

DERBI

**WORKSHOP MANUAL
GPR 125 4-stroke**



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0 - INTRODUCTION

This manual has been produced by **Nacional Motor, S.A.U.** for use by **DERBI** dealer and sub-agency workshops. It is assumed that those using this publication for training purposes and for repairing **DERBI** machines have a basic knowledge of mechanics and of the methods inherent in the technique of vehicle repair. Significant variations in the characteristics of the machines or in the specific repair operations will be communicated by means of updates to this manual.

Completely satisfactory work cannot however be carried out without the availability of suitable facilities and tools, which is why we ask you to consult the pages of this manual referring to special tools and implements.

NACIONAL MOTOR, S.A.U.

Particularly important items of information in this manual are distinguished by the following annotations:



Indicates a serious possibility of suffering **SEVERE PERSONAL INJURIES OR DEATH** if the instructions are not followed.



Indicates the possibility that the **ELEMENT WILL BE DAMAGED** if the instructions are not followed.



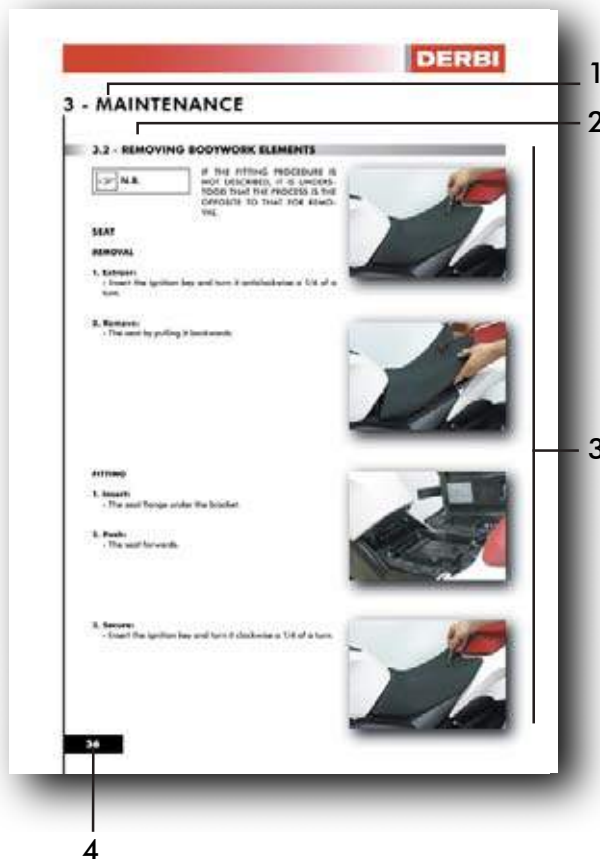
Presents **USEFUL INFORMATION**.

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0 - INTRODUCTION

The aim of this manual is to provide the mechanic with a handy and easy to use reference source. It contains comprehensive explanations of all the installation, extraction, dismantling, assembly, repair and checking procedures organized step by step in sequence.

- 1 Each chapter is divided into sections whose titles appear at the top of each page.
- 2 The titles of the subsections appear in a smaller format than the section titles.
- 3 Each operation is accompanied by photographs or illustrations.
- 4 Numbering corresponding to the chapter.



0 - INTRODUCTION

VIEWS OF THE MACHINE

RIGHT-HAND SIDE (facing forwards)



LEFT-HAND SIDE (facing forwards)



N.B.

Whenever Right-hand or Left-hand Side are specified in this manual, it is understood as meaning facing forward (i.e. in the riding direction).

0 - INTRODUCTION

IDENTIFICATION OF THE MACHINE

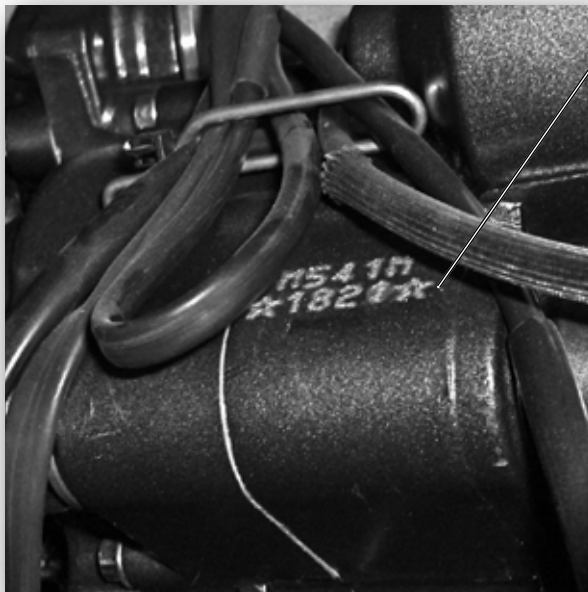


FRAME SERIAL NUMBER VTHRG1A1Axxxxxxx

The frame serial number is located to the right of the steering column.

MANUFACTURER'S PLATE

The manufacturer's plate is located to the right of the steering column. It includes information about the exhaust system's noise emissions (useful in MOT inspections).



ENGINE SERIAL NUMBER *xxxx*

The frame serial number is on the rear of the chassis.

1 - GENERAL INFORMATION

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1 - GENERAL INFORMATION

1.1 - SAFETY REGULATIONS



- In the event of having to carry out work on the machine while the engine is running, ensure that the work area is well ventilated, where possible using suitable extractor fans. Never leave engines running in closed spaces. The exhaust gases produced contain CO (carbon monoxide) **which can cause loss of consciousness and can lead to death when inhaled.**

- The battery electrolyte contains sulphuric acid. Protect eyes, clothing and skin. Sulphuric acid is highly corrosive; in the event of contact with the eyes or skin, wash with copious amounts of water and seek medical attention immediately. If electrolyte is swallowed accidentally, drink copious amounts of water or milk and seek medical attention immediately.

- The battery produces hydrogen, a gas that can be highly explosive. Do not smoke, and avoid flames or sparks close to the battery, especially during battery charging operations.

- Avoid prolonged contact of used engine oil with the skin. Either wear gloves or wash your hands on finishing handling used oil.

- Petrol is extremely inflammable, and in certain conditions can be explosive. Do not smoke, and avoid sparks or other points of ignition in the work area.

- Clean brake pads in a well-ventilated place. DO NOT use compressed air to clean brake pads or brake callipers. Although the dust does not contain asbestos, its inhalation can cause respiratory illnesses.

- Brake liquid attacks painted surfaces very aggressively. Protect painted elements with a clean cloth when performing operations with brake fluid. Wear gloves if possible, since contact of brake fluid with the skin is not advisable.

- Prevent coolant from spilling onto hot elements, since it produces an "invisible flame" which may lead to a person receiving burns as a result of not seeing the flame.

- Do not remove the radiator cap when the engine is hot, since the coolant is under pressure and at a high temperature, and may cause severe burning.

- If coolant enters the eyes, they must be washed immediately with cold water and medical attention sought.

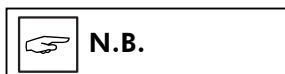
- During normal functioning, the exhaust system and the engine are at a high temperature.

If work has to be carried out on these, either wait until they have cooled down or wear suitable gloves to avoid being burnt.

1 - GENERAL INFORMATION

1.2 - MAINTENANCE REGULATIONS

- Use genuine DERBI spare parts and lubricants recommended by DERBI. Non-genuine or unauthorised parts may damage the machine.
- Only use the specific tools intended for this machine.
- During re-assembly, always use new oil seals, gaskets, piston rings and grommets.
- After dismantling, clean the components with solvents that are non-inflammable or that have a high flammability point. Grease all working surfaces before assembling, excluding tapered joints.
- After assembly, check that all components have been correctly fitted and that they are functioning perfectly.
- For dismantling, checking and re-assembly operations use only tools with metric measurements. Metric screws, nuts and bolts are not interchangeable with imperial measurement joining devices. Using unsuitable tools and joining devices may damage the machine.
- In the case of work on the machine's electrical circuitry, check that electrical connections have been correctly fitted, especially the earth connections.

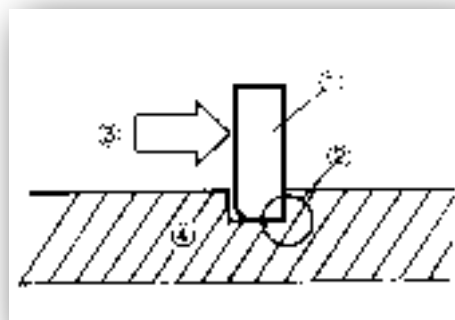


Use only genuine DERBI spare parts. For all lubrication tasks use oils and greases recommended by DERBI. Other makes may seem similar in their function and appearance, but are inferior in quality.




Examine all the locking rings carefully before fitting. Always replace the gudgeon pin circlips after every use. Replace distorted locking rings. On fitting a locking ring (1), ensure that the sharp edge (2) is on the opposite side to the force (3) to be applied to it.

See the figure on the side, (4) Axle.

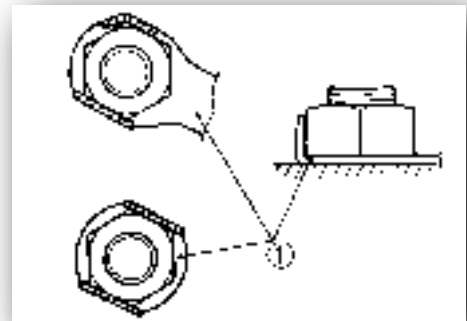


1 - GENERAL INFORMATION

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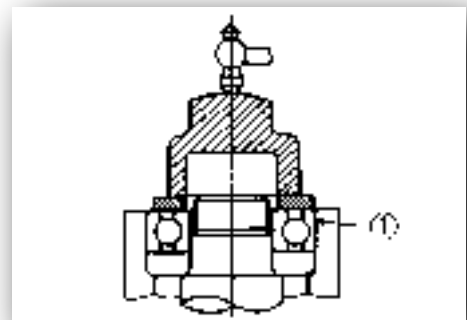
Replace all seals, retaining rings and O-rings when servicing the engine. All surfaces receiving seals, retaining ring edges and O-rings must be cleaned.

Apply oil to all paired parts and bearing during reassembly. Apply grease to the retaining ring edges. After removing them, replace all tab/spacer washers (1) and split pins. Bend the tabs to fit the flat surfaces of the bolt or nut once they have been tightened to the specified torque.



 **CAUTION**

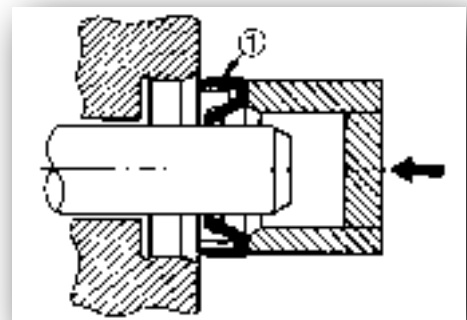
WHEN FITTING BEARINGS, ENSURE THAT THE SAME PRESSURE IS APPLIED TO BOTH RACES TO AVOID DAMAGING THEM.



Fit bearings and retaining rings in such a way that the manufacturers marks remain visible. On fitting retaining rings, applying a thin film of light lithium soap based grease to their edges. Where appropriate, apply oil generously when fitting bearings.

 **CAUTION**

DO NOT USE COMPRESSED AIR TO DRY BEARINGS. THIS WILL DAMAGE THE BEARING SURFACES.



Remove all the dirt, grime, dust and other foreign material before removing and dismantling.

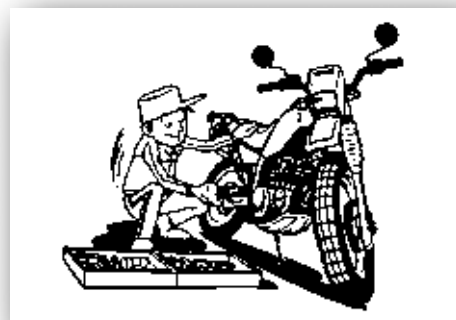


1 - GENERAL INFORMATION



Use properly cleaned tools and equipment.

See "SPECIAL TOOLS".



On dismantling parts, always keep paired items together. This includes gears, cylinders, pistons and other parts submitted to natural wear in pairs. Paired parts must always be reassembled or replaced together.

While dismantling the motorcycle, clean all the parts and lay them out on trays in the order dismantled. This speeds up reassembly and ensures the correct fitting of all the parts.



KEEP ALL PARTS WELL AWAY FROM ANY SOURCE OF IGNITION (CIGARETTES, FLAMES, SPARKS, ETC.).



1 - GENERAL INFORMATION

1.3 - SPECIAL TOOLS FOR THE ENGINE

The following special tools are needed for assembly and for complete and exact adjustments. Only use the proper special tools; thereby avoiding damage caused by the use of unsuitable tools or improvised techniques.

Ref. 864486

Camshaft sprocket locking tool.



Ref. 864487

Crankshaft sprocket locking tool.



Ref. 864567

Set of camshaft locking keys.



Ref. 864592

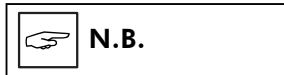
TDC measuring tool (must be accompanied by a dial depth gauge). This is used to calculate the thickness of the cylinder base gasket to be used.



1 - GENERAL INFORMATION

Ref. 865207

Set of tools for 125cc 4-stroke 4v engine.



THE SET OF TOOLS FOR THE ENGINE DOES NOT INCLUDE TOOL REF. 866380.

**Ref. 865259**

Camshaft crown wheel locking tool.

**Ref. 865260**

Magneto flywheel locking tool.

**Ref. 865261**

Tool for supporting piston.



1 - GENERAL INFORMATION

Ref. 866380

Tool kit (A-B-C) for extracting and fitting water pump oil seal.

**Ref. 00H05300041**

Clutch bell housing locking tool.

**Ref. 864868**

Magneto flywheel extractor tool.



1 - GENERAL INFORMATION

1.4 - SPECIAL TOOLS - CHASSIS

The following special tools are needed for assembly and for complete and exact adjustments. Only use the proper special tools; thereby avoiding damage caused by the use of unsuitable tools or improvised techniques.

Ref. 866714

Tool for adjusting the swinging arm nut.



1 - GENERAL INFORMATION

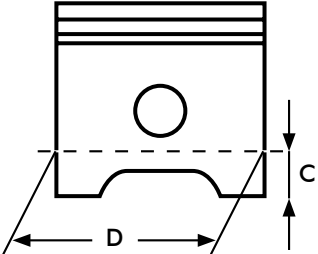
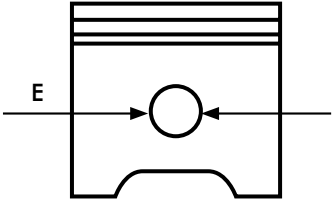
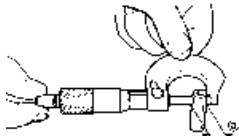
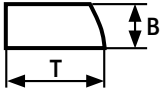
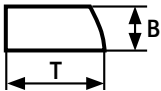
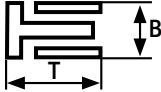
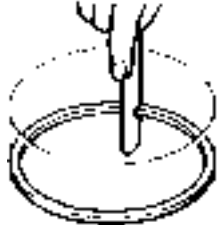
1.5 - TECHNICAL DATA

GENERAL	
MACHINE DIMENSIONS	
Distance between wheel shafts	1353 mm
Length	1968 mm
Wide	720 mm
High	810 mm
Weight	135 Kg
ENGINE	
Diameter x stroke	58 mm. x 47 mm
Cubic capacity	124,2 cm ³
Power	15 HP at 9.250 rpm
Type	Single cylinder 4-stroke, 4 valves, Euro 3
Timing	Double overhead camshaft (DOHC) chain driven
Compression ratio	12:1
Cylinder material	Cast iron
Cylinder head material	Cast aluminium
Type of lubrication	Semi-wet crankshaft
Cooling	Liquid
Idling	1680 ±50 rpm
Gearchange	Manual, 6 gears
Final transmission	Chain driven
Polluting emissions reduction system	Secondary air system and 2-way catalyser
OTHER PARTS OF THE MOTORCYCLE	
Type of chassis	Double beam of injected aluminium alloy
Steering angle	25°
Front suspension	41 mm Ø inverted hydraulic forks
Front suspension travel	110 mm
Rear suspension	Single shock absorber
Rear suspension travel	135 mm
Swinging arm	Double asymmetrical aluminium arm
Front tyre	100/80x17" Tubeless type
Rear tyre	130/70X17" Tubeless type
Make and model of tyres	Pirelli Sport Demon
Front brake	300mm Ø disk
Rear brake	220mmØ disk
POWER SUPPLY	
Carburettor	Keihin CVK Ø30
TRANSMISSION	
Clutch type	Multi-disk in oil bath (5 driving disks and 4 driven disks).
Primary transmission ratio	24/73=1/3,04
1st gear ratio	11/33=1/3
2nd gear ratio	15/30=1/2
3rd gear ratio	18/27=1/1,5
4th gear ratio	20/24=1/1,2
5th gear ratio	25/27=1/1,08
6th gear ratio	23/22=1,045
Final transmission ratio	14/49=1/3,50
Type of chain	With coupling and 130 links

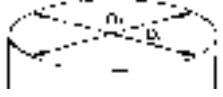
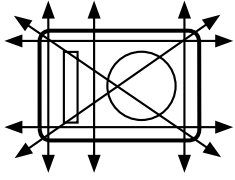
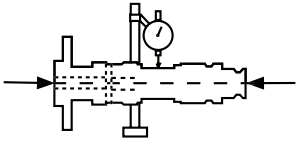
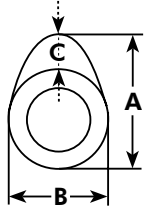
1 - GENERAL INFORMATION

GENERAL	
ELECTRICAL SYSTEM	
Spark plug	NGK CR8 EB
Gap between electrodes (plug gap)	0,7÷0,8 mm
Charging system	Three-phase magneto
Regulated voltage to battery	13v-15v at 8.000 rpm
Ignition system	Electronic CDI type
Battery	FTX7L-BS, 12v - 6Ah (MF type)
Starting system	Electric
CAPACITIES AND TYPES OF FLUIDS	
Periodical engine oil change (with oil filter)	1150 ml
Total engine oil (complete dismantling of the engine)	1200 ml
Type of engine oil recommended	AGIP TECH 4T
Engine oil viscosity	SAE 10W-40
Petrol	Lead free 95 octane
Fuel tank capacity	14,5 litres
Coolant in radiator	780 ml
Coolant in expansion chamber (up to max.)	230 ml
Recommended coolant	AGIP PLUS 30%
Brake fluid	DOT 4

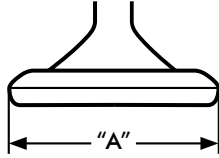
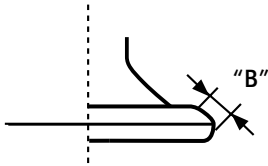


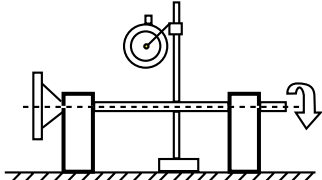
1 - GENERAL INFORMATION

ENGINE			
PISTON DIAMETER (D)	CAT M CAT N CAT O CAT P	57,953-57,960 mm 57,960-57,967 mm 57,967-57,974 mm 57,974-57,981 mm	
EXT. DIAMETER MEASUREMENT POINT PISTON (C)		7,5 mm	
DIAMETER OF PISTON GUDGEON PIN ORIFICE (E)		15,003-15,008 mm	
DIAMETER OF PISTON GUDGEON PIN (a) Standard Service limit		14,997-15,00 mm 14,995 mm	
PISTON RING TYPE 1st compression ring Type Dimension (BxT)		Tapered 1 x 2,5 mm	
2nd compression ring Type Dimension (BxT)		Tapered 1,2 x 2,5 mm	
3rd oil scraper ring Dimension (BxT)		2 x 2,5 mm	
PISTON RING GAP 1st compression ring 2nd compression ring 3rd oil scraper ring		0,2-0,35 mm 0,2-0,35 mm 0,2-0,7 mm	


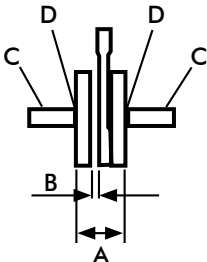
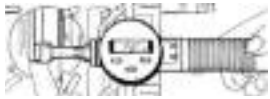


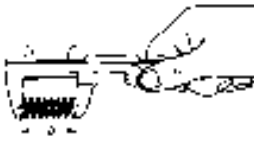
1 - GENERAL INFORMATION

ENGINE									
CYLINDER DIAMETER	<table border="0"> <tr> <td>CAT M</td> <td>58,010-58,017 mm</td> </tr> <tr> <td>CAT N</td> <td>58,017-58,024 mm</td> </tr> <tr> <td>CAT O</td> <td>58,024-58,031 mm</td> </tr> <tr> <td>CAT P</td> <td>58,031-58,038 mm</td> </tr> </table>	CAT M	58,010-58,017 mm	CAT N	58,017-58,024 mm	CAT O	58,024-58,031 mm	CAT P	58,031-58,038 mm
CAT M	58,010-58,017 mm								
CAT N	58,017-58,024 mm								
CAT O	58,024-58,031 mm								
CAT P	58,031-58,038 mm								
									
CYLINDER WARP	0,05 mm								
CYLINDER-PISTON ASSEMBLY	0,050-0,064 mm								
CYLINDER HEAD WARP SET	0,05 mm								
									
ENGINE COMPRESSION VALUE									
Standard	more than 15 kg/cm ²								
Minimum	13 Kg/cm ²								
VALVE ADJUSTMENT VALUE									
Inlet (engine cold below 35°C)	0,012 - 0,015 mm								
Exhaust (engine cold below 35°C)	0,015 - 0,020 mm								
MAXIMUM CAMSHAFT WARP									
Inlet	0,008 mm								
Exhaust	0,008 mm								
									
MAXIMUM CAMSHAFT AXIAL PLAY									
Inlet	0,4 mm								
Exhaust	0,4 mm								
CAM SIZE									
Inlet "A"	31,44-31,54 mm								
Inlet "B"	23,95-24,05 mm								
Inlet (lifted) "C"	7,49 mm								
Exhaust "A"	30,81-30,91 mm								
Exhaust "B"	23,95-24,05 mm								
Exhaust (lifted) "C"	6,86 mm								
									
TIMING CHAIN									
Type	92RH2005 114 links								
Timing chain tensioner	Automatic (ratchet)								

1 - GENERAL INFORMATION

ENGINE		
<p>VALVE DIAMETERS (A) Inlet Exhaust</p>	<p>21,90 - 22,05 mm 18,70 - 18,85 mm</p>	
<p>WIDTH OF VALVE SEATS (B) Inlet Exhaust</p>	<p>2,33 - 2,63 mm 2,82 - 3,12 mm</p>	
<p>VALVE STEM DIAMETER Inlet Exhaust</p>	<p>3,97 - 3,98 mm 3,96 - 3,97 mm</p>	
<p>VALVE GUIDE INTERNAL DIAMETER (A) Inlet Exhaust</p>	<p>3,97 - 3,98 mm 3,97 - 3,98 mm</p>	
<p>VALVE STEM - GUIDE PLAY LIMIT Inlet Exhaust</p>	<p>0,015 - 0,042 mm 0,015 - 0,042 mm</p>	
<p>VALVE WARP Inlet Exhaust</p>	<p>0,01 mm 0,01 mm</p>	

1 - GENERAL INFORMATION

ENGINE	
<p>VALVE SPRINGS (A) Inlet, free length Exhaust, free length Inlet, working length (valve closed) Exhaust, working length (valve closed) Inlet, work load Exhaust, work load</p>	<p>33,24 mm 33,24 mm 26 mm 26 mm 101,87-116,13 N (10,19-11,61 Kgf) 101,87-116,13 N (10,19-11,61 Kgf)</p> 
<p>CRANKSHAFT Crankshaft thickness (A) Diameter of crankshaft supports CLASS 1 CLASS 2 Crankshaft warp between points (C) Crankshaft warp at the supports (D) Axial play of crankshaft in the crankcase</p>	<p>46,87-47,05 mm 32,480-32,485 mm 32,485-32,490 mm 0,1 mm 0,01 mm 0,15 - 0,43 mm</p> 
<p>CONNECTING ROD Connecting rod side play (B) Diameter of the connecting rod Standard Limit</p>	<p>0,39-0,83 mm 15,010 - 15,018 mm 15,023 mm</p> 
<p>CLUTCH Thickness of driving disks Number of driving disks</p>	<p>2,85 - 2,95 mm 5</p> 
<p>Thickness of driven disks Number of driven disks Driven disk flatness service limit</p>	<p>1,46 - 1,53 mm 4 > a 0,05 mm</p> 
<p>Free length of clutch springs Number of springs</p>	<p>31,6 mm 5</p> 
<p>Clutch freeing method</p>	<p>External thrust</p>

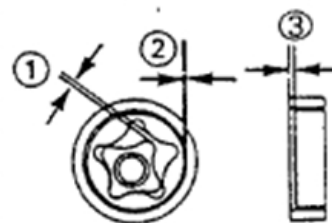
1 - GENERAL INFORMATION

FUEL SUPPLY SYSTEM	
Make	KEIHIN
Model	CVK Ø30
MAIN JET CIRCUIT	
Main jet	100
Main air jet	50
Atomiser (emulsifier tube)	
Outer Diameter	5,0 mm
Inner Diameter	2,8 mm
Tapered needle	
Make	NDYD
Diameter	2,490 mm
IDLING CIRCUIT	
Idling jet	35
Minimum air jet	130
Float Height	Float parallel to the base of the float chamber
Quantity of fuel in the float chamber	33 ml to 35 ml
COLD START CIRCUIT (CHOKE)	
Choke operation	Automatic (PTC)
Resistance value PTC	20 Ω at 24°C
Choke needle travel	10,5 mm

COOLING SYSTEM	
Initial thermostat opening temperature	80°C
Total thermostat opening temperature	85°C
Radiator cap opening pressure	1,0 ± 0,1 Bar
Electric fan on temperature	100 ± 2°C
Electric fan off temperature	97 ± 2°C
Temperature sensor resistance (NTC)	
60°C	600 - 470 Ω
90°C	215 - 175 Ω
120°	93 - 73 Ω

1 - GENERAL INFORMATION

LUBRICATION SYSTEM	
Oil pressure (manometer connected in sensor)	4,2 Bar
Pump with 2 rotors	
Oil suction rotor	
Thickness	13,5 mm
Oil pumping rotor	
Thickness	8,5 mm
Radial clearance (1) between rotor points	0,04 mm
Radial clearance (2) between rotor points	0,08 mm
Axial clearance (3) between Rotor 1 and pump body	0,04 mm
Axial clearance (3) between Rotor 2 and pump body	0,05 mm



FRONT SUSPENSION	
Type	Inverted forks
Travel	110 mm
Arm warp	0,4 mm
Quantity of hydraulic fluid	390 ml \pm 5
Fluid viscosity	SAE 7,5

REAR SUSPENSION	
Type	Single shock absorber
Travel	135 mm

WHEEL RIMS AND TYRES	
Wheel rims axial warp	0,5 mm
Wheel rims radial warp	0,6 mm
Standard shafts warp	0,05 mm
Service limit shafts warp	0,2 mm
Wheel rim material	Aleación de aluminio
Front tyre pressure	
For rider only	1,9 bar
With pillion passenger	2 bar
Rear tyre pressure for rider only	
For rider only	2 bar
With pillion passenger	2,2 bar
Minimum tyre tread depth	1,6 mm

1 - GENERAL INFORMATION

BRAKES	
Thickness of front brake disks (standard)	4 mm
Service limit for thickness of front brake disks	3,5 mm
Thickness of rear brake disks (standard)	3,5 mm
Service limit for thickness of rear brake disks	3 mm
Brake disk warp	0,2 mm
Brake pads service limit	1,5 mm

IGNITION SYSTEM	
Spark plug type	NGK CR8 EB
Gap between electrodes (plug gap)	0,7÷0,8 mm
Degrees of ignition advance	
1.500 rpm	0°
2.250 rpm	5°
3.000 rpm	7°
3.500 rpm	9°
from 4.500 to 9.000rpm	19°
9.500 rpm	21°
10.000 rpm	23°
Pick up resistance (20°C)	105 - 124 Ω
Resistance of the top coil primary winding (25°C ± 5° C)	0,21 Ω ± 0,025 Ω
Resistance of the top coil secondary winding (25°C ± 5° C)	3,1 KΩ ± 0,31 KΩ
Resistance of the spark plug connector cap (20°C)	5 KΩ

CHARGING SYSTEM	
Resistance between phases of charging coil (20°C)	0,4 Ω ± 10%
Output voltage between magneto phases (measured at the regulator connector while disconnected from the latter)	
Idling (1,700rpm)	25v (AC)
5.000rpm	60v (AC)
Regulated voltage to battery	13v - 15v at 8.000 rpm (DC)

ELECTRICAL SYSTEM	
Main fuse	1 x 20A
Secondary fuse	1 x 10A
Headlight bulb	2 x 12v 55W H11
Sidelight bulb	Leds
Rear light bulb	Leds
Number plate light bulb	1 x 12v 5W
Turn indicator bulb	4 x 12v 10W

1 - GENERAL INFORMATION

1.6 - TIGHTENING TORQUES

STANDARD BOLTS AND SCREWS

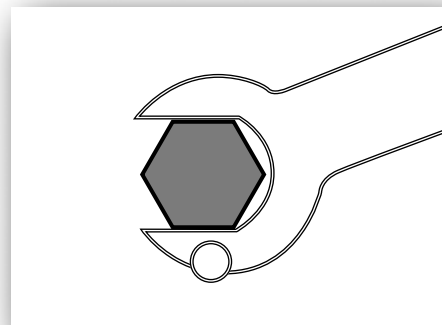
The following table specifies torques for securing devices with ISO standard thread.

The torque specifications for special components or assemblies are indicated in the respective chapters of this manual.

To prevent distortions, tighten assemblies with various fixing devices progressively and in a crossed or alternating manner until the specified torque is reached.

Unless stated otherwise, the specified torques require threads to be clean and dry.

Components should be at room temperature.



BOLT	GENERAL TORQUE SPECIFICATION TYPE 8.8	
	N·m	Kgf·m
M6x1	8 - 10	0,8 - 1
M8x1,25	17 - 19	1,7 - 1,9
M10x1,5	35 - 40	3,5 - 4
M12x1,5	65 - 70	6,5 - 7
M12x1,75	60 - 66	6- 6,6
M14x1,5	70 - 80	7 - 8
M14x2	70 - 80	7 - 8

1 - GENERAL INFORMATION

ENGINE TIGHTENING TORQUES

PARTS TO BE TIGHTENED	DESCRIPTION	THREAD MEASUREMENT	QT.	TIGHTENING TORQUE		Obs.
				Kgf.m	N·m	
Spark plug	-	M10	1	1,2-1,4	12-14	
Cylinder head cover	Bolt	M6	4	1-1,2	10-12	
Camshaft bridge	Bolt	M6	8	1-1,2	10-12	
Timing sprocket 1	Bolt	M8	1	2,5-2,7	25-27	Apply thread sealant*
Timing sprocket 2	Bolt	M8	1	2,5-2,7	25-27	Apply thread sealant*
Cylinder head	Bolt	M8	4	2,7+90°	27+90°	Apply oil to washer
Cylinder head	Bolt	M6	2	1,1-1,3	11-13	Apply oil to washer
Carburetor to air filter box pipe	Clip	-	1	1,2-1,8	12-18	
Inlet manifold	Bolt	M6	3	1,1-1,3	11-13	
Thermostat cover	Bolt	M6	2	1-1,2	10-12	
Coolant temperature sensor	-	M10	1	0,8-1,0	8-10	
Timing chain tensioner	Bolt	M6	2	1,1-1,3	11-13	
Timing chain tensioner spring	Cover	-	1	0,8-1	8-10	
Water pump cover	Bolt	M5	3	0,5-0,6	5-6	
Water pump turbine	-	M5	1	0,4-0,6	4-6	
Clutch lever cam	Bolt	M6	1	0,8-1,0	8-10	
Oil filter cover	-	M56x1,5	1	2,4-2,6	24-26	
Oil pressure sensor	-	M10	1	1,2-1,4	12-14	
Clutch cover	Bolt	M6	10	1,1-1,3	11-13	
Clutch spring	Bolt	M5	5	0,35-0,45	3,5-4,5	
Clutch bell housing-ram	Nut	M12	1	3,5-4,5	35-45	
Balance shaft	Nut	M10	1	3,5-4,5	35-45	
Crankshaft sprocket – clutch bell housing	Nut	M12	1	7,5-8,3	75-83	
Timing chain roller	Bolt	M6	1	1-1,2	10-12	
Oil pump	Bolt	M5	3	0,5-0,6	5-6	
Selector drum flower	Bolt	M5	1	0,35-0,45	3,5-4,5	
Selector drum flower locking cam	Bolt	M6	1	0,8-1,0	8-10	
Starter motor	Bolt	M6	2	1,1-1,3	11-13	
Phase register cover	-	M18X1,5	1	0,35-0,45	3,5-4,5	
Oil filter cover – magneto side	-	M28X1	1	2,4-3,0	24-30	

* Thread sealant: type Loctite 270

1 - GENERAL INFORMATION

ENGINE TIGHTENING TORQUES

PARTS TO BE TIGHTENED	DESCRIPTION	THREAD MEASUREMENT	QT.	TIGHTENING TORQUE		Obs.
				Kgf.m	N.m	
Magneto cover	Bolt	M6	10	1,1-1,3	11-13	
Oil sensor cable securing	Bolt	M4	1	0,3-0,5	3-5	
Neutral sensor indicator	-	M10x1,25	1	0,8-1,0	8-10	
Oil dipstick	-	M12x1,5	1	0,4-0,6	4-6	
Magneto stator	Bolt	M5	2	0,5-0,7	5-7	
Pick-up, (R.P.M. sensor)	Bolt	M5	2	0,3-0,4	3-4	
Starter crown wheel clamp	Bolt	M6	1	0,5-0,6	5-6	
Magneto rotor	Nut	M14x1,5	1	8,3-9,0	83-90	
Magneto rotor – starter clutch	Bolt	M6	6	1,1-1,3	11-13	
Semi-crankcases joint	Bolt	M6	12	1,1-1,3	11-13	

CHASSIS TIGHTENING TORQUES

PARTS TO BE TIGHTENED	DESCRIPTION	THREAD MEASUREMENT	QT.	TIGHTENING TORQUE		Obs.
				Kgf.m	N.m	
Fairing-chassis bracket securing device	Bolt	M6x100 8.8		0,8-1,0	8-10	
Rear mudguard suppl. bracket securing device	Bolt	M6x100 8.8		0,8-1,0	8-10	
Fuel tank bracket plate securing device	Bolt	M6x100 8.8		0,8-1,0	8-10	
Shock-absorber-chassis top securing device	Bolt	M12x175 8.8		5,5-6,5	55-65	
Shock-absorber-swinging arm bottom securing device	Bolt	M12x175 8.8		5,5-6,5	55-65	Apply thread sealant*
Engine cradle top securing device	Bolt	M10x150 12.9		1,7-1,9	17-19	
Engine-chassis bottom securing device	Bolt	M8x125 8.8		1,7-1,9	17-19	
Rear sub-chassis-chassis sec. device	Bolt	M6x125 8.8		1,7-1,9	17-19	
Rear sub-chassis-chassis sec. device	Bolt	M10x150 8.8		3,5-4,0	35-40	
Engine-cradle sec. device	Bolt	M10x150 8.8		3,5-4,0	35-40	
Cylinder head-chassis brackets securing device	Bolt	M6x100 12.9		1,2-1,4	12-14	Apply thread sealant*
Engine cylinder head-brackets sec. device	Bolt	M10x150 8.8		3,7-3,9	37-39	
Swinging arm-chassis adjustment nut sec.device	Bolt	M25x100		1,2-1,5	12-15	
Swinging arm-chassis shaft sec. device	Bolt	M14x150 8.8		7,0-8,0	70-80	
Front footrest-chassis bracketsec. device	Bolt	M8x125 8.8		1,7-1,9	17-19	
Front footrest bracket-bracket sec. dev.	Bolt	M8x125 8.8		1,7-1,9	17-19	
Pillion passenger footrest -chassis bracket sec. dev.	Bolt	M8x125		1,7-1,9	17-19	
Top plate-shank sec. dev.	Bolt	M20x100 5.6		4,0-5,0	40-50	
Top forks cap sec. device.	Bolt	-		1,7-2,15	17-21,5	

* Thread sealant: type Loctite 243

1 - GENERAL INFORMATION

CHASSIS TIGHTENING TORQUES

PARTS TO BE TIGHTENED	DESCRIPTION	THREAD MEASUREMENT	QT.	TIGHTENING TORQUE		Obs.
				Kgf.m	N.m	
Semi-handlebar- plate sec. dev.	Bolt	M8x125 8.8		1,7-1,9	17-19	Apply thread sealant*
Counterweight-handlebars sec. dev.	Bolt	M5x80 8.8		0,35-0,45	3,5-4,5	
Steering lock-forks plate sec. dev.	Bolt	M8x125 8.8		1,7-1,9	17-19	
Fork arm lock – forks sec.dev.	Bolt	M8x125 8.8		1,7-1,9	17-19	
Front wheel-forks sec. dev.	Bolt	M14x150		7,0-8,0	70-80	
Front brake calliper-forks sec. dev.	Bolt	M10x150 8.8		3,5-4,0	35-70	Apply thread sealant*
Front brake disk-wheel rim sec. dev.	Bolt	M6x100 10.9		1,0-1,2	10-12	Apply thread sealant*
Rear wheel-swinging arm sec. dev.	Bolt	M14x150 8.8		7,0-8,0	70-80	
Rear sprocket-wheel rim sec. dev.	Bolt	M6x100 12.9		1,4-1,5	14-18	Apply thread sealant*
Rear brake disk-wheel rim sec. dev.	Bolt	M6x100 10.9		1,0-1,2	10-12	Apply thread sealant*
Brake pedal to bracket sec. dev.	Bolt	M6x100 10.9		1,0-1,2	10-12	
Rear brake rod to brake pedal sec- dev.	Bolt	M6x100 8.8		0,8-1,0	8-10	
Gear lever to bracket sec. dev.	Bolt	M6x100 10.9		1,0-1,2	10-12	
Gear lever sec. dev.	Bolt	M6x100 10.9		0,8-1,0	8-10	
Gear change take-off bush lock sec.dev.	Bolt	M6x100 8.8		0,8-1,0	8-10	
Wheel tensioner-swinging arm sec.dev.	Bolt	M8x125 8.8		1,0-1,2	10-12	
Prop-stand-chassis sec.dev.	Bolt	M10x125 8.8		3,5-4,0	35-40	
Rear brake cylinder sec.dev.	Bolt	M6x100 8.8		0,8-1,0	8-10	
Exhaust pipe-cylinder head sec.dev.	Bolt	M8x125 8.8		1,7-1,9	17-19	
Silencer-chassis sec.dev.	Bolt	M8x125 8.8		1,7-1,9	17-19	
Exhaust pipe clamp sec.dev.	Bolt			0,8-1,0	8-10	
Radiator-chassis sec.dev.	Bolt	M6x100		0,8-1,0	8-10	
Thermoswitch-radiator sec.dev.	Bolt	M14x150		1,7-2,0	17-20	
Chain guard autor sec. dev.	Bolt			0,1-0,2	1-2	
Horn-chassis sec. dev.	Bolt	M8x125 8.8		1,7-1,9	17-19	
Output gear seal-gear change sec.device	Bolt	M5x80 8.8		0,35-0,45	3,5-4,5	Apply thread sealant*
Chain roller to bracket sec.dev.	Bolt	M8x125 12.9		2,5-2,8	25-28	
Threadings to tanks sec.dev.	Bolt	M5		0,2-0,3	2-3	
Threadings to tanks sec.dev.	Bolt	M6		0,2-0,3	2-3	
Var. metal items to chassis sec.dev.	Bolt	M5x80		0,35-0,45	3,5-4,5	
Var. metal items to chassis sec.dev.	Bolt	M6x100		0,8-1,0	8-10	
Var. metal items to chassis sec.dev.	Bolt	M8x125		1,5-1,9	15-19	
Var. metal items to chassis sec.dev.	Bolt	M5x80		0,1-0,2	1-2	
Var. metal items to chassis sec.dev.	Bolt	M6x100		0,2-0,35	2-,35	

* Thread sealant: type Loctite 243

2 - PDI (Pre-delivery inspection)

2.1 - PDI (Pre-delivery inspection) **31**

2 - PDI (Pre-delivery inspection)

Checking the assembly and preparing the machine for delivery to the first purchaser (PDI).

PREPARATION

UNPACKING - check for damage and missing parts.

FRONT AND REAR BRAKES – clean, inspect.

ENGINE OIL – Check level.

FUEL TANK AND TAP – Check for leaks. Fill with fuel.

COOLANT – Check level.

BATTERY – Fill with electrolyte, charge, fit.

TYRES – Inflate to correct pressure.

TRANSMISSION CHAIN – Check the tension (Adjust if necessary).

ACCELERATOR – Check that cable, adjustment and functioning are correct.

CARBURETTOR – Check, adjust idling.

CLUTCH – Adjust cable and lever, and check functioning.

SPARK PLUG – Tighten, check connector cap.

ELECTRICAL SYSTEM – Check and adjust headlight(s). Check sidelight, instrument panel lights, brake light, turn indicators, horn and instrument panel indicator lights.

LUBRICATION – Lubricate elements indicated in the User's Manual.

CHECK THE FOLLOWING TIGHTENING TORQUES:

FRONT WHEEL SHAFT: 7 - 8 kgf.m

FRONT BRAKE CALLIPER: 3.5 - 4 kgf.m

TOP PLATE CLOSING BOLTS: 1.7 – 1.9 kgf.m

SEMI-HANDLEBARS: 1.7 – 1.9 kgf.m

CENTRAL STEERING NUT: 4-5 kgf.m

REAR WHEEL SHAFT: 7 - 8 kgf.m

REAR BRAKE CALLIPER: 2.5 kgf.m

SWINGING ARM SHAFT: 7 - 8 kgf.m

OIL DRAIN PLUG: 2,4 - 2,6 kgf.m

RETIGHTENING VARIOUS ITEMS:

Fairings 0.8-1kgf.m

Lowering of rear-view mirrors 2.5 kgf.m

Rear-view mirror to fairing 0.8-1 kgf.m

Brake/Clutch levers

Light switches.

2 - PDI (Pre-delivery inspection)

ROAD TEST CHECK

CONTROLS – Check throttle, clutch, brakes, brake light switch, gear change lever.

SUSPENSIONS - Check operation and performance.

ENGINE – Check the operation of the choke, starter and the functioning of the engine.

LEAKS – Check for leaking fuel, oil, coolant, hydraulic fluid and exhaust fumes.

INSTRUMENT PANEL – Check operation of instruments.

INDICATOR LIGHTS – Check functioning.

COOLANT – Check level and check circuit.

ELECTRIC FAN – Check that fan switches on and off.

STEERING – Check that steering moves smoothly throughout its movement, without being loose or catching.

BRAKES – Check that braking is correct.

DELIVERY TO CUSTOMER

USER MANUAL - Explain the importance of reading and understanding the information. Highlight sections on safety and maintenance practices. Hand over to customer.

WARRANTY REGISTRATION CARD – Fill in the necessary information and hand the copy to the customer, then return the original to DERBI immediately.

HANDLING – Explain the correct handling of the vehicle.

CONTROLS AND REAR-VIEW MIRRORS – Adjust these for the customer.

TOOL KIT – Install, and demonstrate procedure for the process.

WARNINGS – Explain to the customer, according to models.

KEYS – Full set. Offer to prepare a spare set.

FIRST SERVICE – Explain the importance of the 1,000 km service. (600 miles)

REGULAR MAINTENANCE – Explain the need for regular maintenance.

3 - MAINTENANCE

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3 - MAINTENANCE

3.1 - LOCATION OF ELEMENTS



3 - MAINTENANCE



3 - MAINTENANCE

3.2 - REMOVING BODYWORK ELEMENTS



N.B.

IF THE FITTING PROCEDURE IS NOT DESCRIBED, IT IS UNDERSTOOD THAT THE PROCESS IS THE OPPOSITE TO THAT FOR REMOVAL.

SEAT

REMOVAL

1. Remove:

- Insert the ignition key and turn it anticlockwise a 1/4 of a turn.

2. Remove:

- The seat by pulling it backwards.



FITTING

1. Insert:

- The seat flange under the bracket.

2. Push:

- The seat forwards.



3. Secure:

- Insert the ignition key and turn it clockwise a 1/4 of a turn.



3 - MAINTENANCE

PILLION PASSENGER SEAT

REMOVAL

1. Unscrew:

- The securing bolt (A), located inside the cowling.



2. Remove:

- The seat by pulling it backwards.



FITTING

1. Insert:

- The seat flange under the bracket.



2. Push:

- The seat backwards.

3. Secure:

- The seat using the securing bolt (A).



3 - MAINTENANCE

COWLING TOP COVER

REMOVAL

1. First remove:

- * The seat.
- * The pillion passenger seat.

2. Unscrew:

- The bolt (A) securing the cover at the bottom.



3. Remove:

- The cover by pulling it backwards.



COWLING

REMOVAL

1. First remove:

- * The cowl top cover.

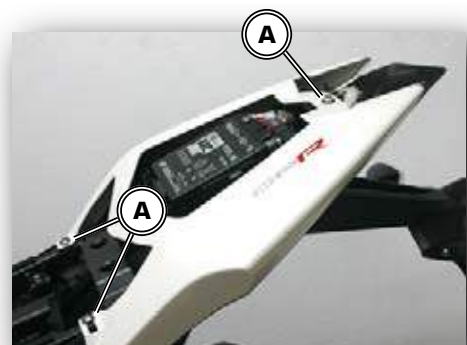
2. Unscrew:

- The 8 bolts, 4 on each side, located at the bottom of the cowl.



3. Unscrew:

- The 3 bolts, one on each side, located at the front of the cowl, and a central one at the back.



3 - MAINTENANCE

4. Remove:

- The cowling by pulling it backwards.



BOTTOM TANK COVER

REMOVAL (same both sides)

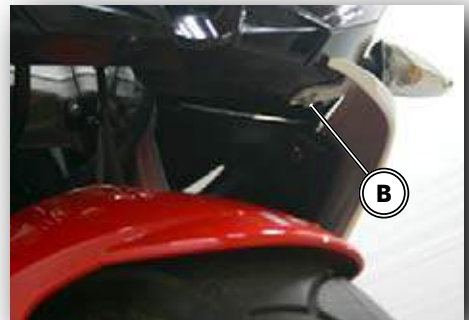
1. Unscrew:

- The bolt (A) located at the bottom of the front wheel arch.



2. Unscrew:

- The bolt (B) located at the top of the front wheel arch.



3. Unscrew:

- The 2 side bolts (C).

4. Remove:

- The bottom tank plate by pulling it out.



3 - MAINTENANCE

BOTTOM FAIRING

REMOVAL (same both sides)

1. First remove:

- * The bottom tank cover.

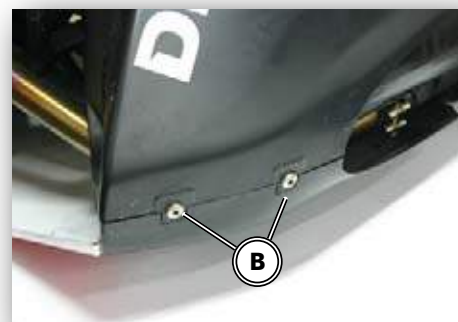
2. Unscrew:

- Remove the 4 side bolts (A) from the bottom fairing.



3. Unscrew:

- The 2 bolts (B) located at the bottom of the cover.



4. Remove:

- The plate by passing the prop-stand through the hole.



CYLINDER HEAD PROTECTIVE COVER

REMOVAL (same both sides)

1. Unscrew:

- The bolt securing the cover.

2. Remove:

- The cover.



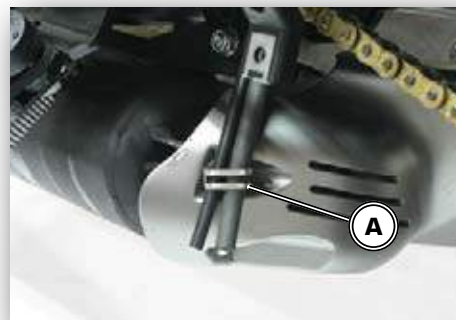
3 - MAINTENANCE

SILENCER END COVER

REMOVAL

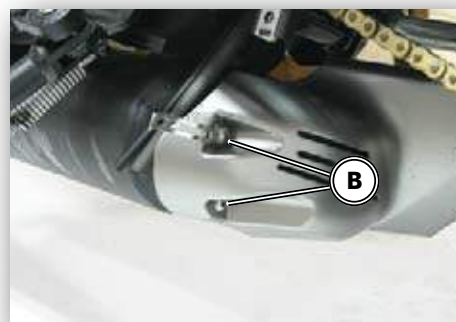
1. Open:

- The clip (A) securing the drain tubes from the tank and the carburettor.



2. Unscrew:

- The 2 left-hand bolts on the silencer end cover.



3. Unscrew:

- The right-hand bolt (C) on the silencer end cover.



4. Refit:

- The cover.



WARNING

BEFORE CARRYING OUT THIS OPERATION, ENSURE THAT THE SILENCER IS COLD.

FRONT MUDGUARD

REMOVAL

1. Unscrew:

- The clip (A) from the speed sensor cable.

2. Unscrew:

- The 4 bolts (B), two on each side of the mudguard.



3 - MAINTENANCE

TOP TANK COVER

REMOVAL (same on both sides)

1. First remove:

- * The seat.

2. Unscrew:

- The front bolt on the tank and tilt it backwards.

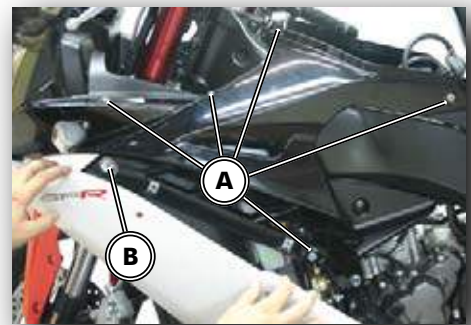


WARNING

SLOSHING FUEL MAY CAUSE IT TO FALL FORWARDS.

3. Unscrew:

- and remove the 5 bolts (A) from the cover.
- and remove 1 bolt (B), gaining access from inside the front forks.



COWLING SIDE CLOSING COVER

REMOVAL (same on both sides)

1. First remove:

- * The seat.
- * The cowling.

2. Unscrew:

- The front bolt on the tank and tilt it backwards.

3. Unscrew:

- and remove the 3 bolts (A) from the cover and remove it.



3 - MAINTENANCE

FRONT BUBBLE SCREEN

REMOVAL

1. Unscrew:

- and remove the 6 bolts from the bubble screen.



2. Remove:

- The bubble screen by sliding it upwards.



CAUTION

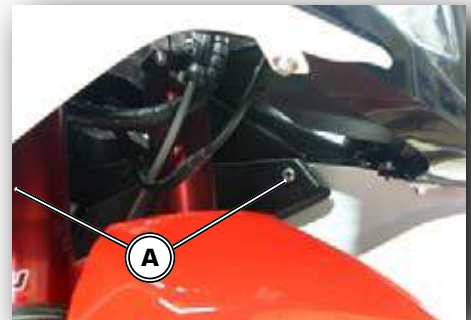
PROTECT THE BUBBLE SCREEN TO PREVENT IT FROM BEING DAMAGED.

RADIATOR AIR DUCTING

REMOVAL

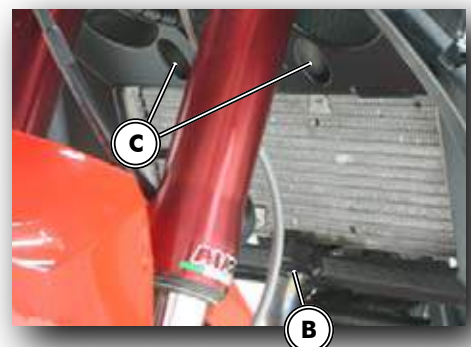
1. Unscrew:

- The 2 bolts (A) securing the ducting on each side.



2. Unscrew:

- The bolt (B) located at the bottom centre.
- The 2 bolts (C) securing the ducting at the top centre.



3 - MAINTENANCE

CENTRAL FRONT FAIRING

REMOVAL

1. First remove:

- * The central bubble windscreen.

2. Remove:

- The 9 bolts (A) from the instrument panel bracket and remove it.



3. Disconnect:

- The instrument panel.



4. Retirar:

- The plastic clips holding the cables.

5. Disconnect:

- The turn indicators.



6. Remove:

- The plastic clips holding the cables.

7. Disconnect:

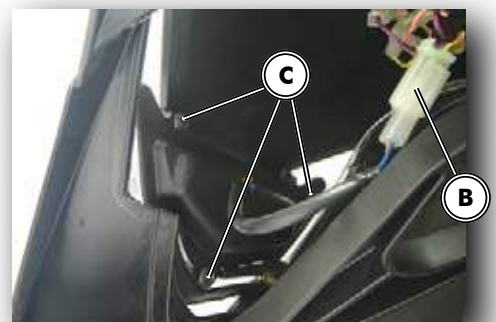
- The sidelight (B).

8. Disconnect:

- The 3 bolts (C) from the sidelight.

9. Remove:

- The plastic clips holding the cables.



3 - MAINTENANCE

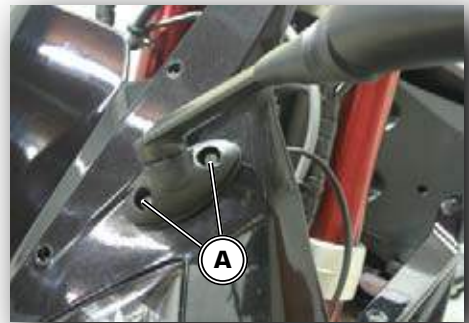
9. Disconnect:

- The connectors from each light unit.



10. Remove:

- The 2 bolts (A) from the rear-view mirror (on each side) and remove them.



11. Remove:

- The 2 bolts (B), 1 on each side, securing the front central fairing.

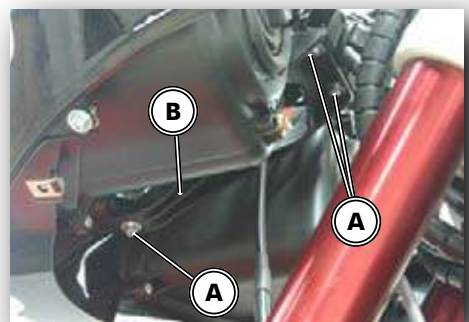


12. Remove:

- The 3 bolts (A) from the front fairing bottom bracket (B).

13. Remove:

- The central front fairing.



3 - MAINTENANCE

FUEL TANK



WARNING

PETROL IS EXTREMELY INFLAMMABLE AND IN CERTAIN CONDITIONS MAY EXPLODE. SMOKING MUST NOT BE ALLOWED IN THE WORK AREA, NOR SHOULD THERE BE NAKED FLAMES OR SPARKS.

REMOVAL

1. Remove:

- The front bolt on the tank and tilt it backwards.



WARNING

THE SLOSHING PETROL MAY MAKE IT FALL FORWARDS.

2. Remove:

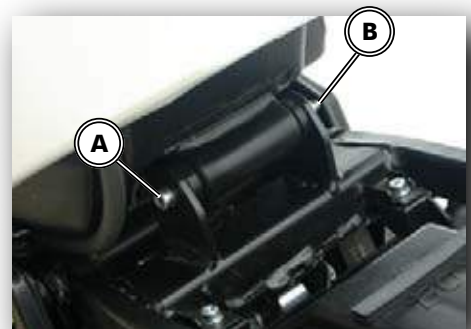
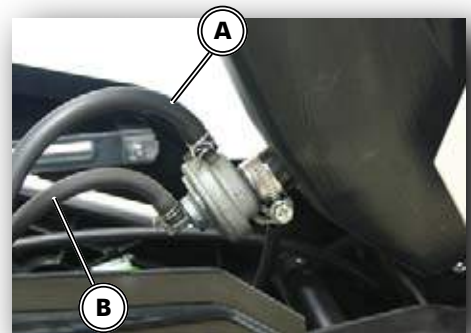
- The carburettor inlet pipe (A).
- The breather pipe (B).

3. Unscrew:

- The bolt (A) and nut (B) securing the tank.

4. Remove:

- The tank.



REAR MUDGUARD

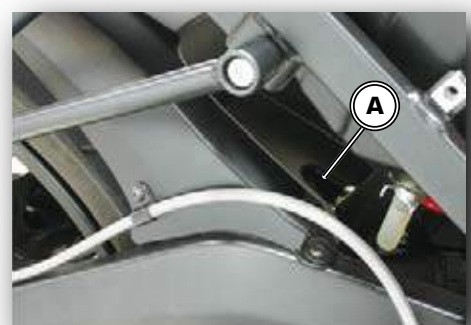
REMOVAL

1. Remove:

- The rear brake hose clip.

2. Remove:

- The 3 bolts, one in the top centre (A).



3 - MAINTENANCE

BOTTOM COWLING CLOSING COVER

REMOVAL

1. First remove:

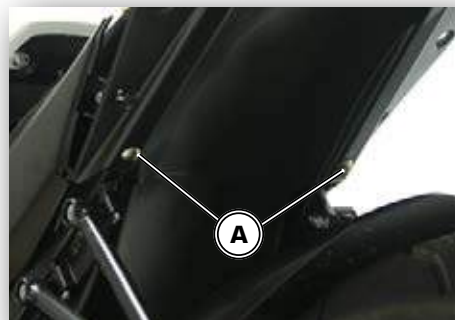
- * The top cowling cover.
- * The cowling.
- * The rear mudguard supplement.

2. Unscrew:

- The 2 bolts (A) from the cover, gaining access to these through the rear wheel arch.

3. Remove:

- The cover by pulling backwards.

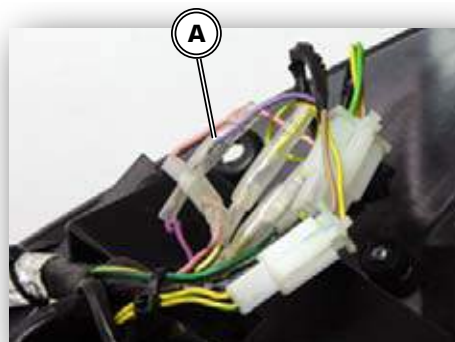


REAR MUDGUARD SUPPLEMENT

REMOVAL

1. First remove:

- * The top cowling cover.
- * The cowling.
- * The rear light (see chapter on electrical system).
- * The number plate light (Steps 1, 2 and 3) (see chapter on electrical system).



