MANUALE STAZIONE DI SERVIZIO

677276 - 677281 (IT-EN-FR-DE-ES-EL)

MSS APE 50

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MSS APE 50

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

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

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

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

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

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Safety guidelines

- If work can only be done on the vehicle with the engine running, make sure that the premises are well ventilated, using special extractor fans if necessary; never let the engine run in an enclosed area. Exhaust gasses 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.

Petrol is highly flammable and it can be explosive given some conditions. Do not smoke in the working area, and avoid open flames or sparks.

- Clean the blocks, the drums, and 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 blocks. Dust caused by shoe wear is toxic since it contains asbestos.

Maintenance guidelines

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 removing these components, clean them using a non-flammable or high flash-point solvent. Lubricate all the work surfaces except the tapered couplings before refitting.

After refitting, make sure that all the components have been installed correctly and work properly.

For disassembly, overhaul and refit operations use only tools with metric measures. Metric bolts, nuts and screws are not interchangeable with coupling members with English measurement. Using unsuitable coupling members and tools may damage the scooter.

When carrying out maintenance operations on the vehicle that involve the electrical system, make sure the electrical connections have been made properly, particularly the ground connections.

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Identification

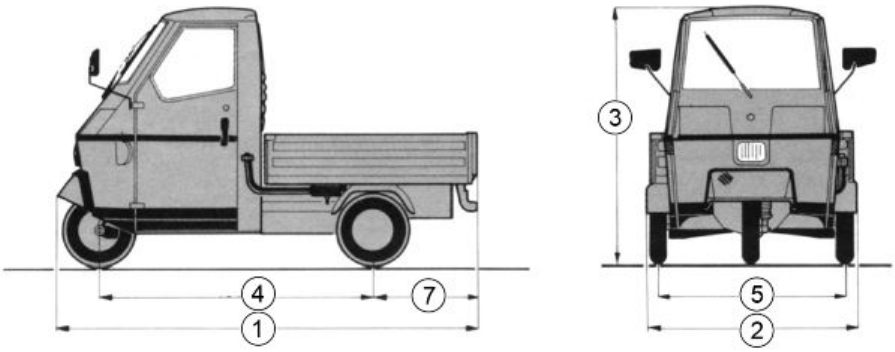
VEHICLE IDENTIFICATION

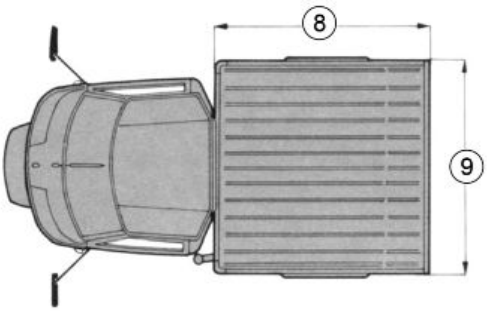
Vehicle	Chassis prefix	Engine prefix
APE 50	TL6T	TL3T
APE 50 EUROPA	TL5T	TL3T
APE 50 mix	ZAPC80000	C801M
APE 50 EUROPE (EURO 2)	ZAPC80000	C801M

Characteristics

SIZES

Sizes (mm)	Deck	Van
(1) Length	2670	2560
(2) Width	1250	
(3) Height	1530	1560
(4) Wheelbase	1590	
(5) Track	1100	
(6) Turning spokes	2400	2400
(7) Rear cantilever	760	660





SIZES - LOAD COMPARTMENT

Sizes (mm)	Deck	Van
(8) Length	1420	-
(9) Width	1200	-

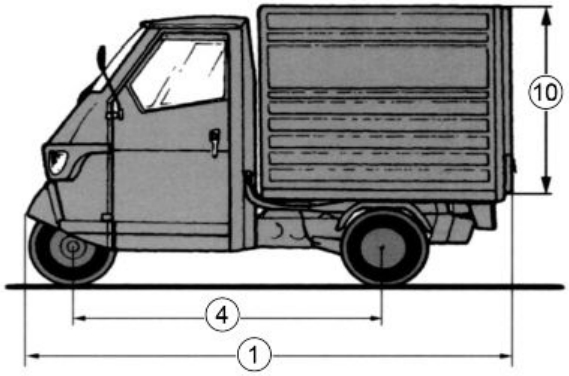
WEIGHTS

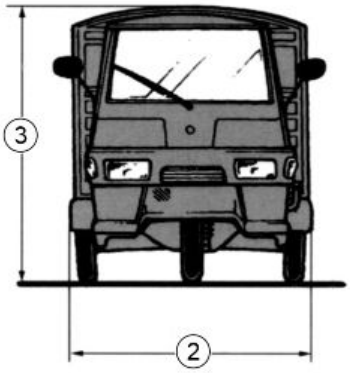
(*) = besides the driver.

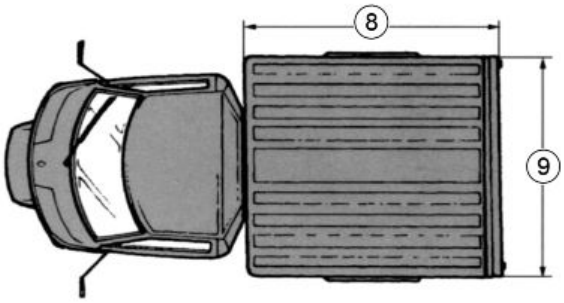
Kilograms (kg)	Deck	Van
Kerb vehicle weight	270	300
Useful load capacity (*)	200	170

SIZES - APE 50 EUROPA

Sizes (mm)	Deck	Short deck	Van	Cross
(1) Length	2660	2520	2560	2580
(2) Width	1250	1250	1250	1270
(3) Height	1530	1530	1560	1580
(4) Wheelbase	1590	1590	1590	1590
(5) Turning spokes	2400	2400	2400	2400







SIZES - LOAD COMPARTMENT - APE 50 EUROPA

Sizes (mm)	Deck	Short deck	Van	Cross
(8) Length	1420	1270	1260	1270
(9) Width	1200	1200	1200	1200
(10) Height	-	-	960	-
Top box size	-	-	-	900x460x300

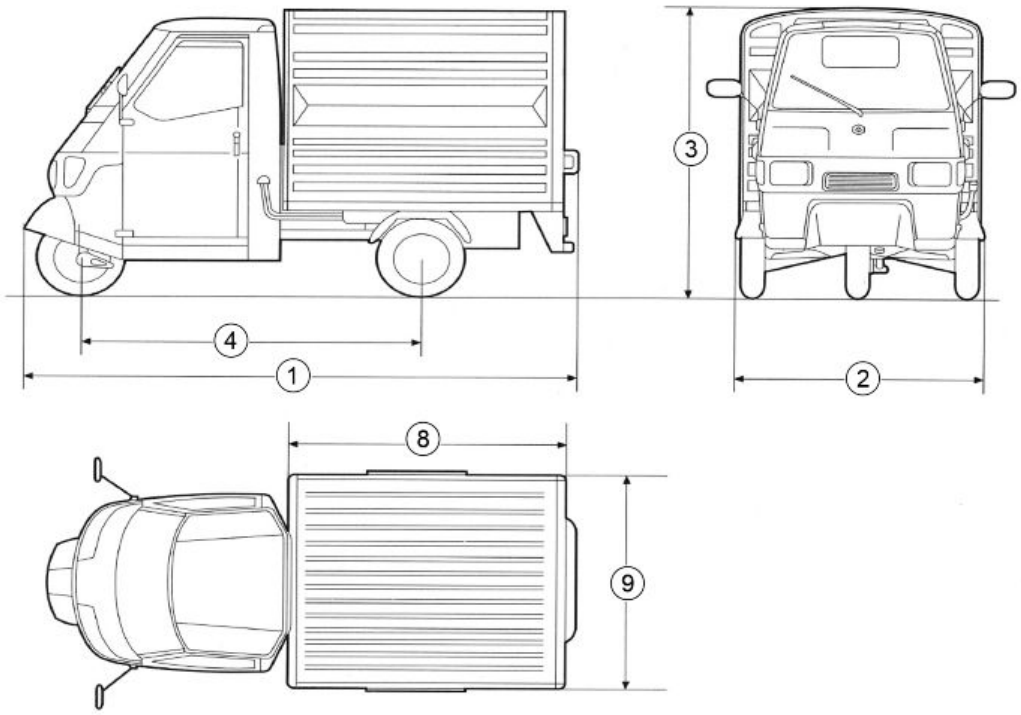
WEIGHTS - APE 50 EUROPA

(*) = besides the driver.

Kilograms (kg)	Deck	Short deck	Van
Total dry weight	220	215	250
Useful load capacity (*)	200	205	170

SIZES - APE 50 EUROPE 2 - APE 50 MIX

Sizes (mm)	Long deck base	Short deck base	Van	Cross	Top long deck
(1) Length	2660	2490	2500	2700	2660
(2) Width	1260	1260	1260	1260	1260
(3) Height	1550	1550	1590	1610	1550
(4) Wheelbase	1590	1590	1590	1590	1590



SIZES - LOAD COMPARTMENT - APE 50 EUROPE 2 - APE 50 MIX

Sizes (mm)	Long deck base	Short deck base	Van	Cross	Top long deck
(8) Length	1427	1257	1257	1427	1422
(9) Width	1211	1211	1211	1211	1262

WEIGHTS - APE 50 EUROPE 2 - APE 50 MIX

(*) = besides the driver.

Kilograms (kg)	Long Deck	Short deck	Van	Cross	Top
Total dry weight	230	230	260	245	230
Useful load capacity (*)	205	205	175	190	205

TECHNICAL DATA - CHASSIS

Specification	Desc./Quantity
Chassis	stamped plate unitised body and a single central longitudinal arm (integrated structure).
Seats in driving cab	One.

TECHNICAL DATA - ENGINE

Specification	Desc./Quantity
Engine	Single-cylinder, 2-stroke with rotating timing and with three transfer ducts, with transmission and differential grouped on the axis of the rear wheels.
Engine capacity	49.8 cm³
Bore x Stroke	38.4 mm x 43 mm
Compression ratio	(10÷10.5):1
Ignition advance	15°±2° before TDC
Carburettor	Dell'orto SHBC 18/16A.
Fuel	2% petrol-oil mixture (20 c.c. of oil per litre of regular petrol for cars). Recommended oil: see "recommended products" table
Spark plug	PIAGGIO P82M; BOSCHW5AC; CHAMPIONL82C; LODGE2HN; AC430Z.

Specification	Desc./Quantity
Consumption (CUNA)	~2.7 litres per 100 km.
Km range	Around 370 Km.

GEAR RATIO

Specification	Desc./Quantity
Gear ratio First	1/54.17
Gear ratio Second	1/29.75
Gear ratio Third	1/19.28
Gear ratio Fourth	1/13.35
Gear ratio Reverse	1/76.47

STEERING

Specification	Desc./Quantity
Steering	Steering tube pivoted on the arm with front wheel-holder oscillating clamp.

SUSPENSION

Specification	Desc./Quantity
Front - rear suspension	Made using integrated helicoidal springs and hydraulic shock absorber.

TYRES

Specification	Desc./Quantity
Wheel rim	2.10"
Front tyre pressure	1.5 bar.
Rear tyre pressure	2.5 bar.

TYRES - APE 50 - APE 50 EUROPA - APE 50 EUROPE EURO 2 - APE 50 MIX

Specification	Desc./Quantity
Wheel rim	10-2.50"
Tyre	100/90x10"
Front tyre pressure	2 bar.
Rear tyres - inflation pressure	3 bar.

Tightening torques

ENGINE - DIFFERENTIAL UNIT

Name	Torque in Nm
Crankcase halves coupling nuts	13 to 15 Nm
Coil support fixing screw	3 to 5 Nm
Spark plug	14 to 18 Nm
Engine gear locking nut	50 to 55 Nm
Clutch assembly locking nut	40 ÷ 45 Nm
Fan flywheel locking nut	45 to 50 Nm
Filler joint fixing nuts	5 to 7 Nm
Nuts fixing the exhaust pipe to the cylinder	5 to 7 Nm
Clutch cover fixing bolts	6 to 8 Nm
Big end fixing bolts	13 to 18 Nm
Nuts fixing the cylinder to the crankcase	13 to 15 Nm
Nuts fixing the differential unit to the engine	32 to 35 Nm
Differential crankcase halves coupling nuts	8 to 10 Nm
Engine - chassis anchoring plate fixing nuts	20 to 24 Nm
Differential oil drain plug	20 ÷ 25 Nm
Gear control guide bushing	60 to 65 Nm
Nuts fixing the silencer to the engine support	23 to 25 Nm
Nuts fixing the elastic connection to the engine support	25 to 30 Nm
Engine front fixing bolt	25 to 30 Nm

FRONT SUSPENSION UNIT

Name	Torque in Nm
Wheel locking centre nut	75 to 90 Nm
Nuts fixing the wheel rim to the drum	20 to 28 Nm
Shock absorber lower anchoring nut	100 to 130 Nm
Shock absorber upper fixing nut	30 to 40 Nm
Steering upper seat	30 to 40 Nm
Steering upper bearing ring nut	50 to 60 Nm

REAR SUSPENSION UNIT

Name	Torque in Nm
Nuts fixing the shoe support to the wheel hub	22 to 28 Nm
Nut fixing the wheel hub to the swinging arm	50 to 70 Nm
Nut for shock absorber lower and upper anchorage	30 to 40 Nm
Nut for anchoring the swinging arm to the chassis	40-50 Nm
Wheel locking centre nut	80 to 100 Nm
Nuts fixing the wheel rim to the drum	20 to 28 Nm

GENERAL PART

Name	Torque in Nm
Brake pump to the chassis	12 to 20 Nm
Handlebar fixing bolt	35 to 60 Nm

Assembly clearances

FITTING CLEARANCES

Name	Description	Dimensions	Initials	Quantity
Distance between the ends of seal rings within the upper and lower cylinder-ring (mm)				0.2 to 0.3
Gearbox fitting clearance (mm)				0.15 to 0.40

CAUTION

THE GEARBOX SHAFT FITTING CLEARANCE MUST BE VERIFIED WITH THE FEELER GAUGE.

Specific tooling

060824Y Probe

Cylinder-piston oversizes

CYLINDER - PISTON

Specification	Desc./Quantity
Normal cylinder nominal sizes	Ø=38.40 +0.025 - 0.005
Normal piston nominal sizes	Ø=38.265 ±0.015

CYLINDER COUPLING - PISTON

Name	Initials	Cylinder	Piston	Play on fitting
Coupling	1st Oversize	38.600 to 38.620	38.455 to 38.475	0.145
Coupling	2nd Oversize	38.800 to 38.820	38.655 to 38.675	0.145
Coupling	3rd Oversize	39.000 to 39.020	38.855 to 38.875	0.145

Piston ring oversizes

SEALING RINGS

Specification	Desc./Quantity
Upper seal ring (Nominal sizes)	Diameter=38.40 mm
Lower seal ring (Nominal sizes)	Diameter=38.40 mm

CLEARANCE UPON FITTING

Name	Description	Dimensions	Initials	Quantity
Upper sealing ring	1st Oversize	38.60		0.20 to 0.60
Lower sealing ring	1st Oversize	38.60		0.20 to 0.60
Upper sealing ring	2nd Oversize	38.80		0.20 to 0.60
Lower sealing ring	2nd Oversize	38.80		0.20 to 0.60
Upper sealing ring	3rd Oversize	39.00		0.20 to 0.60
Lower sealing ring	3rd Oversize	39.00		0.20 to 0.60

Connecting rod - roller cage fitting

CONNECTING ROD - ROLLER CAGE

Connecting rod	Roller cage
1.a category	4.a category
2.a category	3.a category
3.a category	2.a category
4.a category	1.a category

CAUTION

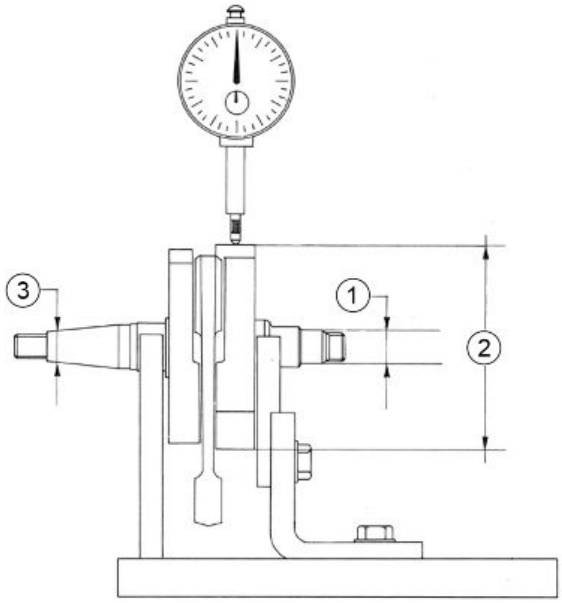
IN CASE OF NOISE, USE CAGE OF THE CATEGORY IMMEDIATELY BELOW.

Crankshaft alignment check

With the proper equipment, check that the eccentricity of the surface of Ø "3"and "1" are contained within 0.003 mm. (the maximum reading limit on the dial gauge clock); Also check the eccentricity of Ø "2", which are allowed for a maximum reading of 0.02 mm. In the case of eccentricities not much greater than that prescribed, perform the straightening of the shaft by means of counterweights with a wedge, or tightening it in a vice (equipped with aluminium bushings) as needed, for much greater eccentricities replace the crankshaft.

Specific tooling

020074Y Crankshaft Alignment Check Tool



Piston - Pin

PISTON - PIN ASSEMBLY CLEARANCE

Name	Description	Dimensions	Initials	Quantity
Piston - pin assembly clearance (mm)				0

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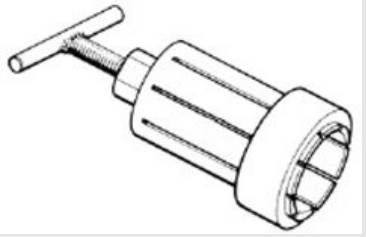
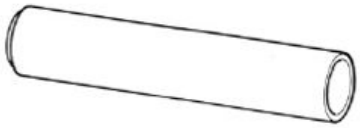
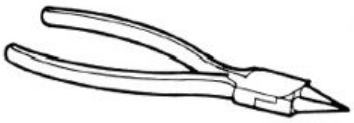
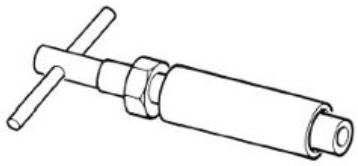
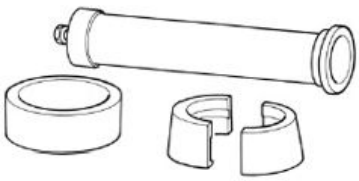
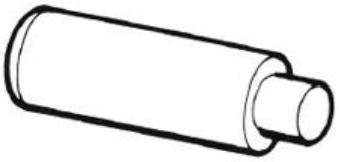
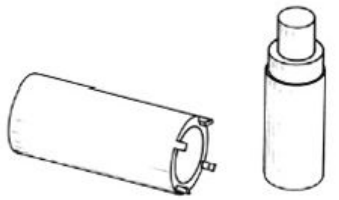
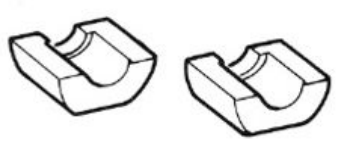
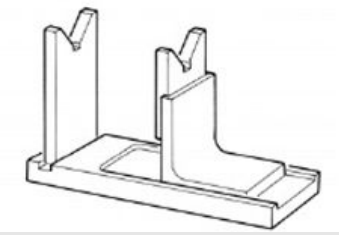
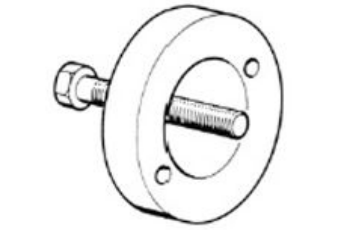
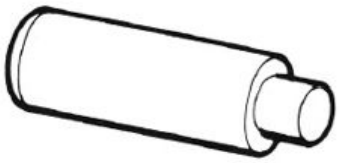
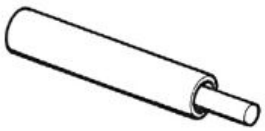
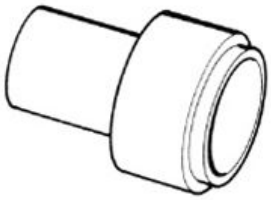
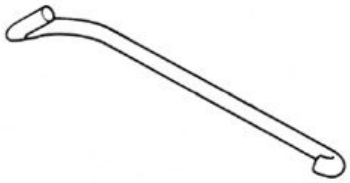
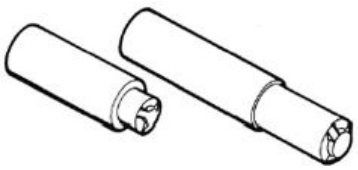
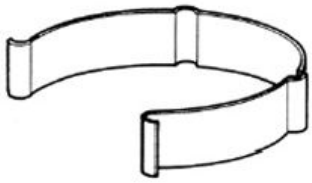
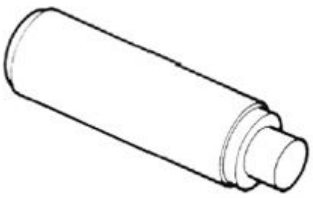
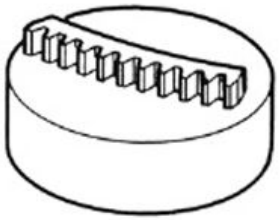
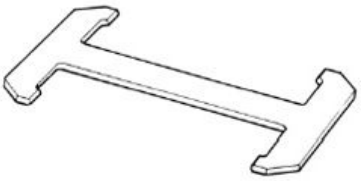
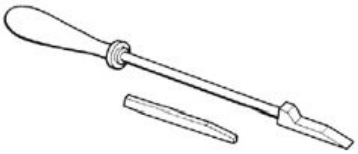
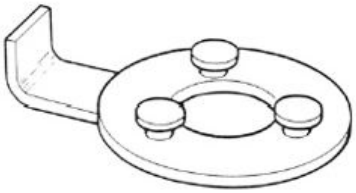
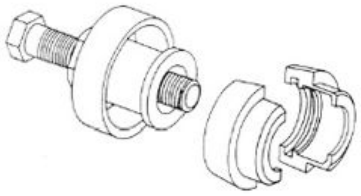
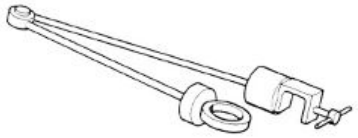
Tooling

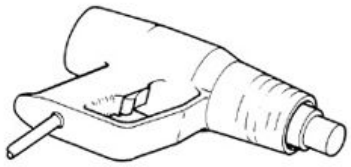
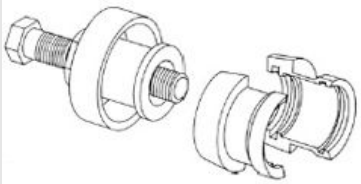
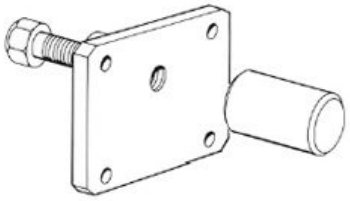
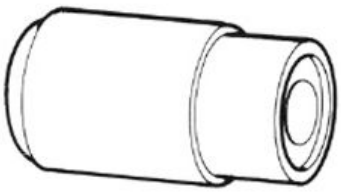
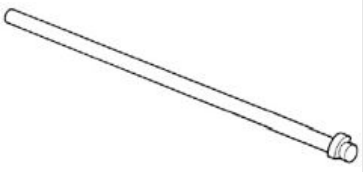
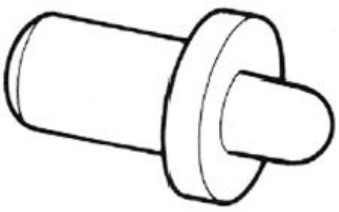
SPECIAL TOOLS

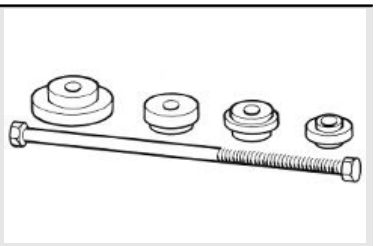
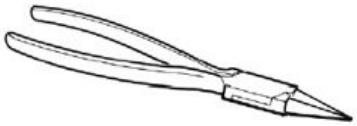
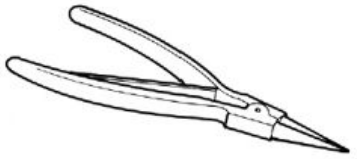
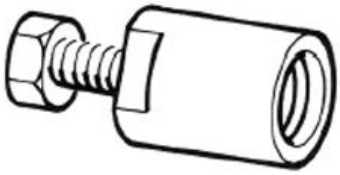
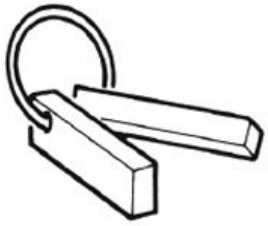
Stores code	Description	
014499Y	Bearing extractor	
016029Y	Lower Steering Bearing Fitting Tool on the steering tube	
017104Y	Pliers for circlips	
018119Y	Axle Fitting Tool	
020004Y	Steering seats extraction punch	
020042Y	Steering tube bearing extractor	

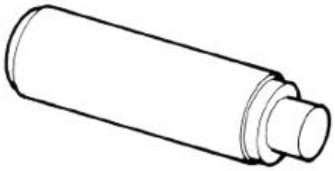
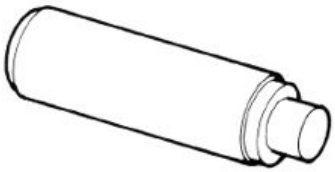
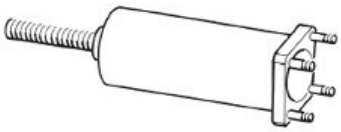
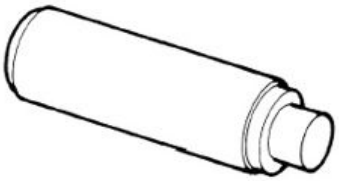
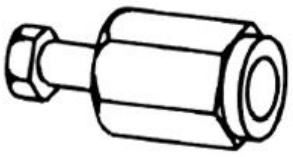
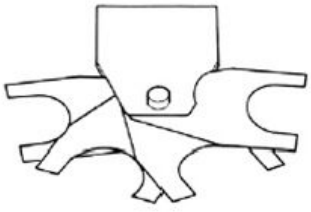
Stores code	Description	
020043Y	Rear Wheel Hub Roller Bearing Fitting Punch	
020044Y	Front Wheel Hub Roller Bearing Fitting Punch	
020055Y	Steering Ring Nut Key	
020057Y	Tool for Starter Motor Bushing Calking	
020074Y	Crankshaft Alignment Check Tool	
020119Y	Flywheel extractor	
020120Y	Punch for Clutch Side Secondary Shaft Roller Bearing	

