FOREWORD

CONTENTS

0.1 RELEASE 00/2003-10 UPDATE

Issue date of original release (Release 00) and subsequent releases:

First edition (Release 00)..... July 2003

0.1.1 MANUAL UPDATES

Always keep manual updated to the latest release you have received.

Add the latest release pages to the manual and destroy all superseded pages (even if they belong to the release before last).

⚠ CAUTION

Failure to keep the manual up-to-date or to eliminate superseded pages will make the manual more difficult to consult and creates a risk of improper servicing

0.1.2 LIST OF MANUAL PAGES AND UPDATE NUMBERS

pag.#	Release	pag.#	Release	pag.#	Release	pag.#	Release
0-1 *-03*	06	2-3 *-03*	06	3-9 *-03*	06	4-3 *-03*	06
0-2 *-03*	06	2-4 *-03*	06	3-10 *-03*	06	4-4 *-03*	06
0-3 *-03*	06	2-5 *-03*	06	3-11 *-03*	06	4-5 *-03*	06
0-4 *-03*	06	2-6 *-03*	06	3-12 *-03*	06	4-6 *-03*	06
0-5 *-03*	06	2-7 *-03*	06	3-13 *-03*	06	4-7 *-03*	06
0-6 *-03*	06	2-8 *-03*	06	3-14 *-03*	06	4-8 *-03*	06
0-7 *-03*	06	2-9 *-03*	06	3-15 *-03*	06	5-1 *-03*	06
0-8 *-03*	06	2-10 *-03*	06	3-16 *-03*	06	5-2 *-03*	06
1-1 *-03*	06	2-11 *-03*	06	3-17 *-03*	06	5-3 *-03*	06
1-2 *-03*	06	2-12 *-03*	06	3-18 *-03*	06	5-4 *-03*	06
1-3 *-03*	06	2-13 *-03*	06	3-19 *-03*	06	5-5 *-03*	06
1-4 *-03*	06	2-14 *-03*	06	3-20 *-03*	06	5-6 *-03*	06
1-5 *-03*	06	2-15 *-03*	06	3-21 *-03*	06	5-7 *-03*	06
1-6 *-03*	06	2-16 *-03*	06	3-22 *-03*	06	5-8 *-03*	06
1-7 *-03*	06	2-17 *-03*	06	3-23 *-03*	06	5-9 *-03*	06
1-8 *-03*	06	2-18 *-03*	06	3-24 *-03*	06	5-10 *-03*	06
1-9 *-03*	06	2-19 *-03*	06	3-25 *-03*	06	5-11 *-03*	06
1-10 *-03*	06	2-20 *-03*	06	3-26 *-03*	06	5-12 *-03*	06
1-11 *-03*	06	2-21 *-03*	06	3-27 *-03*	06	5-13 *-03*	06
1-12 *-03*	06	2-22 *-03*	06	3-28 *-03*	06	5-14 *-03*	06
1-13 *-03*	06	3-1 *-03*	06	3-29 *-03*	06	6-1 *-03*	06
1-14 *-03*	06	3-2 *-03*	06	3-30 *-03*	06	6-2 *-03*	06
1-15 *-03*	06	3-3 *-03*	06	3-31 *-03*	06	6-3 *-03*	06
1-16 *-03*	06	3-4 *-03*	06	3-32 *-03*	06	6-4 *-03*	06
1-17 *-03*	06	3-5 *-03*	06	3-33 *-03*	06	6-5 *-03*	06
1-18 *-03*	06	3-6 *-03*	06	3-34 *-03*	06	6-6 *-03*	06
2-1 *-03*	06	3-7 *-03*	06	4-1 *-03*	06	6-7 *-03*	06
2-2 *-03*	06	3-8 *-03*	06	4-2 *-03*	06	6-8 *-03*	06

0.2 FOREWORD

- This manual provides the information required for normal servicing.
- The information and illustrations contained in this manual will be updated through subsequent releases, see 0.1 (RELEASE 00/ 2003-10 UPDATE).
- This manual is intended for use by **aprilia** Dealers and their qualified mechanics. Certain information has been omitted intentionally, as this manual does not purport to provide a comprehensive treatise on mechanics. The persons who will use this manual must be fully conversant with the basics of mechanics and with the basic procedures of motorcycle repair. Repairing or inspecting a motorcycle when one does not possess such basic knowledge or training could result in improper servicing and make the motorcycle unsafe to ride. For the same reason, certain basic precautions have been omitted in the descriptions of repair and inspection procedures. Take special care to avoid damage to motorcycle components or injury to persons. **aprilia**'s mission is to constantly enhance the riding pleasure of final users through the on-going improvement of its products as well as of the relevant technical literature. All **aprilia** Points of Sale and Subsidiaries worldwide are kept updated on major engineering changes and modifications to repair procedures. Such changes and modifications are then reflected in the next release of the relevant manual. When in doubt about an inspection or repair procedure, please contact the **aprilia** Consumer Service (A.C.S.) Department, who will be glad to provide full information on the procedure in question as well as on any updates or engineering changes affecting the motorcycle under consideration.

aprilia reserves the right to make changes to its products at any time, barring any such changes as may alter the essential features of a product as specified in the relevant manual.

The mention of third parties' products is only made for information purposes, and constitutes no engagement.
aprilia is not liable in any way for the performance or use of any such products and/or services.

For further information, see 0.3 (REFERENCE MANUALS).

First edition: July 2003

Produced and printed by:
DECA s.r.l.
via Risorgimento, 23/1 - 48022 Lugo (RA) - Italy
Tel. +39 - 0545 35235
Fax +39 - 0545 32844
E-mail: deca@decaweb.it
www.decaweb.it

On behalf of:
aprilia s.p.a.
via G. Galilei, 1 - 30033 Noale (VE) - Italy
Tel. +39 - 041 58 29 111
Fax +39 - 041 44 10 54
www.aprilia.com
www.serviceaprilia.com

0.3 REFERENCE MANUALS

0.3.1 OWNER'S MANUALS

aprilia part# (description)
Model years 2003
8104712 UK E F D

0.3.2 SPARE PARTS CATALOGUE

aprilia part# (description)
Model years 2003
A60100 UK E F D

0.4 ABBREVIATIONS/SYMBOLS/CONVENTIONS

= number
< = is less than
> = is more than
≤ = is less than or equal to
≥ = is more than or equal to
~ = approximately
∞ = infinite
°C = degrees Celsius (centigrade)
°F = degrees Fahrenheit
± = plus or minus
AC = Alternated Current
A = Ampere
Ah = Ampere per hour
API = American Petroleum Institute
HT = high tension
AV/DC = Anti-Vibration Double Countershaft
bar = pressure measurement (1 bar =100 kPa)
DC = Direct Current
cm³ = cubic centimetres
CO = carbon oxide
CPU = Central Processing Unit
DIN = German industrial standards (Deutsche Industrie Norm)
DOHC = Double Overhead Camshaft
ECU = Electronic Control Unit
rpm = revolutions per minute
HC = unburnt hydrocarbons
ISC = Idle Speed Control
ISO = International Standardization Organization
Kg = kilograms
Kgm = kilogram per metre (1 kgm =10 Nm)
km = kilometres
kph = kilometres per hour
kΩ = kiloohm
kPa = kiloPascal (1 kPa =0.01 bar)
KS = clutch side (from the German "Kupplung Seite")
kW = kiloWatt
ℓ = litres
LAP = racetrack lap
LED = Light Emitting Diode
LEFT SIDE = left side
m/s = metres per second
max = maximum
mbar = millibar (1 mbar =0.1 kPa)
mi = miles
MIN = minimum
MPH = miles per hour
MS = flywheel side
MΩ = megaohm
N.A. = Not Available
N.O.M.M. = Motor Octane Number
N.O.R.M. = Research Octane Number
Nm = Newton per metre (1 Nm =0.1 kgm)
Ω = ohm
PICK-UP = pick-up
BDC = Bottom Dead Centre
TDC = Top Dead Centre
PPC = Pneumatic Power Clutch
RIGHT SIDE = right side

SAE	= Society of Automotive Engineers
TEST	= diagnostic check
T.B.E.I.	= crowned-head Allen screw
T.C.E.I.	= cheese-headed Allen screw
T.E.	= hexagonal head
T.P.	= flat head screw
TSI	= Twin Spark Ignition
UPSIDE-DOWN	= inverted fork
V	= Volt
W	= Watt
Ø	= Diameter

NOTE

GENERAL INFORMATION 1

GENERAL INFORMATION

CONTENTS

1.1 CONVENTIONS USED IN THE MANUAL

- This manual is divided in sections and subsections, each covering a set of the most significant components. For quick reference, see the summary of sections on page 0-1.
- Unless expressly specified otherwise, assemblies are reassembled by reversing the dismantling procedure.
- The terms "right" and "left" are referred to the rider seated on the vehicle in the normal riding position.
- Motorcycle operation and basic maintenance are covered in the “OWNER'S MANUAL”.

★ Any operations preceded by the star symbol must be repeated on the opposite side of the motorcycle.

In this manual any variants are identified with these symbols:

Frame # ZD4AT.....(STARTING FROM MODEL YEAR 2003).
ASD automatic light switching version (Automatic Switch-on Device)
OPT optional

VERSION:

I Italy	GR Greece	Mal Malaysia
UK United Kingdom	NL Holland	RCH Chile
A Austria	CH Switzerland	HR Croatia
P Portugal	DK Denmark	AUS Australia
SF Finland	J Japan	USA United States of America
B Belgium	SGP Singapore	BR Brazil
D Germany	SLO Slovenia	RSA Republic of South Africa
F France	IL Israel	NZ New Zealand
E Spain	ROK South Korea	CDN Canada

1.2 SAFETY WARNINGS

The following precautionary warnings are used throughout this manual in order to convey the following messages:

⚠ Safety warning. When you find this symbol on the vehicle or in the manual, be careful to the potential risk of personal injury. Disregarding the instructions identified by this symbol may compromise the safety of the user, the motorcycle and third parties.

⚠ CAUTION

Indicates a potential hazard which may result in serious injury or even death.

⚠ WARNING

Indicates a potential hazard which may result in minor personal injury or damage to the vehicle.

IMPORTANT *The word "IMPORTANT" in this manual precedes important information or instructions.*

1.3 GENERAL SAFETY RULES

1.3.1 CARBON OXIDE

When an operation must be performed with the engine running, position the motorcycle out of doors or in a well-ventilated area.
Never operate the engine in an enclosed place.
Use an exhaust emission extraction plant when working indoors.

⚠ CAUTION

Exhaust emissions contain carbon oxide, which is a poisonous gas and may lead to loss of conscience or even death.

Operate the engine out of doors or, if working indoors, use an exhaust emission extraction plant.

1.3.2 FUEL

⚠ CAUTION

The fuel used to operate engines is highly flammable and becomes explosive under particular conditions.
Refuelling and engine service should take place in a well-ventilated area with the engine stopped.
Do not smoke when refuelling or in the proximity of sources of fuel vapours. Avoid contact with bare flames, sources of sparks or any other source which may ignite the fuel or lead to explosion.

DO NOT RELEASE FUEL INTO THE ENVIRONMENT.

KEEP AWAY FROM CHILDREN.

1.3.3 HOT COMPONENT PARTS

The engine and exhaust component parts become hot when the engine is running and will stay hot for some time after the engine has been stopped.
Wear heat gloves before handling these components or allow for the engine and exhaust system to cool down before proceeding.

1.3.4 TRANSMISSION OIL

Use PONTIAX HDI SAE 85W - 140 or ROTRA MP 85W-140 oil. As an alternative to recommended fluids it is possible to use high-quality fluids having equal or higher ratings with respect to A.P.I. GL-5 specifications.

⚠ WARNING

Insufficient lubrication or the use of unsuitable lubricants may result in irreparable damage due to increased wear and tear of the moving parts.
Do not overtighten the drain plug as this could damage the crankcase.
Used oil contains substances that are harmful to the environment, even small quantities must be disposed of in compliance with the regulations in force.
To avoid serious skin damage due to prolonged contact with oil, accurately wash the hands after handling the lubricant.

KEEP AWAY FROM CHILDREN.

1.3.5 HYDROGEN GAS AND BATTERY ELECTROLYTE

⚠ CAUTION

Battery electrolyte fluid is toxic and caustic. It contains sulphuric acid and can cause burns if spilled on the skin.
Wear close-fitting gloves and protectuve clothing when handling the battery electrolyte.
If any battery fluid gets on your skin, rinse the affected area with abundant fresh water.
Take special care to protect your eyes - even a small amount of battery acid can cause blindness. If battery fluid is spilled into your eyes, flush with abundant water for fifteen minutes and contact an eye specialist immediately.
If battery fluid is swallowed accidentally, drink abundant water or milk. Seek medical attention immediately and keep drinking magnesia milk or vegetable oil in the meantime. The battery gives off explosive gases. Keep the battery well away from any sources of ignition, such as flames, sparks, or any heat sources. Do not smoke near the battery.
Make sure the area is well-ventilated when servicing or refilling the battery.

KEEP AWAY FROM CHILDREN.

Battery fluid is corrosive.
Avoid spillage. Take special care not to spill battery fluid on plastic parts.
Ensure that the electrolyte fluid you are using is the suitable type for your battery.

1.3.6 GENERAL PRECAUTIONS AND INFORMATION

Follow these instructions closely when repairing, disassembling or reassembling the motorcycle or its components.

⚠ CAUTION

Using bare flames is strictly forbidden when working on the motorcycle. Before servicing or inspecting the motorcycle: stop the engine and remove the key from the ignition switch; allow for the engine and exhaust system to cool down; where possible, lift the motorcycle using adequate equipment placed on firm and level ground. Be careful of any parts of the engine or exhaust system which may still be hot to the touch to avoid scalds or burns.

⚠ CAUTION

Never put any mechanical parts or other vehicle components in your mouth when you have both hands busy. None of the motorcycle components is edible. Some components are harmful to the human body or toxic.

If not expressly indicated otherwise, for the reassembly of the units repeat the disassembly operations in reverse order. Where a procedure is cross-referred to relevant sections in the manual, proceed sensibly to avoid disturbing any parts unless strictly necessary. Do not use polishing pastes on matt paints.

Never use fuel instead of solvent to clean the motorcycle.

Do not use alcohol, petrol or solvents to clean the rubber and plastic parts and the saddle: use only water and mild soap.

Always disconnect the battery negative (–) lead before soldering any electrical components.

When two or more persons service the same motorcycle together, special care must be taken to avoid personal injury.

Read carefully 1.4 (WARNINGS REGARDING FUEL, LUBRICANTS AND OTHER COMPONENTS).

1.3.7 BEFORE DISASSEMBLING ANY COMPONENTS

- Clean off all dirt, mud, and dust and clear any foreign objects from the vehicle before disassembling any components.
- Use the model-specific special tools where specified.

1.3.8 DISASSEMBLING THE COMPONENTS

- Never use pliers or similar tools to slacken and/or tighten nuts and bolts. Always use a suitable spanner.
- Mark all connections (hoses, wiring, etc.) with their positions before disconnecting them. Identify each connection using a distinctive symbol or convention.
- Mark each part clearly to avoid confusion when refitting.
- Thoroughly clean and wash any components you have removed using a detergent with low flash point.
- Mated parts should always be refitted together. These parts will have seated themselves against one another in service as a result of normal wear and tear and should never be mixed up with other similar parts on refitting.
- Certain components are matched-pair parts and should always be replaced as a set.
- Keep the motorcycle and its components well away from heat sources.

1.3.9 REASSEMBLING THE COMPONENTS

⚠ WARNING

Never reuse a circlip or snap ring. These parts must always be renewed once they have been disturbed.
When fitting a new circlip or snap ring, take care to move the open ends apart just enough to allow fitment to the shaft.
Make a rule to check that a newly-fitted circlip or snap ring has located fully into its groove.

Never clean a bearing with compressed air.

IMPORTANT *All bearings must rotate freely with no hardness or noise. Replace any bearings that do not meet these requirements.*

- Use ORIGINAL **aprilia** SPARE PARTS only.
- Use the specified lubricants and consumables.
- Where possible, lubricate a part before assembly.
- When tightening nuts and bolts, start with the largest or innermost nut/bolt and observe a cross pattern. Tighten evenly in subsequent steps until achieving the specified torque.
- Replace any self-locking nuts, gaskets, seals, circlips or snap rings, O-rings, split pins, bolts and screws which have a damaged thread.
- Lubricate parts subject to wear abundantly before fitting the bearings.
- Make a rule to check that all components you have fitted are correctly in place.
- After repairing the motorcycle and after each service inspection, perform the preliminary checks, and then operate the motorcycle in a private estate area or in a safe area away from traffic.
- Clean all joint surfaces, oil seal edges and gaskets before assembly.
  Apply a light coat of lithium grease along the edges of oil seals. Fit oil seals and bearings with the brand or serial number facing outwards (in view).

1.3.10 ELECTRICAL CONNECTORS

Disconnect electrical connectors as follows; failure to follow the instructions can seriously damage the connectors and the wiring:

◆ Press down on the locking tab, where fitted.

⚠ WARNING

Never separate two connectors by pulling on the wiring.

◆ Grasp both connectors and pull them in opposite directions until they become separated.
◆ Remove any dirt, rust, moisture, etc. from inside the connector blowing with compressed air.
◆ Ensure that the wires are securely crimped to the terminals inside each connector.

IMPORTANT *A connector will only locate properly into the matching connector when it is inserted in the correct mounting position.*

◆ Reconnect the two connectors and ensure that they are fully engaged (the locking tab should click audibly into place).

1.3.11 TORQUE FIGURES

⚠ CAUTION

Do not forget that the tightening torques of all fastenings on wheels, brakes, wheel spindles and other suspension components are essential to ensuring safe operation of the motorcycle and must be set to the indicated values.
Regularly check the tightening torques on all fastenings, and always use a torque wrench when fitting them.
Failure to observe these instructions can result in parts loosening or coming away, thus jamming a wheel or creating other problems which could affect the handling of the motorcycle, potentially resulting in serious injury or death.

1.4 WARNINGS REGARDING FUEL, LUBRICANTS AND OTHER COMPONENTS

1.4.1 FUEL

⚠ CAUTION

The fuel used to operate engines is highly flammable and becomes explosive under particular conditions.
Refuelling and engine service should take place in a well-ventilated area with the engine stopped.
Do not smoke when refuelling or in the proximity of sources of fuel vapours. Avoid contact with bare flames, sources of sparks or any other source which may ignite the fuel or lead to explosion.
Take care not to spill fuel out of the filler, or it may ignite when in contact with hot engine parts.
In the event of accidental fuel spillage, make sure the affected area is fully dry before starting the engine. Fuel expands from heat and when left under direct sunlight. Never fill the fuel tank up to the rim. Tighten the filler cap securely after each refuelling.
Avoid contact with skin. Do not inhale vapours. Do not swallow fuel. Do not transfer fuel between different containers using a hose.
In case of contact with the eyes, rinse abundantly with clean water and immediately seek medical attention.
If accidentally swallowed, do not induce vomiting.
Drink abundant milk or cool water and seek medical attention immediately.

DO NOT RELEASE FUEL INTO THE ENVIRONMENT.

KEEP AWAY FROM CHILDREN.

Use only premium-grade unleaded fuel with a minimum octane rating of 95 (N.O.R.M.) and 85 (N.O.M.M.).

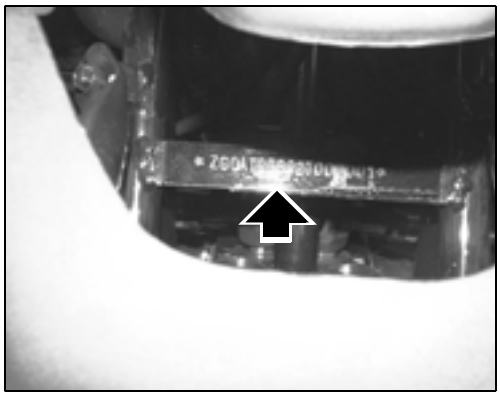
1.4.2 LUBRICANTS

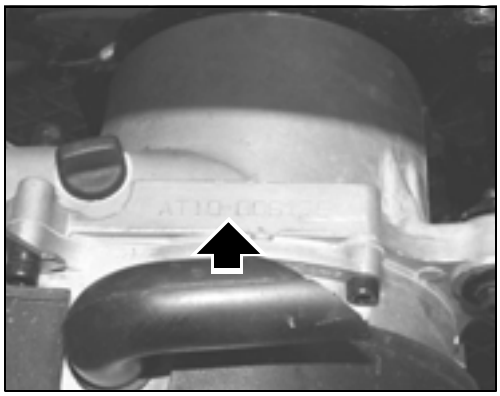
⚠ CAUTION

Correct lubrication is essential to the safety of the motorcycle.
Failure to maintain the lubricant level or the use of incorrect, old or dirty lubricant can cause the engine or transmission to seize, resulting in accidents, serious injury or death.
Prolonged or repeated contact with lubricant may cause severe skin damage.
Wash your hands thoroughly after handling engine oil.
Do not release into the environment.
Dispose of engine oil through the nearest waste oil reclamation firm or through the supplier.

⚠ WARNING

When filling the vehicle with lubricant, make sure not to spill it. Immediately clean up spilled oil, as it can damage the motorcycle's paint.
Oil on the tyres can make them very slippy and dangerous to use.
In case of oil leaks, do not use the motorcycle. Identify the cause of the leak and repair it.





1.5 LOCATION OF SERIAL NUMBERS

These numbers are necessary for vehicle registration.

IMPORTANT *Altering the identification numbers of vehicle or engine is a legal offence punishable by heavy fines and penalties. In addition, altering the frame number (VIN) results in immediate warranty invalidation.*

1.5.1 FRAME NUMBER

The motorcycle's frame number is stamped on the front part of the frame.

1.5.2 ENGINE NUMBER

The engine number is stamped on the crankcase, on the left side of the motorcycle.

1.6 SPARE PARTS

Use Original **aprilia** Spare Parts only for repairs.
Original **aprilia** spare parts are high-quality components designed and built expressly for **aprilia** motorcycles.

⚠ WARNING

Using any parts OTHER THAN original aprilia parts may lead to loss of performance and damage.

1.7 SPECIFICATIONS

	QUASAR 50	QUASAR 100
DIMENSIONS		
Length	1395 mm	1395 mm
Width	860 mm	900 mm
Max. height (at handlebar)	900 mm	960 mm
Seat height	630 mm	690 mm
Distance between centres	895 mm	895 mm
Min. ground clearance	100 mm	130 mm
Weight ready for starting	115 kg	115 kg
Dry weight	110 Kg	110 Kg
ENGINE		
Type	Two-stroke	Two-stroke
Number of cylinders	monocilindrico orizzontale horizontal single-cylinder	monocilindrico orizzontale horizontal single-cylinder
Total displacement	49.3 cm^3	95.6 cm^3
Bore/stroke	40 mm x 39.2 mm	52 mm x 45 mm
Starting	electrical + kick starter	electrical + kick starter
Engine idling rpm	1800 ± 100 rpm	1800 ± 100 rpm
Clutch	automatic dry centrifugal	automatic dry centrifugal
Transmission	continuous automatic variator	continuous automatic variator
Cooling	forced ventilation	forced ventilation
CAPACITY		
Fuel (reserve included)	5 l	5 l
Fuel reserve	0.8 l	0.8 l
Transmission oil	110 cm^3	110 cm^3
Mixer oil (reserve included)	1 l	1 l
Mixer oil reserve	0.15 l	0.15 l
Seats	1	1
Useful load (rider + luggage)	91 Kg	100 Kg
TRASMISSIONE - DRIVE		
Variator	automatic continuous	automatic continuous
Primary	V-belt	V-belt
Ratios:		
1) minimum for continuous transmission	2.86	2.86
2) maximum for continuous transmission	0.976	0.976
Secondary	gear set	gear set

	QUASAR 50	QUASAR 100
FUEL SUPPLY		
Fuel	Premium-grade unleaded petrol (DIN 51607), minimum octane rating 95 (N.O.R.M.) and 85 (N.O.M.M.)	Premium-grade unleaded petrol (DIN 51607), minimum octane rating 95 (N.O.R.M.) and 85 (N.O.M.M.)
CARBURETTOR		
Type	MIKUNI	MIKUNI
Choke	ø 13 mm	ø 13 mm
FRAME		
Type	tubular construction	tubular construction
SUSPENSIONS		
Front	independent arms	independent arms
Rear	hydraulic mono-shock absorber	hydraulic mono-shock absorber
BRAKES		
Front	drum, ø 84.4 mm, with mechanical transmission	drum, ø 84.4 mm, with mechanical transmission
Rear	drum, ø 130 mm, with mechanical transmission	drum, ø 130 mm, with mechanical transmission
WHEEL RIMS		
Type	steel	steel
Front	7x5.2 RS2	8x5.5 RS2
Rear	7x5.2 RS2	8x5.5 RS2
TYRES		
Type	tubeless	tubeless
Front	16x8-7	19x7-8
Rear	16x8-7	18x9.5-8
Inflation pressure	25 kPa (0.25 bar)	25 kPa (0.25 bar)
IGNITION		
Type	C.D.I.	C.D.I.
Spark advance	15°±1° before TDC	15°±1° before TDC
SPARK PLUG		
Standard	NGK BP7HS or NGK BPR7HS	NGK BP7HS or NGK BPR7HS
Spark plug gap	0.6 - 0.7 mm	0.6 - 0.7 mm
ELECTRIC SYSTEM		
Battery	12 V - 4Ah	12 V - 4Ah
Fuses	7A	7A
Generator (with permanent magnet)	12V - 93W	12V - 93W

	QUASAR 50	QUASAR 100
BULBS		
Parking lights	12V - 5W	12V - 5W
Low/high beam	12V - 35/35W	12V - 35/35W
Direction indicators	12V - 10W	12V - 10W
Rear parking / stop light	12V - 5/21W	12V - 5/21W
Number plate light	-	12V - 5W

1.8 LUBRICANT CHART

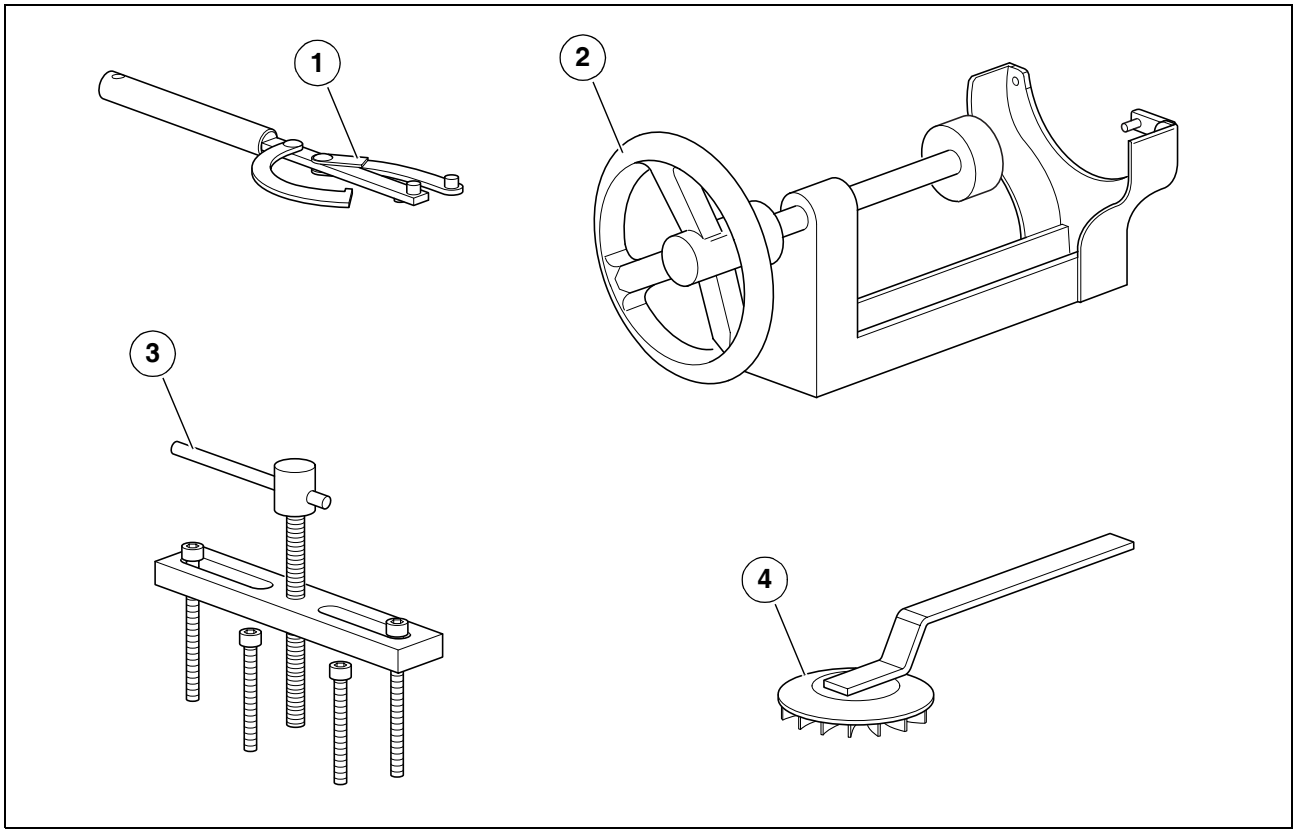
LUBRICANT	PRODUCT
Transmission oil	**RECOMMENDED**: PONTIAX HDI SAE 85W - 140 or AGIP ROTRA MP 85W-140. As an alternative to recommended fluids it is possible to use high-quality fluids having equal or higher ratings with respect to A.P.I. GL-5 specifications.
Mixer oil	**RECOMMENDED:** GREEN HIT 2 or AGIP CITY 2T. As an alternative to recommended fluids it is possible to use high-quality fluids having equal or higher ratings with respect to ISO-L-ETC ++, A.P.I. TC++ specifications.
Bearings and other lubrication points	**RECOMMENDED:** AUTOGREASE MP or AGIP GREASE 30. As an alternative to recommended fluids it is possible to use high-quality grease for bearings, temperature range -30°C...+140°C, floating point 150°C...230°C, highly corrosion protectant, good waterproof and oxidization-proof ability.
Battery lead protection	Use neutral grease or vaseline.
Aerosol chain lubricant	**RECOMMENDED**: CHAIN SPRAY or AGIP CHAIN LUBE.

1.9 SPECIAL TOOLS

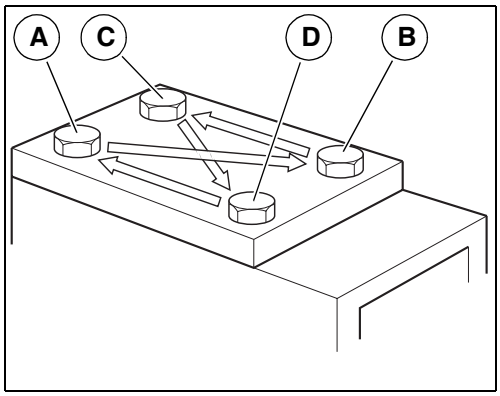
Special tools have been developed to ensure proper disassembly, re-assembly and adjustment without the risk of damaging any components.
Using inadequate tools and/or improvised procedures may lead to irreparable damage. Model-specific special tools for this vehicle are listed below.
If needed, order the brand-specific special tools (see Special Tools Catalogue).

⚠ WARNING

Always read the instructions supplied with the special tools before use.



Ref.	Tool designation and application	Part number
1	Flywheel and clutch bell housing retainer	8900675
2	Universal clutch assembly/disassembly tool	8900674
3	Crankcase separator	8900676
4	Variator locking tool	8900673



1.10 TORQUE FIGURES

The table below reports the standard torque figures for metric size screws and bolts in accordance with ISO standards.

Screw or bolt thread	Spanner	Tightening torque	
		Nm	kgm
M 6	10	6	0,6
M 8	12	15	1,5
M 10	14	30	3,0
M 12	17	55	5,5
M 14	19	85	8,5
M 16	22	130	13,0

For vehicle-specific fastenings see 2.2 (FASTENERS).
Unless otherwise specified, torque figures are intended for application to clean, dry threads at
room temperature.

IMPORTANT *Follow the instructions below to avoid distortion and/or improper fit:*

- Screw all fasteners finger-tight.
- Tighten down the opposing parts to half the prescribed torque: (A) and (B); (C) and (D).
- Repeat sequence tightening to specified torque.

IMPORTANT *This way, the load generated by the fasteners is applied evenly across joint surface.*

NOTES

NOTES

PERIODIC MAINTENANCE

2

PERIODIC MAINTENANCE

CONTENTS

Outlined in this section are the recommended procedures for the periodic maintenance of the key components of the motorcycle.

⚠ CAUTION

Before proceeding to maintain or inspect the motorcycle, stop the engine and remove the ignition switch key. Ensure that the engine and exhaust system have cooled down. Wherever possible, place the motorcycle on firm and level ground and lift it using suitable equipment. Be careful of any parts of the engine or exhaust system which may still be hot to the touch to avoid scalds or burns.
All component parts of the vehicle are inedible. Do not bite, suck, chew or swallow any vehicle parts. If not expressly indicated otherwise, for the reassembly of the units repeat the disassembly operations in reverse order.

2.1 PERIODIC MAINTENANCE CHART

In order to preserve the motorcycle in sleek running order, **aprilia** recommends that you strictly observe the periodic maintenance intervals recommended for the different component parts.

2.2 FASTENERS

⚠ CAUTION

The fasteners reported in the chart must be tightened to the specified torque using a torque wrench. Items highlighted with ( ) are especially important for safety.

ENGINE					
Description	**Qty**	**Screw / nut**	**Nm**	**kgm**	**Notes**
Stator nut	1	M10x1.25	38	3,8	
Stator screw	3	M6	9	0,9	
Oil pump screw	2	M5	4	0,4	
Oil seal support screw	1	M6	10	1,0	
Crankcase screw, flywheel side	6	M6	9	0,9	
Carburettor sleeve screw	4	M6	8	0,8	
Starter motor screw	2	M6	13	1,3	
Oil drain screw	1	M8	18	1,8	
Starting gear screw	2	M6	9	0,9	
Transmission cover screw	6	M6	12	1,2	
Clutch holding nut	1	M28x1	50	5,0	
Secondary pulley nut	1	M10x1	50	5,0	
Transmission casing cover screw	12	M6	12	1,2	
Primary pulley nut	1	M10x1.25	33	3,3	
Cylinder head nut	4	M7	10	1,0	
Spark plug	1	M14x1.25	20	2,0	

CYCLE PARTS					
Description	**Qty**	**Screw / nut**	**Nm**	**kgm**	**Notes**
Front wheel spindle nut	2		70	7,0	
Rear wheel spindle nut	2		90	9,0	
Handlebar clamp bolts	4		10	1,0	
Handlebar cover plate bolts	2		10	1,0	
Footpeg plate bolts	4	M6x16	10	1,0	
Footpeg cover bolts	4		5	0,5	
Number plate holder bolts	4	M6x12	10	1,0	
Rear-view mirror nut	2		27	2,7	
Battery terminal screws	2		5	0,5	

2.3 PERIODIC MAINTENANCE CHART

Components	Post running-in checks (after 2 weeks)	Monthly	Six-monthly	Yearly
Throttle and brake cables	①	①		
Battery	①	①		
Spark plug			①	
Carburettor/idling	①		②	
Transmission cables ●	①		①	
Brake blocks	①		①	
Drive belt				①
Headstock bearing and steering play	①		①	
Piston rings				①
Air cleaner		②		③
Fuel filter			①	
General operation of the vehicle	①		①	
Light system	①	①		
Greasing			①	
Brake light switch	①	①		
Chain lubrication	①	①		
Exhaust tailpipe/silencer				①
Automatic mixer oil	**Check before every use**			
Transmission oil ●	①		③	
Rear pulley spindle				③
Tyre pressures	①	①		
Fixed front movable pulley				③
Variator rollers				③
Nut, screw and bolt tightening	①		①	
Suspensions ●			①	
Mixer oil reserve warning light	①	①		
Fuel hoses	①		①	
Oil hoses	①	①		

KEY
① Check, clean and lubricate, adjust, top up or change if necessary.
② Cleaning.
③ Replace.
④ Adjustment.
● Run monthly in case of use on muddy, wet or rough surfaces (off-road).

⚠ WARNING

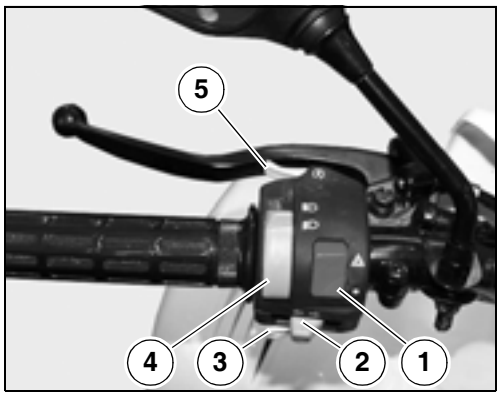
Service the motorcycle more frequently when you ride in the rain, on dusty or bumpy roads, or in competition trials.

2.4 LUBRICATION

Proper lubrication is critical to ensuring smooth operation and preserving vehicle life.

IMPORTANT *Before lubricating any part, clean off any oxidation deposits, grease, dirt or dust.*

Parts subject to oxidation must be lubricated with engine oil or grease, see 1.8 (LUBRICANT CHART).