2. Disconnect:

- The turn indicator connectors (A).

3. Unscrew:

- The bolt and the nut (B) from the turn indicators.




4. Unscrew:

- The 3 bolts (C), gaining access to these through the rear wheel arch.



3 - MAINTENANCE

3.3 - PERIODICAL MAINTENANCE TABLE

 **N.B.**

This chapter contains all the necessary information for carrying out recommended inspections and adjustments. If followed, these preventative maintenance procedures will ensure a reliable operation of the machine and a longer operating life. The need for costly servicing will be significantly reduced. This information applies not only to machines already in service but also new machines in preparation for being sold. All technical assistance staff should familiarize themselves with everything in this chapter.

X 1000 km. (odometer)	1	6	12	18	24	30	36	42	48	54	60	66	72	78	84
ENGINE AND TRANSMISSION															
ENGINE OIL															
OIL FILTER															
CARBURETTOR															
AIR FILTER															
SPARK PLUG															
SECONDARY TRANSMISSION (chain/sprocket/crown wheel)															
TIMING CHAIN															
VALVE ADJUSTMENT															
COOLANT (Level)															
COOLANT	Change every 2 years or 20,000 kilometres (whichever comes first)														

 CHECK

 RENEW

 CLEAN

3 - MAINTENANCE

X 1000 km. (odometer)	1	6	12	18	24	30	36	42	48	54	60	66	72	78	84
CYCLE															
WHEELS															
BRAKE PADS															
FLEXIBLE BRAKE HOSES															
BRAKE LEVERS AND THROTTLE TWIST GRIP															
BRAKE FLUID	Change every 2 years or 20,000 kilometres (whichever comes first)														
FUEL PIPES															
Check for possible fluid leaks (petrol, oil, coolant, brake fluid)															
EXHAUST SYSTEM															
ENGINE MOUNTING BOLTS															
BRAKE CALLIPERS AND DISKS															
SWINGING ARM SHAFT															
STEERING SHAFT															
GENERAL NUTS AND BOLTS (retightening)															
PROP-STAND AND/OR CENTRE STAND															
FRONT SUSPENSION (change oil)															
ODOMETER TAKE-OFF															

CHECK

RENEW

CLEAN

3 - MAINTENANCE

X 1000 km. (odometer)	1	6	12	18	24	30	36	42	48	54	60	66	72	78	84
ELECTRICAL															
ELECTRIC FAN AND THERMAL SWITCH															
LIGHTING															
BATTERY															
CONTROL ELEMENTS															
SIGNALLING															
HORN															

X 1000 km. (odometer)	1	6	12	18	24	30	36	42	48	54	60	66	72	78	84
GENERAL															
Carry out an on-road test drive, paying attention to the general operation of the brakes, steering, clutch, suspensions, engine, lighting and instrument panel lights.															

CHECK

RENEW

CLEAN

3 - MAINTENANCE

3.4 - LUBRICATION POINTS



3 - MAINTENANCE

3.5 - INSPECTION AND MAINTENANCE

3.5.1 - ADJUSTING THE TIMING CHAIN PLAY

1. Check:

- Turn the wheel and find the point where is the least amount of play.



N.B.

THE CORRECT POINT FOR MEASURING PLAY IS THE HALF WAY POINT (A) BETWEEN THE SPROCKET AND THE CROWN WHEEL.

Check the play at this point.

Outside that specified => Adjust.

Transmission chain play:

25-30 mm

If the play is outside of the specified range, proceed to:

2. Loosen:

- Wheel shaft nut (1).

3. Adjust:

- Transmission chain play.
- Move the shaft forwards or outwards using the tensioning bolt (2) until the specified play is obtained.



CAUTION

CHECK THAT THE ALIGNMENT REFERENCE MARKS END UP ON BOTH SIDES WITH THE SAME NUMBER OF MARKS IN ORDER TO ENSURE WHEEL ALIGNMENT.

4. Tighten:

- The wheel shaft nut at nominal torque.

Nut (rear wheel shaft):

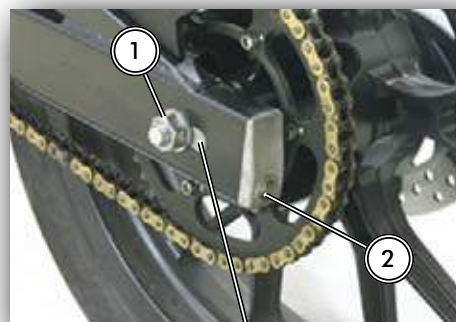
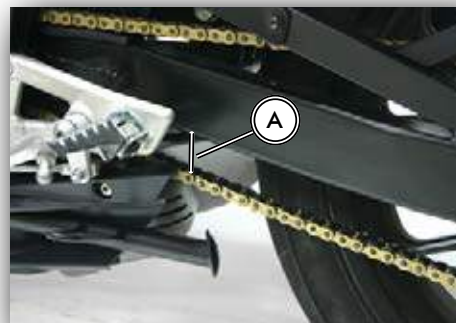
70-80 N.m (7-8 kgf.m)

5. Tighten:

- Once the rear wheel shaft nut has been tightened, tighten the tensioning bolts.

Tensioning bolts:

10-12 N.m (1-1,2 kgf.m)



REFERENCE MARKS

3 - MAINTENANCE

TRANSMISSION CHAIN

1. Inspect:

- The chain for rigidity.

Rigidity => Clean and lubricate or renew.



2. Inspect:

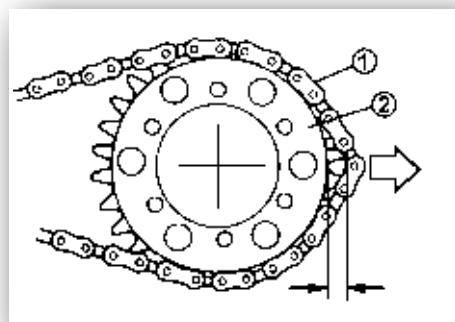
- Transmission chain (1).
- Rear sprocket (2).
- Sprocket.

More than 1/2 tooth of wear => Renew the chain.



N.B.

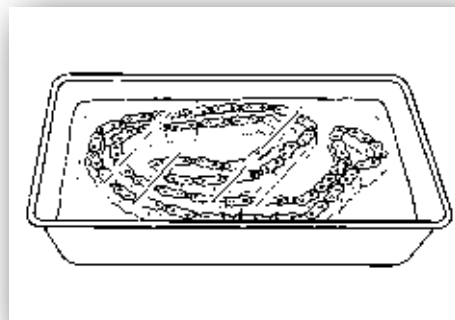
IT IS RECOMMENDED TO RENEW THE COMPLETE TRANSMISSION KIT AND NOT JUST THE CHAIN.



3. Clean:

- The transmission chain.
- Place the chain in a container with petrol, and brush it to remove as much of the dirt as possible.
- Then dry and lubricate it.

Lubricant for the transmission chain:
Spray grease for chains.



3 - MAINTENANCE

FITTING A NEW TRANSMISSION KIT (SPROCKET, REAR SPROCKET AND CHAIN).

1. Fit the new:

- Crown wheel and sprocket assembly.

2. Fit:

- The crown wheel bolts.
- The sprocket securing bolts.

Crown wheel bolts:

14-15 N.m (1,4-1,5 kgf.m)*

Sprocket securing bolts:

3,5-4,5 N.m (0,35-0,45 kgf.m)*

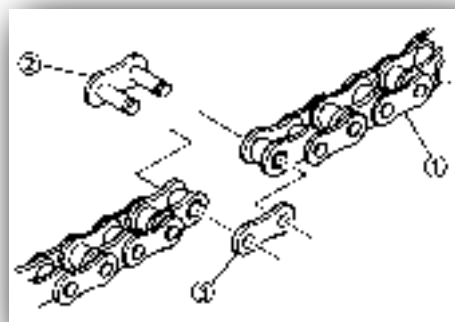


WARNING

*APPLY LOCTITE 243
TYPE THREAD SEALANT

3. Fit:

- Transmission chain(1).
- Chain coupling link (2).
- The plate (3).



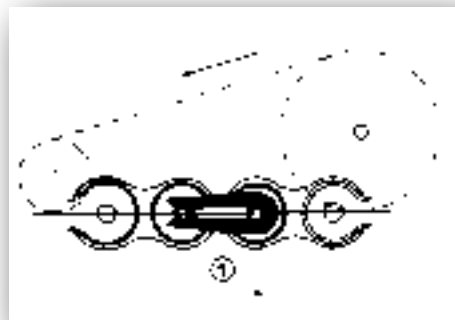
4. Fit:

- The seal (1).



WARNING

FIT THE CHAIN COUPLING SEAL
IN THE DIRECTION INDICATED IN
THE FIGURE.



5. Fit:

- Sprocket cover.

Sprocket cover bolts:

8-10 N.m (0,8-1 kgf.m)

6. Adjust:

- The transmission chain play.

See the "ADJUSTING THE TRANSMISSION CHAIN PLAY".

3 - MAINTENANCE

INSPECTING THE EXHAUST SYSTEM

1. Inspect:

- The nuts (1).

Loose/damaged => Tighten/renew.

- Gasket (exhaust pipe).

Leaking exhaust fumes => Tighten/renew.

The nuts:

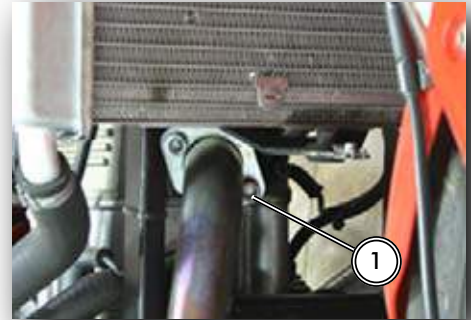
1,7-1,9 N.m (17-19 kgf.m)

2. Inspect:

- The clamp (2) joining the exhaust pipe to the silencer.

Loose/damaged => Tighten/renew.

Clamp tightening torque:
0,8-1 N.m (8-10 kgf.m)

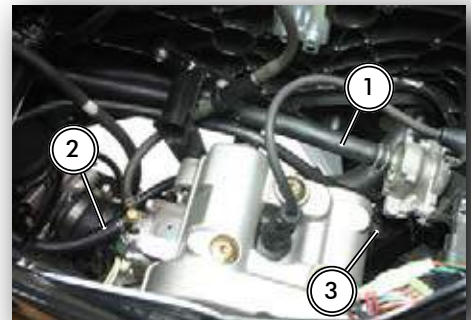


INSPECTING THE AIS VALVE (SECONDARY AIR)

1. Inspect:

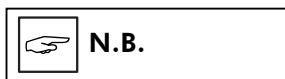
- The pipes:
 - Air inlet from the air filter box (1).
 - Breather inlet (2).
 - Air outlet to the cylinder head (3).

Loose/damaged => Connect/renew.



3 - MAINTENANCE

AIR FILTER RENEWAL



N.B.

IF THE MACHINE IS USED IN THE RAIN OR IN DUSTY AREAS, CHECK AND RENEW THE FILTER MORE FREQUENTLY THAN THE DUE DATES INDICATED IN THE USE AND MAINTENANCE MANUAL'S PROGRAMMED MAINTENANCE TABLE.



REMOVAL

1. Firstly remove:

- * The seat.

2. Remove:

- The 4 bolts (1) from the top cover.

3. Remove:

- The air filter.



AIR FILTER BOX DRAIN PLUG

1. Inspect plug:

- If there is oil.
- If there is damage.

Full/Damaged => Empty/Renew.

2. Remove:

- The clamp (1).
- The plug (2).



3 - MAINTENANCE

INSPECTING THE SPARK PLUG

1. Remove:

- The spark plug connector.
- The spark plug .



CAUTION

BEFORE REMOVING THE SPARK PLUG, BLOW THE AREA AROUND THE PLUG WITH COMPRESSED AIR TO ELIMINATE ANY DIRT THAT MIGHT FALL INTO THE ENGINE.

2. Check:

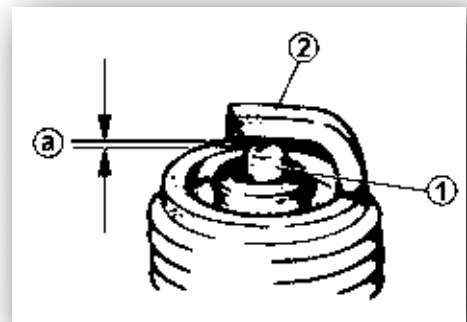
- Type of spark plug - **Regular plug: NGK CR 8 EB**

Incorrect => Renew.

3. Inspect:

- Electrode (1)
- Electrode (2)
- Insulator (3)

Damage/wear => Renew spark plug



4. Clean:

- The spark plug.
(Clean the spark plug with a spark plug cleaner or wire brush)

5. Measure:

- The gap between the electrodes (a).
(using a feeler gauge)

Outside that specified => Adjust the gap.

Gap between electrodes:

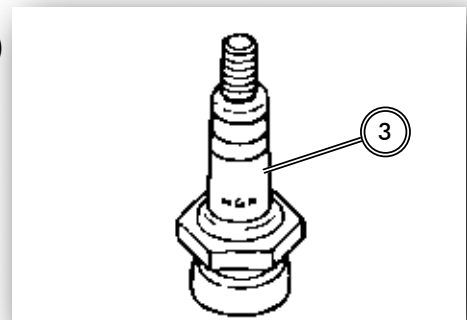
0,7 mm

6. Fit:

- The spark plug.

Spark plug tightness torque:

12 N.m (1,2 kgf.m)



3 - MAINTENANCE

ADJUSTING THE CLUTCH LEVER

1. Check:

- Clutch lever play (A).

Clearance (clutch lever):

10 - 15mm at the end of the lever.

Outside that specified => Adjust.

2. Adjust:

- Clutch cable play.

Adjustment steps:

1. Loosen:

- Turn the locknut (2).

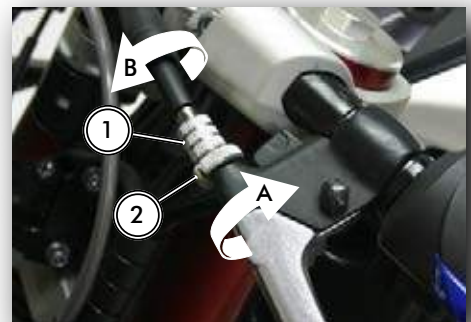
2. Turn:

- The adjuster (1) inwards or outwards until the specified play is obtained

Turning inwards (B) => Increasing the play.

Turning outwards (A) => Reducing the play.

- Tighten the securing nut (2).



ADJUSTING IDLE SPEED (IDLE SPEED)

1. Control:

- The idle speed value, which is within the value $1,680 \pm 50$, after the engine has been running for a few minutes.

Outside that specified => Adjust.

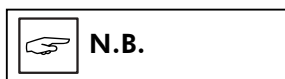
Turning inwards (A) => Increases the rpm

Turning outwards (opposite direction to A) => Decreases the rpm



3 - MAINTENANCE

ADJUSTING THE THROTTLE CABLE



N.B.

BEFORE ADJUSTING THE THROTTLE CABLE PLAY, THE TICK-OVER MUST BE ADJUSTED.

1. Check:

- Throttle cable play (1).

Outside that specified => Adjust.

Clearance:

2÷3 mm.

At the throttle twist grip.

2. Adjust:

- Throttle cable play.

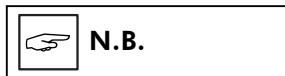
Adjustment steps:

- Loosen the throttle cable locknut (2).
- Turn the adjuster (3) inwards or outwards until the specified play is obtained (1).

Turning inwards (A) => Increases the play.

Turning outwards (B) => Reduces the play.

- Tighten the locknut (2).



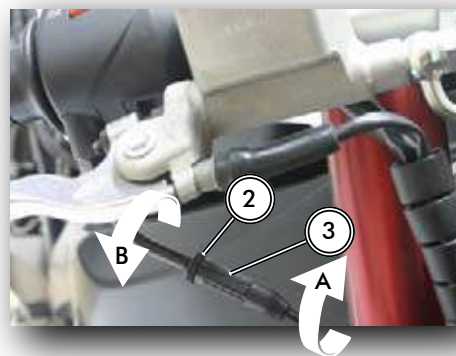
N.B.

IF THE PLAY IS STILL INCORRECT, ADJUST IT USING THE ADJUSTER (3) BELOW THE TWIST GRIP.



WARNING

AFTER ADJUSTING, TURN THE HANDLEBARS FROM SIDE TO SIDE (WITH THE ENGINE RUNNING) TO ENSURE THAT THE TICK-OVER SPEED DOES NOT VARY.



3 - MAINTENANCE

ADJUSTING THE GEAR LEVER

The height of the gear lever can be adjusted by adjusting the lever backlash.

1. Check:

- Gear lever height.

Adjustment steps:

1. Unscrew:

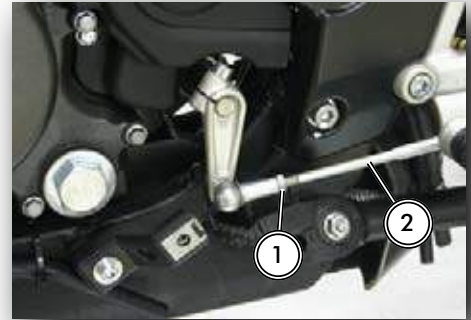
- The nut (1).

2. Turn:

- The adjuster (2) inwards or outwards until the specified play is obtained.

3. Tighten:

- The nut (1).



3 - MAINTENANCE

ADJUSTING THE FRONT BRAKE

This machine is fitted with hydraulically activated disk brakes. This type of brakes comes with adjustment factory set. You must check that the brake fluid level is between the maximum and minimum.

1. Check:

- The brake lever play (a).
- The brake fluid level (b).

Outside that specified => Adjust.

Play:

3-5 mm

2. Adjust:

- The brake lever play.

Adjustment steps:

1. Unscrew:

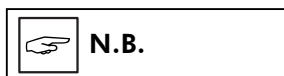
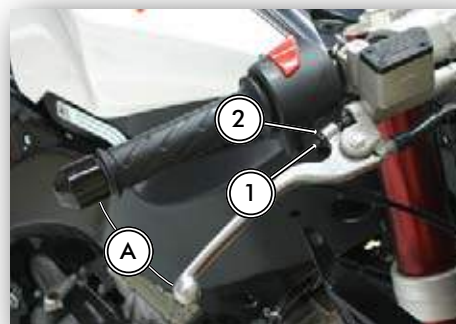
- The nut (2).

2. Turn:

- The adjuster (1) inwards or outwards until the specified play is obtained.

3. Tighten:

- The nut (2).



BEAR IN MIND THAT THE LEVEL WILL BE AFFECTED BY THE WEAR ON THE PADS.

THE MINIMUM LEVEL INDICATES EITHER THAT THERE IS A LEAK OR THAT THE BRAKE PADS NEED TO BE RENEWED.



IF THE BRAKE LEVER PLAY HAS BEEN ADJUSTED, MAKE SURE THAT THE BRAKES ARE NOT BINDING AFTER THE ADJUSTMENT.

3 - MAINTENANCE

ADJUSTING THE REAR BRAKE

1. Check:

- Brake pedal play (a).
- Brake fluid level (b).

Outside that specified => Adjust.

Play:

3-5 mm

2. Adjust:

- Brake pedal play.

Adjustment steps:

1. Unscrew:

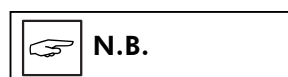
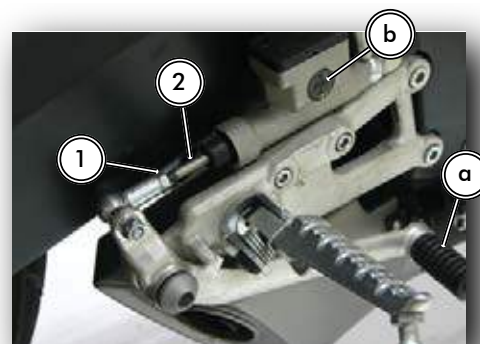
- The nut (1).

2. Turn:

- The adjuster (2) inwards or outwards until the specified play is obtained.

3. Tighten:

- The nut (1).



BEAR IN MIND THAT THE LEVEL WILL BE AFFECTED BY THE WEAR ON THE PADS.



ENSURE THAT THE BRAKES ARE NOT BINDING AFTER ADJUSTING THE PLAY.

3 - MAINTENANCE

INSPECTING THE FRONT BRAKE PADS

1. Unscrew:

- The brake calliper bolts (1).

2. Remove:

- The brake calliper.

3. Inspect:

- The brake pads (2).

4. Measure:

- The brake pad lining thickness. If the lining of either of them is below the service limit => renew both pads.

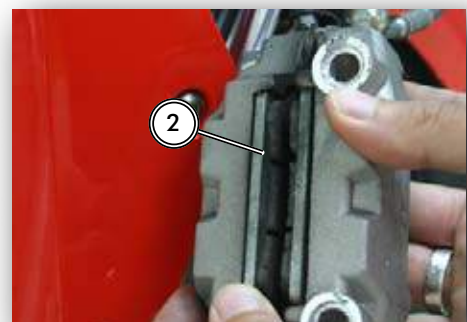
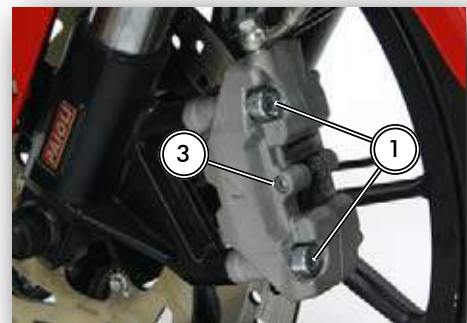
Service limit (lining) => 1.5 mm.

Outside that specified => Renew



CAUTION

IF THE BRAKE PEDAL IS APPLIED WITH THE CALLIPER REMOVED, THE CORRESPONDING SYSTEM MAY NEED TO BE BLED.



RENEWING THE FRONT BRAKE PADS

REMOVAL

1. Remove:

- The front brake calliper (Dismantling the front brake calliper).

2. Remove:

- The stud (1).
- The pad springs (2).
- The brake pads (3).

FITTING

1. Retract:

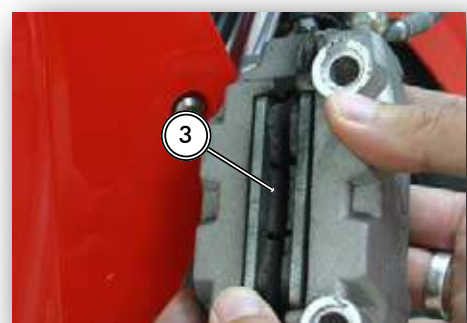
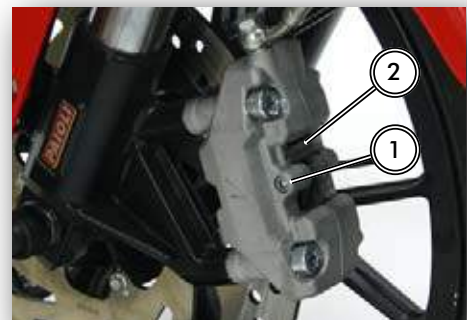
- The calliper pistons manually.

2. Fit:

- The pads into the calliper.

3. Fit:

- The pad springs (2).
- The stud (1).



3 - MAINTENANCE

5. Fit:

- The calliper onto the forks.

6. Tighten:

- The brake calliper bolts (4).

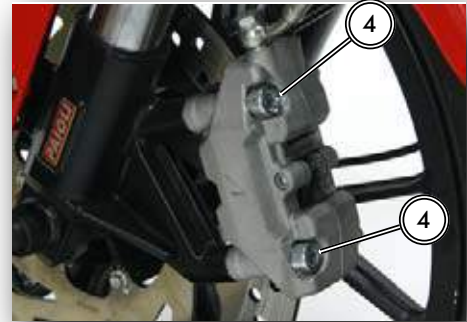
Bolts tightening torque:

35-40 N.m (3,5-4,0 kgf.m)*



WARNING

*APPLY LOCKTITE 243
TYPE THREAD SEALANT



7. Tighten:

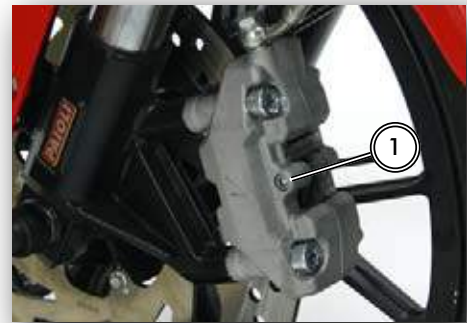
- The stud to nominal torque.

Stud tightening torque:

12-16 N.m (1,2-1,6 kgf.m)

8. Apply:

- The brake lever until pressure builds up in the brake system.



WARNING

NEVER RIDE THE MOTORCYCLE UNTIL THERE IS FULL PRESSURE IN THE BRAKE SYSTEM. PUMP THE LEVER UNTIL THE PADS ARE IN CONTACT WITH THE DISK. IF NOT, THE BRAKES WILL NOT WORK THE FIRST TIME THE LEVER IS USED.



N.B.

CHECK THAT THE CALLIPER IS PROPERLY ALIGNED WITH THE BRAKE DISK.

3 - MAINTENANCE

INSPECTING THE REAR BRAKE PADS

REMOVAL

- 1. Firstly remove:**
 - Rear wheel.
- 2. Unscrew:**
 - The brake calliper bolts (1).
- 3. Remove:**
 - The brake calliper.
- 4. Inspect:**
 - The brake pads (2).
- 5. Measure:**
 - The brake pad lining thickness. If the lining of either of them is below the service limit => renew both pads.

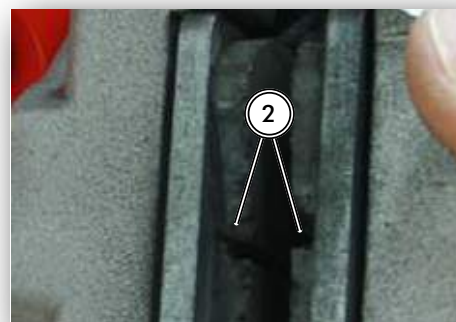
Service limit (lining) => 1.5 mm.

Outside that specified => Renew



WARNING

IF THE BRAKE LEVER IS APPLIED WITH THE CALLIPER REMOVED, THE CORRESPONDING SYSTEM MAY NEED TO BE BLED.



RENEWING THE REAR BRAKE PADS

REMOVAL

- 1. Remove:**
 - The rear brake calliper.
 - (Dismantling the rear disk calliper).
- 2. Remove:**
 - The brake pads (2) by pressing in the direction of the arrow.

FITTING

- 1. Retract:**
 - The calliper piston manually.
- 2. Fit:**
 - The pads into the calliper.
- 3. Tighten:**
 - The two bolts (1) securing the calliper to the bracket.

Bolts tightening torque:
22-28 N.m (2,2-2,8 kgf.m)*



WARNING

*APPLY LOCKTITE 638 TYPE THREAD SEALANT



3 - MAINTENANCE

4. Fit:

- The calliper-bracket assembly to the swinging arm.
- The rear wheel assembly.

5. Tighten:

- The nut (1) to the nominal torque.

Nut (1) (rear wheel shaft):

70-80 N.m (7-8 kgf.m)

6. Tighten:

- Once the rear wheel shaft nut (1) has been tightened, tighten the tensioning bolts (2).

Tensioning bolts (2):

10-12 N.m (1-1,2 kgf.m)

7. Apply:

- The brake pedal until pressure builds up in the brake system.



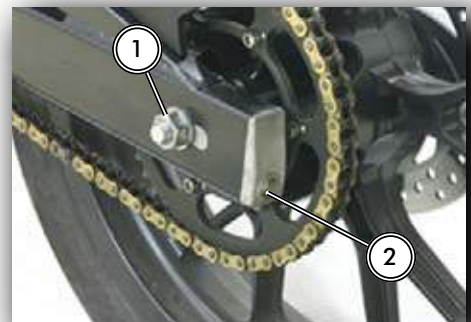
WARNING

NEVER RIDE THE MOTORCYCLE UNTIL THERE IS FULL PRESSURE IN THE BRAKE SYSTEM. PUMP THE PEDAL UNTIL THE PADS ARE IN CONTACT WITH THE DISK. IF NOT, THE BRAKES WILL NOT WORK THE FIRST TIME THE PEDAL IS USED.



N.B.

CHECK THE FREE PLAY IN THE CHAIN TO SEE IF IT REQUIRES ADJUSTING.



3 - MAINTENANCE

INSPECTING THE TYRES

1. Measure:

- Tyre pressure

Outside that specified => Adjust.



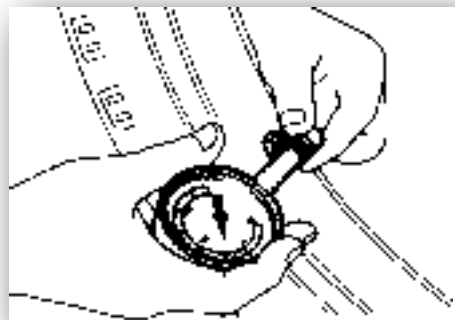
WARNING

TYRE PRESSURES SHOULD ONLY BE CHECKED OR ADJUSTED WHEN THEIR TEMPERATURE IS THE SAME AS AMBIENT TEMPERATURE.

THE TYRE PRESSURE AND SUSPENSION SHOULD BE ADJUSTED IN ACCORDANCE WITH THE TOTAL LOAD, RIDER, PILLION PASSENGER AND ACCESSORIES (COVERS, SIDE-BAGS, ETC. IF THESE ARE APPROVED FOR THIS MODEL), AND IN ACCORDANCE WITH THE RIDING SPEED OF THE MOTORCYCLE.

NEVER OVERLOAD THE MOTORCYCLE.

RIDING AN OVERLOADED MOTORCYCLE MAY CAUSE DAMAGE TO THE TYRES, ACCIDENTS OR INJURY



2. Inspect:

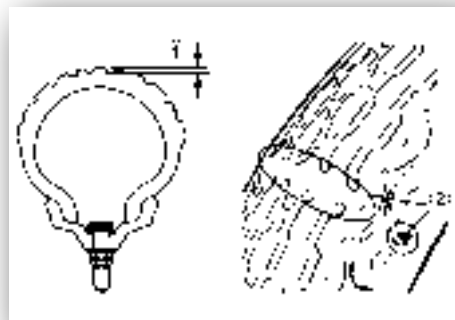
- Tyre surfaces.

Damaged/worn=>Renew.

Minimum tread depth (1):

1,6 mm

Wear indicator (2).



TYRE PRESSURES (COLD)	FRONT TYRE	REAR TYRE
Rider only	1,9 bar	2,0 bar
With pillion passenger	2,0 bar	2,2 bar



WARNING

IT IS DANGEROUS TO DRIVE WITH WORN TYRES. WHEN THE TYRE TREAD BEGINS TO SHOW SIGNS OF WEAR, THE TYRES SHOULD BE RENEWED IMMEDIATELY.

MENDING A PUNCTURED INNER TUBE IS NOT RECOMMENDED. IF IT IS ABSOLUTELY NECESSARY TO DO SO, TAKE GREAT CARE, AND REPLACE THE INNER TUBE WITH A GOOD QUALITY ONE AS SOON AS POSSIBLE. DO NOT USE TUBELESS TYRES ON A WHEEL DESIGNED FOR TUBED TYRES. THE TYRE MAY FAIL, AND THE RESULTING BLOW-OUT MAY CAUSE AN ACCIDENT.

Wheel rims for tubed tyres => use only tubed tyres.

Wheel rims for tubeless tyres => use only tubeless tyres.



WARNING

AFTER FITTING THE TYRE, DRIVE MODERATELY FOR A PERIOD OF TIME, SO AS TO ALLOW THE ROAD SURFACE TO CLEAN ANY EXCESS PARAFFIN OFF THE TYRE.

3 - MAINTENANCE

INSPECTING THE COOLANT LEVEL.



N.B.

ENSURE THAT THE MOTORCYCLE IS FULLY UPRIGHT WHEN CHECKING THE COOLANT LEVEL.

1. Position:

- The motorcycle fully upright on a flat surface.

2. Inspect (cold):

- The coolant level, which should be between the maximum and minimum marks.

3. Inspect (hot):

- The coolant level, which should be close to the maximum mark.

Incorrect level => Top up.

RECOMMENDED COOLANT

AGIP PLUS 30% or equivalent.

4. Remove:

- The expansion chamber cap (1)

5. Top up::

- The coolant using a funnel with a flexible nozzle to aid the operation.



WARNING

DO NOT REMOVE THE EXPANSION CHAMBER CAP IF THE COOLANT IS HOT, TO AVOID THE POSSIBILITY OF BEING BURNT.



WARNING

AVOID SPILLING COOLANT ONTO HOT ELEMENTS OF THE MACHINE. THE COOLANT COULD BURN ON COMING INTO CONTACT WITH THESE.



N.B.

MAXIMUM CAPACITY OF COOLANT IN THE EXPANSION CHAMBER: 230 ml.

3 - MAINTENANCE

CHANGING THE ENGINE OIL

1. First remove:

* The bottom fairing (to gain access to the drain plug and the oil filter).

2. Start up:

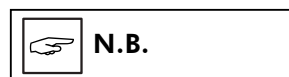
- The engine and leave to warm up for a few minutes.

3. Stop:

- The engine and place a container under it.

4. Remove:

- The drain plug (1).
- The sieve (pre-filter) to be found inside.
- The oil filter cover (2).
- The oil filter.
- The filler cap.



TO AID IN DRAINING THE OIL, REMOVE THE FILLER CAP.

5. Drain:

- The oil out completely.

6. Refit:

- The sieve (pre-filter). Clean it before refitting.
- The drain plug (1).
- The NEW oil filter (4).
- The spring (3).
- The oil filter cover (2)

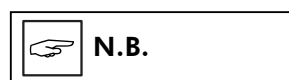


Pre-filter cap:

24-30 N.m (2,4-3,0 Kgf.m)

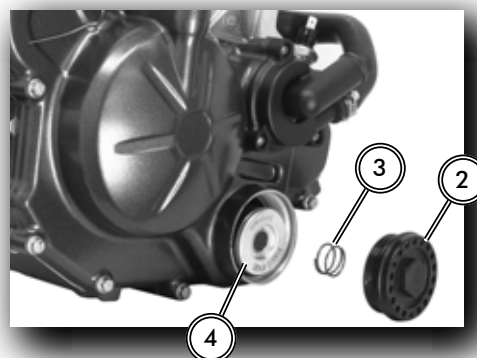
Oil filter cap:

24-26 N.m (2,4-2,6 Kgf.m)



APPLY A THIN FILM OF OIL TO THE DRAIN PLUG AND FILTER COVER O-RINGS.

ALWAYS RENEW THE FILTER WHEN PERFORMING AN OIL CHANGE.



RECOMMENDED ENGINE OIL

AGIP TECH 4-stroke 10W-40 or equivalent.

QUANTITY OF ENGINE OIL

1.150 ml

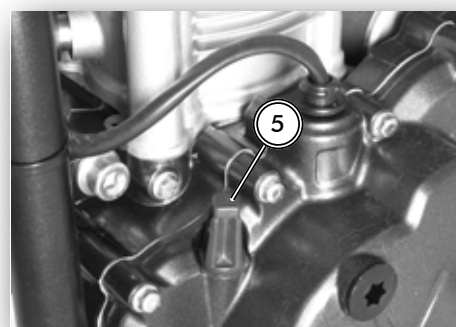
7. Fit:

- The filler cap (5).

8. Check:

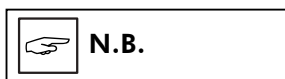
- The oil level in the engine.

See the section entitled: "INSPECTING THE ENGINE OIL LEVEL"



3 - MAINTENANCE

INSPECTING THE ENGINE OIL LEVEL



N.B.

ENSURE THAT THE MOTORCYCLE IS FULLY UPRIGHT WHEN CHECKING THE ENGINE OIL LEVEL.

1. Position:

- The motorcycle fully upright on a flat surface.

2. Start up:

- The engine and leave to warm up for a few minutes.

3. Stop:

- The engine and leave to cool down for a few minutes.

4. Unscrew:

- The dipstick (1) (located in the cover of the left-hand crankcase) and extract it.

5. Clean:

- The oil remains with a clean cloth.

6. Reinsert:

- The dipstick and SCREW IN FULLY.

7. Check:

- The oil level using the dipstick (1). Unscrew the dipstick and extract it.
- The level should be between the maximum level line and the minimum level line.

Level below the minimum => Refill to the maximum.

RECOMMENDED OIL FOR THE ENGINE

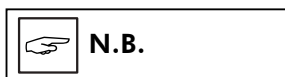
AGIP TECH 4-stroke 10W 40 or equivalent.

8. Reinsert:

- The dipstick and SCREW IN FULLY.

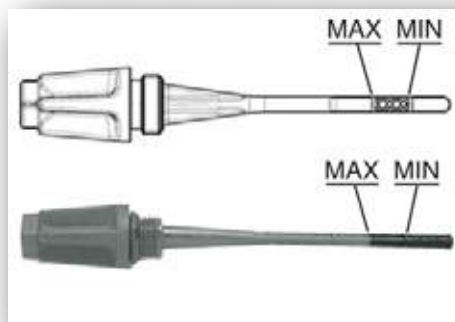
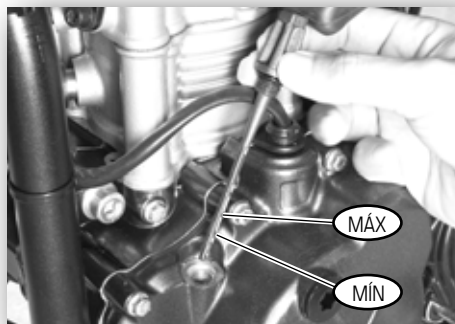
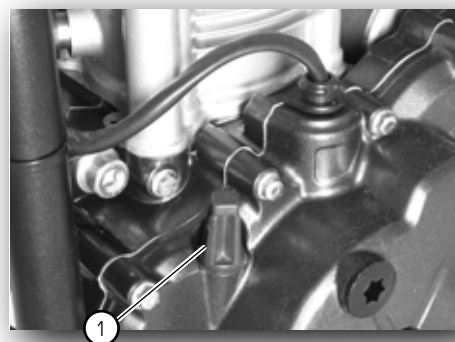
9. Repeat:

- The aforementioned Steps 1 to 7.



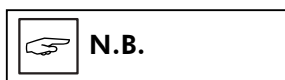
N.B.

BETWEEN THE MIN AND MAX MARK ON THE DIPSTICK IS EQUIVALENT TO APPROXIMATELY 200 ml.



3 - MAINTENANCE

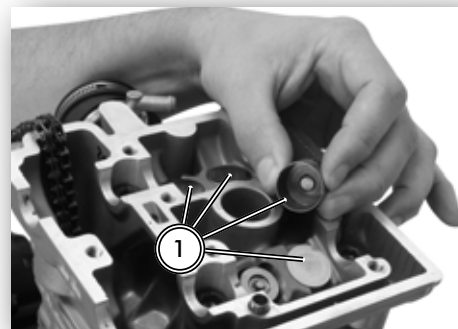
ADJUSTING THE VALVE SETTINGS



N.B.

THE VALVE SETTINGS ARE ADJUSTED BY MEANS OF SHIMS OR CALIBRATED TAPPETS (1). THE SHIMS VARY IN 0.05 MM INCREMENTS. THERE ARE 12 AVAILABLE (2.2 MM TO 2.7 MM).

THIS TASK SHOULD BE PERFORMED WITH THE ENGINE COLD (AMBIENT TEMPERATURE).



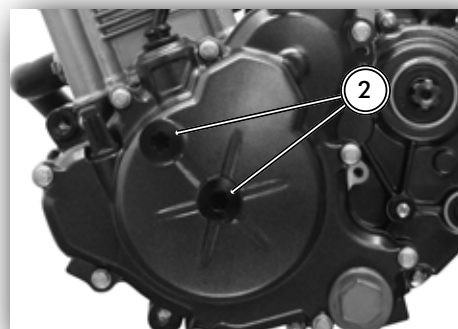
1. First remove:

- * The seat and the fuel tank.

STEPS TO FOLLOW

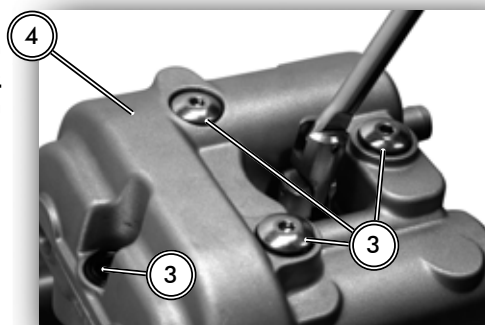
1. Remove:

- The inspection plugs (2) from the flywheel cover.
- The spark plug connector cap and the spark plug.
- The 4 rocker cover bolts (3).
- The rocker cover (4).



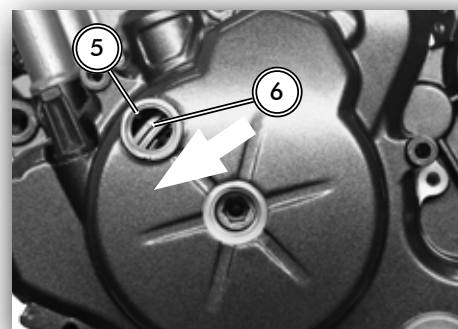
2. Position:

- The piston at top dead centre (TDC) on the compression stroke. To do so, turn the crankshaft in an **anticlockwise direction** with an Allen key until the mark (5) is lined up with the mark to be found on the flywheel (6).



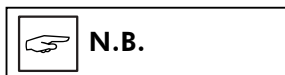
CAUTION

TURN THE CRANKSHAFT IN AN ANTICLOCKWISE DIRECTION. ATTEMPTING TO TURN IT IN THE OPPOSITE DIRECTION MAY CAUSE SERIOUS DAMAGE TO THE ENGINE.



3 - MAINTENANCE

DETAIL SHOWING THE ALIGNMENT OF THE MARK (5) WITH THAT EXISTING ON THE FLYWHEEL (6).



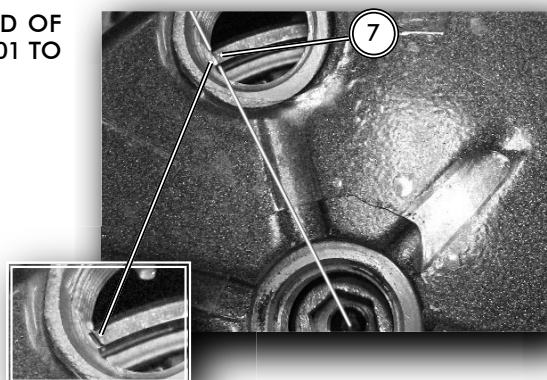
N.B.

UP TO ENGINE NUMBER 7015, THE MARK (6) (A CIRCLE) DOES NOT EXIST.

ON THESE ENGINES (FROM 0001 TO 7015), THE MARK (6) IS A LINE (7) WHICH HAS TO BE ALIGNED WITH THE END OF THE ORIFICE.

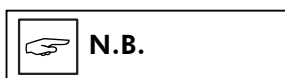


DETAIL OF ALIGNMENT OF THE LINE (7) WITH THE END OF THE INSPECTION THE ORIFICE (FROM ENGINE NOS. 0001 TO 7015).



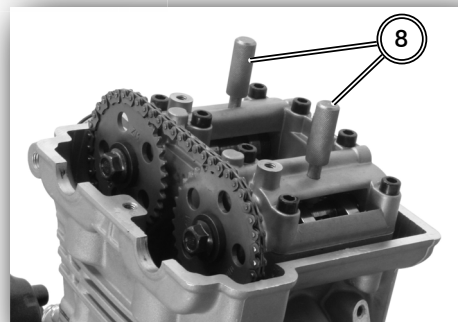
3. Position:

- The locking pins (8) to ensure the alignment. In this situation, the cams should be positioned outwards.



N.B.

AT TDC ON THE COMPRESSION STROKE, THE BRIDGE ORIFICES SHOULD COINCIDE WITH THOSE OF THE CAMSHAFTS.



Ref. 864567

Set of camshaft locking pins (8).

4. Check:

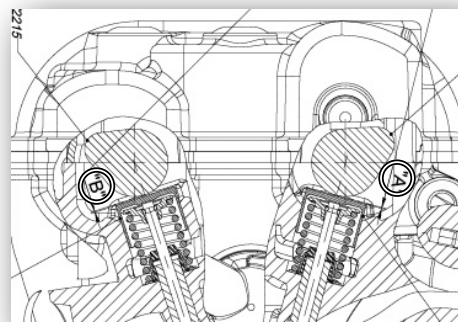
- With a feeler gauge that the clearance between the cam and the valve shim corresponds to the values indicated:

INLET VALVES: 0,10-0,15 mm (Height A)

EXHAUST VALVES: 0,15-0,20 mm (Height B)

Outside that specified => Adjust setting

Within that specified => Refit



3 - MAINTENANCE

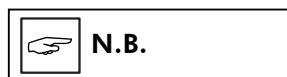
ADJUSTING VALVE SETTINGS THAT ARE OUTSIDE THAT SPECIFIED

Outside that specified => Dismantle the timing

STEPS TO FOLLOW TO DISMANTLE THE TIMING (continues from Point 3 onwards)

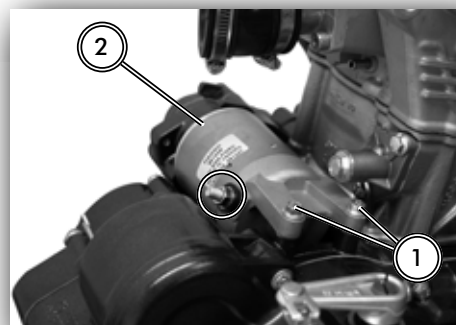
1. Extract:

- The starter motor connector.
- The 2 bolts (1) securing the starter motor.
- The starter motor (2).



N.B.

REMOVE THE STARTER MOTOR TO AID IN EXTRACTING THE TIMING CHAIN TENSIONER.



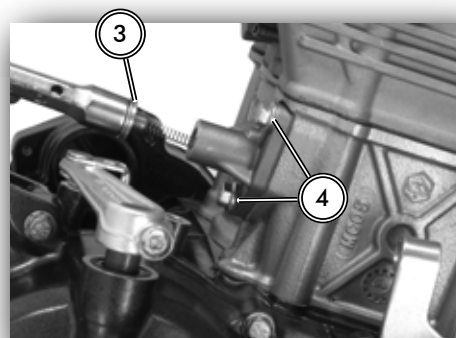
2. Extract:

- First of all the central timing chain tensioner bolt (3).
- The 2 bolts (4) securing the timing chain tensioner.
- The timing chain tensioner.
- The tensioner seal.



CAUTION

ON DISMANTLING THE TIMING, ALWAYS REMOVE THE CENTRAL TIMING CHAIN BOLT FIRST OF ALL. FAILURE TO DO SO MAY LEAD TO SEVERE DAMAGE TO THE TIMING CHAIN.



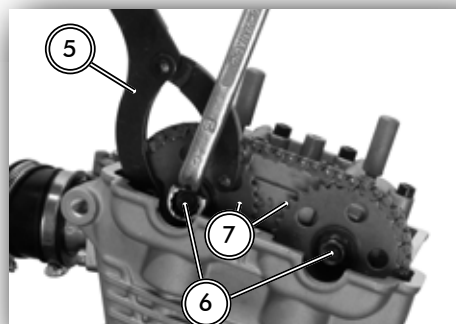
3. Fit:

- The camshaft sprocket locking tool (5).

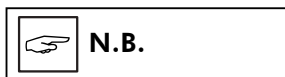
**The camshaft sprocket locking tool:
Ref. 865259**

4. Extract:

- The 2 bolts (6) from the camshaft sprockets.
- The camshaft sprockets (7).



3 - MAINTENANCE

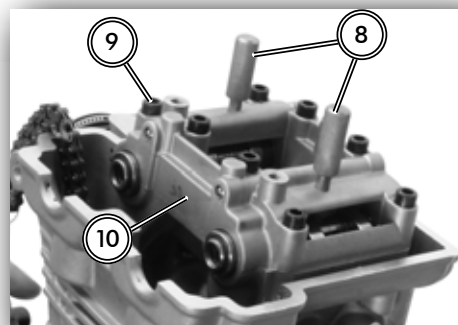


N.B.

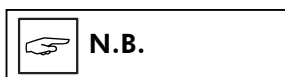
TIE A PIECE OF WIRE TO THE TIMING CHAIN TO PREVENT IT FROM DROPPING INTO THE ENGINE.

5. Extract:

- The 2 locking pins (8).
- The 8 bolts (9) from the camshaft bridge (loosen them by following a cross pattern).
- The camshaft bridge (10).



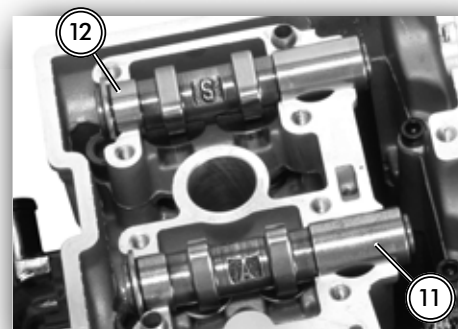
- The inlet camshaft (11).
- The exhaust camshaft (12).



N.B.

THE INLET CAMSHAFT BEARS THE INSCRIPTION "A".

THE EXHAUST CAMSHAFT BEARS THE INSCRIPTION "S".



6. Extract:

- The shims with the incorrect settings and make a note of the numbering (3 digit number) of the fitted shim (13).

7. Calculate:

- The appropriate shim according to the following calculation: $\text{New shim thickness} = (B - A) + C$ (mm)

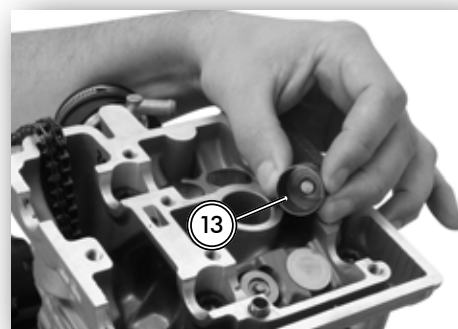
Where

- A = indicated clearance (inlet or exhaust)
- B = Value measured using the feeler gauge
- C = Thickness of the fitted shim

Example (exhaust valve):

- A = 0,20 mm (indicated or desired value)
- B = 0,15 mm
- C = 2,00 mm

Thickness of new shim = $(0,15 - 0,20) + 2,00 = 1,95$ mm

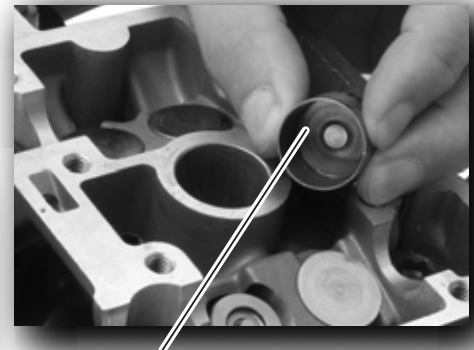


3 - MAINTENANCE

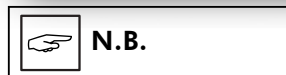
8. Select:

- The valve shim according to the attached table.

	REFERENCE	THICKNESS (mm)
1	CM222701	2,20
2	CM222702	2,25
3	CM222703	2,30
4	CM222704	2,35
5	CM222705	2,40
6	CM222706	2,45
7	CM222707	2,50
8	CM222708	2,55
9	CM222709	2,60
10	CM222710	2,65
11	CM222711	2,70
12	CM222712	2,75



THICKNESS



A series of 4 and 3 digits will be found stamped onto the inside of the shim. The 3 digits indicate the thickness, e.g.: 450 correspond to 2.45 mm.

9. Fit:

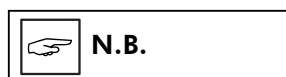
- The selected shims in which the setting was not correct.

Correct valve shims => Refit timing

STEPS TO FOLLOW TO REFIT THE TIMING (continues from Point 9 onwards)

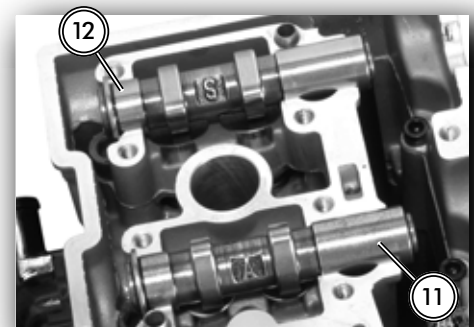
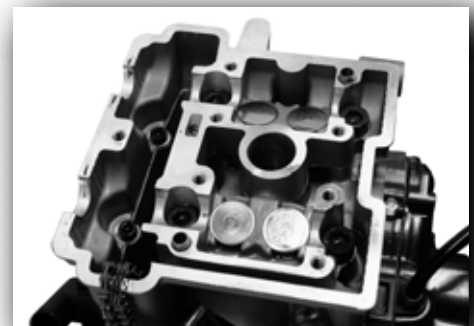
10. Apply:

- A little engine oil to the camshaft supports.
- Fit the camshafts onto their housings.

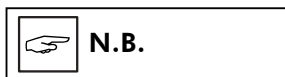


THE INLET CAMSHAFT BEARS THE INSCRIPTION "A" (11).

THE EXHAUST CAMSHAFT BEARS THE INSCRIPTION "S" (12).

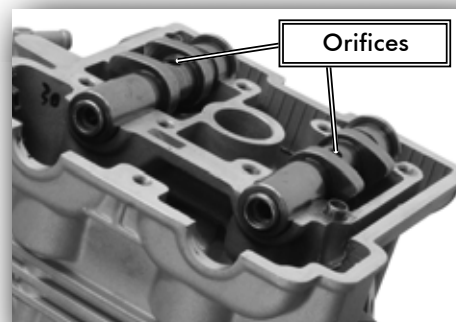


3 - MAINTENANCE



N.B.

POSITION THE CAMSHAFT LOCKING ORIFICES FACING UPWARDS.



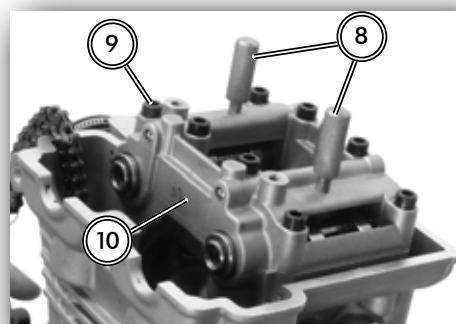
11. Fit:

- The camshaft bridge (10).
- The 8 bolts (9) into the camshaft bridge (tighten them by following a cross pattern).

The bolts (camshaft bridge):

1-1,2 kgf.m (10-12 N.m)

- The locking pins (8).



Ref. 864567

Set of camshaft locking pins (8).

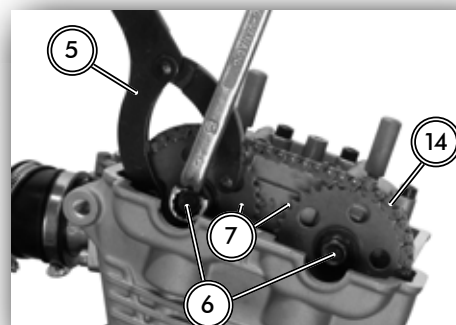


CAUTION

MAKE SURE THE TDC MARK ON THE FLYWHEEL IS CORRECTLY ALIGNED BEFORE FITTING THE CAMSHAFT SPROCKETS.

12. Fit:

- The timing chain (14) over the sprockets.
- The camshaft sprockets (7).
- Apply **Loctite 270-type thread sealant** to the 2 bolts (6) before fitting them.
- The camshaft sprocket washers and bolts (6).
- The sprocket locking tool (5).



The camshaft sprocket locking tool:

Ref. 865259

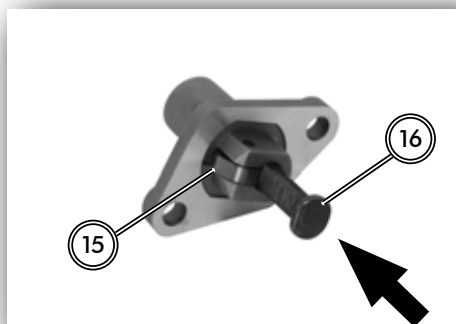


CAUTION

DO NOT TIGHTEN THE SPROCKETS TO THEIR TORQUE SETTING UNTIL THE SUBSEQUENT TENSIONING OF THE TIMING CHAIN HAS BEEN PERFORMED.

13. Adjusting the tensioner:

- Press the tab (15).
- Push the timing chain tensioner (16).
- Release the tab (15).

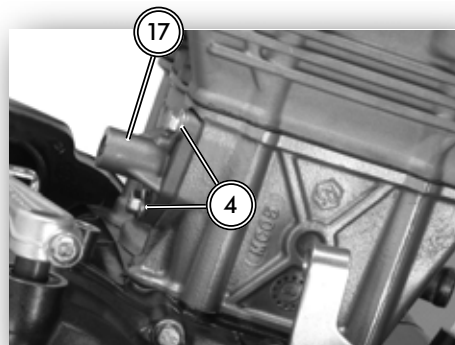


3 - MAINTENANCE



CAUTION

BEFORE FITTING THE TENSIONER GATHER IT IN COMPLETELY IN ORDER TO AVOID DAMAGE TO THE TIMING CHAIN.



14. Fit:

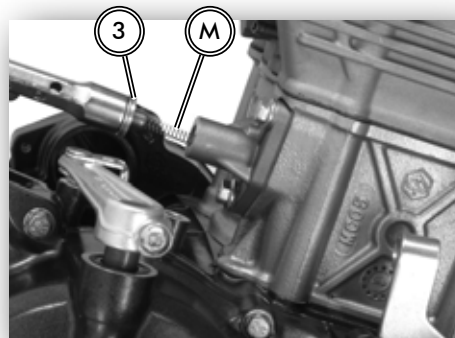
- A NEW tensioner seal.
- The timing chain tensioner (17).
- The 2 tensioner bolts (4).

Timing chain tensioner bolts.

1,1-1,3 kgf.m (11-13 N.m)

15. Fit:

- The spring (M), pressing it down until the bolt is in position.
- The tensioner central bolt (3).



Central timing chain tensioner bolt.

0,8-1 kgf.m (8-10 N.m)



CAUTION

MAKE SURE THAT LOCTITE 270-TYPE THREAD SEALANT HAS BEEN APPLIED TO THE SPROCKET BOLTS.

