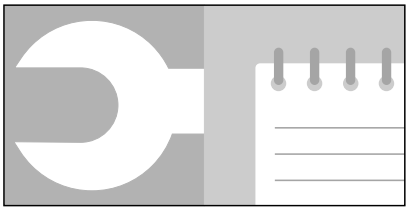
Workshop Manual

50 c.c. ENGINE 6 SPEED



Nacional Motor, S.A., manufacturer of DERBI mopeds and scooters issues this manual with the object of documenting and simplifying to the utmost the task of stripping and assembling the DERBI 50 cc 6 speed engine.

The intended purpose is to provide the maximum support to mechanics in the practice of their profession in the agencies and sub-agencies of our marque.

In the lights of our policy of constant improvement, DERBI-NACIONAL MOTOR, S.A. reserves the right to introduce such modifications as it deems appropriate without prior notice.

All the information included in this manual is based on the most recent data available at the time of publication. The drawings and photographs are intended to serve solely as reference material, and therefore may not be exactly the same as the components and parts in the model currently on sale.

NACIONAL MOTOR, S.A.

N.º 7077TH02002

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1. SERVICING RULES

- Use original DERBI spare parts or the parts and lubricants recommended by DERBI. Parts which do not comply with the DERBI design characteristics may cause damage to the scooter.
- In cases where specified, use the special tools designed for this model.
- On reassembly always use new gaskets.
- When tightening up a series of screws of nuts, start first with the larger diameter screws or start with those on the inside or centre of the part, and apply the full torque specified in two or three diagonal passes.
- Before stripping any parts of the engine, clean it thoroughly to prevent dirt getting into the inside of the engine.
- Before assembly lubricate all rubbing surfaces.
- After assembly and before running the engine, ensure that all parts have been correctly fitted and function properly.

VEHICLE IDENTIFICATION

This manual includes information which will be useful in servicing, maintenance and repair operations on the families of models: RACER, XTREME, DRD, and GPR.



SENDA R DRD



GPR Rácing Réplica

- The frame number is located on the right hand side of the steering tube.



- The engine number is located on the left hand side of the engine, (beside the oil filler cap - gear-change - clutch).



GENERAL TECHNICAL SPECIFICATIONS

RACER MODELS

DIMENSIONS

OVERALL LENGTH (mm.)	2,050
OVERALL WIDTH (mm.)	695
OVERALL HEIGHT (mm.)	1,300
WHEELBASE (mm.)	1,345

FRAME	R	SM
FRAME TYPE	Multi-tube	
FRONT SUSPENSION: TYPE	Showa inverted hydraulic forks	
FRONT SUSPENSION: STROKE/ BAR DIAMETER	175 mm. / 32 mm.	
OIL CAPACITY PER FRONT FORK BAR	175 cc SAE 7.5 W	
REAR SUSPENSION: TYPE / STROKE	Single in-line shock-absorber / 180 mm.	
FRONT TYRE: SIZE	80/90x21”	100/80x17”
FRONT TYRE: PRESSURE	1.0 to 1.1	1.7 to 1.8
REAR TYRE: SIZE	110/80x18”	130/80x17”
REAR TYRE: PRESSURE	1.2 to 1.3	2.0 to 2.1
FRONT BRAKE: TYPE / SIZE	Hydraulic disc 220 mm.	
REAR BRAKE: TYPE / SIZE	Hydraulic disc 180 mm.	
TOTAL CAPACITY FUEL TANK	5.5 litres	
TOTAL CAPACITY OIL RESERVOIR	1.0 litre	
COOLING LIQUID CAPACITY	1.1 litre	

ENGINE

OPERATING CYCLE	Two stroke
BORE x STROKE	39.86 x 40 mm.
NUMBER OF CYLINDERS	One
TOTAL CUBIC CAPACITY	49.9 cc
MAXIMUM POWER	8.5 CV at 9,000 rpm
COMPRESSION RATIO	13:1
FUEL	Unleaded petrol 95 octane
ADMISSION SYSTEM	Reed valve
STARTER SYSTEM	Kick starter
LUBRICATING SYSTEM	Oil pump
COOLING SYSTEM	Liquid-cooled with pump, radiator, and thermostat

CARBURETTOR

BRAND / TYPE	Dell´Orto / PHVA 14
ENGINE IDLE SPEED	1,900 ±100
TURNS IDLE JET AIR SCREW	3
DIFFUSER DIAMETER	14 mm.
# IDLE JET	#36
# MAIN JET	#73
CONICAL NEEDLE: TYPE / STD ADJUSTMENT	A8/3rd
SLIDE VALVE	#30
# EMULSIFIER TUBE	#211GA
CHOKE TYPE	MECHANICAL
# CHOKE JET	#45
FLOAT	3.5 gr.

GENERAL TECHNICAL SPECIFICATIONS

RACER MODELS

TRANSMISSION	R	SM
PRIMARY DRIVE	Spur gears	
PRIMARY DRIVE RATIO	3.5 (77/22)	
CLUTCH	Multi-disc oil bath	
GEAR BOX	Constant mesh	
GEAR RATIOS:		
1st:	3.09 (34/11)	
2nd:	2.00 (30/15)	
3rd:	1.50 (27/18)	
4th:	1.20 (24/20)	
5th:	1.04 (23/22)	
6th:	0.95 (22/23)	
TRANSMISSION OIL CAPACITY / TYPE	650 cc / AGIP GEAR SAE 10W40	
FINAL DRIVE	Chain and gear	
FINAL DRIVE RATIO	4.41 (53/12)	4.07 (53/13)

ELECTRICAL SYSTEM	
GENERATOR	MAGNETO ALTERNATOR
VOLTAGE / GENERATOR POWER	12V / 65W
IGNITION TYPE	CDI
IGNITION ADVANCE	1.2 mm before TDC
SPARK PLUG	NGK B10ES / CHAMPION N1C
SPARK PLUG ELECTRODE GAP	0.6 mm.
BATTERY	12 V / 4 A/h
MAIN FUSE	4 A

GENERAL TECHNICAL SPECIFICATIONS

XTREME MODELS

DIMENSIONS

OVERALL LENGTH (mm.) 2,035
OVERALL WIDTH (mm.) .....800 (R) / 760 (SM)
OVERALL HEIGHT (mm.) 1,220
WHEEL BASE (mm.) 1,355

FRAME	R	SM
FRAME TYPE	Perimeter	
FRONT SUSPENSION: TYPE	PAIOLI conventional hydraulic forks	
FRONT SUSPENSION: STROKE / BAR DIAMETER	190 mm. / 36 mm.	170 mm. / 36 mm.
FRONT SUSPENSION: FORK BAR OIL CAPACITY	285 cc SAE 10W	270 cc SAE 10W
REAR SUSPENSION: TYPE / STROKE	Single in-line shock absorber / 180 mm.	
STEERING ANGLE	26º	24.7º
FRONT TYRE: SIZE	80/90x21”	100/80x17”
FRONT TYRE PRESSURE	1.0 to 1.1	1.7 to 1.8
REAR TYRE: SIZE	110/80x18”	130/80x17”
REAR TYRE PRESSURE	1.2 to 1.3	2.0 to 2.1
FRONT BRAKE: TYPE / SIZE	Hydraulic Disc 240 mm.	Hydraulic Disc 260 mm.
REAR BRAKE: TYPE / SIZE	Hydraulic Disc 180 mm.	
TOTAL CAPACITY, FUEL TANK	7.0 litres	
TOTAL CAPACITY, OIL RESERVOIR	1.0 litre	
COOLING LIQUID CAPACITY	0.85 litre	

ENGINE

OPERATING CYCLE .....Two Stroke
BORE x STROKE.....39.86 x 40 mm.
NUMBER OF CYLINDERS .....One
TOTAL CUBIC CAPACITY .....49.9 cc
MAXIMUM POWER.....8.5 CV at 9,000 rpm
FUEL .....Unleaded petrol 95 Octane
COMPRESSION RATIO 13:1
ADMISSION SYSTEM .....Reed valve
STARTER SYSTEM .....Kick starter
LUBRICATION SYSTEM.....Oil pump
COOLING SYSTEM.....Liquid with pump, radiator, and thermostat

CARBURETTOR

BRAND / TYPE.....Dell-Orto / PHVA 14
ENGINE IDLE SPEED .....1,900 ± 100
TURNS IDLE JET AIR SCREW 23/4
DIFFUSER DIAMETER .....14 mm.
IDLE JET .....#32
MAIN JET .....#71
CONICAL NEEDLE: TYPE / STD. ADJUSTMENT A11/4th
SLIDE VALVE .....#30
EMULSIFIER TUBE .....#211GA
CHOKE TYPE.....MECHANICAL
CHOKE JET.....#45
FLOAT .....3.5 gr.

GENERAL TECHNICAL SPECIFICATIONS

XTREME MODELS

TRANSMISSION	R	SM
PRIMARY DRIVE	Spur gears	
PRIMARY DRIVE RATIO	3.5 (77/22)	
CLUTCH	Multi-disc oil bath	
GEARBOX	Constant mesh	
GEAR RATIOS:		
1st:	3.09 (34/11)	
2nd:	2.00 (30/15)	
3rd:	1.50 (27/18)	
4th:	1.20 (24/20)	
5th:	1.04 (23/22)	
6th:	0.95 (22/23)	
TRANSMISSION OIL CAPACITY / TYPE	650 cc / AGIP GEAR SAE 10W40	
FINAL DRIVE	Chain and gear	
FINAL DRIVE RATIO	4.07 (53/13)	3.78 (53/14)

ELECTRICAL SYSTEM	
GENERATOR	MAGNETO ALTERNATOR
GENERATOR VOLTAGE / POWER	12 V / 65 W
IGNITION TYPE	CDI
IGNITION ADVANCE	1.2 mm. before TDC
SPARK PLUG	NGK B10ES / CHAMPION N1C
SPARK PLUG ELECTRODE GAP	0.6 mm.
BATTERY	12 V / 4 Ah
MAIN FUSE	4 A

GENERAL TECHNICAL SPECIFICATIONS

DRD MODELS

DIMENSIONS

OVERALL LENGTH (mm.) 2,035
OVERALL WIDTH (mm.) .....800 (R) / 760 (SM)
OVERALL HEIGHT(mm.) 1,220
WHEELBASE (mm.) 1,355

FRAME	R	SM
FRAME TYPE	Multi-tube	
FRONT SUSPENSION: TYPE	Marzocchi Conventional hydraulic forks	
FRONT SUSPENSION: STROKE / BAR DIAMETER	195 mm. / 41 mm.	
FRONT SUSPENSION: FORK BAR OIL CAPACITY	445 CC SAE 10W	445 CC SAE 10W
REAR SUSPENSION: TYPE / STROKE	Single shock absorber progressive /180 mm.	
STEERING ANGLE	26º	24,7º
FRONT TYRE: SIZE	80/90x21”	100/80x17”
FRONT TYRE: PRESSURE	1.0 to 1.1	1.7 to 1.8
REAR TYRE: SIZE	100/80x18”	130/80x17”
REAR TYRE: PRESSURE	1.2 to 1.3	2.0 to 2.1
FRONT BRAKE: TYPE / SIZE:	Wavy hydr. disc 260 mm.	Double hydr. disc 240 mm.
REAR BRAKE: TYPE / SIZE	Wavy hydr. disc 218 mm.	Hydr. disc 218 mm.
TOTAL CAPACITY, FUEL TANK	7,0 litres	
TOTAL CAPACITY, OIL RESERVOIR	1,0 litre	
COOLING LIQUID CAPACITY	0,85 litre	

ENGINE

OPERATING CYCLE .....Two stroke
BORE x STROKE.....39.86 x 40 mm.
NUMBER OF CYLINDERS .....One
TOTAL CUBIC CAPACITY.....49.9 cc
MAXIM UM POWER .....8.5 CV a 9,000 rpm
COMPRESSION RATIO 13:1
FUEL .....Unleaded petrol 95 octane
ADMISSION SYSTEM .....Reed valve
STARTER SYSTEM .....Kick starter
LUBRICATION SYSTEM.....Oil pump
COOLING SYSTEM .....Liquid-cooled with pump, radiator and thermostat

CARBURETTOR

BRAND / TYPE.....Dell´Orto / PHVA 14
ENGINE IDLE SPEED .....1,900 ± 100
TURNS IDLE JET AIR SCREW.....2 3/4
DIFFUSER DIAMETER .....14 mm.
IDLE JET .....#32
MAIN JET .....#71
CONICAL NEEDLE: TYPE / STD ADJUSTMENT A11/4th
SLIDE VALVE .....#30
EMULSIFIER TUBE .....#211GA
CHOKE TYPE.....MECHANICAL
CHOKE JET .....#45
FLOAT .....3.5 gr.

GENERAL TECHNICAL SPECIFICATIONS

DRD MODELS

TRANSMISSION	R	SM
PRIMARY DRIVE	Spur gears	
PRIMARY DRIVE RATIO	3.5 (77/22)	
CLUTCH	Multi-disc oil bath	
GEARBOX	Constant mesh	
GEAR RATIOS:		
1st:	3.09 (34/11)	
2nd:	2.00 (30/15)	
3rd:	1.50 (27/18)	
4th:	1.20 (24/20)	
5th:	1.04 (23/22)	
6th:	0.95 (22/23)	
TRANSMISSION OIL CAPACITY / TYPE	650 cc / AGIP GEAR SAE 10W40	
FINAL DRIVE	Chain and gears	
FINAL DRIVE RATIO	4.07 (53/13)	3.78 (53/14)

ELECTRICAL SYSTEM	
GENERATOR	MAGNETO ALTERNATOR
VOLTAGE / GENERATOR POWER	12V / 65W
IGNITION TYPE	CDI
IGNITION ADVANCE	1.2 mm. before TDC.
SPARK PLUG	NGK B10ES / CHAMPION N1C
SPARK PLUG ELECTRODE GAP	0.6 mm.
BATTERY	12 V / 4 A/h
MAIN FUSE	4 A

GENERAL TECHNICAL SPECIFICATIONS

GPR MODELS

DIMENSIONS

OVERALL LENGTH (mm.)	1,900
OVERALL WIDTH (mm.)	670
OVERALL HEIGHT (mm.)	1,135
WHEELBASE (mm.)	1,315

FRAME	R	Racing
FRAME TYPE	Perimeter	
FRONT SUSPENSION: TYPE	Inverted hydraulic forks	
FRONT SUSPENSION: STROKE / BAR DIAMETER	120 mm./ 35 mm.	95 mm./ 35 mm.
FRONT SUSPENSION: FORK BAR OIL CAPACITY	175 cc SAE 10W	140 cc SAE 10W
REAR SUSPENSION: TYPE / STROKE	Progressive single shock absorber / 120 mm.	Progressive single shock absorber / 110 mm.
STEERING ANGLE	24.5º	
FRONT TYRE: SIZE	90/90x16”	90/80x17”
FRONT TYRE: PRESSURE	1.7 to 1.8	2.0 to 2.1
REAR TYRE: SIZE	120/80x16”	110/80x17”
REAR TYRE: PRESSURE	1.7 to 1.8	2.0 to 2.1
FRONT BRAKE: TYPE / SIZE	Hydraulic disc 260 mm.	
REAR BRAKE: TYPE / SIZE	Hydraulic disc 220 mm.	
OVERALL CAPACITY, FUEL TANK	7.25 litres	
OVERALL CAPACITY, OIL RESERVOIR	1.0 litre	
COOLING LIQUID CAPACITY	1.1 litre	

ENGINE

OPERATING CYCLE	Two stroke
BORE x STROKE	39.86 x 40 mm.
NUMBER OF CYLINDERS	One
TOTAL CUBIC CAPACITY	49.9 cc
MAXIMUM POWER	9.0 CV at 9,000 rpm
COMPRESSION RATIO	13:1
FUEL	Unleaded petrol 95 Octane
ADMISSION SYSTEM	Reed valve
STARTER SYSTEM	Kick starter
LUBRICATION SYSTEM	Oil pump
COOLING SYSTEM	Liquid-cooled with pump, radiator, and thermostat

CARBURETTOR

BRAND / TYPE	Dell´Orto / PHVA 17.5
ENGINE IDLE SPEED	1,900 ± 100
TURNS IDLE JET AIR SCREW	3
DIFFUSER DIAMETER	17.5 mm.
# IDLE JET	#34
# MAIN JET	#98
CONICAL NEEDLE: TYPE / STD ADJUSTMENT	A15/4th
SLIDE VALVE	#40
# EMULSIFIER TUBE	#212FA
CHOKE TYPE	MECHANICAL
# CHOKE JET	#50
FLOAT	3.5 gr.

GENERAL TECHNICAL SPECIFICATIONS

GPR MODELS

TRANSMISSION

PRIMARY DRIVE.....Spur gears
PRIMARY DRIVE RATIO.....3.5 (77/22)
CLUTCH.....Multi-disc oil bath
GEARBOX.....Constant mesh
GEAR RATIOS:
1st:.....3.09 (34/11)
2nd:.....2.00 (30/15)
3rd:.....1.50 (27/18)
4th:.....1.20 (24/20)
5th:.....1.04 (23/22)
6th:.....0.95 (22/23)
TRANSMISSION OIL VOLUME / TYPE.....650 cc / AGIP GEAR SAE 10W40
FINAL DRIVE.....Chain and gears
FINAL DRIVE RATIO.....3.71 (52/14)

ELECTRICAL SYSTEM

GENERATOR.....MAGNETO ALTERNATOR
VOLTAGE / GENERATOR POWER.....12V / 65W
IGNITION TYPE.....CDI
IGNITION ADVANCE.....1.2 mm. before TDC.
SPARK PLUG.....NGK B10ES / CHAMPION N1C
SPARK PLUG ELECTRODE GAP.....0.6 mm.
BATTERY.....12 V / 4 A/h
MAIN FUSE.....4 A

MAINTENANCE SCHEDULE

	KMS. / MONTHS (whichever comes first)					
CHECKS	1000 / 2	5000 / 12	10000 / 24	15000 / 36	20000 / 48	25000 / 60
Gearbox/Clutch oil	REPLACE		REPLACE	CHECK	REPLACE	CHECK
Rear shock absorber		CHECK	CHECK	CHECK	CHECK	CHECK
Tightness of fastenings	TIGHTEN	TIGHTEN	TIGHTEN	TIGHTEN	TIGHTEN	TIGHTEN
Battery (level)		CHECK	CHECK	CHECK	CHECK	CHECK
Spark plug	CLEAN	REPLACE	REPLACE	REPLACE	REPLACE	REPLACE
Final drive chain	TIGHTEN UP	CHECK	REPLACE	CHECK	REPLACE	CHECK
Carburettor	ADJUST CLEANING	ADJUST CLEANING	ADJUST CLEANING	ADJUST CLEANING	ADJUST CLEANING	ADJUST CLEANING
Cylinder / cylinder head piston			CLEAN UP		CLEAN UP	
Tightness of cylinder head	TIGHTEN UP	TIGHTEN UP	TIGHTEN UP	TIGHTEN UP	TIGHTEN UP	TIGHTEN UP
Piston rings		CHECK	REPLACE	CHECK	REPLACE	CHECK
Air filter		CLEAN	CLEAN	CLEAN	CLEAN	CLEAN
Oil filter			REPLACE		REPLACE	
Front forks hydraulic fluid			REPLACE		REPLACE	
Steering play	CHECK	TIGHTEN UP	CHECK	TIGHTEN UP	CHECK	TIGHTEN UP
Inlet reed valve			CHECK		CHECK	
Brake hoses			CHECK	CHECK	CHECK	CHECK
Brake pads	CHECK	CHECK	CHECK	CHECK	CHECK	CHECK
Brake fluid		CHECK	REPLACE	CHECK	REPLACE	CHECK
Engine coolant	CHECK	CHECK	REPLACE	CHECK	REPLACE	CHECK
Tyres	CHECK	CHECK	CHECK	CHECK	CHECK	CHECK
Rims / spokes	CHECK	CHECK	CHECK	CHECK	CHECK	CHECK
Fuel and oil hoses	CHECK		REPLACE	CHECK	REPLACE	CHECK
Oil pump setting	CHECK		CHECK		CHECK	

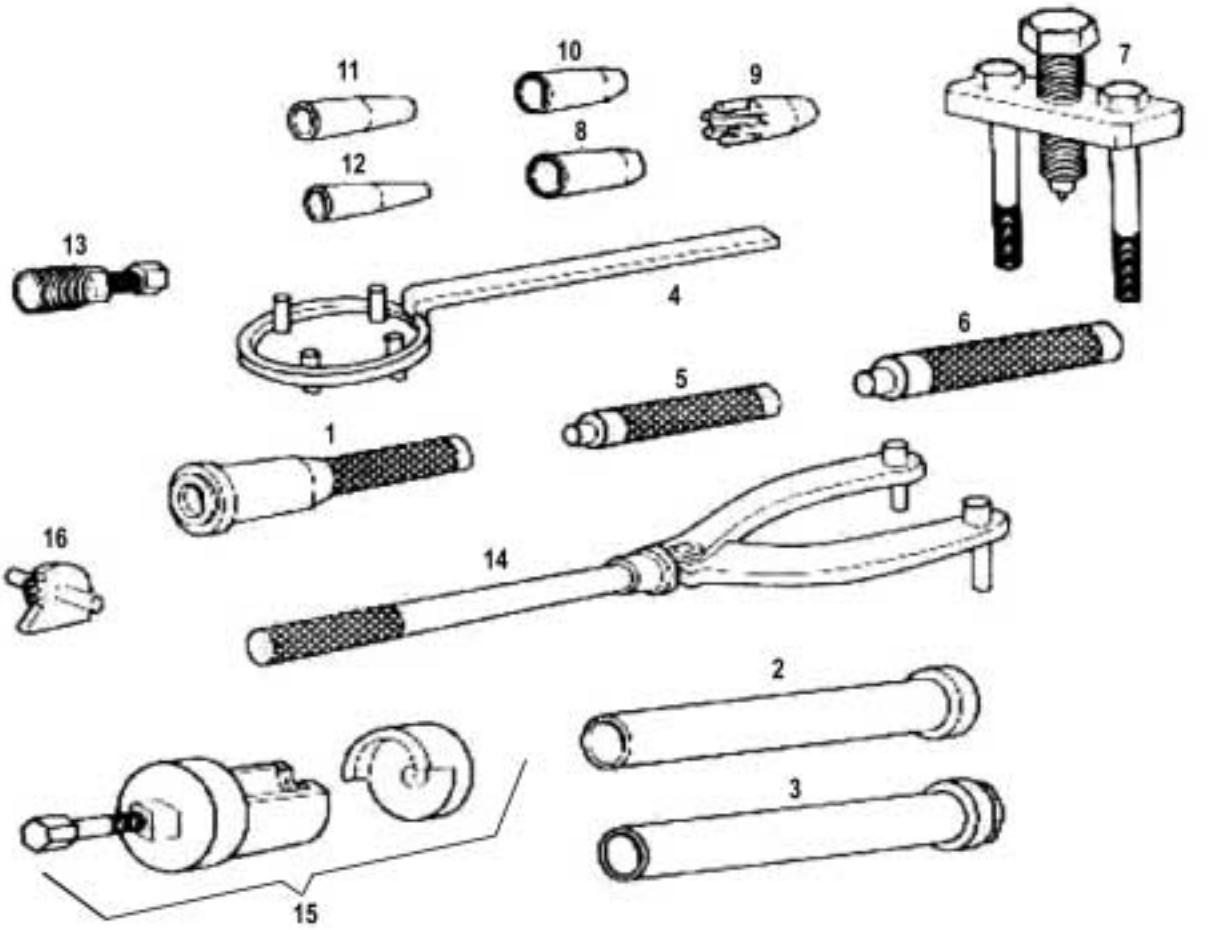
SPARK PLUGS USED IN THE DERBI MANUAL GEARBOX ENGINES 2002

