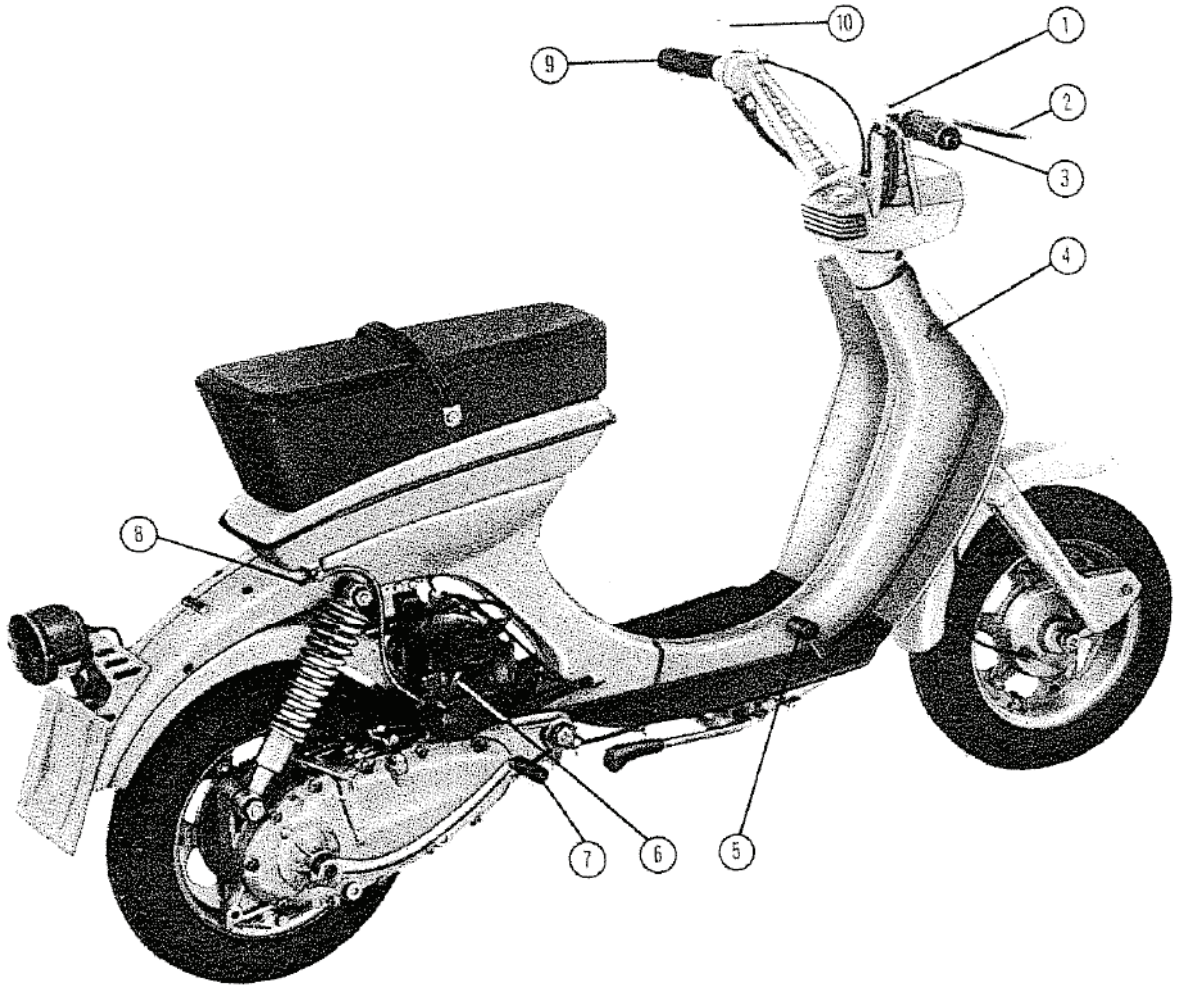
TABLE OF CONTENTS

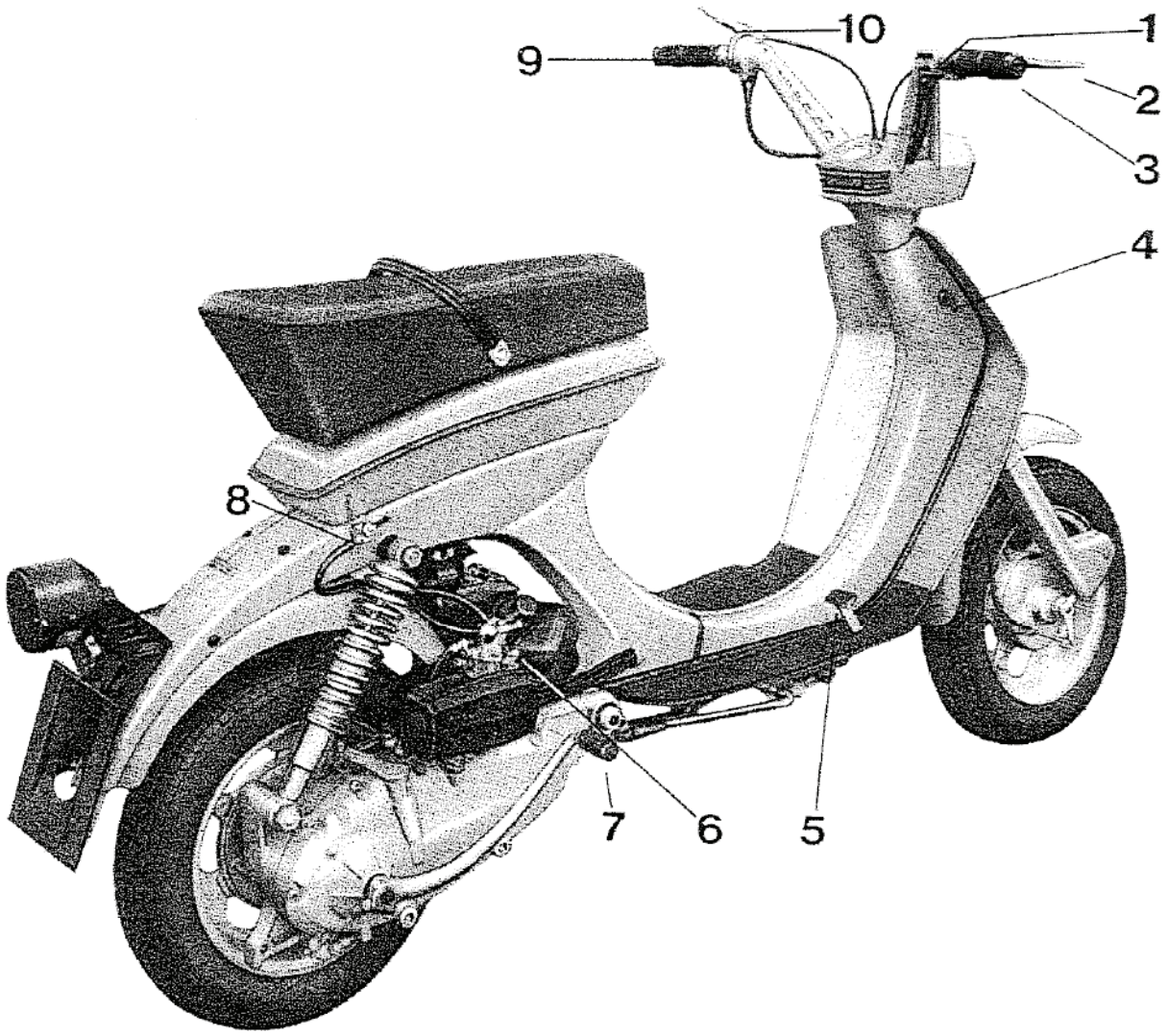
CONTROLS

1. Light switch with horn button and engine cut-out button
2. Front brake lever
3. Throttle control twist-grip
4. Anti-theft steering lock
5. Rear brake pedal
6. Choke control lever with automatic return at full throttle
7. Kickstart pedal
8. 3-way petrol tap (open, reserve, closed)
9. Gear change twist-grip
10. Clutch lever



CONTROLS

1. Horn button
2. Throttle control twist-grip
3. Front brake lever
4. Light switch
5. Engine cut-out button
6. Anti-theft steering lock
7. Rear brake pedal
8. Kick start pedal
9. Carburettor choke control
10. 3-way petrol tap (open, reserve, closed)
11. Gear change twistgrip
12. Clutch lever



MAIN FEATURES

	LUNA	VEGA	COMETA
Engine			
Bore	38 mm	46.4 mm	46.4 mm
Stroke	44 mm	44 mm	44 mm
Capacity	49.8 cc	74.4 cc	74.4 cc
Compression ratio	9.2 : 1	9.3 : 1	9.3 : 1
Maximum output (IGM)	2.23 Hp at 5000 r.p.m.	5 Hp at 6300 r.p.m.	5 Hp at 6300 r.p.m.
Carburation	petrol/oil mixture	petrol/oil mixture	petrol with LUBEMATIC oil injection system
Carburettor DELLORTO	SHA-14-12	SH 1/20	SH 1/20
Settings:			
choke	Ø 12 mm	Ø 20 mm	Ø 20 mm
main jet	52/100	68/100	68/100
Air filter	wire mesh		
Ignition	by flywheel magneto and external H.T. Coil		
Spark plug: with long reach thread	BOSCH W 225 T 2 or	MARELLI CW 240 L or	CHAMPION N 4
Ignition timing	21° ± 1° corresponding to 1.83 ± 0.17 mm of piston stroke before T.D.C.		

	LUNA	VEGA	COMETA
continued: **Ignition**			
Maximum contact breaker gap	0.35 ÷ 0.45 mm		
Clutch	Multi disc in oil bath		
Transmission	By chain in oil bath with adjustable chain guides		
Reduction ratio	1/4.27	1/3.54	
Gearbox	Three speed	Four speed	
	Constant mesh gearbox		
Overall gear ratios			
1st speed	1/27.53	1/19.27	
2nd speed	1/15.10	1/12.52	
3rd speed	1/9.83	1/9.28	
4th speed	—	1/6.90	
Wheels and brakes			
Wheels	Interchangeable		
Rims: in pressed sheet, split in two halves	2.10		
Tyres	3 x 10″		
Front tyre pressure	1.50 Kg/cm^2		
Rear tyre pressure	1.75 Kg/cm^2		

continued: **Wheels and brakes**	LUNA	VEGA	COMETA
Brakes	Mechanical with internal expansion. Control by hand for front wheel, by pedal for rear wheel.		
Diameter of the drum front brake	125 mm		
Diameter of the drum rear brake	150 mm		
Width of brake linings	17 mm		
Lubrication	By petrol/oil mixture with 4 % of oil (AGIP F.1 2T) during the running-in and with 2 % of oil after the first 900 miles.		Lubematic injection system with varying oil percentage independent from the petrol, but supplied in accordance with the effective needs of the engine.
Engine			
Transmission, clutch and gearbox			
Crankcase capacity	450 gr	620 gr	
Silencer	With expansion in double chamber and absorption by means of fiber glass	Composed of a choke, a vibration damper chamber and three baffles	
Steering	By means of a steel tubular fork column and pressed steel legs		
Suspension:			
— front	By means of trailing links and helical springs carried in the fork legs		
— rear	Swinging engine unit carrying a helical spring and hydraulic shock-absorber mounted inside spring		

	LUNA	VEGA	COMETA
Frame	Composed of pressed steel sheets welded to a tubular front section		
Centre stand	With two legs		
Electrical equipment			
The electrical equipment is fed directly by the 6 V flywheel magneto . . . . . poles	6		
Nominal power of flywheel magneto . . . watt	33		
Front headlight	Headlamp 6 V - 25/25 W		
Rear light	Pilot light 6 V - 5 W		
	Pilot and stop light 6 V - 3/15 W		
Main switch	On handlebar, right hand, near the hand grip		
Engine cut-out button	On the light switch		
Horn button	On the light switch		
Speedometer	Illuminated by the pilot light bulb		
Dimensions and performance			
Overall length	1690 mm		
Overall width (handlebar)	660 mm		
Overall height	1028 mm		
Wheelbase	1202 mm		
Unladen weight in running conditions	72 kg	76 kg	76 kg
Fuel tank capacity . . . . . litres	6	6	4.4 petrol + 1.05 oil
— reserve capacity . . . . . litres	0.8	0.8	0.8 petrol + 0.23 oil

continued: **Dimensions and performance**

	LUNA	VEGA	COMETA
Fuel consumption (according to CUNA standard)	1.6 l/100 km	1.8 l/100 km	
Maximum speed	about 55 km	about 82.5 km	
Climbing ability:			
in 1st speed %	19	36	
in 2nd speed %	10	20	
in 3rd speed %	5	12	
in 4th speed %	—	6	
Speed during running-in period:			
in 1st speed km/h	10	13	
in 2nd speed km/h	20	35	
in 3rd speed km/h	33	23	
in 4th speed km/h	—	50	

ENGINE

General description of the engine

The engine is carefully balanced to minimise vibration.

The cylinder of cast iron is inclined at an angle of 9° to the vertical.

The cylinder head is die-cast in light alloy.

The piston, also cast in light alloy, is oralized and fitted with 2 rings.

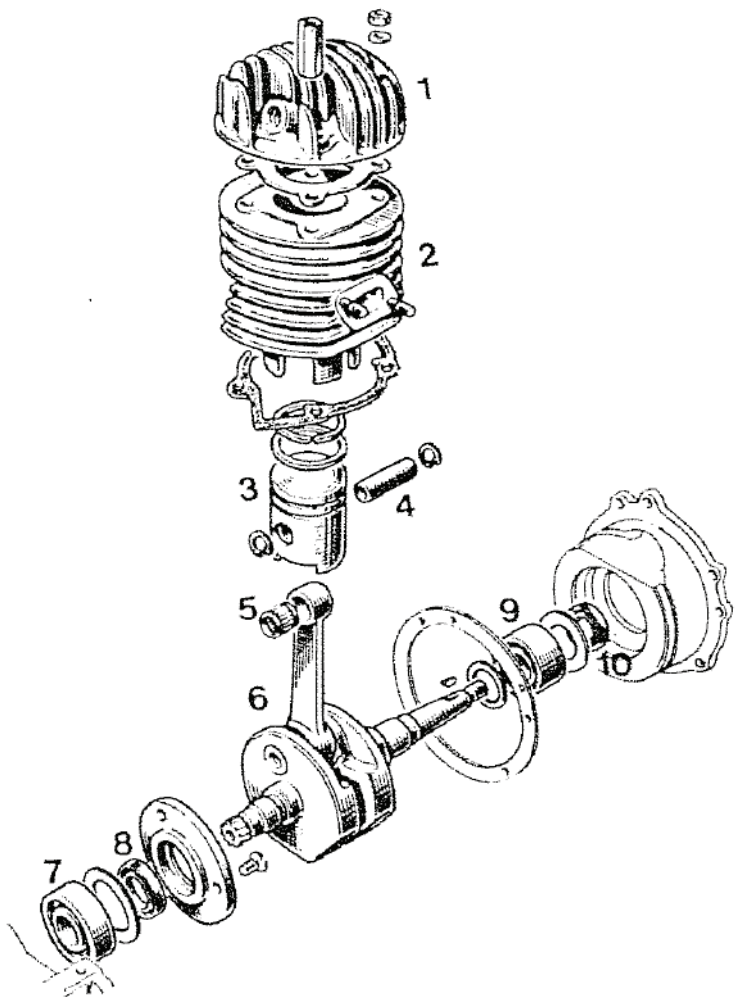
The built-up crankshaft is supported by two main bearings: a roller bearing (drive side) and a needle bearing (magneto side).

Engine cooling is achieved by means of a fan on the flywheel.

Lubrication is by 2 % petrol/oil mixture.

For Lambretta Cometa: the lubrication system is automatic, by means of the LUBEMATIC pump.

The gear rations are chosen to allow vivid acceleration with minimum use of the gearbox.

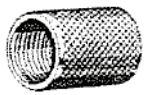


1. Cylinder head - 2. Cylinder - 3. Piston - 4. Gudgeon pin - 5. Needle bearing - 6 Crankshaft - 7. Ball bearing (pinion side) - 8. Retainer (pinion side) - 9. Roller bearing (magneto side) - 10. Retainer (magneto side).

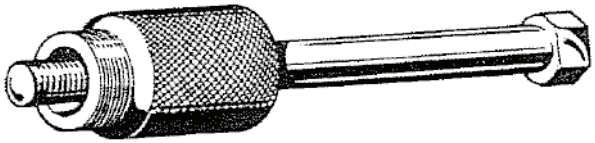
Dismantling and reassembly

Removal of the cylinder/piston assembly can be effected without completely removing the silencer on the Luna although this must be removed first on the Vega-Cometa. To remove the silencer on the latter machines one must slacken the exhaust manifold clamp and remove the two nuts and bolts fixing the bracket to the crankcase.
On the Luna remove the exhaust flange nuts, the four nuts and bolts on the main support brackets and the tailpipe nut. The silencer will then drop down out of the way but can be completely removed by taking out the engine pivot bolt and lowering the front of the engine.
To reach the crankshaft remove the plastic flywheel cowling dust cover and flywheel rotor. Hold the flywheel with tool 58013 and unscrew the 17 mm securiting nut (left-hand thread). Screw the special protection sleeve 71151 on to the crankshaft and screw in the extractor 37058. Tighten up the extractor centre bolt to break the taper, remove the extractor, protection sleeve and flywheel.

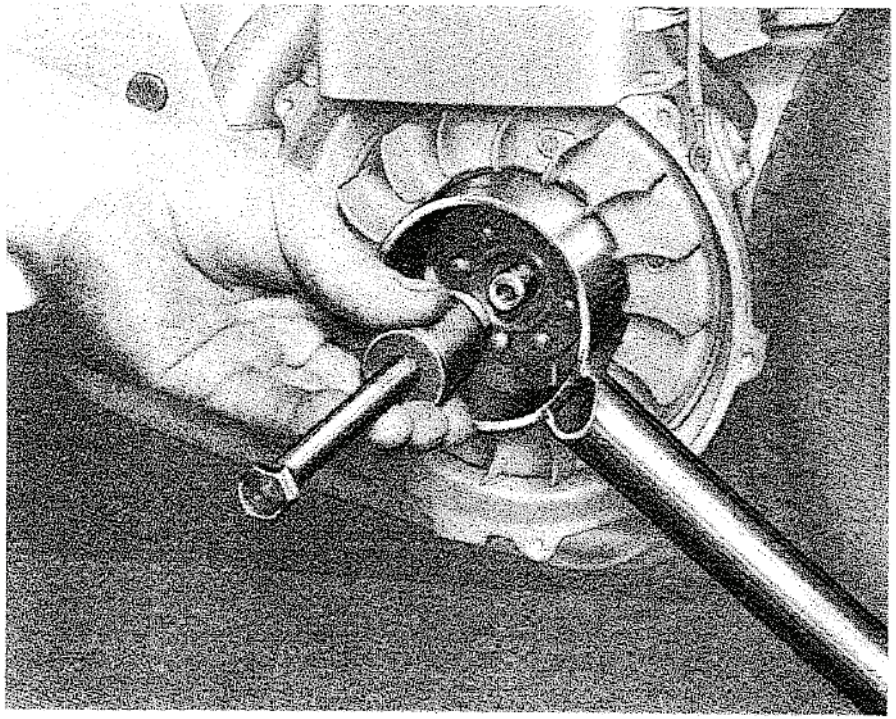
tool 58013



cap 71151

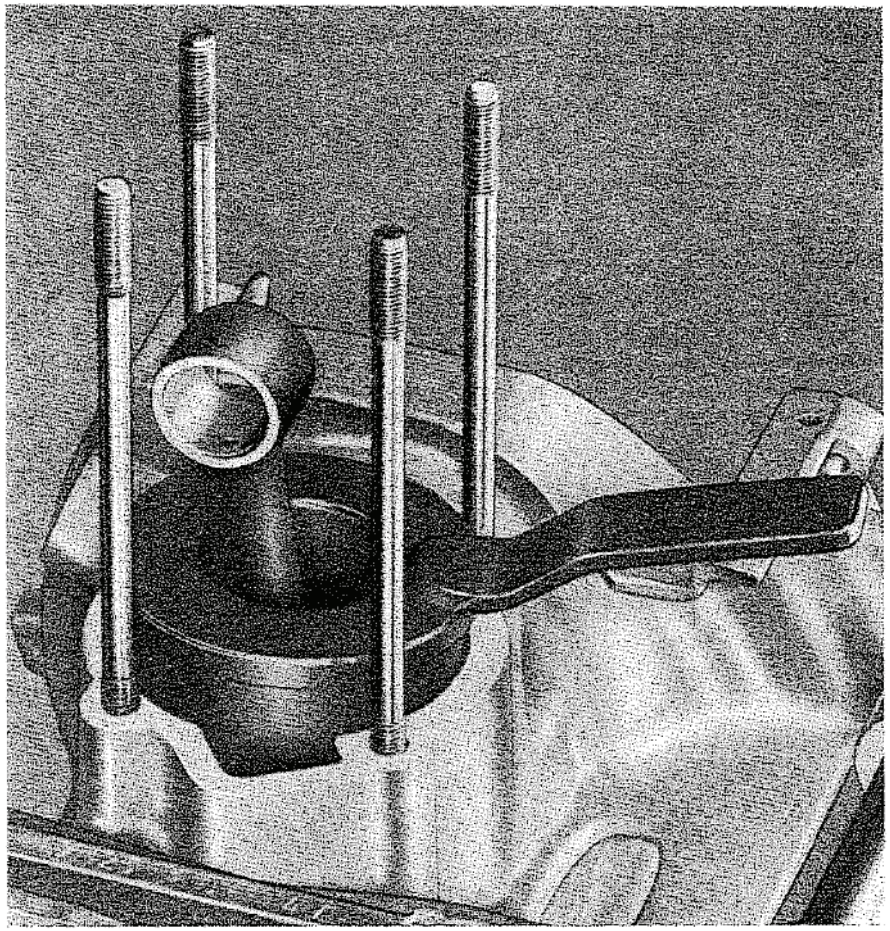


tool 37058

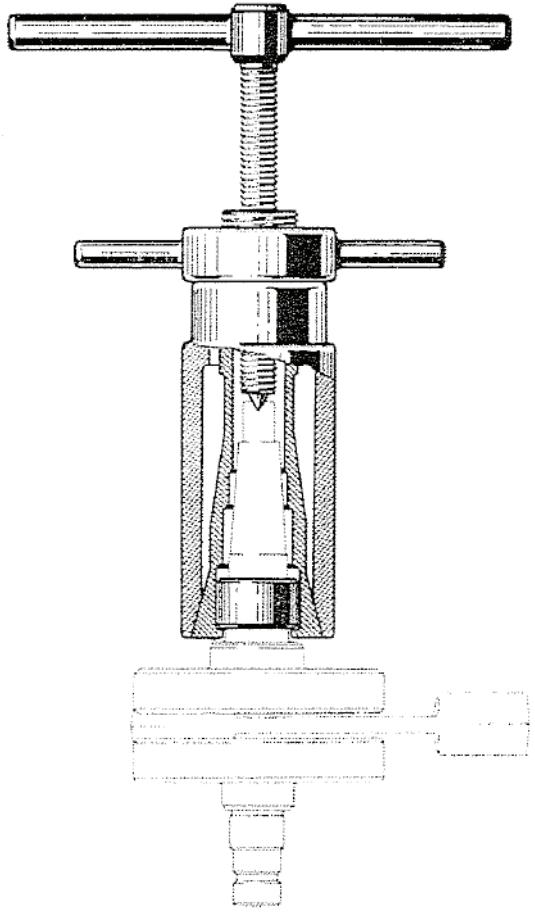


Remove the stator and magneto flange.