16. Fit:

- The camshaft sprocket locking tool.

The camshaft sprocket locking tool:

Ref. 865259



17. Tighten:

- The 2 bolts on the sprockets to the nominal torque.

Sprocket bolts:

2,5-2,7 kgf.m (25-27 N.m)

18. Remove:

- The locking pins (8).

19. Check:

- The correct functioning of the timing by turning the crankshaft a number of times.



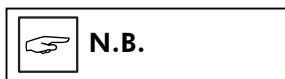
3 - MAINTENANCE

20. Fit:

- The rocker cover (18).
- The 4 rocker cover bolts (19).
- The spark plug.

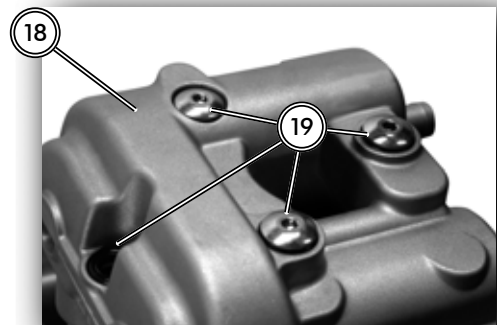
(Rocker cover) bolts:

1-1,2 kgf.m (10-12 N.m)



N.B.

MAKE SURE THAT THE ROCKER COVER GASKET IS PROPERLY POSITIONED AROUND THE SPARK PLUG HOUSING.



Spark plug:

1,2-1,4 kgf.m (12-14 N.m)

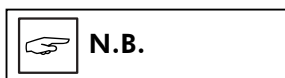
21. Fit:

- The spark plug connector cap.



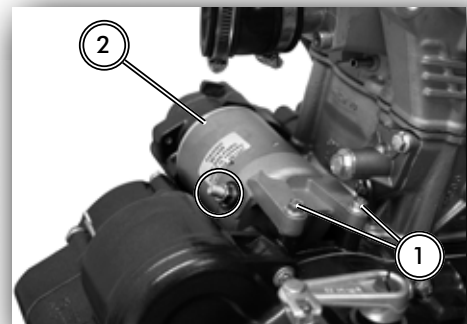
22. Fit:

- The starter motor (2).
- The 2 bolts (1) securing the starter motor.
- The starter motor connector cable.



N.B.

APPLY LOCTITE 243-TYPE THREAD SEALANT TO THE 2 BOLTS BEFORE FITTING THEM.



Starter motor bolts:

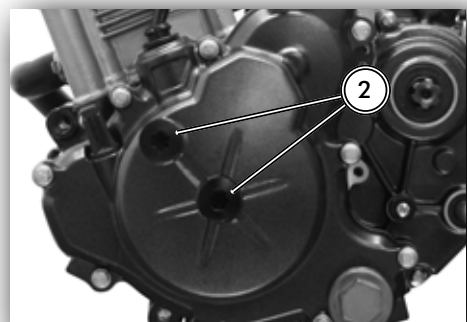
1,1-1,3 kgf.m (11-13 N.m)

23. Fit:

- The inspection plugs (2) in the flywheel cover.

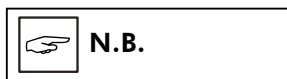
Inspection plugs

0,35-0,45 kgf.m (3,5-4,5 N.m)



3 - MAINTENANCE

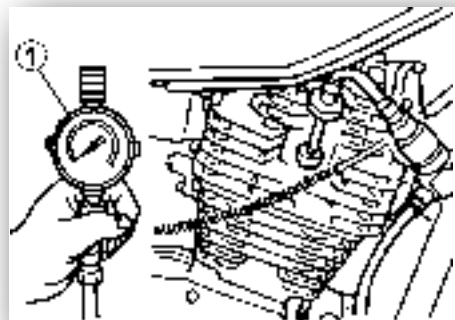
MEASURING THE COMPRESSION PRESSURE



N.B.

AN INSUFFICIENT COMPRESSION PRESSURE WILL LEAD TO A LOSS OF POWER.

BEFORE MEASURING THE COMPRESSION, IT IS IMPORTANT TO ENSURE THAT THE VALVE CLEARANCES ARE CORRECT.



1. Check:

- Valve settings.

Outside that specified => Adjust
See the "ADJUSTING VALVE SETTINGS" section

2. Start up:

- The engine and leave to warm up for a few minutes.

3. Stop:

- The engine.

4. Remove:

- Spark plug.



WARNING

BEFORE REMOVING THE SPARK PLUG BLOW AROUND IT WITH COMPRESSED AIR TO REMOVE ANY DIRT, THEREBY PREVENTING THIS FROM FALLING INTO THE ENGINE.

5. Fit:

- Compression meter (1).

6. Measure:

- Compression pressure.

Standard value: above 15Kg/cm²

Service limit: 13Kg/cm²

Steps for measuring:

- Start the engine with the throttle fully open, until the compression reading stabilises.

If the maximum permitted pressure is exceeded => Inspect the head, valve surfaces and piston head for carbonising.

If it is below the minimum pressure=> Inject a few drops of oil into the cylinder and measure again.

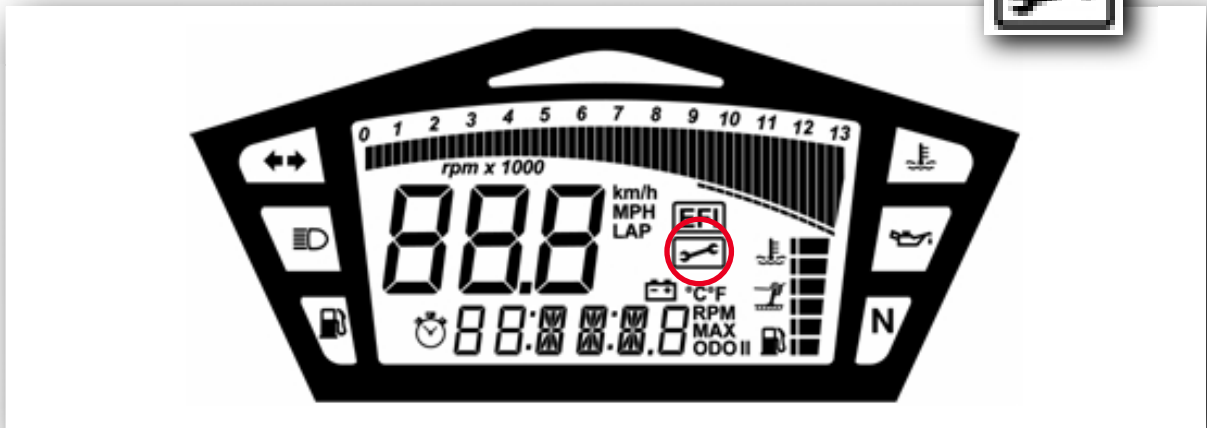
Follow the instructions in the table:

COMPRESSION PRESSURE (WITH OIL INJECTED INTO THE CYLINDER)	
READING	DIAGNOSIS
More than without oil	Worn or damaged pistons or piston rings.
The same as without oil	Possibility of a defect in the seats, valves, head gaskets or piston => Repair.

3 - MAINTENANCE

RESETTING SERVICE INDICATOR

1- Once the machine has travelled the distance set out on the table below, the system will activate the inspection function, which appears on the display in the form of the following icon:



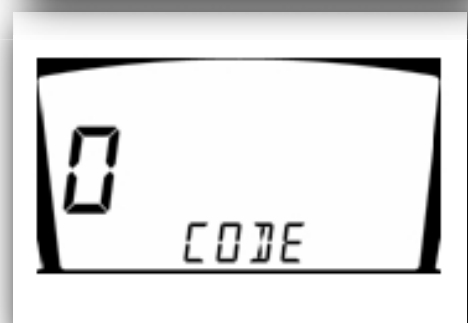
2- Service intervals

FIRST WARNING	1000 Kms
WARNING INTERVAL	6000 Kms

3- Deactivating the service symbol:

First enter into configuration mode. To do so, enter a three figure code – in this case **423**, which will allow changing from kilometres to miles, **service resetting**, as well as resetting the odometer to zero on a once only basis and providing the machine has clocked less than 200 km.

4- To access the configuration described, **the MODE button (1) (located on the instrument panel) must be held down for at least 10 seconds, in the interval time of 1.5 to 4 seconds maximum** after turning on the ignition. The following should be displayed:



3 - MAINTENANCE

5- The code 423 should now be entered.
The first figure will change from 0 to 9 one second at a time.
When the figure arrives at the desired number (in the case of the example, 4), press MODE to save in memory:



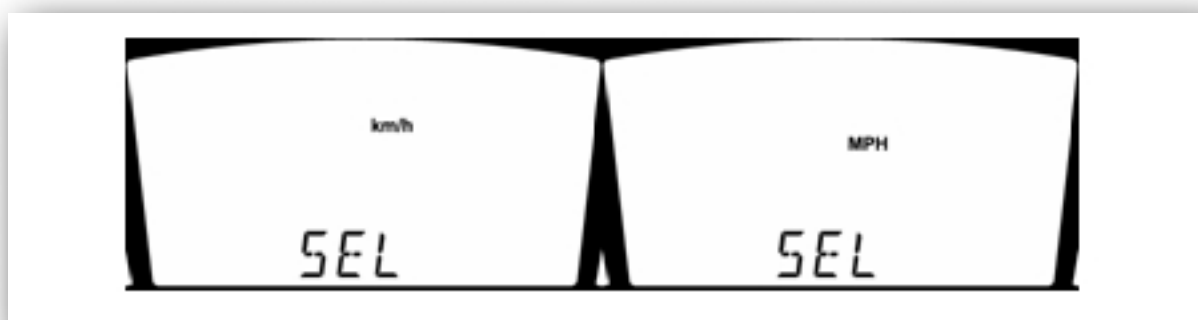
6- The second figure will begin to change (in this case, halt it when it reaches 2):



7- Do the same with the third figure (halt it when it reaches 3):



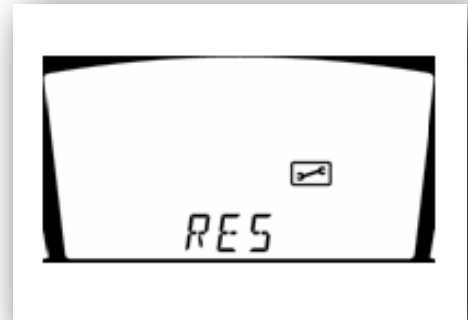
8- Immediately afterwards the configuration 423 will be displayed with the kilometre to miles changing function:



3 - MAINTENANCE

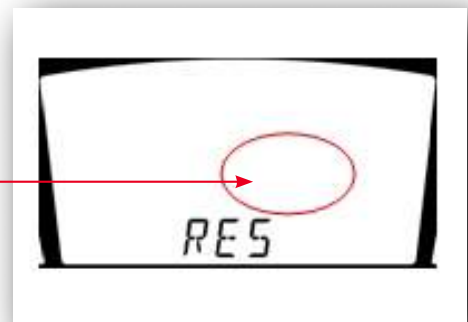
9- The change from kilometres to miles or vice versa is done by holding down the MODE button for over three seconds.

10- The following function is the one for resetting service/total km. To do so, pressing MODE briefly will display the following:

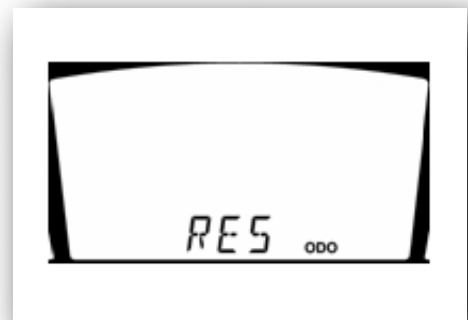


11- The icon with the spanner symbol will only appear when a service is overdue.

To reset, press MODE for over three seconds and the icon will disappear:



12- The third function is resetting the odometer (this can be performed on a once only basis and providing the machine has clocked less than 200 km). This is done by pressing MODE for over 3 seconds, which displays the following:



All the configurations are saved when the ignition is switched off.

3 - MAINTENANCE

3.6 - MAINTENANCE PIECES































FIGURE	CODE	DESCRIPTION
	866221	RIGHT MIRROR
	866222	LEFT MIRROR
	866266	THROTTLE GRIP
	00G00909071	GRIP
	00H00904291	CLUTCH LEVER
	864339	FRONT BRAKE LEVER
	00H01002131	HEADLIGHT BULB
	00H01701011	INDICATOR LIGHT BULB
	00H03302401	BATTERY
	866090	FRONT BRAKE DISC
	866687	SET OF BRAKE PADS
	866115	REAR BRAKE DISC
	865033	DRIVE PLATE Z-49
	864388	TRANSMISSION CHAIN 130S
	AP8235012	REAR BRAKE DRIVE LEVER

FIGURE	CODE	DESCRIPTION
	866692	SET OF BRAKE PADS
	861130	AIR FILTER FOAM
	862931	BLANK KEY
	874533	CYLINDER PISTON ASSEMBLY
	8745340001	PISTON 1 CAT.
	8745340002	PISTON 2 CAT.
	8745340003	PISTON 3 CAT.
	8745340004	PISTON 4 CAT.
	872692	PISTON RING, FIRST
	872693	PISTON RING, SECOND
	872694	PISTON RING, GRAZE
	871341	DRIVE CLUTCH PLATE
	871340	DRIVEN CLUTCH PLATE
	AP8235011	GEARSHIFT LEVER
	863662	OUTPUT PINION Z-14

4 - ENGINE

4.1 - IDENTIFICATION OF SETS	85
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4.4 - INSPECTING THE ENGINE ELEMENTS	104
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4.6 - FITTING THE ENGINE INTO THE FRAME	150

4 - ENGINE

4.1 - IDENTIFICATION OF SETS

CRANKCASE LOCATION



CRANKCASE MECHANISED DIAMETER 1/2

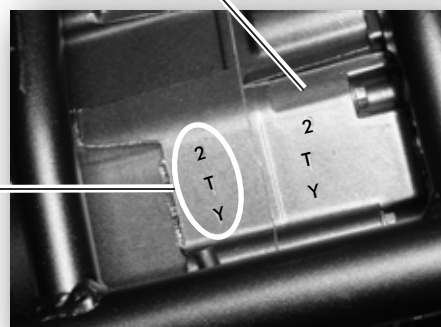
2

S/T BALANCE SHAFT GEARINGENGRANAJES

T

PRIMARY SHAFT GEARING

Y



CRANKCASE MACHINED DIAMETER

	MIN (mm)	MAX (mm)
CLASS 1	36.500	36.508
CLASS 2	36.508	36.516

BALANCE SHAFT – GEAR SET

	CRANKSHAFT GEAR REFERENCE	CRANKSHAFT GEAR REFERENCE
S SET	8714465001	8711565001
T SET	8714465002	8711565002

N.B.: The crankcases available as spare parts are always of the S kind.

	MIN (mm)	MAX (mm)
S CLASS	64.00	64.03
T CLASS	63.97	64.00

N.B.: The distances between the balance shaft and the crankshaft are the following.

4 - ENGINE

PRIMARY SHAFT - GEAR SET

	ENGRANAJE CIGÜEÑAL	ENGRANAJE EJE PRI. (CAMPANA EMBRAGUE)
	REFERENCE	REFERENCE
X CLASS	8714475001	8714605001
Y CLASS	8714475002	8714605002

N.B.: The crankcases available as spare parts are always of the X kind.

	MIN (mm)	MAX (mm)
X CLASS	86.00	86.04
Y CLASS	85.96	86.00

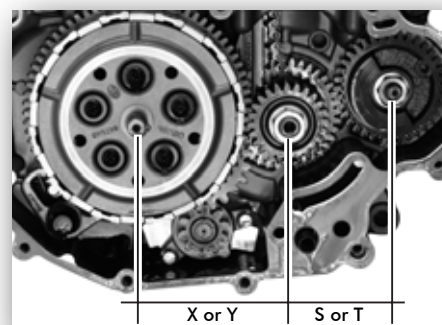
N.B.: the distances between the primary shaft and the crankshaft are the following.

Distances between gears

With the aim of minimising noise and friction, the crankshaft, primary shaft and balance shaft gears exist as joint assemblies.

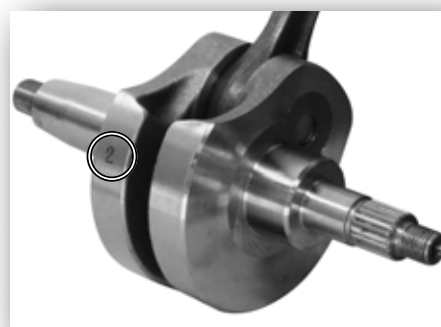
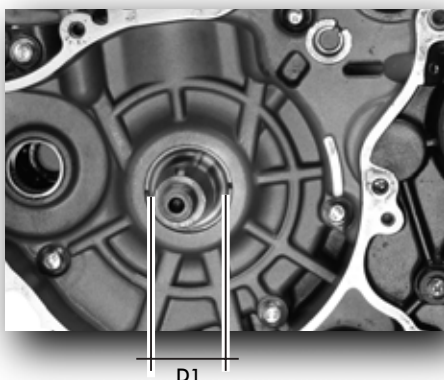
Fitting the sets correctly

FITTING
X + X
Y + Y
S + S
T + T



4 - ENGINE

HALF-BEARING



CRANKCASE MACHINED DIAMETER (D1)

	MIN (mm)	MAX (mm)
CLASS 1	36.500	36.508
CLASS 2	36.508	36.516

CRANKSHAFT DIAMETER			
	MIN (mm)	MAX (mm)	REFERENCE
CLASS 1	32.480	32.485	8711475001
CLASS 2	32.485	32.490	8711475002

HALF-BEARING THICKNESS				
	MIN (mm)	MAX (mm)	Ref. Lower (without orifice)	Ref. Upper (with orifice)
RED	2.005	2.010	864591	864589
BLUE	2.010	2.015	864590	864588

N.B.: Clearance between crankshaft support and semi-bearing: 0,020 - 0,050 mm

CRANKCASE CRANKSHAFT	CLASS 1	CLASS 2
	CLASS 1	RED+BLUE
CLASS 2	RED+RED	RED+BLUE

Example:

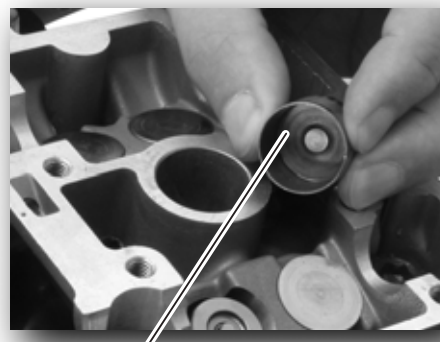
Based on an engine comprising a Class A crankcase (diameter between 36.500 and 36.508 mm), and a Class 2 crankshaft (diameter between 32.485 and 32.490 mm), two RED type bearings should be fitted, Ref. 864591 and 864589.

If the crankcases have mixed bearings, they can be fitted regardless of their initial location.

4 - ENGINE

VALVE GUIDES

	REFERENCE	THICKNESS (mm)
1	CM222701	2,20
2	CM222702	2,25
3	CM222703	2,30
4	CM222704	2,35
5	CM222705	2,40
6	CM222706	2,45
7	CM222707	2,50
8	CM222708	2,55
9	CM222709	2,60
10	CM222710	2,65
11	CM222711	2,70
12	CM222712	2,75

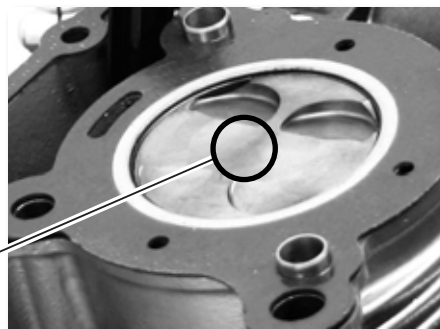


THICKNESS



A series of 4 and 3 digits will be found stamped onto the inside of the shim. The 3 digits indicate the thickness, e.g.: 450 corresponds to 2.45 mm.

CYLINDER AND PISTON SETS



CATEGORY

CATEGORY	CYLINDER (IRON)		PISTON		PISTON REFERENCE
	MIN (mm)	MAX (mm)	MIN (mm)	MAX (mm)	
M	58.010	58.017	57.953	57.960	8745340001
N	58.017	59.024	57.960	57.967	8745340002
O	58.024	58.031	57.967	57.974	8745340003
P	58.031	58.038	57.974	57.981	8745340004



Clearance on assembling 0.050 - 0.064

The cylinder is only available as a spare part in a kit with the piston. Reference 874533.

4 - ENGINE

4.2 - REMOVING THE ENGINE FROM THE FRAME



WARNING

DO NOT REMOVE THE EXHAUST SYSTEM OR THE RADIATOR HOSES IF THE ENGINE IS HOT, SINCE THIS COULD RESULT IN BURNS.

REMOVAL

1. Firstly remove:

- * The bottom side covers.
- * The bottom fairing.
- * The seat.
- * The tank.
- * The chain.
- * The exhaust pipe.

2. Remove:

- The spark plug connector cap.
- Rocker cover oil vapour breather pipe (rocker cover-air filter box).

3. Loosen:

- The gear lever bolt (1).

4. Remove:

- The gear lever.
- The neutral sensor cable.

5. Loosen:

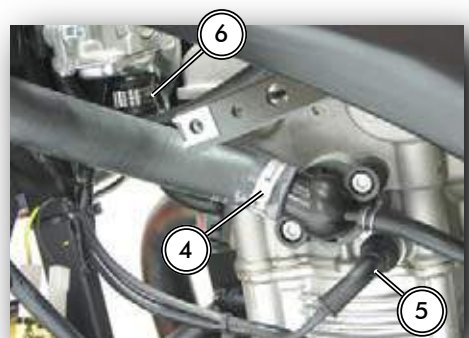
- The nut and bolt (2) on the rear brake pedal.
- The oil pressure sensor cable (3).

6. Disconnect:

- The pipe from the radiator to the thermostat cover (4).

7. Disconnect:

- The coolant temperature sensor (5).
- The AIS valve (6).



4 - ENGINE

8. Disconnect:

- The pipe (7) from the radiator to the water pump.



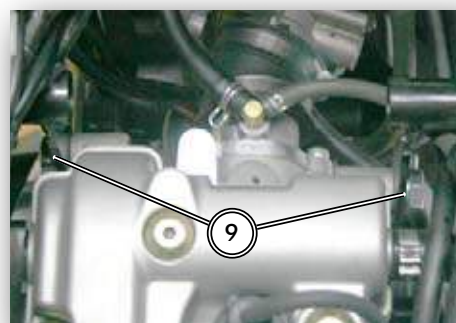
9. Disconnect:

- The carburettor clamps (8) and extract it.
- Electrical connections (starter motor, magneto cover, etc.).



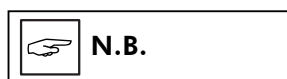
10. Remove.

- The 2 top securing bolts (9).
- The 2 bottom securing bolts (10).



11. Remove.

- The engine.

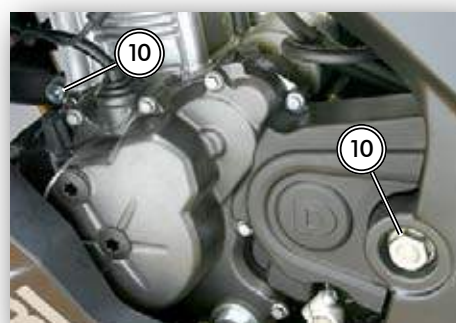


DRAIN OUT THE OIL PRIOR TO EXTRACTING THE ENGINE IF IT IS TO BE DISMANTLED COMPLETELY.

INSERT A SUPPORT SHAFT INTO THE OTHER SIDE JOINING ONLY THE SWINGING ARM AND CHASSIS, TO ENSURE THAT THE SWINGING ARM AND CHASSIS DO NOT COME LOOSE. UNFASTEN THE ENGINE FROM ITS FRONT MOUNTING. WITHDRAW THE ENGINE.

IT IS ADVISABLE TO PLACE A SUPPORT UNDER THE ENGINE BEFORE FREEING IT FROM THE CHASSIS, TO AID IN THE DISMANTLING PROCESS.

ON REFITTING THE ENGINE, IF NECESSARY USE TOOL CODE NO. 866714 TO ADJUST THE SWINGING ARM NUT.

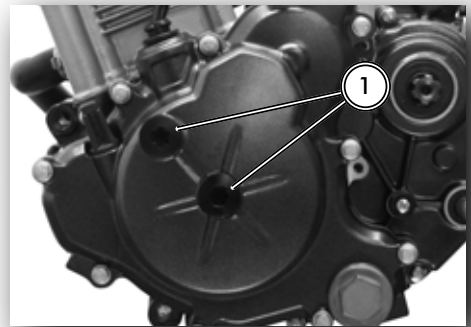


4 - ENGINE

4.3 - DISMANTLING THE ENGINE

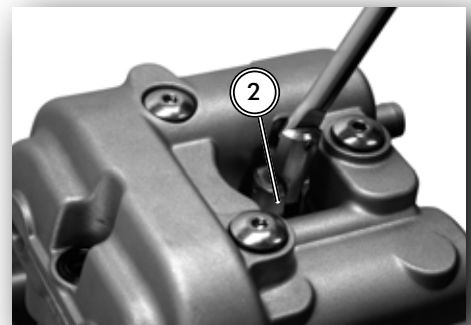
1. Remove:

- The inspection plugs (1) in the flywheel cover.



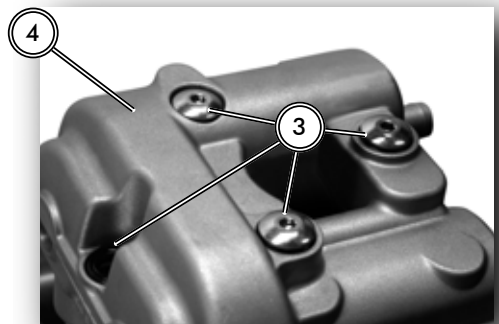
2. Remove:

- The spark plug (2).



3. Remove:

- The 4 rocker cover bolts (3).
- The rocker cover (4).



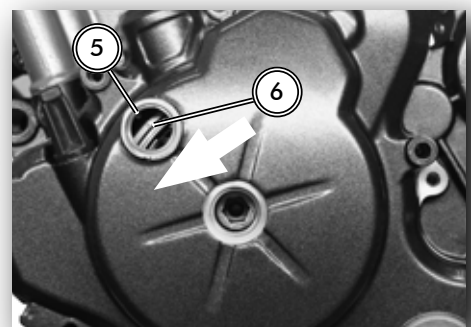
4. Position:

- The piston at top dead centre (TDC) on the compression stroke. To do so, turn the crankshaft in an **anticlockwise direction** with an Allen key until the mark (5) is lined up with the mark to be found on the flywheel (6).



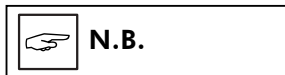
CAUTION

TURN THE CRANKSHAFT IN AN ANTI-CLOCKWISE DIRECTION. ATTEMPTING TO TURN IT IN THE OPPOSITE DIRECTION MAY CAUSE SERIOUS DAMAGE TO THE ENGINE.



4 - ENGINE

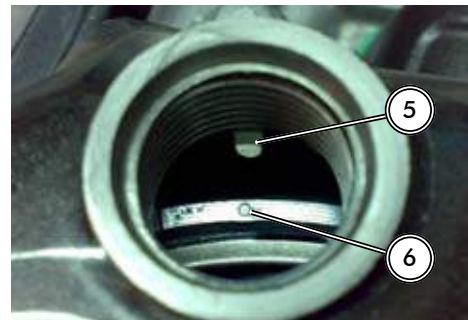
DETAIL SHOWING THE ALIGNMENT OF THE MARK (5) WITH THAT EXISTING ON THE FLYWHEEL (6).



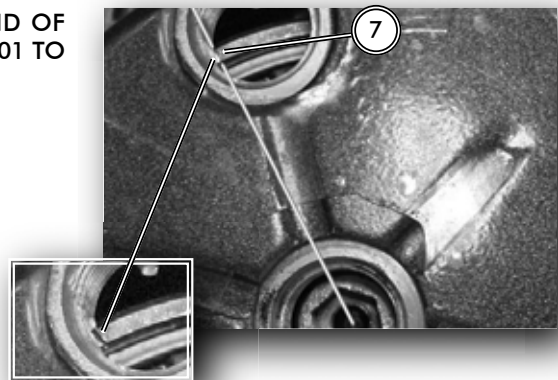
N.B.

UP TO ENGINE NUMBER 7015, THE MARK (6) (A CIRCLE) DOES NOT EXIST.

ON THESE ENGINES (FROM 0001 TO 7015), THE MARK (6) IS A LINE (7) WHICH HAS TO BE ALIGNED WITH THE END OF THE ORIFICE.

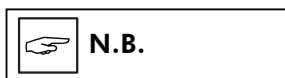


DETAIL OF ALIGNMENT OF THE LINE (7) WITH THE END OF THE INSPECTION THE ORIFICE (FROM ENGINE NOS. 0001 TO 7015).



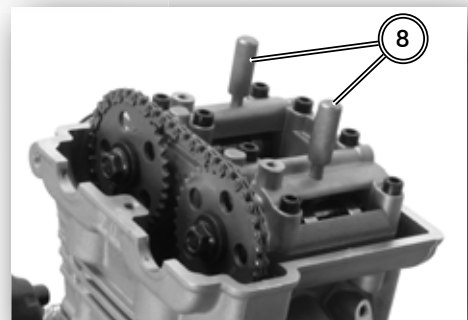
5. Position:

- The locking pins (8) to ensure the alignment. In this situation, the cams should be positioned outwards.



N.B.

AT TDC ON THE COMPRESSION STROKE, THE BRIDGE ORIFICES SHOULD COINCIDE WITH THOSE OF THE CAMSHAFTS.

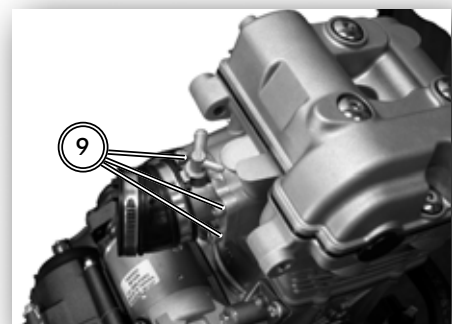


Ref. 864567

Set of camshaft locking pins (8).

6. Remove:

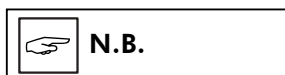
- The inlet manifold, using the 3 bolts (9).



4 - ENGINE

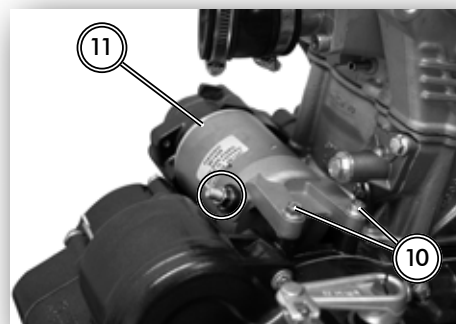
7. Remove:

- The starter motor connector
- The 2 bolts (10) securing the starter motor.
- The starter motor (11).



N.B.

REMOVE THE STARTER MOTOR TO ENABLE EASY EXTRACTION OF THE TIMING CHAIN TENSIONER .



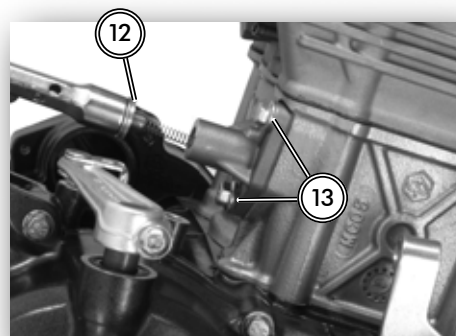
8. Remove:

- First of all the central timing chain tensioner bolt (12).
- The 2 bolts (13) securing the timing chain tensioner.
- The timing chain tensioner.
- The tensioner seal.



CAUTION

ON DISMANTLING THE TIMING, ALWAYS REMOVE THE CENTRAL TIMING CHAIN BOLT FIRST OF ALL. FAILURE TO DO SO MAY LEAD TO SEVERE DAMAGE TO THE TIMING CHAIN.



9. Fit:

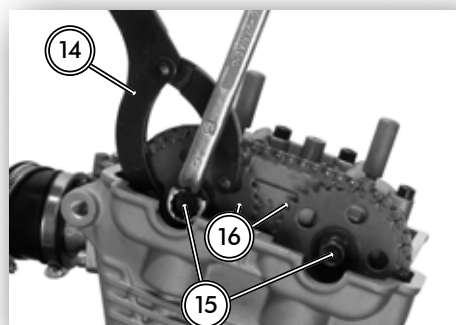
- The camshaft sprocket locking tool (14).

The camshaft sprocket locking tool:

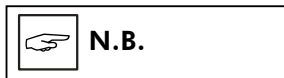
Ref. 865259

10. Remove:

- The 2 bolts (15) from the camshaft sprockets.
- The camshaft sprockets (16).



4 - ENGINE

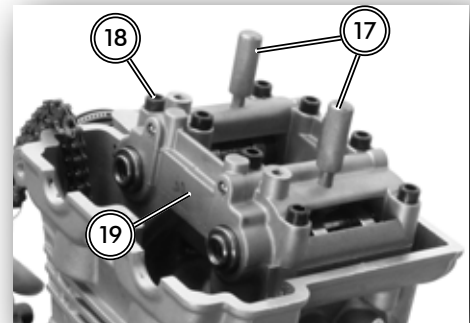


N.B.

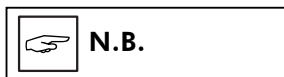
TIE A PIECE OF WIRE TO THE TIMING CHAIN TO PREVENT IT FROM DROPPING INTO THE ENGINE.

11. Remove:

- The 2 locking pins (17).
- The 8 bolts (18) from the camshaft bridge (loosen them by following a cross pattern).
- The camshaft bridge (19).



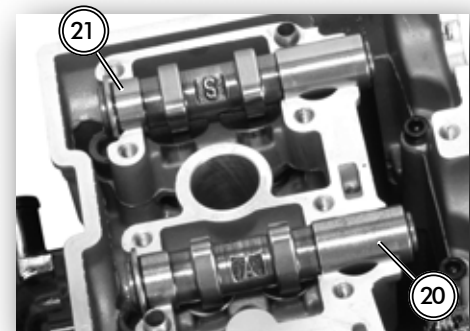
- The inlet camshaft (20).
- The exhaust camshaft (21).



N.B.

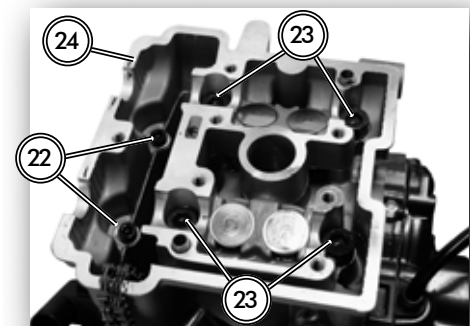
THE INLET CAMSHAFT BEARS THE INSCRIPTION "A".

THE EXHAUST CAMSHAFT BEARS THE INSCRIPTION "S".



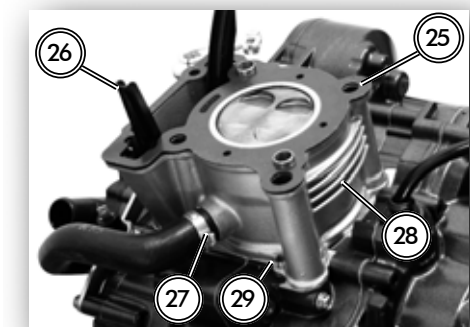
12. Remove:

- The 2 M6 bolts (22) securing the cylinder head to the cylinder.
- The 4 M8 bolts (23) securing the cylinder head to the cylinder.
- The cylinder head (24).



13. Remove:

- The cylinder head gasket (25). (Renew on refitting).
- The mobile timing chain roller (26).
- The coolant pipe (27).
- The cylinder (28).
- The cylinder bottom gasket (29). (Renew on refitting).

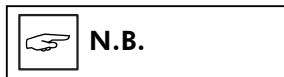
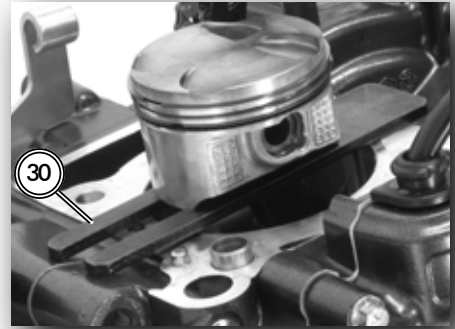


4 - ENGINE

14. Fit:

- The tool for supporting the piston (30).

Tool for supporting the piston.
Ref. 865261



BEFORE REMOVING THE CIRCLIP FROM THE GUDGEON PIN, COVER THE BASE OF THE CYLINDER WITH A CLOTH TO PREVENT OBJECTS FROM FALLING INTO THE ENGINE.

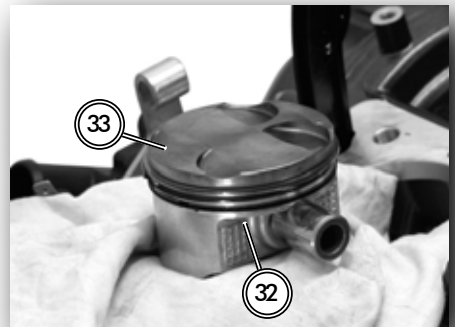
15. Remove:

- The circlip (31) (extracting one is enough) securing the piston gudgeon pin. (Renew on refitting).



16. Remove:

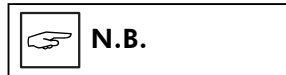
- The gudgeon pin from the piston (32).
- The piston (33).



4 - ENGINE

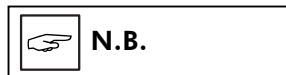
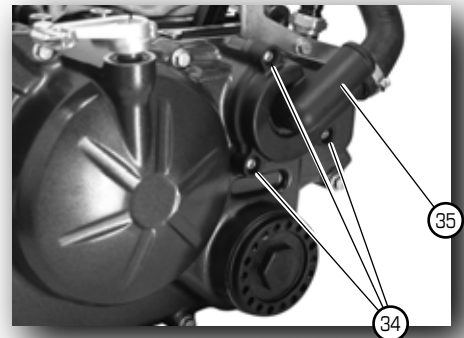
17. Remove:

- The 3 bolts (34) from the water pump cover (35).



N.B.

THERE IS NO NEED TO REMOVE THE WATER PUMP COVER, BUT IT IS RECOMMENDED TO DO SO AS THIS AIDS IN FITTING THE CLUTCH COVER.

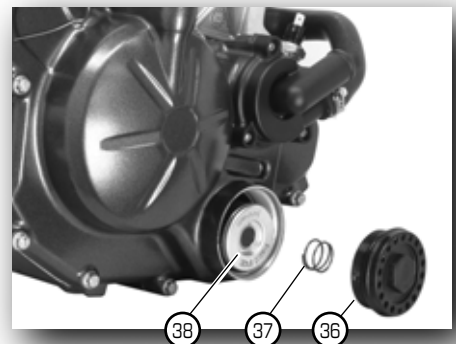


N.B.

IF THE ENGINE OIL HAS NOT BEEN PREVIOUSLY DRAINED, PLACE A RECIPIENT UNDER THE ENGINE AND DRAIN THE OIL.

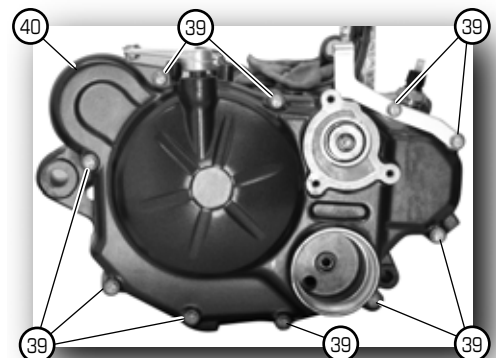
18. Remove:

- El tapón del filtro de aceite (36)
- El muelle (37).
- El filtro de aceite (38).



19. Remove:

- The 10 bolts (39) from the clutch cover.
- The clutch cover (40).
- The clutch cover gasket. (Renew when refitting).



4 - ENGINE

20. Remove:

- The 5 bolts (41) with washer and spring from the clutch closing cover.
- The clutch closing cover (42).



21. Remove:

- The driving disks (43) and driven disks.

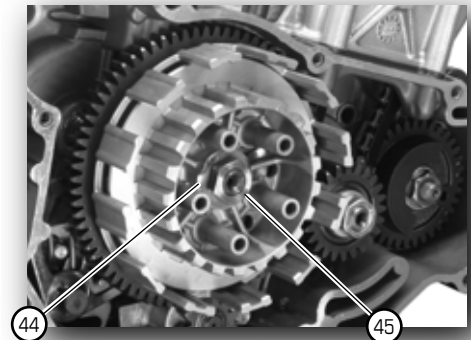


22. Abrir:

- The seal tab (44).

23. Remove:

- The nut (45).
- The seal (44).



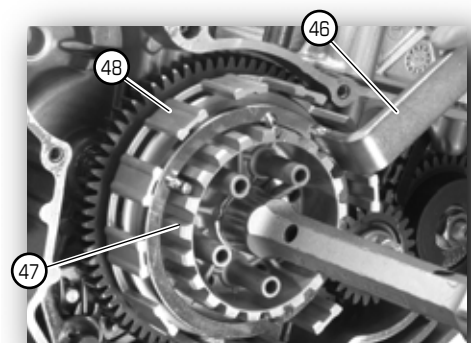
24. Fit:

Use the clutch housing extraction tool (15) to remove it.

Clutch housing extraction tool:
Ref. 00H05300041

25. Remove:

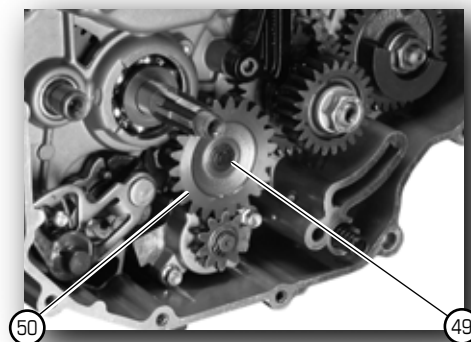
- The clutch box (47) (clutch ram).
- The clutch bell housing (48).



4 - ENGINE

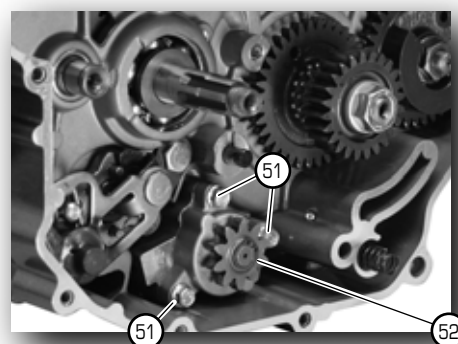
26. Remove:

- The circlip and washer (49) from the pump driving gear (50).
- The pump driving gear (50).



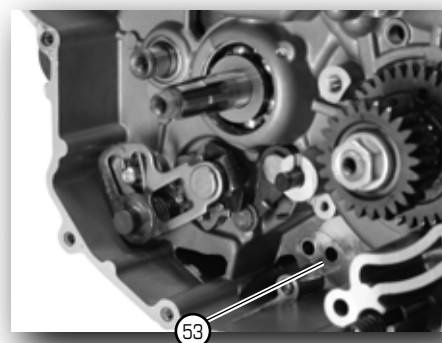
27. Remove:

- The 3 oil pump bolts (51).
- The oil pump (52).



28. Remove:

- The oil pump gasket (7). (Renew on refitting).



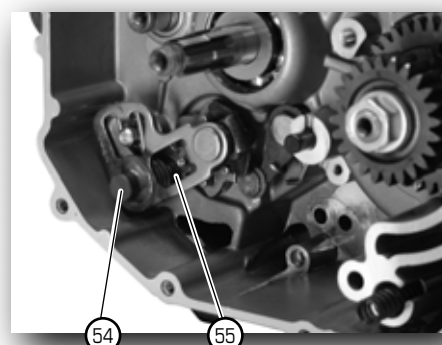
29. Remove:

- The gear selector shaft (54) by pulling it out.



N.B.

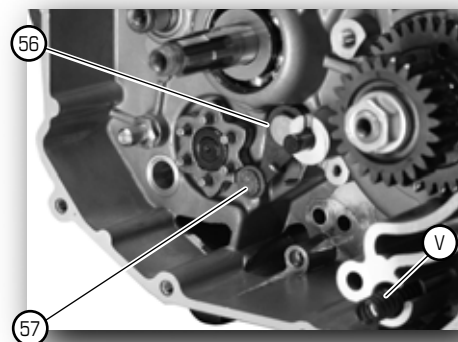
WHEN REFITTING THE SHAFT,
REMEMBER TO FIT THE WAS-
HER (55).



4 - ENGINE

30. Remove:

- The gear change spring bolt (56).
- The gear lever (57).
- The lubrication circuit by-pass valve (V).



31. Fit:

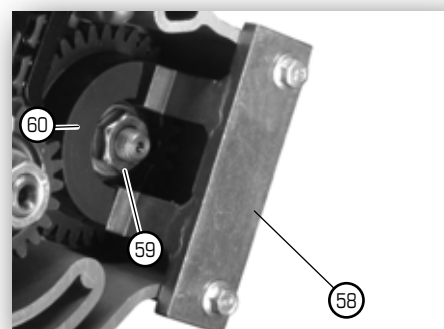
- The balance shaft locking tool (58).

Balance shaft locking tool:

Ref. 864486

32. Remove:

- The nut balance shaft nut (59).
- The balance gear (60).



33. Fit:

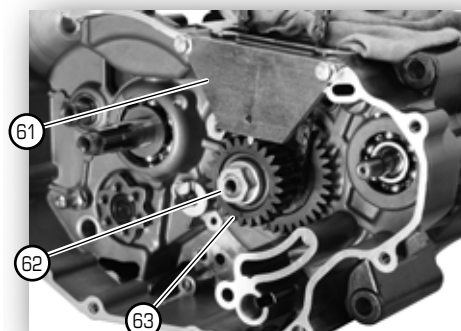
- Fit the crankshaft sprocket using the locking tool (61).

Crankshaft sprocket locking tool:

Ref. 864487

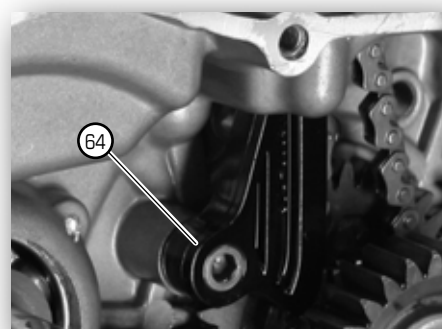
34. Remove:

- The nut (62).
- The fitting tool (61).
- The crankshaft sprocket (63).



35. Remove:

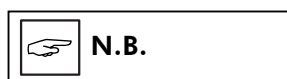
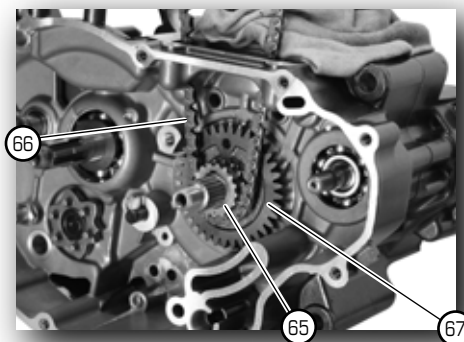
- The fixed timing chain roller (64).



4 - ENGINE

36. Remove:

- The timing chain gear (65).
- The timing chain (66) from the top.
- The intermediate balance shaft gear (67).

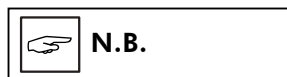
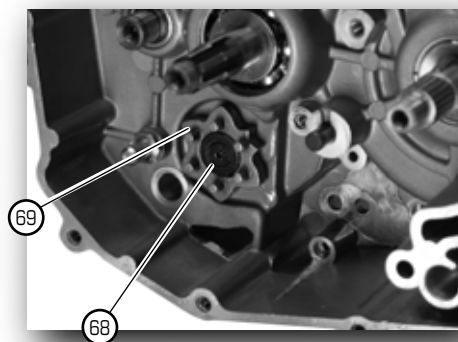


N.B.

TAP THE ALLEN KEY WITH A NYLON Mallet TO UNLOCK IT (BOLT 68).

37. Remove:

- The bolt (68) from the gear selector distributor.
- Gear change shaft assembly (69).

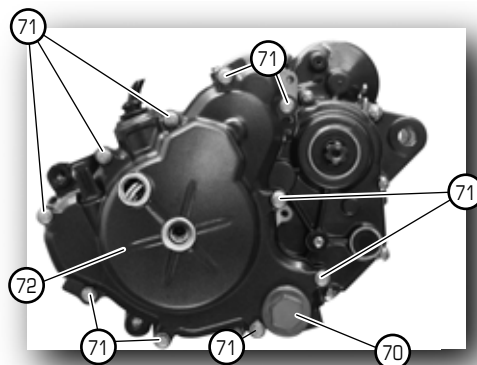


N.B.

IF THE ENGINE OIL HAS NOT BEEN PREVIOUSLY DRAINED, PLACE A RECIPIENT UNDER THE ENGINE AND DRAIN THE OIL.

38. Remove:

- The engine oil pre-filter cap (70).
- The engine oil pre-filter.
- The 10 bolts (71) from the magneto flywheel cover.
- Cylinder head side cover (72).
- The cover gasket. (Renew when refitting).



39. Fit:

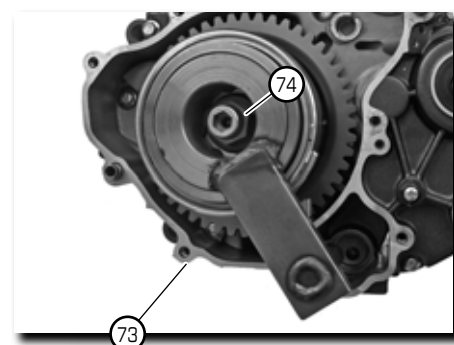
- The magneto flywheel (73) locking tool.

Magneto flywheel locking tool:

Ref. 865259

40. Remove:

- The nut (74) and the washer from the magneto flywheel.



4 - ENGINE

41. Fit:

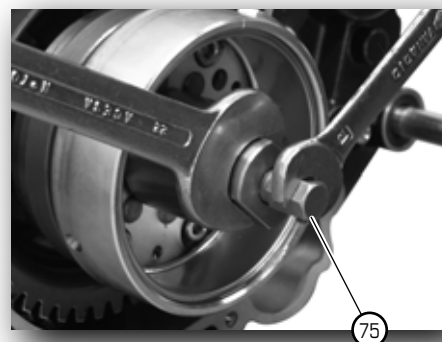
- The magneto flywheel extractor (75).

Magneto flywheel extractor tool:

Ref. 864868

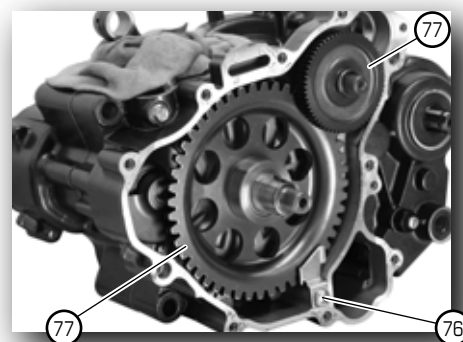
42. Remove:

- The magneto flywheel.
- The magneto flywheel extractor.



43. Remove:

- The starter crown wheel retaining plate (76).
- The 2 starter system sprockets (77).



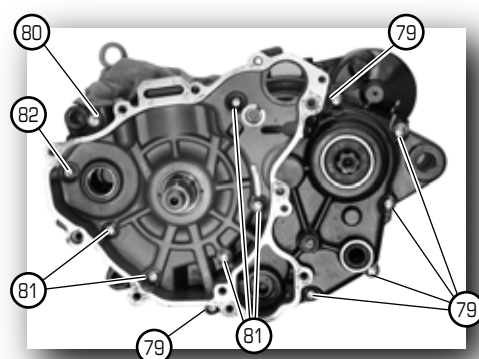
44. Remove:

- The balance shaft (78).



45. Remove:

- The 6 outer bolts (79) on the left-hand crankcase.
- The (longer) outer bolt (80) on the left-hand crankcase.
- The 5 inner bolts (81) on the left-hand crankcase.
- The (shorter) inner bolt (82).



4 - ENGINE

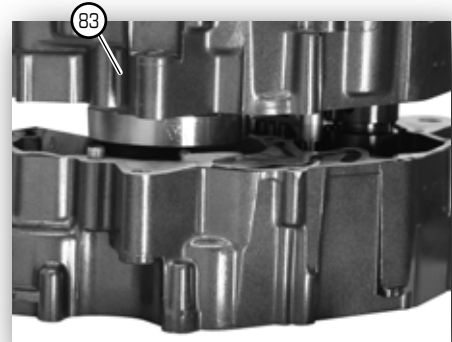
45. Remove:

- The left-hand crankcase (83) upwards.



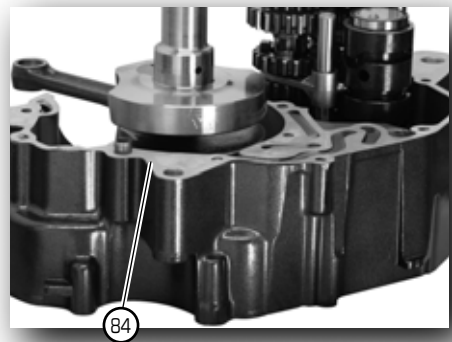
N.B.

TO AID THE TASK, SET THE ENGINE DOWN ON A WOODEN BOX.



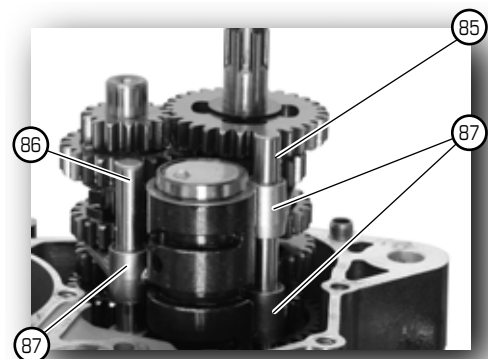
46. Remove:

- The gasket from the crankcases (84).



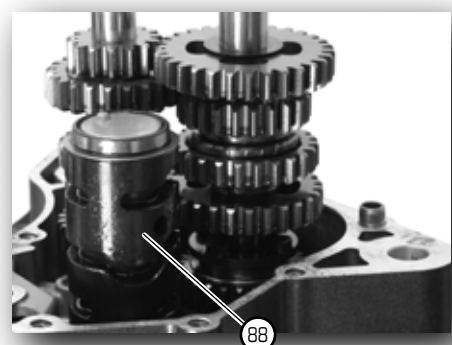
47. Remove:

- The 2 gear selector fork shafts.
 Long shaft (85).
 Short shaft (86).
- The 3 selector forks (87).



48. Remove:

- The selector drum (88) by pulling it upwards.



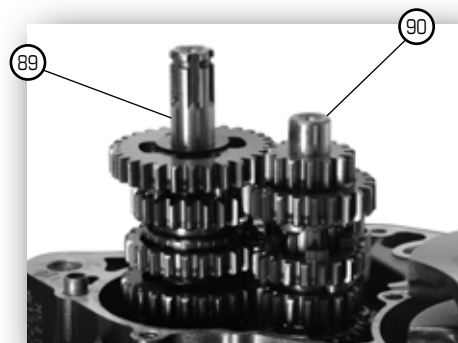
4 - ENGINE

49. Remove:

- The secondary shaft (89).
- The primary shaft (90).



TOTAL LENGTH OF SECONDARY
SHAFT
92'2 mm (+010 - 0,18 mm).



4 - ENGINE

4.4 - INSPECTING THE ENGINE ELEMENTS

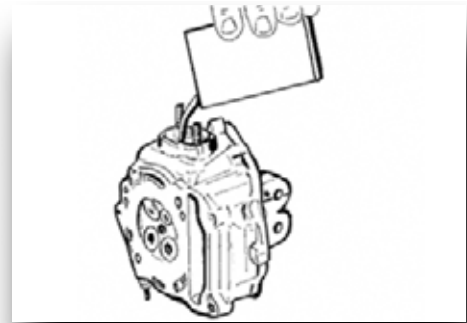
CYLINDER HEAD

CHECKING FOR TIGHT VALVE SEATING

- Test both the inlet and the exhaust valves.
- The test should be carried out by filling the manifold with petrol and checking that petrol does not ooze excessively past the valves.

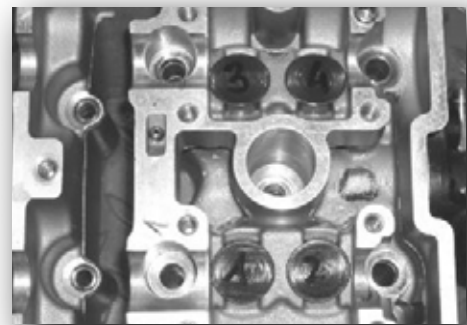
Tight valve seating => Refit cylinder head.

Leaking valve seating => Dismantle and grind the valves.



STEPS TO FOLLOW TO DISMANTLE THE VALVES

- Position the cylinder head on a supporting surface.
- Number the valves and the shims to ensure they are refitted in the correct positions.



- Extract the shims from the valves.

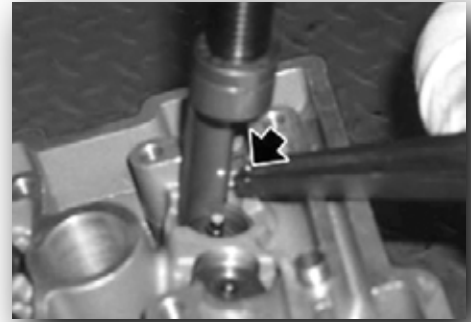


- Use a suitable tool to compress the valve springs.



4 - ENGINE

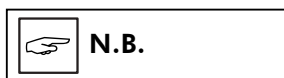
- From each of the valves:
 - Extract the 2 semi-cones.
 - Release the springs.



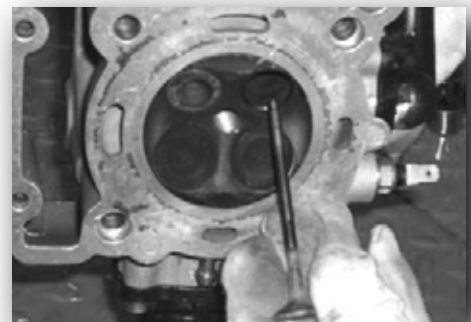
- Remove the plates and the springs.



