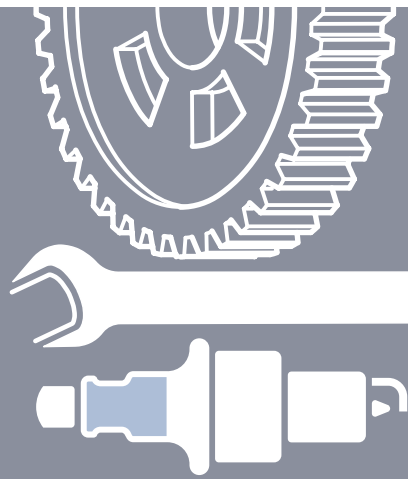
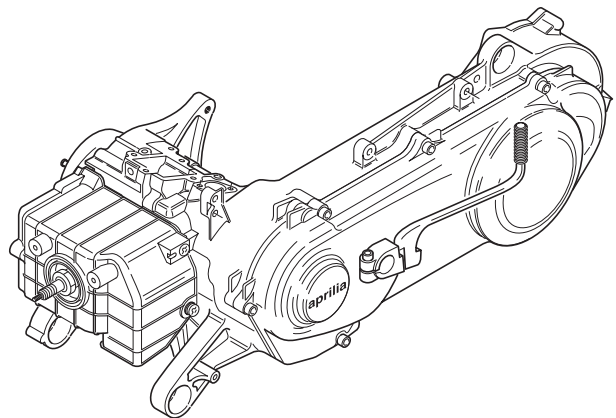


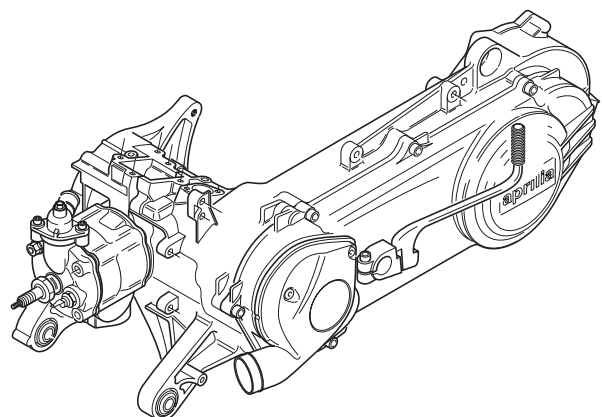
**aprilia**



# QUICK WORKSHOP HANDBOOK



Aprilia Engine 50 cc



**GENERAL INDEX****General safety norms****1****Technical data****2****Oil chart****3****Special engine tools****4****Carburetor****5****Technical observations****6****Disassembly/Reassembly  
sequence****7**

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**INTRODUCTION**

- This manual contains all the essential information for carrying out routine vehicle procedures.
- The information and diagrams in the manual are up-to-date at the time of publication.
- This publication is intended for use by **Aprilia** dealers and their trained mechanics. A large number of procedures do not require explanation and therefore have been omitted. It has not been possible to give detailed mechanical data for every procedure. All personnel consulting this manual must therefore possess the basis skills of a mechanic and be thoroughly familiar with the most common motor cycle repair procedures. Without these skills and the necessary familiarity any repair or routine maintenance INTRODUCTION operation may be ineffective or even dangerous.
- Given the fact that it is not possible to provide detailed descriptions of all procedures, special care must be taken for whatever repair or maintenance work is done, in order to prevent damage to the vehicle and injury to persons.
- In order to provide the best level of customer satisfaction, **Aprilia s.p.a.** constantly improves its products and relevant documentation. All important technical changes and alterations to procedures are notified to all **Aprilia** dealers, branches and points of sale throughout the world. All changes will be included in later editions of this manual.
- If you have any doubts or queries about the procedures described in this manual, please contact the Aprilia Consumer Service (A.C.S.) Department, who will be pleased to give you all the information and explanations you require, and to bring you up to date with any changes.

For further information see:

- SPARE PARTS CATALOGUE no. 550X air  
551X air  
553Y water

Without alteration to the basic features of its models as described and illustrated in this manual, **Aprilia s.p.a.** may carry out modifications to any of the models without notice.

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First edition. July 2000.

## GENERAL SAFETY STANDARDS

### CARBON MONOXIDE

If the engine must be switched on to carry out certain operations make sure the room is well ventilated or open to the outside. Never switch on the engine in a closed room, unless there is a smoke and fume removal system installed and the operating.

#### DANGER

Exhaust fumes contain carbon monoxide, a poisonous gas which make cause loss of consciousness and can be lethal.

Switch on the engine only in an open space or in a closed room if fitted with a fully operating smoke and fume removal system.

### FUEL

Make sure the room is well ventilated. Extinguish all cigarettes, keep fuel containers away from flames and possible sources of sparks.

#### DANGER

Fuel is highly flammable and may explode.  
KEEP OUT OF THE REACH OF CHILDREN

### HIGH TEMPERATURE COMPONENTS

#### DANGER

The engine and parts of the exhaust system reach very high temperatures and remain hot for a certain period after switching off the engine. Handle these components only after putting on protective gloves or waiting for the engine and parts to fully cool down.

### USED ENGINE OIL

#### DANGER

Use latex gloves for maintenance operations involving contact with oil. If left in contact with the skin for long periods, used engine oil can cause skin cancer. Although this is unlikely, unless handled every day, wash your hands with soap and water after handling used engine oil.  
KEEP OUT OF THE REACH OF CHILDREN

## GENERAL PRECAUTIONS AND INFORMATION

For repair and disassembly and reassembly operations follow this instructions.

#### DANGER

Do not carry out any operation in the presence of naked flames.

Before starting any maintenance or inspection operation, switch off the engine and remove the ignition key. Wait for the engine and exhaust system to cool down. Place the motor cycle, if possible, in a raised position on a level, even surface. Take special care of heated parts (engine and the exhaust) in order to avoid burns.

The vehicle is made with parts which cannot be swallowed. Do not bite, chew, suck or otherwise attempt to carry out operations using the teeth or mouth.

Unless otherwise specified, to reassemble parts, reverse the order for disassembly operations. Some operations may involve disassembling parts previously disassembled for other operations to be carried out. Consult the various pages of the manual where each operation is described in order to avoid unnecessary work. Never use fuel as a solvent for cleaning the vehicle.

If welding operations are to be carried out, disconnect the negative pole (-) of the battery. If more than one person is working on the vehicle make sure both are in a safe position whatever the work being done.

### BEFORE DISASSEMBLY

- Before separating pipes or wires etc. (joints and junctions) mark each part with a unique marking. Each piece should be clearly marked for reassembly purposes.

-Clean and wash the disassembled components with close to non-inflammable detergent.

-Keep paired parts together, because normal wear and tear create a natural pairing. In some cases, where one part is replaced the other must also be replaced.

Keep away from sources of heat.

### DISASSEMBLY

-Before separating pipes or wires etc. (joints and junctions) mark each part with a unique marking. Each piece should be clearly marked for reassembly purposes.

-Clean and wash the disassembled components with close to non-inflammable detergent.

-Keep paired parts together, because normal wear and tear create a natural pairing. In some cases, where one part is replaced the other must also be replaced.

Keep away from sources of heat.

REASSEMBLY

 **WARNING**

Never re-use an elastic ring. If removed, replace it with a new ring. If a new ring is fitted, do not stretch more than necessary when fitting it to the shaft. Afterwards, check that the ring is properly fitted to the housing.

Do not clean bearings with compressed air.

**IMPORTANT** Bearings must rotate freely, without sticking or noise. Replace if necessary.

- Use only ORIGINAL **Aprilia** SPARE PARTS.
  - Stick to the oil chart and recommended wearing parts.
  - Wherever possible, lubricate parts before reassembling them.
  - When tightening screws and nuts begin with the largest diameters, or inner nuts and screws, and tighten diagonally. Tighten each before finally tightening to the specified torque.
  - Always replace gaskets, seal rings, elastic rings, O rings and split pins with new ones.
  - Clean all joint surfaces, oil guard edges and gaskets before reassembling.
  - Lightly smear the edges of oil guards with lithium based grease.
  - Refit the oil guards and bearings with the trademark or manufacturer's serial number facing outwards (so it is visible).
  - Grease the bearings fully before fitting.
  - Check that all components have been reassembled properly.
- After a maintenance or repair operation, carry out preliminary checks and commission the vehicle on private property or in a low traffic area.

REFRIGERATION LIQUID

 **DANGER**

Refrigeration liquid is dangerous if swallowed; contact with the skin or eyes could cause irritation. For contact of this kind, wash with plenty of water and see a doctor immediately. If swallowed, it causes vomiting: rinse the mouth and throat with plenty of water and see a doctor immediately.

THIS LIQUID AND CONTAINER SHOULD BE PROPERLY DISPOSED OF.

KEEP OUT OF THE REACH OF CHILDREN.

 **DANGER**

Be careful not to pour any refrigeration liquid onto hot engine parts; it could catch fire. The flames are invisible.

Wear latex gloves during maintenance operations.

Do not use the motor cycle if the refrigeration liquid is below the minimum required level.

Refrigeration liquid consists of one part water (50%) for one part anti-freeze (50%) .

This mixture is suitable for most operating temperatures and also guarantees good rust protection.



The use of the same blend is recommended during the summer, because this reduces evaporation and the need for frequent top ups.

It also reduces mineral salt deposits in the radiator left by evaporated liquid and maintains the cooling system.

If the outside temperature is below 0° C, check the refrigeration circuit frequently, adding anti-freeze if required (for greater concentration). Max 60% anti-freeze.

Use distilled water in the refrigerating liquid, in order not to damage the engine.