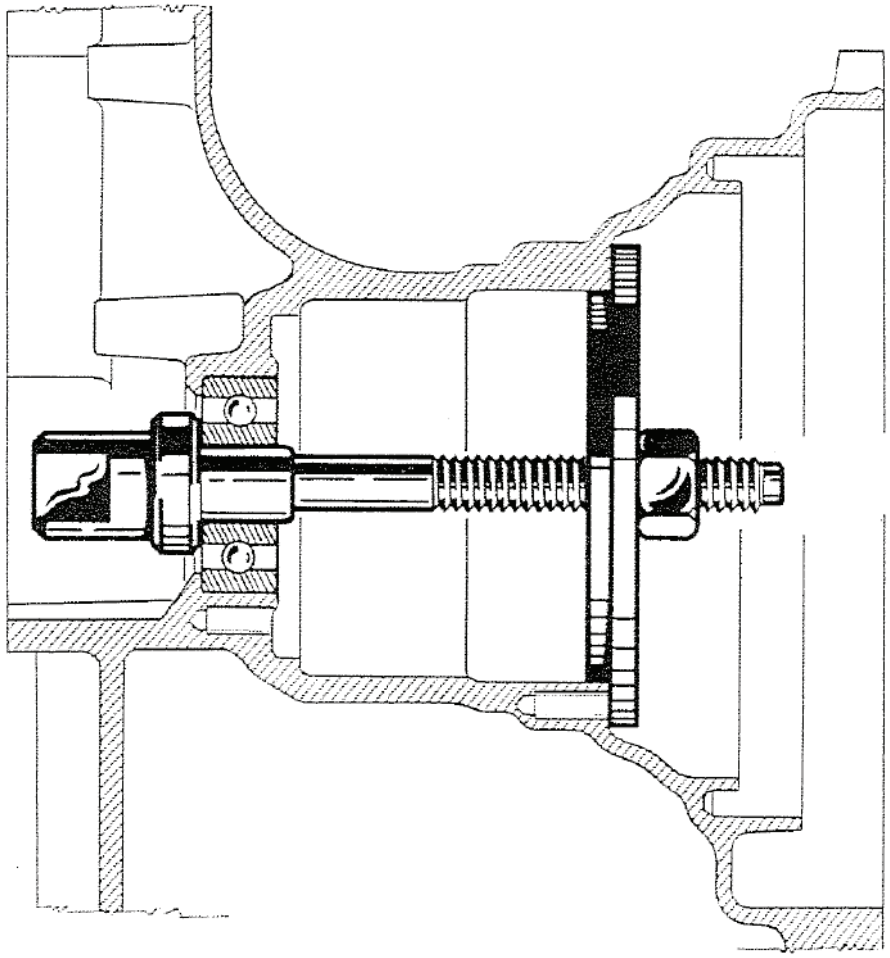
Drain the gearbox oil and remove the crankcase cover. Lock the crankshaft with tool N. 70648 and unscrew the sprocket securing bolt. Remove the chain-guides and pull the sprocket from the crankshaft end. Using a copper hammer gently tap the crankshaft through the main bearing.
Tool N. 70645 is used to extract the inner track of the magneto-side bearing from the crankshaft. This tool can also be used with the crankshaft in situ.



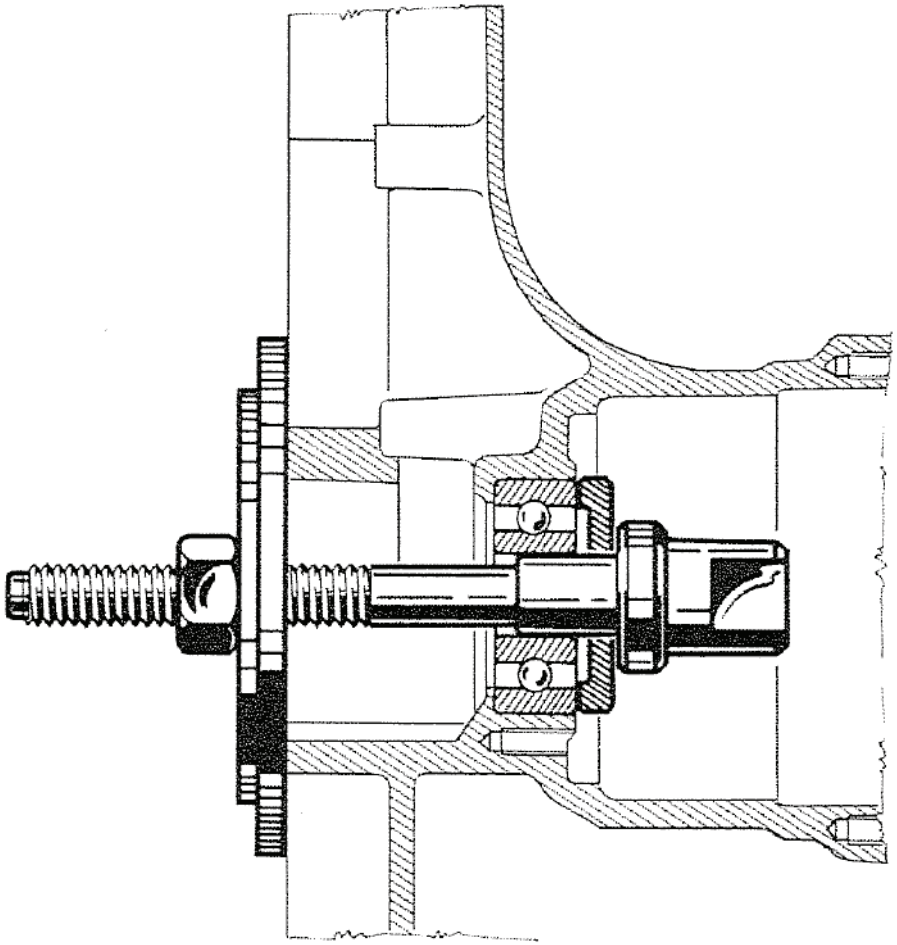
Locking the crankshaft in order to loosen the sprocket securing bolt.



Removing the inner race of the crankshaft bearing with extractor 70645.

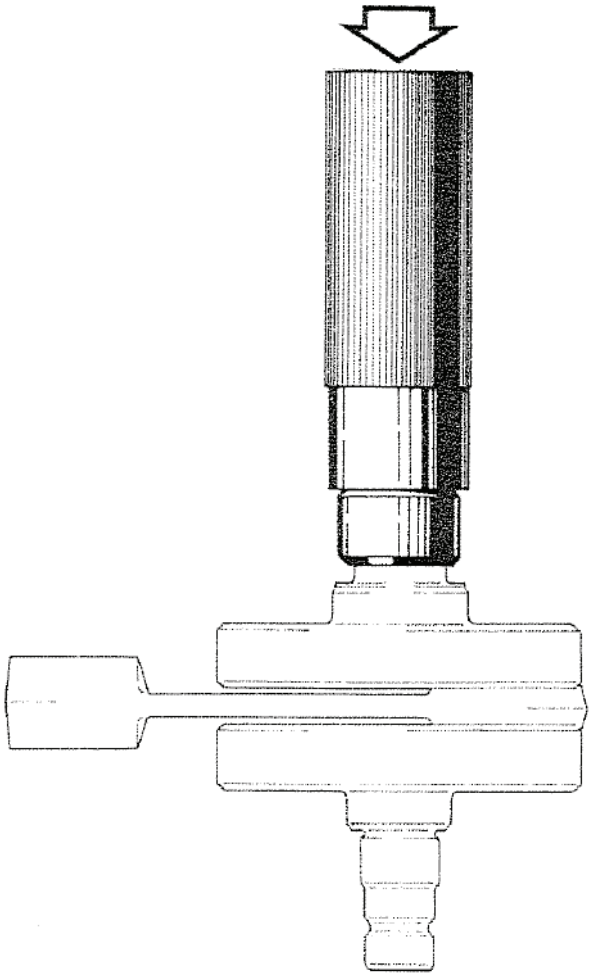


Positioning tool 70650 to remove the drive-side main bearing.

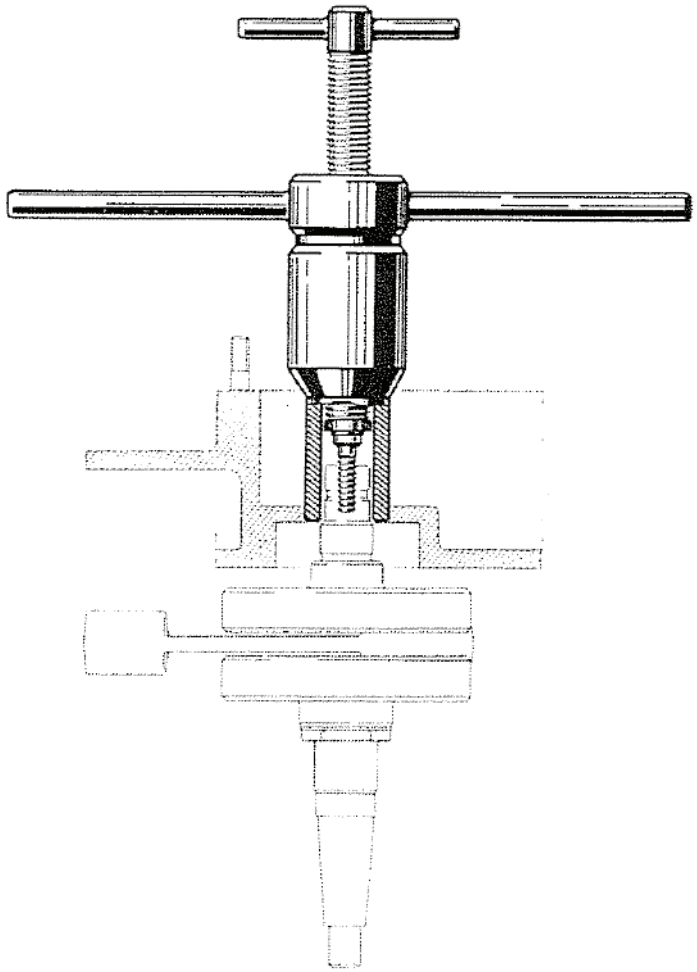


Positioning tool 70650 to refit the drive-side main bearing.

To refit the inner race use punch 70652 and take care to place it in the correct position to avoid possible damage. If the flywheel is dismantled lock it in a vice using the flywheel side web. If it is assembled in the machine tap the punch very carefully in order to avoid distortion of the crankshaft.
The crankshaft is refitted using tool 70658 to pull it through the main bearing as in the illustration.



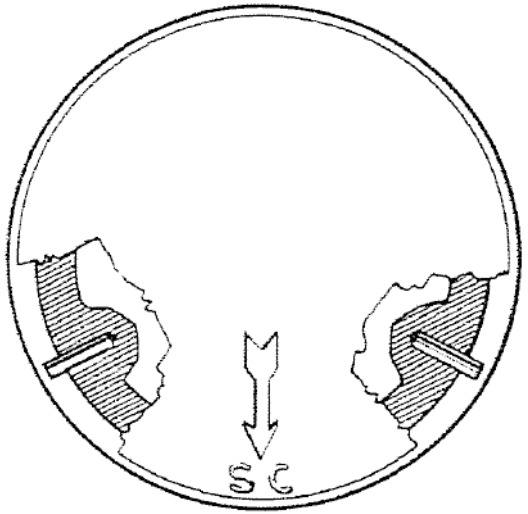
Correct position of tool 70652 for mounting the inner bearing on the crankshaft.



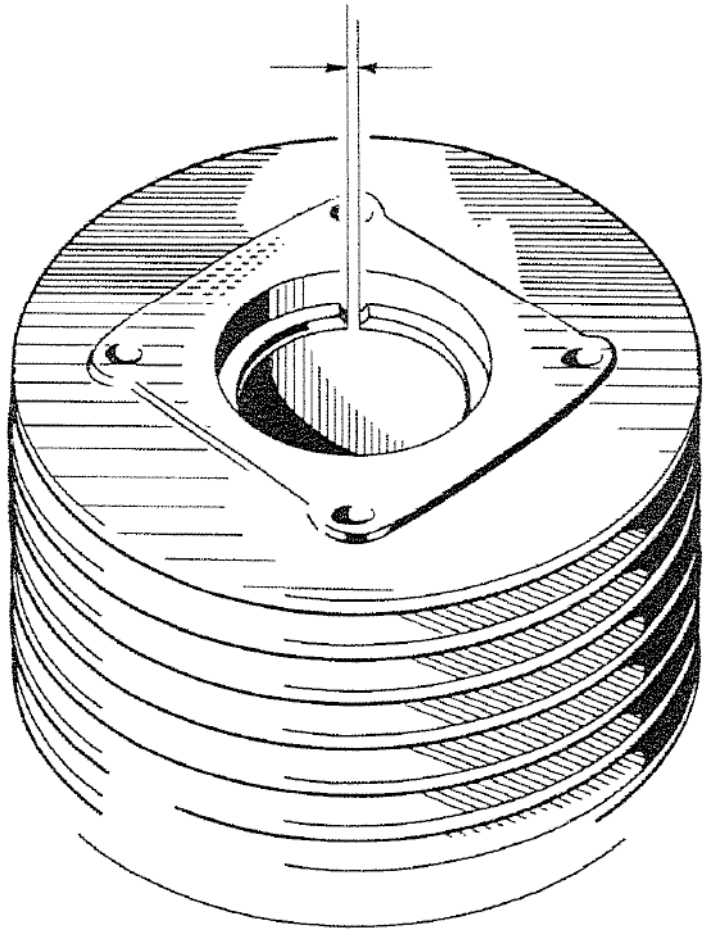
Positioning tool 70658 for crankshaft assembly.

PISTON AND CYLINDER ASSEMBLY

Note that pistons and cylinders are available in three sub-divisons of size denoted by markings +, 0 or — on the piston crown and upper cylinder surface.
Perfect matching of new components is only obtained when both cylinder and piston are stamped with the same symbol. Gudgeon pins are also available in two classes recognizable by black and white spots, pistons are marked in the same way.
The piston must be refitted with the ring pegs either side of the exhaust port and the arrow on the crown (or letters 'SC') towards this port.
Before assembly check the piston ring end-gaps by placing each ring in turn in the cylinder perpendicular to the axis. The end gap must not be less than 0.2 mm.

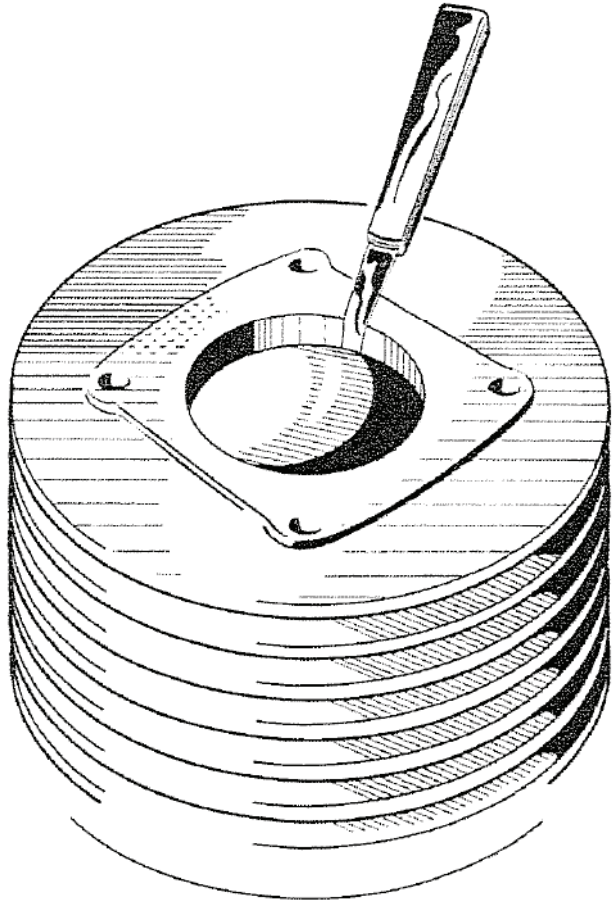


Piston crown.



Checking the piston ring gap.

Replace the ring in the gap exceeds 0.4 mm.
When reassembling the engine it is advisable to check the radial piston clearance. This is achieved by placing the cylinder on the piston without the rings fitted. The play between the cylinder and piston at two diametrically opposite positions level with gudgeon pin must be equal.



Checking the radial play of the piston/cylinder group.

CYLINDER BORING

When boring the cylinder proceed as follows in order to obtain the prescribed surface finish

1) Bore until 0.05 - 0.07 mm below the size required
2) Lap with abrasive N. 180 until the desired size is reached.
3) Coat the inner cylinder surface with oiled fine abrasive N. 80 and lap with a piston using a helical motion until a good fit.
   An old piston without rings of the correct nominal size, mounted on a connecting rod is suitable for this operation.
4) Wash the cylinder with a high pressure water jet and then immerse the cylinder in diesel oil.

ENGINE DECOKE

The decoking of a two stroke engine is a very important operation and should be carried out with the maximum care, in relation to the damaging effect the carbon deposits have on the functioning of the engine.

The parts mostly involved in the decoke operation are:

— Cylinder exhaust port

— Piston ring grooves

— Combustion chamber in the cylinder head

— Piston crown.

The cleaning of the cylinder exhaust port is of fundamental importance, as the deposits which form there bring about a reduction of the exhaust area thus creating an increased resistance to the outlet of the combustion gases from the cylinder.

This resistance can be translated as a loss in the useful cylinder capacity and therefore a reduction in the power output at the moment of specific consumption. Furthermore, it will also create overheating with the danger of fragments of carbon becoming loose thus scoring the cylinder barrel and causing piston seizure.

The cleaning of the piston ring grooves is also very important inasmuch that dirty surfaces facilitate adherance of the incombustible residue of fuel and oil.

Due to the temperature developed on the cylinder these residues form deposits which can hinder the elasticity of the rings insomuch as to cause them to stick.

These conditions also can bring about loss of power, overheating and possible seizure.

The cleaning of the piston crown and cylinder head is necessary because the carbon deposits have a low coefficient of heat transmission and therefore affect the cooling of the head and piston and cause faulty spark plug functioning.

The overheating of the carbon deposits in ratio of their low heat conductivity, can bring about in certain zones a notable increase in the temperature, which through the reduction in the volume of the combustion chamber and therefore subsequent increase in the compression, can bring about preignition or auto-ignition, which manifest themselves by abnormal engine noises and increase engine stresses.

We give you some illustrated details on the operations necessary for the correct decoking of Lambretta engines, so as to facilitate and simplify the execution.

1) Remove head and cylinder.

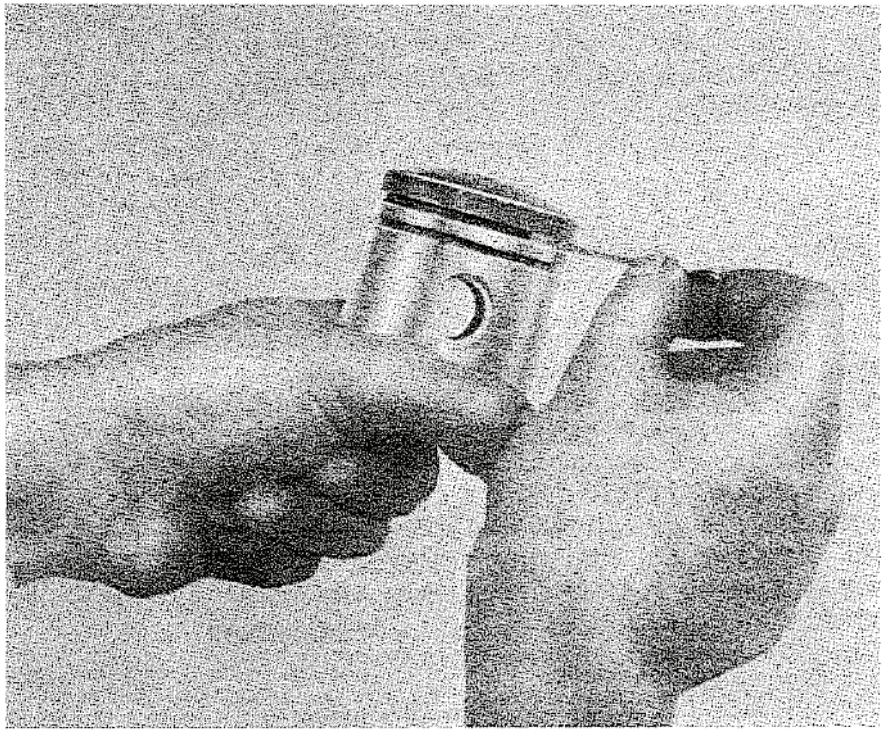
2) Dismantle piston by removing the two gudgeon pins, circlips, and push out the pin by pushing it with a rod or using a gudgeon pin extractor.

3) Clean out the cylinder exhaust port by scraping so as to dislodge the carbon deposits, with a thin scraper. Clean cylinder and port with petrol and dry out with air jet.

4) Clean the exhaust gasket and ascertain if still in usable condition. Otherwise replace with a new one to ensure perfect sealing between cylinder and exhaust tube. When fitting the gasket be sure to fit the right way up, the hole in the gasket must correspond exactly to the outline of the exhaust port on the cylinder.

