aprilia

Workshop manual

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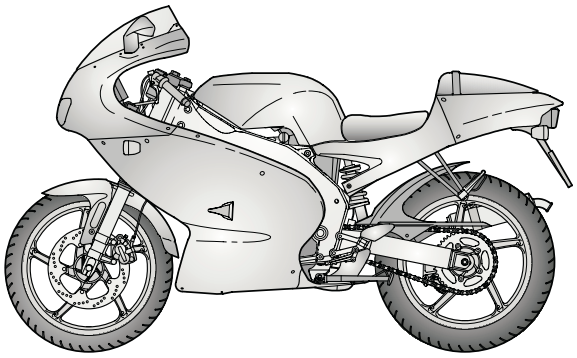

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LIST OF SECTIONS

Introduction

This manual provides basic information about ordinary vehicle servicing procedures.
The data and illustrations that make up the manual were up to date at the time of publication.
The manual is intended for **aprilia** dealers and their qualified mechanics. Many concepts have been intentionally omitted as they were considered superfluous.
Since this publication cannot provide exhaustive mechanical knowledge, it is assumed that people who make use of this manual have received a basic training in mechanics and possess a working knowledge of vehicle repairing techniques.
Repairing or checking the vehicle without such knowledge would be ineffective and even dangerous.
As the repairing and checking procedures are not described in full detail, special care should be taken to avoid damage to property and personal injury.
With a view to providing its customers with the best possible riding experience, **aprilia** is committed to continually improving its products and the accompanying documentation.
aprilia dealers and world branches are informed about all major technical modifications and changes in repairing procedures. Such modifications will be covered in later editions of this manual.
Should any need or doubt arise about repairing and checking procedures, do not hesitate to contact **aprilia**'s Consumer Service (A.C.S.): they will be pleased to provide any information you may require and let you know of any technical modifications and updates.
For further information, please refer to:
SPARE PARTS CATALOGUE # 323 X
Engine Workshop Manual # 966 X
Special Tooling Manual

The main features described herein remaining unchanged, **aprilia** reserves the right to change its models at any time.

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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. Non-compliance with the indications given in the messages preceded by this symbol may result in grave risks for your and other people's safety and for the vehicle!

⚠ WARNING

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

⚠ CAUTION

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

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

PRECAUTIONS AND GENERAL INFORMATION

When repairing, disassembling and reassembling the vehicle, scrupulously observe the following recommendations.

⚠ WARNING

The use of open flames is forbidden under all circumstances.
Before performing any servicing or checks, switch off the engine, remove the ignition key, allow the engine and the exhaust system to cool down, and if possible lift the vehicle on solid level flooring using specific equipment.
To avoid burns, pay special attention to hot engine and exhaust parts.

The vehicle is made up of inedible parts. On no account must any parts be bitten, sucked, chewed or swallowed.

Unless otherwise specified, the reassembly of parts is carried out by following the disassembling procedures in reverse order.
Any overlapping operations in cross-references to other chapters should be interpreted logically so as to avoid unnecessary removal of components.

Never use fuel as a solvent to clean the vehicle.

Disconnect the battery negative (-) cable before performing any electric welding.

When two or more people are working at the same time, pay attention to the safety of each of them.

BEFORE REMOVING COMPONENTS

Remove any dirt, mud, dust and foreign bodies from the vehicle before removing any components.
Use the tools specially designed for this vehicle whenever necessary.

REMOVING COMPONENTS

Never loosen screws and nuts using tools other than the specific spanners.
Mark the positions on all connecting joints (pipes, cables, etc.) before separating them, and identify them with different marks.
Clearly mark each part so it can be easily identified during reinstallation.
Clean and wash the removed components with a low-flash detergent.
Keep mating parts together, as they have adapted to one another through wear and tear. Some components must be used in combination or replaced as a set.
Keep away from heat sources.

REPLACING COMPONENTS

⚠ CAUTION

Never reuse circlips. Always replace removed circlips with new ones.
When fitting a new circlip, take care not to part its ends more than is required to fit it on the shaft.
After fitting a circlip, ensure that it is fully and firmly inserted in its seat.

Never use compressed air to clean the bearings.

IMPORTANT Bearings should always rotate freely, smoothly and silently, otherwise they must be replaced.