**Refrigeration liquid for the engine (recommended):**

 ECOBLU - 40°C or  Agip COOL

On the basis of the freezing point of the refrigeration liquid required, add water in the percentage given below:

Freezing point °C	Refrigeration liquid % by volume
-20°	35°
-30°	45°
-40°	55°

**IMPORTANT:** Features vary from anti-freeze to anti-freeze. Consult the label for the degree of protection provided.

 **WARNING**

Use only nitrite free anti-freeze and anti-corrosion liquid, guaranteeing protection to at least -35°C.

**TECHNICAL INFORMATION**

**ENGINE**

Type	air-cooled	water-cooled
Engine type	Two-stroke, forced air-cooled	Liquid-cooled
Number of valve	-	←
Number of cylinders	1	←
Piston displacement	49,38 cm <sup>3</sup>	←
Bore/Stroke	41,0 mm / 37,4 mm	←
Corrected compression ratio	11,3 ± 0,5:1	12,5 ± 0,5:1
Idle r/min.	1700 ± 200 r/min	1300 ± 100 r/min
Starter system	electric and kick	←
Clutch	Dry shoe, automatic, centrifugal typ	←
Gear box	Automatic stepless variator	←
Lubrication system	with mixing pump	←
Cooling system	forced-air	liquid

**TRANSMISSION**

Variator	Automatic stepless	←
Primary	V-belt	←
Gears	minimum for stepless change: 2,95	←
	maximum for stepless change: 0,75	←
Secondary	gear	←

**CAPACITIES**

Final gear oil	130 ml (4.6 Imp oz)	←
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**CARBURETOR**

Type	KEIHIN PWS 12	←
Choke	Ø12 mm	←

**START SYSTEM**

Type	Electronic with capacitive discharge (CD)	←
Spark lead	14° ± 1° before P.M.S.	←

**SPARK PLUG**

Standard	NGK R BPR7HS	←
Alternative	NGK R BPR8HS	←
Electrode-spark plug distance		←

**ELECTRICAL**

Battery	12 V - 4 kC	←
Fuse	7,5 A - 10 A	←
Generator (magneto)	12 V - 115 W	←
Ignition timing	14° B.T.D.C. at 4000 r/min.	

**TIGHTENING TORQUES AIR COOLED ENGINE**

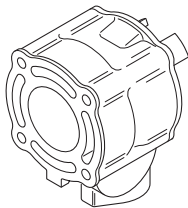
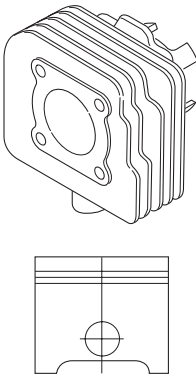
Component to tighten	Name of part	Thread size	TIGHTENING TORQUE		LOCKING PRODUCT
			Nm	Kgm	
Pick-up locking	Screw	M5x12	4 - 6	0,4 - 0,6	no
Oil pump locking	Screw	M5x16	4 - 6	0,4 - 0,6	no
Stator locking	Screw	M5x20	4 - 6	0,4 - 0,6	no
Transmission steel plate locking	Screw	M6x12	8 - 12	0,8 - 1,2	Loctite 270
Cooling fan locking	Screw	M6x16	8 - 12	0,8 - 1,2	no
Carburetor locking	Screw	M6x16	8 - 12	0,8 - 1,2	no
Fan cover base locking	Screw	M6x20	8 - 12	0,8 - 1,2	no
Manifold locking	Screw	M6x20	8 - 12	0,8 - 1,2	no
Upper cylinder plastic cover locking	Screw	M6x20	5 - 6	0,5 - 0,6	no
Transmission cover	Screw	M6x25	8 - 12	0,8 - 1,2	no
Variator cover	Screw	M6x25	8 - 12	0,8 - 1,2	no
Starter motor	Screw	M6x25	8 - 12	0,8 - 1,2	no
Bendix support plate locking	Screw	M6x30	8 - 12	0,8 - 1,2	no
Lower cylinder plastic cover locking	Screw	M6x35	5 - 6	0,5 - 0,6	no
L/r crankshaft locking	Screw	M6x45	8 - 12	0,8 - 1,2	no
L/r crankshaft locking	Screw	M6x45	8 - 12	0,8 - 1,2	no
L/r crankshaft locking	Screw	M6x55	8 - 12	0,8 - 1,2	no
L/r crankshaft locking	Screw	M6x80	8 - 12	0,8 - 1,2	no
Wheel bearing retaining plate locking	Screw	M6x85	6 - 10	0,6 - 1	Loctite 243
Oil plug	Screw	M6x16	10 - 14	1 - 1,4	no
Oil drain	Screw	M8x12	5 - 6	0,5 - 0,6	no
Variator moving pulley cover locking	Screw	M6x12	2	0,2	no
Fan plastics locking	Screw	M4x10	1 - 2	0,1 - 0,2	no
Head locking	Nut	M6 h=9	9 - 11	0,9 - 1,1	no
Clutch locking	Nut	M10x1,5	45 - 55	4,5 - 5,5	no
Flywheel locking	Nut	M10x1,25	35 - 45	3,5 - 4,5	no
Kick-starter locking	Nut	M12x1,25	35 - 45	3,5 - 4,5	no
Exhaust stud		M6x16 (totale 28)	4 - 5	0,4 - 0,5	Loctite 270
Cylinder stud		M6x95 (totale 97)	4 - 5	0,4 - 0,5	no
Spark plug (thread M14 x 1,25)			25 - 30	2,5 - 3	/
Vacuum intake manifold					Loctite 648
NR oil valve					Loctite 648

**TIGHTENING TORQUES FOR WATER-COOLED ENGINE**

Component to tighten	Name of part	Thread size	TIGHTENING TORQUE		LOCKING PRODUCT
			Nm	Kgm	
Pick-up	Screw	M5x12	4 - 6	0,4 - 0,6	
Oil pump	Screw	M5x16	4 - 6	0,4 - 0,6	no
Stator	Screw	M5x20	4 - 6	0,4 - 0,6	no
Transmission steel plate locking	Screw	M6x12	8 - 12	0,8 - 1,2	no
Carburetor	Screw	M6x16	8 - 12	0,8 - 1,2	Loctite 270
Manifold locking	Screw	M6x20	8 - 12	0,8 - 1,2	no
Manifold locking	Screw	M6x20	9 - 11	0,8 - 1,2	no
Transmission cover	Screw	M6x25	8 - 12	0,8 - 1,2	no
Variator cover	Screw	M6x25	8 - 12	0,8 - 1,2	no
Plate conveyor	Screw	M5x10	4 - 6	0,4 - 0,6	no
Plastic cover, variator cooling system	Screw	M5x20	4 - 6	0,4 - 0,6	no
Starter motor	Screw	M6x25	8 - 12	0,8 - 1,2	no
Bendix support plate locking	Screw	M6x30	8 - 12	0,8 - 1,2	no
L/r crankshaft locking	Screw	M6x45	8 - 12	0,8 - 1,2	no
L/r crankshaft locking	Screw	M6x55	8 - 12	0,8 - 1,2	no
L/r crankshaft locking	Screw	M6x80	8 - 12	0,8 - 1,2	no
L/r crankshaft locking	Screw	M6x85	8 - 12	0,8 - 1,2	no
Wheel bearing retaining plate locking	Screw	M6x16	6 - 10	0,6 - 1	no
Oil plug	Screw	M8x12	10 - 14	1 - 1,4	Loctite 243
Oil drain	Screw	M6x12	5 - 6	0,5 - 0,6	no
Variator moving puleey cover locking	Screw	M4x10	2 - 3	0,2 - 0,3	no
Water outlet connector locking	Screw	M6x20	8 - 12	0,8 - 1,2	no
Water outlet vent	Screw	M6x8	8 - 9	0,8 - 0,9	no
Water pump entrainment coupling	Screw special	M6x8,5	8 - 12	0,8 - 1,2	no
Rotor locking	Screw	M6x13	8	0,8	no
Water discharge	Screw	M6x8	8 - 9	0,8 - 0,9	no
Pump cover locking	Screw	M6x25	8 - 12	0,8 - 1,2	no
Flywheel cover locking	Screw	M6x35	8 - 12	0,8 - 1,2	no
Head locking	Nut	M6 h=9	9 - 11	0,9 - 1,1	no
Clutch locking	Nut	M10x1,5	45 - 55	4,5 - 5,5	no
Flywheel locking	Nut	M10x1,25	35 - 45	3,5 - 4,5	no
Kick-starter locking	Nut	M12x1,25 h=7 ch.17	35 - 45	3,5 - 4,5	no
Exhaust stud		M6x16 (totale 28)	4 - 5	0,4 - 0,5	Loctite 270
Cylinder stud		M6x95 (totale 107)	4 - 5	0,4 - 0,5	no
NGK BPR7HS spark plug			25 - 30	2,5 - 3	no
NR oil valve					no
Head water temperature (thermostat)			10 - 12	1 - 1,2	Loctite 648 Loctite 572

**TECHNICAL INFORMATION**

**CYLINDER + PISTON + RINGS**

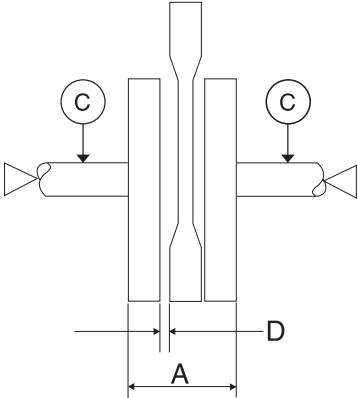
Item:			Standard: mm (in)	Limit: mm (in)
Piston to cylinder clearance		<b>Air</b>	0.06-0.07 (0.0024-0.0028)	0.120 (0.0047)
		<b>Water</b>	0.035-0.045 (0.0014-0.0018)	0.120 (0.0047)
Piston diam.		<b>Air</b>	41.940-40.955 (1.6118-1.6124) Measure at 15 (0.6) from the skirt end	41.075 (1.6171)
		<b>Water</b>	40.970-40.985 (1.6130-1.6136) Measure at 23 (0.9) from the skirt end	41.105 (1.6183)
Cylinder bore		<b>Air</b>	41.005-41.020 (1.6144-1.6150) Measure at 15 (0.6) from the top surface	40.885 min. (1.6096)
		<b>Water</b>	41.010-41.025 (1.6146-1.6152) Measure at 15 (0.6) from the top surface	40.890 min. (1.6098)
Cylinder distortion			-	0.05 (0.002)
Cylinder head distortion			-	0.05 (0.002)