SPARK PLUG	*MODEL*
NGK B8ES	SENDA R/SM 50 X-TREM/DRD EURO-I (W.V.T.A.)
CHAMPION N3C	GPR 50 R/REPLICA EURO-I (W.V.T.A.) BULTACO LOBITO 50 EURO I (W.V.T.A.) BULTACO ASTRO 50 EUROI (W.V.T.A.)
NGK B10ES	SENDA R/SM 50 X-TREM/DRD SPAIN / FRANCE
CHAMPION N1C	GPR R/REPLICA 50 SPAIN / FRANCE BULTACO LOBITO 50 SPAIN BULTACO ASTRO 50 SPAIN

TORQUE SETTINGS TABLE

		TORQUE SETTING		
DESCRIPTION	**METRIC**	**m kg.**	**Nm**	**Thread Sealer**
Upper shock absorber-frame securing	10x125	3.0 to 4.0	30 to 40	
Lower shock absorber-swinging arm securing	12x175	5.5 to 6.5	55 to 65	
Lower shock absorber-link arms securing	12x175	5.5 to 6.5	55 to 65	
Suspension link arm-frame securing	12x175	5.5 to 6.5	55 to 65	
Suspension link arm-swinging arm securing	12x175	5.5 to 6.5	55 to 65	
Rear Engine mount frame swinging shaft	12x150	6.0 to 7.0	60 to 70	
Swinging shaft	14x150	7.0 to 8.0	70 to 80	
Front engine to frame	10x150	3.5 to 4.0	35 to 40	
Lower engine mount to frame	8x125	2.5 to 2.8	25 to 28	
Steering forks to frame securing	25x100	9.0 to 13.0	90 to 130	
Fork leg plug	8x125	1.7 to 1.9	17 to 19	
Exhaust pipe to cylinder	6x100	0.9 a1.2	9 to 12	
Exhaust pipe to frame securing	8x125	1.7 to 1.9	17 to 19	
Exhaust pipe silencer to frame	8x125	1.7 to 1.9	17 to 19	
Exhaust pipe silencer to frame	6x100	0.8 to 1.0	8 to 10	
Steering arm clamps-fork bars	8x125	2.0 to 2.4	20 to 24	
Handlebar to Steering arm	8x125	2.0 to 2.4	20 to 24	
Clip-on bar to Steering arm	8x125	1.7 to 1.9	17 to 19	LOCTITE 243
Front wheel axle	12x150	5.5 to 6.5	55 to 65	
Front wheel axle	14x150	7.0 to 8.0	70 to 80	
Front brake caliper	8x125	1.7 to 1.9	17 to 19	LOCTITE 243
Front brake caliper	6x100	1.0 to 1.2	10 to 12	LOCTITE 243
Rear wheel axle	12x150	5.5 to 6.5	55 to 65	
Rear wheel axle	14x150	7.0 to 8.0	70 to 80	
Rear brake caliper	8x125	1.7 to 1.9	17 to 19	LOCTITE 243
Rear brake disc	8x100	1.7 to 1.9	17 to 19	LOCTITE 243
Rear brake disc	6x100 10.9	1.1 to 1.2	11 to 12	LOCTITE 243
Front brake disc	6x100 10.9	1.1 to 1.2	11 to 12	LOCTITE 243
Rear wheel drive sprocket	8x125	1.7 to 1.9	17 to 19	LOCTITE 243
Rear wheel drive sprocket	6x100 8.8	0.8 to 1.0	8 to 10	
Cylinder head to cylinder securing screw	6x100	1.0 to 1.2	10 to 12	
Cylinder head securing nut	7x100	1.9 to 2.2	19 to 22	
Magneto to crankshaft	10x100	3.5 to 4.5	35 to 45	
Ignition base plate to crankcase	5x80	0.25 to 0.35	8 to 10	LOCTITE 243
Clutch cover	6x100	0.8 to 1.0	8 to 10	
Crankshaft engine pinion	10x100	3.5 to 4.5	8 to 10	
Crankcase half securing screws	6x100	0.8 to 1.0	8 to 10	LOCTITE 243
Starter motor to crankcase	6x100	0.8 to 1.0	32 to 38	
Cylinder head thermistor	14x150	3.2 to 3.8	32 to 38	
Cylinder head thermostat nut	24x100	2.5 to 4.0	25 to 40	
Clutch hub	12x150	3.5 to 4.5	35 to 45	
Crankcase oil drain plug	10x150	1.0 to 1.5	10 to 15	
Counterweight pinion and counterweight	5x80	0.35 to 0.45	3.5 to 4.5	LOCTITE 243
Crankcase primary shaft bearing lock	5x80	0.35 to 0.45	3.5 to 4.5	
Gearbox output pinion lock	5x80	0.35 to 0.45	3.5 to 4.5	LOCTITE 243

SPECIAL TOOLS



NUMBER	REFERENCE	DESCRIPTION
1	00H05400451	GPR CRANKSHAFT OIL SEAL ASSEMBLY TOOL
2	00H05400581	STARTER SHAFT OIL SEAL ASSEMBLY TOOL
3	00H05401561	SELECTOR SHAFT OIL SEAL ASSEMBLY TOOL
4	00H05300041	GPR CLUTCH HUB SECURING TOOL
5	00H05600251	INTERMEDIATE PINION NEEDLE BEARING ASSEMBLY TOOL
6	00H05600241	PRIMARY SHAFT NEEDLE BEARING ASSEMBLY TOOL
7	00H05300151	GPR 75 ENGINE SPLITTING PUSHER TOOL
8	00H05300841	CRANKSHAFT OIL SEAL GUIDE BUSH
9	00H05600351	GPR FINAL DRIVE SHAFT OIL SEAL GUIDE PIN
10	00H05600341	GPR 75 STARTER SHAFT OIL SEAL GUIDE PIN
11	00H05600331	GPR DECLUTCH SHAFT OIL SEAL GUIDE PIN
12	00H05600261	WATER PUMP SHAFT OIL SEAL GUIDE PIN
13	00F05300021	MAGNETO ALTERNATOR EXTRACTOR TOOL
14	00G05300011	MAGNETO ALTERNATOR ROTATION LOCK
15	00H05600321	BALANCE SHAFT GEAR EXTRACTOR TOOL (COUNTERWEIGHT)
16	00H05600231	BALANCE SHAFT GEAR SECURING TOOL (COUNTERWEIGHT)

STRIPPING DOWN THE FRONT SUSPENSION

- Withdraw the fork bars from the steering arms, loosening the clamp screws securing them.
- Secure the fork bar in a bench vice, protecting the face of the vice with cheek pieces of soft metal so as not to scratch or damage the bars, and proceed to loosen the upper fork plug screw.



- Withdraw the upper fork plug screw, together with the pre-load distance piece and the suspension spring.



- Get ready a container to drain the hydraulic fluid out of each fork bar, and proceed to measure the quantity of fluid (pump each fork leg bar so as to ensure that it is completely drained).



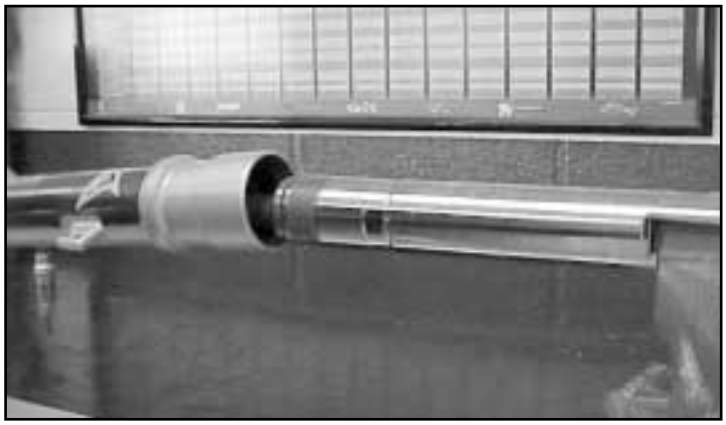
- Extract the oil seal dust ring and the locking circlip.



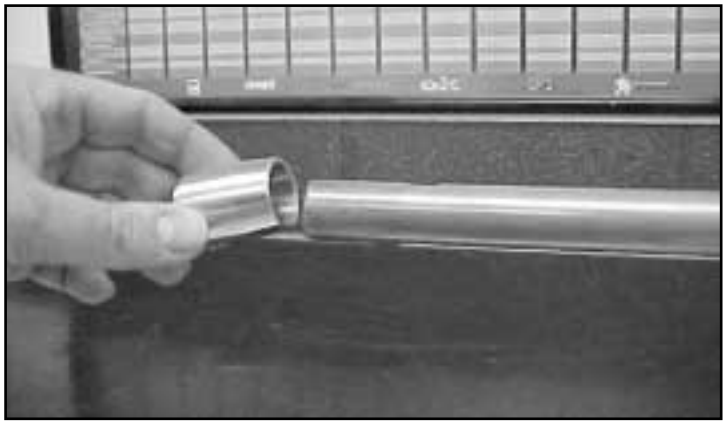
- Locate the Allen screw in the base of the fork leg and loosen it in order to free the hydraulic assembly and the bar.



- Separate the fork leg and the bar with a firm movement.



- Extract the aluminium hydraulic unit support stop on the interior of the fork leg.



- Next extract the hydraulic cartridge through the upper end of the fork bar.



- Grip the fork leg in a bench vice with soft metal cheek pieces over the faces and place a cloth over its mouth so as to avoid causing damage and remove the oil seal using a lever. Always replace the oil seal when refitting the assembly.



- Proceed to clean and degrease all the components of the front suspension, in order to check these parts.
- Check the degree of wear on the fork bar guide bush. Replace it if it shows signs of damage over more than 30% of its entire surface.

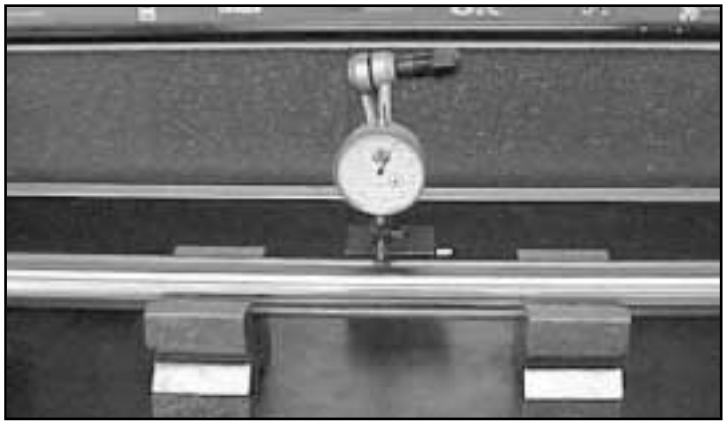


- Check the degree of wear on the fork leg guide bush. Replace it if it shows signs of damage over more than 30% of its entire surface.

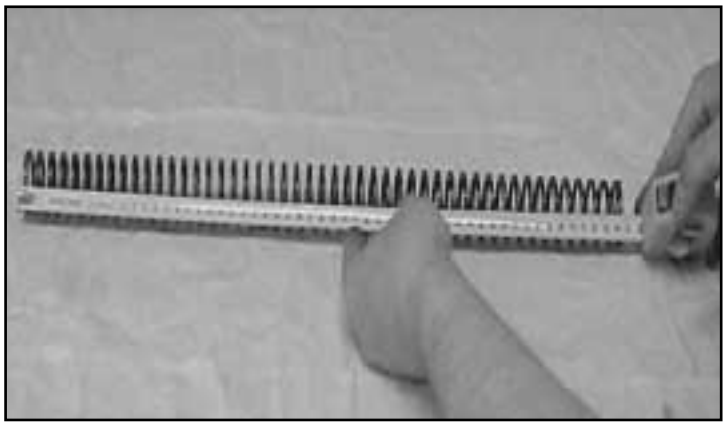


- Using X-bar calibration blocks and a dial comparator micrometer mounted on a fixed rigid support, check the amount of mis-alignment of the bar.

  Service limit: 0.2 mm



- Check the length of the fork suspension spring, and also check for signs of deformation and/or whether it is out of parallel.



- Check the condition of the return spring and the nylon guide in the hydraulic assembly, together with the O-ring seal.

  Replace them in the event that they are deformed or show evident signs of damage.



- Clean and degrease all the elements comprising the assembly in order to proceed to re-assembly.



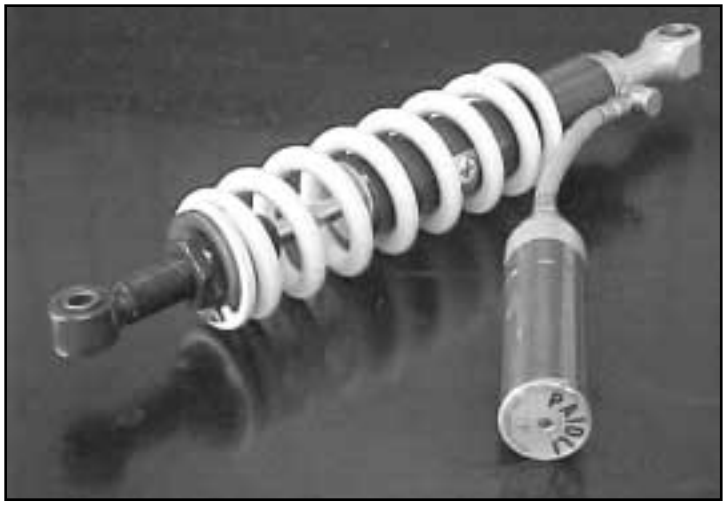
- Proceed to re-assemble the assembly, paying particular attention to the correct torque setting for the hydraulic cartridge - fork leg, and also to the assembly of the oil seal, placing a little suspension oil on the oil seal lips and inserting it using the special insertion tool. Refill with hydraulic oil, and do not forget to insert the pre-load bush between the spring and the fork leg plug.



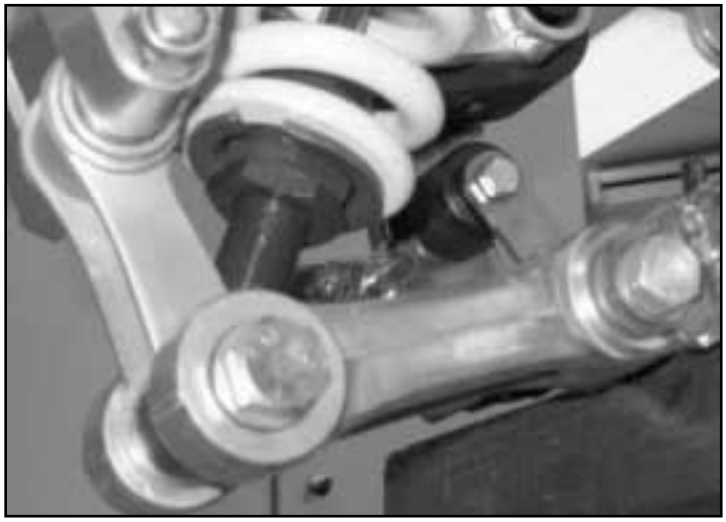
SUSPENSIÓN	Suspension stroke (mm.)		cc oil / bar		Type of oil
MARZOCCHI	R DRD	485	R DRD	445	AGIP 10 W
PAIOLI	X TREME	190	X TREME	285	AGIP 10 W
SEBAC	GPR R	120	GPR R	175	AGIP 10 W
MARZOCCHI	SM DRD	465	DRD SM	445	AGIP 10 W
PAIOLI	X TREME SM	175	X TREME SM	270	AGIP 10 W
SEBAC	GPR Racing	95	GPR Racing	140	AGIP 10 W

STRIPPING DOWN THE REAR SUSPENSION

- The rear shock absorber assembly is maintenance-free, and there are no external adjustments possible, and consequently in the event of malfunction, the entire faulty unit must be replaced.



- In R DRD models maintenance must be carried out on the rear suspension link assembly which provides the progressivity to the whole unit: this maintenance work consists of stripping down the links, cleaning and re-lubrication of the link bearings in the event of intensive off-road usage of the machine, in particular if such areas are very dusty or muddy.



STRIPPING DOWN THE CARBURETTOR

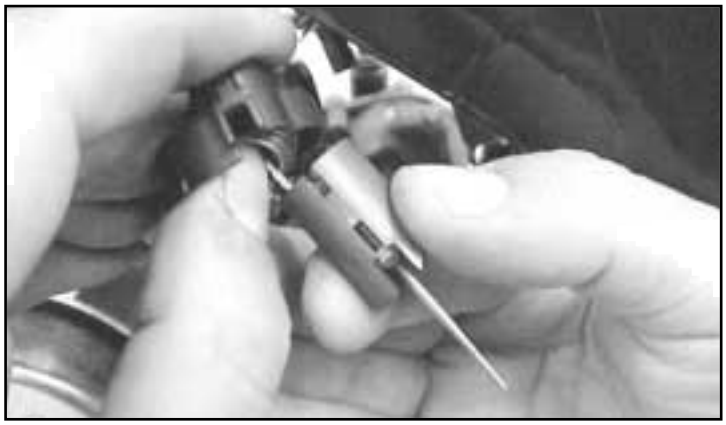
- Slacken off the carburettor - inlet manifold and the air filter outlet securing clamps. Disconnect the fuel, oil and fuel tap vacuum line hoses, and withdraw the carburettor.



- Slacken off the carburettor cover securing screw, and withdraw the cover together with the throttle cable, the fuel valve, and the doser conical needle.



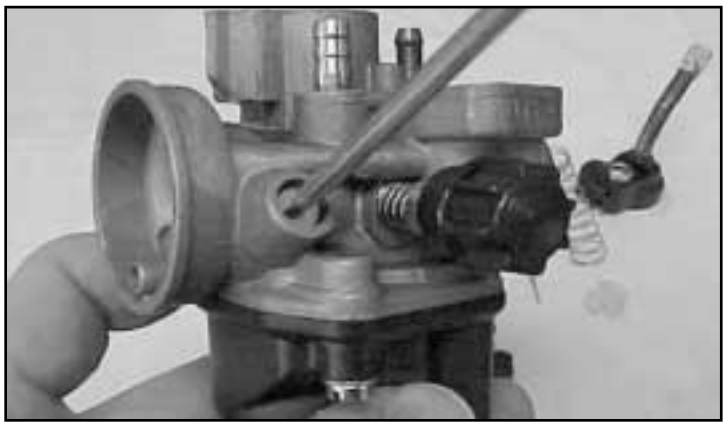
- Compress the gas valve return spring against the cover and extract the throttle cable terminal through the channel in the fuel valve.



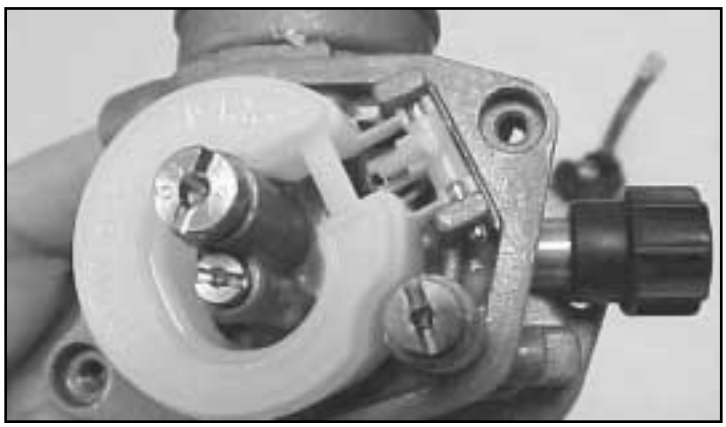
- Remove the piston valve - cold start system (choke) securing clamp and withdraw the assembly.



- Remove the air volume adjustment screw (compensator) in the low speed circuit (idle circuit).

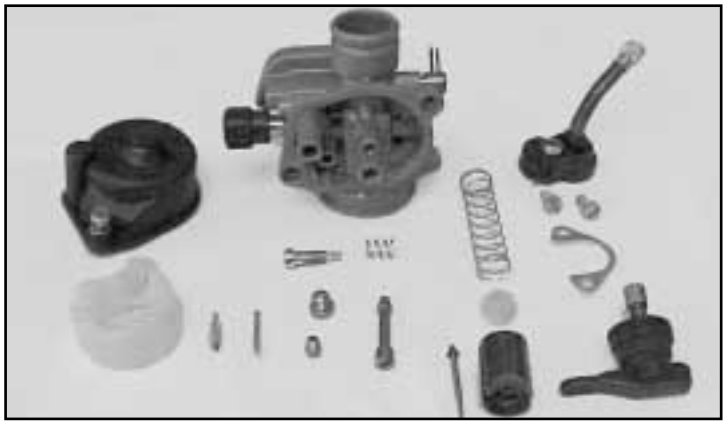


- Remove the carburettor float chamber securing screws and the carburettor float chamber, in order to gain access to the jets: main, idle, and choke, together with the float and the float needle valve.

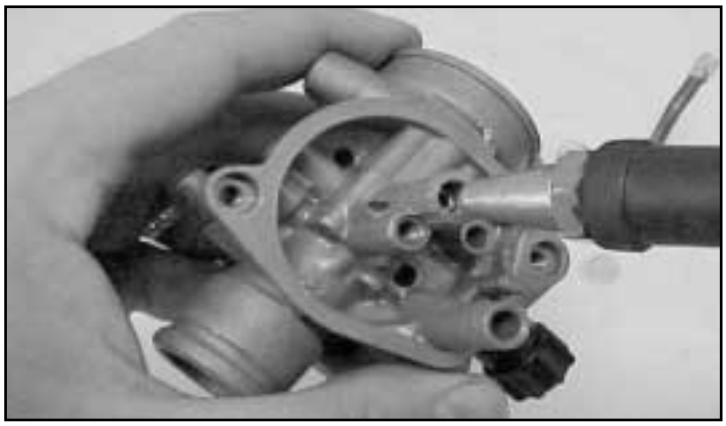


ASSEMBLING THE CARBURETTOR

- Thoroughly clean all the components of the carburettor using solvent (take care not to damage the carburettor float gasket and the cold start piston valve O-ring).



- Using compressed air thoroughly blow clean all the carburettor airway orifices, together with those for oil and fuel.



- Using a balance, check the weight of the float. This is marked on the float itself (3.5 grams). Replace the part if it exceeds the stated weight.



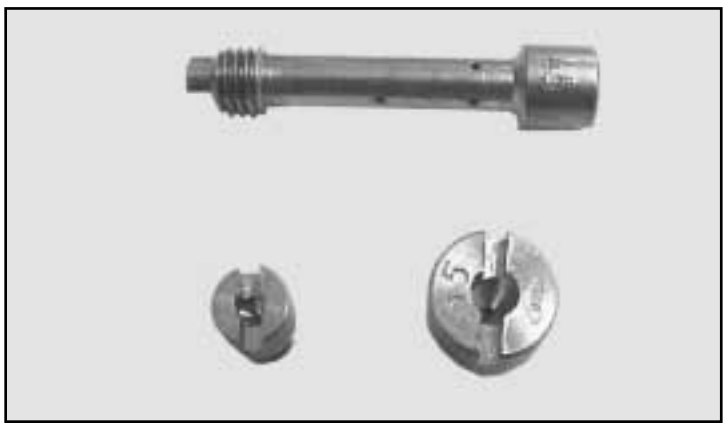
- Check that the cone at the end of the fuel flow control pin and the float connector stud spring are in good condition: if they are not in good condition, replace with a new component.



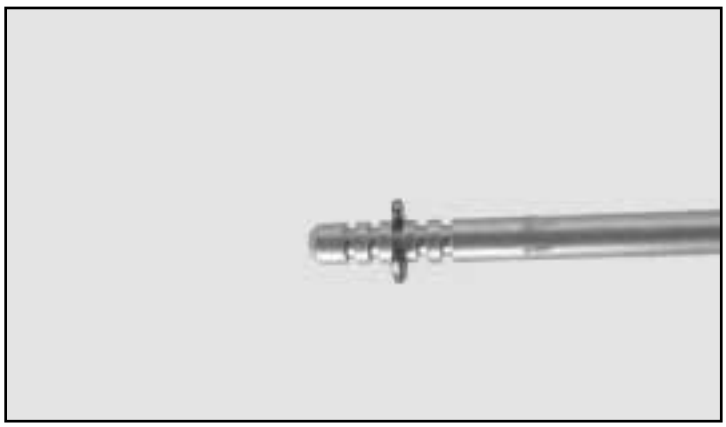
- Check the condition of the cold start piston valve. Replace the unit if signs of damage are found on the vulcanised sealing seat, or on the metal piston body itself (scratches and/or corrosion exceeding 25% of the total surface area).