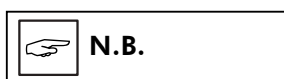
- Extract the valves.



MAKE A NOTE OF THE POSITION OF THE VALVES FOR THEIR SUBSEQUENT REFITTING.



- Extract the valve guide oil seals with the aid of pliers.



TO REFIT THE VALVES, CARRY OUT THE PROCESS IN REVERSE ORDER.



FIT NEW VALVE GUIDE RETAINERS WHEN REFITTING.



4 - ENGINE

VALVE GRINDING

1. Eliminate:

- Carbon sediments (of the surface of the valve seat).

2. Inspeccione:

- Valve seats.

Grooves/wear => Grind the valve.

- Apply blue mechanical dye (Prussian blue) to the valve face.

- Fit the valve into the cylinder head.

- Press the valve against the guide and against the seat to make a visible mark.

- Measure the width of the valve seat.

Where there is contact between the seat and the valve face, the dye will indicate this.

- If the valve seat width is large or small, or if the seat is not centred, it has to be redone

WIDTH OF VALVE SEATS (B)

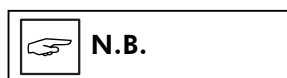
Inlet: 2,33 - 2,63 mm

Exhaust: 2,82 - 3,12 mm

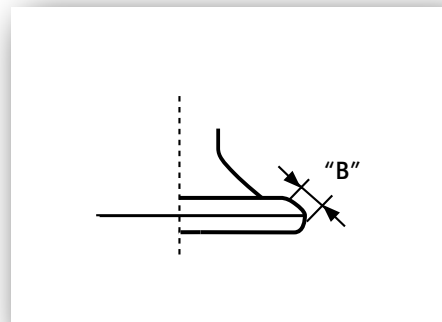
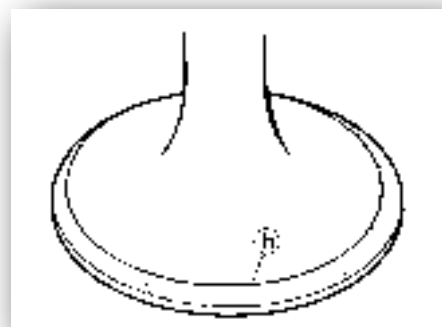
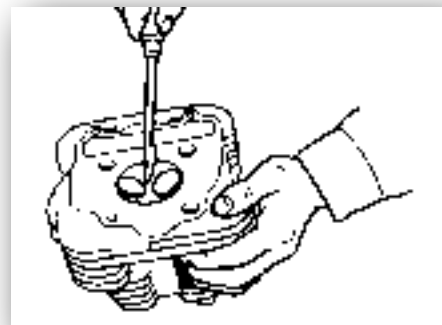
Outside that specified => Grind the valve.

3. Grind:

- Valve face.
- Valve seat (Cylinder head)



AFTER RECTIFYING THE VALVE SEAT OR REPLACING THE VALVE AND ITS GUIDE, THE SEAT AND FACE MUST BE GROUND.



4 - ENGINE

Steps for seating valves:

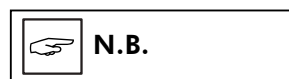
- Apply a fine abrasive paste (grinding paste) to the valve seat.



CAUTION

DO NOT ALLOW THE PASTE TO PENETRATE IN THE SPACE BETWEEN THE VALVE STEM AND THE VALVE GUIDE.

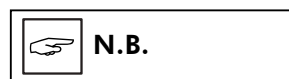
- Apply acid with molybdenum disulphate to the valve stem.
- Fit the valve into the cylinder head.
- Rotate the valve until its face and its seat are uniformly ground, then remove all the paste immediately.



N.B.

TO OBTAIN THE BEST RESULTS FROM GRINDING THE VALVES, ROTATE THE VALVE GENTLY IN THE VALVE SEAT WHILE ROTATING IT BACKWARDS AND FORWARDS WITH THE HANDS.

- Apply a coarse abrasive paste to the valve face and repeat the above steps.



N.B.

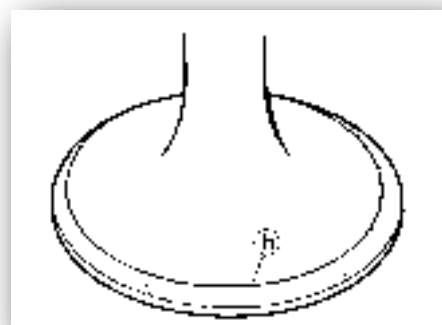
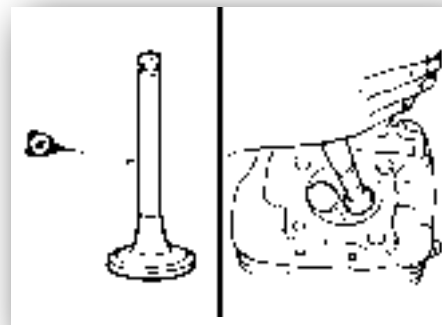
ENSURE THAT THE ABRASIVE PASTE IS COMPLETELY CLEANED FROM THE VALVE FACE AND SEAT AFTER EACH VALVE GRINDING OPERATION.

- Re-apply blue mechanical dye (Prussian blue) to the valve seat (b).
- Fit the valve into the cylinder head.
- Press the valve through the valve guide and against its seat to obtain a good contact.
- Measure the width of the valve seating (c) once again.

Grinding correct => Refit valves.

- Check tightness of valve seating.

Tight valve seating => Refit cylinder head.



4 - ENGINE



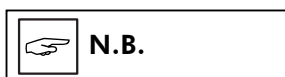
CAUTION

IF THE VALVES HAVE BEEN GROUND, WHEN THE CYLINDER HEAD IS REFITTED ONTO THE ENGINE, ADJUST THE VALVE SETTINGS.

CULATA

1. Eliminate:

- Carbon sediments (from the combustion chamber)
- Use a rounded spatula.



N.B.

AVOID USING ANY SHARP EDGED INSTRUMENT THAT CAN CAUSE DAMAGE AND SCRATCHING.

- IN THE SPARK PLUG THREADS
- ON THE VALVE SEATS.



2. Inspect:

- Cylinder head

Wear/damage => **Renew.**

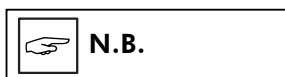
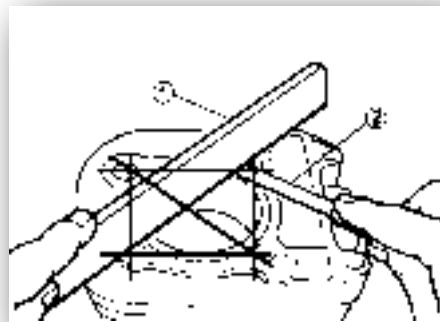
Steps for measuring distortion and for rectification:

Place a ruler (1) and a thickness calliper (2) on the head cylinder surface, as in the figure to the side.

CYLINDER HEAD WARP: 0.05 MM.

Incorrect warp => **Rectificate.**

- Lay a 400 – 600 file on a flat (and skimmed) surface and skim the cylinder head surface by filing with a figure eight movement.



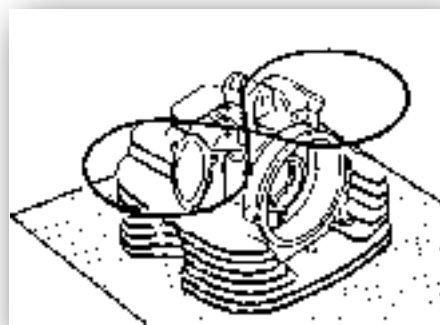
N.B.

TURN THE CYLINDER HEAD SEVERAL TIMES TO PREVENT TOO MUCH MATERIAL BEING TAKEN FROM A SINGLE SIDE.



CAUTION

SKIMMING AND PLANING A CYLINDER HEAD REQUIRES EXPERT HANDS. IF YOU DO NOT CONSIDER YOURSELF AN EXPERT, IT IS RECOMMENDED TO LEAVE THE TASK TO A HEAD-SKIMMING WORKSHOP.



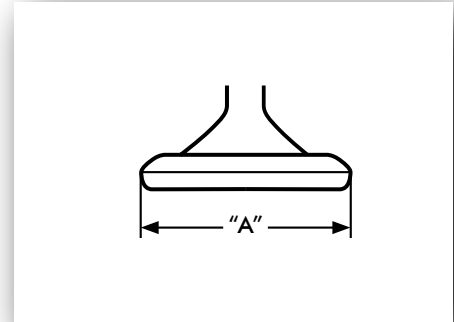
4 - ENGINE

VALVES, VALVE GUIDES AND VALVE SPRINGS

Standard values

VALVE DIAMETERS (A)

Inlet: 21,90 - 22,05 mm
 Exhaust : 18,70 - 18,85 mm



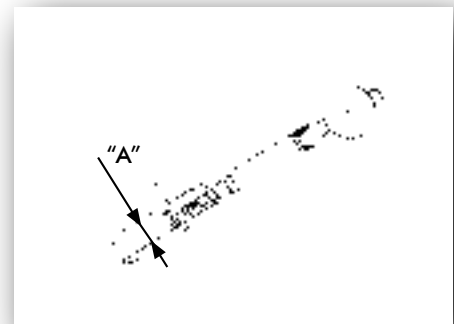
VALVE STEM DIAMETER

Inlet: 3,97 - 3,98mm
 Exhaust: 3,96 - 3,97mm



VALVE GUIDE INTERNAL DIAMETER (A)

Inlet: 3,97 - 3,98 mm
 Exhaust: 3,97 - 3,98 mm



VALVE GUIDE-STEM SERVICE LIMIT CLEARANCE

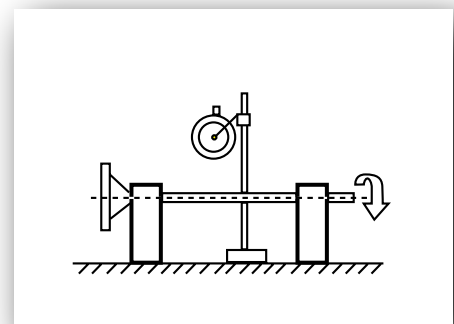
Inlet: 0,015 - 0,042 mm
 Exhaust: 0,015 - 0,042 mm

Outside that specified => **Renew.**

VALVE WARP

Inlet: 0,01 mm
 Exhaust: 0,01 mm

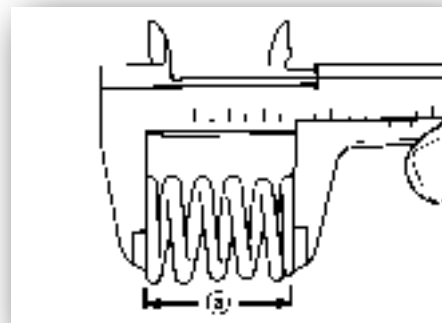
Outside that specified => **Renew.**



4 - ENGINE

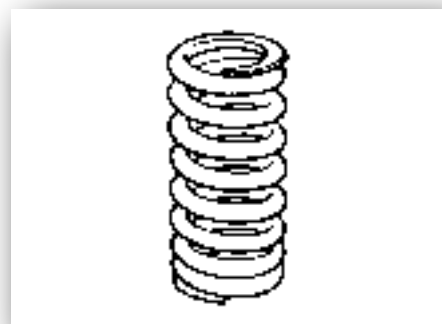
VALVE SPRINGS (a)

Inlet, free length: 33,24 mm
 Exhaust, free length: 33,24 mm
 Inlet, working length (valve closed): 26 mm
 Exhaust, working length (valve closed): 26 mm
 Inlet, work load: 101,87-116,13 N (10,19-11,61 Kgf)
 Exhaust, work load: 101,87-116,13 N (10,19-11,61 Kgf)



- Spring contact face.

Wear/damage/scratches => **Renew.**



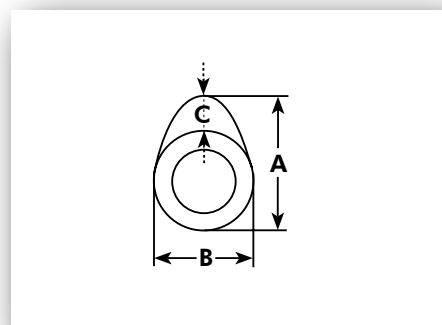
INSPECTING THE CAMSHAFT

1. Check:

- Geometry of the cams (standard values).

CAM SIZE

Inlet "A": 31,44-31,54 mm
 Inlet "B": 23,95-24,05 mm
 Inlet (lifted) "C": 7,49 mm
 Exhaust "A": 30,81-30,91 mm
 Exhaust "B": 23,95-24,05 mm
 Exhaust (lifted) "C": 6,86 mm



Grooves/scratches/blue colouring => **Renew.**

2. Inspect:

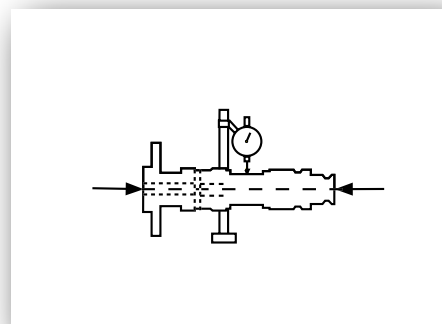
MAXIMUM CAMSHAFT WARP

Inlet: 0,008 mm
 Exhaust: 0,008 mm

MAXIMUM CAMSHAFT AXIAL PLAY

Inlet: 0,4 mm
 Exhaust: 0,4 mm

Outside that specified => **Renew.**



4 - ENGINE

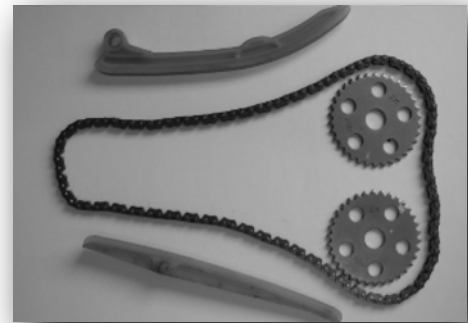
TIMING CHAIN, SPROCKETS AND ROLLERS

Check the condition of the chain, control sprockets and rollers.



N.B.

THE CONDITION OF THE TIMING CHAIN TENSIONER CAN HELP TO INDICATE WHETHER THE CHAIN IS OUT OF SERVICE.



1. Inspect:

- Timing chain.

Stiff/damaged => Renew chain.



2. Inspect:

- Control sprockets.

Damage/wear => Replace the sprockets and the timing chain.

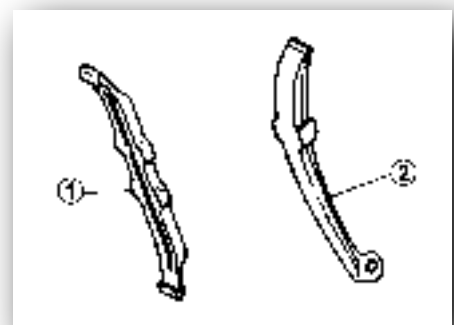
- (1) 1/4 of the tooth
- (2) Correct
- (3) Roller
- (4) Sprocket



3. Inspect:

- Timing chain rollers (exhaust) (1).
- Timing chain rollers (inlet) (2).

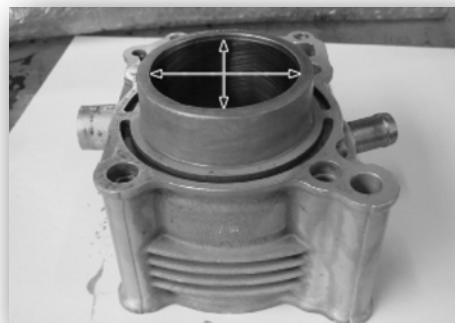
Damage/wear => **Renew.**



4 - ENGINE

DIÁMETRO CILINDRO (standard values)

CAT M:	58,010-58,017mm
CAT N:	58,017-58,024 mm
CAT O:	58,024-58,031mm
CAT P:	58,031-58,038 mm



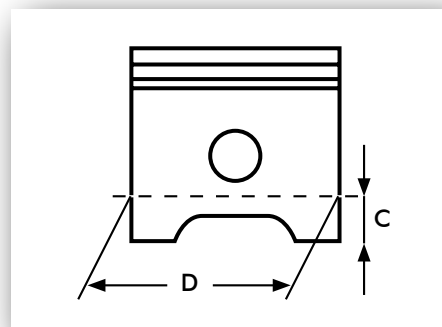
CYLINDER BASE WARP: 0.05 MM

Incorrect warp => **Renew.**

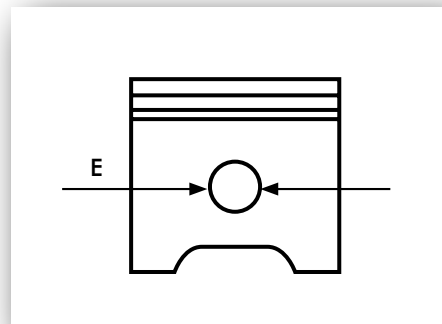
PISTON DIAMETER (D)

CAT M:	57,953-57,960 mm
CAT N:	57,960-57,967 mm
CAT O:	57,967-57,974 mm
CAT P:	57,974-57,981 mm

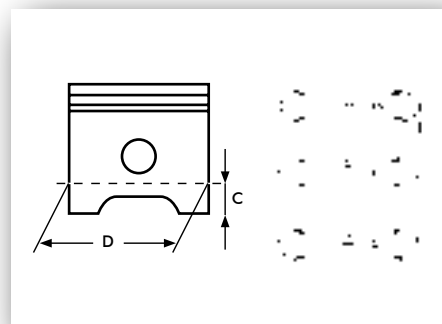
EXT. DIAMETER MEASUREMENT POINT PISTON (C):
7,5 mm



DIAMETER OF PISTON GUDGEON PIN ORIFICE (E):
15,003-15,008 mm



CYLINDER-PISTON ASSEMBLY PLAY: 0,050-0,064 mm
(standard value)



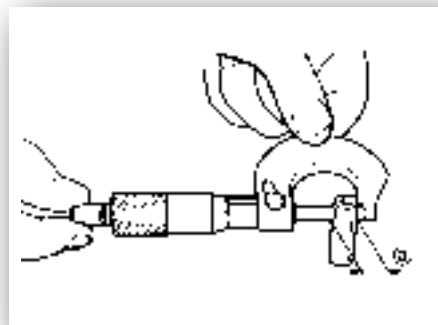
4 - ENGINE

DIAMETER OF PISTON GUDGEON PIN (a)

Standard
Service limit

14,997-15,00 mm
14,995 mm

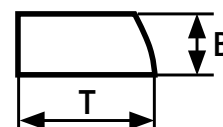
Outside that specified => **Renew.**



PISTON RING TYPE

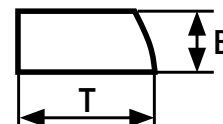
1st compression ring
Type
Dimension (BxT)

Cónico
1 x 2,5 mm



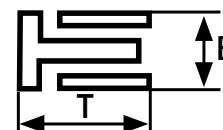
2nd compression ring
Type
Dimension (BxT)

Cónico
1,2 x 2,5 mm



3rd oil scraper ring
Dimension (BxT)

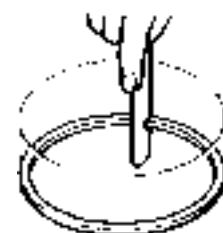
2 x 2,5 mm



PISTON RING GAP (standard values)

1st compression ring
2nd compression ring
3rd oil scraper ring

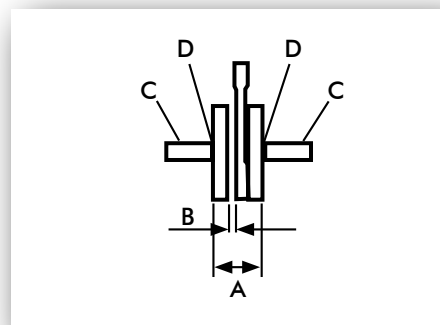
0,2-0,35 mm
0,2-0,35 mm
0,2-0,7 mm



4 - ENGINE

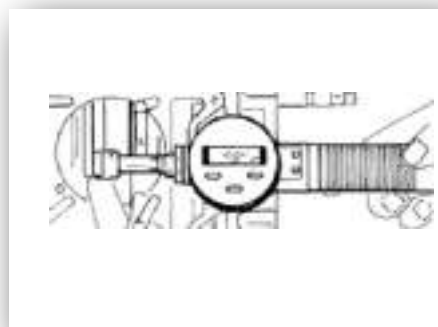
CRANKSHAFT (standard values)

Crankshaft thickness (A)	46,87-47,05 mm
Diameter of crankshaft supports	
CLASS 1	32,480-32,485 mm
CLASS 2	32,485-32,490 mm
Crankshaft warp between points (C)	0,1 mm
Crankshaft warp at the supports (D)	0,01 mm
Axial play of crankshaft in the crankcase	0,15 - 0,43 mm



CONNECTING ROD

Connecting rod side play (B)	0,39-0,83 mm
Diameter of the connecting rod	
Standard	15,010 - 15,018 mm
Limit	15,023 mm



CLUTCH (standard values)

Thickness of driving disks	2,85 - 2,95 mm
Number of driving disks	5

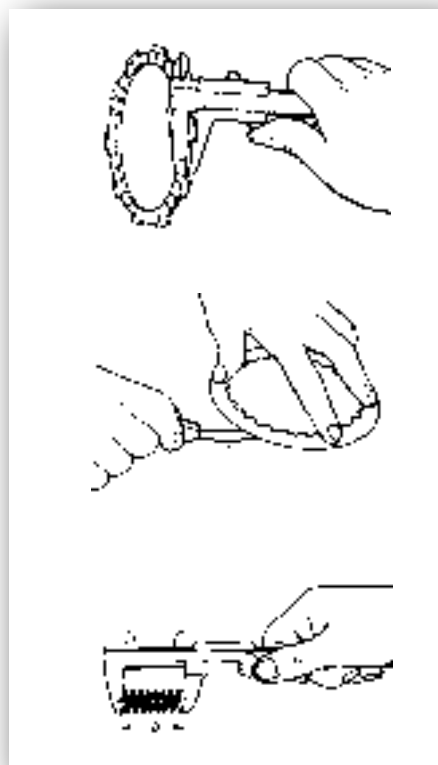
Damage => **Renew.**

Thickness of driven disks	1,46 - 1,53 mm
Number of driven disks	4
Driven disk flatness service limit	> a 0,05 mm

Damage => **Renew.**

Free length of clutch springs	31,6 mm
Number of springs	5

Damage => **Renew.**



4 - ENGINE

INSPECTING THE CLUTCH BELL HOUSING

1. Inspect:

- Primary sprocket teeth (1).
- Clutch housing splines (2).

Wear/damage => **Renew both sprockets.**

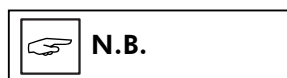
Excessive noise when functioning => **Renew both sprockets.**

- Claws (of the bell housing) (1).

Rough edges/wear/damage => **Eliminate the rough edges or renew the bell housing.**

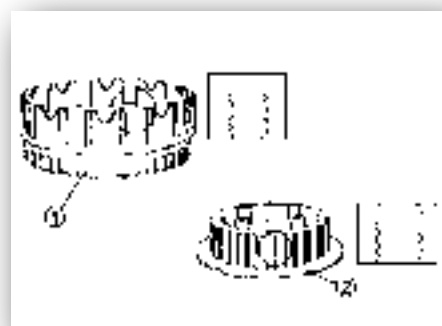
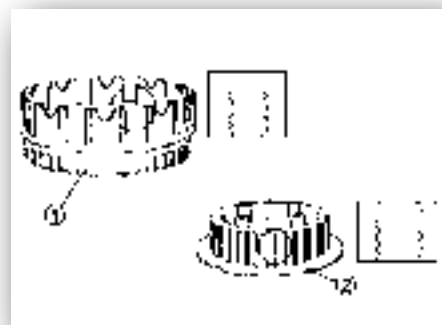
- Clutch housing spline grooves (2).

Edgings/wear/damage => Replace the clutch housing.



N.B.

EDGINGS ON THE BELL HOUSING CLAWS AND CLUTCH HOUSING SPLINE GROOVES RESULT IN IRREGULAR OPERATION.



INSPECTION OF THE FORKS AND GEAR SELECTOR

1. Inspect:

- Fork follower (1).
- Ends of the gear change forks (2).

Scoring/warping/wear/damage => **Renew.**

2. Inspect:

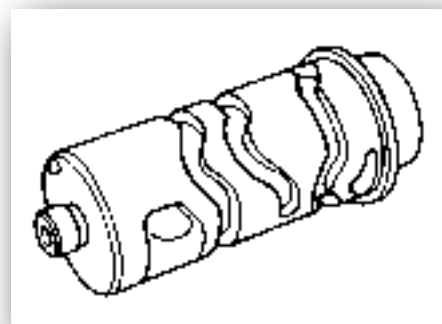
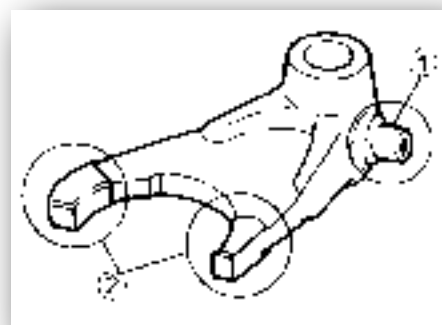
Wear/damage/scratches => **Renew.**

- Gear change selector follower.

Wear/damage => **Renew.**

3. Inspect:

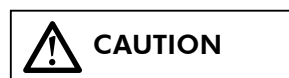
- Gear change fork 1 centre right.
- Gear change fork 2 top left.
- Gear change fork 3 bottom left.
- Guide bar.
- Gear change selector.
- Guide pin.



4 - ENGINE

Roll the guide bar on a flat surface.

Warping => **Renew.**



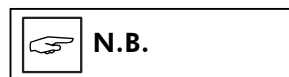
CAUTION

DO NOT TRY AND STRAIGHTEN A WARPED BAR.

4. Check:

- Movement of the gear change forks (in the guide bar)

Uneven movement => **Renew the fork and the bar.**



N.B.

IF THE GEAR CHANGE FORK AND THE DRIVE SPROCKETS ARE DAMAGED, RENEW THE SPROCKETS TO EITHER SIDE ALL TOGETHER.



5. Inspect:

- Gear teeth.

Blue colouring/grooves/wear => **Renew.**

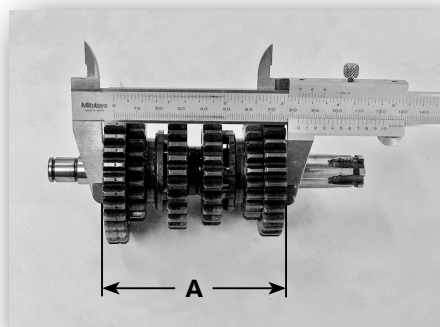
- Gear claws

Rounded edges/cracks/pieces missing => **Renew.**

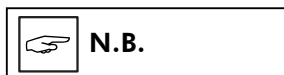


6. Check:

- Length of the secondary shaft pack (A):
92'2mm (+010 - 0,18mm).



4 - ENGINE



N.B.

GEAR TRANSMISSION RATIO

- 1st TR = 73/24
- 1st = 33/11
- 2nd = 30/15
- 3rd = 27/18
- 4th = 24/20
- 5th = 27/25
- 6th = 22/23



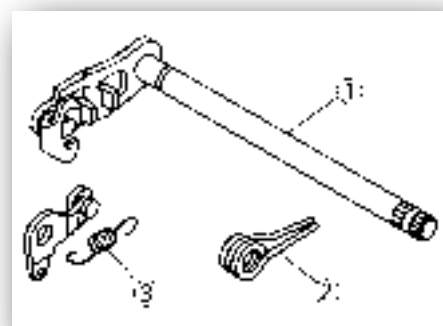
7. Inspect:

- Gear change shaft (1).

Damage/warping/wear => **Renew.**

- Return spring (gear change shaft) (2).
- Return spring (limiter rod) (3).

Wear/damage => **Renew.**



INSPECTING THE OIL PUMP

Oil pressure (manometer connected to sensor):
4.2 Bars

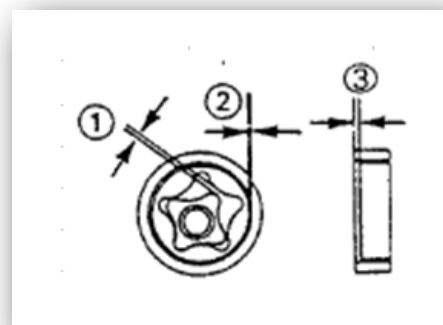
Pump with 2 rotors:

- Oil suction rotor
Thickness: 13,5 mm
- Oil pumping rotor
Thickness: 8,5 mm

(standard values)

- Radial clearance (1) between rotor points: 0.04 mm
- Radial clearance (2) between rotor points: 0.08 mm
- Axial clearance (3) between Rotor 1 and pump body: 0.04 mm
- Axial clearance (3) between Rotor 2 and pump body: 0.05 mm

Cracking/damage => **Renew.**



4 - ENGINE

INSPECTING THE OIL PASSAGES (RIGHT HAND SIDE CASING COVER)

1. Inspect:

- Oil passage

Obstructions => **Blow through with compressed air.**

CASING

1. Wash the casings well with petrol.

2. Clean the seal-bearing surfaces and the casing contact surfaces well.

3. Inspect:

- Casings

Cracks/damage => **Renew.**

- Oil passages

Obstructions => **Blow through the passages with compressed air.**

BEARINGS AND RETAINING RINGS

1. Inspect:

- Bearings

Clean and lubricate, then turn the inner ring by hand.

Roughness => **Renew**

2. Inspect:

- Retaining rings.

Damage/wear => **Renew.**

LOCKING RINGS AND WASHERS

1. Inspect:

- Circlips
- Washers

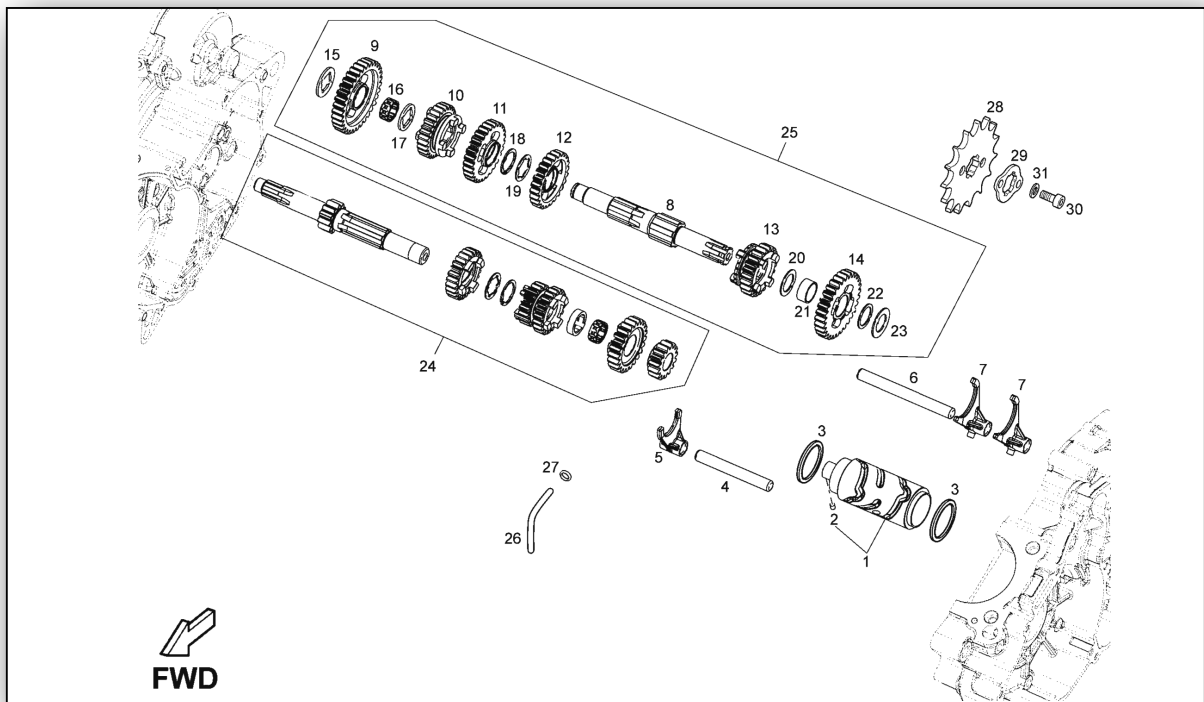
Damage/loose/distorted => **Renew.**

Daños/sueltos/deformados => **Reemplace.**

4 - ENGINE

4.5 - ASSEMBLING THE ENGINE

DRIVE SHAFT SPARE PARTS



1	Distributor drum
2	Roller
3	Washer
4	Primary fork shaft
5	Cat. 1 gear change fork.
6	Secondary fork shaft
7	Cat. 2 gear change fork
8	Secondary shaft
9	1st secondary gear 1°
10	5th secondary gear 5 ^a
11	3rd secondary gear 3 ^a
12	4th secondary gear 4 ^a
13	6th secondary gear 6 ^a
14	2nd secondary gear 2 ^a
15	Adjustment washer
16	Needle bearing assy.
17	Adjustment washer
18	Safety ring
19	Adjustment washer
20	Washer
21	Bush
22	Washer
23	Primary shaft assy.
24	Secondary shaft assembly

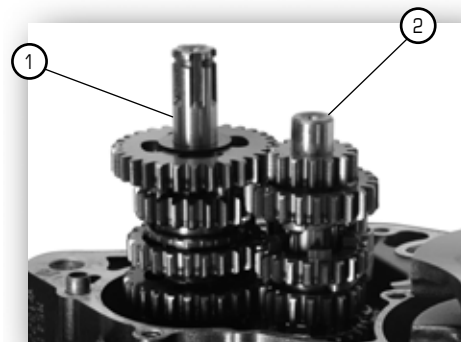
26	Gear change greasing tube
27	O-ring
28	Z14 gear change output gear
29	Output gear seal
30	5M80x10 Allen bolt
31	Int. star washer

4 - ENGINE

ASSEMBLING THE ENGINE

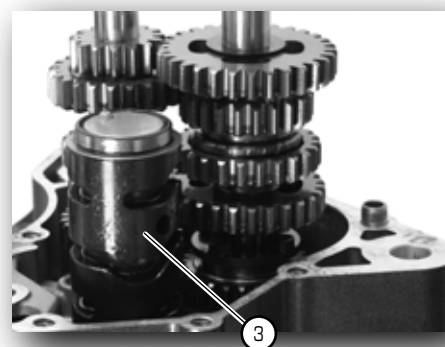
1. Fit:

- The secondary shaft (1).
- The primary shaft (2).



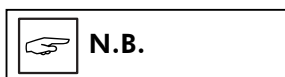
2. Fit:

- The gear selector drum (3).

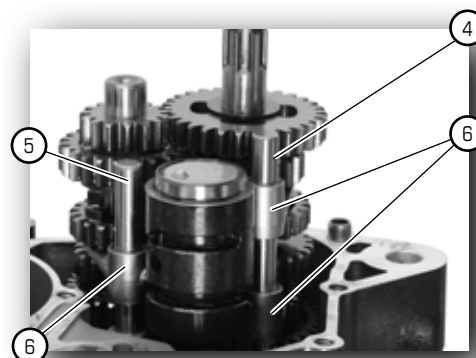


3. Fit:

- The 2 gear selector fork shafts.
Long shaft (4).
Short shaft (5).
- The 3 gear selector forks (6).

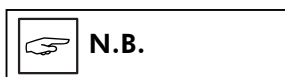


APPLY ENGINE OIL TO THE GEARBOX PARTS AS A WHOLE BEFORE CLOSING THE SEMI-CRANKCASES.



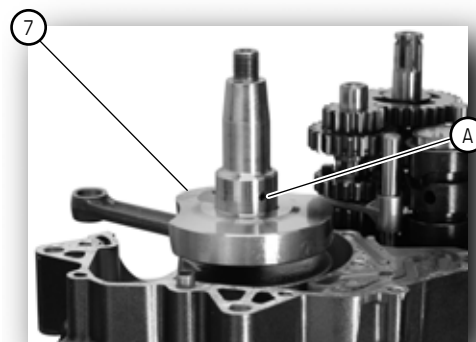
4. Fit:

- Crankshaft (7).



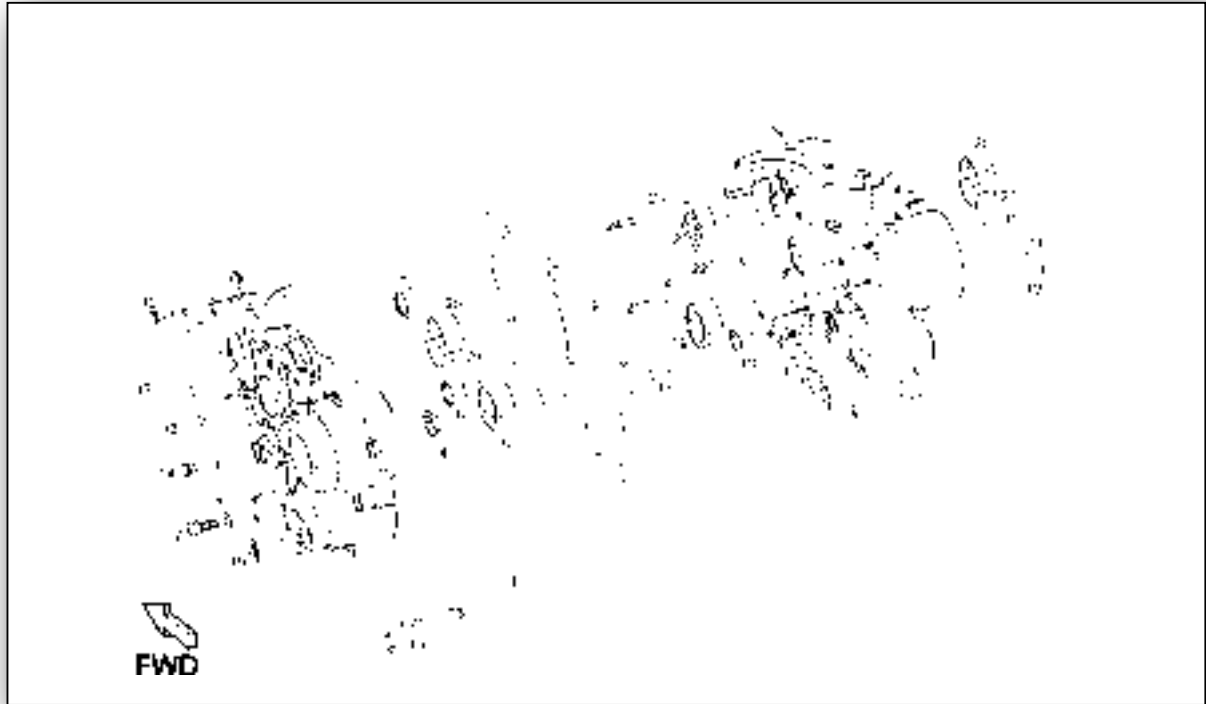
TO AVOID SCRATCHING THE CRANKSHAFT AND TO AID FITTING, APPLY GREASE TO THE EDGES OF THE OIL SEAL, AND ENGINE OIL TO THE BEARINGS.

APPLY ENGINE OIL TO THE CRANKSHAFT THROUGH THE GREASING ORIFICE (A).



4 - ENGINE

CRANKSHAFT PARTS



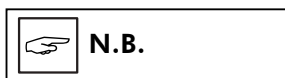
1	Crankcases assy.
2	Counterweight bearing
3	Crankcase gasket
4	Crankshaft oil seal
5	Secondary shaft bearing
6	Primary shaft needle bearing assy.
7	Neutral switch
8	Gasket
9	Counterweight shaft needle bearing assy.
10	Bolt
11	Key
12	M6x75 hex. bolt
13	Key
14	m6x60 bolt
15	Clamp
16	Selector lever shaft oil seal
17	Centring stud
18	Secondary shaft needle bearing assy.
19	Primary shaft bearing
20	5.2x15x1.5 washer
21	M5x14 bolt
22	Centring stud
23	5.2x15x1.5 washer

24	M5x14 bolt
25	Top mounting blue semi-bearing
26	Bottom mounting blue semi-bearing

4 - ENGINE

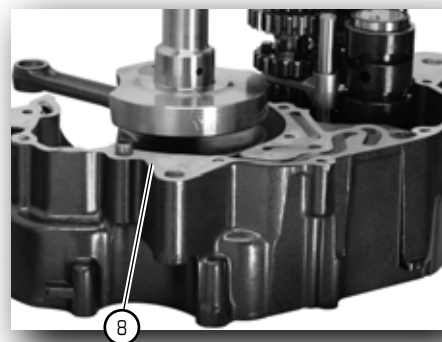
5. Fit:

- The engine crankcase gasket (8) (new gasket).



N.B.

TO AID THE TASK, REST THE ENGINE ON A WOODEN BOX.



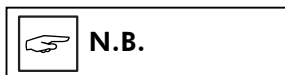
6. Fit:

- The left-hand crankcase (9) onto the right-hand crankcase (10), being guided by the centring studs (11).



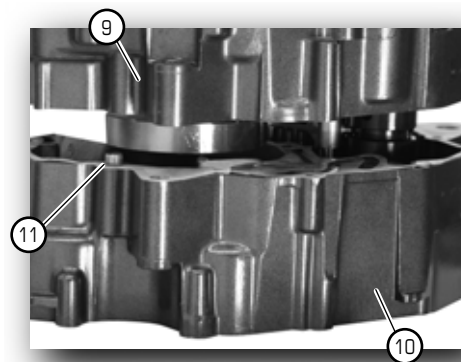
WARNING

MAKE SURE THAT THE GASKET REMAINS IN THE CORRECT POSITION.



N.B.

TAP THE CRANKCASE COVER LIGHTLY WITH A NYLON MALLET.

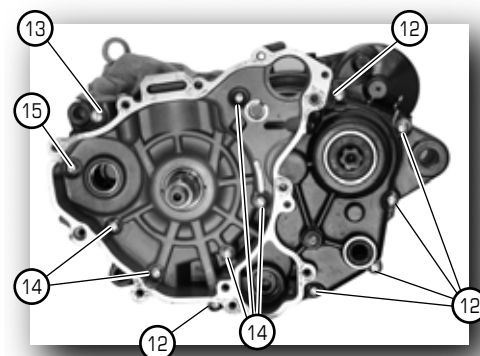


WARNING

TIGHTEN THE CRANKCASE BOLTS IN SUCCESSION CROSSWISE, GOING FROM ONE TO ANOTHER TWO OR THREE TIMES.

7. Fit:

- The 6 outer bolts (12) on the left-hand crankcase.
- The (longer) outer bolt (13) on the left-hand crankcase.
- The 5 inner bolts (14) on the left-hand crankcase.
- The (shorter) inner bolt (15).

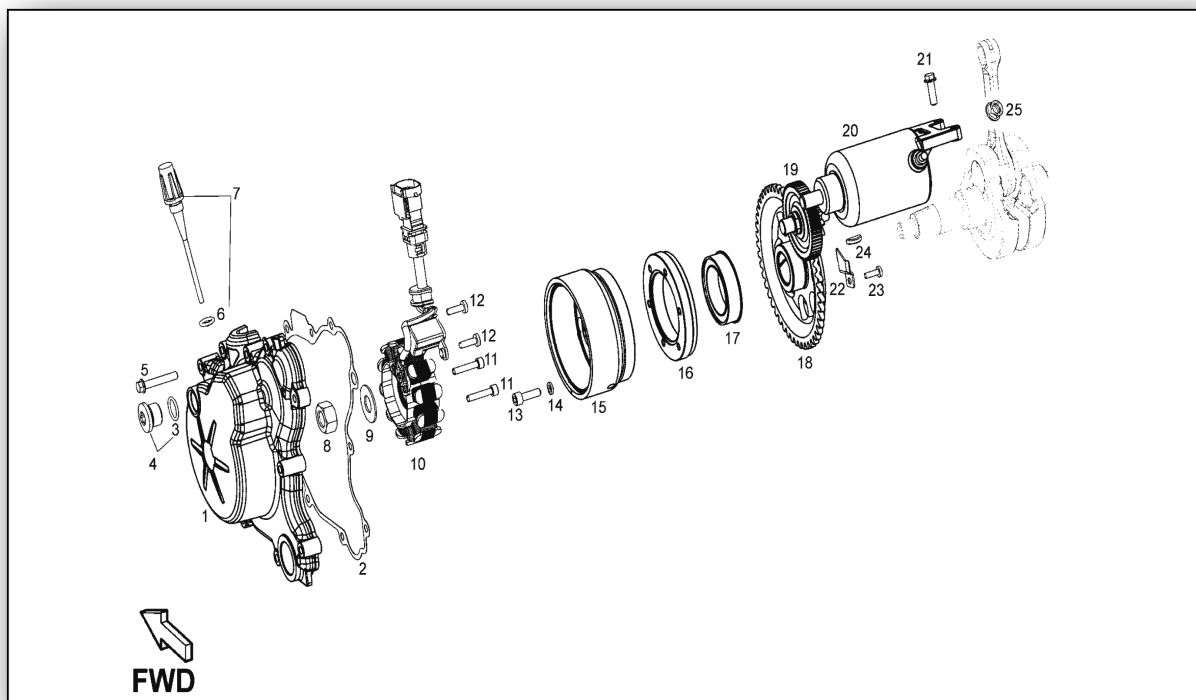


Bolts (crankcases):

1,1-1,3 kgf.m (11-13 N.m)

4 - ENGINE

MAGNETO PARTS



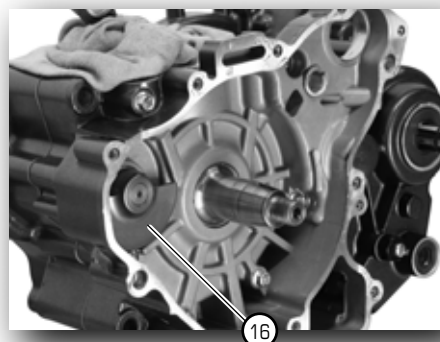
1	Magneto side cover
2	Magneto cover-crankcase gasket
3	O-ring
4	Ignition cover
5	M6x35 bolt
6	O-ring
7	Oil dipstick
8	Nut
9	Flat washer
10	Stator
11	M 5x25 bolt
12	M 5x16 bolt
13	Bolt
14	Washer
15	Rotor
16	Free wheel inner ring
17	Free wheel
18	Electric start crown wheel
19	Starter motor takeoff gear
20	Starter motor
21	M6x25 bolt

22	Starter crown wheel retaining plate
23	M6x14 bolt
24	Key
25	6M100 hexagonal nut with clamp

4 - ENGINE

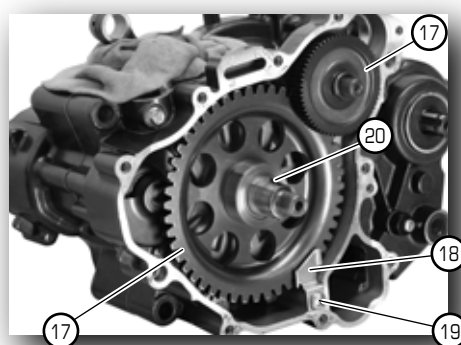
8. Fit:

- The balance shaft (16).



9. Fit:

- The 2 starter system sprockets (17).
- The starter crown wheel retaining plate (18).
- Bolt (19) retaining plate.
- The magneto flywheel key (20).

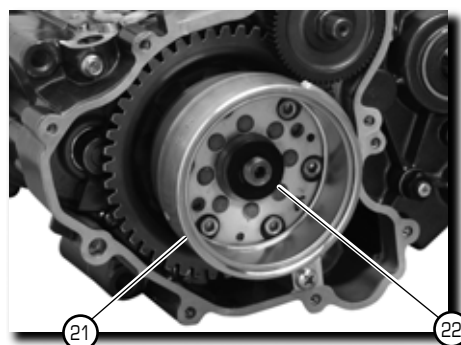


Bolt (18):

0,5-0,6 kgf.m (5-6 N.m)

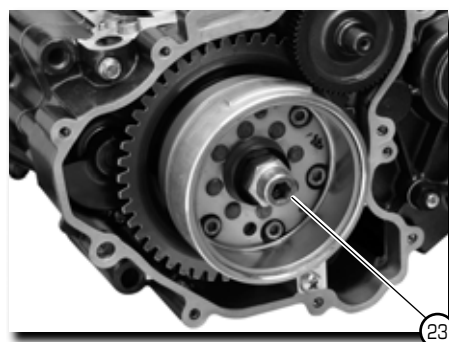
10. Fit:

- The rotor (21)
- The washer (22).



11. Fit:

- The rotor nut (23).



4 - ENGINE

12. Fixing:

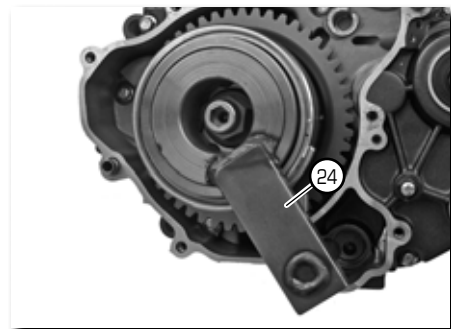
- The rotor onto the magneto flywheel, using the magneto flywheel locking tool (24).

Magneto flywheel locking tool:

Ref. 865259

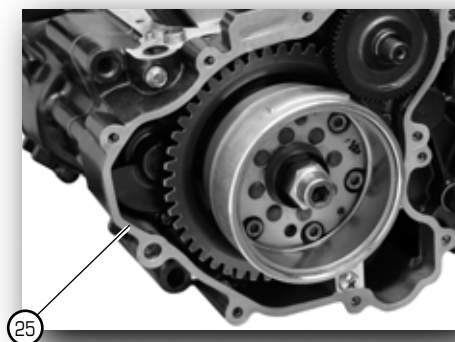
Magneto flywheel rotor nut:

8,3-9,0 kgf.m (83-90 N.m)



13. Fit:

- The cover gasket (25) (new gasket).



14. Fit:

- The magneto flywheel cover (26).
- The 10 bolts (27) on the magneto flywheel cover.

Magneto flywheel bolts:

1,1-1,3 kgf.m (11-13 N.m)

IMPORTANT

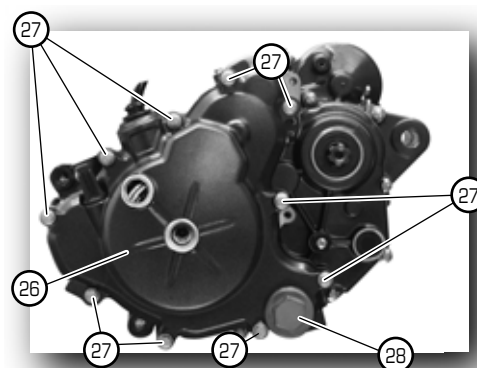
TIGHTEN THE BOLTS ON THE MAGNETO FLYWHEEL COVER IN SUCCESSION CROSSWISE, GOING FROM ONE TO ANOTHER TWO OR THREE TIMES.

15. Fit:

- The engine oil pre-filter.
- The pre-filter plug (28)

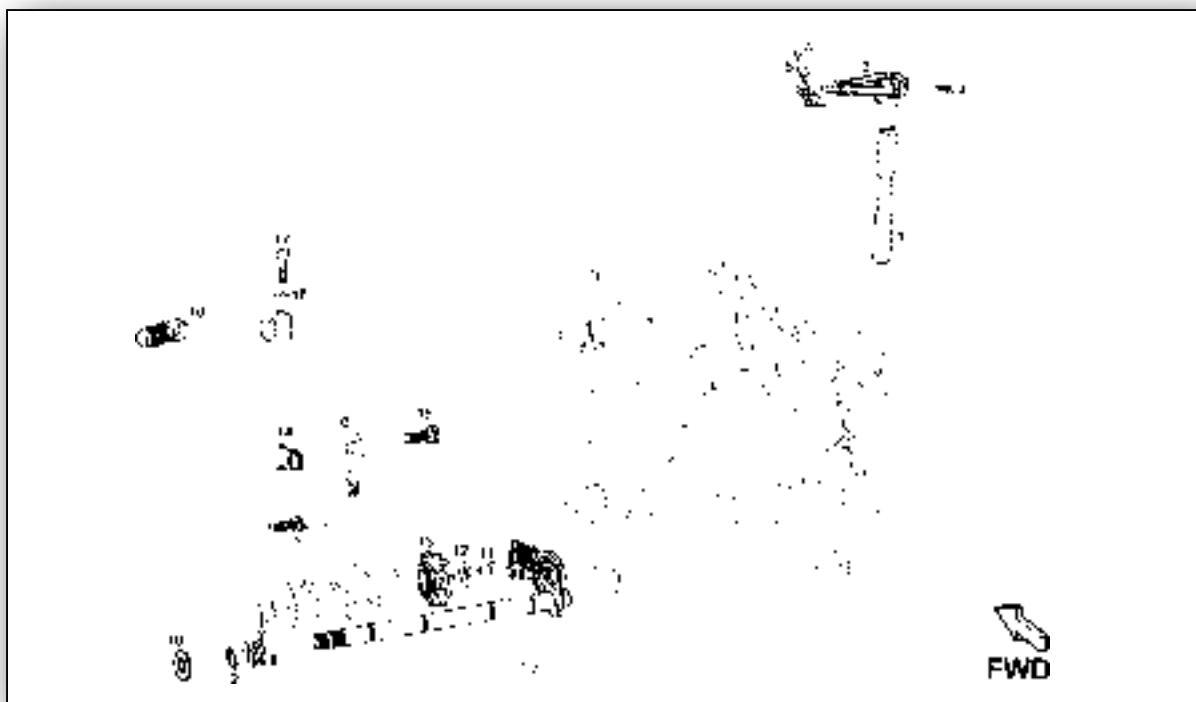
The pre-filter plug:

2,4-3,0 kgf.m (24-30 N.m)



4 - ENGINE

GEAR CHANGE SELECTOR PARTS



1	Clutch push rod
2	Selector spring stud
3	Clutch lever
4	Bolt
5	Clutch cable securing plate
6	Gear selection lever
7	Selector shaft assembly
8	Spring
9	D12 safety ring
10	Washer
11	Bolt
12	Washer
13	Drum control head
14	Gear selection spring
15	Special bolt
16	Gear lever assy.
17	6M100x25 bolt
18	D6 washer

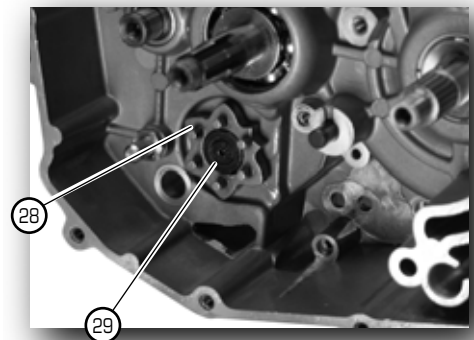
4 - ENGINE

16. Fit:

- Gear change shaft assembly (28).
- The bolt (29) on the gear selector distributor.

Gear selector distributor bolt:

0,5-0,6 kgf.m (5-6 N.m)

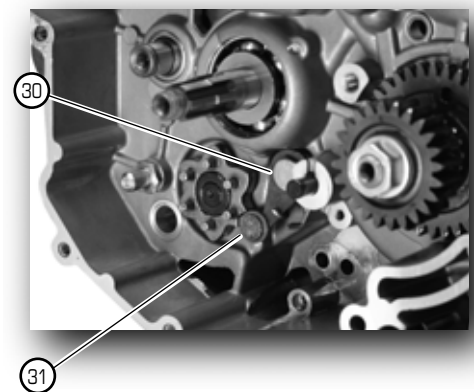


17. Fit:

- The gear selector lever (30) and the spring, using the bolt (31).

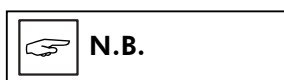
Gear lever bolt:

0,8-1,0 kgf.m (8-10 N.m)



18. Fit:

- The gear change selector shaft (33).

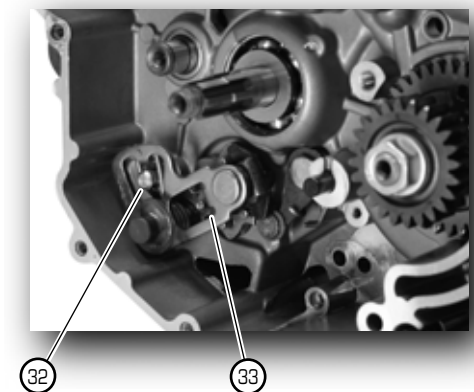


N.B.

APPLY ENGINE OIL TO THE SELECTOR SHAFT BEFORE FITTING IT.

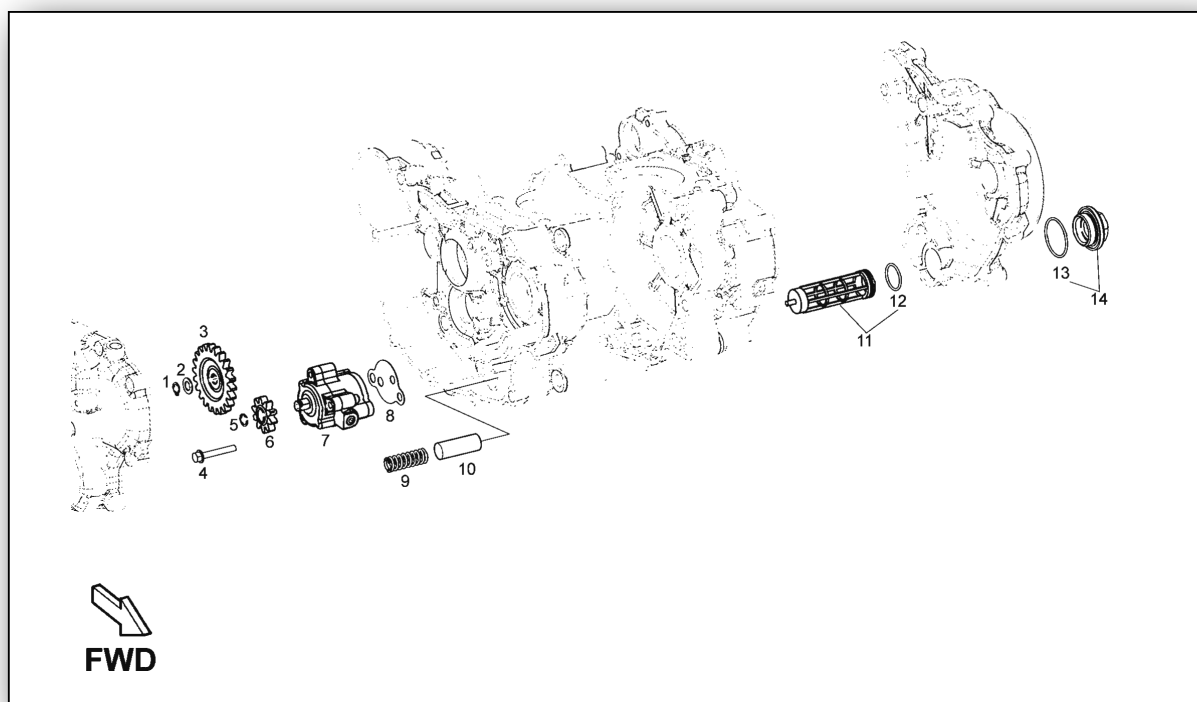
FIT THE GEAR SELECTOR SHAFT, ALIGNING THE ENDS OF THE RETURN SPRING WITH THE POSITIONING BRACKET (32) ON THE CRANKCASE.