2.4.1 COMMUTATOR

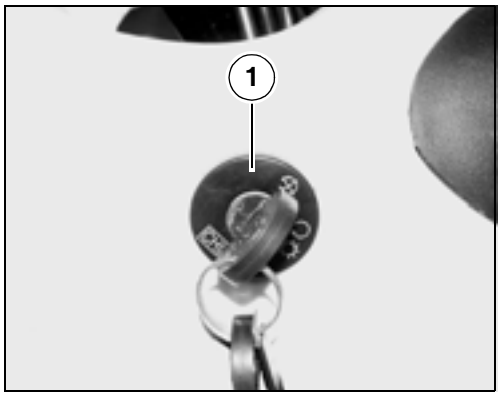
IMPORTANT *Electrical components will only operate with the main switch at the "○" position.*

1) **HAZARD LIGHT SWITCH** (△)
   Press down the top (marked with the symbol) to flash all indicators at once.
2) **DIRECTION INDICATOR LIGHT SWITCH** (⇦⇨)
   Turn the switch to the left to indicate turning to the left; to the right to indicate turning to the right. Press the switch to turn off the indicators.
3) **HORN BUTTON** ( )
   Press to sound the horn.
4) **LIGHT DIP SWITCH** (-)
   Turn the light switch to " " to activate the parking and low beam lights.
   Turn the switch to " " to activate high beam.

IMPORTANT *The light dip switch is only enabled when the main switch is in the " " position.*

5) **STARTING BUTTON** ( )
   Press the " " button: the starter motor will turn over the engine.

2.4.2 MAIN SWITCH



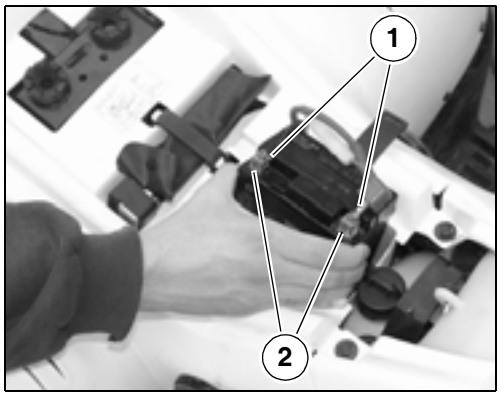
The main switch (1) is at the right side of the motorcycle, on the front fairing.

IMPORTANT *The key turns the main switch and enables the use of the light dip switch, when it is in the "☼" position.*

The motorcycle is delivered with two keys (one reserve key).

IMPORTANT *Keep the reserve key separately from the motorcycle.*

Position	Function	Removing the key
	The engine and lights cannot be operated.	The key may be removed.
	The engine may be started.	The key may not be removed.
	The parking and low beam lights are operating and the high beam lights may be turned on and the engine started.	The key may not be removed.



2.5 BATTERY

Read carefully 1.3.5 (HYDROGEN GAS AND BATTERY ELECTROLYTE).

⚠ CAUTION

Risk of fire.
Keep fuel and other flammable substances away from the electrical components.
Never invert the connection of the battery cables.
Connect and disconnect the battery with the main switch in position "⊗", otherwise some components may be damaged.
Connect first the positive cable (+) and then the negative cable (-).
Disconnect following the reverse order.

IMPORTANT *This vehicle is provided with a maintenance-free battery and no operation is necessary, excepting occasional checks and the recharge when required.*

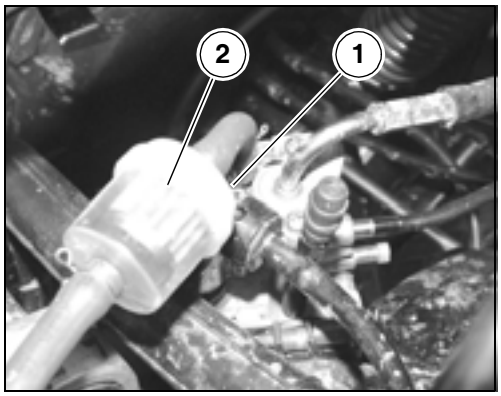
If the motorcycle is not to be used for some time, disconnect the battery terminals.

CHECKING AND CLEANING THE TERMINALS

- Remove the seat, see 6.1.1 (REMOVING THE SEAT).
- Ensure the main switch is in the "⊗" position.
  Make sure that the cable terminals (1) and the battery terminals (2) are:
  -in good conditions (and not corroded or covered with deposits);
  -covered with neutral grease or vaseline.

If necessary, proceed as follows:
- Disconnect the negative (-) and positive (+) leads in this order.
- Clean off corrosion deposits using a wire brush.
- Reconnect the positive (+) and negative (-) leads in the order.
- Cover the terminals of the cables and of the battery with neutral grease or vaseline.

2.6 CHECKING THE ELECTROLYTE BATTERY LEVEL



The vehicle is equipped with a maintenance-free battery, which does not require any check of the electrolyte level.

2.6.1 RECHARGING THE BATTERY

IMPORTANT *You can tell that the battery is nearly flat when you hear a rattling sound from the starter relay when pressing the starter button "⏲".*
Do not remove the battery plugs or the battery may damage.

- Remove the battery, see 6.1.7 (REMOVING THE BATTERY).
- Prepare an appropriate battery charger.
- Set the charger for the desired type of recharge (see table).
- Connect the battery to the battery charger.

⚠ CAUTION

Charge or use the battery in a well-ventilated place. Do not inhale the gases produced by the battery under charging.

- Switch on the battery charger.

Charge rate	Ampere rating	Time (hours)
Normal	0,4	5
Fast	4	0,5

⚠ CAUTION

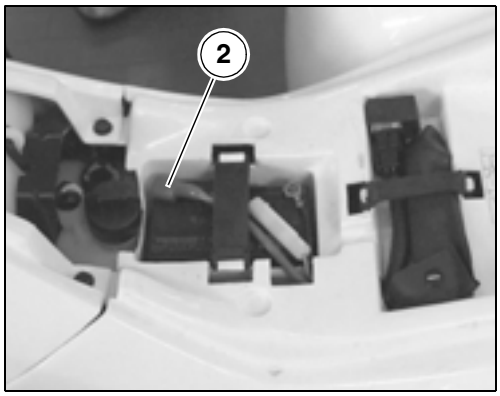
Reassemble the battery only 5/10 minutes after disconnecting the recharge apparatus, since the battery continues to produce gas for a short lapse of time.

INSTALLING THE BATTERY.

- Ensure the main switch is in the "⊗" position.
- Remove the seat, see 6.1.1 (REMOVING THE SEAT).

IMPORTANT *The battery must be positioned in its compartment with the terminals directed towards the right side of the vehicle.*

- Place the battery in its compartment.
- Refit the battery securing elastic band (1).



⚠ CAUTION

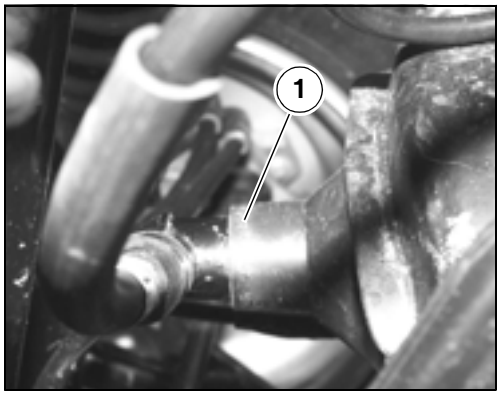
On refitting, connect the positive (+) lead first, then the negative (-) lead.

- Connect the positive terminal (+) with its screw.
- Connect the negative terminal (-) with its screw.
- Cover the terminals of the cables and of the battery with neutral grease or vaseline.
- Put back the red protection element (2).
- Refit the seat.

2.7 SPARK PLUG

Read carefully 1.3 (GENERAL SAFETY RULES).
Check the spark plug every six months, remove carbon deposits and replace if necessary.

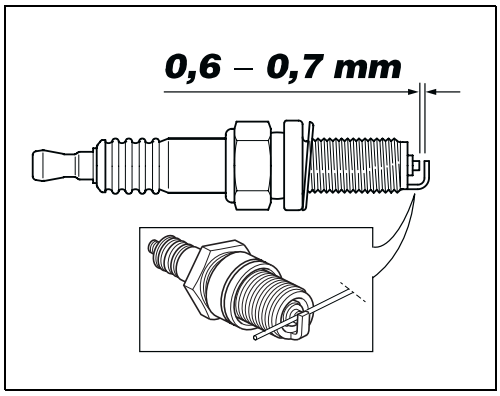
Removal and cleaning.



⚠ CAUTION

Before carrying out the following operations, let the engine and the exhaust tailpipe cool down until they reach room temperature, in order to avoid burns.
Never remove a spark plug cap while the engine is running. Shock hazard: the ignition system produces high voltages.

- Remove the spark plug cap (1).
- Remove any trace of dirt from the spark plug base.
- Unscrew the spark plug and extract it from its seat, taking care to prevent dust or other substances from getting inside the cylinder.
- Make sure that there are neither carbon deposits, nor corrosion marks on the electrode and on the spark plugs ceramics; if necessary, clean with a plug cleaner or wire brush.



Blow out with compressed air to stop residues getting into the engine itself.
If the spark plug has crackings on the insulating material, corroded electrodes or excessive deposits, it must be changed.
Check the electrode gap with a thickness gauge.
Electrode gap should be **0.6 -0.7 mm (0.02-0.03 in)**. If it needs adjusting, bend the earth electrode carefully.
Make sure the washer is in good condition. Fit the washer and screw the spark plug finger-tight to avoid damaging the thread.
Tighten the spark plug by means of the spanner you will find in the tool kit, giving it half a turn to compress the washer. Unscrew and tighten to the prescribed torque.

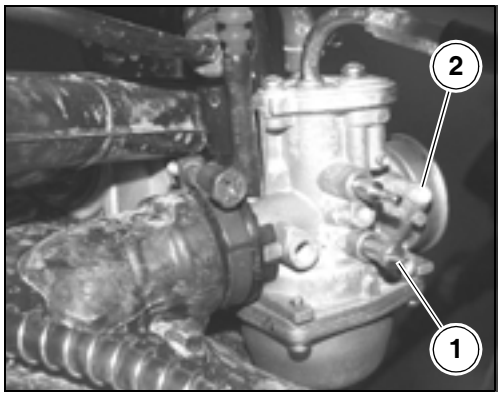
Spark plug torque: 20 Nm (2.0 kgm).

⚠ WARNING

The spark plug must be well tightened, otherwise the engine may overheat and be seriously damaged. Replace only with spark plugs of the type indicated in this manual.

Position the spark plug cap properly, so that it does not come off due to the vibrations of the engine.

2.8 IDLING ADJUSTMENT

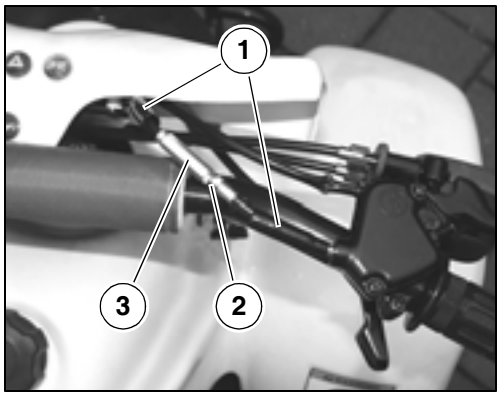


Read carefully 1.3 (GENERAL SAFETY RULES).
Adjust the idling every time it is irregular.

To carry out this operation, proceed as follows:

- Ride the motorcycle for a few kilometres to allow it to warm up, then adjust the screw (1) from the front of the vehicle.
  BY SCREWING IT IN (clockwise), you increase the rpm;
  BY UNSCREWING IT (anticlockwise), you decrease the rpm.
- With the brakes engaged, accelerate and decelerate a few times to check the operation of the throttle and to check if the idling speed is constant.

IMPORTANT *Do not adjust the air screw (2) to avoid upsetting the carburation setting.*



2.9 ADJUSTING THE THROTTLE CONTROL

IMPORTANT *Perform the maintenance operations more frequently if the vehicle is used in rainy or dusty areas, on uneven surfaces or on racetracks.*

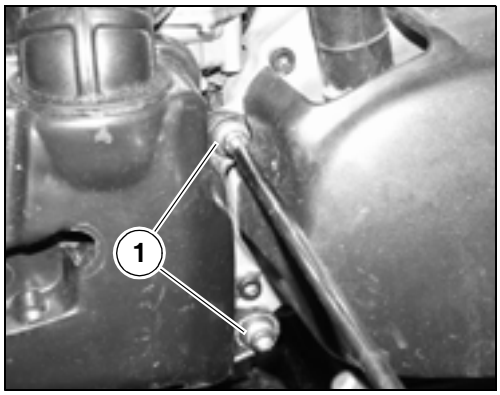
The idle stroke of the throttle lever must be **2-6 mm**.

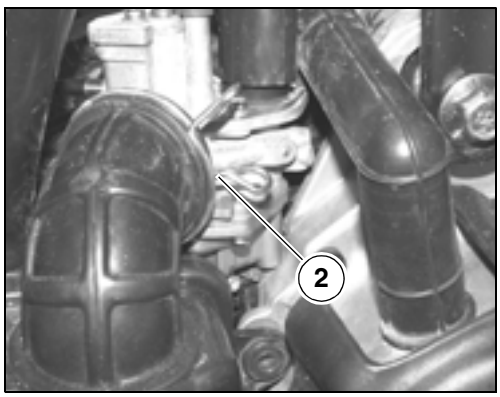
If not, proceed as follows:

- Withdraw the protection elements (1).
- Slacken the locknut (2).
- Rotate the adjuster (3) in such a way as to restore the prescribed value.
- After the adjustment, tighten the lock nut (2) and check the idle stroke again.
- Refit the protection elements (1).

⚠ WARNING

After the adjustment, make sure that the rotation of the handlebar does not modify the engine idling rpm and that the throttle lever returns smoothly and automatically to its original position after being released.





2.10 AIR CLEANER

Read carefully 1.3 (GENERAL SAFETY RULES).
Check the condition and cleanliness of the air cleaner every month.
To clean the filter, remove it from the motorcycle.

Removal:

- Unscrew and remove the two screws (1) and collect the washers.
- Release the clip (2).
- Remove the airbox.

⚠ WARNING

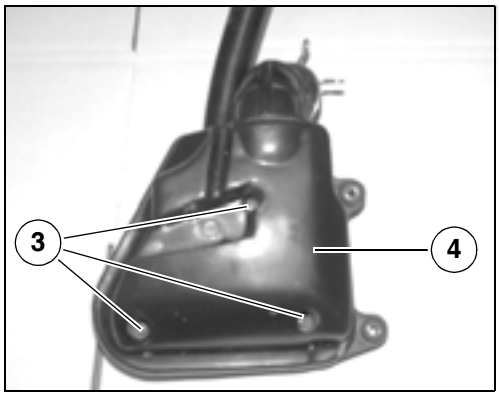
Plug the opening with a clean cloth, in order to prevent any foreign matter to get ito the suction ducts.
Upon reassembly, before positioning the filter case cover, make sure that you have not left the cloth or other objects inside the filter case.

⚠ WARNING

Make sure that the filtering element is positioned correctly, in such a way as to prevent non-filtered air from entering.
Remember that the untimely wear of the piston segments and the cylinder may be caused by a faulty or uncorrectly positioned filtering element.

- Release and remove the three screws (3).
- Remove the filter case cover (4).
- Remove the air cleaner (5).

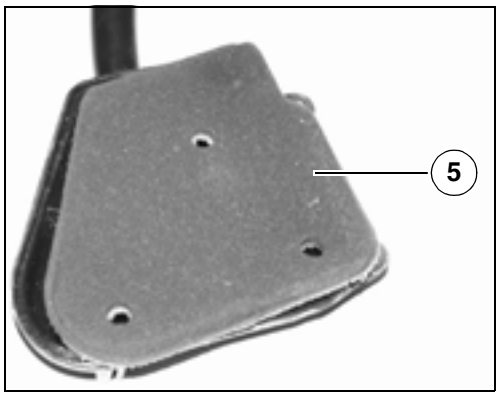
PARTIAL CLEANING



⚠ WARNING

Do not use screwdrivers or alike.

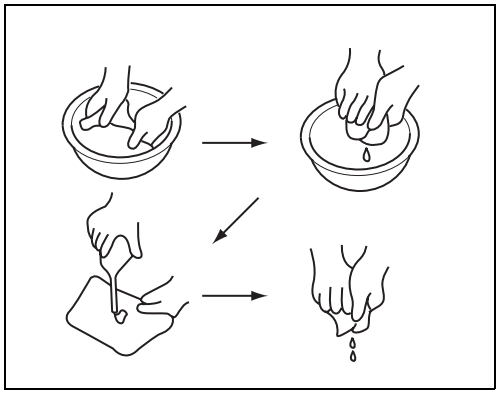
- Seize the air cleaner (5) vertically and strike it more than once on a clean surface.
- If necessary, clean the air cleaner (5) with a compressed air jet (directing it from the inside towards the outside of the filter). If necessary, wash the air cleaner (5) with water and pH neutral detergent.
- Moisten the air cleaner (5) in mixer oil, see 1.8 (LUBRICANT CHART).



⚠ WARNING

When cleaning the filtering element, make sure that it is not torn or otherwise damaged.
Otherwise, change the filtering element.

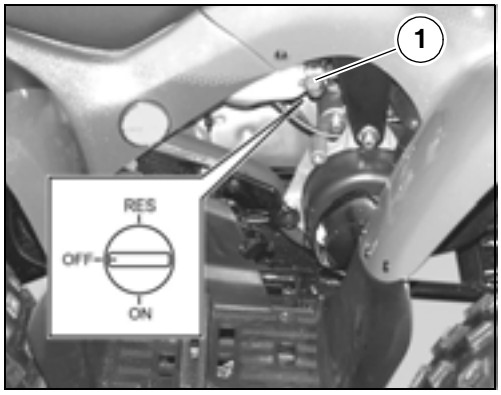
- Clean off excess oil as shown in the figure.

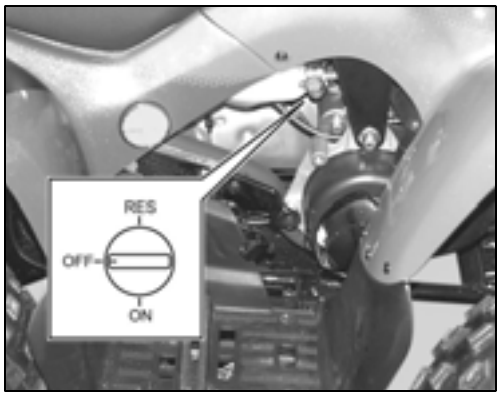


2.11 FUEL TAP

The fuel system is equipped with a tap which can be closed when the motorcycle is not being used.
The fuel tap (1) is at the top of the engine.
The tap can be set to three positions:

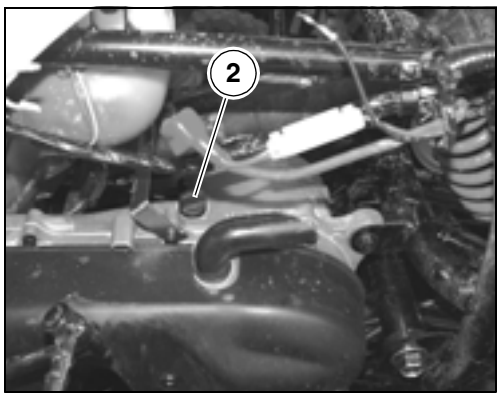
ON
When the tap is set to ON, the fuel will flow from the tank to the carburettor.
Set the tap to this position when using the motorcycle normally.





OFF
With the tap set to OFF, fuel will not flow from the tank.
Set the tap to this position when not using the motorcycle.

RES
When the tap is set to RES, the fuel will flow from the reserve tank to the carburettor.
When using the reserve tank, refill the fuel tank as soon as possible.



2.12 CHECKING THE TRANSMISSION OIL LEVEL

DO NOT RELEASE OIL INTO THE ENVIRONMENT
Carefully read 1.3 (GENERAL SAFETY RULES), 1.4.2 (LUBRICANTS) and 1.8 (LUBRICANT CHART).
Check the bottom part of the transmission: if any oil residue is found, then replace the oil seal, see 3.7 (TRANSMISSION REMOVAL)
Run a transmission oil change every sixth months. Run monthly in case of use on muddy, wet or rough surfaces (off-road).

- Ride for a few miles until reaching the normal running temperature, then stop the engine.
- Place a graduated container no smaller than 110 cm^3 (6.7 cu.in) under the drain plug (1).
- Release the filler cap (2) as well as the drain plug (1).
- Allow the oil to completely drain out of the crankcase and measure the quantity; if less than 110 cm^3 (6.7 cu.in), refill to level with the missing amount, see 1.8 (LUBRICANT CHART).
- Tighten the drain plug (1).
- Use a syringe or similar to inject the oil through the input hole.

IMPORTANT *To facilitate filling the crankcase, turn the wheels by hand.*

- Refit and tighten the filler cap (2).

⚠ WARNING

Tighten down the filler cap and drain plug carefully and check for leaks.
Check the crankcase cover gasket periodically for leaks.
Do not use the vehicle if insufficiently lubricated or if the oil is dirty or of the wrong type, as this will increase the wear of moving parts and can result in serious damage.

2.13 CHECKING AND ADJUSTING THE BRAKES

Read carefully 1.3 (GENERAL SAFETY RULES).

⚠ CAUTION

The brakes are essential to safety and must be kept in perfect working condition. Always check them before using the motorcycle.

The motorcycle is equipped with three drum brakes, two front and one rear. Check them first after the second week and every six months thereafter.
If the thickness of the friction material is worn down to nearly 1 mm, replace the blocks.

ADJUSTING THE FRONT BRAKES

Operate the right hand brake lever:

- Loosen the lock nuts (1).
- Adjust the brake adjuster (2).
- Loosen the lock nuts (1).

ADJUSTING THE REAR BRAKES

Adjust the adjuster (3) at the side of the rear brake drum.

- Adjust the left side brake adjuster (3).

ADJUSTING THE BRAKE PEDAL

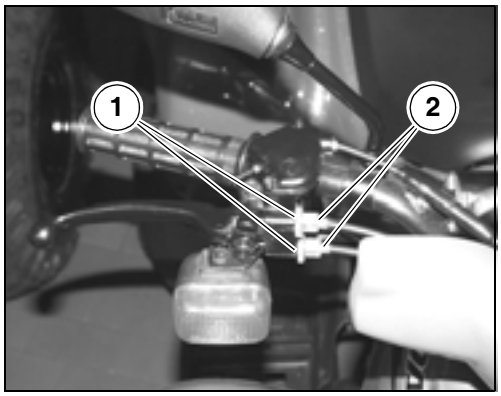
There are two adjustments:
- brake pedal adjuster (5);
- rear brake adjuster (4).

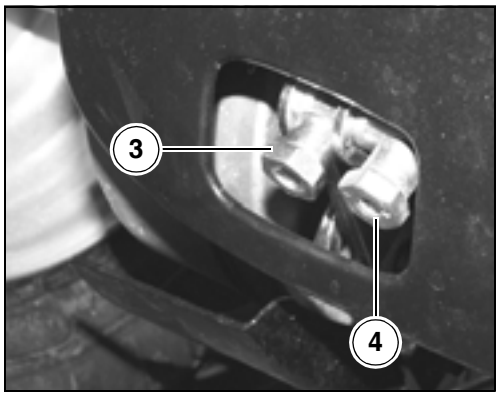
The first of these adjusts all three brakes:

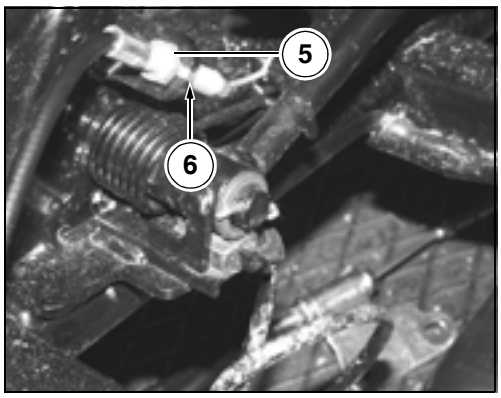
- Slacken the lock nut (6).
- Adjust the adjustment (5).
- Tighten the lock nut (6).

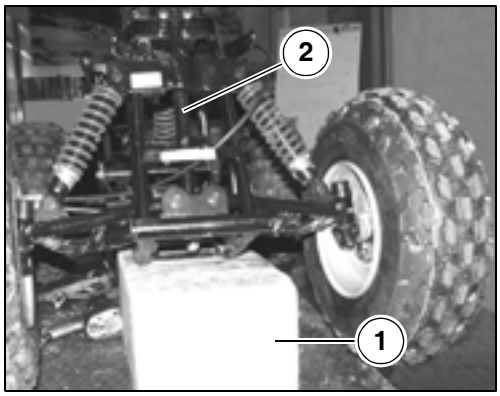
The second only adjusts the rear brake:

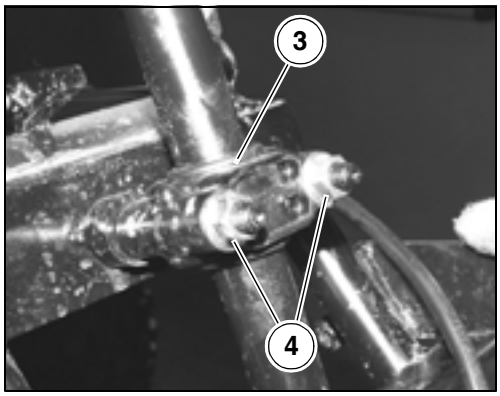
- Adjust the adjustment (4).











2.14 CHECKING THE STEERING

Read carefully 1.3 (GENERAL SAFETY RULES).
Run the first check after the first two weeks, then every month thereafter.

- Place a support (1) under the frame at the front, so as to leave the wheels free to turn.
- Move the base of the headstock (2) in the direction of travel.
- If any play is evident, check the wear of the bush (3) and the tightness of the nuts (4).
- Rotate the base of the headstock (2) manually in both directions.
- Check that the headstock base turns freely and evenly without noise, otherwise replace the bearings, see 6.2.1 (REMOVING THE BASE WITH HEADSTOCK).

2.15 INSPECTING THE FRONT SUSPENSIONS

Read carefully 1.3 (GENERAL SAFETY RULES).
Check the suspension every month.
Check that the shock absorbers are not scratched or grooved. If they are, replace the damaged parts.

Carry out the following checks.
With pulled front brake lever, press the handlebar repeatedly, thrusting the two suspensions downwards.
The stroke must be gentle and there must be no trace of oil on the rods.
Check the fastening of all the components and the functionality of the front suspension joints, see 6.2 (STEERING SYSTEM).

2.16 INSPECTING THE REAR SUSPENSION

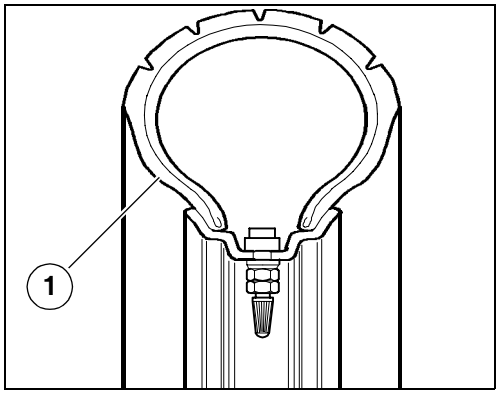
Read carefully 1.3 (GENERAL SAFETY RULES).
Check the rear suspension every month.
Check that the shock absorber is not leaking oil, or scratched or grooved.
Check the fastening of all the components and the functionality of the rear suspension joints, see 6.3.1 (REMOVING THE REAR SHOCK ABSORBER).

2.17 WHEELS

Read carefully 1.3 (GENERAL SAFETY RULES).
- Check the wheels for dents and distortions. If necessary replace them.
- Check the eccentricity of the wheels.
- Check the condition of the wheels and bearings.
- Check the balance of the wheels.
- Turn the wheel slowly several times and observe the point at which it stops.
- If the wheel is not statically balanced it will always stop at the same point. Fit a balancing weight at the centre of the rim, at the highest (lightest) point.

2.17.1 TYRES

This vehicle is fitted with tubeless tyres.



⚠ CAUTION

Check the tyre inflation pressures at regular intervals when the tyres are cold, see 1.7 (SPECIFICATIONS). Checking pressure on hot tyres will result in inaccurate measurement.
Take care to check tyres pressures before and after a long journey. An overinflated tyre will provide a harsh ride, transmitting shock to the handlebar and reducing riding comfort and stability when cornering.
An underinflated tyre will extend the contact patch to include a larger portion of the tyre wall (1). This can result in cuts, the tyre moving on the rim, or coming away from it, thus leading to the rider losing control of the vehicle.
The tyre may even jump off the rim under hard braking. Lastly, the vehicle may skid in a bend. Inspect tread surface and check for wear. Badly worn tyres adversely affect traction and handling. Enquire about correct wear inspection procedure with your supplier. Visually inspect the treads and replace if too worn. If the tyres are old, even if they are not completely worn down, they can harden and lose grip. In this case, replace the tyres. Always change a worn tyre. A tyre that becomes punctured in the tread area should be changed when the puncture is larger than 5 mm (0.2 in). The wheels must be balanced after each tyre repair. Use only tyres of the size indicated by the Manufacturer, see 1.7 (SPECIFICATIONS). Never use tube tyres on tubeless tyre rims. Always check that the caps are in place on the valves, or the tyres may deflate suddenly. Tyre replacement and repair, and wheel servicing and balancing are delicate operations. They should be carried out using adequate tools and are best left to experienced mechanics. New tyres may be coated with an oily film: drive carefully for the the first several kilometres.

2.18 DRIVE CHAIN

⚠ WARNING

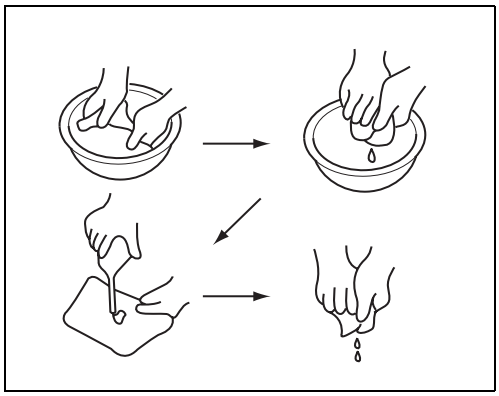
An excessive slackening of the chain may cause noise or make the chain rattle.
Periodically check the slack and adjust it if necessary.
Incorrect maintenance may cause the untimely wear of the chain and/or damages to the pinion and/or the crown.

NOTE *Perform the maintenance operations more frequently if the vehicle is used in rainy or dusty areas, on uneven surfaces or on racetracks.*

CHECKING THE SLACK

To check the slack, proceed as follows:

- Stop the engine.
- Make sure that the vertical oscillation, in an intermediate point between pinion and crown in the upper part of the chain, is about **15~20 mm**.
- Move the vehicle forwards, or turn the wheel, in order to be able to check the vertical oscillation of the chain even when the wheel turns; the slack must be constant in all the rotation phases of the wheel.



⚠ WARNING

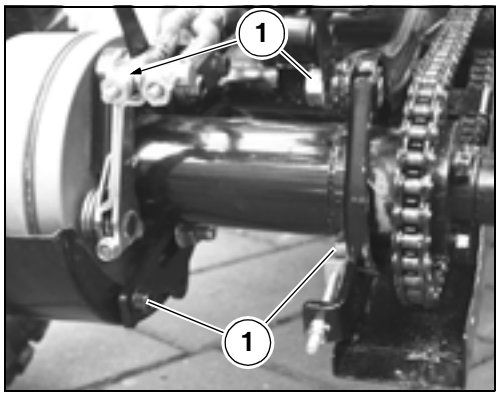
If in some positions the slack is higher than in others, this means that there are crushed or seized links; in this case, replace the chain, see 6.6.1 (BREAKING THE CHAIN). To prevent the risk of seizures, lubricate the chain frequently.

If the slack is even, but exceeding the maximum limit allowed, adjust it.

ADJUSTMENT

If after the check it is necessary to adjust the chain tension, proceed as follows:

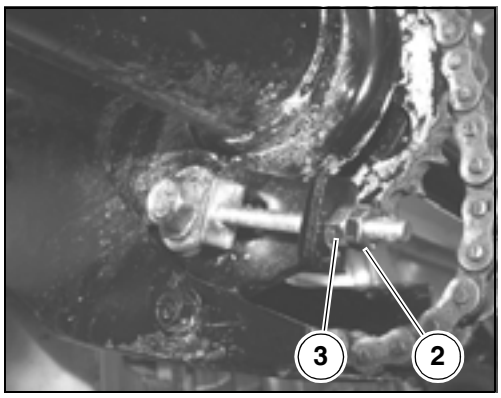
- Slacken the four screws (1).
- Partly slacken the lock nut (2) on the tensioner.
- Adjust the chain tension with the nut (3).
- After the adjustment, tighten the lock nut (2).
- Tighten the four screws (1).
- Check that the slack is now within the maximum limit allowed.



CHECKING THE DRIVING CHAIN, PINION AND SPROCKET WEAR

Further, check the following parts and make sure that chain, pinion and crown do not present:

- damaged rollers;
- loose pins;
- dry, rusty, crushed or seized links;
- excessive wear;
- sprocket or teeth excessively worn or damaged.



⚠ WARNING

If the chain rollers are damaged, the pins are loose and/or the O- rings are damaged or lacking, it is necessary to change the whole chain unit (both sprockets and chain).
Lubricate the chain frequently, especially if there are dry or rusty parts.

CLEANING AND LUBRICATION

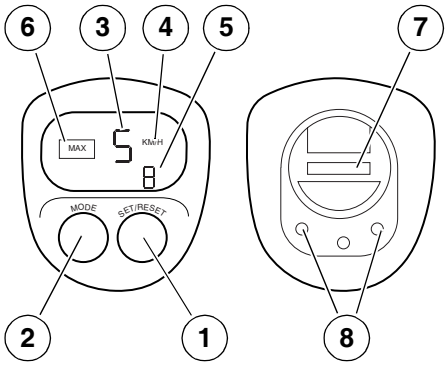
⚠ WARNING

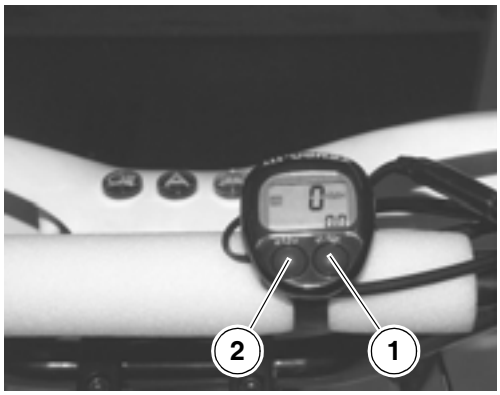
Carry out the adjustment, lubrication, cleaning and change of the chain with great care.

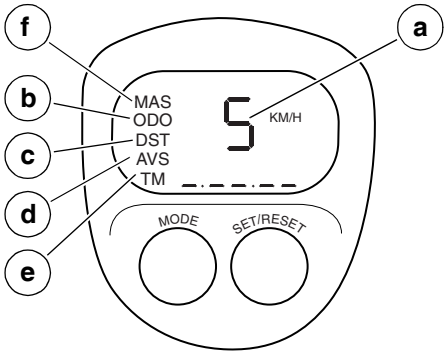
Never wash the chain with water jets, steam jets, high-pressure water jets and highly inflammable solvents.

- Wash the chain with naphtha or kerosene. If it tends to rust quickly, intensify the maintenance intervals.
- After washing and drying the chain, lubricate with spray grease, see 1.8 (LUBRICANT CHART).
- Do not use the vehicle soon after lubricating the chain, since due to the centrifugal force the lubricant would be sprayed outwards and dirty the surrounding areas.

2.19 MULTIFUNCTION COMPUTER







The vehicle is equipped with an electronic device to measure the vehicle speed, the elapsed time and to store the distance covered.

⚠ WARNING

When the vehicle is unused, always keep the dial protected against direct sun rays.

⚠ WARNING

Never remove any part of the multifunction computer, battery cover excluded.

⚠ WARNING

Before using the vehicle, make sure that all the parts composing the multifunction computer are correctly assembled.

NOTE *Switch the multifunction computer on before starting the vehicle. If this is not the case, the operation of the computer itself could be impaired. The multifunction computer is provided with an automatic shutoff device in case the instrument is left unused for more than 5 minutes.*

NOTE *When the vehicle is unused or left unattended, always remove the dial from its mount.*

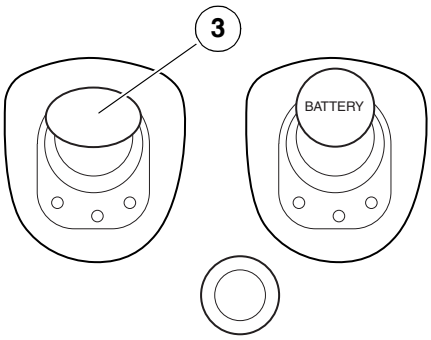
Main components

1) Timer "SET / RESET" push button
2) Function selection "MODE" push button
3) Speed display
4) Units of measurement of the displayed speed
5) Time display
6) Function indicator
7) Battery cover
8) Contacts

Accessories:

- mounting support
- speed sensor
- clip
- magnet
- steel ring
- rubber seal

- cable tie
- screw
- battery



Setting the units of measurement
To select the desired units of measurements, press push button (1). Confirm by pressing push button (2).

NOTE *When setting the units of measurements, the instrument will also display the reset value of the wheel diameter; press push button (1) to set this value to 128 for Quasar 50, 144 for Quasar 100 and store the set data by pressing push button (2).*

Main functions
Before carrying out any setting or adjustment on the multifunction computer, working from below, fit the dial on its mount on the vehicle.
Press push button (2) repeatedly so as to make the following functions appear in the following order.
To start storing data, press push button (1) (the units of measurement indicator is flashing). To stop data storing, press push button (1) again (the units of measurement indicator is not flashing).

Speed function (a)
The speed function is automatically enabled upon battery installation.

ODO function (b)
The ODO function indicates the total distance covered by the vehicle.
The counter will be automatically reset when reaching 10,000 Km.