Only use GENUINE aprilia spares.
Always use the recommended lubricants and consumables.
If possible, lubricate parts before refitting them.
When tightening screws and nuts, start with the larger or the inner ones, and then proceed diagonally.
Carry out the tightening in successive steps before applying the full tightening torque.
Always replace self-locking nuts, seal rings, circlips, O-rings, cotter pins and screws (if the threads are damaged) with new ones.
Clean all mating surfaces, oil seal rims and gaskets before refitting.
Apply a film of lithium grease to the oil seal rims.
Replace the oil seals and the bearings so that the marks or serial numbers face outwards (side in view).
Generously lubricate the bearings before fitting them.
Check that every component has been fitted properly.
After repairing or servicing any parts, carry out preliminary checks and test the vehicle on private ground or in a low-traffic area.

USING THE MANUAL

HOW TO CONSULT THE MANUAL

The manual is divided into chapters, each corresponding to a major type of components.
For easy reference, refer to the TABLE OF CONTENTS.
Unless otherwise specified, parts are reassembled by following the disassembling procedures in reverse order.
The terms “left” and “right” refer to the rider sitting on the vehicle in a normal riding position.
Refer to the Operation and Maintenance Manual for information on how to operate and maintain the vehicle.

In this manual the various versions are indicated by the following symbols:

ASD **automatic light switching version (Automatic Switch-on Device)**

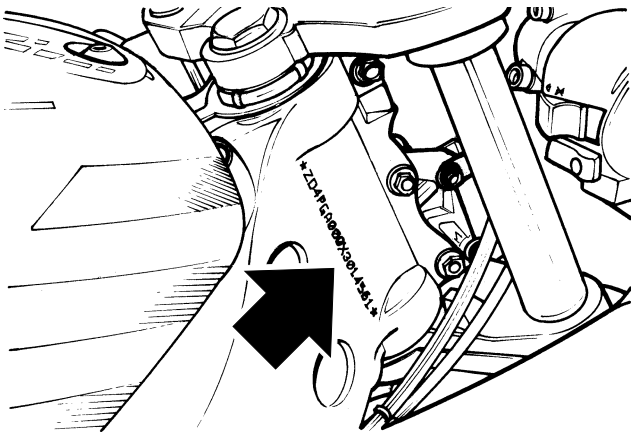
OPT **optional**

NOTES

1

General Information

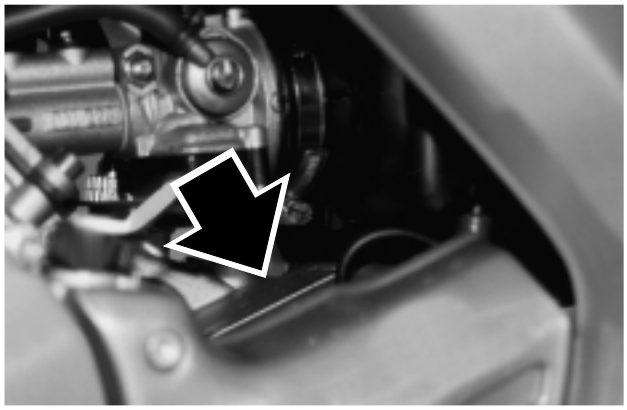
LOCATION OF SERIAL NUMBERS



These numbers are needed for registration purposes.
IMPORTANT Tampering with serial numbers is subject to severe penalties. In particular, tampering with the frame number immediately voids the warranty.

FRAME NUMBER
The frame number is stamped on the right side of the steering head tube.

ENGINE NUMBER
The engine number is stamped on the rear side, near the pinion.



NOTES ON FUEL, LUBRICANTS, COOLANT AND OTHER ITEMS

FUEL

⚠ CAUTION

The fuel used in internal combustion engines is highly flammable and can be explosive under certain conditions.
Refuelling and servicing should be carried out in a well ventilated place after switching off the engine.
Do not smoke while refuelling or in the presence of fuel fumes. Avoid contact with open flames, sparks and any other potential source of ignition or explosion.

Avoid spilling fuel from the tank filler as it may catch fire on contact with the hot engine surfaces.
Should any fuel be inadvertently spilled, be sure to dry up the area before starting the engine.
Since fuel dilates when exposed to heat and direct sunlight, avoid filling the tank to the brim.
Carefully close the tank cap after refuelling.
Do not allow fuel to come into contact with the skin and avoid ingesting it or inhaling its fumes. Do not transfer fuel from one vessel into another using a length of tube.