Stores code	Description	
020121Y	Punch for Flywheel Side Secondary Shaft Roller Bearing	
020123Y	Valves Sealing Rings Punch	
020125Y	Punch to Fit Sealing Rings	
020126Y	Clutch Stop Key	
020127Y	Transmission Spider Calking Punch	
020128Y	Tool to Fit Sealing Rings	
020129Y	Engine Clearance Gear Check Tool	

Stores code	Description	
020130Y	Punch to Fit Roller Casing of Main Shaft, Flywheel Side Crankcase Half	
020131Y	Flywheel lock tool	
020132Y	Gearbox Shaft Shimming Gauge	
020133Y	Tappet plates replacement tool	
020144Y	Primary Sprocket Lock	
020147Y	Flywheel Cone Extractor	
020150Y	Support	

Stores code	Description	
020151Y	Heat gun	
020156Y	Clutch puller	
020161Y	Differential Box Extractor	
020322Y	Clutch Removal	
020781Y	Bearings Fitting Punch	
020842Y	Upper Steering Bearing Removal Punch	
021071Y	punch to fit bearings and sealing rings	

Stores code	Description	
021330Y	Steering seats fitting tool	
021467Y	Bearing extractor	
022465Y	Pliers for circlips	
023638Y	Pliers for circlips	
029551Y	Clutch puller	
029569Y	Gear Engagement Fitting Tool	
030250Y	Clutch Stop Key	

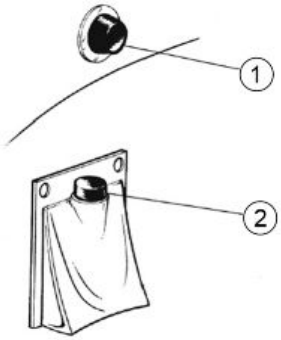
Stores code	Description	
032975Y	Punches for Roller Casings	
033970Y	Punches for Roller Casings	
038077Y	Engine support	
038137Y	Rear Hub Extractor	
038138Y	Roller Casings Punch	
048564Y	Flywheel extractor	
060824Y	Probe	

Stores code	Description
020095Y	Flywheel Lock
020332Y	Digital rev counter
494929	Exhaust fumes analyzer
021330Y003	Steering seats fitting
021330Y004	Steering seats fitting
020114Y	Pane positioning band
018119Y007	Axle fitting
018119Y009	Axle fitting
018119Y014	Axle fitting
018119Y015	Axle fitting
021467Y009	extractor
021467Y013	extractor

INDEX OF TOPICS

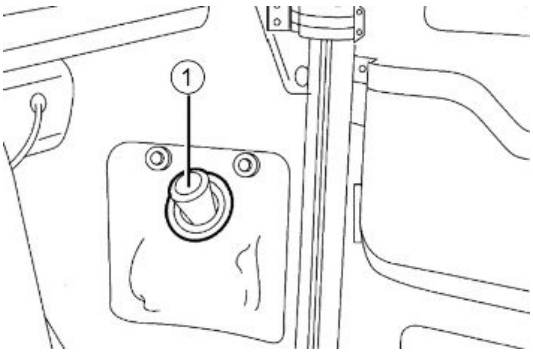
WINDSCREEN WASHER FLUID TOP-UP - APE 50

Inside the passenger compartment in the front left part, there is a container for windscreen washer fluid. If the fluid does not escape when pressing the button, remove the pipe that goes from the container to the and blow inside with compressed air. Do the same for the pipe that goes from the pump to the external nozzle. Refit everything and try pressing the button several times to recharge the system. If despite the above operations, the fluid does not come out, clean the external nozzle with iron wire of a suitable diameter.



WINDSCREEN WASHER FLUID TOP-UP- APE 50 EUROPA

The windscreen washer fluid tank is located inside the passenger compartment, in the front right part. To fill the tank, unscrew the cover (1), restore the fluid level and recharge the system by using the pump on the left side of the passenger compartment several times, until the liquid comes out of the sprayer.

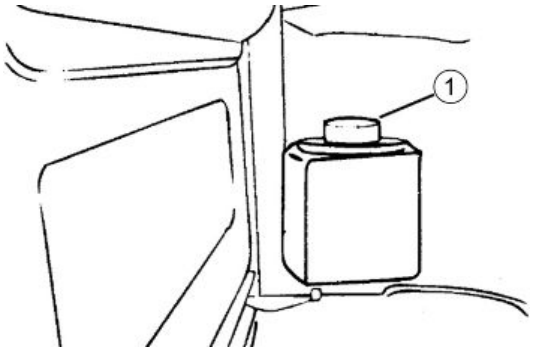


WINDSCREEN WASHER FLUID TOP-UP APE 50 MIX - APE 50 EUROPE

The windscreen washer fluid tank is located inside the cab on the front right panel.

To fill the tank, unscrew cover(1), and top up.

Use a specific detergent.



Scheduled maintenance chart

The following table must be regarded as a general guide for periodic inspections and lubrication interventions. It is necessary to also consider the weather, terrain, geographic location and variety of special use. This interventions table must therefore be changed to reflect the particular needs of the owner. For example, if a vehicle is exposed to sea salt, all parts should be lubricated more frequently than shown in the table to prevent damage caused by corrosion to metal parts.

MAINTENANCE OPERATIONS

In the event of prolonged vehicle inactivity, adhere to the following standards:
1) Clean the vehicle.
2) Remove the fuel from the vehicle.
3) Remove the air filter and with the engine is running at low rpm and input 30 cc. of specific oil through the diffuser of the carburettor.
4) Spread antirust grease on the unpainted metallic parts.
5) Lift the wheels off the ground.
A) Operation to be carried out when the engine is warm. Amount of new oil: about 600 gr. for the engine unit (until touching the load hole) and about 300 gr. for the differential unit (maximum level on the check rod).
B) For the oil level in the tank and to replace, use specific oil.

Unit	Operations	After the first 1000 Km	Every 4000 Km	Every 8000 Km	In the event of a review	Notes
MOTOR						
	Carburettor locking	•				See locking torque table:
	Piston - big end - cylinder lights descaling		•			See locking torque table:
	Cleaning and descaling of the still usable engine parts				•	See locking torque table:
TRANSMISSION AND DIFFERENTIAL						
	Oil replacement	•(A)		•(A)	•	
	Check and restore oil level		•			
air filter						
	Cleaning			•		Clean with pure petrol and dry with compressed air
SPARK PLUG						
	Electrode gap and descaling check	•	•			Bosch W54C; Lodge 2HN; Champion L82C; NGK B6HS;
	Replacement				•	Bosch W54C; Lodge 2HN; Champion L82C; NGK B6HS;
BEARINGS						
	Grease				•	
ARTICULATIONS AND CONTROL LEVERS (ENGINE SIDE)						
	Grease		•		•	
HYDRAULIC BRAKE						
	Check and restore oil level		•(B)			
FLEXIBLE TRANSMISSIONS						
	Adjust	•				
	Lubricate			•	•	
MAIN NUTS AND BOLTS OF THE VEHICLE						
	Locking check	•			•	See locking torque table:

SCHEDULED MAINTENANCE - APE 50 EUROPA

KEY: *(*)= Every 2 years.*
(I) = Check and clean, adjust, lubricate or replace if necessary.
(R)=Replace
In the event of prolonged vehicle inactivity, adhere to the following standards:
1) Clean the vehicle.
2) Remove the fuel from the vehicle.

3) Remove the spark plug, enter from its hole 10/15 cc of oil recommended for the mixer, and then operate the starter lever 2-3 times and refit the spark plug.
4) Spread antirust grease on the unpainted metallic parts.

km x 1,000 (months)	1 (4)	6 (12)	10 (24)	15 (36)	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Locks - Inspection	(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Spark plug - Replacement		(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)
Carburettor - Check	(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Carburetion - check	(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Controls - Inspection/Adjustment	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Condition and tyres use - Check		(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Air filter - Cleaning		(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Steering clearance - Inspection	(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Electrical system and battery - Check	(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Cylinder fan system - Inspection					(I)				(I)				(I)				(I)		
Brake and clutch lever - Grease	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Battery level - Inspection	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Differential oil level - Inspection		(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)
Brake fluid level - Check		(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Gearbox oil - replacement	(R)		(R)		(R)		(R)		(R)		(R)		(R)		(R)		(R)		(R)
Brake fluid - Replacement	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
Tyre pressure - Inspection	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Headlights - check/ adjust			(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Vehicle and brake test - Inspection	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Suspension - Inspection		(I)		(I)		(I)			(I)		(I)		(I)		(I)		(I)		(I)
Flexible transmissions - Lubrication			(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Pressure flexible brakes pipes							(R)						(R)						(R)

SCHEDULED MAINTENANCE - APE 50 MIX

KEY: *(*)= Every 2000 Km or 2 years.*
(I) = Check and clean, adjust, lubricate or replace if necessary.
(R)=Replace
In the event of prolonged vehicle inactivity, we recommend doing the following:
1) Clean the vehicle.
2) With the engine off and the piston at bottom dead center, remove the spark plug, enter from the corresponding hole 10 to 15 cc of specific oil. Then press the engine start-up button 3-4 times, making the engine and the spark plug slowly turn.
3) Drain the fuel tank, cover the unpainted metal parts with rustproof grease;
4) For the battery, follow the instructions set out in the specifications section.

km x 1,000 (months)	1 (4)	6 (12)	10 (24)	15 (36)	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Safety locks (wheels,brakes,steering,suspensions) - Inspection	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)

km x 1,000 (months)	1 (4)	6 (12)	10 (24)	15 (36)	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Spark plug - Replacement		(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)
Carburettor - Cleaning			(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Carburetion - Check	(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Throttle grip/mixer control - Adjustment	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Condition and tyres use - Check		(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Tyre pressure - Inspection	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Air filter - Cleaning		(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Steering clearance - Inspection			(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Brake and clutch lever - Grease		(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Braking system fluid level	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Braking system fluid level - Replacement	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
Gearbox oil - Replacement/Inspection		(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)
Differential oil - Replacement/Inspection		(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)
Battery fluid level - Inspection	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Headlights - check/adjust	(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Suspension - Inspection			(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Flexible transmissions - Lubrication			(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)		(I)
Rear brake disc piping - Replacement							(R)						(R)						(R)
Vehicle and brake test	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Drive shaft nut mix - Inspection				(I)			(I)			(I)			(I)			(I)			(I)

SCHEDULED MAINTENANCE - APE 50 EUROPE

KEY: *(*)= Every 2000 Km or 2 years.*
(I) = Check and clean, adjust, lubricate or replace if necessary.
(R)=Replace

km x 1,000 (months)	1 (4)	5 (12)	10 (24)	15 (36)	20	25	30	35	40	45	50
Safety locks (wheels,brakes,steering,suspensions) - Inspection	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Spark plug - Replacement		(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)
Carburettor - Cleaning			(I)		(I)		(I)		(I)		(I)
Carburetion - Check	(I)		(I)		(I)		(I)		(I)		(I)
Throttle grip/mixer control - Adjustment	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Condition and tyres use - Check		(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Tyre pressure - Inspection	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Air filter - Cleaning		(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Steering clearance - Inspection			(I)		(I)		(I)		(I)		(I)
Clutch brake lever - Grease		(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Fluid level and braking system - Check	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Braking system fluid level - Replacement	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)

km x 1,000 (months)	1 (4)	5 (12)	10 (24)	15 (36)	20	25	30	35	40	45	50
Gearbox oil - Replacement/Inspection		(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)
Differential oil - Replacement/Inspection		(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)	(I)	(R)
Battery fluid level - Inspection	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Headlights - check/adjust	(I)		(I)		(I)		(I)		(I)		(I)
Suspension - Inspection			(I)		(I)		(I)		(I)		(I)
Flexible transmissions - Lubrication			(I)		(I)		(I)		(I)		(I)
Rear brake disc piping - Replacement							(R)				
Vehicle and brake test	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)
Air filter and SAS box (sponge) cleaning			(R)		(R)		(R)		(R)		(R)

Suggested products chart

RECOMMENDED PRODUCTS TABLE

Product	Description	Specifications
AGIP CITY TEC 2T	Oil mixer for 2-stroke engines	JASO FC, ISO-L-EGD Specifications
AGIP CITY HI TEC 4T	Oil for lubricating the flexible transmission lines (brakes, throttle grip, odometer, etc.).	Specifications: SAE 5W-40, API SL, ACEA A3, JASO MA
AGIP GEAR	Differential Oil	Specifications: SAE 80W-90; API GL-4
AGIP GEAR	Gearbox oil	SAE 80W-90; API GL-4
AGIP GREASE PV 2	Grease for brake control levers	Specifications: NLGI 2 ; ISO-LXBIB2
AGIP GREASE MU3	Grease for odometer transmission gear case	Specifications: NLGI 3; ISO-L-XBCHA3, DIN K3K-20
AGIP BRAKE 4	Brake fluid	FMVSS DOT 4

Carburettor

The carburettor is completely decomposed, check all calibrated parts (main jets, idle jets, emulsifiers tubes, etc.). The value of these calibrated parts must correspond to the adjustment data prescribed for the type of carburettor. For a thorough cleaning of all components of the carburettor, use a bath of suitable solvent and blow with compressed air. To clean the calibrated jets, avoid using metallic spikes or wires.

All gaskets, seal rings and springs of the carburettor, should be replaced with each revision.

WARNING

THE CARBURETTOR IS VERY EXPLOSIVE; BE VERY CAREFUL NOT TO SPILL FUEL DURING THE REMOVAL OF THE CARBURETTOR

WARNING

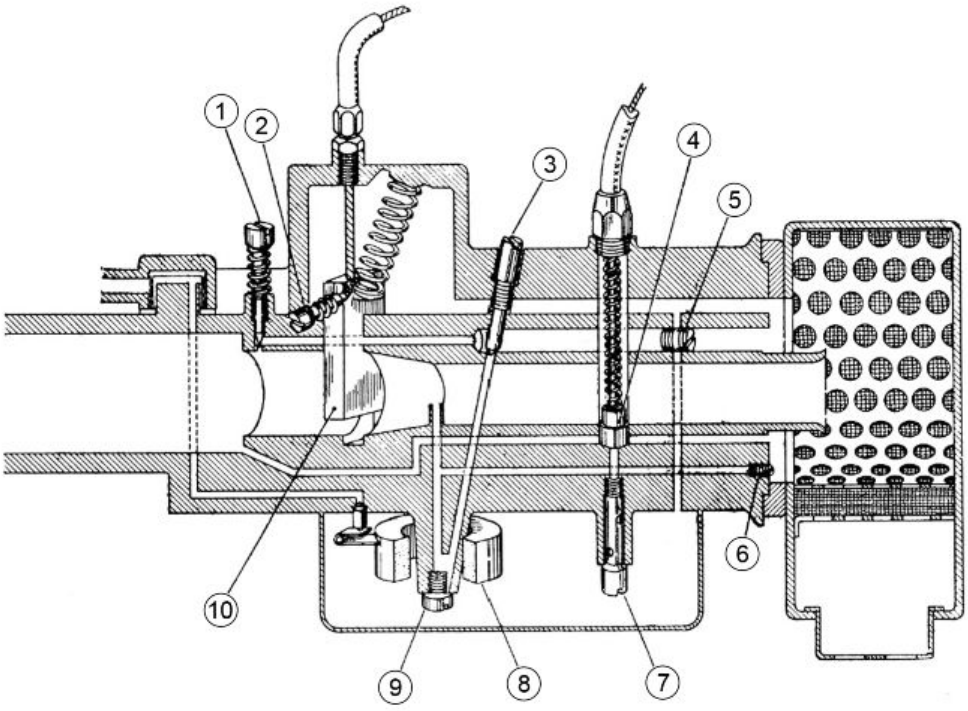
USE EXTREME CAUTION WHEN WORKING ON COMPONENTS CONTAINING PETROL.

WARNING

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

SPECIFICATIONS

Specification	Desc./Quantity
Dell'Orto type	SHBC 18/16 A.
Diffuser	mm. 16.
Max. jet	60/100.
Minimum jet	42/100 long.
Minimum fixed air	110/100.
Maximum fixed air	150/100.
Starter jet	50/100.



KEY:

1. Fuel adjustment screw at idle.

2. Minimum adjustment screw.

3. Minimum jet.

4. Starter valve.

5. Minimum air calibrator.

6. Maximum air calibrator.

7. Starter jet.

8. Float.

9. Max. jet

10. Throttle valve.

Air filter

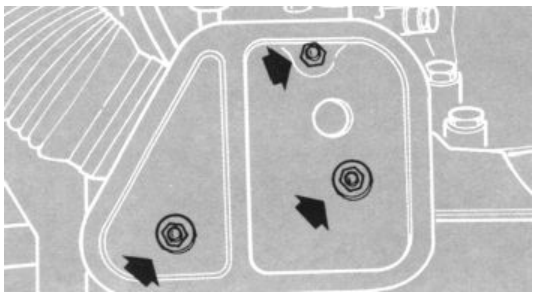
CLEANING:

- Clean with a solvent with high flash point.

- Dry with compressed air.

CAUTION

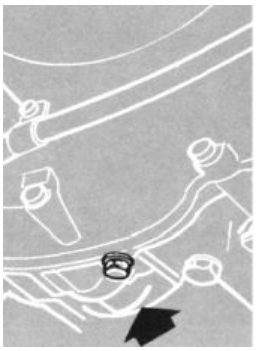
NEVER RUN THE ENGINE WITHOUT THE AIR FILTER, THIS WOULD RESULT IN AN EXCESSIVE WEAR OF THE PISTON AND CYLINDER.

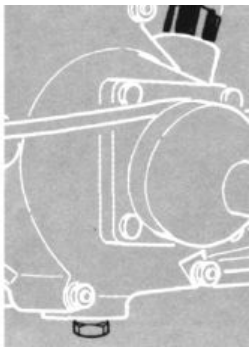


Engine oil replacement

ENGINE OIL AND DIFFERENTIAL REPLACEMENT

- The oil change must be performed with the engine warm.
- Remove the oil filler cap.
- Unscrew the oil drainage plug and drain out all the oil.
- Retighten the drainage plug and fill with oil (about 0.600 litres for the engine and about 0.300 litres for the differential).
- Start the engine and stop it after having run it for about 1 minute in idle.
- Restore, if necessary, the oil level and check for leaks.
- Use appropriate oils.





WARNING

DO NOT REMOVE THE OIL COVER IMMEDIATELY AFTER AN ACTIVITY WITH THE ENGINE AT FULL SPEED AND/OR WITH THE ENGINE RUNNING. THE HEATED OIL MAY LEAK, WITH THE RISK OF BURNING

Recommended products

AGIP GEAR Differential Oil

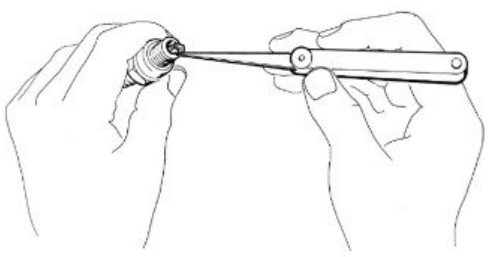
Specifications: SAE 80W-90; API GL-4

AGIP CITY TEC 2T Oil mixer for 2-stroke engines

JASO FC, ISO-L-EGD Specifications

Spark plug

- Disconnect the spark plug pipe and remove it.
- Examine it carefully and if the insulators are chipped or damaged replace them.
- Measure the distance between the electrodes using a feeler gauge and adjust if necessary by carefully bending the outer electrode.
- Make sure that the seal washer is in good condition.



Fit the spark plug, screw by hand and then tighten with a key for the spark plug to the prescribed torque.

Characteristic

Electrode gap

0.6 to 0.7 mm

Recommended spark plugs

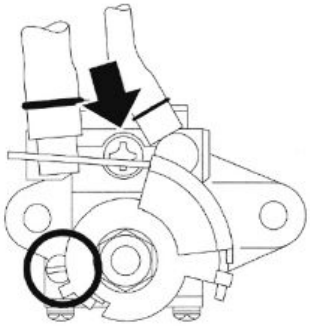
PIAGGIO P82M; Champion L82C; Bosch W54C; Lodge 2HN; Ac 430Z.

Locking torques (N*m)

Spark plug **14 to 18 Nm**

Mixer timing

To adjust the timing, operate on the transmission adjuster screw so that the reference stamped on the mobile control coincides with that made on the mixer body.



N.B.

CHECK FOR THE PROPER TIMING OF THE MIXER, IT IS NECESSARY TO FIRST REMOVE THE METAL COVER FIXED WITH THREE SCREWS ON THE CLUTCH COVER. DUE TO THE PASSAGE OF AN EXHAUST PIPE ON ONE OF THE SCREWS, THE LATTER'S HOUSING HOLE HAS BEEN MADE OPEN TO REMOVE THE LID BY LOOSENING ONLY ONE OF THE SCREWS IN QUESTION.

N.B.

WHENEVER REMOVING THE MIXER FROM THE CLUTCH COVER, THE SEALING O-RING LOCATED ON THE COLLAR OF THE MIXER MUST BE REPLACED.

CAUTION

IN THE EVENT OF REMOVAL OR EXHAUSTION OF THE OIL IN THE TANK, PROCEED TO BLEED THE MIXER AS FOLLOWS: WITH THE MIXER FITTED ON THE VEHICLE WITH THE ENGINE TURNED OFF, PULL OFF THE MIXER TUBE FROM THE CARBURETTOR AND LOOSEN THE BLEED SCREW UNTIL OIL STARTS TO FLOW. TIGHTEN THE SCREW, START THE ENGINE AND WAIT UNTIL OIL COMES OUT OF THE DELIVERY LINE TO THE CARBURETTOR (PREVIOUSLY DISCONNECTED). RECONNECT THE PIPE TO THE CARBURETTOR FIXING IT WITH A BAND.

In carrying out this operation, the engine must be fed with a mixture of 2% of appropriate oil (at least 0.5 litres if the tank is empty).

Recommended products

AGIP CITY TEC 2T Oil mixer for 2-stroke engines

JASO FC, ISO-L-EGD Specifications

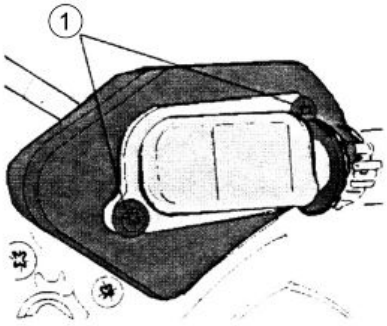
Secondary air system

FILTER CLEANING AND INTEGRITY CHECK

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

1) Unscrew the fixing screws «1» from the aluminium lid of the secondary air box to access the polyurethane sponge contained inside the same box.

2) Clean the polyurethane sponge by washing with soap and water, then dry everything with compressed air and reposition everything back in the corresponding seats, after checking at the same time that the blade is not warped, cracked and/or does not guarantee its seal on its contact surface; replace if necessary.



N.B.

WHEN REASSEMBLING, TAKE CARE TO PROPERLY REPOSITION THE BLADE IN ITS SEAT ON THE TWO PLASTIC AND ALUMINIUM COVERS.

CAUTION

DURING THE OPERATION 1) ALWAYS CHECK THE INTEGRITY AND THE SEAL OF THE RUBBER SLEEVE LOCATED ON THE END OF THE SECONDARY AIR TUBE; IF NECESSARY, REPLACE THE FIXING CLAMPS.

Headlight alignment check

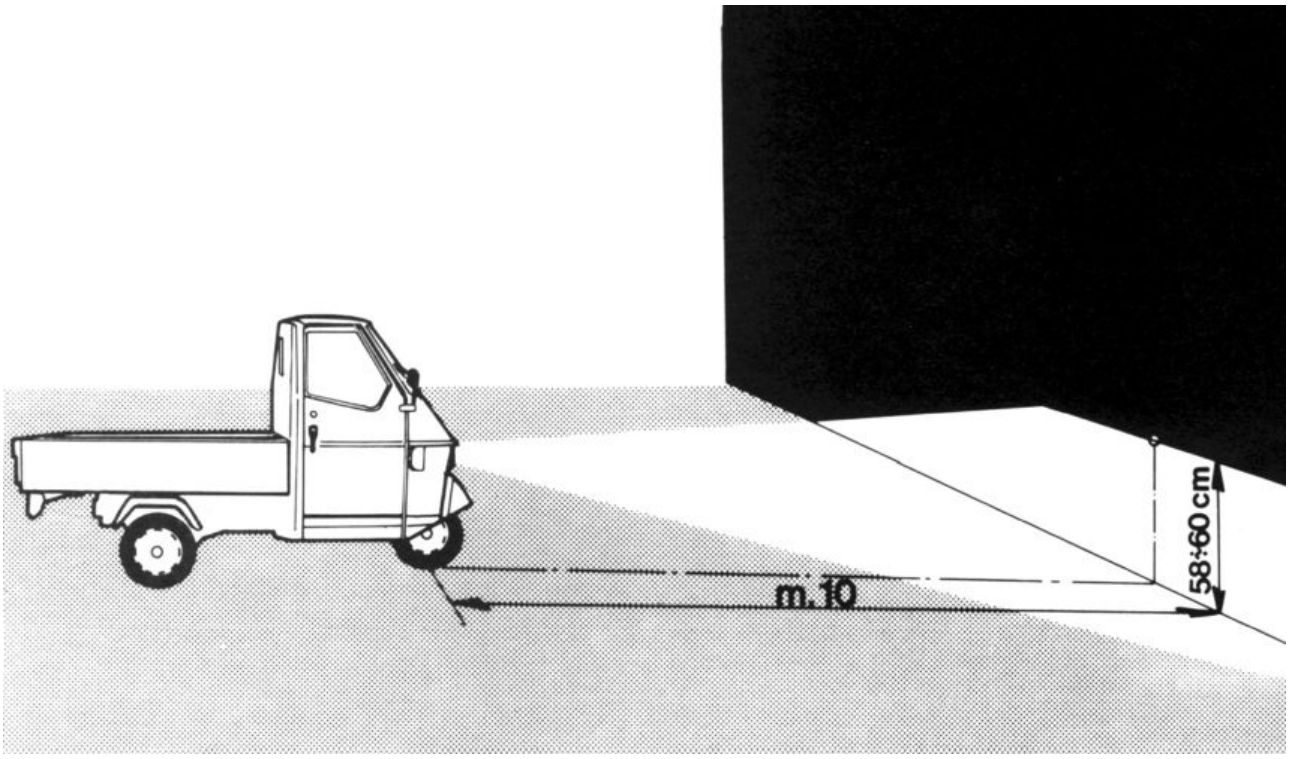
APE 50 - APE 50 EUROPA

Position the unloaded vehicle on a flat surface and at 10 m away from a white screen located in the dark. Make sure that the vehicle axis is perpendicular to the screen.