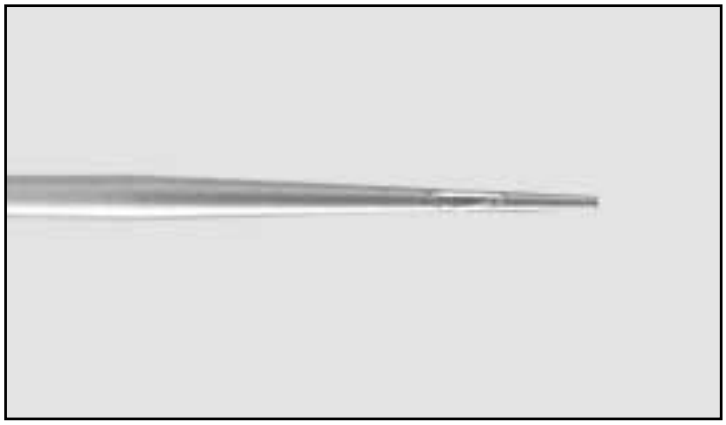
- Check the size of the jets with reference to the numbering stamped on the jets, and install the correct jets (see table of adjusts); failure to observe this will have a negative effect on the performance of the engine.



- Check the position of the doser conical needle circlip. This should be located in the central ring of the five available. By moving the circlip to a ring further up the needle a weaker mixture is obtained, and by moving the circlip further down the needle a richer mixture is obtained; this is to allow adjustment for very extreme climatic conditions.



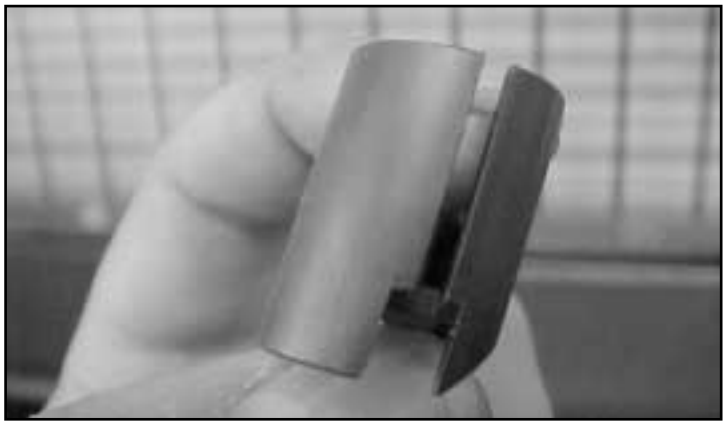
- Replace the doser conical needle if any signs of damage are observed on its circumference, as shown in the figure.



- Check that there are no signs of scratches on the minimum circuit air adjustment screw conical tip, since this would affect its performance.



- Also check that there are no signs of scratches on the slide valve. Replace in the event that such scratches cover more than 25% of its total surface area.



- Take car to install a new slider valve of identical characteristics (refer to the marking on the base of the component).
- Completely re-assemble the carburettor.
- Re-mount the carburettor onto the engine, and connect the fuel, oil and fuel tap vacuum operating hoses correctly.



- Check that the throttle cable is able to move the correct distance and that its operation does not become blocked or stiff at any point in the movement.
- Adjust the ply on the throttle control on the handlebar by tightening or slackening the throttle cable sleeve tensioner located beside the throttle twist grip control until a play of 3 to 5 mm is obtained.

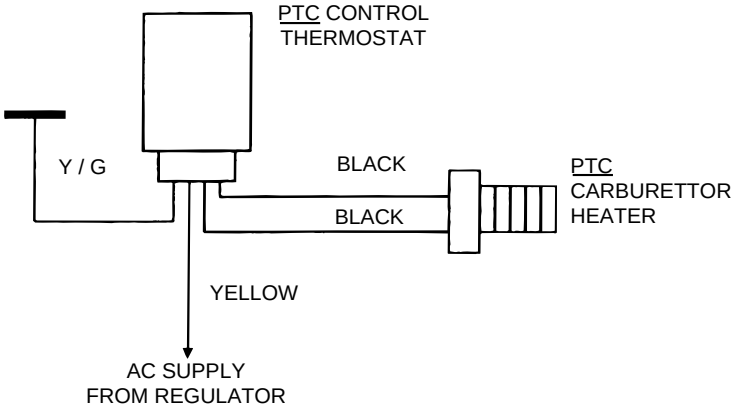
- Remove the right hand side body work cover in order to gain access to the air filter cover, withdraw the air filter cover. Withdraw the air filter foam, and wash it in soap and water, then squeeze out and dry thoroughly. Once dry soak it in special air filter oil, and reinstall.



- Start the engine and warm it up slightly.
- Proceed to adjust the idle speed, using the following procedure:
- Turn the slide valve rest stop screw until the engine does not stall (screwing in).
- Screw the minimum circuit air adjuster screw fully home, but without forcing it. Then unscrew 1 1/2 turns. Start the engine again if it has stalled during this operation.
- Turn the slide valve rest stop screw again, slowly screwing in and out, until a stable idle speed of 1,800 $\pm$ 50 rpm is obtained (use an external rev counter for this purpose).
- Rev up the engine fast using the throttle control, and check that the engine accelerates and decelerates brilliantly and fast, with no soft spots. If this is not obtained, repeat the carburettor adjustment procedure again from the first step.
- For models with a carburettor heater, proceed according to the following information in order to achieve proper operation.

Thermostat control

- Check that the power supply reaches the thermostat connecting a lamp between the Yellow/Green and Yellow cables.
- To check the outputs, black cables, it is necessary to reduce the temperature of the thermostat to 5ºC and then check the output between the black cables using a 12 v bulb.



Check the thermal resistance of the carburettor

- Check the resistance of the PTC at a temperature of between 15º and 20ºC.

  Resistance value: 8Ω ± 3

CARBURETTOR

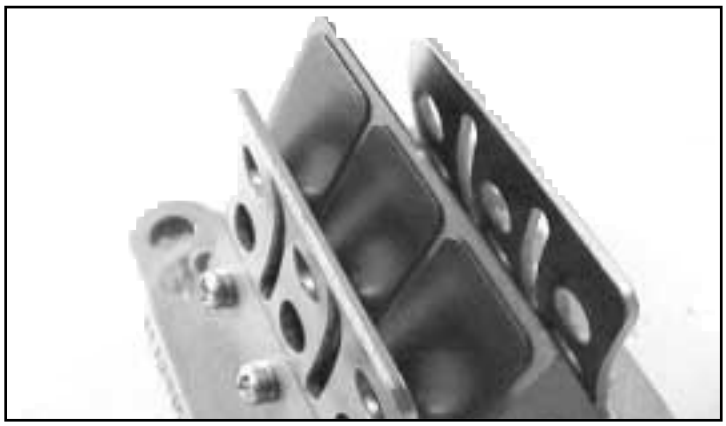
BRAND	MODEL	VEHICLE	MAIN JET	NEEDLE POS	IDLE JET	EMULSIFIER	THROTTLE VALVE	AIR	CHOKE JET	FLOAT [gm]
					SENDA R/SM 2000 GILERA				45	
DELL´ORTO	PHVA 14DD	SENDAR/SM 2000 (Spain,Fra)	71	A11/4th	32	211 GA	30	2 3/4	45	3.5
DELL´ORTO	PHVA 12DD	SENDAR/SM 2000 (Italy)	65	A11/4th	36	211 GA	30	2 1/2	50	3.5
DELL´ORTO	PHVA14DD	SENDAR-2000 (W.V.T.A.)	53	A11/3rd	33	208 GA	40	1 3/4	50	3.5
DELL´ORTO	PHVA14DD	GILERA ZULU (W.V.T.A.)	54	A11/3rd	34	208 GA	40	2 +/- 1/4		3.5
					SENDA R/L/SM - FENIX - CAMPERA				45	
DELL´ORTO	PHVA 14 DD	SENDA-R/FENIX (Spain)	73	A8/3rd	36	211 GA	30	3	50	3.5
DELL´ORTO	PHVA 14 DD	SENDA-R (France)	60	A11/3rd	36	210 GA	30	2 1/2	45	3.5
DELL´ORTO	PHVA 12 DD	SENDA-R (Italy)	65	A11/4th	38	211 GA	30	2 1/2	50	3.5
DELL´ORTO	PHVA 14 DD	SENDA-R (Austria)	60	A11/3rd	38	208 GA	40	2 1/4	50	3.5
DELL´ORTO	PHVA 14 DD	SENDA-R (Germany/95)	62	A11/3rd	34	208 GA	40	2.5	50	3.5
DELL´ORTO	PHVA 17.5 ED	SENDA-R 100 (SouthAmerica)	83	A7/3rd	34	212 FA	40	2 1/2	45	3.5
DELL´ORTO	PHVA 14 DD	SENDA SM (Austria)	63	A8/3rd	36	211 GA	30	3		3.5
DELL´ORTO	SHA 12-12 T	SENDA/FENIX (Spain)	64			39	10		50	3.5
DELL´ORTO	PHBN 12 BS	SENDA L (Germany)	58	A2/3rd	32	210 FA	30	3 1/2	50	3.5
DELL´ORTO	PHBN 12 FS	SENDA L (Germany)	58	A2/3rd	32	210 FA	30	3 1/2	50	3.5
DELL´ORTO	PHBN 12 BS	SENDA L (Austria)	56	A2/3rd	32	210 FA	30	3.5	50	3.5
DELL´ORTO	PHBN 12 FS	SENDA L (Austria/93)	56	A2/3rd	32	210 FA	30	3.5	50	3.5
DELL´ORTO	PHBN 12 FS	SENDA L (Belgium)	64	A2/3rd	32	210 FA	30	3 1/2	55	3.5
MAG.MARELLI	18 OM 1 BA	SENDA R 100/FENIX 100	90	AJ/2nd	34/35	G8	3	2.5	50	4.5
DELL´ORTO	PHVA 17.5 ED	FENIX 100 (South Am.)	86	A7/3rd	34	212 FA	40	2 1/2	50	3.5
DELL´ORTO	PHVA 14 DD	FENIX (Austria)	56	A11/3rd	32	208 GA	40	2 1/2	65	3.5
DELL´ORTO	PHBG 20 BS	BI-3 75 Enduro	88	W9/1st	48	262 AU	40	1 1/2		4
ARBEO	SHA 12-12 MR	CAMPERA	70		Ø 1,0	Ø 1,75mm	Standard	1.5		3.5
					GPR -MITO				45	
DELL´ORTO	PHVA 14 DD	GPR 50R W.V.T.A.	54	A11/3rd	34	208 GA	30	3/4	50	3.5
DELL´ORTO	PHVA 17.5 TS	GPR 50R (Spain)	98	A15/4th	34	212 FA	40	3	50	3.5
DELL´ORTO	PHVA 17.5 ED	GPR 50R (Spain)	98	A15/4th	34	212 FA	40	3	45	3.5
DELL´ORTO	PHVA 14 DD	GPR 50R (France)	70	A11/3rd	36	208 GA	30	2 1/2	45	3.5
DELL´ORTO	PHVA 12 DD	MITO (Italy)	68	A8/3rd	38	211 GA	30	3 1/4	45	3.5
DELL´ORTO	PHVA 14 DD	MITO (Austria)	76	A13/4th	34	210 FA	40	2 1/2	50	3.5
DELL´ORTO	PHVA 17.5 TS	GPR 100 (SouthAm.)	96	A15/4th	34	212 FA	40	3	50	3.5
DELL´ORTO	PHVA 17.5 ED	GPR 100 R (SouthAm.)	96	A15/4th	34	212 FA	40	2 3/4	65	3.5
DELL´ORTO	PHBG 20 BS	GPR 50 1994	95	W9/3rd	48	264 AU	40	1 1/2	65	4
DELL´ORTO	PHBG 20 BS	GPR 75 1992	90	W9/2nd	48	262 AU	30	1 1/2	65	4
DELL´ORTO	PHBG 20 BS	GPR 75 1989	115	W20/2nd	45	258 BP	40	2 1/2		4
					BULTACO LOBITO / ASTRO				50	
DELL´ORTO	PHVA 17.5 ED	BULTACO LOBITO (Spain)	88	A29/2nd	30	212 FA	40	1 3/4	55	3.5
MAG.MARELLI	18 0M 1DA	BULTACO LOBITO (Spain)	92	AG/2nd	34/35	G8	3	2.5	55	4.5
MAG.MARELLI	14 OM 1CA	BULTACO LOBITO (France)	87	AE/4th	35/35	G8	3	2.75	55	4.5
MAG.MARELLI	12 OM 1RA	BULTACO LOBITO (Italy)	84	AI/4th	35/35	G8	5	2	50	4.5
DELL´ORTO	PHVA14DD	BULT.LOBITO, ASTRO (WVTA)	53	A29/3rd	33	212 GA	40	1 3/4		3.5

STRIPPING DOWN THE REED VALVE

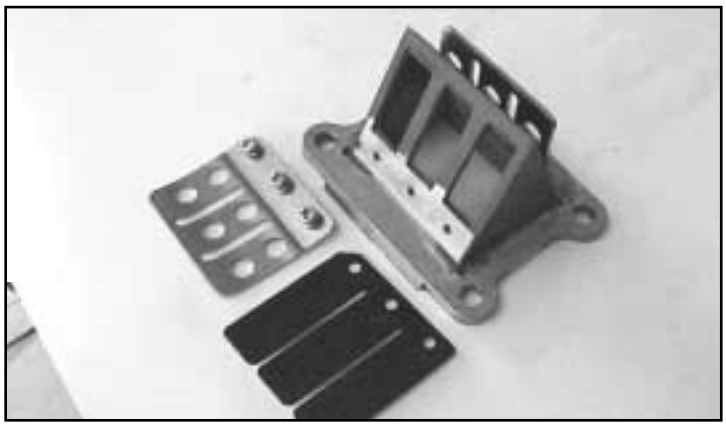
- Withdraw the carburettor from the engine
- Remove the inlet nozzle securing screws, as is, and then it is possible to gain access and withdraw the reed valve.



- Check that there are no signs of cracking, deformation or breaking in the valve reed petals. If signs of damage are present, replace them.

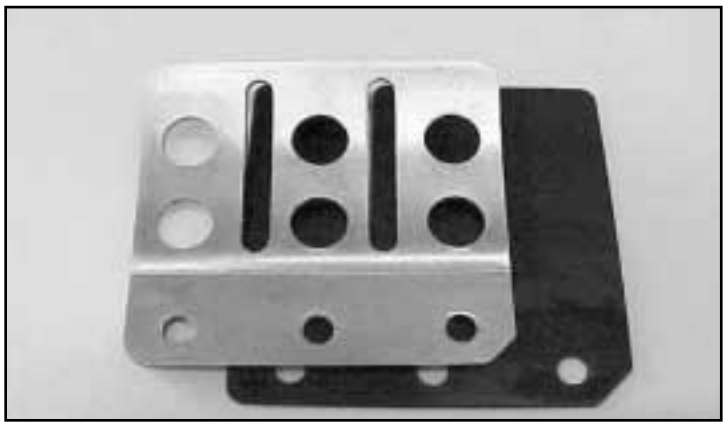


- Remove the opening limiter plate and inlet valve reed petal securing screws and check that there are no cracks in the securing base of the petals. If cracks are found, replace the valve reeds.



ASSEMBLING THE VALVE REEDS

- Assemble in reverse order to stripping down, paying particular attention to the correct positioning of the opening limiter plate and the reeds (it is necessary to mate the bevelling). Elimination of the opening height limiter will change the performance of the engine and may affect engine reliability.
- Check the reed valve box O-ring and replace if it shows signs of damage. Install a new gasket.



COOLING SYSTEM

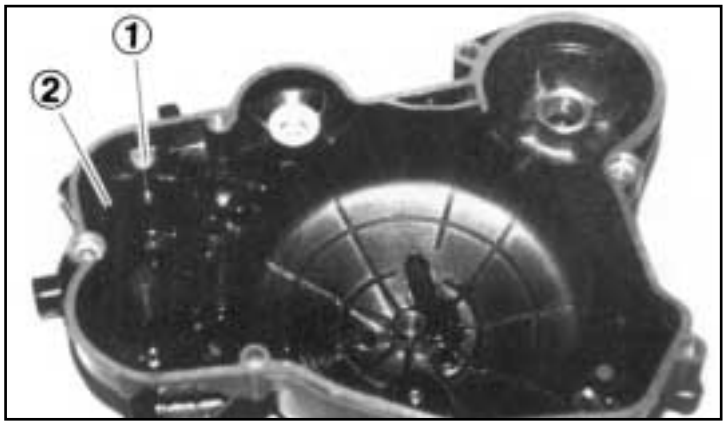
- Drain the engine coolant completely, and proceed to strip down the pump to cylinder and the pump to radiator hoses.
- Remove the water pump cover securing screws and remove the water pump cover.



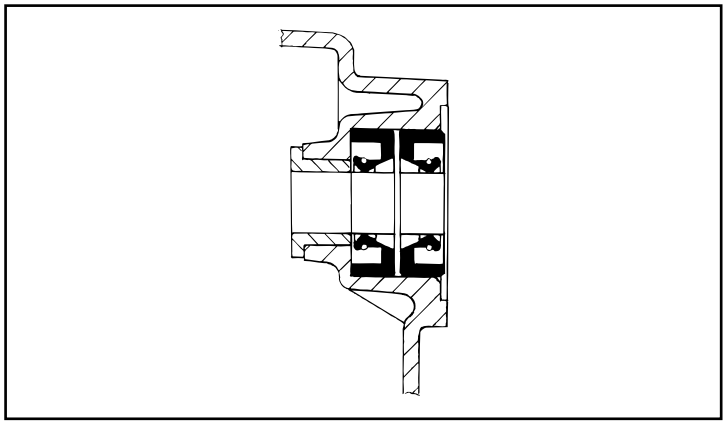
- Slacken off the water pump impeller securing screw and remove it by unscrewing.



- Withdraw the water pump shaft (1) and the impeller pinion (2).

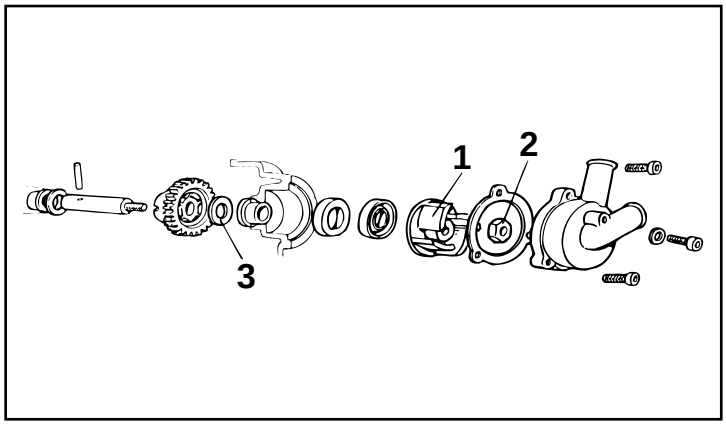


- Change the water pump seals if there is the slightest sign of leakage of coolant liquid or water from the breather hole.
- Fit the new seals according to the drawing attached.



ASSEMBLY

- Fit the water pump shaft and the impeller pinion.
- Fit the washer (3).
- Fit the crankcase cover.
- Fit the pump impeller (1) and the securing nut (2). Tighten up to torque setting 0.2 m.kg.
- Fit the water pump cover gasket, the water pump cover, and the two hoses.
- Fill the transmission with the recommended oil (see page 2-2).
- Fill the cooling liquid circuit (see page 10-2).
- Proceed in the reverse order until the step last mentioned.
- Eliminate the remains of the gasket and coolant deposits on the water pump components
- Install a new water pump cover gasket.
- Proceed to refill and bleed the cooling liquid circuit in accordance with the following procedure:
- Place an external feed reservoir filled with AGIP closed circuit Plus 30 coolant at a height of approximately 2m from the floor, in order to proceed to refill the coolant circuit from the expansion vessel.
- Start up the engine and maintain it at idle speed.
- Open up the feeder reservoir cock and allow the coolant fluid to flow freely until the minimum level in the expansion vessel is reached.





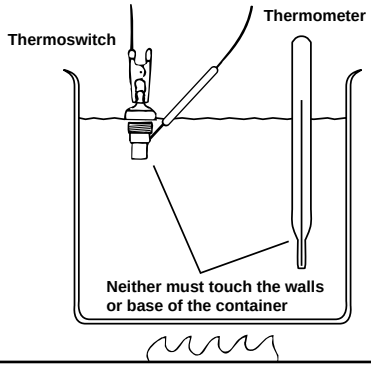
- Remove the bleed screw from the water pump cover and do not reinstall it until the coolant fluid flows out with no bubbles.
- Close the plug-valve of the expansion vessel. Heat up the engine until the thermostat opens.
- Check that the radiator body warms up; if it fails to warm up this indicates that the thermostat has failed to open, or that there are air bubbles inside the coolant liquid circuit.
- Stop the engine and allow to cool.
- Refill the expansion reservoir with coolant liquid until the minimum level in the reservoir is reached (when the engine heats up the level will rise owing to the expansion of the liquid in the circuit.
- Check the electric circuit of the overheating warning lamp on the instrument panel by disconnecting the temperature sensor connector spade and connecting the terminal to earth via a short length of cable, then operate the contact and the warning light on the instrument panel should light up.
- In order to check the cylinder head temperature sensor, as well as the electric fan operating thermos-switch (only in versions fitted with this equipment) submerge the operative part of these components in a container of water (without it touching the sides of the container) and heat up the water. Connect an ohmmeter between the metal body of the devices and the connector terminal, and check that as the temperature of the water rises, the resistance reading at the sensor falls; if this is not the case, replace the thermo-switch.

Sensor	ON	OFF
Cylinder head cooloant temperature	124 ± 3ºC	114 ± 3ºC
Electric fan thermo-swich	97 ± 3ºC	85 ± 3ºC

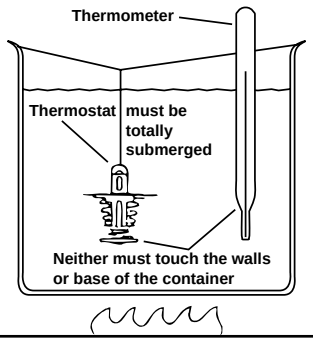
- The thermostat should be checked by submerging it in a container of water (without touching the sides or bottom) and heating the water. Using a thermometer note the temperature when the contact starts to open and again when it stops opening (fully open position).

Temperature ºC	67±3ºC	75ºC
Thermostat opening (mm.)	0,1	3,0

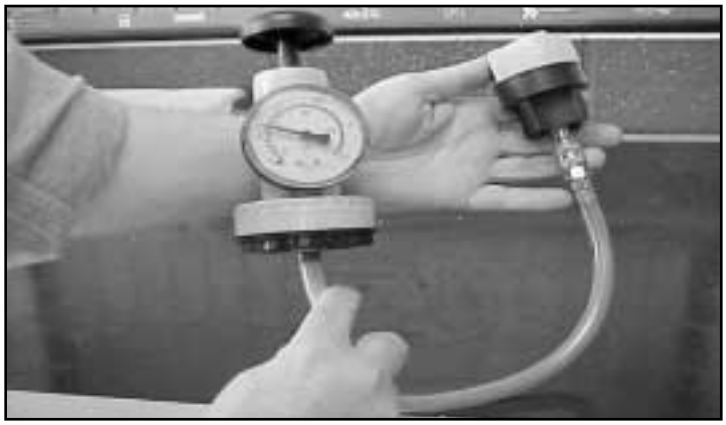
Inspection of the thermoswitch



Measurement temperature valve opening

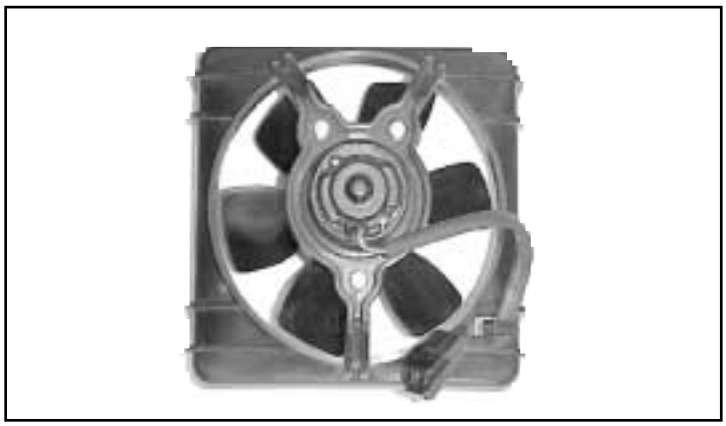


- In order to check the correct operation of the expansion reservoir cap overpressure valve, use a manometer with an appropriate adapter for the thread of the cap.