NOTE *When the multifunction computer battery is removed, all stored values will be deleted.*

DST function (c)
The DST function indicates the partial distance covered by the vehicle.
The counter will be automatically reset when reaching 1,000 Km.
To manually reset counter, press push buttons (1) and (2) at the same time.

AVS function (d)
The AVS function indicates the trip average speed.
To reset the stored speed value, press push buttons (1) and (2) at the same time.

TM function (e)
The TM function indicates the time vehicle is being used.
The counter will be automatically reset when reaching 12 hours.
To manually reset counter, press push buttons (1) and (2) at the same time.

MAS function (f)
The MAS function indicates the maximum speed.
To manually reset counter, push buttons (1) and (2) at the same time.

Installing battery
Using a coin, undo the battery cover (3).
Install battery (3 V) inside its compartment. Take care to position positive pole (+) pointing upwards and negative pole (-) pointing downwards.
Once finished, close battery cover (3) again.

NOTES

ENGINE 3

ENGINE

CONTENTS

3.1.1 COMPONENTS THAT CAN BE REMOVED WITH THE ENGINE INSTALLED

The parts listed below can be removed with the engine installed in the frame.

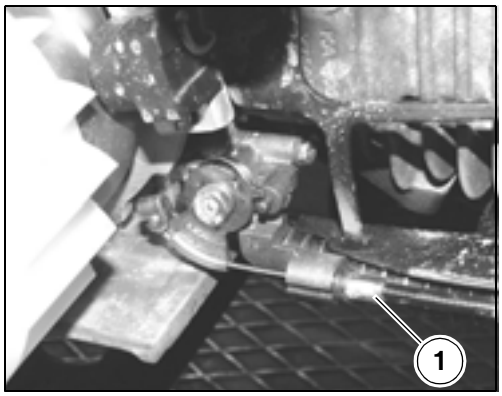
TOP END
- Carburettor
- Intake manifold
- Starter
- Reed valve unit
- Deflector
- Air scoop pipe

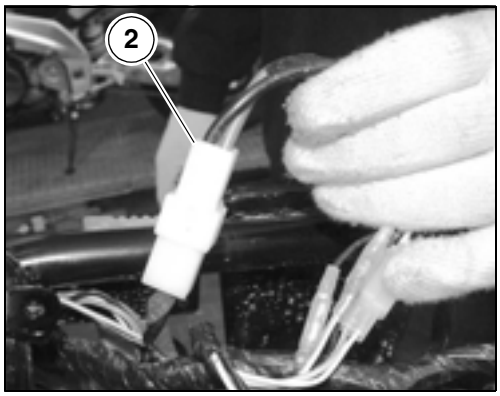
FRONT END
- Cylinder air scoop guard
- Head
- Spark plug
- Cylinder and piston

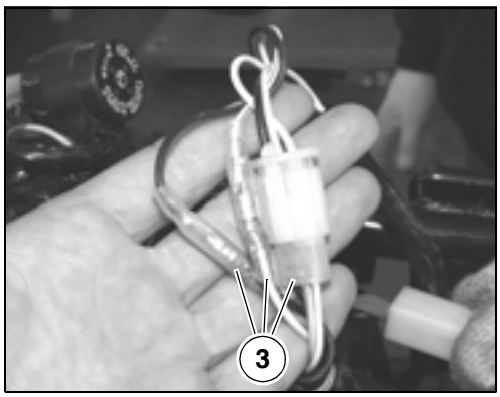
BOTTOM END
- Exhaust system

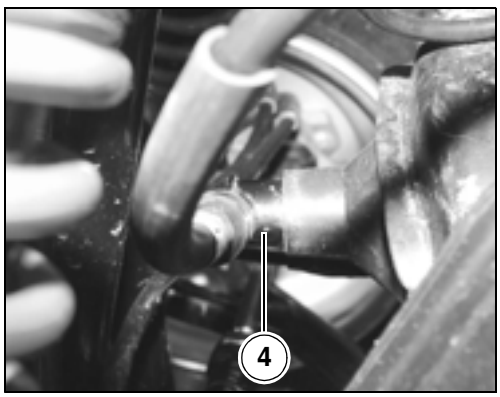
RIGHT-HAND SIDE
- Fan guard
- Ignition casing
- Flywheel
- Stator coil
- Oil pump

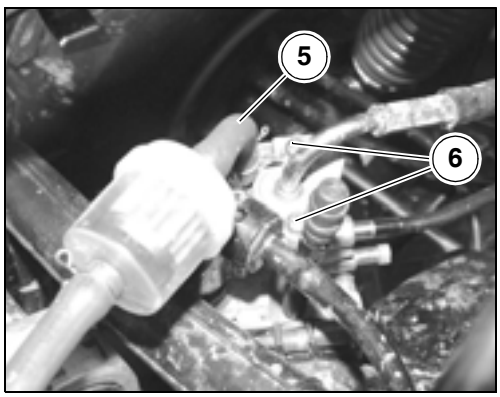
LEFT-HAND SIDE
- Transmission cover
- Speed variator unit
- Clutch unit
- Drive belt











3.1.2 REMOVING THE ENGINE FROM THE FRAME

Read carefully 1.3 (GENERAL SAFETY RULES).

⚠ CAUTION

Switch off the engine and wait for the engine and exhaust system to cool down.

- Remove both fairings, see 6.1.4 (REMOVING THE FRONT FAIRING) and see 6.1.5 (REMOVING THE REAR FAIRING).
- Remove both footpegs, see 6.1.6 (REMOVING THE FOOTPEGS).

⚠ WARNING

To clean the outer parts of the engine use a degreaser, brushes and wipers.
Ensure that no rubber or plastic parts come in contact with detergents and corrosive or penetrating solvents.
Should you need a steam cleaner, do not direct water, steam or high-pressure air jets towards any of the following parts: wheel hubs, handlebar controls, main warning lights, exhaust silencer, main switch.

- Remove the oil tank see 6.1.13 (REMOVING THE MIXER OIL TANK).
- Remove the tank see 6.1.12 (REMOVING THE FUEL TANK).
- Remove the exhaust system, see 6.1.25 (REMOVING THE EXHAUST).
- Remove the airbox, see 2.10 (AIR CLEANER).
- Disconnect the throttle cable (1) from the oil pump and remove the fan guards, see 6.1.8 (REMOVING THE FAN GUARD).

⚠ WARNING

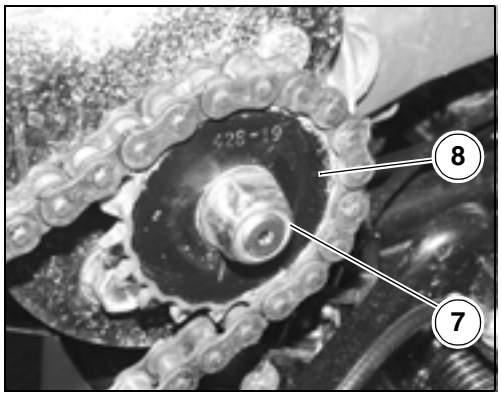
Mark cables, hoses and pipes to avoid confusing them when refitting.

- Disconnect the starter motor connector (2).
- Disconnect the alternator connectors (3).
- Disconnect the spark plug cap (4).
- Disconnect the fuel pipe (5).
- Unscrew and remove the two screws (6).
- Extract the throttle cable from the carburettor making sure not to damage the needle.

⚠ CAUTION

Due to the weight and size of the parts, work with the greatest care.
Block off all openings of engine and hoses to prevent the ingress of dirt.

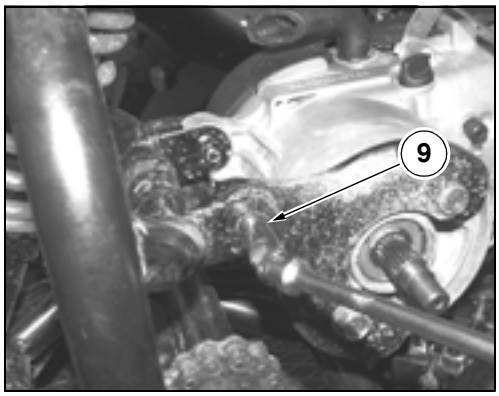
- Release and remove the nut (7) and collect the washer.
- Remove the front chain sprocket (8) and disengage it from the chain.
- ★ Release and remove the rear screw (9) fastening the engine to the rear fork.
- ★ Unscrew and remove the two upper screws (10).



⚠ CAUTION

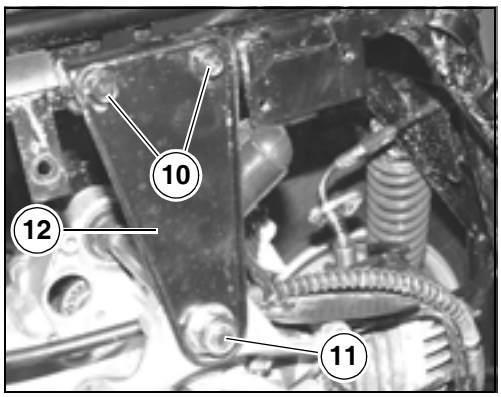
The engine is now supported on the hoist only. All fixings have been removed.
Handle with care. Be careful to avoid injury to your hands, arms and legs.
Clear all tools from the area. Thoroughly clean the area of the floor where the engine is to be placed.

- Slacken the nut (11) on the right-hand side of the vehicle.
- Rotate the brackets (12-13) backwards.
- Remove the engine from the frame by extracting it from the side.
- Place the engine on a supporting surface.



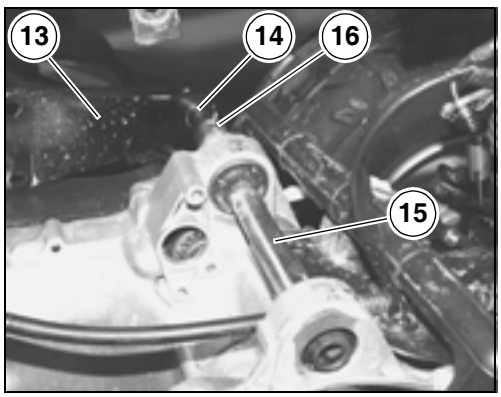
If necessary, proceed as follows:

- Release and remove the nut (11) and collect the washer.
- Remove the bracket (12).
- Extract the pin (14) from the left side and collect the inner spacer (15), the bracket (13) and the outer spacer (16).



⚠ WARNING

When refitting, seat the elements properly on the pin (14).



3.1.3 FITTING THE ENGINE IN THE FRAME

Read carefully 1.3 (GENERAL SAFETY RULES).

IMPORTANT *To refit the engine in the frame, reverse the removal procedure, see see 3.1.2 (REMOVING THE ENGINE FROM THE FRAME). Before proceeding, however, you will have to perform the operations detailed below.*

⚠ CAUTION

Handle with care.
Be careful to avoid injury to hands, arms and legs.

- Check the tension of the drive chain and adjust if necessary, see 2.18 (DRIVE CHAIN).

⚠ WARNING

Inspect any parts you have removed, paying special attention to these components:

- wiring must be properly fastened with wire ties.

⚠ WARNING

Wires and hoses must not be twisted and/or crushed.

- Electrical connectors must be fitted to the matching connectors;
- Hoses and pipes and couplings must be securely in place and fastened with suitable clips;
- The throttle cables must slide smoothly inside their housings and must not bind when handlebars are turned.

FOREWORD

The engine must be on the workbench for disassembly. Operations that can be done without removing the engine from the frame will be indicated by a note.

⚠ WARNING

The manufacturer assumes no responsibility for damage resulting from the use of unsuitable tools for the removal and refitting of the engine or any part of it.

3.2 HEAD UNIT

3.2.1 REMOVING THE HEAD

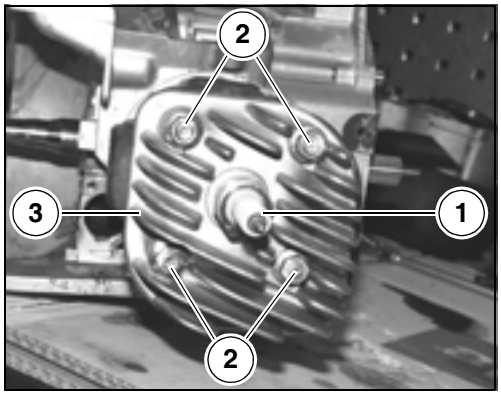
IMPORTANT *When the engine is in place, the cylinder head can be exposed by removing the cylinder air scoop guard, see 6.1.9 (REMOVING THE AIR SCOOP GUARD).*

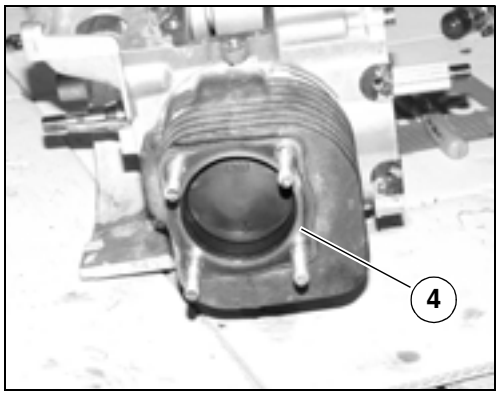
- Unscrew and remove the spark plug (1).

Spark plug torque (1): 20 Nm (2.0 kgm).

- Undo and remove the four nuts (2) in diagonal order.
- Remove the head (3).

IMPORTANT *When refitting replace the head gasket (4).*

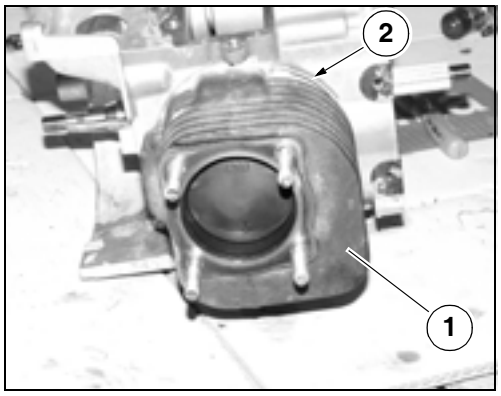


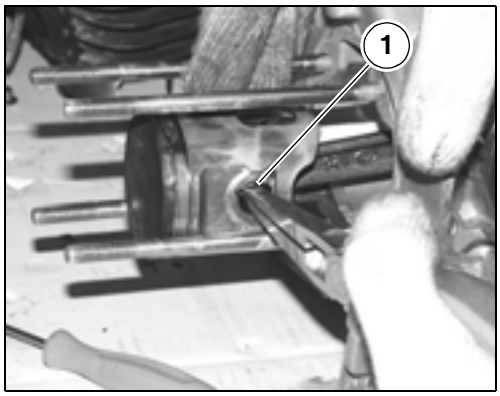


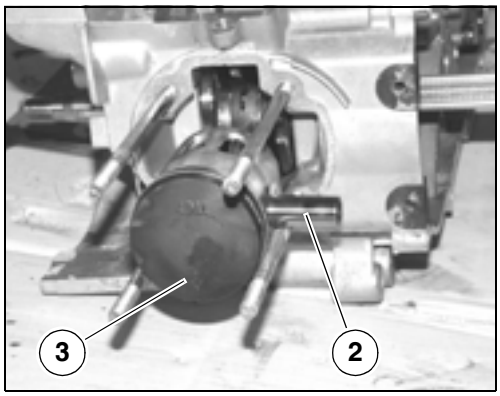
3.2.2 REMOVING THE CYLINDER

- Remove the head, 3.2.1 (REMOVING THE HEAD).
- Withdraw the cylinder (1) from the stud bolts.

IMPORTANT *When refitting replace the cylinder gasket (2).*







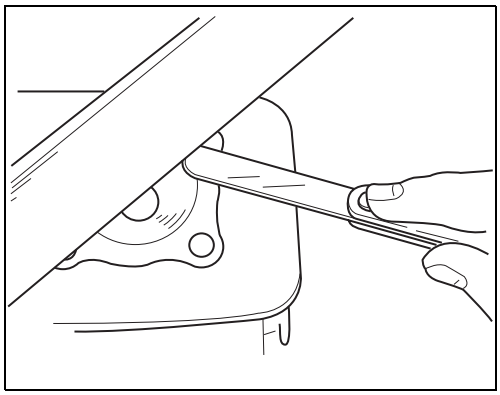
3.2.3 REMOVING THE PISTON

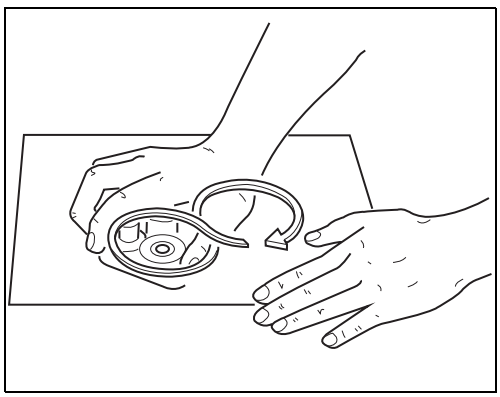
◆ Remove the cylinder, 3.2.2 (REMOVING THE CYLINDER).

⚠ WARNING

Before removing the piston pin retaining ring, cover the crankcase opening with a clean cloth so as to prevent the ring from falling into the crankcase; before removing the piston pin, carefully deburr the retaining ring groove and the adjoining part of the pin insertion hole.

◆ ★ Remove the retaining ring (1).
◆ Extract the piston pin (2).
◆ Remove the piston (3) and the roller cage from its housing in the connecting rod.



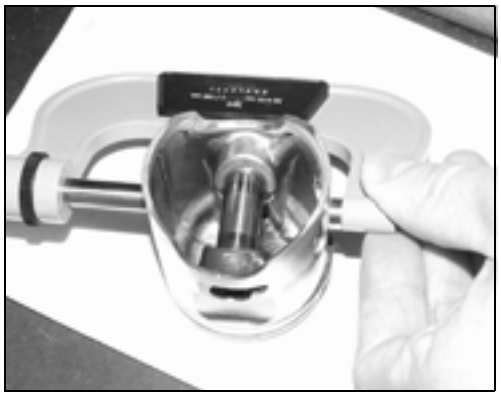


3.2.4 CHECKING THE HEAD AND CYLINDER

Decoke the head using a soft rounded scraper, and taking care not to damage the spark plug thread or scrape the aluminium.
Inspect and decoke the cylinder head combustion chamber.
Check and if necessary restore the planarity of the head to the limit of 0.05 mm. To do so:
- rest a straight edge on the cylinder head and check its planarity using a thickness gauge.

If the planarity is outside the tolerance range, restore it by rubbing the head with wetted 400-600 abrasive paper in a figure-of-eight pattern.
The cylinder must be checked in the same way.
Check that the cylinder barrel shows no signs of seizing, wear or scoring.

3.2.5 CHECKING THE PISTON



Remove the piston rings taking care not to part their ends more than necessary. To decoke the piston top, use a scraper with a slightly rounded edge. Clean the piston ring grooves with a spare ring.
Avoid using silicon-carbide abrasive paper to clean the piston top or grooves, as an excessive amount of metal would be removed and silicon carbide particles would settle in the piston and quickly damage the cylinder bore and corrode the piston itself.

Carefully check the piston skirt. Remove any hardened carbon formations by immersing the whole piston in a suitable liquid such as the type used for cleaning carburettors.

⚠ CAUTION

The use of detergents capable of removing hardened carbon formations is very dangerous. The fumes released by these chemicals can cause serious illnesses and any contact with the skin or the eyes immediately produces severe lesions. It is therefore essential to wear suitable protections such as goggles and gloves, and to scrupulously follow the instructions provided on the package and the container of the detergent.

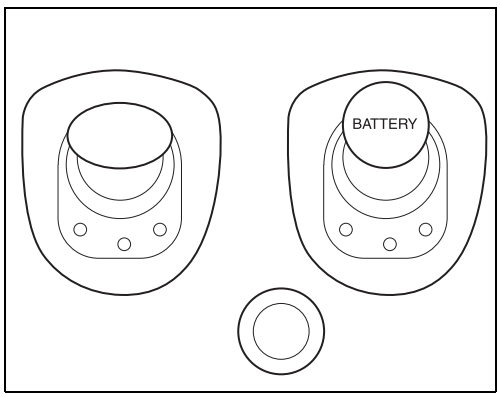
Measure the diameter of the piston using a micrometer. Take the measurement 5 mm from the lower rim of the piston and perpendicularly to the piston pin as shown in the figure.

The clearance between the piston and cylinder must not exceed 0.12 mm.

3.2.6 CHECKING THE PISTON RINGS

Measure the side clearance of the piston rings using a thickness gauge.
Side clearance: 0.02 ÷ 0.06 mm

Check that the piston rings show no signs of anomaly, and that the gap between the ring ends is 0.75 mm.
Check with a thickness gauge by fitting the segment in the upper part of the cylinder, taking care to position it horizontally. Proceed as follows: position the ring squarely in the cylinder using the piston without rings mounted.
Position the ring in the upper part of the cylinder where it normally runs.

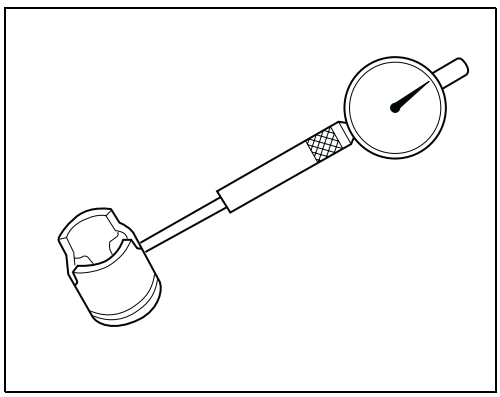


3.2.7 CHECKING THE PISTON PIN

Check the piston pin for any scoring, scratches or altered colour resulting from high temperatures. The piston pin needs replacing whenever it feels scored or scratched to the touch, or if it shows any blue-grey areas. If, on the other hand, the piston pin has become slightly opaque in colour, there is no need to replace it.

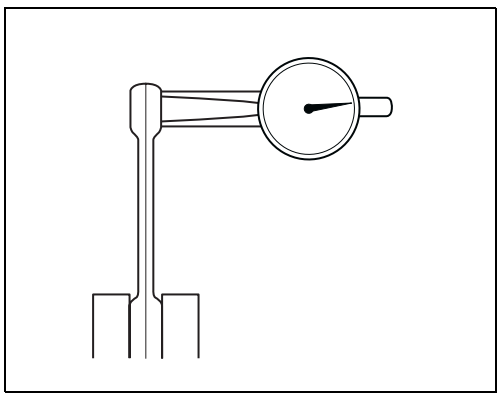
Measure the outside diameter (D) of the piston pin.
Piston pin outside diameter: 9.98 mm.

Check the diameter of the piston pin seat.
Piston pin seat diameter: 10.003 mm.

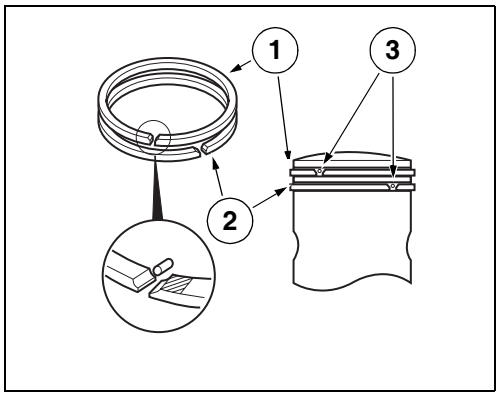


Check the diameter of the roller cage seat on the connecting link.
Connecting link internal diameter: 14.04 mm.

Check that the roller cage is not damaged, and if necessary replace it.



3.2.8 REFITTING THE POWER PLANT



◆ Fit the new upper ring (1) and lower ring (2) on the piston with the tapered side facing upwards. Refer to pins (3).

⚠ WARNING

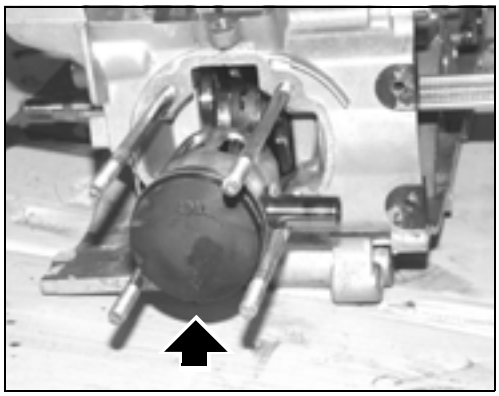
Failure to observe this procedure will make it virtually impossible to fit the cylinder on the piston, and will result in breakage of the piston rings, and possibly more serious damage during engine assembly.

◆ Lubricate the following parts with oil for two-stroke engines: roller cage, piston pin, piston pin retainer seats, cylinder surface.

⚠ WARNING

Always use new retaining rings.

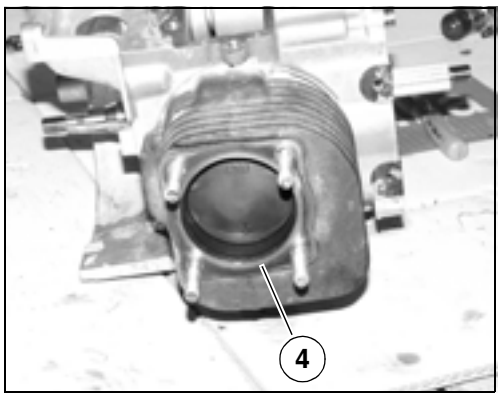
IMPORTANT *Remember that the piston rings must be fitted with the rounded edge facing the piston pin.*



⚠ WARNING

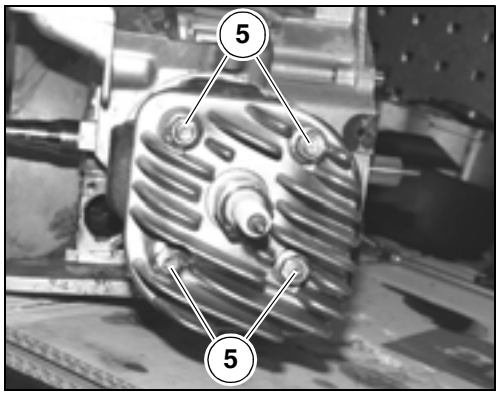
The arrow on the piston must point to the exhaust. Before fitting the piston pin ring, cover the crankcase with a clean cloth so as to prevent any object from falling into the crankcase.
Before fitting the cylinder, apply oil for two-stroke engines to the piston rings.

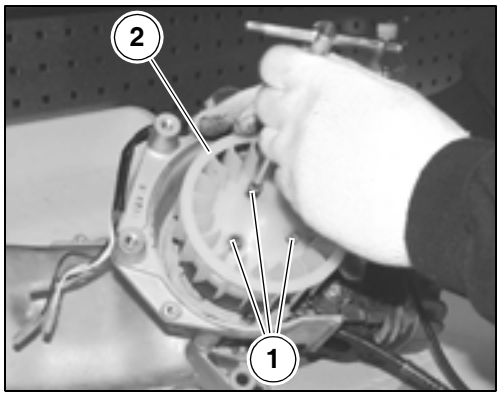
◆ Fit a new cylinder base gasket.
◆ Fit the cylinder.
◆ Refit the head after replacing the gasket (4).
◆ Tighten the four nuts (5) in a cross pattern.
◆ Fit the spark plug.

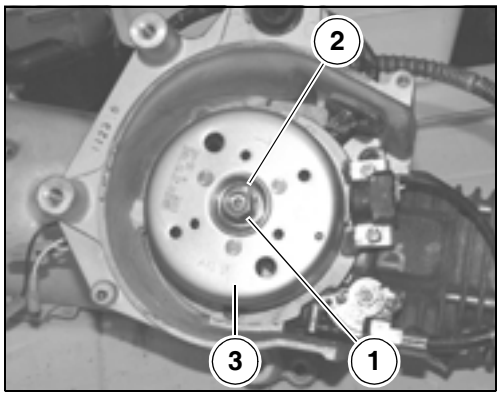


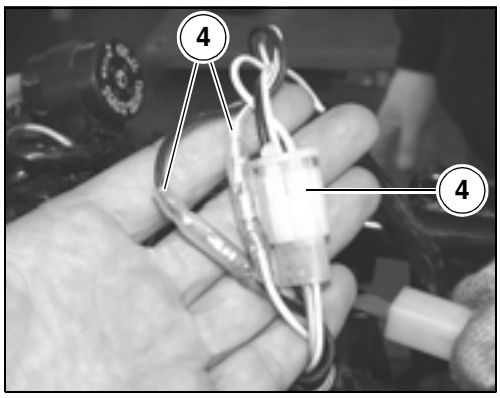
Torque wrench setting for nuts (5): 10 Nm (1.0 kgm).

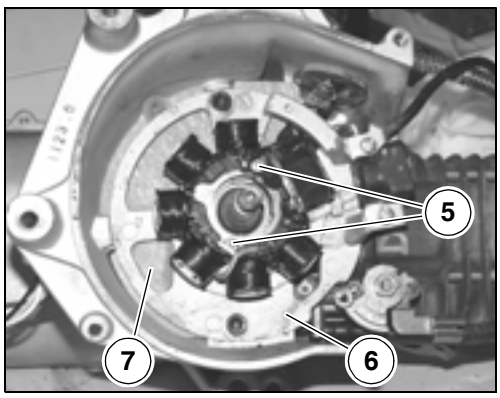
Spark plug torque: 20 Nm (2.0 kgm).











3.3 ALTERNATOR

3.3.1 REMOVING THE COOLING FAN

IMPORTANT *There is no need to remove the engine from the frame.*

- Remove the fan guard, see 6.1.8 (REMOVING THE FAN GUARD).
- Unscrew and remove the three screws (1) and collect the washers.
- Remove the cooling fan (2).

3.3.2 REMOVING THE ALTERNATOR

- Remove the cooling fan, see 3.3.1 (REMOVING THE COOLING FAN).
- Using the special tool (flywheel and clutch bell housing retainer, code 8900675) stop the rotor (3).
- Release and remove the rotor nut (1) and collect the washer (2).

Torque wrench setting for nut (1): 38 Nm (3.8 kgm).

- Remove the rotor (3) and collect the key.

⚠ WARNING

Since the flywheel locknut is tightened with a considerable torque, caution should be exercised in order to prevent injury.

- After disconnecting the connectors (4) from the wiring, introduce the stator wire into the crankcase through its slit.

⚠ WARNING

Make sure not to damage the seal and the cable.

- Release and remove the two screws (5) and collect the washers.

Torque wrench setting for screws (5): 9 Nm (0.9 kgm).

- Remove the stator (6).

IMPORTANT *When refitting replace the gasket (7).*

3.3.3 CHECKING THE FLYWHEEL

Check the mechanical condition of all flywheel components. Check the wear condition of the woodrouchkey, and of the woodrouchkey groove on the crankshaft. Replace any wornout components.

3.4 OIL PUMP

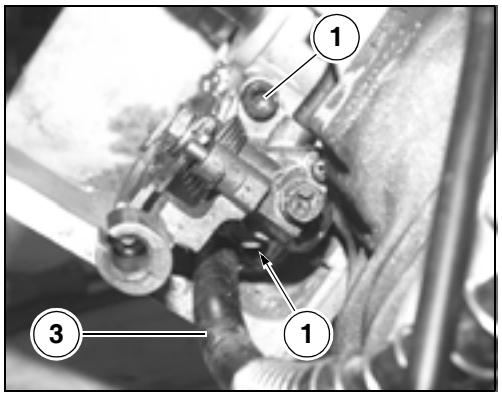
3.4.1 REMOVING THE OIL PUMP

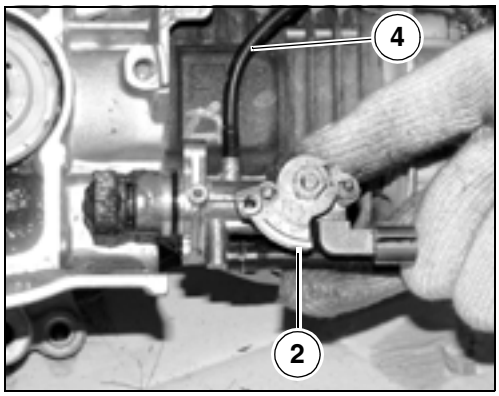
- Remove the alternator, see 3.3.2 (REMOVING THE ALTERNATOR).
- Release and remove the two screws (1).
- Extract the pump (2) together with the oil feed pipe (3) and the pipe that delivers oil to the carburettor (4).

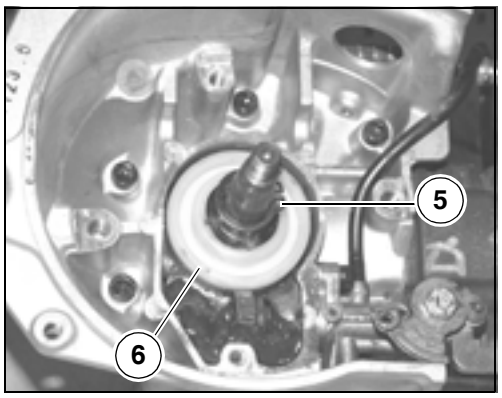
⚠ WARNING

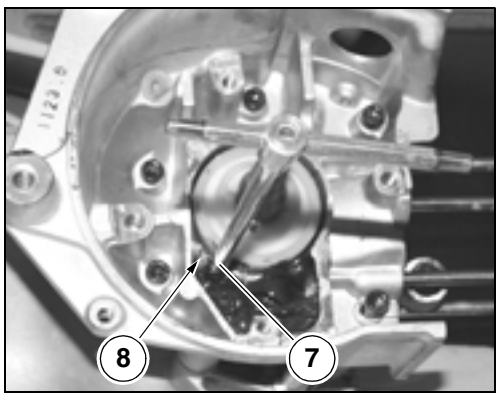
To ensure proper fitting, pay special attention to the passage of the oil delivery pipe (4).

- Remove the circlip (5), the snap ring and the pump driving gear (6).
- Collect the pin.
- Loosen the fixing screw (7) and remove the oil seal stop plate (8).









3.4.2 CHECKING THE OIL PUMP

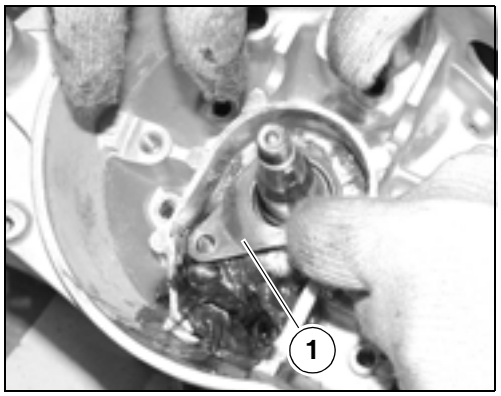
Check the general condition of the oil pump. Remember that wear or malfunction can alter the settings of the pump itself.
This, however, occurs very rarely. Should the pump appear to be malfunctioning, check the feed duct. Check the sealing ring and if necessary replace it. Also check the pump driving gear and replace it in case of excessive wear.
Also check the condition of the pump oil feed and oil delivery pipes, making sure they contain no air bubbles.

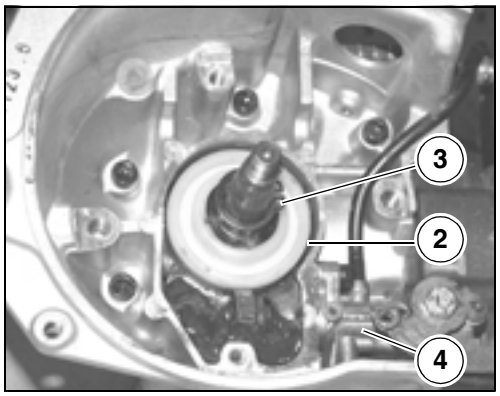
IMPORTANT *It is very important for the oil feed and oil delivery pipes to contain no air. If air bubbles are found in either of the pipes, it is essential to identify and repair the part that let the air in before restarting the engine.*

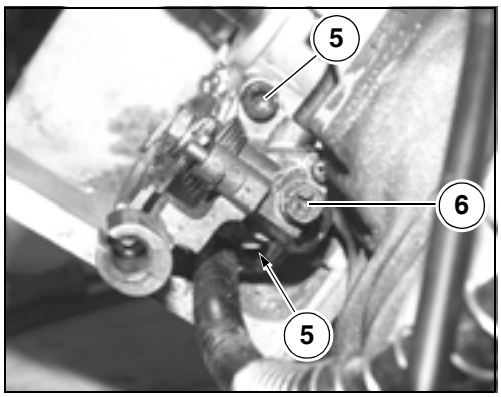
3.4.3 REFITTING THE OIL PUMP

- Fit the oil seal stop plate (1) and fasten it with the fixing screw.
- Fit, in the following order, the pin, pump driving gear (2), washer and the circlip (3).
- Fit the pump (4) paying special attention to the passage of the oil delivery pipe, and then fasten it with the two screws (5).

IMPORTANT *When working on the oil pump, air bubbles may enter and remain in the pipes and in the pump itself, and subsequently hinder lubrication while the engine is running.*
For this reason, be sure to bleed the pump before starting the engine.
Remove the drain screw (6) from the pump and allow the oil and any air bubbles to drain out. When the oil starts flowing out with no bubbles, the bleeding is complete and the screw (6) can be retightened.