Draw a horizontal line on the screen with a height corresponding to 58-60 cm.; Check that the tyres are inflated to the pressure required, start the engine and lock the throttle twist grip at approximately 1/3 of its travel, turn on the headlight, insert the low beam and aim it so that the horizontal demarcation line between the dark and the lighted area does not fall above the horizontal line marked on the screen.

WARNING

THE HEADLIGHT IS FITTED WITH TWO ADJUSTMENT SCREWS, LOCATED AT THE TOP TO ALLOW CORRECTION OF ANY ALTERATION OF THE LIGHT BEAMS. TO ACCESS THESE SCREWS AND, IT IS NECESSARY TO REMOVE THE PROTECTIVE FRONT COWL OF THE HEADLIGHT UNIT BY TURNING THE TWO SCREWS THAT FIX THE SHIELD OF THE FRAME.



HEADLIGHTS AIMING INSPECTION

N.B.

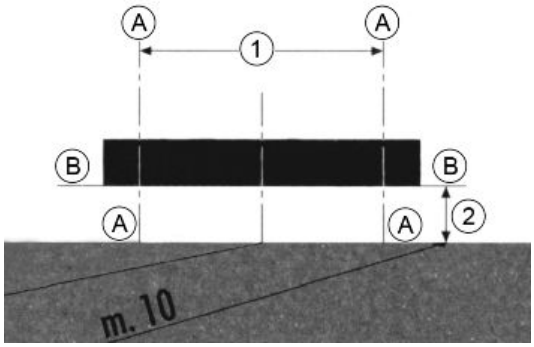
BEFORE CARRYING OUT THE OPERATION FOR HEADLIGHTS AIMING, CHECK THAT THE TYRES ARE INFLATED TO THE PRESSURES INDICATED IN THE SPECIFIC SECTION.

Proceed as follows:

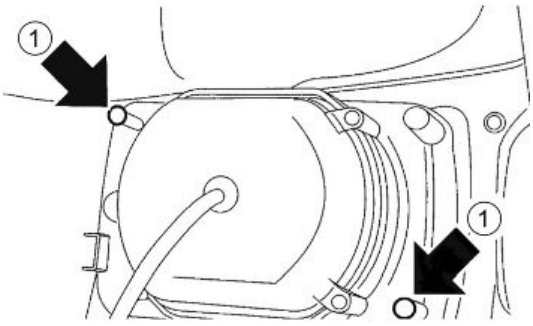
1. Place the vehicle in conditions of use, without load, with the tyres inflated to the prescribed pressure on flat grounds at 10 m from a white screen placed in the shade. Make sure the vehicle axis is perpendicular to the screen;

2.Draw two vertical lines «a-a» at a distance «1» corresponding to the distance between headlight axes. Draw a horizontal line «b-b» at height «2» from ground corresponding to the headlight centre height from ground multiplied by 0.9;

3.Start the engine and lock the throttle twist grip at approximately 1/3 of its travel. Switch the dipped beam headlight on. Direct the beam so that the horizontal line between the light and the shade falls above the horizontal line «b-b» drawn on the screen;



4.If this is not so, adjust the headlight by means of the two screws (1) to correct any beam alterations.



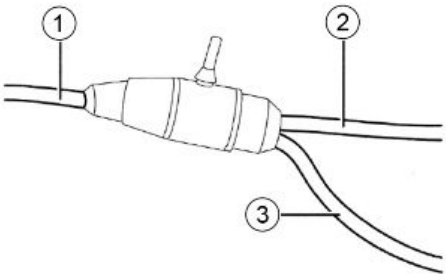
Cables adjustment

SPLITTER_ADJUSTMENT CONTROL CABLE

Splitter control cable «1»: adjust so that clearance is felt on the throttle grip.

Mixer cable «2»: see section "Mixer timing".

Throttle grip cable «3»: adjust so that the sheath does not have clearance.



TRANSMISSIONS ADJUSTMENTS

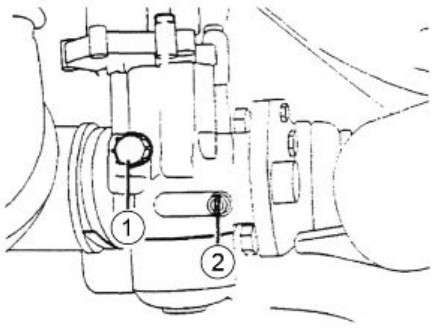
Adjust the control cables: Cable mix: see "mixer timing" specification section.

Gas cable: adjust so that the sheath does not have clearance.

Splitter control cable: adjust so that clearance is felt on the throttle grip. All transmissions must be adjusted so that the sheaves have no clearances.

INDEX OF TOPICS

CO check



The test must be done after a thorough cleaning of all parts of the carburettor, with the air filter clean and spark plug in good condition.

1) Heat the vehicle for the time necessary to activate the catalytic converter.

2) Turn off the vehicle for the time necessary to perform the operations of 3) and 4).

3) Insert an extension pipe of ~ 50 cm at the exhaust fumes socket on the silencer.

4) With the utmost care, check the seal between silencer and tube. Insert the probe of the exhaust fumes analyser into the tube.

5) Start the engine.

6) Wait for a minute for the minimum to stabilise.

7) Without ever operating the accelerator and using the appropriate screw (1), bring the engine speed to 1350 ± 100g/min.

8) Record the flow screw (2) in order to have a value of «CO» at a minimum of 2.0 ± 1.0.

9) Operate the throttle grip by slowly speeding up the engine to a speed of 4000 rpm. and return to the closed position; check that the idle speed remains at the previously established value, otherwise repeat the procedure starting from point 3).

Specific tooling

020332Y Digital rev counter

494929 Exhaust fumes analyzer

INDEX OF TOPICS

Probable cause and troubleshooting

DETONATIONS TO THE EXHAUST

Possible Cause	Operation
Detonations in the silencer to the gas release	Check the ducts and the membrane of the choke device on the carburettor.

NOISE - KNOCKS

Possible Cause	Operation
Worn or leaking shock absorbers	Replace.
Flexible buffers of the swinging arms	Replace.
Insufficient lubrication of the hubs	Remove the hubs and fill the appropriate chamber with special grease.

RUBBER JOINT FAILURE OF THE SECONDARY PIPE ON THE AIR SILENCER

Possible Cause	Operation
Secondary air reed locking	Replace.
Secondary air filter clogging	Clean the filter and the box.
Clogging of the secondary air joint on the silencer	Descale the joint taking care to not let the residues fall into the silencer.

THE VEHICLE PULLS TO ONE SIDE

Possible Cause	Operation
The pressure of one of the tyres is not right	Check and set to the prescribed pressure
Rear swinging arms	Straighten out if possible, or replace.
Worn rubber buffers	Replace.

Engine

ENGINE STOP

Possible Cause	Operation
Idle speed too low	Work on the appropriate adjuster screw del of the carburettor.
Dirt or water in the mixture of the ducts	Clean thoroughly.
Inefficient spark plug	Clean and adjust the gap between the electrodes or replace.
Cock obstruction	Clean.
H.V. cable or spark plug hood damaged	Check or replace.
Fuel tank cap breather obstruction (defective fuel system)	Clean properly.

CRANKSHAFT KNOCKS

Possible Cause	Operation
Excessive clearance of the main bearings	Replace.
Big end failure	Replace the crankshaft.
Crankshaft unbalanced	Check the alignment
Piston pin worn	Replace.

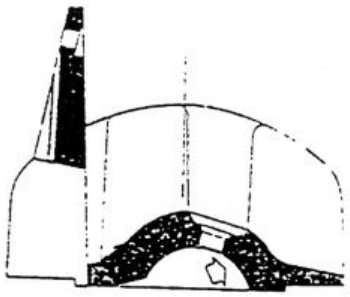
RINGING OF THE PISTON

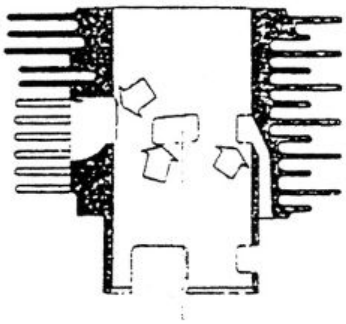
Possible Cause	Operation
Excessive clearance between the piston and cylinder	Replace the piston and correct the cylinder.
Excessive clearance of the roller pin-connecting rod small end or piston pin	Review (for any replacement of the rollers of the connecting rod small end, see the section "Specifications").

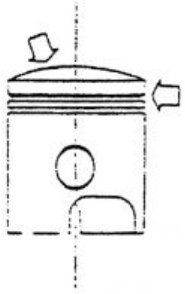
Poor performance

LOW POWER

Possible Cause	Operation
Timing incorrect	Perform the foreseen checks.
Cylinder head or spark plug not fitted correctly	Correct the locking and the fitting.
Leakage of current of the ignition system	Locate the dispersion and act accordingly.
Excessive incrustation on the lights of the cylinder	Descale.
Silencer blocked	Descale with iron wire bent into a hook or with compressed air introduced into the cylinder nozzle fixed to the cylinder after the external exhaust pipe.







Starting difficulties

PROBLEMS WITH STARTING

Possible Cause	Operation
Battery terminals oxidised or not properly locked	Clean, tighten and protect with neutral petroleum jelly
Discharged battery	The battery is the electrical device in the system that requires the most frequent inspections and thorough maintenance. Frequently check that the fluid level fully covers the plates; if not, restore the level adding distilled water (never use natural water, even if it is drinking water) and check fluid density at the same time. If the vehicle is not used for some time (1 month or longer) the battery needs to be recharged periodically. The battery runs down completely in the course of three months. When the battery is being placed on the vehicle, make sure that the connections are not misplaced, keeping in mind that the black ground cable with the terminal attached to the frame is to be connected to the negative terminal whereas, the other cable, must be connected to the terminal marked +.
Carburettor body nozzles	Remove and clean in petrol; dry with a compressed air jet.
Inefficient spark plug	Replace.

Clutch slipping

CLUTCH SLIPPAGE

Possible Cause	Operation
Insufficient idle stroke	Adjust the stroke.
Weak return spring	Replace.
Worn or burned driven disc gasket	Replace the disc.
Insufficient oil in the differential transmission or unsuitable oil	Restore the oil level or replace.

Gearbox

OIL LOSS FROM THE TRANSMISSION - DIFFERENTIAL UNIT

Possible Cause	Operation
Excessive filling	Bring back to level.
Loosening of the crankcase halves locking nuts and the differential cover	Check the locks, replace the gaskets if necessary.
Axle shaft oil seal hood worn or broken	Replace.
Cracked crankcase	Replace.
Loose oil drain plug	Lock and replace if damaged

Gears disengage abruptly or are difficult to engage

SPONTANEOUS GEARS DISENGAGEMENT

Possible Cause	Operation
Gearbox housing worn or damaged	Verify and replace if necessary
Badly adjusted control cable	Adjust.
Trasmission gears or spiders not properly assembled or worn	Review.

Noisy gears

NOISY TRANSMISSION

Possible Cause	Operation
Excessive clearance between the gears of the transmission	Review and replace the worn components.
Insufficient oil in the differential transmission	Restore the oil level or replace.
Bearings of the gear shaft are noisy	Replace.

Locked brakes

BRAKES LOCKED EVEN WHEN YOU CEASE TO PRESS THE PEDAL

Possible Cause	Operation
Return springs stretched	Replace.
Compensation hole on the pump clogged	Clean and bleed the air out of the system.
Rubber gasket swollen or sized	Check the system, replace all the rubber parts and the fluid, bleed air from the system: use the recommended oil

Noisy suspension

NOISY FRONT SUSPENSION

Possible Cause	Operation
Hub bearings worn or with excessive clearance	Replace.
The wheel hub chamber needs to be greased	Disassemble and apply grease.

Possible Cause	Operation
Hydraulic absorber inefficient or discharged	Replace.
Roller casings of swinging arm worn	Replace.

Difficult riding

GUIDE IRREGULARITIES

Possible Cause	Operation
The vehicle "pulls" to one side due to deformation of the steering tube	Check the steering unit and replace if necessary.
Steering is hard or knocks	Check the steering fifth wheels: if they are loose they must be properly tightened; if marked with pricks, they must be replaced.

INDEX OF TOPICS

Dispositivi e accessori

ELECTRICAL SYSTEM DEVICES - APE 50

1. FRONT HEADLIGHTS, 12V-15W AND FROM 12V-5W BULBS

2. HORN

3. FRONT TURN INDICATORS, 12V-10W BULBS

4. WINDSCREEN WIPER

5. INDICATOR UNIT, 12V-1.2 W BULBS

6. WINDSCREEN WIPER SWITCH

7. START-UP BUTTON

8. LIGHT SWITCH

9. TURN INDICATOR SWITCH

10.HORN BUTTON

11. IGNITION SWITCH

12. STOP BUTTON

13.TURN INDICATOR CONTROL DEVICE

14. LOW FUEL WARNING LIGHT INDICATOR

15. START-UP MOTOR

16. 7.5A FUSE

17. START-UP REMOTE CONTROL SWITCH

18. REGULATOR

19.12V-32Ah BATTERY

20. ELECTRONIC CONTROL UNIT

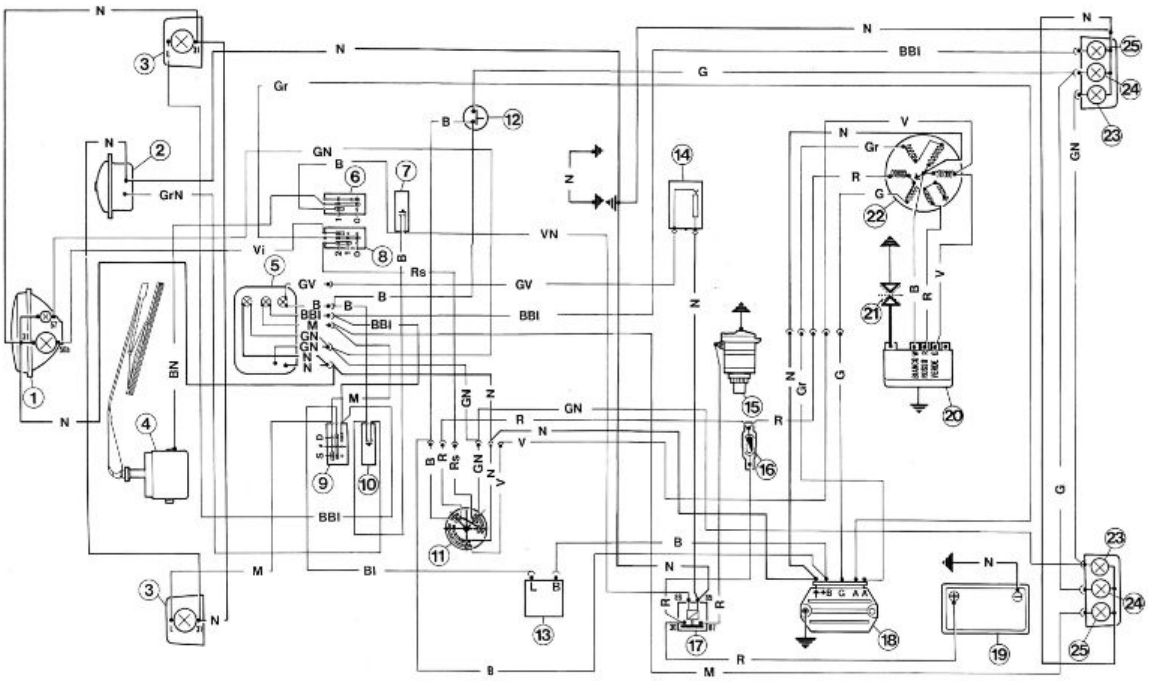
21. SPARK PLUG

22.MAGNETO FLYWHEEL

23.REAR DAYLIGHT RUNNING LIGHTS, 12V- 4W BULBS

24. STOPLIGHTS, 12V-10W BULBS

25. REAR TURN INDICATORS, 12-10W BULBS



ELECTRICAL CABLES COLOUR CODING - APE 50

B = White

Bl = Blue

G = Yellow

M = Brown

N = Black

BV = White-Green

GN = Yellow-Black

RN = Red-Black

Gr = Grey

Rs = Pink

R = Red

Vi = Purple

V = Green

A = Orange

VN = Green-Black

BN = White-Black

BBI = White-Blue

BR = White-Red

CAUTION

WHEN INTERVENING ON THE ELECTRICAL SYSTEM, MAKE ESPECIALLY SURE THAT THE WIRES LEADING TO THE ELECTRONIC CONTROL UNIT ARE CORRECTLY CONNECTED AND RESPECT THE COLOUR CODING GIVEN ON THE CONTROL UNIT.

IGNITION SECTION

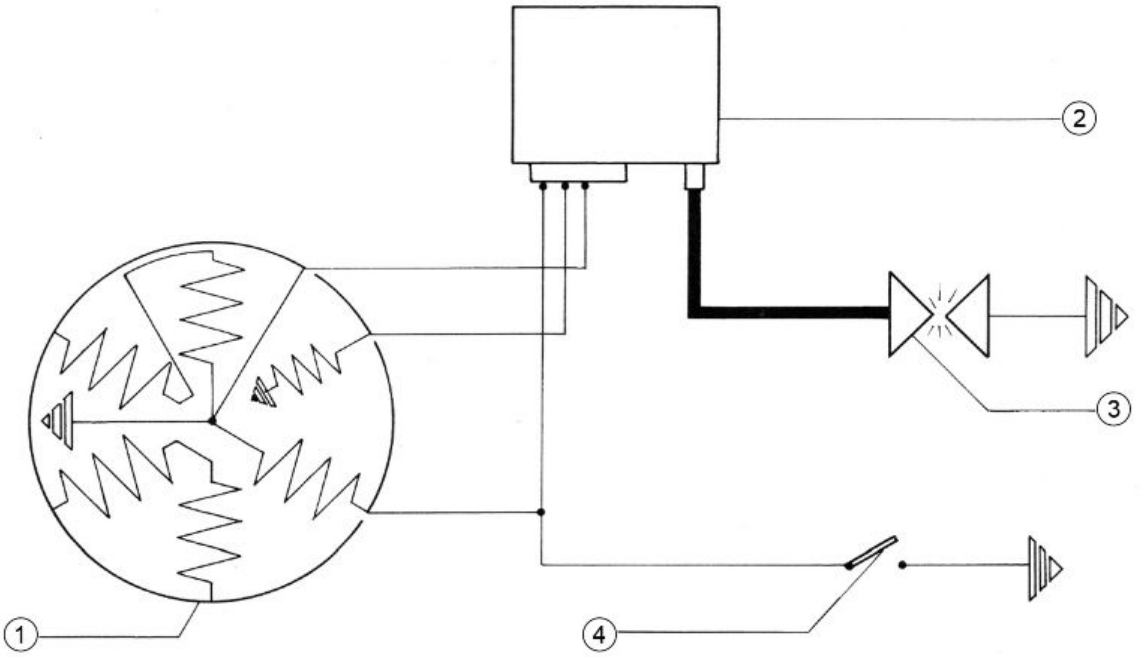
KEY:

1.Alternator

2. Electronic control unit

3. Spark plug

4. Engine stop



STARTER AND RECHARGE SECTION

KEY:

1.Alternator

2.Voltage regulator

3.Starter motor

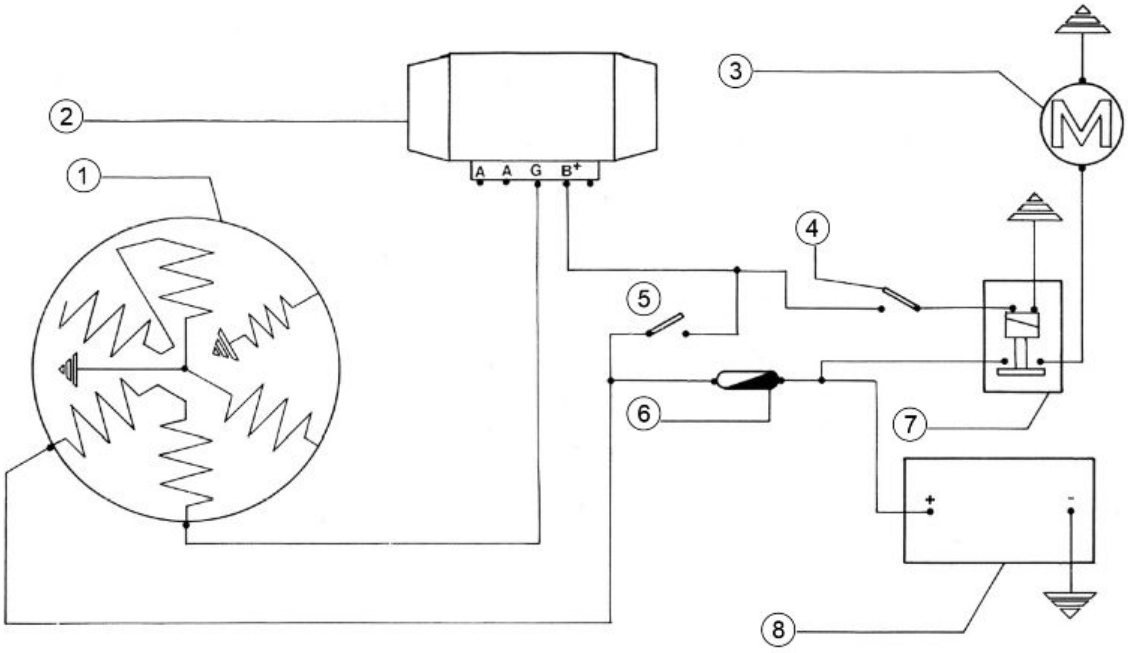
4.Starter button

5. Key switch

6. 7.5A Fuse

7.Remote control

8. 12V-32Ah battery



TURN INDICATORS - STOP - WINDSCREEN WIPER

KEY:

1. Windscreen wiper switch

2. Windscreen wiper

3. 12V-1.2W turn indicator warning light

4. No. 4 12V-10W turn indicator bulbs

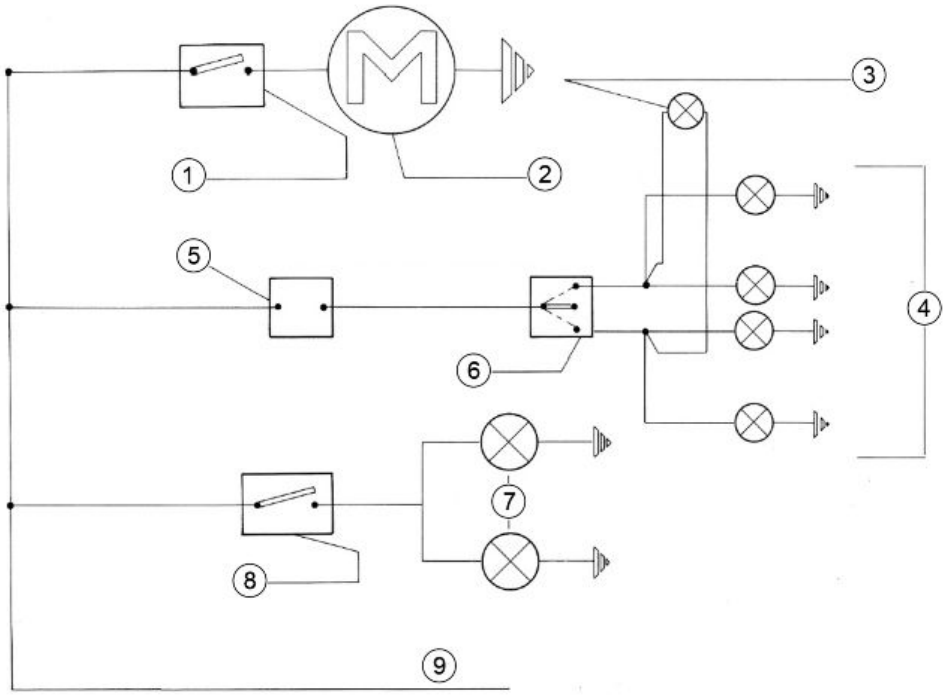
5. Turn indicator command

6. Turn indicator switch

7. No.2 12V-10W stop bulbs

8. Stop switch

9. From B+ of the regulator



HORN SECTION - LEVEL TRANSMITTER

KEY:

1. Turn indicators

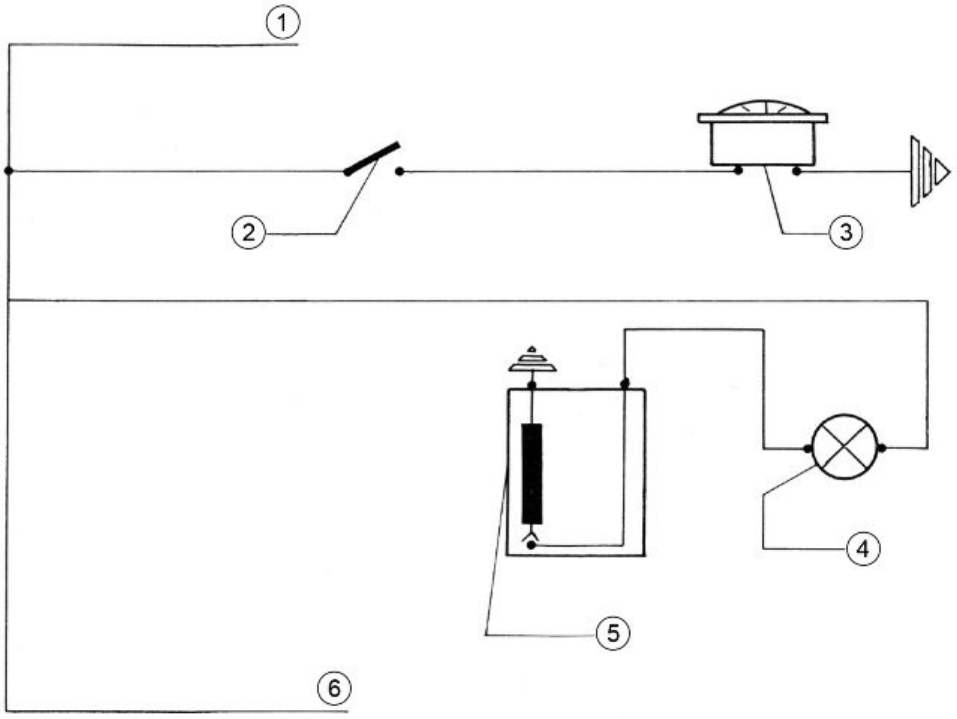
2.Horn button

3. Horn

4. 12V-1.2W Low fuel warning light

5.Fuel warning light transmitter

6. From B+ of the regulator



LIGHTS SECTION

KEY:

1.Alternator

2. 12V-15W Headlight light

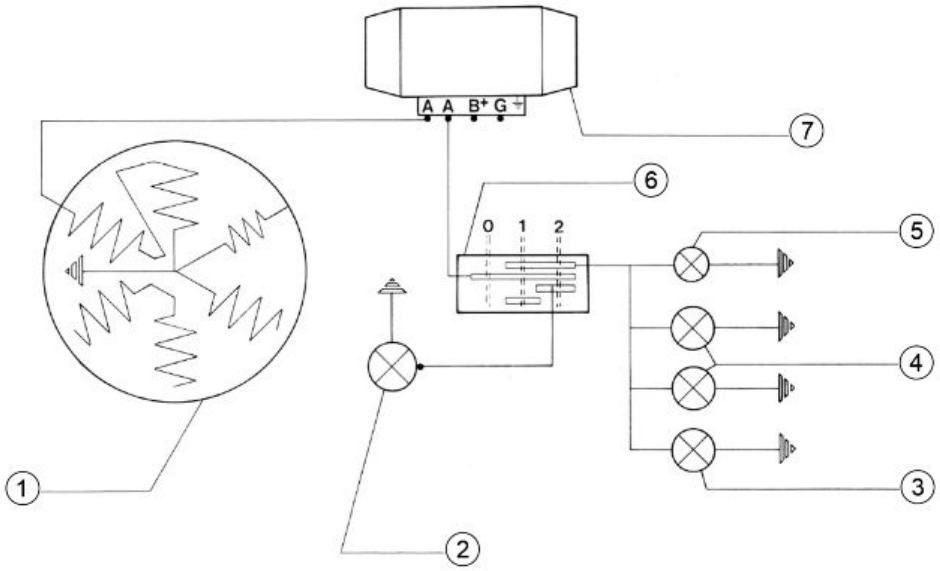
3. 12V-5W City lights

4. 12V-4W Rear daylight running light

5. 12V-1.2W headlight warning light

6. Light switch

7. Voltage regulator



ELECTRICAL SYSTEM DEVICES - APE 50 EUROPA

1. FRONT HEADLIGHTS, 12V-3W, 12V- 15W AND 12V-10W BULBS

2. HORN

3. REAR HEADLIGHTS, 12V-4W, 12V-10W AND 12V-10W BULBS

4. WINDSCREEN WIPER

5. INSTRUMENT PANEL, 12V- 1.2W BULBS

6. WINDSCREEN WIPER SWITCH

7. STARTER BUTTON

8. LIGHT SWITCH

9. TURN INDICATOR SWITCH

10. HORN BUTTON

11. IGNITION SWITCH

12. STOP BUTTON

13. TURN INDICATOR CONTROL DEVICE

14. LOW FUEL WARNING LIGHT CONTROL

15. START-UP MOTOR

16. 8A FUSE

17. START-UP REMOTE CONTROL SWITCH

18. VOLTAGE REGULATOR

19. 12V-9Ah BATTERY

20. ELECTRONIC CONTROL UNIT

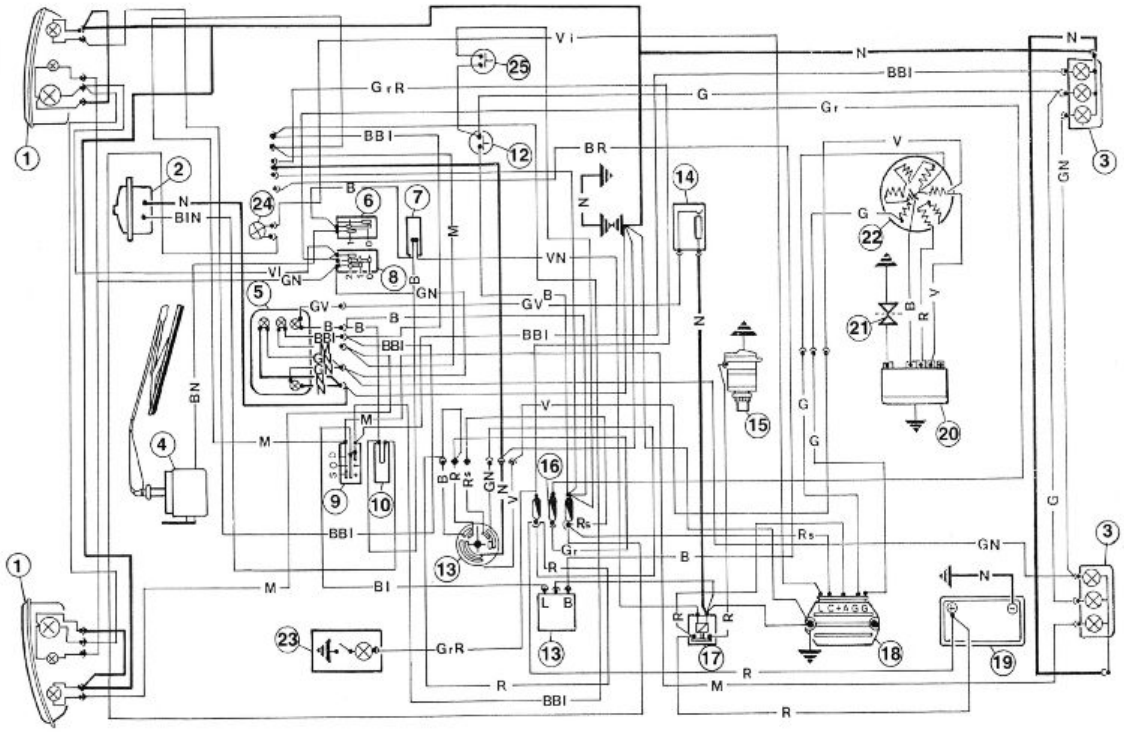
21. SPARK PLUG

22.MAGNETO FLYWHEEL

23. INTERNAL LIGHT FITTING, 12V-5W BULB

24. ALTERNATOR LIGHT, 12V-1.2W BULB

25. STOP SWITCH



ELECTRICAL CABLES COLOUR CODING - APE 50 EUROPA

B = White

Bl = Blue

G = Yellow

M = Brown

N = Black

BV = White-Green

GN = Yellow-Black

RN = Red-Black

Gr = Grey

Rs = Red

Vi = Purple

V = Green

VN = Green-Black

BN = White-Black

BBl = White-Blue

BR = White-Red

A = Blue

Ar = Orange

CAUTION

WHEN INTERVENING ON THE ELECTRICAL SYSTEM, MAKE ESPECIALLY SURE THAT THE WIRES LEADING TO THE ELECTRONIC CONTROL UNIT ARE CORRECTLY CONNECTED AND RESPECT THE COLOUR CODING GIVEN ON THE CONTROL UNIT.

LIGHTS SECTION - APE 50 EUROPA

KEY:

1.Alternator

2. 12V-15W Headlights

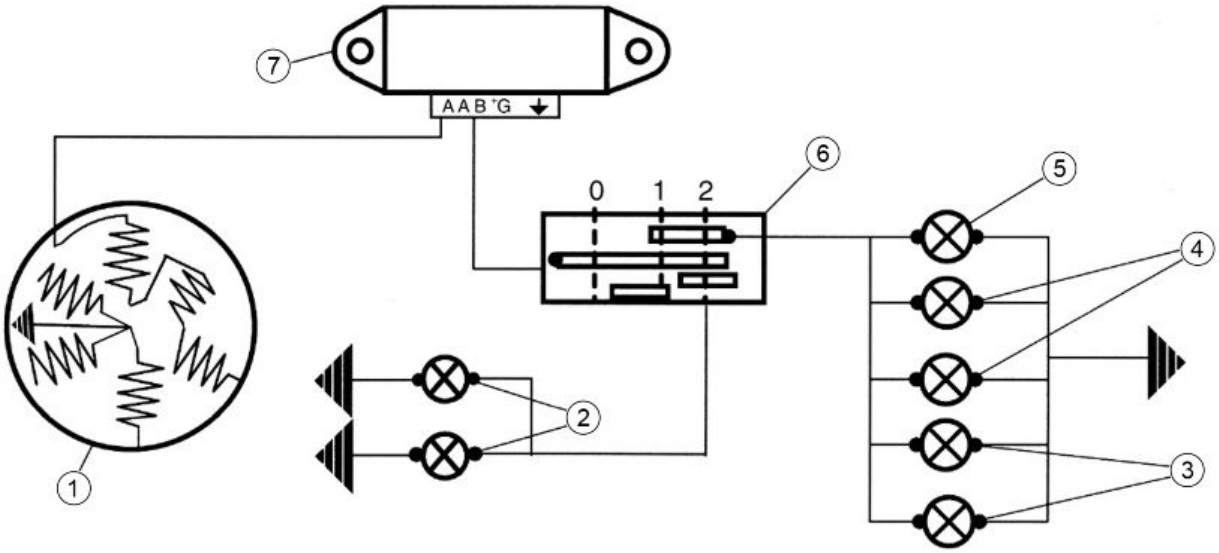
3. 12V-5W City lights

4. 12V-4W Rear daylight running light

5. Headlight warning light

6. Light switch

7. Voltage regulator



ELECTRICAL SYSTEM DEVICES (TOP AND BASE) - APE 50 mix

1. FRONT HEADLIGHTS AND TURN INDICATORS, 12V-3W, 12V- 15W AND 12V-10W BULBS

2. HORN

3. REAR LIGHTS, 12V-4W, 12V-10W AND 12V-10W BULBS

4. WINDSCREEN WIPER

5. INSTRUMENT PANEL, 12V- 1.2W BULBS

6. WINDSCREEN WIPER SWITCH

7. STARTER BUTTON

8. LIGHT SWITCH

9. TURN INDICATOR SWITCH

10. HORN BUTTON

11. IGNITION SWITCH

12. STOP BUTTON ON THE REAR BRAKE

13. CIGARETTE LIGHTER

14. LOW FUEL WARNING LIGHT CONTROL

15. OIL RESERVE WARNING LIGHT CONTROL

16. START-UP MOTOR

17. CIGARETTE LIGHTER LIGHTING, 12V-1.2W BULB

18. STOP BUTTON ON THE FRONT BRAKE

19. STARTER RELAY

20. Voltage regulator

21. 12V-9AH BATTERY

22.ELECTRONIC CONTROL UNIT

23.SPARK PLUG

24. MAGNETO FLYWHEEL

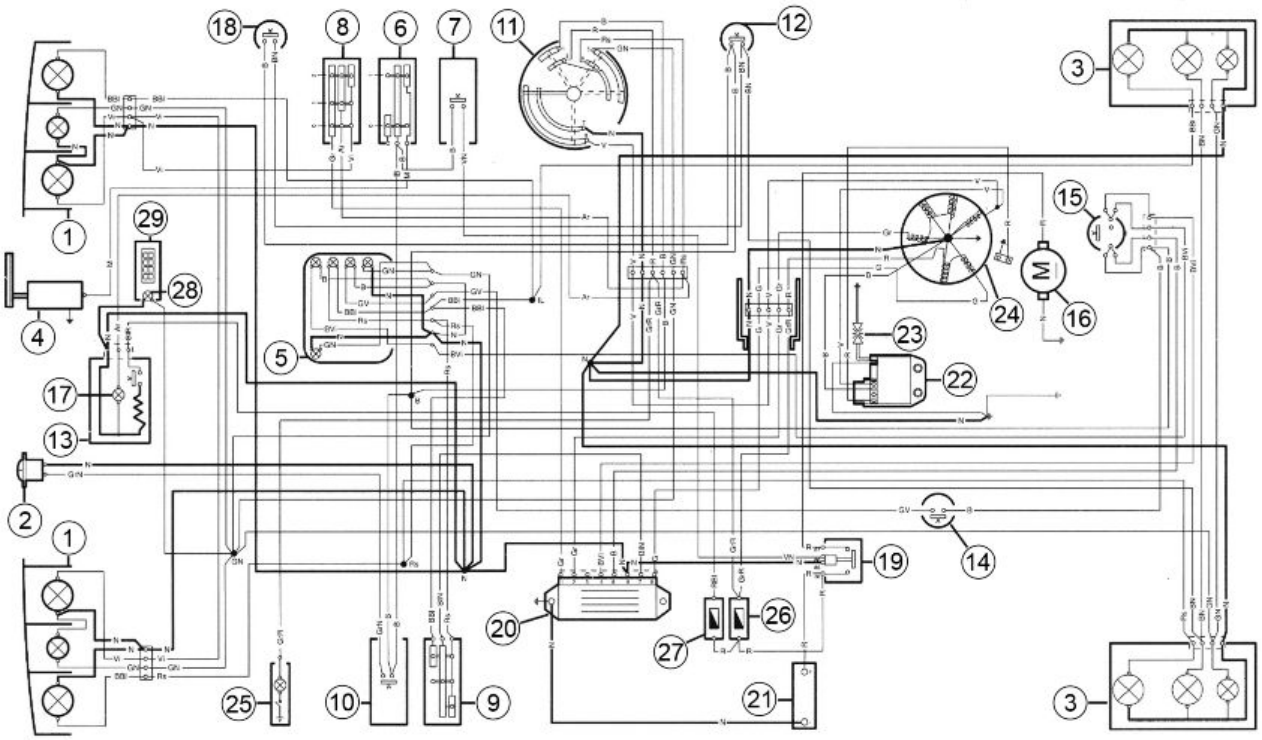
25. INTERNAL LIGHT FITTING, 12V-5W BULB

26. 7.5A (GENERAL) FUSE

27. (CIGARETTE LIGHTER AND LIGHT FITTING) 10A FUSE

28. DIGITAL CLOCK LIGHTING, 12V-1.2W BULBS (TOP VERSION ONLY)

29. DIGITAL CLOCK (TOP VERSION ONLY)



ELECTRICAL CABLES COLOUR CODING - APE 50 mix

Ar = Orange

B = White

BBI = White-Blue

BIN = Blue-Black

BIR = Blue-Red

BN = White-Black

BVi = White-Purple

GN = Yellow-Black

Gr = Grey

GrR = Grey-Red

GV = Yellow-Green

M = Brown

N = Black

Rs = Pink

V = Green

R = Red

Vi = Purple

VN = Green-Black

CAUTION

WHEN INTERVENING ON THE ELECTRICAL SYSTEM, MAKE ESPECIALLY SURE THAT THE WIRES LEADING TO THE ELECTRONIC CONTROL UNIT ARE CORRECTLY CONNECTED AND RESPECT THE COLOUR CODING GIVEN ON THE CONTROL UNIT.

ELECTRICAL SYSTEM DEVICES - APE 50 mix (CROSS VERSION)

1. FRONT HEADLIGHTS AND TURN INDICATORS, 12V-3W, 12V- 15W AND 12V-10W BULBS

2. HORN

3. REAR LIGHTS, 12V-4W, 12V-10W AND 12V-10W BULBS

4. WINDSCREEN WIPER

5. INSTRUMENT PANEL, 12V- 1.2W BULBS

6. WINDSCREEN WIPER SWITCH

7. STARTER BUTTON

8. LIGHT SWITCH

9. TURN INDICATOR SWITCH

10. HORN BUTTON

11. IGNITION SWITCH

12. STOP BUTTON ON THE REAR BRAKE

13. CIGARETTE LIGHTER

14. LOW FUEL WARNING LIGHT CONTROL

15. OIL RESERVE WARNING LIGHT CONTROL

16. START-UP MOTOR

17. CIGARETTE LIGHTER LIGHTING, 12V-1.2W BULB

18. STOP BUTTON ON THE FRONT BRAKE

19. STARTER RELAY

20. Voltage regulator

21. 12V-9AH BATTERY

22.ELECTRONIC CONTROL UNIT

23.SPARK PLUG

24. MAGNETO FLYWHEEL

25. INTERNAL LIGHT FITTING, 12V-5W BULB

26. 20A (GENERAL) FUSE

27.(CIGARETTE LIGHTER AND LIGHT FITTING) 10A FUSE

28. 7.5A (SERVICE) FUSE

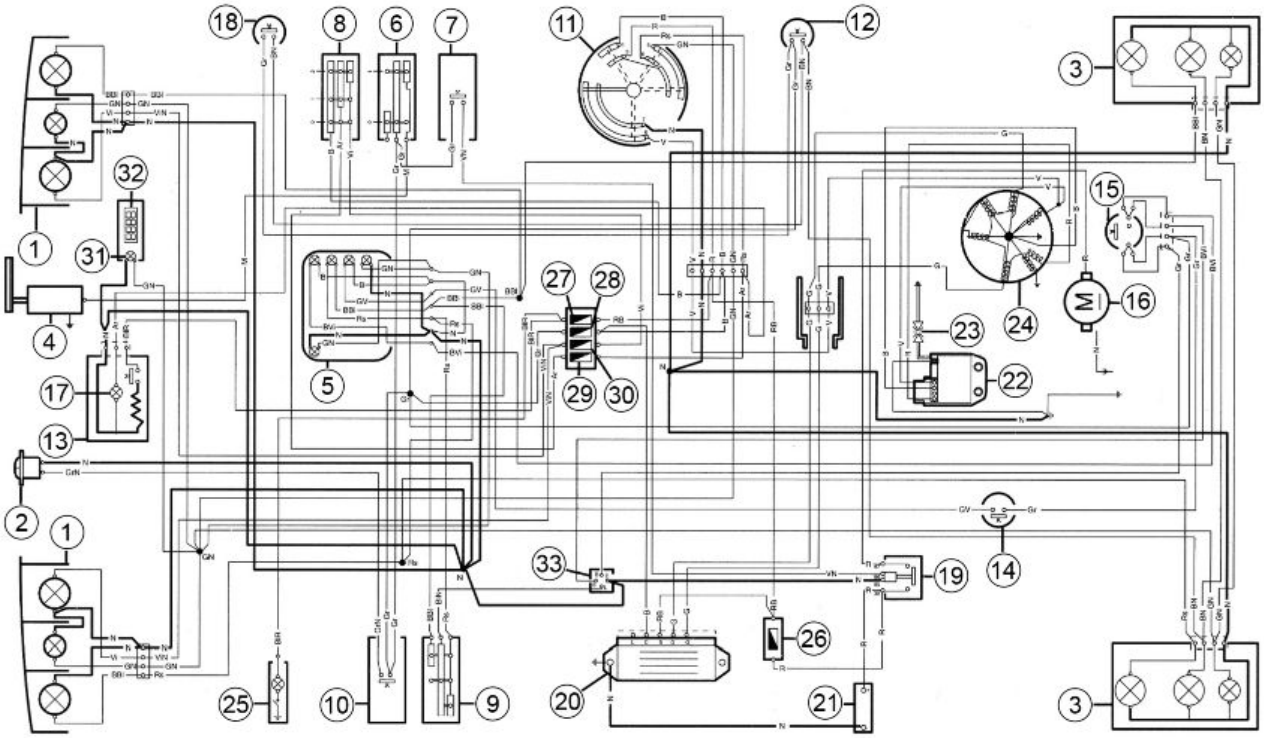
29. 4A FUSE (DAYLIGHT RUNNING LIGHT)

30. 4A FUSE (LOW-BEAM LIGHTS)

31. DIGITAL CLOCK LIGHTING, 12V-1.2W BULBS

32. DIGITAL CLOCK

33. TURN INDICATOR CONTROL DEVICE



ELECTRICAL CABLES COLOUR CODING - APE 50 mix (CROSS VERSION)

Ar = Orange

B = White

BBl = White-Blue

BIN = Blue-Black

BIR = Blue-Red

BN = White-Black

BVi = White-Purple

G = Yellow

GN = Yellow-Black

Gr = Grey

GrN = Grey-Black

GV = Yellow-Green

M = Brown

N = Black

R = Red

RB = Red-White

Rs = Pink

V = Green

Vi = Purple

ViN = Purple-Black

VN = Green-Black

CAUTION

WHEN INTERVENING ON THE ELECTRICAL SYSTEM, MAKE ESPECIALLY SURE THAT THE WIRES LEADING TO THE ELECTRONIC CONTROL UNIT ARE CORRECTLY CONNECTED AND RESPECT THE COLOUR CODING GIVEN ON THE CONTROL UNIT.

ELECTRICAL SYSTEM DEVICES - APE 50 EUROPE

1. HORN

2. NO.2 BULBS FOR FRONT TURN INDICATORS

3. CABLE ASSEMBLY

4. COMPLETE WINDSCREEN WIPER

5. CIGARETTE LIGHTER

6. COMPLETE FRONT COWL

7. COMPLETE BULB HOLDER

8. CLOCK

9. No.2 BULBS FOR HEADLIGHTS

10. No.2 BULBS FOR DAYLIGHT RUNNING LIGHT

11. No.2 BULBS FOR FRONT TURN INDICATORS

12. CABLE ASSEMBLY OF THE CHASSIS

13. STOP BUTTON ON THE FRONT BRAKE

14. LIGHT SWITCH

15. WINDSCREEN WASHER SWITCH

16. START-UP BUTTON

17. IGNITION SWITCH

18. INSTRUMENT PANEL BULB

19. INSTRUMENT PANEL WITH No.6 BULBS

20. MIX OIL WARNING LIGHT

21. TURN INDICATOR WARNING LIGHT

22. CARB. RESERVE WARNING LIGHT

23. HEADLIGHT WARNING LIGHT

24. CABLE HARNESS

25. LIGHT FITTING

26. HORN BUTTON

27. TURN INDICATOR SWITCH

28. VOLTAGE REGULATOR

29. FUSE HOLDER WITH FUSE

30. FUSE HOLDER WITH FUSE

31. Battery

32. NEGATIVE BATTERY CABLE

33. STARTER RELAY

34. LOW FUEL WARNING LIGHT CONTROL

35. No.2 BULBS FOR STOP LIGHT

36. No.2 BULBS FOR REAR TURN INDICATORS

37. No.2 BULBS FOR DAYLIGHT RUNNING LIGHT

38. No.2 REAR LIGHTS

39. LIGHT FOR LICENCE PLATE WITH BULB

40. MIX OIL WARNING LIGHT CONTROL

41. CHASSIS-ENGINE GROUND CABLE

42. STARTER MOTOR

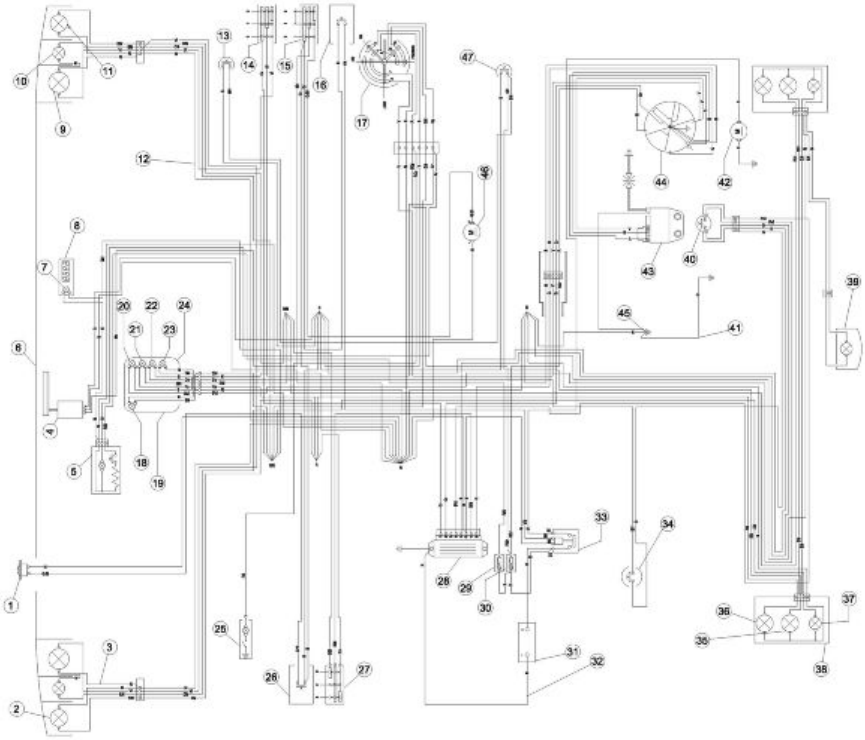
43. ELECTRONIC IGNITION DEVICE

44. MAGNETO FLYWHEEL

45. GROUND ON THE CHASSIS

46. Electric screen washer pump

47. STOP BUTTON ON THE REAR BRAKE



ELECTRICAL CABLES COLOUR CODING - APE 50 EUROPE

B = White

Bl = Blue

G = Yellow

M = Brown

N = Black

BV = White-Green

GN = Yellow-Black

RN = Red-Black

Gr = Grey

Rs = Pink

R = Red

Vi = Purple

V = Green

A = Orange

VN = Green-Black

BN = White-Black

BBI = White-Blue

BR = White-Red

RGr = Red-Grey

BIN = Blue-Black

BVi = White-Purple

RBI = Red-Blue

CAUTION

WHEN INTERVENING ON THE ELECTRICAL SYSTEM, MAKE ESPECIALLY SURE THAT THE WIRES LEADING TO THE ELECTRONIC CONTROL UNIT ARE CORRECTLY CONNECTED AND RESPECT THE COLOUR CODING GIVEN ON THE CONTROL UNIT.

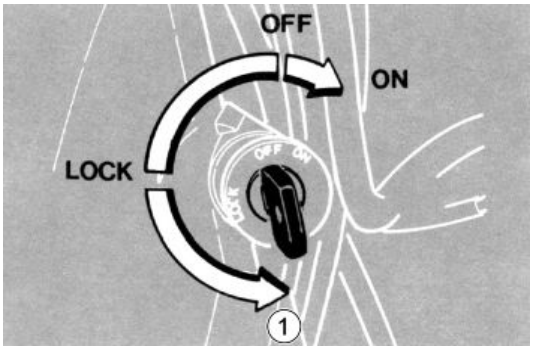
Key-switch

LOCK Position: contacts 7-8, ground ignition, extractable key, locked steering.