**CYLINDER + PISTON + RINGS**

Item:		Standard: mm (in)			Limit: mm (in)
Port at the end of the unassembled segment	Air	1°	R	Approx. 4.0 (0.16)	3.2 (0.126)
		2°	R	Approx. 4.3 (0.17)	3.4 (0.134)
	Water	1°-2°	T	Approx. 4.5 (0.18)	3.6 (0.14)
Port at the end of the segment fitted into the cylinder	Air	1°-2°	R	0.10 - 0.25 (0.004 - 0.010)	0.80 (0.031)
	Water	1°-2°	T	0.08 - 0.18 (0.0031 - 0.0071)	0.80 (0.031)
Segment/slot clearance	Air	1°		0.03 - 0.07 (0.0012 - 0.0028)	- -
		2°		0.02 - 0.06 (0.0008 - 0.0024)	- -
	Water	1°-2°		0.01 - 0.05 (0.0004 - 0.0020)	- -
Piston pin housing bore on piston	Air	10.002 - 10.010 (0.3938 - 0.3941)			10.030 (0.3949)
	Water	12.002 - 12.010 (0.4725 - 0.4728)			12.030 (0.4736)
Piston pin outer diameter	Air	9.995 - 10.000 (0.3935 - 0.3937)			9.980 (0.3929)
	Water	11.996 - 12.000 (0.4723 - 0.4724)			11.980 (0.4717)

**CONROD + CRANKSHAFT**

Item:		Standard: mm (in)	Limit: mm (in)
Connetting rod small end diameter	Air	14.003 - 14.011 (0.5513 - 0.5516)	14.040 (0.5528)
	Water	16.003 - 16.011 (0.6300 - 0.6304)36.0 ± 0.05	16.040 (0.6315)
Width from crank arm to arm (A)	Air	35.95 - 36.10	- -
	Water	37.95 - 38.10	- -
Misalignment limit (C)	Measured between two centres on the bearing housings		0.03 (0.001)
Side clearance of connecting rod big end (D)	Air	0.550 (0.02)	0.656 (0.025)
	Water	0.750 (0.03)	0.850 (0.035)
			

## CLUTCH

Item:	Standard: mm (in)	Limit: mm (in)
Clutch wheel I.D.	110.00 - 110.15 (4.331 - 4.337)	110.50 (4.350)
Clutch shoe thickness	2.0 Water (0.08)	1.0 Water (0.04)
Clutch engagement	3500 ± 200 r/min.	-
Clutch lock-up	7000 ± 300 r/min.	-

## THERMOSTAT

Item:	Standard:	Limit: mm (in)
Thermostat	Triggered at 70° C ± 2° C	-

## OIL PUMP

Item:	Specification:
Oil pump reduction ratio	30.000 (30/1)
Oil pump discharge rate	<b>Air</b> 0.9 - 1.1 ml (0.032 - 0.039 once) for 5 minutes a 3000 r/min.
	<b>Water</b> 0.8 - 1.0 ml (0.028 - 0.035 once) for 5 minutes a 3000 r/min.

## TRANSMISSION

Item:	Standard:	Limit: mm
Reduction ratio	Variable 2.95 - 0.75	-
Final reduction ratio	<b>Air</b> 51/15 x 64 x 17	-
	<b>Water</b> 51/15 x 64 x 17	-
Drive belt width	18.4 (0.75)	17.4 (0.7)
Driven face spring free length	<b>Air</b> 110 (4.3)	104.5 4.1
	<b>Water</b> 110 (4.3)	104.5 4.1

**KEIHIN CARBURETOR**

Type of adjustment	73MA	96MA	97MA	M23B	M23B (CH)
Jet, max	80	70	72	70	70
Jet, min	38	38	45	38	38
Pin	6LCJ 2^	6LCJ 2^	6LCJ 2^	6LCJ 3^	6LCJ 2^
Diffuser	5,5 x 2,6	5,5 x 2,6	5,5 x 2,6	5,0 x 2,6	5,0 x 2,6
Valve	H 40	H 40	H 40	H 40	H 40
Air screw	1 ¼ + / - 1/4	1 ¼ + / - 1/4	2 ½ + / - 1/4	2 ¾ + / - 1/4	2 ¾ + / - 1/4
Petrol inlet	1,6	1,6	1,6	1,6	1,6
Starting jet	45	45	45	45	45



**ELECTRICAL**

Unit: mm (in)

Item:	Note:	Specification:	Unit: mm (in)
Spark plug	Air	Type	NGK-R BPR7HS
		Gap	0.6 - 0.7 mm (0.024 - 0.028) in
	Water	Type	NGK-R BPR7HS
		Gap	0.6 - 0.7 mm (0.024 - 0.028) in

Devices	Manufacturer	Type
C.D.I.	KOKUSAN DENKI	CB 1106
Ignition coil	KOKUSAN DENKI	IG 39
Magneto flywheel	KOKUSAN DENKI	GP 8164
Spark plug Alternative:	NGK-R (5kΩ)	BPR8HS (5kΩ)
Spark plug cover	FACOMSA	F26006 (5kΩ)

**OIL CHART**


**Transmission oil (recommended):**  F.C., SAE 75W - 90 or  Agip GEAR SYNTH, SAE 75W - 90.

Or alternatively branded oils with equivalent or better performance than A.P.I. GL-4.

**Mixer oil (recommended):**  GREEN HIT 2 or  Agip CITY 2T.

Or alternatively branded oils with equivalent or better performance than ISO-L-ETC++, A.P.I. TC++

**Bearings and other grease points (recommended):**  AUTOGREASE MP oppure

 Agip GREASE 30

Or alternatively branded grease for revolving bearings with temperature range of -30 °C to +140 °C, dripping point 150 °C + 230 °C, with high protection and anti corrosion properties, good resistance to water and oxidation.

**FOR H<sub>2</sub>O ONLY**

Lubricating oil for H<sub>2</sub>O version


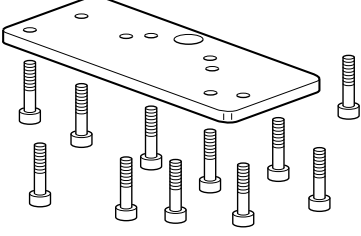
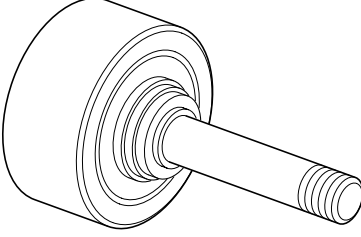
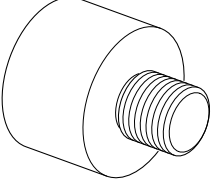
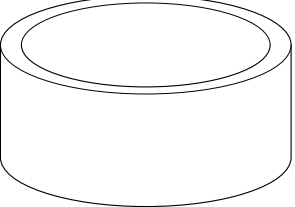
Use only nitrite-free antifreeze and anticorrosive liquid ensuring protection to at least up to -35 °C.

Recommended engine coolant:  ECOBLU - 40 °C or  Agip COOL.

