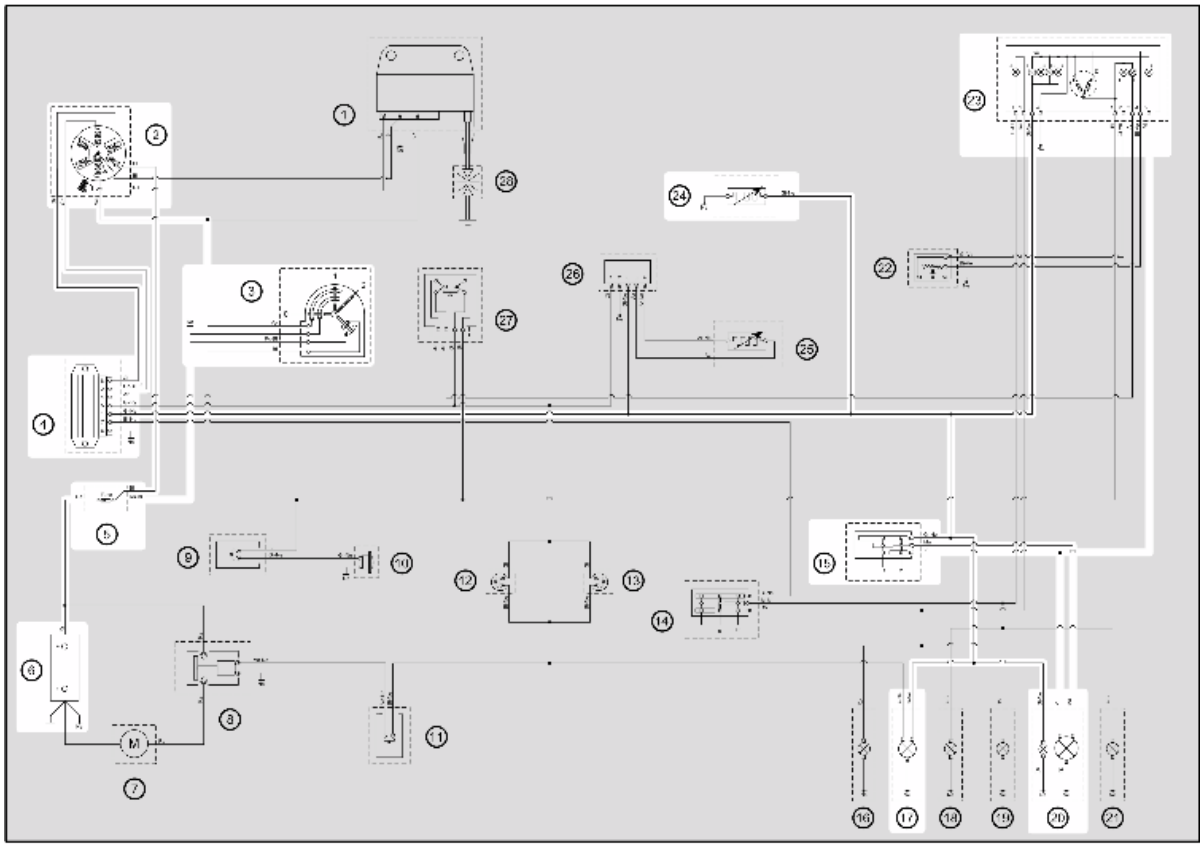
3. Key switch

5. 7.5A Fuse

6. 12V - 9Ah Battery

28. Spark plug

Headlights and automatic starter section



KEY

2. Magneto flywheel - Pick-up

3. Key switch

4. Voltage regulator

5. 7.5A Fuse

6. 12V - 9Ah Battery

15. Light switch

17. Rear light

20. Front light

A. Tail light bulb

B. High-/low-beam light bulb

23. Instrument panel

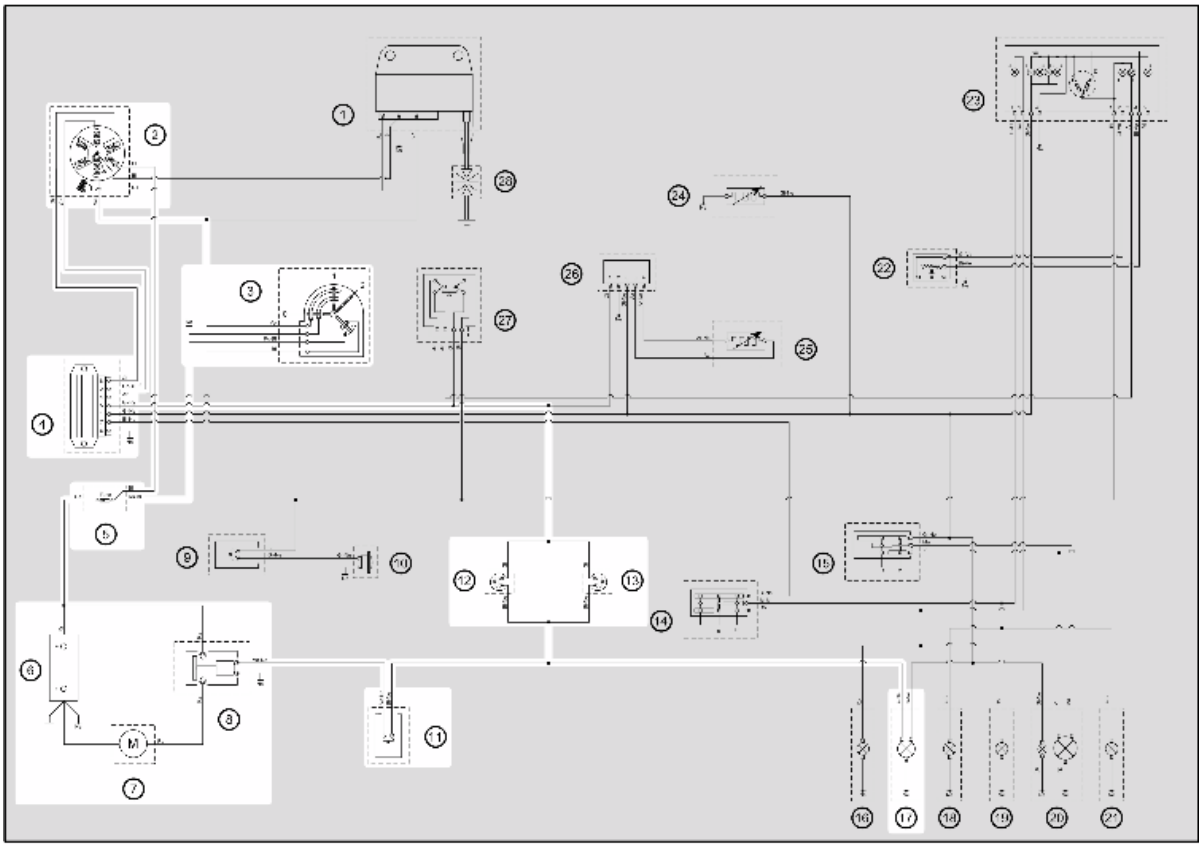
B. Headlight warning light

C. Instrument panel lighting bulbs

G. High-beam warning light

24. Automatic starter

Battery recharge and starting



KEY

2. Magneto flywheel - Pick-up

3. Key switch

4. Voltage regulator

5. 7.5A Fuse

6. 12V - 9Ah Battery

7. Starter motor

8. Start-up remote control switch

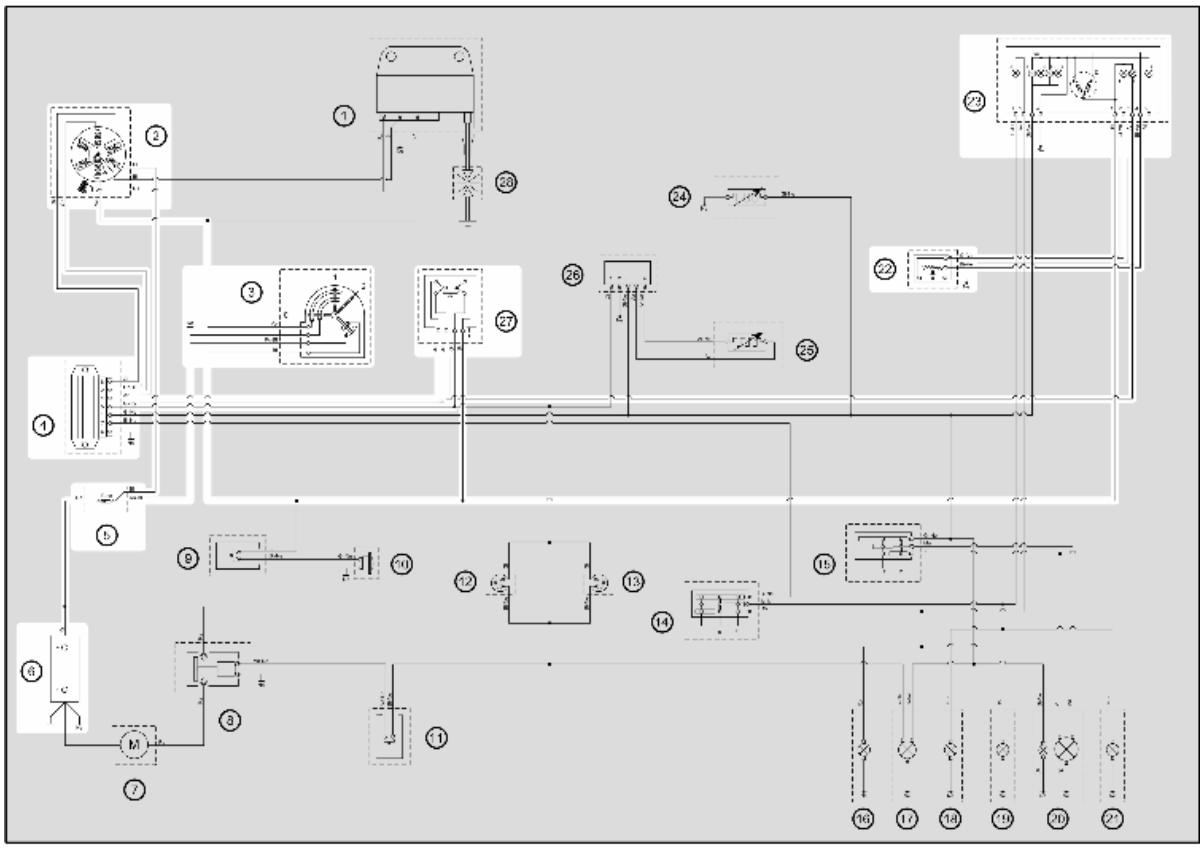
11. Starter button

12. Stop button on rear brake

13. Stop button on front brake

17. Rear light

Level indicators and enable signals section



KEY

2. Magneto flywheel - Pick-up

3. Key switch

4. Voltage regulator

5. 7.5A Fuse

6. 12V - 9Ah Battery

22. Fuel level transmitter

23. Instrument panel

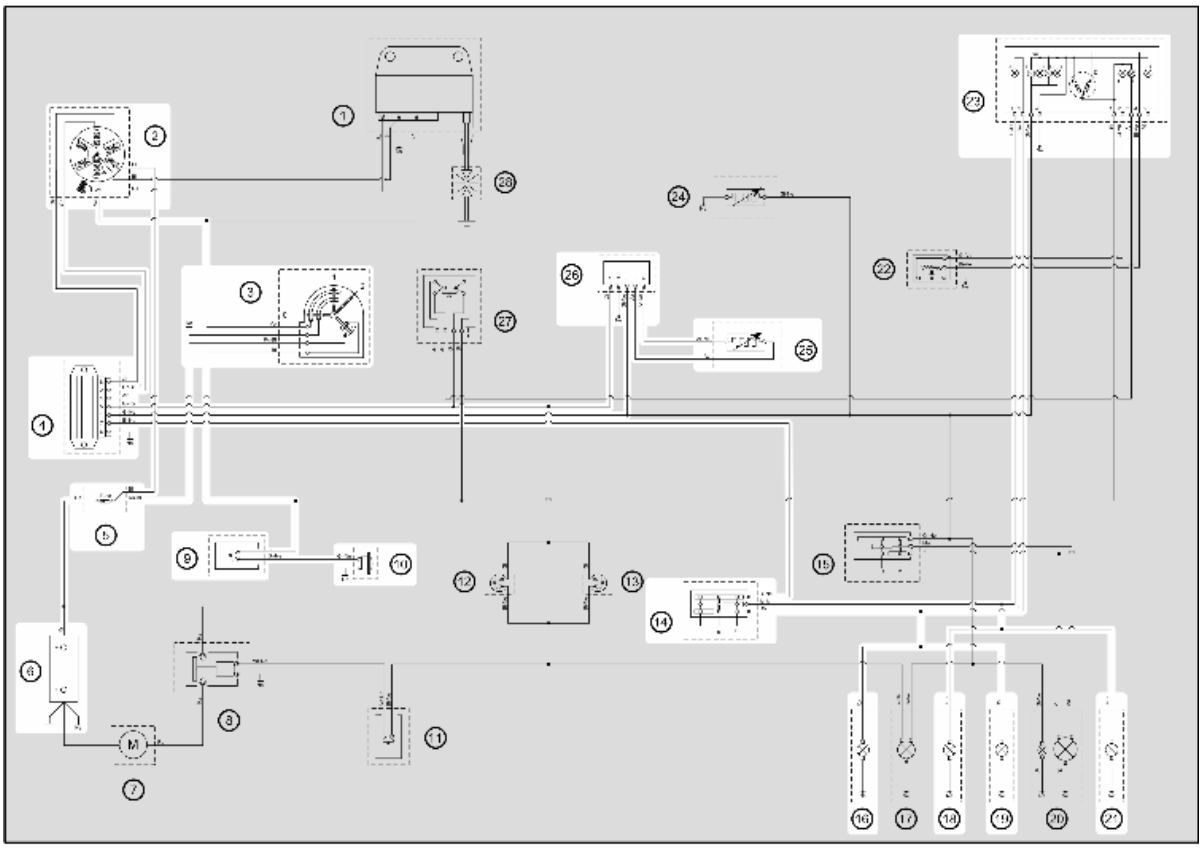
D. Fuel gauge

E. Low fuel warning light

F. Oil warning light

27. Oil reserve warning light

Devices and accessories



KEY

2. Magneto flywheel - Pick-up

3. Key switch

4. Voltage regulator

5. 7.5A Fuse

6. 12V - 9Ah Battery

9. Horn button

10. Horn

14. Turn indicator switch

16. Rear left turn indicator

18. Rear right turn indicator

19. Front left turn indicator

21. Front right turn indicator

23. Instrument panel

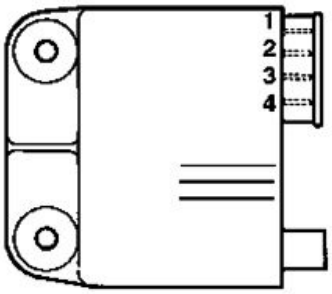
A. Turn indicator warning light

25. Heater

26. Heater control device

Checks and inspections

All the control operations of the system that entail disconnecting cables (to check 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.



Ignition circuit

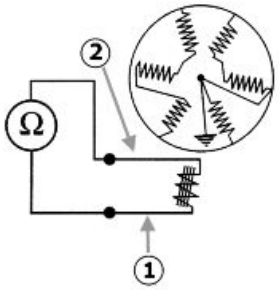
1) Check the condition of the spark plug (clean it with a metal brush, remove deposits, apply short blasts of compressed air and, if necessary, replace it).

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

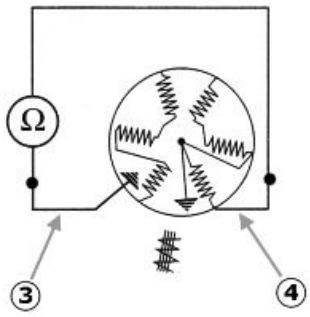
After visually checking the electrical wiring, use a specific tester to measure the loading reel, the pick-up (see chart) and cable continuity.

- If checks on the loading boil, the pick-up and cable continuity show irregularities, replace the stator; otherwise replace the control unit.
- Remember that the engine must be off to disconnect any connections in order to replace the central unit.

A



B



Specific tooling

020331Y Digital multimeter

PICK - UP CHECK (FIGURE A)

	Specification	Desc./Quantity
1	Red cable (1) and White cable (2)	90 ÷ 140 Ohm

RECHARGING COIL CHECK (FIGURE B)

	Specification	Desc./Quantity
1	Red cable (3) and Green cable (4)	800 ÷ 1100 Ohm

CONTINUITY CHECK

	Specification	Desc./Quantity
1	White cable - Engine	Continuity
2	White cable - Frame	Continuity

Voltage regulator check

Voltage regulator

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

1) Lighting system bulbs burn out.

2) Lighting system is not working.

3) Battery overcharges (the main fuse blows).

4) Battery not recharging.

5) Turn indicators not working.

6) Oil and fuel check warning light not working.

Remedies

FAULT 1

Check that the control voltage is between 13V and 14.5V at 5000 rpm with the lights on.

Check that the control voltage is 16V at 5000 rpm with the lights off.

Replace the voltage regulator if control voltages are over >16V.

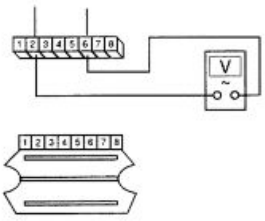
FAULT 2

a) Check that voltage to stator is correctly supplied: disconnect the regulator connector and place the tester to detect alternating voltages between the connection of the grey-blue cable (2) and the black cable (6) to check that the voltage supplied at 3000 rpm is within 25-30 V (FIG. A). If faults are detected, replace the stator.

b) If no faults are detected with these controls, replace the regulator.

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

A

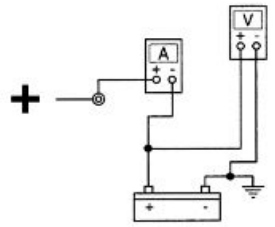


FAULT 3

After checking that there are no short circuits in the system towards earthing with the engine off and the regulator connector detached, replace the regulator because it is certainly inefficient, and replace the protection fuse.

Following the replacement, measure the current and the recharging voltage on the battery ends (FIG. B). The values detected must be 1.5 ÷ 2 A and 13 V at 3000 rpm.

B



FAULT 4

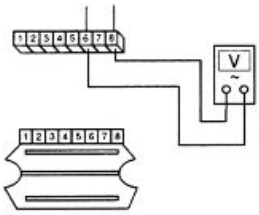
a) Place the tester that detects alternating voltages between the connection of the yellow cable (8) on the regulator and the black cable (6) (FIG. D) to check that the voltage supplied by the generator at 3000 rpm is within 26 ÷ 30 V (the battery should be disconnected to measure this). If faults are detected, replace the stator; otherwise, proceed to point b).

b) Yellow/black cable (1) connected to the regulator. Insert an ammeter between the grey/blue cable (2) of the stator and the battery and use the tester to check that the current supplied at 3000 rpm is approx. 1.5 ÷2 Ampere (FIG. C).

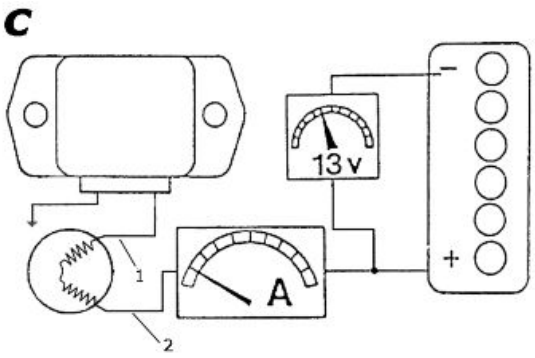
If the values detected are lower than those specified, replace the regulator.

Before carrying out the checks on the regulator and the corresponding system, it is always good practice to check that there is continuity between the black cable and the earthing.

D



C

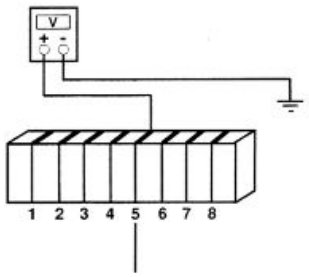


FAULT 5

(FIG. E) If the turn indicators do not work, proceed as follows:

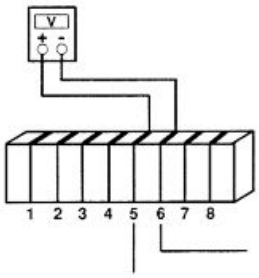
- Remove the regulator connector, and insert the tester probes between the contact 5 (yellow-red) and the ground lead.
- Turn the key switch to ON and check that the battery is getting voltage. If no voltage is detected, check the wiring and the contacts on the key switch and on the battery.

E



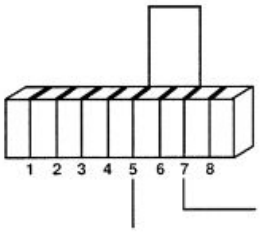
(FIG. F) Repeat the procedure now placing the tester probes between contacts 5 (yellow/ red) and 6 (black), and check the presence of the battery voltage with the key switch set to ON. If there is no voltage, check the regulator ground wiring.

F



(FIG. G) If the above tests have positive results, jump the contacts 5 (yellow/red) and 7 (blue/black) on the connector, set the key switch to ON and shift the turn indicator switch to the right and left to see when the lights are steadily on (as they are powered directly from the battery). If even after this operation the turn indicators fail to turn on, check that the wiring is not damaged and the switch works properly. If these last two tests have a positive result, replace the regulator because it is certainly not functioning properly.

G



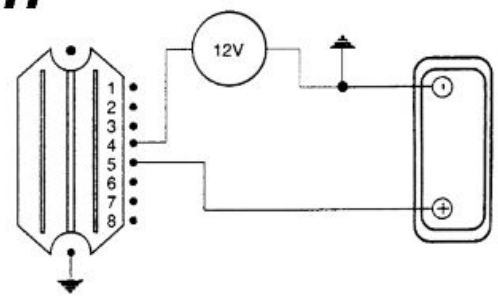
FAULT 6

Oil reserve check warning light not working

(FIG H) - Disconnect the voltage regulator connector.

- Supply 12V to the terminal marked with number 5; with a digital tester check that the terminal number 4 has a similar output (12V) for about 5 seconds.

H



- If no voltage is detected for terminal number 4, replace the regulator.
- If there is voltage for terminal number 4, check both the installation and the bulb of the oil warning light.

Specific tooling

020331Y Digital multimeter

level indicators

- Check resistance between Pin 4 and the ground connection on the 5-way connector in the instrument panel to check the efficiency of the fuel gauge.

Electric characteristic

Resistance value when the tank is full

< = 7Ω

Resistance value when the tank is half-full

38 Ω ±4 Ω

Resistance value with empty tank and low fuel warning light on

90 Ω +13 Ω -3 Ω

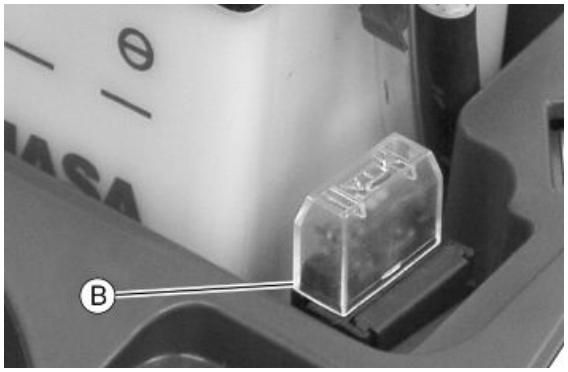
Lights list

BULBS

	Specification	Desc./Quantity
1	High/low beam light bulb	**Type**: Spherical **Power**: 12V 35/35W **Quantity**: 1
2	Front tail light bulb	**Type:** All glass **Power:** 12V 5W **Quantity:** 1
3	Front turn indicator bulb	**Type:** Spherical **Power:** 12V - 10W **Quantity:** 1 RHS + 1 LHS
4	Rear turn indicator light bulb	**Type:** Spherical **Power:** 12V - 10W **Quantity:** 1 RHS + 1 LHS
5	Stop and tail light bulb	**Type**: Spherical **Power**: 12V 21/5W **Quantity**: 1
6	Warning light bulbs: turn indicators, low-beam lights, high-beam lights, low fuel, low oil	**Type**: All glass **Power**: 12V - 1.2W **Quantity**: 5
7	Instrument panel lighting bulbs	**Type**: All glass **Power**: 12V 1.2W **Quantity**: 3

Fuses

The electrical system is protected by a plug fuse «**B**» located to the left of the battery compartment. The ignition system, headlight and the rear light are not fuse-protected. Before replacing a blown fuse, find and solve the problem that caused it to blow. Do not replace the fuse with any alternative form of conductor



CAUTION

IN ORDER TO AVOID DAMAGING THE ELECTRICAL SYSTEM, NEVER DISCONNECT THE WIRING WHILE THE ENGINE IS RUNNING. DO NOT TIP THE SCOOTER TOO MUCH IN ORDER TO AVOID DANGEROUS LEAKAGE OF BATTERY ELECTROLYTE.

Electric characteristic

Fuse

7.5 A

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

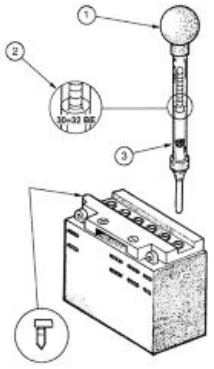
WARNING

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

Dry-charge battery

WARNING

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



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.

After charging the battery, check each element electrolyte level and density. 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 earth wire (**black**) marked (-) must be connected to the **- negative** terminal while the other two **red** wires marked (+) must be connected to the terminal marked with the + **positive** sign.
Regular bench charging must be carried out with the specific battery charger, (single) or (multiple), setting the battery charger selector to the type of battery to be recharged. Connections to the power supply source must be implemented by connecting the corresponding poles (+ to+ and - to -).

4) Cleaning the battery

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 the battery away from naked flames or sparks when charging.
Remove the battery from the vehicle removing the negative clamp first.

CAUTION

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

CAUTION

DRINKING WATER CONTAINS MINERALS THAT CAN BE EXTREMELY HARMFUL TO THE BATTERY: USE DISTILLED WATER ONLY.

CAUTION

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

Specific tooling

020333Y Single battery charger

020334Y Multiple battery charger

1)- Remove the short closed tube and the caps, then pour sulphuric acid into the cells using the type specified for batteries, with a specific gravity of 1.26, corresponding to 30° Bé, at a minimum temperature of 15°C until the upper level is reached.

2) - Leave to rest for at least 2 hours; then, restore the level with sulphuric acid.

3)- Within the following 24 hours, recharge with the specific battery charger (single) or (multiple) at a density of about 1/10 of the battery nominal capacity and until the acid density is about 1.27, corresponding to 31º Bé, and 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 the connections between the wiring and the battery terminals are correct.

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.

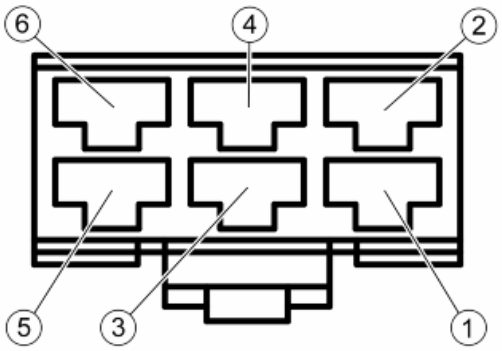
Specific tooling

020333Y Single battery charger

020334Y Multiple battery charger

Connectors

HEATER CONTROL DEVICE CONNECTOR



1. Positive from voltage regulator (Yellow)

2. Ground (Black)

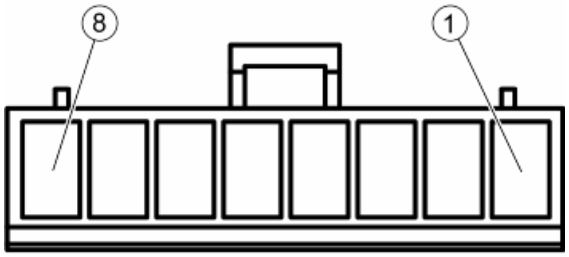
3. Heater (Sky Blue)

4. Heater (Orange-Black)

5. Not connected

6. Positive from the voltage regulator (Yellow-Black)

VOLTAGE REGULATOR CONNECTOR



1. Lights power, instrument panel lighting, heater control device and automatic starter (Yellow-Black)

2. Magneto flywheel (Grey-Blue)

3. Not connected

4. Oil reserve indicator power (Orange)

5. Oil reserve indicator power, start-up circuit and heater control device (Yellow-Red)

6. Ground (Black)

7. Turn indicator switch power (Blue-Black)

8. Magneto flywheel (Yellow)

MAGNETO FLYWHEEL CONNECTOR

1. Pick-up (Red)

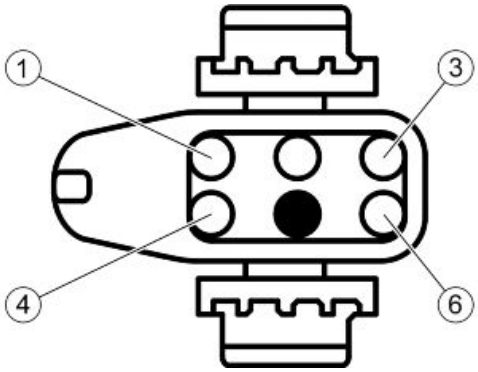
2. Voltage regulator (Yellow)

3. Battery positive (Blue)

4. Voltage regulator (Yellow-Blue)

5. Ground (White)

6. Electronic ignition device (Green)



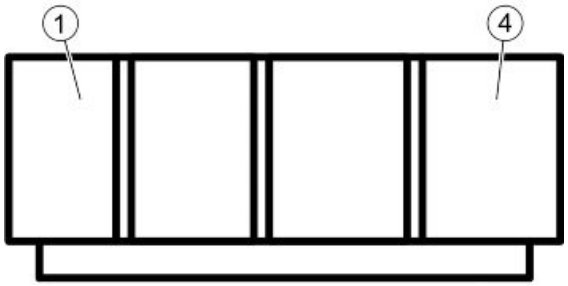
ELECTRONIC IGNITION DEVICE CONNECTOR

1. Pick-up (Red)

2. Ground (Black and White)

3. Magneto flywheel (Green)

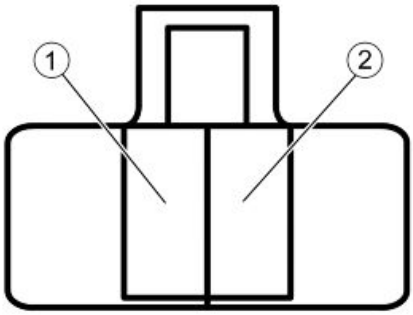
4. Not connected



AUTOMATIC STARTER CONNECTOR

1. Positive from voltage regulator (Yellow-Black)

2. Ground (Black)



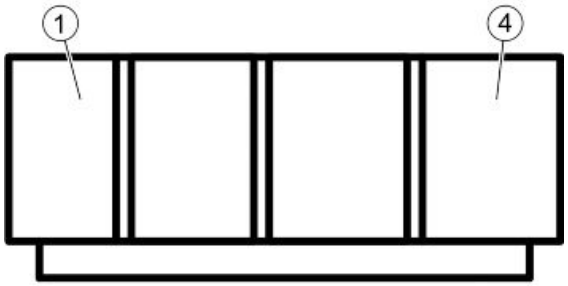
OIL LEVEL INDICATOR CONNECTOR

1. Positive from voltage regulator (Orange)

2. Oil reserve warning light (Orange)

3. Positive from voltage regulator (Yellow)

4. Live Positive (White)



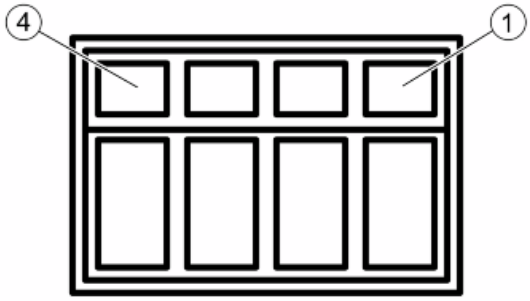
INSTRUMENT PANEL CONNECTOR «A»

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

2. Left turn indicator warning light (Pink)

3. Positive from voltage regulator (Yellow-Black)

4. Ground (Black)



INSTRUMENT PANEL CONNECTOR «B»

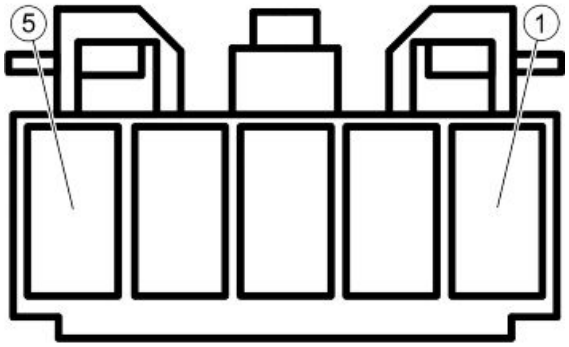
1. Live Positive (White)

2. Low fuel warning light (Yellow-Green)

3. Oil reserve warning light (Orange)

4. Fuel level indicator (White-Green)

5. High-beam warning light (Purple)

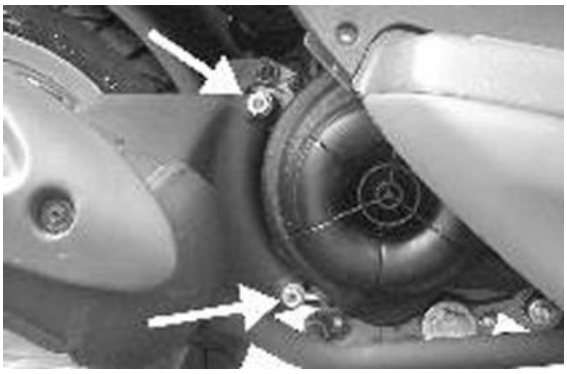


INDEX OF TOPICS

Exhaust assy. Removal

- Remove the 2 fixing nuts from the manifold to the head

- Unscrew the 2 screws fixing the muffler to the housing; then remove the whole muffler paying attention to the interference between its supporting bracket and the cooling cover.