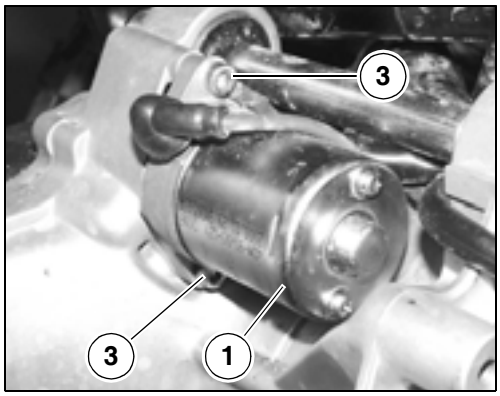


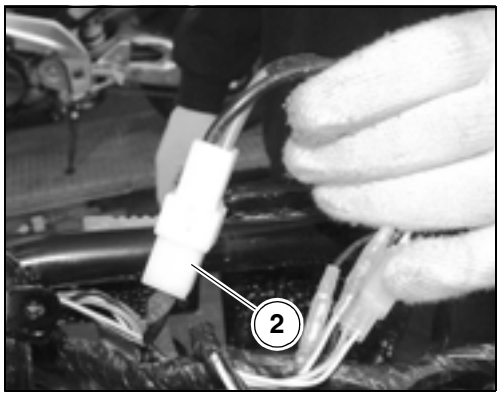
⚠ WARNING

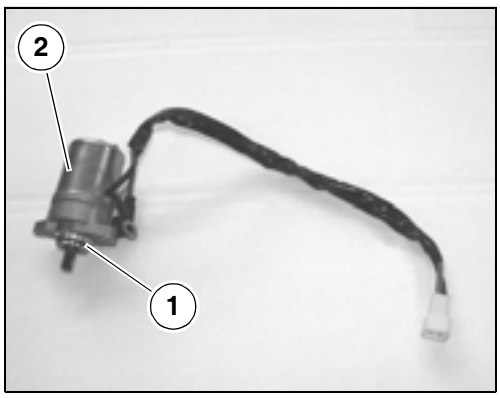
To allow the oil pump to expel all the air, fill the fuel tank with at least 1/2 litre of 2% petrol-oil mixture.
To avoid serious skin damage due to prolonged contact with oil, accurately wash the hands after handling the lubricant.

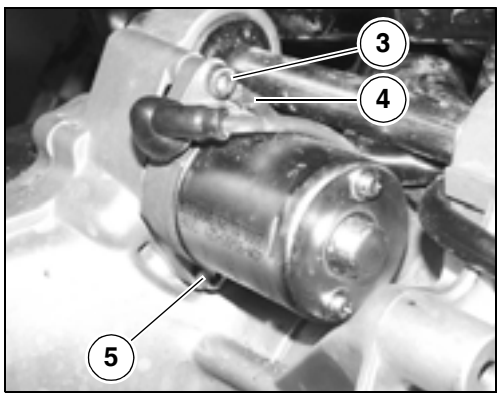
When handling products with a base of petroleum, it is strongly recommended to wear disposable latex or nitrile gloves.

KEEP AWAY FROM CHILDREN.









3.5 STARTER MOTOR

3.5.1 REMOVING THE STARTER MOTOR

If the starter motor (1) fails to operate, check and if necessary restore the electrical connections before removing the motor.

- Disconnect the connector (2).
- Release and remove the two screws (3).

IMPORTANT *There is no need to remove the engine from the frame.*

3.5.2 FITTING THE STARTER MOTOR

- Ensure that the O-ring (1) is properly seated in its groove, apply a thin film of special grease for oil seals. see 1.8 (LUBRICANT CHART). Now refit the starter motor (2).
- Fit the ground cable (4) under the upper screw (3).
- Tighten the two screws (3-5).
- Reconnect the connector to the main wiring harness.

3.6 STARTING SYSTEM

3.6.1 REMOVING THE STARTING SYSTEM

IMPORTANT *There is no need to remove the engine from the frame.*

- Remove the crankcase guard, see 6.1.11 (REMOVING THE CRANKCASE COVER).
- Release and remove the ten screws (1).
- Collect the two brackets.
- Unscrew and remove the central screw (2).
- Remove the variator casing (3) and place it on a clean supporting surface.
- Undo and remove the three nuts (4).
- Remove the plate (5) and filter (6).

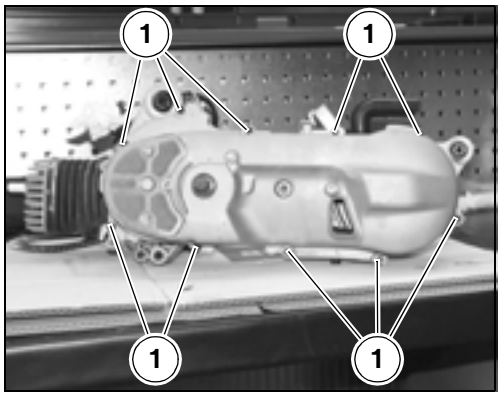
IMPORTANT *When refitting, blow out the filter (6) with compressed air.*

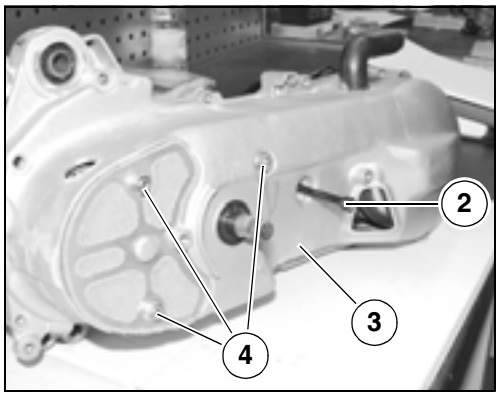
- Remove the gear guard (7) from inside the casing (3).
- Remove the sliding gear (8) complete with spring.

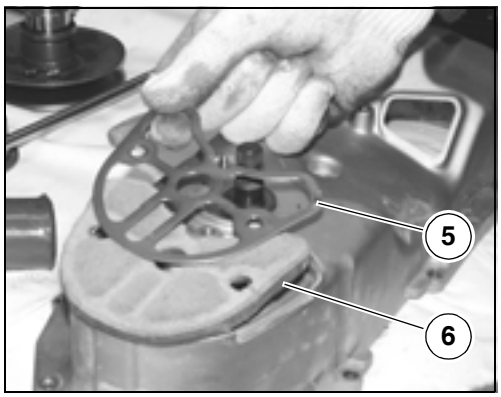
⚠ WARNING

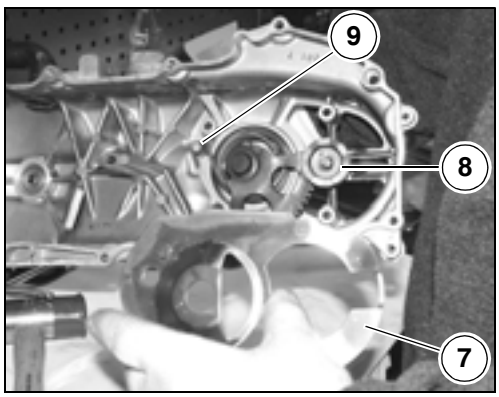
The spring (9) is preloaded.

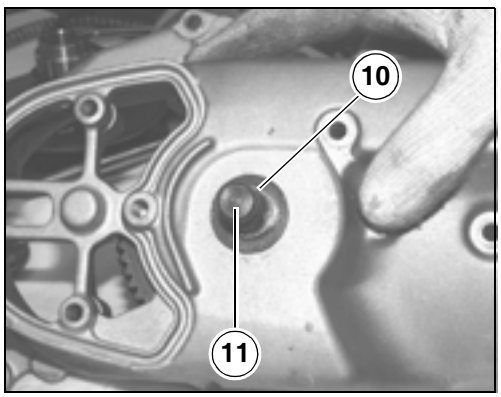
- With a pair of pliars, release the lever return spring (9).
- Remove the circlip (10) and collect the washer.
- Working from the outside of the casing (3) towards the inside, extract the starter shaft (11), the spring (9) and the bush.

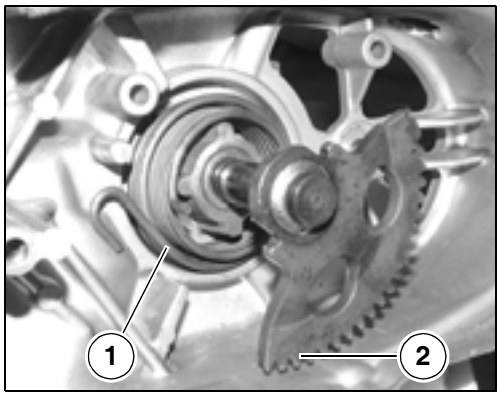


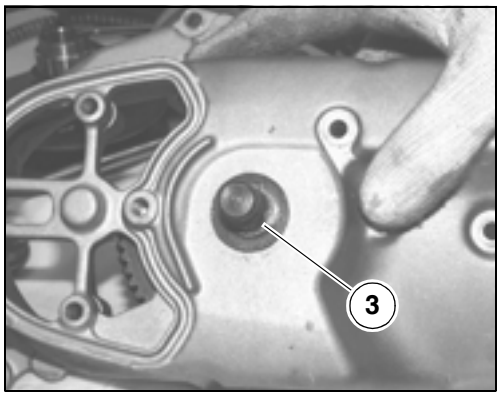


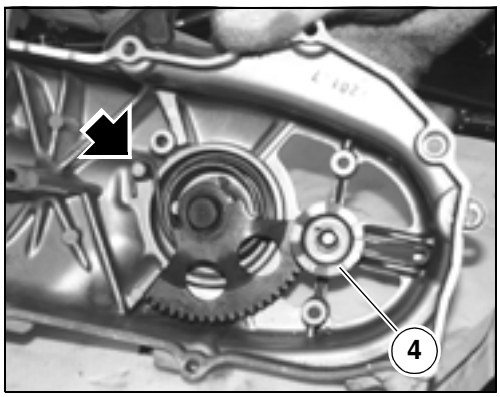












3.6.2 REFITTING THE STARTING SYSTEM

Refit, in the following order, the return spring (1), the pedal shaft (2), the bush, the plain washer and the circlip (3).

Attach the return spring (1) to the pedal spindle (2) and, using a spring pull hook, fix the other end to the pin.

IMPORTANT *When hooking the spring (1), avoid pulling it too hard.*

⚠ WARNING

Excessive pulling may cause the spring to yield.

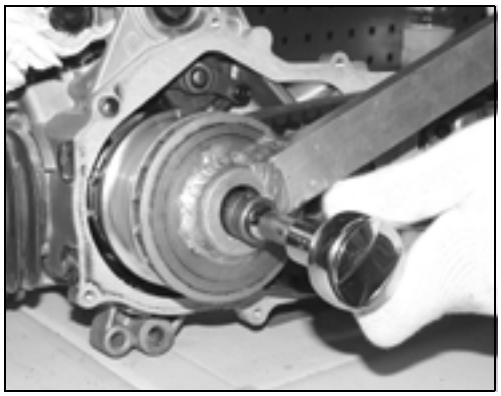
⚠ CAUTION

This is a dangerous operation.

Fit, in the following order, the pinion gear (4) and the spring. Slightly shift the pedal shaft (2) to facilitate the insertion of the gear.

IMPORTANT *Lubricate the spring and the sector gear with recommended grease, see 1.8 (LUBRICANT CHART).*

3.6.3 REMOVING THE PRIMARY PULLEY



IMPORTANT *There is no need to remove the engine from the frame.*

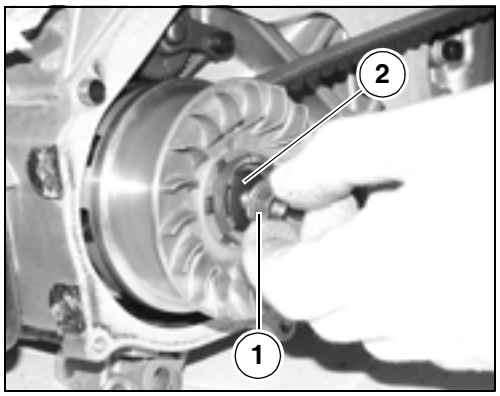
- Remove the variator casing, vedi 3.6.1 (REMOVING THE STARTING SYSTEM).
- Unscrew and remove the pulley nut (1) with the special tool (variator locking tool, code 8900673).

Torque wrench setting for nut (1): 33 Nm (3.3 kgm).

- Remove the coned washer (2)

IMPORTANT *Ensure that the washer (2) is refitted correctly on assembly.*

- Remove the start coupling (3), the spider (4), the (fixed) primary pulley (5) and the shim.

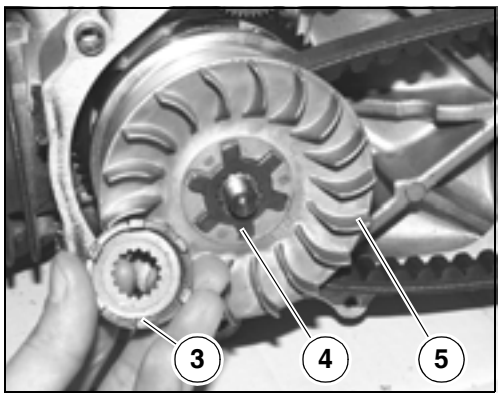


IMPORTANT *The shim is only present on the QUASAR 50.*

- At the same time, remove the bush (7), the (movable) primary pulley (6) and lug holder.

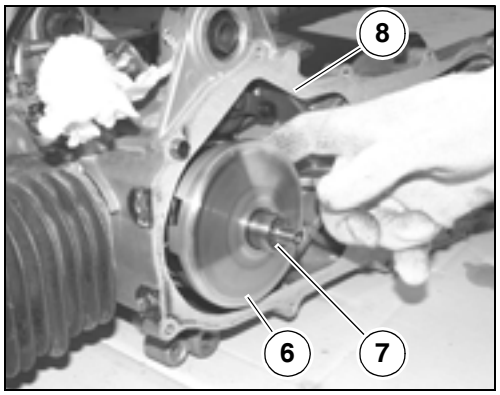
⚠ WARNING

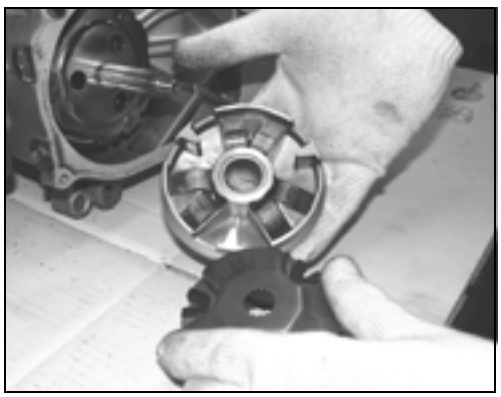
To prevent the six weights from falling inside, take care not separate the pulley from the lug holder.

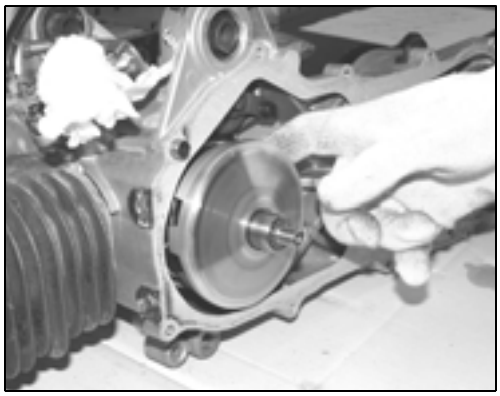


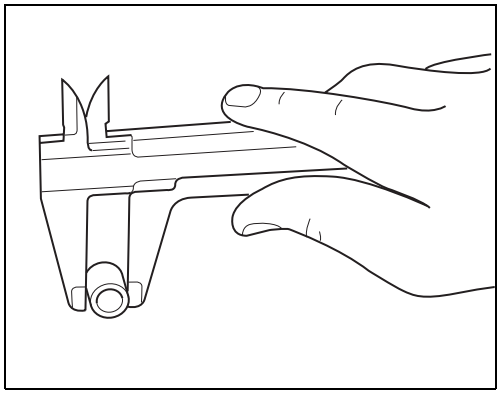
- Separate the pulley from the lug holder and remove the six weights.

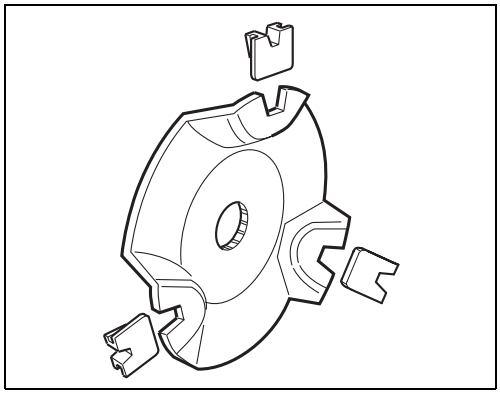
IMPORTANT *When refitting replace the gasket (8).*











3.6.4 CHECKING THE PRIMARY PULLEY

Check the (fixed and movable) primary pulley and the bush for signs of wear, breakage, scoring or other damage, and replace as necessary.
Check that the bush slides smoothly inside the (movable) primary pulley. If not, or if the play is excessive, replace the pulley and the bush.

Check that the outside diameter of the weights is not less than the wear limit, and if necessary replace them.

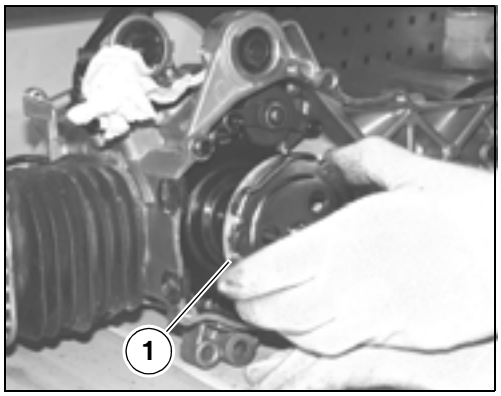
Wear limit: 14.5 mm.

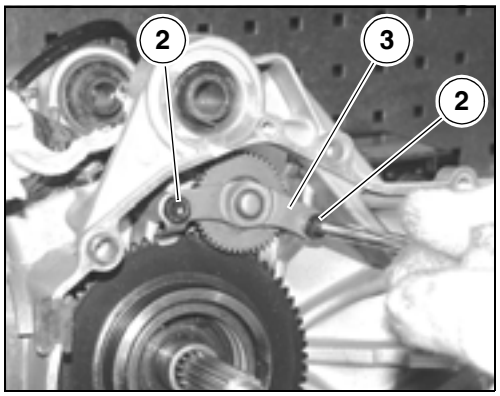
Check the condition of the lug holder and of the three driving lugs. Replace any worn lugs.

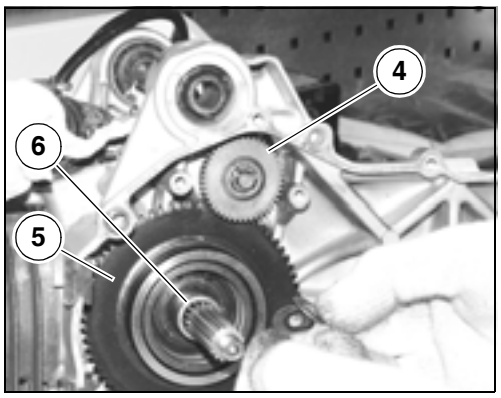
3.6.5 REMOVING THE STARTING FREEWHEELING CLUTCH

IMPORTANT *There is no need to remove the engine from the frame.*

- Remove the primary pulley, see 3.6.3 (REMOVING THE PRIMARY PULLEY).
- Extract the freewheeling clutch (1).
- Release and remove the two screws (2).
- Remove the idler gear stop plate (3), the three front washers, the idler gear itself (4) and the rear washer.
- At the same time remove the freewheeling clutch gear (5) and the roller cage.
- Collect the washer and the bush (6).



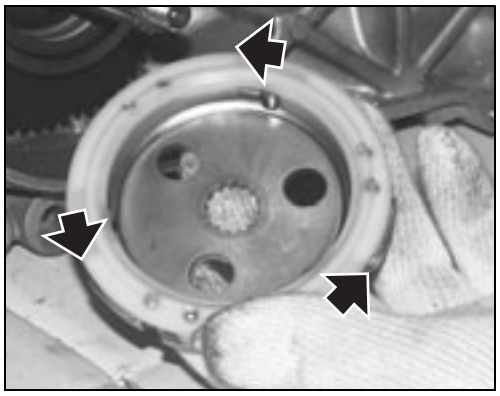


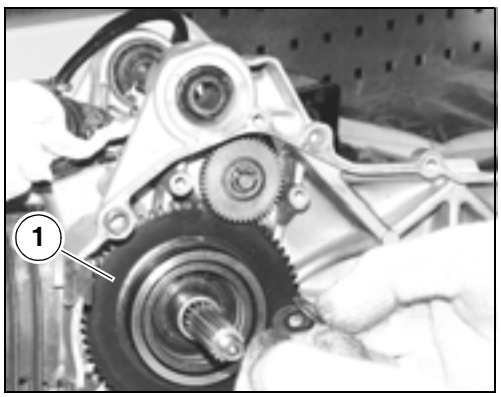


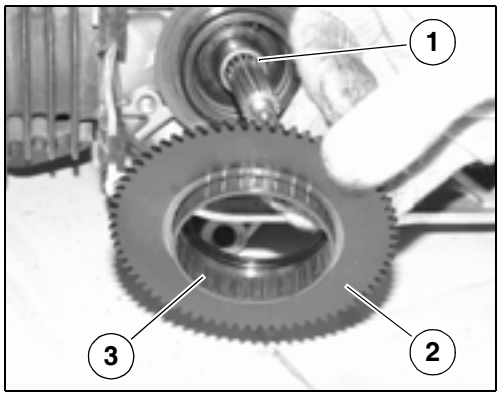
3.6.6 CHECKING THE STARTING FREEWHEELING CLUTCH

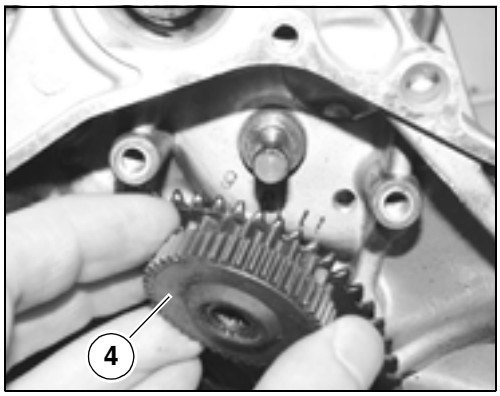
Check the general condition of the starting freewheeling clutch. When pushed in the direction of the arrows, the rollers should slide smoothly in their seats and return to their original positions when released. Replace as necessary.

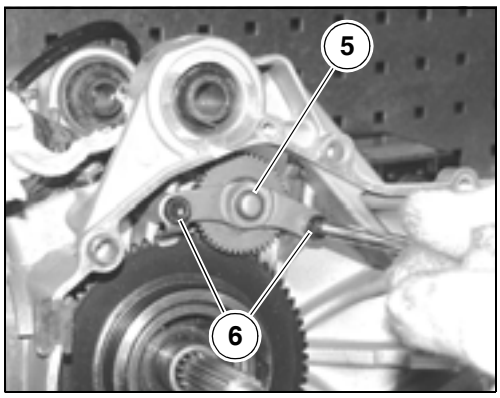
Check the condition of the gear teeth, the inner and outer surface of the freewheeling clutch gear (1) and of the roller bearing. Replace any wornout or damaged components.

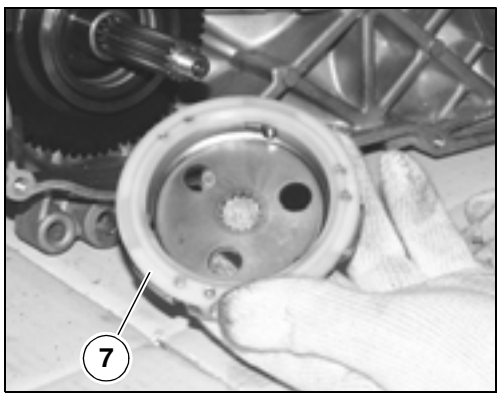












3.6.7 REFITTING THE STARTING FREEWHEELING CLUTCH

- Fit the bush (1) and the washer on the crankshaft.
- Fit the starting gear (2), lubricated with transmission oil, and the roller cage (3).
- Reposition the starting gear (4), lubricated with oil, the rear washer and the three front washers.
- Secure the plate (5) with the two screws (6).

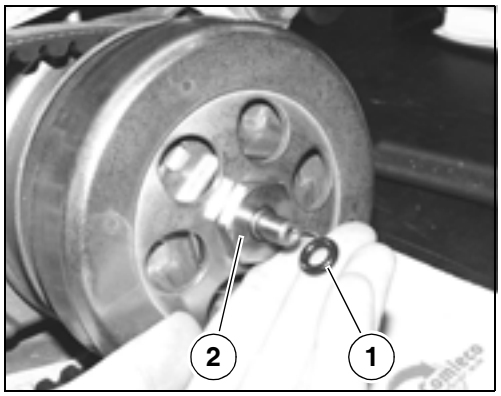
Torque wrench setting for screws (6): 9 Nm (0.9 kgm).

- Reposition the starting freewheeling clutch (7).
- Refit the primary pulley, see 3.6.3 (REMOVING THE PRIMARY PULLEY).

3.6.8 REMOVING THE CLUTCH AND THE SECONDARY PULLEY

- Remove the variator casing, see 3.6.1 (REMOVING THE STARTING SYSTEM).
- Extract the O-ring (1).
- Unscrew and remove the nut (2) with the special tool (flywheel and clutch bell housing retainer, code 8900675).

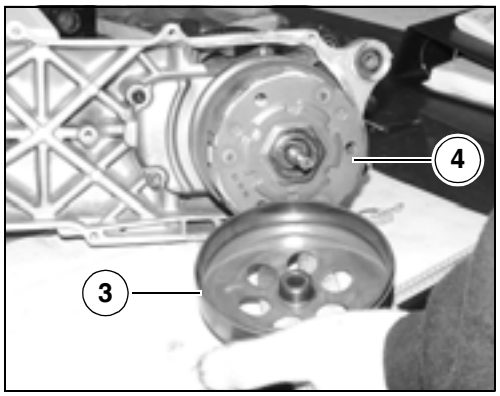
Torque wrench setting for nut (2): 50 Nm (5.0 kgm).



⚠ WARNING

Since the clutch locknut is tightened with a considerable torque, caution should be exercised in order to prevent injury.

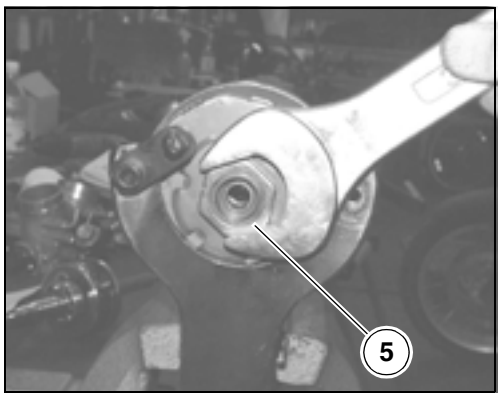
- Remove the clutch bell housing (3) and extract the belt.
- Remove the secondary pulley assembly (4).
- Remove the clutch locknut (5) after having compressed the assembly with the special tool (universal clutch assembly/disassembly tool, code 8900674).



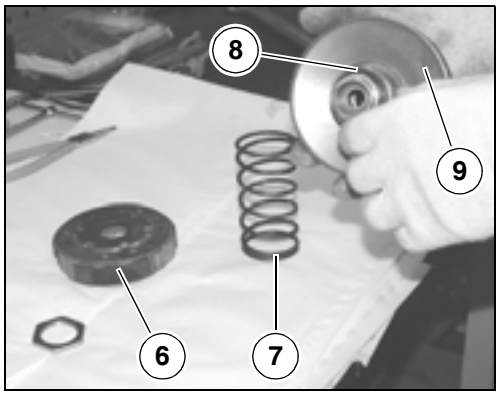
⚠ CAUTION

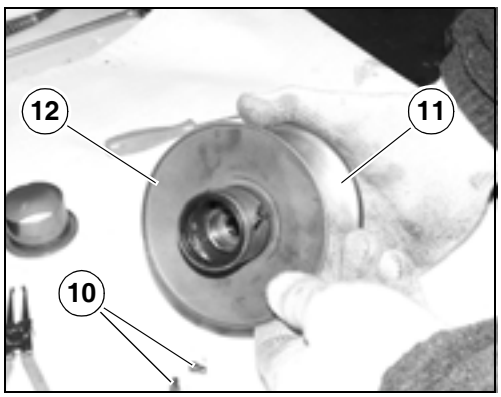
The spring is compressed.

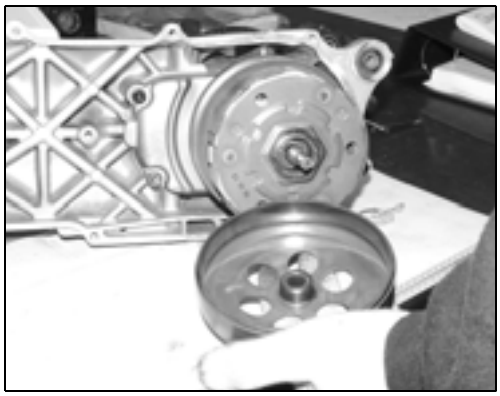
Torque wrench setting for nut (5): 50 Nm (5.0 kgm).



- Remove, in the following order, the clutch block support (6), the counterspring (7), the spring seat (8) and the complete secondary pulley (9).
- Remove the two locking dogs (10), and separate the fixed secondary pulley (11) from the movable one (12).







3.6.9 CHECKING THE CLUTCH

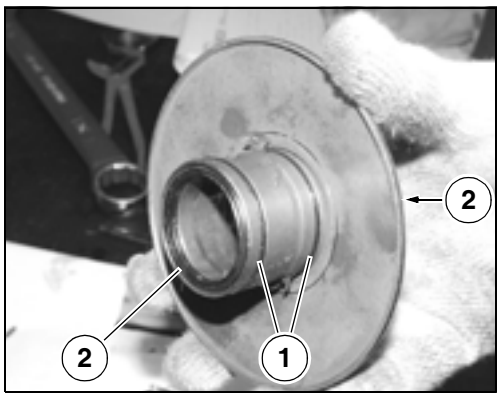
Check the inside surface of the clutch housing. If it shows signs of rust or scoring, remove and clean with emery cloth. Also measure the inside diameter.

Wear limit: 112.5 mm.

Check the clutch blocks. Check the clutch blocks and if necessary reface with coarse-grained abrasive paper. Thoroughly clean after completing the operation.

Dry out the blocks with compressed air. If the clutch blocks have vitrified, the deposit can be removed with emery paper.

IMPORTANT *After removing the vitrified deposit, use compressed air to thoroughly clean the clutch blocks of the sanding residues.*

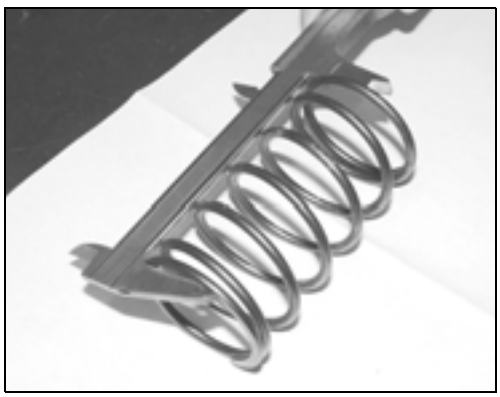


3.6.10 CHECKING THE SECONDARY PULLEY

Check the condition and sliding of the secondary pulley, and if necessary replace it. Check that the race, the locking dogs, the two O-rings (1) and the two oil seals (2) show no signs of damage or wear, and if necessary replace them.

Measure the free length of the (secondary pulley) counterspring. If it falls outside the tolerance range, replace it.

Free length: 69.7 mm.



3.6.11 CHECKING THE BELT

Check that the belt shows no signs of cuts, cracks or excessive wear, and that it is not impregnated with oil. If any of the above defects is present, replace the belt.
Measure the head width at several points along the belt and, if it falls outside the allowable range, replace the belt.
Standard width: 15.9 mm.

3.6.12 REFITTING THE SECONDARY PULLEY

Before fitting the pulley, clean its sliding surface, and if necessary add grease in the fixed half pulley (1) see 1.8 (LUBRICANT CHART).

⚠ WARNING

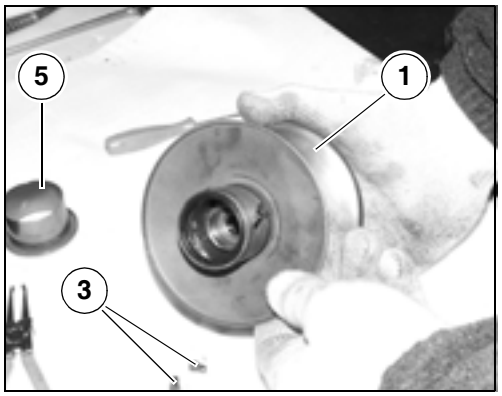
Wrap adhesive tape around the pulley end in order to avoid overturning the lips of the oil seals while fitting the pulley.

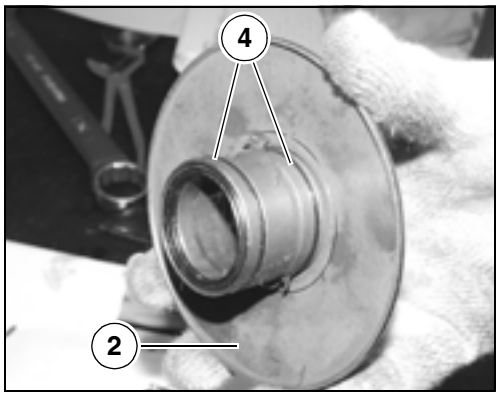
Fit the two locking dogs (3) and apply grease in the groove of the movable pulley (2).
Grease the O-rings (4) of the movable secondary pulley before fitting them.

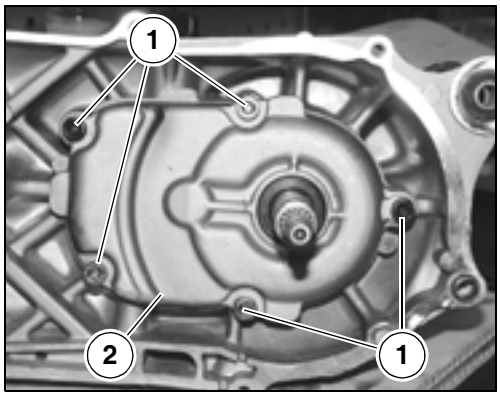
After fitting the spring seat (5), check the sliding of the pulley and then fit the return spring.

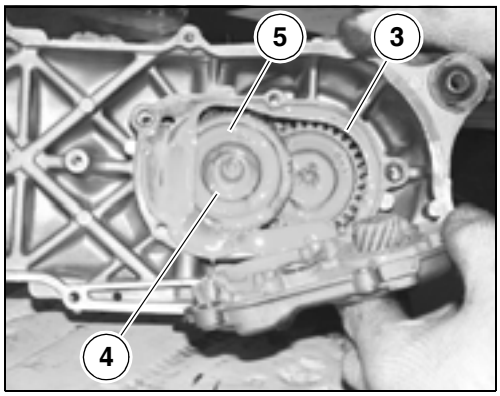
⚠ WARNING

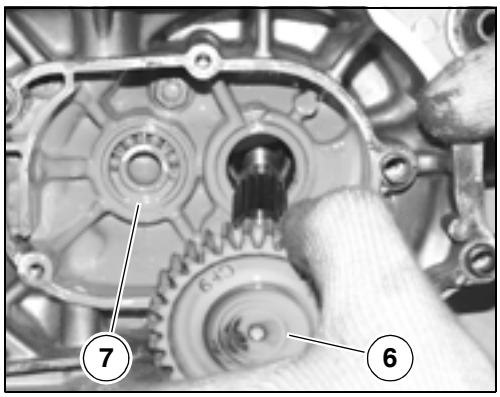
Remove any excess grease.

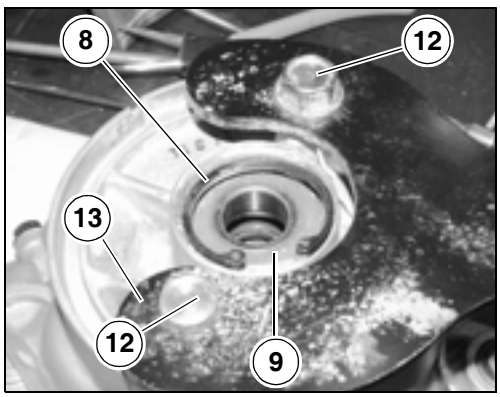


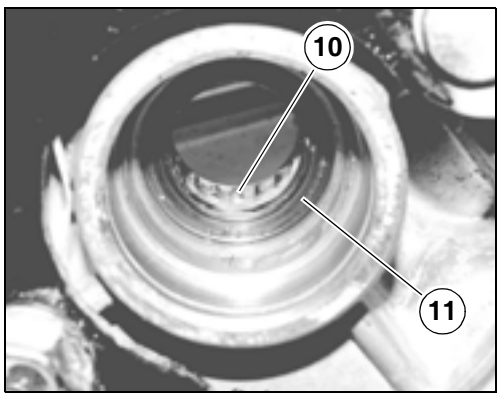












3.7 TRANSMISSION REMOVAL

IMPORTANT *There is no need to remove the engine from the frame.*

- Remove the secondary pulley, see 3.6.7 (REFITTING THE STARTING FREEWHEELING CLUTCH).

⚠ WARNING

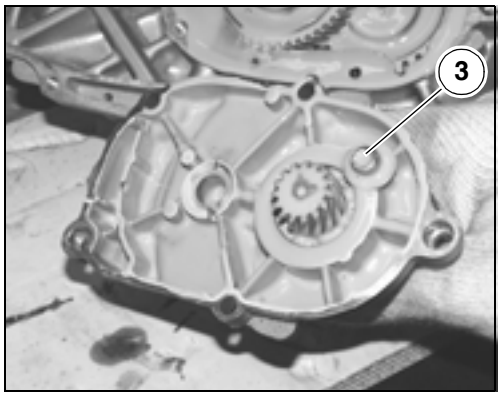
Before removing the transmission cover, drain all the oil, see 2.12 (CHECKING THE TRANSMISSION OIL LEVEL).