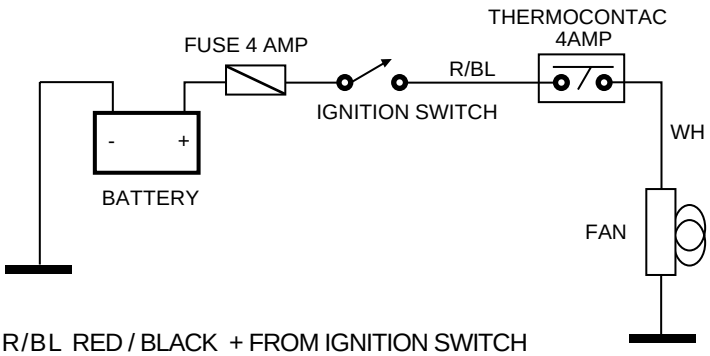
- In vehicles equipped with the electric fan, fan operation should also be checked after filling and bleeding the cooling circuit, as per the following specifications:

CONNECTION	TEMPERATURE ºC
OFF - ON	97 ± 3
ON - OFF	85 ± 3



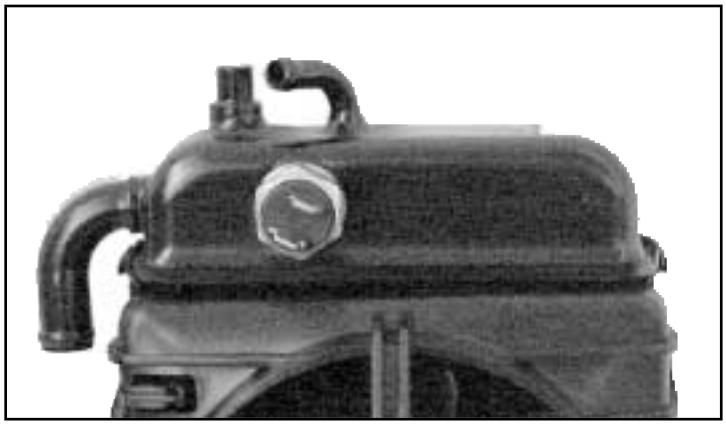
- In the event that the electric fan does not come into operation, check the following:

1. Main fuse
2. Battery voltage charge
3. The electrical circuit operating the fan.



R/BL RED / BLACK + FROM IGNITION SWITCH
WH WHITE + FROM FAN

- If no anomalies or faults are discovered in these areas, proceed to replace the electric fan thermoswitch, which is located on the upper radiator cover.



STRIPPING DOWN THE OIL PUMP

- Remove the inspection cover located on the clutch side crankcase half.
- Slacken off the oil pump inlet and outlet hose securing clamps.
- Plug the inlet hose to prevent draining the oil reservoir.



- Remove the pump operating cable, disconnecting it first from the operating lever arm and then from the sleeve stop on the clutch side crankcase half.



- Remove the two Allen screws securing the pump to the clutch side crankcase half, and withdraw the pump.
- Turn the pump rotation shaft by hand to check that it rotates smoothly.
- Check the condition of the O-ring and the shaft oil seal. Replace if they show signs of damage.
- The oil pump is a safety item for the proper operation of the engine and in the event that it becomes faulty, it should be replaced and not repaired.



ASSEMBLING THE OIL PUMP

- Proceed in the reverse order to that specified for stripping down, shown above.
- Pay particular attention to ensuring that the castellated drive connection between the pump shaft and the gearing in the clutch side crankcase half is properly engaged.
- Proceed to bleed the oil pump according to the following procedure:
- Fit the oil supply hose from the oil reservoir to the oil pump.
- Using a syringe fill the pump outlet hose with AGIP Speed oil, and connect it between the oil pump and the carburettor.
- Withdraw the pump bleed screw.
- Feed the carburettor with a 2% mixture of AGIP Speed oil and petrol from an independent source.
- Start the engine and maintain it at idle speed. Turn the oil pump control lever to its full open position, and keep it in this position until the oil flows out of the pump bleed orifice without any bubbles.
- Fit the pump bleed screw and check that the oil flows freely through the end of the outlet hose which is connected to the carburettor.
- Stop the engine and remove the independent supply of fuel-oil mixture. Reconnect the petrol feed from the fuel tank.
- Fit the pump control cable and adjust the play in the cable until the arrow on the control lever arm is opposite the reference mark on the pump body (and the throttle control is completely closed).
- Refill the oil reservoir with oil until it reaches the maximum mark.

PULLING THE ENGINE FROM THE FRAME



Models: RACER, XTREME - DRD

- Remove all the plastic components around the fuel tank. Take care with the joint between the plastic elements with the fuel tank, and to the front grille protecting the radiator.



- Withdraw the exhaust pipe and silencer assembly.

Models:

GPR R and GPR Racing Replica



- Extract the lateral securing screws attaching the screen to the fairing and the frame, on both sides, and then extract the entire unit.



- Open the cover of the fuel tank fairing. Remove the screws from the battery inspection cover and then the battery inspection cover.
- Withdraw the helmet box, turning it to one side and raising it by the front, and in this way easy access to the engine components is achieved.

- Remove the water pump to radiator coolant liquid hose. Have a tray ready to catch the coolant liquid.



- Disconnect the following electrical connections:
  1. Magneto to HT coil;
  2. Coolant liquid temperatures sensor;
  3. Ignition connection cable from HT coil to spark plug.



- Remove the carburettor:
  1. Fuel cock vacuum operating hose;
  2. Fuel supply;
  3. Engine oil supply from oil pump.



- Withdraw the clutch operating cable. Before withdrawing the cable, slacken off all tension in the cable at the clutch cable tensioner on the handlebar lever.



- Remove the oil pump inspection cover on the clutch side crankcase half, and disconnect the operating cable from the terminal. Disconnect the hoses (oil reservoir supply to oil pump, and oil pump supply to carburettor).



- Remove the gear shift pedal from the gearbox, and also the kick start pedal.

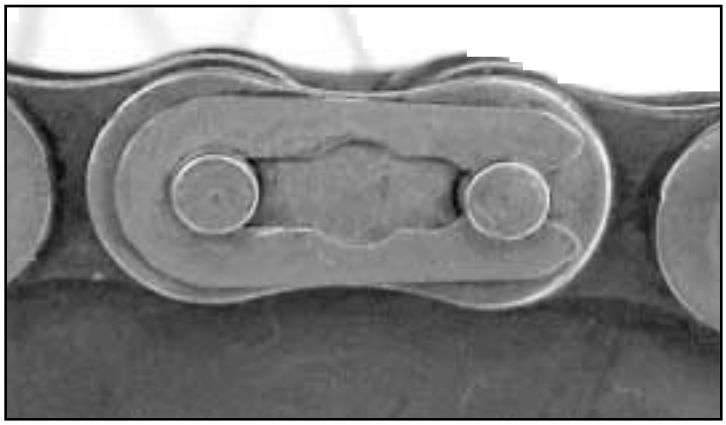




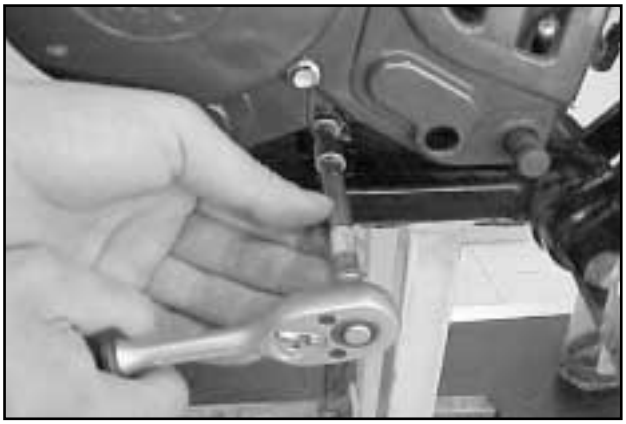
- Drain off the oil from the clutch-side crankcase half and gearbox. The drain plugs are located in the underside of the crankcase and in the clutch cover.



- Remove the final drive chain, opening the connecting link noting the correct position of the link clip.







- First slacken off completely the engine to frame mounting bolts, and then remove.



- Withdraw the engine from the frame, pulling towards the front and rotating slightly.



FITTING THE ENGINE INTO THE FRAME

- Follow the indications for stripping down as given above, but in reverse order.
- Take care to ensure that the electrical connections for the magneto, the spark plug, and the engine temperature sensor are correctly made.
- Install the fuel supply hose to the carburettor and the vacuum line for the fuel cock, and in addition the oil hoses from the oil reservoir to the pump and from the pump to the carburettor.
- Install correctly and ensure proper operation of the throttle control and oil pump control cables.
- Fill and bleed the oil pump (please refer to the specific section in this manual).
- Install the clutch cable properly and adjust for correct play using the tensioner at the handlebar clutch lever.
- Refill the gearbox-clutch assembly and check for correct level (please refer to the specific section in this manual).
- Install the final drive chain, and take care to ensure that the connector link and clip are correctly secured.
- Fill the cooling circuit and bleed (please refer to the specific section in this manual).

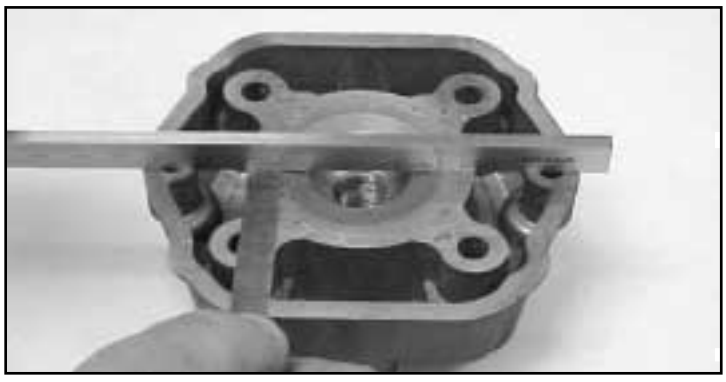
STRIPPING DOWN THE CYLINDER HEAD



- Drain the coolant liquid, removing the hoses fitted to the water pump.
- Place a tray ready to catch the coolant
- Remove the hose from cylinder head to the radiator.
- Disconnect the electrical connector spade on the temperature sensor.
- Disconnect the HT cable from the spark plug cap and withdraw the spark plug
- First slacken off and then extract in this order, the M6 screws and then the M7 nuts.



- Withdraw the cylinder head and cylinder head gasket from the cylinder. Clean off the remains of the gasket and coke deposits without scratching or degrading the surfaces.



- Using a feeler gauge and a straight edge check the mating surfaces for warping, both on the cylinder head and on the cylinder.

  Maximum permitted out of true:

  0.1 mm.

FITTING THE CYLINDER HEAD

- Follow the instructions given above for stripping down the cylinder head, in reverse order.
- Fit a new cylinder head gasket, first ensuring that the mating surfaces are perfectly clean, both on the cylinder head and on the upper face of the cylinder. Do not apply any form of sealant.
- Tighten the M7 nuts and then the M6 screws, and finally torque up to a torque setting of 18 to 20 Nm following a cross pattern sequence.
- Refit the hose between the cylinder head and the radiator correctly.
- Fit a new spark plug.
- Reconnect the temperature sensor and sparkplug electrical connections.
- Refill the cooling circuit with AGIP coolant, and bleed the circuit (please refer to the specific section in this manual).

STRIPPING DOWN THE CYLINDER AND THE PISTON



- Drain the coolant out of the engine.
- Strip down the cylinder head.
- Remove the cooling circuit hose between the cylinder and the water pump.
- Withdraw the cylinder, pulling gently upwards.



- Remove the cylinder base gasket.
- Place a clean rag in the opening of the crankcase to prevent any objects from falling accidentally into the crankcase.
- Remover the gudgeon pin securing clips and then:
  - The gudgeon pin;
  - The Piston;
  - The connecting rod big end bearing.
- If the gudgeon pin needs to be pushed to extract it, support the connecting rod firmly from the other side to prevent it being damaged or bent out of shape.
- Proceed to clean the components and to eliminate the remains of the cylinder gaskets and coke deposits gently (avoid scratching the outside surface of the piston).
- Perform a visual check of the condition of the connecting rod big-end.
- If there are signs of damage on the needle bearing contact surface, replace the connecting rod.



- Perform a visual check of the condition of the connecting rod big end bearing; if signs of damage are found to the needles or if there are cracks in the cage, it should be replaced.
- Withdraw the piston rings by opening them at their ends, and lifting them from the opposite side.

CHECKING THE CYLINDER AND THE PISTON

- Check the piston ring gaps, inserting them into the cylinder bore and measuring the gap with a feeler gauge.

  Maximum permitted piston ring gap: 0.5 mm.



- Check the amount of wear in the cylinder, using an alexometer. Calibrate the alexometer previously using the dimensions given in the table of cylinder - piston families.
- Perform measurements across two perpendicular axes and at three different heights.

  Service limit: 0.05 mm.



Family	Piston ± 0.0025	Cilinder ± 0.0025	Play
A	39,845	39,870	0.020 - 0.030
B	39,850	39,875	
C	39,855	39,880	
D	39,860	39,885	

- Check the diameter of the piston over the diameter perpendicular to the gudgeon pin and at a distance of 15 mm from the bottom edge of the piston skirts.

  Service limit: 0.06 mm.



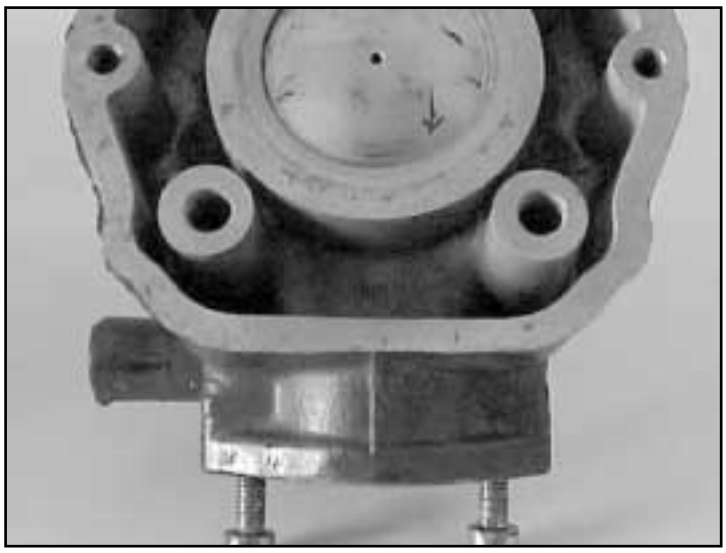
ASSEMBLING THE CYLINDER AND THE PISTON



- Install the piston rings.
- Install a new cylinder base gasket.
- Install the needle bearing cage, the gudgeon pin and the circlips, first lubricating the components with AGIP Speed oil. Pay attention to the position reference mark on the crown of the piston (the arrow should point towards the exhaust port).
- Take care to ensure that the lugs on the gudgeon pin circlips point upwards. Ensure that the circlips are seated fully home in their grooves.



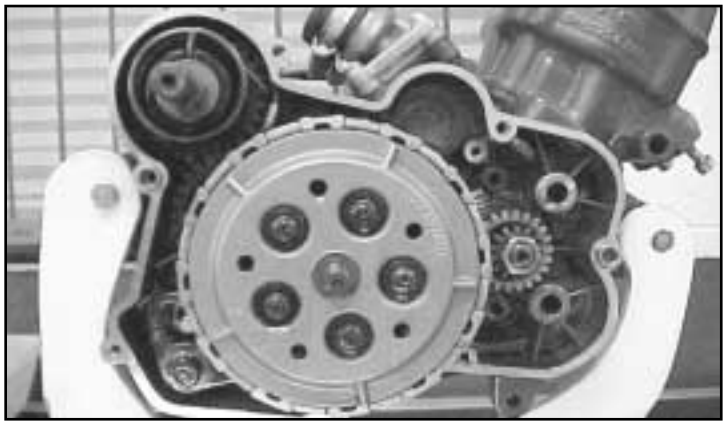
- Compress the rings into the interior of their grooves
- And take care to ensure that they do not ride up over the fixed stop pins.
- Lubricate both the interior wall of the cylinder and the outside of the piston and the piston rings.

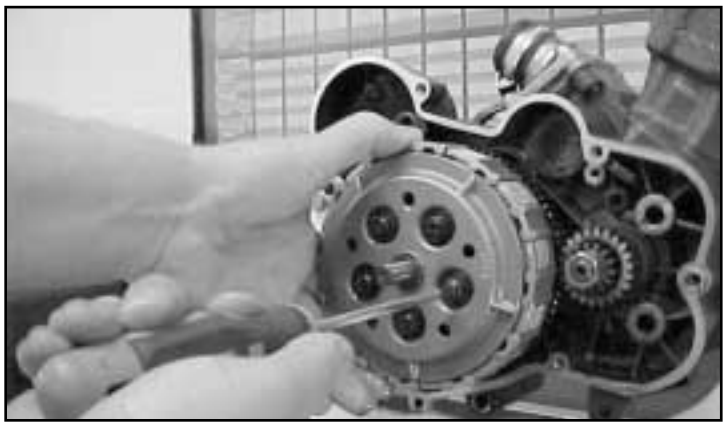


- Fit the cylinder and check that the piston is correctly orientated (with the arrow pointing towards the exhaust port).
- Fit a new cylinder head gasket and re-assemble the cylinder head.
- Fit a new spark plug.
- Reconnect the electrical connectors for the temperature sensor and the spark plug.
- Refill the cooling circuit with AGIP coolant liquid, and bleed the cooling circuit (please refer to the specific section in this manual).

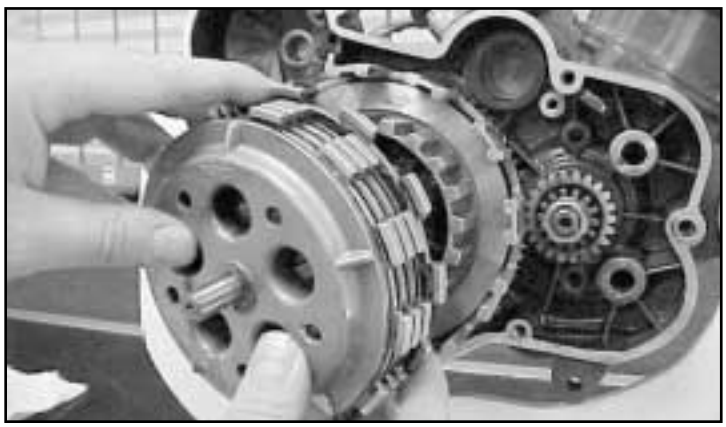
STRIPPING DOWN THE CLUTCH ASSEMBLY

- Drain the coolant liquid from the engine.
- Drain the oil from the transmission, by extracting the two drain plugs (clutch side crankcase half and underside of crankcase, also removing all hoses and operating cables
- Extract the oil pump, with tubes and cable.
- Remove the kick start pedal.
- Remove the clutch side crankcase half securing screws and the crankcase half.
- This gives access to the set of assemblies comprising the primary drive, the clutch, the starter system, and the gear selector shaft.

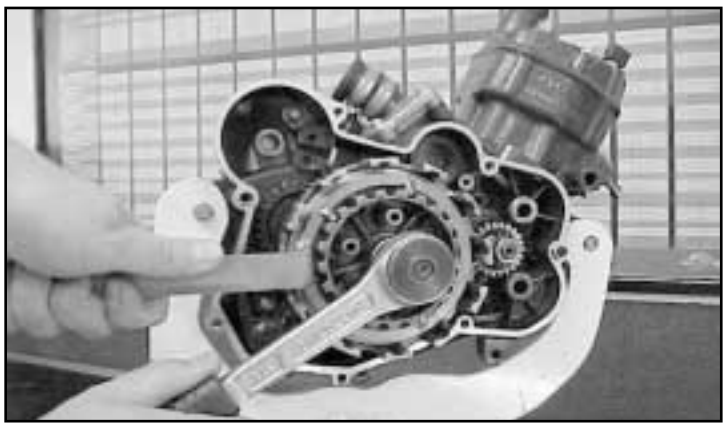




- Strip down all the screws and closing springs on the clutch drive plate.
- Withdraw the set of driven clutch plates and driving clutch plates.



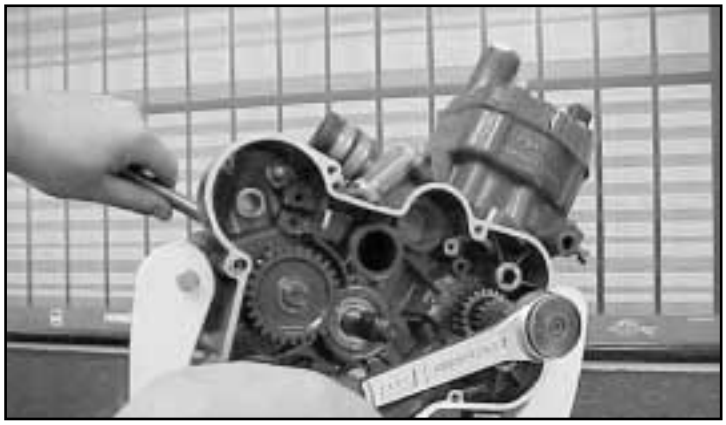
- Unlock the clutch hub securing nut lock washer, and remove the clutch hubs. Special care should be taken with the central bushing and the set of washers.



- In order to free off the torque applied to the balance shaft gear securing nut, in those engines fitted with this unit (1), insert the special tool (part number 00H05600231).



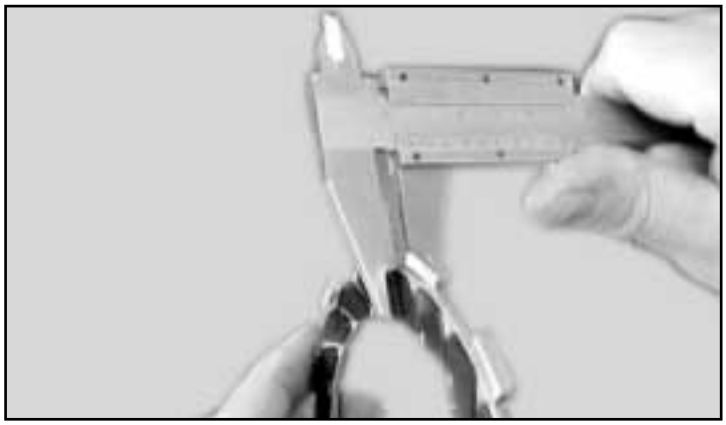
- Using the special tool (part number 00G05300011), fitted to the flywheel, block the crankshaft from turning, and proceed to slacken off the crankshaft output gearing securing nut.



- Check the thickness of the clutch lining on each disc using a caliper gauge.

  Service limit: 3.6 mm.