DO NOT DISPOSE OF FUEL IN THE ENVIRONMENT.
KEEP OUT OF REACH OF CHILDREN.
Only use unleaded premium petrol with a minimum octane number of 95 (RON) or 85 (MON).

TRANSMISSION OIL

⚠ WARNING

Transmission oil can cause serious damage to the skin if handled every day and for long periods.
Wash your hands carefully after using the oil.
Do not dispose of the oil in the environment.
Put it in a sealed container and take it to the filling station where you usually buy it or to an oil salvage center.

In case any maintenance operation has to be carried out, it is advisable to use latex gloves.

Renew the transmission oil after the first 500 km (300 mi) and then every 8,000 km (5,000 mi) (*). See CHANGING THE TRANSMISSION OIL AND THE ENGINE OIL FILTER.

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

Alternatively, use brand-name oils with performance complying with or exceeding the A.P.I. GL-4 specifications.

FORK OIL

⚠ WARNING

Fork oil can cause serious damage to the skin if handled every day and for long periods.
Wash your hands carefully after using the oil.
Do not dispose of the oil in the environment.
Put it in a sealed container and take it to the filling station where you usually buy it or to an oil salvage center.

In case any maintenance operation has to be carried out, it is advisable to use latex gloves.

The response of the suspension can be partly altered by changing the adjustment of the shock absorbers and/or the viscosity of the oil they contain.

Standard oil viscosity: SAE 20W.
Viscosity grades can be chosen according to the desired vehicle geometry (SAE 5W soft, SAE 20W stiff).

The two products can be used in different percentages until the desired response is obtained. The viscosity of F.A. and Agip FORK does not change much with temperature. As a result, the dampening response remains constant.

Fork oil (recommended):
F.A. 5W fork oil or F.A. 20W fork oil;
Alternatively, Agip FORK 5W or Agip FORK 20W.
If an intermediate action between those offered by F.A. 5W end F.A. 20W or by Agip FORK 5W end Agip FORK 20W, is desired, the products can be mixed as follows:
SAE 10W = F.A. 5W 67% by volume + F.A. 20W 33% by volume, or Agip FORK 5W 67% by volume + Agip FORK 20W 33% by volume.
SAE 15W = F.A. 5W 33% by volume + F.A. 20W 67% by volume, or Agip FORK 5W 33% by volume + Agip FORK 20W 67% by volume.

⚠ WARNING

MIXER OIL
Mixer oil can cause serious damage to the skin if handled every day and for long periods.
Wash your hands carefully after using the oil.
Do not dispose of the oil in the environment.
Put it in a sealed container and take it to the filling station where you usually buy it or to an oil salvage center.

In case any maintenance operation has to be carried out, it is advisable to use latex gloves.

Mixer oil (recommended):
PRO GPX 2 or
Agip 2T FORMULA RACING
Alternatively, use brand-name oils with performance complying with or exceeding the ISO-L-ETC ++, A.P.I. TC ++ specifications.

BRAKE FLUID

IMPORTANT The vehicle is equipped with front and rear disc brakes with separate hydraulic circuits.

⚠ WARNING

The following information refers to a single hydraulic circuit but applies to both.
Brake fluid can cause irritation if it comes into contact with the skin or the eyes.
Carefully wash any parts of the body that should happen to come into contact with the fluid. Contact an ophthalmologist or a physician if the fluid comes into contact with the eyes.

DO NOT DISPOSE OF THE FLUID IN THE ENVIRONMENT.

KEEP OUT OF REACH OF CHILDREN.

When handling brake fluid, take care not to spill it on plastic and painted parts as they would be damaged. Check the brake fluid level every 4,000 km (2,500 mi) (CHECKING AND RESTORING THE FRONT BRAKE FLUID LEVEL and CHECKING AND RESTORING THE REAR BRAKE FLUID LEVEL). Renew the fluid every year (RENEWING THE FRONT BRAKE FLUID and RENEWING THE REAR BRAKE FLUID).

Brake fluid (recommended):
F.F., DOT 5 (DOT 4 compatible) or
Agip BRAKE 5.1, DOT 5 (DOT 4 compatible).

