

RR 250 - 400 - 450 - 525

Thanks for your preference, and have a good time! This handbook contains the information you need to properly operate and maintain your motorcycle.

The data and specifications provided in this manual does not constitute an engagement on the part of BETAMOTOR S.p.A. BETAMOTOR reserves the right to make any changes and improvements to its models at any moment and without notice.

IMPORTANT

We recommend you to check all the tightenings after the first one or two hours' ride over rough ground. Special attention should be paid to the following parts:

- rear sprocket
- ensure that the footrests are properly fixed
- front/rear brake levers/calipers/discs
- check that the plastics are properly fastened
- engine bolts
- shock absorber bolts/swingarm
- wheel hubs/spokes
- rear frame
- pipe connections
- tensioning the chain

IMPORTANT

For any servicing requirements, please get in contact with Betamotor's authorized service network.

Operating instructions	81
Ecologic guide	81
Riding safety	82
CHAPTER 1 GENERAL INFORMATION	83
Vehicle identification data	84
Delivery	84
Load	85
Tyres	85
Steering lock	86
Familiarizing with your vehicle	87
Controls	88
Specifications	94
Wiring diagrams	98
Electrical devices	100
CHAPTER 2 OPERATION	103
Checks to be performed before each ride	104
Recommended lubricants	105
Running-in	105
Starting the engine	106
Refuelling	108
CHAPTER 3 CHECKS AND MAINTENANCE	109
Motor oil level check	110
Motor oil and oil filter substitution	111
Check the level of the front and rear brake fluid and bleeding	114
Check the front and rear brake pads	116
Check the oil level in the hydraulic clutch and bleeding	117
Fork oil	118
Air filter	119
Spark plug	120
Carburetor	121
Coolant	124
Removing the plastics	125
Drive chain maintenance and wear	129
Suspensions: telescopic fork and shock absorber	130
Charging the battery	132
Cleaning and checking the vehicle	133
Scheduled maintenance	134
Prolonged inactivity	135

CHAPTER 4 ADJUSTMENTS 137

Brake adjustment: front lever and brake pedal 138

Adjusting the decompressor lever control cable 138

Adjusting the home position of the clutch lever 139

Adjusting the handlebars 139

Adjusting the throttle control cable 140

Checking and adjusting the steering play 140

Tensioning the chain 141

Adjusting the headlight 142

CHAPTER 5 REPLACEMENTS 143

Replacing the brake pads: front and rear 144

Replacing the headlight bulbs 146

Replacing the rear light bulb 146

Replacing the exhaust-pipe 147

CHAPTER 6 TROUBLESHOOTING 149

INDEX 151

OPERATING INSTRUCTIONS

- The vehicle must be accompanied by: number-plate, registration document, tax disc and insurance.
- Do not carry animals, pets or loose objects that can stick out from the vehicle.
- Riding without a crash helmet is forbidden.
- Always ride with the low beam on.
- Any modifications of the engine or other parts resulting in a power and/or speed increase are punishable by severe sanctions including the confiscation of the vehicle.
- To protect your safety and that of others, always drive carefully and with your helmet on.

WARNING

Any modifications and tampering with the vehicle during the warranty period exempt the manufacturer from all responsibility and invalidate warranty.

ECOLOGIC GUIDE

- Every vehicle powered by an internal combustion engine produces an amount of noise (noise pollution) and gases (air pollution) which varies with the riding style.
- The abatement of noise and air pollution levels is the duty of everybody. Avoid full-throttle starts, sudden acceleration and abrupt braking. This will reduce noise emission as well as the wear and tear of the tyres and mechanical parts, and will also allow a considerable reduction in fuel consumption.

RIDING SAFETY

- Observe the Highway Code.
- Always put on and fasten a homologated helmet.
- Always ride with the low beam on.
- Always keep the crash helmet visor clean.
- Avoid wearing garments with hanging ends.
- Do not keep sharp or brittle objects in your pockets while riding.
- Properly adjust the rearview mirrors.
- Always ride in a seated position, with both hands on the handlebars and both feet on the footrests.
- Always pay attention and do not allow anything to distract you while riding.
- Do not eat, drink, smoke, use a mobile phone, etc. while riding.
- Do not wear headphones to listen to music while riding.
- Never ride abreast with other vehicles.
- Do not tow and avoid being towed by other vehicles.
- Always keep a safe distance from other vehicles.
- Do not sit on the vehicle when it is on its stand.
- Do not start off while the vehicle is on its stand.
- Do not pull out the stand when the vehicle is facing downhill.
- Avoid swaying and wheelies as they are extremely dangerous for your own and other people's safety as well as for your vehicle.
- Always apply both brakes on dry roads with no gravel and sand. Using one brake may be dangerous and cause uncontrolled skidding.
- To reduce the braking distance, always apply both brakes.
- On wet roads and in off-road riding, drive with care and at moderate speed. Take special care in applying the brakes.
- Do not start the engine in closed places.

CONTENTS

CHAPTER 1 GENERAL INFORMATION

Vehicle identification data

Delivery

Load

Tyres

Steering lock

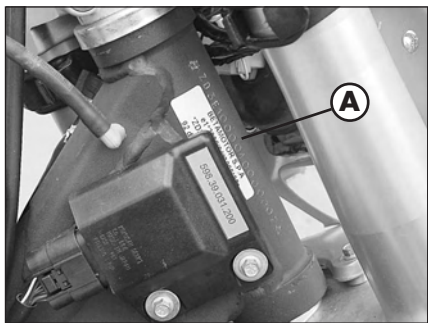
Familiarizing with your vehicle

Controls

Specifications

Wiring diagram

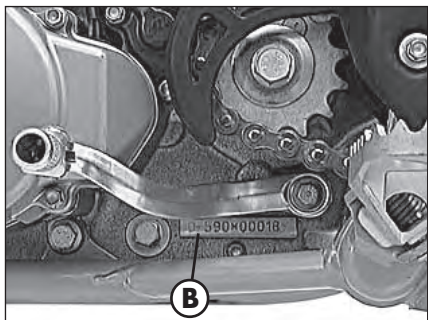
Electrical devices



VEHICLE IDENTIFICATION DATA

FRAME IDENTIFICATION

Frame identification data **A** are stamped on the right side of the steering head tube.



ENGINE IDENTIFICATION

Engine identification data **B** are stamped in the area shown in the figure.

WARNING:

Tampering with the identification numbers is severely punished by law.



DELIVERY

- The vehicle is supplied ready for use. However, it is advisable to conduct a few simple checks before riding:
 - Check the tyre pressures.
 - Check the oil level in the engine.
- The following items are supplied as standard: operation and maintenance manual, tool kit (see photo).

LOAD

- To avoid to let the vehicle be unstable, do not carry bulky or heavy objects.
- Do not carry objects that stick from the vehicle or cover the lighting and signalling devices.

TYRES

- Only fit tyres approved by BETAMOTOR. Unsuitable tyres can adversely affect the road holding of the vehicle.
- To protect your safety, immediately replace any damaged tyres.
- Slick tyres adversely affect the road holding of the vehicle, especially on wet roads and in off-road riding.
- Insufficient pressure results in abnormal wear and overheating of the tyres.
- The front and rear tyres must have the same tread design.



pressure is too low



pressure is correct



pressure is too high

TYRES PRESSION

RR 250 - 400 - 450 - 525

TYRE	front	rear
Off-road	1,0 bar	1,0 bar
Road	1,5 bar	1,8 bar
Size	90/90-21"	140/80-18"

Note

The type, condition and pressure of the tyres affect the road holding of the vehicle. For this reason it is essential to check them before each journey.

- The size of the tyres is shown in the technical specifications and in the vehicle handbook.
- Check the condition of the tyres before each journey. Inspect the tyres for cuts and for nails or other pointed objects sticking out of them. Regarding the minimum allowable thickness of the tread, observe the regulations in force in your country. We recommend replacing the tyres at the latest when the tread is 2 mm thick.
- Check the inflating pressure on a regular basis while the tyres are cold. Proper pressure ensures optimum riding comfort and prolongs the life of the tyres.

**STEERING LOCK**

The vehicle is supplied with one key and a spare to be used for the steering lock.

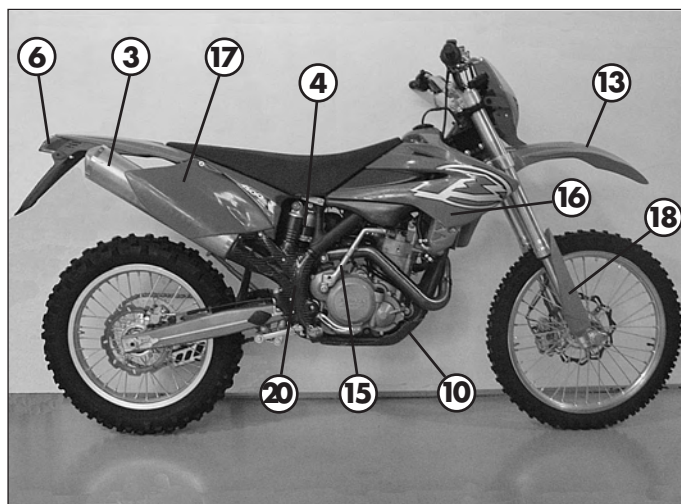
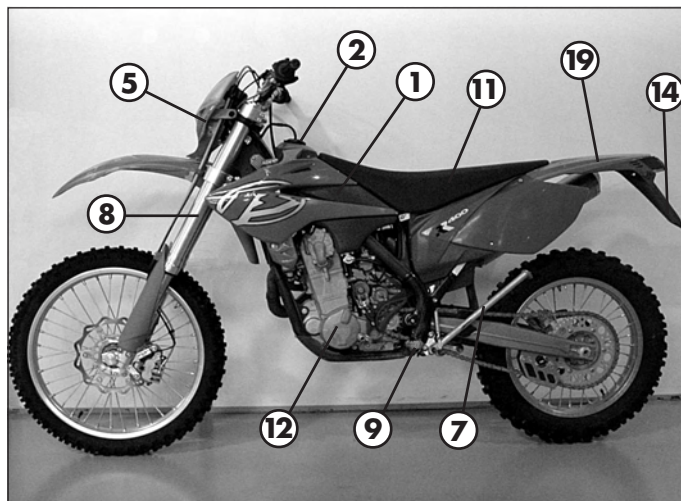
WARNING:

Do not keep the spare keys in the vehicle. Keep the keys in a safe and easy-to-reach place. The code number stamped on the keys should be copied on this manual (or elsewhere) so it can be used to ask for duplicates should both keys be lost.



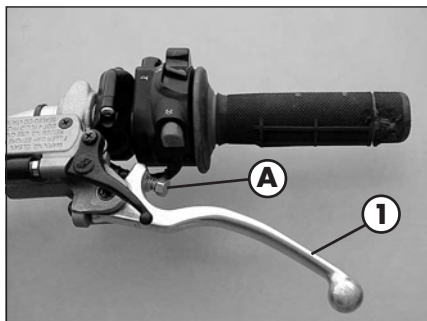
To engage the steering lock, fully turn the handlebars to the right, insert the key, press and turn it fully anticlockwise and then release it.

FAMILIARIZING WITH THE VEHICLE



Main parts:

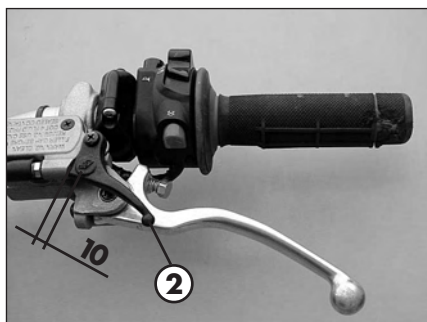
- | | | |
|-------------------------|--------------------------|---------------------|
| 1 - Fuel tank | 10 - Lower bumper | 19 - Rear mudguard |
| 2 - Tank cap | 11 - Saddle | 20 - Lateral bumper |
| 3 - Silencer | 12 - Engine | |
| 4 - Rear shock absorber | 13 - Front mudguard | |
| 5 - Headlight | 14 - Number-plate holder | |
| 6 - Rear light | 15 - Kick-start | |
| 7 - Side stand | 16 - Front side panel | |
| 8 - Fork | 17 - Rear side panel | |
| 9 - Rider's footrests | 18 - Fork covers | |



CONTROLS

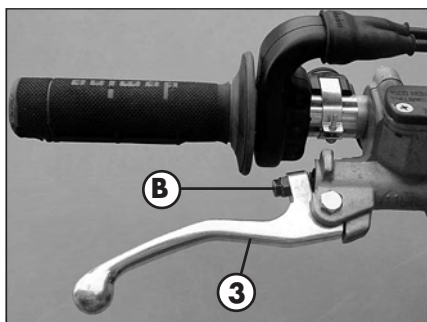
CLUTCH LEVER

Clutch lever **1** is fitted to the left-hand side of the handlebars. Screw **A** can be used to alter the home position of the lever (see Adjustments).



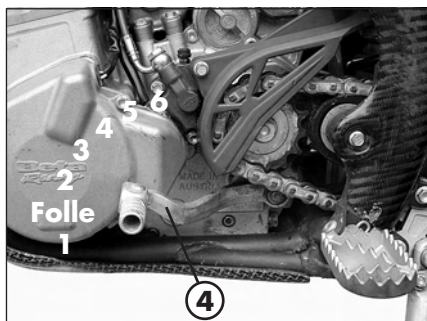
DECOMPRESSOR LEVER

Decompressor lever **2** makes the engine easier to start in case of flooding. It is also used whenever the exhaust brake needs to be reduced. Ensure that the lever has a play of approximately 10 mm (see figure). If necessary, restore the play (see Adjustments).



FRONT BRAKE LEVER

Front brake lever **3** is fitted to the right-hand side of the handlebars. Screw **B** can be used to adjust the home position of the lever (see Adjustments).

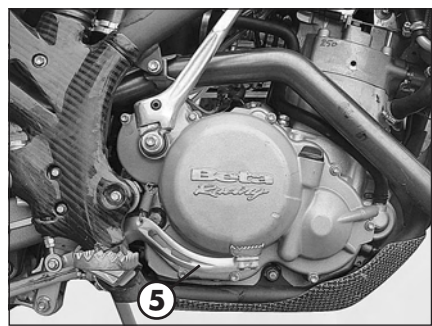


GEARCHANGE LEVER

Gearchange lever **4** is fitted to the left side of the engine. The positions corresponding to the different gears are shown in the figure. The neutral position is between the **1st** and **2nd** gears.