- Release and remove the five screws (1).
- Remove the transmission cover (2) complete with drive shaft.
- Remove the seal (3)
- Remove the washer (4).
- Remove the double idler gear (5).
- Remove the ouput shaft (6).

IMPORTANT *The following operations require the engine to be removed from the frame, see 3.1.2 (REMOVING THE ENGINE FROM THE FRAME). To remove the bearing (7), heat the engine casing.*

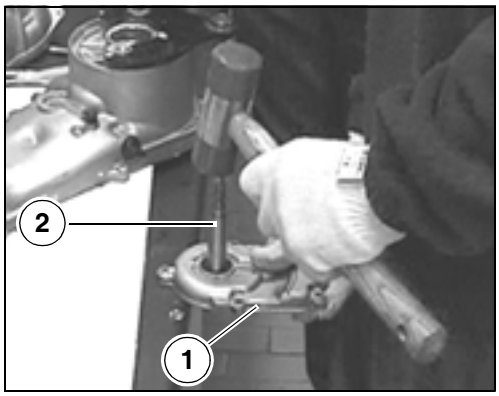
- Remove the circlip (8).
- Use a suitable punch to tap the bearing (9) out from the casing.
- Use a suitable punch to tap the bearing (10) and gasket (11) out from the casing.
- Release and remove the two screws (12), one inside and the other outside the casing, and extract the engine stand (13).

3.7.1 REMOVING THE DRIVE SHAFT

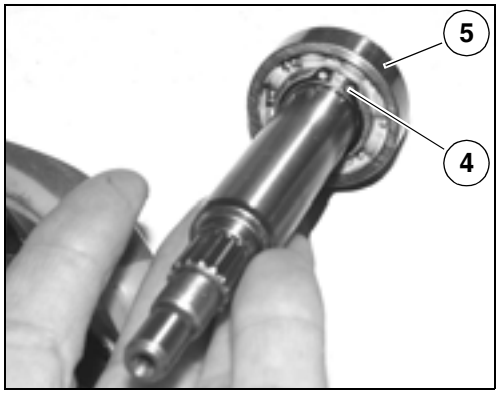


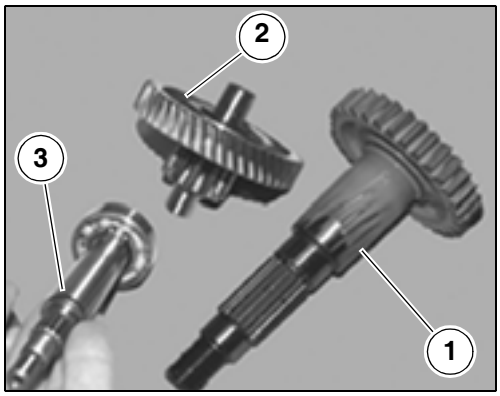
- Remove the transmission cover (1), see 3.7 (TRANSMISSION REMOVAL).
- Release and remove the screw (3) and collect the washer.
- Extract the complete drive shaft (12) using a mallet to tap it towards the interior of the casing.

IMPORTANT *When refitting, replace the oil seal inside the transmission cover (1).*



- Remove the circlip (4).
- Remove the bearing (5).



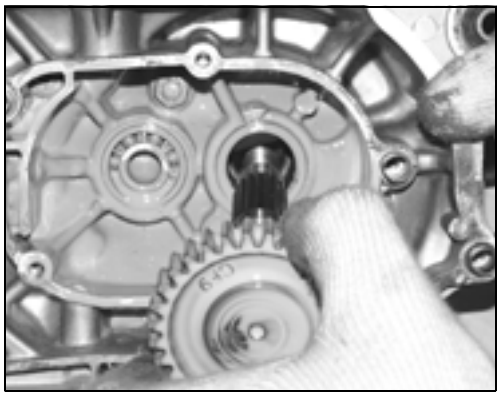


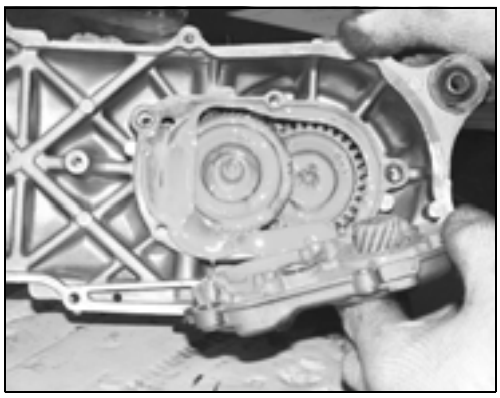
3.7.2 CHECKING THE TRANSMISSION

Check that the output shaft gears (1), the double idler gear (2) and the drive shaft (3) show no signs of wear. Replace any worn components.

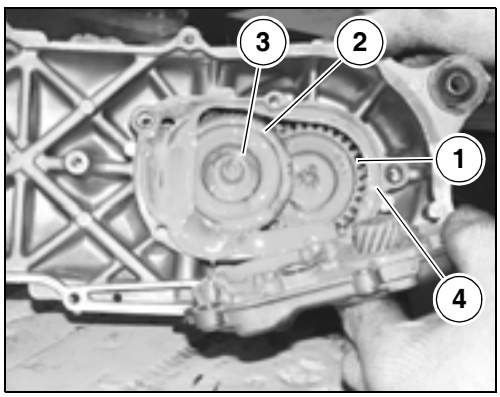
Check that the transmission bearings show no signs of scoring or seizing. Replace as necessary.

Check that the drive shaft slides smoothly. Replace in case of malfunction.

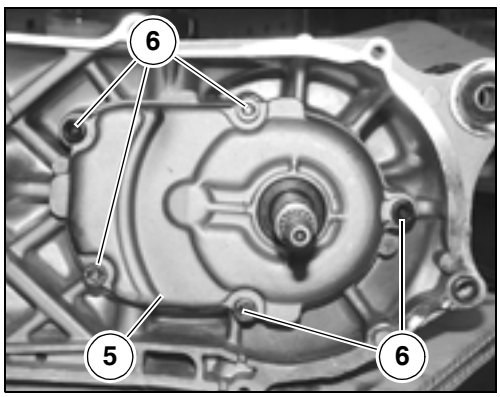




3.7.3 REFITTING THE TRANSMISSION



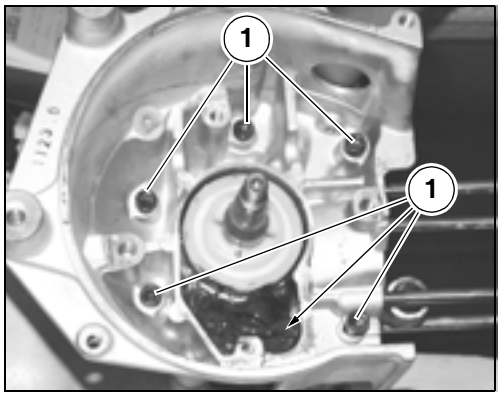
- Fit, in the following order, the output shaft (1), the double idler gear (2) and the washer (3), after lubricating the bearings and the oil seal, see 1.8 (LUBRICANT CHART).
- Replace the seal (4).
- Fit the transmission cover (5).
- Tighten the five screws (6) in a cross pattern.
- Top up oil level, see 2.12 (CHECKING THE TRANSMISSION OIL LEVEL).



3.8 CRANKCASE - CRANKSHAFT

3.8.1 REMOVING THE CRANKSHAFT

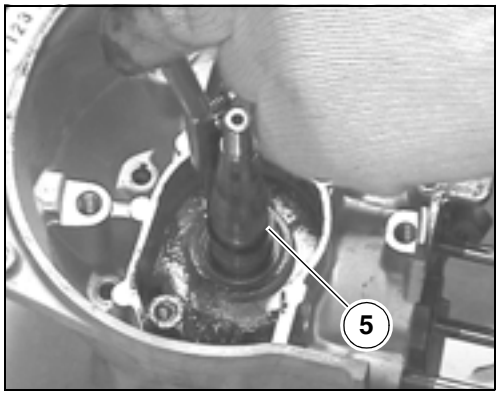
- Remove the piston, see 3.2.3 (REMOVING THE PISTON).
- Remove the complete oil pump, see 3.4.1 (REMOVING THE OIL PUMP).
- Remove the starter clutch, see 3.6.5 (REMOVING THE STARTING FREEWHEELING CLUTCH).
- Release and remove the six screws (1).
- Remove the crankshaft circlip (5).
- Tension the tool (2) (crankcase separator, code 8900676) after fixing it to the two cast supports.



⚠ WARNING

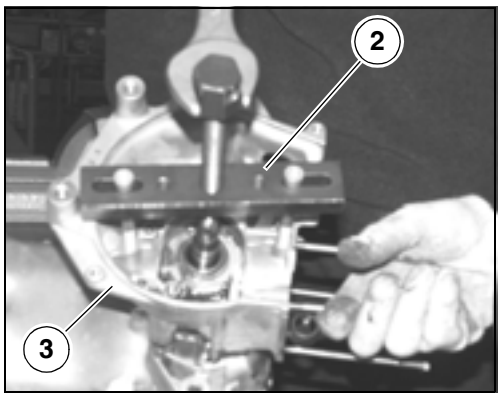
Tighten the tool support bolts making sure that the tool is parallel with the crankcase.

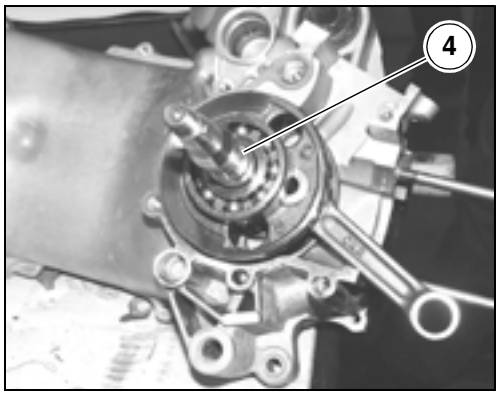
- Lubricate between the spacer tube and the crankcase bearings. Hit the axle while applying a rotary effort with the crankcase separator.



IMPORTANT *Use a mallet on the half crankcase, taking care to hit the reinforced part, not the gasket contact surface.*

- Remove the right-hand half-casing (3).
- Tap the crankshaft (4) with a mallet towards the interior of the left-hand half-casing and remove it complete.





3.8.2 CHECKING THE CRANKCASE, THE CRANKSHAFT AND THE CONNECTING LINK

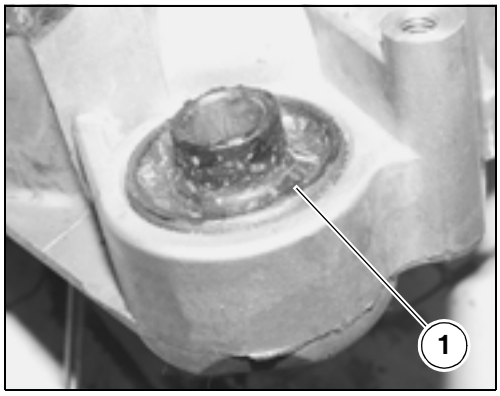
Check the crankshaft bearings by rotating their inner races. Replace any bearing that does not rotate smoothly, or that shows any radial play or excessive side play. If the inner race of the bearing is stiff, clean it thoroughly. Apply a little lubricant to the bearing and then perform the test again. Uneven rotation of the bearing may be due to the presence of dirt or foreign bodies in the pin. Once the pin has been thoroughly cleaned, the inner race of the bearing should no longer be stiff or rotate jerkily when turned manually. If the rotation is still abnormal, replace the bearing.
Check the condition of the connecting rod. Check the crankshaft bearing housings for wear and scorings. Check the condition of the connecting rod big-end bearing by rotating it around its pin. If, after the component has been

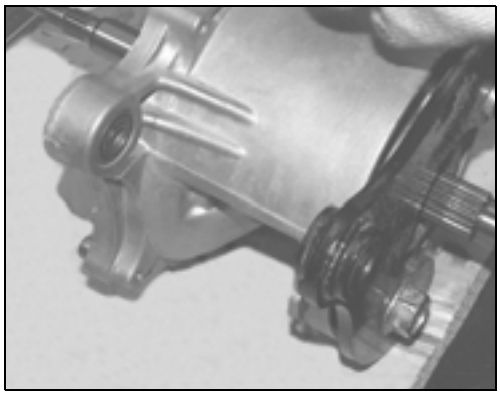
carefully cleaned, the big-end bearing is still stiff, does not rotate smoothly, or has an excessive play, proceed to replace it.

⚠ WARNING

The replacement of the big-end bearing should be carried out by a skilled technician using the special tools required for this operation.

Also check that the connecting rod is not bent, and that its travel is exactly perpendicular to the crankshaft.

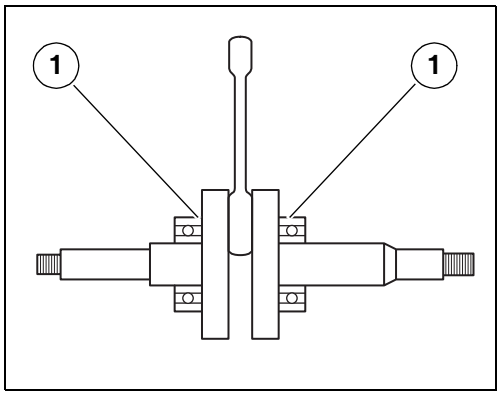




3.8.3 REMOVING THE ENGINE SILENT BLOCK

IMPORTANT *The procedure described below applies to all four silent blocks.*

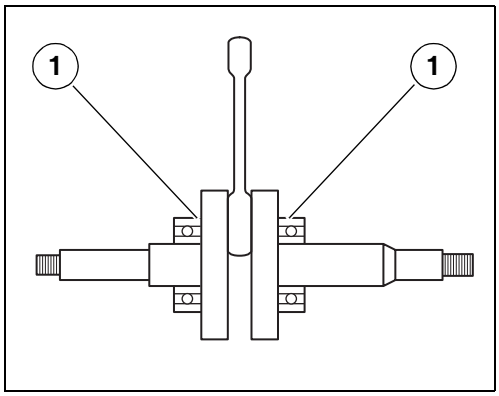
- Using an automatic heater, heat the crankcase to approximately 150°C (~ 10 minutes' operation).
- Use a hydraulic press to remove the silent block (1), applying force towards the interior.



3.8.4 FITTING THE BEARINGS

Fit two new bearings (1) on the crankshaft.
Heat the bearings in oil at 120 °C (248 °F) and fit them to the crankshaft with a tubular drift resting on the inner race and the special support, using a hydraulic press to carefully snug them on.
Using an automatic heater, heat the crankcase to approximately 150° C (~10 minutes' operation) and then drive the crankshaft into the left-hand crankcase, see 3.8.5 (FITTING THE CRANKCASE).

3.8.5 FITTING THE CRANKCASE



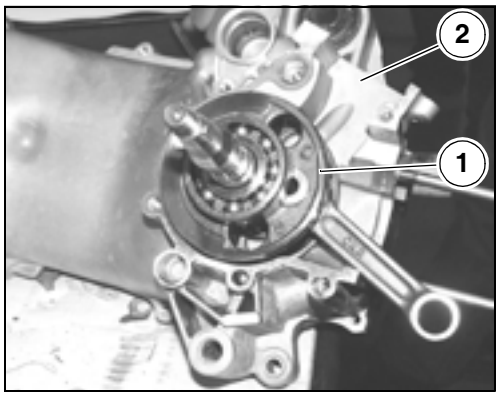
⚠ WARNING

Apply grease to the oil seals and oil to the bearings so as to protect the crankshaft (1) against possible scoring and facilitate the fitting.

- Using an automatic heater, heat the right-hand crankcase to approximately 150 °C (~ 10 minutes' operation).
- Install the crankshaft (1) into the left-hand crankcase (2).
- Mount the right-hand crankcase on the crankshaft.
- Tighten the six fastening screws (3) in a cross pattern.

Torque wrench setting for screws (3): 9 Nm (0.9 kgm).

- Fit the circlip (4).

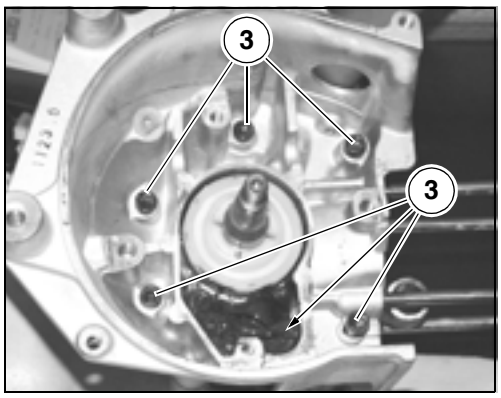


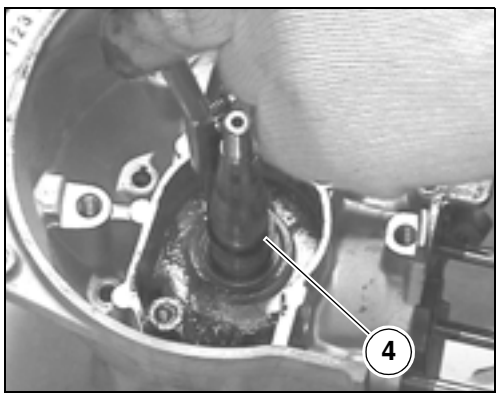
After completing the operation, check that the crankshaft (1) has been properly installed.

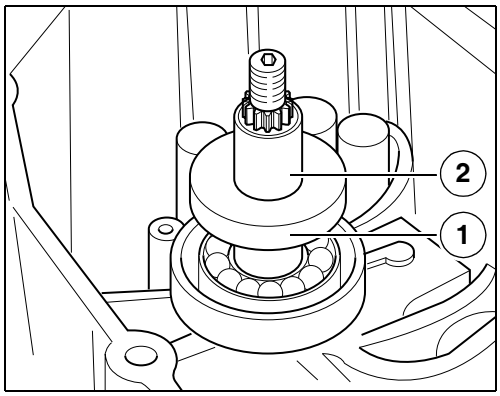
IMPORTANT *If necessary, use a mallet to restore the axial play.*

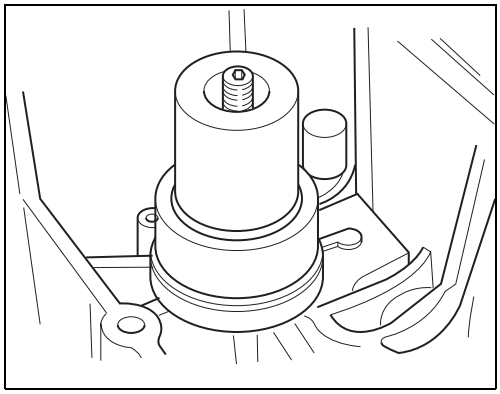
⚠ WARNING

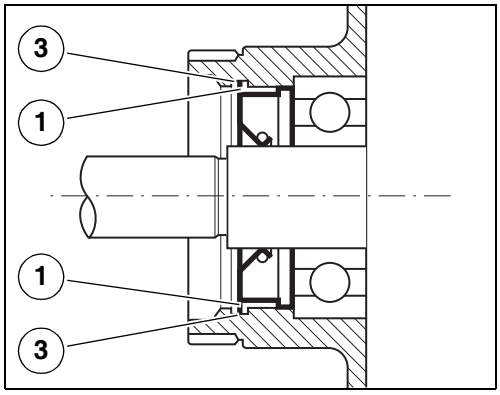
Carry out this operation with a plastic or rubber mallet, not an iron hammer. Take care not to hit the crankshaft.











3.8.6 FITTING THE CRANKSHAFT OIL SEAL

- On the left side of the engine, fit the oil seal (1), the circlip and the centring bush (2) taking care to smear the lip of the oil seal with grease, see 1.8 (LUBRICANT CHART).
- To facilitate the fitting, use a drift of suitable diameter.
- Once the parts are in place, check that the oil seal lip (1) is seated in the crankcase recess (3) as shown in the figure.
- Fit the oil seal to the right side in the same manner as described above.

NOTES

NOTES

SISTEMA DI ALIMENTAZIONE
FUEL SYSTEM

4

FUEL SYSTEM

CONTENTS

4

4.1 MAINTENANCE

Check the condition of the fuel system hoses every six months. Hoses which are dried out, cracked or cut must be replaced. Make sure the hoses are not twisted or crushed. Periodically check and clean the fuel filter.

4.2 DRAINING THE FUEL TANK

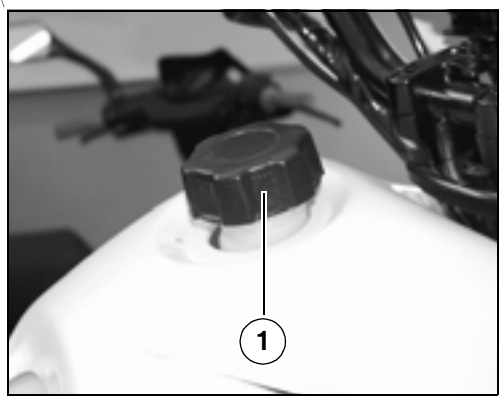
Read carefully 1.3 (GENERAL SAFETY RULES).

⚠ CAUTION

Risk of fire. Allow for the engine and exhaust silencer to cool down completely. Fuel vapours are harmful to human health. Ensure that the room is well ventilated before proceeding. Do not inhale fuel vapours. Do not smoke or use bare flames near fuel vapours.

DO NOT RELEASE FUEL INTO THE ENVIRONMENT.

- The engine should be off and completely cold.
- Prepare a container of more than adequate capacity to contain the amount of fuel in the tank. Place the container on the floor on the right-hand side of the motorcycle.
- Remove the fuel tank filler cap (1).
- Use a manual pump or similar system to drain the fuel tank.

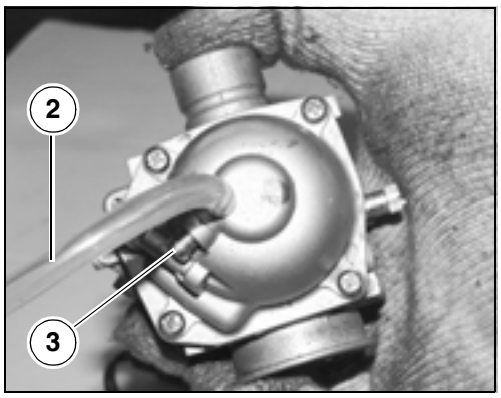


⚠ CAUTION

After draining the tank, close the fuel filler cap (1).

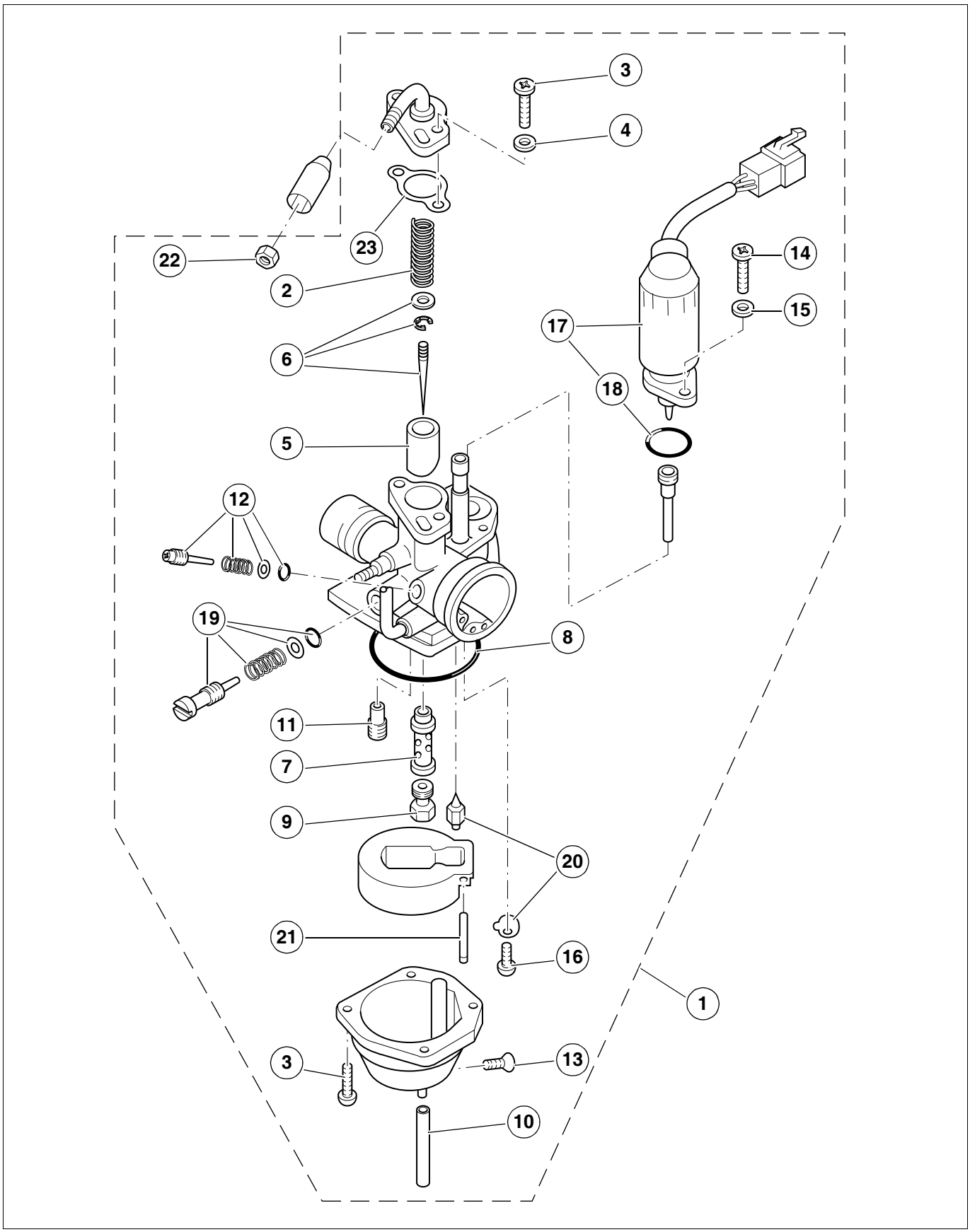
To drain the carburettor completely, proceed as follows:

- Place the free end of the hose (2) into a container.
- Working on the left-hand side of the vehicle, open the fuel drain by releasing the drain screw (3) below the sump.
- When all the fuel in the carburettor has drained out, fully tighten down the drain screw (3).



⚠ WARNING

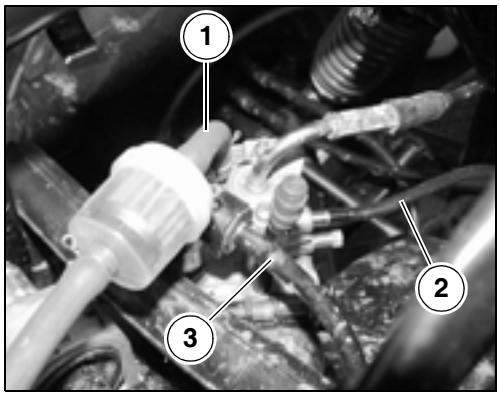
Tighten the drain screw (3) to avoid fuel leaks from the carburettor when refilling.

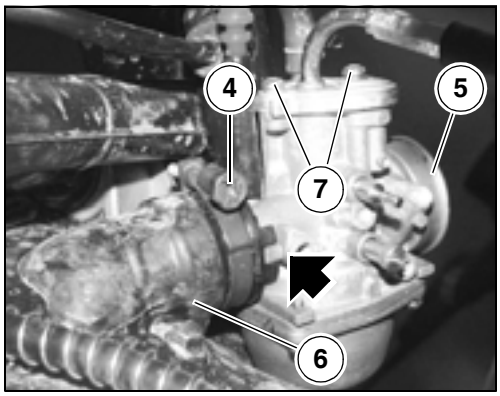

3
4
22
23
2
14
15
17
6
18
5
12
19
8
11
7
9
20
21
16
1
3
13
10

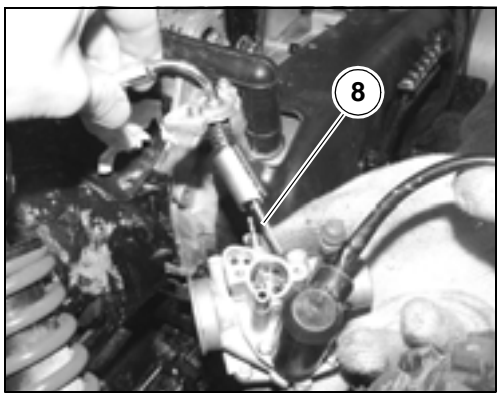
Key:
1) Carburettor
2) Spring
3) Screw
4) Elastic washer
5) Gas valve
6) Needle kit
7) Emulsion tube
8) Sump gasket
9) Maximum jet
10) Minimum hose
11) Pilot jet
12) Minimum air adjuster screw
13) Sump drain screw
14) Screw
15) Washer
16) Screw
17) Automatic starter
18) O-Ring
19) Minimum adjuster screw
20) Float kit
21) Float spindle
22) Gas cable adjuster screw
23) Gasket

4.2.1 CARBURETTOR SPECIFICATIONS

Components	Version 50 specifications	Version 100 specifications
Carburettor type	MIKUNI	MIKUNI
Float needle	1.2 mm (0.05 in)	1.2 mm (0.05 in)
Main jet	75	82,5
Needle	CRI 3	CR 4
Emulsion tube	426 E-1	681 E-3
Minimum jet	17,5	17,5
Air jet	1.2 mm (0.05 in)	1.2 mm (0.05 in)







4.3 REMOVING THE CARBURETTOR

◆ Remove the airbox, see 2.10 (AIR CLEANER).

IMPORTANT *Close the fuel tap to avoid fuel leaks.*

⚠ WARNING

Place a cloth below the carburettor to collect any spillage.

◆ Disconnect the fuel pipe (1).
◆ Disconnect the oil pipe (2).
◆ Disconnect the automatic starter connector (3) from the main wiring harness.
◆ Slacken the clip (4) and remove the carburettor (5) from the intake hose (6).

⚠ WARNING

Plug the intake hose (6) with a clean cloth.

◆ Unscrew the two screws (7).
◆ Extract the needle (8) which is still attached to the throttle cable.

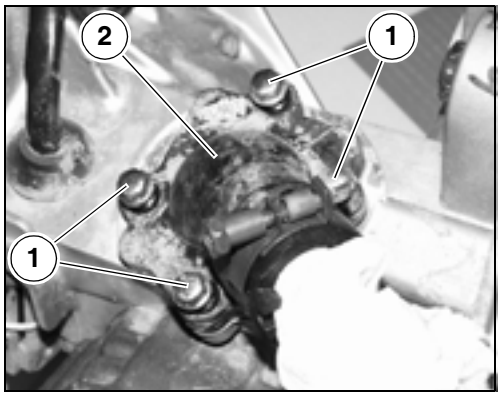
⚠ WARNING

Take care not to damage the needle (8).

◆ Remove the carburettor (5),

IMPORTANT *When refitting, fit the carburettor (5) in the intake hose (6) taking care to fit the carburettor tongue between the two tongues on the manifold. This will ensure proper positioning of the carburettor.*

4.4 REMOVING THE REED VALVE UNIT



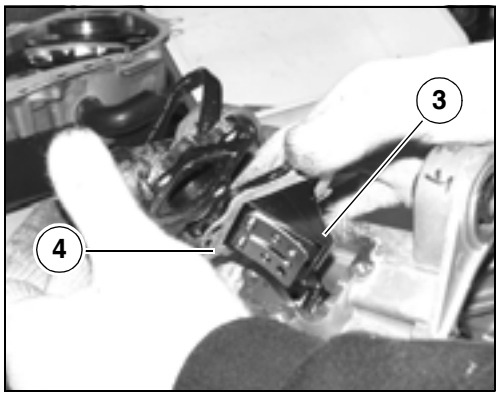
- Remove the deflector, see 6.1.10 (REMOVING THE DEFLECTOR).
- Remove the four screws (1).

Torque wrench setting for screws (1): 8 Nm (0.8 kgm).

- Remove, in the following order, the intake manifold (2), the reed valve (3) and the related gasket (4), taking care to insert a cloth in the intake slot so as to prevent dirt from entering and hindering the operation of the mechanisms.
- Check for any damage or breakage of the reed valve stops and if necessary replace them.

⚠ WARNING

Never attempt to repair the reed valve or its support.

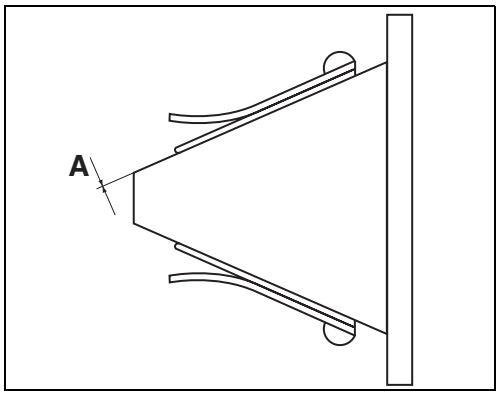


4.4.1 CHECKING THE REED VALVE

Check for any damage or breakage of the reed valve stops and if necessary replace them.

Measure the bending limit (A) of the reed valve. If it falls outside the tolerance range, replace the valve.

Bending limit: 0.2 mm



NOTES

ELECTRIC SYSTEM 5

ELECTRIC SYSTEM

CONTENTS

5

5.1 FOREWORD

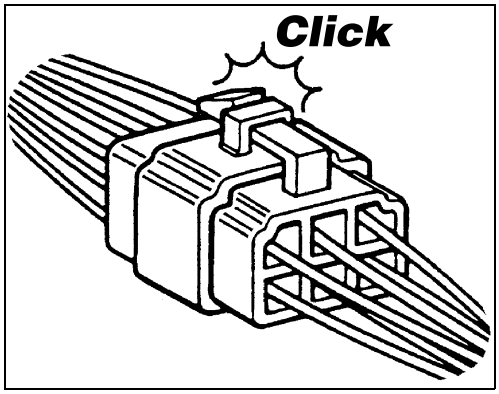
Please read the following information before reading this section.

IMPORTANT *For ease of reference, the same numbering is used in the specific wiring diagrams and in the general schematics.*

5.1.1 CABLE COLOURS

O Orange
Lb Light blue
B Blue
W White
Y Yellow
Gr Grey
Brn Brown
Blk Black
R Red
Pnk Pink
Grn Green
Ppl Purple

5.1.2 ELECTRICAL CONNECTORS



Disconnect the electrical connectors as follows:

- Press down on the locking tab, where fitted.

⚠ WARNING

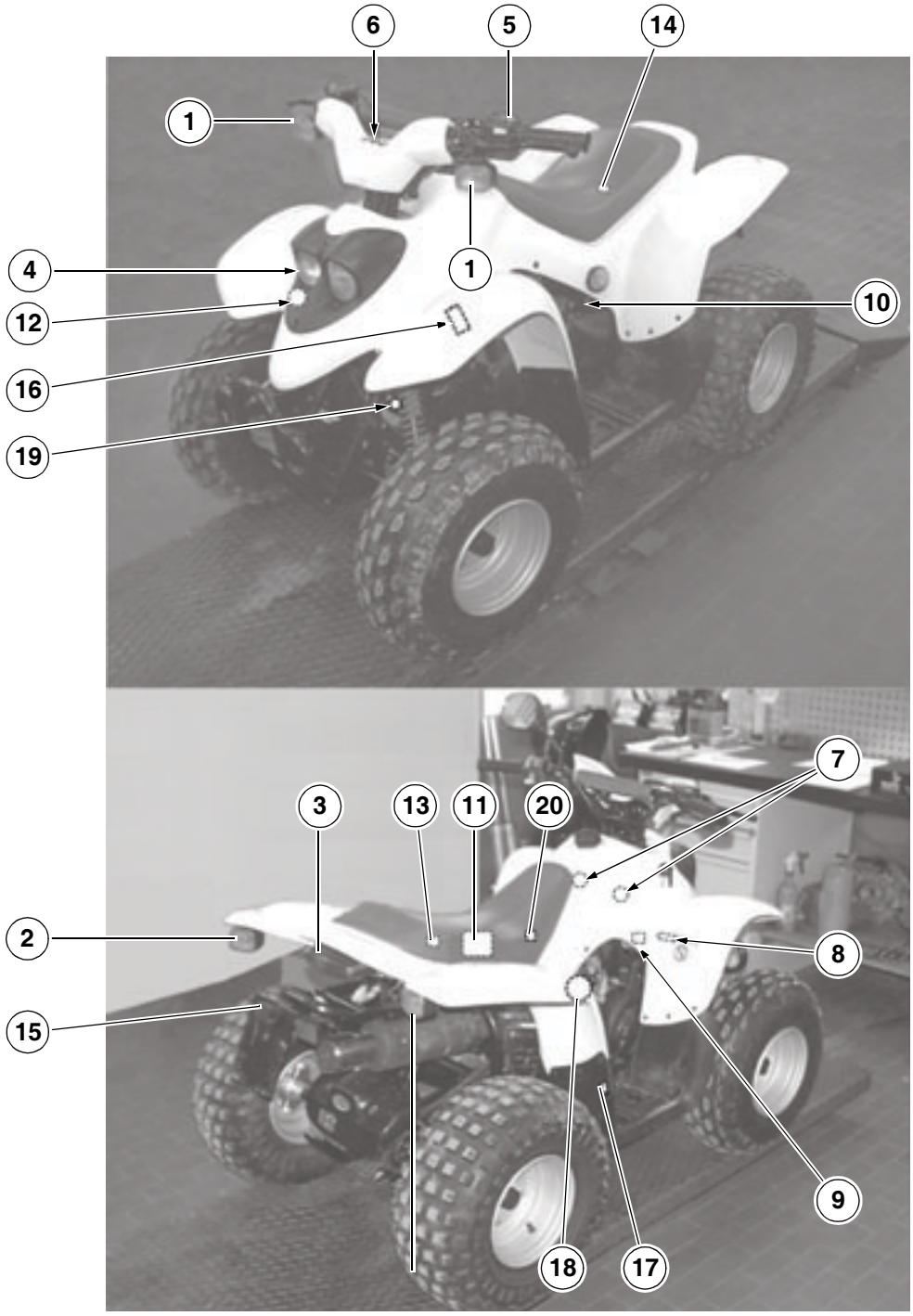
Never separate two connectors by pulling on the wiring.