⚠ CAUTION

Do not use brake fluids other than those prescribed. To avoid damaging the braking system, never mix different types of fluids when topping up.
Never use brake fluid taken from an old container, or from a container that has been open for a long time.
Sudden changes in brake play or a spongy feel of the brake levers are due to problems in the hydraulic circuits.
Take special care in ensuring that the brake discs and the brake linings are not oily or greasy, especially after checking or servicing the brakes.
Ensure that the brake lines are not twisted or worn.
Take care not to let any water or dust into the brake circuit.
Latex gloves are recommended for all maintenance operations involving the hydraulic circuit.

COOLANT

⚠ WARNING

The coolant is harmful if ingested. Contact with the skin or the eyes may cause irritation. Should the liquid come into contact with the skin or the eyes, generously rinse with water and seek medical attention.
If the fluid is ingested, cause vomiting, generously rinse the mouth and throat with water and immediately seek medical attention.

DO NOT DISPOSE OF THE COOLANT IN THE ENVIRONMENT.

KEEP OUT OF REACH OF CHILDREN.

⚠ WARNING

Take care not to spill any coolant on hot engine parts as it may catch fire and produce invisible flames.

Latex gloves are recommended for all maintenance operations.

Do not use the vehicle if the coolant level is below the minimum.

Check the coolant level before starting off and every 2,000 km (1,250 mi) (CHECKING AND RESTORING THE COOLANT LEVEL). Renew the coolant every two years (RENEWING THE COOLANT).

The cooling solution is composed of 50 per cent water and 50 per cent antifreeze. This mixture is ideal for most operating temperatures and ensures sufficient protection against corrosion.

It is advisable to use the same mixture during the hot season as this reduces evaporation and the need for frequent replenishing.
This also reduces evaporation and the formation of mineral salts deposits in the radiator and maintains the cooling system in perfect working order.

If the outside temperature is below 0° C, frequently check the cooling circuit and if necessary increase the antifreeze concentration (up to 60 per cent).

To avoid damaging the engine, always use distilled water in the cooling solution.

Engine coolant (recommended):
IP ECOBLU -40°C (-104°F) or
Agip COOL
Depending on the freezing temperature of the cooling mixture to be obtained, add the following coolant percentages to the water:

Freezing point °C (°F)	Coolant percentage by volume
-20° (-68°)	35
-30° (-86°)	45
-40° (-104°)	55

IMPORTANT Different antifreezes have different characteristics. The degree of protection provided by each product is specified on its label.

⚠ CAUTION

Only use nitrite-free antifreeze and anticorrosive providing protection to temperatures of at least -35° C (-95° F).

CARBON MONOXIDE
Whenever the engine needs to be run in order to carry out some operation, ensure that this is done in the open air or in a well-ventilated room.
Never run the engine in a closed environment unless the place is equipped with an exhaust system.

⚠ WARNING

Exhaust gases contain carbon monoxide, a poisonous gas that may cause fainting or even death.
Run the engine in an open space or in a closed space equipped with an exhaust system.

HIGH TEMPERATURE COMPONENTS

⚠ WARNING

The engine and the exhaust components reach high temperatures during use and remain hot for some time even after the engine has been switched off.

Before handling these components, put on insulating gloves or wait for the engine and the exhaust system to cool down.

RUNNING-IN RULES

⚠ WARNING

After the first 500 km (312 mi), carry out the checking operations indicated in the column "After running-in" of the REGULAR SERVICE INTERVALS CHART, in order to avoid hurting yourself or other people and/or damaging the vehicle.

The running-in of the engine is primary to ensure its correct functioning and its correct functioning. If possible, drive on hilly roads and/or roads with many bends, so that the engine, the suspensions and the brakes undergo a more effective running-in.

For the first 500 km (312 mi), keep to the following indications:

0-100 km (0-62 mi)
During the first 100 km (62 mi) put on the brakes with caution, avoiding sharp and prolonged brakings.
This ensures a correct bedding-in of the pads on the brake disc.

0-300 km (0-187 mi)
Do not keep the throttle grip open more than one half for long stretches.

300-500 km (187-312 mi)
Do not keep the throttle grip open more than three-fourths for long stretches.

SPARE PARTS

Only use Genuine **aprilia** Spares.
All Genuine aprilia Spares are high-quality parts specially designed and manufactured for **aprilia** vehicles.