BRAKE PEDAL

Brake pedal **5** is located in front of the right-hand footrest.
 The position of the pedal can be adjusted to suit the requirements of the driver (see Adjustments).



DIGITAL SPEEDOMETER

CYCLING THROUGH THE FUNCTIONS

It is always possible to cycle through the different functions while the vehicle is stationary or in motion. Pressing button **C** or **D** displays the following functions in succession:

TIME - LAP - TOD - TD - COUNTDOWN

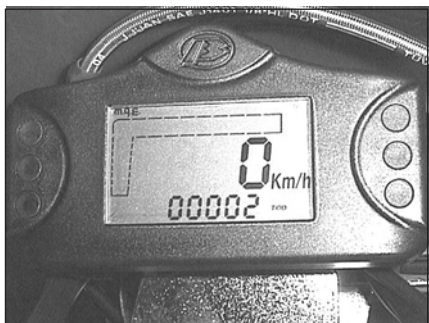


BUTTON FUNCTIONS

The functions of the buttons change with the function currently displayed:

- 1 - TIME $T \geq 3''$ and $Vel=0$ activates time setting mode
 $T < 3''$ or $Vel > 0$ cycles through functions
- 2 - LAP $T \geq 3''$ resets LAP and TD
 $T < 3''$ cycles through functions
- 3 - TOD $T \geq 3''$ and $Vel=0$ enables setting of circumference, unit and number of pulses for each wheel turn
 $T < 3''$ or $Vel > 0$ cycles through functions
- 4 - TD $T \geq 3''$ resets LAP and TD
 $T < 3''$ cycles through functions
- 5 - COUNTDOWN $T \geq 3''$ and $Vel=0$ enables setting of countdown
 $T < 3''$ or $Vel > 0$ cycles through functions

T = Time during which button is pressed down
 Vel = Speed of vehicle



CURRENT SPEED FUNCTION

This information is constantly displayed together with an indication provided by a graphic bar. The default unit is km/h. To change the unit, press the button to access the Setup menu and select Mph. When Mph is selected, no indication is provided as to which unit is currently displayed.

1 - TIME FUNCTION (TIME)

$T \geq 3''$ and $Vel=0$ activates time setting mode
 $T < 3''$ or $Vel > 0$ cycles through functions

The time can only be set while the vehicle is stationary.

Press and hold button **C** or **D** for more than 3 seconds to enter the time setting mode. Once the time has been set, press the button for about 3 seconds to go back to the standard operating mode. The Time parameter is displayed in the 0-24 format if km/h has been selected, and in the 0-12 format if Mph has been chosen.

When in the setting menu, if no buttons are pressed for 20 seconds the system will automatically return to the standard operating mode.

Moving off ($Vel > 0$) while the setting mode is activated causes the system to automatically return to the standard operating mode.

2 - AUTOMATIC LAP FUNCTION (LAP)

$T \geq 3''$ resets LAP and TD
 $T < 3''$ cycles through functions

This information represents the actual riding time associated with the TD parameter. It is an automatic counter which is activated by the first pulse generated by the speed sensor and stops 3 seconds after receiving the last pulse from the sensor. The counter for this parameter can be reset while in LAP mode by pressing the **C** or **D** button for about 3 seconds until 00'00" is displayed. The LAP function can be reset while the vehicle is stationary or in motion and also causes the reset of the TD parameter.

3 - MILEOMETER FUNCTION (TOD)

$T \geq 3''$ and $Vel=0$ enables setting of circumference, unit and number of pulses for each wheel turn

$T < 3''$ or $Vel > 0$ cycles through functions

The information is displayed together with the TOD caption. Depending on the selected unit, the information is displayed in kilometres (default) or miles and is permanently stored in non-volatile memory. It is not possible to reset this information during normal operation of the instruments.

4 - AUTOMATIC TRIP FUNCTION (TD)

$T \geq 3''$ resets LAP and TD

$T < 3''$ cycles through functions

This function is always accompanied by the TD caption. The information displayed represents the total distance covered by the vehicle in kilometres or miles (according to the selected unit). It is an automatic counter which is activated by the first pulse generated by the speed sensor.

The counter for this parameter can be reset while in TD mode by pressing the button for about 3 seconds until *000.0* is displayed. The TD function can be reset while the vehicle is stationary or in motion and also causes the reset of the LAP parameter.

5 - COUNTDOWN TRIP FUNCTION (Countdown)

$T \geq 3''$ and $Vel=0$ enables setting of countdown

$T < 3''$ or $Vel > 0$ cycles through functions

This function is always accompanied by a flashing TD caption. The counter is always active and is automatically decreased by 0.1 kilometres or miles according to the selected unit. The value for this parameter can be changed in TD decrease mode by pressing the button for about 3 seconds while the vehicle is stationary. The different figures that make up the counter can be altered starting from the most significant figure and shifting in successive steps to the least significant figure. Pressing the button for a short time decreases the value by one step; pressing it for a longer time allows a different parameter to be selected. After setting the least significant figure, press the button for about three seconds to go back to the standard operating mode. If the parameter reaches *000.0*, the system automatically sets it to *999.9*.

While in the setting menu, if no buttons are pressed for 20 seconds the system will automatically return to the standard operating mode.

Moving off ($Vel > 0$) while the setting mode is activated causes the system to automatically return to the standard operating mode.

SLEEP MODE

One minute after the last pulse from the speed sensor has been received, or after the button was last depressed, the microcontroller switches to a power-saving status named Sleep Mode. In order to save power, all standard instrument activity is suspended, the display and the backlighting are turned off (if the vehicle has no battery the backlighting is automatically turned off as soon as the engine is switched off) and only the clock remains in operation. The system can go into Sleep Mode regardless of the selected function.

WAKE UP (from Sleep Mode)

The system wakes up from Sleep Mode whenever:

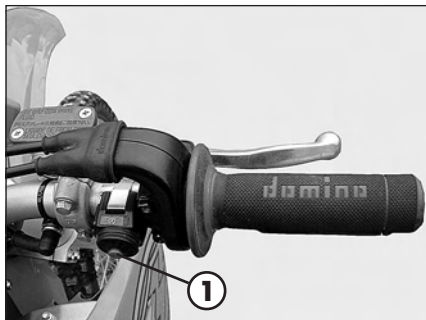
- The instrument receives a signal from the speed sensor.
- The button is depressed.

As soon as the microcontroller wakes up the following happens:

- The display and the warning lights are checked (all the warning lights come up providing that power is supplied by the vehicle) for about 2 seconds.
- The selected wheel circumference and number of wheel pulses are displayed for about 2 seconds.
- The last function in use when the system went into Sleep Mode is activated. If the waking up takes place through the electronic transmission (i.e. without pressing the button), the instruments immediately switch to the standard operating mode without checking the display and the warning lights and without showing the selected wheel circumference and number of wheel pulses.

CHANGING THE WHEEL CIRCUMFERENCE AND THE UNIT

This operation is to be performed by an authorized BETAMOTOR workshop.



STARTER BUTTON

Starter button **1** is located on the right-hand side of the handlebars and operates the electric engine starter. Push the button until the engine starts. Do not press the button **1** while the engine is running.

LH SWITCH

Dip switch **2** has three positions:

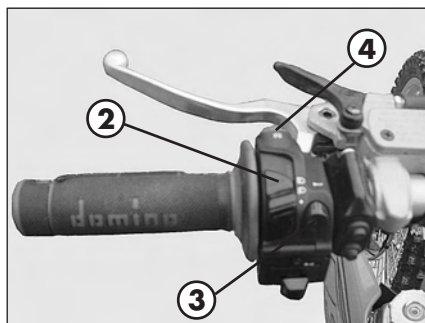
A = lights off

B = low beam on

C = high beam on

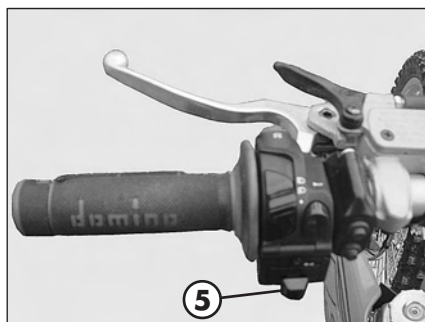
Button **3** operates the horn.

Switch **4** is used to stop the engine. Press the button until the engine stops.



INDICATOR SWITCH

Shifting lever **5** left or right activates the left or right indicators (if installed). When released, the lever returns to the central position. Press it to turn the indicators off.



KICKSTART

Kickstart **6** is fitted to the right-hand side of the engine.

The upper part of the kickstart can be oriented.

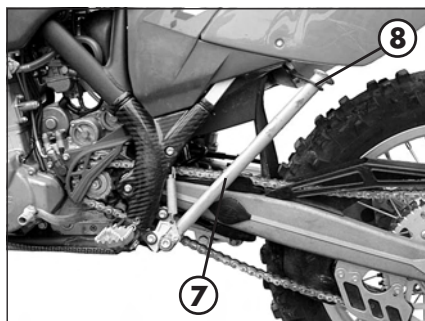


SIDE STAND

Press down side stand **7** with the foot and lean the vehicle against it.

Ensure that the ground is solid and the vehicle stands steadily.

If the vehicle is used off-road, the closed stand can be further fastened by means of rubber band **8**.



1

SPECIFICATIONS

Dry weight - RR 250	117 kg (front 54 Kg; rear 63 Kg)
Dry weight - RR 400 - 450	117,5 kg (front 54,5 Kg; rear 63 Kg)
Dry weight - RR 525	118 kg (front 55 Kg; rear 63 Kg)

DIMENSIONS - RR 250

maximum length	2270 mm
maximum width	813 mm
overall height	1255 mm
wheelbase	1490 mm
saddle height	940 mm
ground clearance	320 mm
footrest height	405 mm

DIMENSIONS - RR 400 - 450 - 525

maximum length	2270 mm
maximum width	813 mm
overall height	1255 mm
wheelbase	1500 mm
saddle height	940 mm
ground clearance	320 mm
footrest height	405 mm

FRAME molybdenum steel with double cradle split above exhaust port

TYRES

pressure bar (off-road)	front 1,0 / rear 1,0
pression bar (road)	front 1,5 / rear 1,8

WHEEL DIMENSION

front cover	90/90-21
rear cover	140/80-18
front rim	1,6x21
rear rim	2,15x18

CAPACITIES

fuel tank	8,5 liter
fuel type	petrol unleaded, with a minimum octane number of 95 (R.O.N.)
including reserve	1 liter
coolant circuit	1,3 liter
motor oil type	synthetic oil (MOTOREX COBRA 15W40)

FRONT SUSPENSION

"Marzocchi" hydraulic upside-down fork (Ø45 mm shafts)

Oil content in the gearshift fork stem:

right	610 cc
left	610 cc
Oil type	EB-H16 SAE 7,5
Oil level	90 ±2 mm
Trail	108,5 mm
front wheel travel	290 mm
fork angle	26,5°

REAR SUSPENSION

Single shock absorber with compound lever

shock absorber travel	105 mm
rear wheel travel	300 mm

FRONT BRAKE

Ø255 mm floating disc and dual-piston floating caliper

REAR BRAKE

Ø240 mm disc and single-piston floating caliper

1

ENGINE

Type	Single cylinder, 4-stroke, liquid-cooled with countershaft and electric starting
Bore x stroke RR 250	75 x 56,5 mm
Bore x stroke RR 400	89 x 64 mm
Bore x stroke RR 450	89 x 72 mm
Bore x stroke RR 525	95 x 72 mm
Displacement (cm ³) RR 250	250 cm ³
Displacement (cm ³) RR 400	398 cm ³
Displacement (cm ³) RR 450	448 cm ³
Displacement (cm ³) RR 525	510 cm ³
Compression ratio RR 250	12:1
Compression ratio RR 400 - RR 450 - RR 525	11:1
Carburetor	see table

	RR 250	RR 400	RR 450	RR 525
Type	Keihin FCR-MX 37	Keihin FCR-MX 39	Keihin FCR-MX 39	Keihin FCR-MX 39
Carburetor-setting number	3700A	3900A	3900A	3900B
Main jet	160	178	178	178
Jet needle	OBEKT	OBDVR	OBDVR	OBDVT
Idling jet	42	42	42	42
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle position	3. rd from top	3. rd from top	3. rd from top	3. rd from top
Starting jet	85	85	85	85
Mixture control screw open	0,75	1,25	1,25	1,25
Slide	15	15	15	15
Performance restrictor	slide stop	slide stop	slide stop	slide stop
Stop pump membrane	858/2,15 mm	858/2,15 mm	858/2,15 mm	858/2,15 mm
Hot start device	-	-	-	-

WIRING DIAGRAM

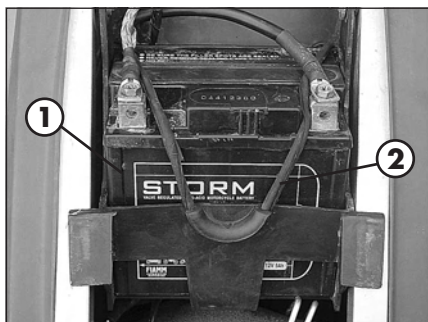
- 1) RIGHTHAND FRONT TURN INDICATOR (12V-10W BULB)
- 2) FRONT BRAKE LIGHT BUTTON
- 3) START BUTTON
- 4) WHEEL REVOLUTION SENSOR
- 5) HIGH BEAM WARNING LIGHT
- 6) TURN INDICATOR WARNING LIGHT
- 7) DISPLAY
- 8) LOW BEAM WARNING LIGHT
- 9) NOT CONNECTED
- 10) MODE BUTTON
- 11) ENGINE STOP BUTTON
- 12) HORN BUTTON
- 13) LIGHTS SELECTOR SWITCH
- 14) TURN INDICATOR SWITCH
- 15) LEFTHAND CONTROL SET
- 16) LEFTHAND FRONT TURN INDICATOR (12V-10W BULB)
- 17) FLASHER UNIT
- 18) 12V REGULATOR
- 19) LEFTHAND REAR TURN INDICATOR (12V-10W BULB)
- 20) NUMBER-PLATE LIGHT (12V-5W BULB)
- 21) REAR LIGHT (12V-5/21W BULB)
- 22) RIGHTHAND REAR TURN INDICATOR (12V-10W BULB)
- 23) BATTERY POSITIVE TERMINAL
- 24) BATTERY 12V-5Ah
- 25) GENERATOR
- 26) 10A FUSE
- 27) EARTH BRAID
- 28) STARTER RELAY
- 29) STARTER MOTOR
- 30) BATTERY NEGATIVE TERMINAL
- 31) ELECTRONIC CONTROL UNIT
- 32) HV COIL
- 33) SPARK PLUG
- 34) REAR BRAKE LIGHT BUTTON
- 35) FRAME EARTH
- 36) PARKING LIGHT BULB, 12V-3W
- 37) HEADLIGHT WITH 12V-25/25W
- 38) 12V HORN

Key to colours

Bi = White
 Ve = Green
 Ma = Brown
 Vi = Purple

Bl = Blue
 Ne = Black
 Gi = Yellow
 Rs = Red

Ar = Orange
 Az = Sky-blue
 Ro = Pink
 Gr = Grey



ELECTRICAL DEVICES

BATTERY

Battery **1** is located under the saddle and requires no maintenance.