Removal of the engine from the vehicle

- Support the scooter adequately.
- Disconnect the battery.
-Remove the muffler assembly.
- Remove the rear wheel.
- Remove the rear brake mechanical transmission.
-Disconnect the electric terminals.
- Remove the throttle grip and mixer transmissions.
- Disconnect the hoses (petrol-oil).
- Remove the engine-side swinging arm and remove the entire engine.

WARNING

Be very careful when handling fuel.

CAUTION

When installing the battery, first attach the positive cable and then the negative cable.

WARNING

Wear safety goggles when using hitting tools.

INDEX OF TOPICS

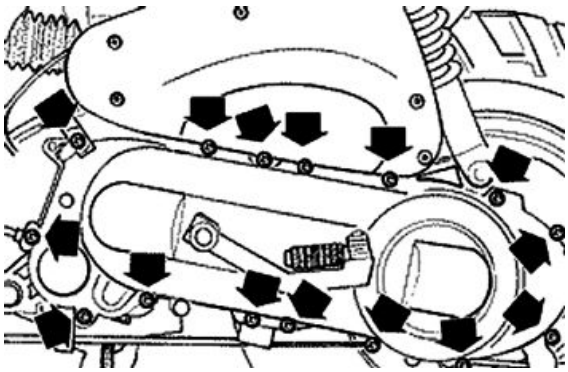
Automatic transmission

Transmission cover

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

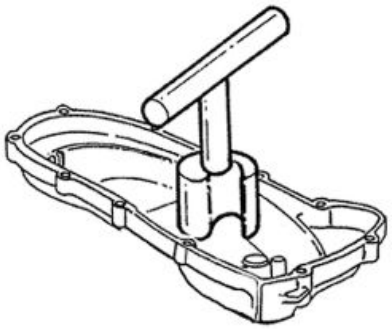
N.B.

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



Kickstart

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



Specific tooling

020261Y Starter spring fitting

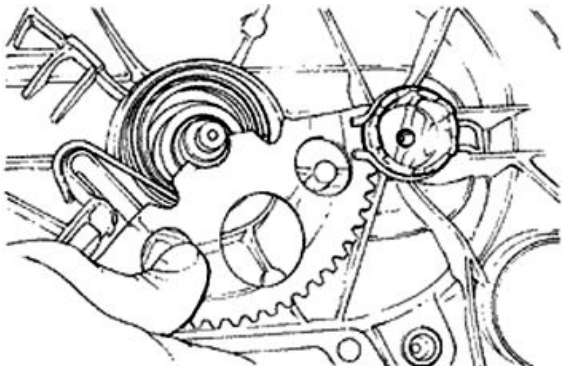
Recommended products

AGIP GREASE MU3 Grease for odometer transmission gear case

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

- Remove the 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

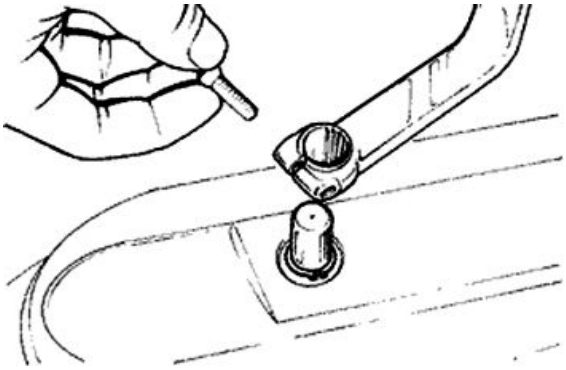


WHILE REMOVING THE TOOTHED SECTOR, BE VERY CAREFUL OF THE SPRING TENSION: IT COULD CONSTITUTE A HAZARD FOR THE OPERATOR.

- 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 fixing screw **12 ÷ 13**

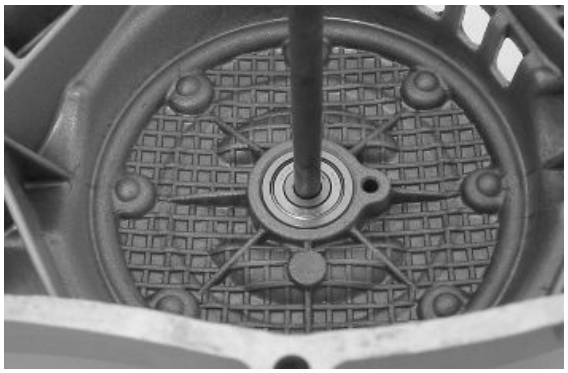


Removing the driven pulley shaft bearing

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

N.B.

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



Refitting the driven pulley shaft bearing

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

N.B.

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

CAUTION

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

Removing the driven pulley

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

N.B.

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

Specific tooling

020565Y Flywheel lock calliper spanner

Inspecting the clutch drum

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

Characteristic

Clutch bell diameter/standard value

Ø 107+0.2 +0 mm

Clutch bell diameter/max. value allowed after use

Ø 107.5 mm

Eccentricity measured /max.

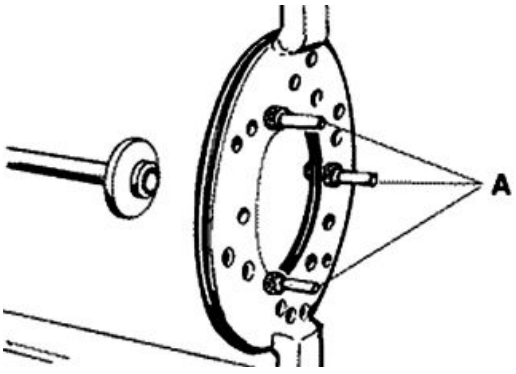
0.20 mm

Removing the clutch

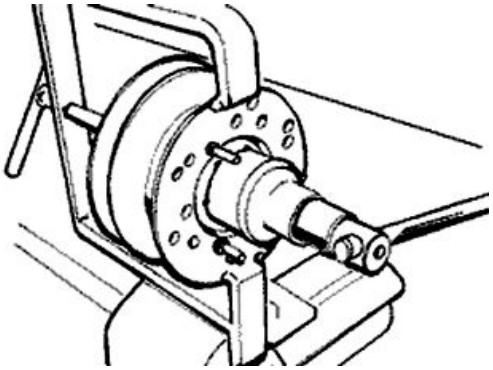
- Equip the tool with long pins screwed into position «**A**» from the outside, insert the entire driven pulley in the tool and put the central screw under stress.

CAUTION

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



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



Specific tooling

020444Y Tool for fitting/ removing the driven pulley clutch

Inspecting the clutch

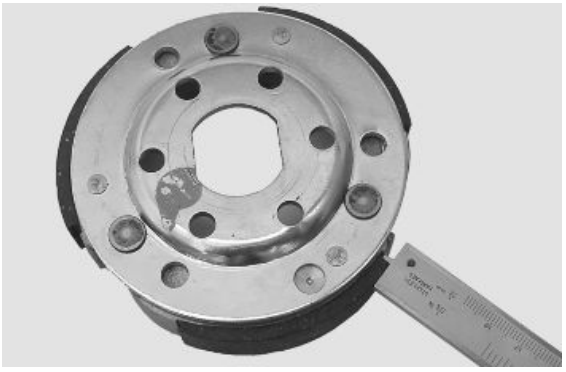
- Check the thickness of the clutch mass friction material.
- The masses must not show traces of lubricants; otherwise, check the driven pulley unit seals.

N.B.

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

CAUTION

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



Characteristic

Check minimum thickness

1 mm

Pin retaining collar

- Remove the collar with the aid of 2 screwdrivers.

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

Removing the driven half-pulley bearing

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

CAUTION

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

Specific tooling

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

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

N.B.

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

Specific tooling

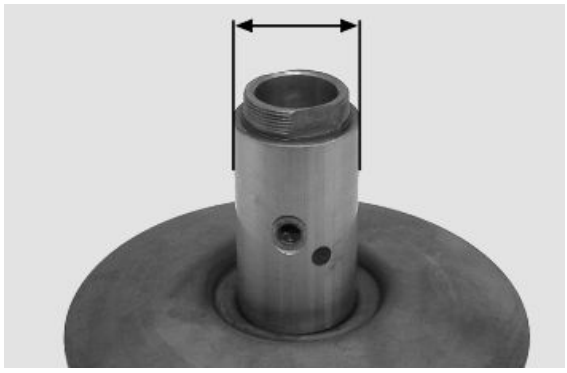
020376Y Adaptor handle

020363Y 20 mm guide

Inspecting the driven fixed half-pulley

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

Characteristic



Stationary driven half-pulley/Standard diameter

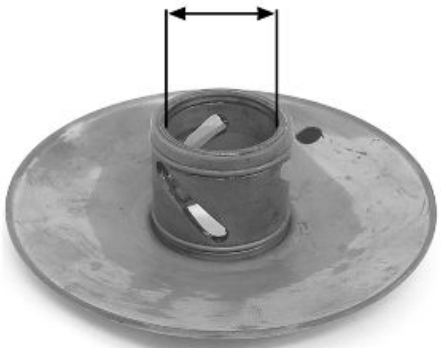
Ø 33.965 to 33.985 mm

Stationary driven half-pulley / Minimum diameter admitted after use

Ø 33.96 mm

Inspecting the driven sliding half-pulley

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



Characteristic

Mobile driven half-pulley/ Maximum diameter allowed

Ø 34.08 mm

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

Recommended products

AGIP GREASE SM 2 Grease for the tone wheel revolving ring

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

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

Recommended products

AGIP GREASE SM 2 Grease for the tone wheel revolving ring

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

Refitting the driven half-pulley bearing

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

CAUTION

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

Specific tooling

020376Y Adaptor handle

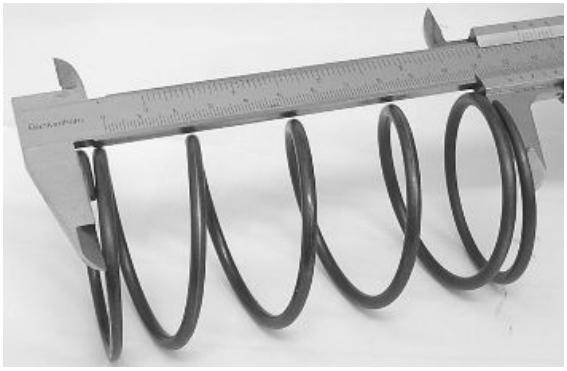
020456Y Ø 24 mm adaptor

020362Y 12 mm guide

020171Y Punch for Ø 17 mm roller case

Inspecting the clutch spring

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



Characteristic

Standard length

118 mm

Minimum length allowed after use

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

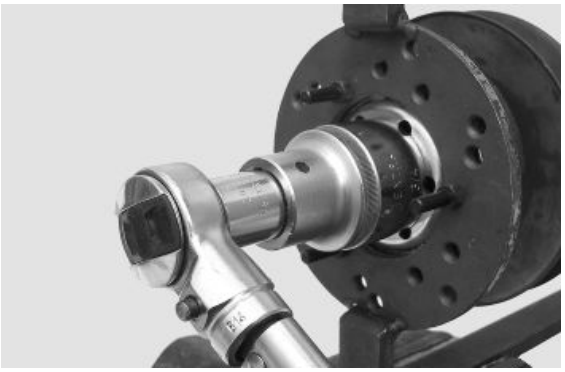
SO AS NOT TO DAMAGE THE CLUTCH NUT USE A SOCKET WRENCH WITH SMALL CHAMFER.

CAUTION

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

Locking torques (N*m)

Clutch lock ring nut 55 ÷ 60



Refitting the driven pulley

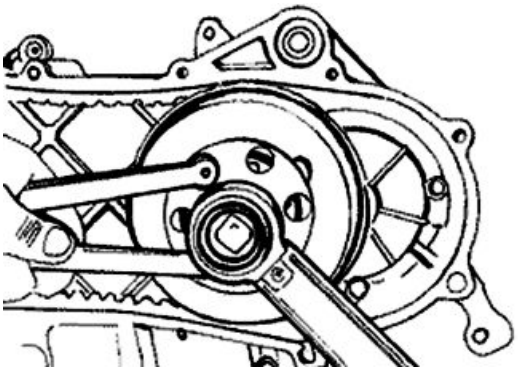
-Refit the driven pulley assembly, the clutch bell and the nut, using the specific tool.

Specific tooling

020565Y Flywheel lock calliper spanner

Locking torques (N*m)

Clutch bell nut 40 ÷ 44



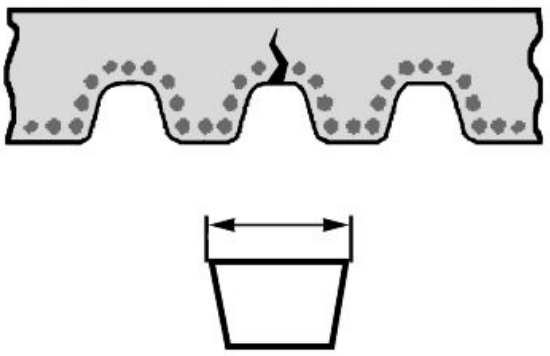
Drive-belt

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

Characteristic

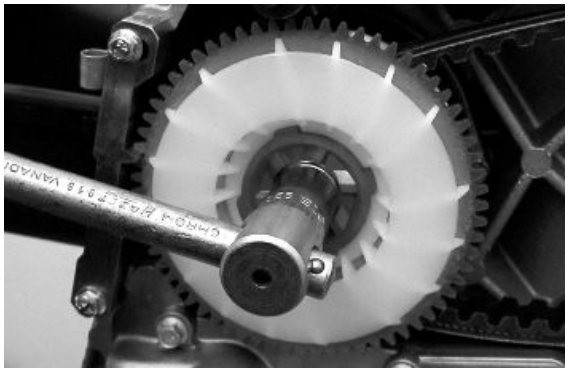
Transmission belt/Minimum width

17.5 mm



Removing the driving pulley

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



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

Specific tooling

020451Y Starting ring gear lock

Mixer gears and belt

- Remove gear and belt.

CAUTION

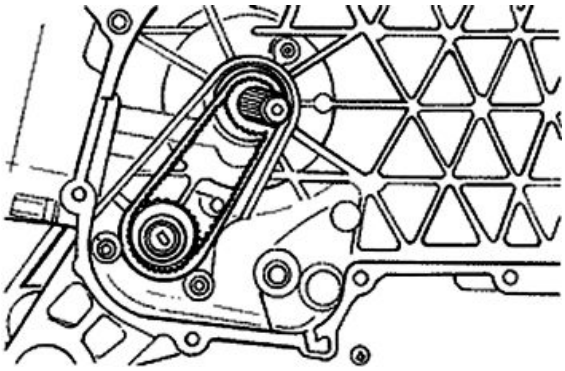
PAY PARTICULAR ATTENTION TO NOT TOUCHING OR BENDING THE BELT BECAUSE THIS COULD BREAK SUDDENLY DURING OPERATION.

CAUTION

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

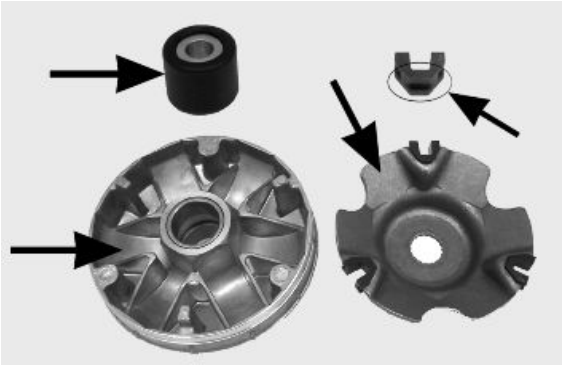
N.B.

REPLACE THE BELT AS INDICATED IN THE SCHEDULED MAINTENANCE TABLE.



Inspecting the rollers case

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

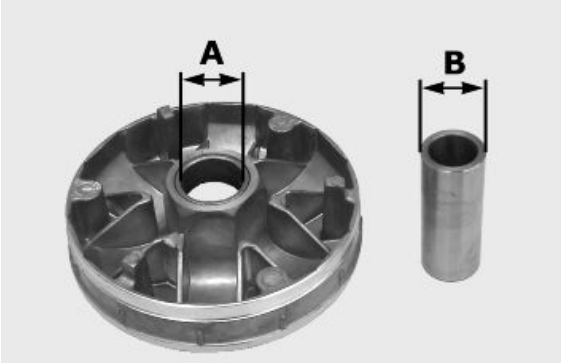


the metallic insert does not come out of the plastic shell borders.

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

- Check that the internal bushing shown in the figure is not abnormally worn and measure inside diameter «**A**».

- Measure outside diameter «**B**» of the pulley sliding bushing shown in the figure.



CAUTION

DO NOT LUBRICATE OR CLEAN THE BUSHING.

Characteristic

Driving pulley / Maximum diameter:

20.12 mm

Driving pulley/ Standard diameter:

20.021 mm

Driving pulley bushing/ Diameter maximum:

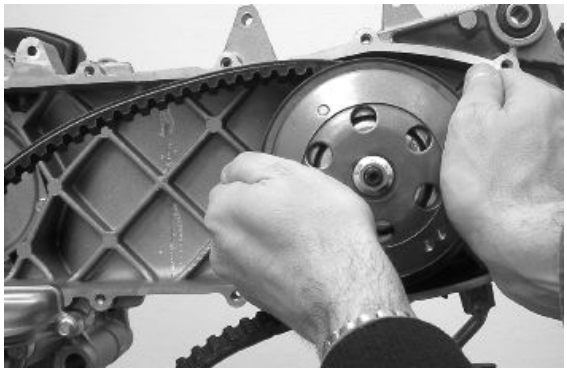
XXX mm

Driving pulley bushing/ Standard diameter:

20 -0.020/-0.041mm

Refitting the driving pulley

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



N.B.

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

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

N.B.

REPLACE THE NUT WITH A NEW ONE AT EVERY REFIT

CAUTION

UPON FITTING THE DRIVING PULLEY UNIT IT IS OF UTMOST IMPORTANCE THAT THE BELT IS FREE INSIDE IN ORDER TO AVOID WRONG TIGHTENING AND CONSEQUENTLY DAMAGING THE CRANKSHAFT KNURLING.

Specific tooling

020451Y Starting ring gear lock

Locking torques (N*m)

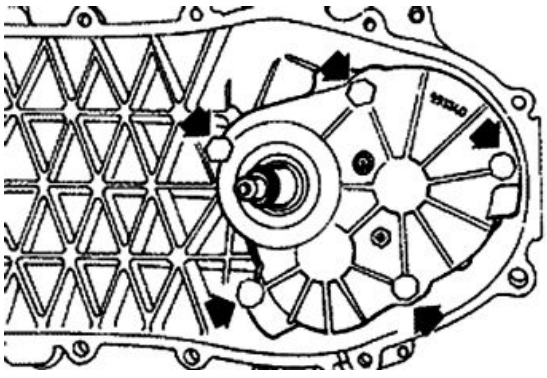
Crankshaft pulley nut **18 to 20 + 90° Nm**

For 25 km/h engine type versions, the limit washer is 5.5 mm thick

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.

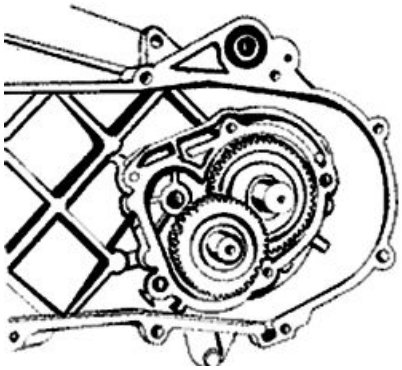


See also

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

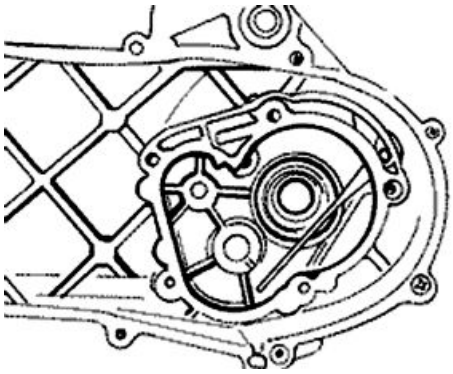
- Remove the oil seal and the seeger ring.
- Remove the bearing by pushing from the outside towards the inside of the gear compartment, using the appropriate punch.

Specific tooling

020363Y 20 mm guide

020376Y Adaptor handle

020358Y 37x40-mm adaptor

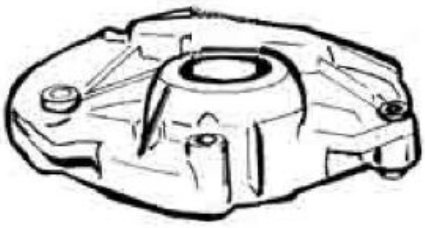


Removing the driven pulley shaft bearing

- 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

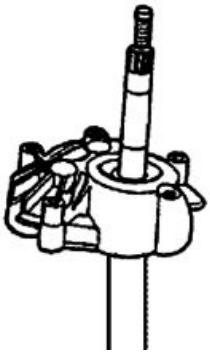
020452Y Tube for removing and refitting the driven pulley shaft



- 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.

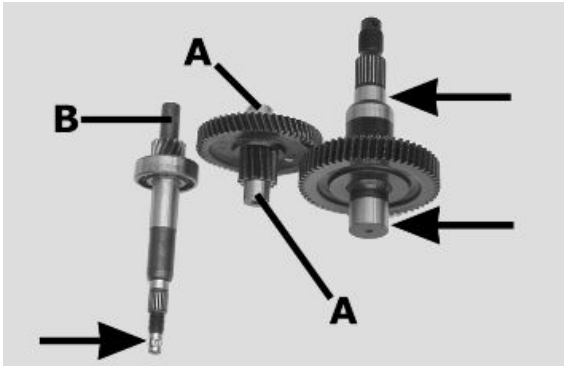
Specific tooling

020452Y Tube for removing and refitting the driven pulley shaft



Inspecting the hub shaft

- Check the three shafts for wear or distortion of the toothed surfaces, the bearing housings, and the oil seal housings.
- In case of anomalies, replace the damaged components.
- Check capacity (A) of the transmission gear (wear, deformations, etc.)
- Check the pulley shaft seating: Superficial wear (B) may indicate irregularities in the crankcase seatings or in the pulley shaft capacities



Inspecting the hub cover

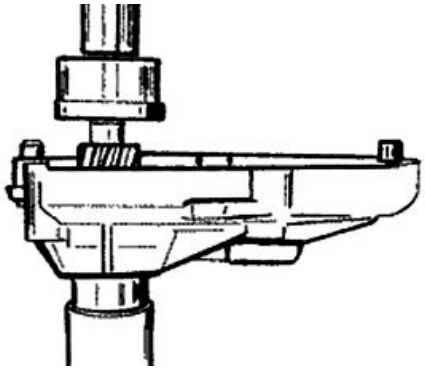
- Check that the fitting surface is not dented or distorted.
- If faults are found, replace the hub cover.

Refitting the driven pulley shaft bearing

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

Specific tooling

020452Y Tube for removing and refitting the driven pulley shaft

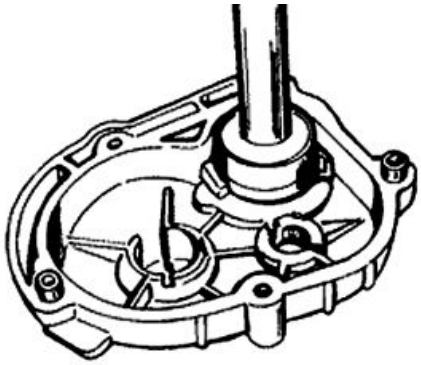


• Heat the hub cover and insert the bearing with the specific punch.

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

N.B.

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



Specific tooling

020151Y Air heater

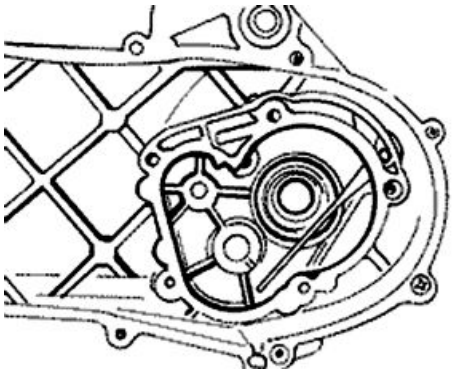
020376Y Adaptor handle

020439Y 17 mm guide

020358Y 37x40-mm adaptor

Refitting the wheel axle bearing

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



Specific tooling

020151Y Air heater

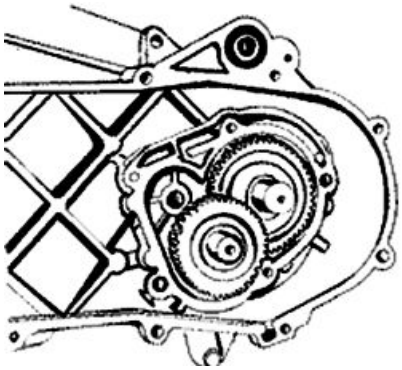
020376Y Adaptor handle

020363Y 20 mm guide

020359Y 42x47-mm adaptor

Refitting the ub cover

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

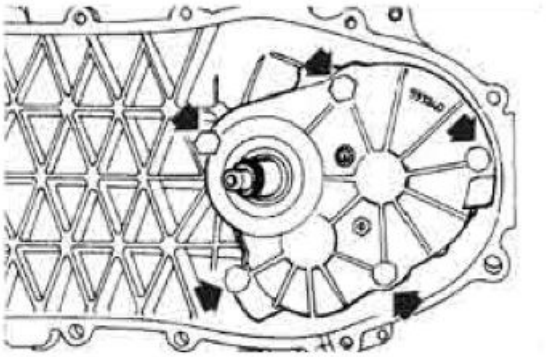


N.B.

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

Locking torques (N*m)

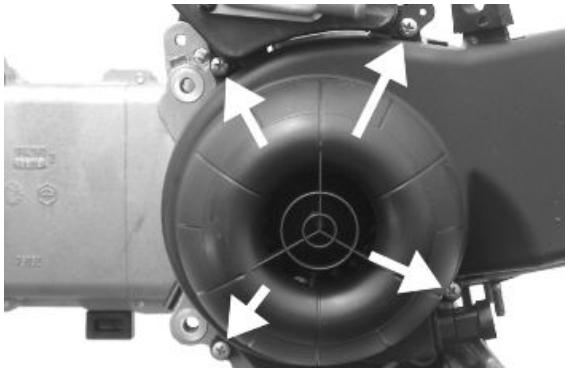
Rear hub cap screw **12 ÷ 13**



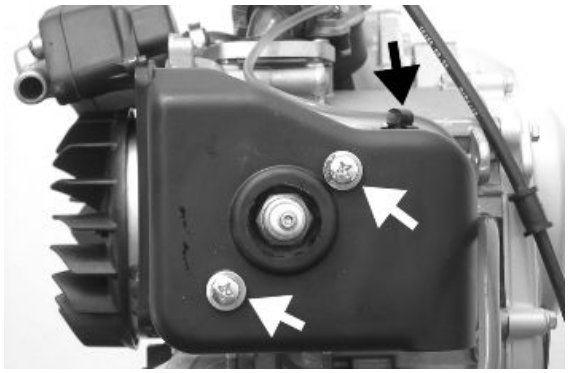
Flywheel cover

Cooling hood

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

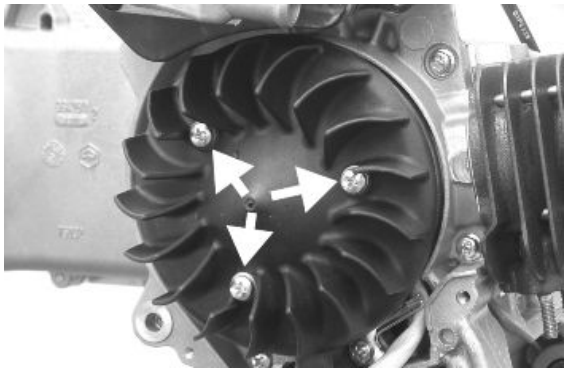


- Remove the oil piping retention band from the hood
- Remove the 2 screws shown in the figure



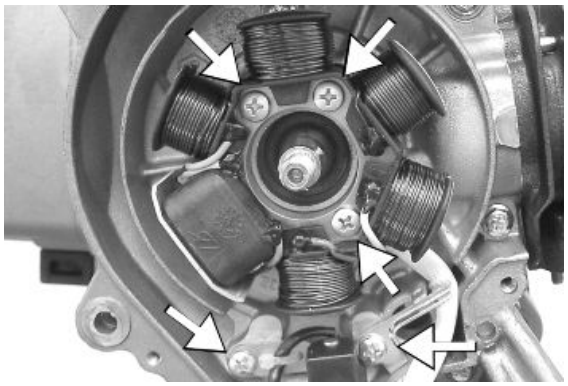
Cooling fan

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



Removing the stator

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



Refitting the stator

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

N.B.

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

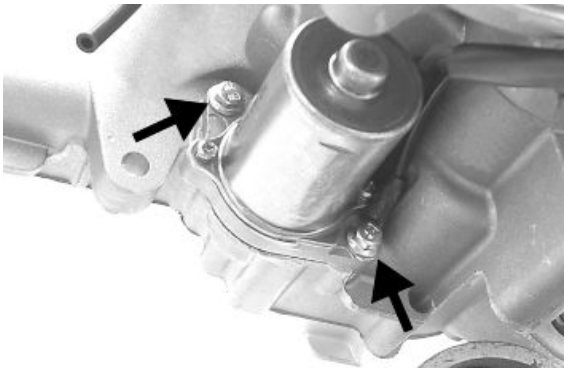
Locking torques (N*m)

Stator clamping screws 3 ÷ 4 Pick-Up clamping screw 4 ÷ 5

Flywheel and starting

Removing the starter motor

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.