**SPECIAL ENGINE TOOLS**

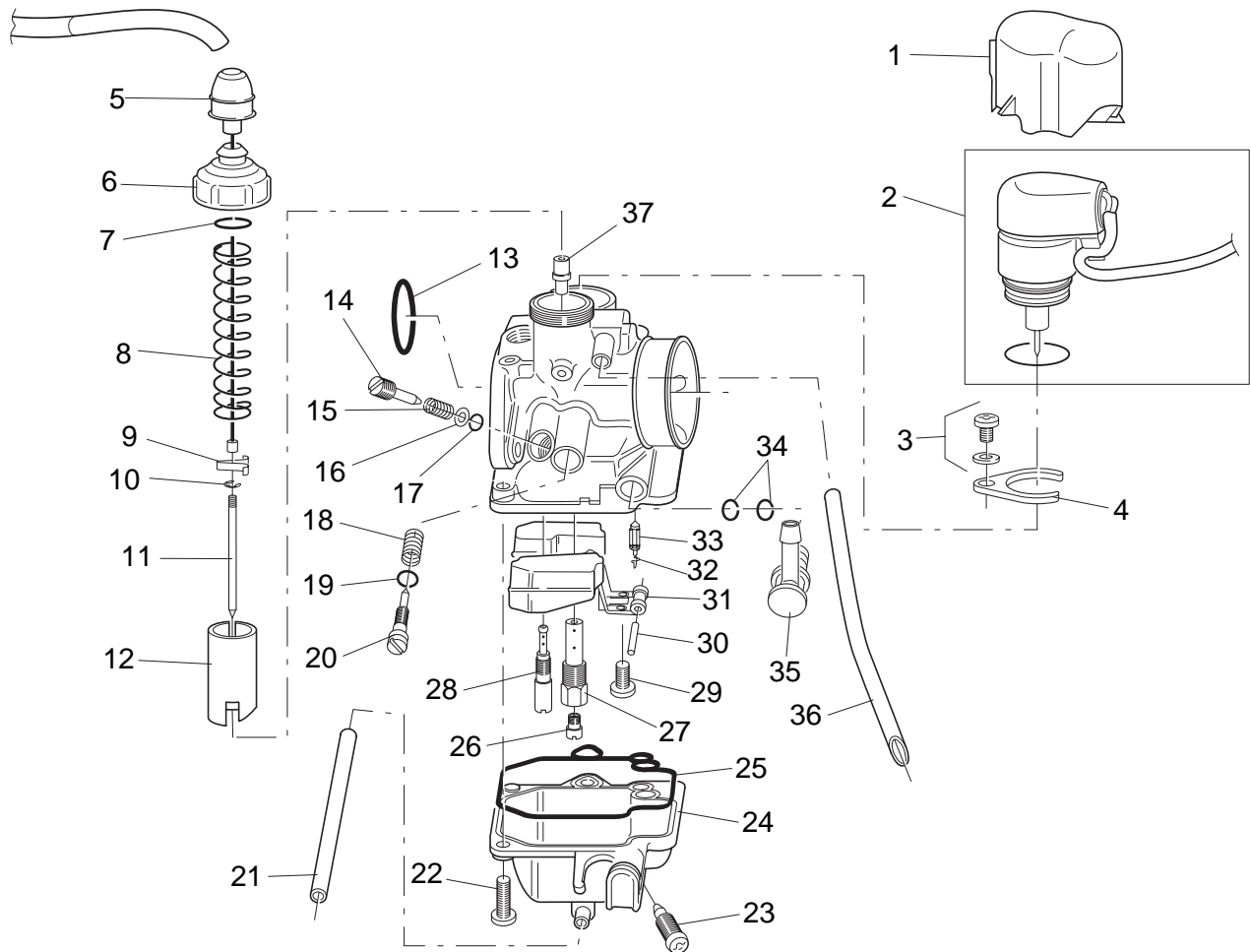
 Drawing	Tool code	Name/function
	<p><b>8140229</b></p>	<p>Engine support.</p>
	<p><b>8140430</b></p>	<p>Tool for fitting the teflon ring onto the air injector.</p>
	<p><b>8140429</b></p>	<p>Tool for fitting the teflon ring onto the air injector.</p>
	<p><b>8140431</b></p>	<p>Air injector extractor.</p>

**SPECIAL ENGINE TOOLS**

 Drawing	Tool code	Name/function
	<p><b>8140228</b></p>	<p>Adapter plate for flywheel and drive shaft extraction.</p>
	<p><b>8140227</b></p>	<p>Reduction gear for bearing assembly.</p>
	<p><b>8140225</b></p>	<p>Reduction gear for drive shaft traction.</p>
	<p><b>8140226</b></p>	<p>Spacer for drive shaft centering.</p>

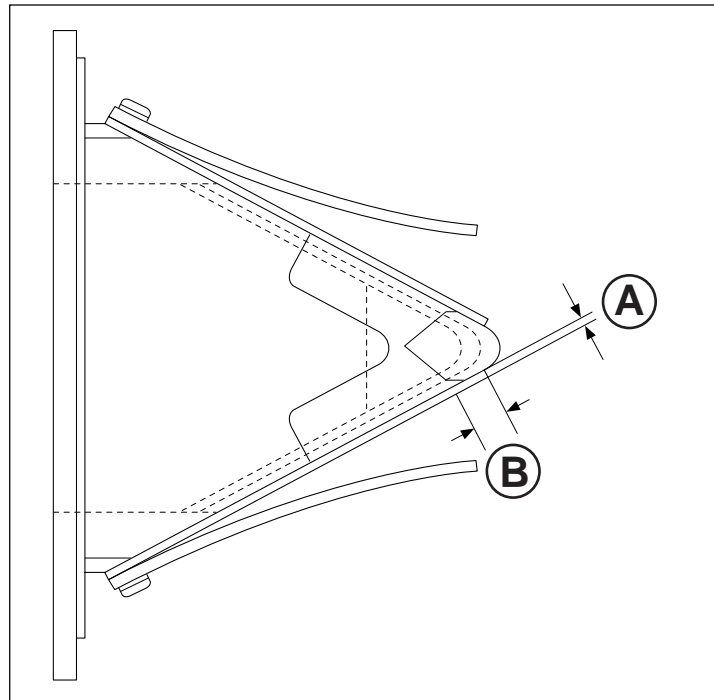


**CARBURETOR**



DISASSEMBLY SEQUENCE	ITEM NAME	DISASSEMBLY SEQUENCE	ITEM NAME
1	External cover	20	Adj. min. eng. speed screw
2	Valve starter	21	Pipe
3	Screw	22	Screw
4	Starter fixing plate	23	Fuel unload screw
5	Plug	24	Flat
6	Gas valve cover	25	Gasket
7	Gasket	26	Max. jet
8	Spring	27	Jetholder
9	Plate	28	Min. jet
10	Metering rod lock	29	Screw
11	Jet Needle	30	Float pin
12	Valve	31	Float
13	O-Ring	32	Lock
14	Air fuel screw	33	Pin valve
15	Spring	34	O-Ring
16	Washer	35	Union
17	O-Ring	36	Pipe
18	Spring	37	Atomizer
19	O-Ring		

## LAMINAR VALVE



Measurement of clearance (A) between laminar valve and its housing and size (B).  
If clearance (A) is in excess of 0.2 mm (0,08"), replace the laminar valve.  
(B)size is at least 1 mm (0.04").

**TECHNICAL COMMUNICATIONS**

## DISASSEMBLY SEQUENCE

### TRAPEZOID BELT – CLUTCH – PRIMARY AND SECONDARY PULLEY

- Remove the 9 securing screws (1) variator cover (2) and gasket (3).
- Remove the 6-sided nut (4), spacer (5), toothed cup (6), spacer (7).
- Remove the fan (8) and the primary fixed pulley (9).
- Remove the 6-sided nut (10), Remove clutch bell (11).
- Remove the clutch assembly from the shaft (31).
- Remove the trapezoid belt (12).
- Remove shim (13), bush (14) and mobile primary pulley (9A)
- Remove the three locking screws (15) of the mobile pulley guard (16) and remove mobile block-holder (17) and the six counterweights (18).
- Remove blocks (19).

### CLUTCH

- Remove the 6-sided nut (20).
- Remove the whole centrifugal clutch (21), Limit spring (22), and spring holder cup (23).
- Remove guide dowels (24).
- Slide mobile secondary pulley (25) off fixed pulley (28).
- Remove oil guard (26) and the two O-Rings (27).

### TRANSMISSION

- Remove the 8 locking screws (29), transmission cover (30) O-Ring (30A).
- Remove transmission shaft (31) from the variator half-crankcase.
- Remove output shaft (32), double intermediate gear (33) and related shims (34) from transmission cover.

### STARTER

- Remove locking screw (35) and starter lever (36).
- Remove sliding gear (37) and its spring (38).
- Remove starter lever return spring (39) starter shaft (40) and its bush (41).

### STARTER PINION

- Remove the two locking screws (42), bendix support bracket (43) and the two sleeves (43A).
- Remove bendix (44).

### REASSEMBLY

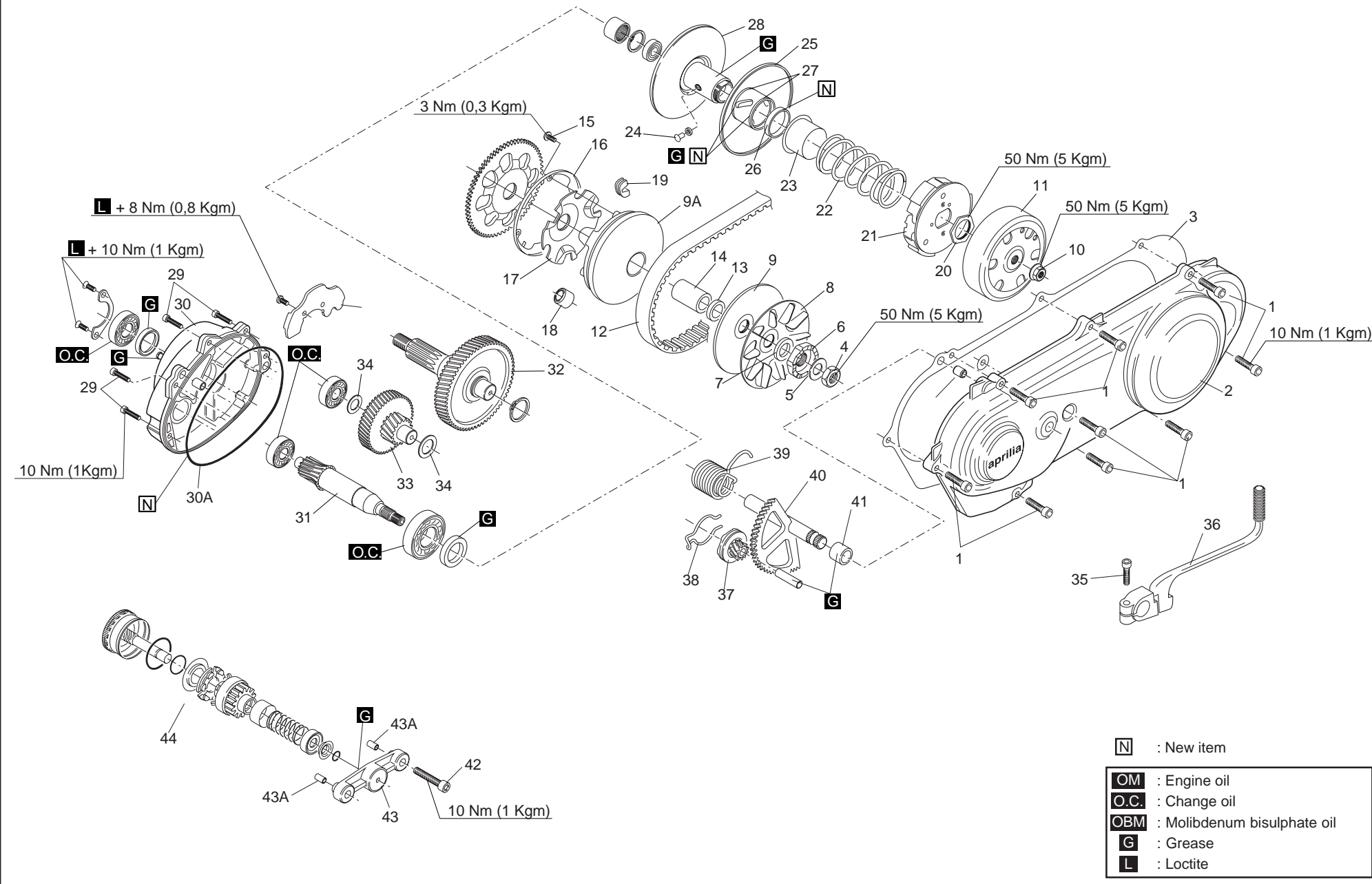
Reverse the order of disassembly instructions, making sure tightening torques are correct, and all components requiring grease are greased or, if necessary, replaced with components specified in the table.