It is not necessary to check the level of the electrolyte or top up with water.

Keep the battery terminals clean and, if necessary, protect them with a small quantity of acid-free grease.

Removing the battery

Remove the saddle and disconnect the battery. Be sure to disconnect the negative terminal first and then the positive terminal.

Release rubber band **2**.

Remove the battery.

When fitting the battery, insert it with the terminals at the front (see figure). Lastly connect the negative terminal to the battery.

WARNING

To avoid damaging rubber band **2**, take care not to pass it over the edge of the battery.

WARNING

Extreme caution should be exercised if the electrolyte (sulphuric acid) should spill out of the battery. The electrolyte can cause severe burns. In case of contact with the skin, rinse generously with water.

Should the electrolyte come into contact with the eyes, rinse with water for at least 15 minutes and immediately seek medical assistance.

Although the battery is sealed, there is a possibility that explosive gases might leak out.

Keep sparks and open flames away from the battery.

Keep exhausted batteries out of the reach of children and dispose of them as prescribed by law.

Do not remove the protections.

When installing the battery, take care to observe the polarity of the connections.

INACTIVITY

If the vehicle is left unused for a long period, remove the battery and charge it with a suitable charger every 15 days. Keep the battery in a dry place at a temperature of 5-35°C and out of the reach of children.

FUSE

Fuse **3** is located in starting relay **4** underneath right-hand side panel **5**.

To gain access to the fuse, remove the saddle and lift tilting support **6**, where the battery is contained.

The fuse protects the following devices:

- electric starter
- horn
- indicators
- instrument panel

The starting relay also contains spare fuse **7** (10 amperes).

Always replace a blown fuse with another of the same type.

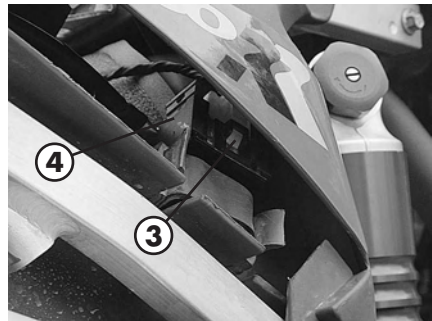
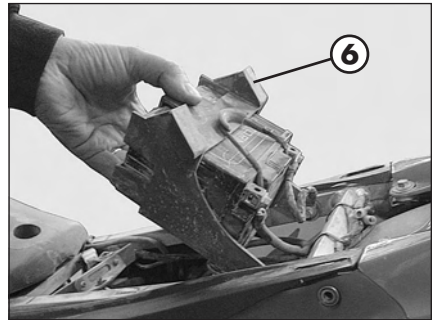
If the new fuse should also burn out when fitted, immediately contact a specialized BETAMOTOR workshop.

The fuse has a capacity of 10 amperes.

WARNING

Do not on any account fit a larger capacity fuse or attempt to fix a broken fuse.

Unskilled operations could cause a breakdown of the entire electrical system.



CONTENTS

CHAPTER 2 OPERATION

Checks to be performed before each ride

Recommended lubricants

Running-in

Starting the engine

Refuelling

CHECKS TO BE PERFORMED BEFORE EACH RIDE

The vehicle can be used only if it is in perfect condition from a technical point of view. To ensure maximum safety, it is advisable to carry out a general inspection of the motorcycle before each ride. The checks to be performed are described below.

1 CHECK THE ENGINE OIL LEVEL

Insufficient oil levels lead to early wear and, in the long run, to engine damage.

2 FUEL

Check the level of the fuel in the tank, arrange the breather pipe so that it has no kinks and fit the fuel tank cap.

3 DRIVE CHAIN

A slack chain can come out of the chainring and sprocket. An overtight chain can break or damage the other components of the final drive. A dirty or poorly lubricated chain can cause premature wear of the parts.

4 TYRES

Thoroughly check the tyre tread. If a tyre presents cuts or bulges, replace it. The thickness of the tread must be as prescribed by law. Check the tyre pressure. Wear and unsuitable pressure adversely affect road holding.

5 BRAKES

Check the operation of the brakes and the level of the brake fluid. If the brake fluid level falls below the minimum, check the brake pads for wear and the braking system for possible leaks. If an oil leak is found, have the braking system overhauled by a specialized BETAMOTOR workshop.

6 CABLE CONTROLS

Check the adjustment and the operation of all the cable controls.

7 COOLANT

Check the level of the coolant when the engine is cold.

8 ELECTRICAL SYSTEM

With the engine running, check the operation of the headlight, the rear and brake lights, the indicators, the warning lights and the horn.

9 SPOKES

Check that the spokes are properly tightened.

10 NUTS AND BOLTS

Inspect all the nuts and bolts.

Note

Check the presence of the vehicle identification papers.

In cold weather, it is advisable to warm up the engine by letting it idle a few minutes before starting it off. Each time the vehicle is used cross-country, it is necessary to wash carefully, dry it and then lubricate.

RECOMMENDED LUBRICANTS

To maximize the vehicle's performance and ensure many years of trouble-free operation, we recommend using the following products:

PRODUCT TYPE	SPECIFICATIONS
ENGINE OIL	BARDAHL XTM15W 50
BRAKE OIL	BARDAHL BRAKE FLUID DOT4
FORK OIL	EB-H16 SAE 7,5
TIE ROD GREASE	BARDAHL MPG2
CLUTCH OIL	ARAL VITAM LS (mineral oil)
LIQUID COOLANT	IP ECOBLU

Note

It is essential that all renewals should be performed with the products listed in the table above.

RUNNING-IN

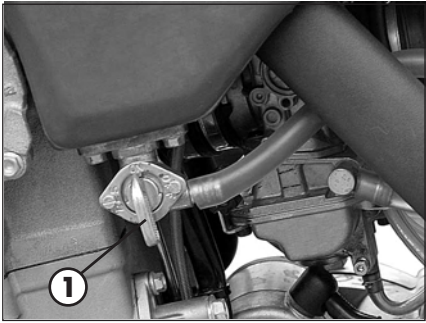
The running-in period lasts approximately 15 hours, during which it is advisable to:

- 1 During the first 3 hours of operation the engine should only be used to approximately 50 percent of its power. In addition, the engine speed should not exceed 7,000 rpm.
- 2 For the next 12 hours of operation the engine should only be used to about 75 percent of its power.
- 3 Use the vehicle after properly warming up the engine.
- 4 Avoid travelling at constant speed (changing the speed causes the different components to bed in evenly and more quickly).

WARNING

After the first 3 hours or 20 litres of petrol change the engine oil.

- Always use high-octane unleaded petrol.
- After using the vehicle on rough ground for the first time, carefully **check the tightening of all nuts and bolts.**



STARTING THE ENGINE

COLD STARTING

- 1 Open fuel cock **1**.
- 2 Take the vehicle off the stand.
- 3 Shift into neutral.
- 4 Operate choke **2**.
- 5 WITHOUT opening the throttle, firmly and FULLY operate kickstart **3** or use the electric starter.



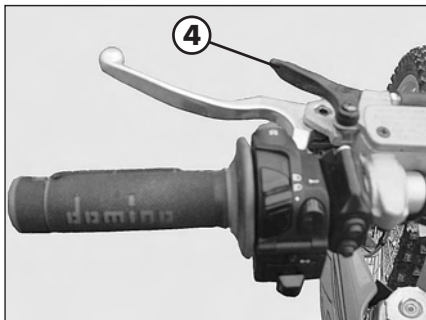
HOT STARTING

- 1 Open fuel cock **1**.
- 2 Take the vehicle off the stand.
- 3 Shift into neutral.
- 4 WITHOUT opening the throttle, firmly and FULLY operate kickstart **3** or use the electric starter.



WHAT TO DO IF THE ENGINE IS FLOODED

After a fall, the engine may receive more fuel than is needed. In that case pull decompressor lever **4**, actuate the kickstart 5-10 times or press the electric starter button twice for 5 seconds. Subsequently start the engine as described previously. If necessary, remove the spark plug and dry it.



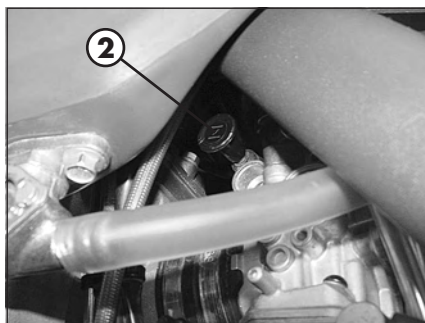
WARNING

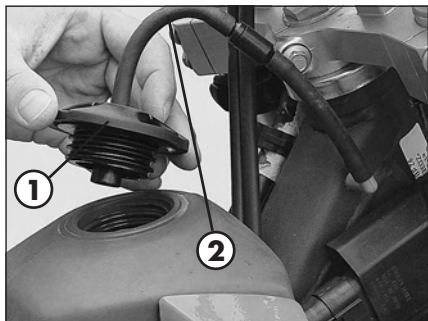
The carburettor is equipped with an accelerating pump.

When starting the engine, do not open the throttle fully more than once as the engine might get flooded.

CHOKE

When choke **2** is pulled out completely, a hole is opened in the carburettor through which the engine can suck in extra fuel. This makes it possible to obtain a rich fuel-air mixture suitable for cold starting. To deactivate the choke, push it in to its starting position.





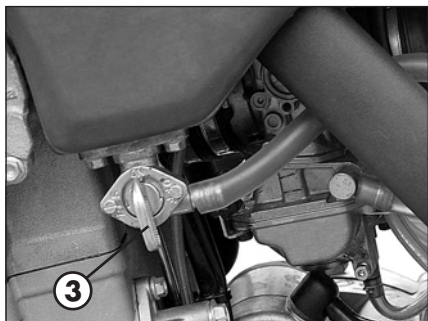
REFUELLING

FUEL TANK CAP

Open: Turn tank cap **1** anticlockwise.

Close: Replace the tank cap and turn it clockwise.

Arrange tank breather pipe **2** so that it forms no kinks.



FUEL COCK

OFF Fuel cock **3** is closed.

ON Before using the vehicle, turn the knob to ON. This allows the fuel to flow to the carburettor. When the fuel cock is in the ON position the fuel tank empties until only the reserve fuel is left.

RES The reserve fuel is used only if the knob is in the RES position. Do not forget to bring the knob back to the ON position after refuelling.

Reserve fuel 1 litre

The fuel tank capacity is approximately 8.5 litres, including 1 litre reserve. Immediately wipe off any fuel spills from the bodywork and other parts of the vehicle.

Stop the engine before refuelling.

Petrol is highly flammable. Take care not to spill it from the tank while refuelling.

Keep open flames and lighted cigarettes away from the tank filler: danger of fire.

Avoid inhaling harmful vapours.

Fuel expands under the action of heat. It is therefore recommended not to fill the tank to the brim.

CONTENTS

CHAPTER 3 CHECKS AND MAINTENANCE

Motor oil level check

Motor oil and oil filter substitution

Check the level of the front and rear brake fluid and bleeding

Check the front and rear brake pads

Check the oil level in the hydraulic clutch and bleeding

Fork oil

Air filter

Spark plug

Carburetor

Coolant

Removing the plastics

Drive chain maintenance and wear

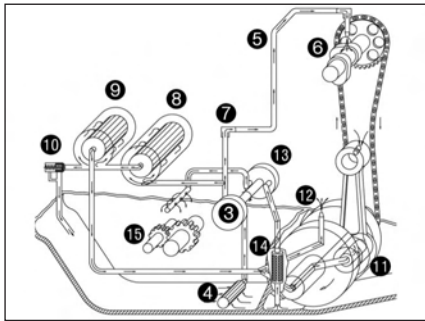
Suspensions: telescopic fork and shock absorber

Charging the battery

Cleaning and checking the vehicle

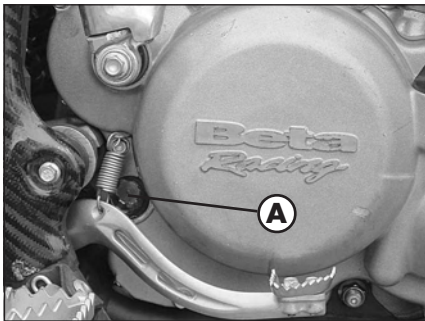
Scheduled maintenance

Prolonged inactivity



OIL CIRCUIT

Oil pump **3** sucks engine oil from the oil sump through long oil unit **4**. Oil pipe **5** conveys the oil to the cylinder head up to camshaft lubrication point **6**. The oil quantity is adjusted by means of oil passage screw **7**. An oil pipe branches off towards long oil unit **8**, where the coarser particles are filtered out. The oil then comes to short oil unit **9**, which filters out the smaller particles. The filtered oil is then pumped through bypass valve **10** to small-end bearing **11** and sprayed from below through jet **12** onto the piston. A second oil pump **13** sucks oil from the crankcase through short oil unit **14** and lubricates gears **15**.