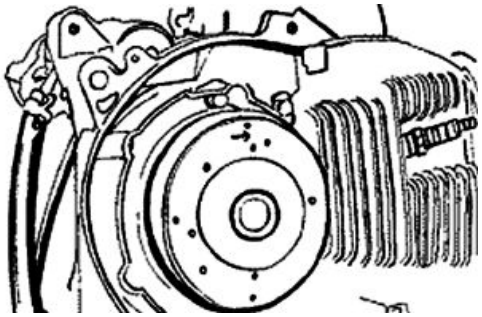
Specific tooling

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.

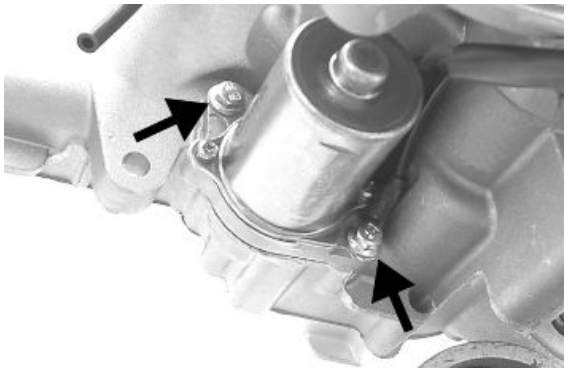
A VARIATION OF THE AIR GAP DISTANCE CAN LEAD TO A VARIATION IN THE IGNITION ADVANCE SUCH AS TO CAUSE PINGING, KNOCKING ETC.

Locking torques (N*m)

Flywheel nut **40 ÷ 44**

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.

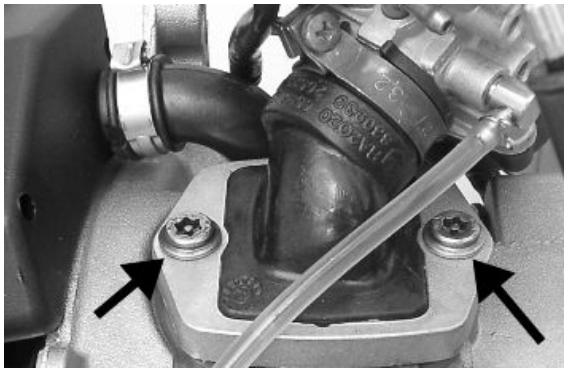
Locking torques (N*m)

Starter screws **12 ÷ 13**

Cylinder assy. and timing system

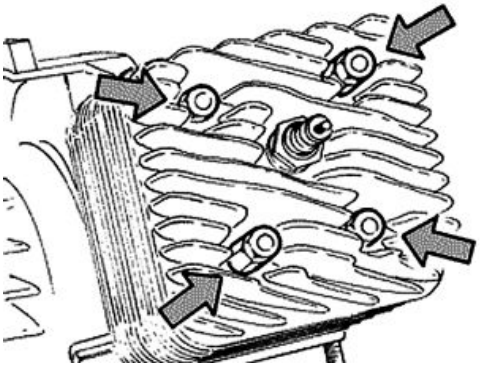
Removing the intake manifold

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



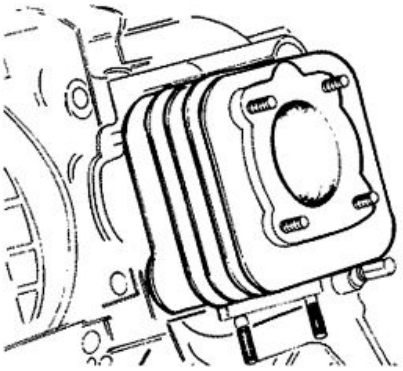
Removing the cylinder head

Remove the 4 screws shown in the figure



Removing the cylinder - piston assy.

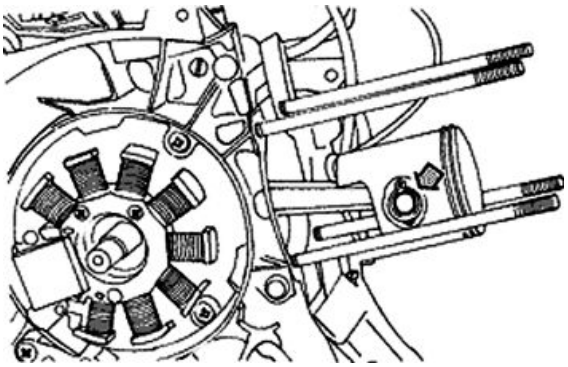
Remove the cylinder very carefully



Remove the snap rings and remove the pin

CAUTION

AFTER EACH REMOVAL OPERATION REPLACE THE PIN RETENTION SNAP RINGS

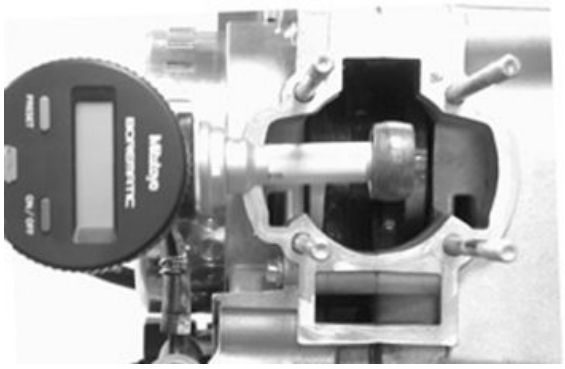


Inspecting the small end

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

N.B.

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



Characteristic

Rod small end: standard diameter

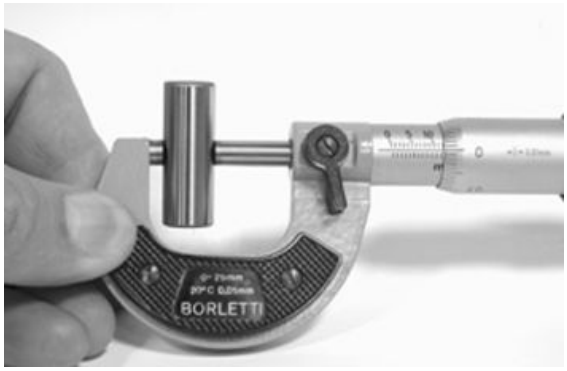
17 +0.011-0.001

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

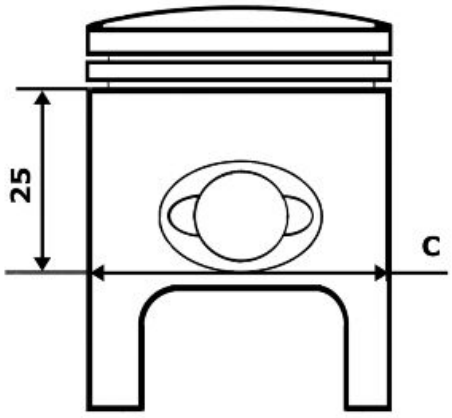
12 +0.007 +0.012

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



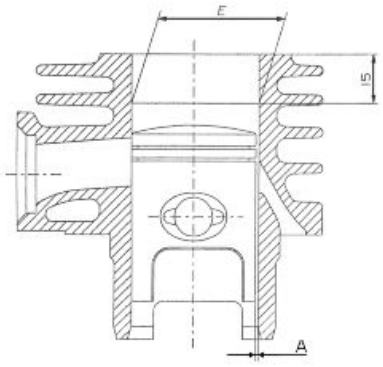
See also

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

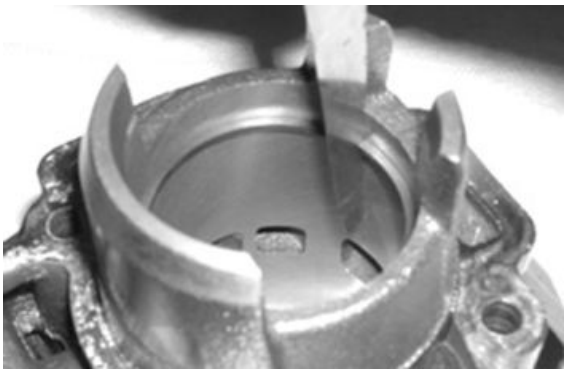
Cylinder - piston assy.

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)

Cylinder head nuts 10 -11

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

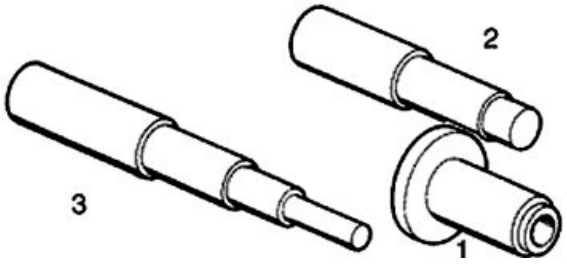
CAUTION

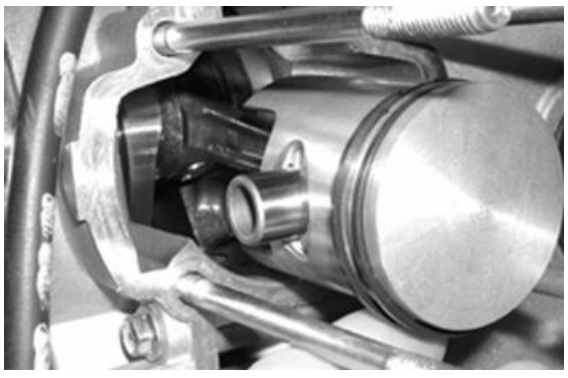
**POSITION THE ARROW PRINTED ON THE PISTON CROWN TOWARDS THE EXHAUST OPENING.
THE WRIST PIN SNAP RINGS MUST BE POSITIONED ON THE PISTON WITH THE SPECIFIC TOOL**

Recommended products

AGIP CITY TEC 2T Oil

Recommended oil

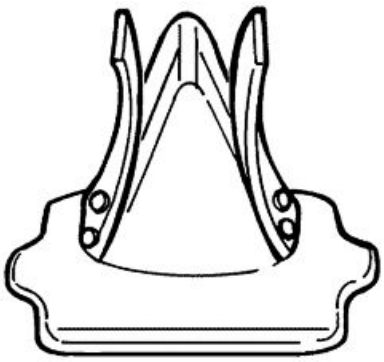




Inspecting the timing system components

CAUTION

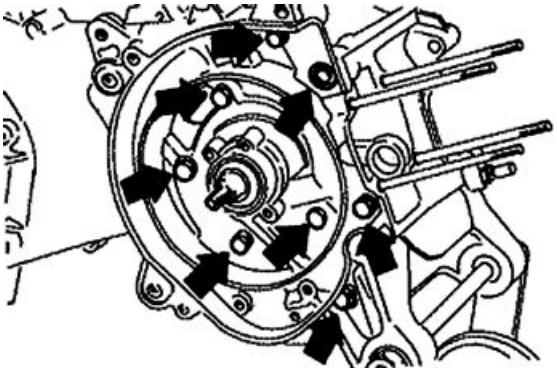
CHECK THE CORRECT REED UNIT SEAL; NO LIGHT MUST PASS BETWEEN THE SUPPORT AND LAMELLA.



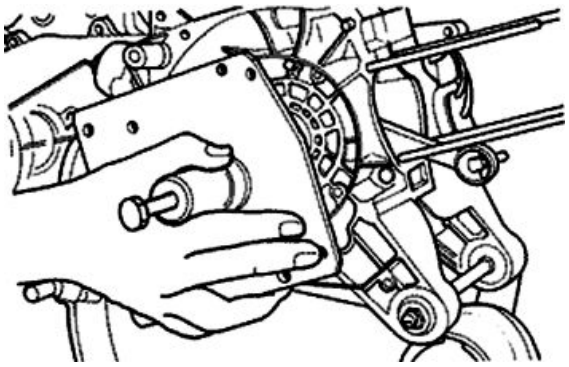
Crankcase - crankshaft

Splitting the crankcase halves

Remove the eight crankcase union fasteners.



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

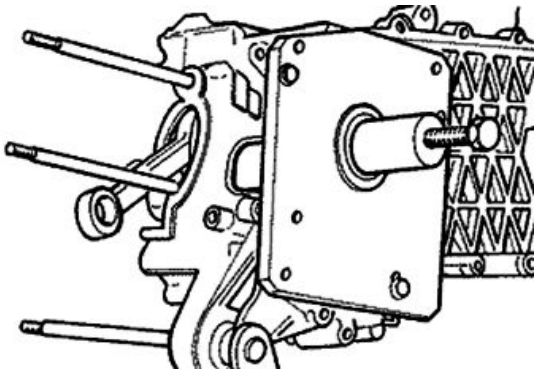


Specific tooling

020163Y Crankcase splitting plate

Removing the crankshaft

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



Specific tooling

020163Y Crankcase splitting plate

Removing the crankshaft bearings

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

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

N.B.

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

Specific tooling

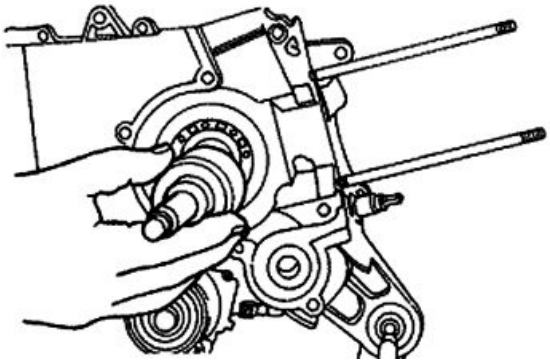
004499Y001 Bearing extractor bell

004499Y006 Bearing extractor ring

004499Y002 Bearing extractor screw

004499Y007 Half rings

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



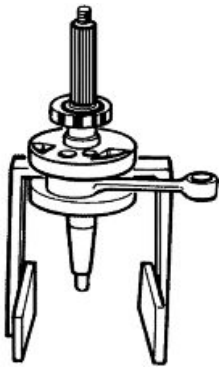
Specific tooling

001467Y007 Driver for OD 54 mm bearing

001467Y006 Pliers to extract 20 mm bearings

Refitting the crankshaft bearings

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

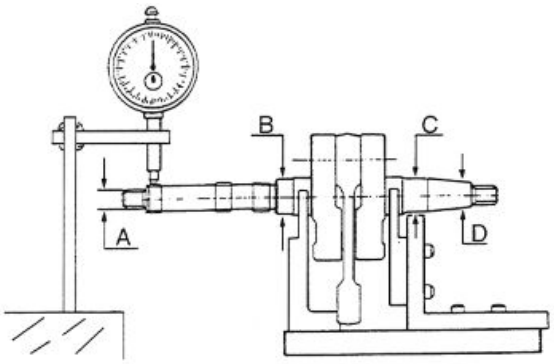


Specific tooling

020265Y Bearing fitting base

Inspecting the crankshaft alignment

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



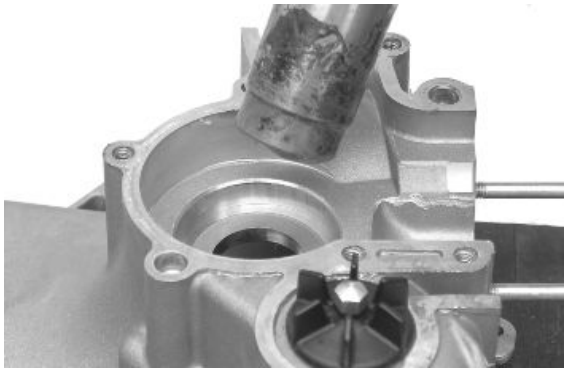
Specific tooling

020335Y Magnetic support for dial gauge

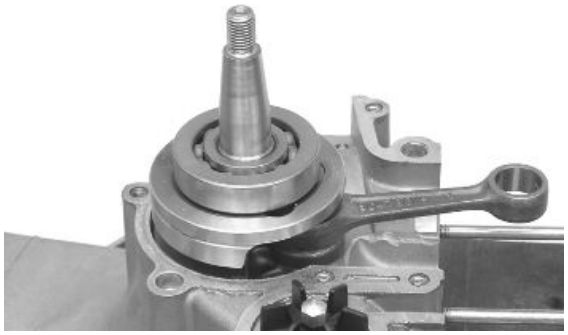
020074Y Support base for checking crankshaft alignment

Refitting the crankshaft

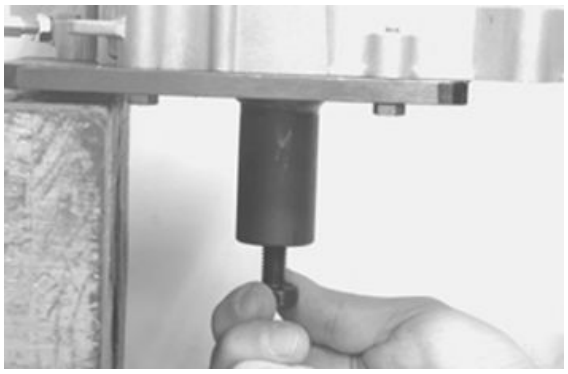
- Position the transmission side half crankcase on two wooden supports
- Using a thermal gun, heat the bearing seat to about 120°



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



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

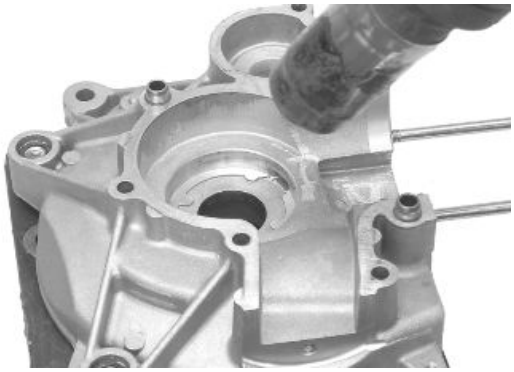


Specific tooling

020163Y Crankcase splitting plate

Refitting the crankcase halves

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

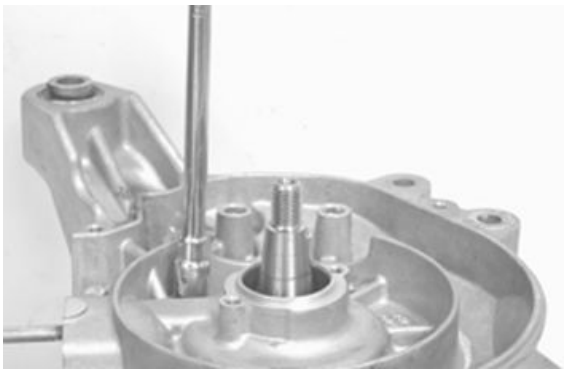


Recommended products

Loctite 510 Liquid sealant

Gasket

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

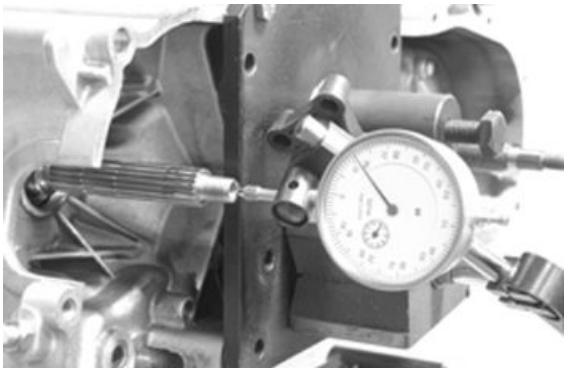


Locking torques (N*m)

Half-crank case joint bolts 12 ÷ 13

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

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



Specific tooling

020335Y Magnetic support for dial gauge

Characteristic

Axial clearance with warm crankcase

0.10 ÷ 0.12 mm

Axial clearance with cold crankcase

0.06 to 0.08 mm

Limit value with cold crankcase

0.02 ÷ 0.03 mm

Lubrication

Crankshaft oil seals

Refitting

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

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

N.B.

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

Specific tooling

020340Y Flywheel and transmission oil seals fitting punch

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

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

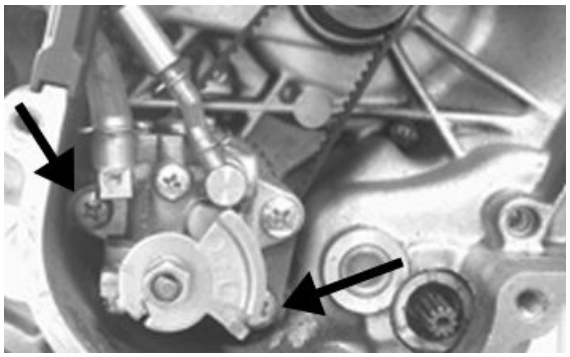
Specific tooling

020340Y Flywheel and transmission oil seals fitting punch

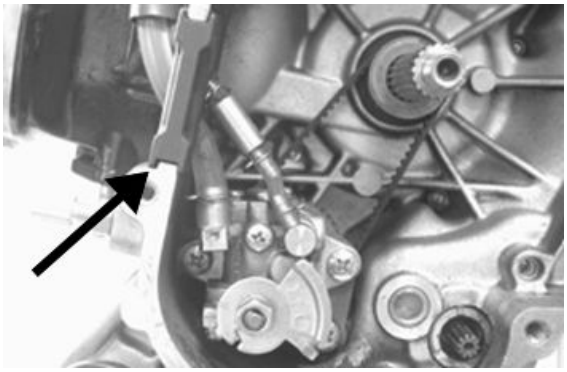
Oil pump

Removal

- Remove the 2 screws shown in the figure



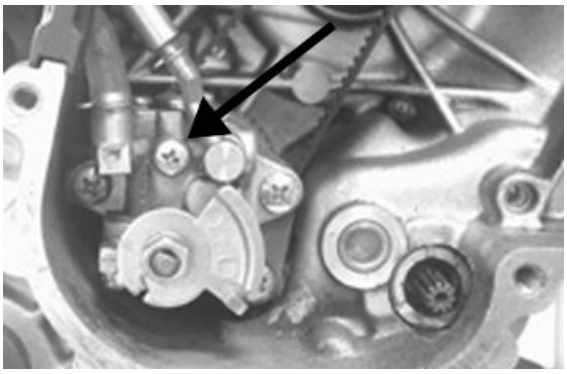
Remove the tube passage seal from the crankcase shown in the figure



Refitting

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

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

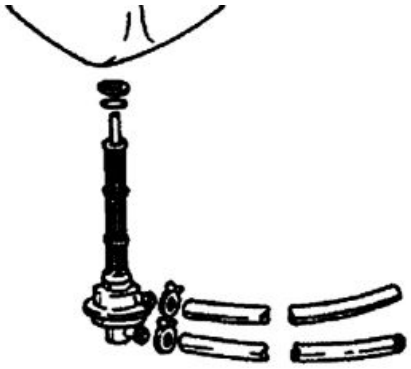


Fuel supply

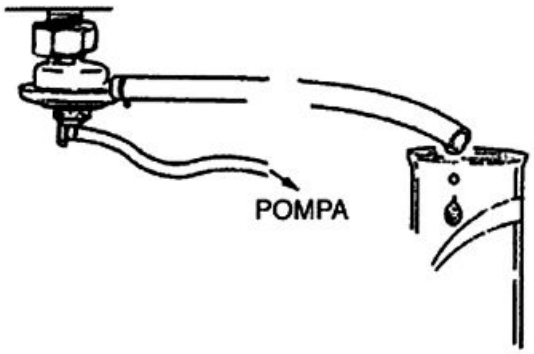
- Completely empty the gas tank.
- Remove the petrol delivery tube and the suction tube.
- Loosen the clip and remove the tap.
- Clean the tank and the filter of the tap with a specific solvent.
- Refit the tap making sure that there is an O-Ring.
- Turn the tap to the direction it had before it was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

N.B.

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



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



N.B.

THE MEASUREMENT MAY BE FALSIFIED BY THE INCORRECT NUMBER OF REVS OR BY THE WRONG POSITION OF THE TUBE.. IN THIS CASE, THE TENDENCY IS TO OBTAIN A REDUCED FUEL FLOW RATE. THE SUCTION OUTLET ON THE MANIFOLD HAS A SECTION INTENTIONALLY REDUCED FOR THE PURPOSE OF ENHANCING THE SUCTION PULSATION AND THEREBY GUARANTEE A CONSTANT TAP FLOW RATE.

Specific tooling

020329Y MityVac vacuum-operated pump

Characteristic

Minimum flow rate

20 cc

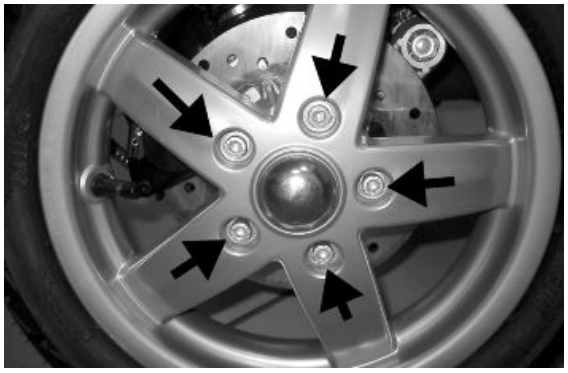
INDEX OF TOPICS

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

Front

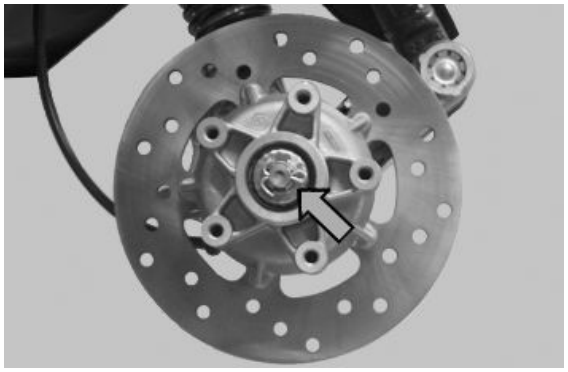
Removing the front wheel

- Support the scooter adequately.
- Loosen the five screws fixing the wheel to the hub.

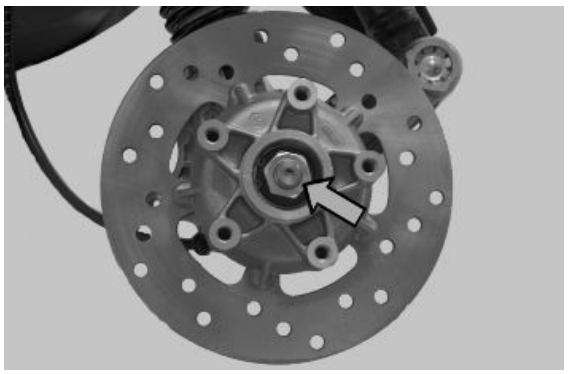


Front wheel hub overhaul

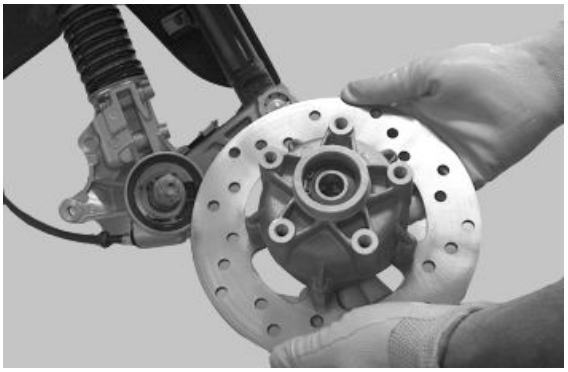
- Support the scooter adequately.
- Remove the front wheel.
- Remove the front calliper.
- Remove the cotter pin and remove the cap.



- Unscrew the nut fixing the front wheel hub.



- Remove the wheel hub.



- Remove the ball bearing check seeger ring indicated in the photograph

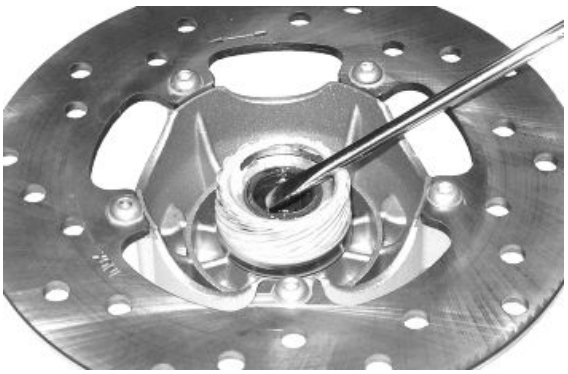
Extract the ball bearing using the specific tool

Specific tooling

001467Y014 Pliers to extract ø 15-mm bearings

001467Y017 Bell for bearings, OD 39 mm

- Remove the oil seal on the roller bearing side using a screwdriver.



- Remove the roller bearing using the specific tool

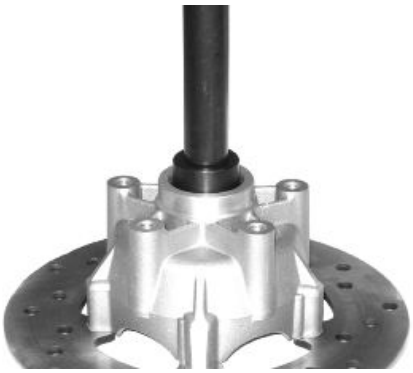
Specific tooling

020376Y Adaptor handle

020456Y Ø 24 mm adaptor

020363Y 20 mm guide

- Heat the roller bearing seat with a heat gun
- Use the specific tool to introduce and push the bearing until it stops, with the shielded side facing out
- Refit the ball bearing check seeger ring



Specific tooling

020151Y Air heater

020376Y Adaptor handle

020357Y 32 x 35 mm adaptor

020412Y 15 mm guide

- Use the specific tool to fit and push the roller casing until it stops
- Refit the oil seal on the roller bearing side
- Lubricate the area between the roller bearing and the ball bearing

Specific tooling

020038Y Punch

Recommended products

AGIP GREASE MU3 Grease for odometer transmission gear case

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

- To refit, follow the removal steps but in reverse order; be careful to tighten to the prescribed torque.

Locking torques (N*m)

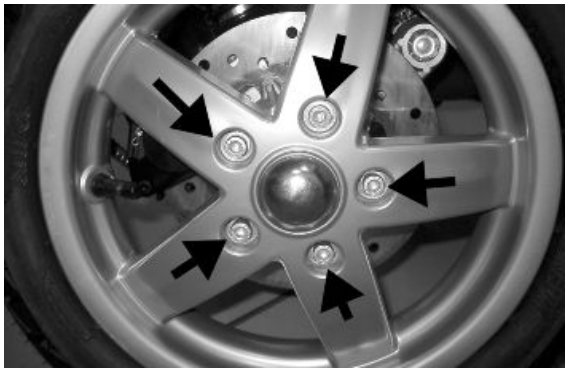
Front wheel axle nut 75 ÷ 90

Refitting the front wheel

- When refitting, tighten the 5 screws to the specified torque

Locking torques (N*m)

Wheel rim screws **20 ÷ 25**



Handlebar

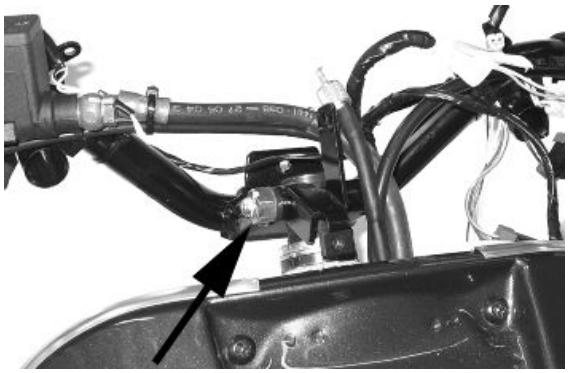
Removal

Remove the handlebar cover before carrying out this operation,.