OFF: contacts 7-8, ground ignition. Key may be removed.

ON Position: contacts 1 -3 (c.c. to the services) and 5-6 (Provision to the ignition of the daylight running light in c.a.). Key may not be removed.

Position 1: contacts 7-8 (ground ignition) and 3-5 (c.c. to the daylight running light). Parking extractable key.

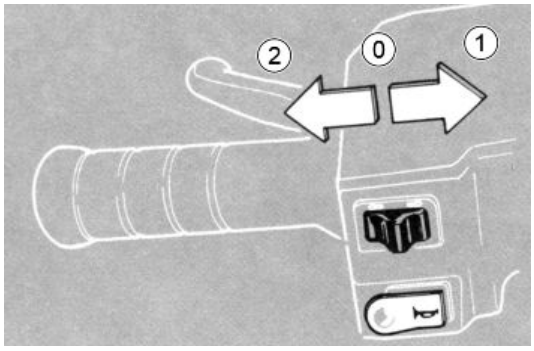


Turn signal switch

Position **0**: no contact.

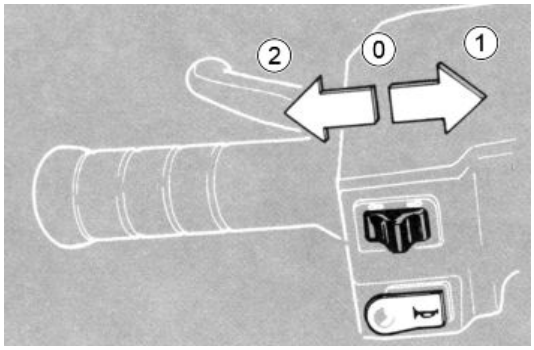
Position **1**: contact between the Blue and White - Blue cables.

Position **2**: contact between the Blue and Brown cables.



Horn button

Button in working position, contact between the White and Grey Black cables.

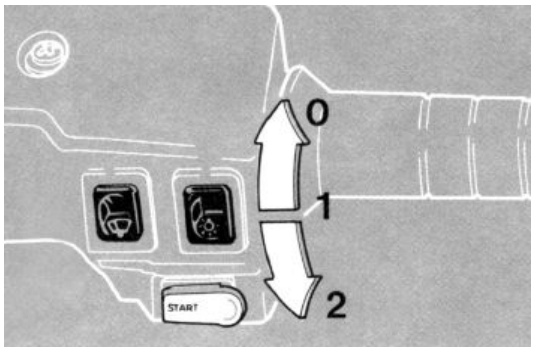


Headlight switch

Position **O**: no contact.

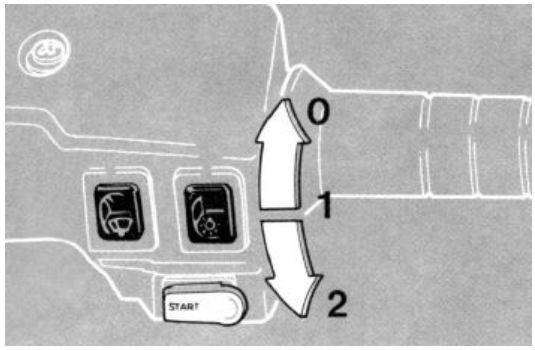
Position **1**: contact between the Pink and Grey cables.

Position **2**: contact between the Pink and Grey and Purple cables.



Wiper switch

In working position, contact between the White and White Black cables.

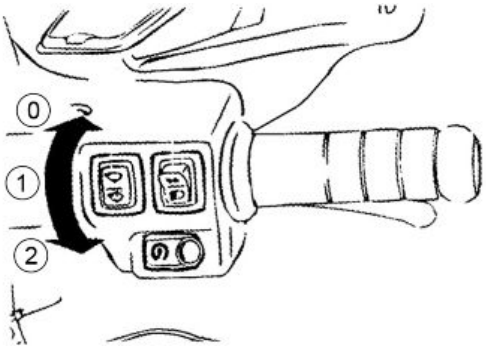


POSITIONS OF THE WINDSCREEN WIPER SWITCH - APE 50 MIX - APE 50 EUROPE

0 = Windscreen wiper turned off

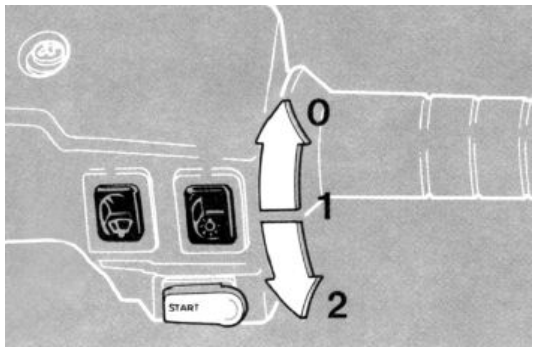
1 = Windscreen wiper turned on

2 = Windscreen washer enabling



Pulsante avviamento

In working position, contact between the White and Green Black cables.

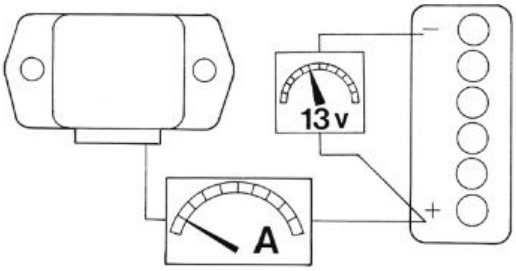


Interventions

The failure of the alternate current section of the voltage regulator can cause, depending on the type of fault, the following problems:

1) Burning of the bulbs (regulator stopped).

2) Operation failure of the lighting (short circuit in the regulator).



FAILURE 1

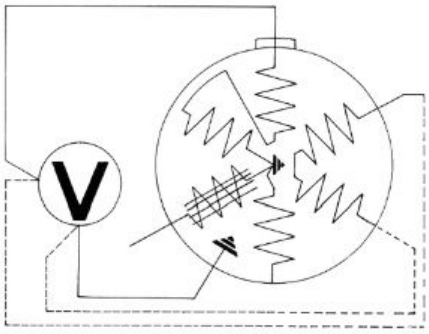
Replace the regulator because it is securely inefficient.

FAILURE 2

a) Check the correct current output of the alternator: disconnect the grey regulator cable, place a voltmeter between the cable and ground to detect the alternate current voltages and to check that the output voltage at 3000 rpm is greater than or equal to 20V.

b) If the checks carried out disclose no failures, replace the regulator.

c) If replacing the regulator does not restore proper operation, proceed to the checks of the electrical system connections.



interventions

The failure of the direct current section of the voltage regulator can cause, depending on the type of fault, the following problems:

3) Burning of the protective fuse (short circuit in the regulator) and subsequent battery recharge failure.

4) Battery recharge failure(regulator stopped).

FAILURE 3

Replace the regulator, because it is securely inefficient and replace the protective fuse.

FAILURE 4

a) Insert an ammeter between the regulator and the battery and verify that the current ouput at 3000 rpm is greater than 1 amp, with the battery maintained at 13V. If the values are lower than required, replace the regulator.

b) If replacing the regulator does not restore proper operation, check the voltage output from the alternator, as in point 2a. Checking the output voltage at 3000 rpm on the c.c. section is greater than or equal to 25V.

Characteristics

STARTER MOTOR

Specification	Desc./Quantity
Rated voltage	12V.
rated power	0.25 Kw.
Rotation	Left.

Bench tests

TESTS TO BE PERFORMED AT THE BENCH WHEN THE STARTER MOTOR HAS TO BE OVERHAULED.

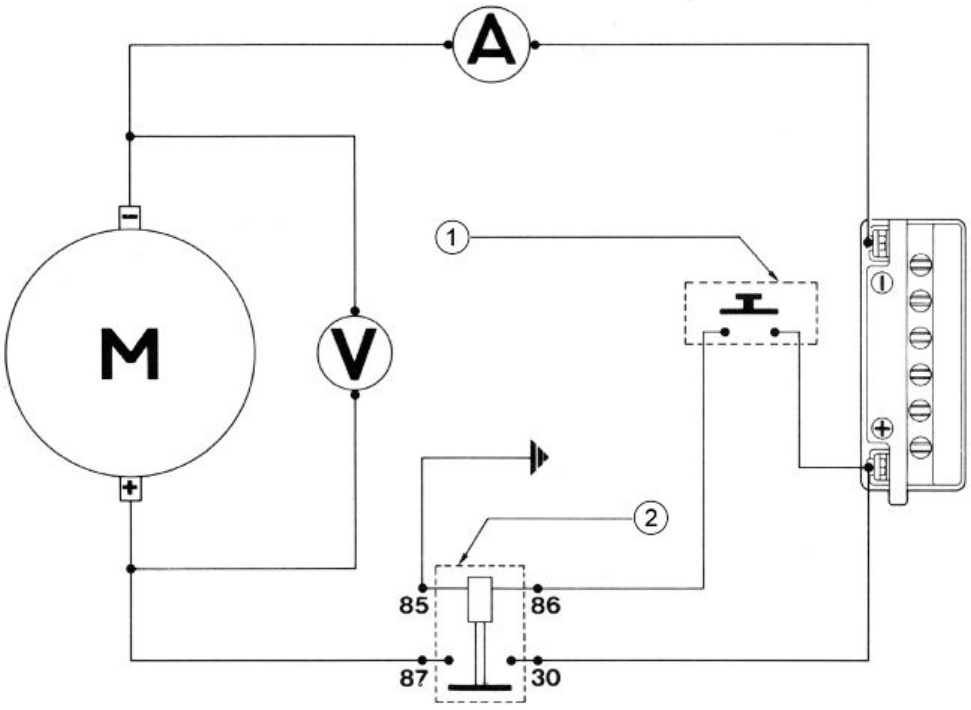
1) No-load test: the starter motor, under no-load, must draw a maximum of 30 Amp. with a supply voltage of 11.5 to 12V and must rotate at rpm 11,000.

2) Load test: braking the starter motor so that it draws 60 Amp, and with a supply voltage of 10 to 10.5 V a torque 0.06 kgm must be obtained, for no lower than 4,600 rpm.

3) Pickup test: with rotor locked and a supply voltage 8 to 8.5V the current drawn must not be higher than 160 Amp and the torque must be no lower than 0.3 kgm.

N.B.

THE VALUES SHOWN ABOVE MUST BE TAKEN WITH A CHARGED BATTERY AND AFTER THE STARTER MOTOR HAS BEEN ROTATING FOR 30" UNDER CONDITIONS OF POINT 1.

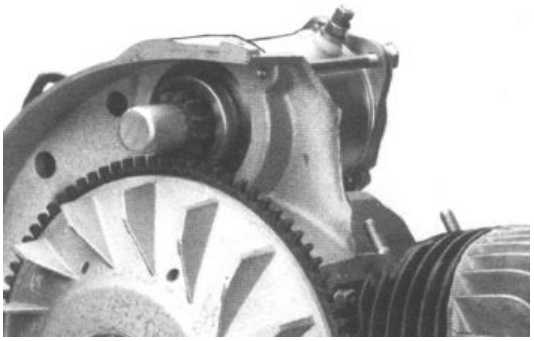


KEY:

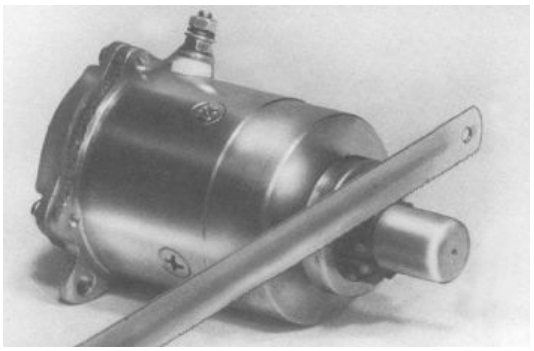
1 = Starter button

2 = Remote control

Starter motor removal



Safety cap removal

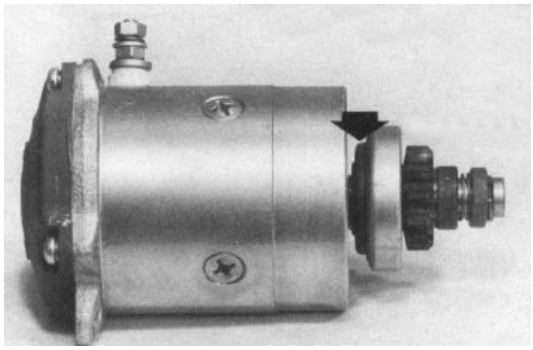


Coupling pin removal

Remove the retainer ring and remove the pinion.

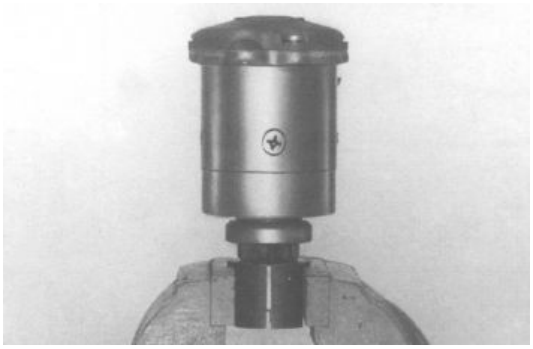
CAUTION

ALWAYS REPLACE THE INDICATED GASKET GIVEN TOGETHER WITH THE SPECIFIC RECOMMENDED PRODUCT.



Safety cap calkin

- Position the hood.
- Chamfer, as shown, the hood with the appropriate tool.



CAUTION

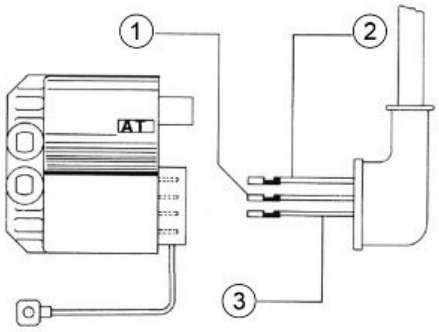
REPLACING THE BRUSHES, AND REMOVE THE REAR LID AND REPLACE.

Specific tooling

020057Y Tool for Starter Motor Bushing Calking

Controllo impianto di accensione

All system check operations involving disconnection of the cables (inspections of connections and devices that are part of the ignition circuit) must be made with the engine turned off: otherwise the control unit could be irreparably damaged.
It is therefore important and necessary that in case of removal of the cables, when refitting attention is paid to correctly reconnecting each cable to the corresponding coupling respecting the distinct colour codings.



KEY:

1 = Red

2 = White

3 = Green

INSPECTIONS TO BE PERFORMED IN THE EVENT OF IGNITION IRREGULARITIES

In the event of failure and abnormal operation of the ignition, whose causes are not detectable by a visual inspection, it is necessary first to replace the control unit with a corresponding, safely functional replacement.

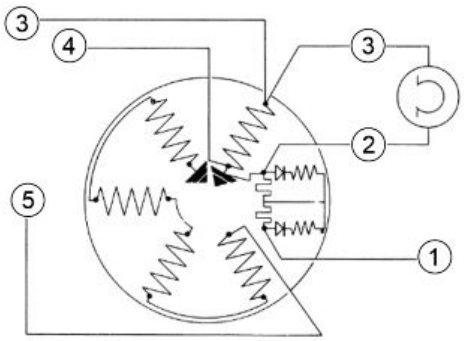
Remember that the disconnections and connections to replace the control unit must be performed when the engine stopped.

If replacing it restores the ignition operation, the fault lies in the control unit, which obviously needs to be replaced.

In the event that the failure persists, it is necessary to carry out checks on the alternator and on the stator parts as follows:

After a visual inspection of the electrical connections, measurements are carried out on the loading coil and on the pick-up using an Ohm meter, capable of detecting the resistance from 1 to 1000 ohms.

Connect the instrument between the green cable and the white one, there must be continuity and an ohmic value of 500± 20 ohm.



KEY:

1 = Red

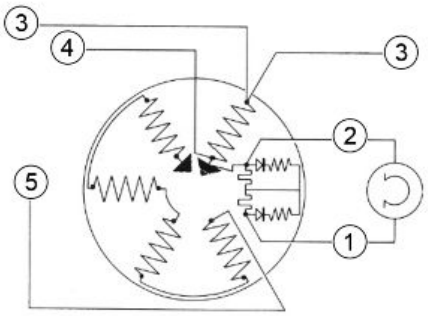
2 = White

3 = Green

4 = Black

5 = Blue

Connect the instrument between the red and white cables, there must be continuity and an ohmic value of 110± ±5 ohm.



KEY:

1 = Red

2 = White

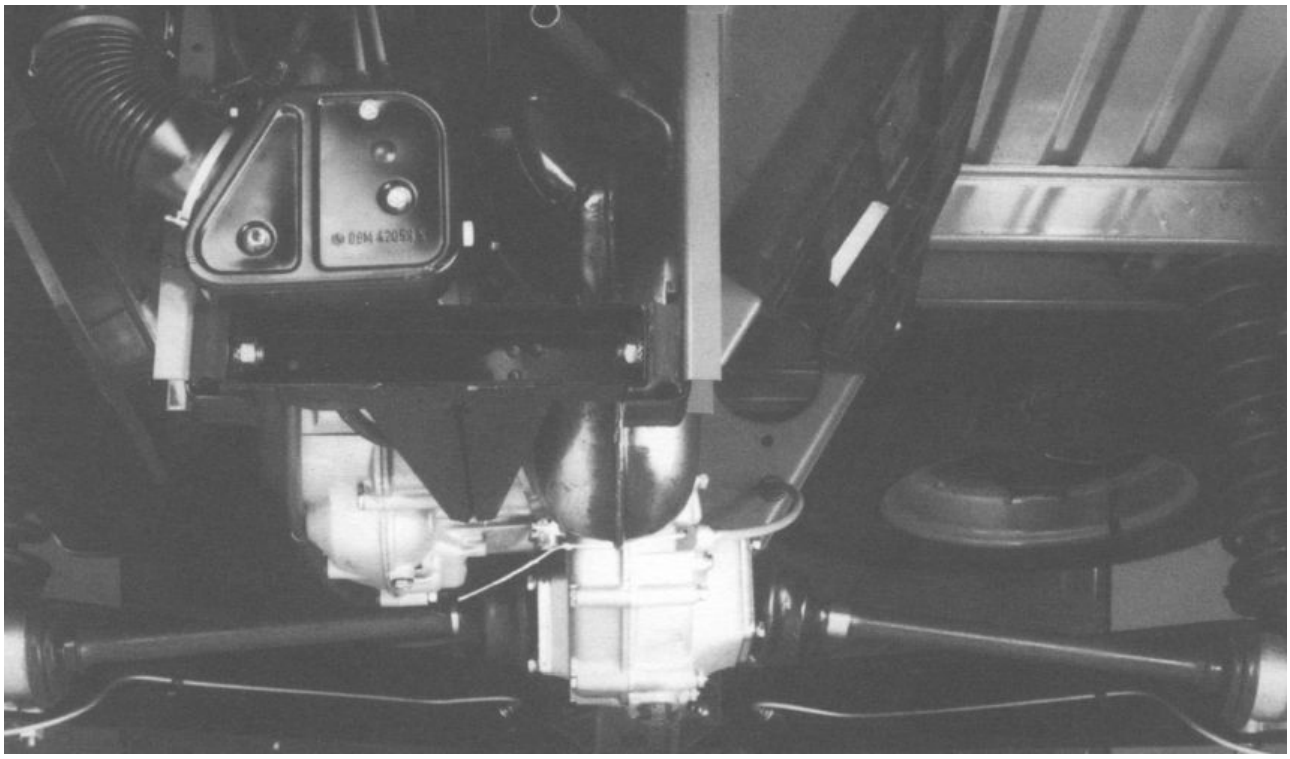
3 = Green

4 = Black

5 = Blue

If there are failures on the checks on the loading coil and on the pick-up, proceed to the replacement.

INDEX OF TOPICS



Remove the oil from the engine.

Disconnect the negative cable from the battery and the starter motor cables.

Remove the fuel delivery line.

Remove the throttle grips, starter, etc.

Remove the axle shaft complete with hubs.

Remove the three fixing bolts (due at the front, and one at the rear) and remove the differential engine unit of the chassis.

WARNING

WE RECOMMEND THE USE OF EYE PROTECTION WHEN USING CONTACT TOOLS.

WARNING

DO NOT REMOVE THE OIL COVER IMMEDIATELY AFTER AN ACTIVITY WITH THE ENGINE AT FULL SPEED AND/OR WITH THE ENGINE RUNNING. THE HEATED OIL MAY LEAK, WITH THE RISK OF BURNING

CAUTION

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

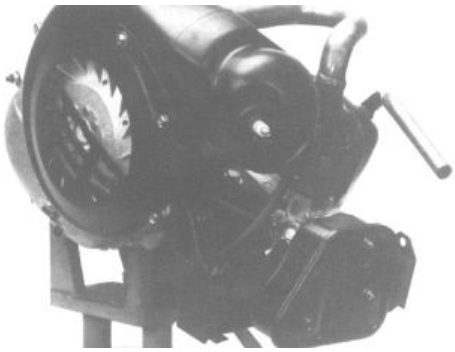
INDEX OF TOPICS

ENGINE	EN

Engine type 1

Flywheel

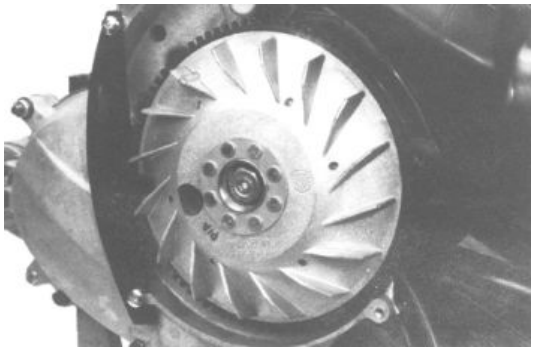
Remove the scroll cover.



Using the special tool to block the flywheel.

Specific tooling

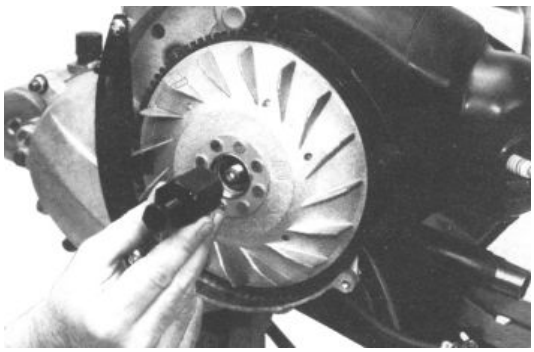
020095Y Flywheel Lock



Using the appropriate tool, unscrew the lock-nut of the flywheel.

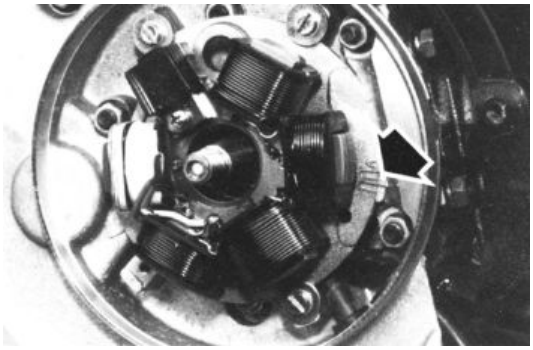
Specific tooling

048564Y Flywheel extractor



Stator

For refit operations, operate in the opposite direction to the removal, bearing in mind the following: position the stator as shown, correctly position the key, and lock the flywheel nut to the prescribed torque.



Locking torques (N*m)

Fan flywheel locking nut **45 to 50 Nm**

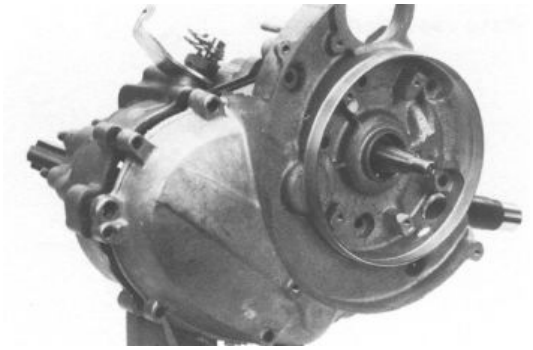
Crankcase splitting

Fitting:

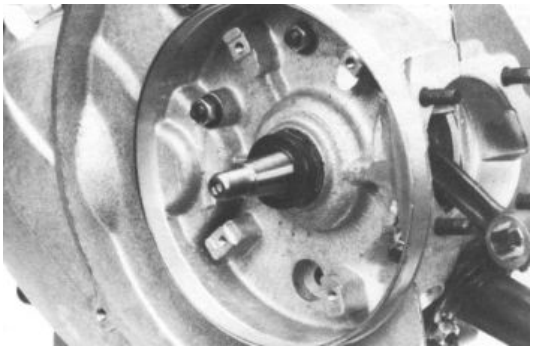
Clean the mating surfaces thoroughly.

Position a new gasket on the flywheel side crankcase halves.

Join the two crankcase halves.



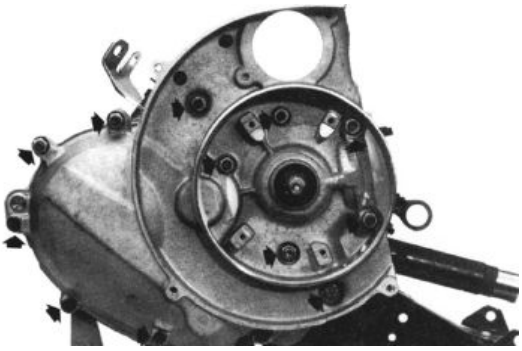
Insert the flywheel side seal ring.



Half-crankcase splitting

Removal:

Undo the screws and disassemble the crankcase halves.



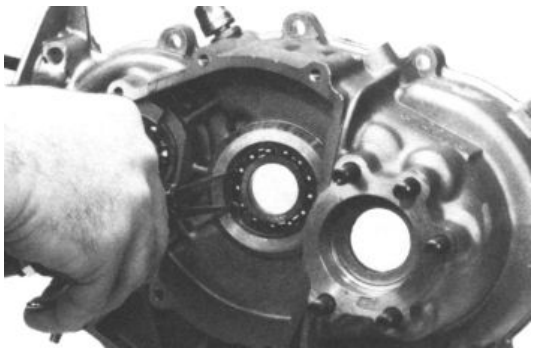
Crankcase bearings

Removal:

Remove the circlips and with punches of a suitable diameter to eject the bearings.