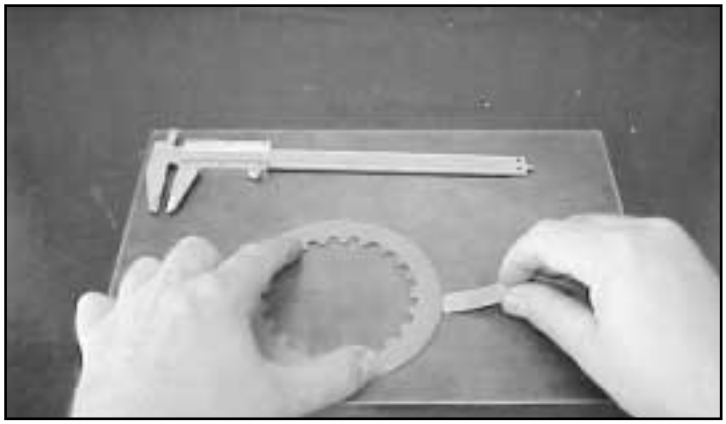
- Replace any disc which shows signs of losing its lining, thermal fatigue (heat discolouration), deformation, or which has damage on the external castellation.



- Check the clutch discs for warping.

  Service limit: 0.15 mm.

- Replace any discs which have lost any lining, show signs of thermal fatigue (heat discolouration), or which has damage on the internal castellation.

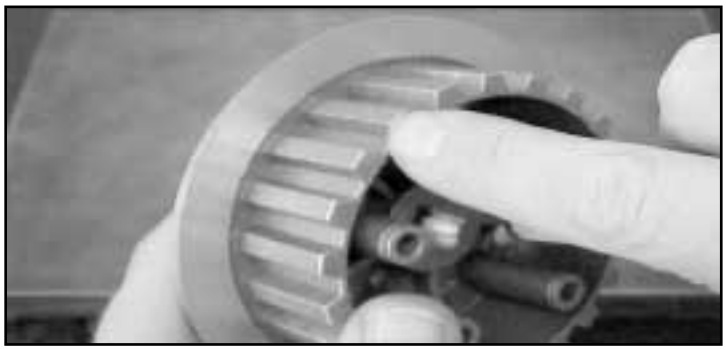


CHECKING THE CLUTCH ASSEMBLY

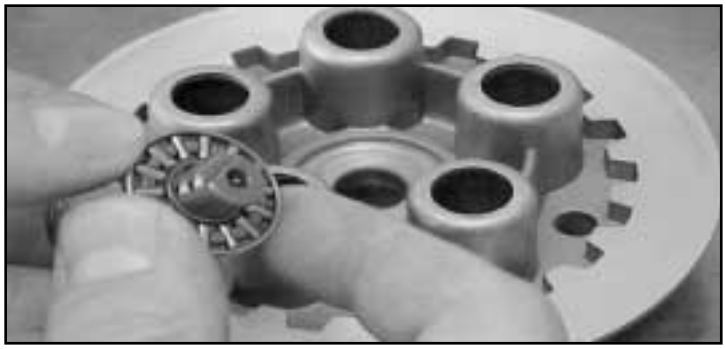
- Check the clutch drive hub:
  1. Scratching on the castellations;
  2. Play in the rivets and silent-blocks attaching to the gearing;
  3. Condition of the bearing turning on the primary shaft.
- If major damage is observed, replace the clutch hub.



- Check for scratching and chipping on the bearing surface of the discs; if damage is found, replace the part.

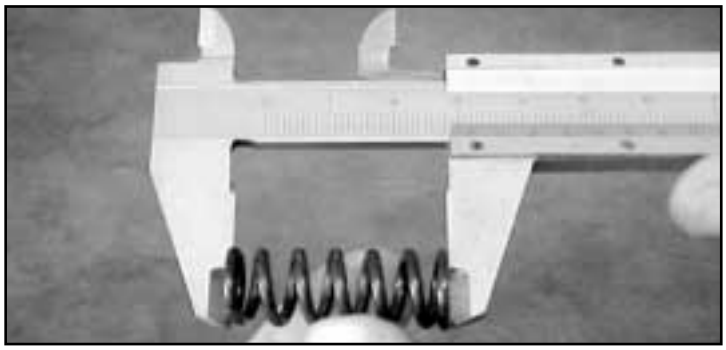


- Check the drive plate assembly and the axial needle bearing, and replace any damaged parts.

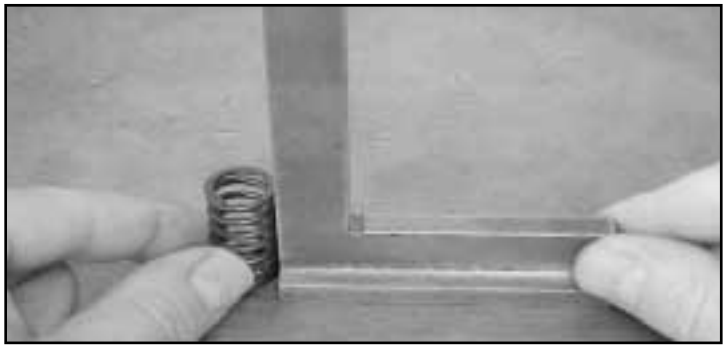


- Check the free length of the spring, and replace the part if it is longer than the service limit.

  Service Limit: 30 mm.

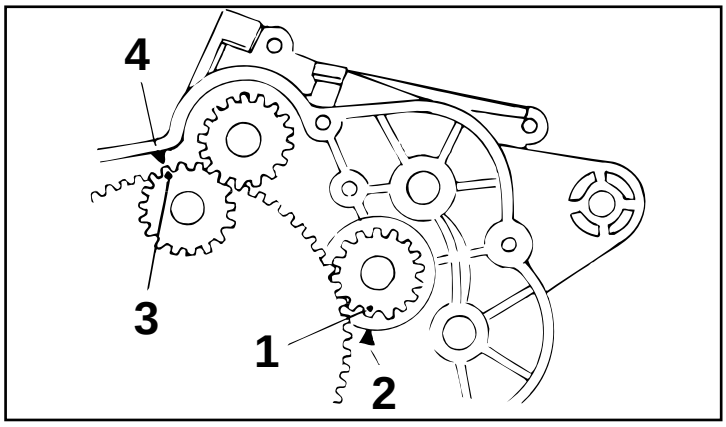


- Using a square, check the spring for parallelism. Replace the spring in the event that it is deformed.



ASSEMBLING THE CLUTCH

- Refit in reverse order to stripping down.
- Remember to install the clutch hub support washers (both driven and driving hubs).
- Keep the following steps in mind when installing the balance shaft in those engines which are fitted with this unit. (Faulty installation will give rise to an excessive level of vibration.)
- Align reference mark 1 punched in the engine output pinion with reference mark 2 on the crankcase, and reference mark 3 punched on the face of the balance shaft pinion with its reference mark 4 on the crankcase.

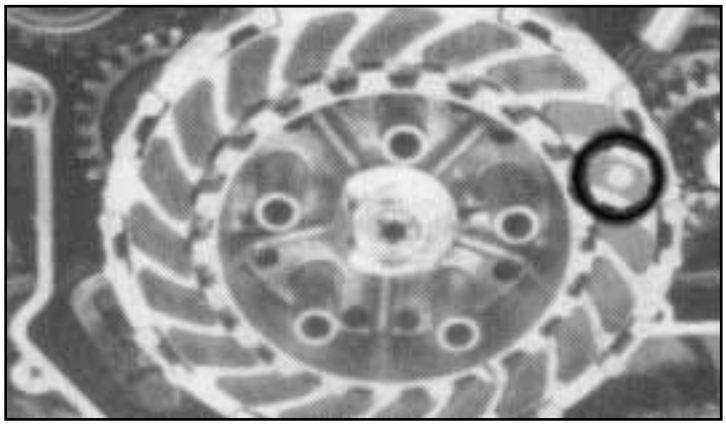


- Fit the clutch hub 1 taking care not to alter the position of the balance shaft and the engine output pinion. First engage the clutch hub with the engine output pinion 2 and the balance shaft intermediate gear 3, then turn the intermediate starter pinion 4 with the hand until it engages with the clutch hub; finally turn the clutch hub to the left or to the right until it engages with the intermediate pinion secondary pinion 3.

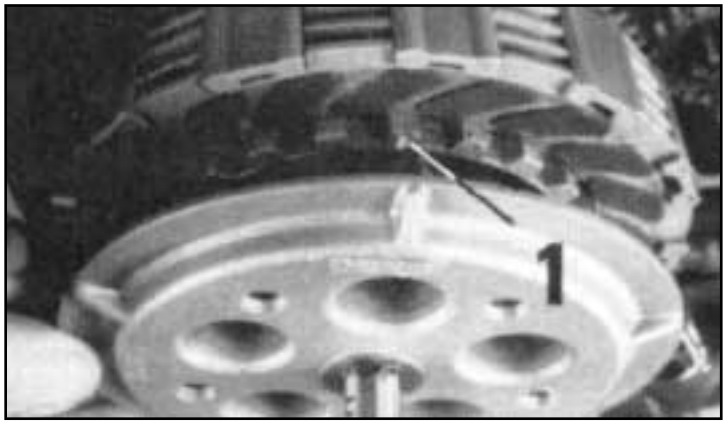


- Take care to apply the correct torque both when tightening the crankshaft gear nut and the clutch hub nut (do not forget to fit a new lock washer and to close it up against one of the flats of the nut), and in the case of the balance shaft intermediate pinion locking nut apply thread seal compound. Ensure that the correct torque is applied to the clutch pressure plate securing screws and the springs.

- Fit the clutch discs in such a way that the mark faces outwards.



- Fit the clutch pressure plate in such a way that the DERBI logo faces the notch in the driven clutch hub.
- Fit a new clutch cover gasket.
- Fit new lock washers on the oil drain plugs (in the crankcase and the clutch side crankcase half) and tighten.
- Fill the gearbox - clutch assembly, using 650 cc of AGIP 10W40 Gear oil.
- Fit the clutch operating cable over the lever located on the clutch side crankcase half, and check the free play at the clutch (left hand side handlebar) lever (play should be approximately 5 mm).
- Start the engine and carry out a brief check of the correct operation of the gearbox and the clutch.



STRIPPING DOWN THE CRANKSHAFT AND THE GEARBOX

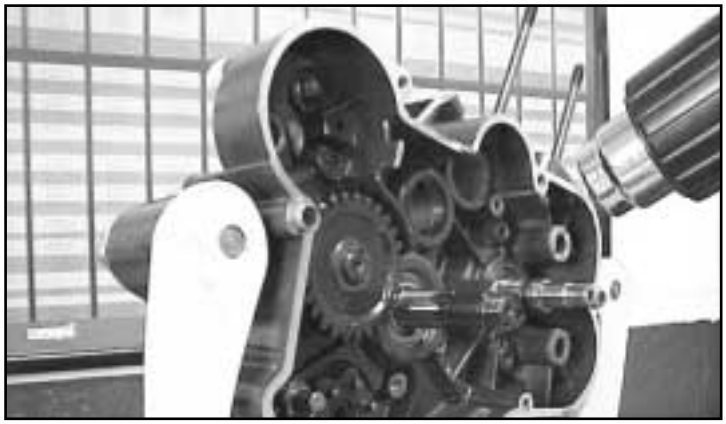
- Withdraw the engine from the frame and set it up on an engine stand.
- Strip down the thermodynamic section (cylinder head, cylinder, and piston).
- Strip down the magneto alternator.
- Strip down completely the primary drive assembly, including the starter system and the gear selector shaft.



- First slacken off and then withdraw all the crankcase half securing screws, from the left hand side of the engine.



- Extract the intermediate starter gear located on the end of the gearbox secondary shaft, and additionally the gear lock transfer and the star gear.

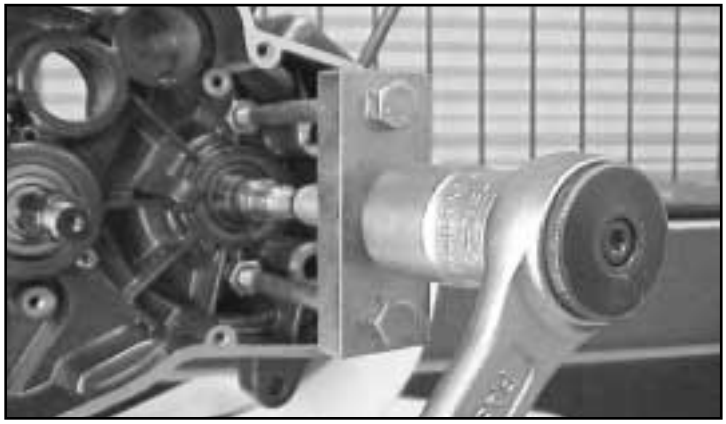


- Heat up the crankcase assembly around the seatings of the crankshaft, primary shaft, and secondary shaft bearings on both sides (to approximately 60ºC).

- Rest the crankcase on a wooden block on its right hand side (primary drive side). Fit the special tool (part reference number: 00H05300151) into the threaded sockets for this purpose; with the operating point resting centred on the crankshaft, proceed to separate the crankcase halves. Do not use levers on the crankcase mating surfaces (if these surface are damaged the crankcase must be replaced).



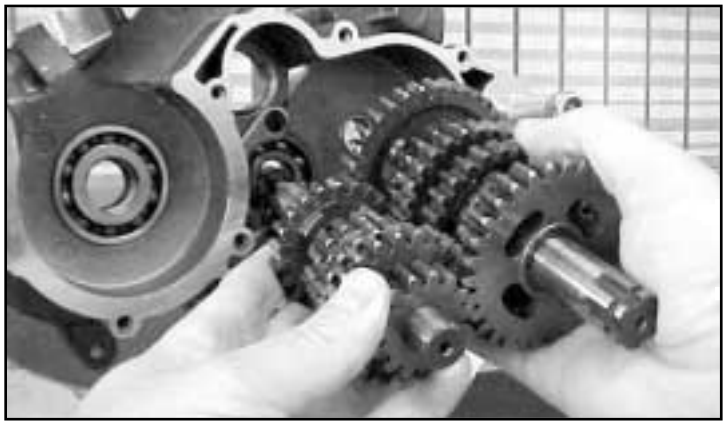
- Now fit the special tool (part reference number: 00H05300151) into the threaded sockets for this purpose beside the crankcase in the right hand side crankcase half, and withdraw the crankshaft.
- After heating up the crankshaft bearing seatings in the crankcase to approximately 60ºC, withdraw the bearings.



- Extract the selector fork guide shafts, and the selector drum and the selector forks.



- Extract the gearbox in one single operation, by pulling on the two gearbox shafts.



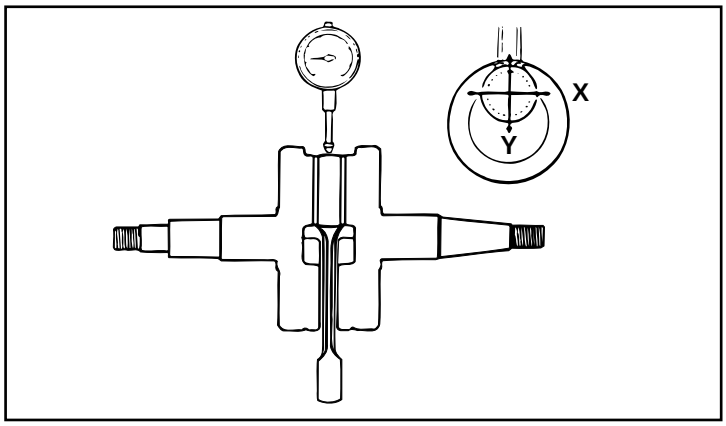
- Clean and completely degrease the crankshaft assembly, in order to proceed to checking.
- Using feeler gauges, check the lateral play in the connecting rod at the big end on the crankpin.

  Service limit: 0.8 mm.



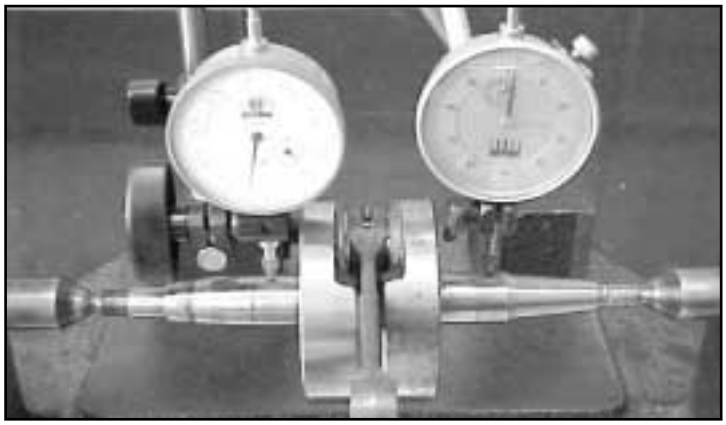
- Using a dial comparator gauge, determine the connecting rod big end bearing play in the X and Y axes.

  Service limit: 0.05 mm.
- Replace the connecting rod and bearings in the event that the service limit is exceeded.



- Mount the crankshaft on a lathe where it can be rotated and check the wobble between the crankshaft cheeks using two comparators set up perpendicular to the circumference of the supporting shafts (check that there are no burrs or scratches).

  Service limit: 0.06 mm.

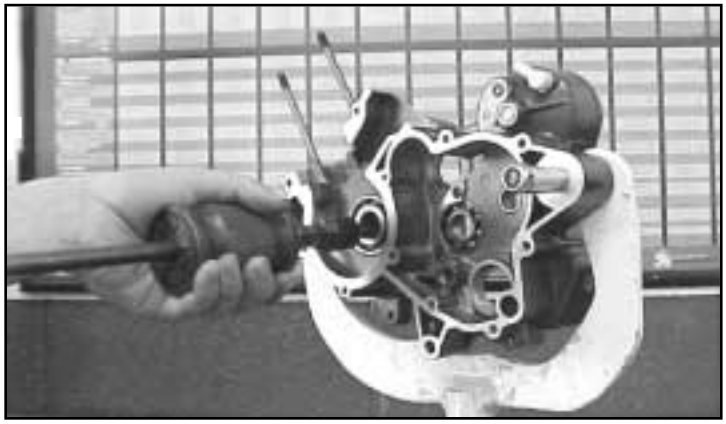


CRANKSHAFT AND GEARBOX ASSEMBLY

- Clean and lubricate the bearings and check that they turn smoothly, with no flat spots or roughness.
- If any signs of damage are found, replace the bearings in pairs.



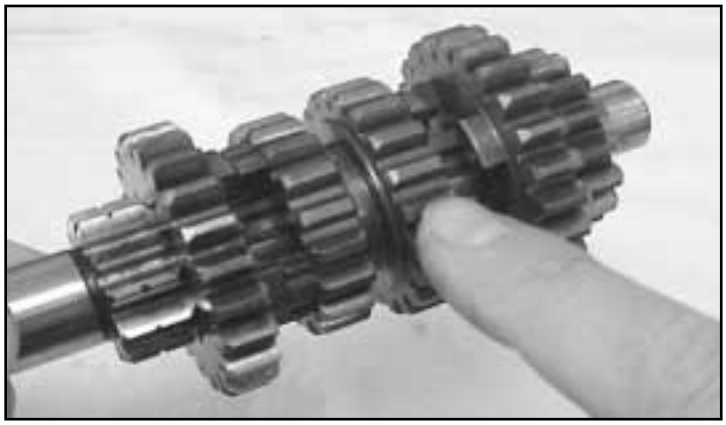
- In order to remove any damaged bearings use the special bearing extractor tool, after first heating up the crankcase to approximately 90ºC. Never reinstall any bearings once they have been extracted, because they will be damaged by the operation of removing them from their seating.



- In order to replace the bearings, heat up the crankcase to approximately 90ºC and prepare the bearing to be inserted by placing it in a freezer; this will make insertion of the bearing easy, almost without it needing to be pushed. If it is necessary to apply force, use the special bearing punch tool, which acts only on the outer ring of the bearing and thus avoids causing any damage.



- Clean and degrease the gearbox assembly and then proceed to check.
- Carry out a visual check on the gear teeth in the gearbox. If there are any signs of thermal fatigue (heat discolouration), or loss of the surface hardening, or any other irregular wear on the teeth (filing), replace the damaged components. If the damage is on the primary shaft the entire shaft must be replaced.



- Proceed to strip down the secondary shaft completely, extracting the assembly securing circlip, and then proceeding to separate all the pieces of the assembly in an orderly fashion. Spread out a clean cloth and place the parts on this cloth as they are stripped down.



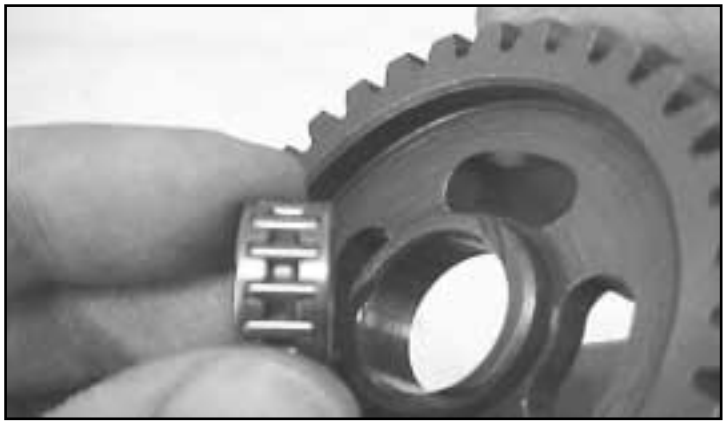
- Check that there is no burring or signs of irregular wear on the studs and slots in the gear change locking system in the sliding gears or on their striations.



- Check the condition of wear of the rotation bushes in the free gears on the secondary shaft.
- If they show signs of damage over more than 25% of their surface, replace them. The fixed locating circlips in the assembly should also be replaced.



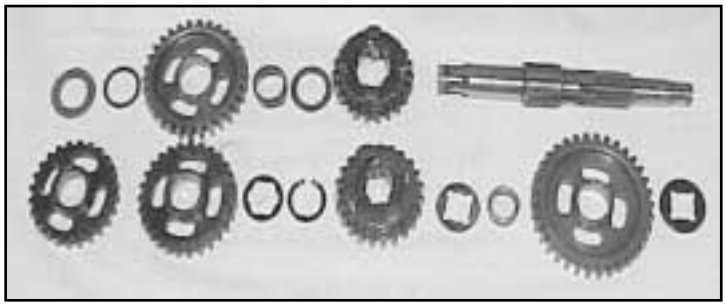
- Check also the secondary shaft needle bearings. Replace them if they show signs of damage.

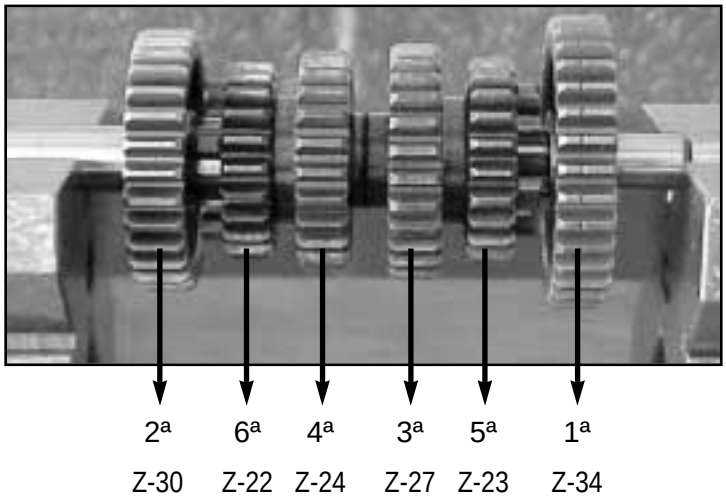


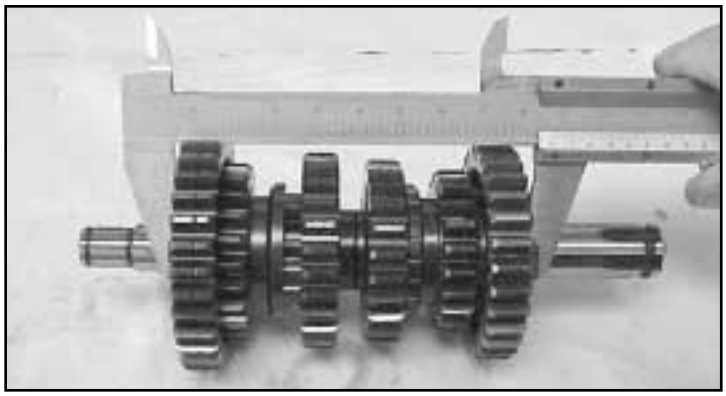
- Clean all the components of the gearbox and gear selector assembly, and additionally the crankshaft, using any degreasing agent.
- Re-assemble the gearbox secondary shaft, taking particular care to ensure correct assembly of all the components, in order to avoid malfunction and seizing.
- Fit the gearbox assembly into the right hand crankcase half, (the primary and secondary shafts should be inserted meshed together at the same time).
- First check the overall width of the secondary shaft sub-assembly including the adjusting shims on each side.