- After removing the transmissions and disconnecting the electrical terminals, remove the terminal fixing the handlebar to the steering.
- 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.

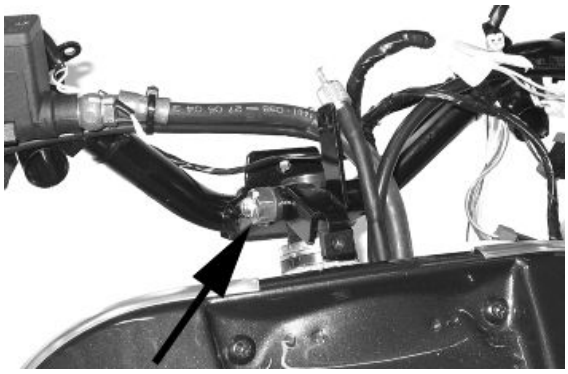


Refitting

Carry out the removal operations but in the reverse order, observing the prescribed tightening torque.

Locking torques (N*m)

Handlebar fixing screw **50 ÷ 55**



Steering column

Removal

After removing the upper seat, lean the vehicle on one side and extract the steering tube completely from the fork.

Specific tooling

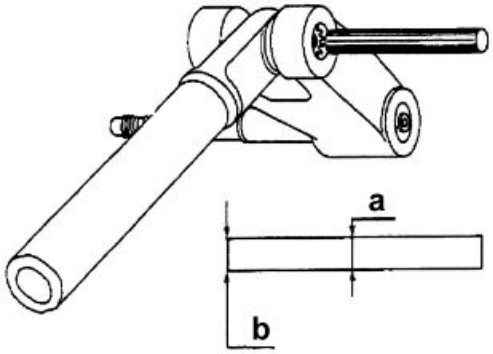
020055Y Wrench for steering tube ring nut

Overhaul

Servicing the front suspension-steering assembly, described below, deals mainly with replacing parts (pin- NADELLA roller bushings - sealing rings unit and dust guard) which connect the steering tube to the front wheel holder swinging hub.

N.B.

BEFORE PROCEEDING WITH THE DESCRIBED SERVICE, CHECK THAT THE STEERING TUBE AND THE WHEEL HOLDER HUB ARE IN EXCELLENT CONDITIONS: ONLY THEN IS THE SERVICE JUSTIFIABLE.
MOREOVER, REMEMBER THE STEERING TUBE SHOULD BE REPLACED WITH A NEW ONE WHEN DEFORMED.

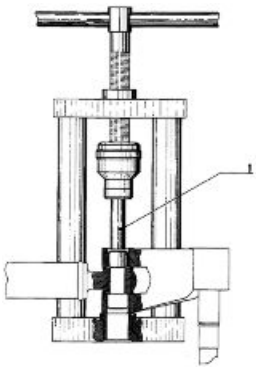


a = Ø 12 Punch

b = Sharp-edged end

Use a suitable punch with the dimensions indicated on the figure; hit with a mallet until the wedging washer is crushed and then extract it with the help of a pointed end.

Repeat the operation for the second washer using the punch on the side opposite to the one shown in the figure.



Use the tool fitted with part 1 as shown in the figure and move the tool handgrip until the pin and the NADELLA are simultaneously ejected in the direction opposite the tool thrusting force.

After removing the pin and the first NADELLA, the swinging hub gets detached from the steering tube.

To remove the second NADELLA, use the tool fitted with part 2 instead of part 1, on the side opposite the one shown in the figure.

N.B.

DURING THE REMOVAL OPERATIONS DESCRIBED ABOVE, THE ROLLER BUSHINGS ARE DESTROYED WHEN THE EXTRACTOR IS USED. UPON REFITTING, IT IS THEREFORE NECESSARY TO USE NEW BUSHINGS AS WELL AS A NEW PIN, NEW SEALING RINGS AND DUST GUARDS.

Specific tooling

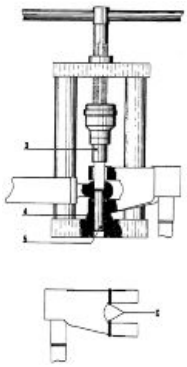
020021Y Front suspension service tool

Connect the swinging hub to the steering tube with the guiding pin.

- Use the tool fitted with part 3 on the stem and part 4 .

Lubricate the pin with recommended grease and insert it temporarily on the swinging hub, move the tool handgrip until part 3 is fully inserted on the steering tube.

After fitting the pin, insert the two spacers, slightly hitting them with the mallet.



N.B.

BEFORE PROCEEDING WITH THE DESCRIBED FITTING, PLACE THE TWO DUST GUARD RINGS ON THE SWINGING HUB AS SHOWN IN THE FIGURE.

Specific tooling

020021Y Front suspension service tool

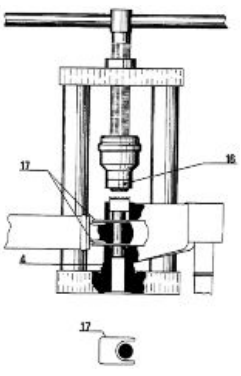
Recommended products

AGIP GREASE SM 2 Grease for odometer transmission gear case

Lithium grease with NLGI 2 molybdenum disulphide; ISO-L-XBCHB2, DIN KF2K-20

Insert the sealing ring on the pin and the roller bushing with its wedging washer at the same time.

- Remove the tool and the part 5 (guide), which has been partially ejected during the previous pin fitting phase, and leave part 4 always fitted.
- Replace part 3 with part 16 (on the stem).
- By moving the tool handgrip, push the wedging washer - roller bushing - seal ring unit, placing part 16 until it stops on the swinging hub.



- Repeat the above operation using the tool with part 16 and part 22, instead of part 4, always fitted to the stem, on the side opposite that indicated in the figure to fit the second wedging washer - roller bushing - sealing ring unit.

WARNING

BEFORE PROCEEDING WITH THE DESCRIBED PRE-FITTING, DIP THE SEALING RINGS IN MINERAL OIL AND THE "NADELLA" ROLLER BUSHINGS (PREVIOUSLY WASHED IN PURE PETROL OR NEUTRAL PETROLEUM TO ELIMINATE THE ANTIRUST PROTECTION), HALF-FILLED WITH GREASE.

Specific tooling

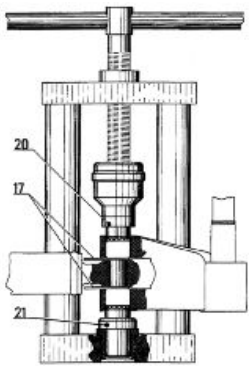
020021Y Front suspension service tool

Recommended products

AGIP GREASE MU3 Grease for odometer transmission gear case

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

- Use the tool fitted with part 20 on its stem and part 21 on the tool base as shown in the figure.
- By moving the tool handgrip, push the two NADELLA bushings until their internal bottoms make contact with the pin end.
- Use the tool fitted with parts 3 and 4 to fit the pin, and press moving the tool handgrip, until wedging the washers on the swinging hub.
- Now, remove the two spacers (parts 17 and 16) and, once the space between the NADELLAs - steering tube and swinging hub - has been fully filled with grease, move the dust guard rings until they are placed in that space.
- By wedging the washers as described above, the front suspension unit refitting stage is finished.



Recommended products

AGIP GREASE MU3 Grease for odometer transmission gear case

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

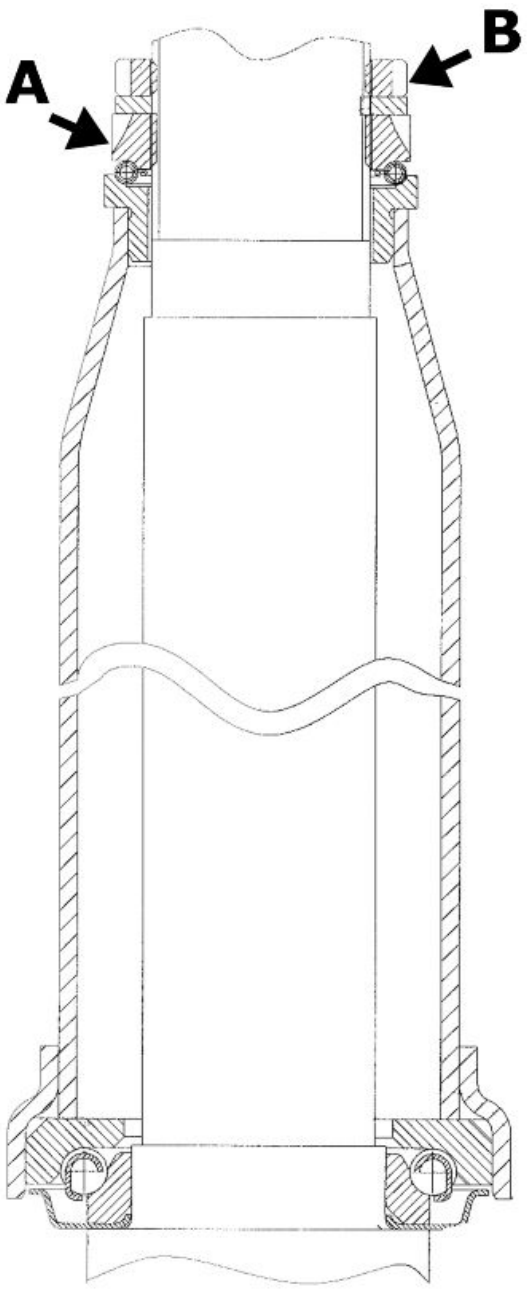
Refitting

CAUTION

USE NEW ROLLER CASINGS, PIN, SEALING RINGS AND DUST GUARDS FOR REFITTING.

When fitting the fork, lubricate with the steering bearing tracks with the recommended grease.

Tighten the lower ring nut **"A"** and the upper ring nut **"B"** to the specified torque



Recommended products

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.

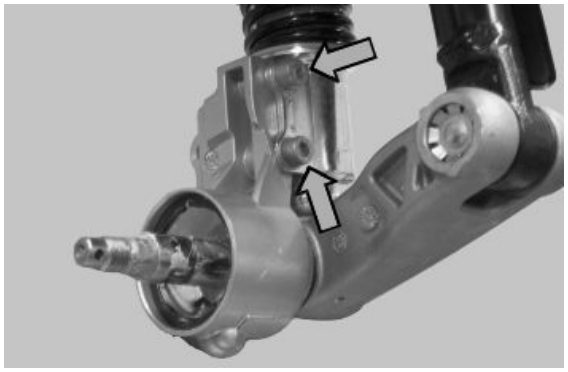
Locking torques (N*m)

Steering lower ring nut 8 ÷ 10 **Steering upper ring nut** 35 ÷ 40

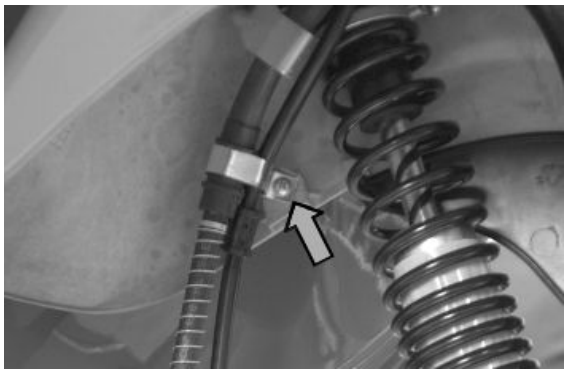
Front shock absorber

Removal

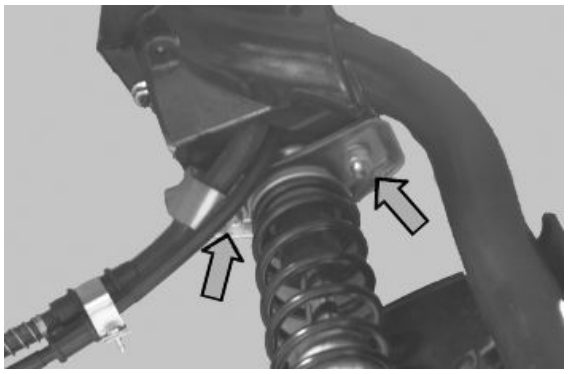
- Support the scooter adequately.
- Remove the wheel hub.
- Loosen the shock absorber lower clamps and remove the brake calliper shock absorber support.



- Loosen the screws fixing the front brake pipe retainer clamp and the odometer cable in order to reach the upper clamps.



- Unscrew the upper fixing nuts.



- Remove the front shock absorber.

Refitting

To refit, carry out the removal operations in reverse order, observing the prescribed tightening torques.

Locking torques (N*m)

Lower shock absorber clamping screw 20 - 27 Upper shock absorber fixing nut 20-30

Shock-absorber - calliper bracket

Removal

- Remove the front wheel hub with the brake disc
- Remove the front shock absorber lower clamps

- Remove the bracket locking seeger ring
- Unscrew the bracket

- Before refitting the bracket in the wheel axle, place the O-ring as shown in the photograph so that it is correctly placed after fitting the bracket.
- Refit the washer and the Seeger ring.
- Refit the lower screws fixing the shock absorber to the bracket and tighten at the prescribed torque

Locking torques (N*m)

Lower shock absorber clamping screw 20 - 27

Overhaul

- The bracket for the shock absorber -calliper attachment has two roller bearings separated one from the other as shown in the photograph

- Remove the two roller bearings from the bracket with the specific tool operating on the shock absorber attachment side as shown in the photograph

Specific tooling

020376Y Adaptor handle

020441Y 26 x 28 mm adaptor

020365Y 22 mm guide

- Remove the oil seal on the wheel hub side with the screwdriver as shown in the photograph

- Suitably hold the brake calliper - shock absorber attachment bracket
- Fit a new oil seal and move it until it stops using the specific tool

Specific tooling

020376Y Adaptor handle

020360Y Adaptor 52 x 55 mm

- Assemble a new roller bearing on the shock absorber side and move it until it stops using the specific tool

Specific tooling

020036Y Punch

- Suitably hold the brake calliper - shock absorber attachment bracket
- Assemble a new roller bearing on the wheel hub side and move it until it stops using the specific tool

Specific tooling

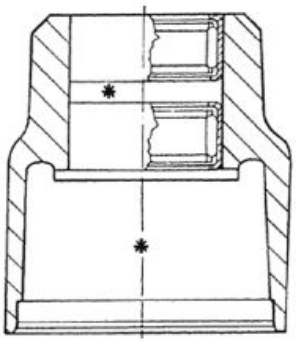
020037Y Punch

Refitting

- Refit the parts in reverse order of the removal operation.

CAUTION

BEFORE CARRYING OUT REFITTING OPERATIONS IN THE AREAS MARKED WITH AN ASTERISK, LUBRICATE THEM WITH THE RECOMMENDED PRODUCT



Specific tooling

020036Y Punch

020037Y Punch

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

Steering bearing

Removal

- Use the specific tool both to remove the lower seat of the upper bearing and to remove the upper seat of the lower bearing fitted on the chassis.

N.B.

TO REMOVE THE LOWER SEAT OF THE LOWER STEERING BEARING JUST USE A SCREW-DRIVER AS A LEVER BETWEEN THE SEATING AND THE SLEEVE.

Specific tooling

020004Y Punch for removing fifth wheels from headstock

- Remove the fifth wheel fitting and the dust guard on the steering tube as shown in figure, using the specific tool. Proceed giving a few taps with the mallet.

Specific tooling

020004Y Punch for removing fifth wheels from headstock

- Refit the fifth wheel fitting and the dust guard on the steering tube until they stop, using the specific tool.

Specific tooling

006029Y Punch for fitting fifth wheel seat on steering tube

Rear

Removing the rear wheel

- Remove the muffler.
- Remove the cotter pin and remove the cap.

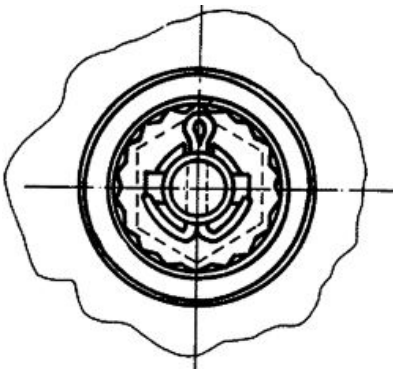
- Unscrew the nut fixing the wheel axle and collect the washer.

Refitting the rear wheel

- To refit, follow the removal steps but in reverse order; be careful to tighten to the prescribed torque.

Locking torques (N*m)

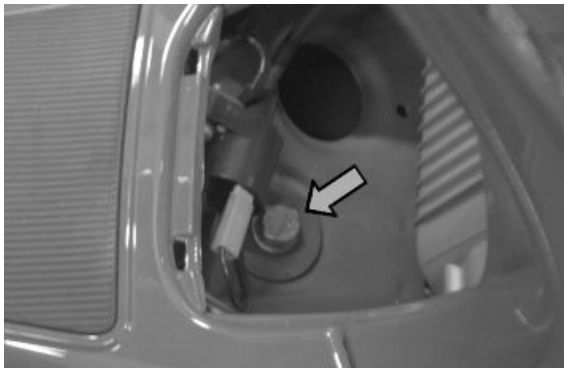
Locking torque 137 ÷ 152 Nm



Swing-arm

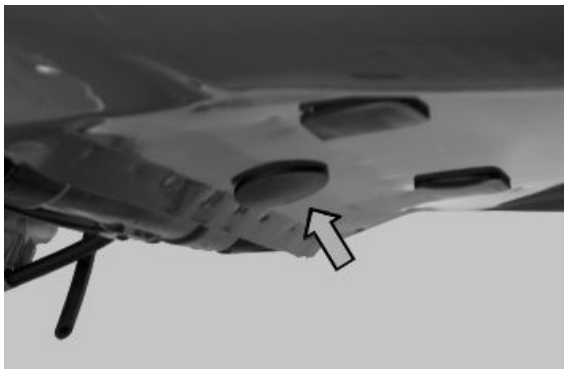
Removal

- Support the scooter adequately.
- Remove the central tunnel inspection door.
- To remove the upper clamp from the chassis, proceed as follows:

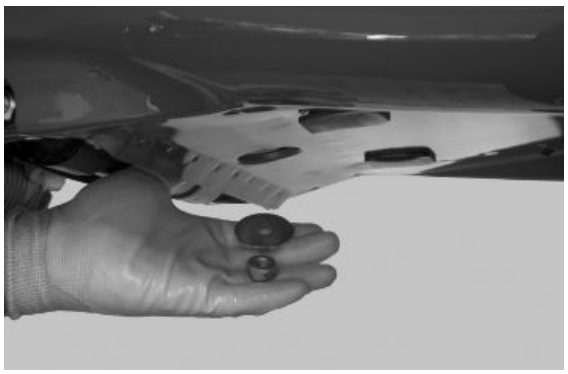


- Unscrew the pin and collect the washer.

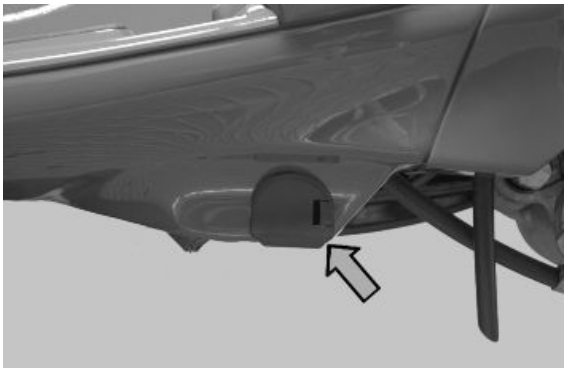
- Remove the cap from the lower part.



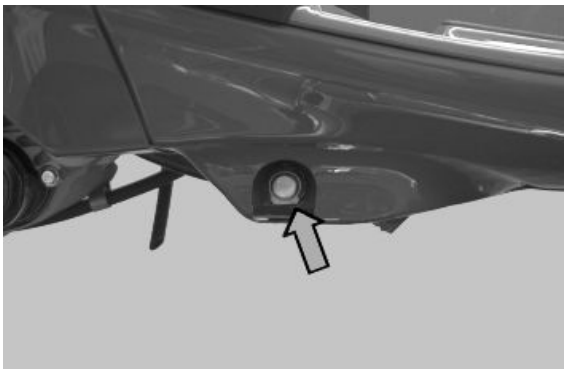
- Collect the lower fixing nut and collect the washer.



- Working on both sides, remove the cover caps.

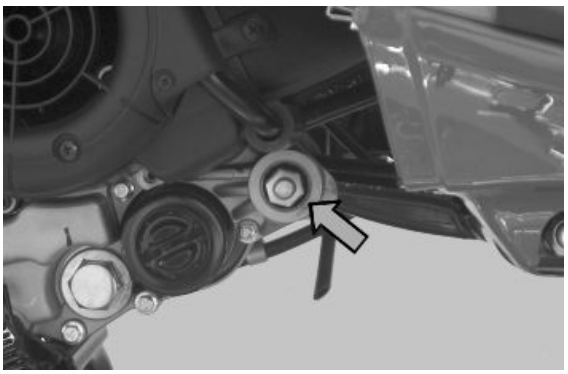


- Working on the right side, unscrew the side fixing nut to the chassis and collect the washer.

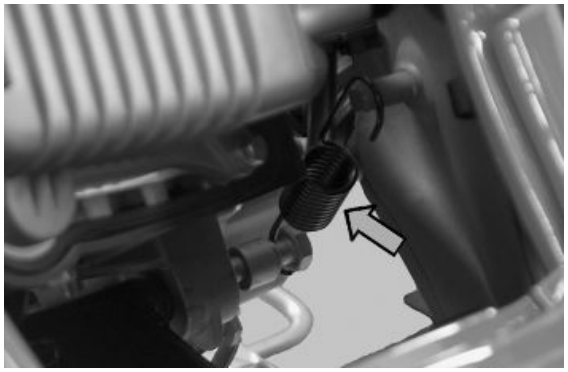


- Working on the left side, remove the pin.

- Remove the spoiler terminal from both sides.
- Working on the right side, unscrew the fixing nut.

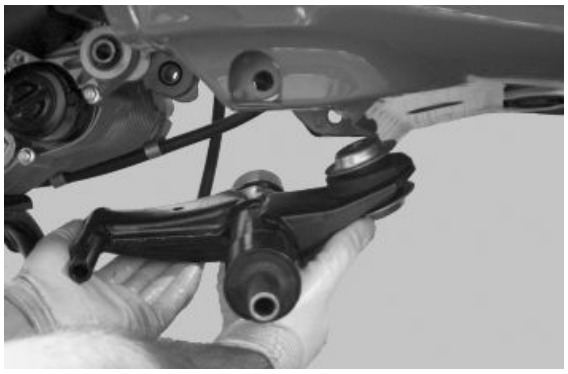


- Working on the left side, release the pin from the spring shown.



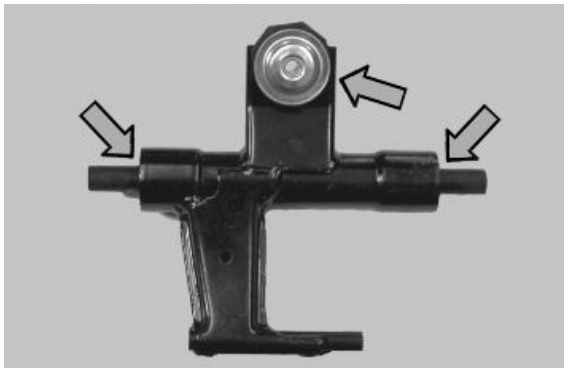
- Remove the fixing pin to the engine and collect the spacer.
- Now the swinging arm is free.

- Remove the swinging arm from the vehicle; first release it from the engine side and then from the chassis side.



Overhaul

- Check that the silent-blocks are in good conditions.
- Otherwise, replace the swinging arm.

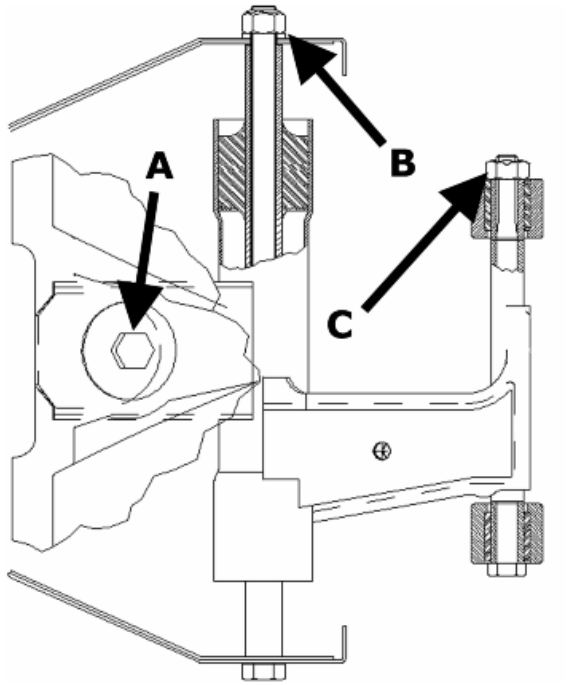


Refitting

For rifting, respect the locking torques

Locking torques (N*m)

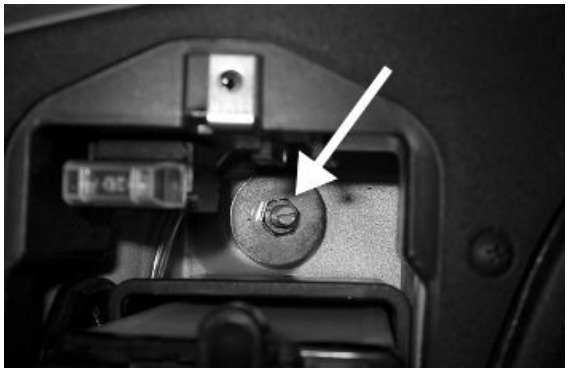
Swinging arm to engine pin locknut 33 ÷ 41
Swinging arm to chassis pin locknut 44 ÷ 52
Swinging arm plate to chassis screw 33 ÷ 41



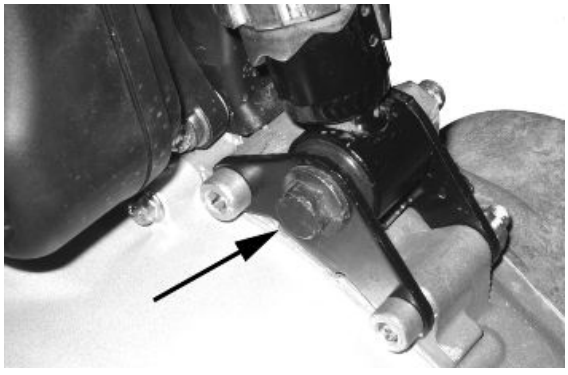
Shock absorbers

Removal

- Adequately support the rear part of the scooter.
- Remove the battery cover.
- Undo the indicated upper fixing screw to the frame.



- Unscrew the lower fixing pin to the transmission crankcase.



Refitting

- To fit, follow the removal steps but in reverse order; be careful to tighten to the prescribed torques.

Locking torques (N*m)

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

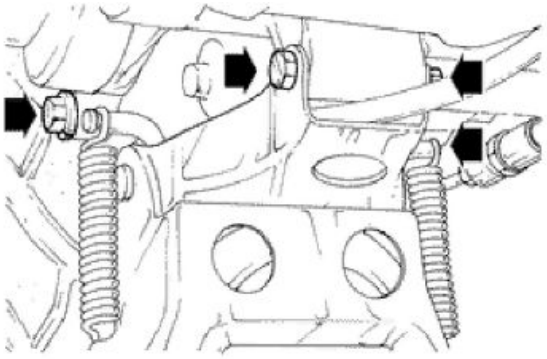
Centre-stand

Replace complete stand

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

Locking torques (N*m)

Stand screw torque 18.5 to 19 Nm



Side stand

REMOVAL

- Uncouple the centre stand return spring;

Remove the screw shown in the photograph

FITTING

To refit, carry out the removal operations in reverse order and comply with the specified torque.

Locking torques (N*m)

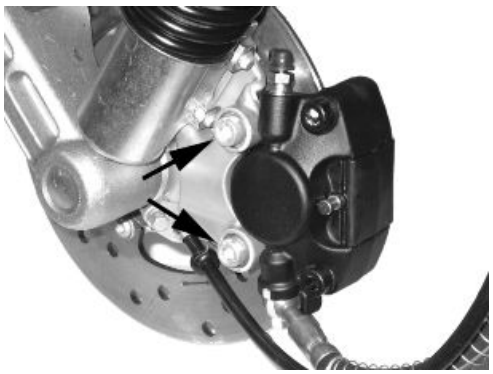
Side stand fixing bolt 35 ÷ 40

INDEX OF TOPICS

Front brake calliper

Removal

- Remove the front wheel.
- Undo the two fixing screws to the shock absorber
- calliper support.



N.B.

SHOULD IT BE NECESSARY TO REPLACE THE CALLIPER, FIRST LOOSEN THE FITTING CONNECTING THE PIPE TO THE BRAKE CALLIPER.

Refitting

To fit, follow the removal steps but in reverse order; be careful to tighten to the prescribed torques.

N.B.

ONCE REFITTING IS FINISHED, BLEED THE SYSTEM.

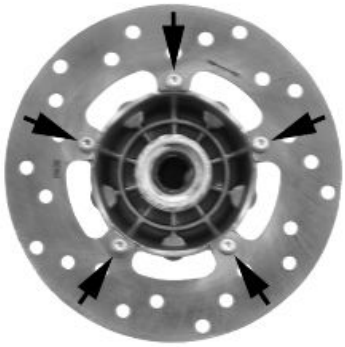
Locking torques (N*m)

Screw tightening calliper to the support 20 ÷ 25 Brake pipe connection 20 to 25 N•m

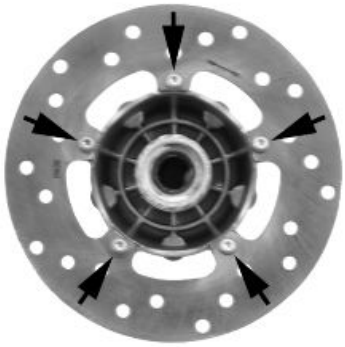
Front brake disc

Removal

- Remove the front wheel
- Remove the front brake calliper
- Remove the hub and the disc operating on the wheel axle nut
- Adequately support the hub with the disc and operating on the five screws shown in the photograph, remove the brake disc



Refitting



- Carry out the operations in the reverse order from the removal being careful to respect the direction of disc rotation shown by the arrow printed on it
- Tighten the 5 screws to the specified torque

Recommended products

Loctite 243 Medium strength threadlock

Loctite 243 medium-strength threadlock

Locking torques (N*m)

Brake disc screws **8 ÷ 10**

Disc Inspection

- Remove the front wheel
- Use a micrometer to check the disc thickness as shown in the photograph
- Repeat the measurement in at least 6 points on the disk
- Remove the front brake calliper
- In order to secure the appropriate tool adequately use a metal plate with M8 threaded hole and fix it to one of the two front brake calliper attachment points
- Place the dial gauge on the disk outer edge
- Make the wheel hub turn and check the disk deviation

Specific tooling

020335Y Magnetic support for dial gauge

Characteristic

Minimum thickness allowed after use:

4 mm

Disc thickness at wear limit (front)

3.5 mm

Max. deviation allowed:

0.1 mm

- If a value other than that prescribed is detected, replace the disc and check again.
- If the problem persists, check and replace the wheel hub if required.

Front brake pads

Removal

Proceed as follows:

- Remove the front calliper.
- Remove the cotter pin and slide off the pin that locks the two pads.
- Remove the pads, being careful with the pad spring clamp.
- Check the thickness of the friction material of the pads.
- Replace the pads if the thickness is below the minimum value.
- The replacement must be made with greater residual thickness if the pad has not worn evenly. A 0.5 mm thickness difference in the residual friction material is permitted.