5) To clean piston; check the efficiency and quality of the rings; remove rings placing them on the bench so as to able to replace them into the original grooves. Wash piston with petrol, scrape and remove the carbon

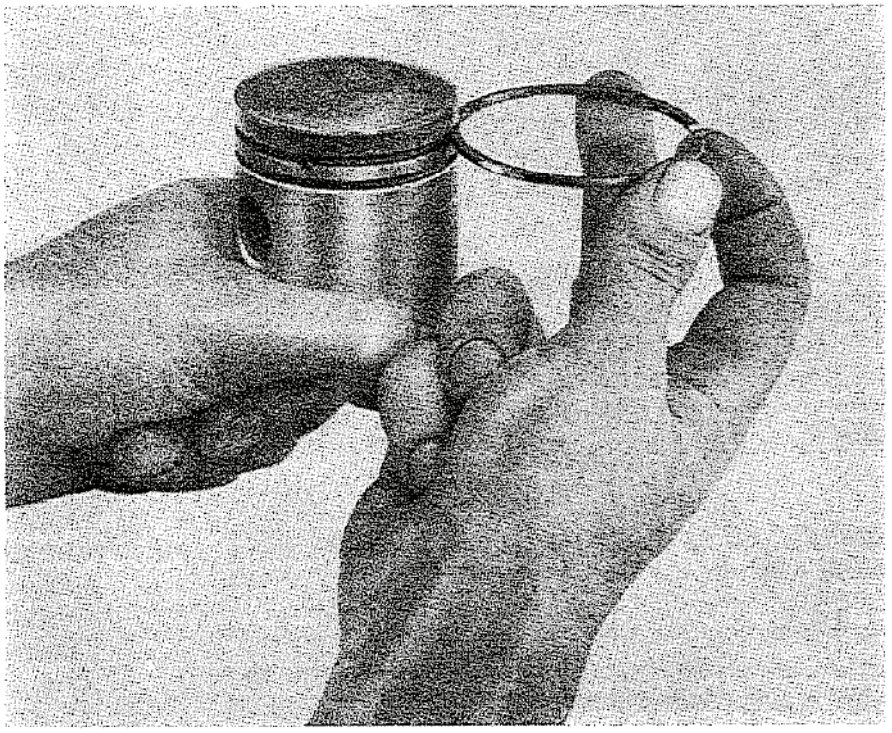
deposits from the piston crown, clean the crown with a thin blade, do not use emery cloth, as the emery dust and metallic dust caused by the emery can stick to the piston and work loose during running.
By using a piece of an old ring scrape the ring grooves with its broken edge. Wash piston and rings with petrol and dry with compressed air.
Check the play between rings and grooves by rotating each ring on its respective groove.
Check the piston ring stop pins.



Scraping the ring grooves.

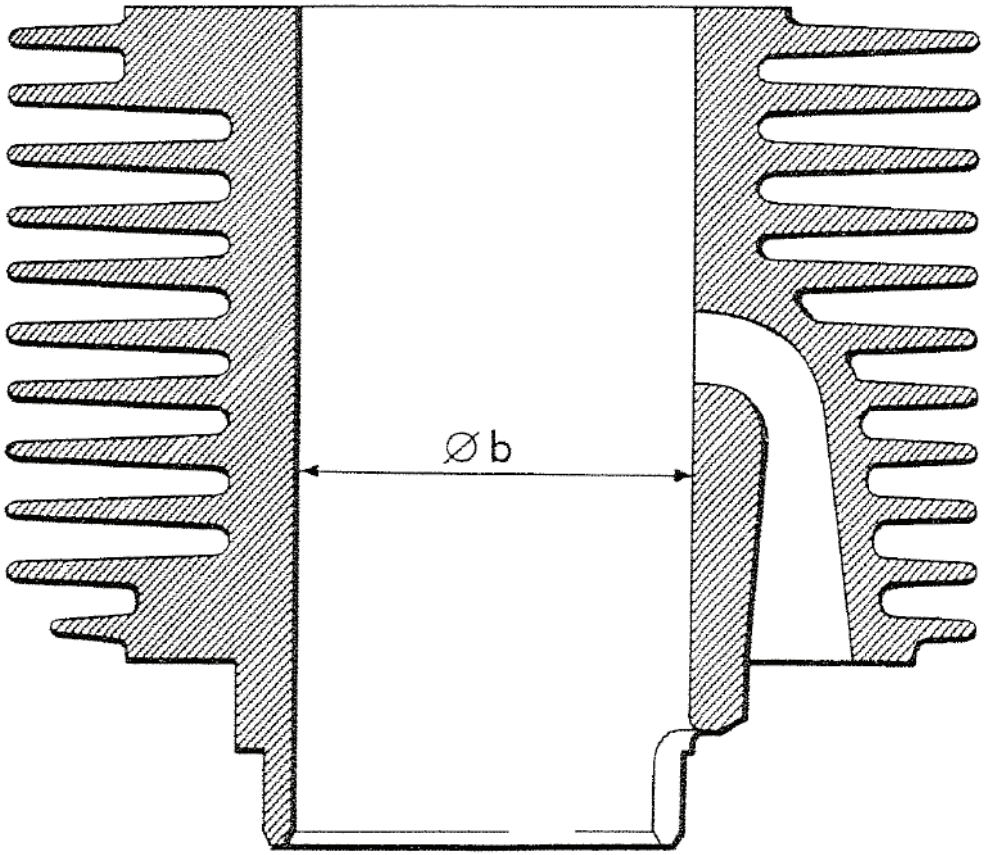
To check the piston ring gap, slip each ring into the cylinder square to the bore. The gap in the ring should not be smaller than 0.2 mm. If the gap is more than 0.4 mm change ring. Refit rings to respective grooves.

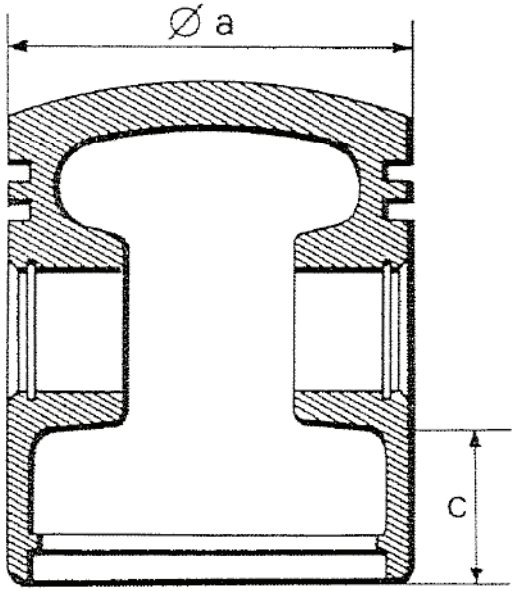
6) The clean cylinder head, remove carbon deposits from the combustion chamber and clean its surface with a curved scraper.
Wash in petrol and dry.



Checking ring gap.

ASSEMBLY TOLERANCES AND WEAR LIMITS





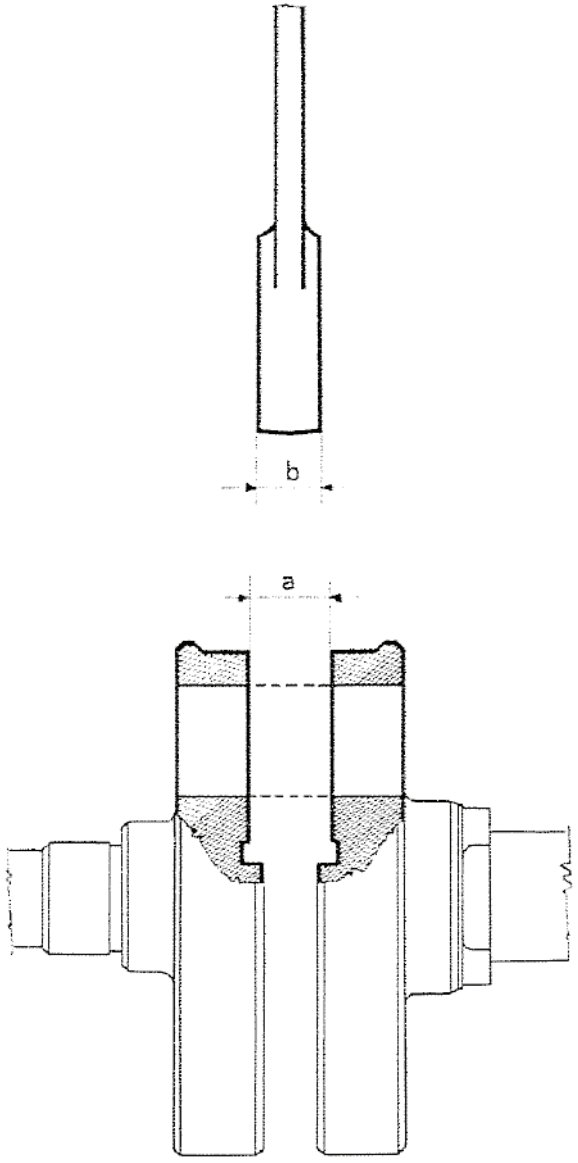
a = piston diameter
b = cylinder diameter
c = height of the diameter 'a'

ASSEMBLY TOLERANCES AND WEAR LIMITS FOR CYLINDER AND PISTON

	Grading	STANDARD ASSEMBLY					1st OVERSIZE					2nd OVERSIZE					3rd OVERSIZE					Play at fitting	wear limit
		CYLINDER		PISTON		RING	CYLINDER		PISTON		RING	CYLINDER		PISTON		RING	CYLINDER		PISTON		RING		
		Part.	Diameter mm b	Part.	Diameter mm a	Part.	Diameter mm b	Part.	Diameter mm a	Part.	Part.	Diameter mm b	Part.	Diameter mm a	Part.	Part.	Diameter mm b	Part.	Diameter mm a	Part.	Part.	b - a	b - a
50 cc	—	20951220	38.0	20151140	37.0	20151008	38.2	20151150	37.2	20151017	20151018	38.4	20151160	37.4	20151018	20151019	38.6	20151170	37.6	20151019		Min. 0,033 mm	0,15 mm
	0																						
	+		0.014 0.020		0.975 0.981		0.014 0.020		0.975 0.981			0.014 0.020		0.975 0.981			0.014 0.020		0.975 0.981		Max 0,045 mm	
75 cc	—	20851220-20851240	46.4	20851140	45.4	20851008	46.6	20851150	45.6	20851017	20851018	46.8	20851160	45.8	20851018	20851019	47.0	20851170	46.0	20851019		Min. 0,033 mm	0,15 mm
	0																						
	+		0.014 0.020		0.975 0.981		0.014 0.020		0.975 0.981			0.014 0.020		0.975 0.981			0.014 0.020		0.975 0.981		Max 0,045 mm	

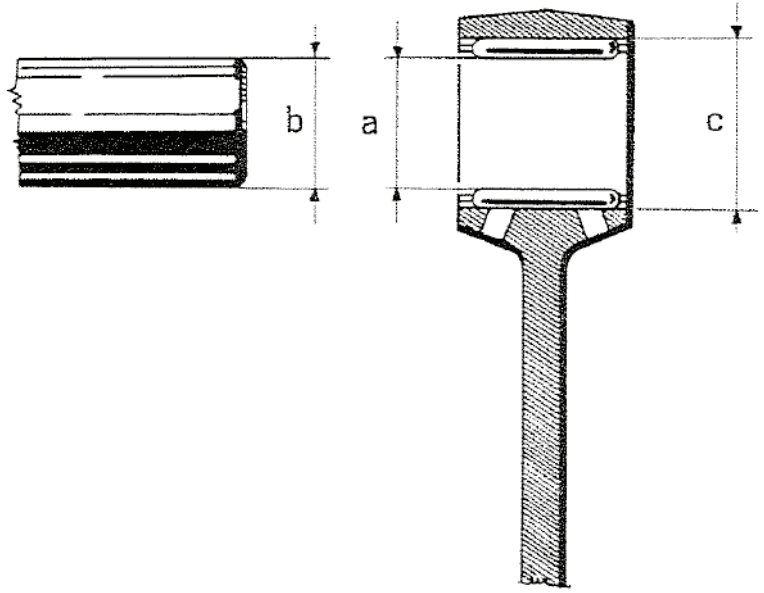
ASSEMBLY TOLERANCES AND WEAR LIMITS BETWEEN CRANKSHAFT AND CONNECTING ROD BIG END

Crank pin width a	Connecting rod width b	Play at fitting a - b		Wear limits a - b
		min.	max.	
mm.	mm.	mm.	mm.	mm.
$12\ ^{-0}_{+0.110}$	$11.9\ ^{-0.032}_{-0.075}$	0.132	0.285	0.40



ASSEMBLY TOLERANCES AND WEAR LIMITS BETWEEN GUDGEON PIN AND SMALL END BUSH

Small end bush c	Gudgeon pin b	Play at fitting a - b		Wear limit a - b
		Minimum	Maximum	
mm.	mm.	mm.	mm.	mm.
$16^{+0.008}_{+0.015}$	$12^{-0.003}_{+0.002}$	0.006	0.021	0.050



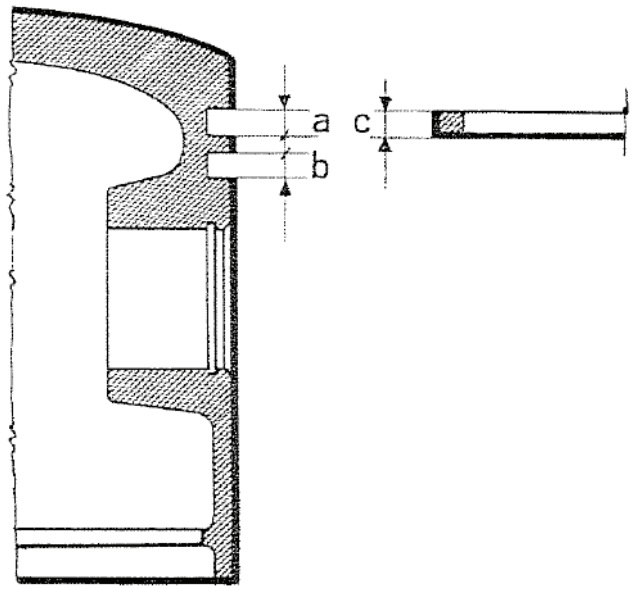
a = internal needle cage diameter

b = gudgeon pin diameter

c = small end diameter

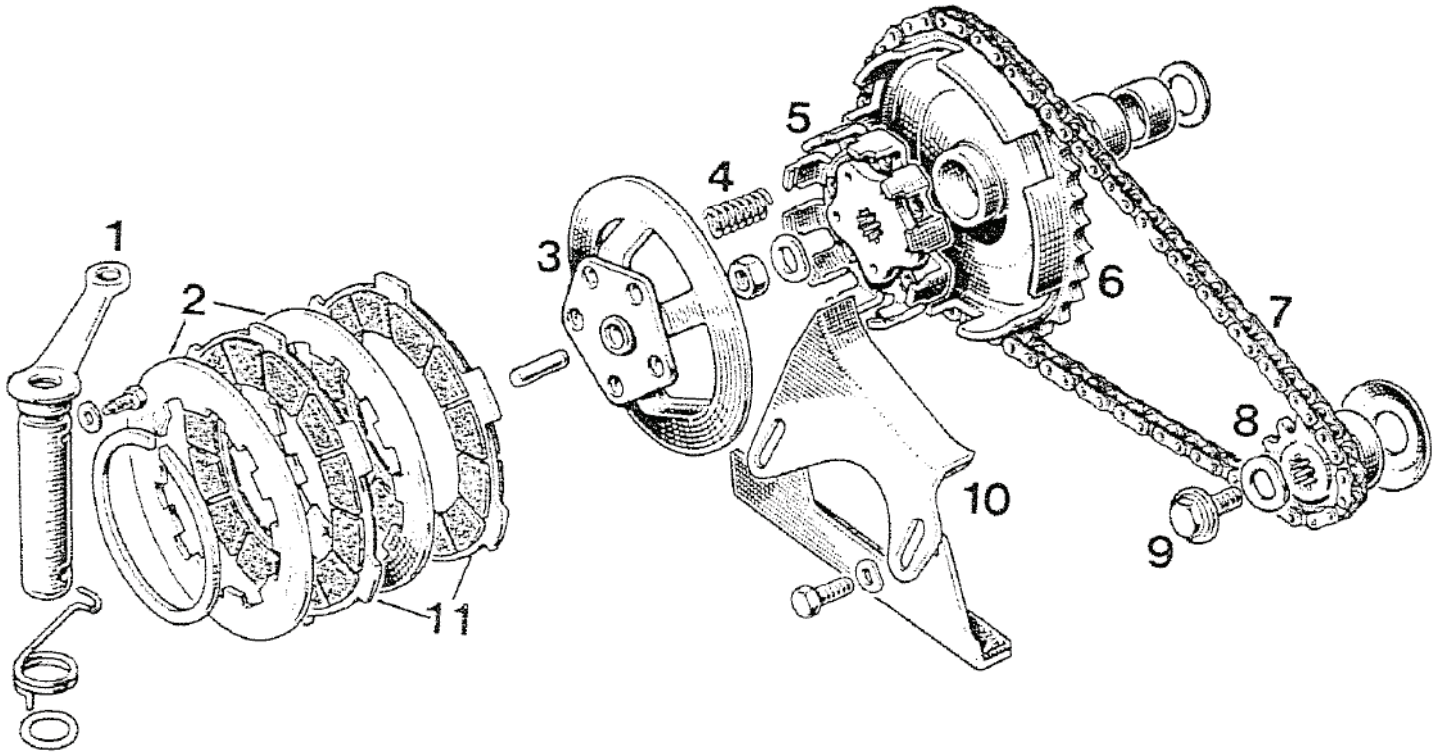
ASSEMBLY AXIAL PLAY AND WEAR LIMITS BETWEEN PISTON RING GROOVE AND RINGS

Height of superior groove a	Height of inferior groove b	Height of ring c	Play at fitting a - c		Play at fitting b - c		Wear limits b - c a - c
			Minimum	Maximum	Minimum	Maximum	
mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
2 + 0.075 / + 0.095	2 + 0.055 / + 0.075	2 — 0.01 / — 0.022	0.085	0.117	0.065	0.097	0.2



CLUTCH AND TRANSMISSION

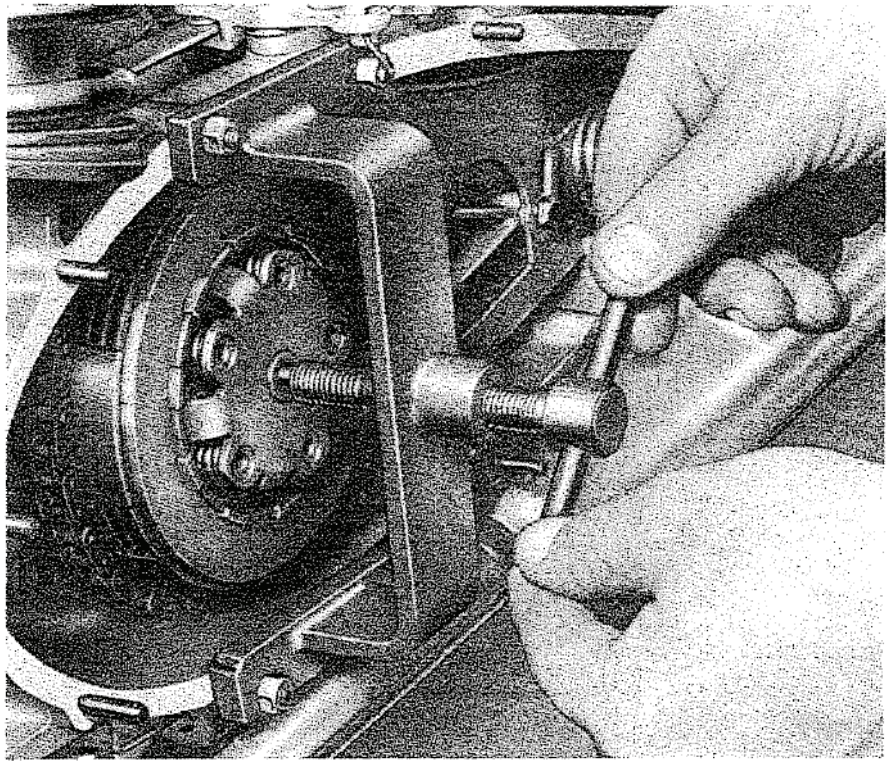
The LUNA clutch consists of five plates in an oil bath. The two driving plates are lined with a friction material and two driven plates are plain steel. The fifth plate also acts as the pressure plate and incorporates a flange operating against the inner bell via five springs. Assembly is maintained by a large circlip retaining the thicker of the two driven plates in the inner bell. The VEGA and CO-META have two extra plates, one driving and one driven. Operation is by cable from the handlebar lever to the lever on the crankcase cover.
The external bell is driven by the transmission chain from the crankshaft sprocket.
The upper chain guide is adjustable to compensate for elongation of the chain.



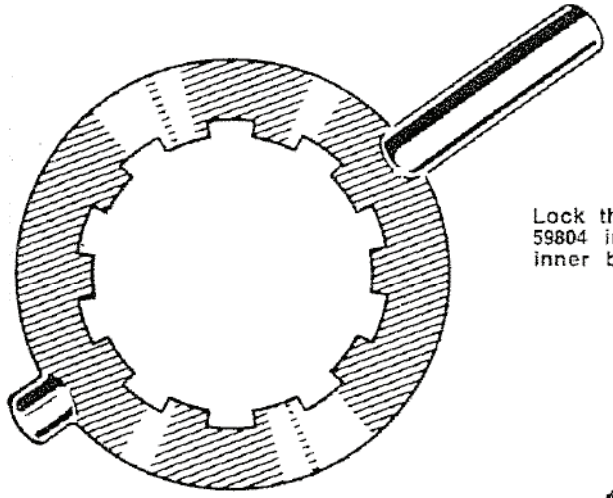
1. Operating lever - 2. Driving plates - 3. Flange - 4. Springs (5) - 5. Inner bell - 6. Outer bell - 7. Transmission chain - 8. Sprocket splined to the crankshaft - 9. Sprocket securing bolt - 10. Chain guides - 11. Driven plates.

DISMANTLING AND REASSEMBLY

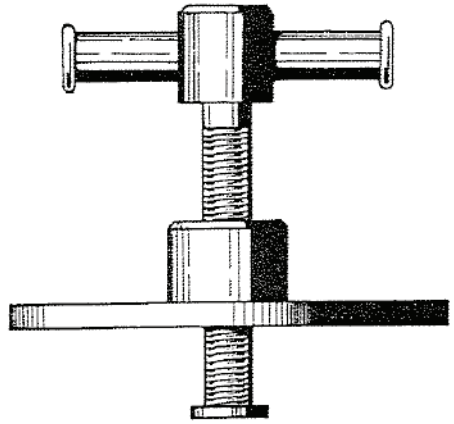
When dismantling and reassembling the clutch note that it is not necessary to remove the silencer of the LUNA. The tailpipe securing nut should be removed and the tailpipe bracket moved out of the way.
Detach the clutch cable from the external lever and remove the crankcase cover nuts, and washers. Take off the cover being careful not to lose the pressure pin which may drop out if the cover is inverted.
Use tool 70643 which is in the illustration in order to compress the clutch to facilitate removal of the circlip.
Whilst dismantling check that the plates are not distorted and fit freely in the clutch bells.
Lock the inner and outer bells with tool 59804 in order to slacken the securing nut on the main gear shaft.