- Grasp both connectors and pull them in opposite directions until they become separated.
- Remove any dirt, rust, moisture, etc. from inside the connector blowing with compressed air.
- Ensure that the wires are securely crimped to the terminals inside each connector.

IMPORTANT *A connector will only locate properly into the matching connector when it is inserted in the correct mounting position.*

- Reconnect the two connectors and ensure that they are fully engaged (the locking tab should click audibly into place).

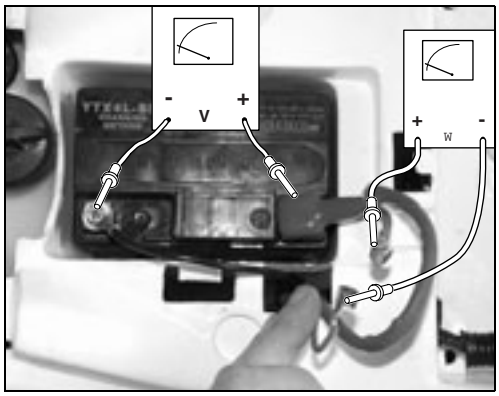
5.2 ELECTRICAL COMPONENTS



Key:
1) Front direction indicators
2) Rear direction indicators
3) Tail light
4) Headlight
5) Left-hand commutator
6) Handlebar cover
7) Hazard lights relay
8) Voltage stabiliser
9) Rectifier
10) Engine Control Unit
11) Battery
12) Warning horn
13) Starting relay
14) Fuse
15) Number plate light (Quasar 100 only)
16) Coil
17) Stoplight switch
18) Starter motor
19) Spark plug
20) Oil level sensor

5.3 TROUBLESHOOTING

5.3.1 CHECKING CHECKING THE CHARGE VOLTAGE

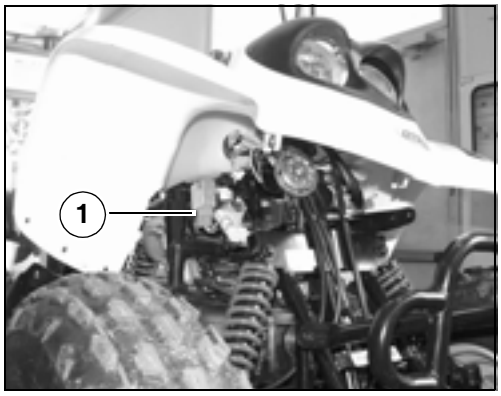


- After having completely charged the battery, see 2.5 (BATTERY).
- Connect a multimeter between the positive (+) and negative (-) battery terminals.
- After starting the engine, disconnect the fuse and connect an ammeter to the ends of the wires.
- Using a revolution counter, accelerate and measure the charge voltage and current.

13.5 ~ 15.5 V / 1.0 A below 5000 rpm.

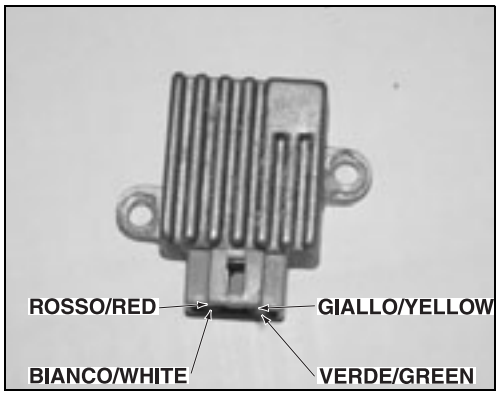
If the measured value is incorrect, check the rectifier, see 5.3.2 (RECTIFIER).

5.3.2 RECTIFIER



- Disconnect the four-way connector (1) (coloured green).
- Set a multimeter to the x 1 MΩ range and measure the resistance of each terminal from the rectifier side (inner male terminals).

	Connect meter (+) to:				
Connect meter (-) to:	-	White	Yellow	Red	Green
	White	-		8-10 k	∞
	Yellow	∞	-	∞	33-35 k
	Red	∞	∞	-	∞
	Green	∞	33-35 k	∞	-

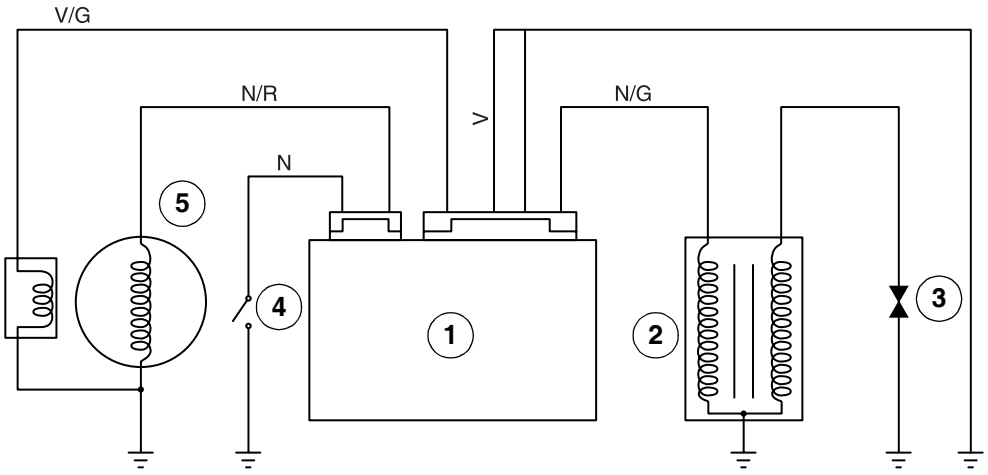


⚠ WARNING

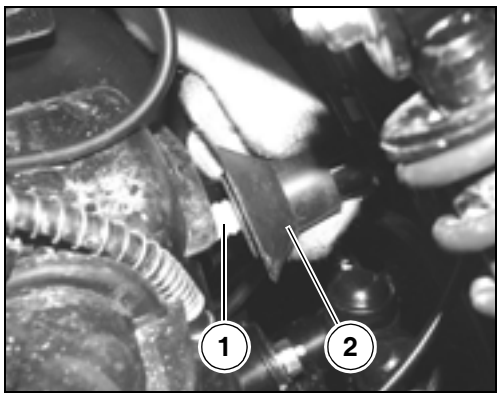
This test method provides an approximate measure of resistance. Where possible, fit a substitute rectifier known to be in good working order to test the charge system.

If the reading found deviates from the specified value, change the rectifier.

5.4 FUEL INJECTION SYSTEM



Key:
1) Engine Control Unit (ECU)
2) HT coil
3) Spark plug
4) Main switch
5) Generator



5.4.1 HIGH TENSION COIL

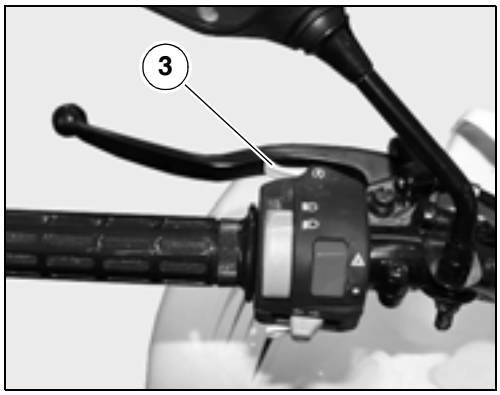
Read carefully 1.3 (GENERAL SAFETY RULES).

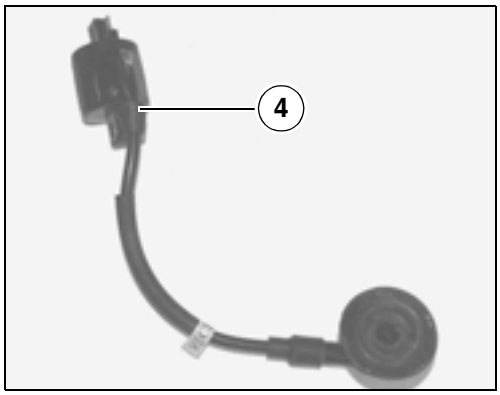
- Remove the cylinder guard, see 6.1.9 (REMOVING THE AIR SCOOP GUARD).
- Remove the spark plug (1) and refit its cap (2).
- Touch the spark plug to the head fins.

⚠ CAUTION

Do not touch the metal parts. Electrical shock hazard. Hold the spark plug only by its cap (2).

- Turn the key to "○" and press the start button "⚡" (3).
- Check that the electrodes spark.
- If this does not happen, replace the coil (4).





5.5 BULBS

Read carefully 1.3 (GENERAL SAFETY RULES).

⚠ CAUTION

Risk of fire. Keep fuel and other flammable substances away from the electrical components.

⚠ WARNING

Before changing a bulb, move the main switch to position "⊗" and wait a few minutes, so that the bulb cools down. Change the bulb wearing clean gloves or using a clean and dry cloth. Do not leave fingerprints on the bulb, since these may cause its overheating and consequent breakage. If you touch the bulb with bare hands, remove any fingerprint with alcohol, in order to avoid any damage.

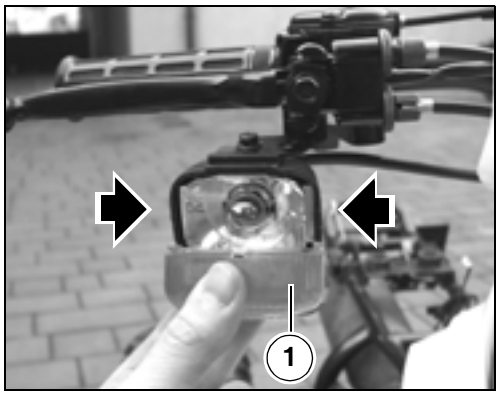
DO NOT FORCE THE ELECTRIC CABLES.

IMPORTANT *Before changing a bulb, check the fuse, see 5.5.6 (CHANGING THE FUSES).*

5.5.1 CHANGING THE DIRECTION INDICATOR BULBS

Read carefully 5.5 (LAMPADINE).

- Remove the protection screen (1) from the indicator mount by pushing on its sides with a screwdriver.

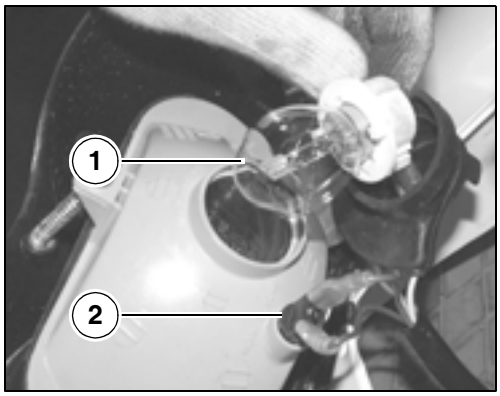


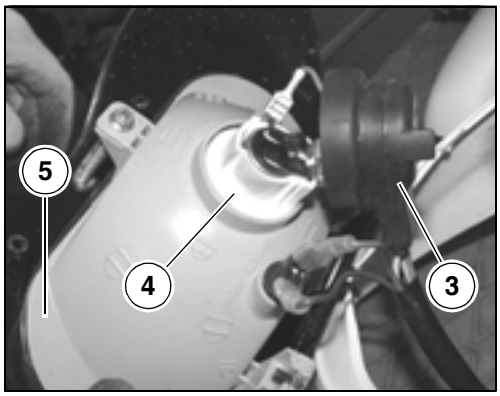
⚠ WARNING

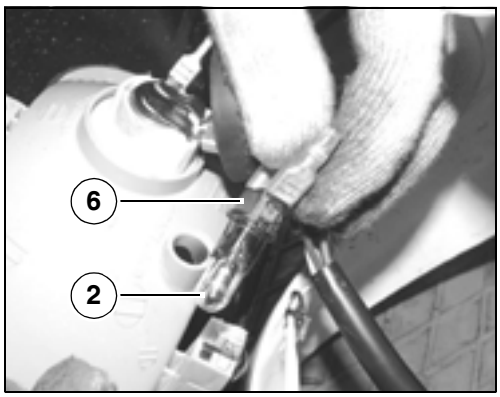
Make sure not to damage the protection screen, while removing it.

- Extract the damaged bulb and replace it with a new one of the same type.

IMPORTANT *When refitting, assemble the protection screen (1) carefully to its mount.*







5.5.2 CHANGING THE HEADLIGHT BULBS

Read carefully 5.5 (BULBS).
The headlight contains:
one low/high beam bulb (1).
one parking light bulb (2);

- Remove the lamp unit from the front fairing, see 6.1.20 (REMOVING THE HEADLIGHT).

LOW/HIGH BEAM BULB (HALOGEN).

- Move the bulb protection element (3) with your hands.
- Twist the bulb holder anti-clockwise (4) and remove it from the lamp body (5).
- Extract the damaged bulb and replace it with a new one of the same type.

IMPORTANT *After replacing, adjust the headlight beam, see 5.5.5 (ADJUSTING THE HEADLIGHT BEAM).*

PARKING LIGHT

⚠ WARNING

Do not pull on the wiring to extract the bulb holder.

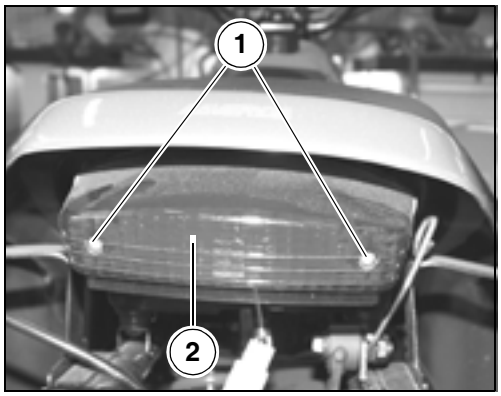
- Grasp the bulb holder (6) and pull to extract.
- Withdraw the bulb (2) and replace it with one of the same type.

5.5.3 CHANGING THE REAR LIGHT BULB

Read carefully 5.5 (BULBS).

To change the bulbs, proceed as follows:

- Release and remove the two screws (1).
- Remove the lens (2).
- Extract the damaged bulb and replace it with a new one of the same type.



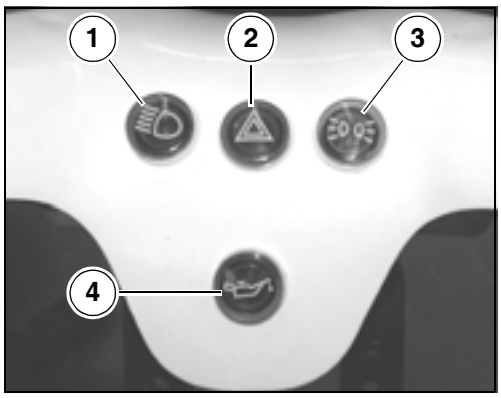
5.5.4 CHANGING THE HANDLEBAR COVER LIGHTS

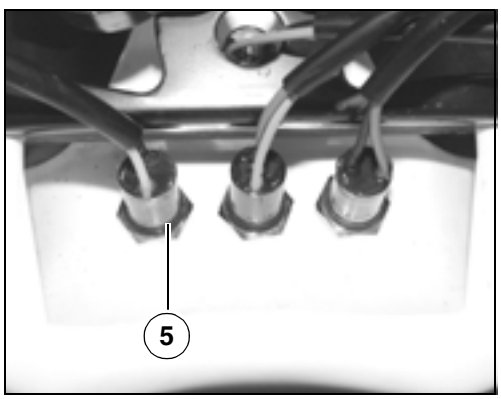
The handlebar cover contains:
1) High beam warning light (blue)
2) Hazard light (red)
3) Parking/low beam warning light (green)
4) Mixer oil reserve warning light (red)

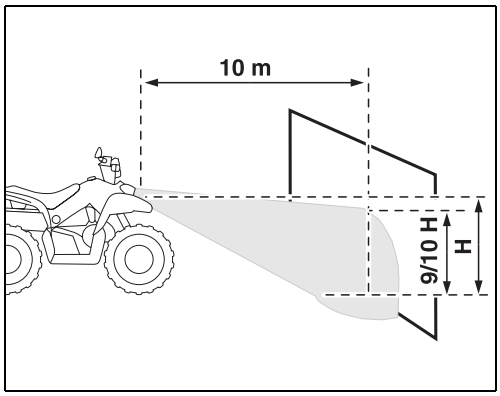
To change the bulbs, proceed as follows:

IMPORTANT *Remove the handlebar cover, see 6.1.2 (REMOVING THE HANDLEBAR COVER).*

- Disconnect the two connectors for the warning light being replaced.
- Unscrew the nut (5).
- Remove the warning light from the handlebar cover.

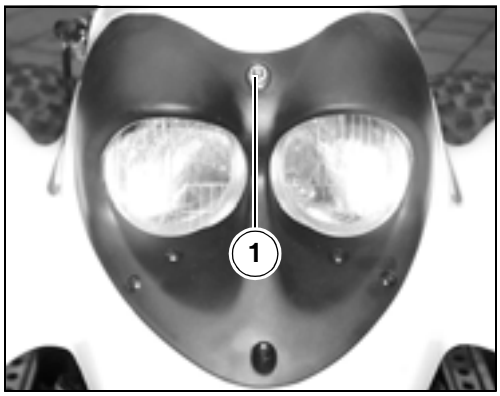


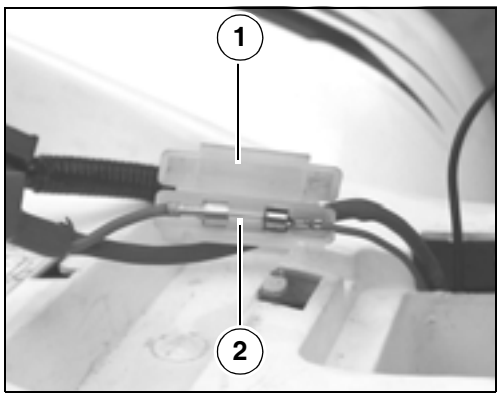




5.5.5 ADJUSTING THE HEADLIGHT BEAM

To rapidly check the correct direction of the beam, place the vehicle on flat ground, 10 m away from a wall.
Turn on the low beam, sit on the vehicle and make sure that the beam projected on the wall is slightly under the horizontal line of the headlight (about 9/10th of the total height).
To adjust the headlight beam:
Use a screwdriver to adjust the screw (1).
By SCREWING IT IN (clockwise), you set the beam downwards.
By UNSCREWING IT (anti-clockwise), you set the beam upwards.





5.5.6 CHANGING THE FUSES

Read carefully 1.3 (GENERAL SAFETY RULES).

⚠ WARNING

Do not repair faulty fuses.
Never use fuses different from the recommended ones.
The use of unsuitable fuses may cause damages to the electric system or, in case of short circuit, even a fire.

IMPORTANT *If a fuse blows frequently, there probably is a short circuit or an overload in the electric system.*

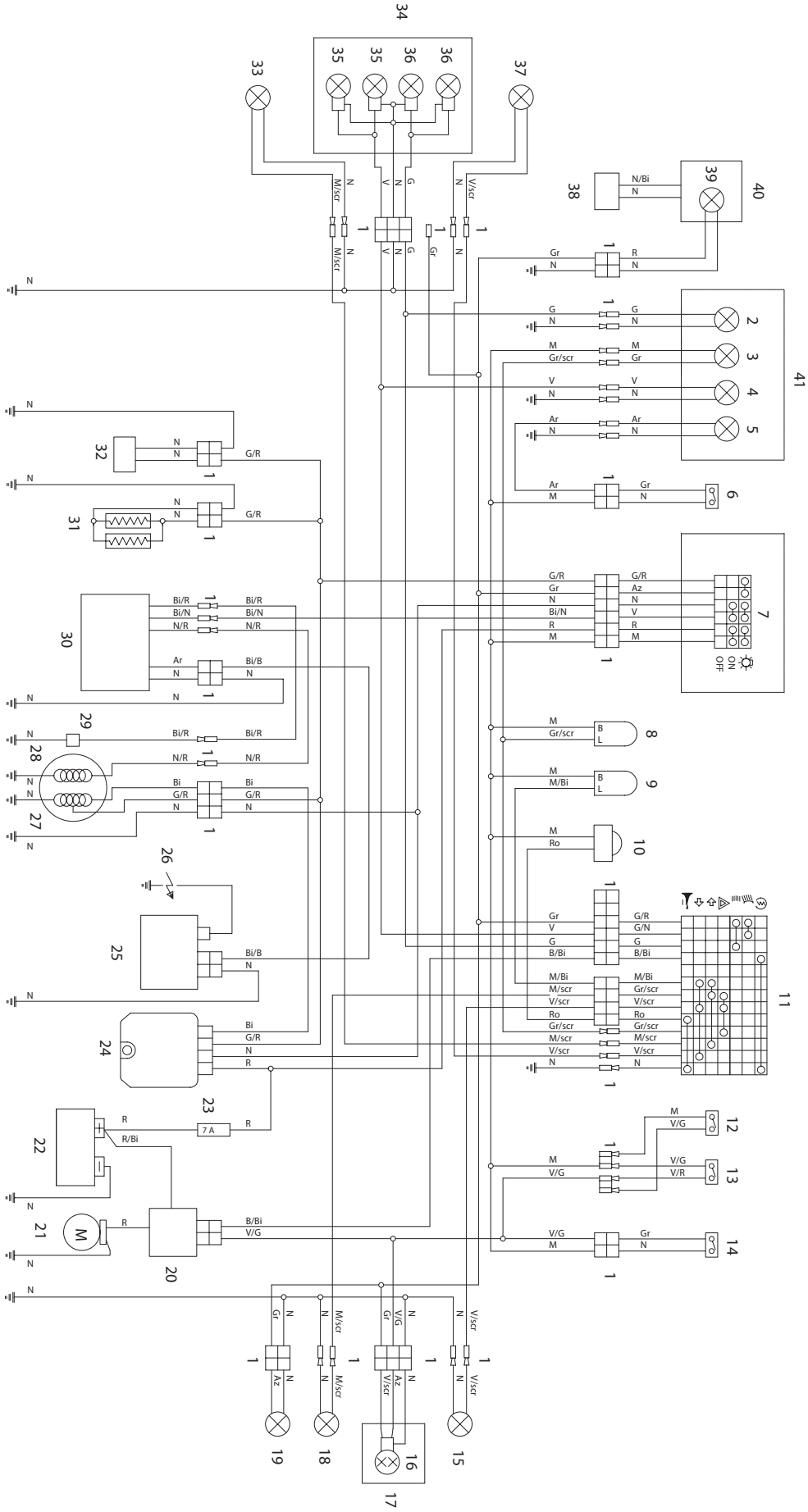
If an electric component does not work or works irregularly, or if the vehicle fails to start, it is necessary to check the fuse.

For the check, proceed as follows:
- Remove the seat, see 6.1.1 (REMOVING THE SEAT).
- Disconnect the battery cables, see 6.1.7 (REMOVING THE BATTERY).
- Extract the fuse (2).

IMPORTANT *When you find a blown fuse, determine and rectify the cause before fitting a new fuse.*

- Replace the damaged fuse with a new one having the same amperage.

5.6 WIRING DIAGRAM



Key:

1) Multiple connectors
2) High beam warning light
3) Hazard warning light
4) Mixing oil level warning light
5) Mixing oil level warning light
6) Keyswitch with parking light switch
7) Hazard flasher with buzzer
8) Flasher with buzzer
9) Horn
10) Left dimmer switch
11) Right brake light switch
12) Integral braking light switch
13) Parking light warning light
14) Left brake light switch
15) Right rear direction indicator
16) Two-position rear lamp
17) Tail light
18) Rear left direction indicator
19) Starting relay
20) Starter
21) Fuse
22) Battery
23) Voltage regulator
24) Coil
25) Spark plug
26) Generator
27) Condenser charger
28) Pick up
29) C.D.I. unit
30) Number plate light
31) Automatic starter
32) Resistor
33) Headlight
34) Front parking light lamp
35) High beam bulb
36) Right front direction indicator
37) Odometer sensor
38) Left front direction indicator
39) Odometer light
40) Odometer
41) Dashboard

NOTES

NOTES

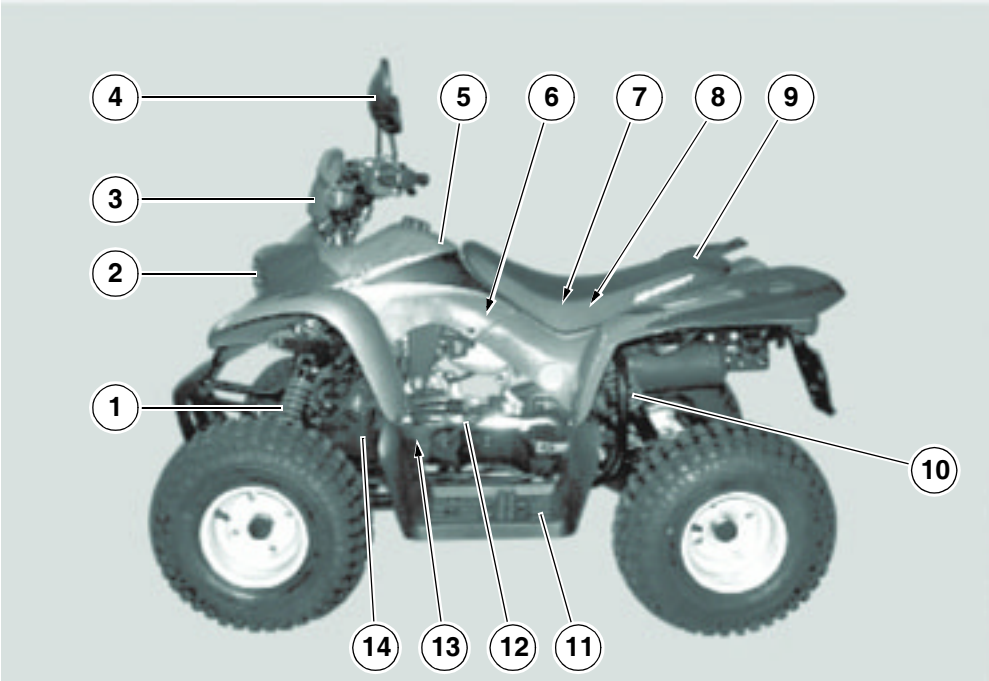
CYCLE PARTS

6

CYCLE PARTS

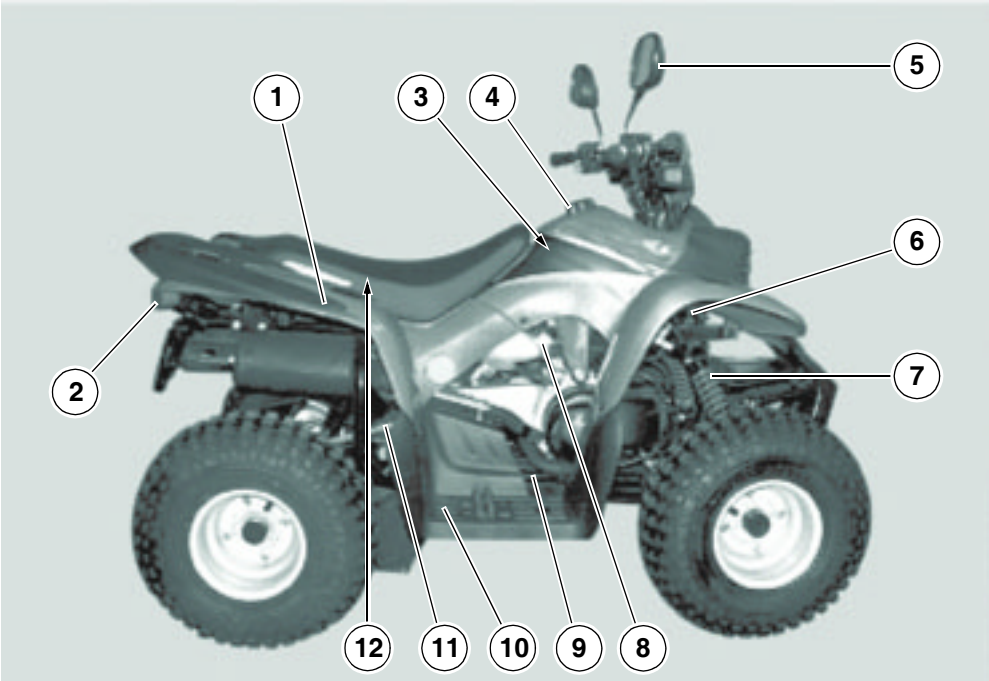
CONTENTS

6.1 BODYWORK



KEY

1) Left-hand front shock absorber
2) Headlight
3) Handlebar cover
4) Left-hand rearview mirror
5) Front fairing
6) Mixer oil tank filler cap
7) Battery
8) Fuse
9) Seat
10) Rear shock absorber
11) Left footpeg
12) Kick start lever
13) Transmission air filter
14) Air cleaner

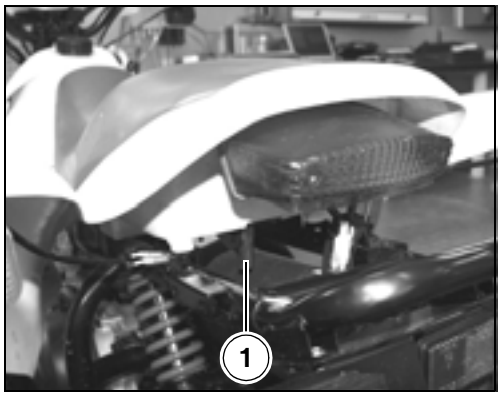


KEY

1) Rear fairing
2) Tail light
3) Fuel tank
4) Fuel filler cap
5) Right-hand rearview mirror
6) Warning horn
7) Front right shock absorber
8) Fuel tap
9) Front + rear brake pedal (100 cc only)
10) Right footpeg
11) Drive chain
12) Glove / tool kit compartment

6.1.1 REMOVING THE SEAT

- Disengage the seat with the lever (1).
- Remove the seat (2).

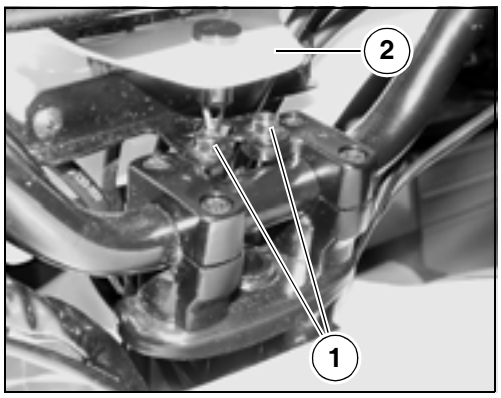


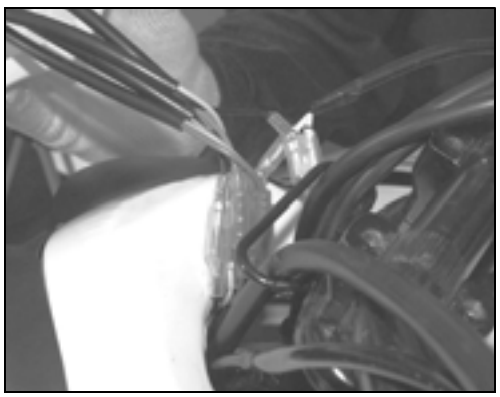
6.1.2 REMOVING THE HANDLEBAR COVER

- Unscrew the two screws (1).
- Remove the handlebar cover (2).
- Disconnect the handlebar cover connectors.

⚠ WARNING

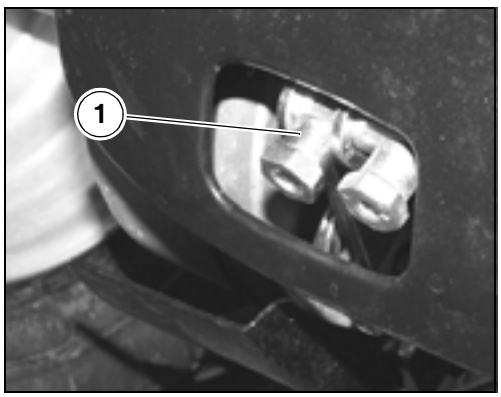
Mark all wires with their original positions to avoid confusing them when refitting.

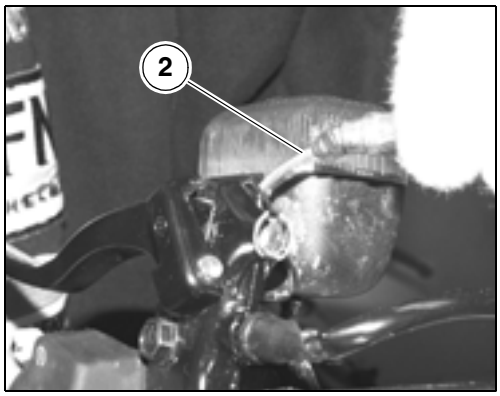


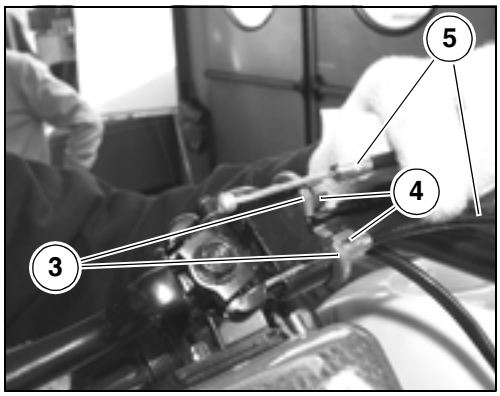


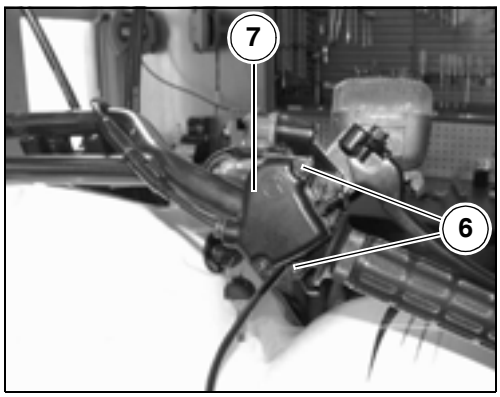
6.1.3 REMOVING THE HANDLEBAR

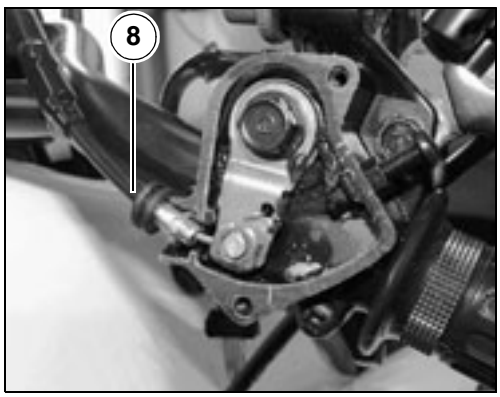
- Remove the handlebar cover, see 6.1.2 (REMOVING THE HANDLEBAR COVER).
- Loosen the adjuster nut (1).









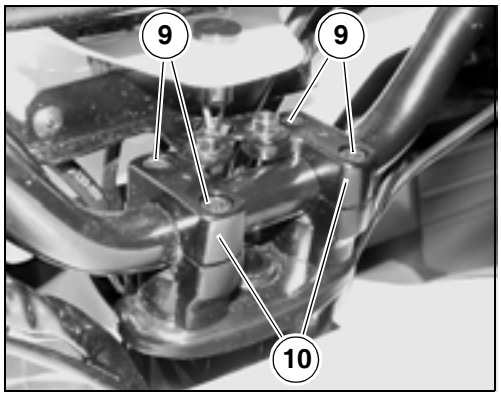


- Remove the rear brake cable (2) from its seat.
- Loosen the two locking washers (3) completely.
- Tighten the two adjusters (4) all the way in.
- Remove the front brake cables (5).
- Remove the two screws (6).
- Remove the guard (7).
- Remove the throttle cable (8) from its seat.
- Disconnect the commutator, stop light and direction indicator connectors.

⚠ WARNING

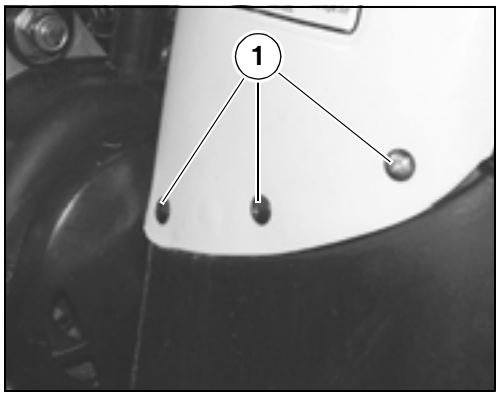
Mark all wires with their original positions to avoid confusing them when refitting.

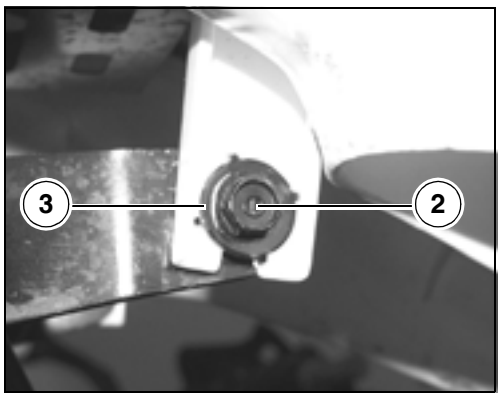
- Release and remove the four screws (9).
- Remove the two clamps (10).
- Remove the handlebar.