Characteristic

Minimum value

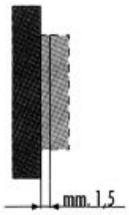
1.5 mm

See also

Front
brake calliper

- Pads must be replaced when the friction material thickness reaches the wear limit.
- To replace:

remove the protection cover, the bolt and the leaf spring. Slide off the pads and replace them once the plungers are down. Carry out these operations in reverse order to fit.



CAUTION

BEFORE USING THE BRAKE, OPERATE THE LEVER A FEW TIMES.

Refitting

- Insert the brake pads
- Insert the fixing pin being careful to position the clip with the ends towards the bleed screw as in the photo.

- Insert the lock on the bolt and then the protection cover

Fill

Front

- Remove the rubber cap from the bleed screw.
- Insert a rubber pipe in the bleed screw to permit the brake fluid to be recovered.
- With the right-hand brake lever, load the system and bring it up to the required pressure.
- Keeping the right-hand brake lever pulled, loosen the bleed screw to purge the air. Then tighten the bleed screw
- Release the brake lever
- Repeat the operation until only brake fluid comes out of the rubber pipe.
- Remove the fluid recovery pipe and refit the rubber cap over the bleed screw.
- Top up the brake fluid to the right level in the reservoir.

If necessary, bleeding can be done using a special vacuum pump

N.B.

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

N.B.

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

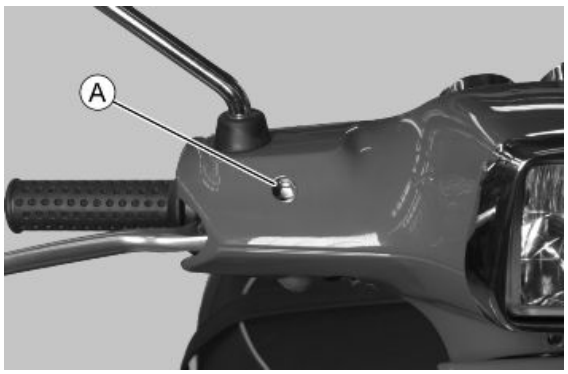
Specific tooling

020329Y MityVac vacuum-operated pump

Locking torques (N*m)

System bleed calliper fitting: 20 ÷ 25 Nm

Brake fluid level check



- Rest the vehicle on its centre stand on flat ground.
- The brake fluid reservoir has a sight glass «**A**» made of transparent material; the quantity of liquid contained in the sight glass indicates the level of fluid in the reservoir.
- When the sight glass «**A**» is full, the level inside the reservoir is above the MIN level; when it is partially full, the level has dropped to the MIN level;

when it is fully empty, the level of fluid in the reservoir is below the MIN level.

N.B.

THE LEVEL TENDS TO DROP AS THE BRAKE PADS GET WORN, A MINIMUM LEVEL SHOULD NOT BE REACHED. IF THE LEVEL IS TOO LOW, CHECK AND FIX THE SYSTEM SEALS, IF REQUIRED. TOP UP THE PUMP TANK, IF REQUIRED, CONSIDERING THAT THE "MAX." LEVEL MUST ONLY BE OBTAINED WITH NEW PADS.

- Under standard climatic conditions, replace fluid as indicated in the scheduled maintenance table.

Front brake pump

Removal

- Remove the front and rear handlebar covers
- Remove the two screws fixing the brake pump to the handlebar indicated in the photograph
- Remove the oil pipe joint from the pump
- Remove the connector to the stop light switch

Overhaul

Proceed as follows:

1) Remove the brake lever by loosening the retaining screw; open the cover (2) and take out the diaphragm (3);

2) remove the cap (4) and take out the internal parts in order;

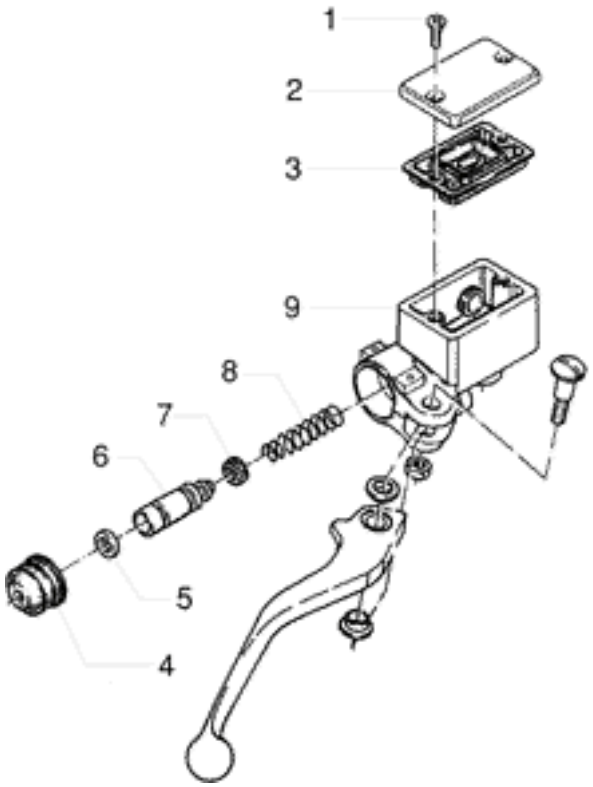
3) Check that:

- The body of the pump shows no signs of internal damage or corrosion;
- The plunger shows no sign of damage or abnormal wear;
- The plunger return spring is in good condition.

CAUTION

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

1. Reservoir cap screw
2. Reservoir cap.
3. Diaphragm.
4. Bellows.
5. Sealing ring
6. Piston.
7. Gasket.
8. Spring.
9. Reservoir



Refitting

To refit, carry out the removal operations but in reverse order, observing the specified torques.

N.B.

USE NEW COPPER GASKETS ON THE JOINTS.

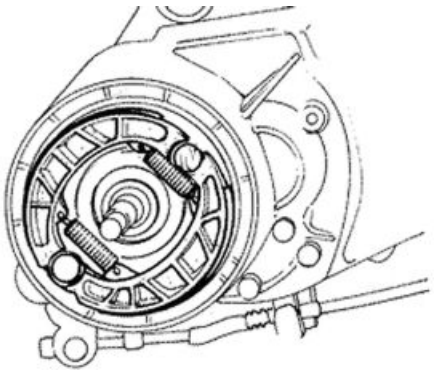
CAUTION

ONCE REFITTING IS FINISHED, BLEED THE SYSTEM.

Locking torques (N*m)

Oil pipe joint to the pump: 20 - 25 Brake pump fixing screws to the handle bar: 7 ÷ 10 Nm Pipe / brake calliper coupling 20 ÷ 25

Rear drum brake



Once the muffler and the wheel have been removed, follow these steps:

- Remove the shoe spring using the specific pliers.
- Remove the shoes with the help of a lever.
- Refit the new shoes with a few taps with the mallet.
- Attach the spring using the specific spanner.

CAUTION

REPLACE THE SHOES BEFORE THE FRICTION MATERIAL IS FULLY WORN

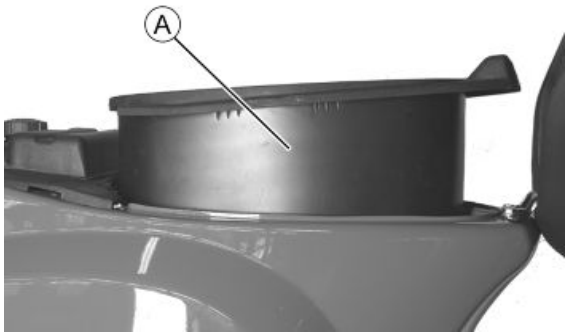
Specific tooling

020325Y Brake-shoe spring calliper

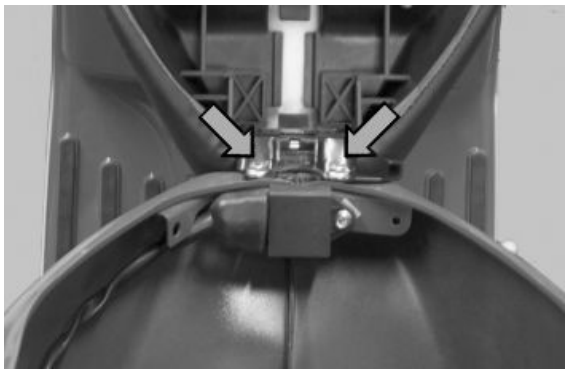
INDEX OF TOPICS

Seat

- Lift the saddle and remove the helmet compartment «**A**».

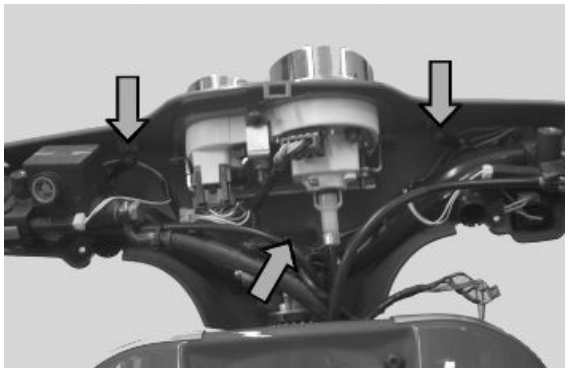


- Undo the two screws indicated.



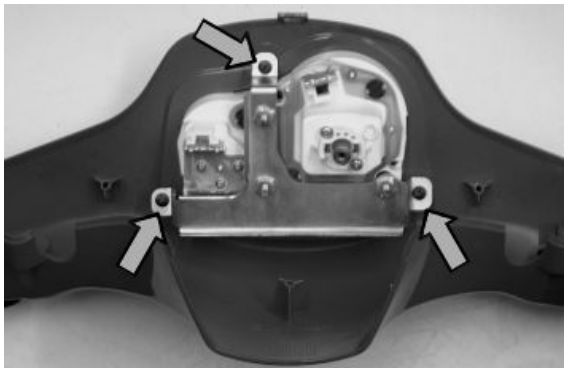
Rear handlebar cover

- Remove the front handlebar cover.
- Undo the three screws indicated in figure fixing it to the handlebar, the odometer transmission and the electrical connectors.



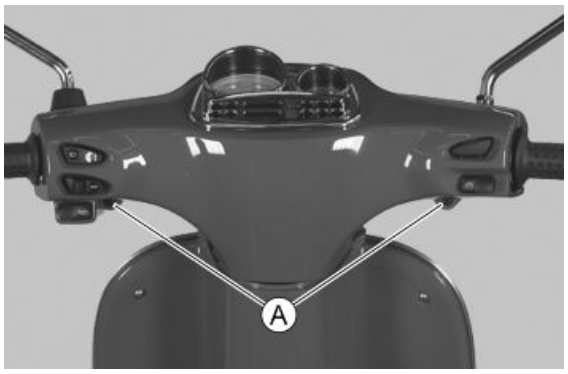
Instrument panel

- Remove the rear handlebar cover.
- Undo the three screws indicated fixing the rear handlebar cover.



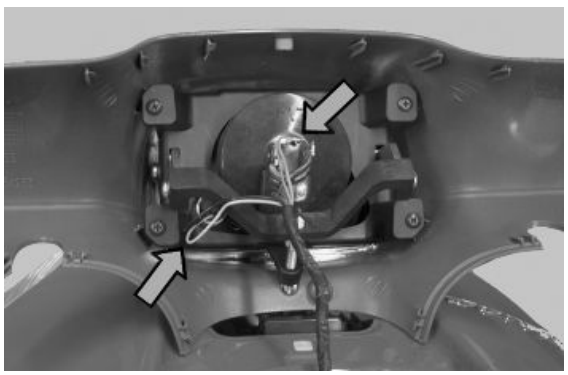
Front handlebar cover

Proceed as follows:
-Remove the rear-view mirrors.
- Undo the two screws «**A**».



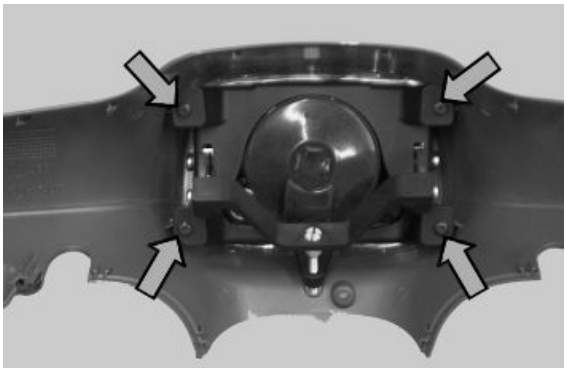
- Undo the screw «**B**» and remove the front handlebar cover.

- Disconnect the electrical terminals and remove the turn indicator bulb.



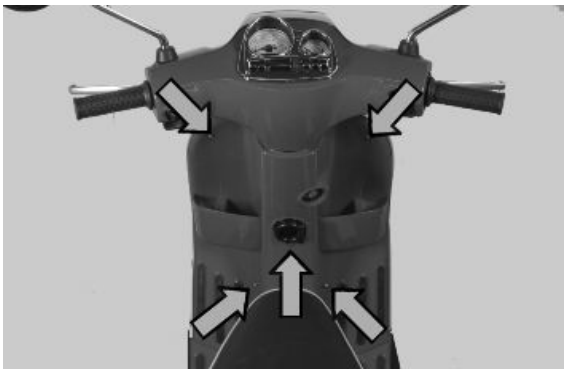
Headlight assy.

- Remove the front handlebar cover.
- Undo the four screws indicated fixing the front handlebar cover.

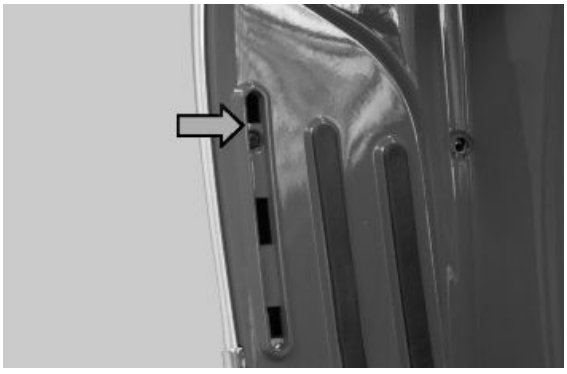


Knee-guard

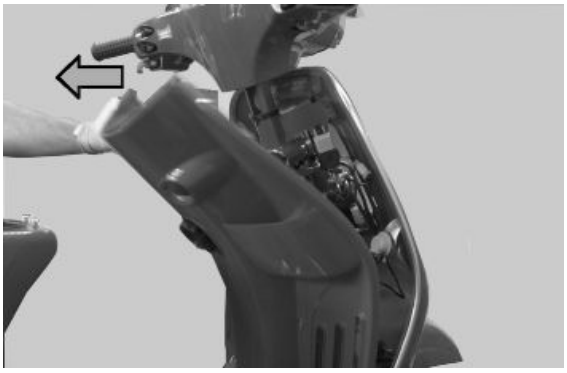
- Undo the five screws indicated.



- Remove the rubber strip from both sides and undo the indicated screw.

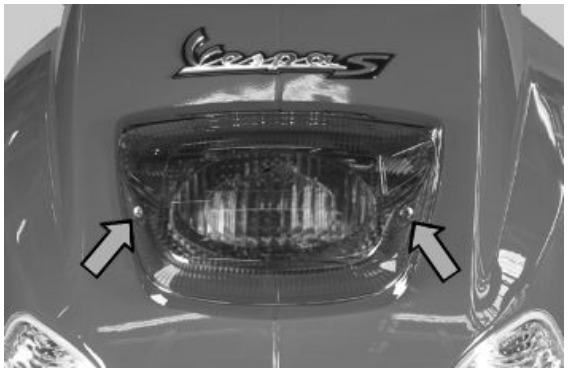


- Remove the shield back plate bringing it to the rear part of the scooter.

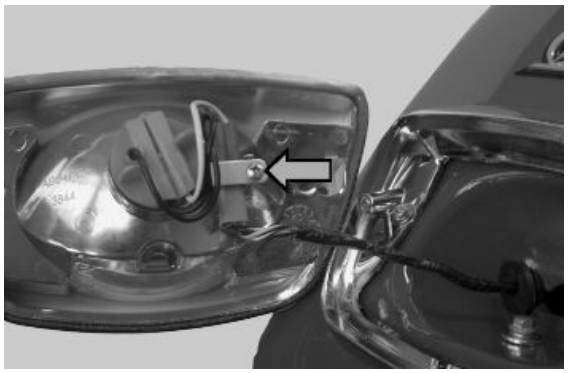


Taillight assy.

- Undo the two fixing screws and remove the rear light unit.



- Undo the screw indicated and disconnect the connector.

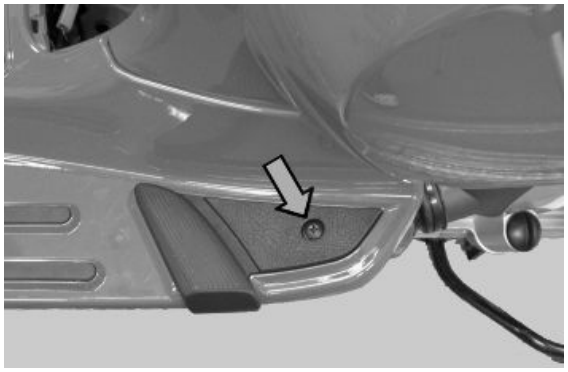


Footrest

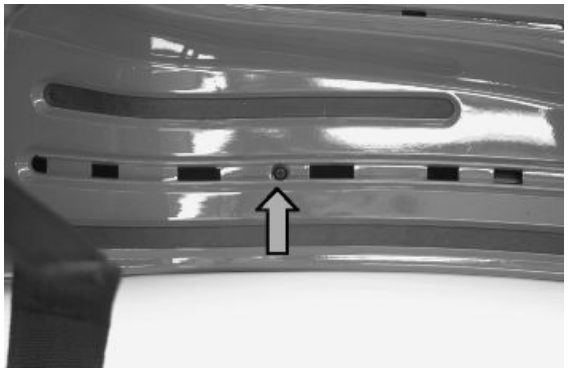
- Remove the shield back plate.
- Remove the side fairings.
- Remove the central tunnel inspection door.

From both sides, unscrew:

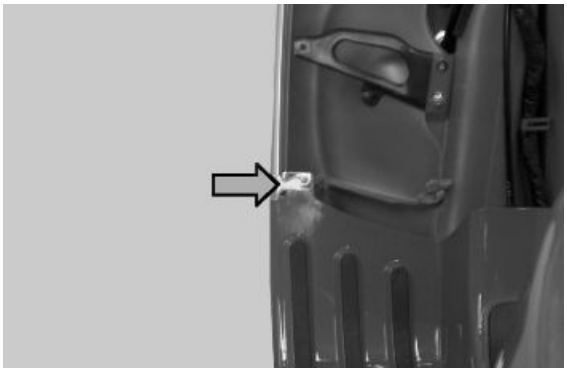
- The fixing screw at the back.



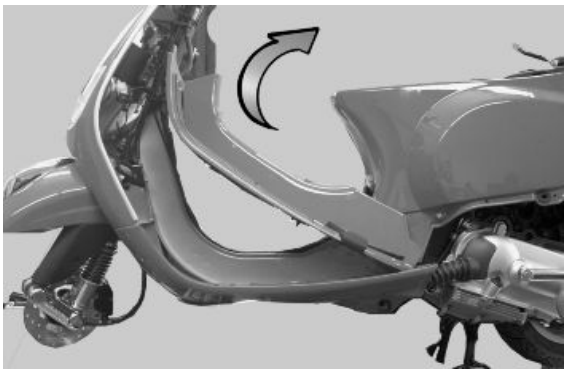
- The fixing screw on the central part.



- The fixing screw at the front.

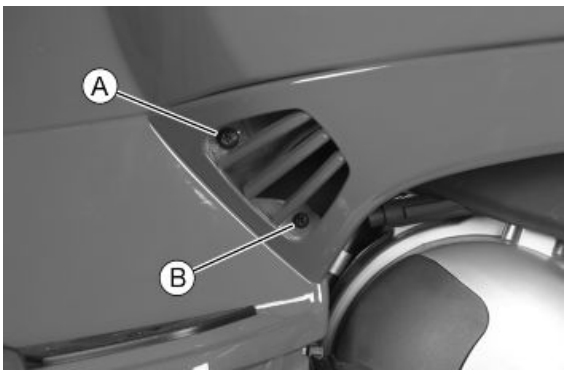


- Remove the footrest.

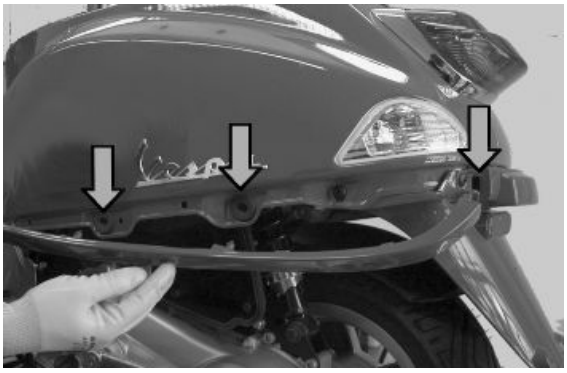


Side fairings

- Undo the screw «**A**» and the smaller screw «**B**».

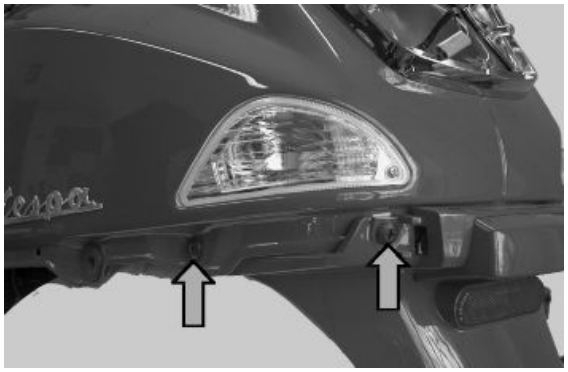


- Detach the seats on the fairing.

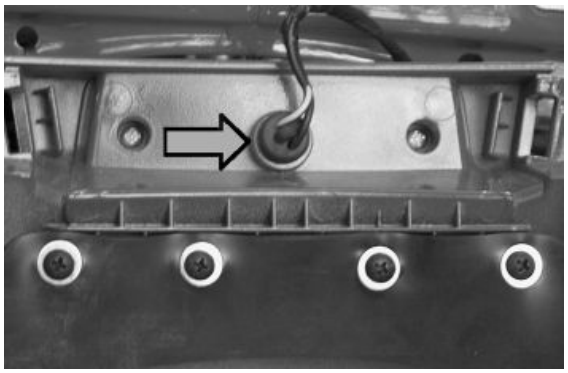


License plate holder

- Remove the side fairings.
- Working on both sides, undo the two screws indicated.

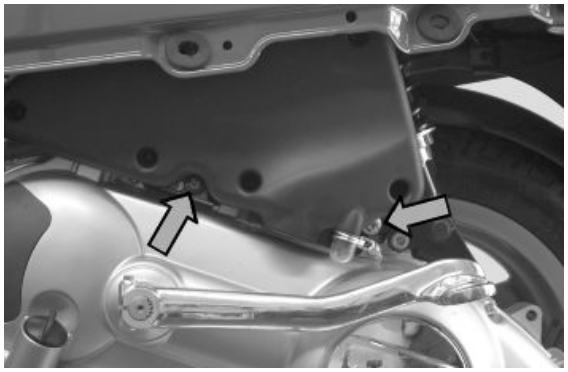


- Remove the license plate light.

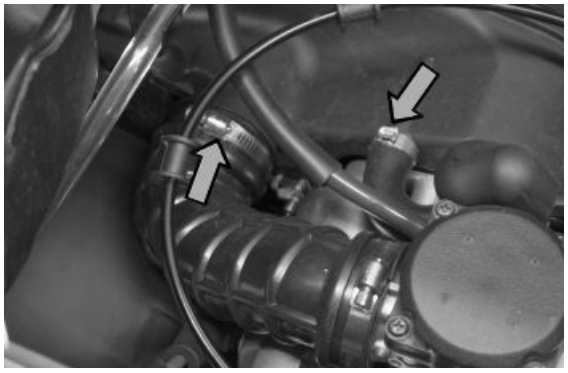


Air filter

- Remove the helmet compartment.
- Remove the side fairings.
- Undo the two indicated clamps to the crankcase.

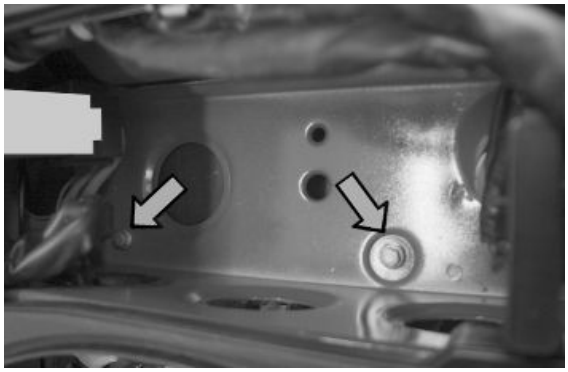


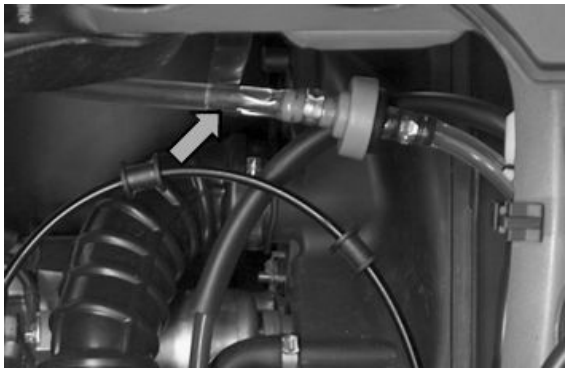
- Undo the two clamps indicated.



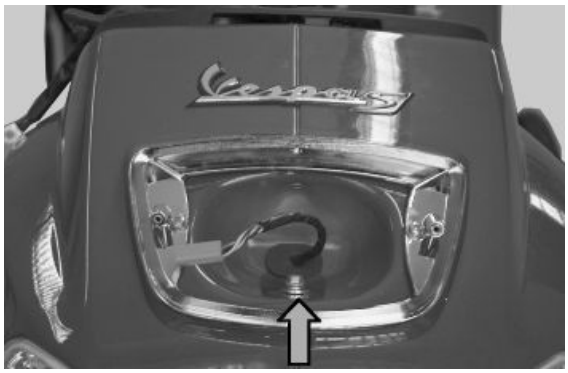
Fuel tank

- Adequately support the rear part of the scooter.
- Remove the wheel and the rear mudguard.
- Remove the battery compartment.
- Disconnect the fuel outlet pipe.
- Undo the two fixing screws to the chassis and collect the fuel pipe supporting plate.

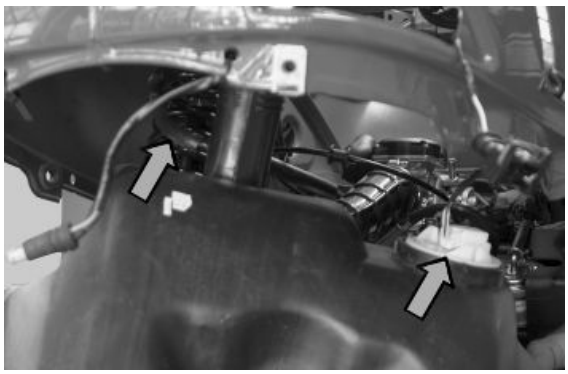




- Remove the turn indicators.
- Remove the rear light unit and undo the indicated screw.



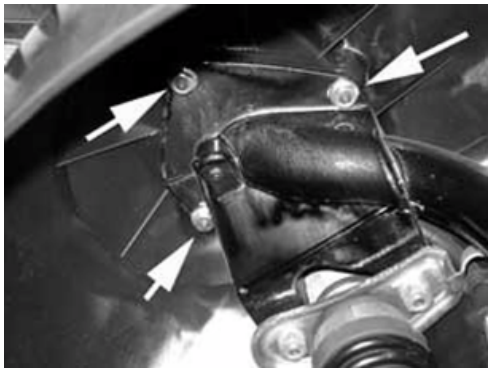
- Unscrew the closing cap.
- Lower the fuel tank and disconnect the bleed pipes and the level indicator connector.



- Remove the tank.

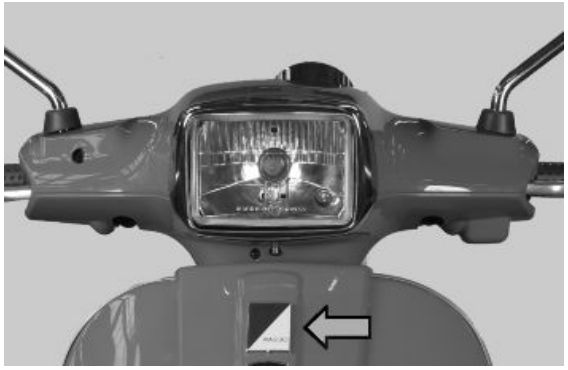
Front mudguard

- First remove the steering tube and uncouple the front brake pipes from the calliper in order to remove the front mudguard
- Remove the three mudguard-steering tube clamps indicated in the figure

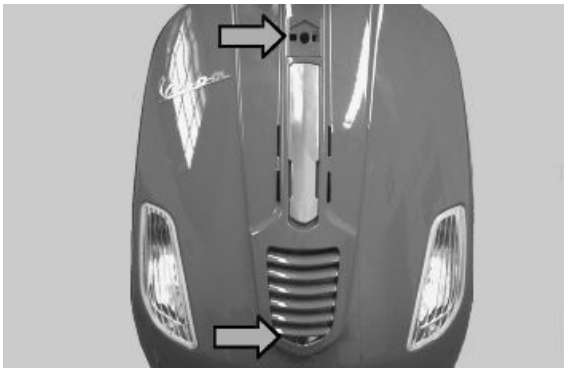


Front central cover

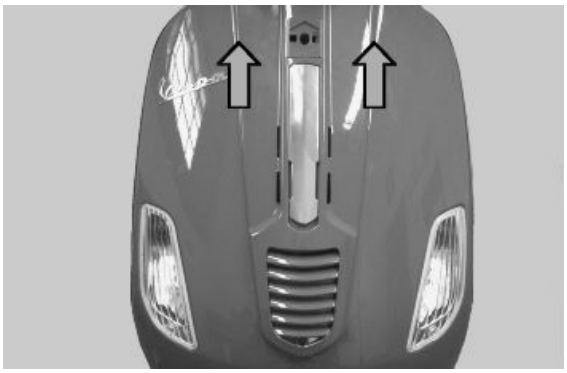
- Remove the "Piaggio" clip-on badge.



- Undo the two screws indicated.



- Remove the front central cover, sliding it upwards.