FIT THE GEAR SELECTOR SHAFT, ALIGNING THE YOKE (33) WITH THE NIPPLES OF THE GEAR SELECTOR DISTRIBUTOR.



4 - ENGINE

OIL PUMP ASSEMBLY PARTS



1	Rubber ring.
2	Flat washer
3	Intermediate oil pump gear
4	Bolt
5	Circlip
6	Oil pump gear
7	Oil pump gear
8	Crankcase / oil pump gasket
9	Oil pressure valve spring
10	Oil by-pass valve
11	Oil filter
12	Oil filter gasket
13	Plug gasket
14	Oil filter plug

4 - ENGINE

19. Fit:

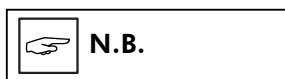
- The oil pump gasket (34) (new gasket).

20. Fit:

- The oil pump (35).
- The 3 oil pump bolts (36).

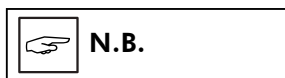
The oil pump bolts:

0,5-0,6 kgf.m (5-6 N.m)



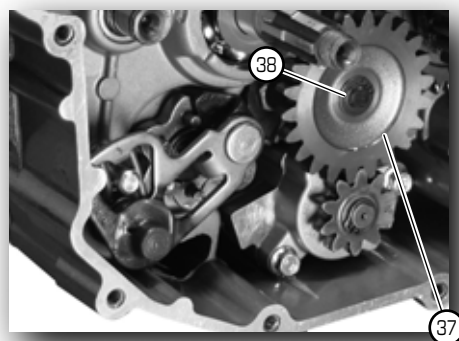
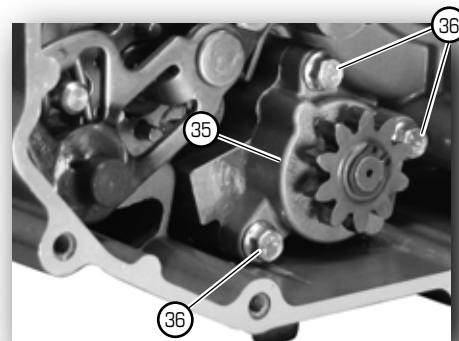
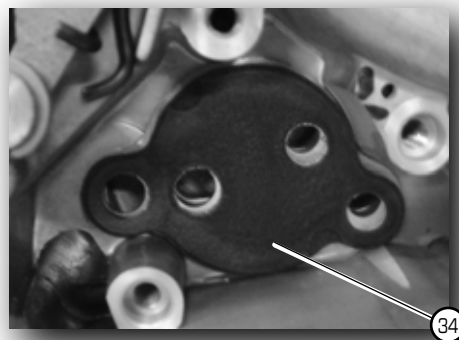
N.B.

ONCE THE PUMP BOLTS HAVE BEEN TIGHTENED TO THEIR TORQUE SETTINGS, CHECK THAT THE PUMP TURNS PROPERLY.



N.B.

THE OIL PUMP IS A DOUBLE ROTOR PUMP, WITH EACH ROTOR PUMPING SEPARATELY.

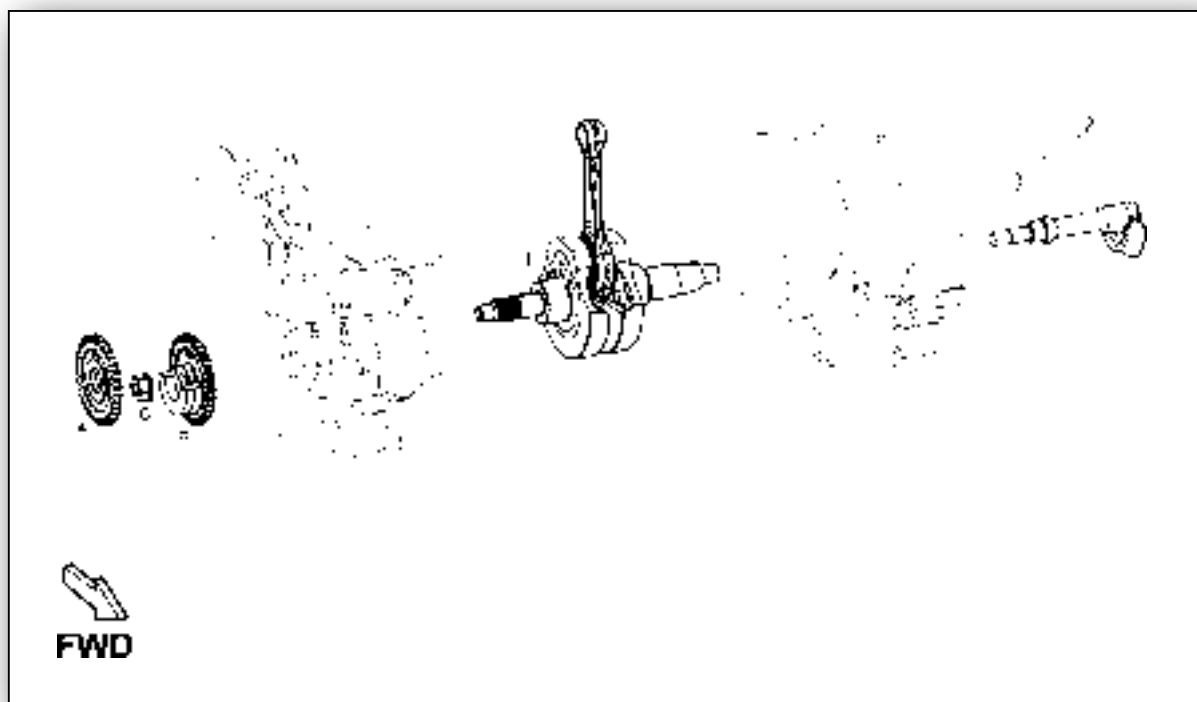


21. Fit:

- The pump driving gear (37).
- The NEW circlip and washer (38) on the pump driving gear (37).

4 - ENGINE

CRANKSHAFT PARTS



1	Crankshaft-connecting rod assy.
2	Counterweight shaft
3	Key
4	Intermediate gear counterweight
5	Counterweight gear
6	Nut

4 - ENGINE

22. Fit:

- The balance shaft gear (39).
- The intermediate balance shaft gear (40).



CAUTION

ALIGN THE CRANKSHAFT AND BALANCER GEARS USING THE GUIDE POINTS.



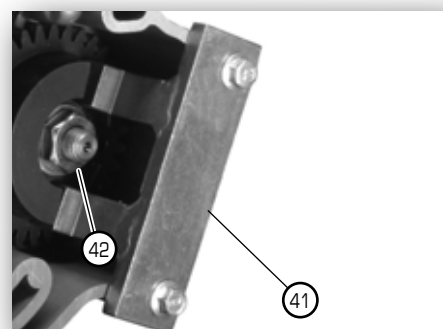
23. Fije:

- The balance shaft locking tool (41).

Balance shaft locking tool:
Ref. 864486

- The balance shaft nut (42).

Balance shaft nut.
3,5-4,5 kgf.m (35-45 N.m)



24. Remove:

- The balance shaft locking tool.



CAUTION

FIT THE TIMING CHAIN SPROCKET WITH THE GUIDE POINT FACING FORWARDS.

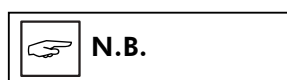
25. Fit:

- The timing chain sprocket (43).



26. Fit:

- The timing chain (44).



N.B.

FIT IT ON THE CENTRAL TEETH.



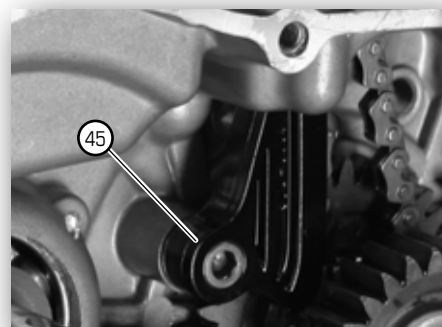
4 - ENGINE

27. Fit:

- The fixed timing cWhain roller (45).

Fixed timing bolt:

1,0-1,2 kgf.m (10-12 N.m)



28. Fit:

- The crankshaft gear (46).
- The fitting tool (47).

Crankshaft sprocket locking tool:

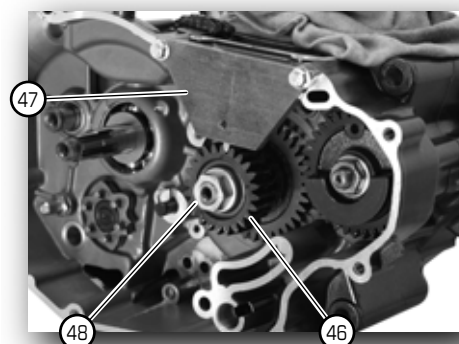
Ref. 864487

29. Fit:

- The crankshaft gear nut (48).

Crankshaft gear nut:

7,5-8,3 kgf.m (75-83 N.m)



30. Remove:

- The fitting tool (47).

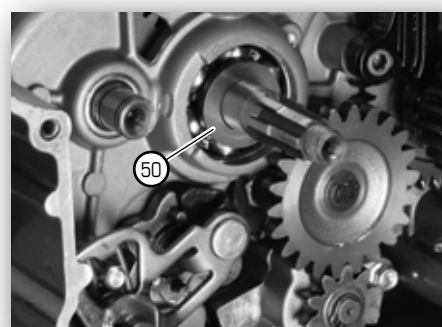
31. Fit:

- The lubrication circuit by-pass valve (49).



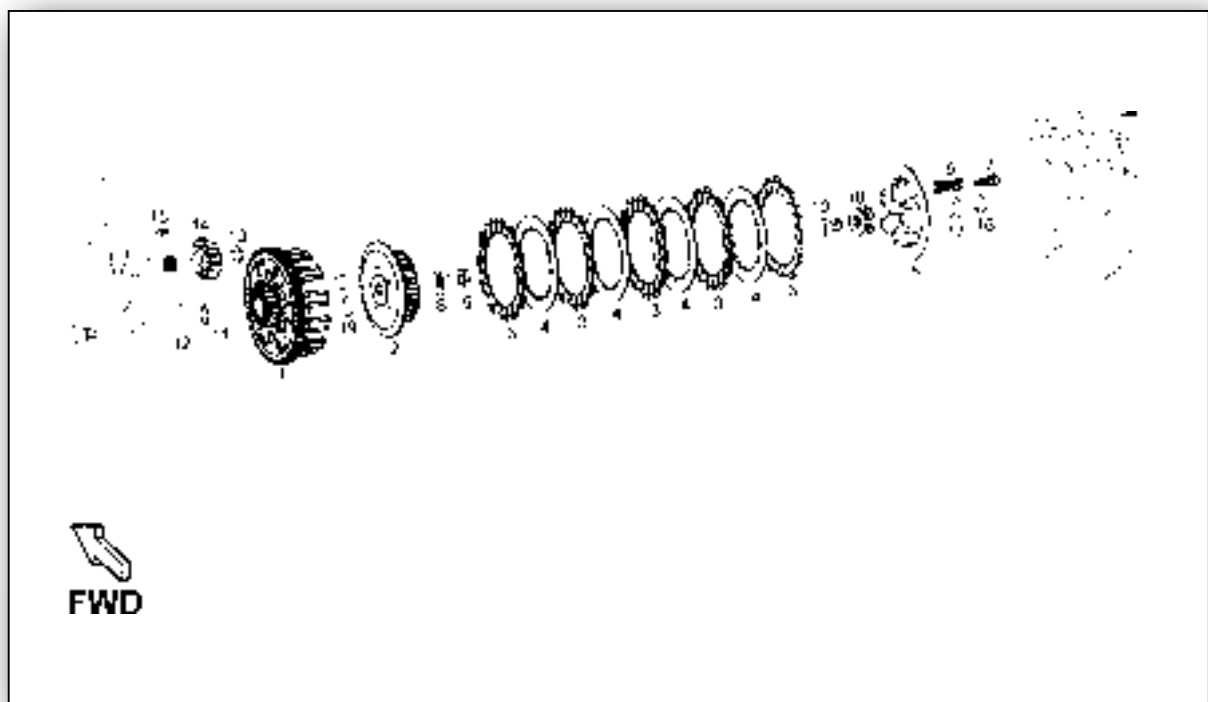
32. Instale:

- The clutch bell housing washer (50).



4 - ENGINE

CLUTCH BELL HOUSING PARTS

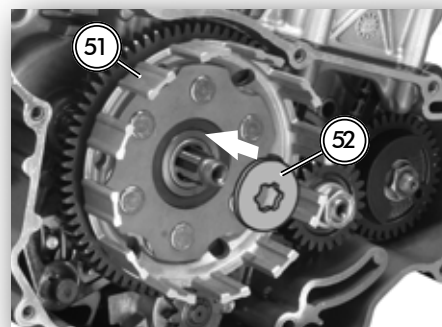


1	Clutch bell housing
2	Clutch casing
3	Driving disk (5u.)
4	Driven disk (4u.)
5	Clutch closing cover
6	Clutch spring
7	Bolt with washer
8	Washer
9	M6 hexagonal nut
10	Clutch bolt
11	Separator
12	Washer
13	Nut with tapered spring
14	Engine gear
15	Key
16	Seeger ring
17	Washer
18	Needle bearing assy.
19	Separator bush

4 - ENGINE

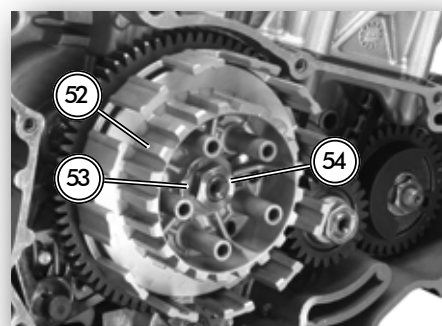
33. Fit:

- The clutch bell housing (51) with the central bush.
- The separating washer (52).



34. Fit:

- The clutch bell housing (52).
- The seal (53).
- The nut (54).
- The tool for fitting the clutch bell housing (55) onto the clutch housing (52).



Bell housing fitting tool:
Ref. 00H05300041

35. Tighten:

- The nut (54) to the indicated torque.

The clutch housing nut:

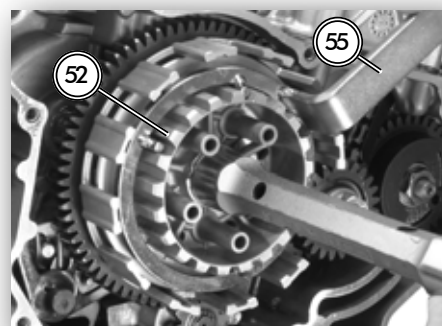
3,5-4,5 kgf.m (35-45 N.m)

36. Closing:

- The seal tab (53).

37. Remove:

- The clutch bell housing fitting tool (55).



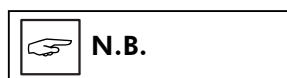
CAUTION

IF THE CLUTCH BELL HOUSING HAS BEEN RE-NEWED, MAKE SURE IT IS OF THE APPROPRIATE SET TYPE (S OR T). SEE (IDENTIFYING SETS) SECTION.

4 - ENGINE

38. Fit:

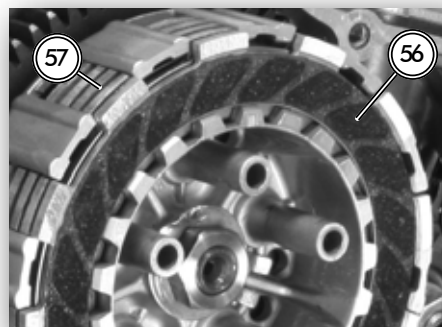
- The driving disks (56) and the driven disks (57).



N.B.

FIT THE DRIVING DISKS (BLADES TO THE RIGHT) AND THE DRIVEN DISKS (ROUNDED PROFILE INWARDS) ALTERNATELY ONTO THE CLUTCH HUB, BEGINNING WITH A DRIVING DISK AND ENDING WITH A DRIVING DISK AS WELL.

LUBRICATE ALL THE DISKS WITH ENGINE OIL BEFORE FITTING.



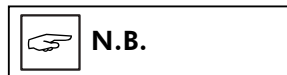
39. Fit:

- The clutch closing cover (58).



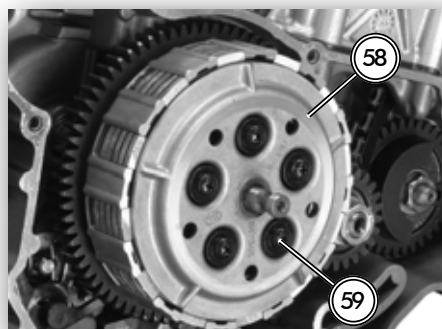
CAUTION

THE CLUTCH CLOSING COVER CAN ONLY BE FITTED IN ONE POSITION.



N.B.

IN THE CORRECT FITTING POSITION, THE PACK OF DISKS IS COMPLETELY COMPRESSED.



40. Fit:

- The 5 clutch closing cover springs.
- The 5 bolts (59) with washers.

41. Tighten:

- The 5 bolts (59).

The clutch closing cover bolts:

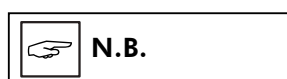
0,35-0,45 kgf.m (3,5-4,5 N.m)

42. Fit:

- The cover gasket (60) (new gasket).
- The clutch cover (61).
- The 10 clutch cover bolts (62).
- The clutch cable support (63).

The clutch cover bolts:

1,1-1,3 kgf.m (11-13 N.m)



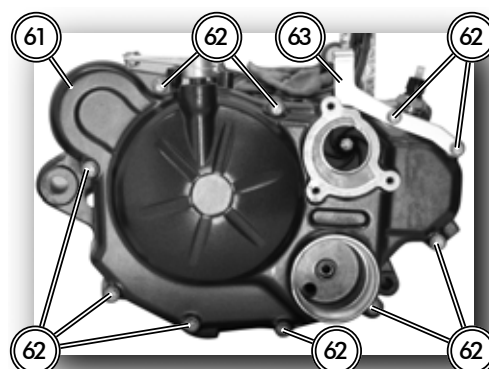
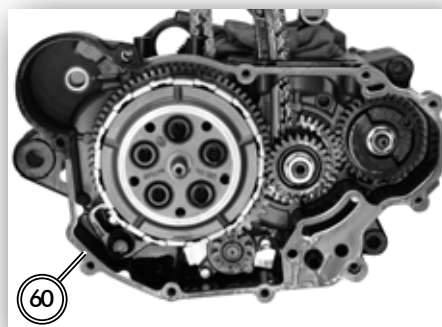
N.B.

TO HELP THE COVER TO FIT, THE WATER PUMP TURBINE SHOULD BE TURNED UNTIL THE 2 GEARS COINCIDE.



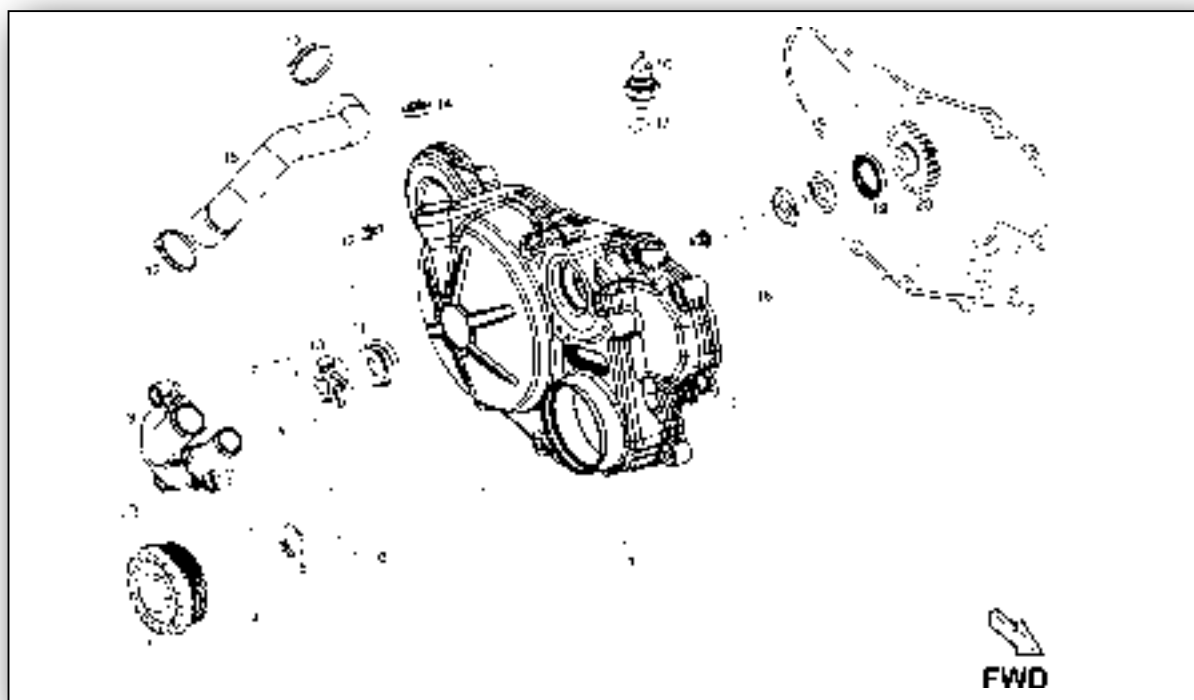
CAUTION

TIGHTEN THE BOLTS ON THE COVER IN SUCCESSION CROSSWISE, GOING FROM ONE TO THE OTHER TWO OR THREE TIMES.



4 - ENGINE

CLUTCH COVER PARTS



1	Clutch cover assy.
2	Clutch cover – crankcase gasket
3	Oil filter cover
4	O-ring
5	Oil filter cartridge spring
6	Oil filter cartridge
7	M5x14 bolt
8	Water pump cover
9	O-ring
10	Complete drive shaft
11	Water pump oil seal
12	Clamp
13	M6x35 bolt
14	Oil seal
15	Pump-cylinder head pipe
16	Oil pressure sensor
17	Washer
18	Water pump shaft assy.
19	20x30x5 oil seal
20	Water pump gear

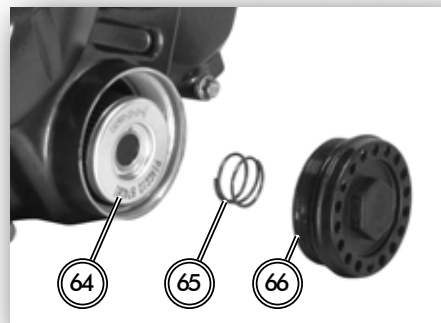
4 - ENGINE

43. Fit:

- The oil filter (64).
- The spring (65).
- The oil filter plug (66).

The oil filter plug:

2,4-2,6 kgf.m (24-26 N.m)



44. Fit:

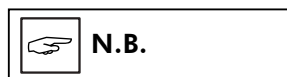
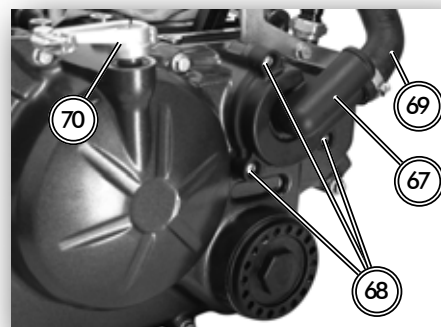
- The water pump cover (67) and the 3 bolts (68).
- The coolant pipe (69).
- The clutch cam (70).

45. Tighten:

- The 3 water pump bolts (68).

The water pump cover:

0,5-0,6 kgf.m (5-6 N.m)



N.B.

FIT A NEW GASKET TO THE PUMP COVER.

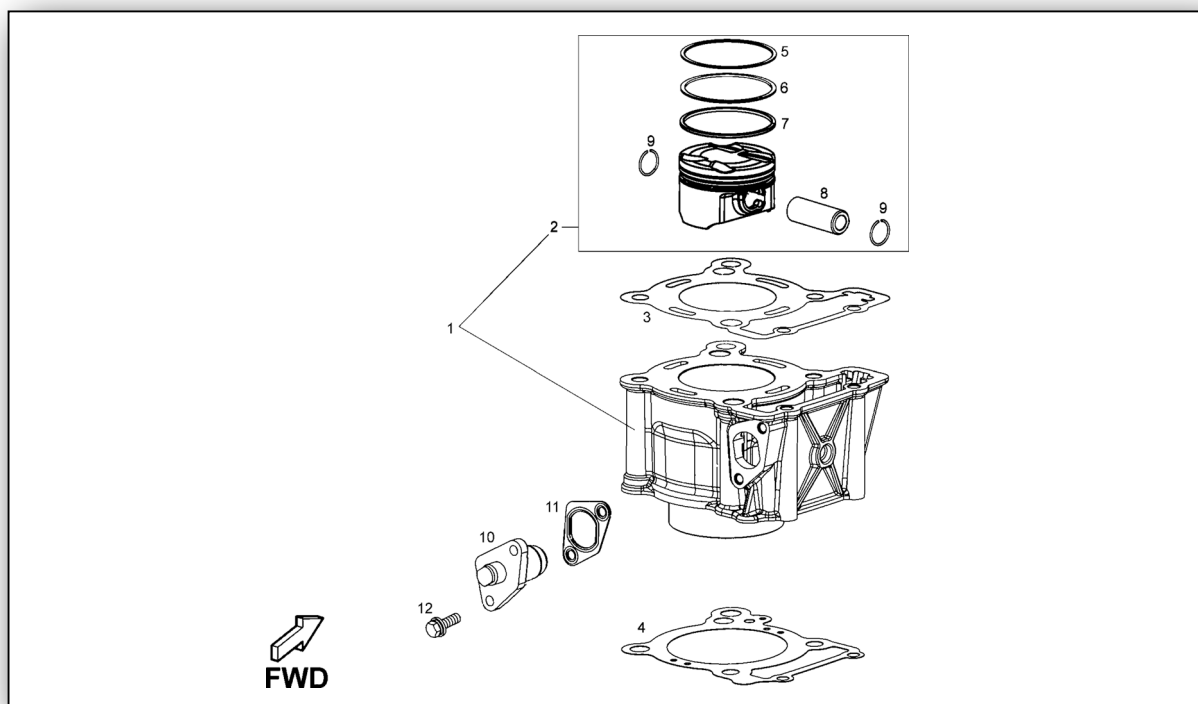


CAUTION

THE CLUTCH CAM CAN ONLY BE FITTED IN ONE POSITION.

4 - ENGINE

CYLINDER HEAD AND CYLINDER PARTS



1	Piston-cylinder assy.
3	1st cat. piston assy.
4	Cylinder - cylinder head gasket
5	Cylinder - crankshaft gasket
6	First piston ring
7	Scraper ring
8	Piston gudgeon pin
9	Piston gudgeon pin circlip
10	Chain tensioner
11	Gasket
12	M6x16 bolt

4 - ENGINE

46. Fit the rings onto the piston in the following order:

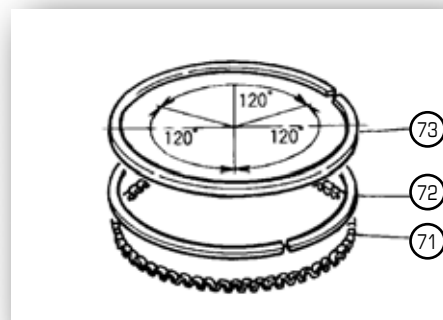
- Bottom ring (oil ring) (71).
- Central ring (scraper) (72).
- Top ring (compression) (73).



N.B.

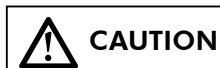
FIT THE RINGS IN SUCH A WAY THAT THE MANUFACTURER'S MARK IS TOWARDS THE TOP.

LUBRICATE THE PISTON AND THE RINGS WELL WITH ENGINE OIL.



47. Position:

- The ends of the rings must be staggered 120°.



CAUTION

POSITION THE ENDS OF THE RINGS AT 120° FROM EACH OTHER, AS SHOWN IN THE FIGURE.

48. Lubricate:

- External surface of the piston
- Rings

49. Fit:

- The piston fitting clamp (74).

Piston fitting clamp:

Ref. 865261



N.B.

BEFORE REMOVING THE CIRCLIP FROM THE GUDGEON PIN, COVER THE BASE OF THE CYLINDER WITH A CLOTH TO PREVENT OBJECTS FROM FALLING INTO THE ENGINE.

APPLY ENGINE OIL TO THE GUDGEON PIN.

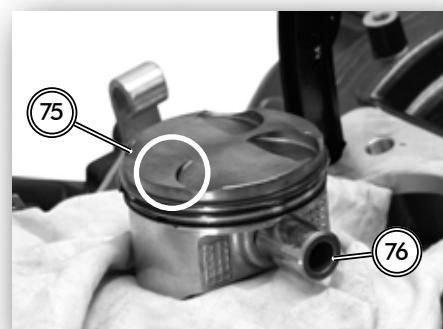


CAUTION

THE PISTON HAS A FITTING POSITION. POSITION THE (◀) MARK POINTING TOWARDS THE EXHAUST SIDE.

50. Fit:

- The piston (75).
- The piston gudgeon pin (76).



4 - ENGINE

51. Fit:

- The piston gudgeon pin securing circlips (77).



CAUTION

DO NOT RE-USE THE PISTON GUDGEON PIN CIRCLIPS. ALWAYS FIT NEW ONES.



52. Fit:

- The cylinder bottom gasket (78) (new gasket).

53. Lubricate:

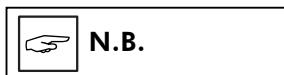
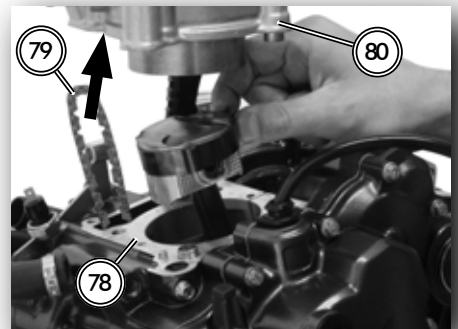
- The internal surface of the cylinder with engine oil.

54. Pass:

- The timing chain (79) through the cylinder slot.

55. Fit:

- The cylinder (80).



N.B.

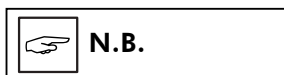
DO NOT RE-USE THE CYLINDER BOTTOM GASKET. ALWAYS FIT A NEW ONE.

TO AID IN INSERTING THE PISTON IN THE CYLINDER, USE A PISTON RING COMPRESSOR.



CAUTION

LUBRICATE THE INTERNAL SURFACE OF THE CYLINDER WITH ENGINE OIL.



N.B.

IF THE PISTON OR THE CYLINDER HAS BEEN RENEWED, THE THICKNESS OF THE NEW GASKET TO BE FITTED MUST BE CALCULATED.

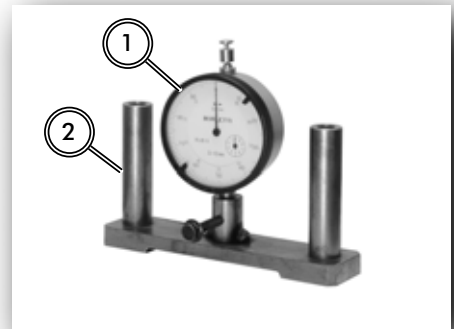
4 - ENGINE

CALCULATING THE BOTTOM GASKET THICKNESS



THE CYLINDER GASKET THICKNESS MUST BE CALCULATED TO ESTABLISH THE APPROPRIATE COMPRESSION RATIO.

PERFORM THE CALCULATION WITH THE COMPARATOR GAUGE **WITHOUT FITTING ANY CYLINDER BOTTOM GASKET.**

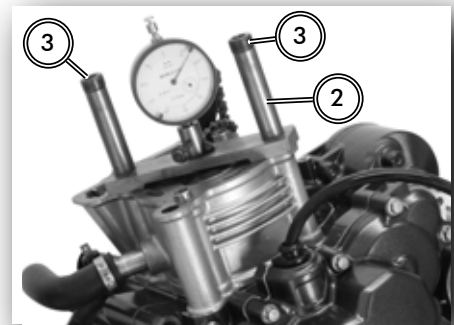


1. Fit:

- The comparator (1) onto the TDC measuring tool (2).



PLACE THE COMPARATOR ON A FLAT SURFACE AND ADJUST CORRECTLY (0).



2. Fije:

- The TDS measuring tool (2), by means of two M8 bots for securing the cylinder head to the crankcase (3).

TDC measuring tool:
Ref. 864592

3. Position:

- The piston at TDC.
- Take a reading of the measurement on the comparator.

4. Choose:

- The cylinder base gasket (see table).

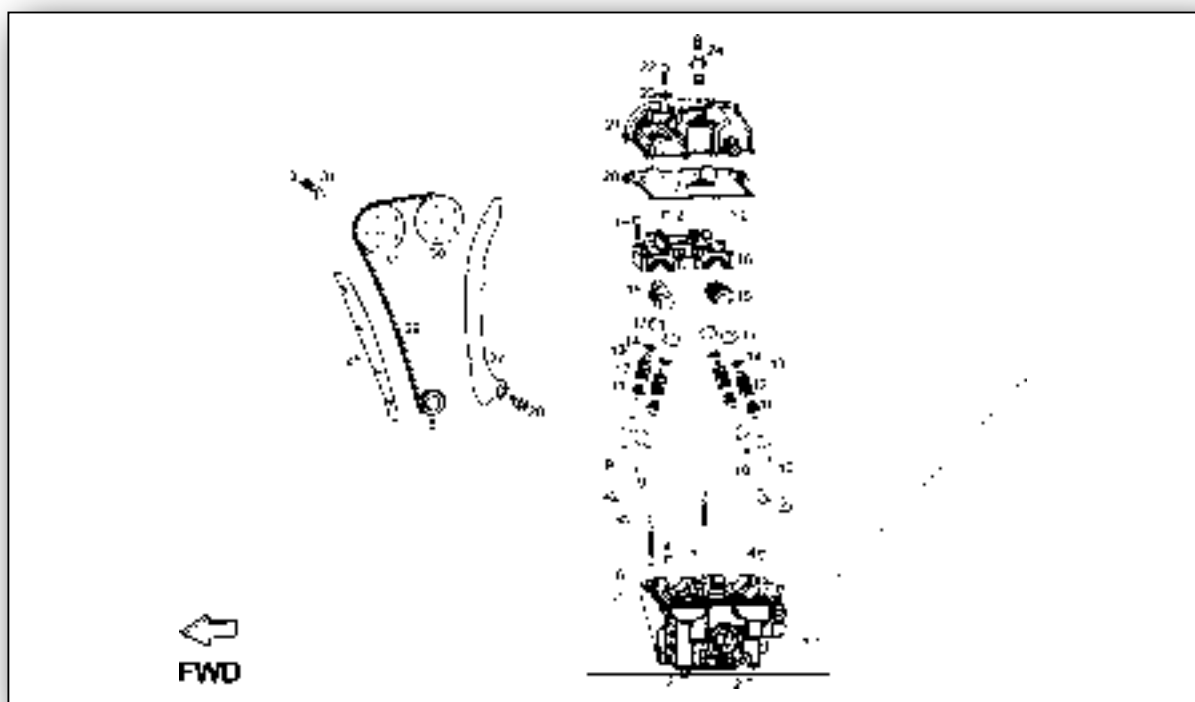


THERE ARE THREE THICKNESSES OF GASKET AVAILABLE:
0.3, 0.4 AND 0.5 MM.

TDC measurement (mm)	Thickness of Gasket (mm)	Reference
0.95 / 1.09	0.3 ± 0.05	CM157501
1.1 / 1.25	0.4 ± 0.05	CM157502
1.26 / 1.45	0.5 ± 0.05	CM157503

4 - ENGINE

VALVES AND CAMSHAFT PARTS



1	Cylinder head assy.
2	12x13 centring bush
3	M8x20x1 bolt
4	8x13 centring bush
5	M8x166 bolt
6	8.5x16x1.5 washer
7	M6x130 bolt
8	Distribution gear
9	125cc exhaust valve
10	125cc inlet valve
11	Oil seal
12	Valve spring
13	Valve semi-cone
14	Valve top casing
15	Exhaust camshaft
16	Intake camshaft
17	Seal washer
18	Camshaft cover
19	M6x40 bolt
20	Rocker cover gasket
21	Rocker cover
22	Rocker cover bolt
23	Valve cover rubber washer
24	NGK CR8EB spark plug

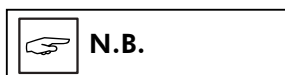
25	Gasket
26	Chain guide fixed roller
27	Chain tensioner mobile roller
28	M6 bolt
29	Timing chain
30	Crown wheel
31	8.25x23x4 washer

4 - ENGINE

(CONTINUES FROM POINT 55)

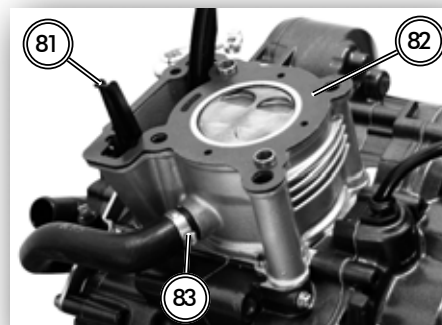
56. Fit:

- The front timing chain roller (81).
- The cylinder head gasket (82) (new gasket).
- The coolant pipe (83).



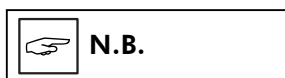
N.B.

REMEMBER TO FIT THE FRONT CHAIN ROLLER BEFORE FITTING THE CYLINDER HEAD.



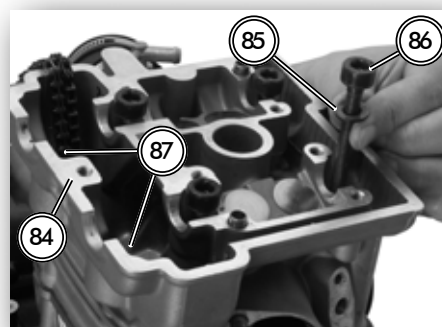
57. Fit:

- The cylinder head (84).



N.B.

TIE A PIECE OF WIRE TO THE TIMING CHAIN TO PREVENT IT FROM DROPPING INTO THE ENGINE.



CAUTION

APPLY OIL TO THE WASHERS OF THE 4 BOLTS JOINING THE CYLINDER HEAD TO THE CRANKCASE.

58. Fit:

- The washers (85) impregnated with engine oil onto the M8 bolts (86).
- The 4 M8 bolts (86) securing the cylinder head to the crankcase.
- The 2 M6 bolts (87) securing the cylinder head to the crankcase.

Bolts securing the cylinder head to the crankcase.

Bolts M8 - 2,7 kgf.m + 90° (27 N.m + 90°)

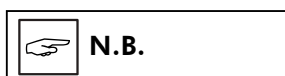
Bolts M6 - 1,1-1,3 kgf.m (11-13 N.m)



CAUTION

TIGHTEN THE M8 BOLTS FIRST.

TIGHTEN THE CYLINDER HEAD BOLTS IN SUCCESSION CROSSWISE, GOING FROM ONE TO THE OTHER TWO OR THREE TIMES.



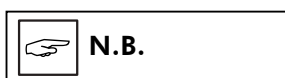
N.B.

AFTER TIGHTENING THE M8 BOLTS TO THEIR INDICATED TORQUE, THEY SHOULD BE TURNED ANOTHER 90° (1/4 OF A TURN).

4 - ENGINE

59. Fit:

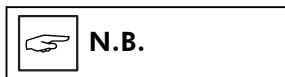
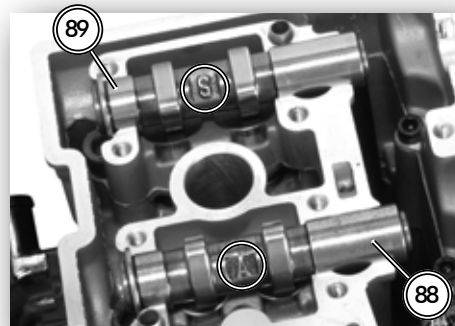
- A little engine oil to the camshaft supports.
- The camshafts onto their housings:
 - The inlet camshaft (88).
 - The exhaust camshaft (89).



N.B.

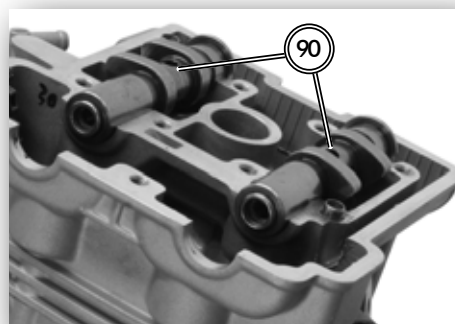
THE INLET CAMSHAFT BEARS THE INSCRIPTION "A"

THE EXHAUST CAMSHAFT BEARS THE INSCRIPTION "S"



N.B.

POSITION THE CAMSHAFT LOCKING ORIFICES (90) FACING UPWARDS.



60. Fit:

- The camshaft bridge (91).
- The 8 bolts (92) into the camshaft bridge (tighten them by following a cross pattern).

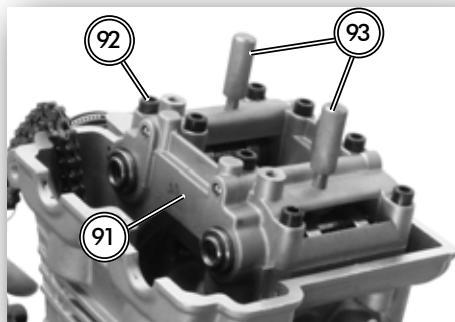
The bolts (camshaft bridge):

1-1,2 kgf.m (10-12 N.m)

- The locking pins (93).

Ref. 864567

Set of camshaft locking pins (93).



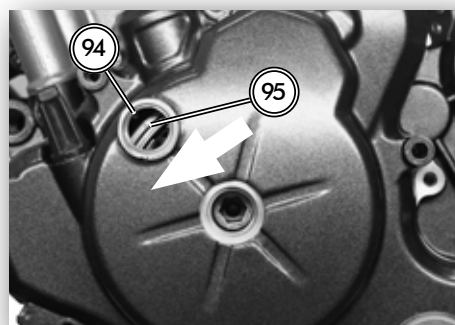
61. Fit:

- The piston at top dead centre (TDC) on the compression stroke. To do so, turn the crankshaft in an **anticlockwise direction** with an Allen key until the mark (94) is lined up with the mark to be found on the flywheel (95).



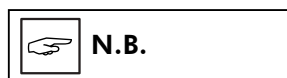
CAUTION

TURN THE CRANKSHAFT IN AN ANTICLOCKWISE DIRECTION. ATTEMPTING TO TURN IT IN THE OPPOSITE DIRECTION MAY CAUSE SERIOUS DAMAGE TO THE ENGINE.



4 - ENGINE

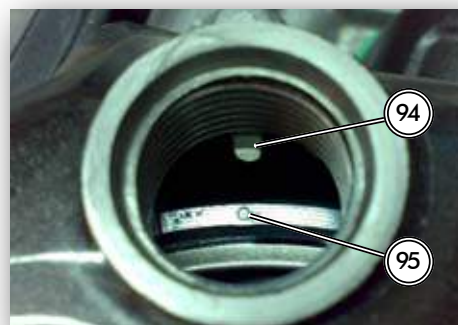
DETAIL SHOWING THE ALIGNMENT OF THE MARK (94) WITH THAT EXISTING ON THE FLYWHEEL (95).



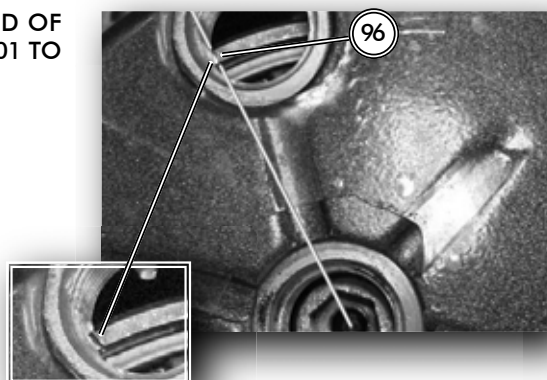
N.B.

UP TO ENGINE NUMBER 7015, THE MARK (95) (A CIRCLE) DOES NOT EXIST.

ON THESE ENGINES (FROM 0001 TO 7015), THE MARK (95) IS A LINE (96) WHICH HAS TO BE ALIGNED WITH THE END OF THE ORIFICE.



DETAIL OF ALIGNMENT OF THE LINE (96) WITH THE END OF THE INSPECTION THE ORIFICE (FROM ENGINE NOS. 0001 TO 7015).



62. Fit:

- The timing chain (79) over the sprockets.
- The camshaft sprockets (97).
- Apply **Loctite 270-type thread sealant** to the 2 bolts (98) before fitting them.
- The camshaft sprocket washers and bolts (98).
- The sprocket locking tool (99).

The camshaft sprocket locking tool:

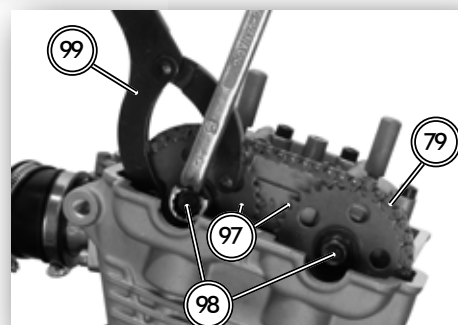
Ref. 865259



CAUTION

MAKE SURE THE TDC MARK ON THE FLYWHEEL IS CORRECTLY ALIGNED BEFORE FITTING THE CAMSHAFT SPROCKETS.

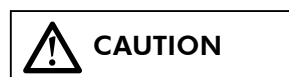
DO NOT TIGHTEN THE SPROCKETS TO THEIR TORQUE SETTING UNTIL THE SUBSEQUENT TENSIONING OF THE TIMING CHAIN HAS BEEN PERFORMED.



4 - ENGINE

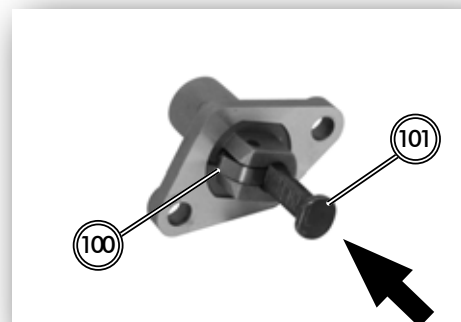
63. Adjusting the tensioner:

- Press the tab (100).
- Push the timing chain tensioner (101).
- Release the tab (100).



CAUTION

DO NOT TIGHTEN THE SPROCKETS TO THEIR TORQUE SETTING UNTIL THE SUBSEQUENT TENSIONING OF THE TIMING CHAIN HAS BEEN PERFORMED.

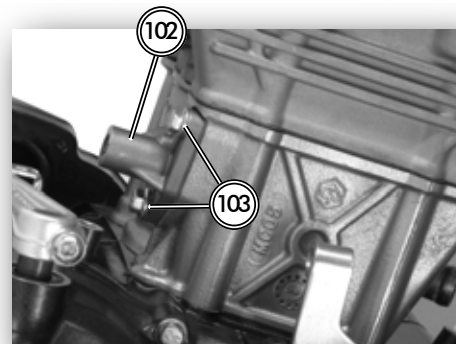


64. Fit:

- A NEW tensioner seal.
- The timing chain tensioner (102).
- The 2 tensioner bolts (103).

Timing chain tensioner bolts.

1,1-1,3 kgf.m (11-13 N.m)

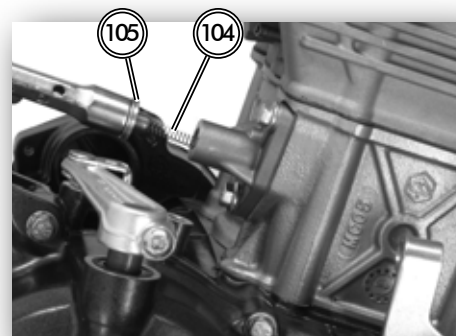


65. Fit:

- The spring (104), pressing it down until the bolt is in position.
- The tensioner central bolt (105).

Central timing chain tensioner bolt.

0,8-1 kgf.m (8-10 N.m)



CAUTION

MAKE SURE THAT **LOCTITE 270-TYPE THREAD SEALANT** HAS BEEN APPLIED TO THE SPROCKET BOLTS.

66. Fit:

- The camshaft sprocket locking tool. (99).

The camshaft sprocket locking tool:

Ref. 865259

67. Tighten:

- The 2 bolts on the sprockets to the nominal torque.

Sprocket bolts:

2,5-2,7 kgf.m (25-27 N.m)



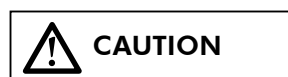
4 - ENGINE

68. Remove:

- The locking pins (93).

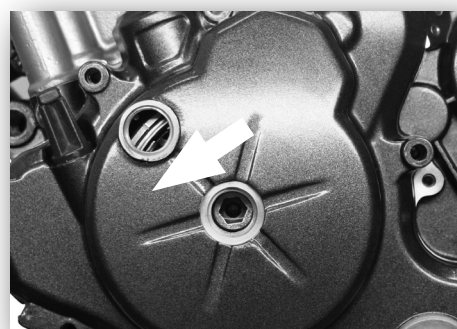
69. Check:

- The correct functioning of the timing by turning the crankshaft a number of times.



CAUTION

TURN THE CRANKSHAFT IN AN ANTICLOCKWISE DIRECTION. ATTEMPTING TO TURN IT IN THE OPPOSITE DIRECTION MAY CAUSE SERIOUS DAMAGE TO THE ENGINE.



70. Check:

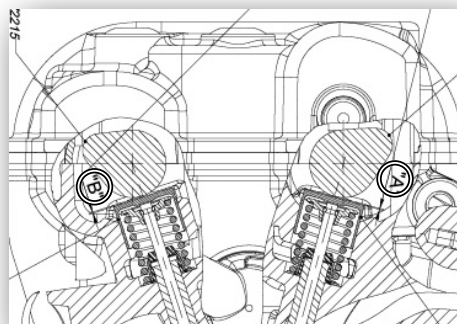
- Valve settings. Use a feeler gauge to check that the clearance between the cam and the valve shim corresponds to the values indicated:

INLET VALVES: 0,10-0,15 mm (Cota A)

EXHAUST VALVES: 0,15-0,20 mm (Cota B)

Outside that specified => Adjust setting (See VALVE SETTINGS section).

Within that specified => Refit the cylinder head

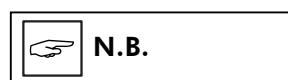


71. Fit:

- The rocker cover (106).
- The 4 rocker cover bolts (107).
- The spark plug.

(Rocker cover) bolts:

1-1,2 kgf.m (10-12 N.m)

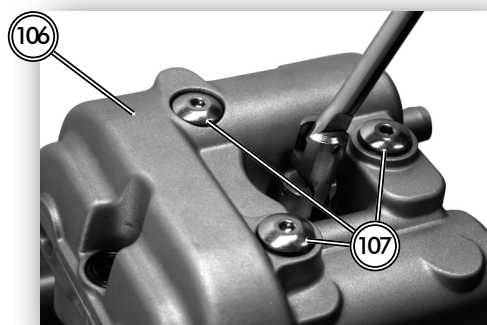


N.B.

MAKE SURE THAT THE ROCKER COVER GASKET IS PROPERLY POSITIONED AROUND THE SPARK PLUG HOUSING.

Spark plug:

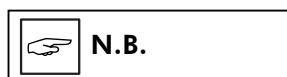
1,2-1,4 kgf.m (12-14 N.m)



4 - ENGINE

72. Fit:

- The starter motor (108).
- The 2 bolts (109) securing the starter motor.

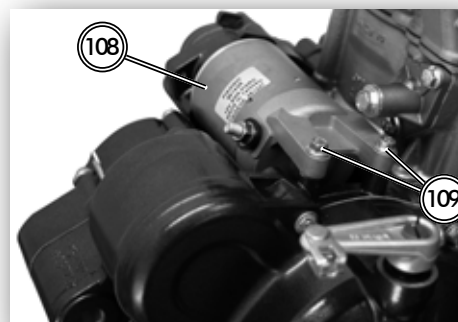


N.B.

APPLY LOCTITE 243-TYPE
THREAD SEALANT TO THE 2
BOLTS BEFORE FITTING THEM.

Starter motor bolts:

1,1-1,3 kgf.m (11-13 N.m)

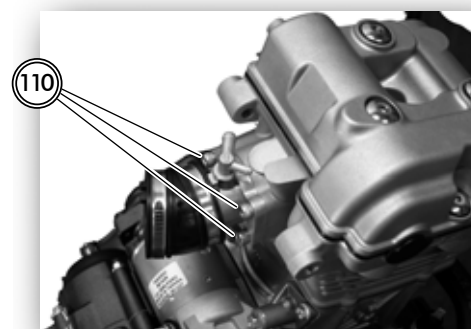


73. Fit:

- The inlet manifold, using the 3 bolts (110).

Inlet manifold bolts:

1,1-1,3 kgf.m (11-13 N.m)

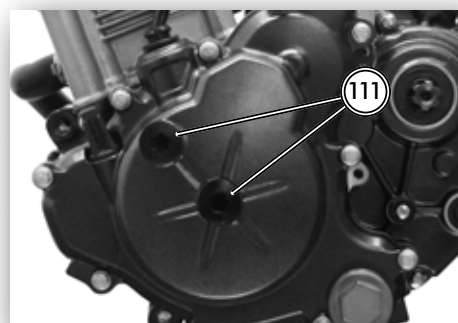


74. Fit:

- The inspection plugs (111) from the flywheel cover.

Inspection plugs

0,35-0,45 kgf.m (3,5-4,5 N.m)

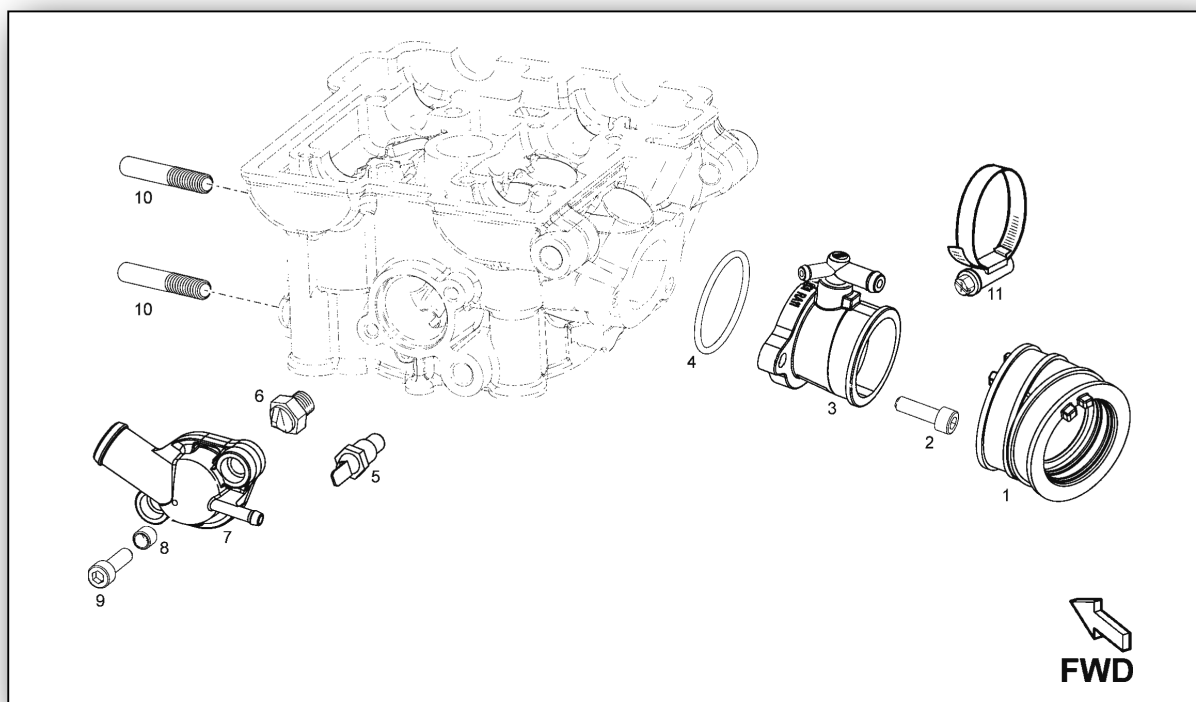


CAUTION

ONCE THE ENGINE HAS BEEN
REFITTED ONTO THE CHASSIS,
ENSURE THAT THE OIL LEVEL
IN THE ENGINE IS CORRECT
BEFORE STARTING IT UP.

4 - ENGINE

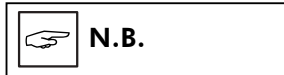
THERMOSTAT PARTS



1	Hose joining the carburet. to the inlet manifold
2	Bolt
3	Intake connector
4	O-ring
5	Thermistor
6	Thermostat
7	Thermostat cover
8	6.3x8x6.8 bush
9	M6x20 bolt
10	Studs
11	Carburettor clamp

4 - ENGINE

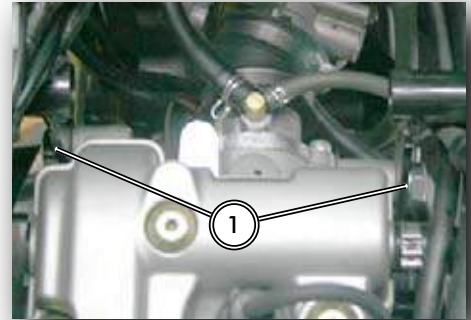
4.6 - FITTING THE ENGINE INTO THE FRAME



N.B.