Specific tooling

022465Y Pliers for circlips



Fitting:

Heat the crankcase to around 80° C.

Position the bearings.

Fit the retainer ring.

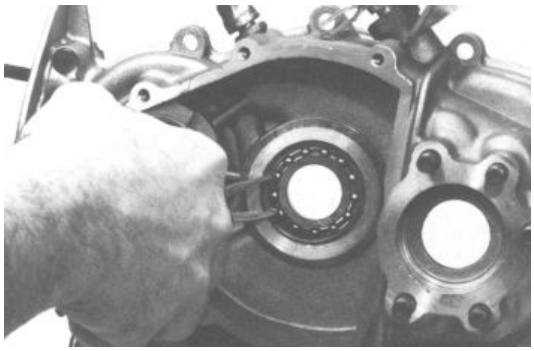
Fit the bench seal ring.

Specific tooling

020150Y Support

020151Y Heat gun

022465Y Pliers for circlips



Fly-wheel side half-crankcase

Removal:

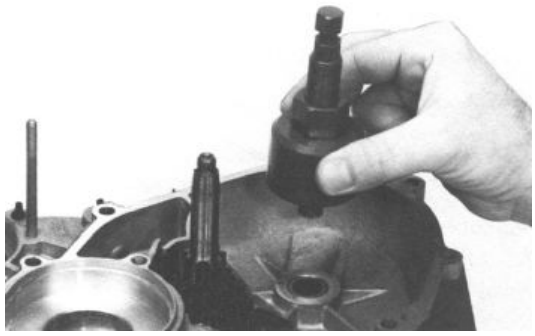
Remove the bench bearing, operate with a punch of an adequate diameter.

Specific tooling

021467Y Bearing extractor

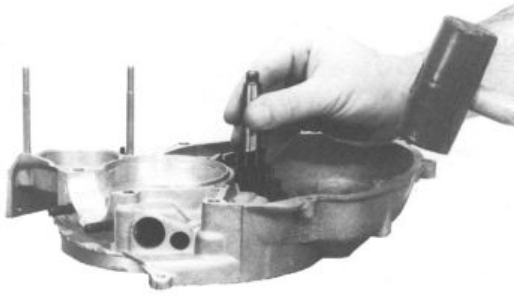
021467Y013 extractor

021467Y009 extractor



After warming the crankcase, remove it with light taps of the hammer.

Remove the bearing from the shaft, by leveraging it with 2 screwdrivers.



Fitting:

Heat the crankcase to around 80° C.

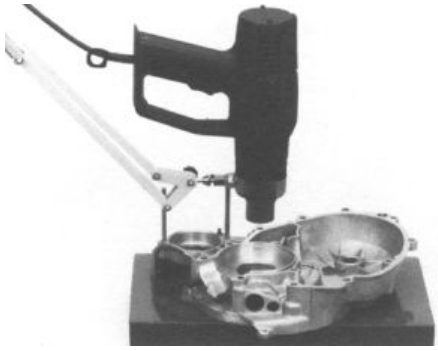
Fit the bench ball bearing.

Fit main shaft of the transmission complete with bearing.

Specific tooling

020150Y Support

020151Y Heat gun

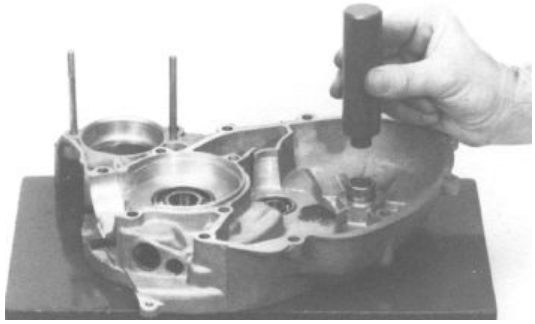


Fitting:

Let the crankcase cool and fit the roller bearing.

Specific tooling

032975Y Punches for Roller Casings



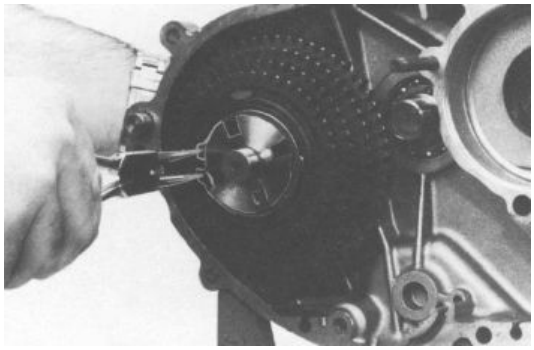
Gear-box coupling replacement

Removal:

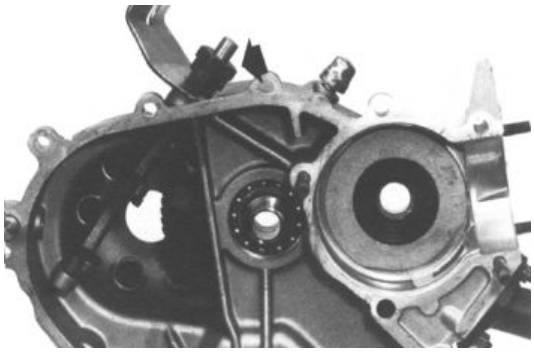
Using the special tool remove the gear retaining seeger.

Specific tooling

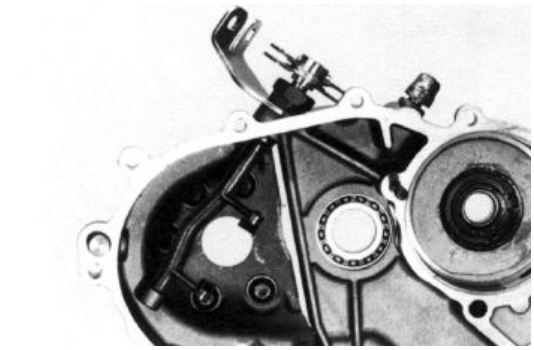
023638Y Pliers for circlips



Removal.

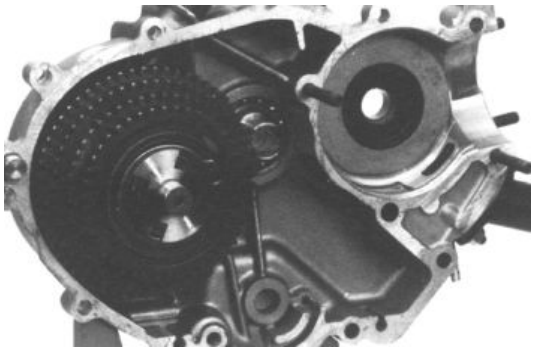


Fitting.



Fitting:

Reposition the transmission secondary shaft in its seat.



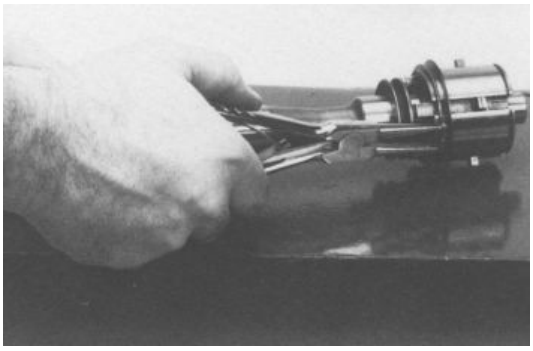
Overhaul

Using the appropriate tool, disassemble the gear engagement.

Inspect the components and replace those that are damaged.

Specific tooling

023638Y Pliers for circlips

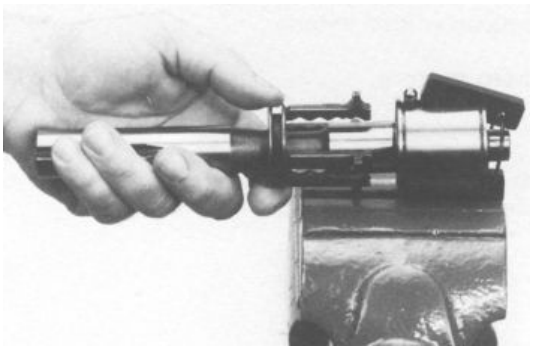


Coupling refitting

Using the appropriate tool, reassemble the gear engagement.

Specific tooling

029569Y Gear Engagement Fitting Tool



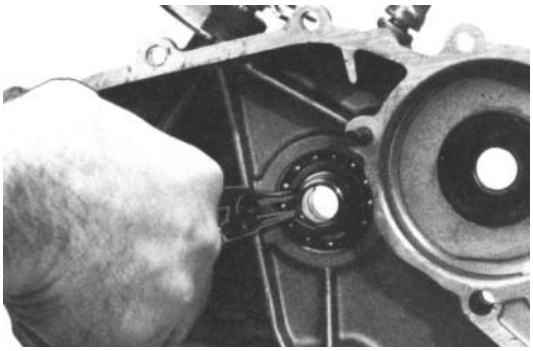
Clutch drum

Removal:

After removing the circlips (for the piston pin), using a hard plastic mallet, remove the clutch housing

Specific tooling

023638Y Pliers for circlips



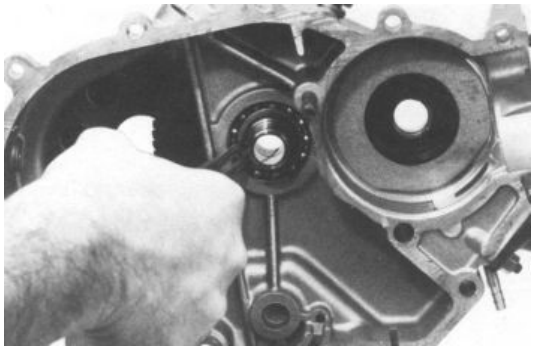
Fitting:

Position the clutch housing with light taps with the hard plastic mallet.

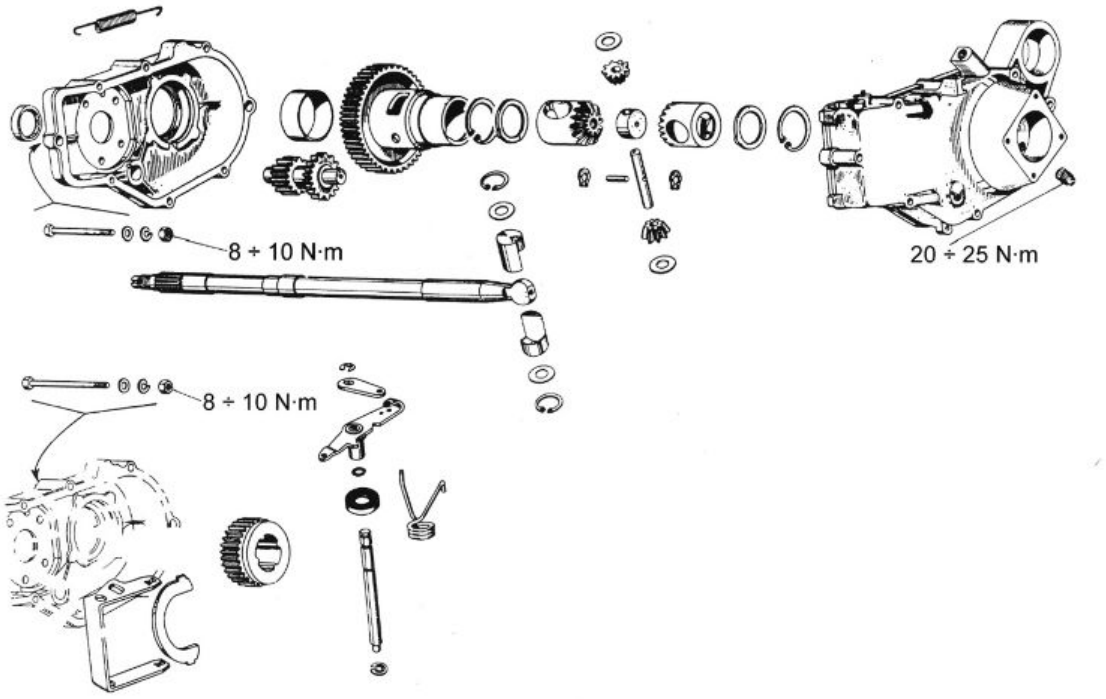
Fit the locking circlip.

Specific tooling

023638Y Pliers for circlips



Differential assembly



WARNING

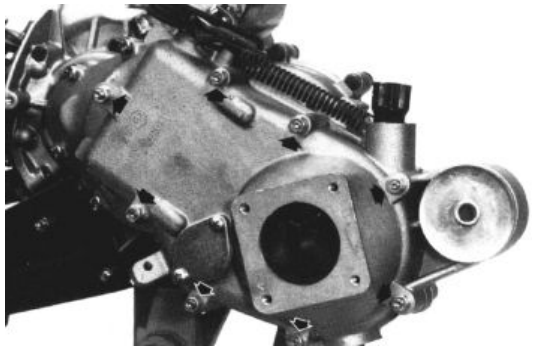
REFIT THE PARTS IN REVERSE ORDER OF THE REMOVAL, TAKING CARE TO CORRECTLY INSERT THE REVERSE GEAR CONTROL FORK INTO THE SLIDING GEAR.

WARNING

AFTER INSTALLING THE AXLE SHAFT IN THE CROWN WHEEL, CHECK THE PROPER SWING OF THE AXLE SHAFT IN RELATION TO THE CROWN WHEEL.

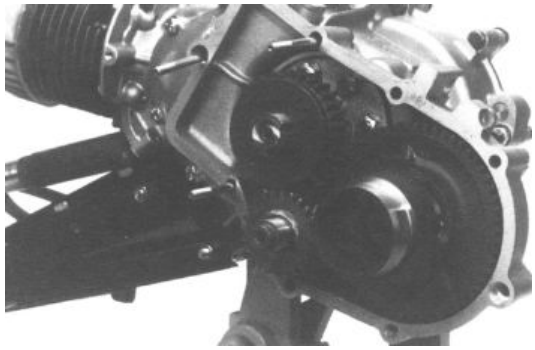
Cover removal

Undo the indicated screws.



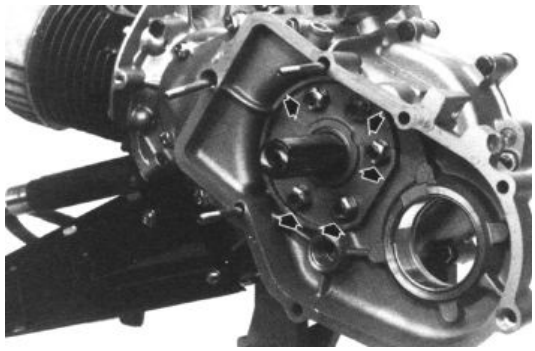
Differential box and transmission gears

Remove the gears



Differential case

Undo the indicated screws.

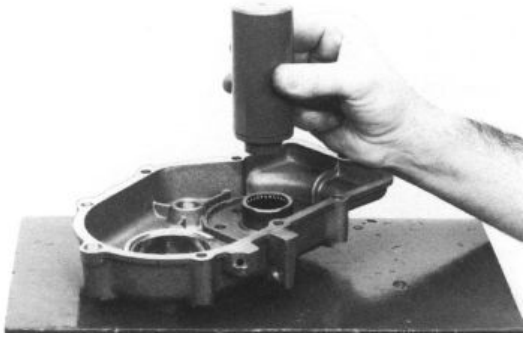


Remove the bearing using a section of tube.

Refit the bearing as shown in figure.

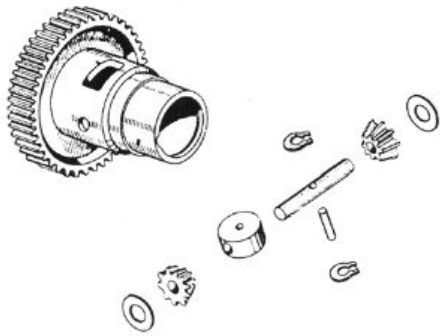
Specific tooling

038138Y Roller Casings Punch



Differential box overhaul

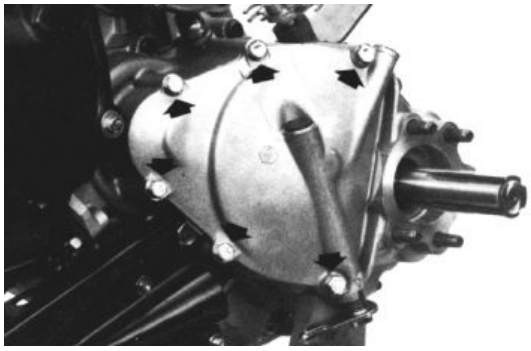
Inspect all components and replace damaged parts



Clutch cover and thrust plate

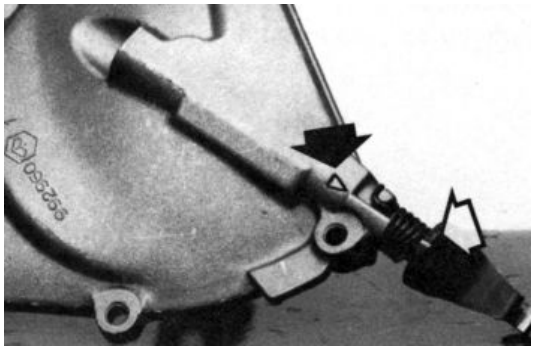
Removal:

Undo the indicated screws.



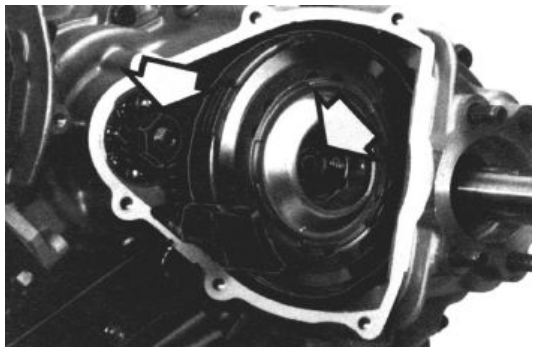
Fitting:

In order to correctly position the thrust plate actuating pad, follow these steps: hold the clutch lever full stroke, insert the actuating pad into its housing and holding the actuating pad, slowly release the clutch lever, check that the references on the clutch lever and on the cover are the same as shown in the figure.



Clutch and engine gear

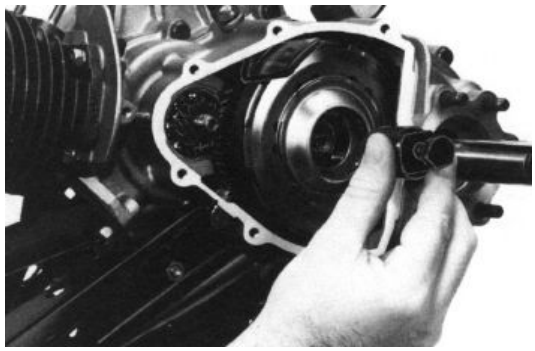
Using the special tool to block the clutch assembly.



Specific tooling

030250Y Clutch Stop Key

Using the special tool, undo the fixing nut of the clutch assembly



Specific tooling

029551Y Clutch puller

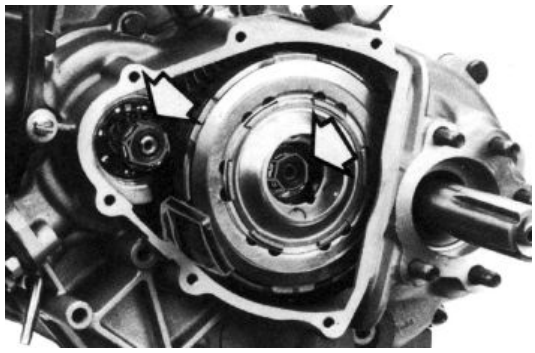
Fitting:

Reposition the clutch assembly and the engine gear in their seat.

Tighten to the specified torque.

CAUTION

REFIT ALL PARTS, COMPONENTS, THE UNIT IN REVERSE ORDER TO THE REMOVAL, PAYING ATTENTION TO REPOSITION THE CLUTCH KEY AND ENGINE GEAR MOTOR.



Specific tooling

030250Y Clutch Stop Key

Locking torques (N*m)

Engine gear locking nut 50 to 55 Nm **Clutch assembly locking nut** 40 ÷ 45 Nm

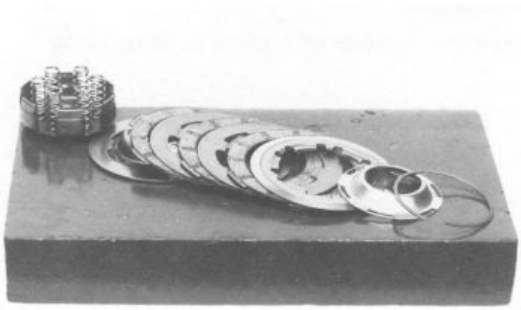
Clutch overhaul

Using the special tool to disassemble the clutch assembly.

Specific tooling

020322Y Clutch Removal

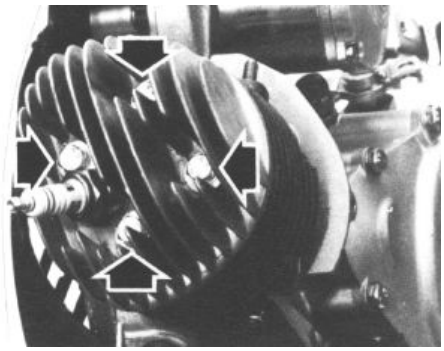
Inspect the components and replace damaged parts.



Cylinder head

Undo the fixing screws and remove the cylinder hood

Undo the fixing screws of the cylinder head.



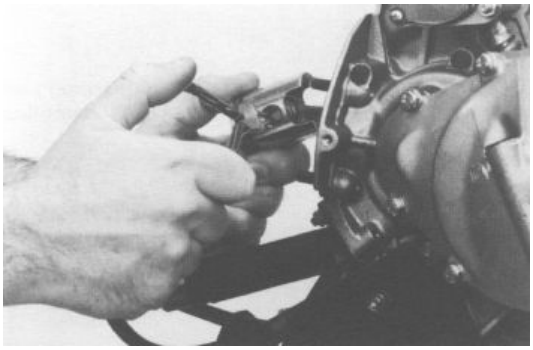
Piston

Remove the seal ring of the pin.

Remove the seal ring by removing the pin.

CAUTION

REFIT THE PARTS IN REVERSE ORDER TO THE DISASSEMBLY, TAKING CARE TO POSITION THE PISTON WITH THE ARROW STAMPED ON THE SKY IN THE SAME DIRECTION AS THE EXHAUST.



Crankshaft

Removal:

To remove the crankshaft, separate the crankcase halves and using gentle taps with a rubber mallet to remove it.

CAUTION

SUPPORT THE CRANKSHAFT TO PREVENT DAMAGE BY FALLING.

Fitting:

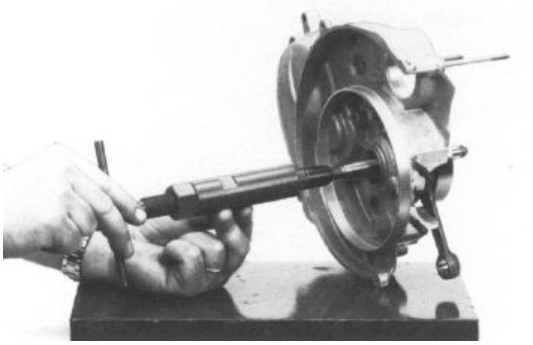
Using the appropriate tools necessary, position the crankshaft in its seat.

Specific tooling

018119Y Axle Fitting Tool

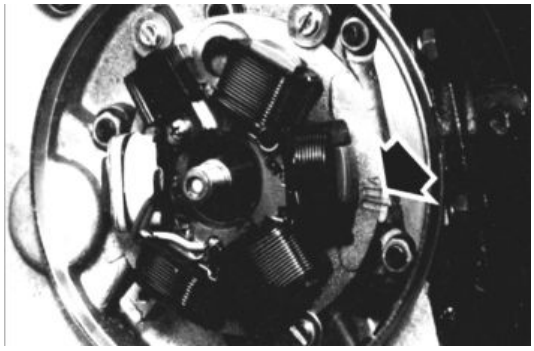
018119Y009 Axle fitting

018119Y007 Axle fitting



Engine timing

Coil support operation check.

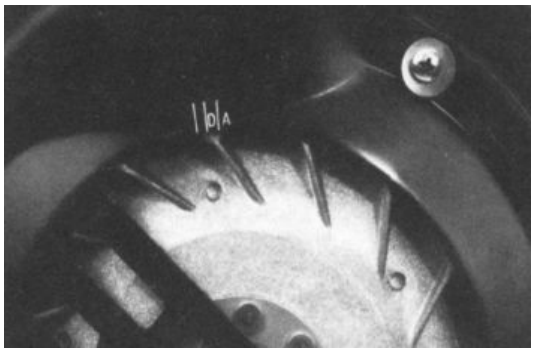


ENGINER TIMING CHECK

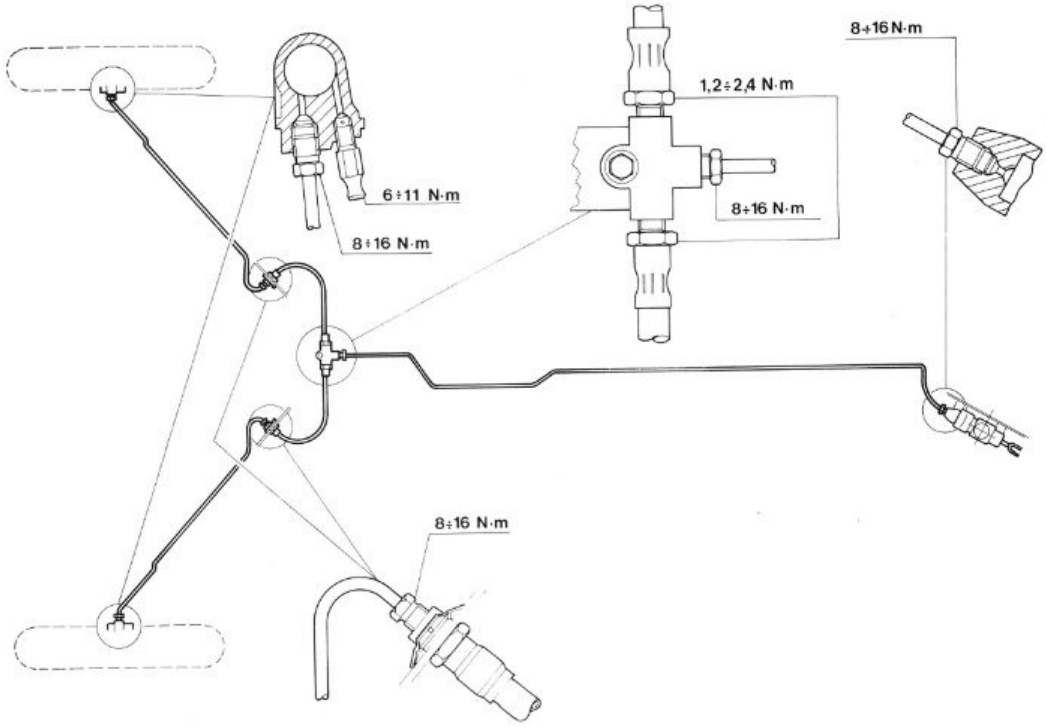
Check to be carried with the Tecno- test 130/P strobe gun (or a similar one that is able to function properly up to at least 11,000 times per minute).