CHECKING THE ENGINE OIL LEVEL

The engine oil level can be checked when the engine is cold or hot. Place the vehicle in an upright position (not on the side stand) on level ground. When the engine is cold, the oil should reach the lower edge of sight **A**. When the engine is hot, the oil should reach the upper edge of the sight. Top up as necessary.

WARNING

The use of insufficient quantities of oil or of oil of inferior quality results in premature wear of the engine.

CHANGING THE ENGINE OIL AND THE OIL FILTER

Before performing this operation, if lower bumper **A** is present, remove it after unscrewing the three screws **B** as shown in the figure.

Whenever the oil is changed, the long and short oil units need to be cleaned and both oil filters replaced.

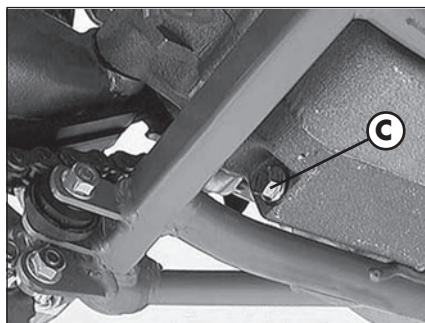
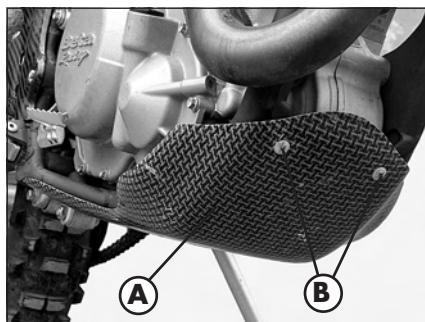
The oil must be changed when the engine is at operating temperature.

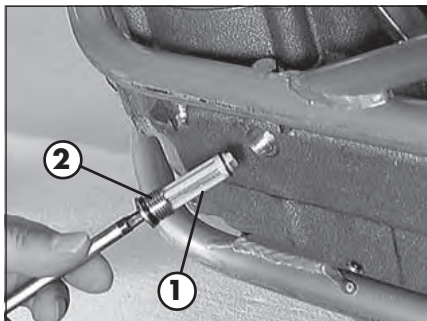
WARNING

When at operating temperature, the engine and the oil it contains are very hot. Take special care to avoid burns.

Park the motorcycle on level ground, remove screw **C** and let the oil drain in a container.

Thoroughly clean the screw (with a magnet). After the oil has drained completely, clean the sealing surface, replace screw **C** with the seal ring and tighten at 20 Nm.

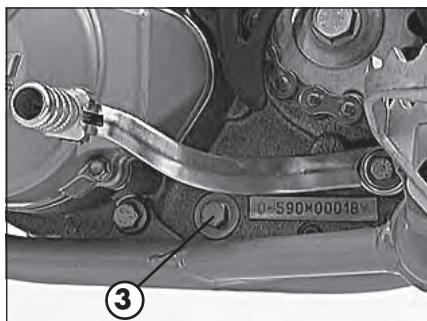




CLEANING THE SHORT OIL UNIT

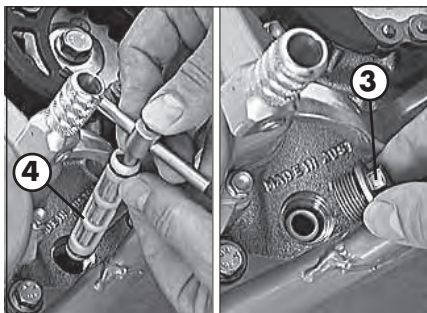
Short oil unit **1** is inserted in Allen screw **2** on the lower side of the engine. Insert an Allen wrench into the screw socket and loosen the oil drain screw.

Remove the oil unit, thoroughly clean its components and blow them with low-pressure compressed air. Check the O-rings for damage and if necessary replace them. Replace the oil unit with the screw and tighten the screw at 10 Nm.

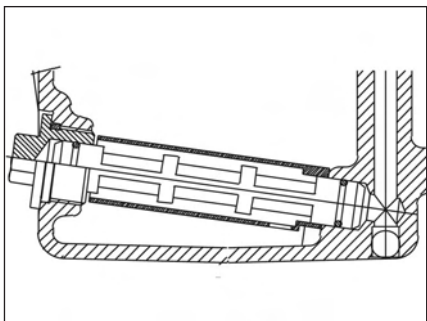


CLEANING THE LONG OIL UNIT

The long oil unit is inserted in hexagonal-head screw **3** next to the engine serial number. Remove the screw with the oil unit, thoroughly clean the components and blow them with low-pressure compressed air. Check the O-rings for damage and if necessary replace them.



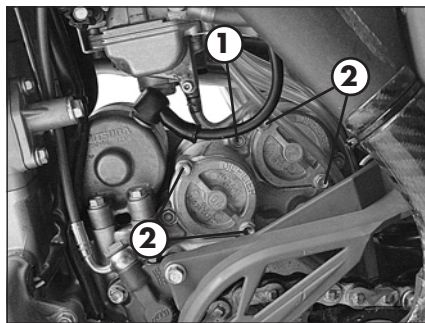
To replace long oil unit **4**, use a 300 mm spanner as shown in the figure, then insert the spanner through the opening in the hole on the opposite side of the crankcase. Push the oil unit in the crankshaft until it stops and then remove the spanner. Replace screw **3** and tighten at 1.5 Nm.



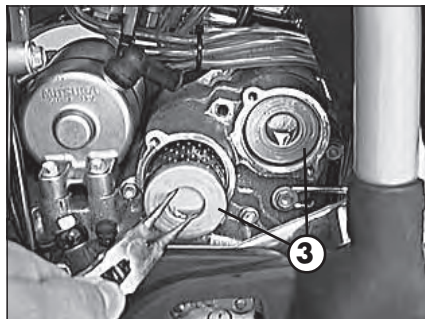
The oil unit is fitted in a tilted position (see diagram). To avoid malfunctions, be sure to observe this position.

REPLACING THE OIL FILTER

Remove screw **1** and allow the oil to drain into a container placed under the engine. Remove the four screws **2** and take off the two oil filter covers.

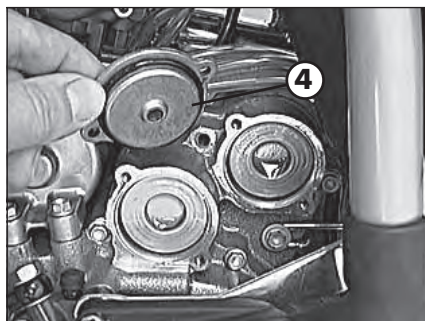


Using special seeger ring pliers, pull the two filter elements **3** out of the crankcase. Clean the oil filter covers, the sealing surfaces of the O-rings and the crankcase. Check the oil filter cover O-rings for damage and if necessary replace them.



Insert the long filter unit at the front and the short filter unit at the back of the crankcase. Grease the oil filter cover O-rings and fit covers **4**.

Fit screws **2** and tighten them at 6 Nm. Tighten screw **1** at 8 Nm.



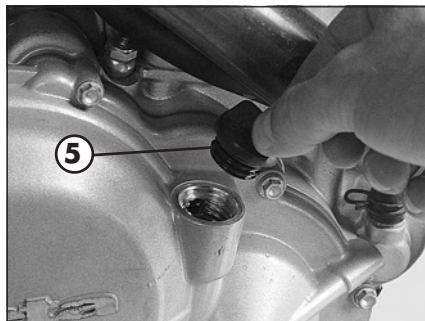
Remove screw fastener **5** from the clutch cover and pour in 1.25 litres of fully synthetic engine oil (MOTOREX COBRA 15W40).

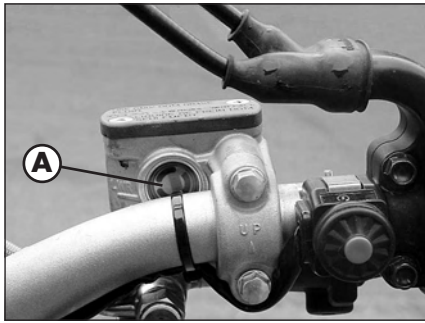
WARNING

Before starting the engine, it is advisable to rotate the engine (using the kickstart) to allow the oil to spread evenly throughout the system.

Start the engine and check the tightening of all the screw fasteners and of the oil filter covers.

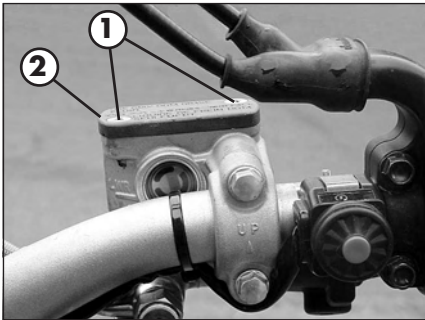
Finally check the engine oil level and if necessary top up.





CHECK THE LEVEL OF THE FRONT BRAKE FLUID

Check the level of the brake fluid through sight **A**. The level of the fluid should never fall below the mark in the sight.



RESTORING THE LEVEL OF THE FRONT BRAKE FLUID

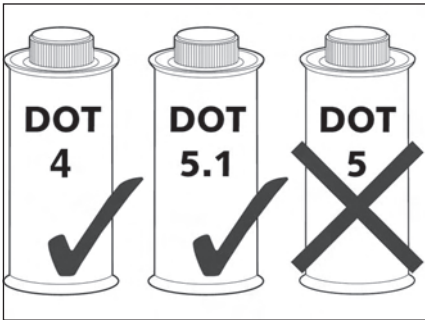
To restore the level of the brake fluid, loosen the two screws **1**, lift cap **2** and add brake fluid (IP DOT 4) until its level is 5 mm below the upper rim of the reservoir.

WARNING

We recommend using DOT 4 brake fluid. Should this fluid be unavailable, use DOT 5.1 fluid instead. Do not on any account use DOT 5 brake fluid. This is a purple fluid with a base of silicone oil which requires special seals and tubes.

WARNING

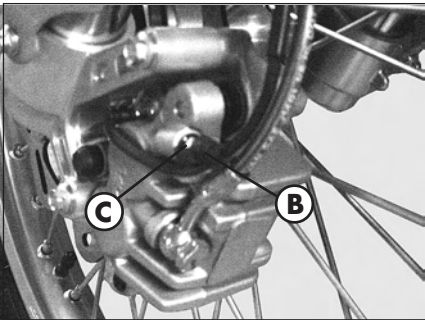
The brake fluid is extremely corrosive. Take care not to spill it on the paintwork.



BLEEDING THE FRONT BRAKE

Follow these steps to bleed the front brake circuit:

- Remove rubber cap **B** from valve **C**.
- Remove the oil reservoir cap.
- Insert one end of a small tube into valve **C** and place the other end in a container.
- Unscrew valve B (while pulling the brake lever) and then pump by repeatedly actuating the brake lever until oil starts flowing out continuously with no air bubbles. During this operation, it is important that the lever should not be released completely and that the brake pump reservoir should be continuously refilled to make up for the oil that is flowing out.
- Tighten the valve and extract the tube.
- Replace the cap.
- Replace the fluid reservoir cap on the brake pump.



CHECK THE LEVEL OF THE REAR BRAKE FLUID

Check the level of the brake fluid through sight **D**. The level of the fluid should never fall below the mark in the sight.

RESTORING THE LEVEL OF THE REAR BRAKE FLUID

To restore the level of the brake fluid, unscrew cap **3** and pour in brake fluid (IP DOT 4) until the level reaches the mark in sight **D**.

WARNING

We recommend using DOT 4 brake fluid. Should this fluid be unavailable, use DOT 5.1 fluid instead. Do not on any account use DOT 5 brake fluid. This is a purple fluid with a base of silicone oil which requires special seals and tubes.

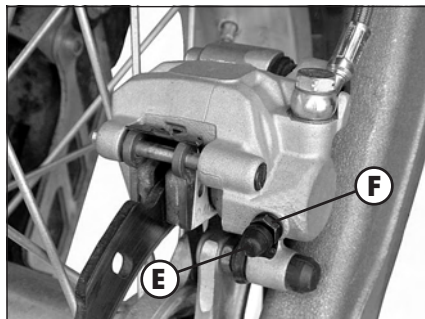
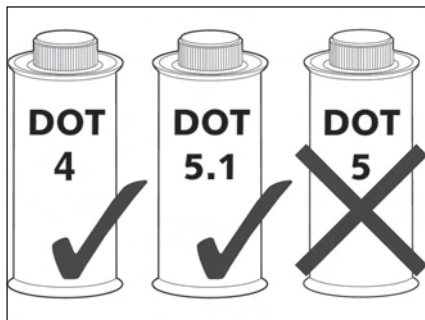
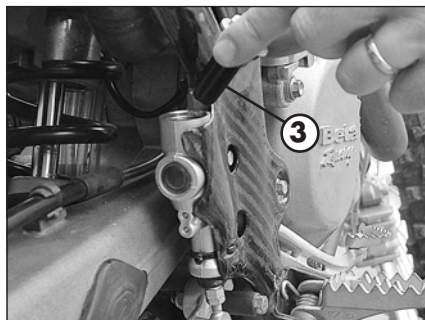
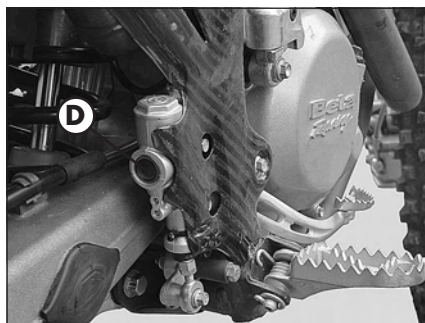
WARNING

The brake fluid is extremely corrosive. Take care not to spill it on the paintwork.

BLEEDING THE REAR BRAKE

Follow these steps to bleed the rear brake circuit:

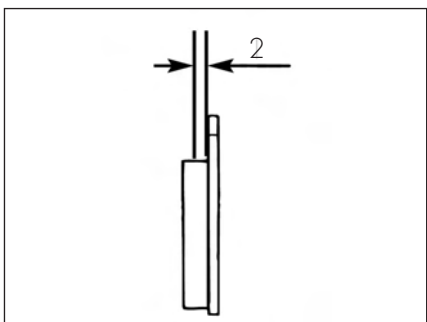
- Remove rubber cap **E** from valve **F**.
- Unscrew the brake fluid reservoir cap.
- Insert one end of a small tube into valve **F** and place the other end in a container.
- Unscrew valve **F** (while pulling the lever) and repeatedly operate the brake pedal until the fluid comes out smoothly with no air bubbles. During this operation, be sure to never release the pedal completely and keep pouring fresh fluid into the brake pump reservoir so as to replace the fluid that comes out.
- Tighten the valve and extract the tube.
- Replace the cap.
- Replace the screw cap on the brake pump.