INDEX OF TOPICS

Aesthetic inspection

Appearance check:

- Paintwork
- Fitting of plastics
- Scratches
- Dirt

Tightening torques inspection

Lock check

- Safety locks
- Fixing screws

Safety locks

- Rear shock absorber upper retainer
- Rear shock absorber lower retainer
- Front/rear wheel screws
- Front wheel axle nut
- Rear wheel axle nut
- Swinging arm - Chassis bolt
- Swinging arm - Engine bolt
- Engine arm - Frame arm bolt
- Handlebar lock-nut
- Steering lower ring nut
- Steering upper ring nut

Electrical system

Electrical System:

- Main switch
- Headlamps: high-beam lights, low-beam lights, tail lights and their warning lights
- Adjusting the headlights according to the regulations currently in force
- Rear lights and stop light
- Front and rear stop light switches
- Turn indicators and their warning lights
- Instrument lighting
- Instrument panel: fuel gauge
- Instrument panel warning lights
- Horn

- Starter

CAUTION

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

WARNING

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

CAUTION

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

WARNING

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

CAUTION

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

Levels check

Level check:

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

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

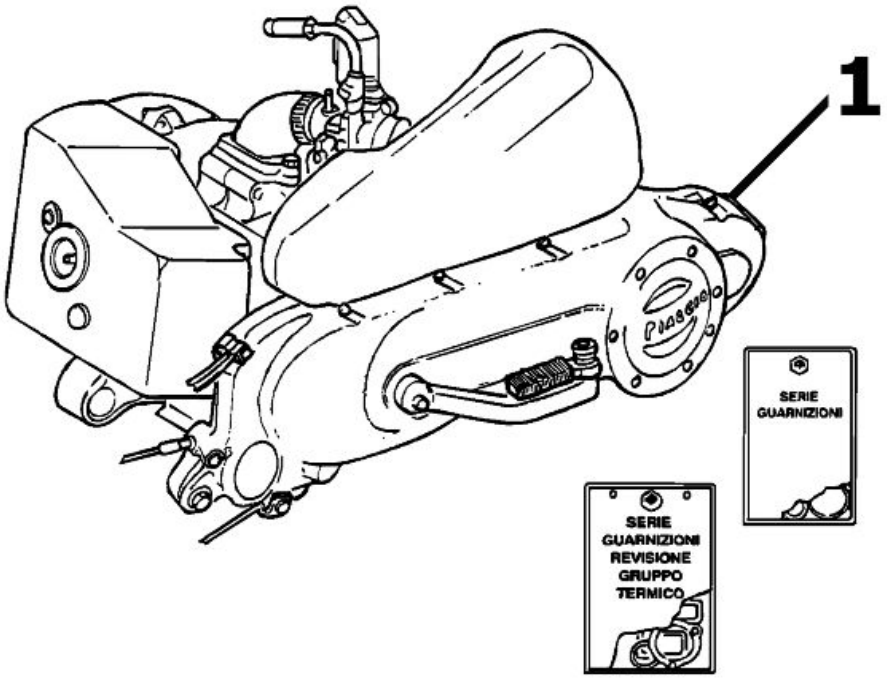
- Throttle travel check

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

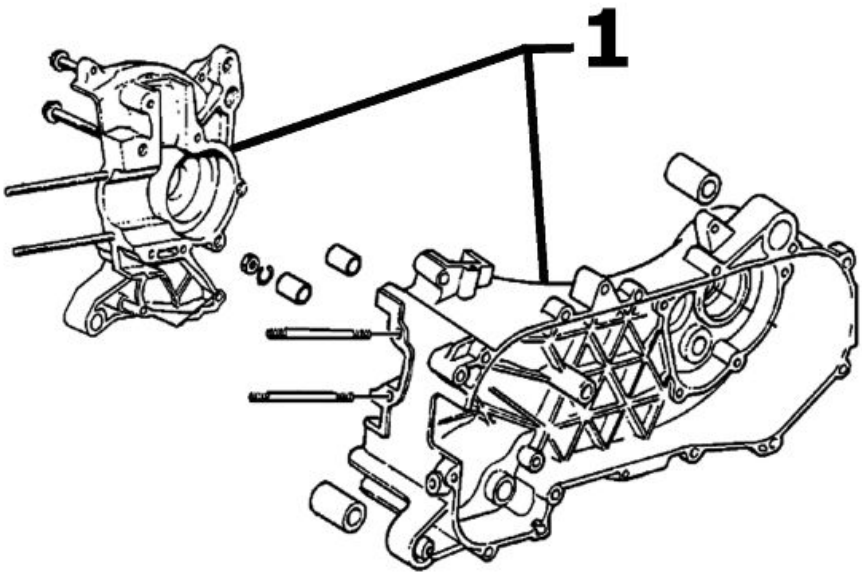
Engine



ENGINE

	Code	Action	Duration
1	001001	engine from frame - removal and re-fitting	

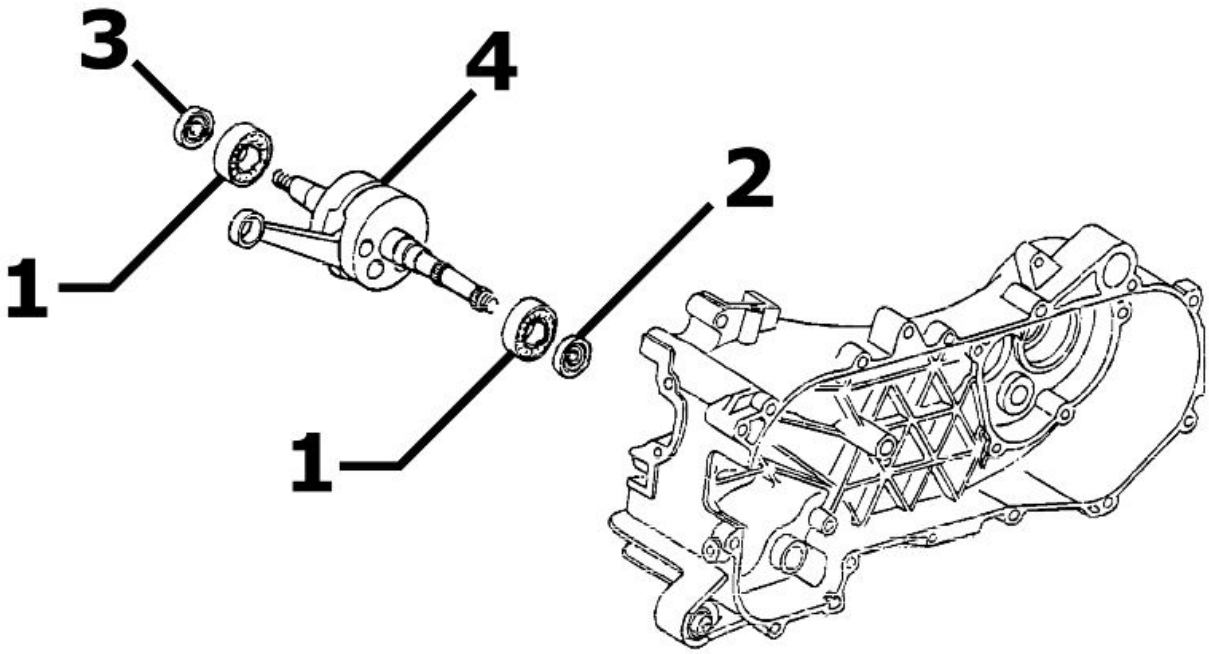
Crankcase



CRANKCASE

	Code	Action	Duration
1	001133	Engine crankcase - Replacement	

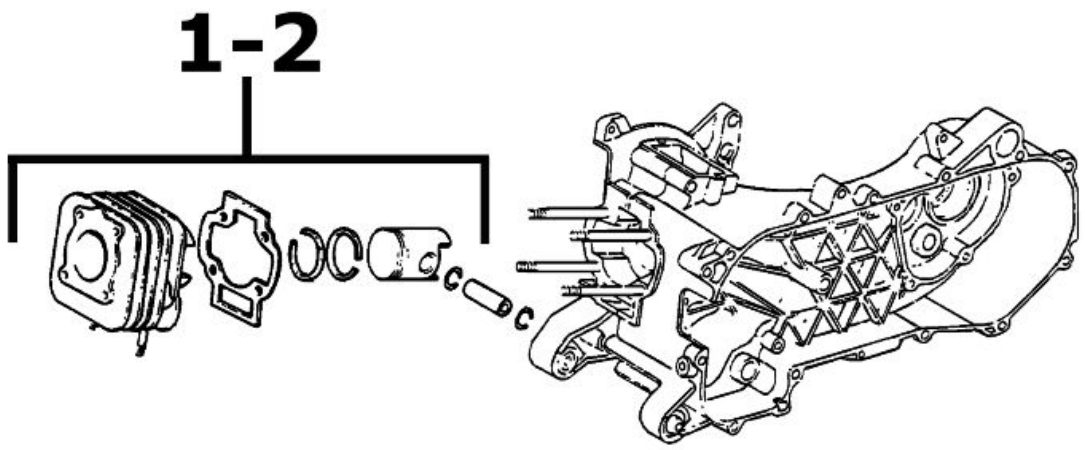
Crankshaft



CRANKSHAFT

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

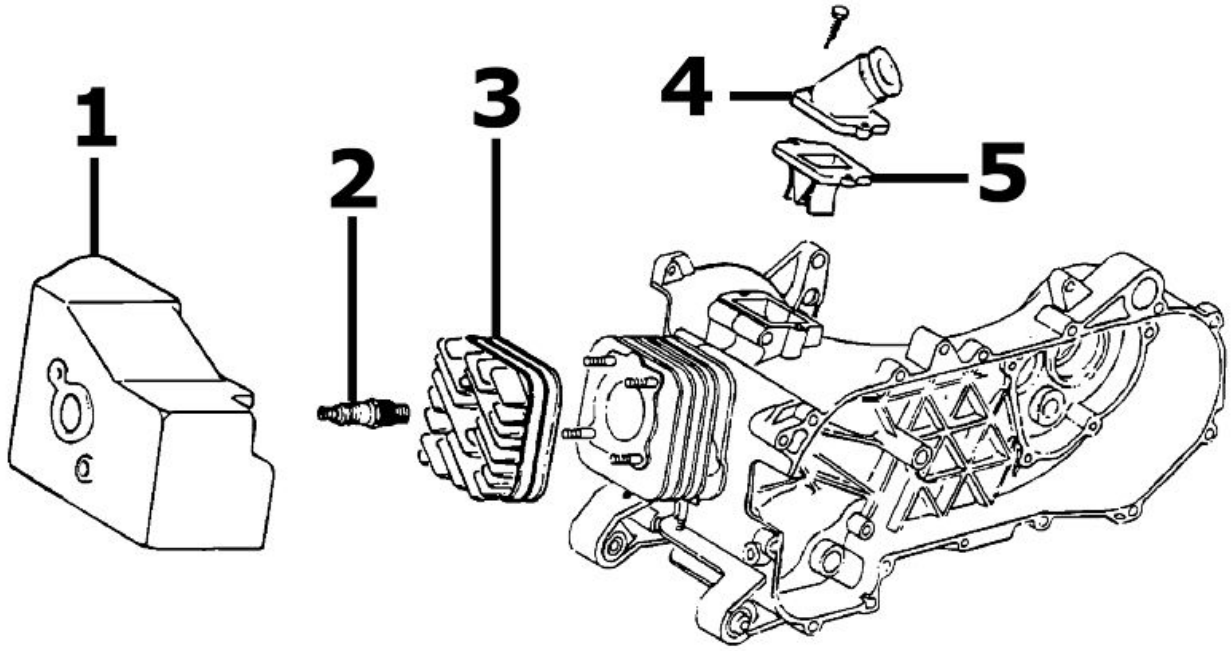
Cylinder assy.



CYLINDER- PISTON

	Code	Action	Duration
1	001002	Cylinder-Piston - Replacement	
2	001107	Cylinder / piston - Inspection / cleaning	

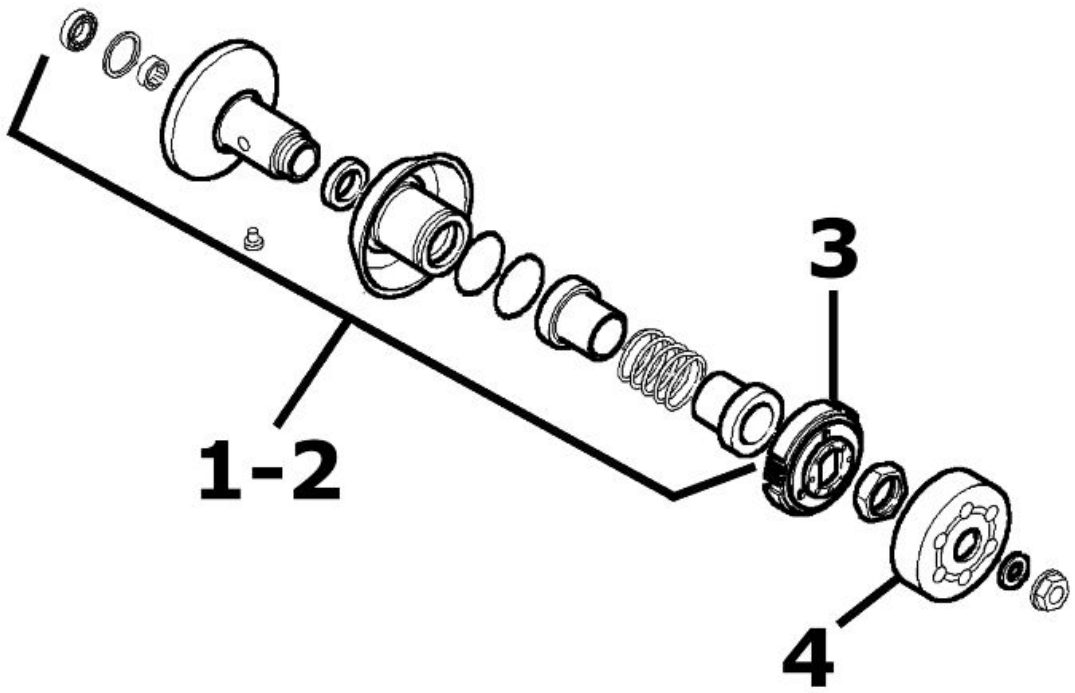
Cylinder head assy.



HEAD

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

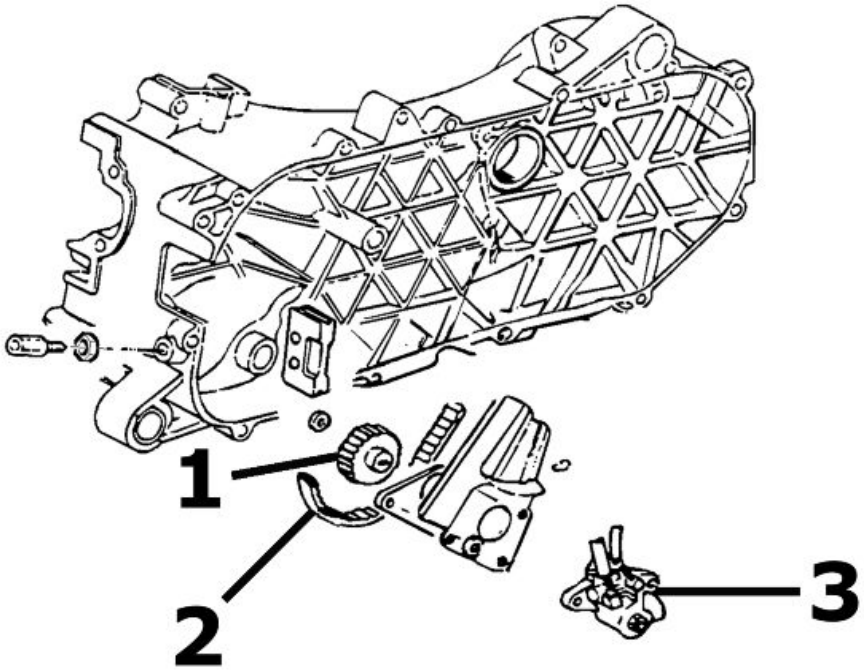
Driven pulley



DRIVEN PULLEY - CLUTCH

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

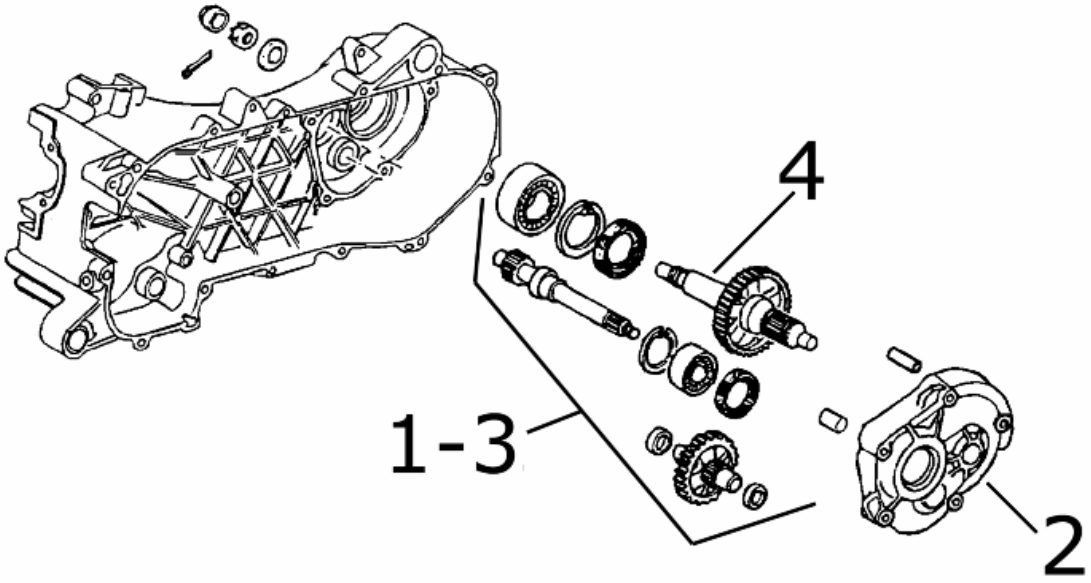
Oil pump



OIL PUMP

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

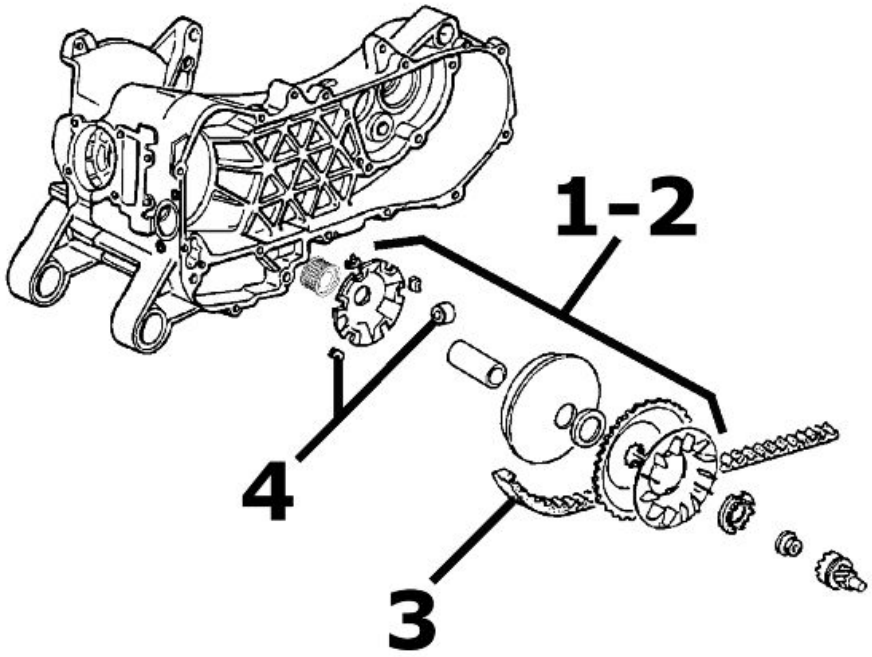
Final gear assy.



FINAL REDUCTION GEAR

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

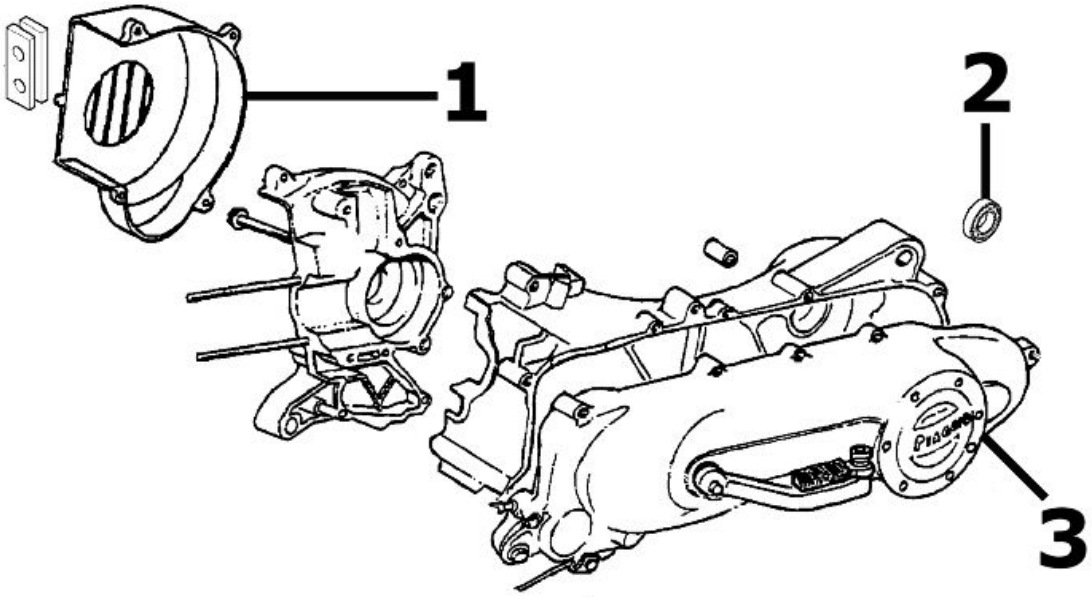
Driving pulley



DRIVING PULLEY

	Code	Action	Duration
1	001066	Driving pulley - Removal and refitting	
2	001086	Driving half-pulley - replace	
3	001011	Driving belt - Replacement	
4	001177	Variator rollers / shoes - Replacement	

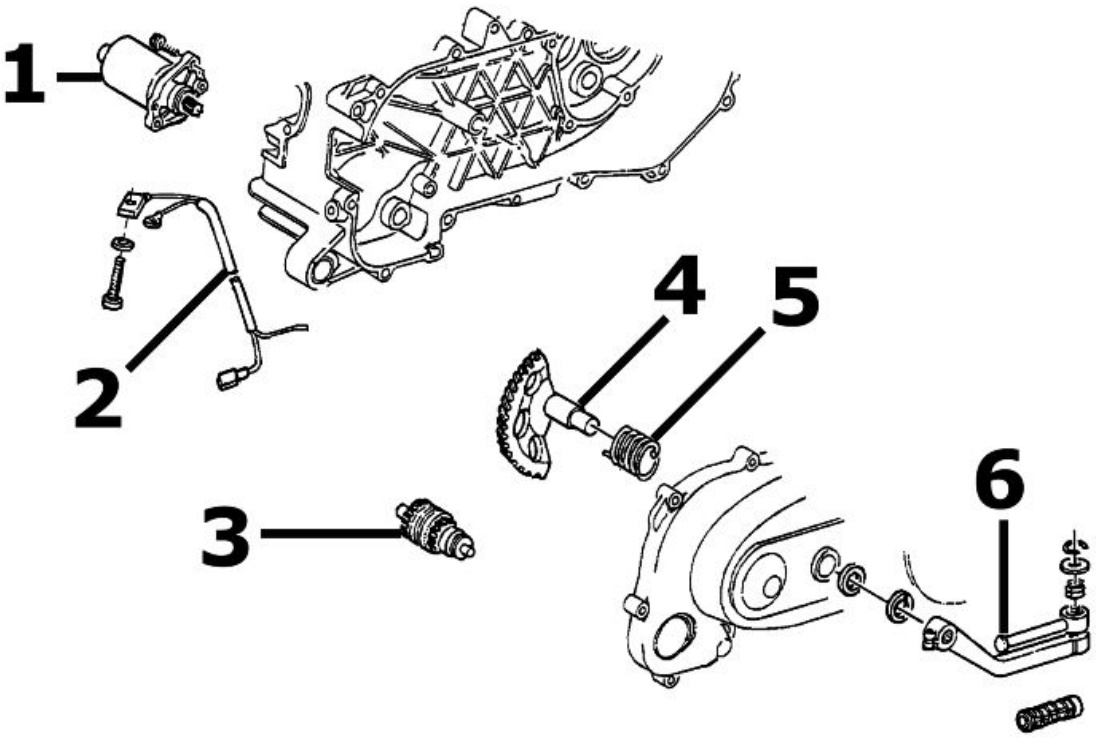
Transmission cover



TRANSMISSION COVER

	Code	Action	Duration
1	001087	Flywheel cover - Replacement	
2	001135	Transmission cover bearing - Replacement	
3	001096	Transmission crankcase cover - Replacement	

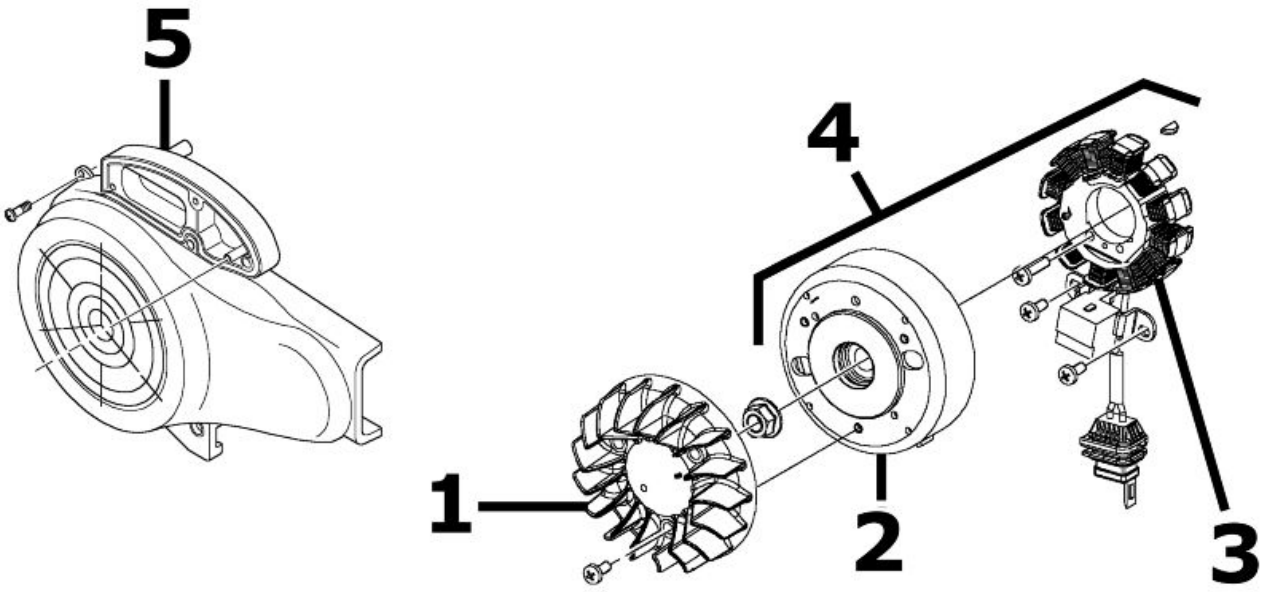
Starter motor



ELECTRICAL START-UP

	Code	Action	Duration
1	001020	Starter motor - Replacement	
2	005045	Starter motor cable harness - Replacement	
3	001017	Starter sprocket wheel - Replacement	
4	001021	Kick starter - Inspection	
5	008008	Starter spring pack - Replacement	
6	001084	Starter lever - Replacement	

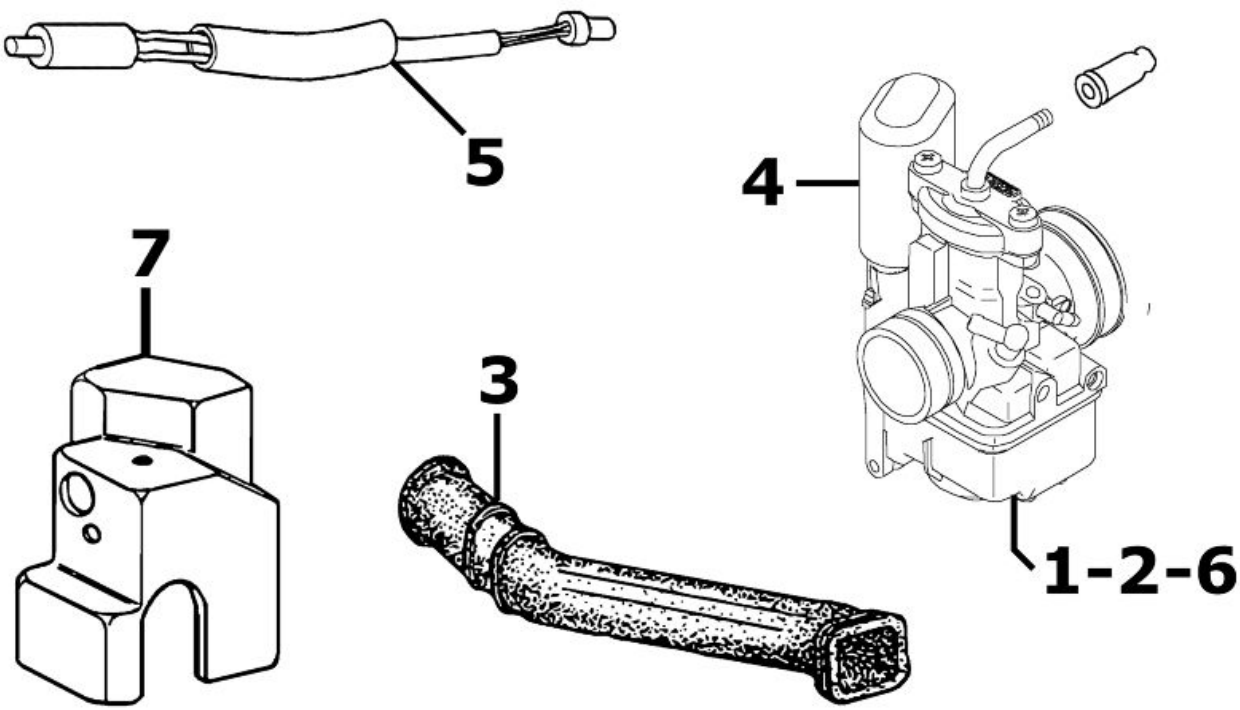
Flywheel magneto



MAGNETO FLYWHEEL

	Code	Action	Duration
1	001109	Cooling fan - Replacement	
2	001173	Rotor - Replacement	
3	001067	Stator - Fitting and Refitting	
4	001058	Flywheel - Replacement	
5	001087	Flywheel cover - Replacement	

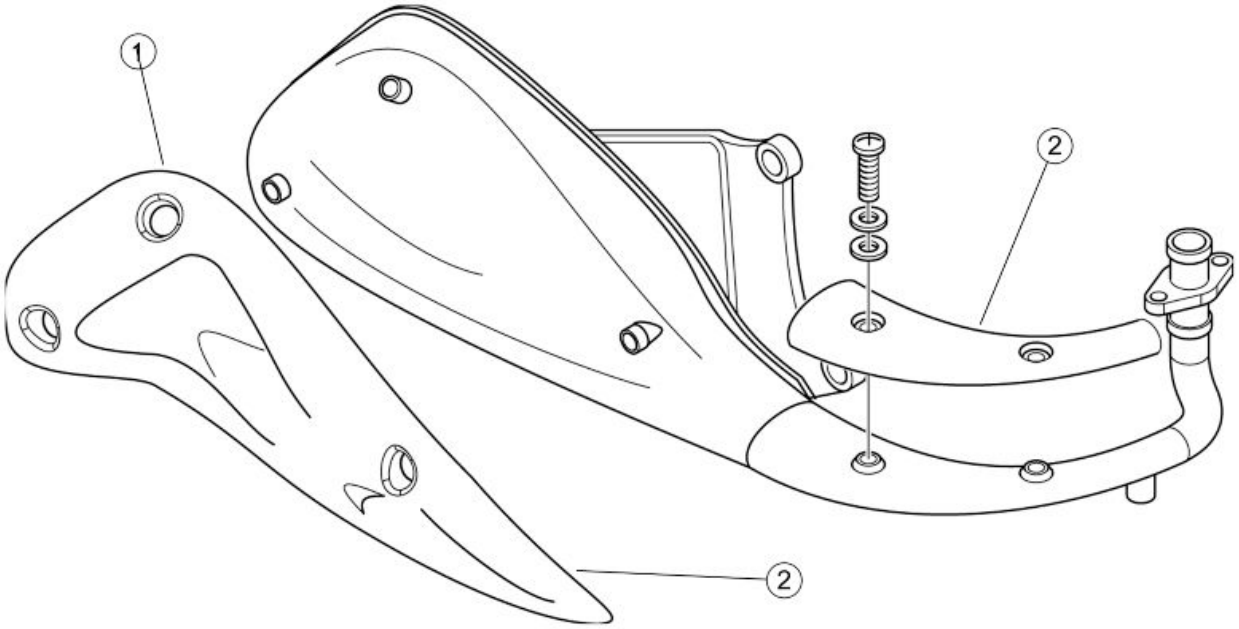
Carburettor



CARBURETTOR

	Code	Action	Duration
1	001008	Carburettor - Inspection	
2	001063	Carburettor - Replacement	
3	007020	Carburettor heating tubing - replacement	
4	001081	Automatic choke - Replacement	
5	001082	Carburettor heating resistor - Replacement	
6	003058	Carburettor - Adjustment	
7	004177	Heating hood - Replacement	