**⚠ Pay the utmost attention to the proper assembly of the dolly block holders on the spline shaft, to avoid damaging any component.**

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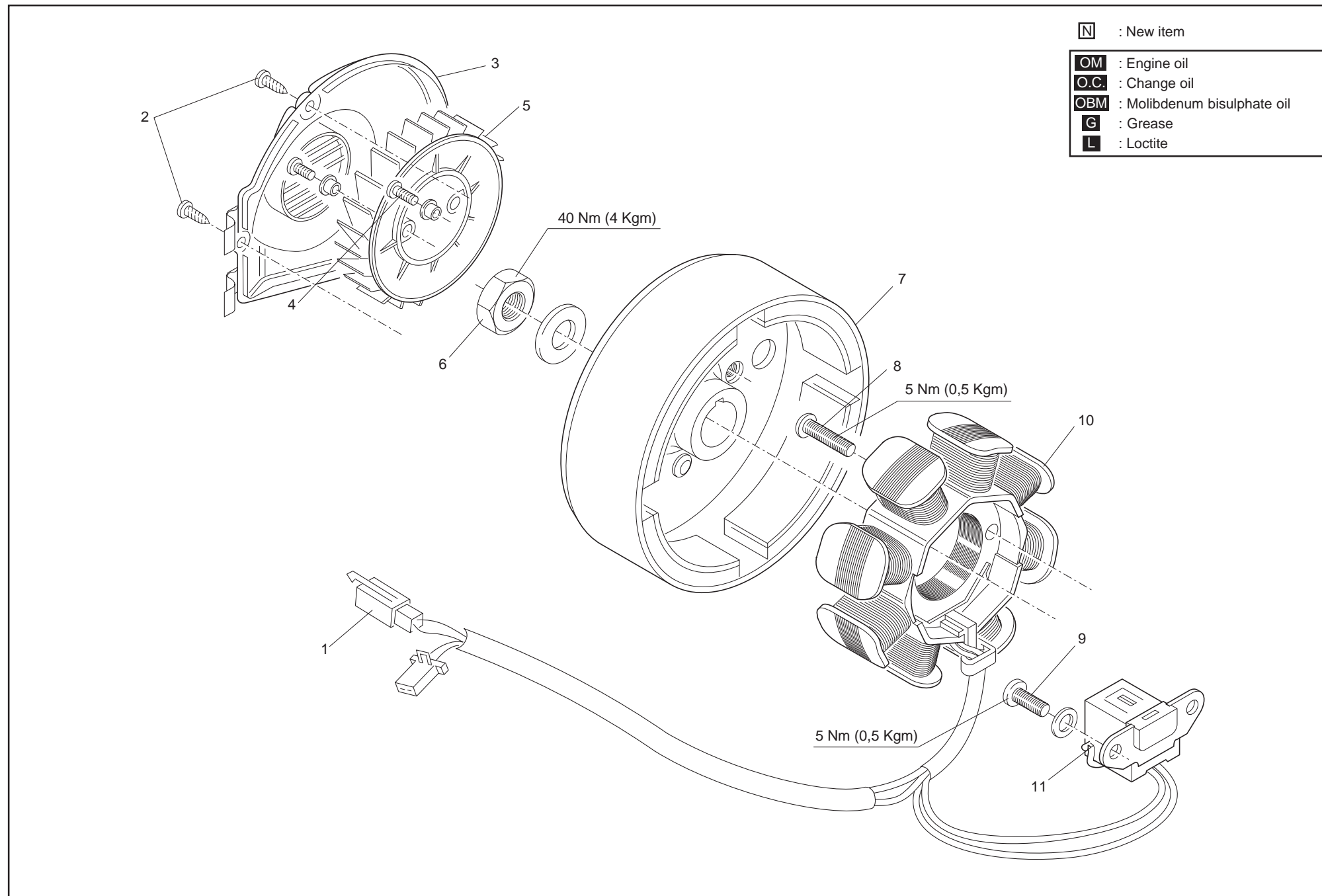
TRANSMISSION

TABLE 01



## CHECKING WEAR LIMITS

Chart references	Component	Wear limit
11	Bell diameter	Max. diameter: 110.5 mm (original diameter: 110.00 – 110.15 mm)
12	Trapezoid belt	Min. width: 17.4 mm (original width: 18.4 mm)
18	Variator roller	Outer diameter: 16 ,5 (original diameter: 17 mm)
21	Clutch shoe	Min. thickness: 2 mm (original thickness: 3mm) measured at the centre of the friction area
22	Limit spring	Min. length: 104.5 mm (original length: 110 mm)
N.B. 8-9	Fan/primary fixed pulley	The two components have become a single component (I.M."C") See table 01 – water model component no. 7



## DISASSEMBLY SEQUENCE

### C.A. GENERATOR

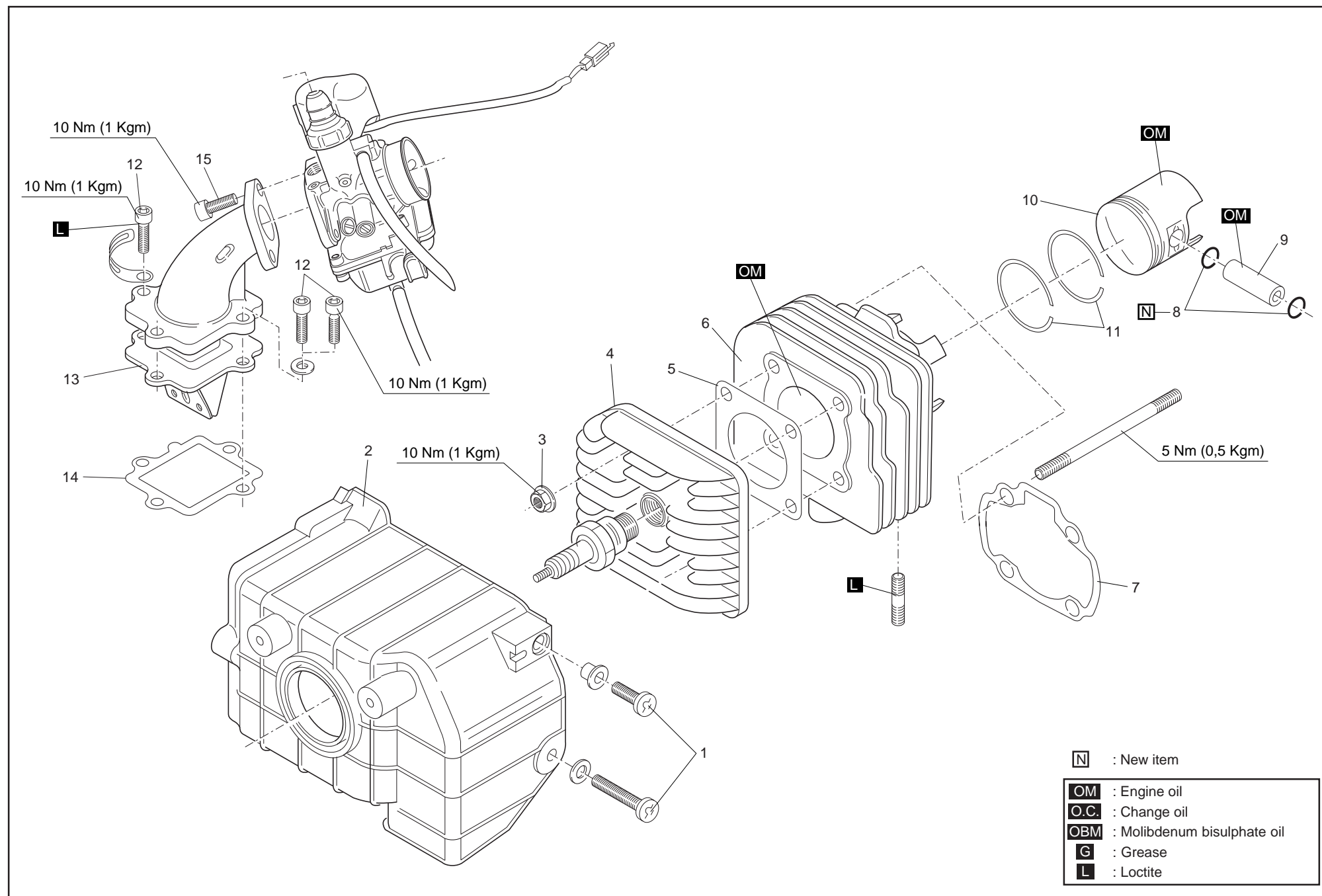
- Disconnect connectors (1).
- Remove the four screws of the fan cover (2) and fan cover (3).
- Remove the two fan screws (4) and fan (5).
- Remove rotor nut (6).
- Remove rotor (7).
- Remove the two locking screws of stator plate (8) and pick-up (9).
- Remove stator (10) and pick-up (11).