⚠ CAUTION

Using NON-genuine aprilia **spares may result in damage and poor performance.**

TECHNICAL DATA

DIMENSIONS	
Max. length	1920 mm (75.6 in)
Max. length (rear mudguard extension included OPT)	1985 mm (78.1 in)
Max. width	675 mm (26.6 in)
Max. height (front part of the fairing included)	1155 mm (45.5 in)
Seat height	810 mm (31.9 in)
Distance between centres	1280 mm (50.4 in)
Min. ground clearance	170 mm (6.7 in)
Weight ready for starting	115 Kg (253.5 lbs)

ENGINE	
Type	one-cylinder, 2-stroke with laminar suction. Separate lubrication with variable strength automatic mixer (1.0 - 3.0 %).
Number of cylinders	1
Total displacement	49,75 cm^3 (3 $cu.in^3$)
Bore / stroke	40,3 mm / 39,0 mm (1.6 in / 1.5 in)
Compression ratio	12 ± 0,5 : 1
Starting	electric
Engine idling rpm	1100 ± 100 rpm
Clutch	multidisc in oil bath, with manual control on the left side of the handlebar.
Cooling	liquid-cooled

CAPACITY	
Fuel (reserve included)	13 l (27.4 gals)
Fuel reserve	2,6 l / 5.5 gals (mechanical reserve)
Transmission oil	820 cm^3 (50 $cu.in^3$)
Coolant	0,9 l / 1.9 gals(50% water + 50% antifreeze with ethylene glycol)
2 stroke oil (reserve included)	1,6 l (3.4 gals)
2 stroke oil reserve	0,35 l (0.7 gals)
Front fork oil	285 cm^3 / 17.4 $cu.in^3$ (for each rod)
Seats	n° 1 (2 in the countries where this is allowed)
Vehicle max. load (driver + luggage)	105 Kg (231.5 lbs)
Vehicle max. load (driver+passenger+luggage)	396,8 lbs / 180 Kg (in the countries where this is allowed)

TRANSMISSION	
Type	mechanical, 6 gears with foot control on the left side of the engine

GEAR RATIOS	
Ratio 1st	
Primary	20/71 = 1:3.550
Secondary	12/36 = 1:3.000
Final ratio	12/47 = 1:3.916
Total ratio	1:41.712

CONTINUED ›

GEAR RATIOS	
Ratio 2nd	
Secondary	16/33 = 1:2.062
Total ratio	1:28.677
Ratio 3rd	
Secondary	19/29 = 1:1.526
Total ratio	1:21.222
Ratio 4th	
Secondary	22/27 = 1:1.227
Total ratio	1:17.064
Ratio 5th	
Secondary	24/25 = 1:1.042
Total ratio	1:14.483
Ratio 6th	
Secondary	25/24 = 1:0.960
Total ratio	1:13.348

CARBURETTOR	
Number	1
Model	DELLORTO SHA 14/12M

FUEL SUPPLY	
Fuel	Leaded or unleaded premium grade petrol (4 Stars UK) according to the DIN 51600 standard, min. O.N. 95 (N.O.R.M.) and 85 (N.O.M.M.)
Fuel A AUS	unleaded petrol according to the DIN 51607 standard, min. O.N. 95 (N.O.R.M.) and 85 (N.O.M.M.)

FRAME	
Type	in aluminium
Steering inclination angle	24° (- 75°F)
Fore stroke	102 mm (4 in)

SUSPENSIONS	
Front	hydraulically operated telescopic fork
Wheel stroke	110 mm (4.3 in)
Rear	hydraulic adjustable mono-shock absorber
Wheel stroke	120 mm (4.7 in)

BRAKES	
Front	disc brake - Ø 280 mm (11 in) - with hydraulic transmission
Rear	disc brake - Ø 220 mm (8.6 in) - with hydraulic transmission

WHEEL RIMS	
Type	light alloy
Front	2,50 x 17”
Rear	3,00 x 17”

TYRES	
Front	90/80 17” 46S; 90/80 17” 46P
Rear	110/80 17” 57S; 110/80 17” 57P
INFLATION PRESSURE FOR SOLO RIDER	
Front	170 kPa (24.6 Psi / 1.7 bar)
Rear	190 kPa (27.5 Psi / 1.9 bar)
INFLATION PRESSURE FOR RIDER AND PASSENGER (in the countries where this is allowed)	
Front	180±10 kPa (1.8±0.1 bar / 26±1.45 Psi)
Rear	210±10 kPa (2.1±0.1 bar / 30.4±1.45 Psi)

IGNITION	
Type	C.D.I.
Spark advance	20° ± 1° (68°F ± 34°F) before T.D.C.