FRONT BRAKE LINING CONTROL

In order to verify the wear condition of front brake is enough to view the plincer from the bottom, where is possible to glimpse the brake lining tails which will have to show a brake of 2 mm in thickness. If the stratum is lesser let's start replacing them.



Note

Perform the check according to the times shown in the table on page 134.

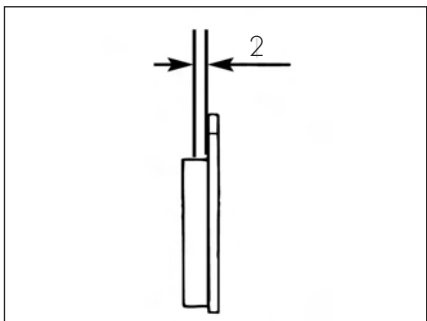
WARNING

Failure to promptly replace the brake pads can result in a considerable reduction of the braking action and in damage to the brake disc.



REAR BRAKE LINING CONTROL

In order to verify the wear condition of rear brake is enough to view the plincer from the back side, where is possible to glimpse the brake lining tails which will have to show a brake of 2 mm in thickness. If the stratum is lesser let's start replacing them.



Note

Perform the check according to the times shown in the table on page 134.

WARNING

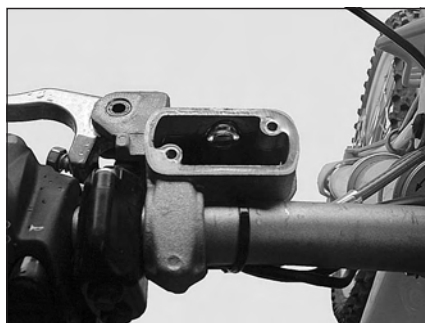
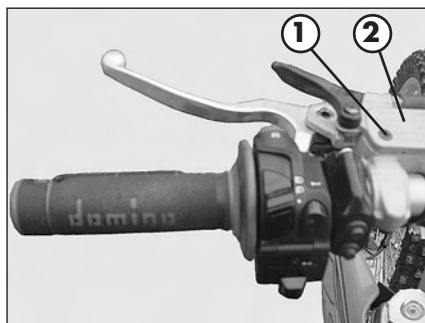
Failure to promptly replace the brake pads can result in a considerable reduction of the braking action and in damage to the brake disc.

CHECKING THE OIL LEVEL IN THE HYDRAULIC CLUTCH

To check the oil level in the clutch pump, first remove cover **2**.

Remove the two screws **1** and take off cover **2** together with the rubber bellows. With the clutch pump in a horizontal position, the level of the oil should be 4 mm below the upper rim.

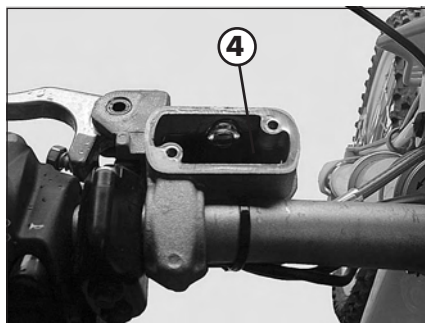
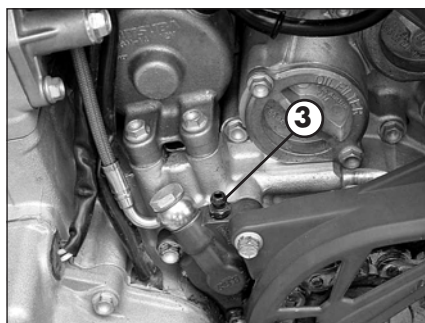
If necessary top up with ARAL VITAM LS hydraulic oil, which is available from your BETAMOTOR dealer.

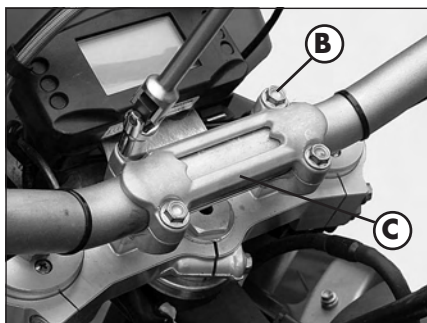


BLEEDING THE HYDRAULIC CLUTCH

To bleed the hydraulic clutch, first remove the clutch pump cover. To do this, remove the two screws **1** and take off cover **2** together with the rubber bellows. Remove the breather valve from clutch pump cylinder **3**. Fit the bleed syringe filled with SAE 10 hydraulic oil in the breather valve socket. Pump in oil until it comes out of clutch pump hole **4** with no air bubbles. Ensure that no oil overflows. The bleed syringe is available from BETAMOTOR dealers. Once the bleeding is complete, check the oil level in the clutch control cylinder.

If necessary top up with ARAL VITAM LS hydraulic oil, which is also available from your BETAMOTOR dealer.





FORK OIL

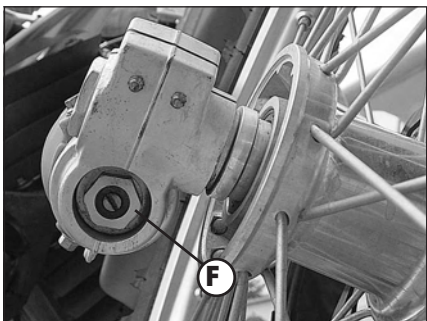
Right/left-hand rod

The procedure for changing the oil in the forks is provided only for information. We recommend having the operation performed by a BETAMOTOR authorized workshop.

- Remove the handlebars after unscrewing the four screws **B** fixing clevis **C**.



- Unloosen the stem clamping screws **D** and **E**.



- Remove lower plug **F** and upper plug **A** (pay attention to the spring).
- Let all the oil drain from the rod.
- Replace fork lower plug **F**.



- Pour in fresh oil of the type shown in the table on page 105.
- Fit and tighten upper plug **A**.
- Tighten in sequence, first the **D** screw, then the **E** screw and aging the **D** screw.

AIR FILTER

A dirty air filter hinders the passage of air, reduces engine power and increases fuel consumption. For these reasons it is essential to clean the air filter on a regular basis.

Follow these steps to gain access to the air filter.

- Remove the saddle.
- Lift and rotate battery **1** (see figure).
- Release filter fastener **2**.
- Pull out air filter **3**.
- Carefully wash the filter with soap (or special detergent) and water.
- Dry the filter.
- Wet the filter with filter oil and then remove the excess oil to prevent it from dripping.

WARNING

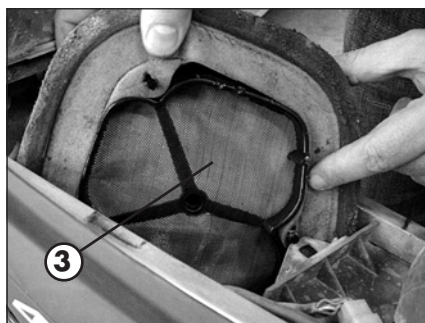
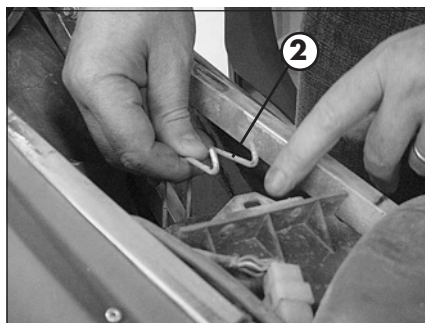
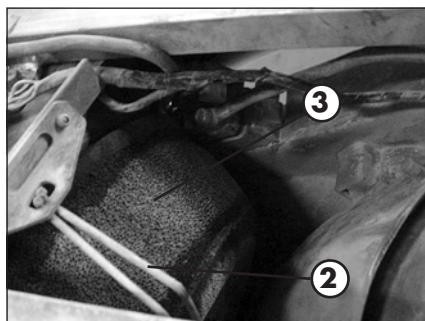
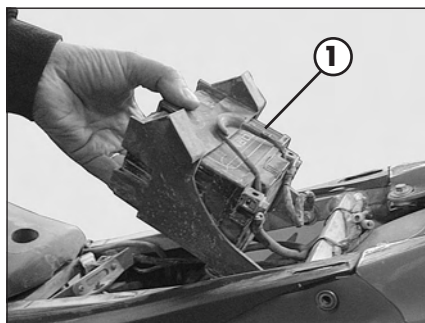
To avoid corroding the filter, do not clean it in foam containing petrol or petroleum. Never use the vehicle if the air filter is not in place. The infiltration of dust and dirt can cause damage and considerable wear.

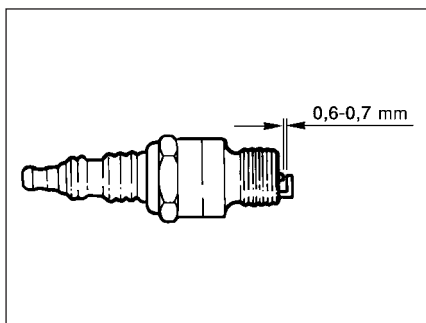
- If necessary clean the inside of the filter box.
- Replace the filter taking special care to ensure the seal of the rubber gasket.
- Attach filter fastener **2**.

WARNING:

After each operation check that no object is left in the filter box.

Clean the filter every time the vehicle is used over rough ground.





SPARK PLUG

Keeping the spark plug in good condition makes for reduced consumption and optimum engine performance.

It is advisable to remove the spark plug when the engine is hot (and naturally off) because the carbon formation and the colour of the insulator provide important information on carburetion, lubrication, and the general condition of the engine.

Note

Black spark plug = mixture is rich

Light brown spark plug = mixture is correct

White spark plug = mixture is lean

This operation must be performed with the utmost care to avoid severe hand burns. Always wear protective gloves.

To carry out the check, simply remove the current cap and then unscrew the spark plug using the spanner provided.

Carefully clean the electrodes using a wire brush. Blow the spark plug with compressed air to prevent any residues from getting into the engine.

Measure the spark gap with a thickness gauge. The gap should be 0.6-0.7 mm. If the gap is not as specified, restore the proper gap by bending the earth electrode.

Check that the insulator is not cracked and that the electrodes are not corroded, in which case the spark plug should be immediately replaced.

Conduct the check by referring to the table on page 134.

Lubricate the spark plug thread, and then (when the engine is cold) screw in the spark plug by hand to its abutting end. Finally tighten the spark plug with the spanner.

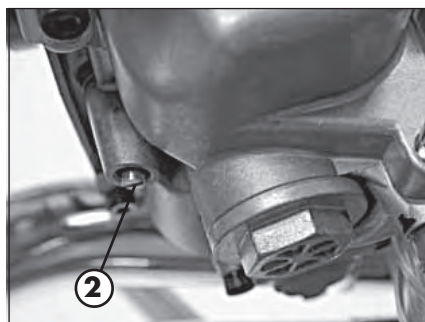
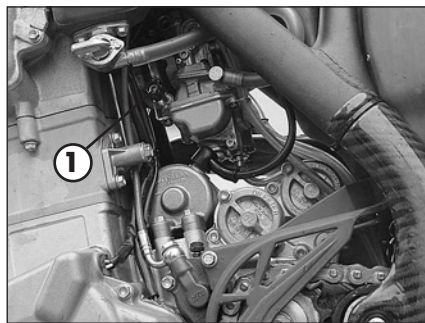
Note:

- Always use NGK DCPR 8 E spark plugs.

CARBURETTOR - ADJUSTING THE IDLE SPEED

Engine starting is strongly affected by the idle speed adjustment. In other words, an engine whose slow running is properly adjusted is easier to start than an engine with an unsuitably tuned up engine.

The idle speed is adjusted by means of adjusting wheel **1** and mixture adjusting screw **2**. The adjusting wheel regulates the idling mixture, which reaches the engine through the idling system. Rotating the wheel clockwise decreases the quantity of fuel (lean mixture); rotating it anticlockwise increases the quantity of fuel (rich mixture).



To properly adjust the idle speed, follow these steps:

- Turn in mixture adjusting screw **2** until it stops, then turn it until you obtain the basic adjustment recommended by BETAMOTOR (see engine specifications on page 96).
- Warm up the engine.
- Turn adjusting wheel **1** to obtain the standard idle speed (1400-1500 rpm).
- Slowly turn mixture adjusting screw **2** clockwise until the idle speed begins to lower. Remember this position, then slowly turn the mixture adjusting screw anticlockwise until the engine speed lowers again. Determine the point between the two positions where the highest idle speed is obtained. Should the engine speed increase considerably, decrease the engine speed to the standard level and repeat the above procedure. If you make a markedly sporting use of your vehicle, which increases the heating of the engine, choose a leaner mixture by turning the adjusting screw approximately 1/4 of a turn clockwise from the ideal setting.

NOTE

Failure to successfully complete the above procedure can be the result of an improperly sized idling jet.

a) If the mixture adjusting screw is turned until it stops and no changes in the idle speed are observed, a smaller idling jet is required.

b) If the engine stalls when the adjusting screw is still two turns open, a larger idling jet is needed.

Naturally, after replacing the jet the adjusting procedure will have to be restarted from the beginning.

- Turn the adjusting wheel until you obtain the desired idle speed.
- The idle speed will have to be adjusted again in case of marked changes in the outside temperature and riding altitude.

CARBURETTOR WEAR GUIDELINES

The throttle valve, the needle valve and the needle jet are subject to heavy wear due to engine vibrations.

This can result in carburettor malfunctions (e.g. mixture enrichment).