## CHECKING WEAR LIMITS

Chart references	Component	Wear limit
10	Stator	Cables: Yellow/White earth - White/Red earth 0,4 $\Omega \pm 20 \%$
11	Pick-up	Cables: Brown - White 185 $\Omega \pm 20 \%$

**REASSEMBLY**

Reverse the order of disassembly instructions, making sure tightening torques are correct, and all components requiring grease are greased or, if necessary, replaced with components specified in the table.



## DISASSEMBLY SEQUENCE

### HEAD – CYLINDER – PISTON

- Remove locking screws for cooling cap (1) and cooling cap (2).
- Remove the four tightening nuts of head (3).
- Remove head (4), head gasket (5), cylinder (6), base gasket (7).
- Remove one piston pin retainer (8).
- Slide out piston pin (9) and piston (10).
- Remove segments (11).

### CARBURETOR – LAMINAR UNIT

- Remove four locking screws from collector (12).
- Remove laminar unit (13) and laminar unit gasket (14).
- Remove the two carburetor locking screws (15).

## CHECKING WEAR LIMITS

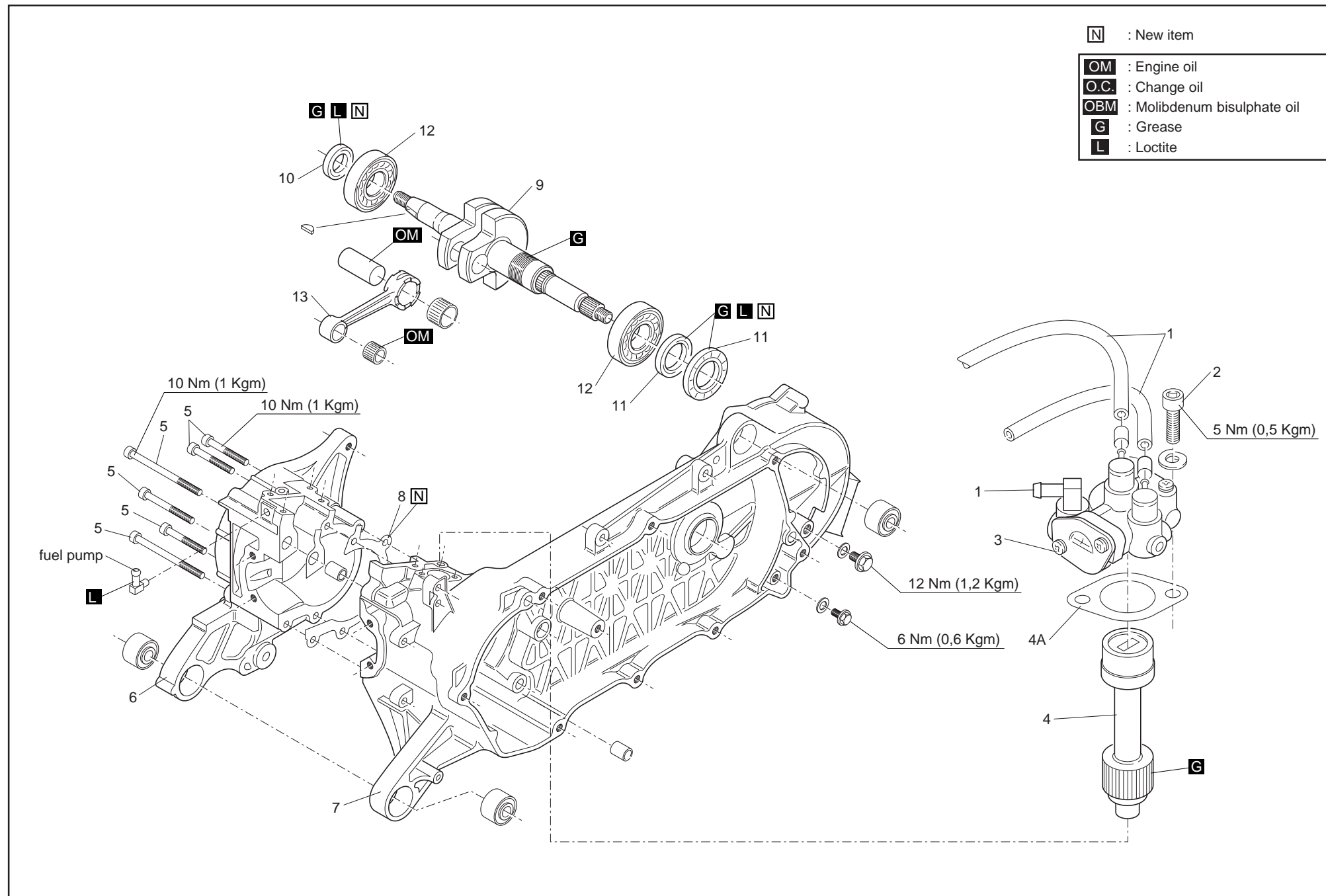
Chart references	Component	Wear limit
4	Head	Flatness limit: 0.05 mm
6	Cylinder	Max bore: 41.075 mm
9	Piston pin	Min diameter: 9.980 mm
10	Piston	Min diameter: 40.885
		Piston-cylinder clearance: 0.120 mm
11	Upper segment	End space max: 0.8 mm
	Lower segment	End space max: 0.8 mm
13	Laminar valve	Valve body – laminar element space, max: 0.02 mm

### REASSEMBLY

Reverse the order of disassembly instructions, making sure tightening torques are correct, and all components requiring grease are greased or, if necessary, replaced with components specified in the table.

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HEATING UNIT  
TABLE 03



## DISASSEMBLY SEQUENCE

### OIL MIX PUMP

- Disconnect oil delivery and return (1).
- Remove the two pump unit locking screws (2).
- Remove pump unit (3).
- Remove oil pump shaft (4) and gasket (4A).

### CRANKCASE – ENGINE SHAFT

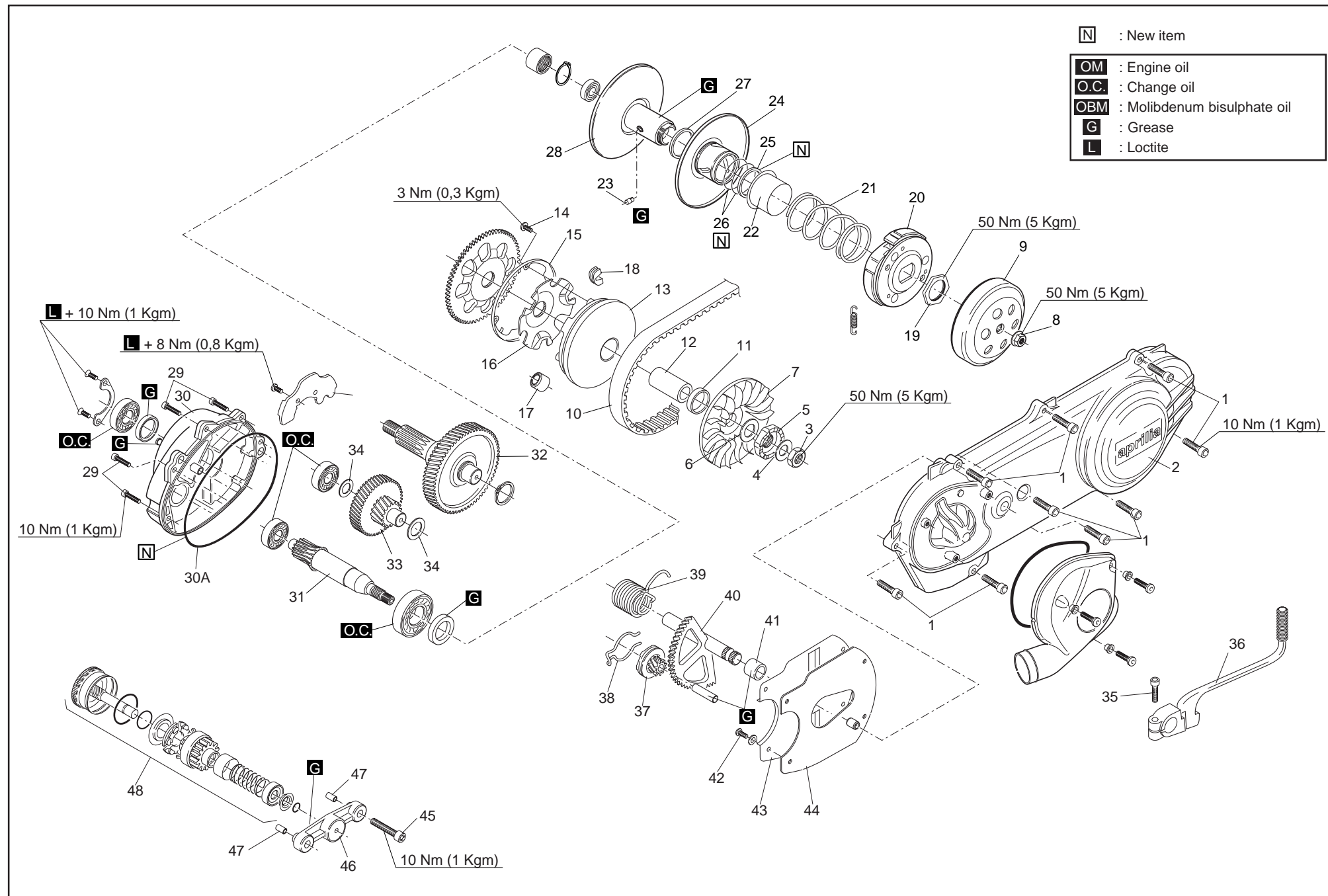
- Remove the six crankcase locking screws (5).
- Separate right half-crankcase (6) from left half-crankcase (7).
- Remove gasket (8).
- Remove engine shaft (9) from right half-crankcase.
- Remove right oil guard (10) and left (11).
- Remove bearings (12).