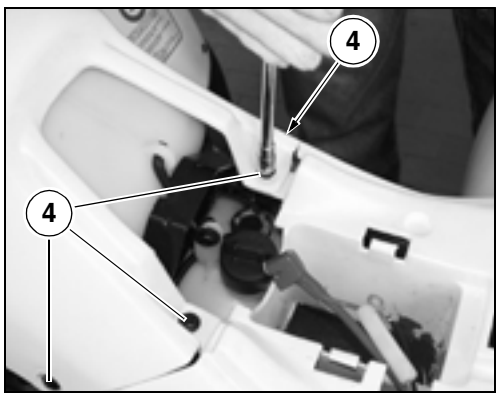


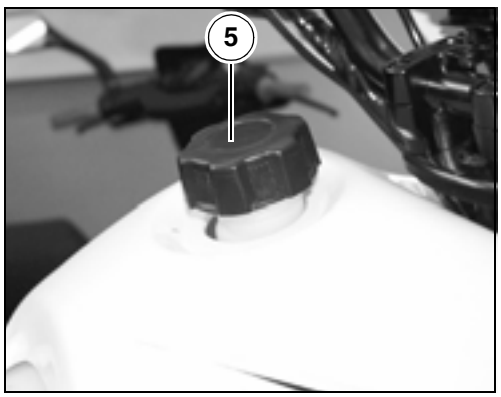
6.1.4 REMOVING THE FRONT FAIRING

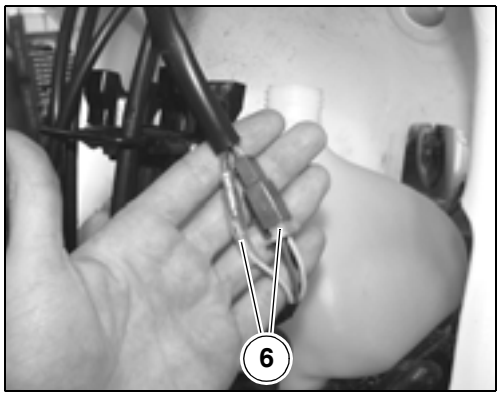
- Remove the handlebar see 6.1.3 (REMOVING THE HANDLEBAR).
- ★ Unscrew and remove the three screws (1) and collect the washers and nuts.
- ★ Release and remove the front screw (2) and collect the washer (3).
- Release and remove the four screws (4).
- Release and remove the fuel tank filler cap (5).



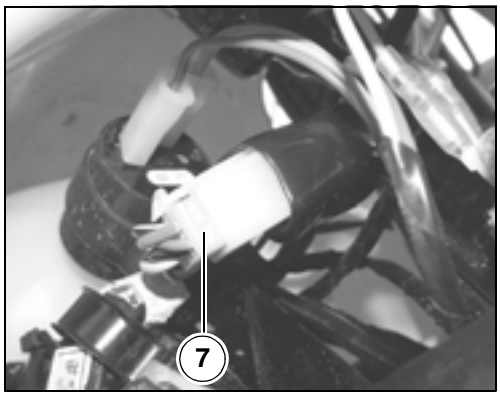


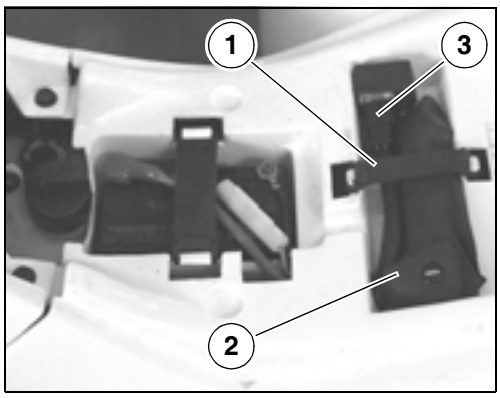






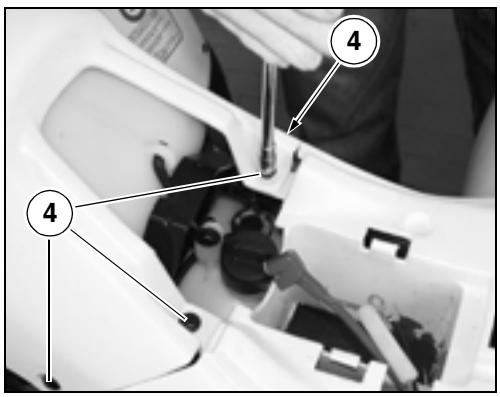
- Disconnect the headlight connectors (6).
- Disconnect the main switch connector (7).
- Remove the front fairing.

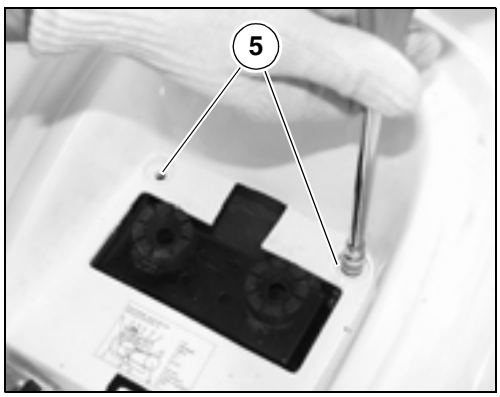




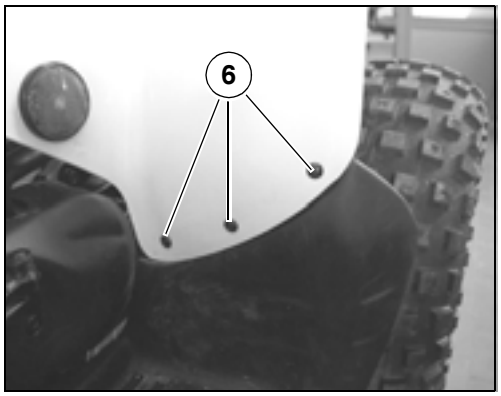
6.1.5 REMOVING THE REAR FAIRING

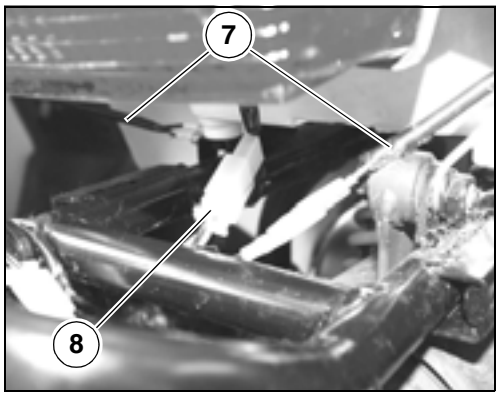
- Remove the battery, see 6.1.7 (REMOVING THE BATTERY).
- Unhook the elastic band (1).
- Remove the tool kit (2).
- Remove the starter relay (3).
- Release and remove the four screws (4).
- Release and remove the two screws (5).





- Unscrew and remove the three screws (6) and collect the washers and nuts.
- Disconnect the direction indicator connectors (7).
- Disconnect the tail light connectors (8).
- Remove the rear fairing.

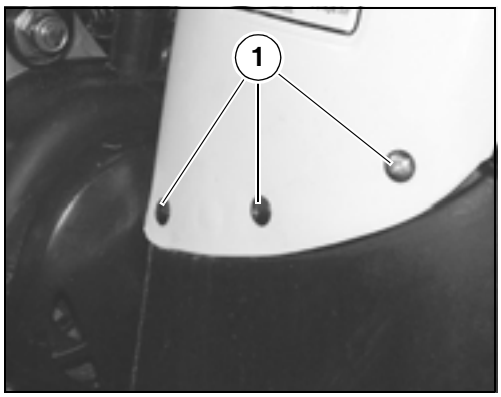


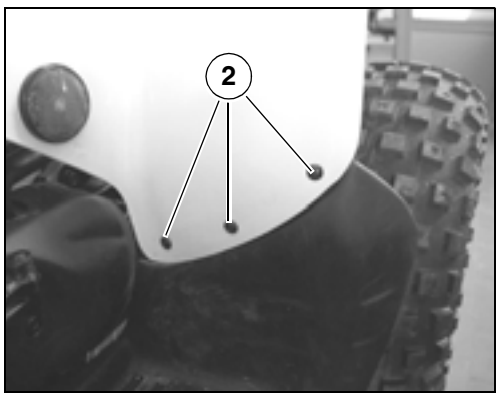


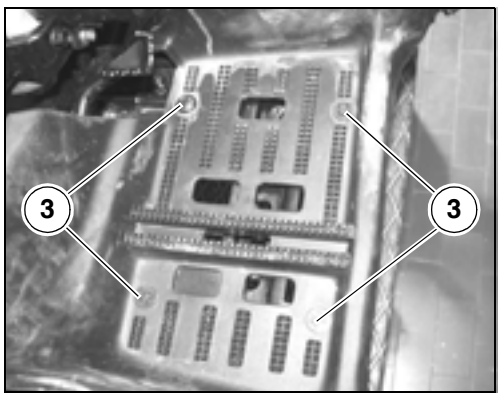
6.1.6 REMOVING THE FOOTPEGS

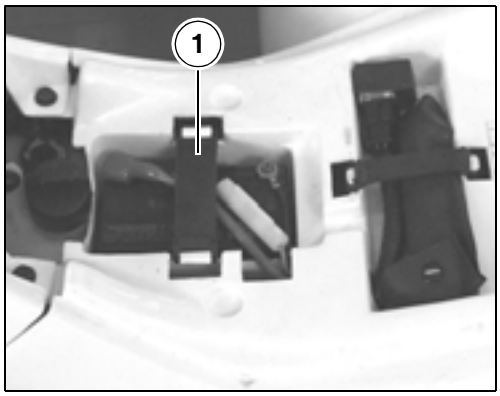
- Unscrew and remove the three screws (1) and collect the washers and nuts.
- Unscrew and remove the three screws (2) and collect the washers and nuts.
- Unscrew and remove the four screws (3) and collect the washers and nuts.
- Remove the footpeg.

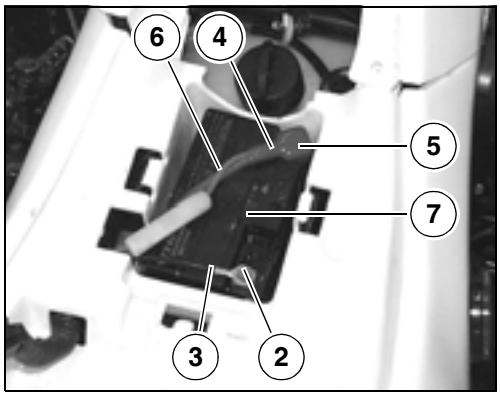
IMPORTANT *Repeat the process to remove the other footpeg if needed.*











6.1.7 REMOVING THE BATTERY

- Set the main switch to "⊗".
- Remove the seat, see 6.1.1 (REMOVING THE SEAT).
- Unhook the elastic band (1).
- Release and remove the negative (-) terminal screw (2).
- Slide the negative lead (3) aside.
- Lift the red protective cap (4).
- Release and remove the positive (+) terminal screw (5).
- Slide the positive lead (6) aside.

⚠ WARNING

Do not pull on the wiring.

- Wearing latex gloves, grasp the battery (7) firmly and remove it from its compartment by lifting it.

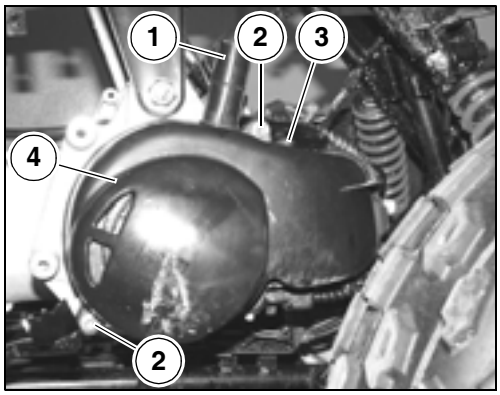
⚠ CAUTION

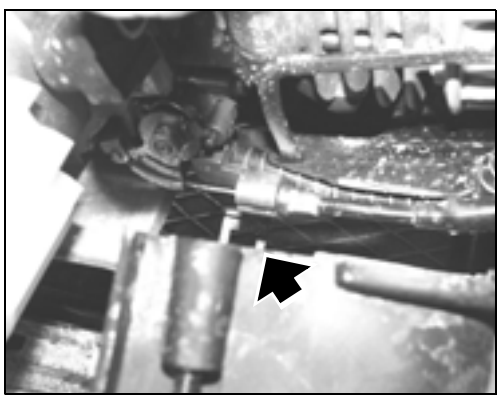
Once removed, the battery must be stored in a safe place out of the reach of children.

⚠ WARNING

On refitting, connect the positive (+) lead first, then the negative (-) lead.

IMPORTANT *Replace the rubber section resting on the battery if damaged.*





6.1.8 REMOVING THE FAN GUARD

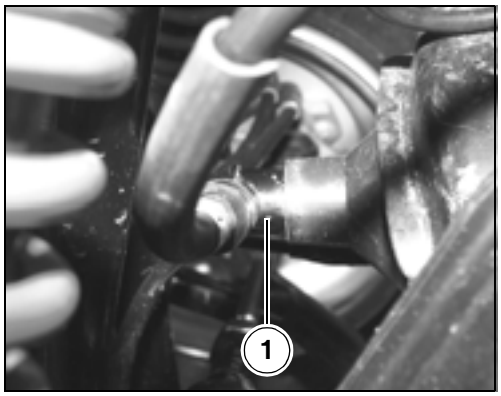
- Remove the right footpeg, see 6.1.6 (REMOVING THE FOOTPEGS).
- Remove the air scoop pipe (1).
- Release and remove the two screws (2).
- Unscrew and remove the screw (3).
- Remove the fan guard (4).

IMPORTANT *When refitting, position the fan guard slot correctly into its seat on the cylinder air scoop guard.*

6.1.9 REMOVING THE AIR SCOOP GUARD

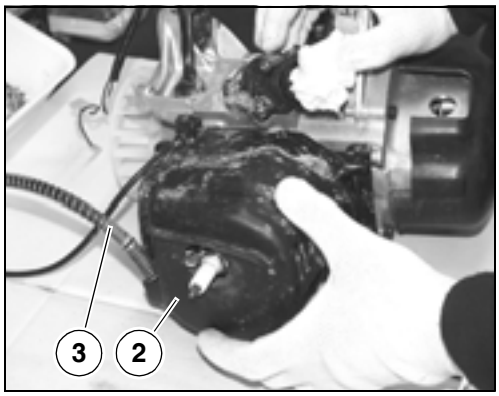
IMPORTANT *There is no need to remove the engine from the frame.*

- Disconnect the spark plug cap (1).
- Remove the fan guard, see 6.1.8 (REMOVING THE FAN GUARD).
- Remove the cylinder air scoop guard (2).



⚠ WARNING

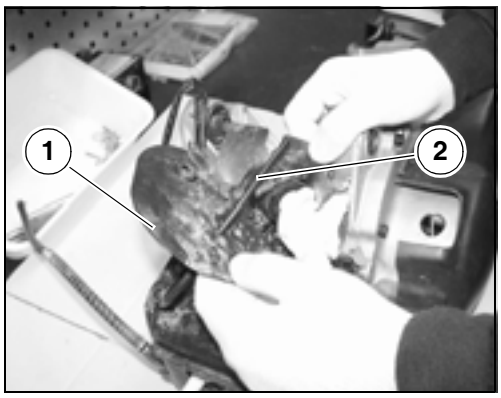
When refitting, place the mixer oil hose (3) correctly in its seat.



6.1.10 REMOVING THE DEFLECTOR

IMPORTANT *There is no need to remove the engine from the frame.*

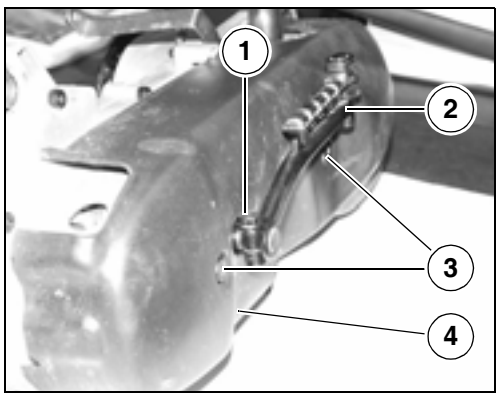
- Remove the carburettor, see 4.3 (REMOVING THE CARBURETTOR).
- Remove the deflector (1), taking care not to damage to the mixer oil hose (2).

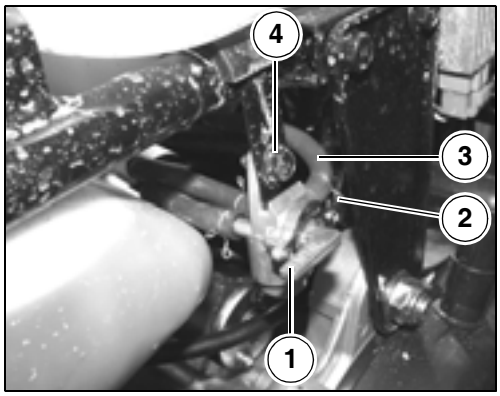


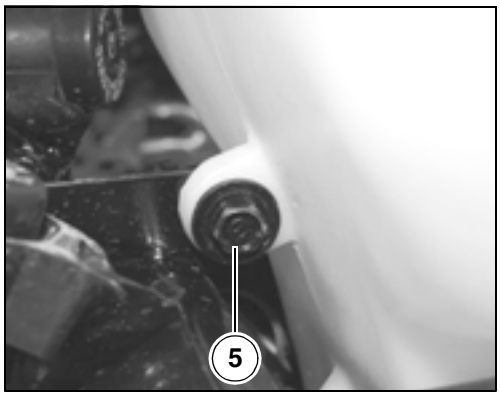
6.1.11 REMOVING THE CRANKCASE COVER

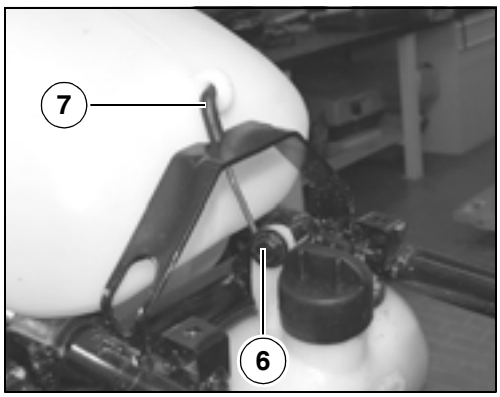
IMPORTANT *There is no need to remove the engine from the frame.*

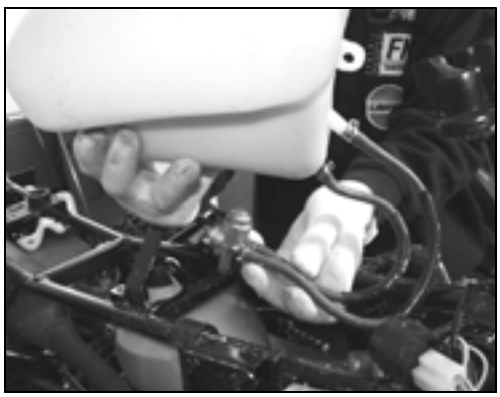
- Remove the left footpeg, see 6.1.6 (REMOVING THE FOOTPEGS).
- Loosen the screw (1).
- Extract the kick start pedal (2).
- Unscrew and remove the two screws (3).
- Remove the crankcase cover (4).







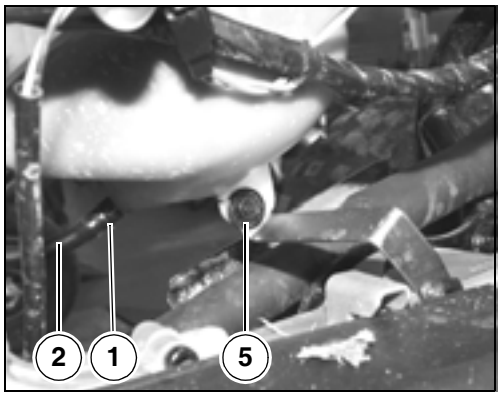


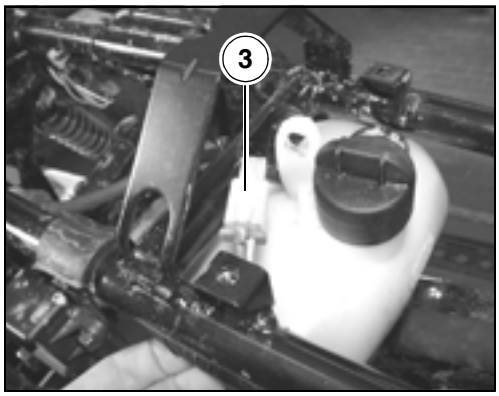


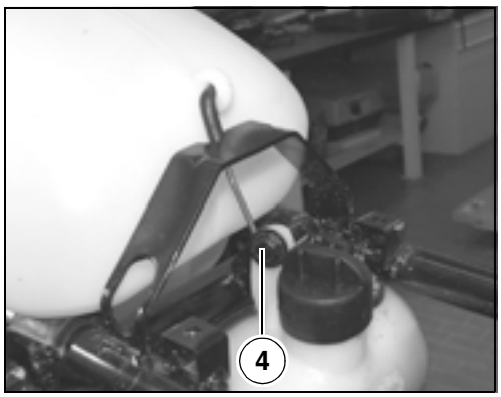
6.1.12 REMOVING THE FUEL TANK

- Remove the front fairing, see 6.1.4 (REMOVING THE FRONT FAIRING).
- Close the fuel tap (1).
- Release the hose clip (2).
- Remove the tap-carburettor hose (3).
- Unscrew and remove the screw (4).
- Unscrew and remove the tank front screw (5) and collect the washer.
- Loosen the tank rear screw (6).
- Extract the rod (7) from the tank.
- Remove the tank complete with fuel tap.

6.1.13 REMOVING THE MIXER OIL TANK

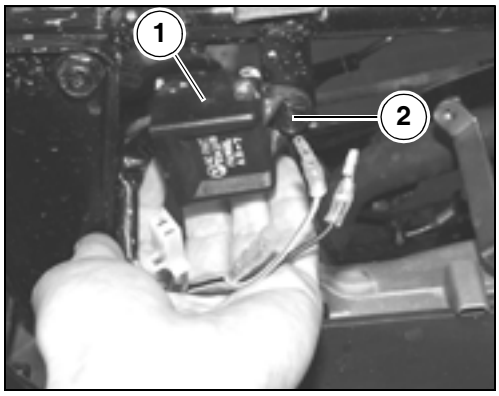






- Remove the rear fairing, see 6.1.5 (REMOVING THE REAR FAIRING).
- Prepare a container of at least 1.5 litres.
- Empty out the oil tank with a pump.
- Release the clip (1).
- Extract the hose (2) from the tank and place it in the container.
- Disconnect the oil reserve warning light connector (3).
- Release and remove the screw (4) and collect the washer.
- Unscrew and remove the screw (5).
- Remove the mixer oil tank .

6.1.14 REMOVING THE CONTROL UNIT



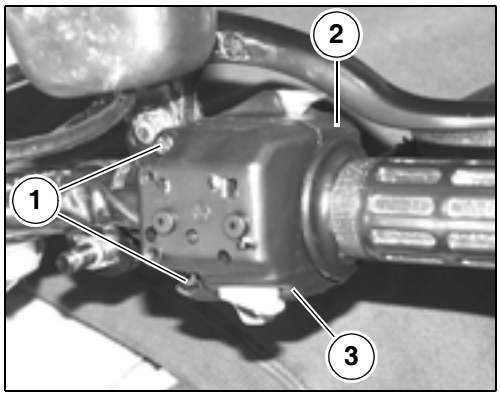
Read carefully 1.3 (GENERAL SAFETY RULES).

- Set the main switch to "⊠".
- Disconnect the connectors from the ECU (1).

⚠ WARNING

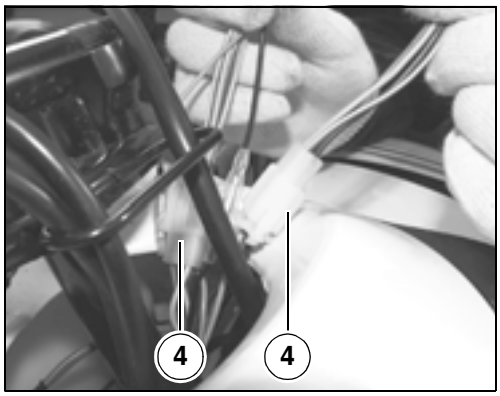
Make sure to refit each connector to the matching connector on assembly.

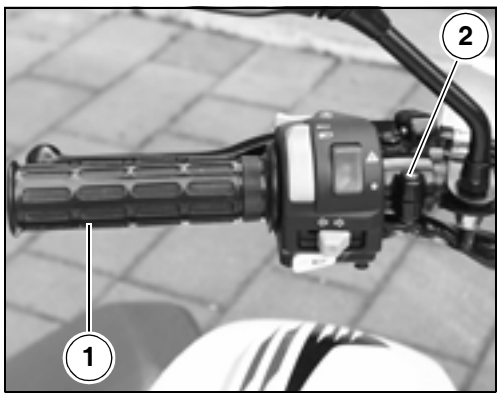
- Unscrew and remove the screw (2).
- Remove the Ecu (1).



6.1.15 REMOVING THE SWITCHGEAR

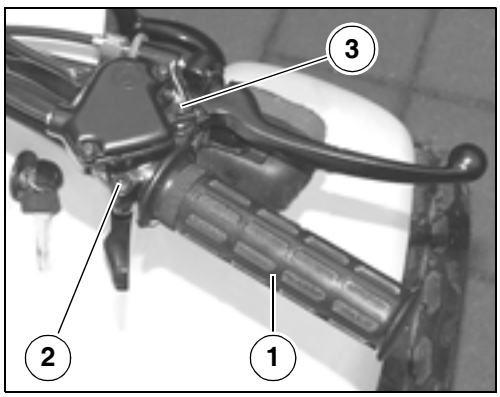
Read carefully 1.3 (GENERAL SAFETY RULES).
- Set the main switch to "⊠".
- Release and remove the two screws (1) and housing halves (2-3).
- Disconnect the two connectors (4).
- Remove the two housing halves (2-3).





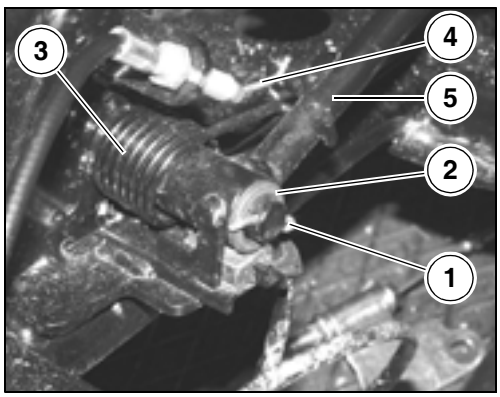
6.1.16 REMOVING THE REAR BRAKE LEVER

- Disconnect the brake cable, see 6.1.3 (REMOVING THE HANDLEBAR).
- Remove the commutator, see 6.1.15 (REMOVING THE SWITCHGEAR).
- Remove the twistgrip (1).
- Unscrew and remove the screw (2).
- Extract the brake lever.



6.1.17 REMOVING THE RIGHT SWITCHGEAR

- Disconnect the brake and throttle cables and the stoplight switch wires, see 6.1.3 (REMOVING THE HANDLEBAR).
- Remove the twistgrip (1).
- Unscrew and remove the screw (2).
- Exatrct the right switchgear (3).

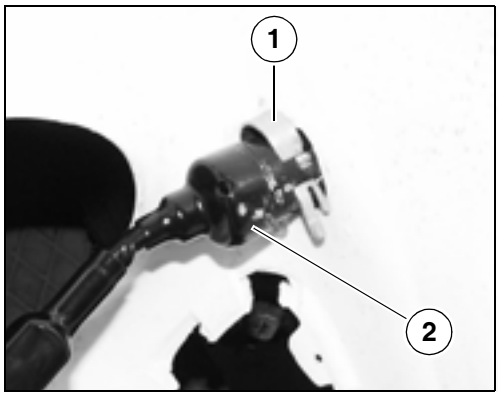


6.1.18 REMOVING THE BRAKE PEDAL

QUASAR 100 only:

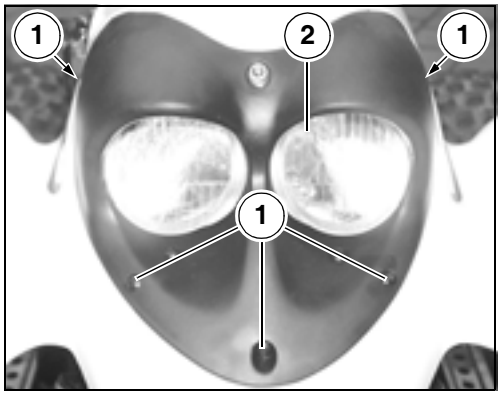
- Remove the right footpeg, see 6.1.6 (REMOVING THE FOOTPEGS).
- Remove the split pin (1) and collect the washer (2).
- Unhook the spring (3).
- Disengage the brake cable (4).
- Remove the brake pedal (5).
- Collect the spring (3).

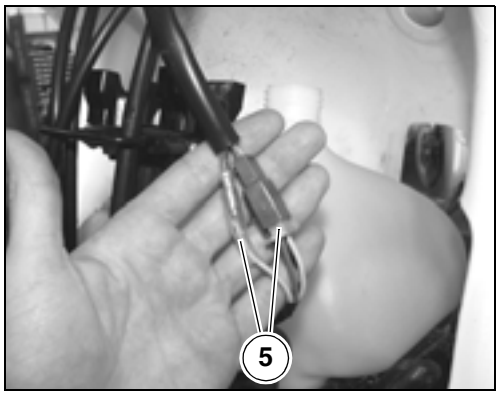
6.1.19 REMOVING THE MAIN SWITCH

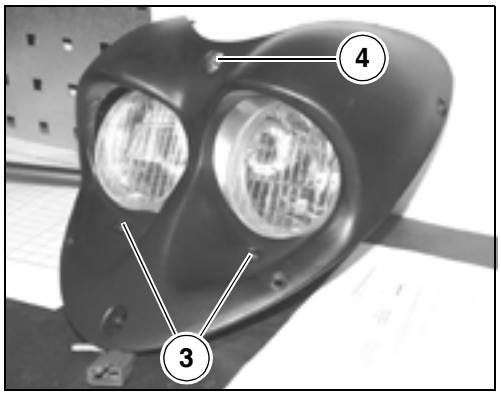


- Remove the ignition key.
- Remove the front fairing, see 6.1.4 (REMOVING THE FRONT FAIRING).
- Straighten out the retaining shims (1).
- Remove the retainer (1).
- Withdraw the main switch (2) from outside the fairing.

6.1.20 REMOVING THE HEADLIGHT

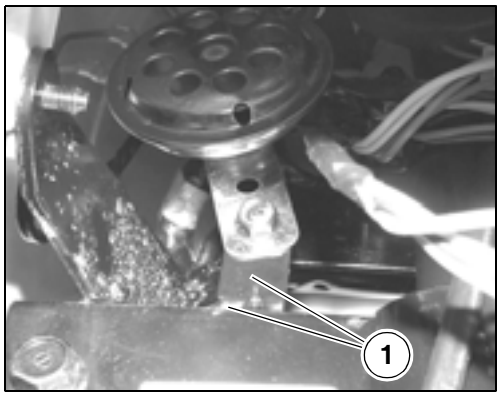


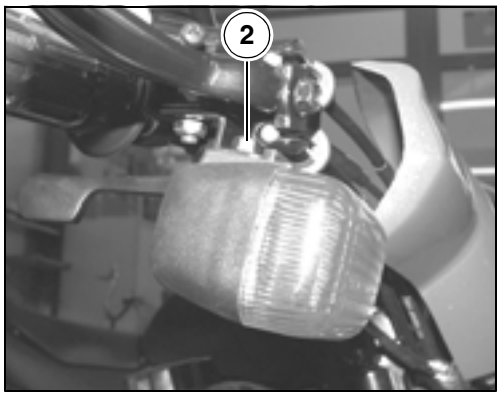




- Set the main switch to "⊠".
- Release and remove the five screws (1).
- Disconnect the two headlight connectors (5).
- Remove the headlight (2) together with the spoiler.

If necessary, remove the headlight only (2):
- unscrew and remove the two screws (3).
- unscrew and remove the screw (4) and collect the nut, two washers and spring;
- Remove the headlight (2).

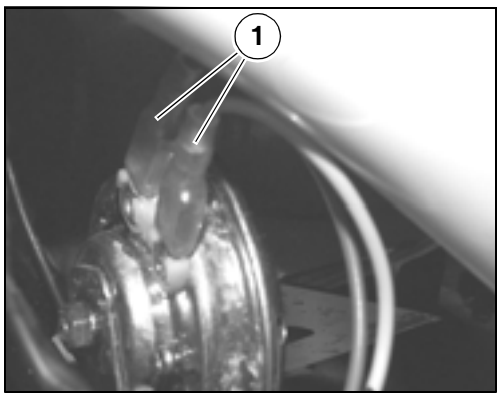




6.1.21 REMOVING THE FRONT DIRECTION INDICATORS

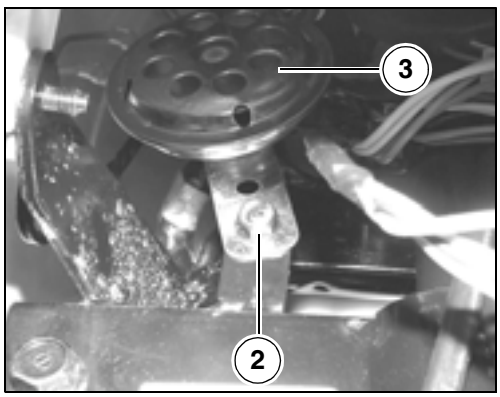
- Disconnect the two connectors (1).
- Unscrew and remove the screw (2).
- Remove the direction indicator.

IMPORTANT *Repeat the process for the other indicator if needed.*

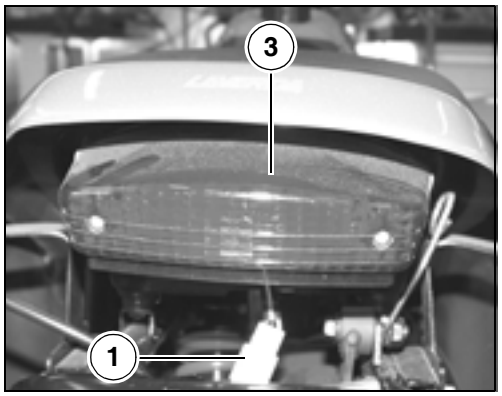


6.1.22 REMOVING THE WARNING HORN

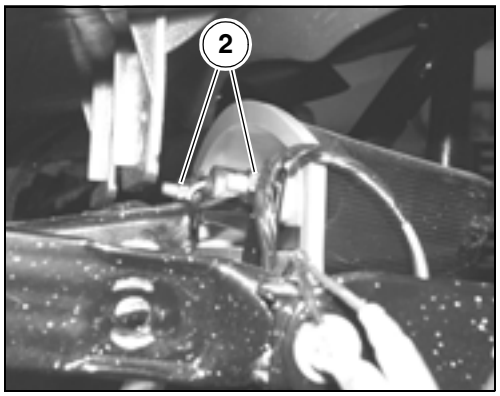
- Disconnect the two connectors (1).
- Unscrew and remove the screw (2).
- Remove the horn (3).



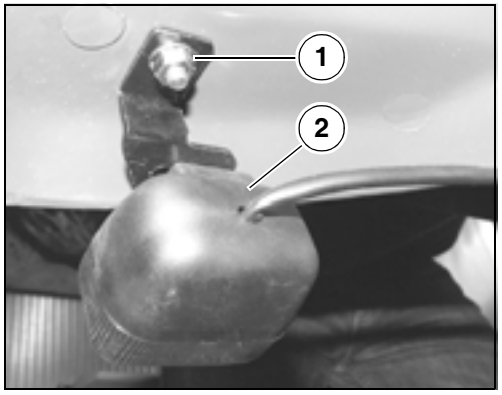
6.1.23 REMOVING THE TAIL LIGHT



- Set the main switch to "⊗".
- Disconnect the connector (1).
- Release and remove the two nuts (2) and collect the washers.
- Remove the tail light (3).