CAUTION

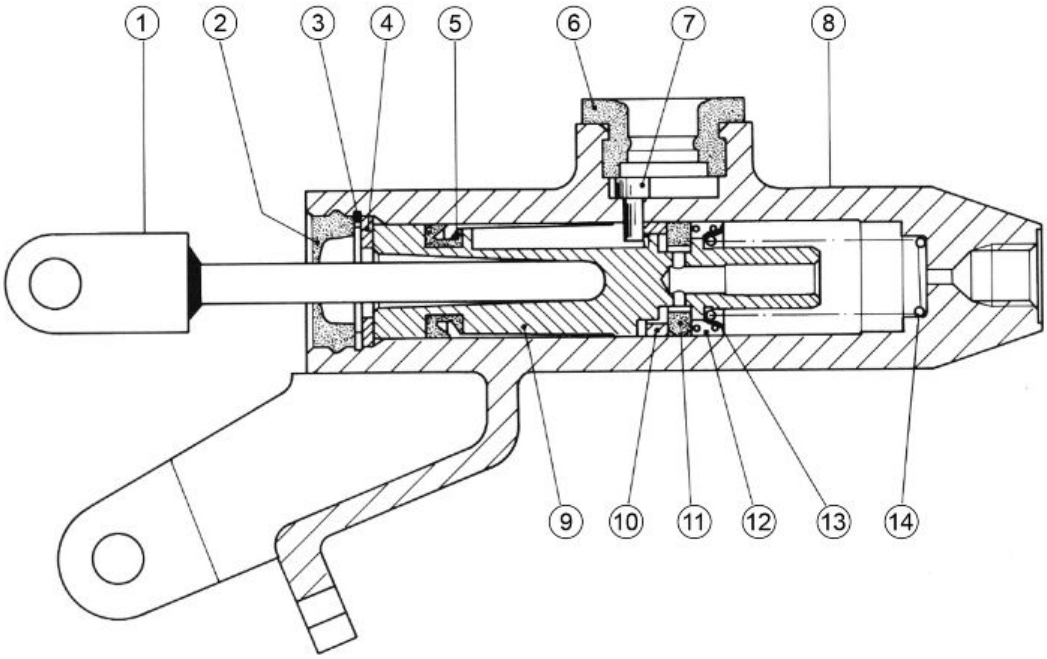
BEFORE PERFORMING THE TESTS ABOVE, CHECK THE CORRECT JOINING OF THE FLYWHEEL ON THE CRANK-SHAFT.



INDEX OF TOPICS



Brake pump



Key pump section:

1) Lug

2) Gasket
3) Seeger ring
4) Washer
5) Gasket
6) Buffer
7) Plug
8) Pump body
9) Piston
10) Ring
11) Toric gasket
12) Spring
13) Cup
14) Spring

Brake pump overhaul specifications

After washing all the parts with a specific solvent, never use oil, petrol or solvents that have a corrosive effect on the rubber, check that:

The pump body does not show signs of internal damage or corrosion as this may result in sealing ring or piston failure; the latter must also be replaced if worn or scratched.

The rubber parts in the piston and the valve are not dilated or damaged as this most likely leads to poor braking.

The piston return spring is in good condition.

The passages connecting the pump tank to the pump body are not clogged or dirty.

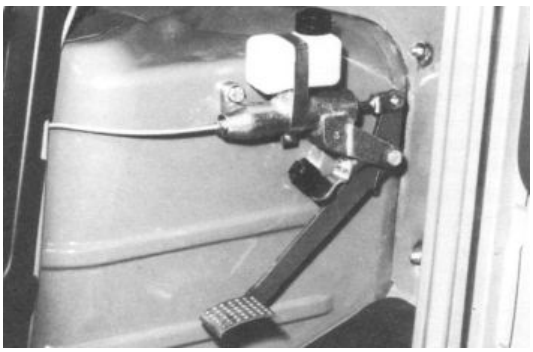
Removing brake fluid reservoir and pump from chassis

Removal:

After removing the brake fluid, remove the tank.

CAUTION

- BRAKE FLUID IS HARMFUL TO THE EYES. IF IT COMES INTO CONTACT WITH THE EYES WASH THE AFFECTED PART CAREFULLY AND CONSULT A DOCTOR.
- FOR CORRECT OPERATION OF THE BRAKES, USE ONLY THE RECOMMENDED BRAKE FLUID.
- FOLLOW THE INSTRUCTIONS PROVIDED BY THE BRAKE FLUID MANUFACTURER.
- NEVER MIX LIQUIDS WITH DIFFERENT TECHNICAL SPECIFICATIONS.
- USE ONLY BRAKE FLUID KEPT IN SEALED CONTAINERS. IF THE LIQUID IS EXPOSED TO THE AIR FOR TOO LONG IT ABSORBS HUMIDITY AND LOSES ITS EFFICIENCY.
- KEEP THE BRAKE FLUID FREE OF LITTER, SAND OR DUST.



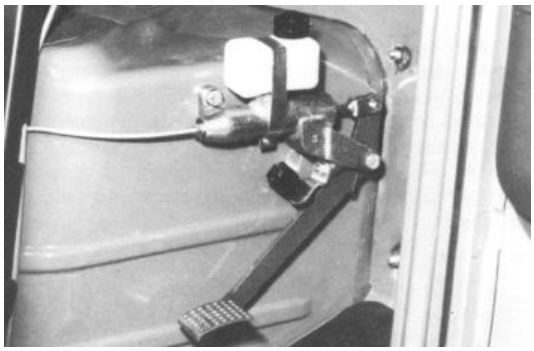
- IF THE BRAKE FLUID LEVEL FALLS CONSIDERABLY, HAVE THE BRAKING SYSTEM CHECKED BY AN AUTHORISED PIAGGIO SERVICE CENTRE.

Refitting brake fluid reservoir and pump from chassis

Fitting:

Reposition the brake fluid tank appropriately.

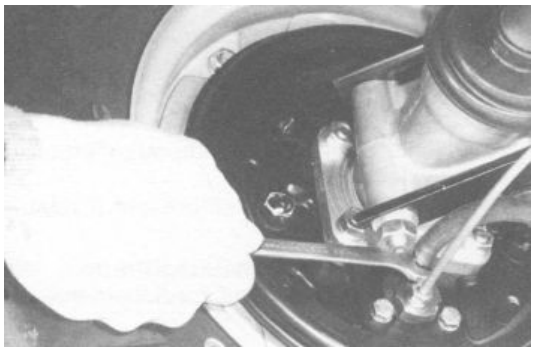
Restore the correct level and bleed the system.



Air bleed of brake hydraulic circuit

Push down the pedal to the end of its travel and slowly let it return to its starting position, repeating the operation until the pedal feels a back pressure. **As this operation is carried out add fluid to the tank to prevent the pump from discharging.**

Lower the pedal, keeping it pressed, undo the bleed screw on a rear wheel, let the air out, after this bleed point has been connected through a small rubber pipe to a tray full of brake fluid. Screw the bleed screw.



Repeat the above operations until the escape of air bubbles from the that tube does not stop.

Repeat the above operations for the other wheel.

CAUTION

THE AIR COMING OUT OF THE TUBE MAY ENTER DURING THE CONTINUOUS BLEEDING OPERATION; IN SUCH A CASE INSPECT ALL FITTINGS AND THE CORRECT TIGHTENING OF THE GASKETS OF THE PUMP AND OF THE CYLINDERS OF THE WHEEL.

In performing the circuit filling operation shown above, ensure that the liquid level in the tank never falls below the minimum, and top up continuously with the recommended product.

CAUTION

BRAKE FLUID IS HYGROSCOPIC; IT TENDS TO ABSORB MOISTURE FROM THE SURROUNDING AIR.
IF THE HUMIDITY IN THE BRAKE FLUID IS ABOVE A GIVEN VALUE, BRAKING IS POOR.
UNDER NORMAL DRIVING AND CLIMATIC CONDITIONS YOU SHOULD CHANGE THE FLUID EVERY TWO YEARS.
IF THE BRAKES UNDERGO SEVERE OPERATING CONDITIONS THE LIQUID SHOULD BE REPLACED MORE FREQUENTLY.

CAUTION

WHEN REFILLING TO LEVEL USE ONLY THE TYPE OF LIQUID THAT HAD BEEN USED PREVIOUSLY.

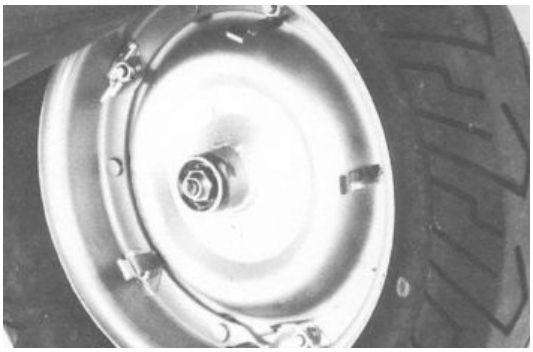
Recommended products

AGIP BRAKE 4 Brake fluid

FMVSS DOT 4

Drum removal

In the filling operations, a maximum oversize of 0.4 mm on the regular drum diameter is allowed.



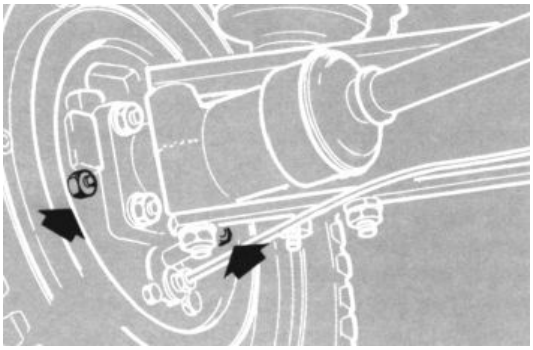
Shoe and drum clearance adjustment

Before performing the adjustment between the shoe and the drums, it is necessary to set the brakes in motion, in a way that ensures the centring of said shoe.

Then act as follows for each wheel:

Lift the wheel off the ground, lower of the brake pedal to the bottom until it brings the shoe against the drum.

Holding down the pedal, rotate the nuts of the adjustment eccentricities outwards until they stop, then rotate them in the opposite direction by about 45°.



Then release the pedal and check that the wheel turns freely.

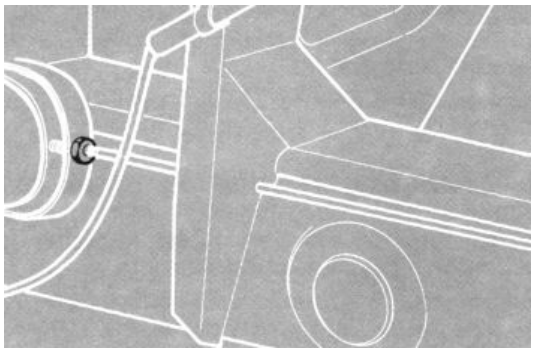
Parking brake adjustment

In order to adjust the travel of the control hand lever, proceed as follows:

Bring the lever to its rest position and move it upward by two teeth on the sector.

Act on the tensioner so as to prevent the rotation by hand of the wheels.

Lock the tensioner in position with its lock nut.

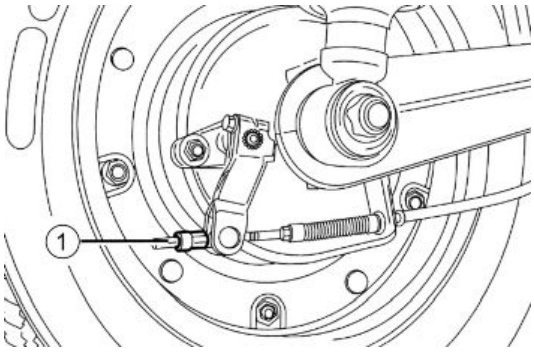


CAUTION

REMEMBER THAT A NORMAL ADJUSTMENT OF THE TENSION OF THE CABLE AFFECTS THE OPERATION OF THE BRAKE ON THE REAR WHEELS.

Front drum brake

For the mechanical adjustment of the front brake, act on the adjuster screw «1», so that, with the lever in its rest position, the wheel turns freely.



CAUTION

FOR ADJUSTMENTS RELATING TO THE BRAKING SYSTEM, WE RECOMMEND CONTACTING AN AUTHORISED PIAGGIO SERVICE CENTRE.

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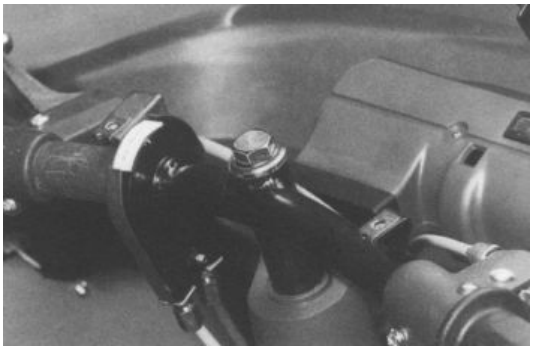
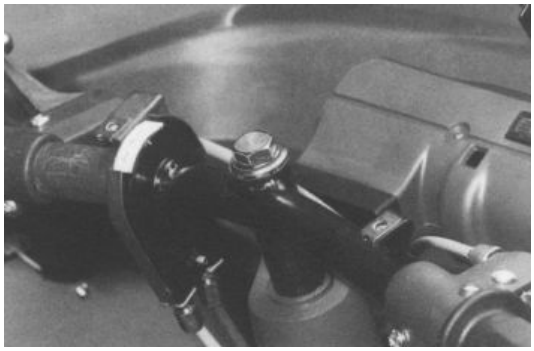
Handlebar



INSTALLING

Locking torques (N*m)

Locking bolts 35 to 60 Nm



Steering wheel from chassis

Specific tooling

020055Y Steering Ring Nut Key

STEERING ON THE CHASSIS - LOCKING

Specific tooling

020055Y Steering Ring Nut Key

Locking torques (N*m)

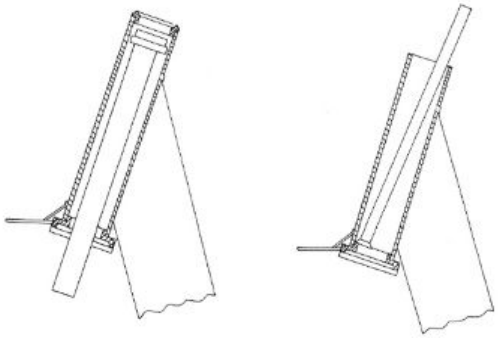
Upper seat 30 to 40 Nm **Steering ring nut** 50 to 60 Nm

Steering bearing housing from chassis

UPPER SEAT

Specific tooling

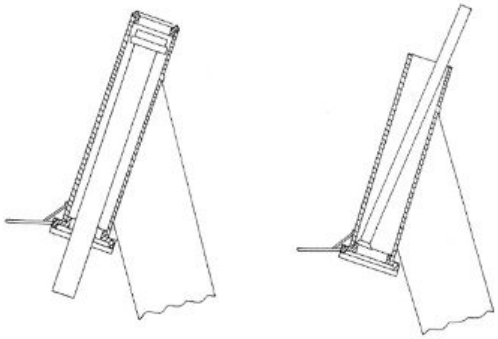
020842Y Upper Steering Bearing Removal Punch



LOWER SEAT

Specific tooling

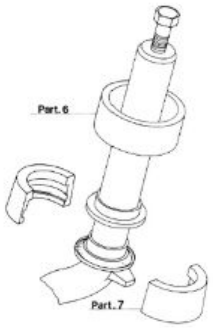
020004Y Steering seats extraction punch



Lower housing from steering column

Specific tooling

020042Y Steering tube bearing extractor

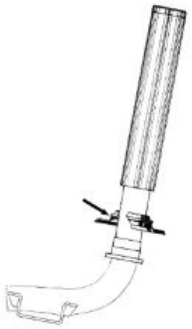


Dust ring

DUST GUARD AND LOWER SEAT ON THE STEERING TUBE

Specific tooling

016029Y Lower Steering Bearing Fitting Tool on the steering tube



Steering bearing housing on chassis

Specific tooling

021330Y003 Steering seats fitting

021330Y004 Steering seats fitting

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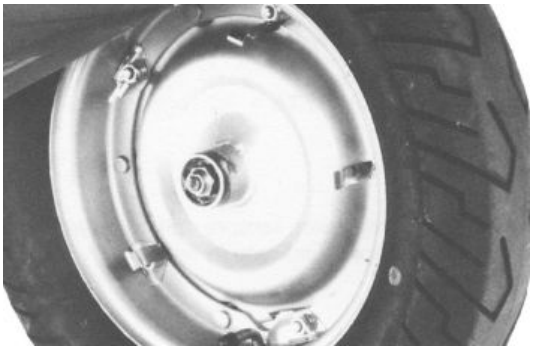
Brake drum



FRONT WHEEL DRUM LOCKING

CAUTION

ALWAYS USE NEW NUTS, CHAMFERING THEM IN THE APPROPRIATE WAY.

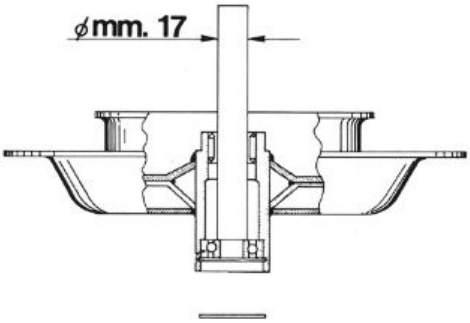
Locking torques (N*m)

Brake drum locking **75 to 90 Nm**

Drum bearings

DRUM BEARINGS

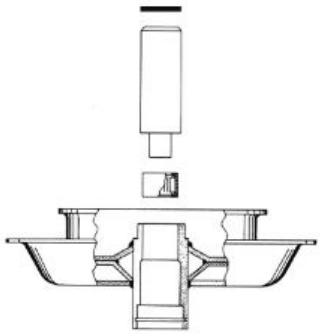
Use a Ø 17 section of tube for the ball bearing and a Ø 23 section of tube for the roller bearing.



Roller cage and split ring on brake drum

Specific tooling

033970Y Punches for Roller Casings



Ball bearing and split ring on brake drum

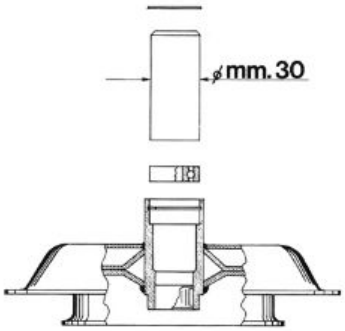
Heat the bearing housing area with the appropriate tools and fit the ball bearing and the circlip.

CAUTION

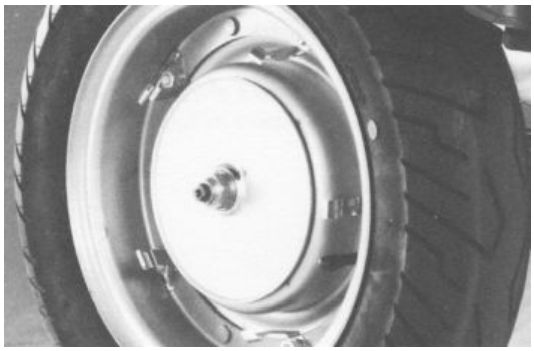
BEFORE REFITTING THE DRUM, FILL THE INTERNAL CHAMBER WITH THE SPECIFIC GREASE.

Specific tooling

020151Y Heat gun

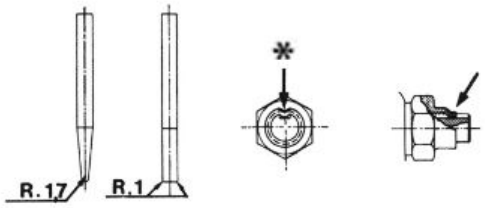


Drum and rear wheel



REAR WHEEL BRAKE DRUM LOCKING

When refitting the drum brake on the wheel axle, do not reuse the previously removed chamfered nut, but replace it with a new one; the locking must be carried out, chamfering carefully with a (steel) punch, the collar in the existing groove on the wheel-holder shaft, then fit the cover after filling it with specific grease.



Recommended products

AGIP GREASE PV 2 Grease for brake control levers

Specifications: NLGI 2 ; ISO-LXBIB2

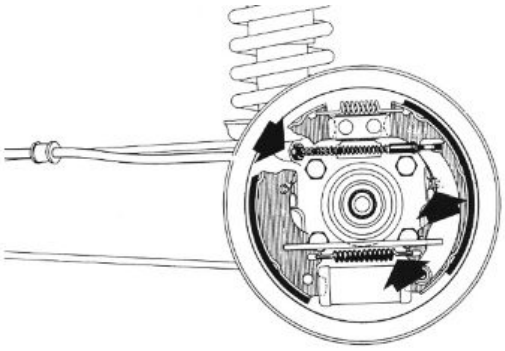
Locking torques (N*m)

Rear wheel brake drum locking **80 to 100 Nm**

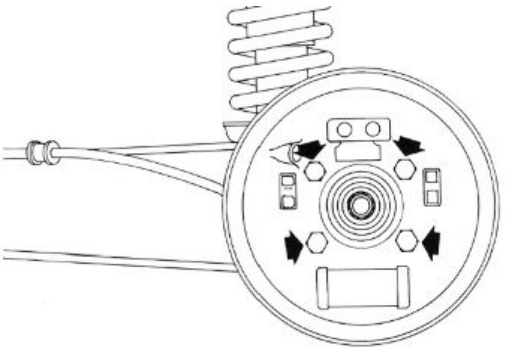
KEY:

***=** chamfer.

Parking brake control and brake shoes



Brake cylinder and shoe disc

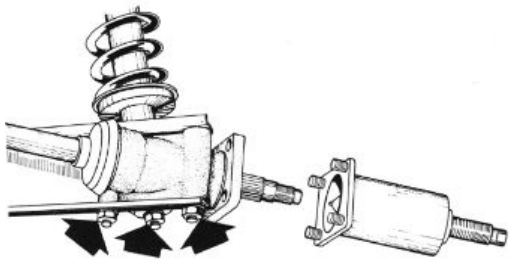


Wheel hub

Unscrew the indicated clamps and using the tool remove the hub.

Specific tooling

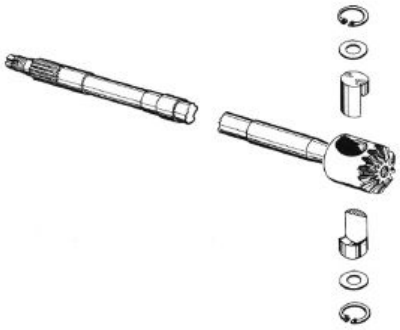
038137Y Rear Hub Extractor



Planetary and half-pins

In order to optimise the joint of the axle shaft, be careful:

- **when refitting the two half-pins;**
- **that the most open part is facing the axle shaft.**

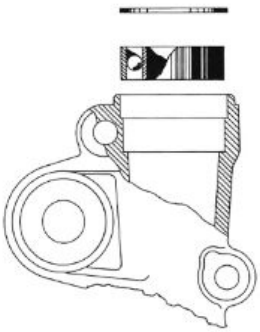


Ball bearing and split ring on hub

Heat the housing area with the appropriate tools and fit the ball bearing and the remaining parts.

Specific tooling

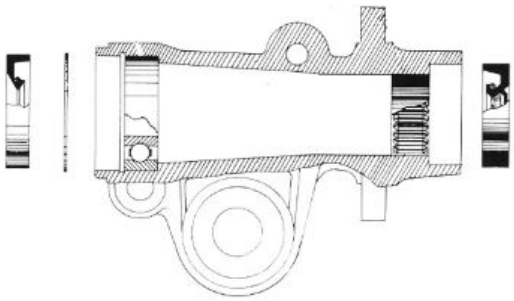
020151Y Heat gun



BALL BEARING AND ROLLER BEARING

FROM THE HUB

Use a Ø 24 section of tube for the ball bearing and a Ø 24 section of tube for the roller bearing.

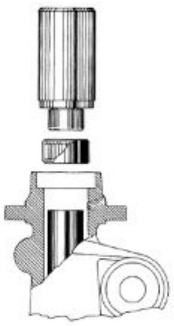


Spacer, roller cage and split ring

SPACER - ROLLER BEARING - SEAL RING

CAUTION

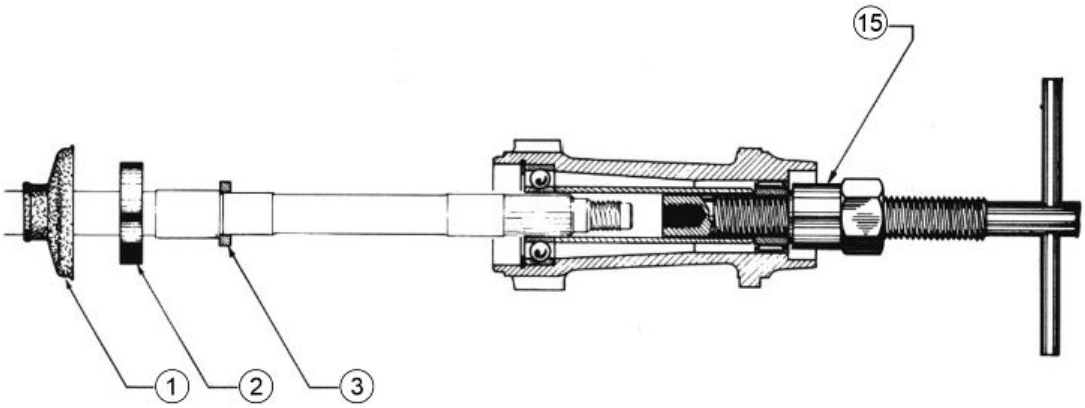
BEFORE FITTING THE SPACE AND THE ROLLER BEARING, FILL THE INTERNAL CHAMBER OF THE HUB WITH SPECIFIC GREASE.