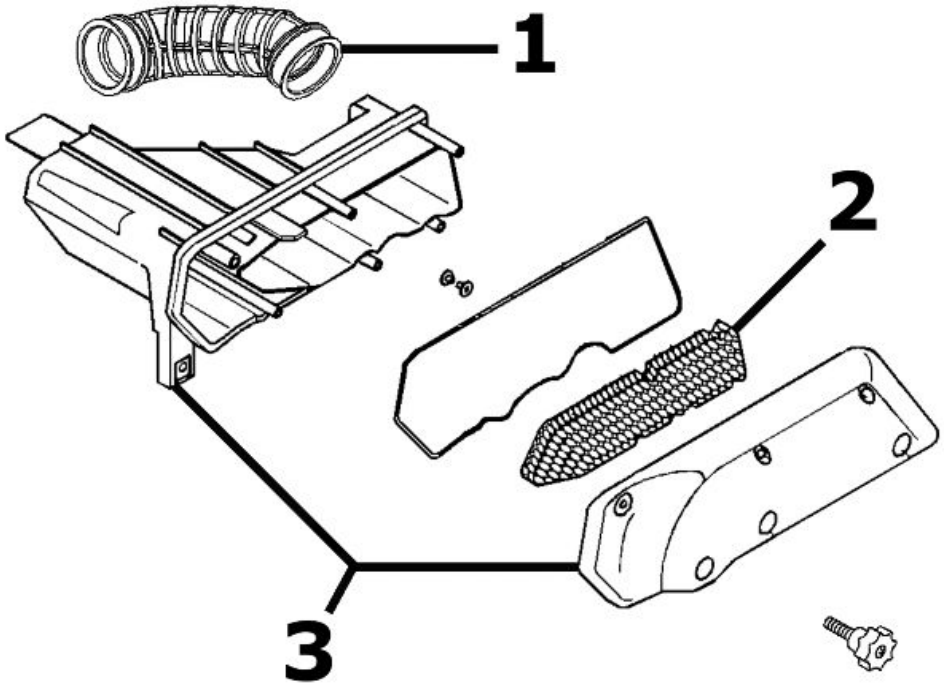
Exhaust pipe



MUFFLER

	Code	Action	Duration
1	001009	Muffler - Replacement	
2	001095	Muffler guard - Replacement	

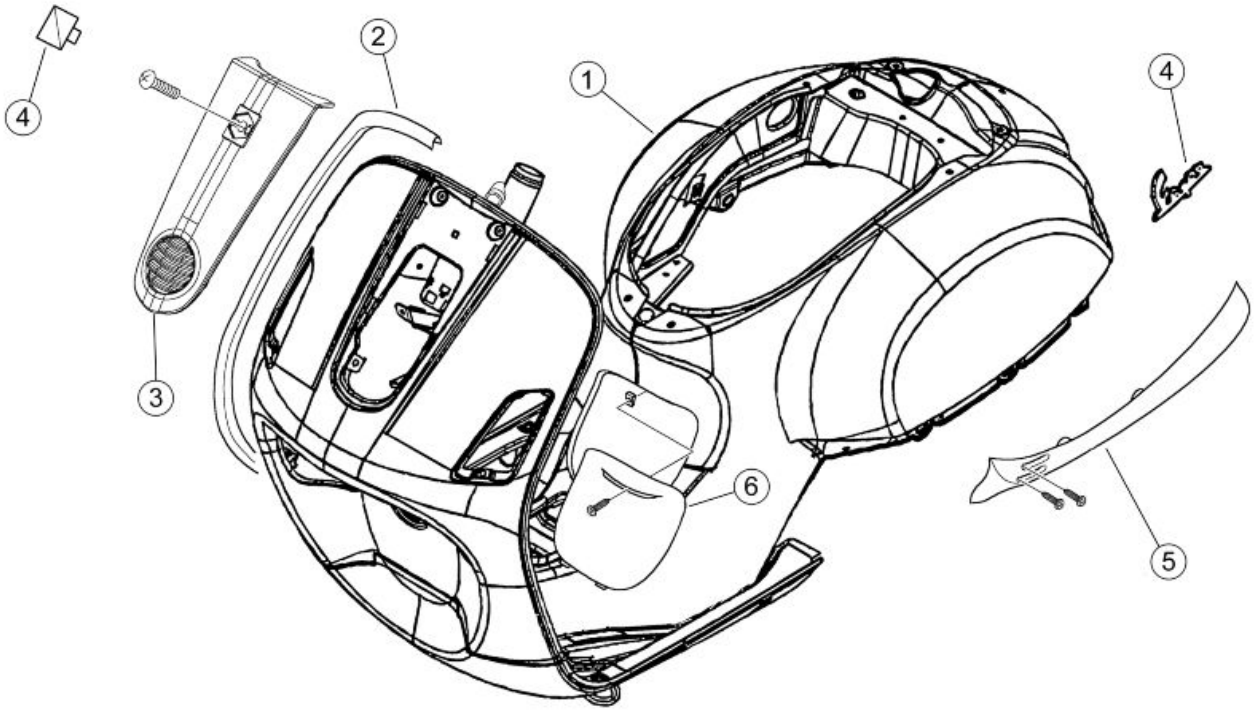
Air cleaner



AIR CLEANER

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

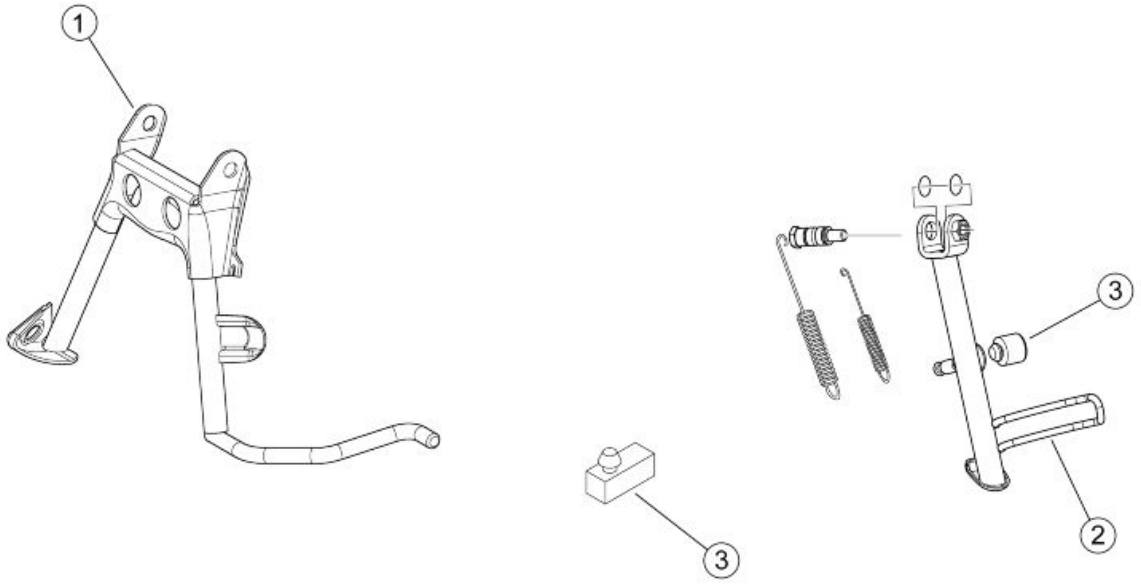
Frame



FRAME

	Code	Action	Duration
1	004001	Chassis - Replacement	
2	004023	Shield rim - Replacement	
3	004149	Shield central cover - Replacement	
4	004159	Plates / Stickers - Replacement	
5	004012	Rear side panels - Replacement	
6	004059	Spark plug inspection flap - Replacement	

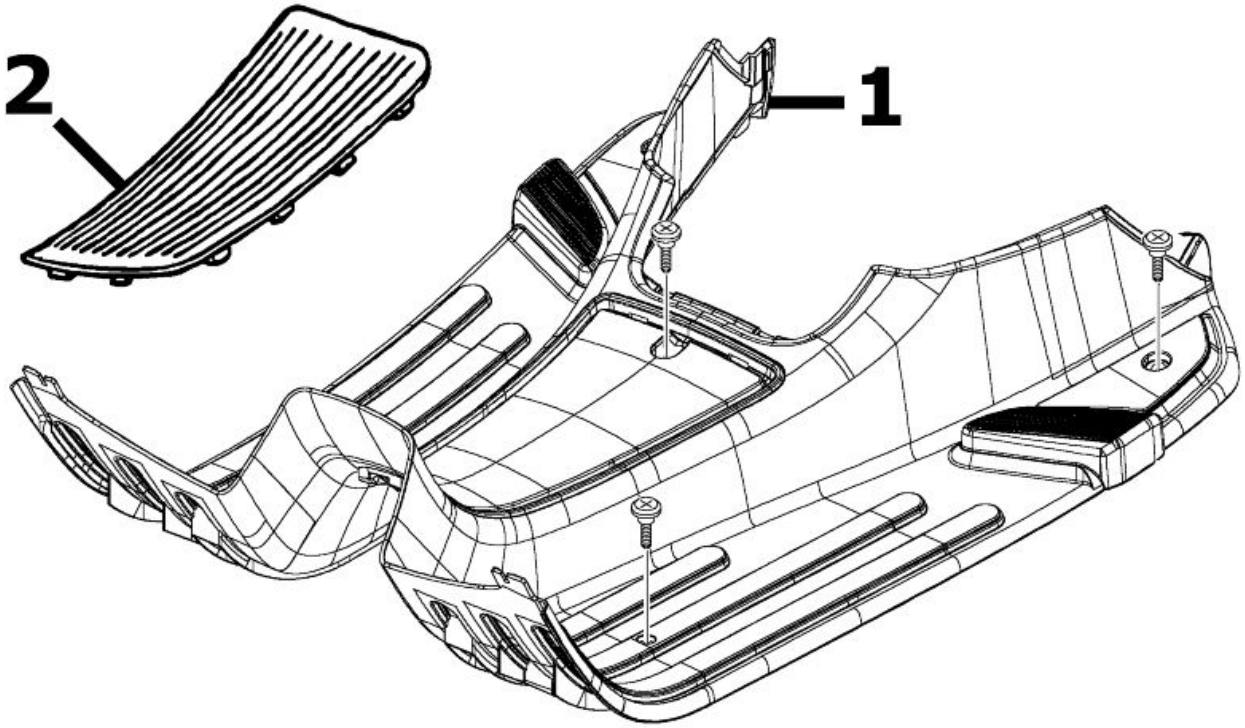
Centre-stand



STAND

	Code	Action	Duration
1	004004	Stand - Replacement	
2	004102	Side stand - Replacement	
3	004179	Stand buffer - Replacement	

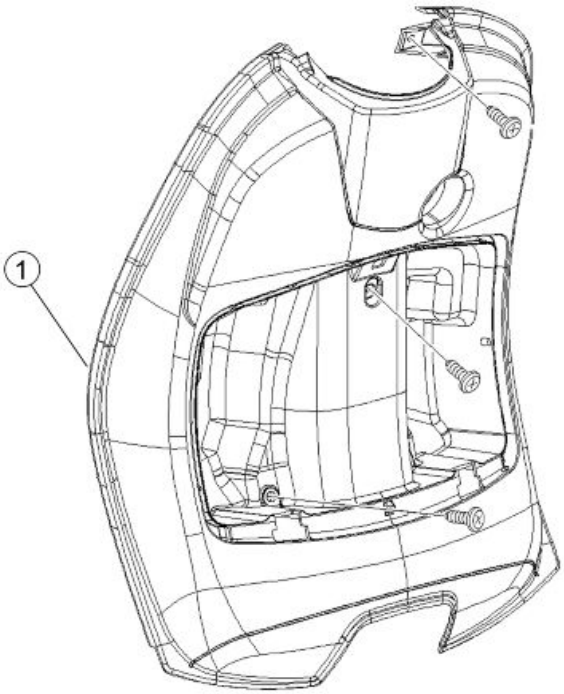
Footrests



FOOTREST

	Code	Action	Duration
1	004178	Footrest - Replacement	
2	004078	Front/rear footrest rubber - Replacement	

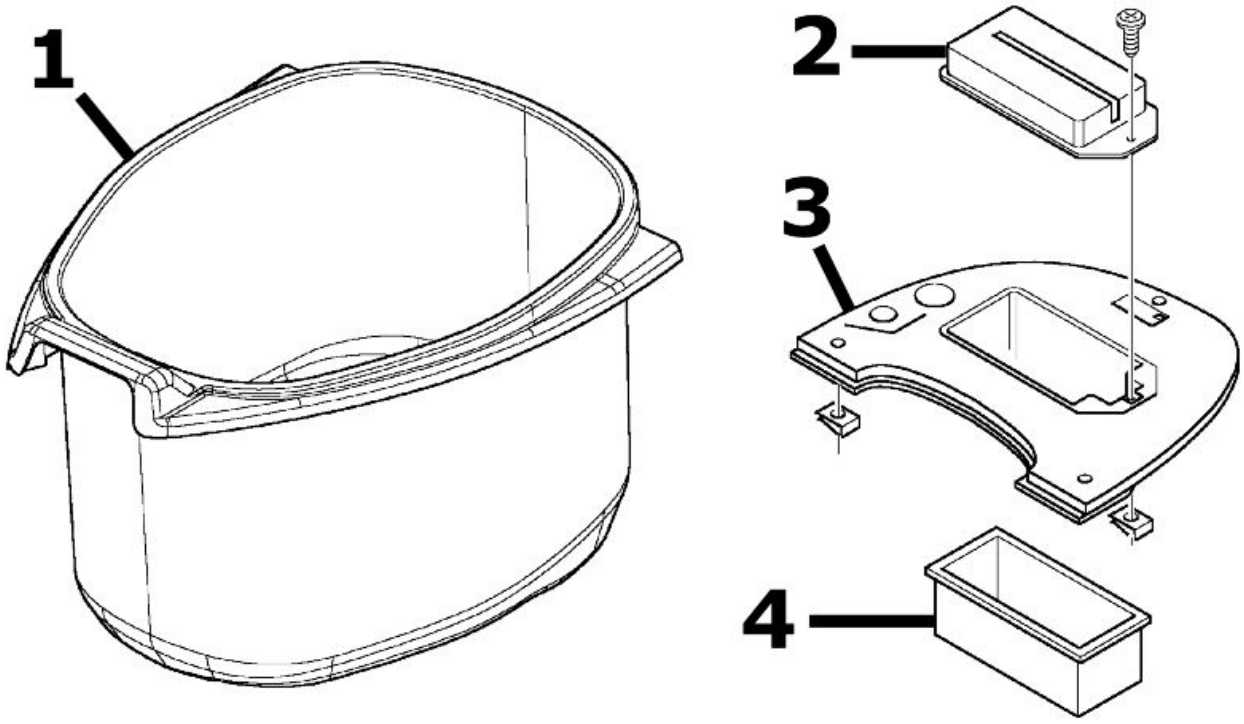
Rear cover



SHIELD BACK PLATE

	Code	Action	Duration
1	004065	Front shield, rear part - Removal and refitting	

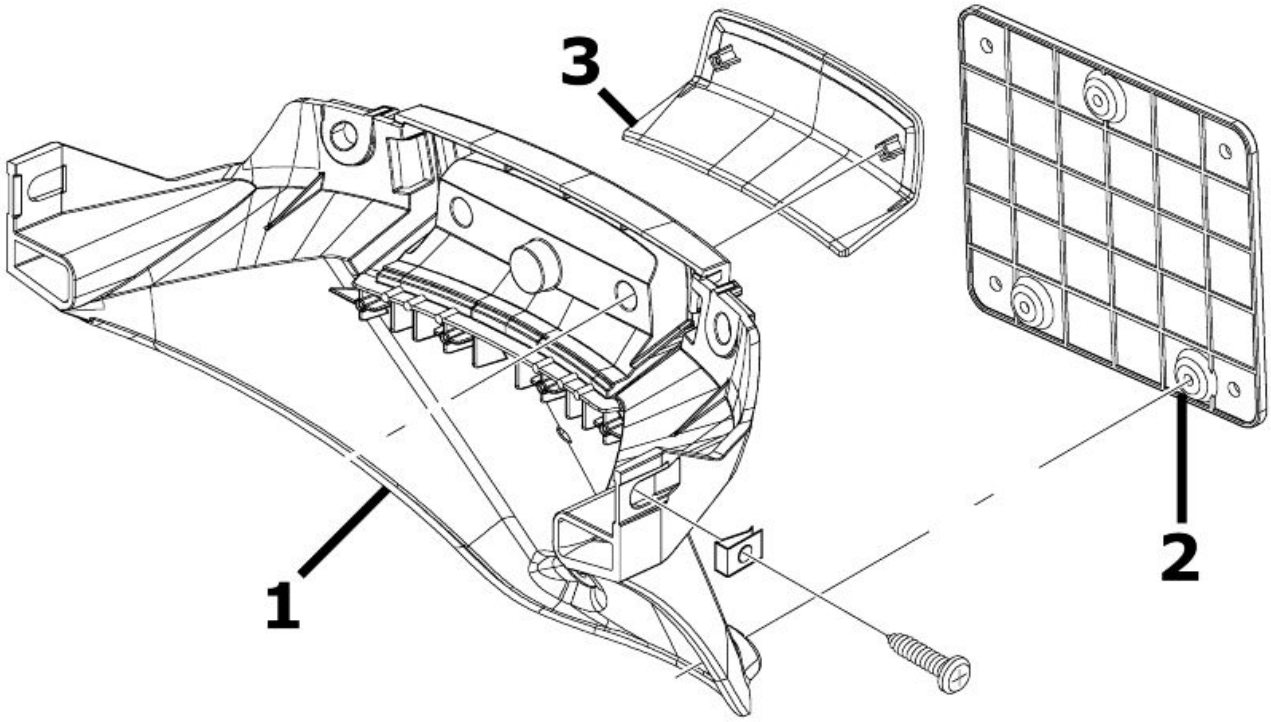
Underseat compartment



HELMET COMPARTMENT

	Code	Action	Duration
1	004016	Helmet compartment - Replacement	
2	005046	Battery cover - change	
3	004011	Central chassis cover - Replacement	
4	004071	Battery compartment - replacement	

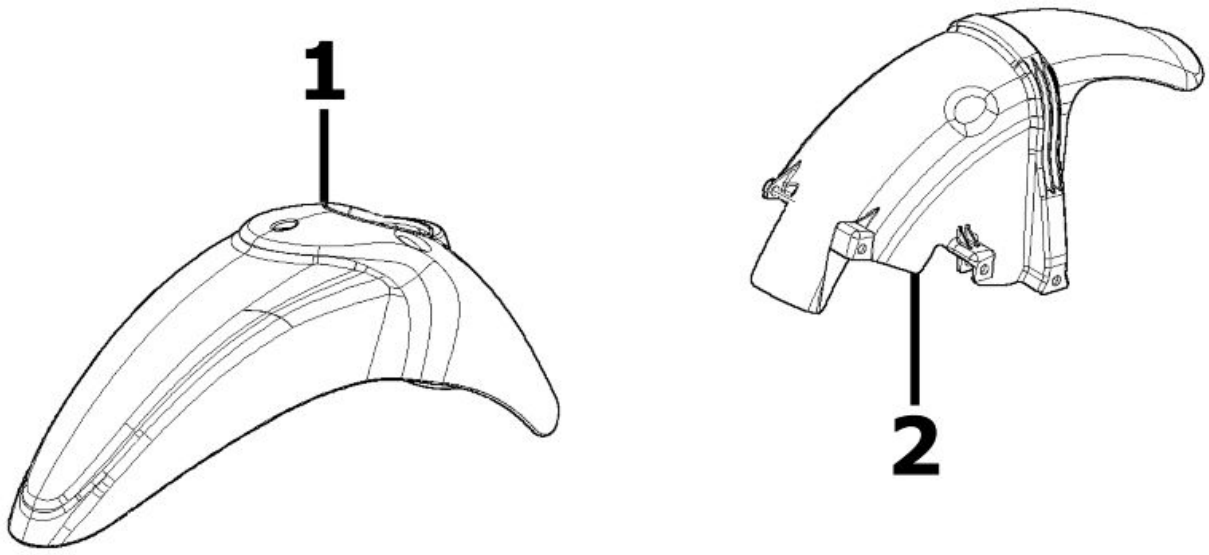
Plate holder



LICENSE PLATE HOLDER

	Code	Action	Duration
1	004136	License plate support - Replacement	
2	005048	Licence plate holder - Replacement	
3	005032	Licence plate light glass - Replacement	

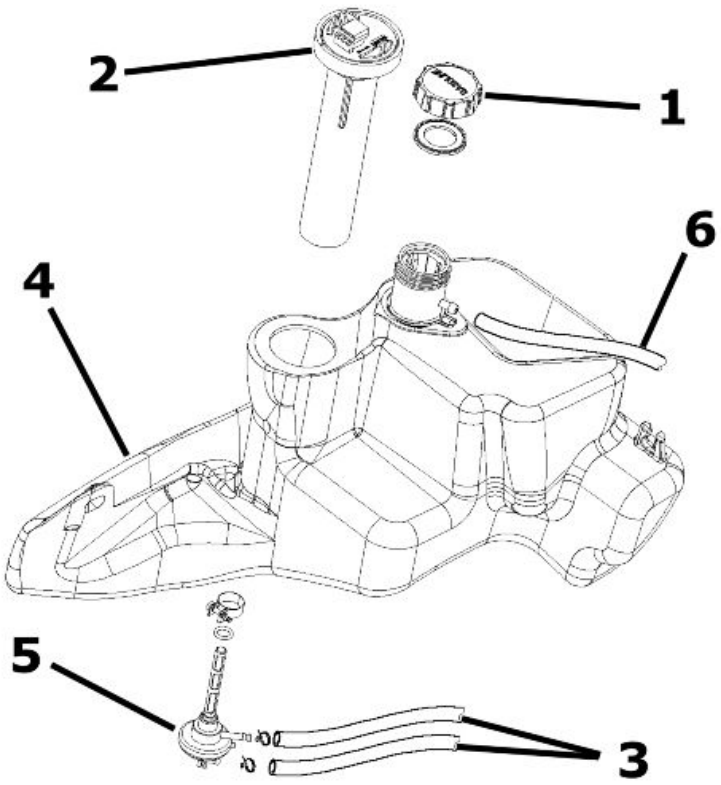
Mudguard



MUDGUARDS

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

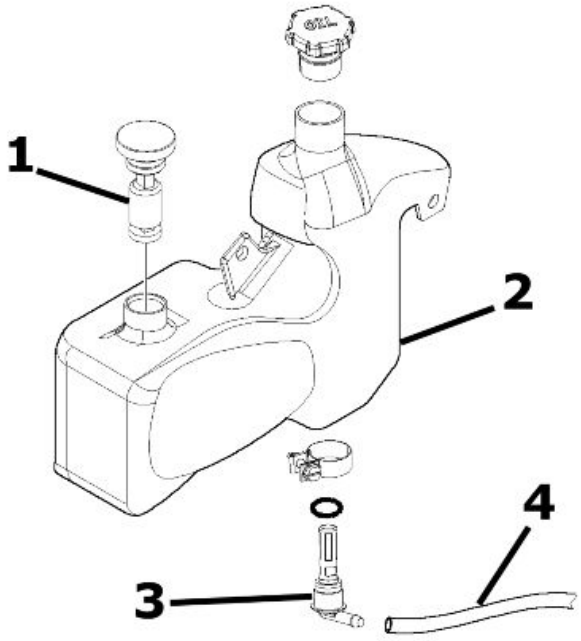
Fuel tank



FUEL TANK

	Code	Action	Duration
1	004168	Fuel tank cap - Replacement	
2	005010	Tank float - Replacement	
3	004112	Cock-carburettor hose - Replacement	
4	004005	Fuel tank - Replacement	
5	004007	Fuel valve - Replacement	
6	004109	Fuel tank breather - Replacement	

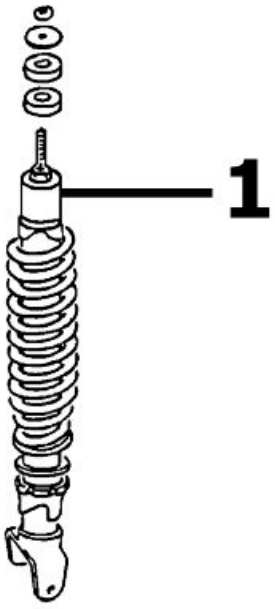
Tank oil



OIL RESERVOIR

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

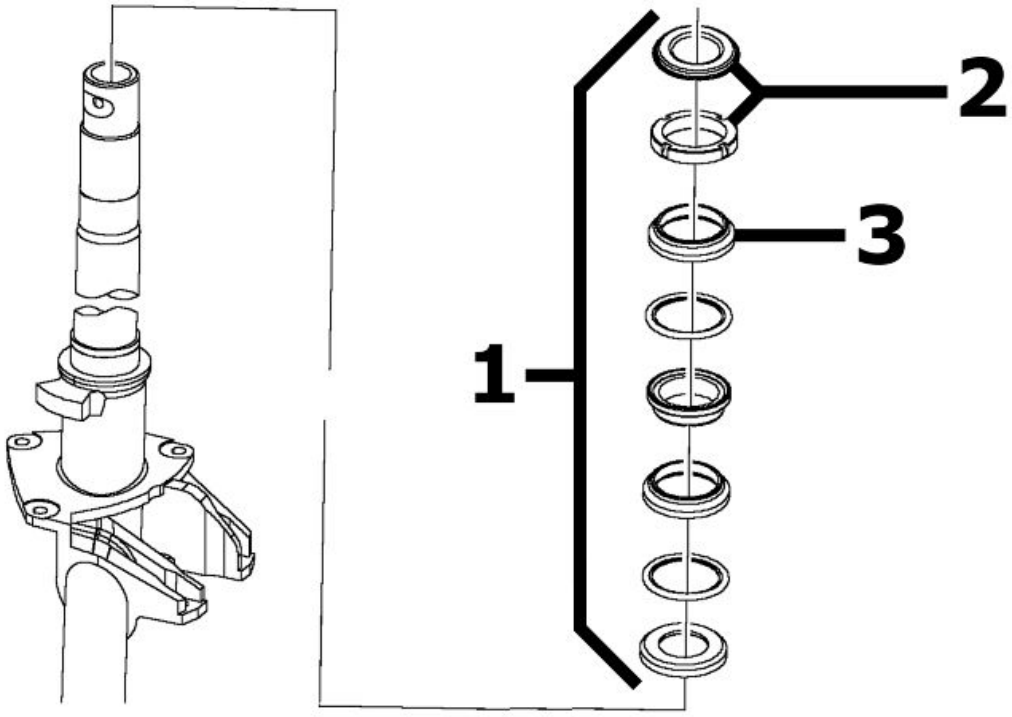
Rear shock-absorber



REAR SHOCK ABSORBER

	Code	Action	Duration
1	003007	Rear shock absorber - Removal and Refitting	

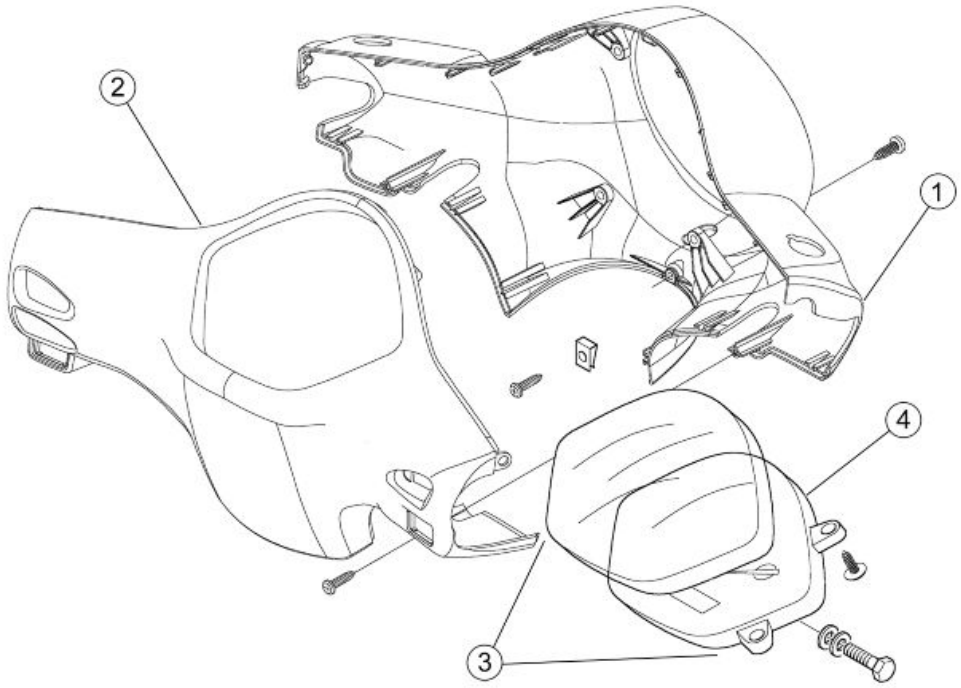
Steering column bearings



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	

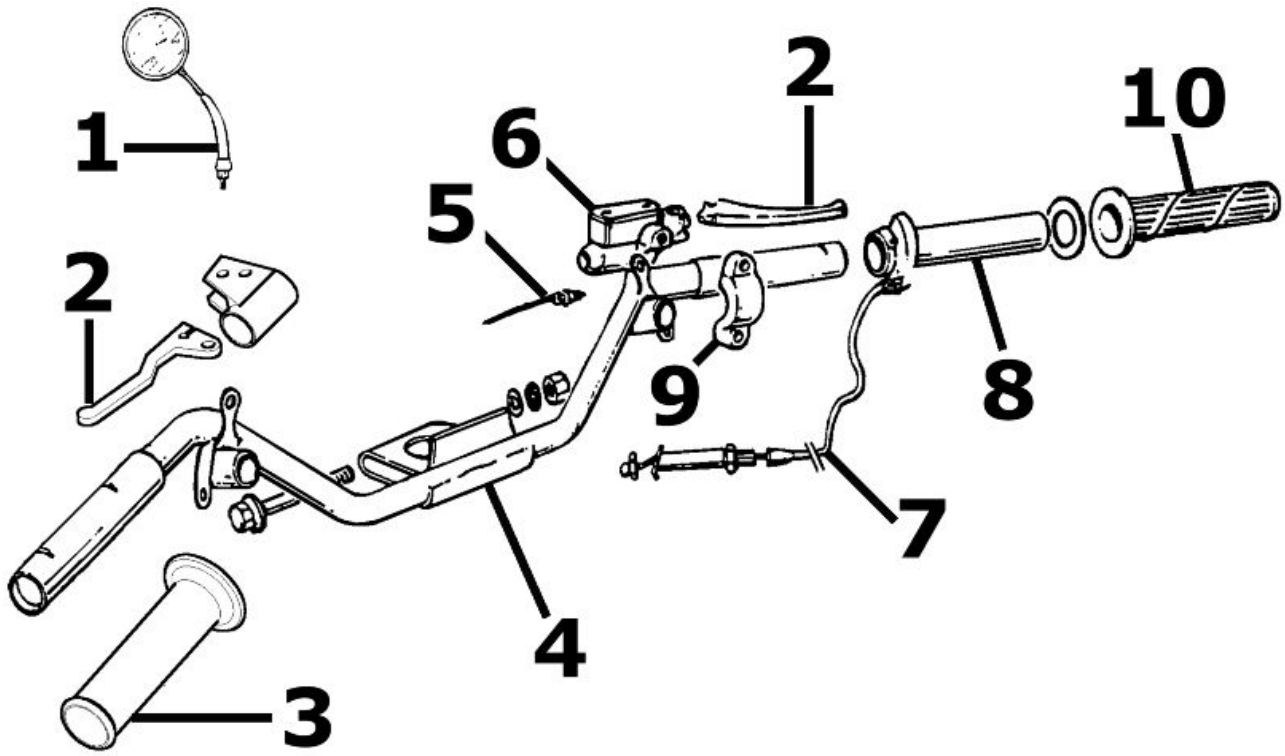
Handlebar covers



ODOMETER - HANDLEBAR COVER

	Code	Action	Duration
1	004018	Handlebar front section - Replacement	
2	004019	Handlebar rear section - Replacement	
3	005014	Odometer - Replacement	
4	005038	Instrument panel warning light bulbs - Replacement	