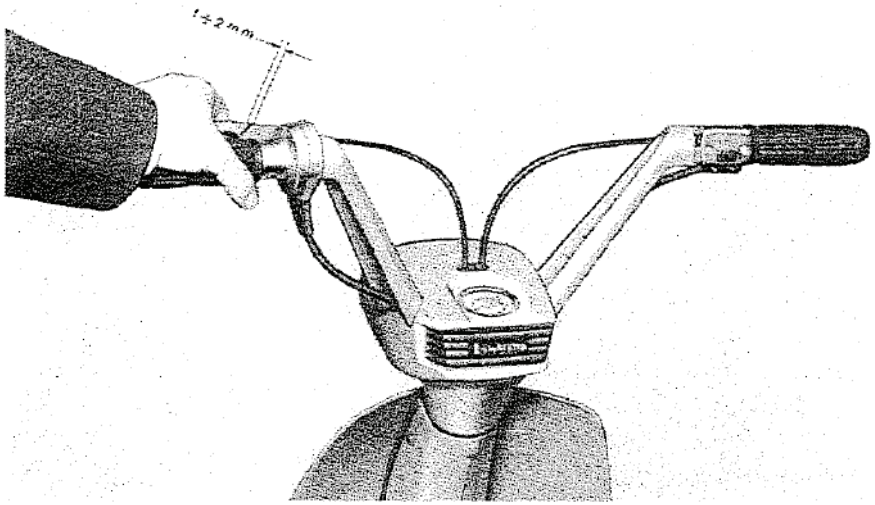
Positioning tool 70643 for clutch plates disassembly.



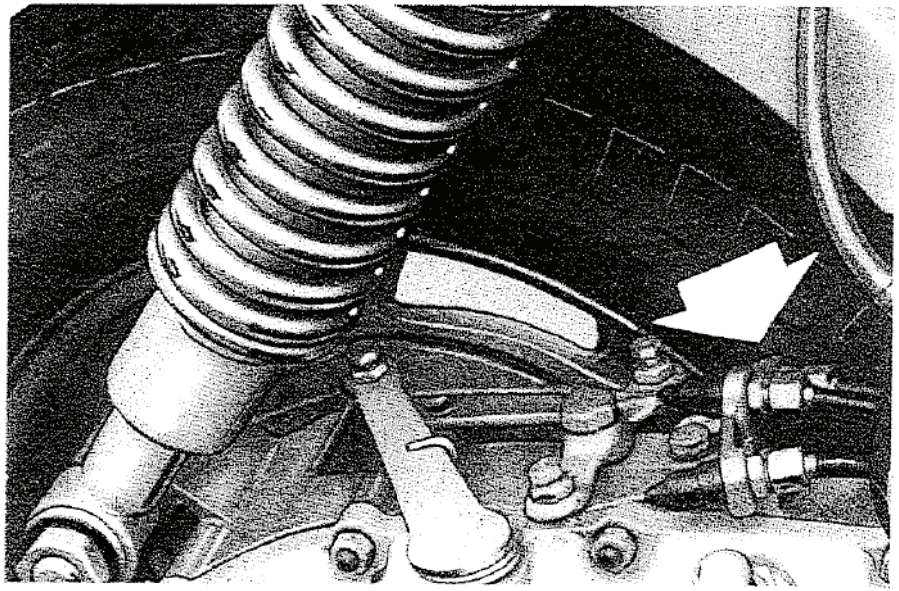
Lock the clutch bell with tool 59804 in order to remove the inner bell nut.



Remove the inner clutch bell with extractor 59328.



Checking the free travel of the clutch lever.

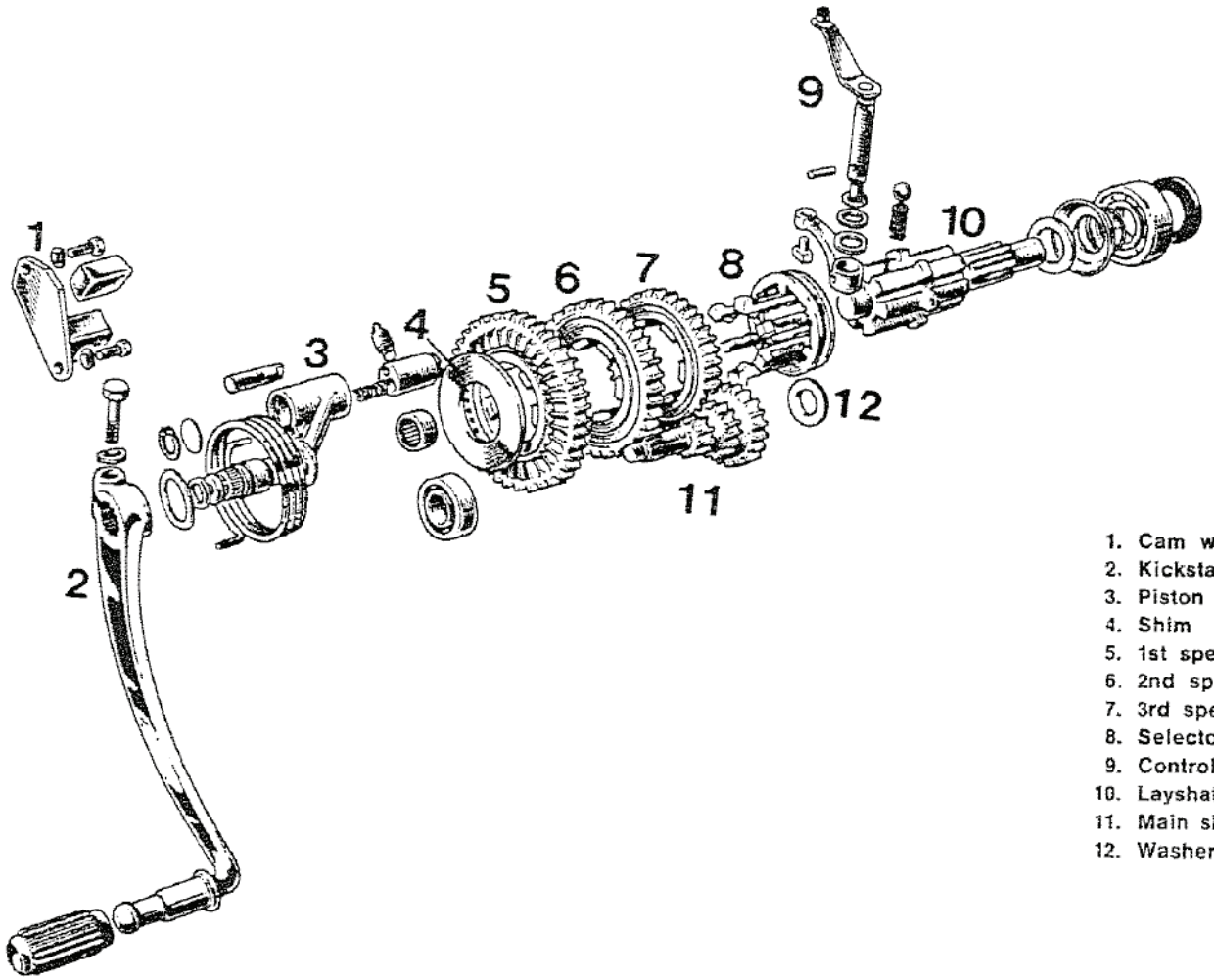


Clutch control cable adjustment.

Adjustment

To adjust the clutch operation the cable adjuster in the illustration must be unscrewed until there is approx. 1 - 2 mm free play on the handlebar lever. When the adjustment is correct retighten the lock-nut on the adjuster screw.

GEAR CHANGE GROUP - Lambretta LUNA



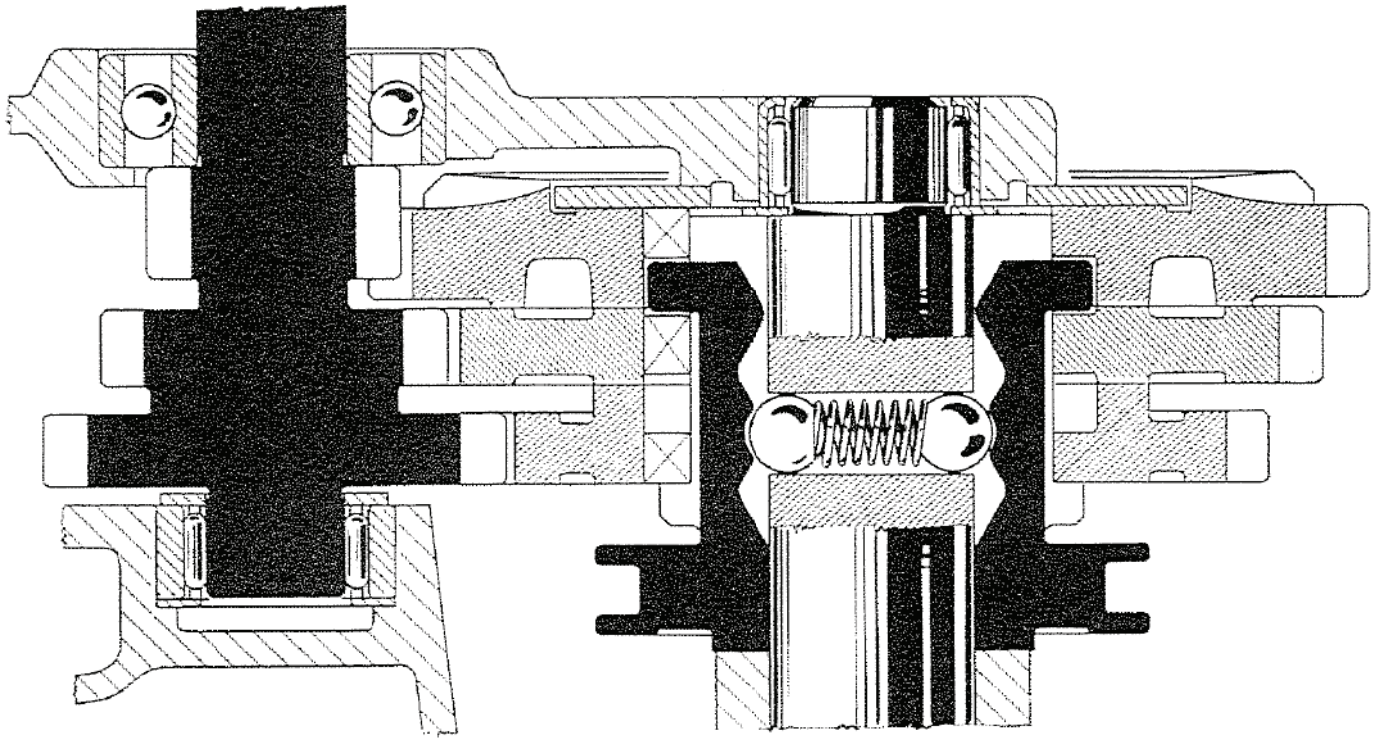
1. Cam with rubber buffer
2. Kickstart pedal
3. Piston
4. Shim
5. 1st speed gear
6. 2nd speed gear
7. 3rd speed gear
8. Selector sleeve
9. Control lever
10. Layshaft
11. Main shaft
12. Washer

GEARBOX

Description

The three-speed gearbox has constant mesh gears alternatively engaged with the rear axle (layshaft) by means of the selector sleeve.

Operation is by double cable from the left-hand twistgrip. On the outer face of the first gear are ratchet teeth which engage with the kicstart shaft piston.



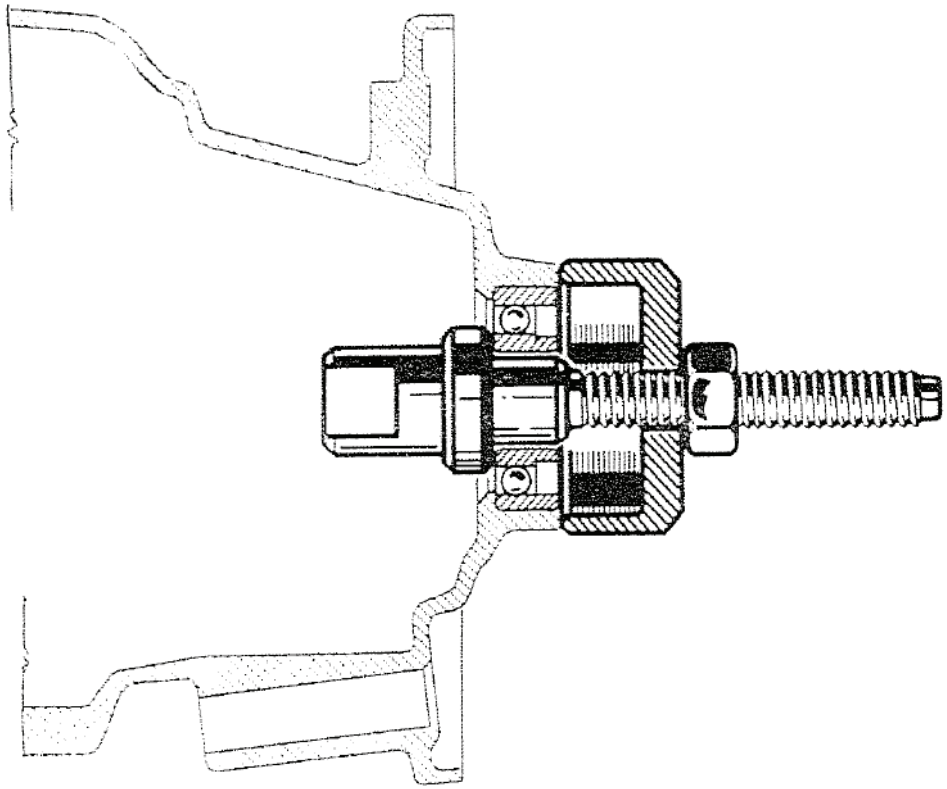
GEAR CHANGE LAMBRETTA LUNA

1. Main Shaft - 2. Ball bearing - 3. Washer - 4. Bush - 5. Needle cage - 6. Needle bearing - 7. Gearbox flange - 8. Washer - 9. 1st speed gear - 10. 2nd speed gear - 11. 3rd speed gear - 12. Selector sleeve - 13. Layshaft.

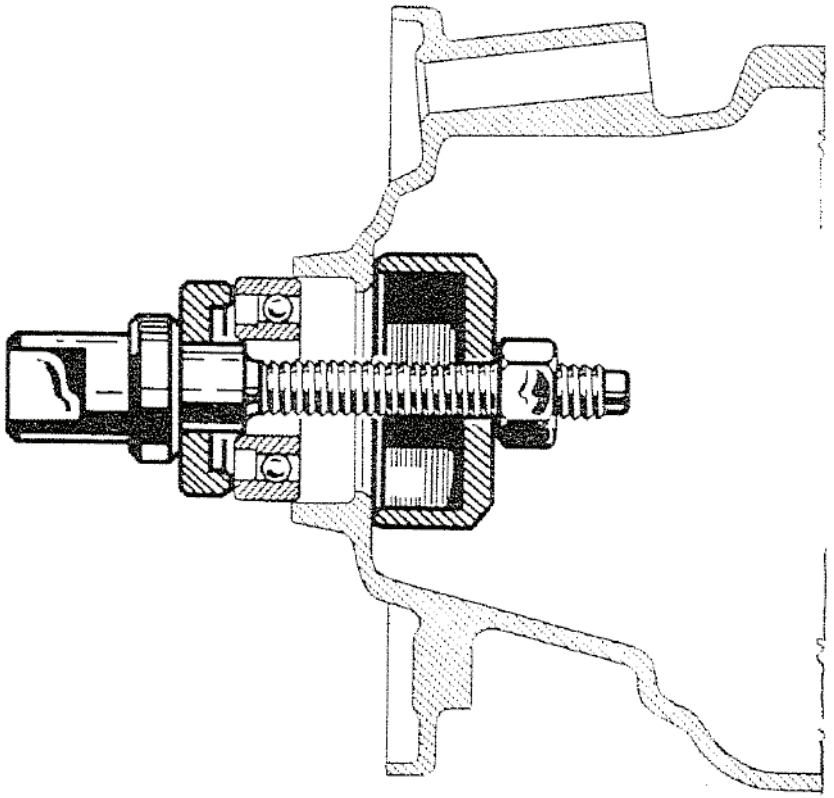
Dismantling and reassembly

To reach the gearbox first remove the crankcase cover, clutch complete and gearbox flange securing nuts.
The flange is removed by careful leverage with a screwdriver against the crankcase and occasionally tapping the main gear shaft through the outer ball bearing with a copper hammer.

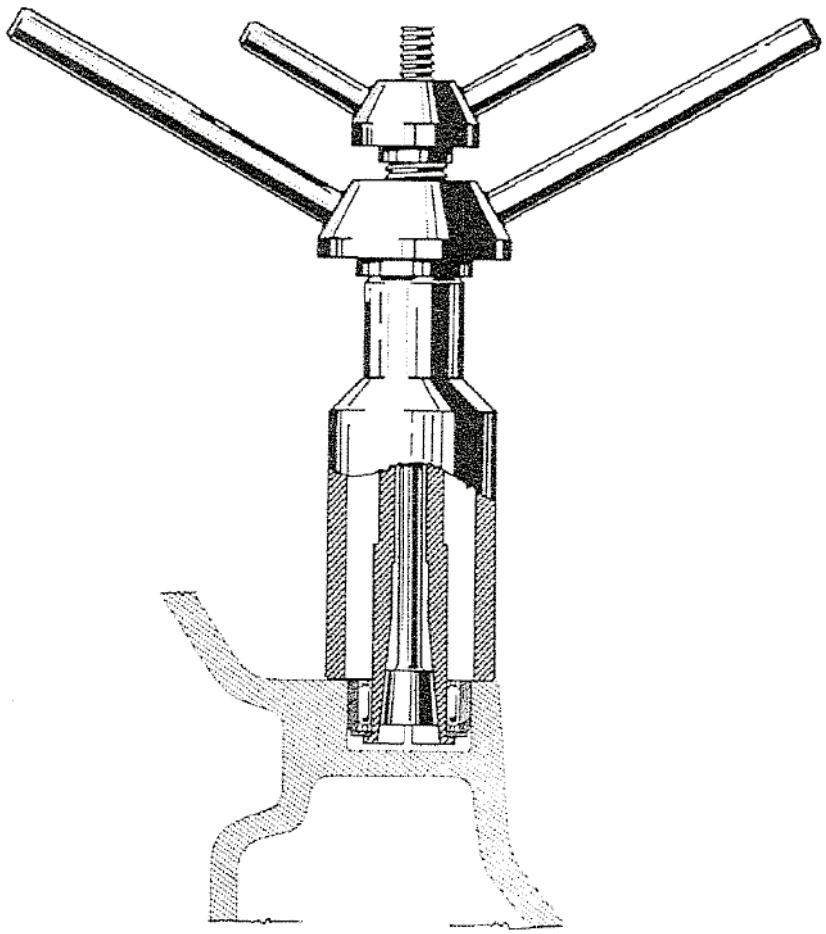
Remove the rear hub nut and pull the hub off the layshaft.
Tap the layshaft carefully through the layshaft bearing.
Slide the selector sleeve from the layshaft taking care not to lose the two balls and spring.
The layshaft bearing can be removed and refitted using tool N. 70651.
Remove the outer bearing track of the main shaft bearing from the crankcase using tool N. 70653.



Removing the layshaft ball bearing with tool 70651.



Fitting the layshaft ball bearing with tool 70651.



Removing the main shaft bearing sleeve with extractor 70653.

When the gearbox is reassembled check that the gears are positioned as follows:

— the 3rd speed gear must have the boss towards the clutch

— the 2nd speed gear must have the Innocenti symbol 'j' towards the clutch

— the 1st speed gear must have the kickstart ratchet teeth towards the clutch

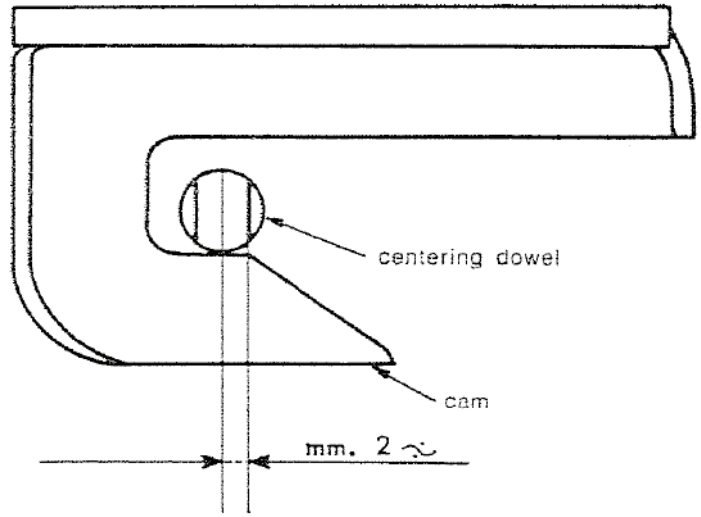
The end float between the 1st speed gear shim and the face of the needle bearing outer track in the gearbox flange must be between 0.10 and 0.25 mm measured with a feeler gauge.
Shims of four thicknesses 1.6, 1.8, 2.0 and 2.2 mm are available in order to bring the end float between these limits.

Adjustment of the crankshaft piston/cam group

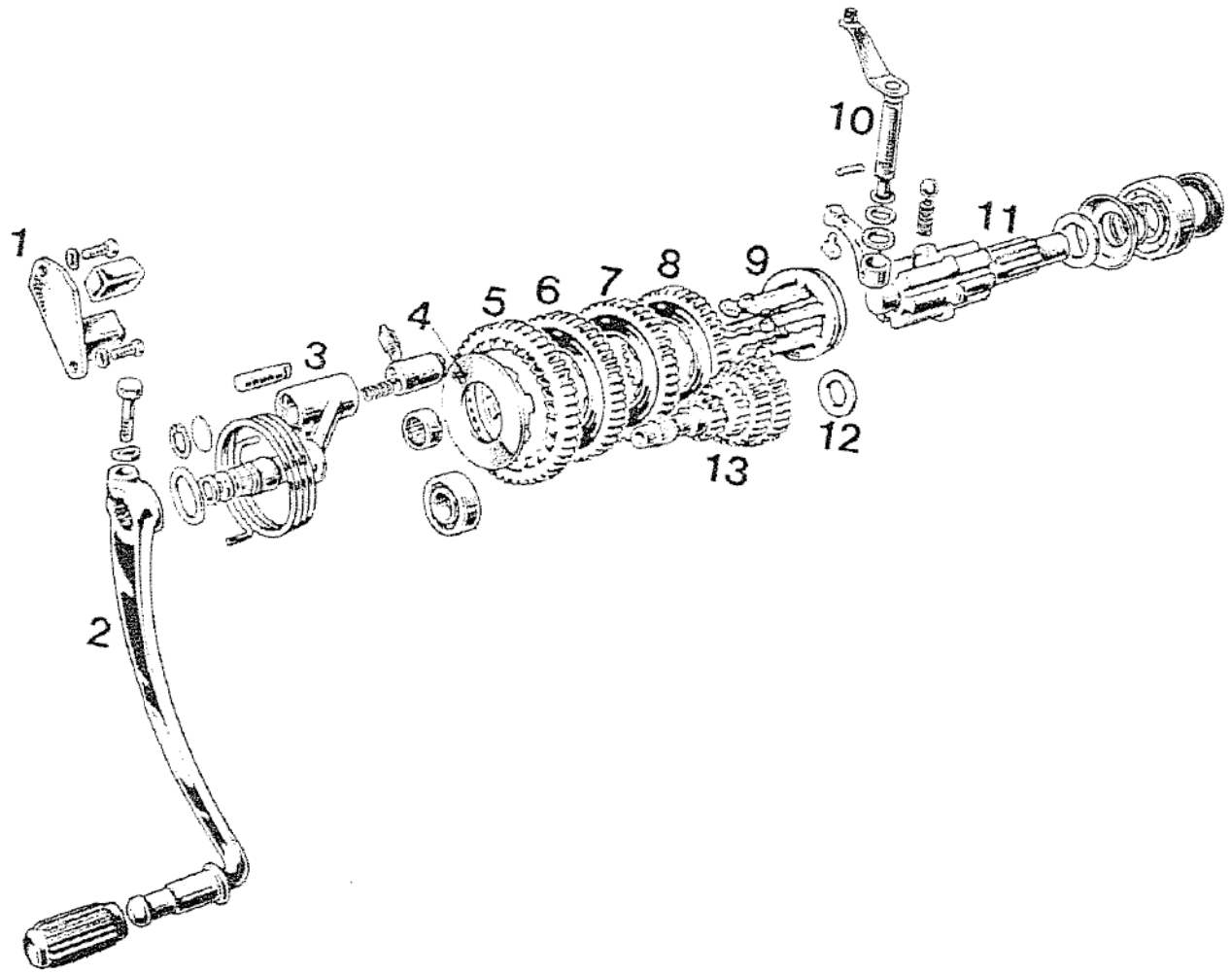
It is advisable to check the regular operation of the starter group, before proceeding to the crankcase cover assembly. To ensure its efficiency, control that, in the rest position, the contact between the centering dowel and the cam are regulated as shown an the figure.