IT IS ADVISABLE TO PLACE A SUPPORT UNDER THE ENGINE BEFORE FITTING IT ONTO THE CHASSIS, TO AID THE PROCESS.

ON REFITTING THE ENGINE, IF NECESSARY USE TOOL CODE NO. 866714 TO ADJUST THE SWINGING ARM NUT.



1. Fit:

- The engine to the frame

2. Fit:

- The 2 top mounting bolts (1).

Top mounting bolts (M10)

3,7-3,9 kgf.m (37-39 N.m)

- The swinging arm mounting bolt (2).

Swinging arm mounting bolt

7-8 kgf.m (70-80 N.m)

- The bottom front mounting bolt (3).

Bottom front mounting bolt (onto the chassis cradle)

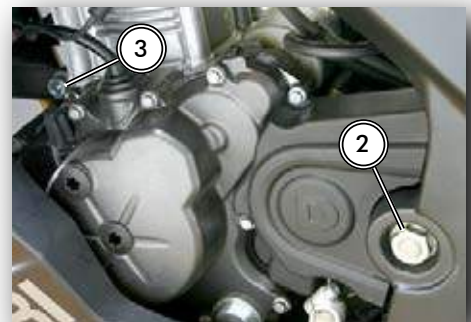
3,5-4 kgf.m (35-40 N.m)

3. Fit:

- The electrical connections (starter motor, magneto flywheel cover, etc.).
- The carburettor and its pipes.
- The carburettor clamps (4).

4. Fit:

- The pipe (5) from the radiator to the water pump.



4 - ENGINE

5. Fit:

- The coolant temperature sensor (6).
- The AIS valve (7).
- The pipe from the radiator to the thermostat (8).



6. Fit:

- The clutch cable (9).
- The oil pressure sensor cable (10).



7. Fit:

- The gear lever bolt (11).
- The gear lever.
- The neutral sensor cable.

Gear lever bolt

0,8-1 kgf.m (8-10 N.m)



8. Fit:

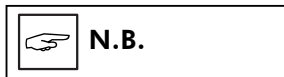
- The spark plug connector cap.
- The rocker cover oil vapour breather pipe (rocker cover-air filter box).
- The fuel tank (connecting its pipes).
- The seat.



4 - ENGINE

9. Fit:

- The exhaust pipe.



N.B.

FIT A NEW EXHAUST PIPE- CYLINDER HEAD GASKET.

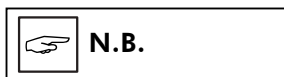
Securing the exhaust pipe to the cylinder head

1,7-1,9 kgf.m (17-19 N.m)



10. Fit:

- The chain.



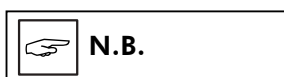
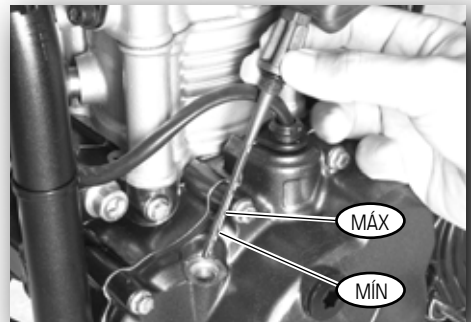
N.B.

CHECK THE TRANSMISSION CHAIN ADJUSTMENT.



CAUTION

ENSURE THAT THE OIL LEVEL IN THE ENGINE IS CORRECT BEFORE STARTING UP THE ENGINE.



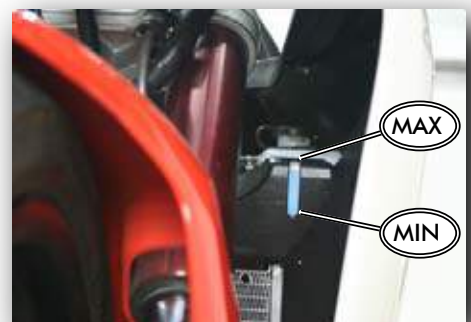
N.B.

BEFORE FITTING THE FAIRINGS, FILL THE COOLING CIRCUIT WITH COOLANT AND BLEED ANY AIR OUT OF THE CIRCUIT.

Recommended coolant: AGIP PLUS 30%

11. Fit:

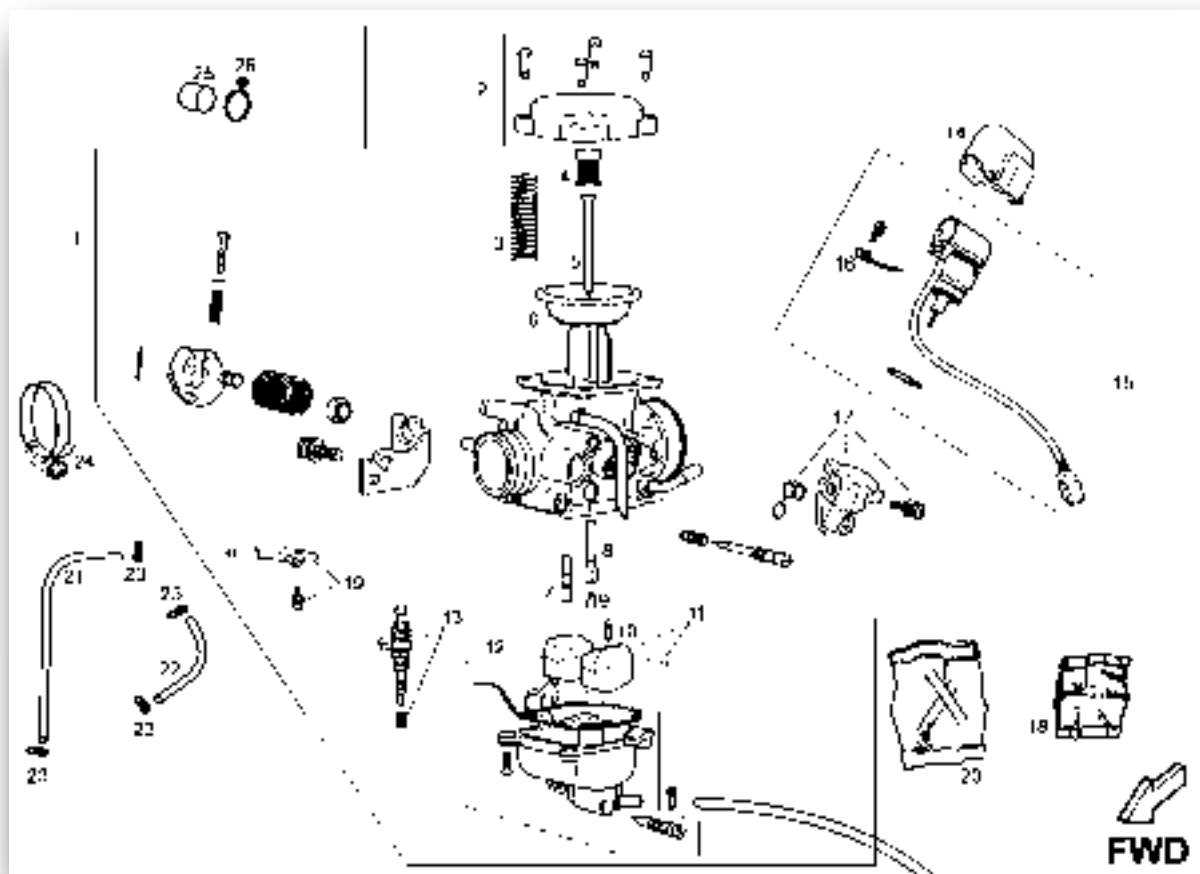
- The bottom fairing.
- The bottom side covers.



5 - FUEL SUPPLY SYSTEM

5.1 - DISMANTLING THE CARBURETTOR	155
5.2 - ASSEMBLING THE CARBURETTOR	160
5.3 - CHECKING THE FLOAT CHAMBER LEVEL	164
5.4 - CHECKING THE VACUUM VALVE AND TAPERED NEEDLE ...	164
5.6 - CHECKING THE AUTOMATIC CHOKE	166

5 - FUEL SUPPLY SYSTEM



1	Carburetor
2	Cover
3	Spring
4	Bushing
5	Needle
6	Valve
7	Jet min
8	Needle jet
9	Main jet
10	Main jet
11	Float
12	Float bowl seat
13	Kit acceleration pump kit
14	Cover
15	Starter device
16	Plate
17	Starter
18	Carburetor gasket
19	Raccord
20	Tube
21	Tube
22	Tube
23	Clamp
24	Clamp

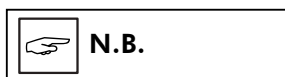
25	Cap
26	Clamp

5 - FUEL SUPPLY SYSTEM

5.1 - DISMANTLING THE CARBURETTOR

- To dismantle the carburettor from the engine, move the air filter clear and remove the throttle control cable, the automatic choke connection, the carburettor retaining clamps and the filter box and suction collector, the air feed pipe to the membrane and the inlet connector.

- Extract the carburettor and turn it so that the water pipes for heating the carburettor can be removed.



N.B.

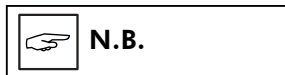
THIS OPERATION IS NECESSARY TO AVOID DRAINING THE COOLANT SYSTEM.



CAUTION

TO AVOID BURNS, DO NOT REMOVE THE CARBURETTOR IF THE ENGINE IS HOT.

- Once the carburettor has been removed from the motorcycle, work on a bench for greater comfort.



N.B.

BEFORE DISMANTLING, DRAIN ANY PETROL EXISTING IN THE CARBURETTOR FLOAT CHAMBER.

- Remove the protection, the clamp and the choke, by removing the screw indicated in the figure.



- Remove the 2 screws and the choke support with gasket.



5 - FUEL SUPPLY SYSTEM

- Remove the clamp and the hood with the ventilation filter from the membrane chamber.



- Remove the 4 securing screws and the vacuum chamber cover.



WHILE REMOVING THE COVER, TAKE SPECIAL CARE TO PREVENT THE SPRING FROM SUDDENLY FLYING OUT.

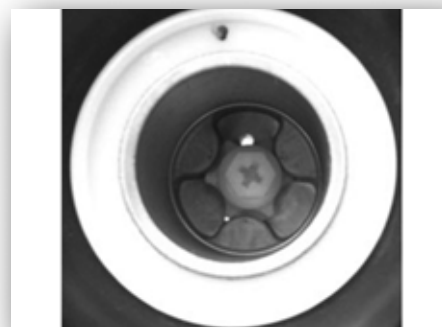


Remove the depression valve together with the membrane.



5 - FUEL SUPPLY SYSTEM

Unscrew the bayonet fitting 1/8th of a turn and extract it, then remove the spring and the valve needle.



- Remove the 4 screws indicated in the figure.

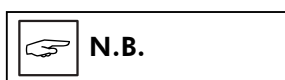


- Remove the complete bowl with the throttle pump, control and gasket.



- Remove the sealing gasket.

- Remove the throttle pump intake and output valve from the bowl.



N.B.

PROCEED WITH CARE, AS THE VALVES COME APART AND ARE MADE UP OF A JET, SPRING AND SPHERE.

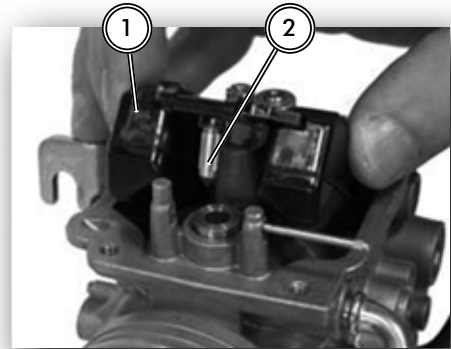
AVOID DISMANTLING THE PUMP PISTON AND ITS DRIVE.



5 - FUEL SUPPLY SYSTEM

- Hold the carburettor suitably and with a punch and hammer tap out the float rod, tapping from the throttle control side.

- Remove the float (1) and needle (2).



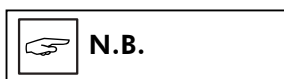
- Remove the main jet.



- Remove the jet.



- Remove the atomiser (3), by tilting the carburettor body.

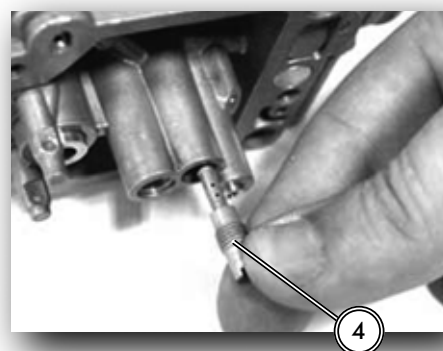


THIS OPERATION IS NECESSARY TO PREVENT THE ATOMISER FROM BECOMING LOST DURING THE CARBURETTOR BODY CLEANING OPERATIONS. IN THE EVENT OF THE ATOMISER BEING JAMMED IN ITS HOUSING, DO NOT PROCEED WITH DISMANTLING, TO PREVENT DAMAGE TO THE SAME.



5 - FUEL SUPPLY SYSTEM

- Remove the slow jet. (4).



- Remove the screw for adjusting the slow jet flow (pilot jet screw) together with the O-ring, washer and spring.



CAUTION

DO NOT ATTEMPT TO DISMANTLE THE COMPONENTS FITTED INTO THE CARBU-RETTOR BODY, SUCH AS: FUEL SUPPLY DUCT, NEEDLE SEAT, CHOKE JET, THROTTLE JET AND BY-PASS COLLECTOR COVER, SLOW AND MAIN AIR CALIBRATOR, OPERATING SHAFT OF BUTTERFLY VALVE WITH SHAFT. THE SECURING SCREWS HAVE BEEN RIVETED AFTER ASSEMBLY.



5 - FUEL SUPPLY SYSTEM

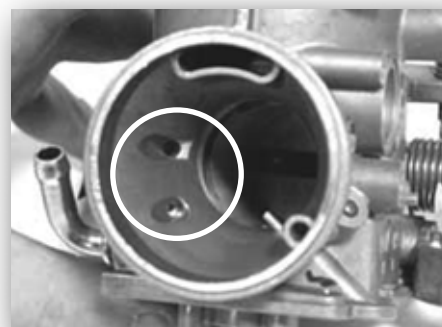
5.2 - ASSEMBLING THE CARBURETTOR

- Before proceeding with the assembly, wash the carburettor body carefully with petrol and blow with compressed air.

- Pay special attention in the duct supplying fuel to the needle seat (5).



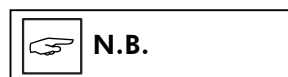
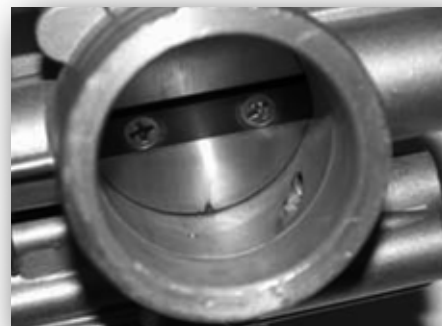
- Check the air calibration in the maximum circuit carefully.



- In the slow jet circuit, take special care with the cleaning of the following points: air calibration, output diameter controlled by the mixture screw, (pilot jet screw), bypass holes near the butterfly valve.

- In the choke circuit, the duct connecting with the jet must be blown through very thoroughly since the jet support conceals other, non-accessible calibrations in its interior.

- Thoroughly blow through the throttle jet.



ITS OUTPUT DIAMETER IS VERY SMALL AND IS AIMED TOWARDS THE BUTTERFLY VALVE. INCORRECT POSITIONING OF THE JET WILL LEAD TO POOR ATOMISING

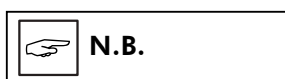
- Check the presence of the 5 spheres closing off the machined ducts in the carburettor body.

- Check that the flat surfaces joining with the bowl and the membrane have not been damaged or dented.

- Check that the depression valve seat duct is not scratched.

5 - FUEL SUPPLY SYSTEM

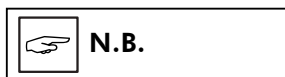
- Check that the butterfly valve and shaft have no unusual wear.
- Check that the needle seat (5) has no unusual wear.
- If any irregularities are found, renew the carburettor.
- Check that the pump rocker arm return spring is not distorted.



N.B.

TO PREVENT DAMAGE, AVOID INSERTING METAL OBJECTS INTO THE CALIBRATED SECTIONS.

- Clean and carefully blow through the slow jet and reassemble it.



N.B.

IDLING JET: 35

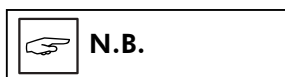
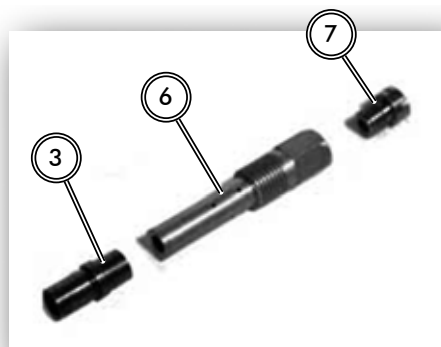


- Lavar y soplar cuidadosamente los componentes del circuito de máximo, pulverizador (6), atomiser (3) y surtidor de máximo (7).

- Fit the atomiser (3) in the carburettor body with the shorter cylindrical part aimed at the jet (6).

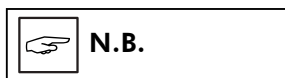
- Fit the atomiser (3), ensuring that diffuser (6) is inserted correctly, and tighten the atomiser(3).

- Fit the main jet. (7).



N.B.

MAIN JET: 100



N.B.

JET OUTER DIAMETER: 5.0 mm

JET INNER DIAMETER: 2.8 mm

5 - FUEL SUPPLY SYSTEM

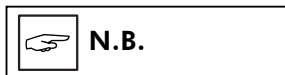
- Check that the tapered needle of the float has no signs of wear on the sealing surface (8), on the shock absorbing rod and the return spring.

- If wear is detected, renew the tapered needle of the float.

- Check that the float has no signs of wear on the rod seat, on the plate contacting with the needle, or fuel infiltration.

- If anomalies are detected, renew the float.

- Insert the float with the needle on the fuel input side.



N.B.

ENSURE THAT THE RETURN SPRING (OF THE FLOAT NEEDLE) IS FITTED ONTO THE FLOAT PLATE CORRECTLY.

- Remove the float bowl drain (9) screw, wash and blow out the bowl carefully, paying special attention in the cleaning of the throttle pump ducts.

- Operate the throttle pump piston several times and blow through with compressed air.

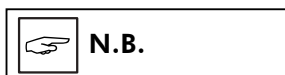
- Refit the throttle pump valves, inserting them in the order:

INTAKE VALVE (A)

- Spring
- Sphere
- Jet

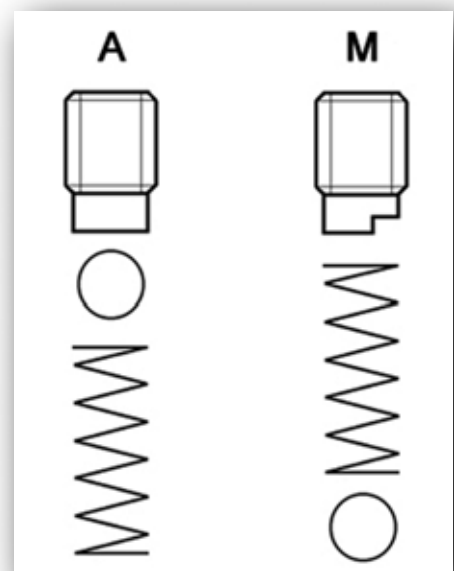
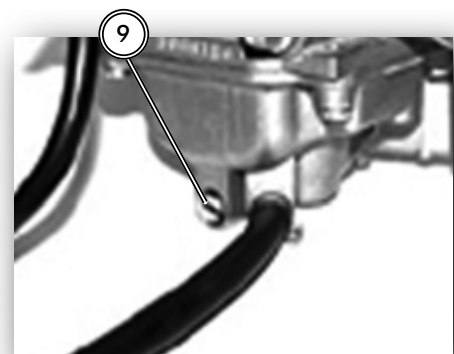
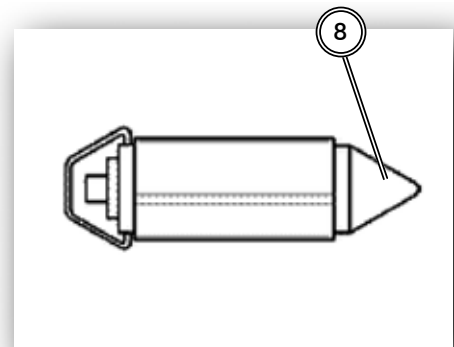
OUTPUT VALVE (M)

- Sphere
- Spring
- Jet



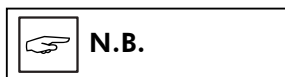
N.B.

THE OUTPUT VALVE JET HAS LOWER.



5 - FUEL SUPPLY SYSTEM

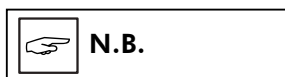
- Check for leaks at the screw by pouring small amounts of fuel into the chamber.
- Fit a new gasket on the bowl.



ALWAYS FIT A NEW GASKET TO ENSURE THERE ARE NO LEAKS.



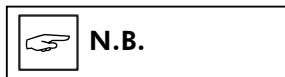
- Fit the bowl onto the carburettor body and tighten the 4 screws.



TAKE SPECIAL CARE TO ENSURE THAT THE GASKET IS CORRECTLY FITTED IN THE FLOAT CHAMBER.

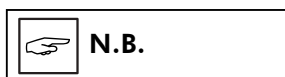


- Check that the control roller is free and turns in its own housing.

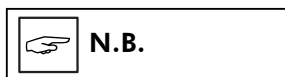


AVOID ANY DISTORTION OF THE THROTTLE PUMP CONTROL ROCKER ARM.

- Wash and carefully blow through the mixture screw (pilot jet screw).
- Check that the screw is not damaged and/or corroded.
- Fitting the spring onto the screw.
- Fit the washer onto the screw.
- Fit the O-ring onto the screw.
- Thread the mixture screw into the carburettor body.



ADJUSTING THE SCREW: UNSCREW 2.25 TURNS FROM THE FULLY SCREWED IN POSITION.



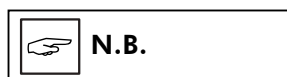
THE FINAL POSITION OF THE SCREW WILL DETERMINE THE CARBON MONOXIDE (CO) VALUE OF THE EXHAUST GASES.



5 - FUEL SUPPLY SYSTEM

5.3 - CHECKING LEVEL OF THE FLOAT CHAMBER

- Fit the carburettor tilted as in the figure.
- Check that the reference mark on the float is parallel with the flat joining surface of the bowl.
- If other positions are detected, modify the positioning of the metal needle control plate until the indicated position is obtained.

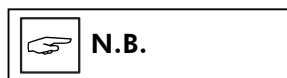


N.B.

VOLUME OF FUEL WITH THE
CORRECT FLOAT CHAMBER
LEVEL: 33-35 ml.

5.4 - CHECKING THE VACUUM VALVE AND TAPERED NEEDLE

- Check that the vacuum valve needle is not worn.
- Check that the vacuum valve needle shows no sign of scratching on its outer surface.
- Check that the vacuum supply hole is not obstructed.
- Check that the membrane is not broken or hardened. If it is, renew the whole valve.
- Insert the needle into the valve housing.

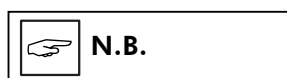


N.B.

MAKE OF NEEDLE: NDYD
DIAMETER OF NEEDLE:
2.49mm



- Refit the vacuum fuel valve in the carburettor body, taking care that the needle enters inside the atomiser.



N.B.

THE VALVE CAN ONLY BE IN-
SERTED IN ONE POSITION.



5 - FUEL SUPPLY SYSTEM

- Refit the needle spring.
- Refit the vacuum chamber cover, taking care to ensure that the spring is correctly fitted into the housing in this cover.



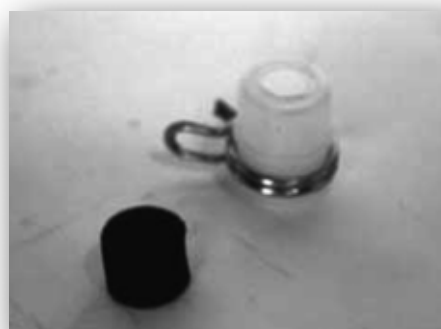
CAUTION

TAKE CARE WHEN FITTING THE COVER TO AVOID PINCHING THE MEMBRANE.

- Tighten the screws.
- Wash and blow through the atmospheric pressure intake filter sponge.

- Refit the filter with the corresponding clamp.

- Wash and blow through the choke support with compressed air.
- Fit a new gasket onto the carburettor body and lock the 2 securing bolts.



5 - FUEL SUPPLY SYSTEM

5.5 - CHECKING THE AUTOMATIC CHOKE

- Check that the automatic choke piston is not scratched or corroded.
- Check that the piston slides freely.
- Check that the piston sealing gasket is not distorted.
- The choke will be on for more or less time, depending on the atmospheric temperature.
- Measure the piston protrusion as indicated in the figure and check the corresponding value.
- Ensure that the choke is adjusted to atmospheric temperature.
- The choke must be disconnected gradually by means of electric heating.
- Check the resistance of the choke when it is adjusted to atmospheric temperature.



N.B.

RESISTANCE VALUE:
20 Ω at 24° C

- Connect the automatic choke to a 12v battery and check that the piston reaches the maximum protrusion.



N.B.

MAXIMUM OVER-MEASURE-
MENT: 10.5 mm

- The effective heating time depends on the atmospheric temperature.



N.B.

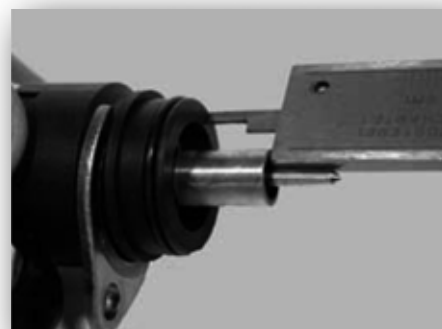
MAXIMUM HEATING TIME FOR
THE MEASUREMENT: 5 min.

- If protrusions, resistances or times are found to be different to those stipulated, the choke should be renewed.



N.B.

TAKE CARE NOT TO PROVO-
KE A SHORT CIRCUIT WHEN
CARRYING OUT THIS CHECK.
TO THIS END, USE A LENGTH
OF CABLE WITH A TERMINAL
ADAPTED TO THE CONNec-
TION WITH THE CHOKE.



5 - FUEL SUPPLY SYSTEM

- Continue with the fitting of the choke in the carburettor, paying attention to the correct positioning of the O-ring, insert the plate with the moulded part resting against the choke, and tighten the securing bolt (10).

- Position the choke as shown in the figure.

- Fit the protective device.

Technical Characteristics

Checking the automatic choke:

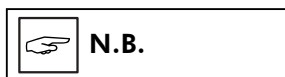
Protrusion value
10,5mm a 20°C

Checking the automatic choke:

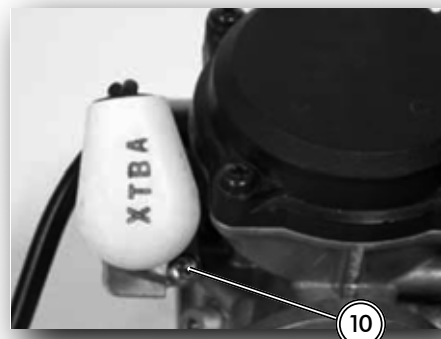
Maximum protrusion
18,5- 19 mm

Checking the automatic choke:

Max. time:
5 min.



ONCE THE CARBURETTOR HAS BEEN CONNECTED TO THE ENGINE AND AFTER RUNNING THE ENGINE FOR A FEW MINUTES, CHECK THAT THE IDLING RATE (TICK-OVER) IS CORRECT: 1680 ± 50 rpm.

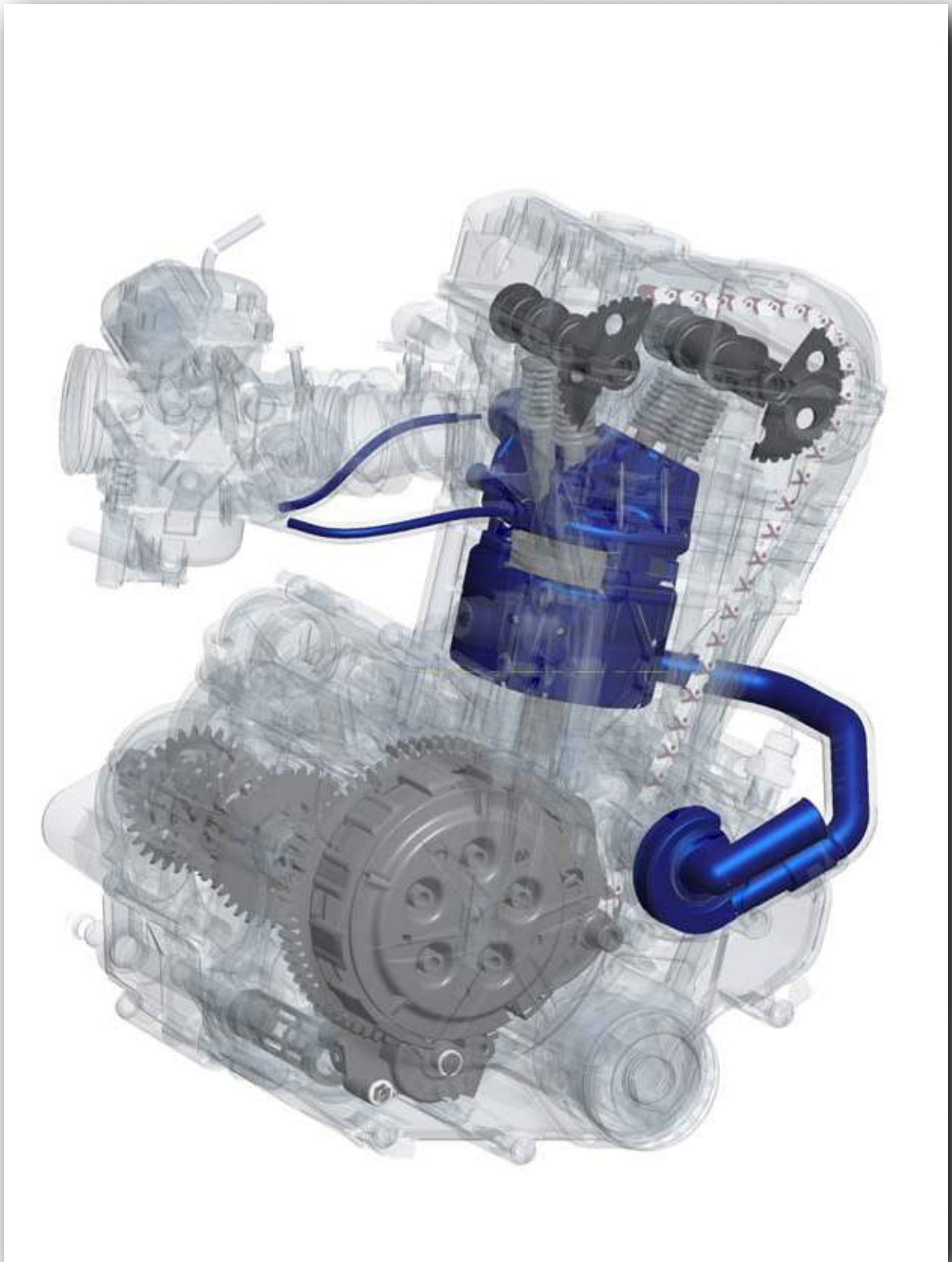


6 - COOLING SYSTEM

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6 - COOLING SYSTEM

6.1 - DIAGRAM OF THE SYSTEM



6 - COOLING SYSTEM

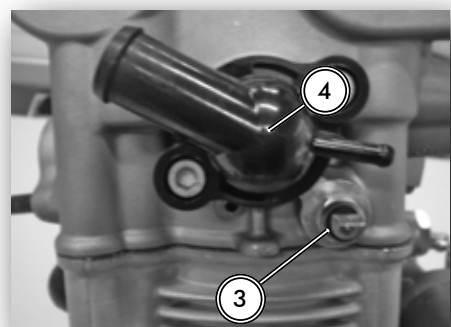
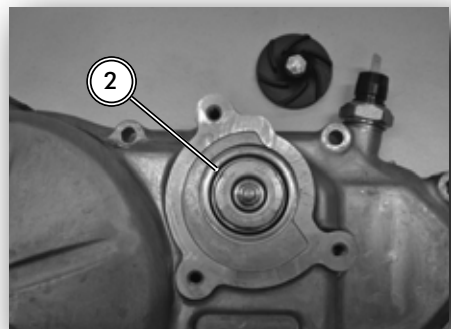
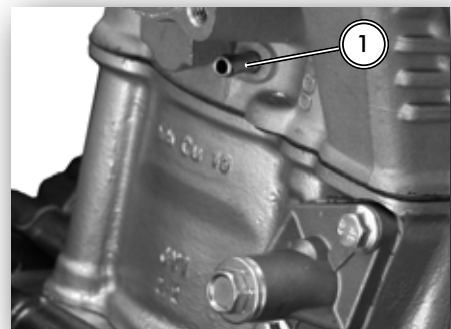
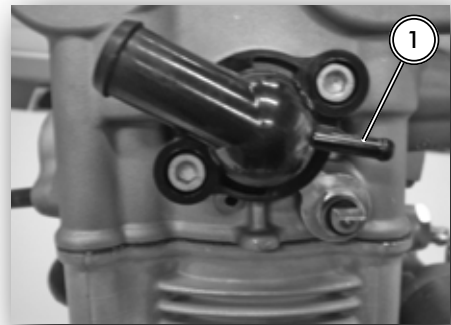


6 - COOLING SYSTEM

6.2 - DESCRIPTION OF THE SYSTEM AND CHECKING OF ELEMENTS

DESCRIPTION

- There is a small by-pass (1) to heat up the carburettor.
- The radiator is fitted with an electric fan.
- Activation of the electric fan is controlled by a thermal switch.
- Activation of the electric fan is at 100 +/- 2° C.
- Deactivation of the electric fan is at 97 +/- 2° C.
- Radiator cap opening pressure 1.0 +/- 0.1 bar.
- Radiator coolant capacity: 780 ml.
- Expansion chamber coolant capacity: 230 ml.
- Capacity of the whole circuit: 1,010 ml.
- Recommended coolant: AGIP PLUS 30%
- The pump oil seal (2) is the metal type.
- Resistance value of the temperature sensor (NTC):
 - A 60° C = 600-470 Ω
 - A 90° C = 215-175 Ω
 - A 120° C = 93-73 Ω
- The thermostat is located in the cylinder head (4).
- Thermostat opening:
 - Opening commencement temperature: 80° C
 - Fully open temperature: 85° C



6 - COOLING SYSTEM

- Draining the circuit: Through the water pump inlet pipe.

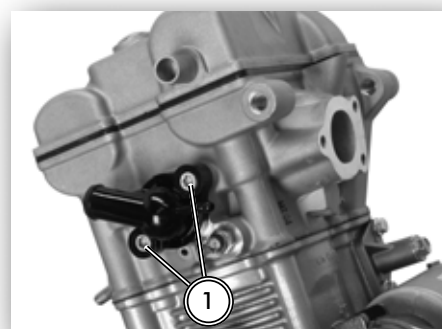


CHECKING THE ELEMENTS

- Thermostat.

Remove:

- The 2 thermostat cover bolts (1).

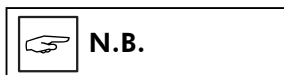


- The thermostat (2).



WARNING

DO NOT REMOVE THE THERMOSTAT IF THE ENGINE IS HOT.



N.B.

THERMOSTAT COVER BOLTS TIGHTENING TORQUE.



The thermostat cover bolts:

1-1,2 kfg.m (10-12 N.m)

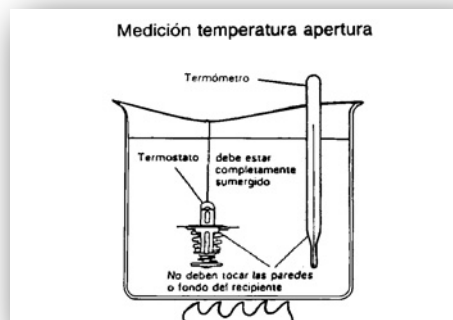
6 - COOLING SYSTEM

CHECKING THE ELEMENTS

- Thermostat (checking opening).
- Submerge the thermostat in a container filled with coolant.
- Submerge a thermometer in the same container, graduated between 0° - 150° C (32° - 302° F).
- Position the container over a burner and heat the liquid up slowly.
- Check that the temperature indicated on the thermometer and the thermostat opening temperature correspond to:

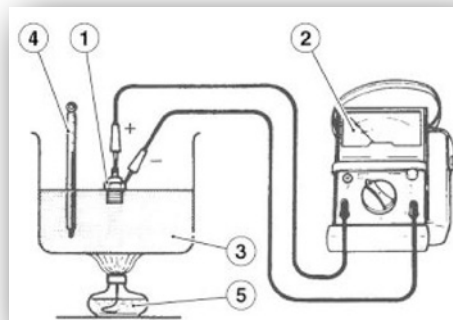
Opening commencement temperature: 80° C

Fully open temperature: 85° C



CHECKING THE ELEMENTS

- Thermal switch.
- Remove the thermal switch (1) from the radiator.
- As indicated in the figure, connect a pocket meter (2) (configured to measure electrical continuity) to the thermal switch (1).
- Submerge the thermal switch in a container (3) filled with coolant.
- Submerge a thermometer (4) in the same container, graduated between 0°- 150° C (32° - 302° F).
- Position the container over a burner (5) and heat the liquid up slowly.
- Check that the temperature indicated on the thermometer, and the value of the thermal switch indicated on the meter, correspond to:
- Above 100 +/- 2° C = Open circuit (0).
- Below 100 +/- 2° C = No circuit (1).



WARNING

DO NOT REMOVE THE SWITCH OF THE RADIATOR IS HOT.



N.B.

THERMAL SWITCH TIGHTENING TORQUE.

Thermal switch:

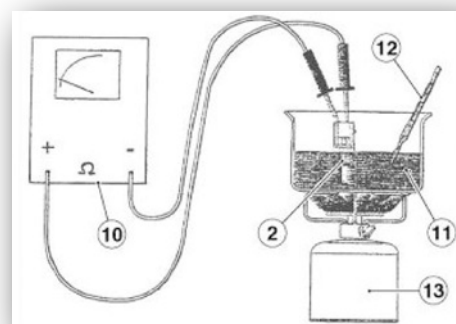
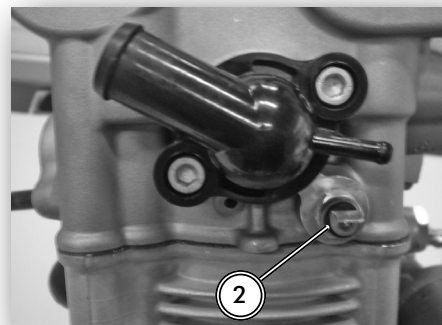
1,7-2,0 kfg.m (17-20 N.m)

6 - COOLING SYSTEM

CHECKING THE ELEMENTS

- Temperature sensor (NTC).
- Remove the temperature sensor (2) from the cylinder head.
- As indicated in the figure, connect a pocket meter (10) (configured to measure resistance) to the temperature sensor (2).
- Submerge the temperature sensor in a container (11) filled with oil.
- Submerge a thermometer (12) in the same container, graduated between 0°- 150° C (32° - 302° F).
- Position the container over a burner (13) and heat the oil up slowly.
- Check that the temperature indicated on the thermometer, and the value for the temperature sensor indicated on the meter, correspond to:

- A 60° C = 600-470 Ω
- A 90° C = 215-175 Ω
- A 120° C = 93-73 Ω



WARNING

DO NOT REMOVE THE TEMPERATURE SENSOR IF THE ENGINE IS HOT.



N.B.

TEMPERATURE SENSOR TIGHTENING TORQUE.

Temperature sensor:

0,8-1,0 kfg.m (8-10 N.m)



N.B.

AFTER CHECKING SOME OF THE ELEMENTS INDICATED, ON RE-FITTING THEM AIR MUST BE BLED OUT OF THE CIRCUIT.

6 - COOLING SYSTEM

6.3 - RENEWING THE WATER PUMP OIL SEAL

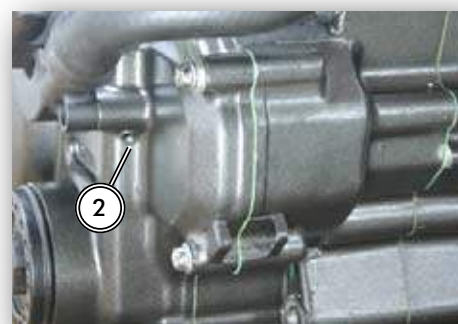
DESCRIPTION

- The water pump oil seal (1) is of a metal type with a ceramic interior.

- If liquid is leaking out of the hole (2) in the clutch cover at the height of the water pump, this is an indication that the oil seal needs to be replaced.

- A hydraulic press and tool kit Ref. 866380 are required to renew the oil seal.

- Grease the various elements to aid their insertion.



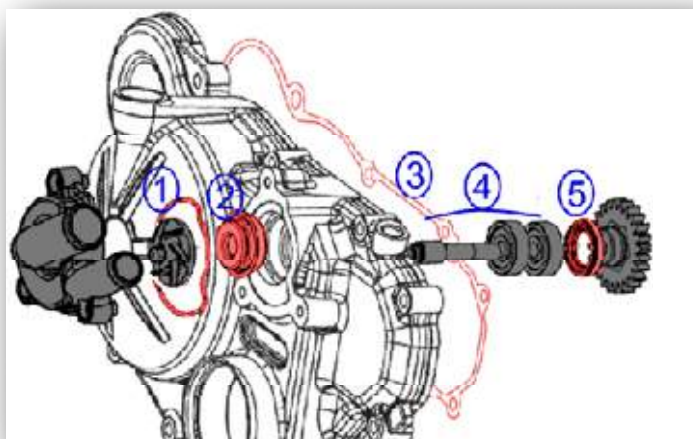
O-ring (1) Ref. 871418

Oil seal (2) Ref. 842595

Gasket (3) Ref. 871557

Shaft/bearings (4) Ref. 871372

Oil seal (5) Ref.82871R



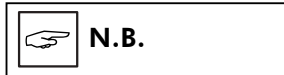
CAUTION

RENEWAL OF ELEMENTS 2, 3 AND 5 IS OBLIGATORY.

Inspect the bearings and the shaft.

Wear => Renew

6 - COOLING SYSTEM



N.B.

Ref. 866380

Tool kit (A-B-C) for extracting and fitting water pump oil seal.

STEPS FOR REMOVING THE WATER PUMP:

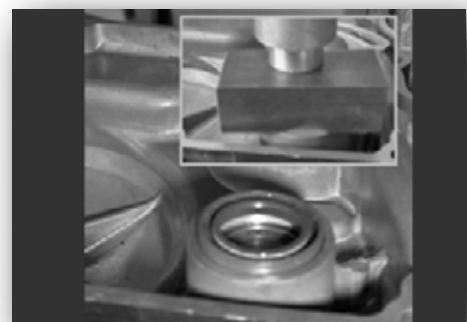
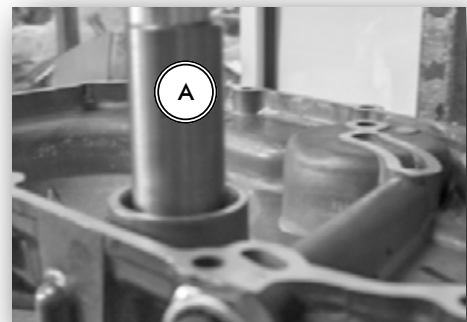
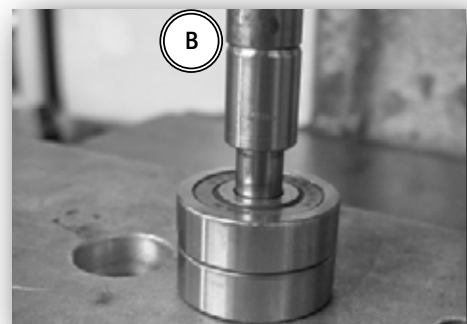
- Remove the clutch cover.
- Remove the water pump cover and the turbines (right-hand threads).
- Remove the shaft and the bearings using tool B.
- Remove the oil seal with A.
- Separate the elements from the shaft.

REFITTING THE PUMP AND THE NEW OIL SEAL STEP BY STEP:

- Fit the shaft with the bearings using the press and tool B, inserting it all the way in.

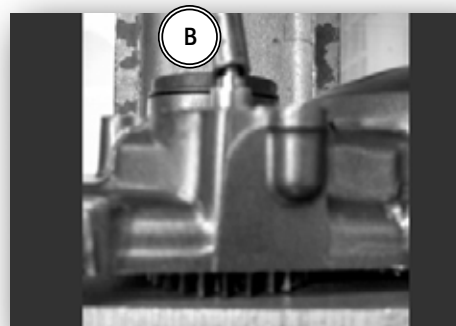
- Use A to fit the shaft/bearings assembly into its housing, until the bearings are fully in.

- Position the oil seal and press it home until flush with the cover.

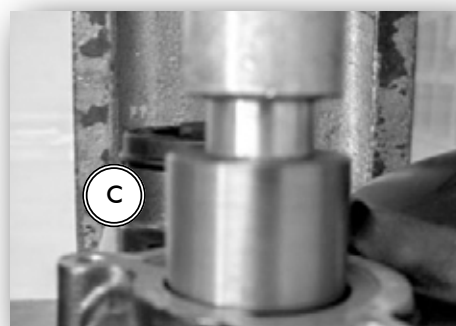


6 - COOLING SYSTEM

- Position the gear in the oil seal and push the shaft with B until it is fully in.



- Fit the water seal with C. This tool adjusts the seals internal spring preload.

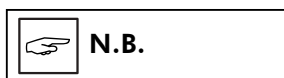


- Assemble the remaining elements.



CAUTION

DO NOT USE GREASE FOR THE PUMP COVER O-RING.

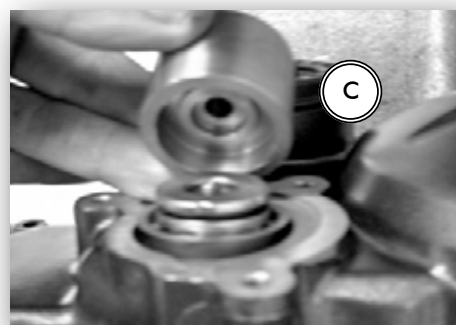


N.B.

WATER TURBINE TIGHTENING TORQUE.

Water pump turbine:

0,4-0,6 kfg.m (4-6 N.m)

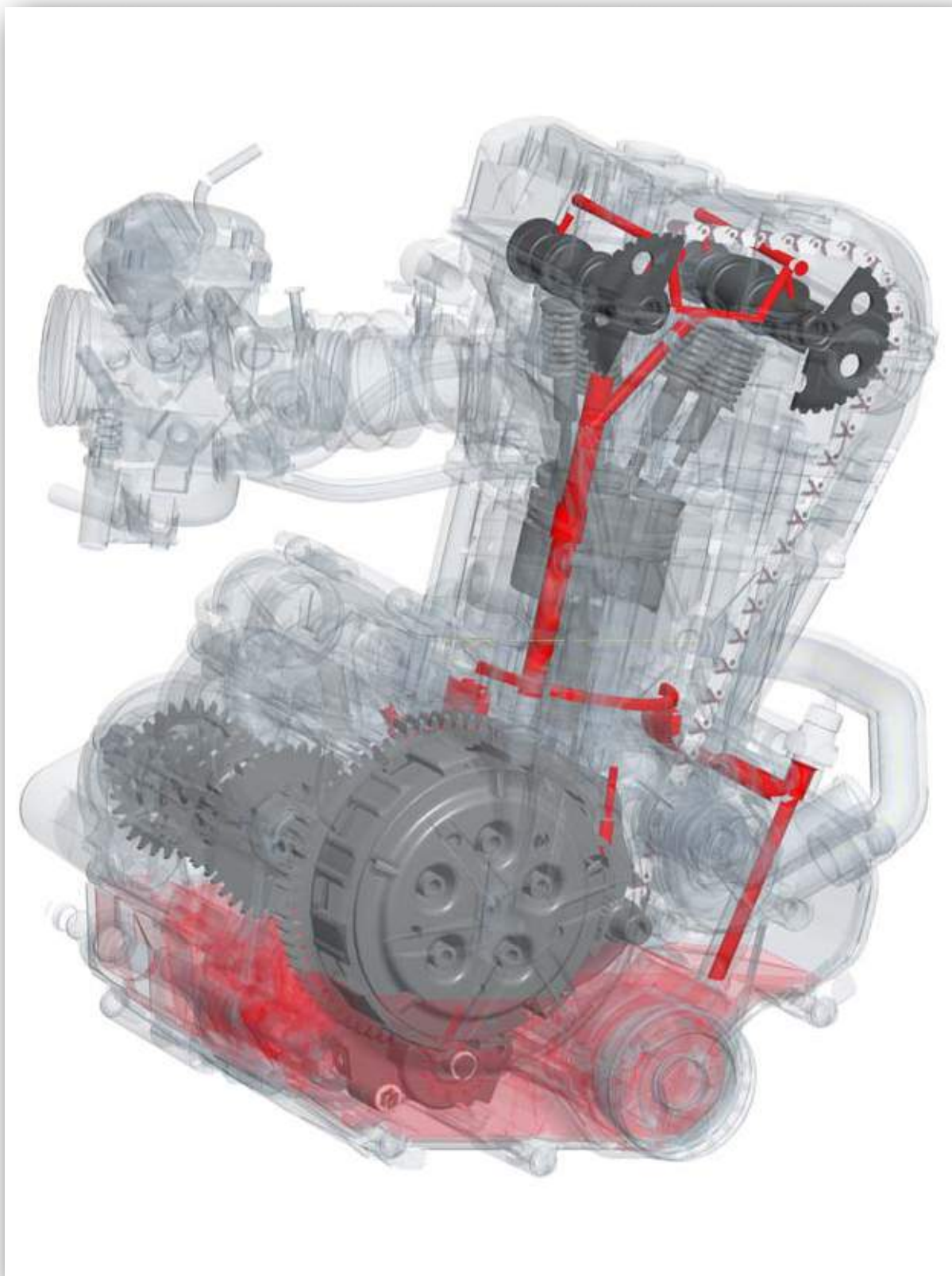


7 - LUBRICATION SYSTEM

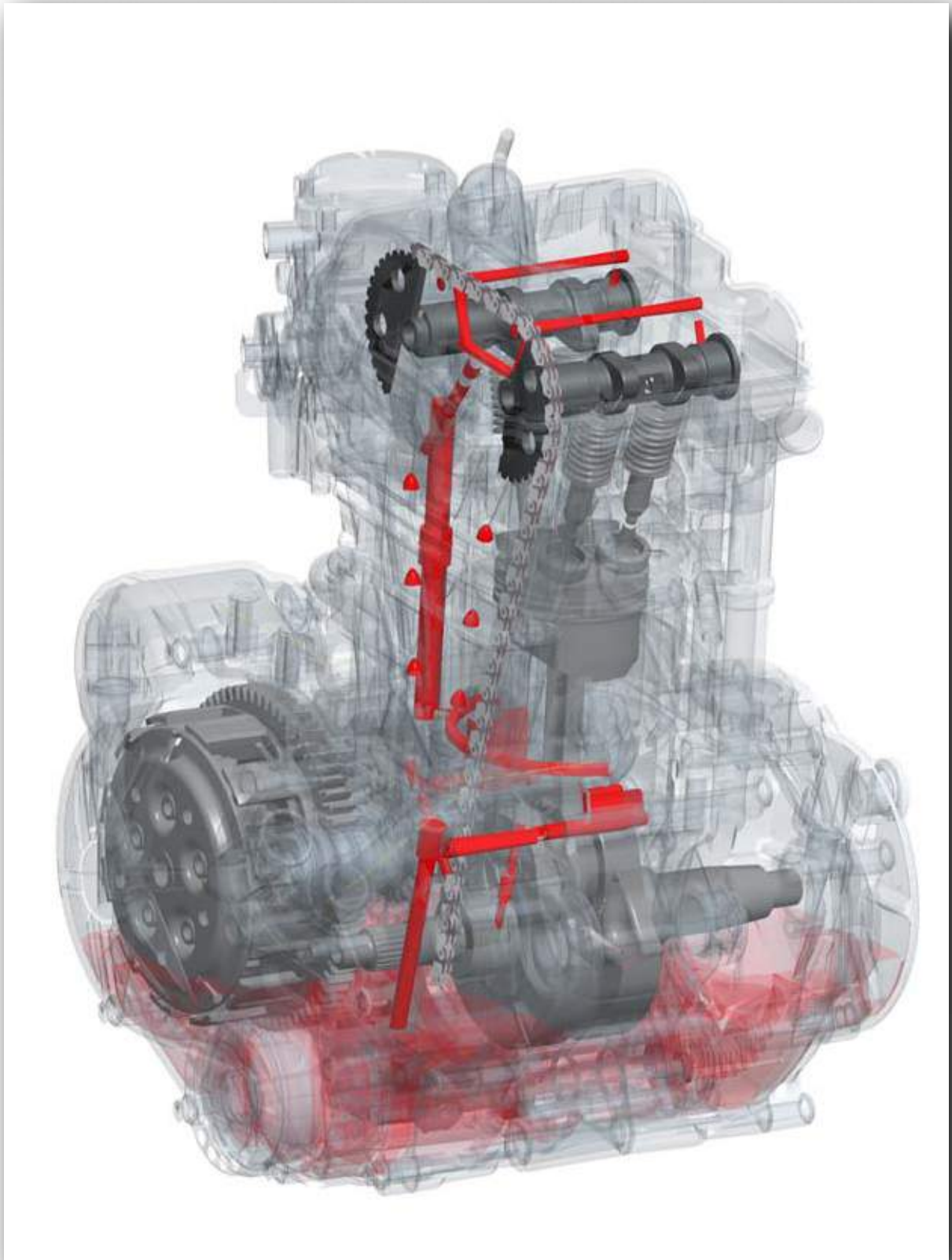
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7 - LUBRICATION SYSTEM

7.1 - DIAGRAM OF THE SYSTEM



7 - LUBRICATION SYSTEM

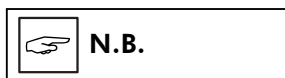


7 - LUBRICATION SYSTEM

7.2 - DESCRIPCION OF THE LUBRICATION SYSTEM

DESCRIPTION

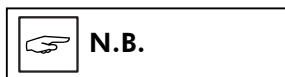
- Lubrication is the semi-wet crankcase type.
- The oil is not contained in the front part of the crankcase (1).
- The gearbox (2) is used as an oil tank.
- The pump (3) is driven by the clutch via an intermediate gearing (4).
- The pump is fitted with two rotors made of sintered material:
 - One 13 mm thick rotor, for oil suction.
 - One 8.5 mm thick rotor, for pumping.



N.B.

THE OIL PUMP IS A DOUBLE ROTOR PUMP WITH EACH ROTOR PUMPING SEPARATELY.

- The suction is from:
 - The front of the crankcase (crankshaft housing).
 - The rear of the crankcase (gearbox).
- Pumping is:
 - To the oil filter (classic circuit).
 - To the gearbox.

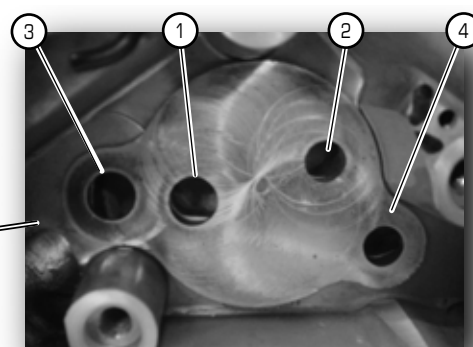
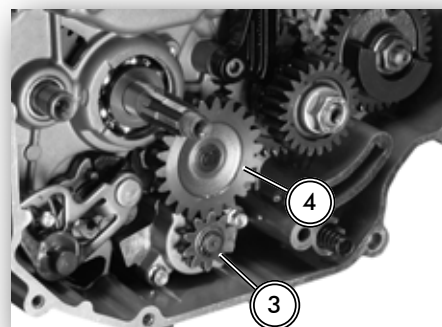
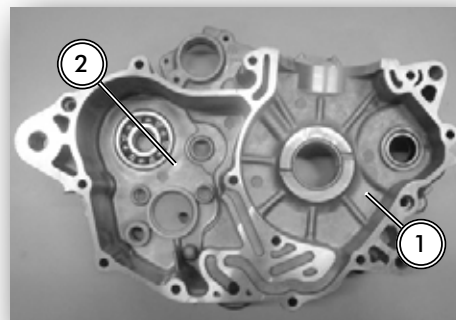


N.B.