  Overall width of secondary shaft:
  MAX 87.700 mm.
  MIN 87.350 mm.

  (there are different thicknesses of shim available to ensure that the thickness is correct.)
- Next install the selector forks, the selector drum and the washers, and the selector fork studs. Lubricate the surface of the gear mechanism with AGIP gear 10W40.
- Check that the gearbox operates correctly, by selecting the different gears, and turning the selector drum in both directions. If it seizes, check once again that the components have been correctly fitted. Leave the gearbox with neutral selected, and confirm that all the elements in the assembly are able to rotate freely.
- Fit the crankshaft into the right hand side crankcase half.
- Fit a new crankcase sealing gasket, paying particular attention to the free piece in the area of the admission system.
- Heat up the left hand crankcase half to approximately 60ºC, and close it onto the right hand crankcase half. Then fit the assembly securing studs, after first ensuring that they are scrupulously clean.
- Crankcase joint securing screw torque setting: 6Nm (0,6 mkg).
- Check that the crankshaft and the gearbox shafts rotate freely after the crankcase is completely closed.







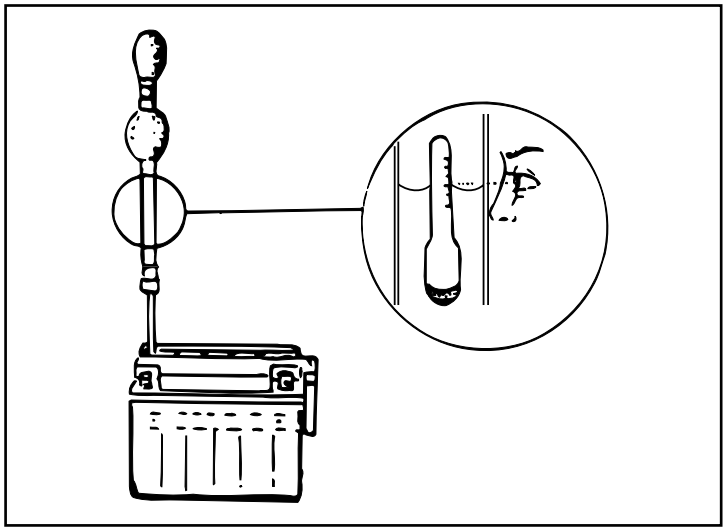
- Check the axial play of the gearbox secondary shaft, which should be between 0.2 and 0.4 mm.
- Using the special installation punch tool (special tool, part reference number: 00H05400451), fit new seals on the crankshaft, first applying AGIP Speed lubricant to the lips.
- Refit the primary drive assembly.
- Refit the magneto - ignition system.
- Refit the cylinder, piston, and cylinder head assemblies.
- Remount the engine into the frame.
- Refill and bleed the cooling system, and the separate engine lubricating system.
- Refill the gearbox-clutch side crankcase half with oil.
- Start up the engine and carry out a brief check of all its functions, and check the correct operation of the gearbox and the clutch.

BATTERY MAINTENANCE

SERVICE INFORMATION

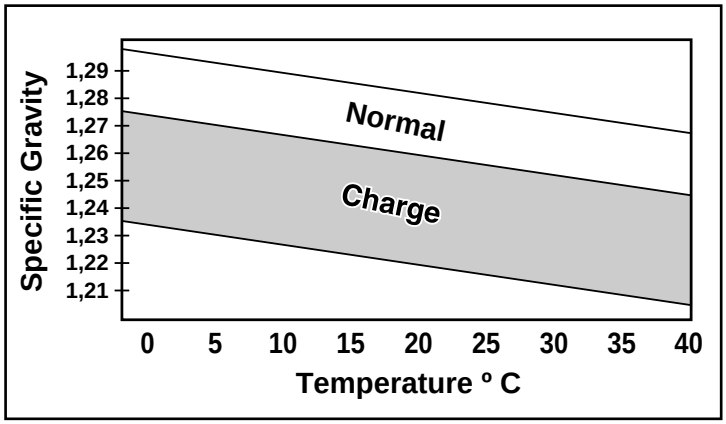
- Do not reverse the polarity of the battery. This could cause damage to some sensitive electronic devices.
- The battery produces explosive gases. Do not allow sparks or naked flames near the battery especially when charging.
- The electrolyte contains sulphuric acid. If this comes into contact with the skin, it produces burns. If this occurs, wash the affected area with plenty of water and consult a doctor.
- To avoid causing damage to sensitive equipment, do not disconnect the battery cables or other connections while the ignition switch is in the ON position, or while the engine is running.
- Whenever possible charge the battery slowly. Rapid charging should be used only in cases of emergency.
- Take the battery out of the machine in order to charge it.
- Keep the breather tube free of obstruction, particularly while charging.
- Batteries if left unused lose their charge. Do not leave the battery for more than one month without giving it a top-up charge, and after one month charge the battery every two weeks.

DENSITY OF THE ELECTROLYTE



- Check the level of the electrolyte periodically and if the level is low, add distilled water.
- Check each cell with a densitometer.
- Density with fully charged battery at 20ºC, 1.26 to 1.28.
- With values of lower than 1.26, charge the battery.
- Check that the density does not vary by more that 0.05 between the battery cells.

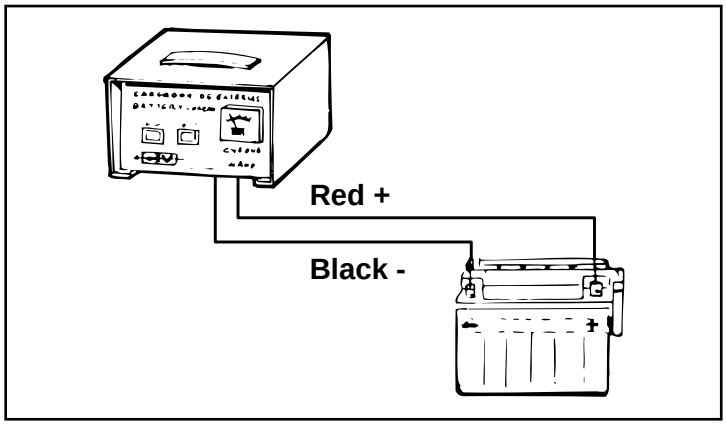
- The density of the electrolyte varies with the temperature: please refer to the attached table.



CHARGING THE BATTERY FOR THE FIRST TIME

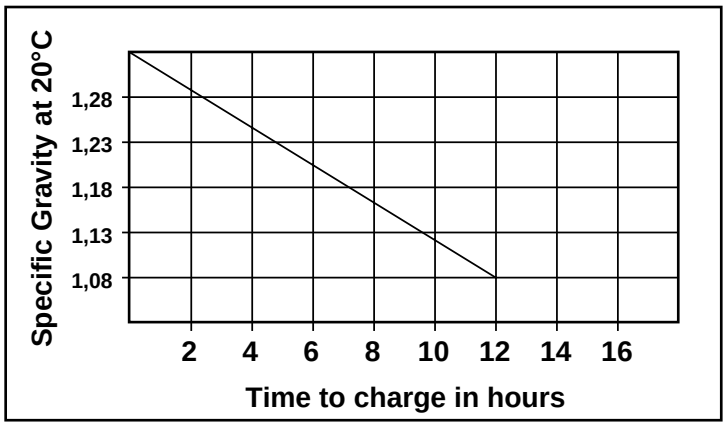
- Before putting a new battery into service, carry out the following operations:
- Cut or remove the seal from the breather tube.
- Remove all the cell caps and fill the cells with electrolyte.

  Specific gravity of the electrolyte: 1.28 at 20ºC.
- Leave the battery to rest for one hour before charging.
- If the level of the electrolyte has fallen, top up with fresh electrolyte.
- Connect the positive (+) terminal of the charger to the positive (+) terminal of the battery, and the negative (-) terminal of the charger to the negative (-) terminal of the battery.
- Charging current: 0.4 A.
- Charging time: from 10 to 15 hours.



NORMAL IN-SERVICE BATTERY CHARGING

- Remove the battery from the machine.
- Clean the battery with plenty of water, ensuring that the water does not penetrate into the cells of the battery.
- Check the level of the electrolyte and top up with distilled water if necessary.
- Connect the positive (+) terminal of the charger to the positive (+) terminal of the battery, and the negative (-) terminal of the charger to the negative (-) terminal of the battery.
- Charging current: 0.4 A.
- Determine the charging time with reference to the attached table.

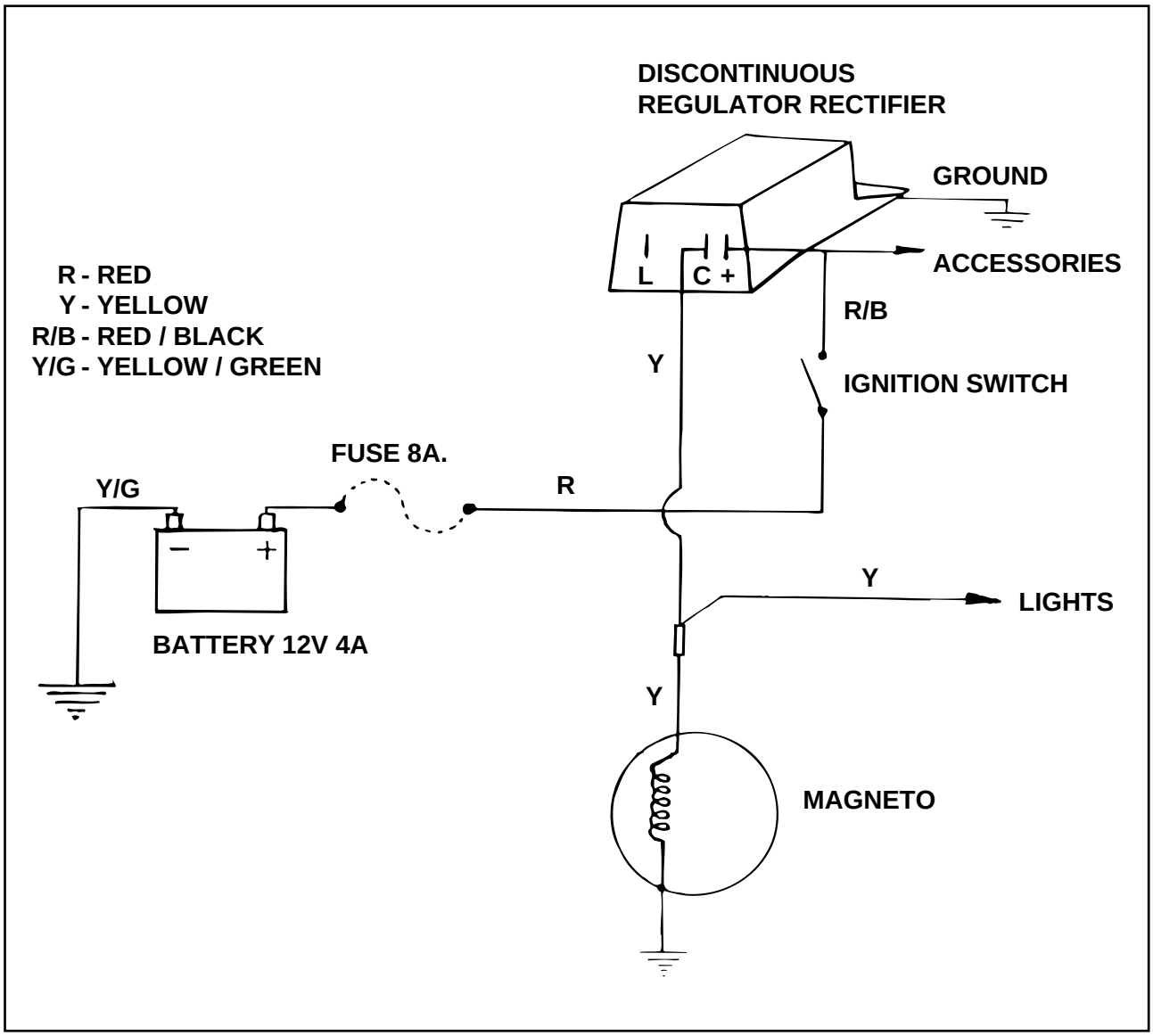


CHECKING THE CHARGING OUTPUT

- Remove the saddle in order to gain access to the battery.
- In order to carry out this check, it is necessary to use a fully-charged battery.
- Connect a voltmeter between the positive and negative terminals of the battery.
- Start the engine and gradually increase the revolutions and read the regulated voltage.

  Regulated voltage: 13.5 ± 0.5 V.

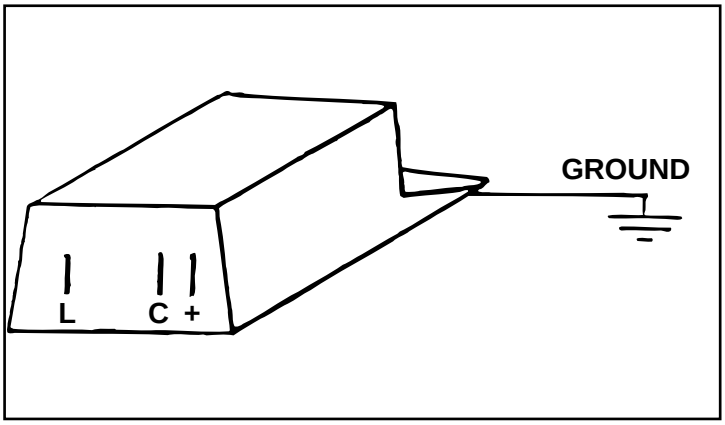
BATTERY CHARGING SYSTEM - WIRING DIAGRAM



CHECKING THE AC / DC REGULATOR

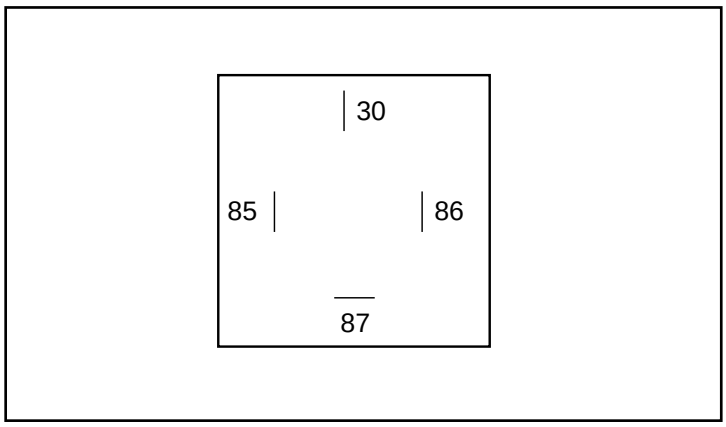
- The regulator is checked with the engine running at 4,000 rpm, the lights on and the battery fully charged.

TESTER CONNECTIONS	C - A - C	+ DC
EARTH	13^{+1}_{-0} V.	13^{+1}_{-0} V.



STARTER MOTOR

- In the event that the starter motor does not turn, the following causes are possible:
  - Main fuse, disconnected or blown.
  - Battery discharged.
  - Faulty starter relay.
- Replace the fuse and / or charge the battery as necessary.
- If the starter motor still will not turn, proceed to check the electrical wiring and the starter push button on the handlebars, and the starter relay in the following manner:
- Connect terminals 85 and 86 of the relay to the battery terminals (regardless of polarity).
- Connect terminals 30 and 87 of the relay to the ends of the tester probes, having selected “continuity / ohms Ω“ (resistance measurement):



READING OHMS (Ω)	RELAY CONDITION
0 (closed cirduit)	CORRECT
∞ (open circuit)	FAULTY

* Without disconnecting the tester probes from the terminals 30 and 87 of the relay, disconnect one of the terminals 85 or 86 from the battery terminals:

READING OHMS (Ω)	RELAY CONDITIONS
0 (closed circuit)	FAULTY
∞ (open circuit)	CORRECT

- In the event that the sequence shown in the above tables is not observed, replace the relay.

CHECKING THE OIL LEVEL AND FUEL LEVEL PILOT LIGHTS

- Proceed according to the following procedure:
- Turn on the ignition switch and check that the fuel reserve level and engine oil level pilot light verification check comes into operation (approximately 10 seconds) on the instrument panel (if this check does not operate, check the condition of the battery voltage, the main fuse, the check unit, and the electrical connection to these components).
- Disconnect the connector spade of the corresponding sensor, and short the end that plugs into the electrical wiring circuit with a tail of electric cable, then turn on the ignition switch, and the pilot light for the reserve with the bridged sensor should remain on: if this is not the case, there is a fault in the electrical wiring in the circuit for this pilot light.

Fuel level sensor:

COLOUR OF CABLE	YELLOW / GREEN
BLUE / WHITE	FUEL RESERVE LIT

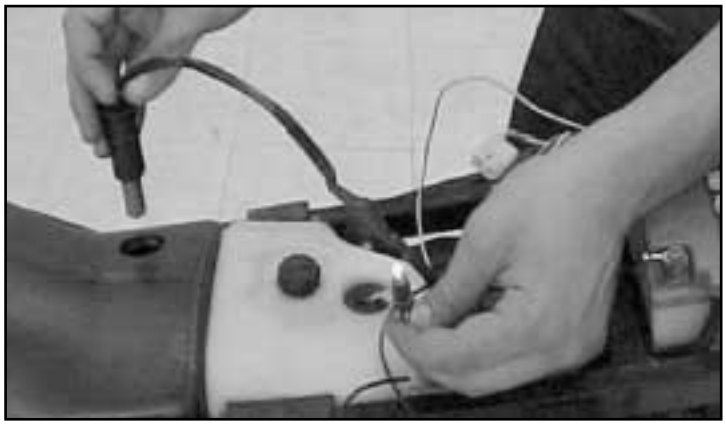
Oil level sensor:

COLOUR CABLE	YELLOW / GREEN
BLUE / BLACK	OIL RESERVE LIT

- Take a couple of ends of cable and connect them to the terminals of the battery of the machine, and put a bulb in one of them. Disconnect the spade connector of the sensor to be checked, and connect the ends to the cables. Then remove the sensor to be checked from its socket (taking care in the case of the fuel sensor, because it is located at the bottom of the tank, which should be emptied before carrying out this test). Hold the sensor in a vertical position, out of the tank for about 1 minute, after which time the pilot lamp should come on. If the pilot light does not light up, it is faulty, and should be replaced.







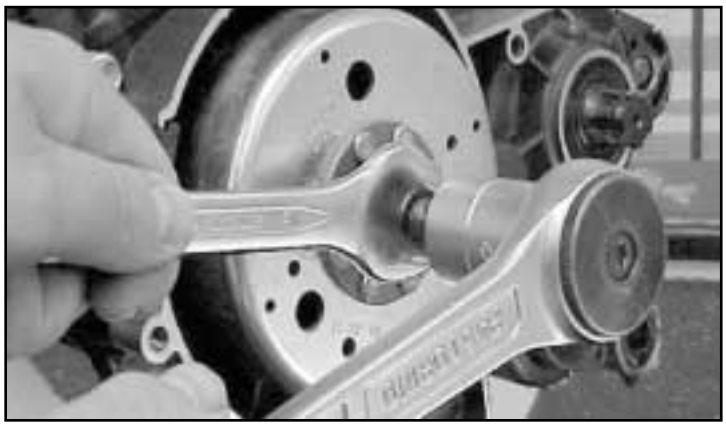
- Reinstall the sensors and the electrical connections properly, fill the fuel tank and the oil reservoir, then turn on the ignition key. Check that the reserve tank pilot light operating test runs (about 10 seconds). Keep the ignition key switched on for about 1 minute, and after that time the oil and fuel reserve pilot lights should go off and stay off. If this does not occur, it indicates that the pilot light is faulty and in this case should be replaced.

STRIPPING DOWN THE MAGNETO ALTERNATOR

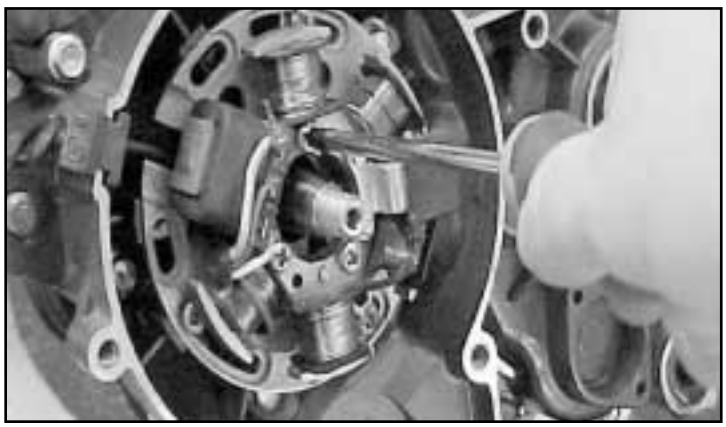
- Remove the gear shift lever and the magneto alternator cover, which are situated on the left hand side of the engine.
- Block the magneto from rotating by means of special immobilising tool (part number 00G05300011), and proceed to slacken off the magneto nut, which secures it to the crankshaft.



- Insert special extractor tool (part number 00F05300021) and withdraw the magneto.



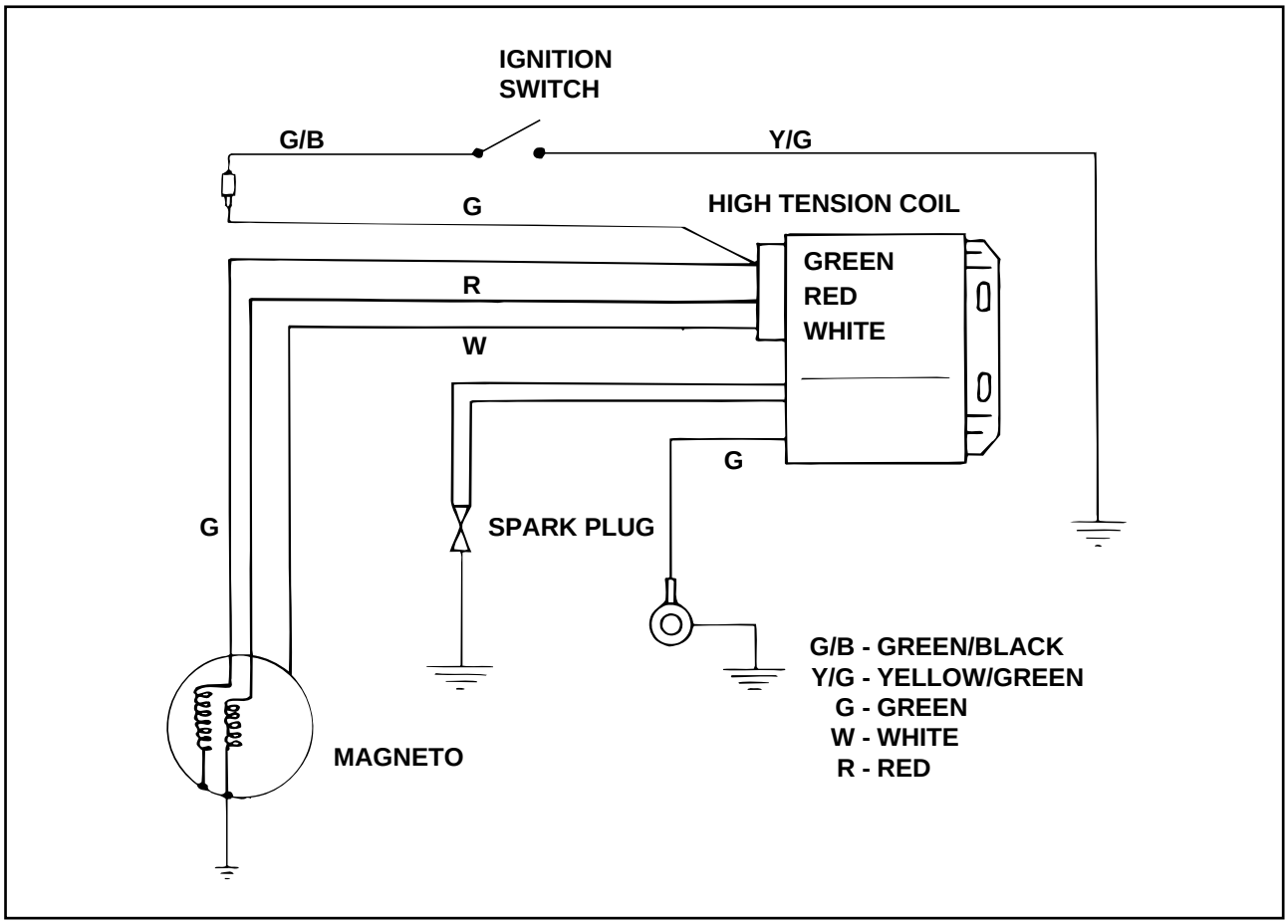
- Extract the stator coil assembly, by first slackening off and then removing the screws securing the assembly to the base. Finally, extract the base plate, which is secured to the crankcase with screws.