Moreover, in this position, the piston toothing top must be at the same level of the kickstarter shaft hub, and it must be possible to press the piston in its housing of at least 1 mm.

If necessary, adjust the cam by unscrewing the screws which fix it to the crankcase cover. Adjust it until you will realize the above mentioned conditions. Then lock to the bottom the fixing screws.



GEAR CHANGE GROUP - LAMBRETTA VEGA - COMETA



1. Cam with rubber buffer - 2. Kickstart pedal - 3. Piston - 4. Shim - 5. 1st speed gear - 6. 2nd speed gear - 7. 3rd speed gear - 8. 4th speed gear - 9. Selector sleeve - 10. Control lever - 11. Layshaft - 12. Washer - 13. Main shaft.

GEARBOX LAMBRETTA VEGA-COMETA

The gearbox of the Lambretta 75 cc models is similar in operation to that of the LUNA but has 4 speeds instead of 3.

Accordingly the gears must be positioned as follows on the layshaft:

— the 4th speed gear must have the boss towards the clutch

— the 3rd speed gear must have the boss towards the clutch

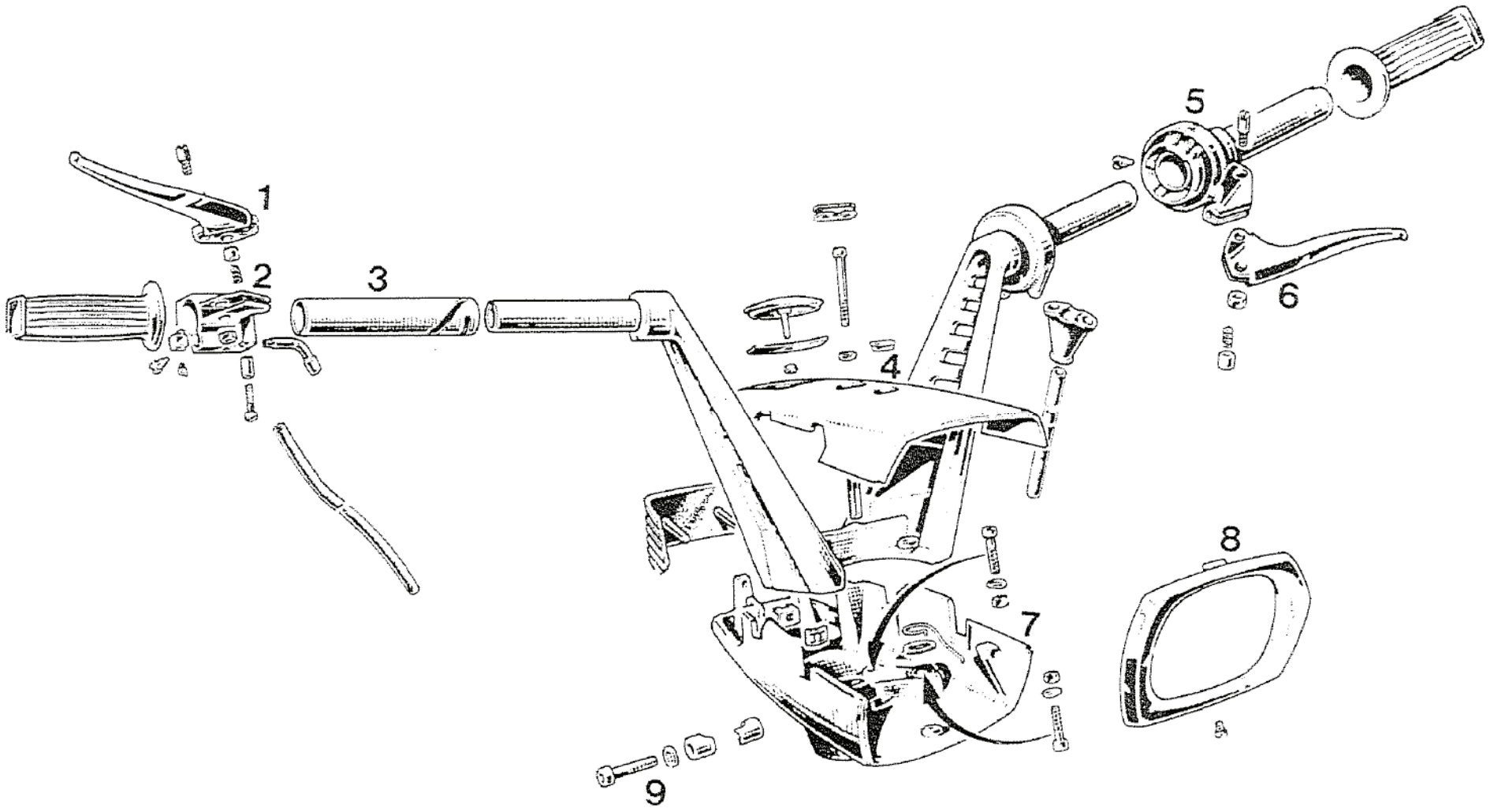
— the 2nd speed gear must have the boss towards the wheel

— the 1st speed gear must have the kickstart ratchet teeth towards the clutch.

Failure to position the gears in this way will lead to breakage of the teeth when the gearbox is used with the engine running.

Apart from the above all the instructions for the 3-speed gearbox apply.

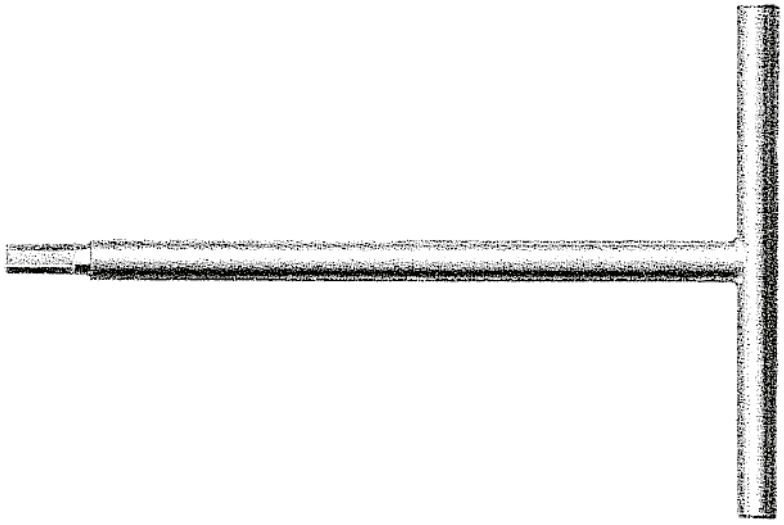
STEERING



1. Front brake lever - 2. Brake lever support - 3. Throttle control pin - 4. Upper cap - 5. Change control pin with support for clutch lever - 6. Clutch lever - 7. Lower part of handlebar - 8. Headlamp rim - 9. Screw fixing the handlebar to fork.

STEERING, CONTROLS AND SUSPENSION

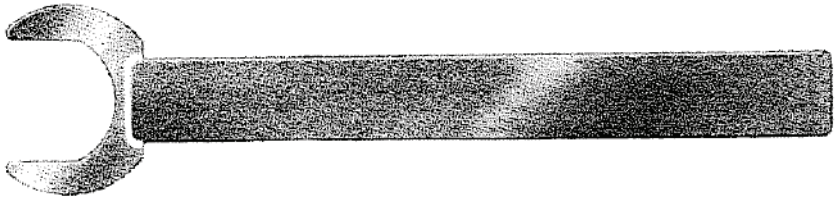
The steering consists of the forks with legs in pressed steel and tubular steel column and light alloy handlebars. Die-cast light alloy upper and lower headlamp shells are fitted to the handlebar and the ligth switch mounted near the throttle twistgrip. The gear-change control takes the form of a twist grip on the left hand side of the handlebar, opposite the throttle control.
The fork column is mounted in the frame by two ball races acting on frame cups and fork cones.
The handlebar is fixed to the fork column by means of a clamp locked by an allen screw.



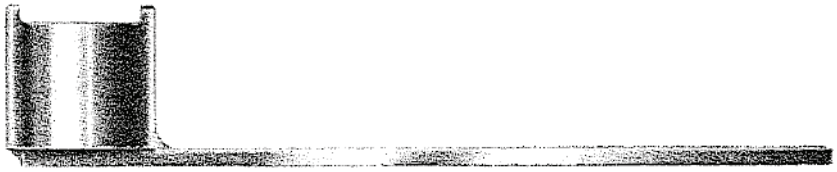
Tool 77224 for clamp screw.

STEERING ADJUSTMENT

Two lock nuts at the top of the column control the steering race adjustment.
To gain access to the races, first remove the handlebar clamp bolt with tool 77224 and lift the handlebar from the forks. Spanner 80845 is used on the upper lock nut and spanner 80847 on the lower, the cone not being threaded.



Tool 80845 for locking nut.



Tool 80847 for steering adjustment.

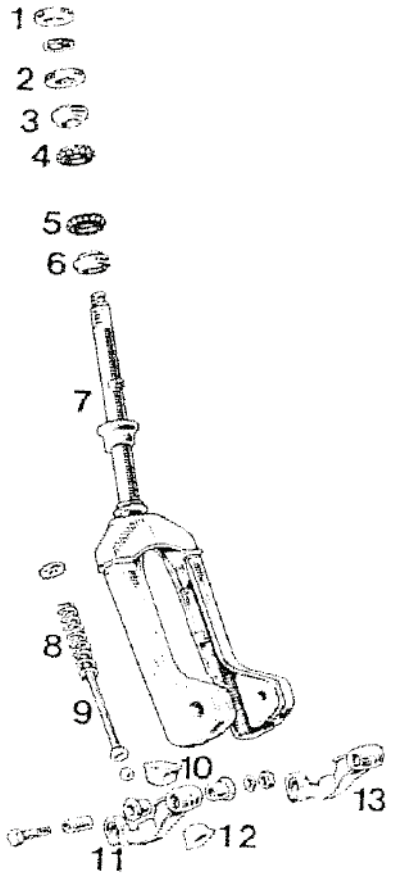
DISMANTLING AND REASSEMBLY

To take off the forks remove the handlebar, front wheel and steering race lock nuts.
To remove the fork links, compress the springs and remove the lower buffer. Remove the ball bearing from the push-rod cup and take out the pivot bolt. The link can now be pulled clear and the push-rod, spring and upper buffers removed.
Use tool 79807 to fit the steering race cups into the frame.

Tool 79807 for mounting steering race cups.

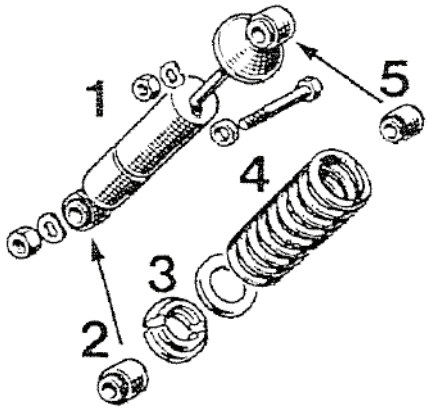
SUSPENSION

The front suspension consists of trailing links and helical springs in the fork legs. The front wheel is fitted in the links and the brake back-plate located by a peg on the offside link which fits into a slot in the back plate to prevent rotation.



1. Steering lock nut - 2. Steering lock nut - 3. Upper cup - 4. Upper race - 5. Lower race - 6. Lower cup - 7. Forks - 8. Spring (fitted in fork legs) - 9. Push rod - 10. Upper buffer - 11. Righthand link with locating pin for wheel - 12. Lower Buffer - 13. Left-hand link.

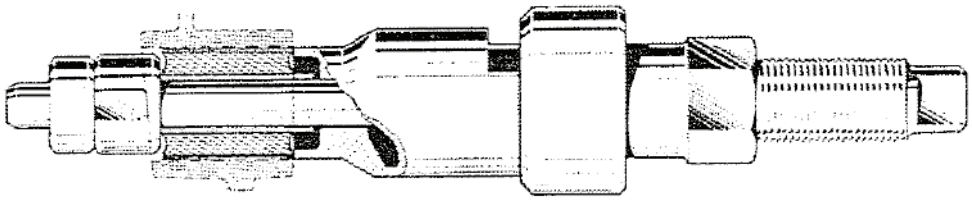
The rear suspension is formed by the engine unit pivotting at the front end and controlled by a hydraulic shock absorber/helical spring unit at the rear.



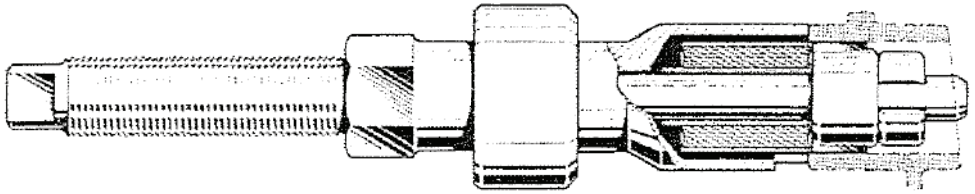
1. Telescopic shock absorber - 2. Lower silentblock - 3. Retaining half caps - 4. Spring - 5. Upper silentblock.

ENGINE SILENTBLOCKS

Use tool N. 76891 as shown in the illustrations to remove and replace the silentblocks in the crankcase lugs.



Using tool N. 76891 to fit the silentblocks.



Using tool N. 76891 to remove the silentblock.

ANTI-THEFT STEERING LOCK

To reach the steering lock remove the handlebar and the inner legshield cover.

The steering lock is supplied as a spare part complete with a plate to be used as packing between the rear part of the lock and the bracket on the frame.

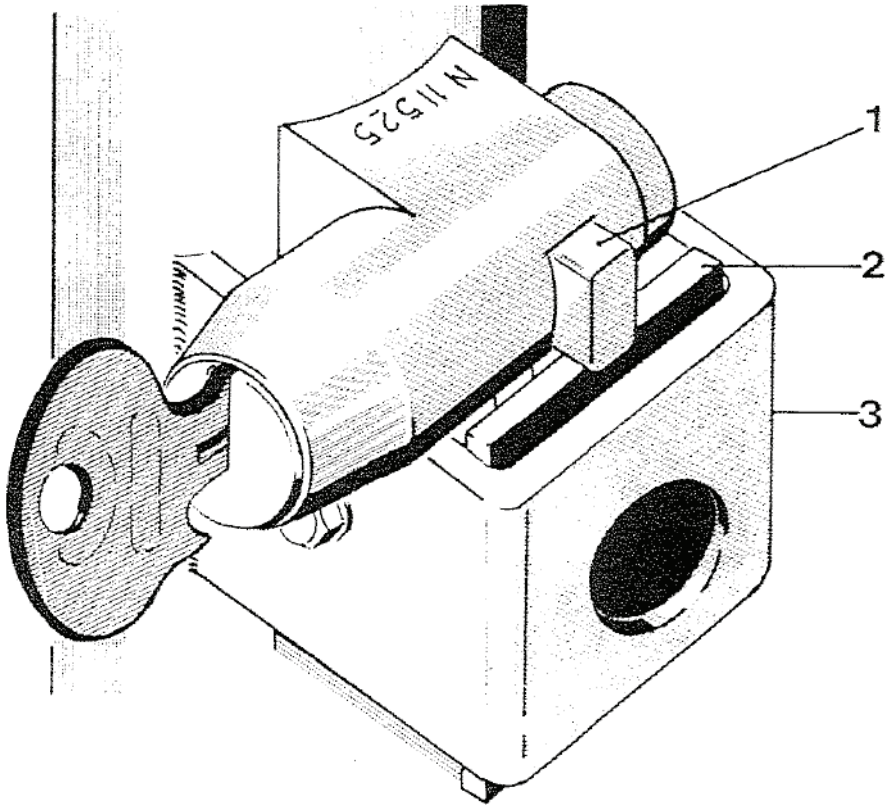
Assemble as follows:

— Turn the key so that the lock is in the unlocked position.

— Place the plate under the latch-piece on the flat side of the lock and fit the assembly to its mounting bracket with a gentle tap on the upper surface.

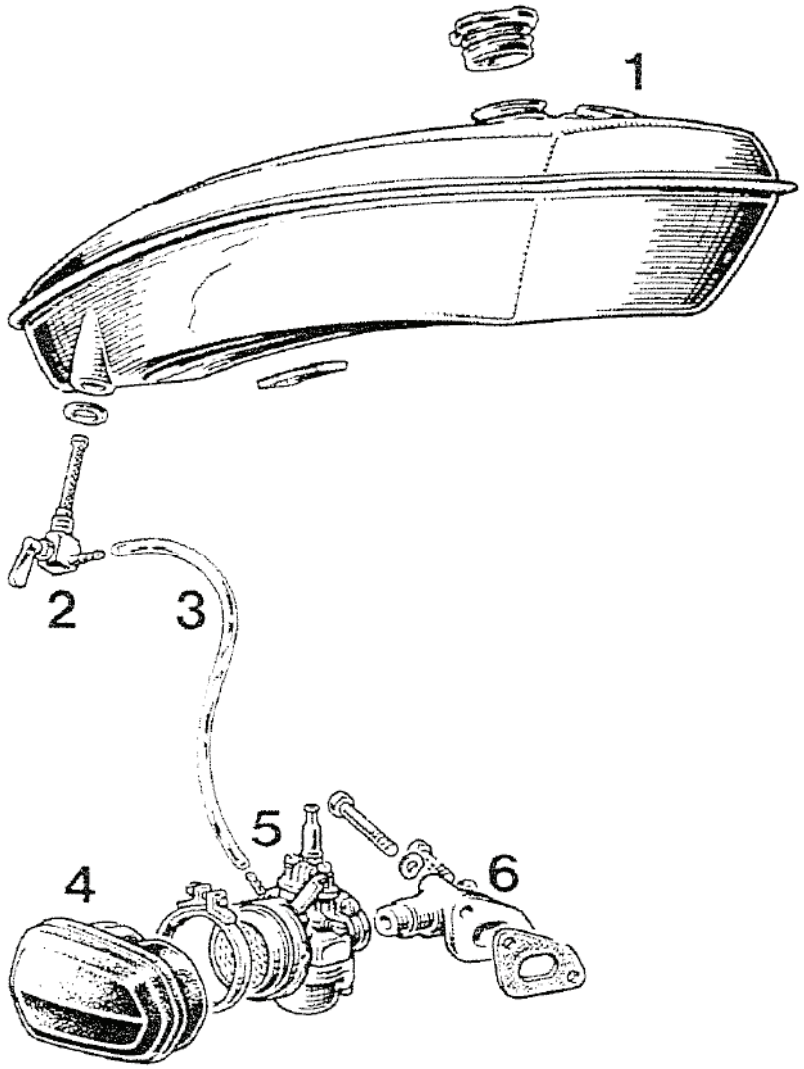
— Secure the lock using the special bolt.

— Refit the inner legshield cover and handlebar.



1. Latch-piece
2. Plate
3. Bracket on the frame

FUEL SYSTEM - LAMBRETTA LUNA - VEGA



1. Petrol tank - 2. Petrol tap with filter - 3. Connecting tube - 4. Air filter (LUNA) - 5. Carburettor (LUNA) - 6. Inlet pipe (LUNA).

FUEL SYSTEM

The tank is fitted by the two screws which secure the seat. The petrol filler cap is a push-fit in the tank and incorporates a vent.

Petrol feeds the carburettor by gravity-flow through a plastic pipe. The petrol tap includes a filter and has three positions Open, Closed and Reserve. The air filter is mounted on the carburettor air intake.

The DELLORTO carburettor is of the SHA 14-12 type for the LUNA and SH 1/20 type for the VEGA-COMETA.

The starter control on the LUNA automatically returns when the throttle opens fully but that of the VEGA-COMETA must be returned by hand.

Refer to the chapter on "General features" for data relating to the carburettor settings.

CARBURETTOR MAINTENANCE

To retain the carburettor in perfect condition always keep it clean. If it is suspected of a fault it should be dismantled and all component parts washed in petrol.

Particular care should be given to the jets, atomiser, throttle slide and the ducts in the carburettor body.

Before reassembly check the following:

— the throttle slide runs smoothly without excessive play, if it is worn it should be replaced.

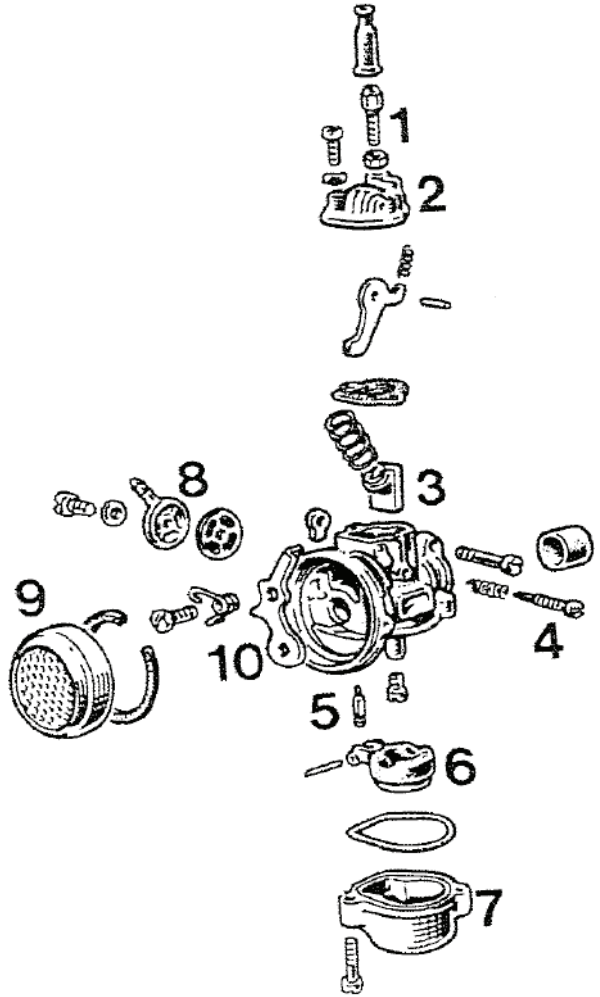
— the float is not deformed or leaking and moves freely on its pivot pin.