Wheel hub on half-shaft

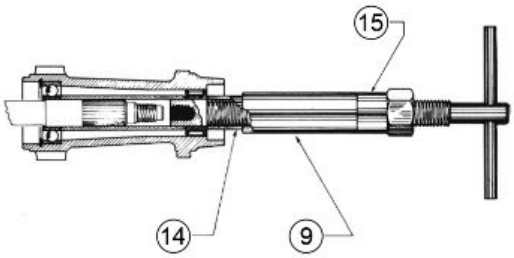
Prepare the dust gaiter cap (1), the seal ring (2) and the spacer (3) on the axle shaft, then fit the hub as described below:

1) - Use the appropriate tool complete with part. 15 and push the hub until it enters the axle shaft in the ball bearing.



2) - Remove the specific tool from the axle from, add the parts. 9 and 14 as shown in the figure and complete the fitting until the spacer ring touches the ball bearing (3).

3) - Position the seal ring (2), the dust gaiter (1) and the external seal ring.



CAUTION

FITTING OF THE REMAINING COMPONENT PARTS OF THE UNIT, PROCEED IN REVERSE ORDER TO THE REMOVAL.

Specific tooling

018119Y015 Axle fitting

018119Y009 Axle fitting

018119Y014 Axle fitting

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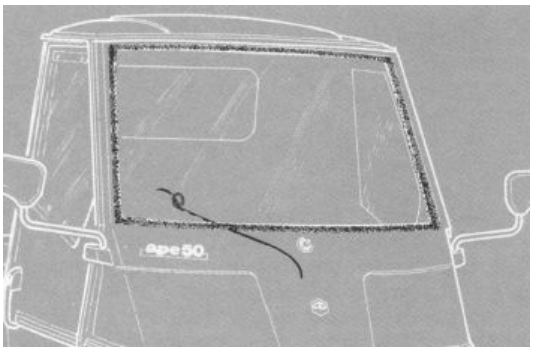
Windscreen

WINDSCREEN GLASS REMOVAL

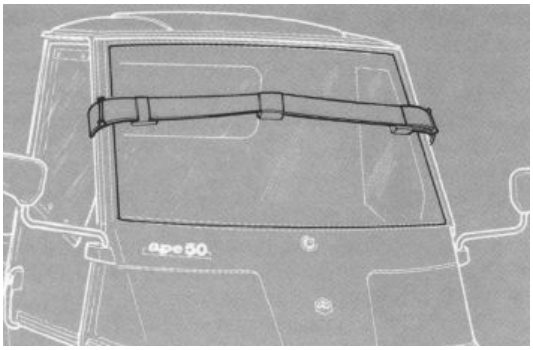


- Remove the trims and the profiles.
- Mark a hole on the sealing compound gasket (interposed between frame and glass) by passing a harmonic steel wire (Ø 0.5 mm).
- Proceed to cut the gasket by sliding the wire along the perimeter of the glass.

N.B.

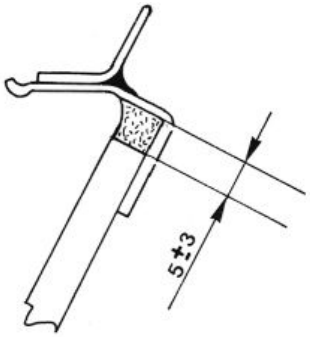
TWO PERSONS ARE REQUIRED TO CUT THE SEALING GASKET WITH THE STEEL WIRE AS DESCRIBED ABOVE (ONE WORKING FROM INSIDE THE CAB, AND THE OTHER, FROM OUTSIDE).

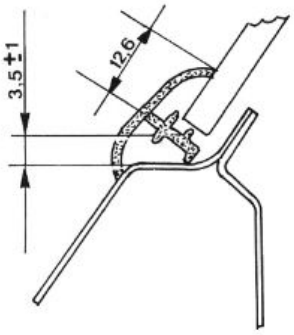
WINDSCREEN GLASS ASSEMBLY



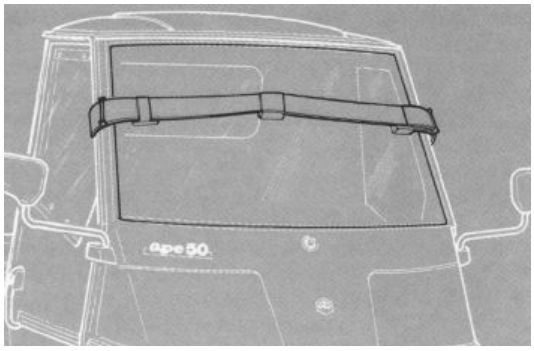
- Thoroughly clean the area that houses the window pane, remove any adhesive or glass that may have been left (use any mechanical tool, blades, abrasive elements, etc.). Check that the frame profile is not deformed (straighten if required).
- If necessary, touch up the area that houses the pane using original varnish so as to ensure the sealant will adhere properly.
- Protect the external and internal edge of the frame using a special tape for bodywork; use a brush to apply a thin coat of specific primer on the whole adherence surface involved when the recommended adhesive sealant is applied.

- Degrease the edge of the new window pane with ethyl alcohol. Using the appropriate tool to centre it with respect to the upper and lower edges of the housing frame, observing proper distances. Check that the distance of the pane from the edge of the housing frame is the same on both sides.





- The adhesive sealing compound cartridge has two components that should be come into contact inside that cartridge; they should be carefully mixed before being used. For that operation, use of the appropriate whisk that must be fixed to a (slow rotation) drill and inserted inside the cartridge, proceed at this point to the mixing operation for a period of 3 ', by slowly rotating the drill.



CAUTION

IN ORDER TO ENSURE THE EFFECTIVENESS OF THE BONDING, AND THEN THE RESULTING GLASS SEAL, ALWAYS MAKE SURE THAT THE PRIMER AND THE ADHESIVE SEALING COMPOUND, BEFORE THEY ARE USED, HAVE NOT LOST THE REQUIRED PROPERTIES FOR THE FUTURE EXCEEDING OF THE STORAGE LIMITS, PRESCRIBED BELOW BY THE BOSTON COMPANY.

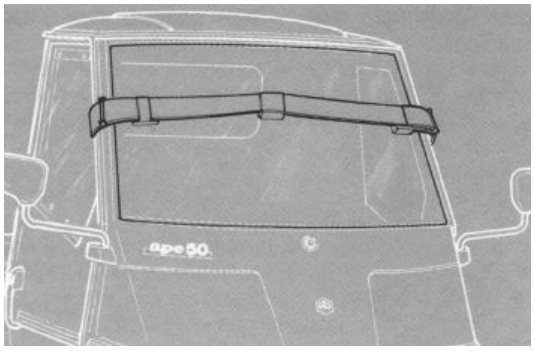
CAUTION

THE EXPIRATION DATE OF THE RECOMMENDED PRODUCTS, IS 12 MONTHS FROM THE DATE OF PRODUCTION.

Specific tooling

AC/UNI Whisk Whisk for "Thio Bostik 80" cartridge

Make sure that a period of 30' minimum and 4h maximum has elapsed from the moment the primer was applied, to insert the cartridge in the appropriate gun, which should be connected to a compressed air unit. Be careful to apply the adhesive sealing compound as a uniform string between the frame and the pane.



N.B.

BOTH THE PRIMER AND THE ADHESIVE SEALING COMPOUND ARE AVAILABLE AT OUR SPARE PARTS DISTRIBUTION CENTRE.

N.B.

FOR TOOLS, MIXING WHISK AND GUN, FOR CORRECT USE OF THE SEALING COMPOUND, REFER TO DEALERS OF THE BOSTON COMPANY.

Specific tooling

AC/UNI Gun Gun for "Thio Bostik 80" cartridge

AC/UNI Whisk Whisk for "Thio Bostik 80" cartridge

- Once the adhesive sealing compound is applied, proceed to fit three finishing strips (trimmings) to the sides of the frame, at the positions previously shown in the figure, and two profiles until they adhere to the pane and the frame edge.

CAUTION

FIT THE THREE STRIPS WITH THE TOP EDGE FACING THE PANE. THEN APPLY THE BAND ON THE LOWER TRIM, AND THE TAPE FROM THE BODYWORK ON THE SIDE STRIPS TO ENSURE A PERFECT ADHERENCE, IN THE DRYING PHASE. ONCE DRIED (NEEDED TIME AT 20°: 4 TO 5 HOURS «DUST OUT» - THAT IS FOR THE INITIAL STAGE; 6 HOURS FOR TOTAL HARDENING), REMOVE THE TOOL, BEING CAREFUL TO REMOVE WITH A SPATULA ANY ADHESIVE SEALING COMPOUND THAT MAY HAVE OOZED WHEN THE TRIMS WERE PRESSED.

Specific tooling

020114Y Pane positioning band

INDEX OF TOPICS

CAUTION

(FOR VEHICLES EQUIPPED WITH "MARELLI" ALTERNATOR): AT THE TIME OF INSTALLING THE BATTERY ON THE VEHICLE OR IN THE EVENT OF STARTING WITH AN AUXILIARY BATTERY AND STEERING WHEEL CABLES, TAKE GREAT CARE TO NOT INVERT THE POLARITY': THIS RESULTS IN A FAST BURNING OF THE BATTERY-ALTERNATOR CONNECTING CABLE WITH RISK OF FIRE.

CAUTION

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

WARNING

BEFORE RECHARGING THE BATTERY, REMOVE THE COVERS OF EACH CELL. KEEP OPEN FLAMES OR SPARKS AWAY FROM THE BATTERY DURING CHARGING. REMOVE THE VEHICLE BATTERY, DISCONNECTING THE NEGATIVE CABLE FIRST.

WARNING

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 milk. Following milk of magnesia, beaten egg or vegetable oil. Seek immediate medical attention.

The batteries produce explosive gas; Keep them away from naked flames, sparks and cigarettes. If the battery is charged in a closed place, take care to ensure adequate ventilation. Always protect your eyes when working close to batteries.

WARNING

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

WARNING

DO NOT REMOVE THE OIL COVER IMMEDIATELY AFTER AN ACTIVITY WITH THE ENGINE AT FULL SPEED AND/OR WITH THE ENGINE RUNNING. THE HEATED OIL MAY LEAK, WITH THE RISK OF BURNING

WARNING

CHECK AND ADJUST TYRE PRESSURE WITH TYRES AT AMBIENT TEMPERATURE.

WARNING

NEVER EXCEED THE RECOMMENDED INFLATION PRESSURES OR TYRES MAY BURST. DO NOT BE ABOVE THE TYRE DURING INFLATION.

WARNING

BE VERY CAREFUL WHEN HANDLING FUEL.

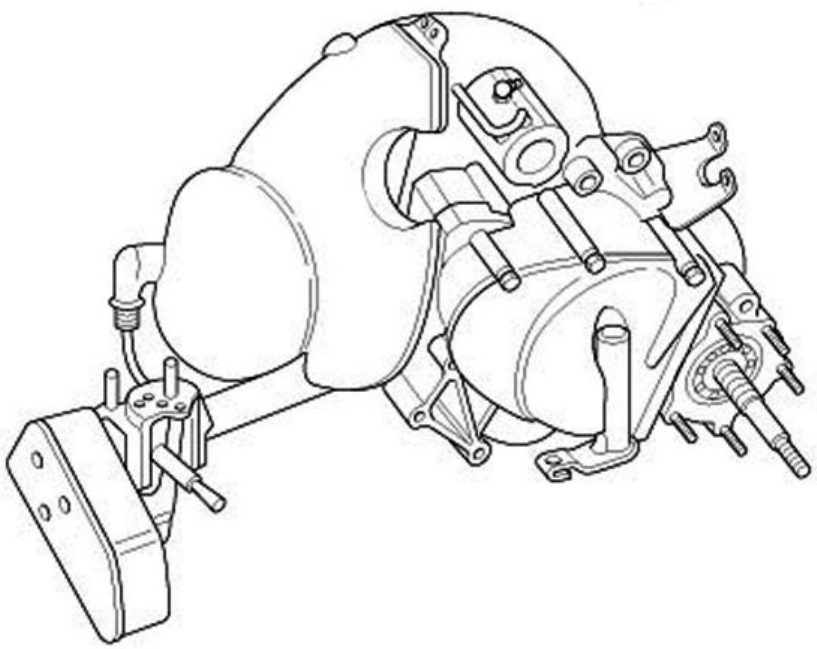
INDEX OF TOPICS

TIME-SHEET

TEMP

Engine

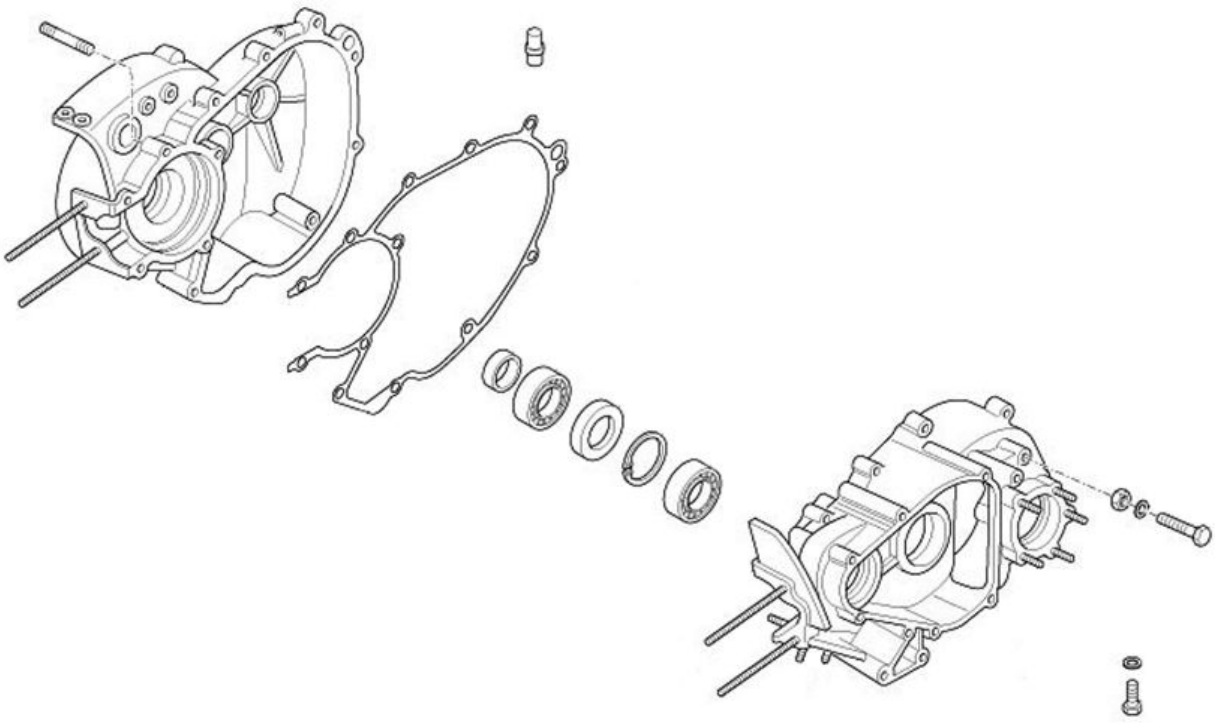
Engine, assembly



COMPLETE ENGINE

	Code	Action	Duration
1	001001	ENGINE FROM THE FRAME - RE-PLACEMENT	
2	001032	ENGINE SUPPORT - REPLACE-MENT	
3	003016	ENGINE SUPPORT FRONT BUF-FERS - REPLACEMENT	
4	003017	ENGINE SUPPORT REAR BUFFER - REPLACEMENT	
5	003052	IGNITION TIMING	
6	003057	ENGINE ANCHORING - NUTS TIGHTENING	
7	003064	Engine oil - Replacement	

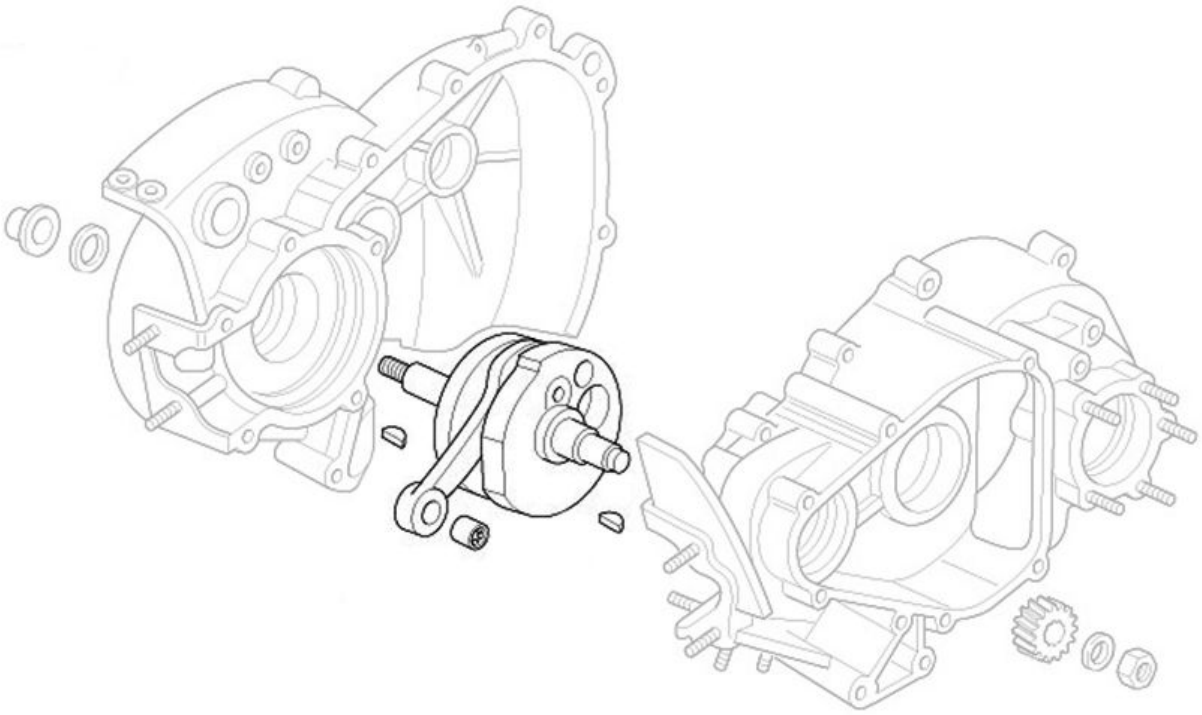
Crankcase



CRANKCASE

	Code	Action	Duration
1	001118	Main bearings - Replacement	
2	001120	ENGINE CRANKCASE BEARINGS - REPLACEMENT	

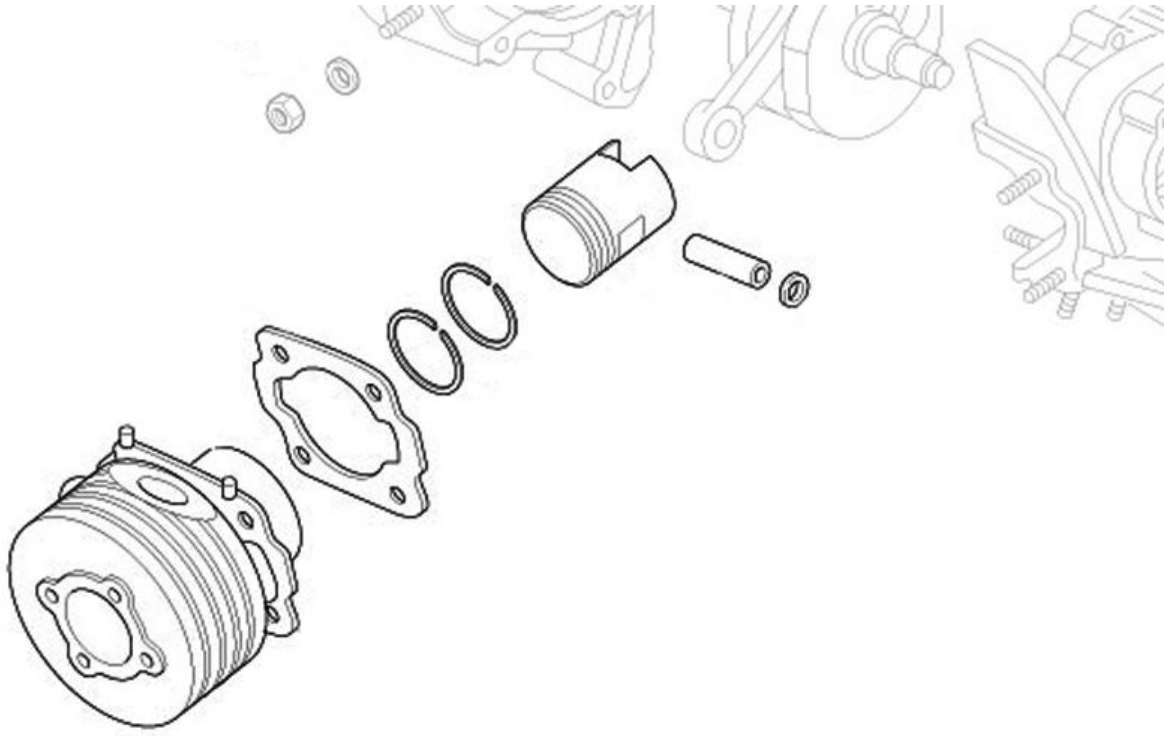
Crankshaft



CRANKSHAFT

	Code	Action	Duration
1	001101	CRANKSHAFT - OVERHAUL	
2	001117	CRANKSHAFT - REPLACEMENT	

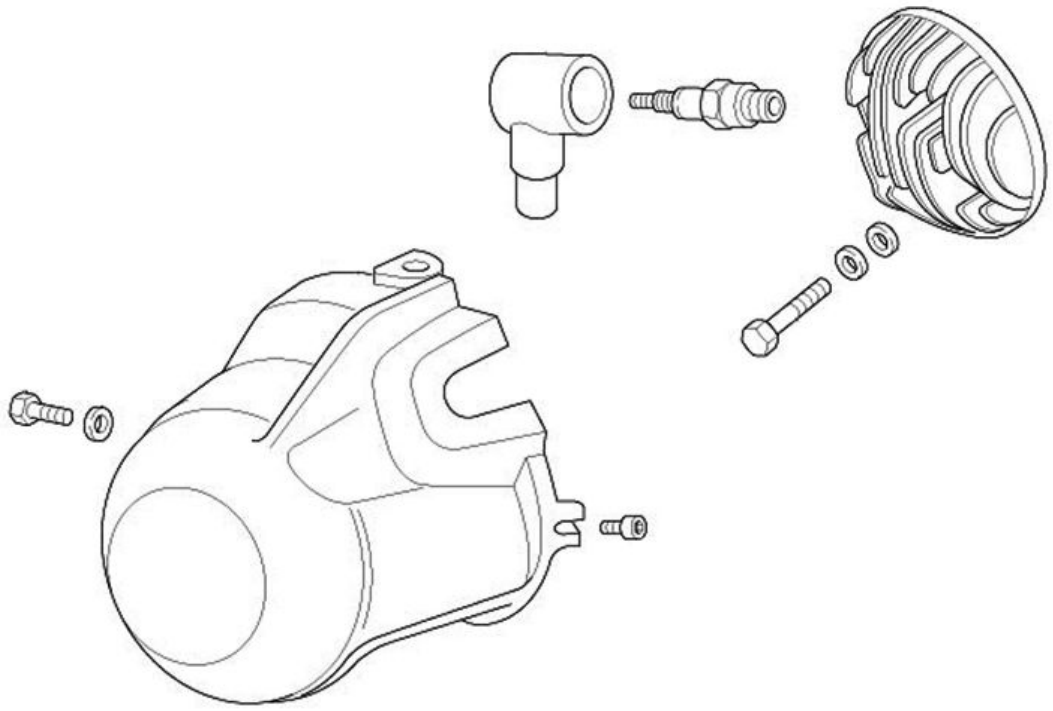
Cylinder-pistston-wrist pin unit



CYLINDER - PISTON - PIN

	Code	Action	Duration
1	001002	CYLINDER PISTON - REPLACE-MENT	
2	001107	CYLINDER / PISTON - INSPEC-TION / CLEANING	

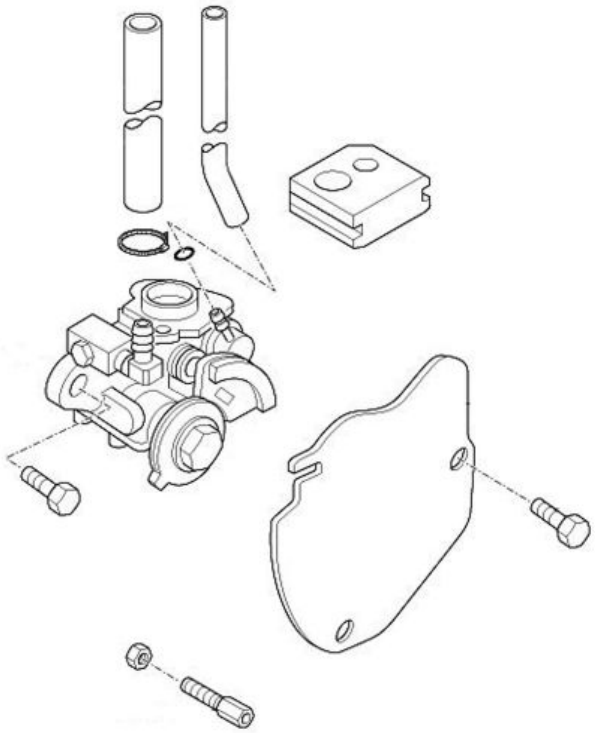
Cylinder head cover



HEAD COVER

	Code	Action	Duration
1	001093	Spark plug - Replacement	
2	001094	Spark plug hood - Replacement	
3	001097	COOLING HOOD - REPLACEMENT	
4	003056	HEAD/CYLINDER - TIGHTENING	

Oil pump



OIL PUMP

Titolo	Durata/Valore	Testo Breve (< 4000 car.)	Indirizzo Immagine
OIL PUMP			

B

C

D

E

F

H

I

M

O

P

S

T

V

W