STRIPPING DOWN THE MAGNETO ALTERNATOR

- Disconnect the magneto spade connector located on the left hand side of the frame.





- Proceed to static checks on the assembly as detailed below, using a multimeter (tester), connected so as to measure continuity / resistance (ohms: (), and selecting an appropriate scale in accordance with the magnitude of the values to be measured.



Checking the lighting coil:

COLOUR CABLE	YELLOW
WHITE	0,3 a 0,9 Ω ± 10%

Checking the magneto supply coil:

COLOUR CABLE	GREEN
EARTH	610 Ω ± 10%

Checking the pick-up coil:

COLOUR CABLE	RED
EARTH	80 Ω ± 10%

Checking the secondary high tension coil (without spark plug cap):



COLOUR CABLE	THICK BLACK
EARTH	3,4 kΩ ± 15%

- Checking the spark plug cap: disconnect the spark plug cap from the secondary cable and measure the resistance reading between the ends of the connector: the reading should be equal to:

  5.0 kΩ ± 15%

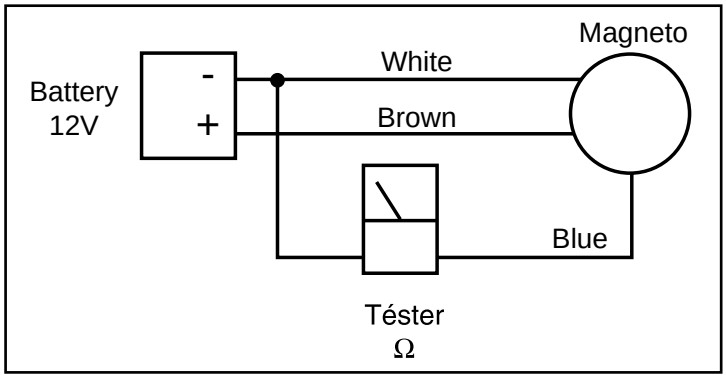
- In ignition systems with the HALL sensor, use the following procedure to carry out this check (please refer to the diagram below):
- Using the machine's own battery and a few ends of electric cable, connect the terminals of the battery direct to the following magneto cables:

BATTERY TERMINAL	COLOUR MAGNETO CABLE
POSITIVE	BROWN
NEGATIVE	WHITE

- Connect a tester, selecting the appropriate scale for continuity / ohms (Ω), and connecting the probes as in the table below:

TESTER PROBE	COLOUR MAGNETO CABLE
POSITIVE (RED)	BLUE
NEGATIVE (BLACK)	WHITE

- Rotate the magneto rotor by hand, taking it through one complete revolution of 360º, and observe whether the tester shows a very high resistance reading throughout the greater part of the revolution (open circuit), and gives a very low reading (closed circuit / continuity) during a very short part of the revolution. If this does not occur, this is a sign of a fault and the magneto should be replaced.



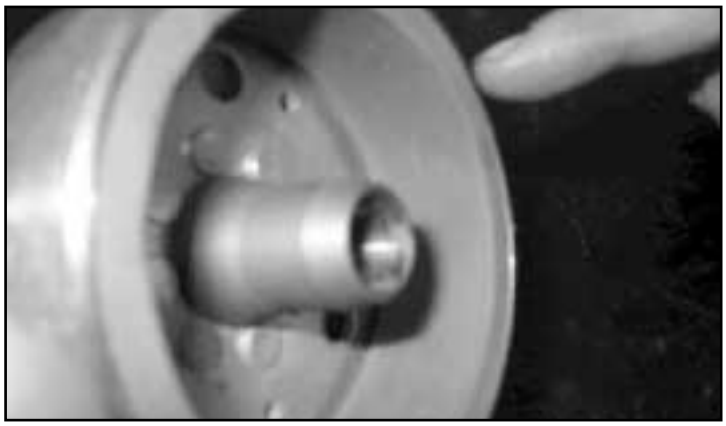
- In the event of a fault, the entire faulty component as identified through the procedures indicated above should be replaced.
- Proceed to re-assemble the unit, taking special care to check the condition of the key at the end of the crankshaft. If it shows any signs of damage, it should be replaced.

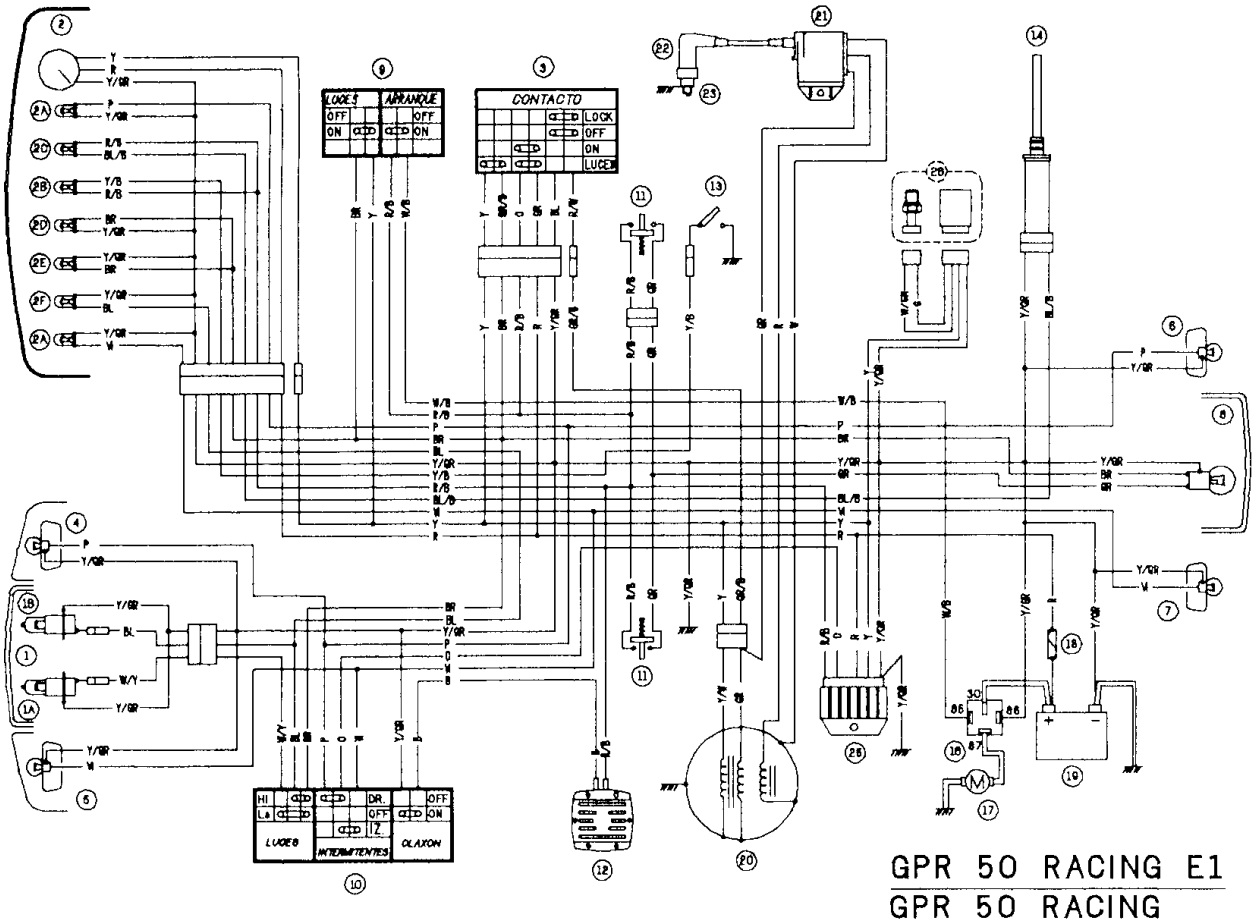


- In order to be able to synchronise the ignition timing correctly, when assembling the coil base plate onto the engine crankcase, take care to ensure that the reference mark on the magneto coil base plate is aligned with the centre of the arrow on the crankcase.



- Re-assemble the magneto coil unit onto the magneto coil base plate, using special immobilising tool (part reference number 00G05300011) to prevent the part from rotating. Check that the magnet in the interior shows no signs of breakage or of damage: in the event that damage is found, it should be replaced. Tighten the securing screws to the recommended torque setting. The setting of the ignition timing does not require any maintenance. Ensure that the electrical cables in the unit are correctly routed to avoid any possible chafing, which could lead to later damage and failures.

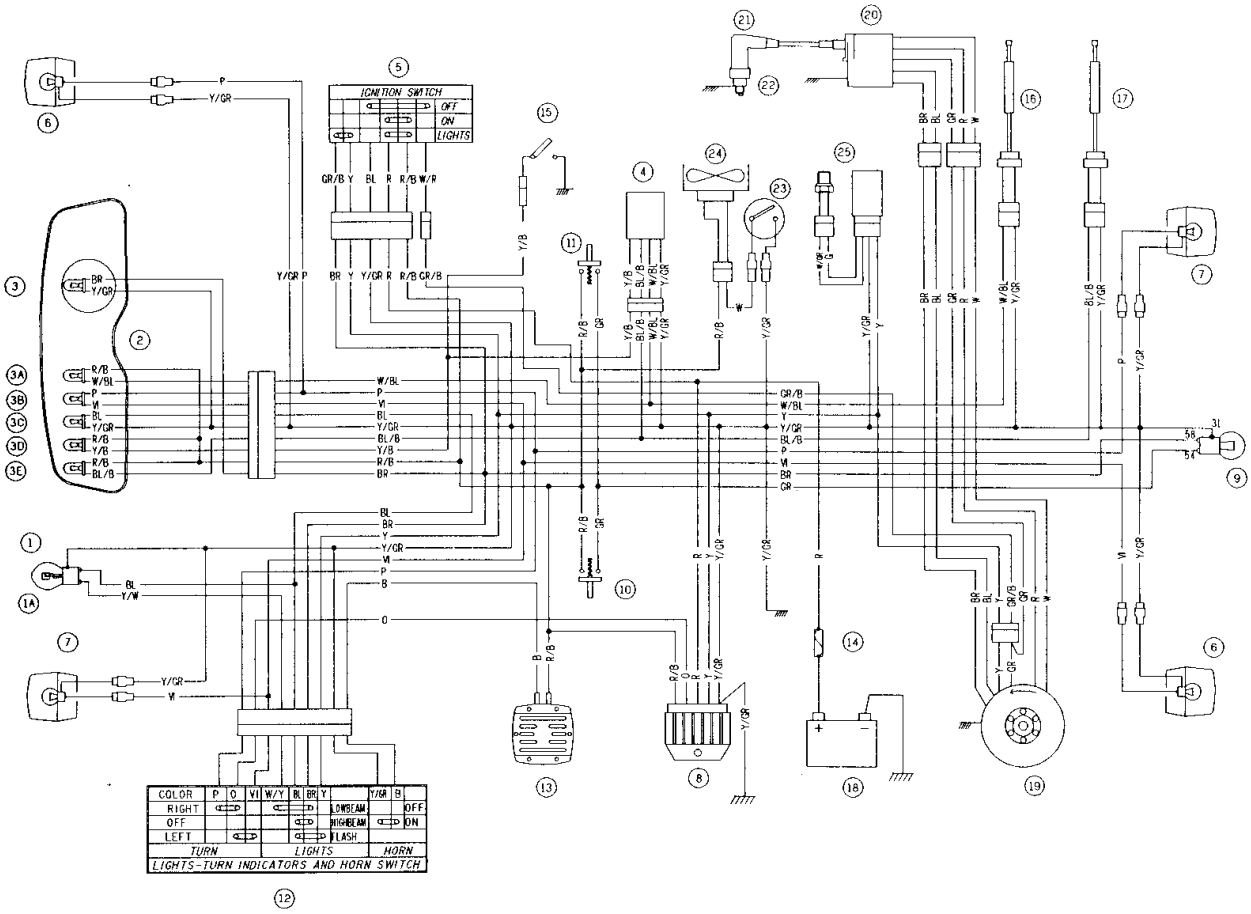




1 HEADLIGHT
1A HEADLIGHT DIPPED BEAM 12V 55W
1B HEADLIGHT HIGH BEAM 12V 55W
2 DASHBOARD
2A TURN SIGNAL INDICATOR LIGHT 12V 1.2W
2B WATER INDICATOR LIGHT 12V 1.2W
2C Oil Indicator Light 12V 1,2W
2D SPEEDOMETER 12V 1,2W
2E TACHOMETER 12V 1.2W
2F HIGH BEAM INDICATOR LIGHT 12V 1.2W
3 IGNITION SWITCH
4 FRONT RIGHT TURN SIGNAL LIGHT 12V 10W
5 FRONT LEFT TURN SIGNAL LIGHT 12V 10W
6 REAR RIGHT TURN SIGNAL LIGHT 12V 10W
7 REAR LEFT TURN SIGNAL LIGHT 12V 10W
8 TAIL/BRAKELIGHT 12V 12V 5/21W
9 HEADLIGHT / ENGINE STOP SWITCH
10 DIMMER / TURN SIGNAL / HORN SWITCH
11 BRAKE LIGHT SWITCH
12 HORN 12V DC
13 TEMPERATURE SWITCH
14 OIL SENSOR
16 STARTER RELAY
17 STARTER MOTOR
18 FUSE 4A
19 BATTERY 12V 4A
20 FLYWHEEL MAGNETO 12V 85W
21 ELECTRONIC CONVERTER A.T.
22 SPARK PLUG CAP ANTI-RADIO INTERFERENCES
23 SPARK PLUG
25 TURN SIGNAL BOX 12V 10/10W+REGULATOR 12V 80W AC/DC
26 CARBURETOR HEATER KIT ---- (OPTIONAL)

D	F	UK	I	E	
Orange	Orange	Orange	Arancio	Naranja	O
Grün	Vert	Green	Verde	Verde	GR
Schwarz	Noir	Black	Nero	Negro	B
Braun	Marron	Brown	Marrone	Marron	BR
WeiB	Blanc	White	Bianco	Blanco	W
Grau	Gris	Gray	Grigio	Gris	G
Gelb	Jaune	Yellow	Giallo	Amarillo	Y
Blau	Blau	Blue	Azzurro	Azul	BL
Rot	Rouge	Red	Rosso	Rojo	R
Rosa	Rosa	Pink	Rosa	Rosa	P
Violett	Violet	Violet	Viola	Violeta	VI

ELECTRICAL WIRING DIAGRAM SENDA R DRD



1 HEADLAMP ASSEMBLY
1A BULB 12V 35/35W

2 SPEEDOMETER
3 LIGHTING BULB 12V 1.2W
3A FUEL CONTROL PILOT LIGHT 12V 2W
3B TURN INDICATOR CONTROL PILOT LIGHT 12V 2W
3C HIGH BEAM CONTROL PILOT LIGHT 12V 1.2W
3D WATER TEMPERATURE CONTROL PILOT LIGHT 12V 2W
3E OIL RESERVE CONTROL PILOT LIGHT 12V 2W

4 CHECK CONTROL TIMER
5 IGNITION SWITCH

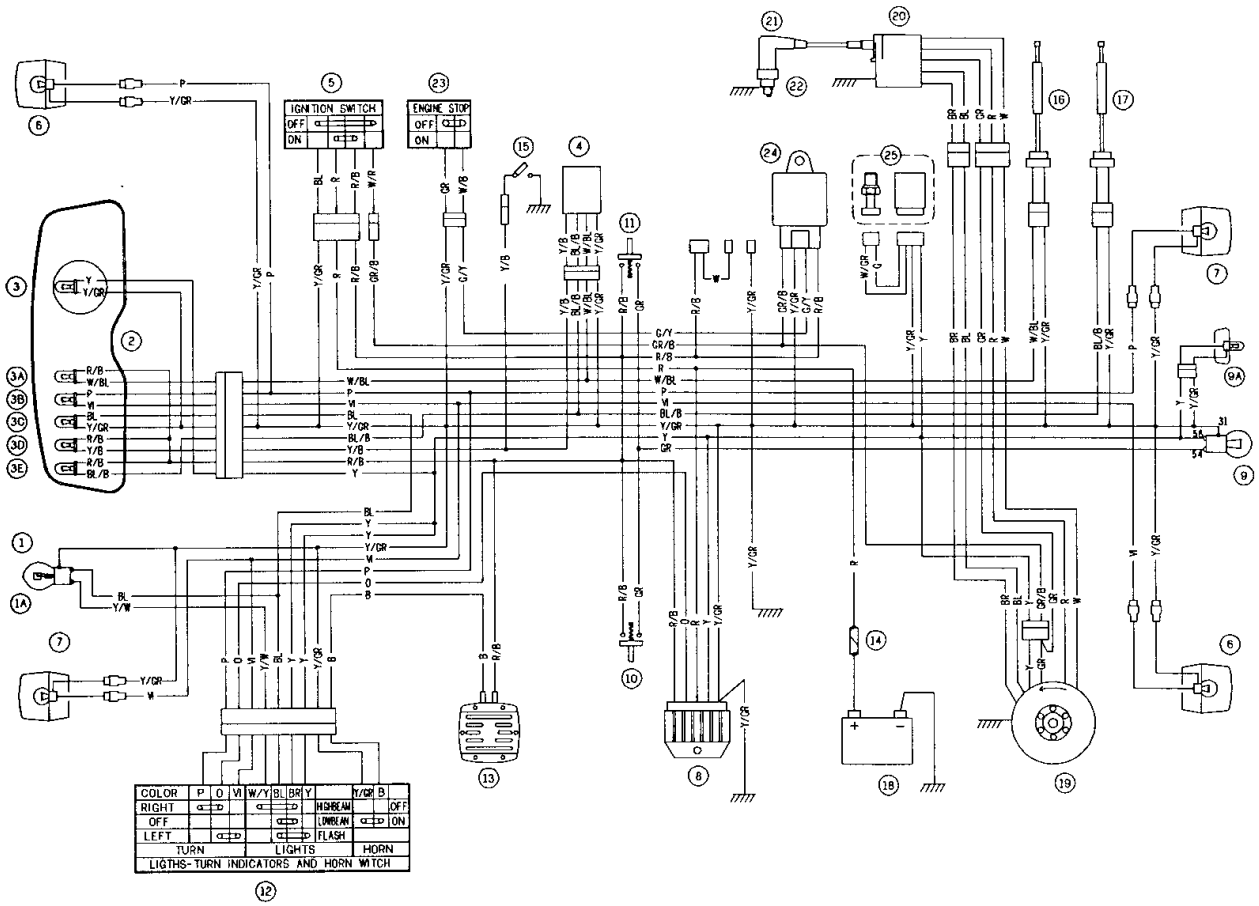
6 FRONT RIGHT - REAR LEFT TURN INDICATOR
INDICATOR BULB 12V 10W
7 FRONT LEFT - REAR RIGHT TURN INDICATOR
INDICATOR BULB 12V 10W

8 TURN INDICATORS CENTRAL CONTROL 12V 10/10W+REGULATOR 12V 80W DC

9 TAILLIGHT
TAIL/STOP BULB 12V 21/5W DIN

10 STOPLIGHT SWITCH
11 STOPLIGHT SWITCH
12 LIGHTS TURN INDICATORS AND HORN SWITCH
13 HORN
14 FUSE 4 Amp
15 WATER TEMPERATURE THERMOSTAT
16 FUEL LEVEL SENSOR
17 OIL LEVEL SENSOR
18 BATTERY 12V 4 AH
19 ELECTRONIC MAGNETO 12V 65W
20 IGNITION COIL
21 SPARK PLUG COVER
22 SPARK PLUG
23 *THERMOCONTACT VENTILATOR*
24 *VENTILATOR*
25 *CARBURATOR HEATER KIT*

D	F	UK	I	E	
Orange	Orange	Orange	Arancio	Naranja	O
Grün	Vert	Green	Verde	Verde	GR
Schwarz	Noir	Black	Nero	Negro	B
Braun	Marron	Brown	Marrone	Marron	BR
WeiB	Blanc	White	Bianco	Blanco	W
Grau	Gris	Gray	Grigio	Gris	G
Gelb	Jaune	Yellow	Giallo	Amarillo	Y
Blau	Blau	Blue	Azzurro	Azul	BL
Rot	Rouge	Red	Rosso	Rojo	R
Rosa	Rosa	Pink	Rosa	Rosa	P
Violett	Violet	Violet	Viola	Violeta	VI



1 HEADLAMP ASSEMBLY
1A BULB 12V 35/35W

2 SPEEDOMETER
3 LIGHTING BULB 12V 1.2W
3A FUEL CONTROL PILOT LIGHT 12V 2W
3B TURN INDICATOR CONTROL PILOT LIGHT 12V 2W
3C HIGH BEAM CONTROL PILOT LIGHT 12V 1.2W
3D WATER TEMPERATURE CONTROL PILOT LIGHT 12V 2W
3E OIL RESERVE CONTROL PILOT LIGHT 12V 2W