Check also that the rubber tip of the float needle does not have any grooves or circular incisions.
When completely dismantling the carburettor it is advisable to replace all gaskets.

AIR FILTER

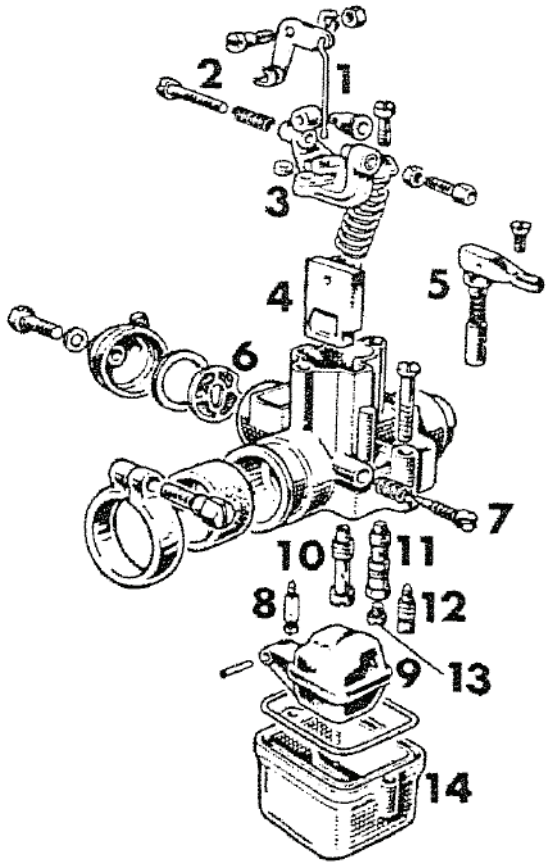
The air filter (wire mesh type) is housed in the suction box, on the carburettor.
The filter must be cleaned frequently (every 4,000 Km).

CARBURETTOR PARTS (LUNA)



1. Throttle adjustment screw - 2. Carburettor cover - 3. Throttle - 4. Idling screw - 5. Needle rubber - 6. Float - 7. Float chamber - Petroli filter - Air filter.

CARBURETTOR PARTS (VEGA-COMETA)



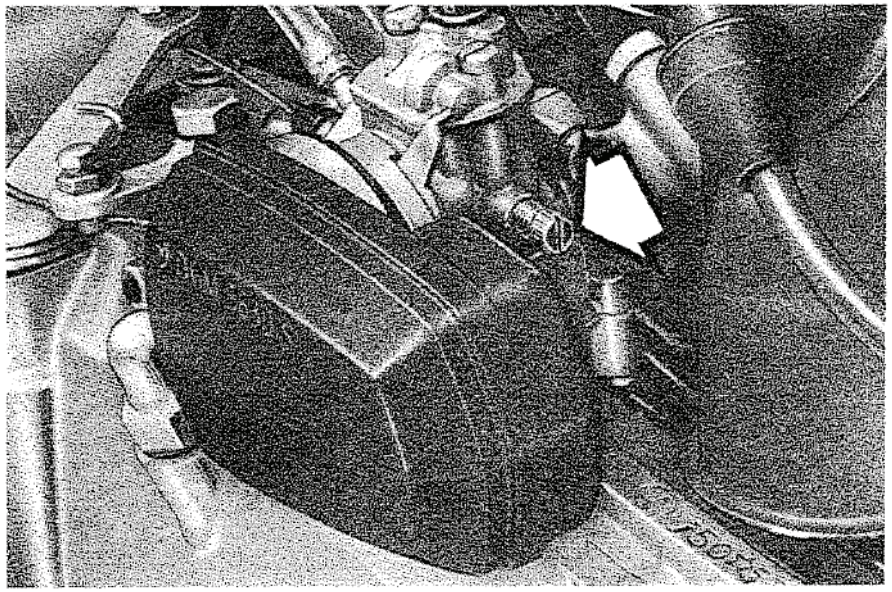
1. Throttle control lever - 2. Throttle adjusting screw - 3. Carburettor cover - 4. Throttle - 5. Starter control - 6. Fuel filter - 7. Idle adjustment screw - 8. Needle rubber - 9. Float - 10. Starter jet - 11. Choke - 12. Idling jet - 13. Max. jet - 14. Float chamber.

CARBURETTOR ADJUSTMENT (LUNA)

Only one adjusting screw is fitted to the LUNA carburettor and two on the VEGA-COMETA.

Set the idle, so that the engine runs smoothly without 'hunting' or lumpiness.

If the engine runs erratically when idling check that the carburettor is fitted properly to the inlet manifold and the clamp bolt is tight. If the carburettor is loose an air leak may occur.

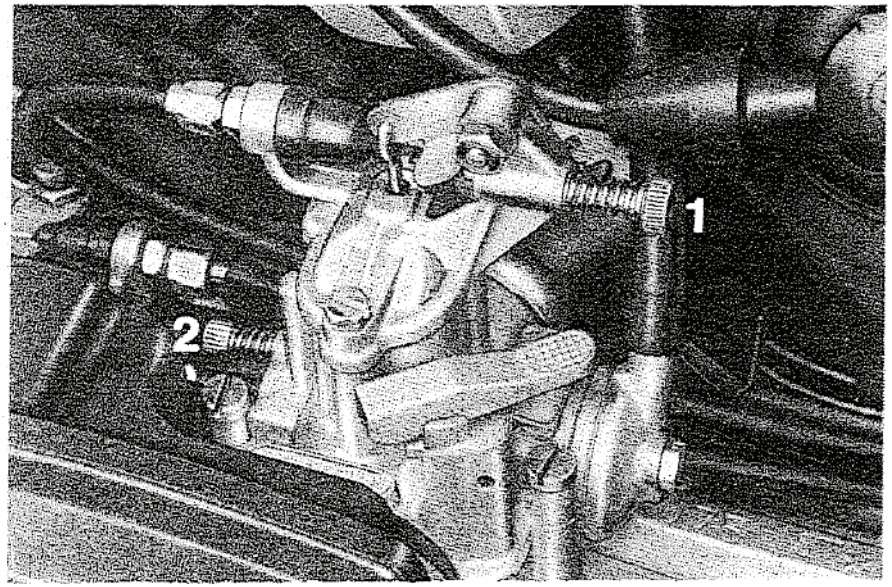


Idling screw

CARBURETTOR ADJUSTMENT (VEGA-COMETA)

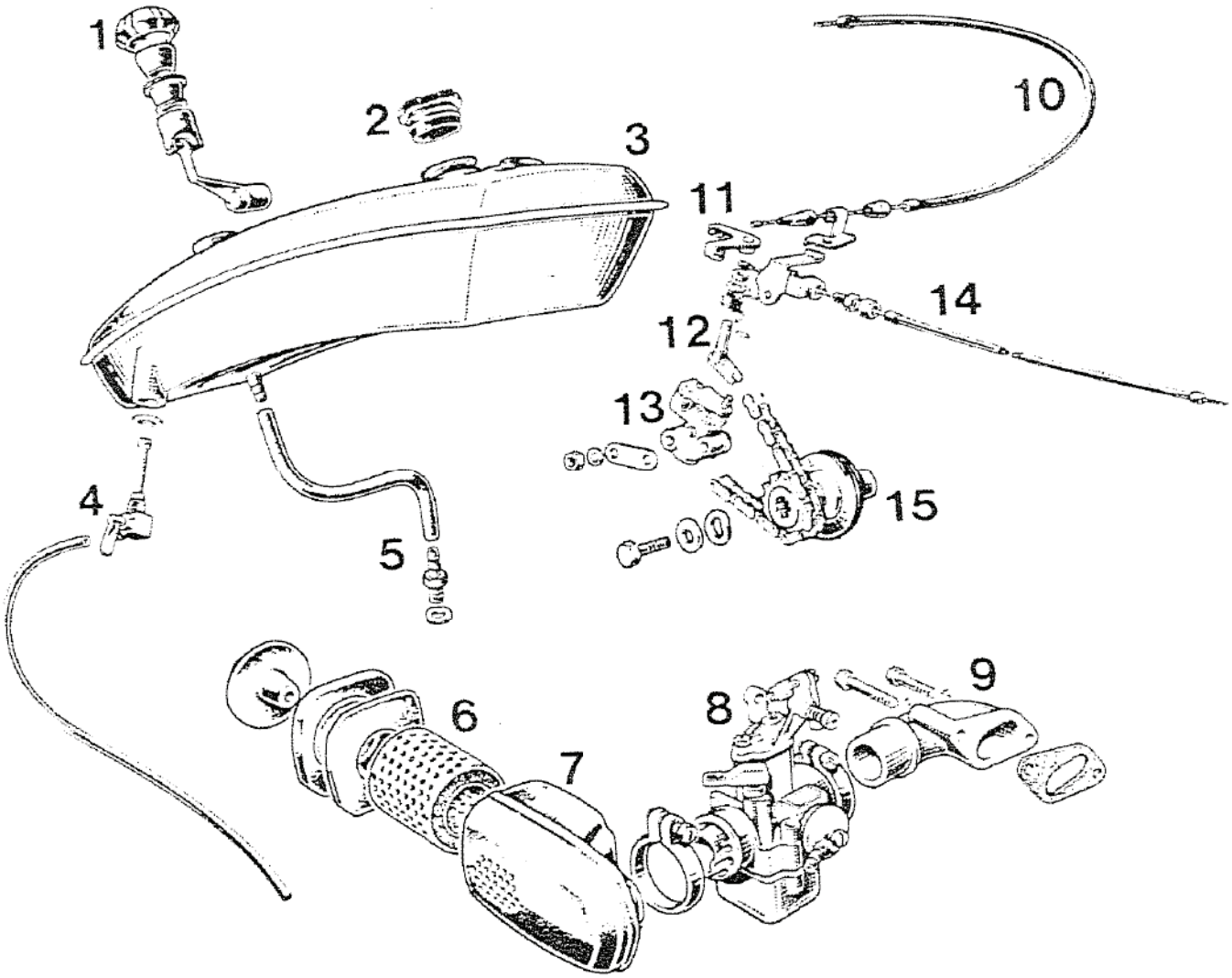
The idle adjustment must be carried out only with the engine at its normal running temperature.

1) Check that the carburettor is fitted vertically and the clamp bolt is tight.
2) Turn the throttle adjusting screw until a fast idle is obtained.
3) Turn the idle adjustment screw (screw in to weaken. out to richen) until the engine is running smoothly and consistently.
4) Unscrew the throttle adjusting screw until the desired idling speed is obtained



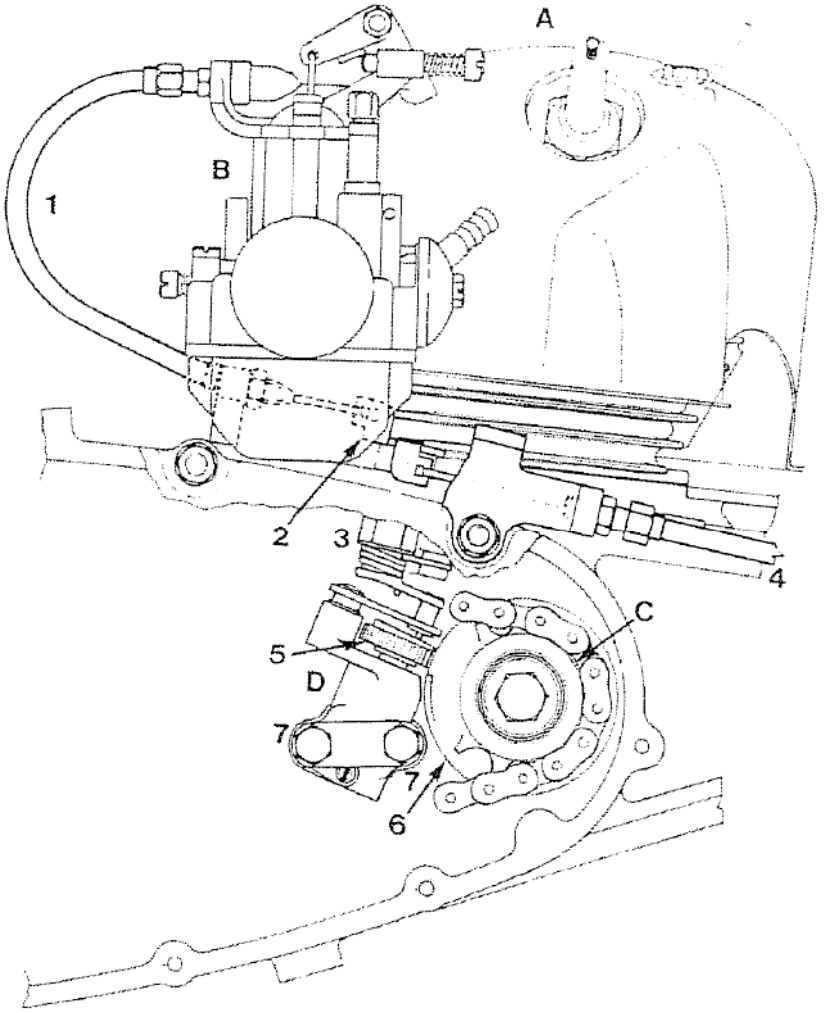
1. Throttle adjustment screw - 2. Idling adjustment screw.

FUEL SYSTEM - LAMBRETTA COMETA



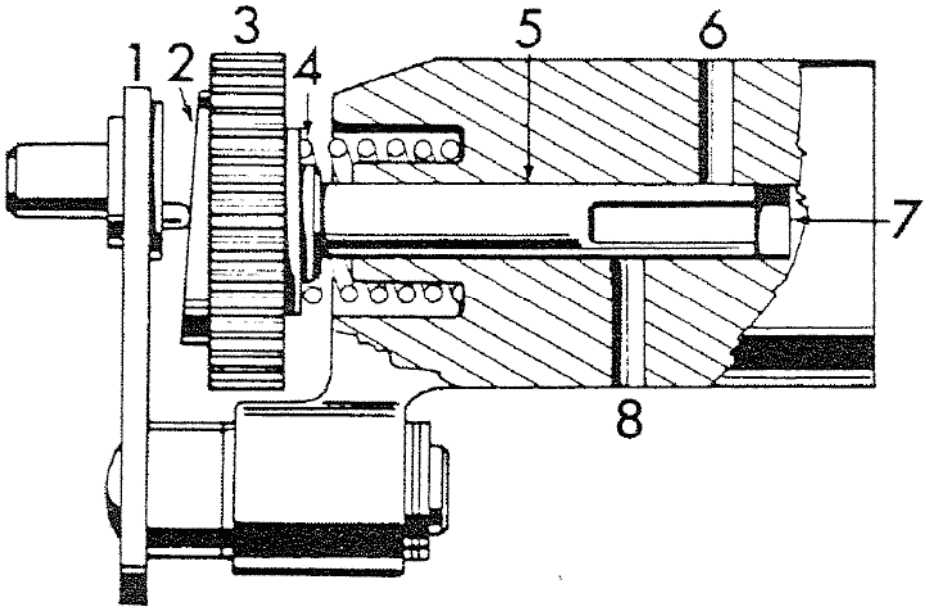
1. Oil cap with level indicator - 2. Petrol cap - 3. Tank - 4. Petrol tap with filter - 5. Connecting tube - 6. Wire mesh air filter - 7. Air filter box - 8. Carburettor - 9. Inlet pipe - 10. Cable connecting pump lever to throttle - 11. Throttle cables connecting lever - 12. Shaft for pin control - 13. Lubematic oil pump - 14. Cable connecting pump to throttle twistgrip - 15. Crankshaft pinion with gear for pump control.

LUBEMATIC SYSTEM



A. Cylinder group - B. Carburettor - C. Pinion and transmission chain - D. oil pump - 1. Cable connecting pump to carburettor throttle - 2. Throttle cables connecting lever - 3. Shaft for pin control - 4. Cable connnecting the pump to the throttle twistgrip - 5. Gear for pump piston control - 6. Gear keyed on the crankshaft for pump control - 7. Screw fixing the pump to the crankcase.

LUBEMATIC PUMP



1. Lever with pin - 2. Rotating inclined plate - 3. Piston control gear - 4. Spring - 5. Piston - 6. Oil delivery duct - 7. Pump cylinder chamber - 8. Oil suction duct.

AUTOMATIC "LUBEMATIC" INJECTION SYSTEM

The new automatic injection system introduced on the Lambretta COMETA, completely supersedes the old petrol/oil mixture method of lubrication, thus allowing the use of whatsoever type of gasoline for the feed of the two-stroke engines.

Two separate tanks are foreseen on the Lambretta COMETA one of about 1 imp. gall. capacity, for the petrol and the other of 2 pints capacity for the oil Agip F1 2T, or oil specification SAE 40.

Both tanks are located under the saddle.

One oil refill is sufficient for about 9-10 petrol refills.

FUNCTIONING

The petrol follows the normal way, i.e. from the tank it reaches the carburettor and from this, through the manifold, it enters in the engine; the oil instead is sucked by the alternative pump and is conveyed through an internal duct directly to the cylinder inlet port.

The rotating motion of the piston is secured by the pump gear, to which it is connected.

The alternative motion of the piston is realized by means of a rotating inclined plate and of the pin controlled by the throttle. A spring between the pump body and the gear keeps the inclined plate pressed on the pin.

When the pin is in the ascending zone of the inclined plate, the pump effects the delivery when instead it passes in the descending zone the oil is sucked from the tank.

Every 45 turns of the crankshaft, the pump effects one turn and therefore one oil delivery, so that when the engine revs increase, the quantity of delivered oil grows automatically. Furthermore there is a device which permits, at the same number of revs, an increase or decrease of the quantity of oil pushed in a single stroke. This device is formed by the lever which connects the pump to the carburettor.

This lever changes, under the direct action of the throttle, the postion of the pin contact point on the rotating inclined plate.

When changing the pin position, by means of the throttle, the piston stroke varies and, consequently, the pump delivery varies also.

In this way a second automatic regulation of the delivery is obtained, depending upon the throttle position. In fact, to obtain a better lubrication, it is necessary to consider, besides the engine revs. number, also the power supplied by the latter and the cylinder temperature, conditions which are in fact controlled by the throttle. The power grows with the increase of the number of revs and also, at the same number of revs, with the increase of the cylinder filling.

The pump effects oil delivery from a minimum rate of 0.8 % up to a maximum rate of 2.7 %, which permits to go downhill with a closed throttle or to go uphill at a low number of revs and with a maximum torque. Consequently, better lubrication conditions respectively to the mixture lubrication method are secured.

INSTRUCTIONS FOR USE

1) **when starting the vehicle for the first time**

2) **after long season rest periods (during which the vehicle is not used)**

3) **after engine disassembly operation which may empty the lubrication ducts.**

Its is necessary to check the oil tank (eventually to fill

up the oil tank with two-stroke oil AGIP F1 2T or SAE 40 and to pour in the petrol tank 2 pints of petrol mixture, with 4 % of oil (1 : 25).

This is rendered necessary to allow the pump to fill the oil ducts, as its delivery is so small, that a few minutes are necessary so that the oil might reach the cylinder.

For points 2-3 it is necessary to completely drain the eventual old gasoline from the petrol tank before pouring in 2 pints of petroil mixture with 4 % of oil.

Let the engine run for at least 10 minutes, **with periodical accelerations,** then complete the petrol tank filling by adding gasoline only.

The oil tank is supplied with a level indicator, which red mark appears under the transparent cap of the oil tank, when the oil level is at the minimum.

A further control for checking that there is oil in the tank and that it freely reaches the pump, is possible through the tube connecting the tank to the pump. To this effect, this tube is made of transparent material.

Obviously the lubrification efficiency does not depend of the quantity of oil in the tank. It is sufficient that the oil be present in the tank even in minimum quantity.

In any case, we do not advise to run habitually with the oil level at the minimum.

NOTE FOR THE REPAIR SHOPS

Normally it is not necessary to regulate or to control the LUBEMATIC system. The pump has not a fixed keying respectively to the crankshaft. Therefore, it must be remounted without any timing operation.

Consider that the pump calibration (also as a spare part) is done in the factory. During disassembly or replacement of the pump, it is very important to avoid tempering the V screw, for not altering the pump calibration.

The throttle-pump-carburettor connection does not compromise the engine lubrication also in case of breakage of the control cable. In fact, if the breakage occurs before the lever, only the delivery regulating (controlled by the throttle twistgrip) remains interrupted, the carburettor is interrupted and therefore the engine runs at idling speed, lubricated by the constant delivery of the pump.

If, instead, the breakage occurs after the lever, the pump operates normally and only the carburettor is interrupted.

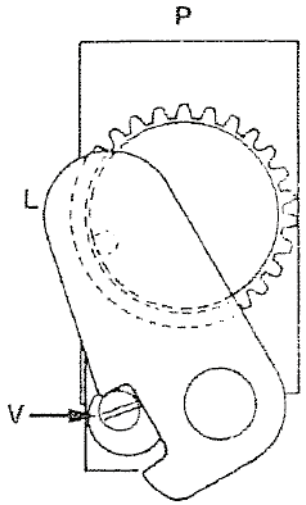
It is necessary instead to be careful that the spring mounted under the connecting lever (A) is not deformed or unefficient, as, in this case, it would be possible to control the opening of the throttle and not the variation of the pump delivery, obtained by means of the pin position on the rotating inclined plate.

In case of disjunction or replacement of the throttle cable (throttle side) it is necessary to fix the cable to the connecting lever, by leaving a certain play (0.2 ÷ 0.3 mm) in order to secure the pump delivery at the minimum.

In case of disjunction or replacement of the pump be sure to pour a drop of Loctite AV in the screwed holes on the crankcase, after having carefully cleaned and degreased the holes and the screws. Place in the correct position two seal rings between the crankcase and the pump, at the level of the inlet and delivery ports. Then screw up to a max. torque of 0.6 kgm. An excessive tightening of the screws might cause deformations and lock the pump operation.

After the pump tightening on the crankcase we recommend to check that: both gears are regularly engaged together; the free rotation between these gears does not exceed 0.1 - 0.2 mm: the inclined level gear turns freely;

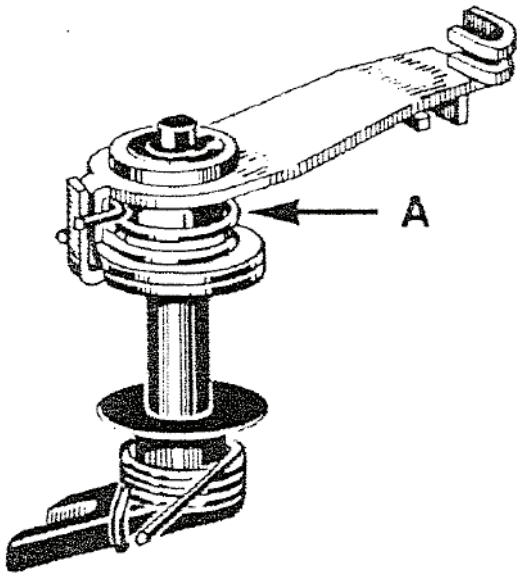
when pressed with a finger at the stroke end, the gear returns automatically and rapidly under the spring action.