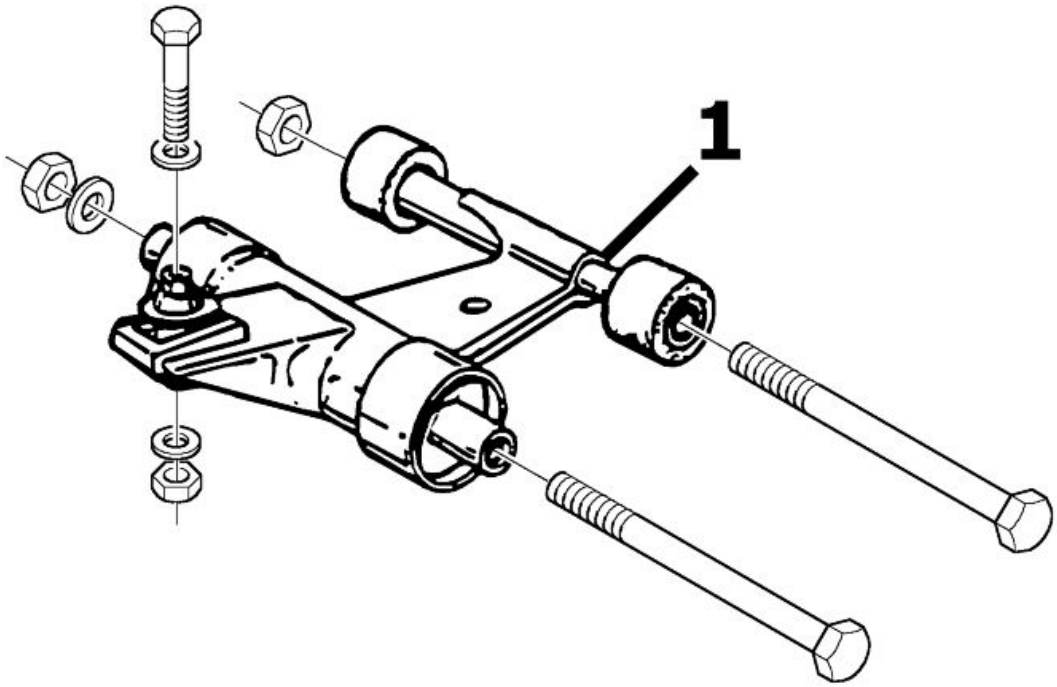
Handlebar components



HANDLEBAR COMPONENTS

	Code	Action	Duration
1	004066	Driving mirror - Replacement	
2	002037	Brake or clutch lever - Replacement	
3	002071	Left hand grip - Replacement	
4	003001	Handlebar - Replacement	
5	005017	Stop switch - Replacement	
6	002024	Front brake pump - Removal and Refitting	
7	002054	Throttle or splitter transmission complete - Replacement	
8	002060	Complete throttle control - Replacement	
9	004162	Mirror support and/or brake pump fitting U-bolt - Replacement	
10	002059	Right hand grip - Replacement	

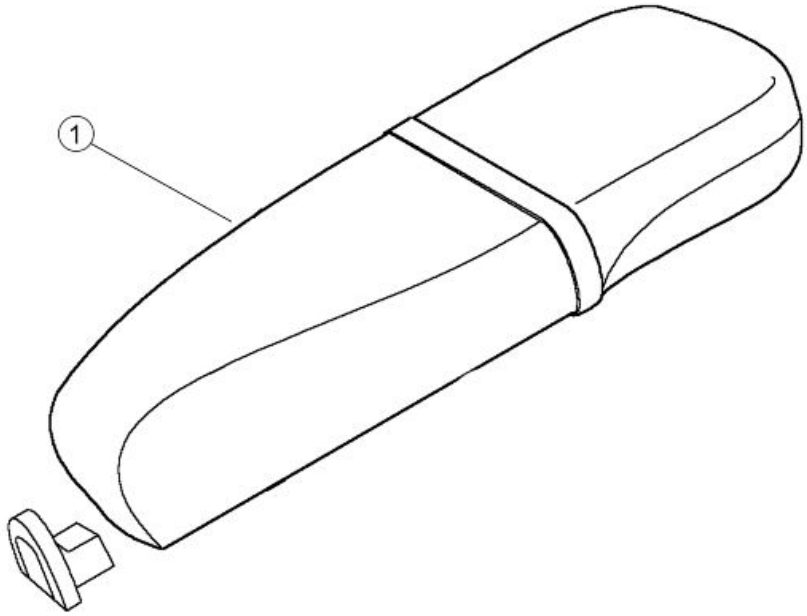
Swing-arm



SWINGING ARM

	Code	Action	Duration
1	001072	Swinging arm - Engine-chassis connection - Replacement	

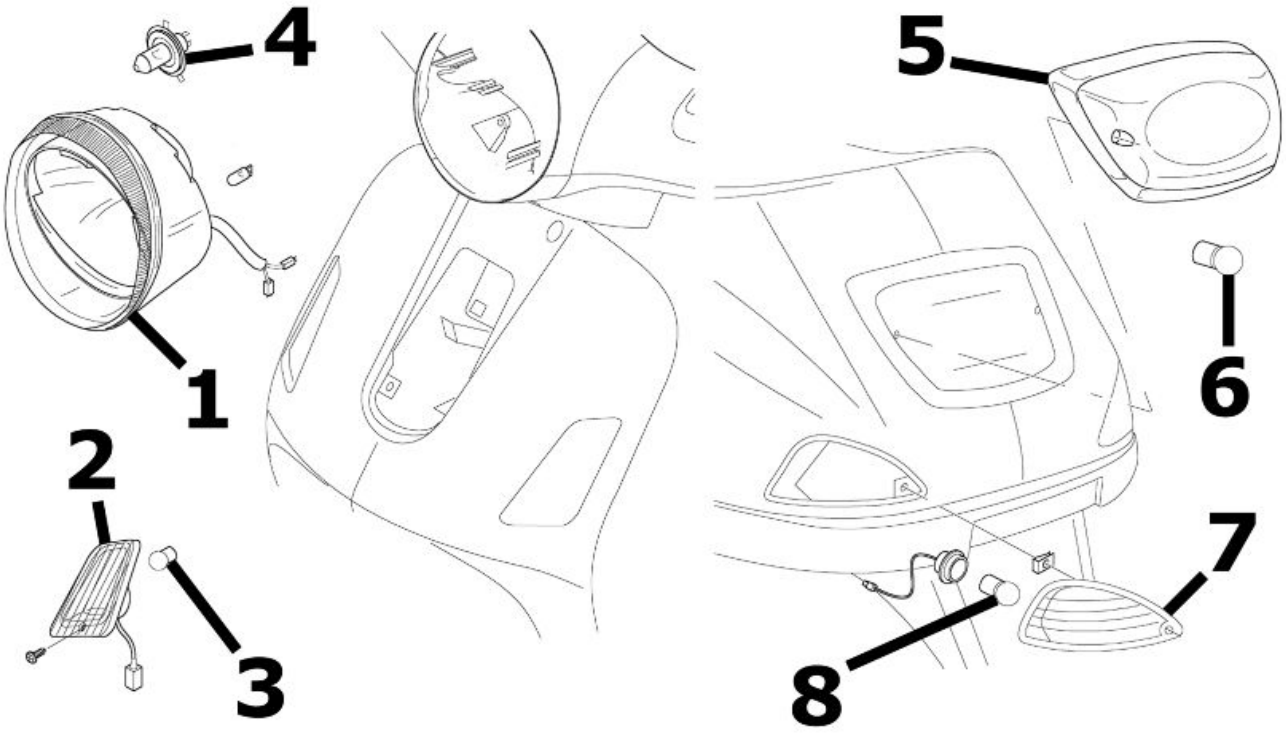
Seat



SADDLE

	Code	Action	Duration
1	004003	Saddle - Replacement	

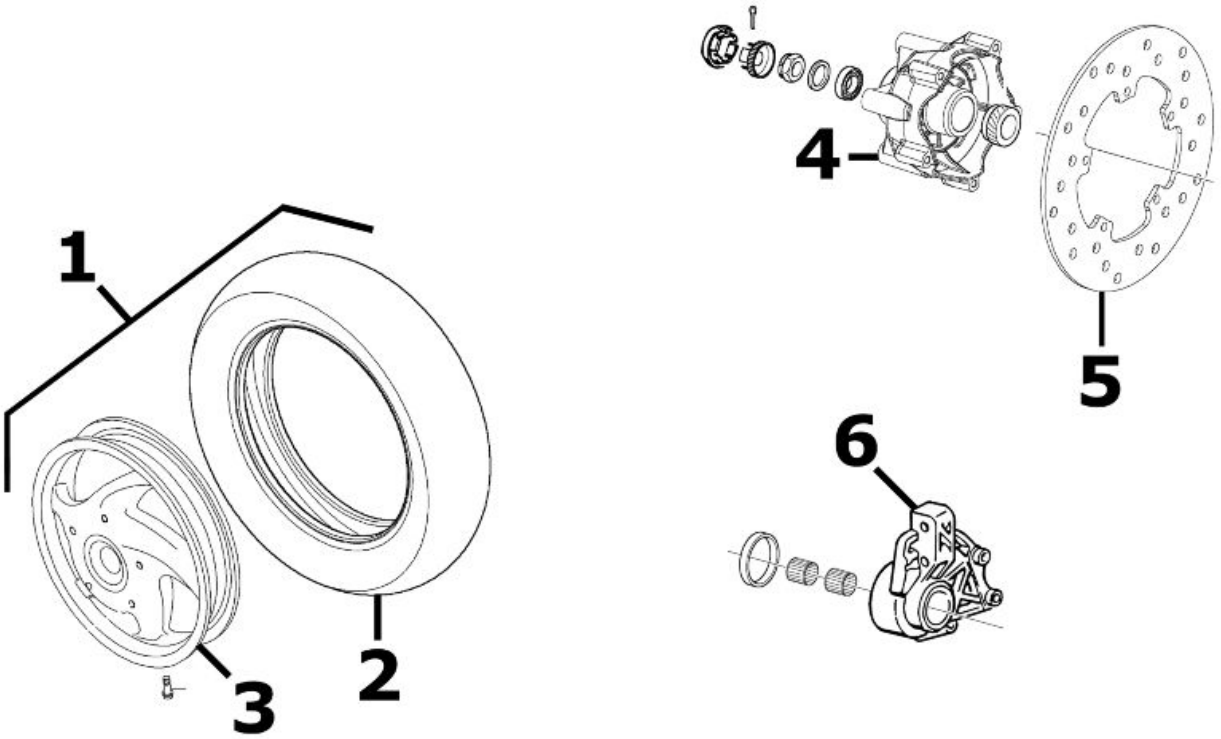
Turn signal lights



TURN INDICATOR LIGHTS

	Code	Action	Duration
1	005002	Front headlamp - Replacement	
2	005012	Front turn indicator - Replacement	
3	005067	Front turn indicator bulb - Replacement	
4	005008	Front headlamp bulbs - Replacement	
5	005005	Taillight - Replacement	
6	005066	Rear light bulbs - Replacement	
7	005022	Rear turn indicators - Replacement	
8	005068	Rear turn indicator bulb - Replacement	

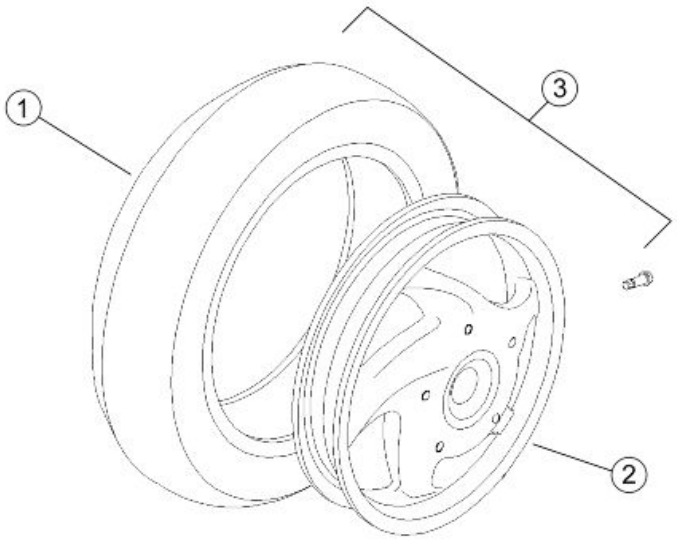
Front wheel



FRONT WHEEL

	Code	Action	Duration
1	004123	Front wheel - Replacement	
2	003047	Front tyre - replace	
3	003037	Front wheel rim- Replacement	
4	003033	Front wheel hub- Replacement	
5	002041	Front brake disc - Replacement	
6	003034	Front wheel hub bearing - Replacement	

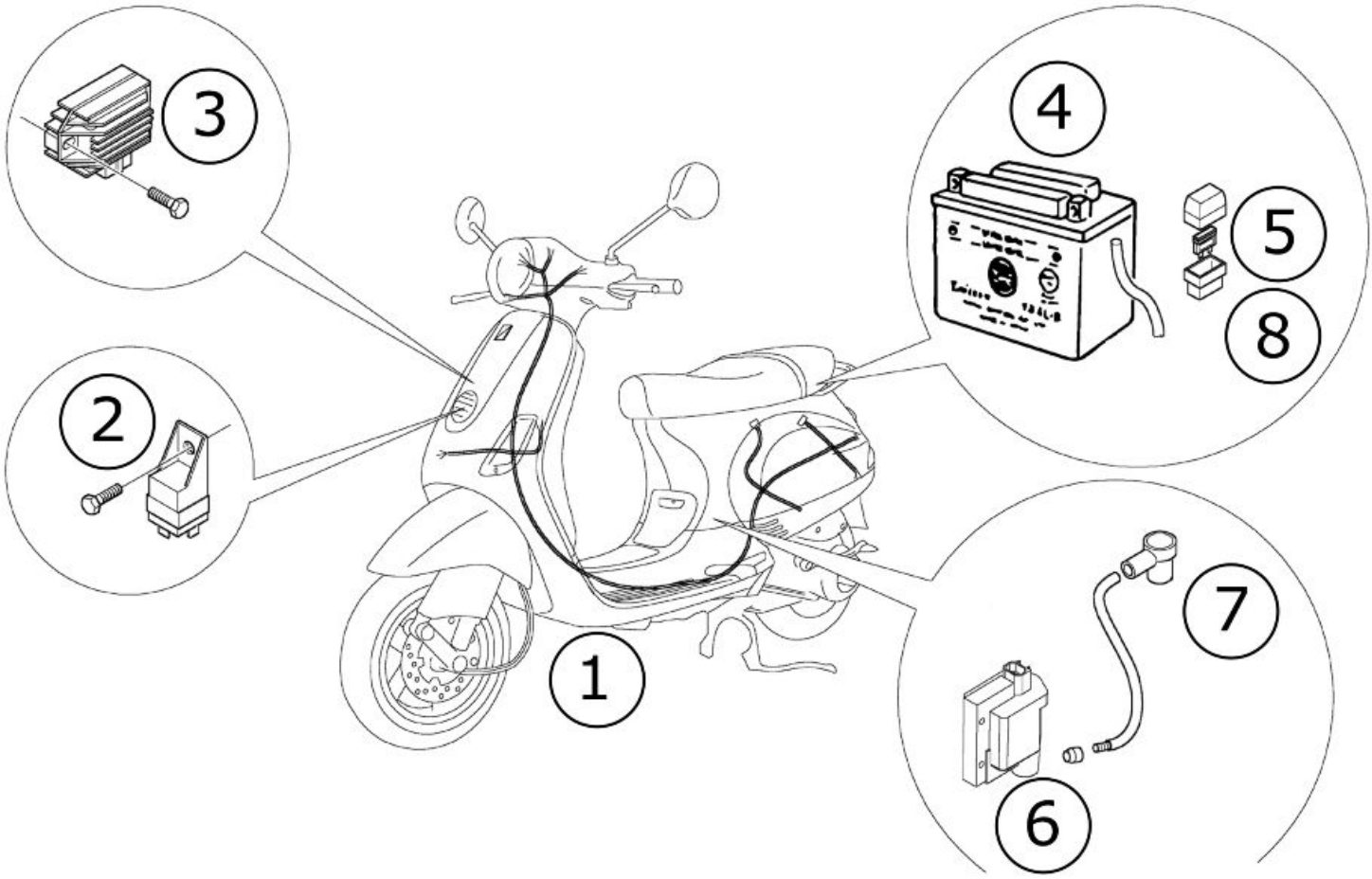
Rear wheel



REAR WHEEL

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

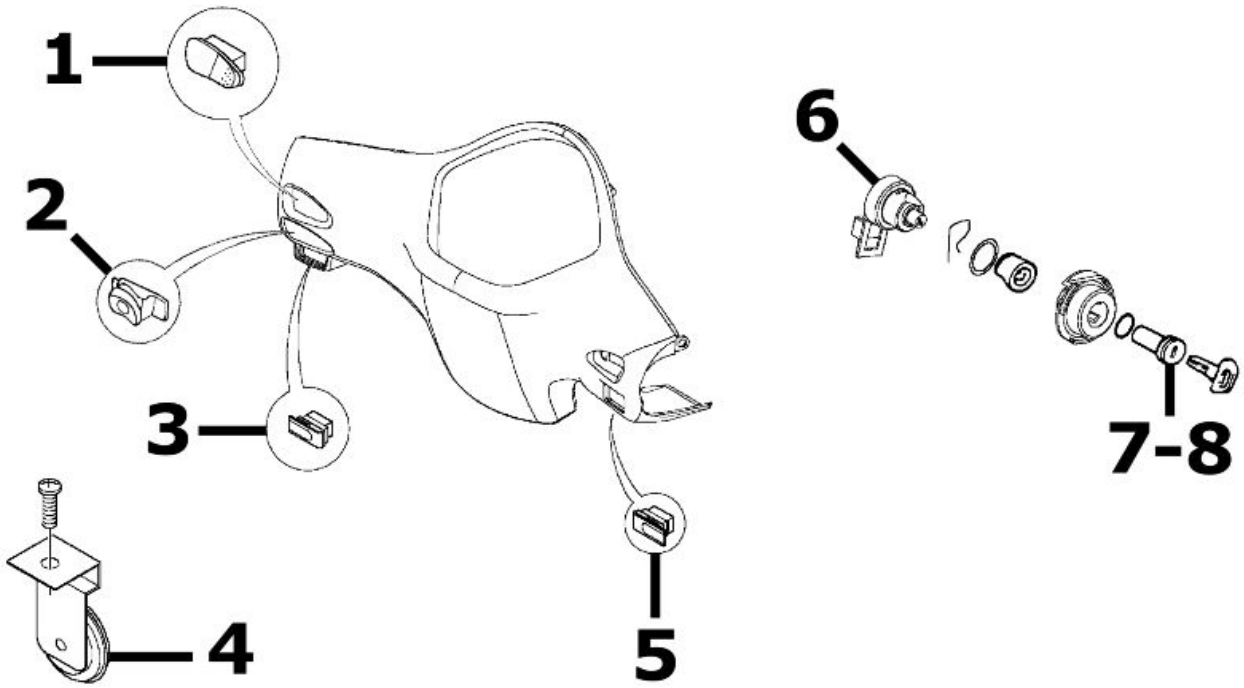
Electric devices



ELECTRICAL COMPONENTS

	Code	Action	Duration
1	005001	Electrical system - Replacement	
2	005011	Start-up remote control switch - Replacement	
3	005009	Voltage regulator - Replacement	
4	005007	Battery - Replacement	
5	005052	Fuse (1) - Replacement	
6	001023	Control unit - Replacement	
7	001094	Spark plug cap - Replacement	
8	005054	Fuse block (1) - Replacement	

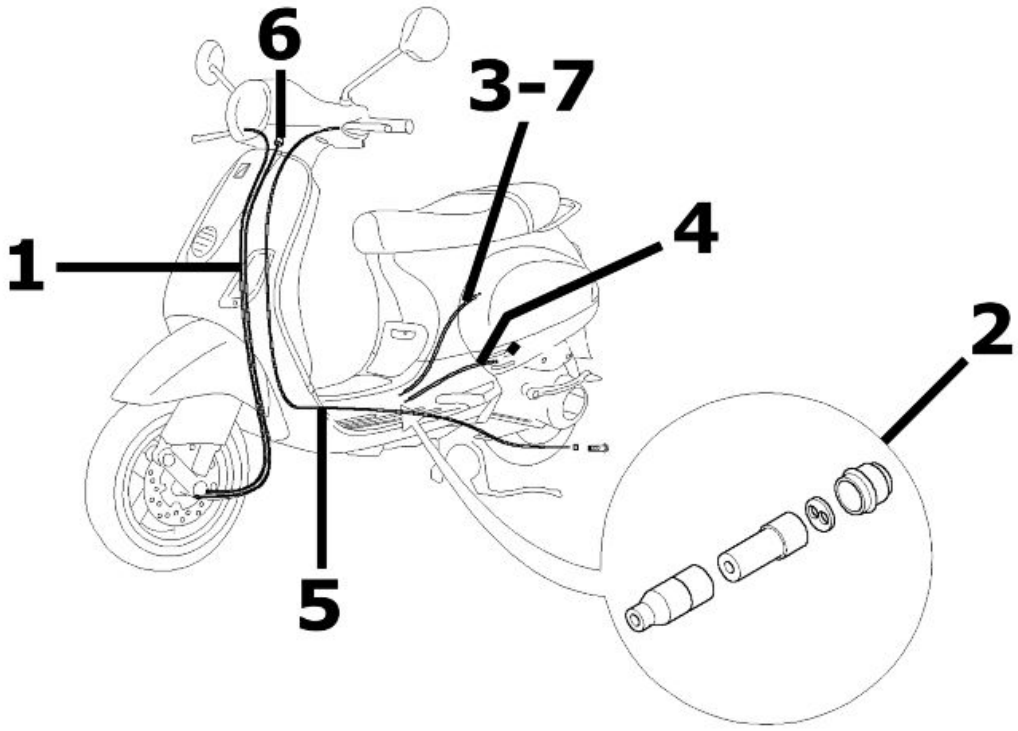
Electronic controls



ELECTRICAL CONTROLS

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

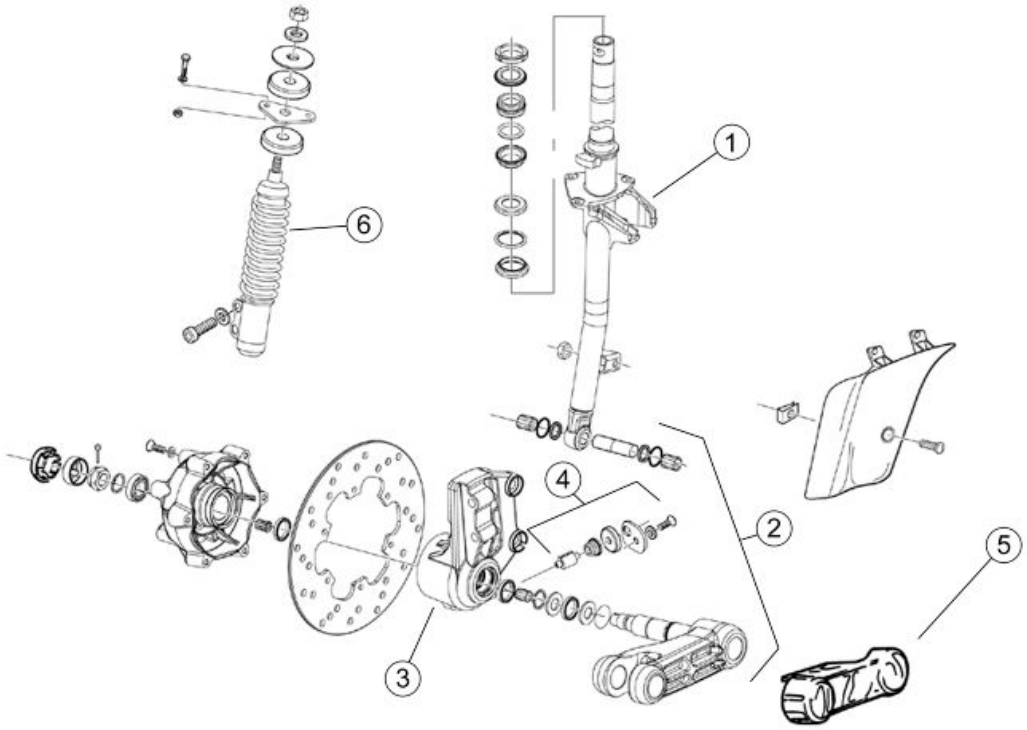
Transmissions



TRANSMISSION

	Code	Action	Duration
1	002051	Odometer transmission assembly - Replacement	
2	002012	Splitter - Replacement	
3	002057	Carburettor / splitter transmission complete - Replacement	
4	002058	Mix / splitter transmission complete - Replacement	
5	002053	Rear brake transmission complete - Replacement	
6	002049	Odometer cable - Replacement	
7	003061	Accelerator transmission - Adjustment	

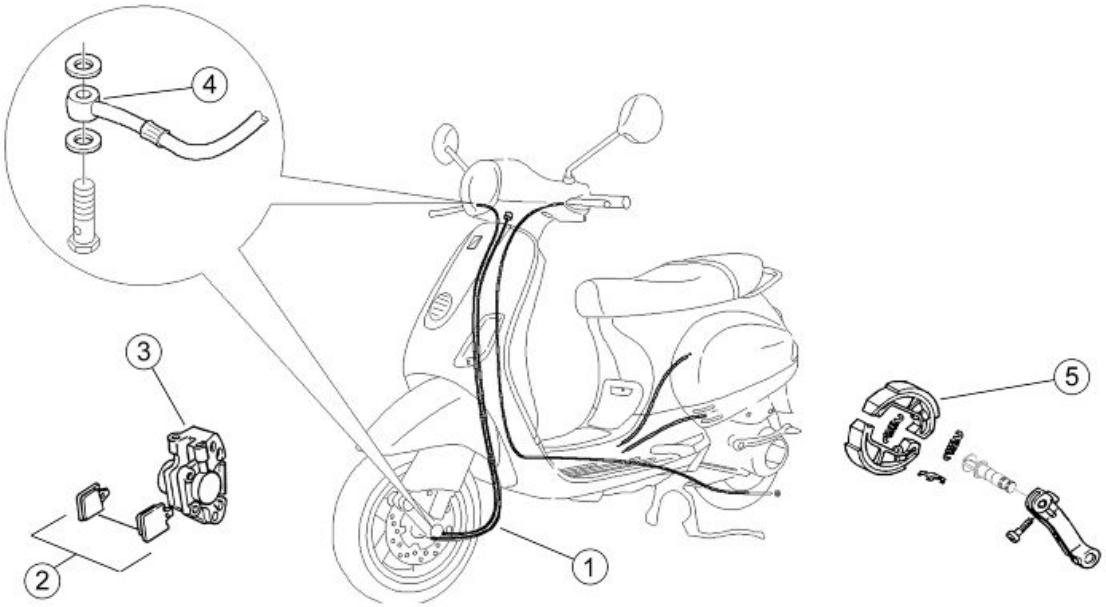
Front suspension



FRONT SUSPENSION

	Code	Action	Duration
1	003045	Steering tube - Replacement	
2	003010	Front suspension - Service	
3	003035	Shock absorber support and brake calliper - Replacement	
4	001064	Odometer reel - Replacement	
5	003044	Shock absorber cover - Replacement	
6	003011	Front shock absorber - Removal and Refitting	

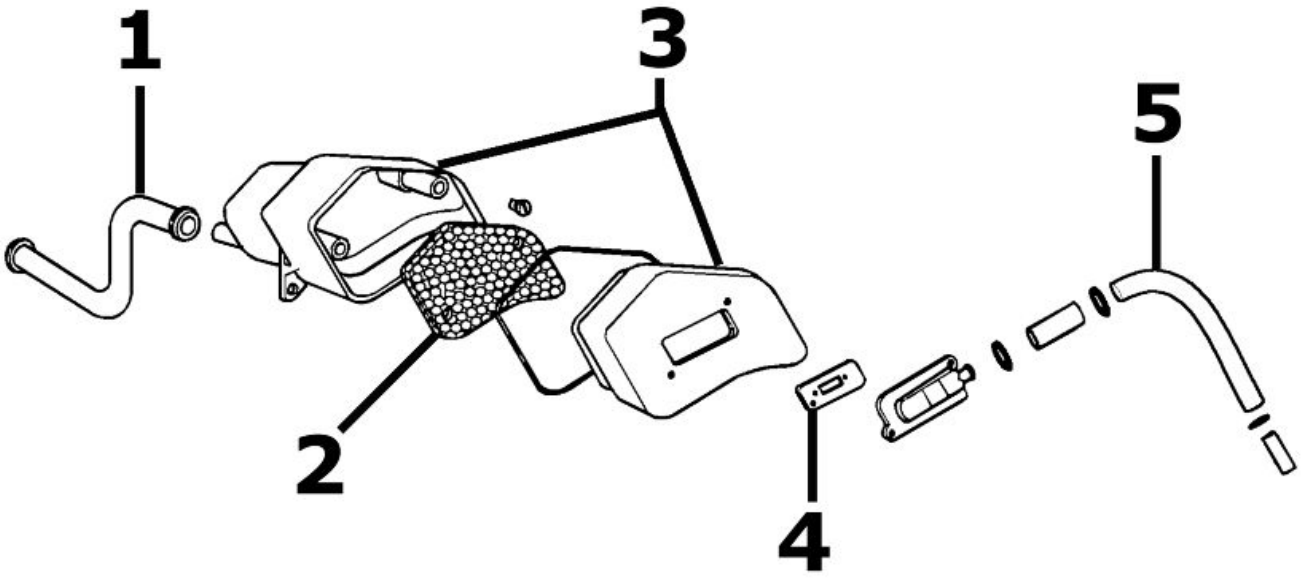
Braking system



BRAKING SYSTEM

	Code	Action	Duration
1	002021	Front brake hose - Remov. and Refitt.	
2	002007	Front brake shoes/pads - Remov. and Refitt	
3	002039	Front brake calliper - Removal and Refitting	
4	002047	Front brake fluid and air bleeding system - Replacement	
5	002002	Shoes - Rear brake pads - Replacement	

Secondary air box



SECONDARY AIR HOUSING

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

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