CONTINUED ›

SPARK PLUG	
Standard	NGK R BR9ES
Alternative	CHAMPION RN1C
D NL	NGK R BR8ES
Spark plug gap	0.6 - 0.7 mm (0.02 - 0.03 in)

ELECTRIC	
Battery	12 V - 4 Ah
Fuse	7.5 A
Generator	12 V - 105 W

BULBS	
Low beam	12 V - 35 W
High beam	12 V - 35 W
Parking light	12 V - 5 W
Direction indicators	12 V - 10 W
Rear parking light/ number plate light/stoplight	12 V - 5 / 21 W
Revolution counter	12 V - 5 W
Speedometer	12 V - 3.4 W
Coolant temperature indicator	12 V - 1.2 W

WARNING LIGHTS	
Neutral	12 V - 1.7 W
Right direction indicators	12 V - 1.7 W
High beam	12 V - 1.7 W
2 stroke oil reserve	12 V - 1.7 W
Left direction indicators	12 V - 1.7 W
Low beam	12 V - 1.7 W

LUBRICANT CHART

Gearbox oil (recommended): F. C., SAE 75W - 90 or Agip GEAR SYNTH, SAE 75W - 90.
As an alternative to the recommended oil, it is possible to use high-quality oils with characteristics in compliance with or superior to the A.P.I. GL-4 specifications.

2 stroke oil (recommended): PRO GPX 2 or Agip 2T FORMULA RACING.
As an alternative to the recommended oil, use high-quality oils with characteristics in compliance with or superior to the ISO-L-ETC++, A.P.I. TC++ specifications.

Fork oil (recommended): F. A. 5W or F. A. 20W fork oil;
As an alternative Agip FORK 5W or Agip FORK 20W.
If you need an oil with intermediate characteristics in comparison with the two recommended products, these can be mixed as indicated below:

SAE 10W = F. A. 5W 67% of the volume + F. A. 20W 33% of the volume, or
Agip FORK 5W 67% of the volume + Agip FORK 20W 33% of the volume;
SAE 15W = F. A. 5W 33% of the volume + F. A. 20W 67% of the volume, or
Agip FORK 5W 33% of the volume + Agip FORK 20W 67% of the volume.

Bearings and other lubrication points (recommended): AUTOGREASE MP or Agip GREASE 30.

As an alternative to the recommended product, use high-quality grease for rolling bearings, working temperature range -30°C.... +140°C (86°F…+ 284°F), dripping point 150°C... 230°C (302°F… 446°F), high protection against corrosion, good resistance to water and oxidation.

Protection of the battery poles: neutral grease or vaseline.
Spray grease for chains (recommended): CHAIN SPRAY or Agip CHAIN LUBE.

⚠ WARNING

Use new brake fluid only.
Brake fluid (recommended): F. F., DOT 5 (Compatible DOT 4) or Agip BRAKE 5.1, DOT 5 (Compatible DOT 4).

⚠ WARNING

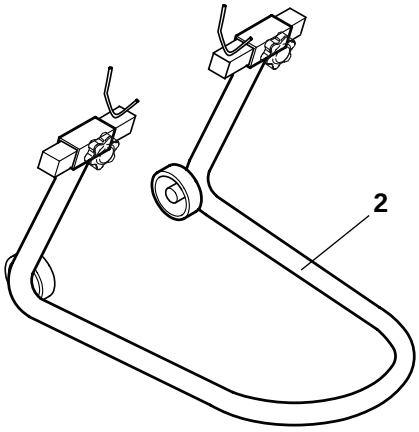
Use only antifreeze and anticorrosive without nitrite, ensuring protection at -35°C (-95°F) at least.
Engine coolant (recommended): ECOBLU - 40°C (- 104°F) or Agip COOL.