## CHECKING WEAR LIMITS

Chart references	Component	Wear limit
9	Engine shaft	Standard width: 35,95 - 36,10 mm
9	Engine shaft	Offset limit: 0,03 mm (measured on two centers)
9	Engine shaft	Connecting rod head side clearance: 0.656 mm (original clearance: 0.55 mm)
13	Connecting rod	Max. diameter of foot of connecting rod: 14.040 mm (original diam.: 14.003 – 14.011 mm)

### REASSEMBLY

Reverse the order of disassembly instructions, making sure tightening torques are correct, and all components requiring grease are greased or, if necessary, replaced with components specified in the table.



## DISASSEMBLY SEQUENCE

### TRAPEZOID BELT – CLUTCH – PRIMARY AND SECONDARY PULLEY

- Remove the 9 securing screws (1) variator cover (2).
- Remove 6-sided nut (3), spacer (4), toothed cup (5), spacer (6).
- Remove the primary fixed pulley (7).
- Remove 6-sided nut (8), Remove clutch bell (9).
- Remove clutch assembly from shaft (31).
- Remove trapezoid belt (10).
- Remove shim (11), bush (12) and mobile primary pulley (13).
- Remove the three locking screws (14) of guard (15) of the mobile pulley and Remove mobile block-holder (16) and the six counterweights (17).
- Remove blocks (18).

### CLUTCH

- Remove 6-sided nut (19).
- Remove the whole centrifugal clutch (20), Limit spring (21), and spring holder cup (22).
- Remove guide dowels (23).
- Slide mobile secondary pulley (24) off fixed pulley (25).
- Remove oil guard (25) and the two O-Rings (26) and the oil guard (27).

### TRANSMISSION

- Remove the 8 locking screws (29), transmission cover (30) O-Ring (30A).
- Remove transmission shaft (31) from the variator half-crankcase.
- Remove output shaft (32), double intermediate gear (33) and related shims (34) from transmission cover.

### STARTER

- Remove locking screw (35) and starter lever (36).
- Remove sliding gear (37) and its spring (38).
- Remove starter lever return spring (39) starter shaft (40) and its bush (41).
- Unscrew the screws (42) and remove the air conveyor (43) and sound dampening panel (44)

### STARTER PINION

- Remove the two locking screws (45), bendix support bracket and the sleeves (47).
- Remove bendix (48).

## CHECKING WEAR LIMITS

Chart references	Component	Wear limit
9	Bell diameter	Max. diameter: 107.5 mm (original diameter: 107 – 107.2 mm)
10	Trapezoid belt	Min. width: 17.4 mm (original width: 18.4 mm)
17	Variator roller	Outer diameter: 16,5 (original diameter: 17 mm)
20	Clutch shoe	Min. thickness: 1 mm (original thickness: 1.8-2 mm) measured at the centre of the friction area
21	Limit spring	Min. length: 105 mm (original length: 110 mm)

### REASSEMBLY

Reverse the order of disassembly instructions, making sure tightening torques are correct, and all components requiring grease are greased or, if necessary, replaced with components specified in the table.

**⚠ Pay the utmost attention to the proper assembly of the dolly block holders on the spline shaft, to avoid damaging any component.**

RELEASE 00 2000 - 07 WATER

TRANSMISSION

TABLE 01



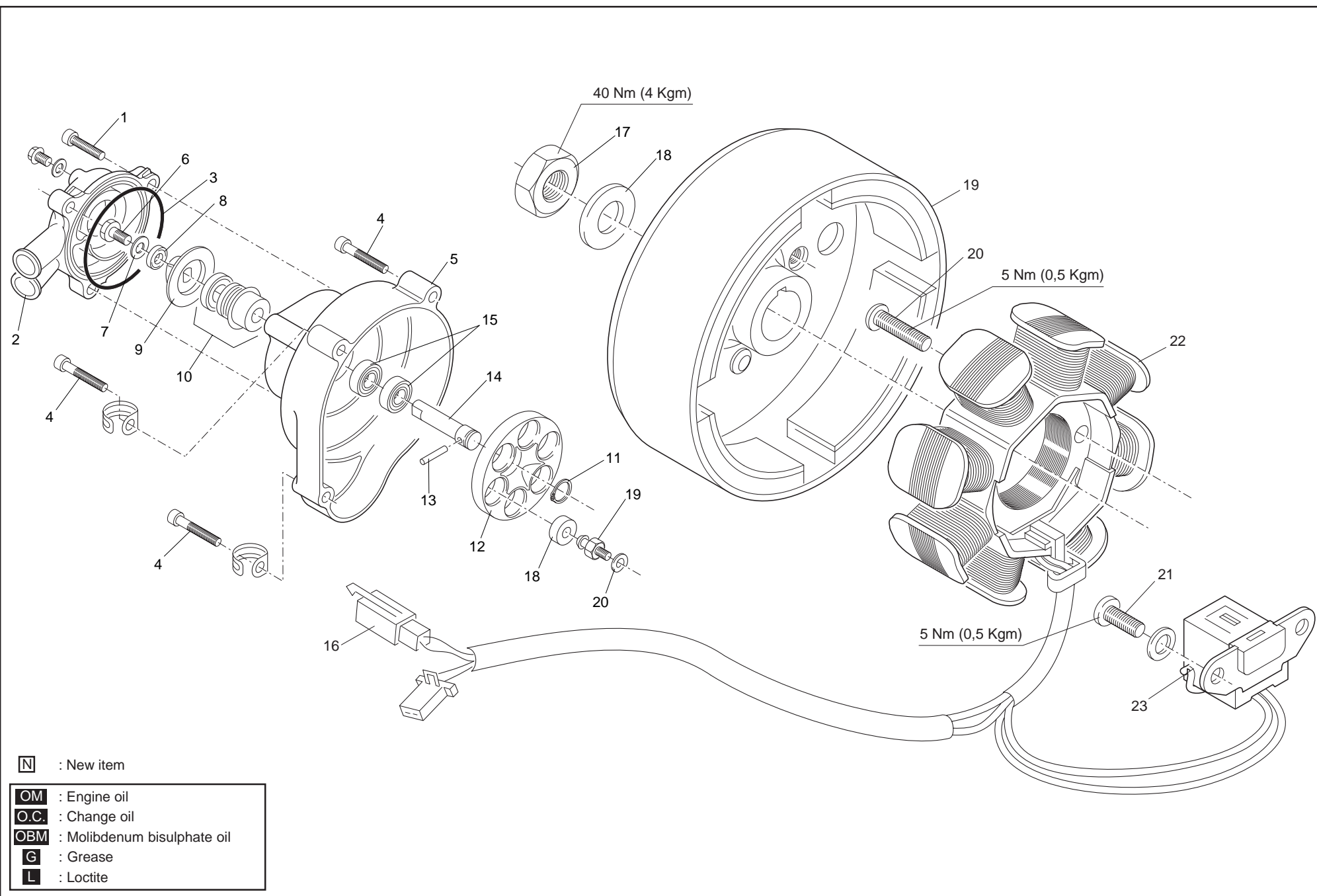
# DISASSEMBLY SEQUENCE

## COOLING UNIT

- Remove the 3 screws (1) and remove water pump unit (2) with O-Ring (3).
- Remove the four screws (4) and flywheel cover (5).
- Unscrew screw (6) setting aside washer (7) and lock washer (8).
- Slide out rotor (9) and pump mechanical seal (10).
- Remove seeger ring (11), and pump rotor draft gear (12).
- Remove plug (13) and rotor shaft (14).
- Remove the two bearings (15).

## A.C. GENERATOR

- Disconnect connectors (16).
- Remove rotor nut (17) and set washers aside (18).
- Remove rotor (19).
- Remove the two locking screws of stator plate (20) and pick-up (21).
- Remove stator (22) and pick-up (23).



## CHECKING WEAR LIMITS

Chart references	Component	Wear limit
10	Stator	Cables: Yellow/White earth - White/Red earth $0,4 \Omega \pm 20 \%$
11	Pick-up	Cables: Brown - White $185 \Omega \pm 20 \%$

## REASSEMBLY

Reverse the order of disassembly instructions, making sure tightening torques are correct, and all components requiring grease are greased or, if necessary, replaced with components specified in the table.