CHECKING THE FLOAT LEVEL (float height)

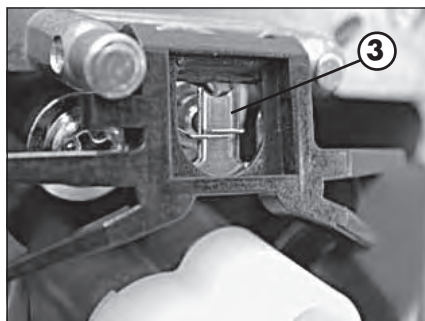
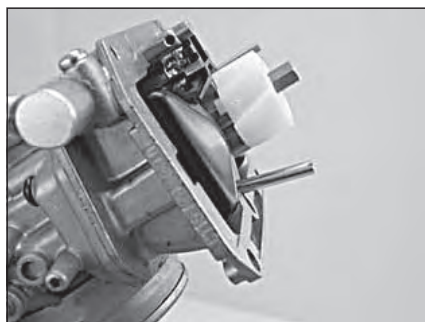
Remove the carburettor and the float chamber. Tilt the carburettor so that the float touches the float needle valve without pressing it too hard.

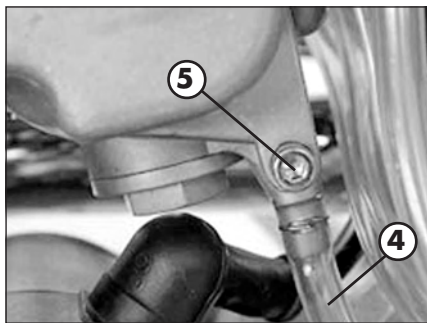
In this position the float edge should be parallel with the float chamber sealing surface (see figure).

If the float height does not correspond to the nominal value, check the float needle valve and if necessary replace it.

If the needle valve is in working order, adjust the float height by bending float lever **3**.

Fit the float chamber, install the carburettor and adjust the idle speed.



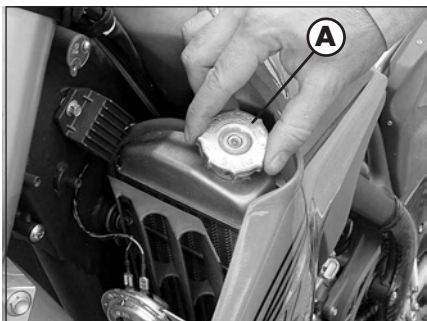


DRAINING THE CARBURETTOR FLOAT CHAMBER

The carburettor float chamber can be drained by following the procedure described below while the engine is cold. Close the fuel cock and place tube **4** in a container to gather the fuel that flows out. Open drain screw **5** and drain the fuel. Close the drain screw, open the fuel cock and check the seal of the system.

WARNING

Fuel is flammable and toxic and must be handled with great care. Never work on the fuel system near heat sources or open flames. Always allow the engine to cool down before working on the fuel system. Wipe off any excess fuel with a rag. Materials soaked in fuel are also flammable. In case of ingestion or contact with sensitive parts of the body immediately seek medical attention. Fuel is to be disposed of as prescribed by law.



COOLANT

The level of the coolant must be checked when the engine is cold. Use the following procedure:

- Unscrew cap **A** and visually check the level of the liquid. When the engine is cold, the radiator fins should be immersed in the liquid for about 10 mm.
- Top up if the coolant does not cover the radiator fins (see chart on page 105).



The capacity of the circuit is shown in the table on page 95.

WARNING

To avoid scalds, never unscrew the radiator filler cap when the engine is hot.

REMOVING THE PLASTICS

To facilitate checks and operations in certain areas of the vehicle, it is essential to remove the bodywork sections as described below.

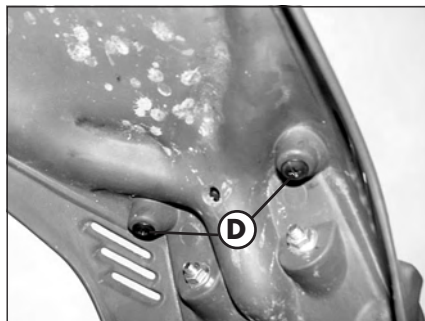
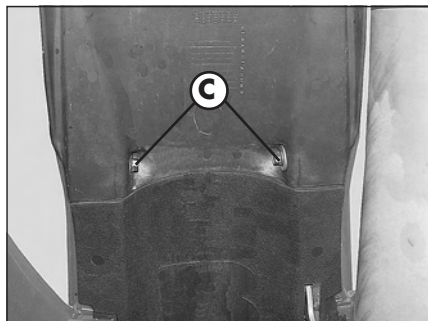
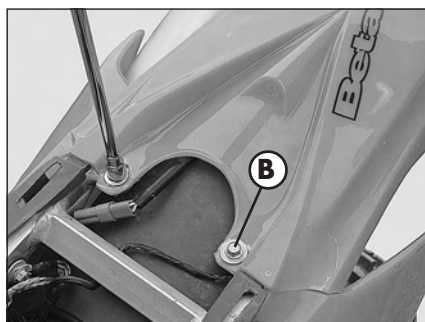
Removing the saddle

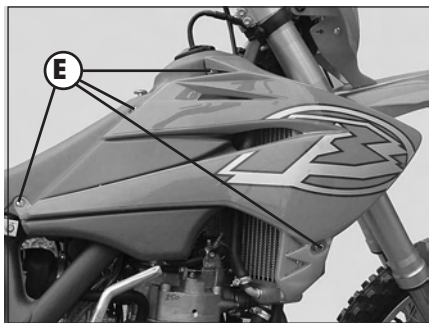
Remove the two fixing screws **A** (one on each side), lift the saddle as shown in the figure and pull it off from the back of the vehicle.



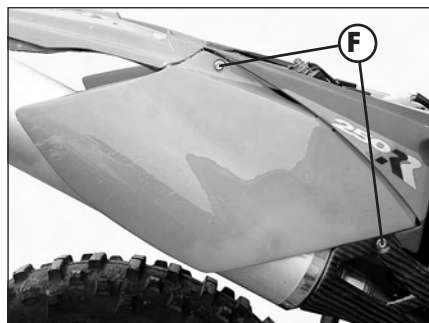
Removing the rear mudguard

Remove the two fixing screws **B** and then the two fixing screws **C** and **D** from under the rear mudguard.

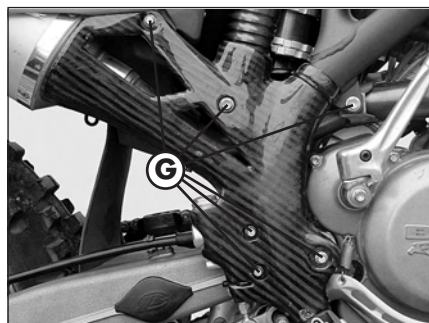




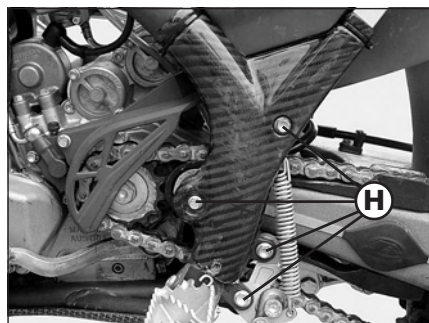
Removing the front side panels
Unscrew the eight fixing screws **E** (four on each side) and remove the panels.



Removing the rear side panels
Unscrew the four fixing screws **F** (two on each side) and remove the panels. The upper screw fixes the saddle as well as the rear panel.

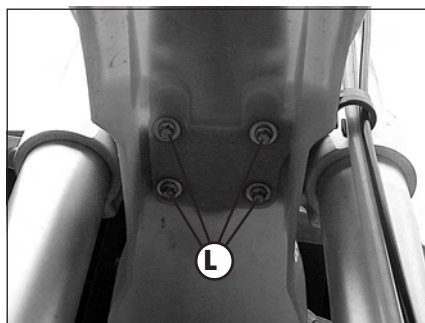


Removing the right-hand side bumper
Unscrew the six fixing screws **G**, remove the plastic strap and take off the side bumper (if present).

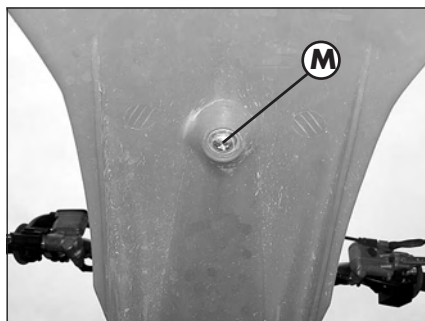


Removing the left-hand side bumper
Unscrew the four fixing screws **H**, remove the two plastic straps and take off the side bumper (if present).

Removing the front mudguard
Remove the four screws **L** from underneath the front mudguard.



Remove screw **M** (also located under the mudguard) fixing the mudguard backing plate.



Remove the two mudguard backing fixing screws **N** from the top of the backing plate.



Removing the fork covers
Unscrew the eight fixing screws **P** (five on the left side and three on the right side) and take off the fork covers.





Removing the headlight fairing.
Release the two rubber bands **Q** as shown in the figure, pull out the headlight insert and take off fairing **R**.



DRIVE CHAIN MAINTENANCE

The life of the drive chain largely depends on its maintenance. Chains without X-rings must be periodically cleaned in petroleum and then immersed in hot chain oil or treated with a chain spray.

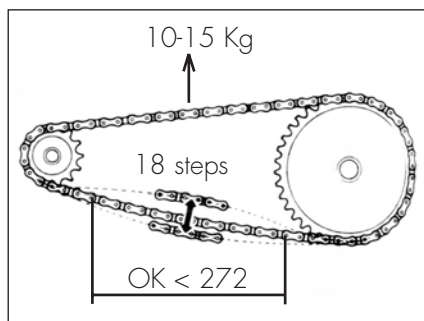
X-ring chains require very little maintenance. The best way to clean them is rinsing them generously with water. Never use brushes or solvents to clean an X-ring chain. Once the chain has dried, you can use a chain spray specially designed for X-ring chains.

Take special care in preventing the lubricant from coming into contact with the rear tyre or brake disc, otherwise the tyre grip and the action of the brake would be greatly reduced, making it very difficult to control the vehicle.

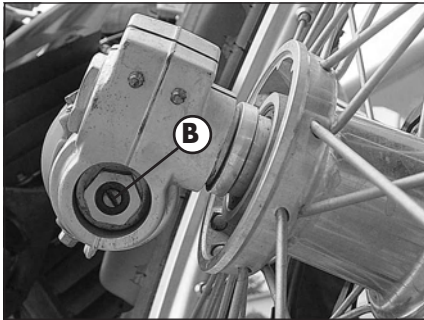
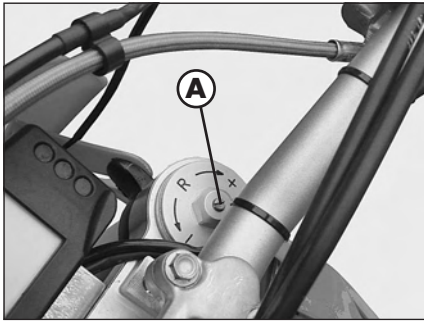
DRIVE CHAIN WEAR

To check the wear of the drive chain use the procedure described below.

Shift into neutral, pull up the upper stretch of the chain with a force of 10-15 kg (see figure). Measure the length of 18 links on the lower stretch of the chain. If the length is ≥ 272 mm, replace the chain. Chains do not always wear evenly. For this reason it is important that the measurement is taken at different points along the chain.



When fitting a new chain, be sure to replace the chainring and sprocket as well. New chains wear more quickly if fitted on old and worn sprockets. After replacing the chain, adjust its tension as described on page 141.



SUSPENSIONS

TELESCOPIC FORK

ADJUSTING THE REBOUND DAMPER

The hydraulic rebound damper determines the behaviour of the telescopic fork during extension and can be adjusted by means of screw **A**. Turning the screw clockwise (towards the + sign) increases the action of the rebound damper; turning it anticlockwise (towards the - sign) decreases the action of the rebound damper.

Standard adjustment:

10 clicks from the completely closed position

ADJUSTING THE COMPRESSION DAMPER

The hydraulic compression damper determines the behaviour of the telescopic fork during compression and can be adjusted by means of screw **B** located at the lower end of the fork legs. Turning the screw clockwise increases the action of the compression damper; turning it anticlockwise decreases the action of the compression damper.

Standard adjustment:

18 clicks from the completely closed position

SHOCK ABSORBER

ADJUSTING THE HYDRAULIC COMPRESSION DAMPER (high and low speeds)

The shock absorber can be adjusted for both high and low speeds.

The terms 'high' and 'low' refer to the compression speed of the shock absorber, not to the speed of the vehicle.

The low-speed adjustment affects the behaviour of the shock absorber during low-speed compression; conversely the high-speed adjustment affects its behaviour during high-speed compression.

Low-speed adjustment

- Using a screwdriver, loosen screw **C** by turning it clockwise to decrease the hydraulic compression damper.

Standard adjustment:

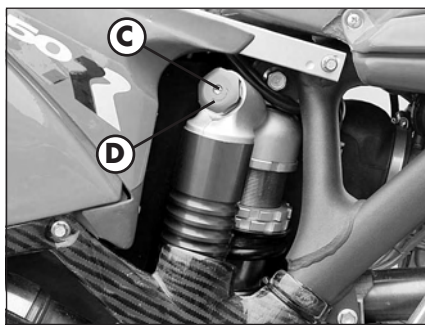
Screw completely open, 21/21 clicks

High-speed adjustment

- Turn knob **D** anticlockwise to decrease the hydraulic compression damper.

Standard adjustment

Knob completely open, 24/24 clicks



WARNING

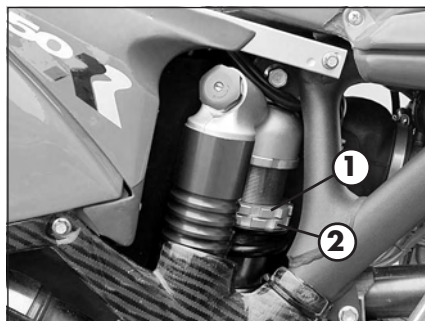
Starting from the standard position, turn the knob anticlockwise (with a closing action). The central screw will move along with the knob. This is normal, as the screw will be in completely open position anyway.

ADJUSTING THE SPRING PRELOAD

To adjust the spring preload, use the procedure described below.

Loosen counter-ring **1**. Rotate ring **2** clockwise to increase the spring preload (and consequently the shock absorber preload) or anticlockwise to decrease it. After obtaining the desired preload, turn counter-ring **1** until it stops against adjusting ring **2**.