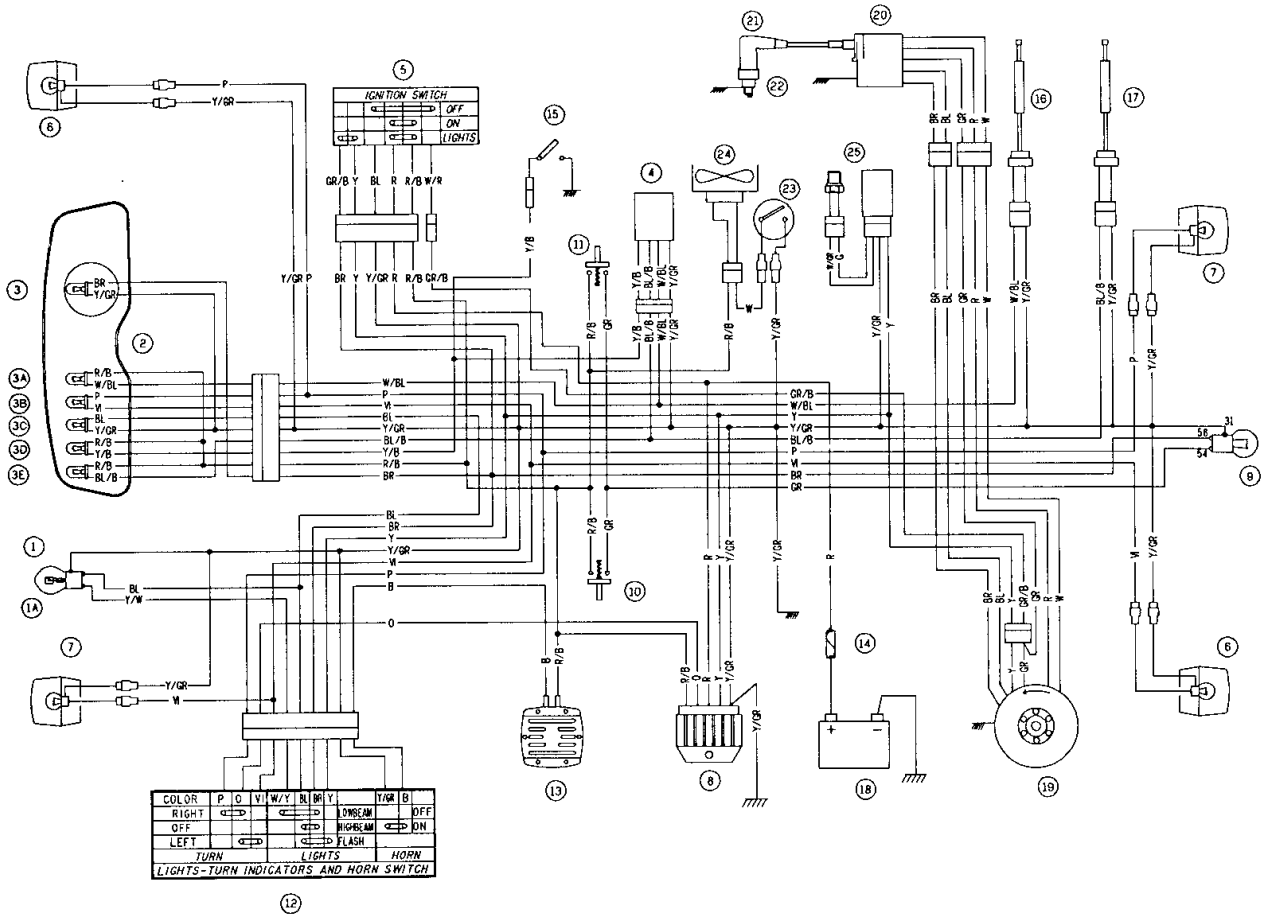
4 CHECK CONTROL TIMER
5 IGNITION SWITCH
6 FRONT RIGHT - REAR LEFT TURN INDICATOR
INDICATOR BULB 12V 10W

7 FRONT LEFT - REAR RIGHT TURN INDICATOR
INDICATOR BULB 12V 10W
8 TURN INDICATORS CENTRAL CONTROL 12V 10/10W +
REGULATOR 12V 80W DC

9 TAILLIGHT
TAIL/STOP BULB 12V 21/5W DIN
9A LICENCE PLATE LIGTH ASSEMBLY
LICENCE PLATE BULB 12V 5W.
10 STOPLIGHT SWITCH
11 STOPLIGHT SWITCH
12 LIGHTS TURN INDICATORS AND HORN SWITCH
13 HORN
14 FUSE 4 Amp
15 WATER TEMPERATURE THERMOSTAT
16 FUEL LEVEL SENSOR
17 OIL LEVEL SENSOR
18 BATTERY 12V 4 AH
19 ELECTRONIC MAGNETO 12V 65W
20 IGNITION COIL
21 SPARK PLUG COVER
22 SPARK PLUG
23 ENGINE STOP
24 RELE ENGINE STOP
25 CARBURATOR HEATER KIT (OPTIONAL)

D	F	UK	I	E	
Orange	Orange	Orange	Arancio	Naranja	O
Grün	Vert	Green	Verde	Verde	GR
Schwarz	Noir	Black	Nero	Negro	B
Braun	Marron	Brown	Marrone	Marron	BR
WeiB	Blanc	White	Bianco	Blanco	W
Grau	Gris	Gray	Grigio	Gris	G
Gelb	Jaune	Yellow	Giallo	Amarillo	Y
Blau	Blau	Blue	Azzurro	Azul	BL
Rot	Rouge	Red	Rosso	Rojo	R
Rosa	Rosa	Pink	Rosa	Rosa	P
Violett	Violet	Violet	Viola	Violeta	Vl

ELECTRICAL WIRING DIAGRAM SENDA R X-TREME WVTA



1 HEADLAMP ASSEMBLY
1A BULB 12V 35/35W

2 SPEEDOMETER
3 LIGHTING BULB 12V 1.2W
3A FUEL CONTROL PILOT LIGHT 12V 2W
3B TURN INDICATOR CONTROL PILOT LIGHT 12V 2W
3C HIGH BEAM CONTROL PILOT LIGHT 12V 1.2W
3D WATER TEMPERATURE CONTROL PILOT LIGHT 12V 2W
3E OIL RESERVE CONTROL PILOT LIGHT 12V 2W

4 CHECK CONTROL TIMER
5 IGNITION SWITCH

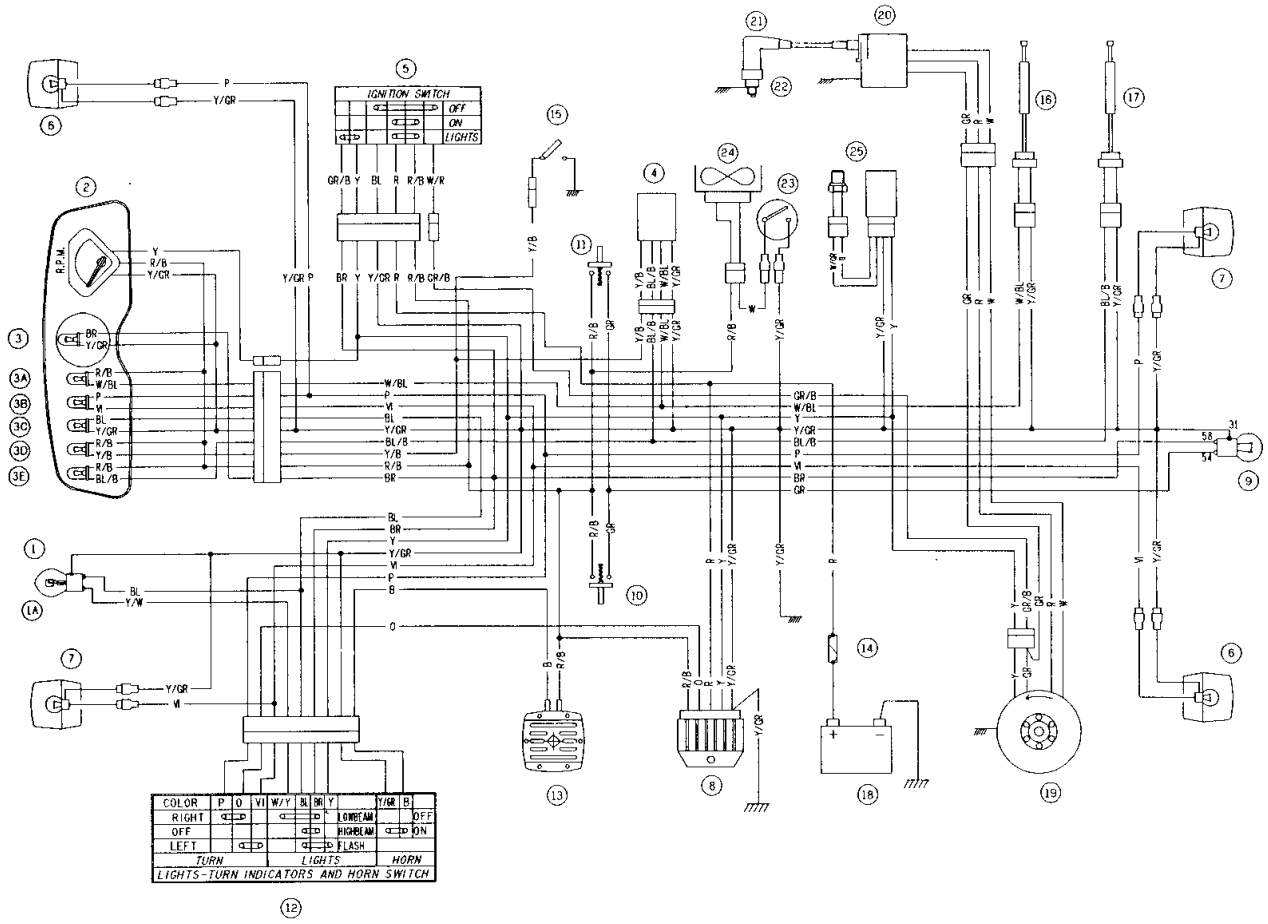
6 FRONT RIGHT - REAR LEFT TURN INDICATOR
INDICATOR BULB 12V 10W
7 FRONT LEFT - REAR RIGHT TURN INDICATOR
INDICATOR BULB 12V 10W

8 TURN INDICATORS CENTRAL CONTROL 12V 10/10W+REGULATOR 12V 80W DC

9 TAILLIGHT
TAIL/STOP BULB 12V 21/5W DIN

10 STOPLIGHT SWITCH
11 STOPLIGHT SWITCH
12 LIGHTS TURN INDICATORS AND HORN SWITCH
13 HORN
14 FUSE 4 Amp
15 WATER TEMPERATURE THERMOSTAT
16 FUEL LEVEL SENSOR
17 OIL LEVEL SENSOR
18 BATTERY 12V 4 AH
19 ELECTRONIC MAGNETO 12V 65W
20 IGNITION COIL
21 SPARK PLUG COVER
22 SPARK PLUG
23 *THERMOCONTACT VENTILATOR*
24 *VENTILATOR*
25 *CARBURATOR HEATER KIT*

D	F	UK	I	E	
Orange	Orange	Orange	Arancio	Naranja	O
Grün	Vert	Green	Verde	Verde	GR
Schwarz	Noir	Black	Nero	Negro	B
Braun	Marron	Brown	Marrone	Marron	BR
WeiB	Blanc	White	Bianco	Blanco	W
Grau	Gris	Gray	Grigio	Gris	G
Gelb	Jaune	Yellow	Giallo	Amarillo	Y
Blau	Blau	Blue	Azzurro	Azul	BL
Rot	Rouge	Red	Rosso	Rojo	R
Rosa	Rosa	Pink	Rosa	Rosa	P
Violett	Violet	Violet	Viola	Violeta	VI



1 HEADLAMP ASSEMBLY
1A BULB 12V 35/35W

2 SPEEDOMETER
3 LIGHTING BULB 12V 1.2W
3A FUEL CONTROL PILOT LIGHT 12V 2W
3B TURN INDICATOR CONTROL PILOT LIGHT 12V 2W
3C HIGH BEAM CONTROL PILOT LIGHT 12V 1.2W
3D WATER TEMPERATURE CONTROL PILOT LIGHT 12V 2W
3E OIL RESERVE CONTROL PILOT LIGHT 12V 2W

4 CHECK CONTROL TIMER
5 IGNITION SWITCH

6 FRONT RIGHT - REAR LEFT TURN INDICATOR
INDICATOR BULB 12V 10W
7 FRONT LEFT - REAR RIGHT TURN INDICATOR
INDICATOR BULB 12V 10W

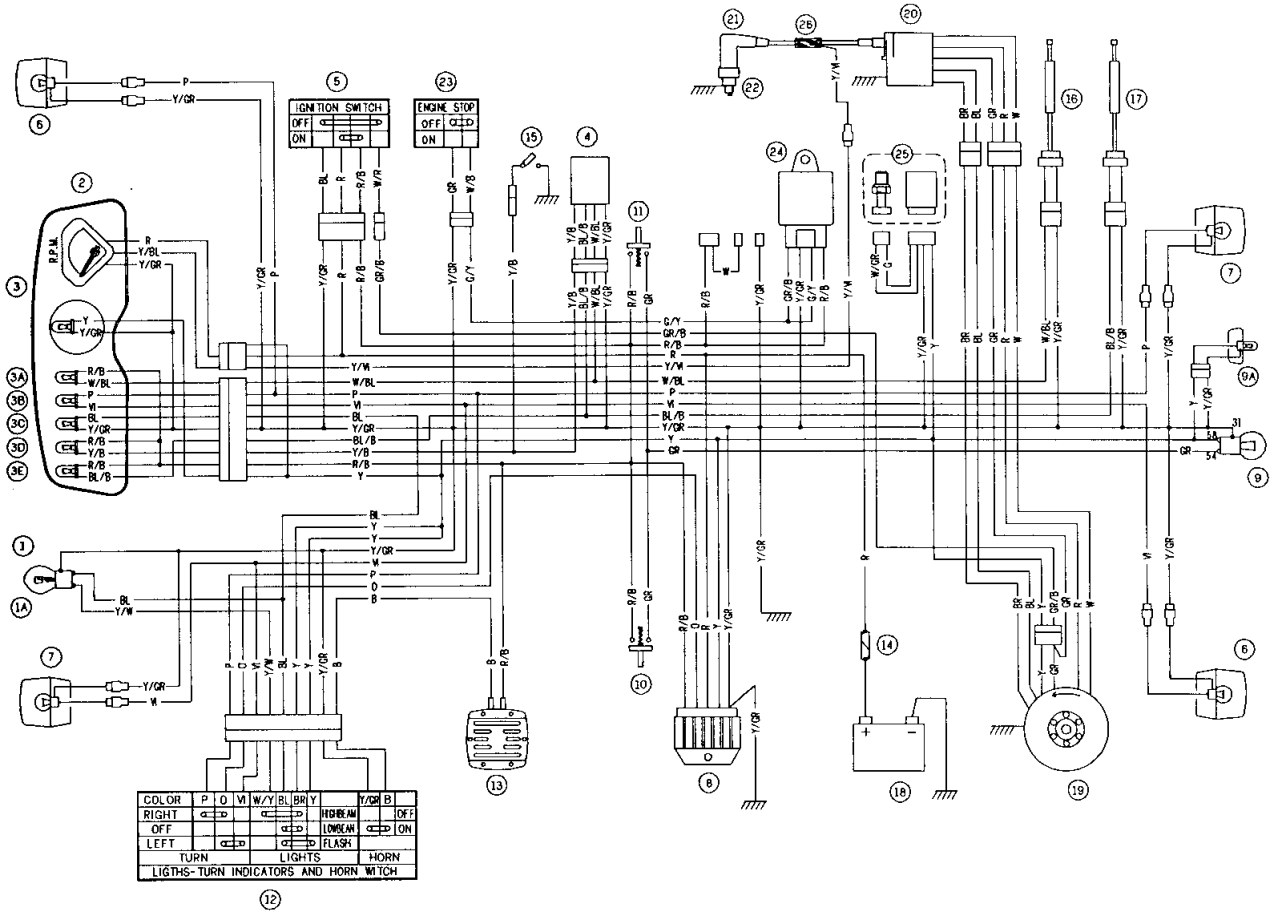
8 TURN INDICATORS CENTRAL CONTROL 12V 10/10W+REGULATOR 12V 80W DC

9 TAILLIGHT
TAIL/STOP BULB 12V 21/5W DIN

10 STOPLIGHT SWITCH
11 STOPLIGHT SWITCH
12 LIGHTS TURN INDICATORS AND HORN SWITCH
13 HORN
14 FUSE 4 Amp
15 WATER TEMPERATURE THERMOSTAT
16 FUEL LEVEL SENSOR
17 OIL LEVEL SENSOR
18 BATTERY 12V 4 AH
19 ELECTRONIC MAGNETO 12V 65W
20 IGNITION COIL
21 SPARK PLUG COVER
22 SPARK PLUG
23 THERMOCONTACT VENTILATOR
24 VENTILATOR
25 CARBURATOR HEATER KIT

D	F	UK	I	E	
Orange	Orange	Orange	Arancio	Naranja	O
Grün	Vert	Green	Verde	Verde	GR
Schwarz	Noir	Black	Nero	Negro	B
Braun	Marron	Brown	Marrone	Marron	BR
WeiB	Blanc	White	Bianco	Blanco	W
Grau	Gris	Gray	Grigio	Gris	G
Gelb	Jaune	Yellow	Giallo	Amarillo	Y
Blau	Blau	Blue	Azzurro	Azul	BL
Rot	Rouge	Red	Rosso	Rojo	R
Rosa	Rosa	Pink	Rosa	Rosa	P
Violett	Violet	Violet	Viola	Violeta	VI

ELECTRICAL WIRING DIAGRAM SENDA SM X-TREME USA



1 HEADLAMP ASSEMBLY
1A BULB 12V 35/35W

2 SPEEDOMETER
3 LIGHTING BULB 12V 1.2W
3A FUEL CONTROL PILOT LIGHT 12V 2W
3B TURN INDICATOR CONTROL PILOT LIGHT 12V 2W
3C HIGH BEAM CONTROL PILOT LIGHT 12V 1.2W
3D WATER TEMPERATURE CONTROL PILOT LIGHT 12V 2W
3E OIL RESERVE CONTROL PILOT LIGHT 12V 2W

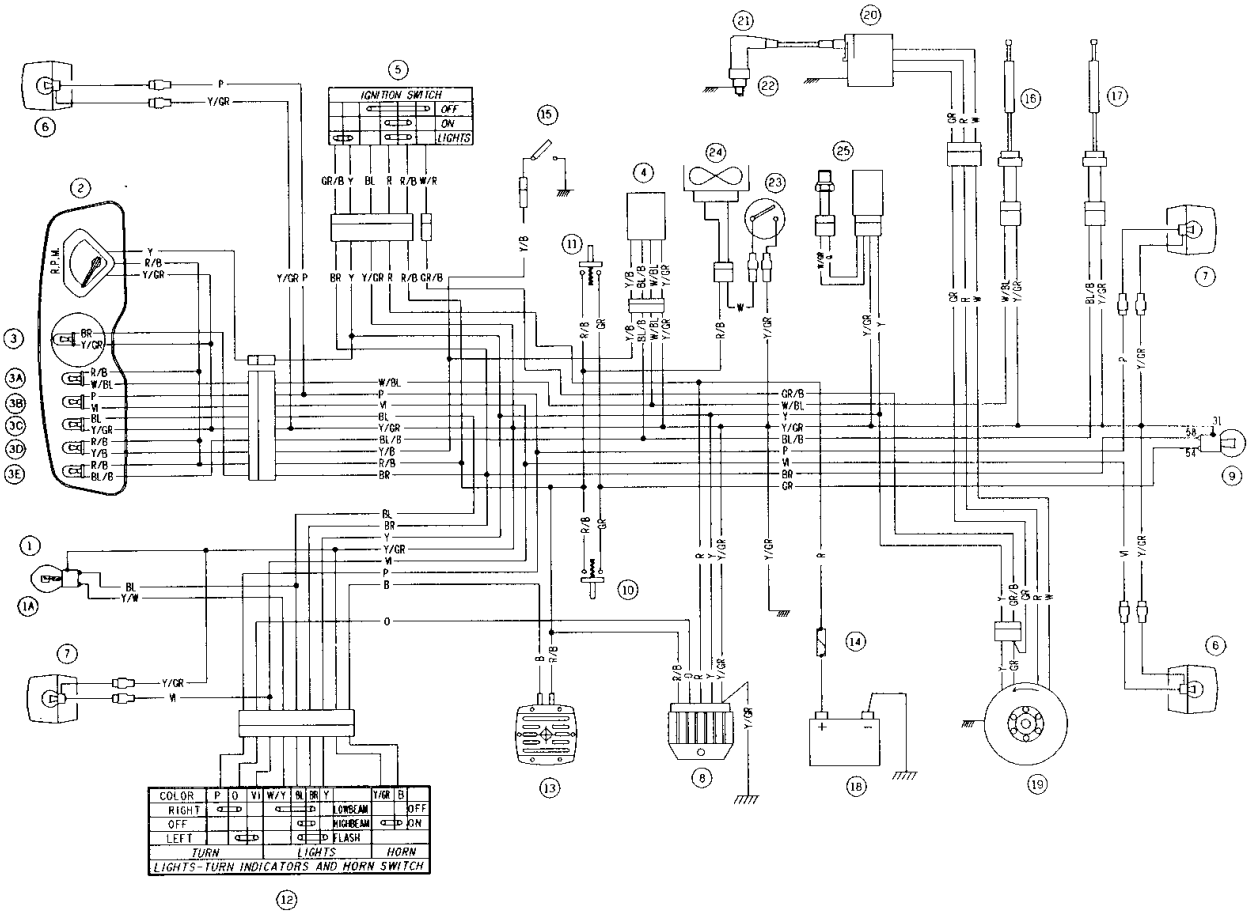
4 CHECK CONTROL TIMER
5 IGNITION SWITCH
6 FRONT RIGHT - REAR LEFT TURN INDICATOR
INDICATOR BULB 12V 10W

7 FRONT LEFT - REAR RIGHT TURN INDICATOR
INDICATOR BULB 12V 10W

8 TURN INDICATORS CENTRAL CONTROL 12V 10/10W +
REGULATOR 12V 80W DC

9 TAILLIGHT
TAIL/STOP BULB 12V 21/5W DIN
9A LICENCE PLATE LIGTH ASSEMBLY
LICENCE PLATE BULB 12V 5W.
10 STOPLIGHT SWITCH
11 STOPLIGHT SWITCH
12 LIGHTS TURN INDICATORS AND HORN SWITCH
13 HORN
14 FUSE 4 Amp
15 WATER TEMPERATURE THERMOSTAT
16 FUEL LEVEL SENSOR
17 OIL LEVEL SENSOR
18 BATTERY 12V 4 AH
19 ELECTRONIC MAGNETO 12V 65W
20 IGNITION COIL
21 SPARK PLUG COVER
22 SPARK PLUG
23 ENGINE STOP
24 RELE ENGINE STOP
25 CARBURATOR HEATER KIT (OPTIONAL)
26 INDUCTIVE SENSOR RPM

D	F	UK	I	E	
Orange	Orange	Orange	Arancio	Naranja	O
Grün	Vert	Green	Verde	Verde	GR
Schwarz	Noir	Black	Nero	Negro	B
Braun	Marron	Brown	Marrone	Marron	BR
WeiB	Blanc	White	Bianco	Blanco	W
Grau	Gris	Gray	Grigio	Gris	G
Gelb	Jaune	Yellow	Giallo	Amarillo	Y
Blau	Blau	Blue	Azzurro	Azul	BL
Rot	Rouge	Red	Rosso	Rojo	R
Rosa	Rosa	Pink	Rosa	Rosa	P
Violett	Violet	Violet	Viola	Violeta	VI



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1A BULB 12V 35/35W

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3 LIGHTING BULB 12V 1.2W
3A FUEL CONTROL PILOT LIGHT 12V 2W
3B TURN INDICATOR CONTROL PILOT LIGHT 12V 2W
3C HIGH BEAM CONTROL PILOT LIGHT 12V 1.2W
3D WATER TEMPERATURE CONTROL PILOT LIGHT 12V 2W
3E OIL RESERVE CONTROL PILOT LIGHT 12V 2W

4 CHECK CONTROL TIMER
5 IGNITION SWITCH

6 FRONT RIGHT - REAR LEFT TURN INDICATOR
INDICATOR BULB 12V 10W
7 FRONT LEFT - REAR RIGHT TURN INDICATOR
INDICATOR BULB 12V 10W

8 TURN INDICATORS CENTRAL CONTROL 12V 10/10W+REGULATOR 12V 80W DC

9 TAILLIGHT
TAIL/STOP BULB 12V 21/5W DIN

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25 CARBURATOR HEATER KIT

D	F	UK	I	E	
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Schwarz	Noir	Black	Nero	Negro	B
Braun	Marron	Brown	Marrone	Marron	BR
WeiB	Blanc	White	Bianco	Blanco	W
Grau	Gris	Gray	Grigio	Gris	G
Gelb	Jaune	Yellow	Giallo	Amarillo	Y
Blau	Blau	Blue	Azzurro	Azul	BL
Rot	Rouge	Red	Rosso	Rojo	R
Rosa	Rosa	Pink	Rosa	Rosa	P
Violett	Violet	Violet	Viola	Violeta	VI