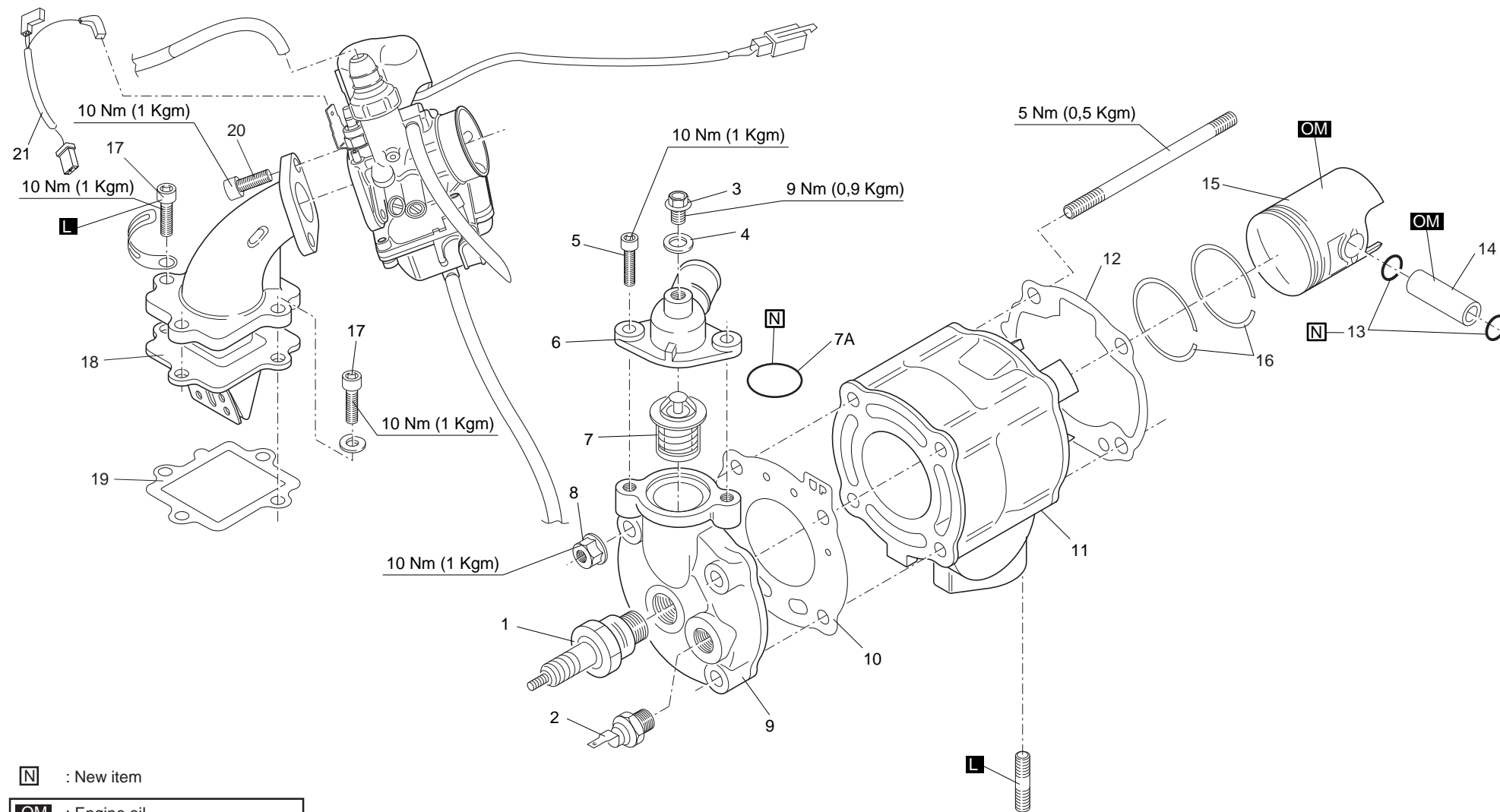
## DISASSEMBLY SEQUENCE

### HEAD – CYLINDER – PISTON

- Remove spark plug (1) and thermostat (2)
- Remove screw (3) and washers (4)
- Remove the two screws (5) and remove the connection (6)
- Slide out the thermostat (7) or O-Ring (7A)
- Remove the four tightening head nuts (8).
- Remove head (9), head gasket (10), cylinder (11), base gasket (12).
- Remove one piston pin retainer (13).
- Slide out piston pin (14) and piston (15).
- Remove segments (16).

### CARBURETOR – LAMINAR UNIT

- Remove four locking screws from collector (17).
- Remove laminar unit (18) and laminar unit gasket (19)
- Remove the two carburetor locking screws (20).
- Disconnect heating cable (21)



**N** : New item

**OM** : Engine oil  
**O.C.** : Change oil  
**OBM** : Molibdenum bisulphate oil  
**G** : Grease  
**L** : Loctite

## CHECKING WEAR LIMITS

Chart references	Component	Wear limit
9	Head	Flatness limit: 0.05 mm
11	Cylinder	Max bore: 41.105 mm
14	Piston pin	Min diameter: 11.98 mm
15	Piston	Min diameter: 40.890 mm
		Piston-cylinder clearance: 0.120 mm
16	Upper segment	End space, max: 0.8 mm
	Lower segment	End space, max: 0,8 mm
18	Laminar valve	Valve body – laminar element space, max:
<b>N.B. 7A</b>		For engines from no. ABL02Y0021673 to no. ABL02Y0023673, the O-Ring (7A) replaces the thermostat (7).

### REASSEMBLY

Reverse the order of disassembly instructions, making sure tightening torques are correct, and all components requiring grease are greased or, if necessary, replaced with components specified in the table.

RELEASE 00 2000 - 07 WATER

HEATING UNIT

TABLE 03

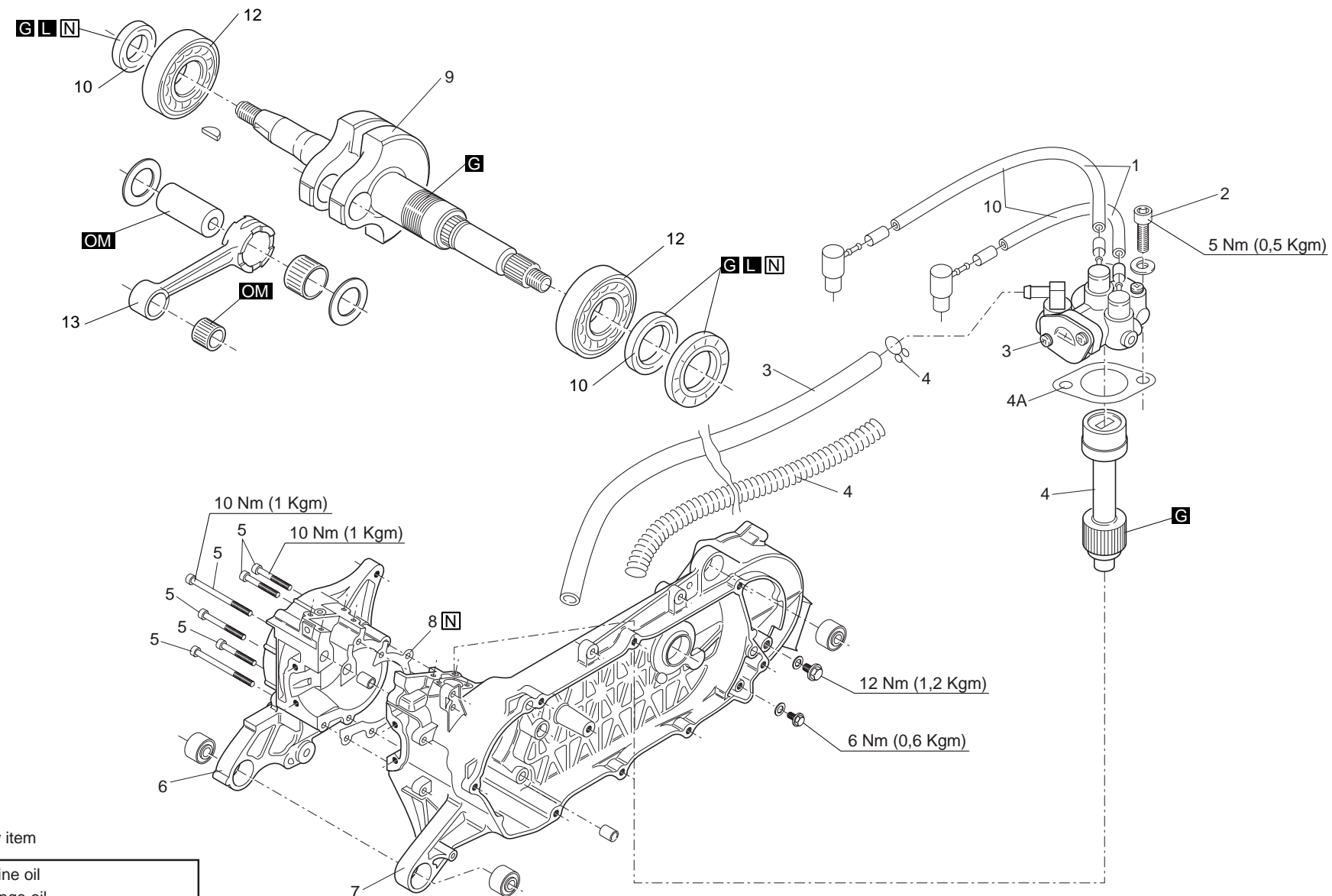
## DISASSEMBLY SEQUENCE

### OIL MIX PUMP

- Disconnect oil delivery and return (1).
- Remove the two locking screws of pump unit (2).
- Remove pump unit (3).
- Remove oil pump shaft (4) and gasket (4A).

### CRANKCASE – ENGINE SHAFT

- Remove the six crankcase locking screws (5).
- Separate right half-crankcase (6) from left half-crankcase (7).
- Remove gasket (8).
- Remove engine shaft (9) from right half-crankcase.
- Remove right oil guard (10) and left (11).
- Remove bearings (12).



**N** : New item

**OM** : Engine oil  
**O.C.** : Change oil  
**OBM** : Molybdenum bisulphate oil  
**G** : Grease  
**L** : Loctite

## CHECKING WEAR LIMITS

Chart references	Component	Wear limit
9	Engine shaft	Standard width: 37.95 – 38.10 mm
9	Engine shaft	Offset limit: 0.03 mm (measured on two centers)
9	Engine shaft	Connecting rod head side clearance: 0.85 mm (original clearance: 0.75 mm)
13	Connecting rod	Max. diameter of foot of connecting rod: 16.04 mm (original diam.: 16.003 – 16.011 mm)

### REASSEMBLY

Reverse the order of disassembly instructions, making sure tightening torques are correct, and all components requiring grease are greased or, if necessary, replaced with components specified in the table.

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COVER AND ENGINE SHAFT

TABLE 04