Spring preload: 260 mm



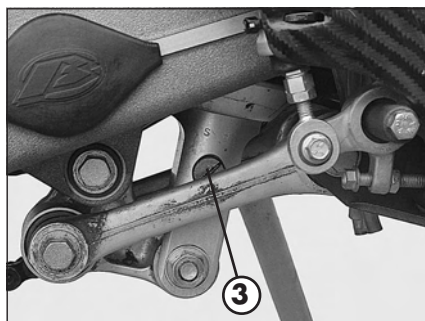
ADJUSTING THE HYDRAULIC REBOUND DAMPER

Turn screw **3** to adjust the hydraulic rebound damper.

Turning the screw anticlockwise (out) decreases the damping effect.

Standard adjustment:

24 clicks from the completely closed position





CHARGING THE BATTERY

Remove the battery and check its charge. Using an open-circuit multimeter (10-12 hours after the activation), check that the voltage is greater than 12.6 V. If it is lower, it is advisable to recharge the battery.

Based on the type of charger available, charge the battery using either of the following procedures:

- Constant voltage (14.4-15 V) - Charge the battery for about 12 hours. Check the voltage 10-12 hours after the end of recharge as described above.
- Constant current: Charge battery at 0.5-0.8 A until the voltage between the terminals stabilizes at ~14.5 V.

WARNING

The battery is sealed. When recharging it, do not remove the seal nor add any liquid.

WARNING

When recharging, first connect the battery to the battery charger and then turn on the charger.

If the battery is charged in a closed room, take care to ensure proper ventilation as during the charge the battery produces explosive gases.

CLEANING AND CHECKING THE VEHICLE

Use water jet to soften the dirt and mud accumulated on the paintwork, then remove them with a soft bodywork sponge soaked in water and shampoo (2-4 percent shampoo in water). Subsequently rinse well with water, and dry with air and cloth or suede leather. For the outside of the engine use a brush soaked in petroleum and clean rags. Petroleum damages the paintwork. Always wash the vehicle before waxing it with silicon waxes.



Detergents pollute water. Always wash the vehicle in areas equipped for collection and purification of the washing liquids.



Never wash the vehicle in the sun, particularly during the summer when the bodywork is hot. The shampoo would dry before being rinsed off and cause damage to the paintwork. Do not clean the plastic surfaces with cloths soaked in petrol or naphtha as they would lose their shine and mechanical properties.

CHECKS AFTER CLEANING

After cleaning the motorcycle, it is advisable to:

- Clean the air filter (refer to the procedure described on page 119).
- Empty the fuel container by loosening the fuel emptying screw in order (as described on page 124) to check for the presence of water.
- Add grease to the chain.

SCHEDULED MAINTENANCE

Item	Interval	hour (h)	3	after/every 15
		fuel (litre)	20	100
Air filter (after off-road use)			P	P
Valves			I	I
Spark plug (replace every 30 hours)			-	I
Idle speed			I	I
Throttle cable play			I	I
Clutch			I	I
Engine oil			S	S
Engine oil filter			S	S
Motor oil net filter			P	P
Exhaust pipe bolts			-	T
Brakes			I	I
Brake lines (replace every 4 years)			I	I
Brake fluid (replace every 2 years)			I	I
Tyres			-	I
Steering			I	I
Fork			-	I
Rear suspension			-	I
Frame nuts / bolts and oil tubes			T	T
Chain tension			I	I

I = Check and if necessary adjust, clean, lubricate or replace.

P = Clean

S = Replace/renew

T = Tighten

Note:

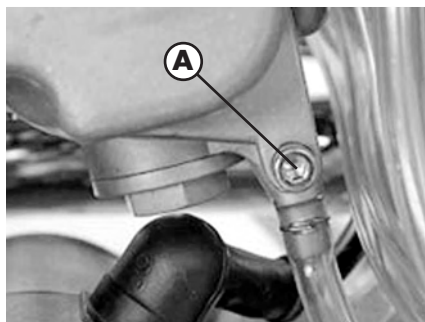
For any service requirements, please contact Betamotor's Authorized Service Network.

PROLONGED INACTIVITY

A few simple operations should be performed to keep the vehicle in good condition whenever it is to remain inactive for a long period (e.g. during the winter):

- Thoroughly clean the vehicle.
- Reduce the tyre pressures by approximately 30 percent, and if possible raise the tyres off the ground.
- Remove the spark plug and pour a few drops of engine oil into the spark plug hole. Make the engine turn a few times by operating the kick-start (where available) and then replace the spark plug.
- Cover the unpainted parts, excepting the brakes and the rubber parts, with a film of oil or spray silicone.
- Remove the battery and keep it in a dry place. Charge the battery every 15 days.
- Protect the vehicle with a dust cover.

- Drain the carburetor float chamber by loosening screw **A**. The fuel drained from the chamber through a suitable pipe must be collected in a container and poured into the fuel tank. Do not dispose of the fuel in the environment.
- Retighten the screw.



AFTER PROLONGED INACTIVITY

- Reinstall the battery.
- Restore the tyre inflating pressures.
- Check the tightening of all the screws having an important mechanical function.

Note:

Periodically check the tightening of the screws.

- Start the vehicle for the first time by means of the kick-start

CONTENTS

CHAPTER 4 ADJUSTMENTS

Brake adjustment: front lever and brake pedal

Adjusting the decompressor lever control cable

Adjusting the home position of the clutch lever

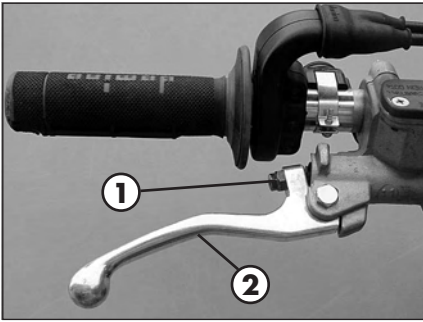
Adjusting the handlebars

Adjusting the throttle control cable

Checking and adjusting the steering play

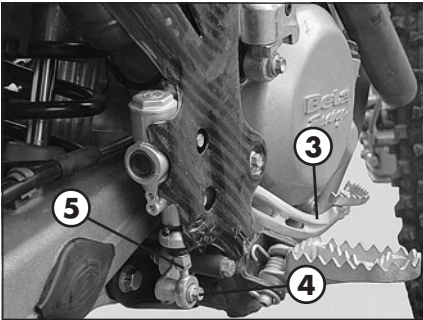
Tensioning the chain

Adjusting the headlight



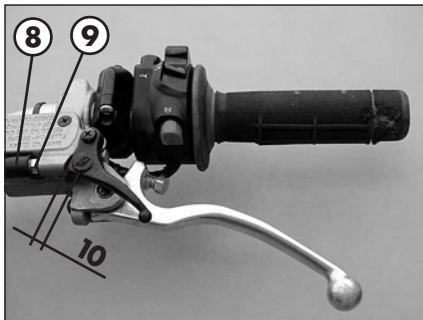
ADJUSTING THE HOME POSITION OF THE FRONT BRAKE LEVER

The home position of brake lever **2** can be adjusted by means of screw **1**.



ADJUSTING THE HOME POSITION OF THE BRAKE PEDAL

The home position of brake pedal **3** can be adjusted by means of set screw **4**. Then adjust the idle travel of the pedal by means of pump control rod **5**.



ADJUSTING THE DECOMPRESSOR LEVER CONTROL CABLE

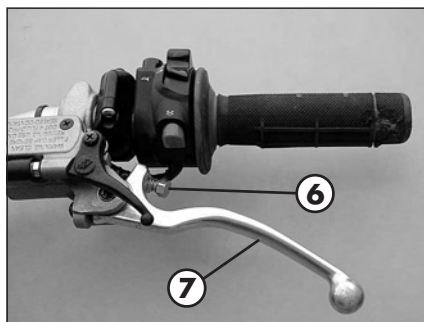
Start the engine and let it idle. Slowly pull the decompressor lever until you feel the rocker arm knocking. The idle travel before the knocking is perceived should be approximately 10 mm as measured from the end of the lever. If necessary adjust the idle travel using the procedure described below.

Push back protective cap **8**, loosen the counternut and turn adjusting screw **9** accordingly. Tighten the counternut and refit the protective cap.

A decompressor lever with no idle travel leads to engine damage.

ADJUSTING THE HOME POSITION OF THE CLUTCH LEVER

The idle travel of clutch lever **7** can be adjusted by means of screw **6**.



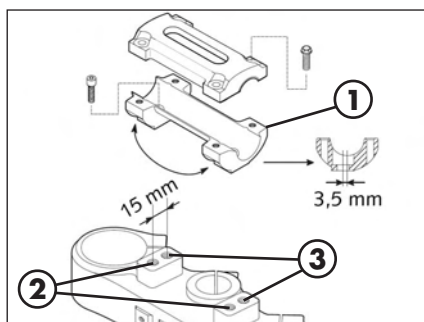
ADJUSTING THE HANDLEBARS

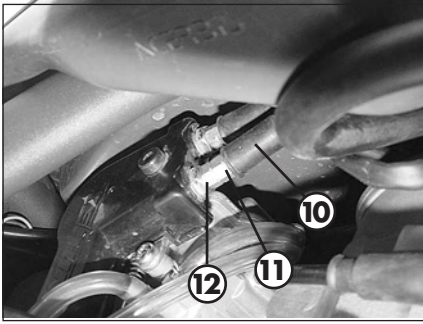
The handlebars can be fastened in one of four positions.

Lower clevis **1** can be positioned on holes **2** and **3** respectively and can be rotated 180 degrees to allow four different adjustments capable of suiting different driver's requirements.

Note:

The four positions make it possible to move the handle-bar axis as to the vertical axis of the steering-wheel





ADJUSTING THE THROTTLE CONTROL CABLE

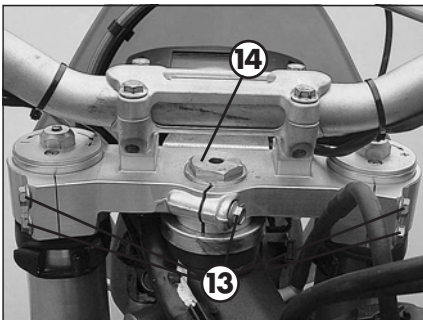
The throttle control cable should always have a 3-5 mm play. In addition, the idle speed should not change when the handlebars are fully rotated to the left or right. Push back protective cap **10**. Loosen counternut **11** and turn adjusting screw **12**. Turning the screw anticlockwise decreases the idle travel; turning it clockwise increases it. Tighten the counternut and check that the throttle twist grip turns smoothly.



CHECKING AND ADJUSTING THE STEERING PLAY

Periodically check the play of the steering head tube by moving the forks backwards and forwards as shown in the figure. If any play is felt, carry out the adjustment by following these steps:

- Unscrew the five screws **13**.
 - Pull out the handlebars paying special attention to the clevises.
 - Loosen nut **14**.
 - Reduce the play by turning ring
- To refit the parts, follow the reverse procedure.



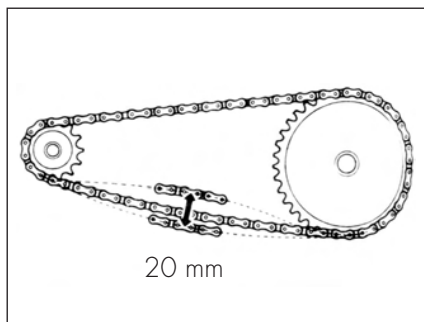
Note:

Proper adjustment must leave no play and cause no stiffness, and allow the steering to rotate smoothly. Check the fitting direction of the clevises as it can alter the geometry of the handlebar.

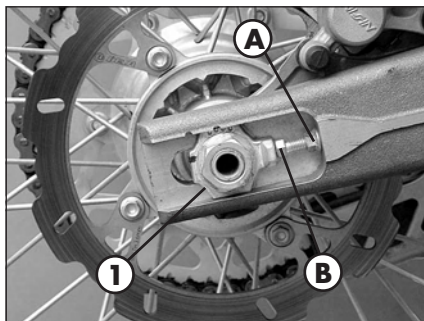
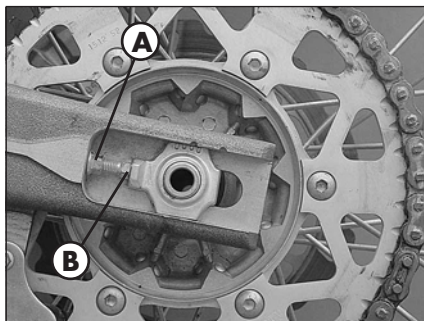
TENSIONING THE CHAIN

To ensure the drive chain a longer life, it is advisable to periodically check its tension. Always maintain the chain clean and lubricated.

If the chain play exceeds 20 mm, tension the chain by following these steps:



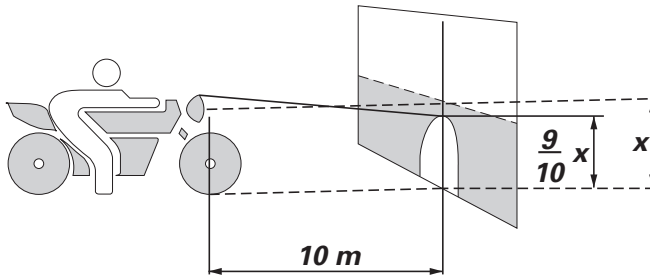
- Loosen wheel spindle nut **1**.
- Loosen conternuts **A** on either side of the fork.
- Turn adjusting screws **B** on either side until the desired chain tension is obtained.
- Tighten conternuts **A** on either side of the fork.
- Tighten nut **1**.



4

ADJUSTING THE HEADLIGHT

- The light beam is adjusted manually by turning the headlight fixing screws on the headlight fairing.
- Periodically check the direction of the beam. The beam can only be adjusted vertically.
- Place the vehicle on level ground (but not on the stand) 10 metres from a vertical wall.
- Measure the height of the headlight centre above the ground and then draw a cross on the wall at $\frac{9}{10}$ of the height of the headlight centre.
- Turn on the low beam, get on the motorbike and check that the light beam on the wall is slightly lower than the cross drawn previously.