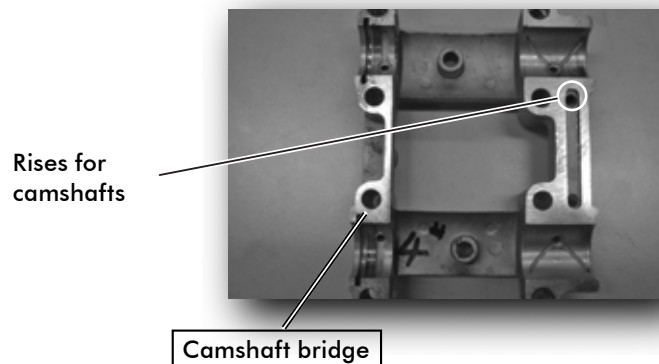
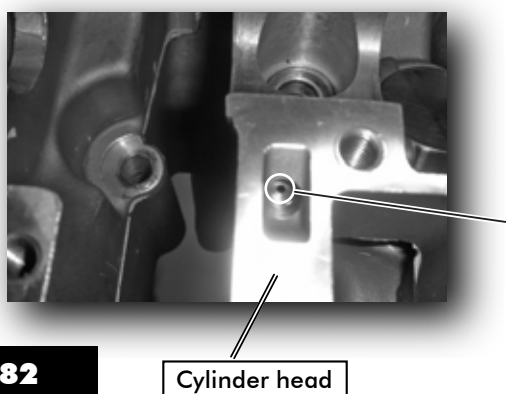
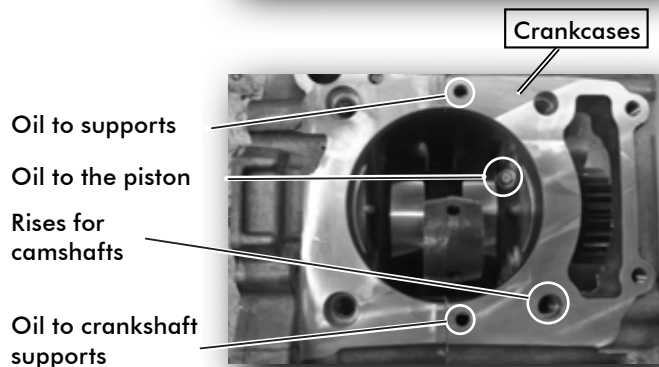
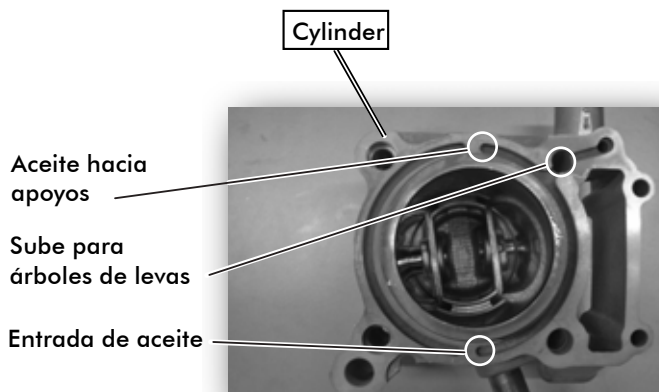
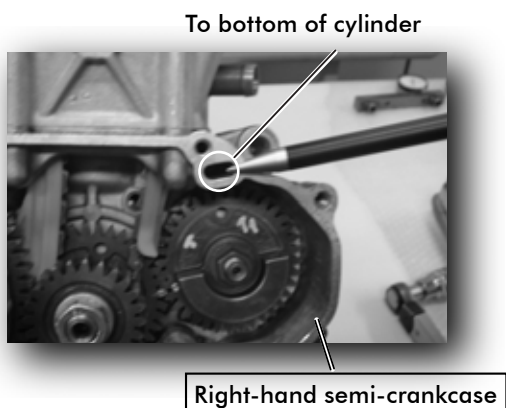
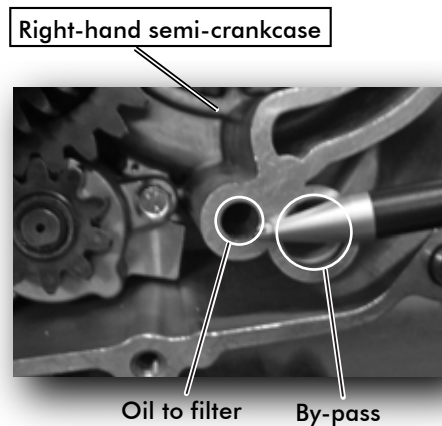
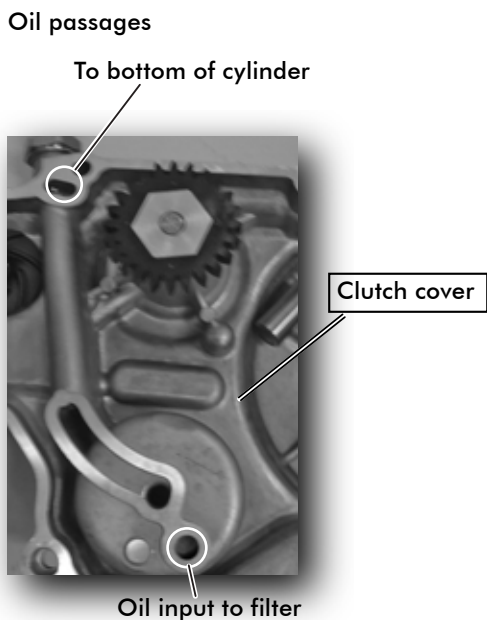
TO CHECK THE PUMP, SEE THE INSPECTING ENGINE ELEMENTS SECTION.

- (1) Crankshaft breather.
- (2) To the gearbox.
- (3) Suction from the gearbox.
- (4) To the filter, lubrication technical part.

Right-hand semi-crankcase (without the pump).

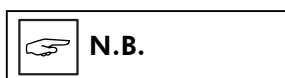


7 - LUBRICATION SYSTEM



7 - LUBRICATION SYSTEM

- The maximum pressure is 4.2 bars, and at the top of the engine the pressure is 1 bar.



N.B.

TO CHECK THE PRESSURE, CONNECT A MANOMETER INSTEAD OF THE SENSOR.

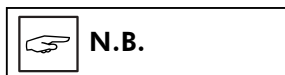
- The elements of the circuit are:

- Pre-filter (1).

- Filter (2).

- Pressure overload by-pass valve (3).

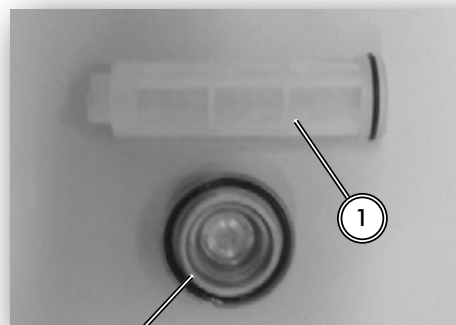
- Oil pressure sensor (4).



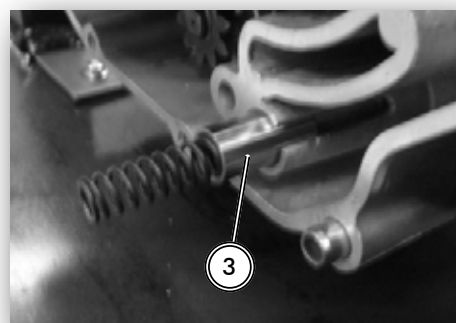
N.B.

TO CHECK THE OIL PRESSURE SENSOR, MEASURE ITS ELECTRICAL CONTINUITY. WITHOUT PRESSURE IT SHOULD GIVE A CONTINUITY READING, AND WITH PRESSURE AN OPEN CIRCUIT.

OIL PRESSURE SENSOR TIGHTENING TORQUE 1.2-1.4 KGFM (12-14 NM)(12-14 N.m)



Pre-filter plug (oil drain plug).

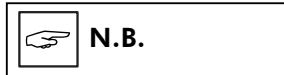


8 - CHASSIS

8.1 - INSPECTING THE WHEELS	185
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8 - CHASSIS

8.1 - INSPECTING THE WHEELS



N.B.

BALANCE THE WHEEL WHENEVER A TYRE OR WHEEL HAS BEEN FITTED OR REPLACED.



WARNING

NEVER TRY TO CARRY OUT REPAIRS TO A WHEEL RIM.

1. Inspect:

- The wheel shaft.
(Rolling it on a flat surface).

Warping => Renew.



WARNING

NEVER TRY TO STRAIGHTEN A WARPED SHAFT.

Wheel shaft warp limit:
0,2 mm

2. Inspect:

- The tyres.

Damaged/worn => Renew

See the "INSPECTING THE TYRES" section.

3. Check the wheel rims:

- Spokes.

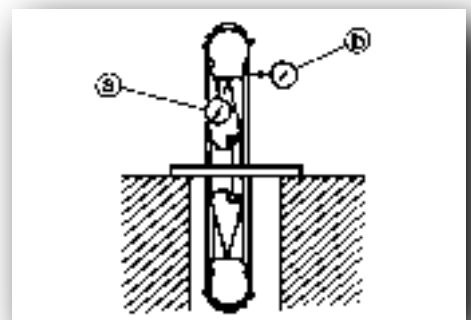
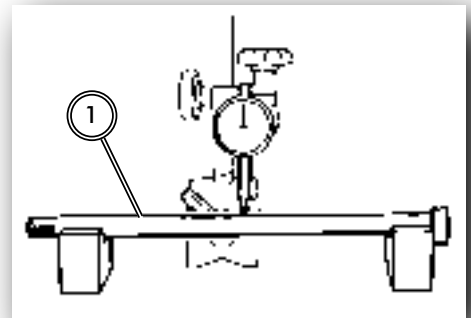
Warping/damage => Renew

Above that specified => Renew

Distortion limits for the front wheel.

Radial (a):
0,6 mm

Axial (b):
0,5 mm



8 - CHASSIS

4. Check:

- Front wheel bearings.

Bearings allow play in the wheel hub or the wheel does not turn freely => Renew.

- Retaining rings.

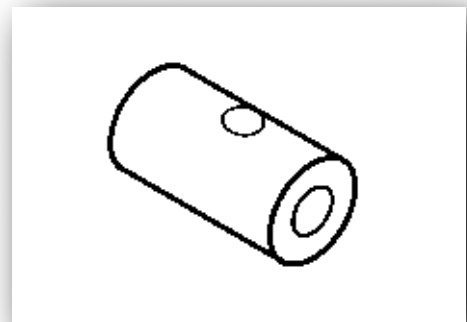
Damaged/worn => Renew



5. Inspect:

- The spacer.

With scratches/worn => Renew the spacer and the retaining ring.



8 - CHASSIS

8.2 - FRONT WHEEL

WARNING

ENSURE THAT THE MOTORCYCLE IS SUPPORTED FIRMLY AND THERE IS NO RISK OF IT FALLING.

PUT THE MOTORCYCLE ON A FLAT SURFACE.

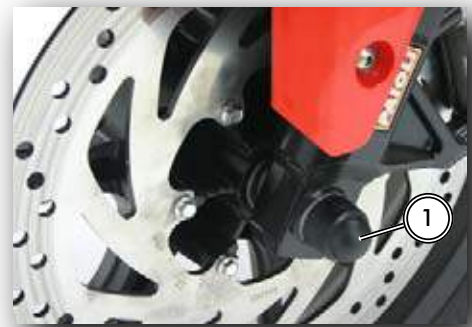
CAUTION

IF THE BRAKE LEVER/PEDAL IS APPLIED WITHOUT THE WHEEL BEING FITTED, THE CORRESPONDING SYSTEM WILL HAVE TO BE BLED.

REMOVAL

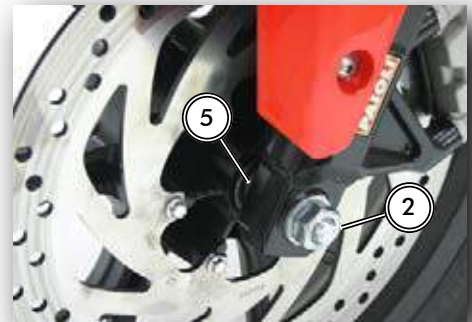
1. Remove:

- The brake calliper.
- The nut cap (1).



2. Remove:

- The nut (2).



3. Loosen:

- The shaft brake bolt (3).

4. Remove:

- The front wheel shaft (4).
- The two spacers, one on each side (5).
- The take-off (6).
- The front wheel.

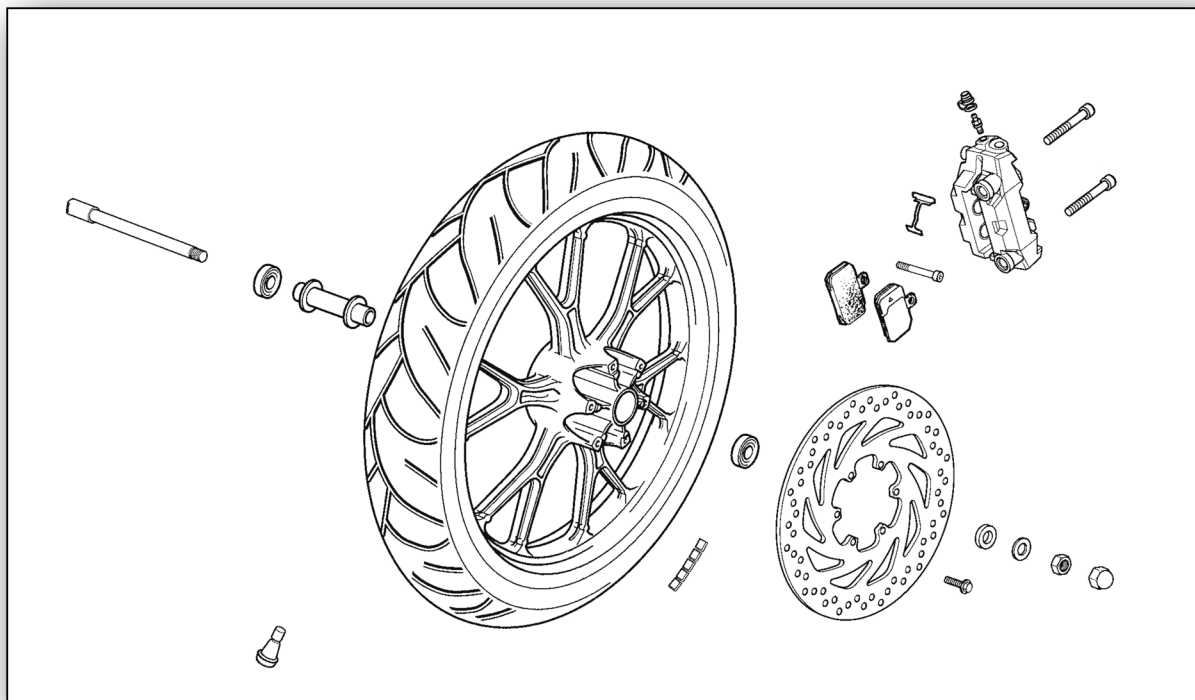


5. Remove:

- The brake disk.

8 - CHASSIS

FITTING THE FRONT WHEEL



Take note of the following points:

1. Lubricate:

- Wheel shaft.
- Rodamientos.
- Retenes.

Recommended lubricant: Lithium soap based grease.

2. Fit:

- The front wheel.
- Front wheel shaft.

3. Tighten:

- The shaft nut.
- Brake calliper bolts.
- Shaft brake bolt.
- Brake disk bolts.

Shaft nut: 70-80 Nm (7-8 kgfm)

Brake calliper bolts: 35-40 Nm (3.5-4.0 kgfm). Apply Loctite 243-type thread sealant.

Shaft brake bolt: 17-19 Nm (1.7-1.9 kgfm)

Brake disk bolts: 10-12 N.m (1,0-1,2 kgf.m). Apply Loctite 243-type thread sealant.



WARNING

BEFORE TIGHTENING THE WHEEL SHAFT, PUSH THE FRONT FORKS DOWN SEVERAL TIMES, HOLDING THE HANDLEBARS, TO CHECK THEIR OPERATION.

ENSURE THAT THE SPEEDOMETER CABLE GUIDE IS CORRECT.

4. Check:

- Functioning of the front brake.

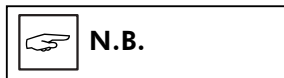
Irregular functioning => Dismantle or check again.

- Brake lever play.

See the "ADJUSTING THE FRONT BRAKES" section.

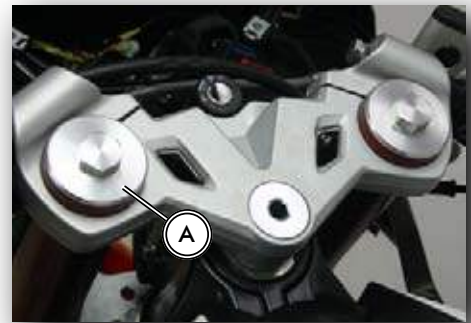
8 - CHASSIS

8.3 - FRONT SUSPENSION



N.B.

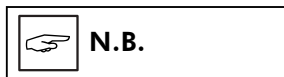
THE LEFT-HAND BAR HAS A SUSPENSION SPRING INSIDE. THE RIGHT-HAND BAR ONLY ACTS AS A HYDRAULIC DAMPER (IT HAS NO SPRING).



REMOVAL

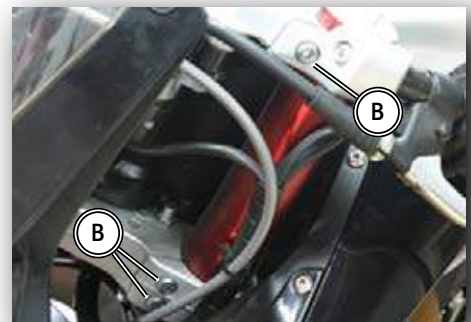
1. Firstly remove:

- * The front wheel.



N.B.

LOOSEN THE TOP LOCKING BOLT BEFORE REMOVING THE FORKS FROM THE PLATES. THESE WILL PREVENT THEM FROM MOVING ON UNSCREWING THE TOP BOLT.



1. Unscrew:

- The top locking bolt (A).

2. Unscrew:

- The bolts from the plates (B).

3. Remove:

- The fork arm from the plates.
- The top locking bolt, holding the locknut.



CAUTION

PLACE A PROTECTOR BETWEEN THE BAR AND THE SPANNER TO AVOID DAMAGING THE FORMER.



4. Position:

- A suitable sized container in which to drain off the hydraulic fluid from the bar (pump the fork stem assembly in order to ensure it is completely drained).



8 - CHASSIS

5. Separate:

- The bar firmly from the fork stem.



6. Extract:

- The dust-guard.



7. Extract:

- The safety circlip.



8. Extract:

- The oil seal.



PLACE A PROTECTOR BETWEEN THE BAR AND THE SPANNER TO AVOID DAMAGING THE FORMER.

9. Clean and degrease:

- All the front suspension components, so that they can be subsequently checked.



8 - CHASSIS

INSPECTING THE FRONT FORKS

1. Check:

- The degree of wear on the suspension bar guide bush. Renew it in the event of it being damaged on over 30% of its total surface.

- With the aid of some X-shaped chocks and a comparison meter fitted on a fixed support, determine the degree of wear on the bar.



Service limit:

0,4 mm.

- Clean and degrease all the elements making up the assembly, ready for reassembly.

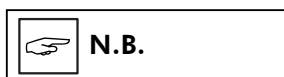
Outside that specified => Renew.

Within that specified => Refit.



2. Fit:

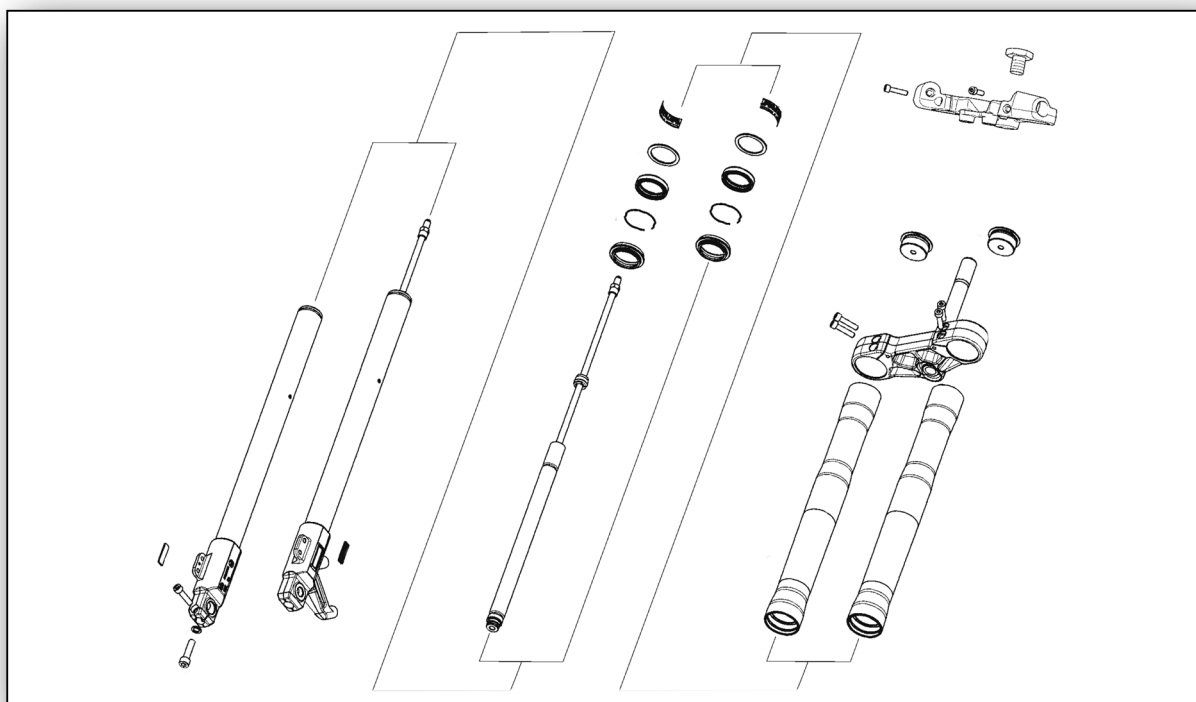
- The forks (see section).
- The front wheel (see section).



SUSPENSION	cm ³ OIL / BAR	TYPE OF OIL
PAIOLI	390 ml ± 5 ml	SAE 7,5 W

8 - CHASSIS

FITTING FRONT SUSPENSION



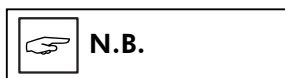
8 - CHASSIS

FRONT SUSPENSION

FITTING

1. Position:

- The oil seal.



N.B.

APPLY A LITTLE HYDRAULIC FLUID TO THE EDGES OF THE OIL SEAL TO AID ITS FITTING.

2. Insert:

- The oil seal into the fork arm (2) using the tool (1).

Use a 52Ø tool for bearings (1).

3. Fit:

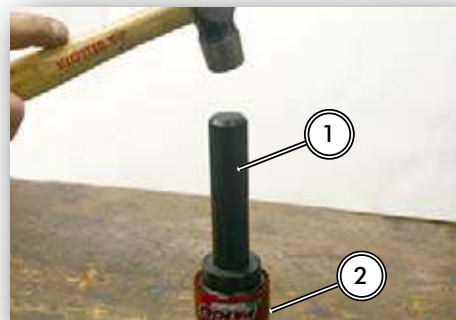
- The safety circlip.

4. Fit:

- The dustguard.

5. Fit:

- The bar in the fork arm.



8 - CHASSIS

6. Insert:

- Hydraulic fluid.

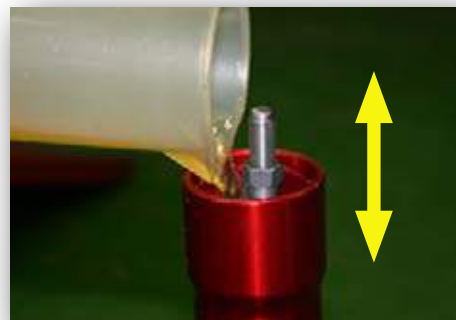
Quantity of oil: 390 ml \pm 5 ml.

Type of oil: SAE 7.5 W



N.B.

AS THE FLUID IS BEING INSERTED, PUMP THE STEM UP AND DOWN TO EXPEL THE AIR.



7. Fit:

- The top locking bolt, holding the locknut.

Locknut

17,6 – 21,5 N.m (1,76 – 2,15 kgf.m)



CAUTION

PLACE A PROTECTOR BETWEEN THE BAR AND THE SPANNER TO AVOID DAMAGING THE FORMER.



8. Fit:

- The top locking bolt to the fork arm.



N.B.

APPLY A THIN LAYER OF HYDRAULIC FLUID TO THE O-RING (3).



9. Fit:

- The fork arms onto the plates.

10. Tighten:

- The plate bolts.
- The top locking bolt.

Tightening torques for the fork assembly elements:

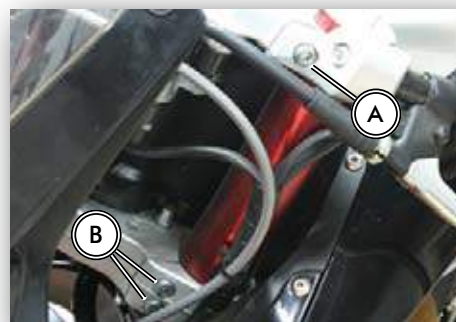
The top plate closing device (A-B)

17 – 19 N.m (1,7 – 1,9 kgf.m)



CAUTION

RESPECT THE TIGHTENING TORQUES TO AVOID DISTORTING THE FORK ARM.



8 - CHASSIS

INSPECTING THE STEERING COLUMN

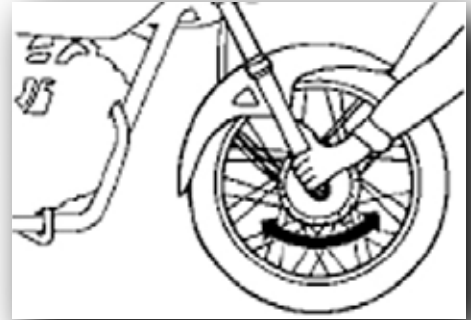
1. Raise:

- The front wheel by putting a suitable support under the engine.

2. Hold:

- The end of the front forks and gently swing the fork assembly.

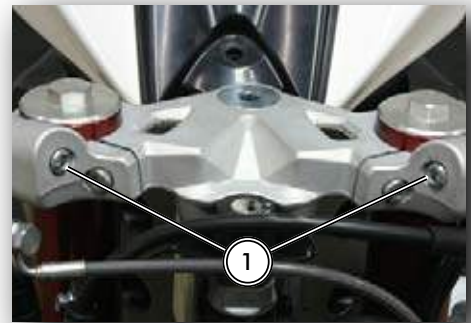
Loose => Adjust the steering column.



8.4 - STEERING

1. Remove:

- The semi-handlebars (1).

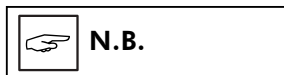


2. Remove:

- The top plate and the semi-handlebars fitted.
- The top plate nut (2).

Top plate nut:

30 – 35 N.m (3 – 3,5 kgf.m).



N.B.

THIS MACHINE'S STEERING BEARINGS ARE HOUSED DIRECTLY IN THE CHASSIS.



3. Remove:

- The 3 nuts (3).
- The steering bearings.
- If they are in poor condition, change them.



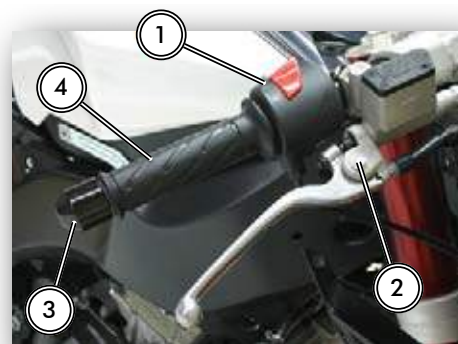
8 - CHASSIS

DISMANTLING THE SEMI-HANDLEBARS

RIGHT-HAND SEMI-HANDLEBAR

1. Remove:

- The starter switch assembly (1).
- The front brake control assembly (2).
- The handlebar counterweight (3).
- The throttle twist grip (4).



2. Remove:

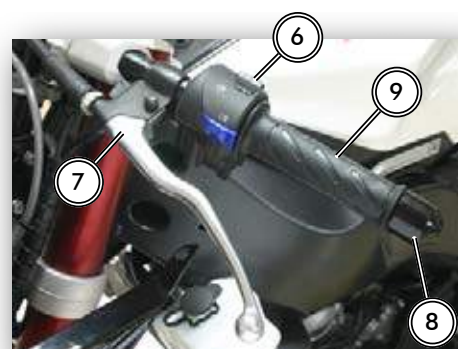
- The semi-handlebar securing bolts (5).
- The semi-handlebar.



LEFT-HAND SEMI-HANDLEBAR

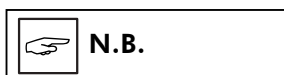
3. Remove:

- The light switch assembly (6).
- The clutch lever assembly (7).
- The handlebar counterweight (8).
- The left-hand handlebar grip (9).

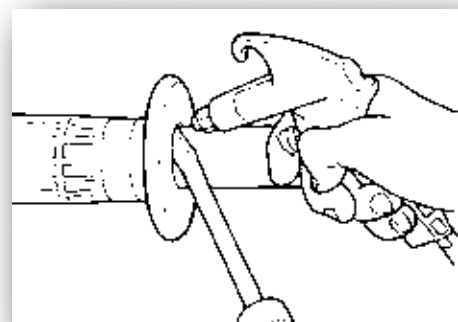


4. Remove:

- The semi-handlebar securing bolts (10).
- The semi-handlebar.



TO REMOVE THE HANDLEBAR GRIP, USE COMPRESSED AIR TO BLOW BETWEEN THE HANDLEBAR AND THE SIDE IN CONTACT WITH THE ADHESIVE.



8 - CHASSIS

FITTING THE SEMI-HANDLEBARS

1. Fit:

- The components corresponding to the side to be fitted.

2. Fit:

- The semi-handlebars onto the top plate.

Fitting torques:

- The semi-handlebar nut to the plate:
17 – 19 N.m with sealer (1,7 – 1,9 kgf.m)
- Counterweight to handlebars:
3,5 – 4,5 N.m (0,35 – 0,45 kgf.m)



N.B.

APPLY A THIN LAYER OF LITHIUM SOAP BASED GREASE TO THE RIGHT HAND END OF THE HANDLEBARS.



WARNING

CHECK THE OPERATION OF THE THROTTLE TWIST GRIP.

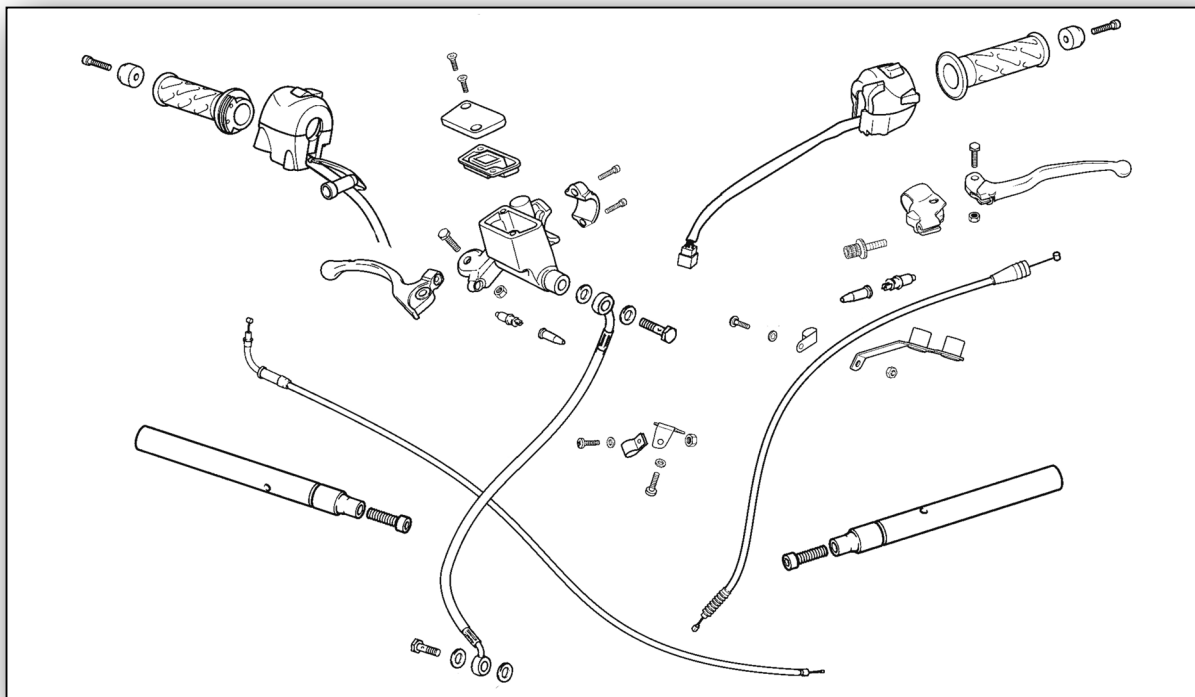
3. Adjust:

- The throttle cable play.

4. Check:

- The functioning of the brakes.

FITTING THE SEMI-HANDLEBARS ASSEMBLY



Reverse the dismantling procedure

8 - CHASSIS

8.5 - REAR WHEEL

WARNING

ENSURE THAT THE MOTORCYCLE IS SUPPORTED FIRMLY, AND THERE IS NO RISK OF IT FALLING.

PUT THE MOTORCYCLE ON A FLAT SURFACE.

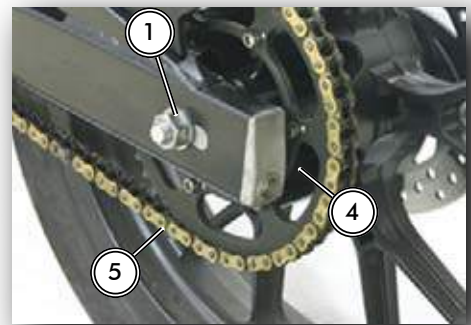
CAUTION

IF THE BRAKE LEVER/PEDAL IS APPLIED WITHOUT THE WHEEL BEING FITTED, THE CORRESPONDING SYSTEM WILL HAVE TO BE BLED.

REMOVAL

1. Remove:

- One of the 2 wheel shaft nuts (1).



2. Remove:

- Wheel shaft (2), releasing:
 - The brake calliper (3) and bracket.
 - The wheel.
 - The spacer (4) (left-hand side).
 - The chain (5).

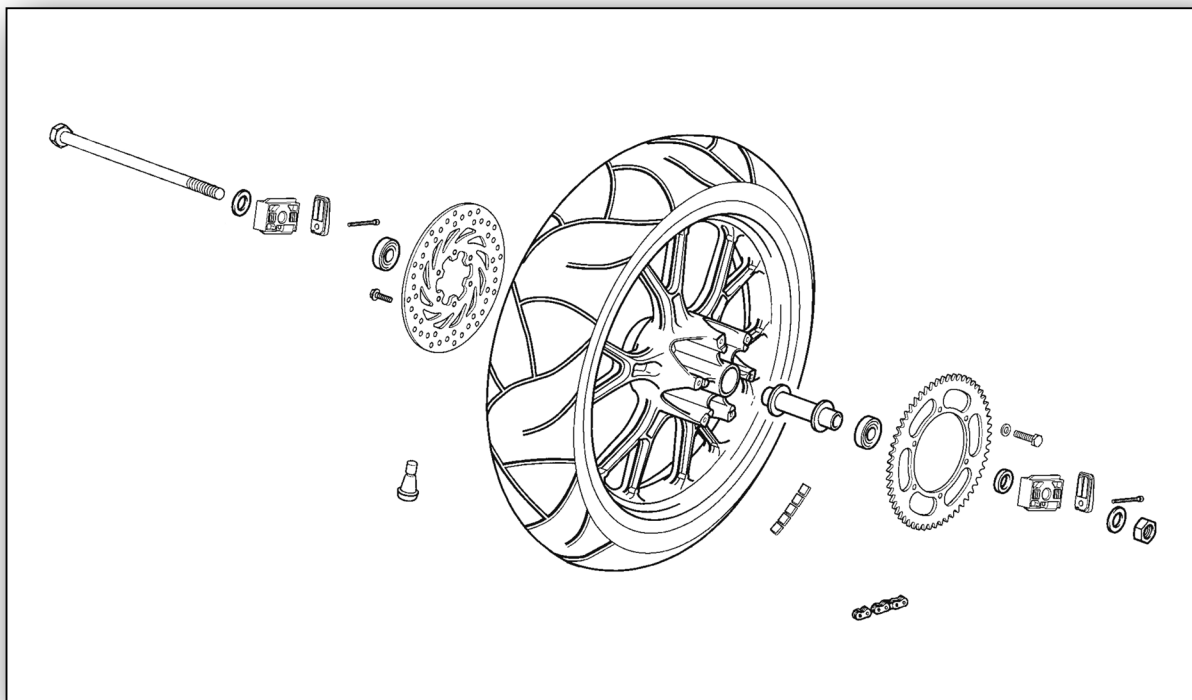


3. Remove:

- The brake disk.
- The drag plate.

8 - CHASSIS

FITTING THE REAR WHEEL



Take note of the following points:

1. Lubricate:

- The rear wheel shaft.
- The bearing.
- The retaining rings.

Recommended lubricant: Lithium soap based grease

2. Fit:

- Rear wheel.
- The rear wheel shaft.
- Calliper and bracket.
- Brake disk.
- Drag plate.
- The chain.

See the "ADJUSTING THE TRANSMISSION CHAIN" section.

3. Tighten:

- The shaft nuts.
- Disk bolts.
- Drag plate.

Shaft nut: 70-80 Nm (7-8 kgfm)

Disk bolts: 10-12 Nm (1.0-1.2 kgfm) - apply Loctite 243-type thread sealant.

Drag plate: 14-15 Nm (1.4-1.5 kgfm) - apply Loctite 243-type thread sealant.

4. Check:

- Rear brake functioning.

Irregular functioning => Dismantle or check again.

- Brake lever play.

See the "ADJUSTING THE REAR BRAKE" section.

8 - CHASSIS

8.6 - REAR SUSPENSION

INSPECTING THE REAR SUSPENSION

1. Inspect:

- The swinging arm play.

Play => Tighten the joint shaft nut or replace the bushes.

- Swinging arm vertical movement

Irregular movement/warping/stains => Renew the bushes.

- Swinging arm vertical movement

2. Inspect:

- The shock absorber.

Fluid leaks/damage => Renew the shock absorber.



WARNING

ENSURE THAT THE MOTORCYCLE IS SUPPORTED FIRMLY, AND THERE IS NO RISK OF IT FALLING.

PUT THE MOTORCYCLE ON A FLAT SURFACE.

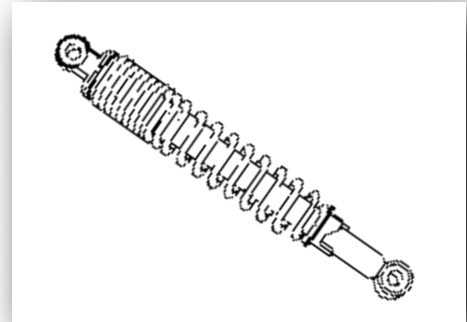
REMOVAL

1. Remove:

- The top bolt (left-hand side) securing the nut on the other end.

2. Remove:

- The bottom bolt.



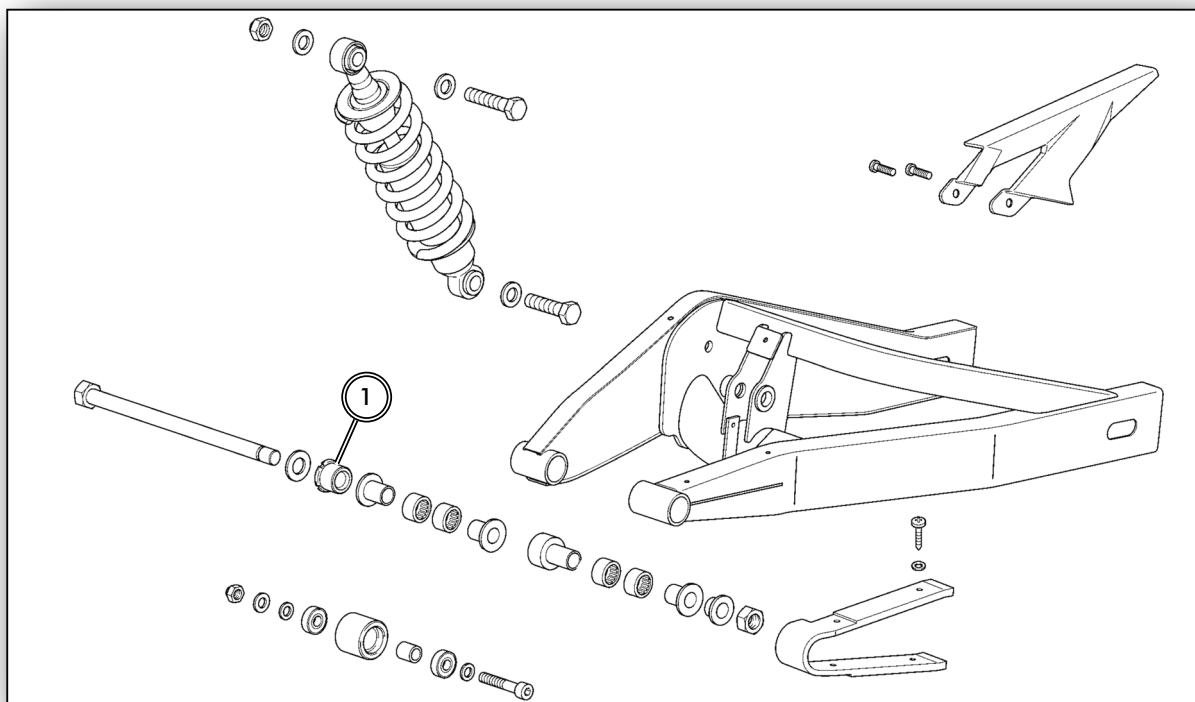
8 - CHASSIS

3. Remove:

- The shock absorber through the bottom cavity between the rear wheel and the exhaust pipe.



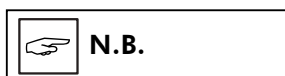
FITTING THE REAR SUSPENSION



Reverse the dismantling procedure

Shock absorber top securing device: 55-65 Nm (5.5-6.5 kgfm)

Shock absorber bottom securing device: 55-65 Nm (5.5-6.5 kgfm) - apply Loctite 243-type thread sealant.



USE TOOL CODE NO. 866714
TO ADJUST THE SWINGING
ARM NUT (1).

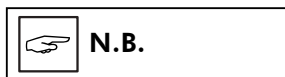
9 - BRAKING SYSTEM

9.1 - FRONT BRAKE	203
9.2 - REAR BRAKE	211

9 - BRAKING SYSTEM

9.1 - FRONT BRAKE

DISMANTLING BRAKE CALLIPER



N.B.

PLACE A RECIPIENT UNDER THE CALLIPER TO COLLECT THE BRAKE FLUID.

REMOVE THE CALLIPER FROM THE FORKS TO PREVENT BRAKE FLUID FROM FALLING ONTO THE DISK.

1. Unscrew:

- The two bolts (2) from the calliper and separate the calliper backwards from the disk.

2. Unscrew:

- The banjo bolt (1).

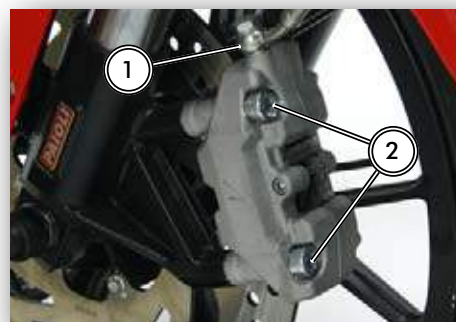


CAUTION

CLEAN UP ANY SPILT BRAKE FLUID IMMEDIATELY. BRAKE FLUID IS EXTREMELY CORROSIVE.

2. Press:

- The brake LEVER to empty the fluid.



FITTING THE BRAKE CALLIPER

1. Fit:

- The bottom end of the brake pipe and the calliper.
- Tighten to the nominal torque:

Brake calliper bolts:

35 ÷ 40 N.m (3,5 ÷ 4 kgf.m)

2. Tighten:

- The brake calliper banjo bolt.

Brake calliper banjo bolt:

25 ÷ 31 N.m (2,5 ÷ 3,1 kgf.m)

3. Refill:

- With brake fluid (DOT 4).



WARNING

USE DOT 4 BRAKE FLUID

4. Bleed:

- The brake system pipe.

Bleed nipple:

4 ÷ 8 N.m (0,4 ÷ 0,8 kgf.m)

9 - BRAKING SYSTEM

5. Check:

- The brake fluid level.
- The condition of the braking force to see if any resistance is noted or any loss of fluid.

Functioning correctly => Refit the fluid reservoir cover.

Brake fluid cover screws:

1 ÷ 1,5 N.m (0,1 ÷ 0,15 kgf.m)



WARNING

NEVER RIDE THE MOTORCYCLE UNTIL THE BRAKE LEVER IS OPERATING PROPERLY. PUMP THE LEVER UNTIL THE PADS ARE IN CONTACT WITH THE DISK. IF NOT, THE BRAKES WILL NOT WORK THE FIRST TIME THE LEVER IS USED.

REMOVING THE FRONT WHEEL CYLINDER

1. Unscrew:

- The banjo bolt (1).



WARNING

CLEAN UP ANY SPILT BRAKE FLUID IMMEDIATELY. BRAKE FLUID IS EXTREMELY CORROSIVE.

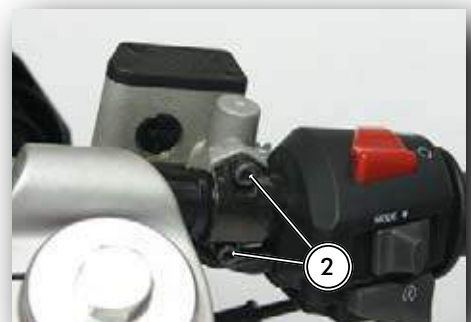


2. Remove:

- The bolts (2) and the front brake lever assembly.

3. Remove:

- The brake lever securing bolt and nut.
- The brake lever.



9 - BRAKING SYSTEM

FITTING THE FRONT BRAKE WHEEL CYLINDER

1. Fit:

- The banjo bolt (1).
- The 2 bolts and the front brake lever assembly.

2. Tighten:

- The brake pipe banjo bolt.
- The 2 bolts and the front brake lever assembly.

Brake hose banjo bolt:

25 ÷ 31 N.m (2,5 ÷ 3,1 kgf.m)

Brake lever assembly bolts:

8 ÷ 10 N.m (0,8 ÷ 1,0 kgf.m)

3. Refill:

- With brake fluid (DOT 4).



WARNING

USE DOT 4 BRAKE FLUID

4. Bleed:

- The brake system pipe.

Bleed nipple:

4 ÷ 8 N.m (0,4 ÷ 0,8 kgf.m)

5. Check:

- The brake fluid level.
- The condition of the braking force, to see if any resistance is noted or any loss of fluid.

Functioning correctly => Refit the fluid reservoir cover.

Brake hose banjo bolt:

1 ÷ 1,5 N.m (0,1 ÷ 0,15 kgf.m)



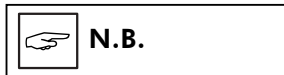
WARNING

NEVER RIDE THE MOTORCYCLE UNTIL THE BRAKE LEVER IS OPERATING PROPERLY. PUMP THE LEVER UNTIL THE PADS ARE IN CONTACT WITH THE DISK. IF NOT, THE BRAKES WILL NOT WORK THE FIRST TIME THE LEVER IS USED.

9 - BRAKING SYSTEM

CHECKING THE BRAKE LEVER MASTER CYLINDER (VISUAL CHECK):

- 1. Remove:**
 - The master cylinder (Extracting the front master cylinder).
- 2. Remove:**
 - The front master cylinder.
- 3. Check:**
 - That there are no scratches, corrosion or holes on the inner walls of the master cylinders and on the outer part of each piston.



N.B.

IF ANY DAMAGE IS DISCOVERED ON THE MASTER CYLINDER OR ON THE PISTON, CHANGE THEM.



CHECKING THE BRAKE CALLIPER MAIN CYLINDER

- 1. Check:**
 - That the anti-dust covers are not damaged.
 - Damaged => Renew them.
- 2. Check:**
 - That the piston return is not damaged.
 - Damaged => Renew it.

EXTRACTING THE FRONT BRAKE DISK

- 1. Remove:**
 - The front wheel (see section).
- 2. Unscrew:**
 - The mounting bolts (1).
- 3. Remove:**
 - The disk.



9 - BRAKING SYSTEM

FITTING THE FRONT BRAKE DISK

1. Position:

- The disk so that side (2) is facing outwards.



WARNING

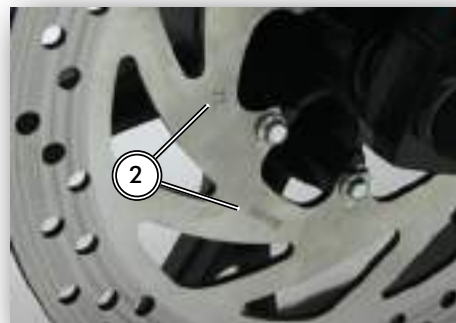
APPLY LOCTITE 243-TYPE
THREAD SEALANT TO THE
THREADS OF THE BRAKE DISK
MOUNTING BOLTS.

2. Tighten:

- The front brake disk mounting bolts (1).

Nominal tightening torque:

1,0-1,2 Kgf.m (10-12 N.m) Apply Locktite 243-type thread sealant.



WEAR TO THE FRONT BRAKE DISK

1. Check:

- The thickness of the disks (A) at the point where they are most worn.

- If the disk is more worn than specified in the service limit, renew it.

Measurement area (B).

- Presence of cracks or fissures.

Outside that specified => Renew it.

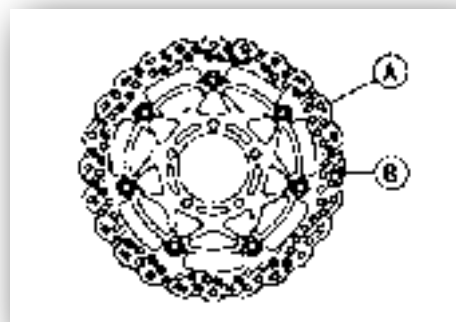
Standard brake disk thickness:

4 mm

Service limit:

3,50 mm

Outside that specified => Renew it.



9 - BRAKING SYSTEM

FRONT BRAKE DISK DISTORTION

1. Check:

- Place a dial gauge against the disk (A) as shown, and measure the disk's deviation from centre as the tyre is turned (B) by hand.

- If the deviation from centre exceeds the service limit, renew the disk.

Wear disk:

0,2 mm

Outside that specified => Renew it.



BLEEDING THE BRAKE SYSTEM PIPE

The brake fluid has a very low compression coefficient, with the result that almost all the movements of the brake lever are transmitted directly to the calliper for braking. Air however compresses easily. When air enters the brake system pipes, the movement of the brake lever is partially used up in compressing the air. This causes the lever to feel spongy and leads to a loss of braking power.



WARNING

BLEED AIR OUT OF THE BRAKE SYSTEM WHEN THE BRAKE LEVER FEELS SPONGY AFTER CHANGING THE BRAKE FLUID, OR WHEN THE BRAKE SYSTEM PIPE HAS BEEN LOOSENED FOR ANY REASON.

1. Remove:

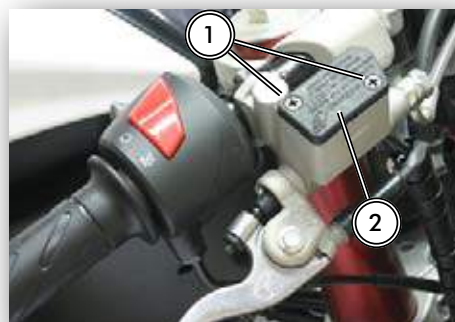
- Bolts (1).
- Reservoir cover (2).

2. Fill:

- The reservoir with brake fluid up to the top reservoir line.

3. Pump:

With the cover removed, pump the brake lever slowly several times until no bubbles can be seen rising through the liquid.



9 - BRAKING SYSTEM

4. Bleed:

- The air completely from the master cylinder using this procedure.

5. Remove:

- The transparent plastic cap from the bleed nipple (3) and refill from the other end of the hose (lever reservoir).

6. Repeat:

- This procedure until there is no air left emerging towards the bleed valve (3).

7. Pump:

- The brake lever until it becomes hard and holds the brakes down.

8. Open and close:

- The bleed valve (3) quickly while keeping the brake on.

9. Release:

- The brake.



N.B.

CHECK THE FLUID LEVEL FREQUENTLY DURING THE BLEEDING OPERATION AND REPLENISH THE RESERVOIR WITH BRAKE FLUID WHEN NECESSARY. IF THE RESERVOIR EMPTIES COMPLETELY OF BRAKE FLUID AT ANY TIME DURING THE BLEEDING PROCEDURE, PERFORM THE BLEEDING PROCEDURE ALL OVER AGAIN FROM THE BEGINNING, SINCE AIR WILL HAVE ENTERED THE PIPE.

TAP THE BRAKE PIPE LIGHTLY FROM THE CALLIPER TO THE RESERVOIR TO ACHIEVE A MORE COMPLETE BLEEDING.

10. Fit:

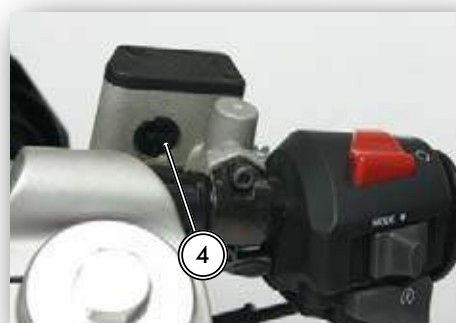
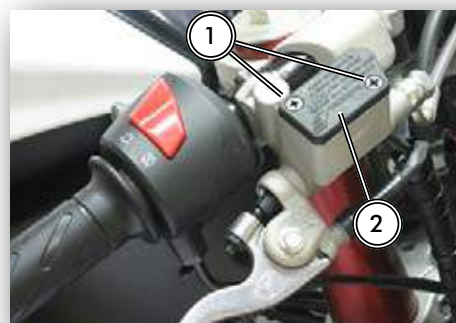
- The bleed valve cap (3).

11. Fit:

- The reservoir cover (2).
- The cover securing screws (1).

Brake fluid cover screws:

1 ÷ 1,5 N.m (0,1 ÷ 0,15 kgf.m)



9 - BRAKING SYSTEM

12. Tighten:

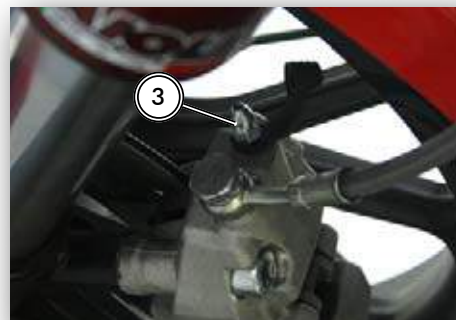
- The bleed valve (3).

Bleed nipple:

4 ÷ 8 N.m (0,4 ÷ 0,8 kgf.m)

13. Check:

- The brake fluid level through the inspection window (4).
- Once the bleeding process has been carried out, check the efficiency of the brake to see if there is any resistance or any fluid loss.



WARNING

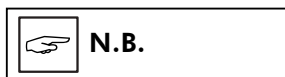
TAKE THE PRECAUTIONS LISTED BELOW:

- 1) NEVER RE-USE BRAKE FLUID.
- 2) DO NOT USE FLUID FROM A CONTAINER THAT HAS BEEN LEFT OPEN OR HAS BEEN LEFT UNUSED FOR A PROLONGED PERIOD OF TIME.
- 3) DO NOT MIX TWO TYPES OR BRANDS OF FLUID FOR USE IN THE BRAKE. THIS REDUCES THE BRAKE FLUID BOILING POINT AND MAY RESULT IN THE BRAKES NOT WORKING EFFICIENTLY. IN ADDITION, IT MAY CAUSE DETERIORATION OF THE BRAKE PARTS.
- 4) DO NOT LEAVE THE RESERVOIR CAP OFF AT ANY TIME, TO PREVENT CONTAMINATION OF THE FLUID.
- 5) DO NOT CHANGE THE FLUID IN RAINY OR VERY WINDY CONDITIONS.
- 6) EXCEPT ON THE BRAKE LININGS AND THE DISK, USE ONLY BRAKE FLUID, ISOPROPYLIC ALCOHOL OR ETHYL ALCOHOL FOR CLEANING BRAKE PARTS. DO NOT USE ANY OTHER TYPE OF LIQUID FOR CLEANING THESE PARTS. PETROL, ENGINE OIL OR ANY OTHER PETROLEUM DISTILLATE WILL CAUSE RUBBER PARTS TO DETERIORATE. IF OIL IS SPILT ON ANY PART, IT WILL BE DIFFICULT TO CLEAN COMPLETELY AND MAY DETERIORATE THE RUBBER USED IN THE DISK BRAKE.
- 7) ON HANDLING THE DISK BRAKE LININGS OR THE DISK, TAKE CARE TO ENSURE THAT NO BRAKE FLUID COMES INTO CONTACT WITH THEM. CLEAN ANY REMAINS OF BRAKE FLUID THAT ACCIDENTALLY COMES INTO CONTACT WITH THE LININGS OR WITH THE DISK WITH A SOLVENT WITH A HIGH INFLAMMATION POINT. DO NOT USE ONE THAT LEAVES GREASY RESIDUES. CHANGE THE PADS FOR NEW ONES IF THEY CANNOT BE CLEANED SATISFACTORILY.
- 8) BRAKE FLUID DESTROYS PAINTED SURFACES RAPIDLY. CLEAN UP ANY SPILT BRAKE FLUID IMMEDIATELY.
- 9) IF ANY OF THE BRAKE SYSTEM PIPE SECURING SYSTEMS OR THE BLEED VALVE OPENS AT ANY TIME, THE AIR MUST BE BLED FROM THE BRAKE SYSTEM.

9 - BRAKING SYSTEM

9.2 - REAR BRAKE

DISMANTLING THE BRAKE CALLIPER



N.B.

PLACE A CONTAINER UNDER THE CALLIPER TO COLLECT THE BRAKE FLUID.

1. Firstly remove:

- The rear wheel.

2. Unscrew:

- The two bolts (2) securing the calliper to the bracket.

3. Unscrew:

- The banjo bolt (1).



WARNING

CLEAN UP ANY SPILT BRAKE FLUID IMMEDIATELY. BRAKE FLUID IS EXTREMELY CORROSIVE.

4. Press:

- The brake pedal in order to drain the fluid.



ASSEMBLING BRAKE CALLIPER

1. Fit:

- The calliper to the bracket using the bolts (2).
- The calliper-bracket assembly to the swinging arm.
- The rear wheel (see section).

Nominal torque (wheel shaft):

70-80 N.m (7,0-8,0 kgf.m)

Rear brake calliper securing bolt

22-28 N.m (2,2-2,8 kgf.m) Loctite 638-type thread sealant applicator.

2. Tighten:

- The brake hose banjo bolt (1).

Brake hose banjo bolt:

25 ÷ 31 N.m (2,5 ÷ 3,1 kgf.m)

3. Refill:

- With brake fluid (DOT 4).



WARNING

USE DOT 4 BRAKE FLUID

9 - BRAKING SYSTEM

4. Bleed:

- The brake system pipe.

Bleed nipple:

- 4 ÷ 8 N.m (0,4 ÷ 0,8 kgf.m)

5. Check:

- The brake fluid level.
- The condition of the braking force to see if any resistance is noted or any loss of fluid.

Functioning correctly => Refit the fluid reservoir cover.