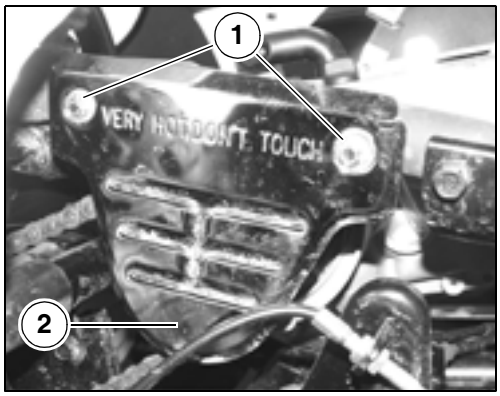


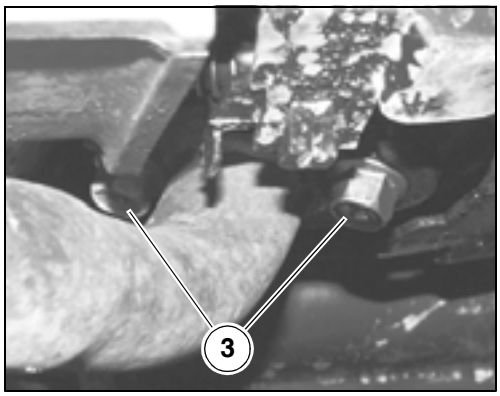
6.1.24 REMOVING THE REAR DIRECTION INDICATORS

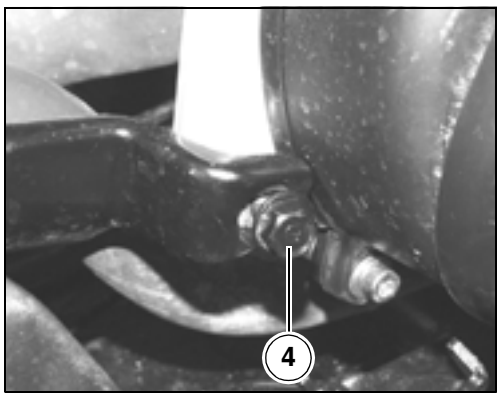


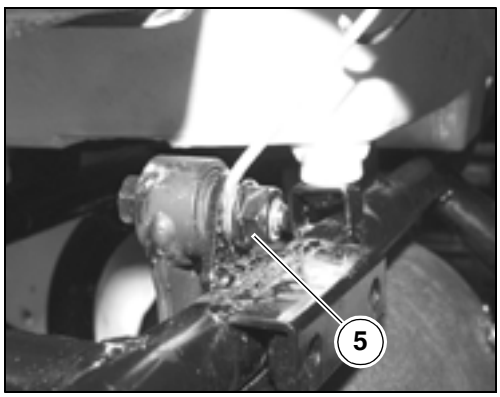
- Disconnect the two connectors.
- Release and remove the nut (1) and collect the screw.
- Remove the direction indicator (2).

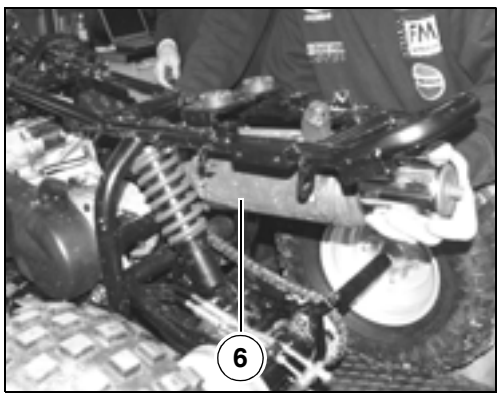
IMPORTANT *Repeat the process for the other indicator if needed.*









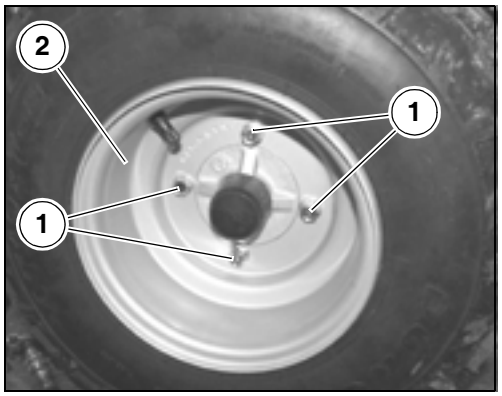


6.1.25 REMOVING THE EXHAUST

- Remove the rear fairing, see 6.1.5 (REMOVING THE REAR FAIRING).
- Remove the right footpeg, see 6.1.6 (REMOVING THE FOOTPEGS).
- Release and remove the two screws (1).
- Remove the plate (2).
- Release and remove the two screws (3).
- Unscrew and remove the screw (4).
- Release and remove the nut (5) and collect the screw and the cable guide.
- Depress the brake pedal.
- Twist the exhaust pipe (6) slightly in both directions to extract it.

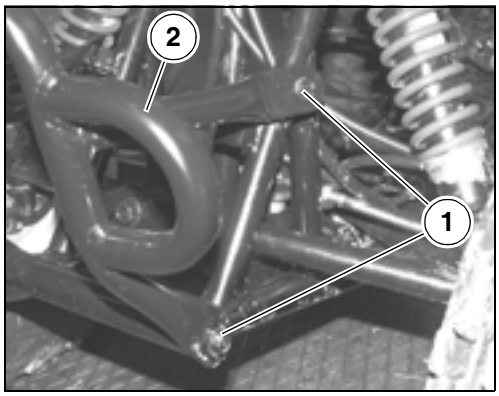
IMPORTANT *When refitting, replace the engine/exhaust gasket.*

6.1.26 REMOVING THE WHEELS

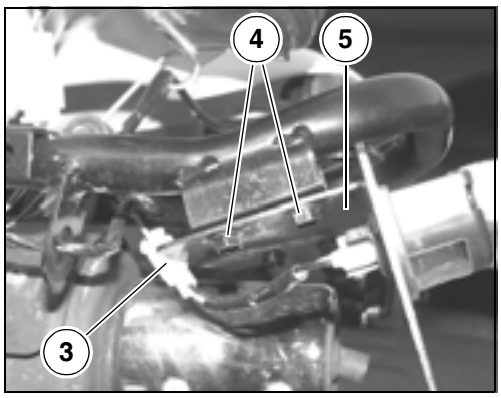


- Place a support under the front of the frame to remove one or both of the front wheels or under the rear axle to remove one or both of the rear wheels.
- Release and remove the four screws (1) and collect the washers.
- Remove the wheel (2).

6.1.27 REMOVING THE FRAME

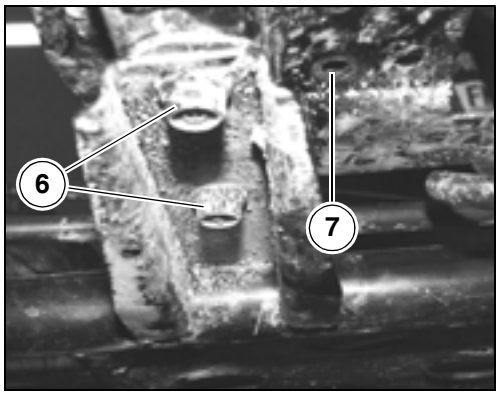


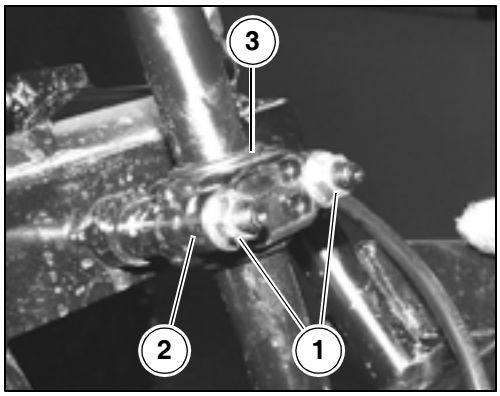
- Remove the engine, see 3.1.2 (REMOVING THE ENGINE FROM THE FRAME).
- Remove the horn, see 6.1.22 (REMOVING THE WARNING HORN).
- Remove the steering unit, see 6.2 (STEERING SYSTEM).
- Remove the rear fork, see 6.3.2 (REMOVING THE FORK).
- ★ Release and remove the two screws (1).
- Remove the front subframe (2).
- Disconnect the license plate light connector (3) (QUASAR 100 only).
- ★ Release and remove the two screws (4).
- Remove the number plate bracket (5).
- ★ Release and remove the two screws (6).
- ★ Remove the footpeg bracket (7).
- Remove the electrical components from the frame and free all cables from their clips.

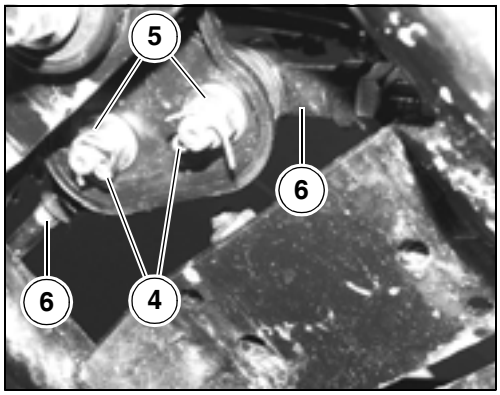


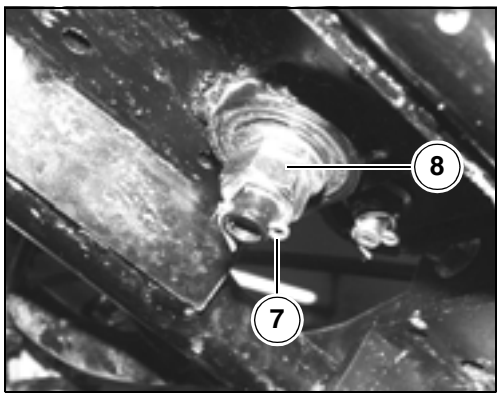
⚠ WARNING

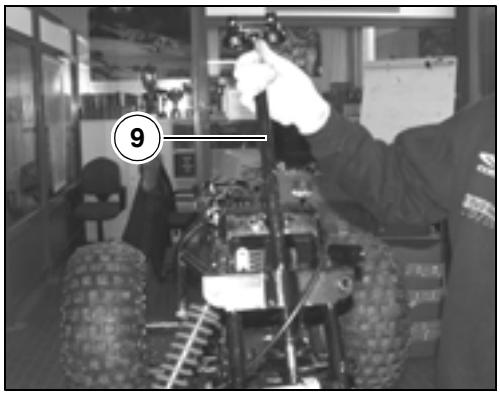
Make sure to have enough spare clips to secure the wiring on assembly.











6.2 STEERING SYSTEM

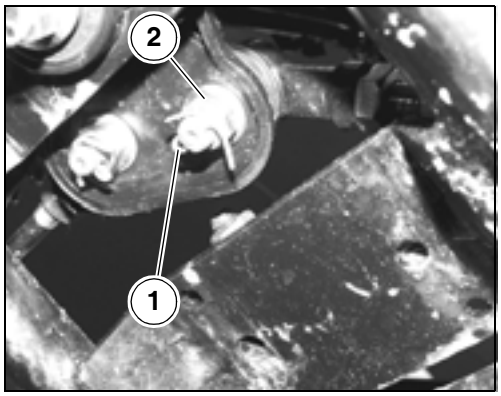
6.2.1 REMOVING THE BASE WITH HEADSTOCK

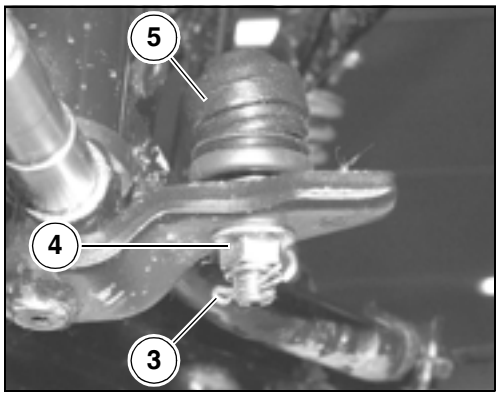
- Remove the front fairing, see 6.1.4 (REMOVING THE FRONT FAIRING).
- Release and remove the two nuts (1) and collect the clamp (2) and bush (3).
- Remove the two split pins (4).
- Release and remove the two nuts (5).
- Extract the two levers (6) from the base.
- Extract the spilt pin (7).
- Release and remove the nut (8).
- Remove the base with headstock (9).

6.2.2 REMOVING THE STEERING LEVER

- Extract the spilt pin (1).
- Release and remove the nut (2).
- Extract the spilt pin (3).
- Release and remove the nut (4).
- Remove the steering lever (5).

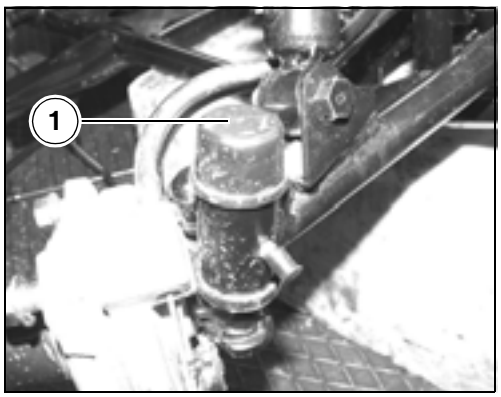
IMPORTANT *Repeat the process to remove the other lever if needed.*

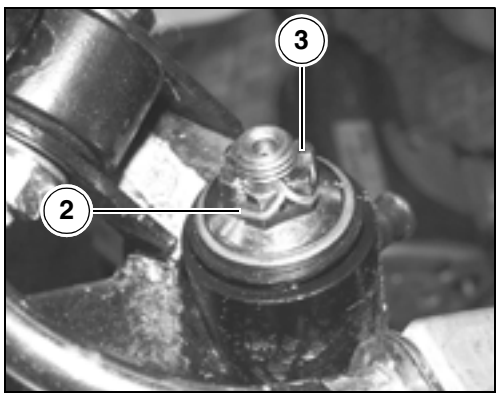


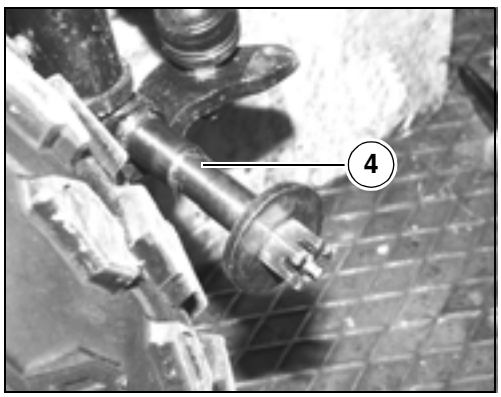


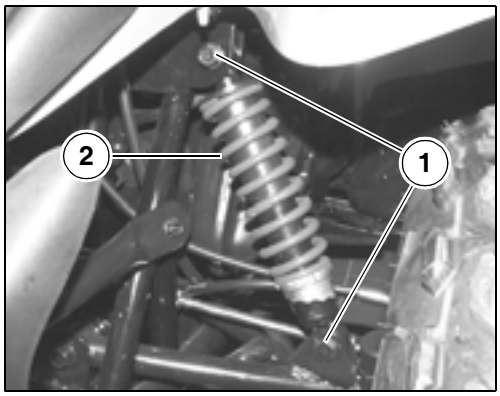
6.2.3 REMOVING THE JOINT

- Remove the brake in question, see 6.4.1 (REMOVING THE BRAKE).
- Remove the waterproof cover (1).
- Extract the spilt pin (2).
- Release and remove the nut (3).
- Remove the steering lever, see 6.2.2 (REMOVING THE STEERING LEVER).
- Extract the joint (4).



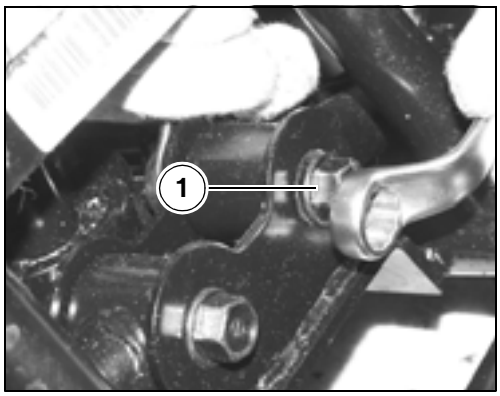






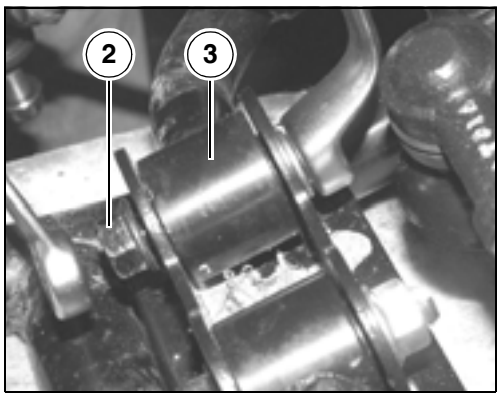
6.2.4 REMOVING THE FRONT SHOCK ABSORBER

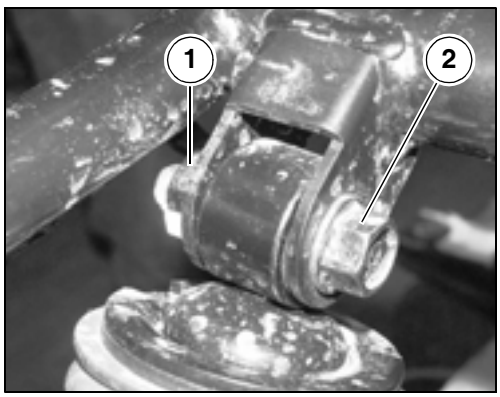
- Place a support under the front of the frame.
- Unscrew and remove the two screws (1) and collect the washers and nuts.
- Remove the shock absorber (2).



6.2.5 REMOVING THE SUSPENSION ARM

- Remove the shock absorber, see 6.2.4 (REMOVING THE FRONT SHOCK ABSORBER).
- Remove the joint, see 6.2.3 (REMOVING THE JOINT).
- Release and remove the screw (1) and collect the nut.
- Release and remove the screw (2) and collect the nut.
- Remove the suspension arm (3).

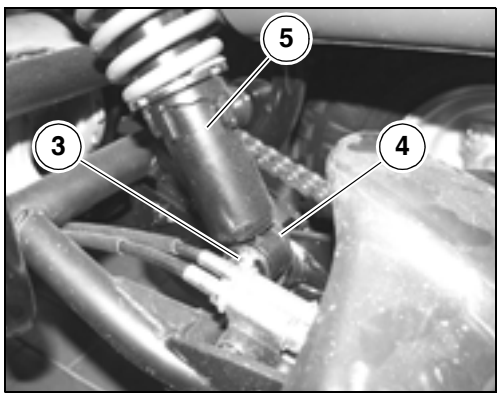




6.3 FORK

6.3.1 REMOVING THE REAR SHOCK ABSORBER

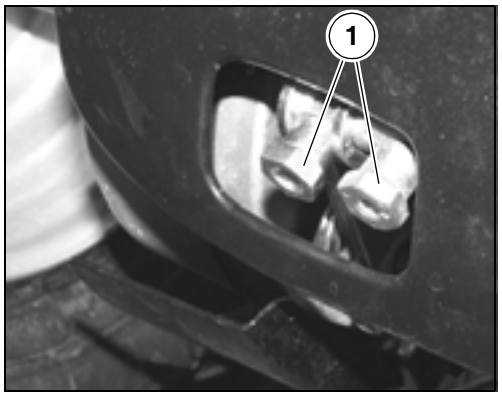
- Place a support under the rear of the frame.
- Release and remove the nut (1) and collect the screw (2).
- Release and remove the nut (3) and collect the screw (4).
- Remove the shock absorber (5).

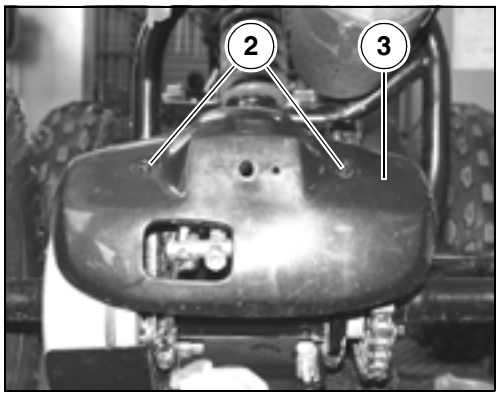


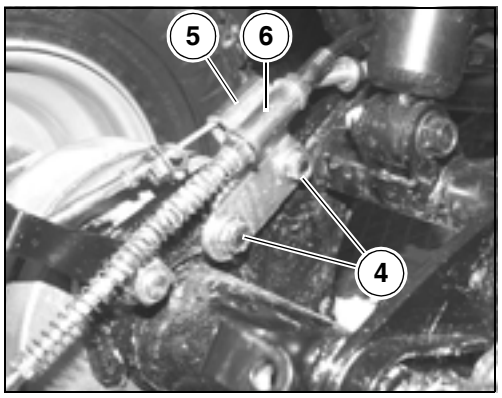
6.3.2 REMOVING THE FORK

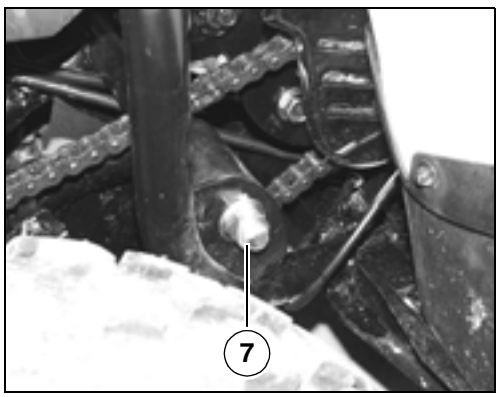
- Remove the chain, see 6.6.1 (BREAKING THE CHAIN).
- Release and remove the two nuts (1).
- Release and remove the two screws (2).
- Remove the guard (3).
- Release and remove the two nuts (4).
- Remove the two plates (5-6) complete with brake cables.
- Remove the rear shock absorber, see 6.3.1 (REMOVING THE REAR SHOCK ABSORBER).
- Release and remove the nut (7).
- Extract the fork spindle (8) and collect the washer.
- Remove the complete fork.

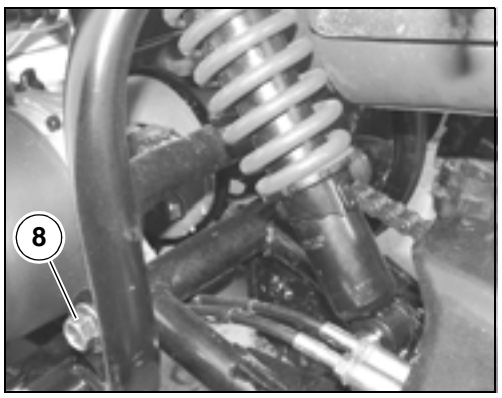
IMPORTANT *If necessary, remove the individual components.*

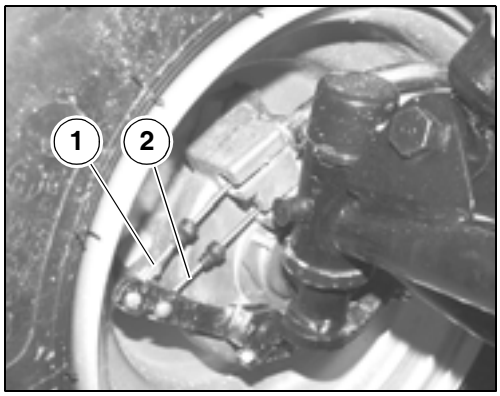


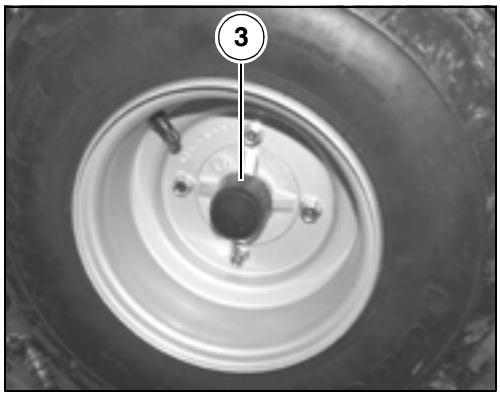


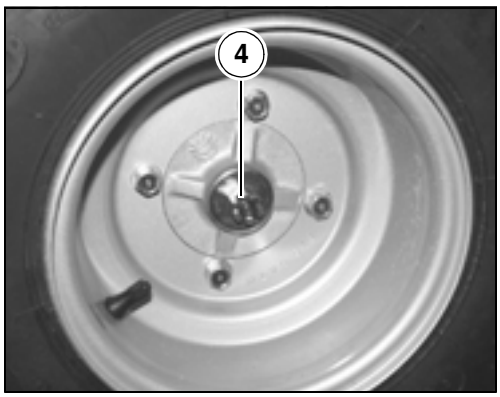


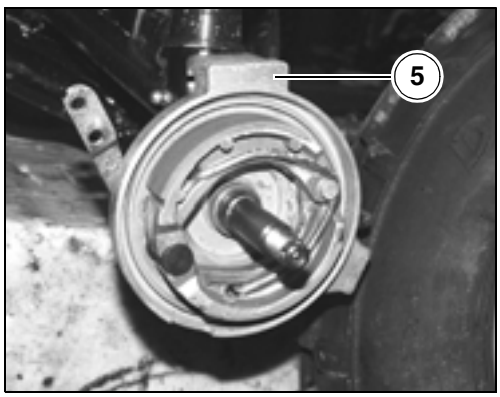












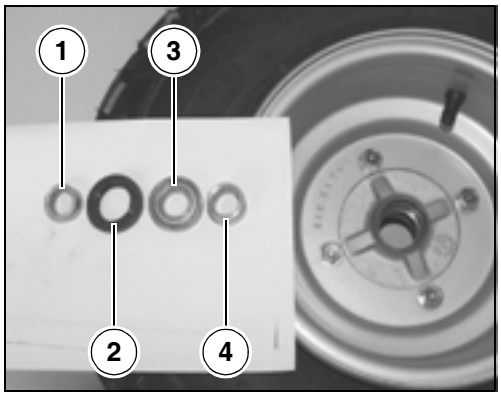
6.4 FRONT BRAKES

6.4.1 REMOVING THE BRAKE

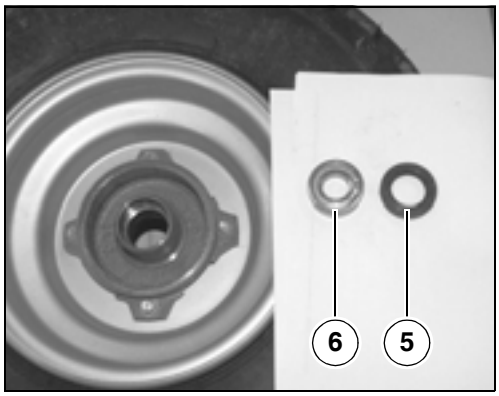
IMPORTANT *The following procedure can be applied to either brake.*

- Place a support under the front of the frame.
- Disconnect the two brake cables (1-2).
- Remove the hub cap (3).
- Extract the spilt pin.
- Release and remove the nut (4) and collect the washer.
- Extract the wheel complete with brake drum.
- Extract the brake block plate (5).

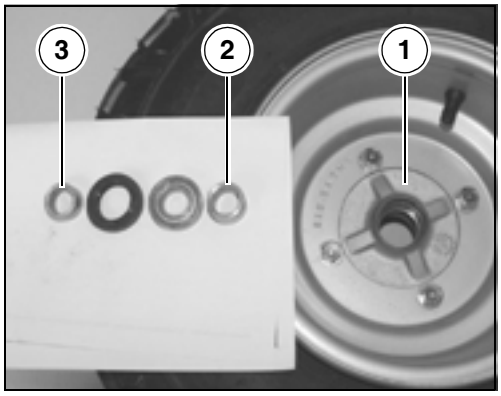
6.4.2 REMOVING THE BRAKE DRUM



- Remove the complete wheel, see 6.4.1 (REMOVING THE BRAKE).
- Remove the following components from the outer side of the wheel in order:
  - the spacer (1);
  - the oil seal (2);
  - the bearing (3);
  - the spacer (4);
- Remove the following components from the inner side of the wheel in order:
  - the oil seal (5);
  - the bearing (6);



6.4.3 CHECKING THE COMPONENTS



BRAKE DRUM

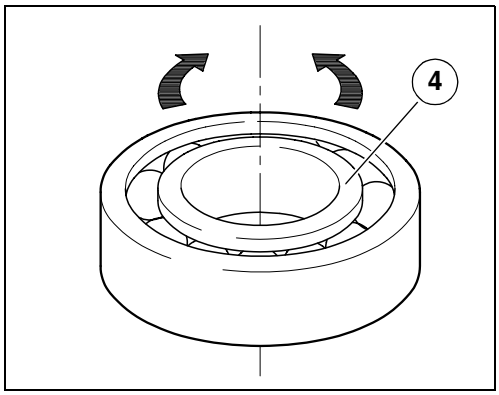
- Inspect the sliding surface for scoring and/or scratching. Eliminate minor scoring with wet sand paper (grain size 1).
- Replace the drum (1) if badly scored.

BEARINGS

- Rotate the inner ring (4) manually. The ring should turn smoothly, with no hardness or noise. There should be no end float. Replace any bearings that do not meet these requirements.

SEALS

- Check the condition of the seals. Replace any damaged or worn seals.



BRAKE BLOCKS

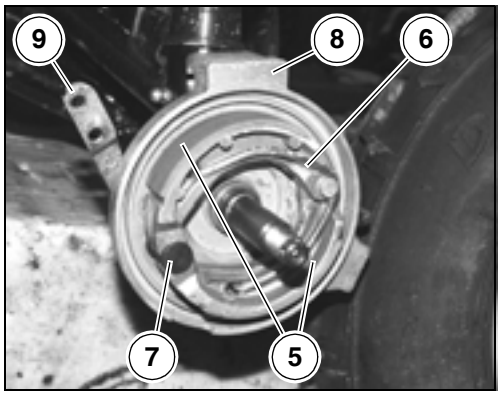
- Check the brake lining for wear (5).

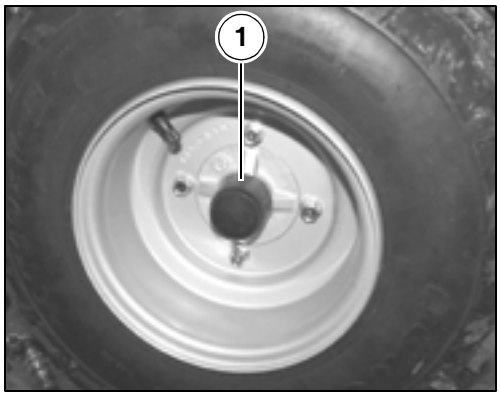
Minimum brake lining thickness: 1mm.

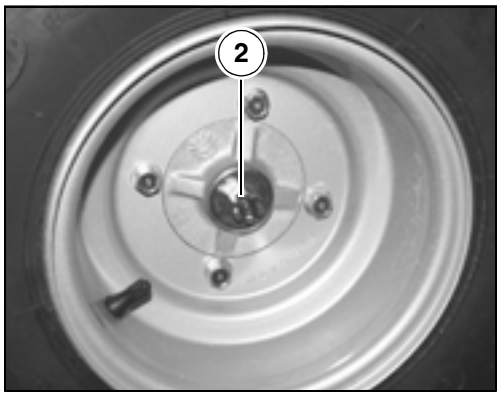
- Inspect the spring (6) and replace if yielded.

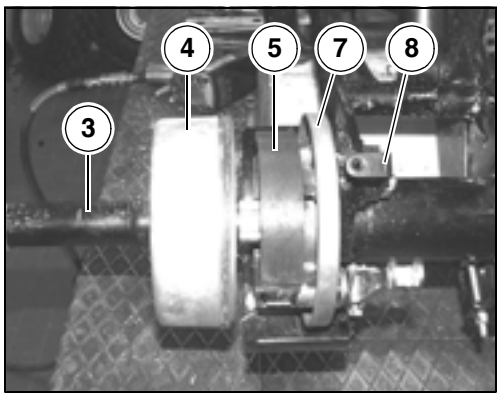
Check the condition of the following components:
- brake cam (7);
- block plate (8);
- brake lever (9);
- spacers (2-3).

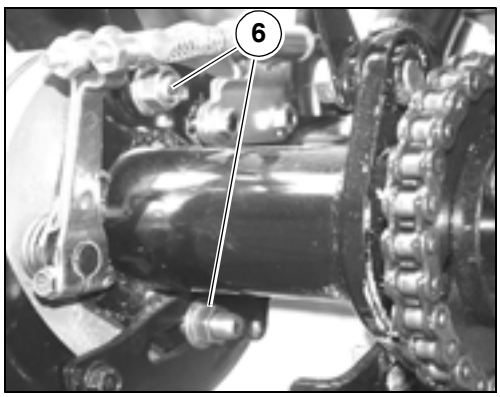
Replace any component which shows excessive wear or damage.

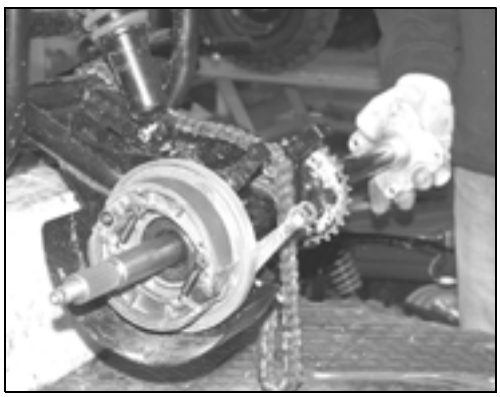












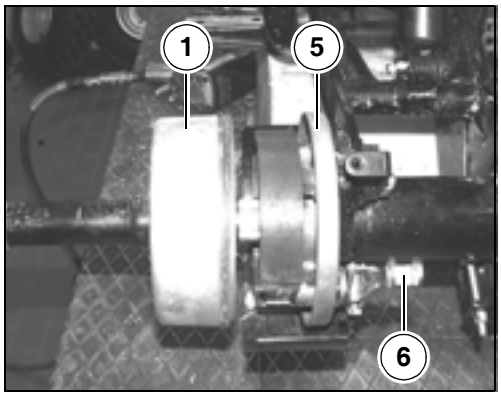
6.5 REAR BRAKE

6.5.1 REMOVING THE BRAKE

- Place a support under the rear of the frame.
- Disconnect the brake cables and remove the guard, see 6.3.2 (REMOVING THE FORK).
- Remove the left-hand hub cap (1).
- Extract the spilt pin.
- Release and remove the nut (2) and collect the washer.
- Remove the complete left wheel.
- From the left side, extract in order: the spacer (3), brake drum (4) and brake blocks (5).
- Unscrew and remove the two nuts (6) and collect the washers, screws and bracket (8).
- Extract the brake block plate (7).

If necessary extract the wheel axle (9) from the right-hand side.

6.5.2 CHECKING THE COMPONENTS



BRAKE DRUM

◆ Inspect the sliding surface for scoring and/or scratching. Eliminate minor scoring with wet sand paper (grain size 1). Replace the drum (1) if badly scored.

SEALS

◆ Check the condition of the seals. Replace any damaged or worn seals.

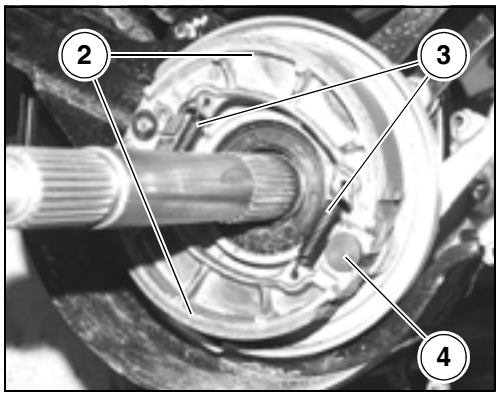
BRAKE BLOCKS

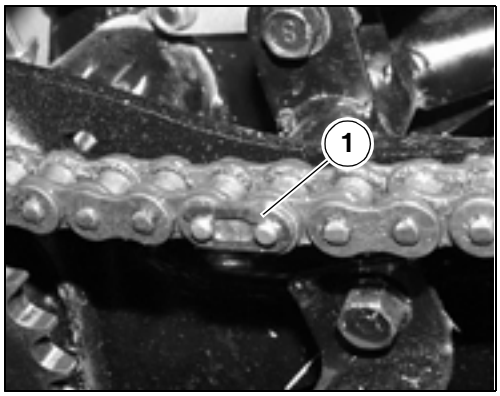
◆ Check the brake lining for wear (2).

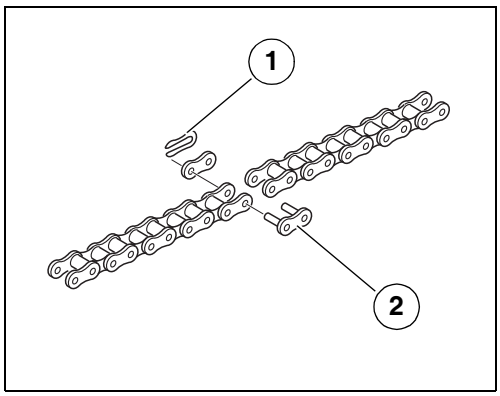
Minimum brake lining thickness: 1mm

◆ Inspect the spring (3) and replace if yielded.
◆ Check the condition of the following components:
- brake cam (4);
- block plate (5);
- brake lever (6);

Replace any component which shows excessive wear or damage.







6.6 CHAIN

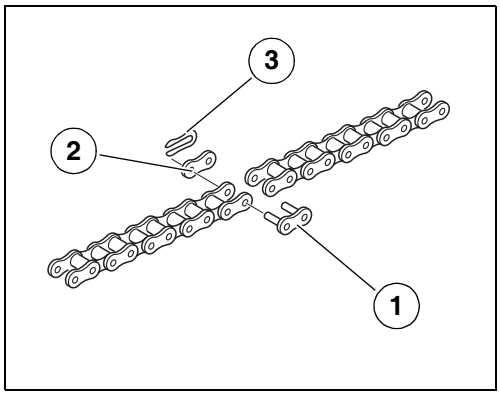
6.6.1 BREAKING THE CHAIN

Read carefully 1.3 (GENERAL SAFETY RULES).

- Slacken the chain, see 2.18 (DRIVE CHAIN).
- Turn the rear wheels to identify the master link.
- Extract the clip (1) and remove the plate beneath it.
- Extract the master link (2) from the opposite side.
- Remove the chain.

⚠ WARNING

If the chain is very worn, replace the entire unit (pinion, crown and chain).



6.6.2 REFITTING THE CHAIN

- Check the fitting of the chain on the pinion and crown.
- The chain open ends should be uppermost midway between the front and rear sprockets.
- Join the two ends of the chain and fit the master link pins (1) from the inside outwards.
- Fit the outer link plate (2) to the pins.
- Fit the clip (3) to the pins.

IMPORTANT *The master link clip (3) must be installed with the open end directed away from the direction in which the chain runs.*

NOTES

NOTES