P = Oil pump

L = Lever with pin

V = Execentric screw for pump delivery regulation (do not tamper it)



A = Spring connecting the cables lever with the pin control shaft

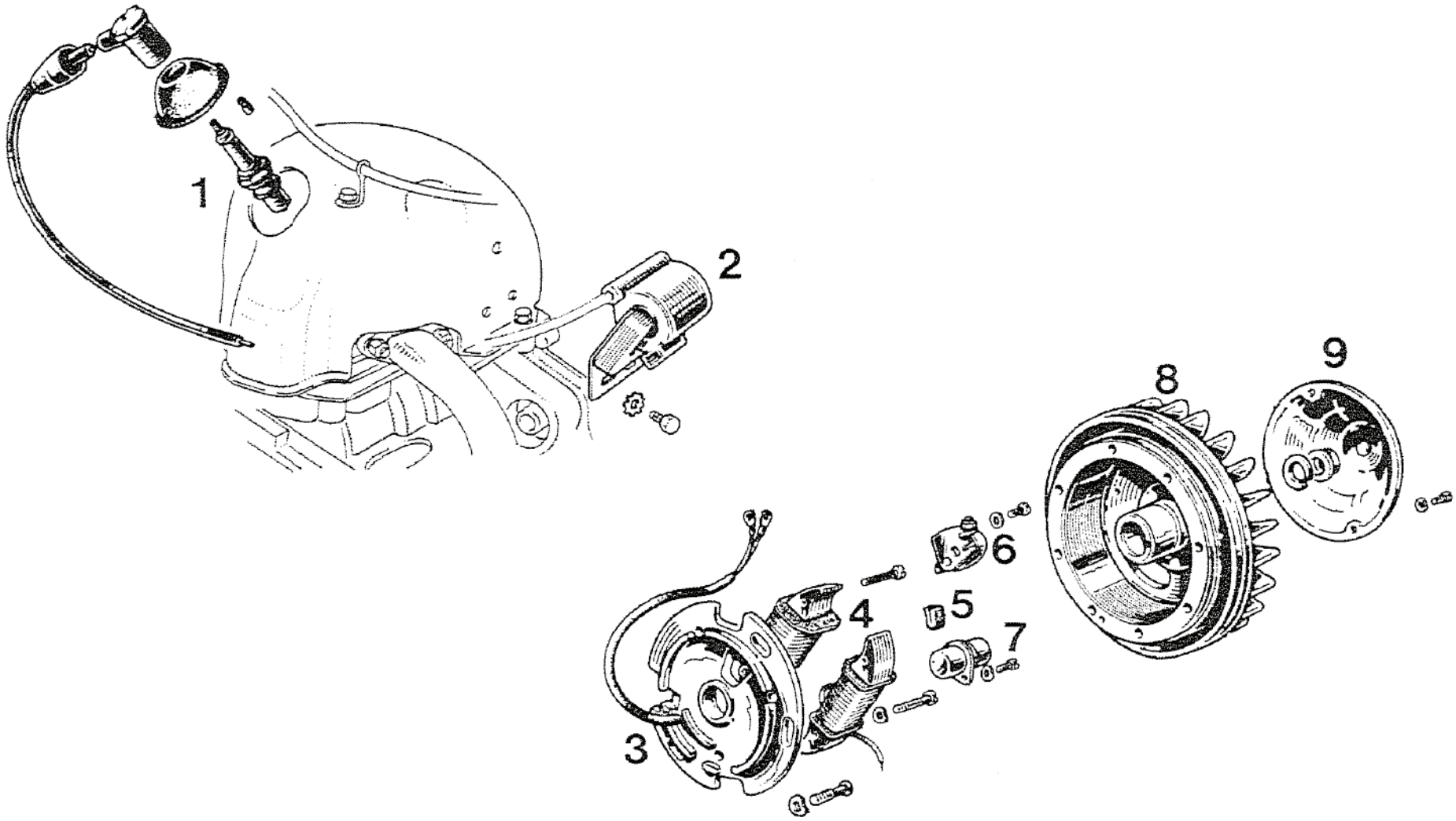
NOTE: The engines mounted on the Lambretta 75 SL, before the fitting of the filter and of the seal valve, are equipped with oil pumps built carefully and selected for securing a perfect seal, even without valve.
If after having parked the scooter for a few days, thick smokes coming out of the silencer, disappearing after a few minutes should be noted when starting the engine, keep present that:

— if the engine is previous to the modification i.e. without valve, it will be advisable to mount the latter. The valve should be mounted with the threaded hole upwards, and should be forced in the pump oil delivery duct and precisely in the hole already drilled on the crankcase since the beginning of the production;
— if the engine has already the valve, it is necessary to replace the latter by a new one. To extract the valve from the crankcase housing, use the screwed hole of the valve.

If insead the engine, of pre or post-modification type, continues to smoke excessively, the inconvenience can be caused by oil suction from the engine crankcase and, therefore, do not limit the check to the LUBEMATIC plant, but extend it to the sealing parts between the engine crankcase and the transmission crankcase, as for a whatsoever two stroke engine.

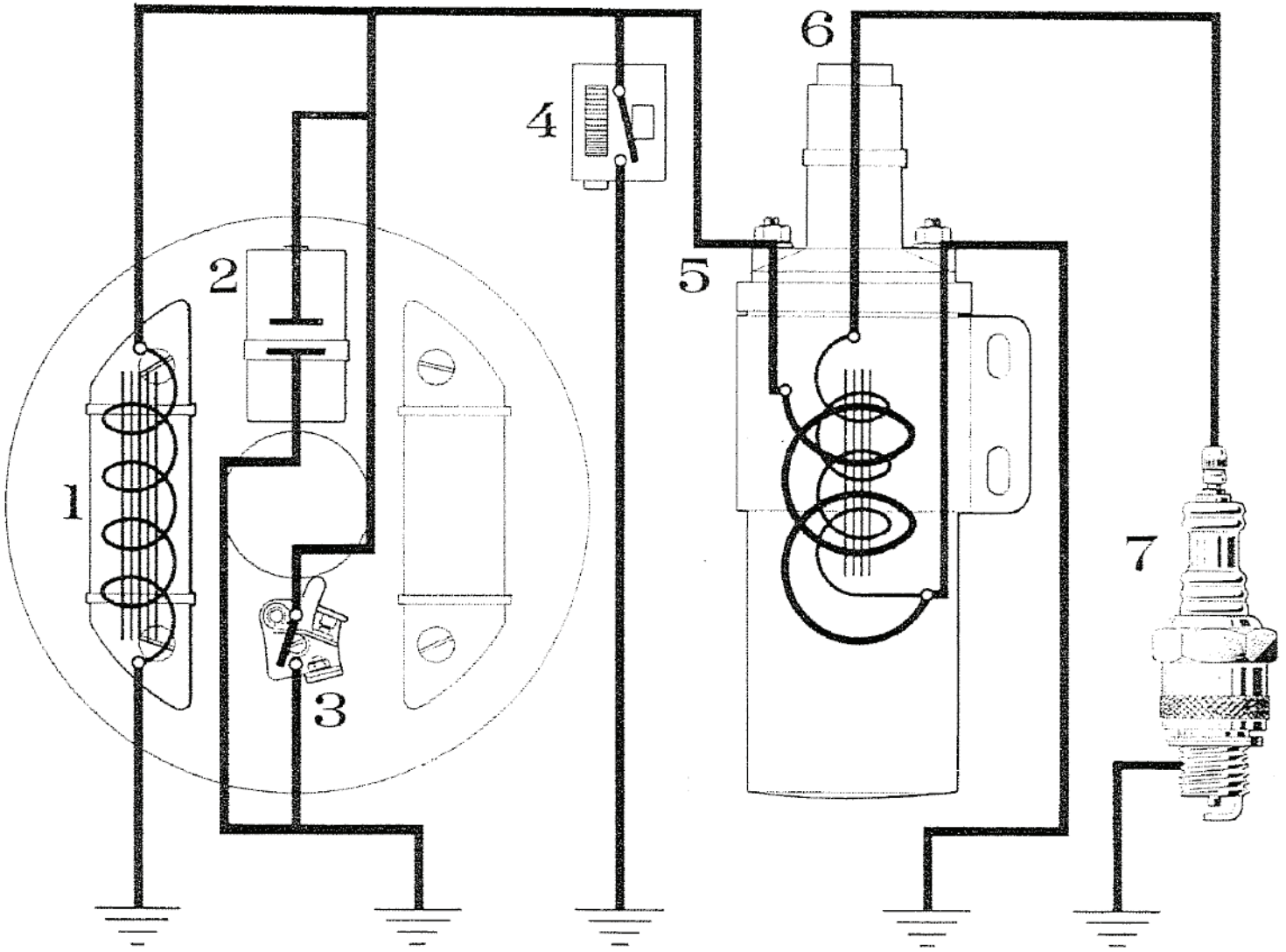
IMPORTANT: To adjust the idling carburetion in the engines fitted with LUBEMATIC pumps, disconnect first the terminal cylinders of the cables from the pump control lever: the short throttle cable, between the pump and the carburettor as well as the long throttle cable, which connects the lever to the twistgrip. After the idling adjustment, connect the short cable to the lever (act on the coupling screw), until you will obtain a play of about 0.2 mm. Connect then the long cable, making sure to leave the same play of about 0.2 mm.
With this adjustment you will automaticlly obtain, by turning completely the throttle twistgrip, the maximum oil pump delivery and the complete opening of the throttle.

FLYWHEEL MAGNETO - H.T. COIL - SPARK PLUG



1. Spark plug - 2. H.T. Coil - 3. Stator plate - 4. Coils - 5. Oiled felt pad - 6. Contact points - 7. Condenser - 8. Rotor - 9. Antidust cover.

IGNITION DIAGRAM



1. Flywheel low-tension winding - 2. Condenser - 3. Contact breaker - 4. Earth cut-out button for stopping engine - 5. Primary winding for feeding H.T. Coil - 6. Secondary winding for feeding the spark plug - 7. Spark plug.

IGNITION

Description

The ignition system is supplied by a coil in the flywheel magneto, an external H.T. coil and the spark plug.

The primary circuit consists of the three parts in parallel - the low tension coil, condenser and contact breaker points.

The primary winding of the H.T. coil is a shunt to this circuit.

The secondary winding feeds the spark plug.

The engine cut-out button operates by shorting the primary circuit to earth.

The flywheel is placed on the nearside of the crankshaft and also operates as an engine cooling fan.

The stator plate assembly is mounted to the crankcase behind the rotor. Five coils are fitted, the third supplying the ignition system. The securing bolt holes are ovalized to enable variations to the ignition timing to be effected. The contact breaker points and condenser are also fitted to the stator plate. Unlike most systems the contact points are in parallel with the low voltage winding of the H.T. coil.

The flywheel rotor with built-in magnets is fitted on the flywheel taper with a Woodruff key and locked in position with a left-hand threaded nut.

The hub of the flywheel is shaped to operate as a cam and the contact breaker acts on this surface. Lubrication is effected by a felt pad which should be given a drop of oil occasionally.

The nominal output is 33 watts

A long reach spark plug is used with an electrode gap of 0.5 to 0.6 mm.

The fixed spark advance is $21° \pm 1°$ equivalent to 1.83 ± 0.17 mm of piston stroke before T.D.C.

An arrow cast on the flywheel face indicates the timing point when aligned with the notch on the crankcase.

Maximum opening of the contact breaker points is 0.35 to 0.45 mm.

Checking and timing the flywheel magneto

Checking of the ignition timing must be carried out with the cylinder head removed. Decarbonise the piston crown and lock the bracket N. 70659 to two of the four cylinder studs.

Mount a dial gauge on this bracket and check that the gauge has reserve travel when the piston is at T.D.C., to avoid damage. Keep the piston near T.D.C., and check the contatc breaker points. The points surfaces must be clean and parallel to each other. True them with a fine file if they are pitted or corroded. If badly worn they must be replaced. Check that the gap is between the prescribed limits using a feeler gauge through the aperture in the flywheel. If the desired gap is not obtained, adjust them by slackening the securing screw and rotating the base plate.

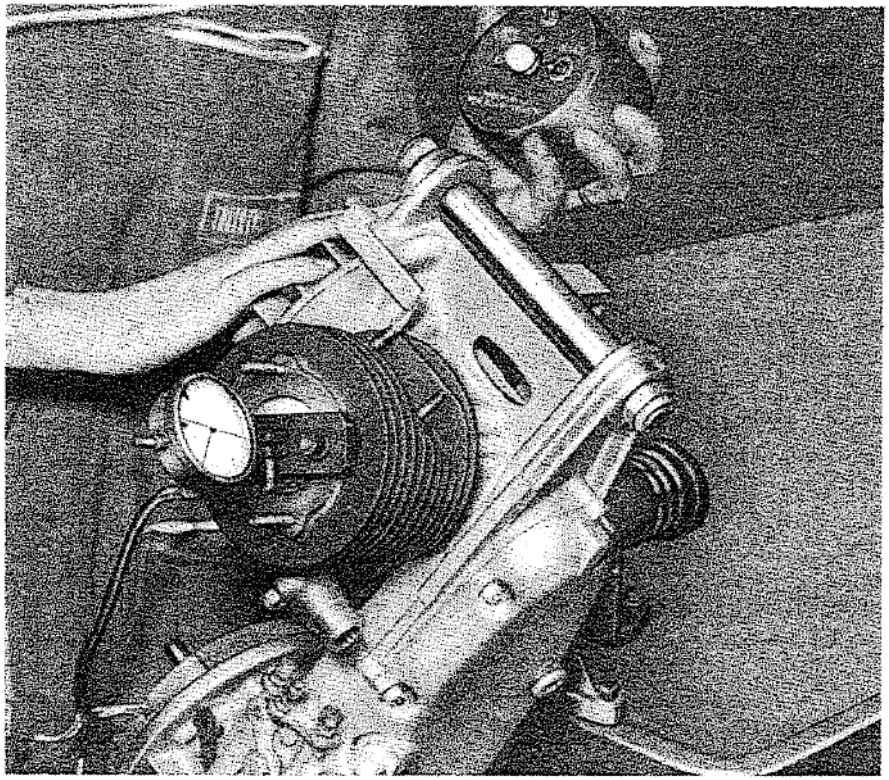
Disconnect the green wire from the stator and connect it to one terminal of the circuit tester N. 05017.

Connect the other tester terminal to earth. Find the exact T.D.C. position by manually rotating the flywheel. Set the dial gauge to zero at exact T.D.C.

Switch on the circuit tester and slowly turn the flywheel anti-clockwise. Note the dial gauge reading when the tester light goes out.

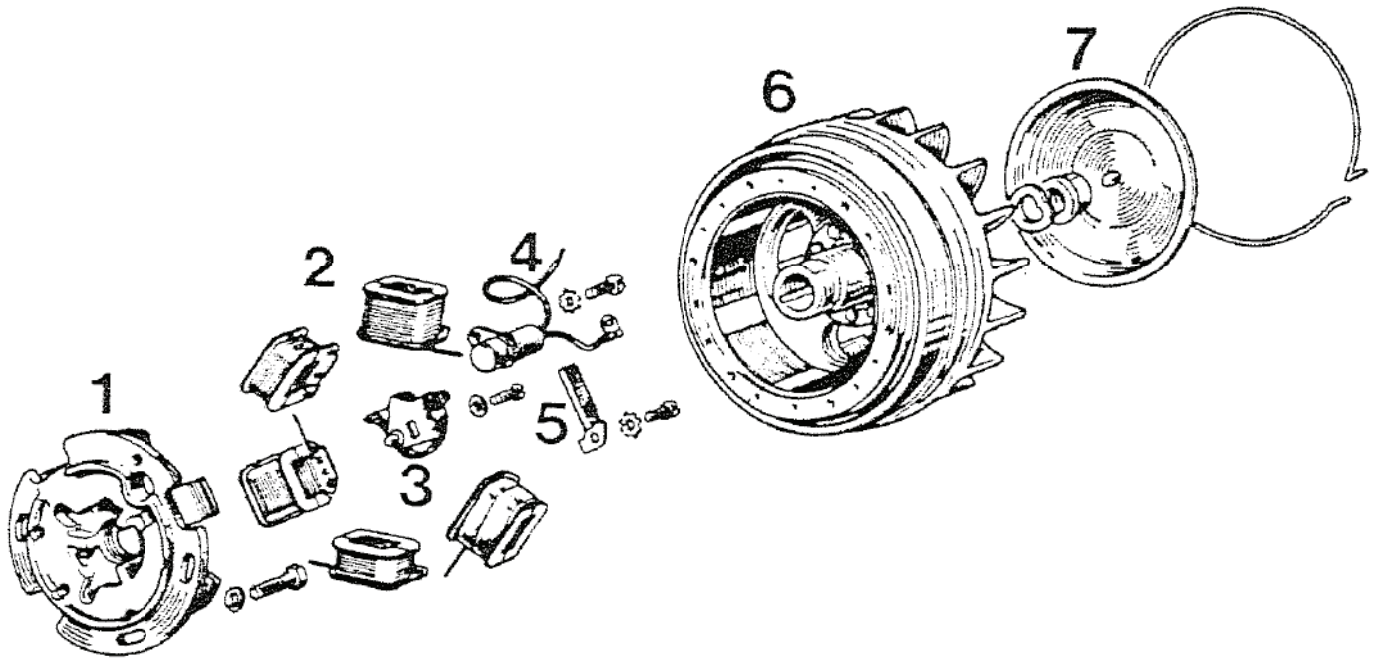
If the dial gauge reading is outside the tolerance the flywheel must be removed and the stator plate rotated slightly. Turn the plate anti-clockwise to retard the timing and clockwise to advance.

After this operation it is to be preferred that the dial gauge reading is nearer maximum tolerance than minimum tolerance, i.e., the reading should be nearer to 2.0 mm.



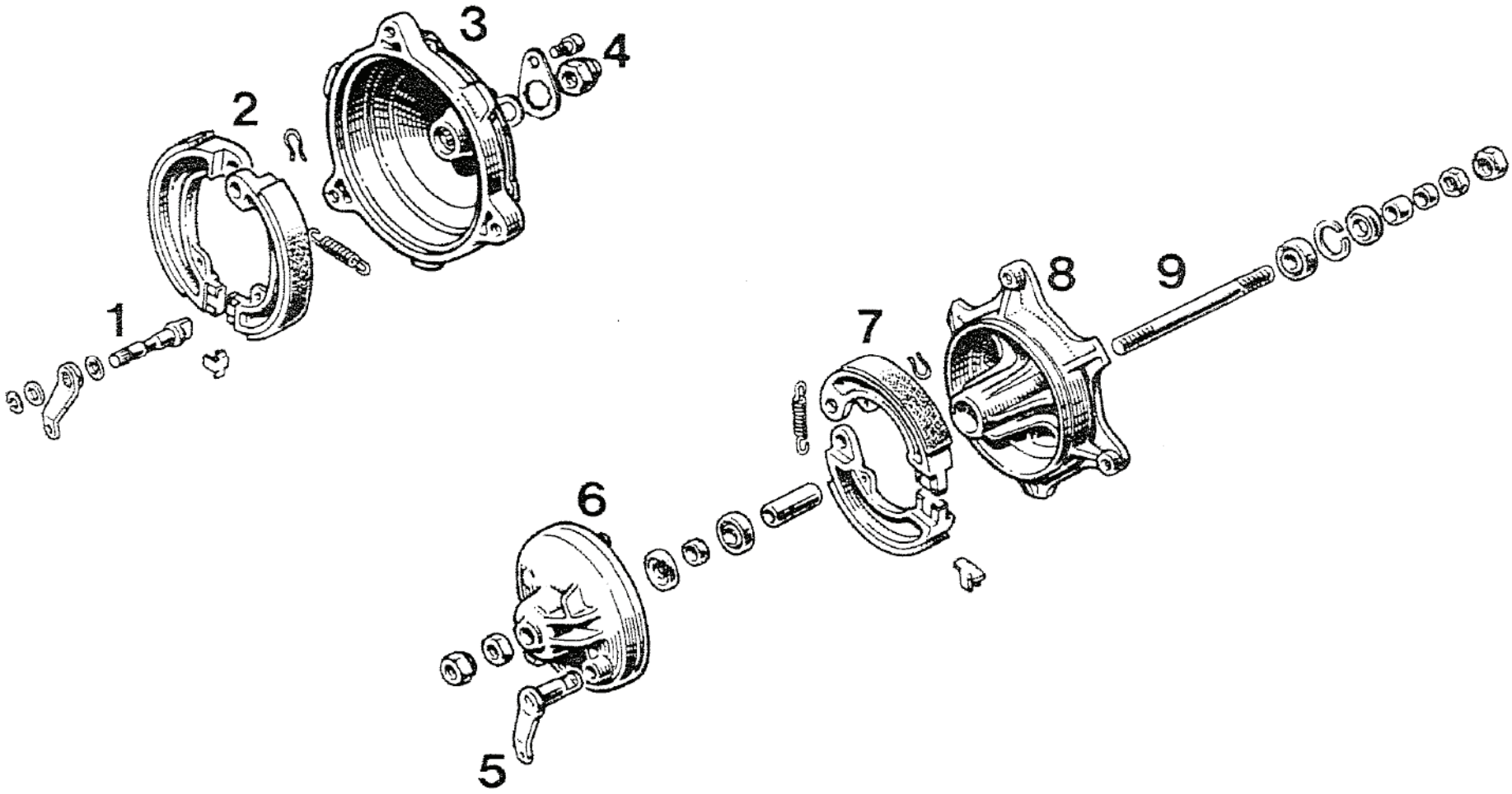
Using a dial gauge to time the flywheel magneto.

FLYWHEEL MAGNETO (VEGA-COMETA)



1. Stator plate - 2. Coils - 3. Contact points - 4. Condenser - 5. Oiled felt pad - 6. Rotor - 7. Antidust cover.

BRAKE PARTS



1. Rear brake shoes control cam - 2. Rear brake shoes - 3. Rear drum - 4. Nut - 5. Front brake shoes control cam - 6. Disc for front brake shoes - 7. Front brake shoes - 8. Front drum - 9. Front wheel spindle.