Brake fluid cover screws:

- 1 ÷ 1,5 N.m (0,1 ÷ 0,15 kgf.m)



WARNING

NEVER RIDE THE MOTORCYCLE UNTIL THE BRAKE LEVER IS OPERATING PROPERLY. PUMP THE LEVER UNTIL THE PADS ARE IN CONTACT WITH THE DISK. IF NOT, THE BRAKES WILL NOT WORK THE FIRST TIME THE LEVER IS USED.

DISMANTLING THE REAR BRAKE CYLINDER



N.B.

PLACE A CONTAINER UNDER THE CALLIPER TO COLLECT THE BRAKE FLUID.

REMOVE THE CYLINDER FROM THE BRACKET FIRST, TO PREVENT FLUID FROM FALLING.

1. Unscrew:

- The two bolts from the bracket (1).

2. Remove:

- The brake cylinder from the bracket.

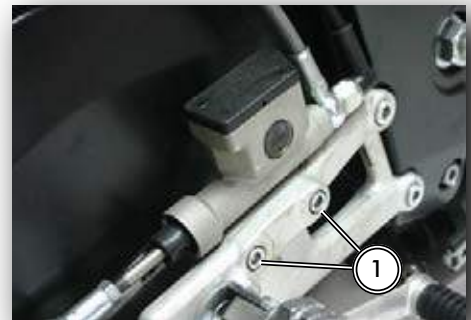
3. Unscrew:

- The banjo bolt (2).



WARNING

CLEAN UP ANY SPILT BRAKE FLUID IMMEDIATELY. BRAKE FLUID IS EXTREMELY CORROSIVE.



9 - BRAKING SYSTEM

FITTING THE REAR BRAKE WHEEL CYLINDER

1. Fit:

- The banjo bolt (1).
- Nominal tightening torque:

2. Apretar:

- El perno banjo (1) del manguito del freno.
- Los 2 tornillos (2) del soporte.

Brake hose banjo bolt:

25 ÷ 31 N.m (2,5 ÷ 3,1 kgf.m)

Bracket bolts:

10 ÷ 12 N.m (1,0 ÷ 1,2 kgf.m)

3. Refill:

- With brake fluid (DOT 4).



WARNING

USE DOT 4 BRAKE FLUID

4. Bleed:

- El tubo del sistema de frenado.

Purgador:

4 ÷ 8 N.m (0,4 ÷ 0,8 kgf.m)

5. Comprobar:

- El nivel del líquido de frenos.
- The condition of the braking force, to see if any resistance is noted or any loss of fluid.

Funcionamiento correcto => Cierre la tapa del depósito de líquido.

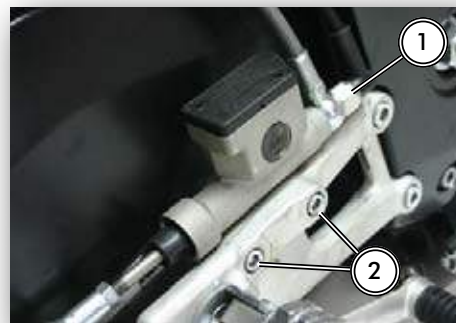
Brake hose banjo bolt:

1 ÷ 1,5 N.m (0,1 ÷ 0,15 kgf.m)



WARNING

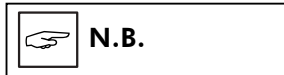
NEVER RIDE THE MOTORCYCLE UNTIL THE BRAKE LEVER IS OPERATING PROPERLY. PUMP THE LEVER UNTIL THE PADS ARE IN CONTACT WITH THE DISK. IF NOT, THE BRAKES WILL NOT WORK THE FIRST TIME THE LEVER IS USED.



9 - BRAKING SYSTEM

CHECKING THE BRAKE LEVER MASTER CYLINDER (VISUAL CHECK):

- 1. Remove:**
 - The master cylinder (Extracting the front master cylinder).
- 2. Remove:**
 - The front master cylinder.
- 3. Check:**
 - That there are no scratches, corrosion or holes on the inner walls of the master cylinders and on the outer part of each piston.



N.B.

IF ANY DAMAGE IS DISCOVERED ON THE MASTER CYLINDER OR ON THE PISTON, CHANGE THEM.



CHECKING THE BRAKE CALLIPER MAIN CYLINDER

- 1. Check:**
 - That the anti-dust covers are not damaged.
 - Damaged => Renew them.
- 2. Check:**
 - That the piston return is not damaged.
 - Damaged => Renew it.

EXTRACTING THE REAR BRAKE DISK

- 1. Remove:**
 - The front wheel (see section).
- 2. Unscrew:**
 - The mounting bolts (1).
- 3. Remove:**
 - The disk.



9 - BRAKING SYSTEM

FITTING THE REAR BRAKE DISK

1. Position:

- The disk so that side (2) is facing outwards.


WARNING

APPLY LOCTITE 243-TYPE
THREAD SEALANT TO THE
THREADS OF THE BRAKE DISK
MOUNTING BOLTS.

2. Tighten:

- The front brake disk mounting bolts (1).

Nominal tightening torque:

1,0-1,2 Kgf.m (10-12 N.m) Apply Locktite 243-type thread sealant.



WEAR TO THE REAR BRAKE DISK

1. Check:

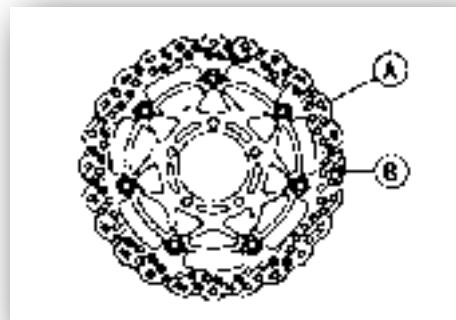
- The thickness of the disks (A) at the point where they are most worn.

- If the disk is more worn than specified in the service limit, renew it.

Measurement area (B).

- Presence of cracks or fissures.

Outside that specified => Renew it.



Standard brake disk thickness:

3,5 mm

Service limit:

3 mm

Outside that specified => Renew it.

9 - BRAKING SYSTEM

REAR BRAKE DISK DISTORTION

1. Check:

- Place a dial gauge against the disk (A) as shown, and measure the disk's deviation from centre as the tyre is turned (B) by hand.

- If the deviation from centre exceeds the service limit, renew the disk.

Wear disk:
0,2 mm

Outside that specified => Renew it.



9 - BRAKING SYSTEM

BLEEDING THE BRAKE SYSTEM PIPE

The brake fluid has a very low compression coefficient, with the result that almost all the movements of the brake lever are transmitted directly to the calliper for braking. Air however compresses easily. When air enters the brake system pipes, the movement of the brake lever is partially used up in compressing the air. This causes the lever to feel spongy and leads to a loss of braking power.



WARNING

BLEED AIR OUT OF THE BRAKE WHEN THE BRAKE LEVER FEELS SPONGY AFTER CHANGING THE BRAKE FLUID OR WHEN THE BRAKE SYSTEM PIPE HAS BEEN LOOSENED FOR ANY REASON.

1. Remove:

- Bolts (1).
- Reservoir cover (2).

2. Fill:

- The reservoir with brake fluid up to the top reservoir line.

3. Pump:

- With the cover removed, pump the brake lever slowly several times until no bubbles can be seen rising through the liquid.

4. Bleed:

- The air completely from the master cylinder using this procedure.

5. Remove:

- The transparent plastic cap from the bleed nipple (3) and refill from the other end of the hose (lever reservoir).

6. Repeat:

- This procedure until there is no air left emerging towards the bleed valve (3).

7. Pump:

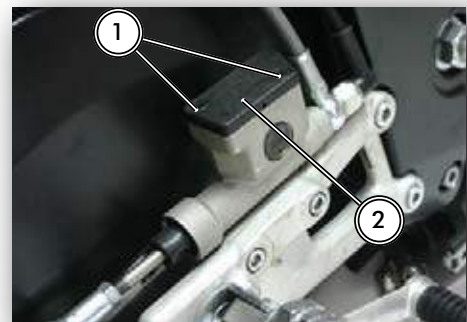
- The brake pedal until it becomes hard and holds the brakes down.

8. Open and close:

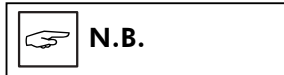
- The bleed valve (3) quickly while keeping the brake on.

9. Release:

- The brake.



9 - BRAKING SYSTEM



N.B.

CHECK THE FLUID LEVEL FREQUENTLY DURING THE BLEEDING OPERATION AND REPLENISH THE RESERVOIR WITH BRAKE FLUID WHEN NECESSARY. IF THE RESERVOIR EMPTIES COMPLETELY OF FLUID AT ANY TIME DURING THE BLEEDING OPERATION, PERFORM THE BLEEDING PROCEDURE ALL OVER AGAIN FROM THE BEGINNING, SINCE AIR WILL HAVE ENTERED THE PIPE.
TAP THE BRAKE PIPE LIGHTLY FROM THE CALLIPER TO THE RESERVOIR TO ACHIEVE A MORE COMPLETE BLEEDING.

10. Fit:

- The bleed valve cap (3).

11. Fit:

- The reservoir cover (2).
- The cover securing screws (1).

Brake fluid cover screws:

1-1,5 N.m (0,1-0,15 kgf.m)

12. Tighten:

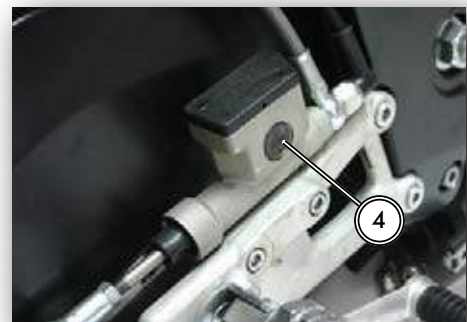
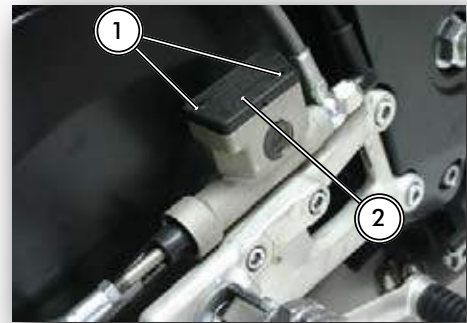
- The bleed valve (3).

Bleed nipple:

4-8 N.m (0,4-0,8 kgf.m)

13. Check:

- The brake fluid level through the inspection window (4).
- Once the bleeding process has been carried out, check the efficiency of the brake to see if there is any resistance or any fluid loss.



9 - BRAKING SYSTEM



TAKE THE PRECAUTIONS LISTED BELOW:

- 1) NEVER RE-USE BRAKE FLUID.
- 2) DO NOT USE FLUID FROM A CONTAINER THAT HAS BEEN LEFT OPEN OR HAS BEEN LEFT UNUSED FOR A PROLONGED PERIOD OF TIME.
- 3) DO NOT MIX TWO TYPES OR BRANDS OF FLUID FOR USE IN THE BRAKE. THIS REDUCES THE BRAKE FLUID BOILING POINT AND MAY RESULT IN THE BRAKES NOT WORKING EFFICIENTLY. IN ADDITION, IT MAY CAUSE DETERIORATION OF THE BRAKE PARTS.
- 4) DO NOT LEAVE THE RESERVOIR CAP OFF AT ANY TIME, TO PREVENT CONTAMINATION OF THE FLUID.
- 5) DO NOT CHANGE THE FLUID IN RAINY OR VERY WINDY CONDITIONS.
- 6) EXCEPT ON THE BRAKE LININGS AND THE DISK, USE ONLY BRAKE FLUID, ISOPROPYLIC ALCOHOL OR ETHYL ALCOHOL FOR CLEANING BRAKE PARTS. DO NOT USE ANY OTHER TYPE OF LIQUID FOR CLEANING THESE PARTS. PETROL, ENGINE OIL OR ANY OTHER PETROLEUM DISTILLATE WILL CAUSE RUBBER PARTS TO DETERIORATE. IF OIL IS SPILT ON ANY PART, IT WILL BE DIFFICULT TO CLEAN COMPLETELY AND MAY DETERIORATE THE RUBBER USED IN THE DISK BRAKE.
- 7) ON HANDLING THE DISK BRAKE LININGS OR THE DISK, TAKE CARE TO ENSURE THAT NO BRAKE FLUID COMES INTO CONTACT WITH THEM. CLEAN ANY REMAINS OF BRAKE FLUID THAT ACCIDENTALLY COMES INTO CONTACT WITH THE LININGS OR WITH THE DISK WITH A SOLVENT WITH A HIGH INFLAMMATION POINT. DO NOT USE ONE THAT LEAVES GREASY RESIDUES. CHANGE THE PADS FOR NEW ONES IF THEY CANNOT BE CLEANED SATISFACTORILY.
- 8) BRAKE FLUID DESTROYS PAINTED SURFACES RAPIDLY. CLEAN UP ANY SPILT BRAKE FLUID IMMEDIATELY.
- 9) IF ANY OF THE BRAKE SYSTEM PIPE SECURING SYSTEMS OR THE BLEED VALVE OPENS AT ANY TIME, THE AIR MUST BE BLED FROM THE BRAKE SYSTEM.

10 - ELECTRICAL SYSTEM

10.1 - GENERAL INDICATIONS	221
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10.3 - WIRING DIAGRAM	224
10.4 - CHARGING SYSTEM	225
10.5 - IGNITION SYSTEM	226
10.6 - STARTER MOTOR SYSTEM	227
10.7 - INSTRUMENT PANEL	228
10.8 - LIGHTING AND INDICATION	235
10.9 - FITTING NEW COMPONENTS	241
10.10-INSPECTING THE BATTERY AND FUSES	245

10 - ELECTRICAL SYSTEM

10.1 - GENERAL INDICATIONS

CHECKING CONNECTORS

Check for corrosion, damp etc. in the connectors.

1. Disconnect:

- Connectors.

2. Dry:

- Each of the terminals with compressed air.

3. Connect and disconnect:

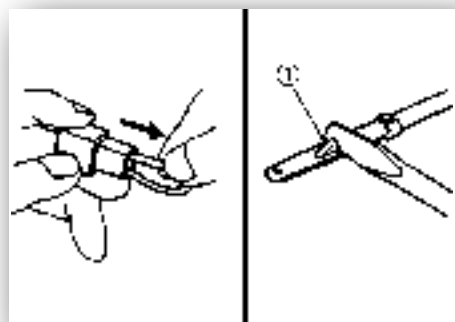
- The connector two or three times.

4. Check:

- Pull the conductor to check if it is loose.

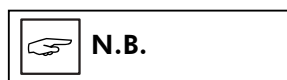
5. Check:

- If the terminal comes loose, bend the pin (1) and refit the terminal in the connector.



6. Connect:

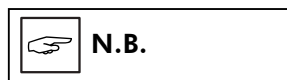
- The connector.



THE TWO PARTS OF THE CONNECTOR MAKE A SOUND WHEN THEY FIT TOGETHER.

7. Check:

- The continuity of the circuit with a Multimeter.

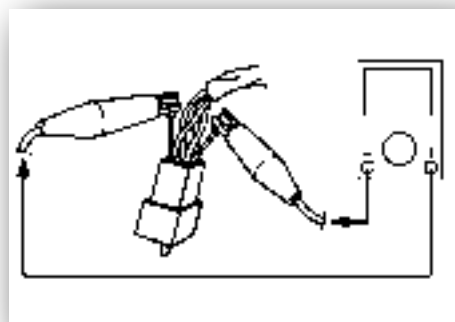
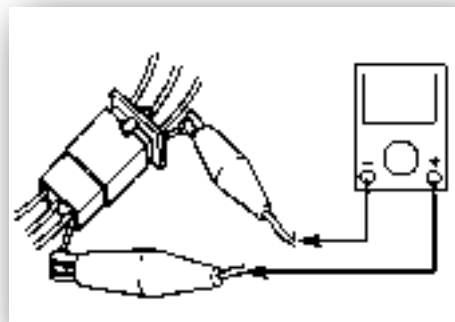


IF THERE IS NO CIRCUIT, CLEAN THE TERMINALS.

FOLLOW THE STEPS FROM (1) TO (7) ABOVE ON INSPECTING THE ELECTRICAL SYSTEM.

AS A PROVISIONAL SOLUTION, USE A CONTACT CLEANER.

USE THE MULTIMETER AS SHOWN IN THE FIGURE.



10 - ELECTRICAL SYSTEM

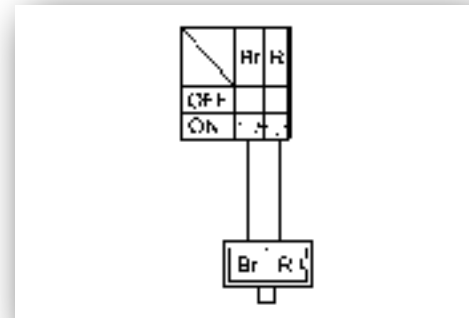
SWITCH CONNECTIONS SHOWN IN THIS MANUAL

This manual contains connection tables like the one in the figure on the left, showing the switch terminal connections (main switch, brake switch, light switch, etc.).

The column on the far left indicates the different switch positions, the top line indicates the colours of the conductors connected to the switch terminals.

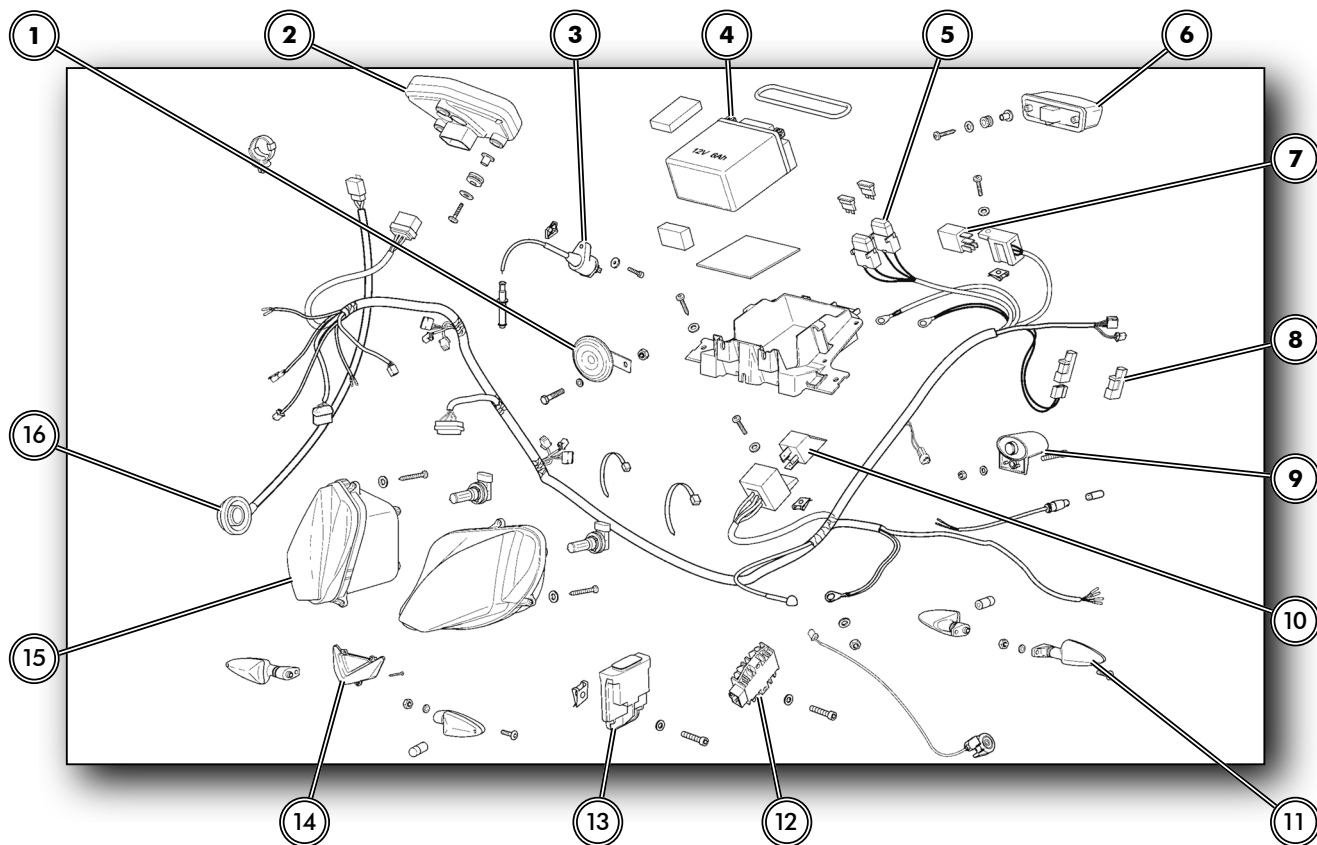
"○-○" indicate that the terminals that have continuity, i.e. a closed circuit with the switch in a particular position.

In this table:
"BR and R" have a closed circuit with the switch in the "ON" position.

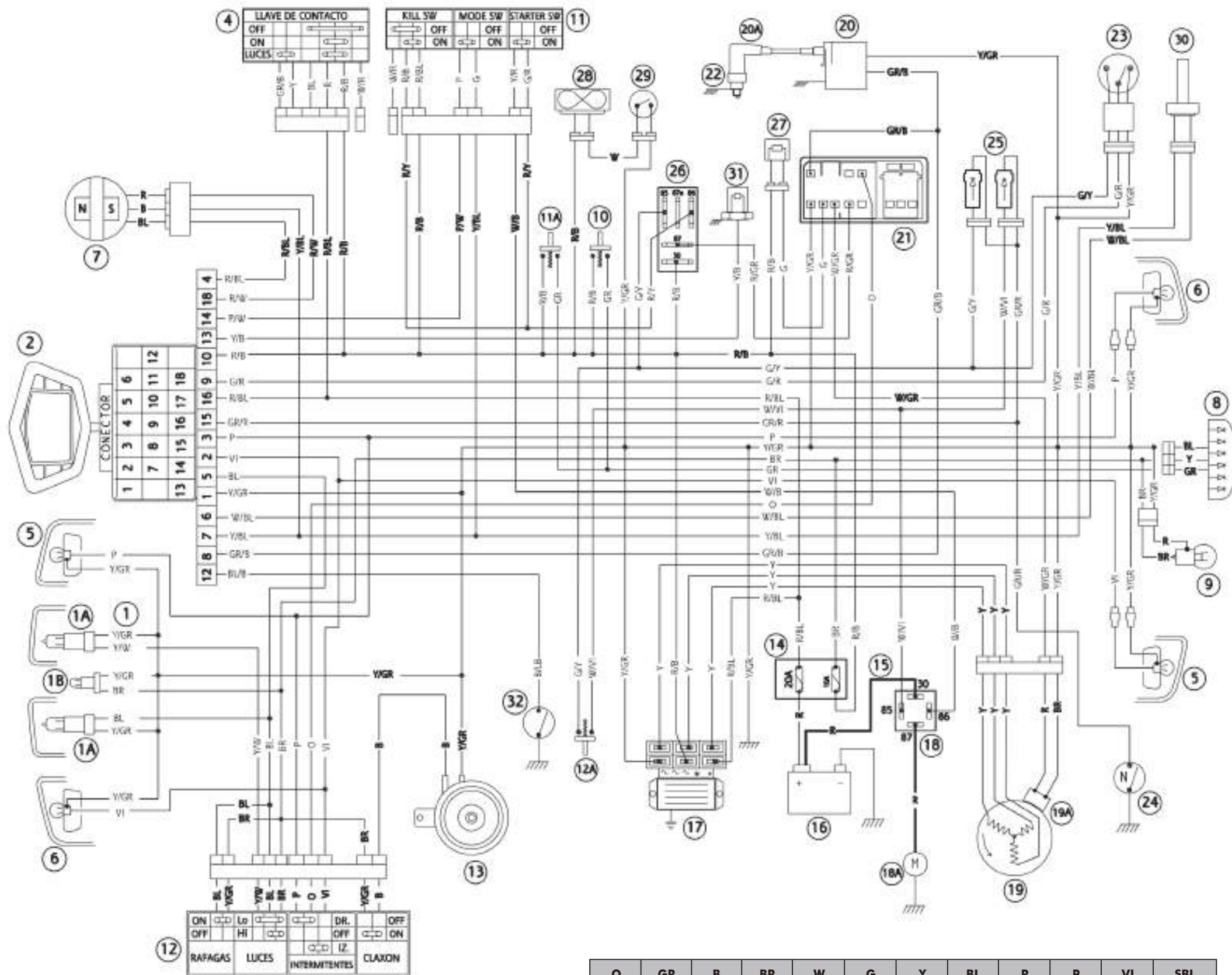


10 - ELECTRICAL SYSTEM

10.2 - LOCATING ELECTRICAL COMPONENTS



- 1 1 HORN
- 2 2 INSTRUMENT PANEL
- 3 3 HT COIL ASSY.
- 4 4 BATTERY
- 5 5 FUSES
- 6 6 INDICATOR LIGHT
- 7 7 MAIN RELAY
- 8 8 DIODE
- 9 9 NUMBER PLATE LIGHT
- 10 10 STARTER RELAY
- 11 11 TURN INDICATORS
- 12 12 REGULATOR
- 13 13 CDI UNIT
- 14 14 SIDELIGHT ASSY.
- 15 15 HEADLIGHT ASSY.
- 16 16 TAKE-OFF ASSY.



1	Headlight assembly
1A	Bulb 12V 55W H11
1B	Led
2	Speedometer
3	Led lighting bulb c/Km.
3A	Led neutral pilot light
3B	Led turn indicator control pilot light
3C	Led high beam control pilot light
3D	Led oil indicator
3E	Led fuel sensor
3F	Led water temp
4	Keyswitch
5	Front right- rear left turn ind. - indicator bulb 12V 10W
6	Front left - rear right turn ind. - Indicator bulb 12V 10W
7	Unit drive
8	Taillight leds
9	License plate light assembly bulb 12V 5W din
10	Brakelight button
11	Start button
11A	Brakelight button
12	Turn lights indicators and horn switch
12A	Clutch button
13	Horn
14	Fuse 12v 20 amp
15	Fuse 12v 10 amp.
16	Battery 12v 6 amp.
17	AC regulator
18	Starter motor contactor
18A	Starter motor
19	Electronic magneto
19A	Pick-up
20	Ignition coil and spark cover assembly
21	Electronic ignition device
22	Spark
23	Side stand switch
24	Neutral Sensor
25	Diodo
26	Main relay
27	Electric choke
28	Ventilator
29	Termocontact ventilator
30	Fuel sensor
31	Water temp sensor
32	Oil lever sensor

O	GR	B	BR	W	G	Y	BL	R	P	VI	SBL
Orange	Green	Black	Brown	White	Gray	Yellow	Blue	Red	Pink	Violet	Blue sky

10 - ELECTRICAL SYSTEM

10.4 - CHARGING SYSTEM

COMPONENTS

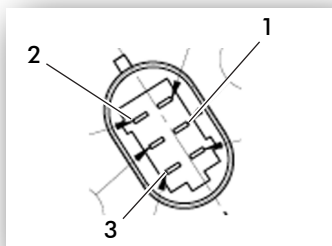
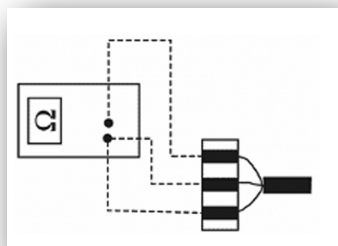
The main elements of the charging system are:

- Magneto: This is a three-phase element generating alternating current.
- Current rectifying regulator: This has the job of rectifying the alternating current generated by the magneto to direct current in order to charge the battery. In addition it regulates the voltage received by the battery between a minimum and maximum value.
- Three-phase system with a power rating of 200W.
- DC voltage produced at the regulator output:

13 -15v at 8,000 rpm

Stator resistance between phases:
0,4 Ω +/- 10%.

Check on the magneto side of the connector between 1, 2 and 3 (3 measurements).



- AC voltage measured between the phases at the regulator input connector:

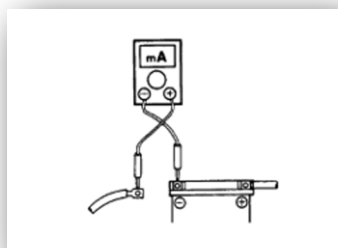
1,700 rpm (idling): 25v
5,000 rpm: 60v.



CURRENT LEAKAGE

- With the ignition key in the OFF position, connect the ammeter in series between the negative battery terminal and the negative battery cable.

- The readout value must be less than 1mA = 0.001A.



10 - ELECTRICAL SYSTEM

10.5 - IGNITION SYSTEM

DESCRIPTION OF THE SYSTEM

Logic of the system

- The fundamental parameter is the rpm reading from the engine revs sensor (pick-up)
- Based on the information from this sensor, the CDI unit calculates the moment in which the spark plug should fire (ignition advance).

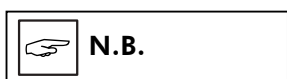
Components

- Engine RPM sensor (pick-up)
- Ignition coil
- Ignition unit (CDI unit)
- Main relay

Description of components

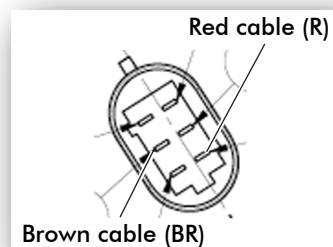
- Engine RPM sensor (pick-up)

Sensor resistance: $105-124\Omega$ a $20^{\circ}C$
(magneto side connector between R and BR cable).



N.B.

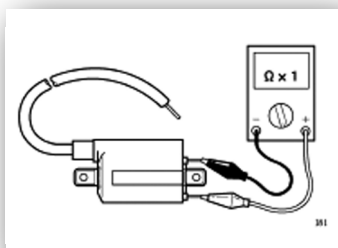
CHECK THE INSULATION TO EARTH OF THE REV SENSOR (PICK-UP).



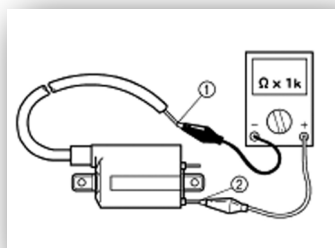
- Ignition coil

Resistance of primary coil: between the two terminals
 $0,21\ \Omega \ +/-\ 0,025\ \Omega$ a $25\ +/-\ 5^{\circ}C$

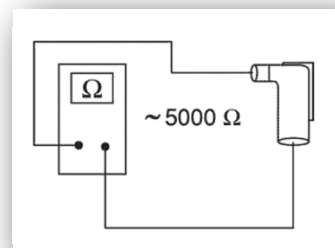
Resistance of secondary coil between the end of the spark plug cable and the primary connector (where the Y/GR cable is connected).
 $3,1\ K\Omega \ +/-\ 0,31\ K\Omega$ a $25\ +/-\ 5^{\circ}C$



Primary coil



Secondary coil



Spark plug connector cap
resistance 5K at $20^{\circ}C$

10 - ELECTRICAL SYSTEM

- Ignition unit (CDI unit)

Current discharge to the primary winding of the ignition coil via the Green/Black (GR/B) cable.

The unit receives power (+) from the main relay via the Red/Green (R/GR) cable.

The unit's earth connection is via the Yellow/Green (Y/GR) cable.



- Main relay

Its job is to give a signal to the ignition unit to generate the electrical spark when the neutral, clutch and prop-stand switches are in the "authorised" positions.

It has four pins or terminals:

- 85 excitation coil earth
- 86 excitation coil positive
- 30 positive supply
- 87 voltage output



10.6 - STARTER MOTOR SYSTEM

COMPONENTS

- Battery
- Main fuse
- Ignition switch
- Emergency stop switch
- Starter switch
- Starter relay
- Starter motor

As additional elements: neutral, clutch and prop-stand switches and diodes.

10 - ELECTRICAL SYSTEM

10.7 - INSTRUMENT PANEL

The instrument panel incorporates the following functions:

- Instant speed display
- Tachometer.
- Maximum RPM programming with flashing light.
- Maintenance requirement indicator light (service).
- Maximum speed display.
- Indication in KM or Miles.
- 2 trip-meters in kilometres: Trip (TD) 1 and Trip 2(TD2)
- Battery voltage indicator.
- 12 hour clock.
- Maximum speed display.
- Chronometer with memory for 20 times, corresponding to 20 circuit laps.
- Neutral indicator.
- Prop-stand indicator light.
- Coolant temperature indicator light.
- Low oil pressure indicator light. If this lights up when running, the machine must be stopped.
- Reserve fuel indicator, which lights up when there are only 3 litres of fuel left.
- Turn indicators indicator.
- Main beam indicator.
- Excess engine temperature indicator. If this lights up when running, the machine must be stopped.
- The LCD is backlit with blue light.

On turning on the ignition, the instrument panel checks all its components.



The instrument panel is controlled using a single "MODE" button (1) located on the right-hand twist grip. You can adjust or reset several options for the instruments using this button, by pressing it for a minimum of 3 seconds. To move from one function to another, move the "MODE" button (1) to the left to alternate the functions.



10 - ELECTRICAL SYSTEM

ADJUSTING THE TIME

The time is adjusted as follows:

1. To display total kilometres
2. Press the "MODE" button for 3 seconds. The minutes indication will disappear
3. Press the "MODE" button to increase the hours until the desired hour is reached
4. Press the "MODE" button down for 3 seconds
5. Press the "MODE" button until the desired minutes are reached.
6. Press the "MODE" button down for 3 seconds to save the time data.

RESETTING THE TRIP METER VALUES

The trip meter values are reset by pressing the button down for 3 seconds with the LCD indicating the aforementioned function.

USING THE CHRONOMETER

The machine is fitted with a chronometer that allows the measuring of 20 times performed by the machine in motion, for example when timing laps on a circuit.

The measurement mode can be accessed only when the machine is in motion. By contrast, the viewing mode can only be accessed when the machine is halted.

MEASURING THE TIME

To access the measurement mode, press the "MODE" button for 3 seconds with the machine running. The LCD screen will indicate the number of times registered ("LAP") and the chronometer will indicate zero.

Each time the button is pressed, the chronometer will register the time for the corresponding lap and begin the timing of the next lap. The time achieved will be displayed on screen for 10 seconds. Each subsequent pressing registers a time, until all the 20 laps available have been used up. If times continue to be measured, the chronometer will revert to overwriting "LAP" 1.

The chronometer mode can only be exited with the machine halted.

VIEWING THE LAP TIMES

The lap times can only be viewed with the machine halted.

- Press the button until the chronometer function is reached, and then press down for 3 seconds to access the chronometer function.
- Pressing the button will display the lap times registered.

RESETTING THE CHRONOMETER

The chronometer is reset in maximum speed mode. Press the button down for 3 seconds with the instrument panel in maximum speed mode. The maximum speed and the chronometers will reset.

To once more measure lap times and access the measurement mode, the "MODE" button must be pressed down for 3 seconds in chronometer mode with the machine running.

Warning: Avoid pressing the "MODE" button when the machine's ignition is being turned on, or when the instrument panel is performing its start-up check, to avoid entering workshop mode.

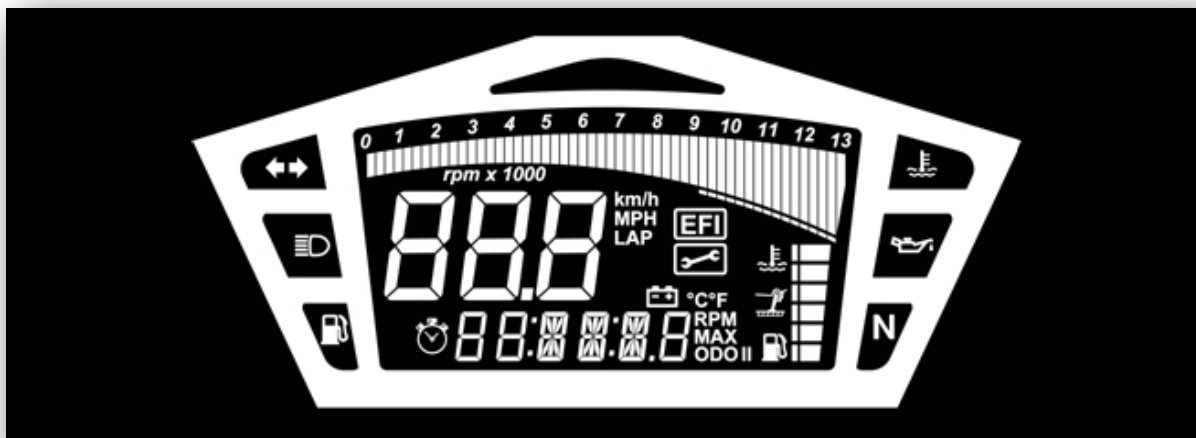
GEAR CHANGE INDICATION - PARAMETERS

The parameters are the following:

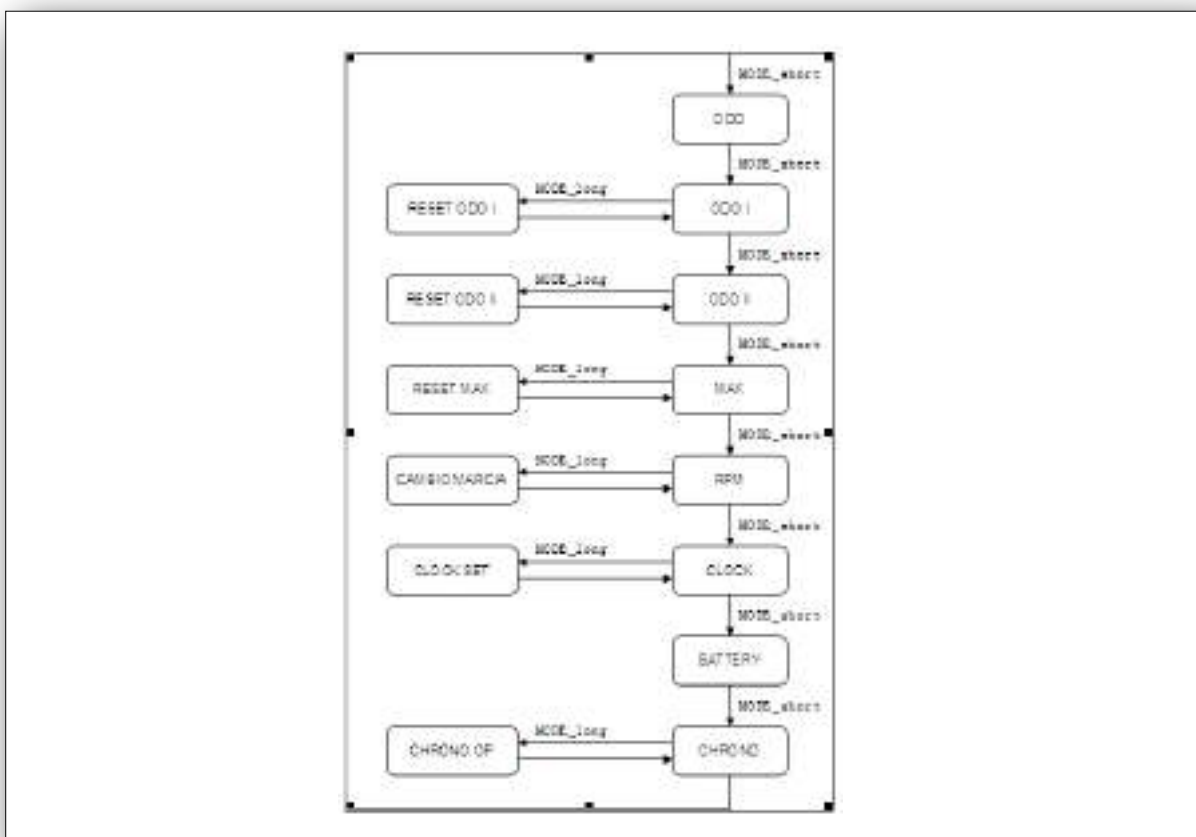
RPM MIN	8000 RPM
RPM MAX	11.500 RPM

10 - ELECTRICAL SYSTEM

The layout of the LCD screen for this application is the following:



All the dashboard functions are controlled using a single MODE button. This should be pressed briefly to change from one function to another, or held down to define the different adjustments. The diagram for the steps in the user interface is the following:

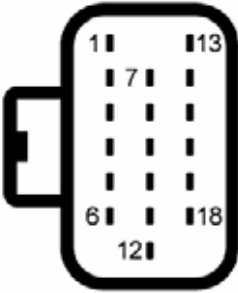


On switching on the ignition once again, the dashboard should display the last function displayed when it was switched off.

10 - ELECTRICAL SYSTEM

CONNECTIONS

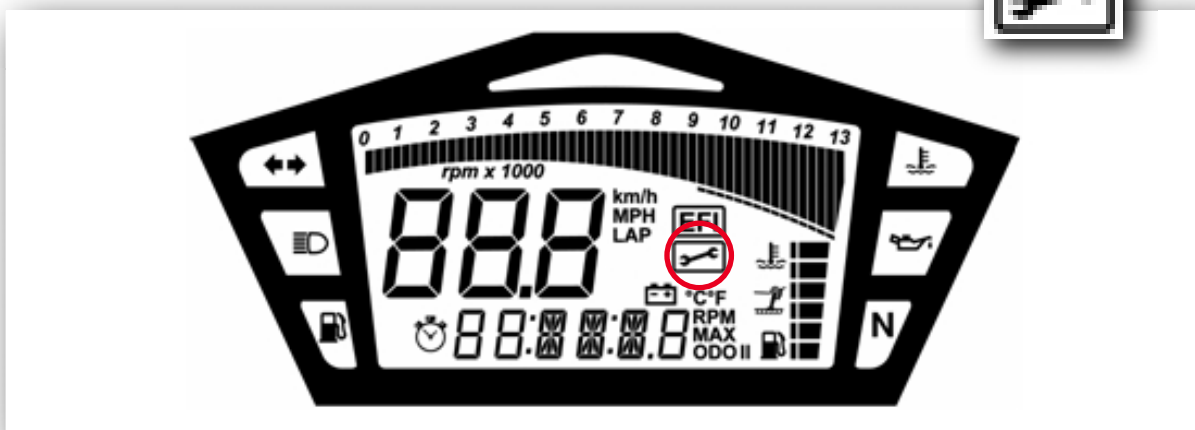
The functions of the connectors are the following:

	FUNCTIONS	VALUE
1	DASHBOARD EARTH	
2	LEFT-HAND TURN INDICATOR INPUT	
3	RIGHT-HAND TURN INDICATOR INPUT	
4	SPEED SENSOR INPUT	
5	MAIN BEAM INPUT	
6	RESERVE SENSOR INPUT	
7	EARTH FOR SENSORS	
8	125 CC RPM INPUT	
9	PROP-STAND INPUT	
10	MODE INPUT	
11	LINE K	
12	OIL SENSOR INPUT	
13	WATER TEMPERATURE INPUT	
14	+KEY	
15	NEUTRAL INPUT	
16	+BATTERY	
17	50 CC RPM INPUT	
18	SPEED SENSOR POWER SUPPLY	

10 - ELECTRICAL SYSTEM

RESETTING SERVICE INDICATOR

1- Once the machine has travelled the distance set out on the table below, the system will activate the inspection function, which appears on the display in the form of the following icon:



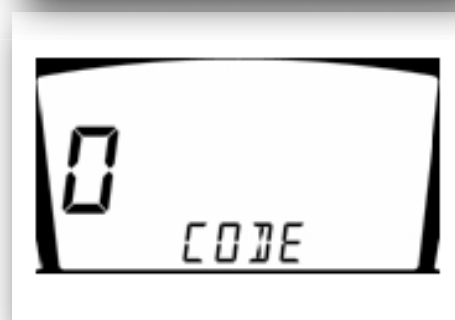
2- Service intervals

FIRST WARNING	1000 Kms
WARNING INTERVAL	6000 Kms

3- Deactivating the service symbol:

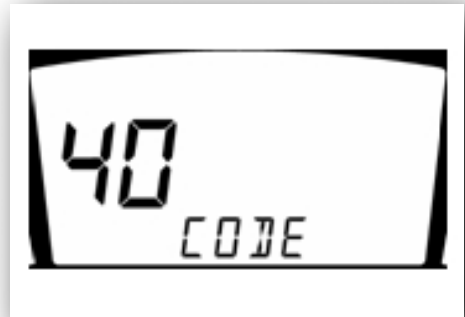
First enter into configuration mode. To do so, enter a three figure code – in this case **423**, which will allow changing from kilometres to miles, **service resetting**, as well as resetting the odometer to zero on a once only basis and providing the machine has clocked less than 200 km.

4- To access the configuration described, **the MODE button (1) (located on the starter control) must be held down for at least 10 seconds, in the interval time of 1.5 to 4 seconds maximum** after turning on the ignition. The following should be displayed:



10 - ELECTRICAL SYSTEM

5- The code 423 should now be entered.
The first figure will change from 0 to 9 one second at a time.
When the figure arrives at the desired number (in the case of the example, 4), press MODE to save in memory:



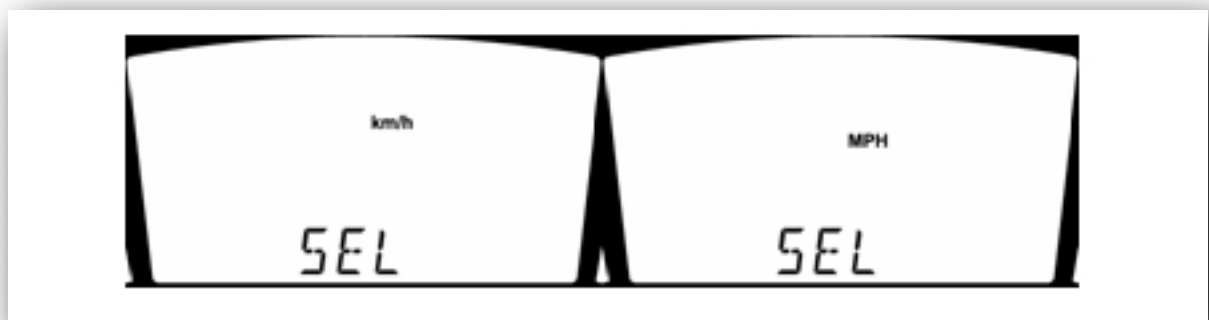
6- The second figure will begin to change (in this case, halt it when it reaches 2):



7- Do the same with the third figure (halt it when it reaches 3):



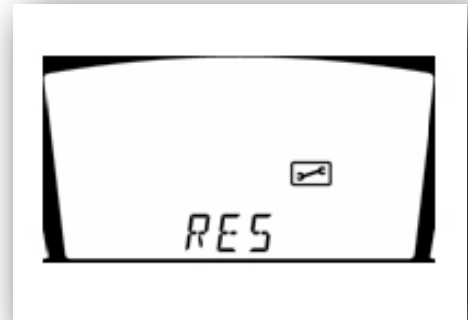
8- Immediately afterwards the configuration 423 will be displayed with the kilometre to miles changing function:



10 - ELECTRICAL SYSTEM

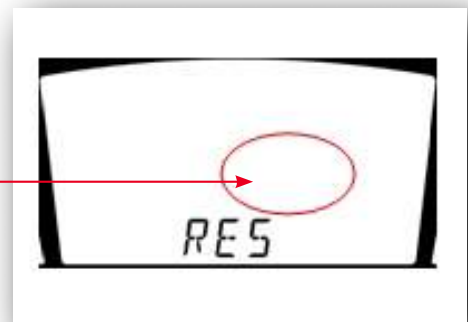
9- The change from kilometres to miles or vice versa is done by holding down the MODE button for over three seconds.

10- The following function is the one for resetting service/total km. To do so, pressing MODE briefly will display the following:

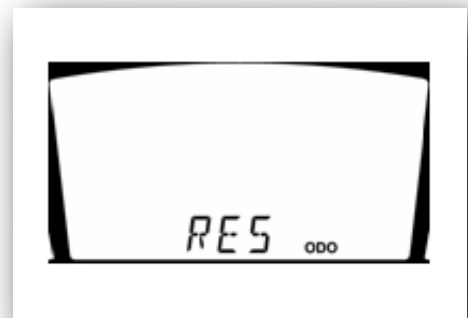


11- The icon with the spanner symbol will only appear when a service is overdue.

To reset, press MODE for over three seconds and the icon will disappear:



12- The third function is resetting the odometer (this can be performed on a once only basis and providing the machine has clocked less than 200 km). This is done by pressing MODE for over 3 seconds, which displays the following:



All the configurations are saved when the ignition is switched off.

10 - ELECTRICAL SYSTEM

10.8 - LIGHTING AND INDICATING

ADJUSTING THE HEADLIGHT BEAM (RIGHT-LEFT)

1. Firstly remove:

* The instrument panel cover and the instrument panel.

2. Adjust:

-To adjust the height, adjust screw (A) on both sides.

SCREWING IN => Lower

SCREWING OUT => Higher



3. Adjust:

- The spread of the headlight beam.

To adjust the width of the light beam, adjust screw (B) on both sides.

SCREWING IN => Wider

SCREWING OUT => Narrower



CHANGING THE HEADLIGHT BULBS

1. Firstly remove:

* The instrument panel bracket.

2. Disconnect:

- The headlight unit.

3. Remove:

- The headlight unit.

4. Turn:

- The headlight unit to the left.

5. Remove:

- The headlight unit.

Bulb type: 12v 55W H11



CHANGING THE HEADLIGHT

1. First:

* Carry out the steps in CHANGING THE HEADLIGHT BULBS

2. Retirar:

- Los 3 tornillos (A) que sujetan el faro.



10 - ELECTRICAL SYSTEM



WARNING

KEEP INFLAMMABLE PRODUCTS AND HANDS AWAY FROM THE BULB WHILE IT IS LIT, BECAUSE IT IS HOT. DO NOT TOUCH IT UNTIL IT COOLS DOWN.



CAUTION

AVOID TOUCHING THE BULB GLASS. KEEP FREE OF OIL. IF NOT, THE TRANSPARENCY OF THE GLASS, THE LIFETIME OF THE BULB AND THE AMOUNT OF LIGHT EMITTED WILL BE AFFECTED. IF THE BULB BECOMES SOILED WITH OIL, CLEAN IT CAREFULLY WITH A DAMP CLOTH OR WITH ALCOHOL OR A CONTACT CLEANER.

CHANGING THE SIDELIGHT

DISMANTLING

1. Firstly remove:

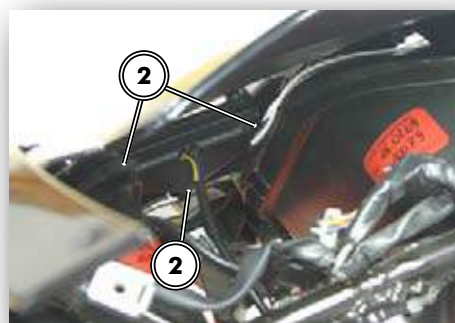
- * The instrument panel cover and the instrument panel.

2. Disconnect:

- The sidelight.

3. Remove:

- The 3 bolts (C) securing the sidelight.



10 - ELECTRICAL SYSTEM

CHANGING THE REAR LIGHT

DISMANTLING

1. Firstly remove:

- * The seat, the pillion passenger seat, the upper cowling cover and the cowling.

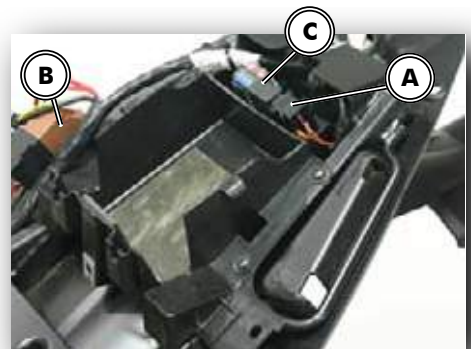
2. Remove:

- The battery (only withdraw it).



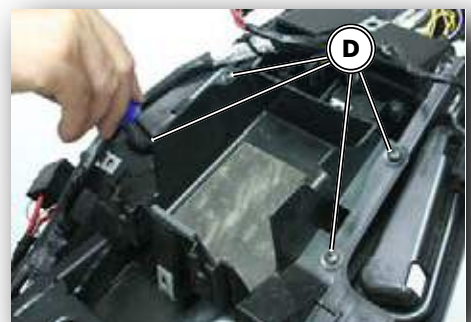
3. Remove:

- The main relay (A).
- The starter relay (B).
- The fuses (C).



4. Remove:

- The 4 bolts (D) from the battery box.



10 - ELECTRICAL SYSTEM

5. Remove:

- The 3 bolts on the rear light bracket cover.



6. Disconnect:

- The rear light from the general wiring.



7. Unscrew:

- The rear light and remove it.



10 - ELECTRICAL SYSTEM

CHANGING THE TURN INDICATOR BULBS

1. Unscrew:

- Glass cover screw.



2. Remove:

- The glass cover.



3. Remove:

- The bulb by pushing it in and turning it to the left.

Bulb type: 12v 10W



CHANGING THE HORN

DISMANTLING

1. Firstly remove:

- * The left-hand bottom tank cover.

2. Disconnect and remove:

- The two horn connectors, and remove the bolt.



10 - ELECTRICAL SYSTEM

CHANGING THE NUMBER PLATE LIGHT

DISMANTLING

1. Remove:

- The rear reflector by means of the 2 screws located inside.



2. Remove:

- The rear mudguard supplementary support.



3. Remove:

- The nut and bolt (inside).
- The number plate light.



4. Remove:

- The bulb by pulling it out.

Bulb type: 12v 5W



10 - ELECTRICAL SYSTEM

10.9 - FITTING NEW COMPONENTS

CHANGING THE DIODE

DISMANTLING

1. Firstly remove:

* The seat, the pillion passenger seat, the upper cowling cover and the cowling.

2. Disconnect:

- The diode.



CHANGING THE REGULATOR

DISMANTLING

1. Remove:

- The front bolt on the tank and tilt it backwards.



2. Remove:

- The two bolts securing the regulator to the chassis.

3. Disconnect:

- The regulator from the wiring system.



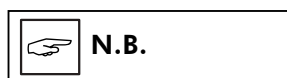
10 - ELECTRICAL SYSTEM

CHANGING THE CDI UNIT

DISMANTLING

1. Remove:

- The front bolt on the tank and tilt it backwards (see the first image in the previous section).



N.B.

ON CONNECTING OR DISCONNECTING THE CDI UNIT, ALWAYS DO SO WITH THE BATTERY DISCONNECTED FROM THE WIRING.

2. Remove:

- The protective rubber.

3. Desconectar:

- The CDI unit.



CHANGING THE STARTER RELAY

DISMANTLING

1. Firstly remove:

- * The seat, the pillion passenger seat, the upper cowling cover and the cowling.

2. Remove:

- Pull the relay out while holding down the connector strip.



10 - ELECTRICAL SYSTEM

CHANGING THE MAIN RELAY

DISMANTLING

1. Firstly remove:

- * The seat and the pillion passenger seat.

2. Remove:

- The fuse box for ease of access.

3. Remove:

- Pull the relay out while holding down the connector strip.



CHANGING THE INSTRUMENT PANEL

DISMANTLING

1. Firstly remove:

- * The instrument panel cover.

2. Disconnect:

- The instrument panel.

3. Remove:

- The 3 bolts and remove it.



10 - ELECTRICAL SYSTEM

CHANGING THE HT COIL

DISMANTLING

1. Remove:

- The front bolt on the tank and tilt it backwards.



2. Unplug:

- The spark plug connector, by pulling it off firmly.



3. Disconnect:

- The coil cables.



4. Unscrew:

- The securing bolt.



10 - ELECTRICAL SYSTEM

10.10 - INSPECTING THE BATTERY AND FUSES

INSPECTING THE BATTERY

DISMANTLING

1. Firstly remove:

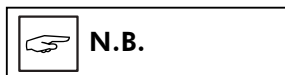
- * The seat and the pillion passenger seat.

2. Inspect:

- The battery terminals.

Dirtiness => Clean with wire brush.

Poor connection => Put right.



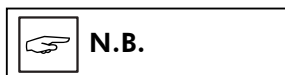
N.B.

AFTER CLEANING THE TERMINALS, APPLY A THIN LAYER OF GREASE TO THEM.



CAUTION

ON DISCONNECTING THE BATTERY, FIRST REMOVE THE NEGATIVE CABLE AND THEN THE POSITIVE CABLE.



N.B.

IF THE BATTERY IS NOT RECEIVING CHARGE, INSPECT THE CHARGING SYSTEM.

Replace the battery if:

- The voltage does not reach a specific value:
Above 12v.
- The voltage is not reached after being charged with an electronic charger.
- The charging system is working properly and the battery is not charging.



CAUTION

ALWAYS USE AN ELECTRONIC CHARGER FOR CHARGING MF (MAINTENANCE-FREE) TYPE BATTERIES.

3. Fit:

- The battery.

4. Connect:

- The battery cables.



CAUTION

FIRST CONNECT THE POSITIVE CABLE AND THEN THE NEGATIVE CABLE.

5. Fit:

- The pillion passenger seat and the seat.



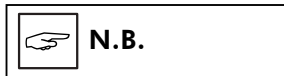
10 - ELECTRICAL SYSTEM

INSPECTING THE FUSES



CAUTION

DISCONNECT THE MAIN SWITCH WHEN INSPECTING OR RENEWING A FUSE. FAILURE TO DO SO MAY RESULT IN A SHORT CIRCUIT.



N.B.

THE ELECTRICAL SYSTEM HAS 2 FUSES:

- ONE 20A FUSE: THE MAIN FUSE

- ONE 20A FUSE: THE SECONDARY FUSE



DISMANTLING

1. Firstly remove:

* The seat and the pillion passenger seat.

2. Remove:

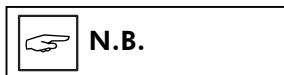
- The fuse cover.

3. Inspect:

- The fuse.

4. Connect:

- Multi-meter to the fuse to check if there is a circuit.



N.B.

ADJUST THE MULTI-METER SELECTOR TO CONTINUITY.

If the apparatus registers 0 (continuity). The fuse is OK-

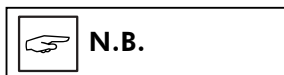
If the apparatus registers 1 (no circuit), replace the fuse.

5. Renew:

- Blown fuse.

6. Check:

- Turn on the switches to check the functioning of the corresponding electrical devices.



N.B.

IF THE FUSE BLOWS AGAIN IMMEDIATELY, INSPECT THE ELECTRICAL CIRCUIT.



WARNING

NEVER USE A FUSE WITH AN AMPERAGE OTHER THAN THAT SPECIFIED, OR OTHER MATERIALS INSTEAD OF A FUSE, AN INCORRECT FUSE MAY CAUSE MAJOR DAMAGE TO THE ELECTRICAL SYSTEM, MALFUNCTIONING OF THE LIGHTS AND IGNITION, AND MAY ALSO CAUSE A FIRE.



DERBI

Rev.0 - 2009

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