CONTENTS

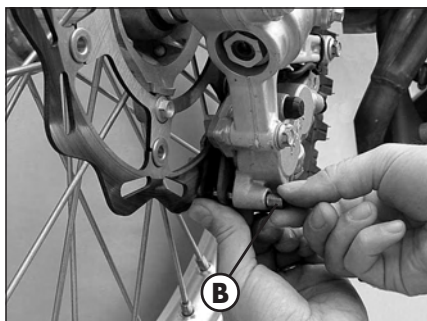
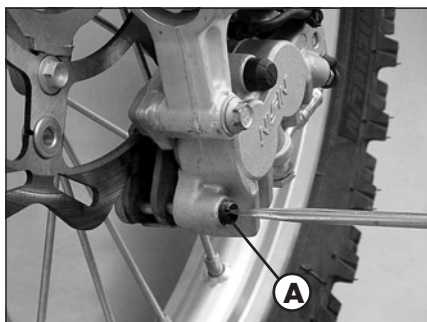
CHAPTER 5 REPLACEMENTS

Replacing the brake pads: front and rear

Replacing the headlight bulbs

Replacing the rear light bulb

Replacing the exhaust-pipe



REPLACING THE BRAKE PADS

The procedure for replacing the brake pads is provided only for information. We recommend having the operation performed by a BETAMOTOR authorized workshop.

FRONT

Follow these steps to replace the pads:

- Push the brake caliper towards the disc so that the pistons reach their home positions.
- Unscrew dowel **A**.
- Pull out pin **B** while supporting the two pads as shown in the figure.
- Remove the brake pads taking care not to drop the leaf spring located under the pads.
- To reassemble, follow the reverse procedure. When fitting the pads, ensure that the leaf spring is properly in place.

WARNING

The brake disc must always be kept free from oil and grease. An oily or greasy disc strongly reduces the braking action.

After work has been carried out on the braking system, pull the brake lever to bring the pads into contact with the disc. This will allow the correct pressure point to be restored, thus ensuring proper operation of the braking system.

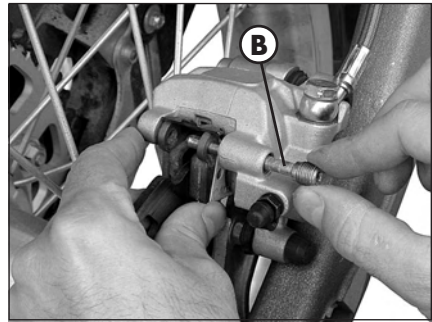
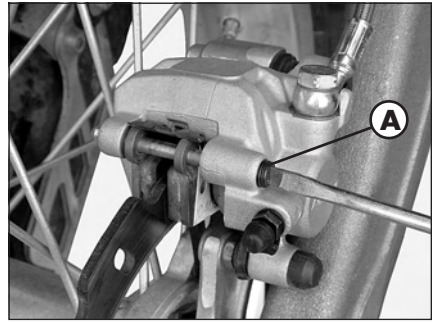
REAR

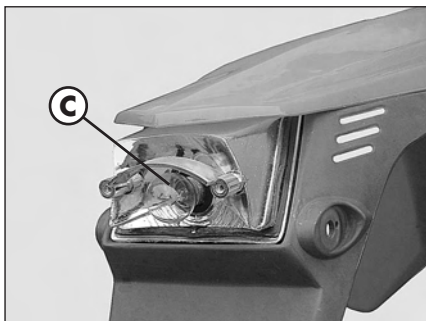
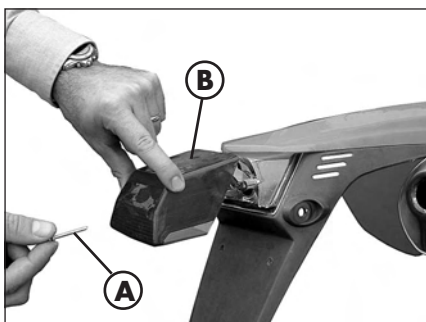
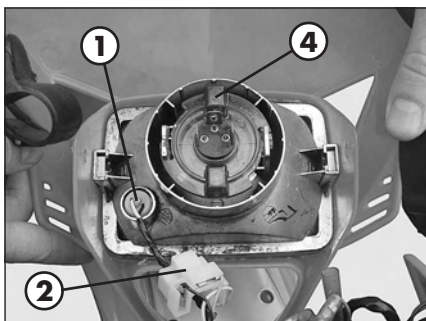
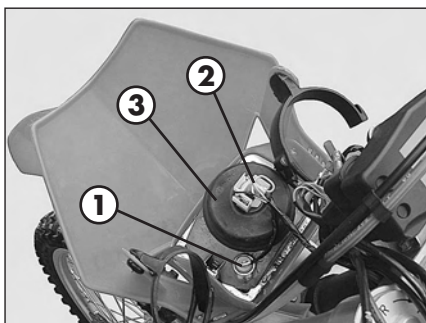
Follow these steps to replace the pads:

- Push the brake caliper towards the disc so that the pistons reach their home positions.
- Unscrew dowel **A**.
- Pull out pin **B** while supporting the two pads as shown in the figure.
- Remove the brake pads taking care not to drop the leaf spring located above the two pads.
- To reassemble, follow the reverse procedure. When fitting the pads, ensure that the leaf spring is properly in place.

WARNING

The brake disc must always be kept free from oil and grease. An oily or greasy disc strongly reduces the braking action. After work has been carried out on the braking system, pull the brake lever to bring the pads into contact with the disc. This will allow the correct pressure point to be restored, thus ensuring proper operation of the braking system.





REPLACING THE HEADLIGHT BULBS

Release both elastic bands and move the headlight fairing forwards.

Carefully pull out the parking light bulb together with bulb holder **1** from the headlight reflector.

Detach connector **2** from the headlight bulb and remove rubber cap **3**.

Turn fixing flange **4** anticlockwise and remove the bulb from the headlight reflector. Fit the new bulb taking care not to touch the glass. Turn fixing flange **4** clockwise until it stops. Replace rubber cap **3** and connector **2**. Refit the parking light bulb together with bulb holder **1**.

If the parking light bulb needs to be replaced, simply remove it from the bulb holder and insert the new bulb.

Reattach the headlight fairing to the support pegs and fasten it with the two rubber bands.

REPLACING THE REAR LIGHT BULB

To replace the brake light bulb, follow these steps:

- Remove the two fixing screws **A** and lens **B**.
- Replace faulty bulb **C**.
- Refit lens **B** and fasten it with the two fixing screws **A**.

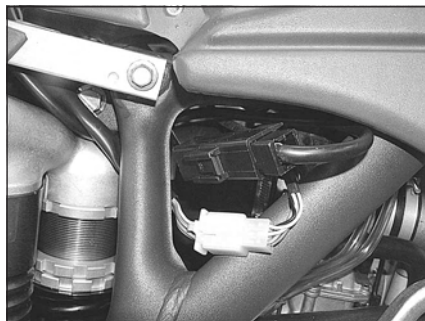
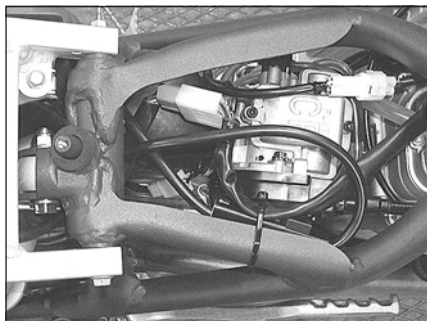
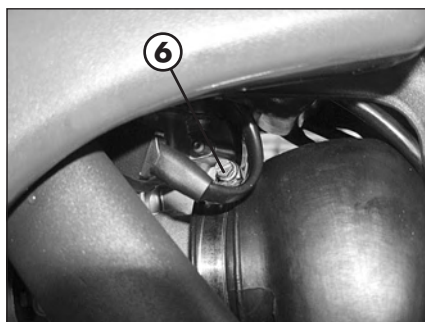
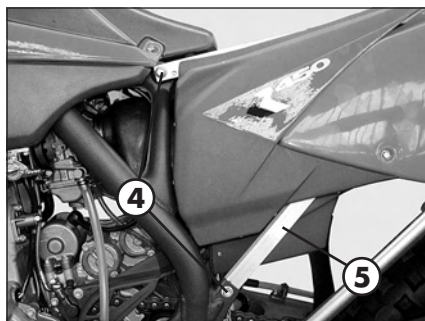
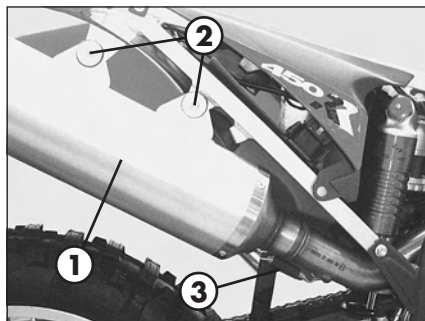
The bulbs have bayonet bases. To remove them, press them lightly, rotate them 30° anticlockwise and then extract them.

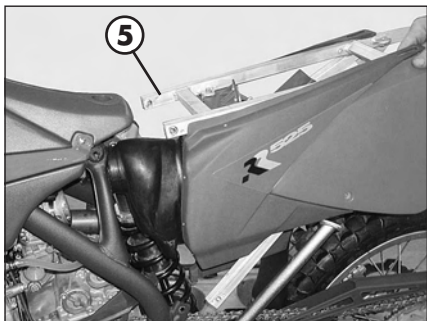
REPLACING THE EXHAUST-PIPE

The description of the exhaust-pipe substitution is purely informative; actually is advisable to turn to a BETAMOTOR shop in order to make this.

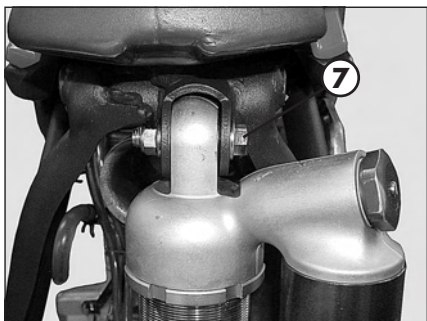
As for substitution you must proceed in the following way:

- Put the motor-cycle on the stand under the motor
- Remove the saddle (vedi pag. 125)
- Remove the right and the left lateral bumper (vedi pag. 126).
- Remove the right back side (vedi pag. 126)
- Remove the silencer **1** unscrewing the two fixing screws **2** and the spring **3** united to the exhaust-pipe
- Remove all the four fixing screws **4** (two on the right and two on the left) of the loom **5**
- Release with a screwdriver the coupling-box filter fixing clamp **6**
- Disconnect the back plant connectors and the starting relé cutting the clamp (the picture on the bottom shows the connectors disposition under the tank)

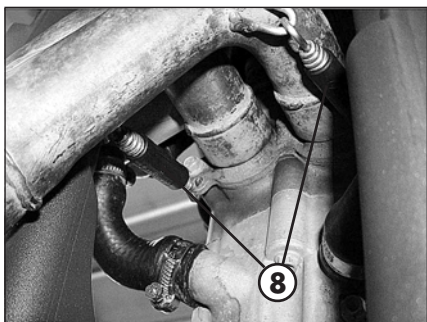




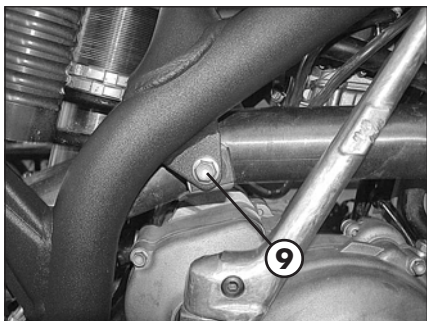
- Unthread the loom **5** toward the back



- Remove the upper fixing bolt of the damper **7** in order to make it possible for the exhaust-pipe to pass



- Remove the two springs attached to the cylinder **8**.



- Unscrew the bolt **9** over the lever set in motion and remove the tube running it from the back.

In order to reassemble it follow the inverted procedure

CONTENTS

CHAPTER 6 TROUBLESHOOTING

INDEX

PROBLEM	CAUSE	REMEDY
Engine does not start	-Fuel system clogged (fuel lines, fuel tank, fuel cock).	Clean the system.
	-Air filter dirty.	Proceed as described on page 119.
	-No current supplied to spark plug.	Clean or replace the spark plug. If the problem persists, contact a BETAMOTOR dealer.
	-Engine flooded.	Rotate the engine twice for at least 5 seconds while pulling the decompressor lever. If this does not solve the problem, remove the spark plug and dry it.
Engine misfires	-Spark gap wrongly adjusted.	Restore the spark gap.
	-Spark plug dirty.	Clean or replace the spark plug.
Engine knocks	-Spark advance excessive.	Check the ignition timing.
	-Carbon formation in cylinder or on spark plug.	Contact a BETAMOTOR dealer.
Engine overheats and loses power	-Silencer partly clogged.	Contact a BETAMOTOR dealer.
	-Exhaust port clogged.	Contact a BETAMOTOR dealer.
	-Ignition delayed.	Check the timing.
Front braking poor	-Brake pads worn.	Follow the procedure described on page 144.
	-Air or humidity in the hydraulic circuit.	Follow the procedure described on page 114.
Rear braking poor	-Brake pads worn.	Follow the procedure described on page 145.
	-Air or humidity in the hydraulic circuit.	Follow the procedure described on page 115.

Adjusting decompressor	138
Air filter	119
Bleeding clutch	117
Bleeding the brakes: front and rear	114
Brakes, adjustment: front and rear	138
Carburetor	121
Checks to be performed before each ride	104
Clutch, adjustment	139
Clutch oil: check the level	117
Controls	88
Coolant	124
Engine oil: check	110
Engine oil: renewal	111
Fork oil: right/left rod	118
Front and rear brake: check pads	116
Front and rear brake: check the level	114
Handlebars, adjustment	139
Recommended lubricants	105
Refuelling	108
Replacing exhaust-pipe	147
Replacing the brake pads: front and rear	144
Replacing the bulbs	146
Running-in	105
Scheduled maintenance	134
Spark plug	120
Specifications	94
Starting	106
Steering, check and adjustment	140
Steering lock	86
Suspensions: telescopic fork and shock absorber	130
Tensioning the chain	141
Throttle play, adjustment	140
Troubleshooting	150
Vehicle identification data	84
Wiring diagrams	98

A large rectangular box with a solid black border, containing 25 horizontal dotted lines spaced evenly down the page, intended for handwriting practice.