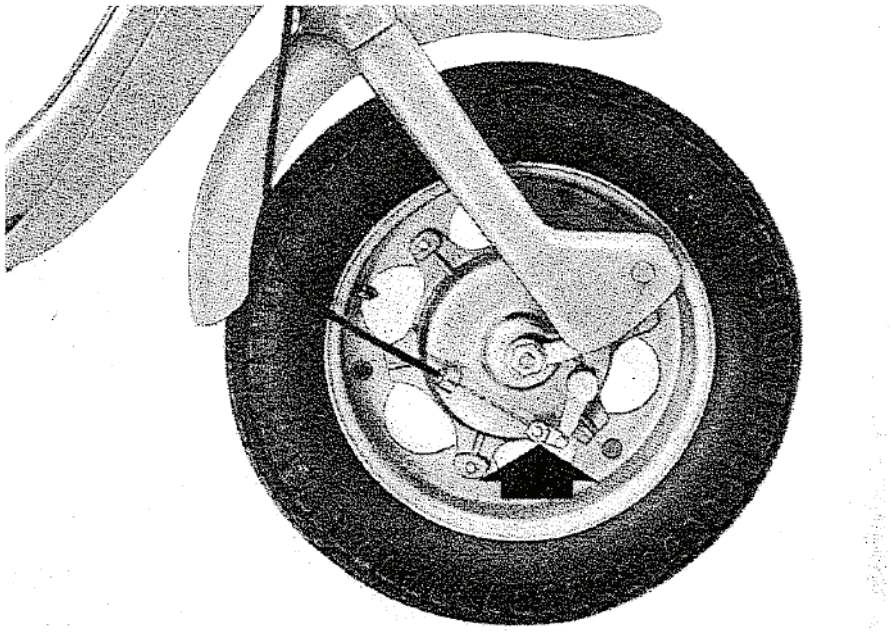
BRAKES

Both brakes are of the drum type with expanding shoes. The rear brake cable is controlled by the pedal on the footboard.

The front brake cable is controlled by a lever on the right- hand side of the handlebar.

FRONT BRAKE

Adjustment is carried cut by slackening the clamp in the illustration and tightening the cable.

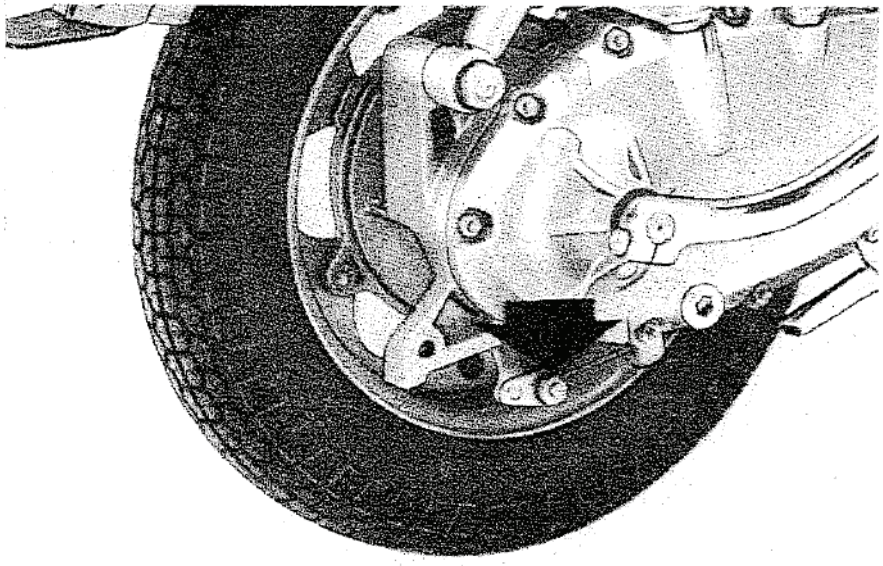


Front brake adjustment.

REAR BRAKE

Adjustment is carried out by slackening the clamp in the illustration and tightening the cable.

No special attention is needed for the brakes but, due to the importance of this part of the scooter, the following checks should be scrupulously carried out in addition to normal maintenance:



Rear brake adjustment.

— The cams operating the shoes must not be damaged or irregurarly or badly worn.

— The brake shoe return spring must be perfectly flexible.

— The brake linings must not show wear irregularities.

— The friction surface of the drums must be smooth and not scored. Very light scores can be removed by skimming on a lathe provided only a minimum amount of metal is removed.

After replacing the rear shoes it is possible to eliminate the surface roughness by using tool 70655 to skim the lining.

Use compressed air to remove all abrasive dust etc., after this operation.

The tool can also be used on worn brake shoes provided the amount of material removed does not leave insufficient for proper braking.

After any attention to the brakes always carry out a road test.

WHEELS AND TYRES

The wheels are made up from two rims held together by three nuts.

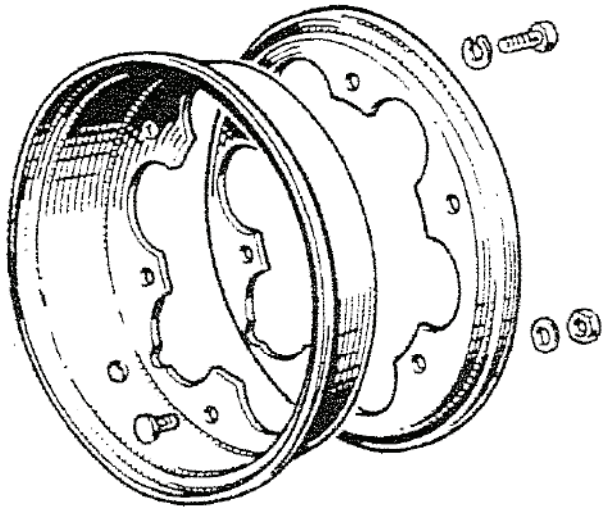
Tyre Size

3.00 x 10″

The following pressures must be maintained in order to avoid premature or irregular tyre wear and to ensure good road-holding.

Front	150 K/cm²
Rear	1.75 Kg/cm²

Always check tyre pressures when the tyres are cold, i.e. not after a run. It is advisable occasionally to dismantle the wheels to check the condition of the inner tubes, tyre walls and tread. Before loosening the three rim-securing nuts always deflate the tyre. The rims must be re-assembled in the correct way to avoid eccentric running.



Wheel rims

LUBRICATION

Engine lubrication on the LUNA and VEGA is achieved by the petrol/oil mixture.

The COMETA uses the 'Lubematic oil injection system with separate oil and petrol tanks. This system is dealt with in a separate booklet.

A 2 % mixture is quite sufficient after the running—in period and this low ratio will show obvious savings in fuel costs together with decreased carbon deposits. It is however necessary to use the correct type of oil such as Agip F.1 2T or BP Energol Two-stroke and good quality petrol.

The cultch, transmission and gearbox are lubricated by the oil in the crankcase. When replacing this oil it is better to drain the old lubricant when the engine is warm. Clean and replace the drain plug carefully and refill the crankcase with 450 gr of fresh oil on the LUNA and 620 gr on the VEGA-COMETA.

When dismantling or overhauling the following parts they must be cleaned carefully and regreased with AGIP F.1 Grease 15 or BP Energrease A.1:

— gearbox control cable knuckles

— rear brake cable linkage

— front brake cable linkage

— clutch and front brake lever pivots

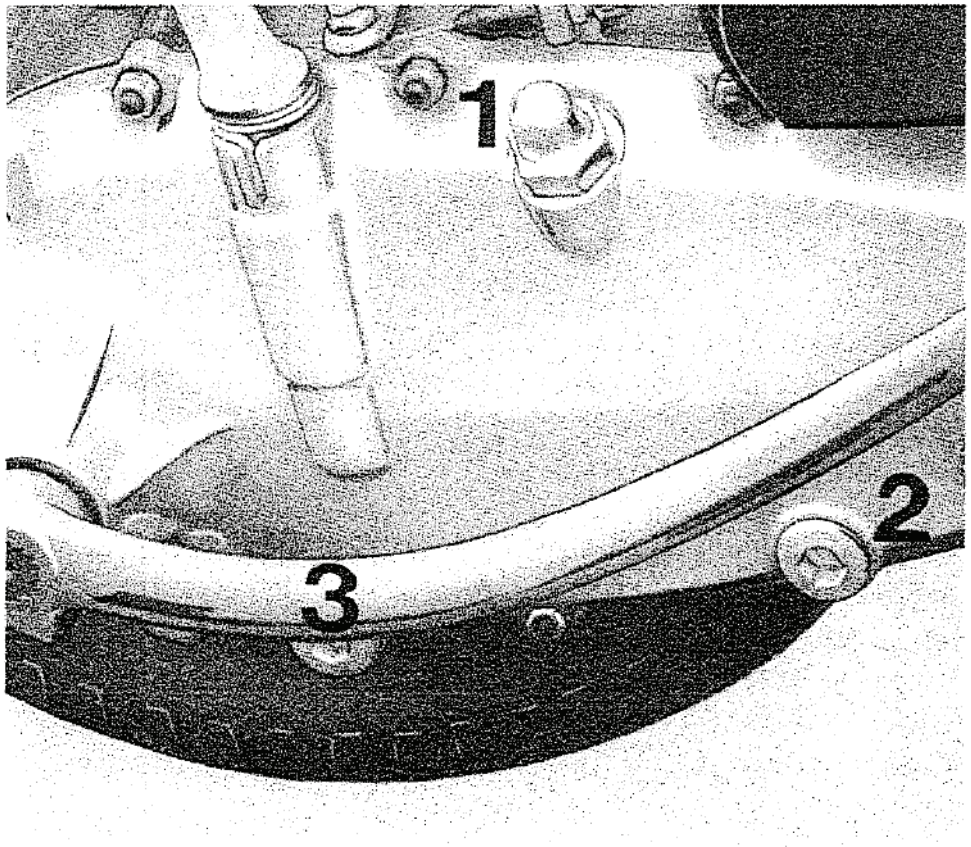
— front fork springs

— control cables

The steering races and front wheel bearings must be lubricated with AGIP F.1 Grease 30 or BP Energrease L.3

The steering ball bearing and the front wheel bearings must be greased with AGIP F.1 Grease 30.

ENGINE CRANKCASE/TRANSMISSION/GEARBOX GROUP



1 = Oil filler plug
2 = Oil level plug
3 = Oil drainage plug

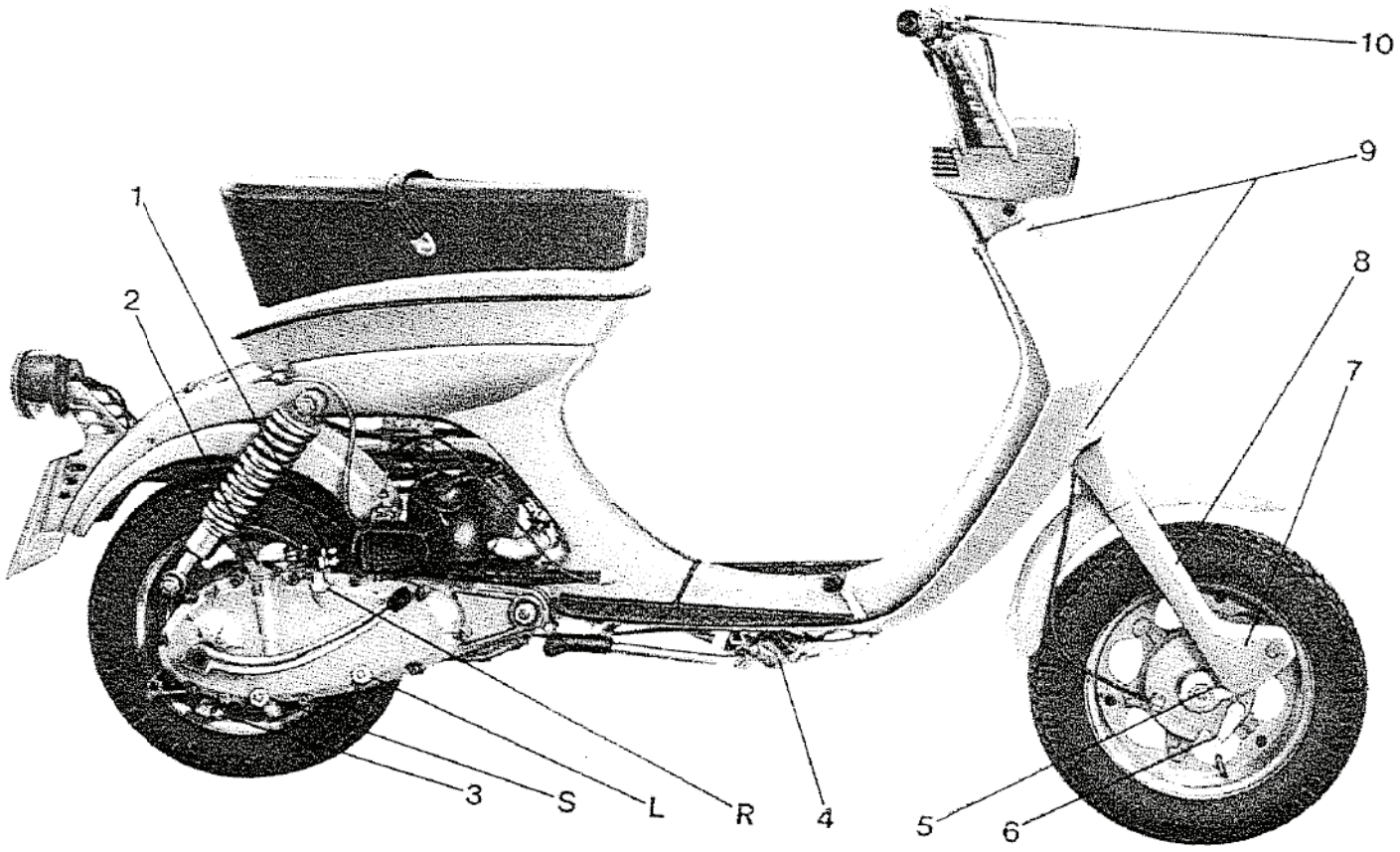
L

LUBRICATION DIAGRAM AND PRESCRIBED QUALITIES OF THE LUBRICANTS TO BE USED

Ref. N.	Part to be lubricated	Types of oil or grease to be used	Operations to be carried out
1	Engine (only for LUNA-VEGA)	Petrol/oil mixture with 2 % of oil (after running-in period) AGIP F. 1 2T	
2	Gear change pivots and trunnions	AGIP F. 1 Grease 15	Grease every 1500 miles
3	Clutch cable trunnion	»	»
4	Rear brake cable pivot	»	»
5	Rear brake pedal pin	»	»
6	Front wheel bearing	AGIP F. 1 Grease 30	Grease at each overhaul
7	Front brake cable pivot	AGIP F. 1 Grease 15	Grease every 1500 miles
8	Front suspension pivots	»	Grease every 3000 miles
	Front suspension springs	»	Grease at each overhaul
9	Steering races	AGIP F. 1 Grease 30	»
10	Lever and controls on handlebar	AGIP F. 1 Grease 15	Grease every 1500 miles
	Speedometer transmission	»	Re-establish the level every 1500 miles
	Clutch - transmission - gearbox	AGIP F. 1 Rotra SAE 90	Change oil every 3000 miles

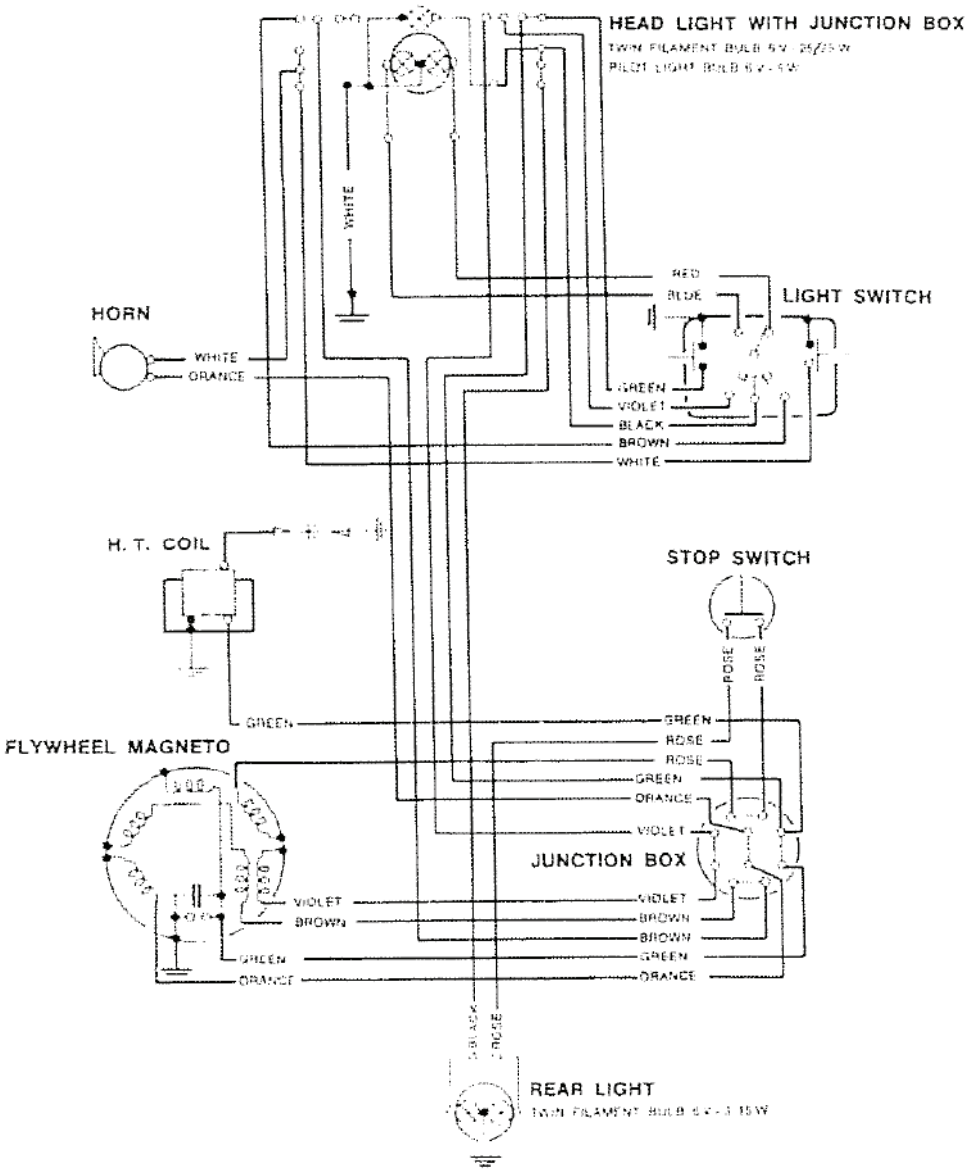
AGIP F.1 Rotra SAE 90 = **BP Energol Gear Oil SAE 90**
AGIP F.1 Grease 15 = **BP Energrease A.1**
AGIP F.1 Grease 30 = **BP Energrease L.3**
AGIP F.1 2 T = **BP Two stroke Oil**

LUBRICATION DIAGRAM



R. Oil filler plug - L. Oil level plug - S. Oil drain plug - 1. Gear change pivots and trunnions - 2. Clutch cable trunnion - 3. Rear brake cable pivot - 4. Rear brake pedal pin - 5. Front wheel bearings - 6. Front brake cable pivot - 7. Front suspension pivots - 8. Front suspension helical springs in the fork legs - 9. Steering races - 10. Levers and controls on handlebar: cable nipples.

ELECTRICAL EQUIPMENT



Insulation and continuity tests

Connect a megometer to the circuit to be tested.
Continuity must be achieved and each of the other circuits must be checked in turn to ensure effective insulation.

Headlamp adjustment

— Remove the headlamp rim

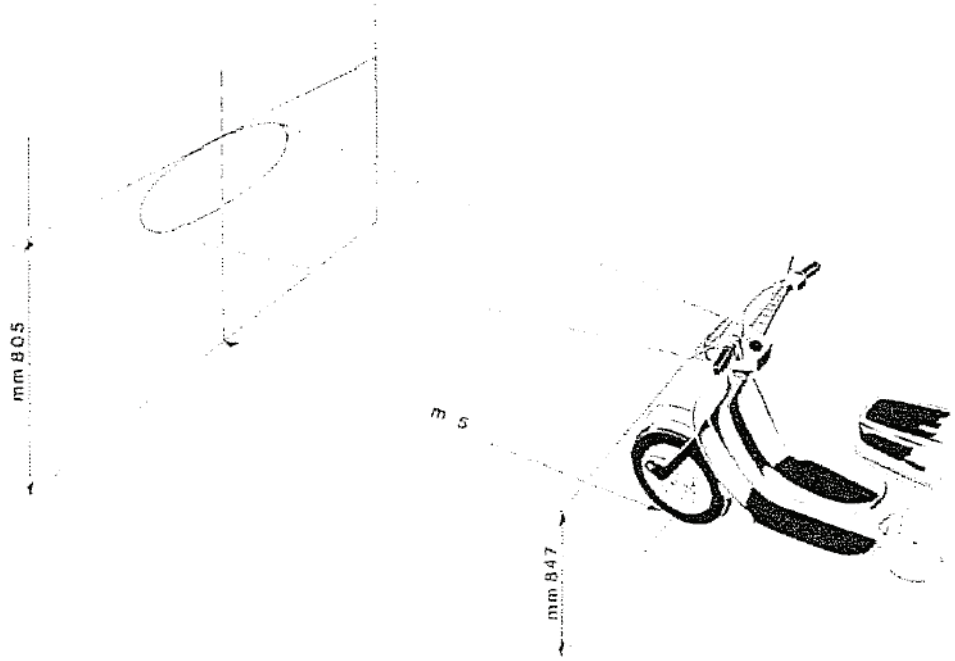
— Check tyre pressures

— Place a vertical screen as in the illustration

— Put the scooter into its normal load condition

— Loosen the headlamp adjustment screws until the upper edge of the zone illuminated by the main beam coincides with the horizontal line marked on the screen

— Replace the headlamp rim



BULBS

Position	Use	No.	Characteristics		
			Rating	Bulb	Socket
Head-lamp	main and dipped beam	1	6 V - 25/25 W	Spherical	P 26 s
Head-lamp	pilot light	1	6 V - 5 W	Festoon	S 8.5/9.5
Tail light	rear number plate light/ stop light	1	6 V - 3/15 W	Spherical	BAY 15 d/19

PERIODICAL MAINTENANCE OPERATIONS

EVERY 2000 Km

Brakes: Check and adjust if necessary.

Spark plug: Check and clean the electrodes. Adjust if necessary:

Lubrication

Engine crankcase: check and re-establish the oil level.
Grease all the prescribed points: clutch cable knuckles-gearbox control cable knuckles - rear and front brake cable knuckle - rear brake pedal pin - control lever pivots on handlebars.

EVERY 4000 Km

Carry out the operations prescribed for the maintenance every 1500 miles, plus the following:

Clutch: Control and adjust if necessary.

Flywheel magneto: Check and clean the contact breaker points. Adjust if necessary - Moisten the felt pad on the flywheel cam with a drop of oil.

Air filter: disassemble the filter element and clean it.

Lubrication: Change the engine crankcase oil with a hot engine.

Grease the joints of the front suspension.

Decarbonize the silencer, the cylinder head, the cylinder and the piston.

<<TECH MENU