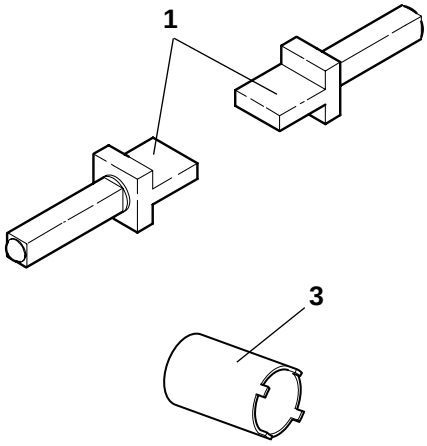
SPECIAL TOOLS OPT

Proper removal and refitting of parts, as well as correct adjustment of components, can only be obtained with suitable tools.
Special tools prevent possible damage due to the use of unsuitable equipment and/or improper techniques.
The following is a list of the tools specially designed for this vehicle.
Should any generic special tools be needed, refer to the Special Tooling Manual.

⚠ WARNING

Before using a special tool, consult any accompanying documentation.

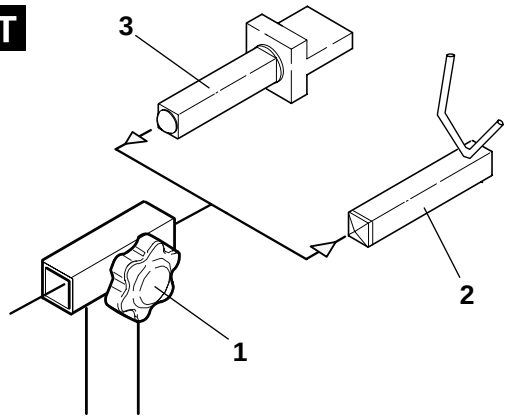




Code	Pos.	Tool name and function
8140204	1	Stand support peg
8705021	2	Rear stand
8101945	3	Swing arm pivot adjusting bush spanner

PLACING THE VEHICLE ON THE REAR STAND

OPT



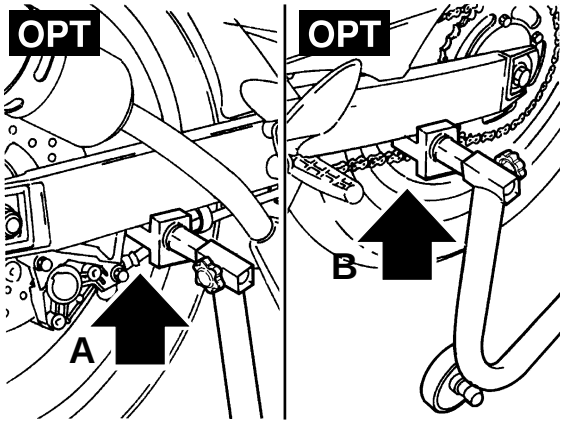
Loosen knob (1).
Remove fork-shaped support (2) and pull it out of the stand seat.
Insert support peg (3).
Repeat the above operations on the opposite side of the stand.

⚠ CAUTION

Lift the vehicle by acting only on the two swing arm bars.
Rear stand support peg: 8140204

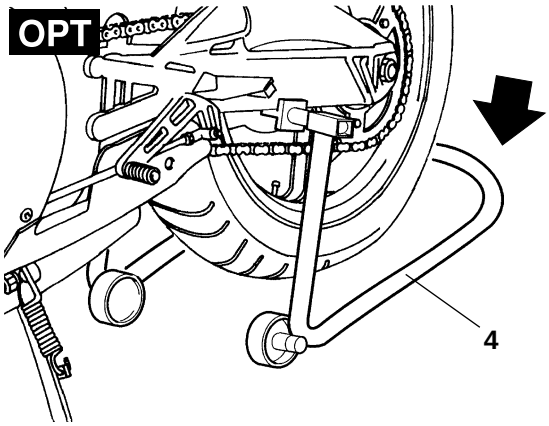
Insert the stand from the back of the vehicle and position it so that the two support pegs (3) are inserted as follows:
- The right-hand peg between the brake caliper and the brake line connection on the swing arm (Pos. A).
- The left-hand peg between the rear sprocket and the chain (Pos. B).

Remove support pegs (3) and bring them into contact with the swing arm.
Tighten the two knobs (1).



IMPORTANT A second operator is needed to help to keep the vehicle in a vertical position with both wheels resting on the ground.

Rest one foot on the rear part of stand (4).
Push stand (4) downwards to travel end (see figure).



Rear stand: 8705021

GENERAL SPECIFICATIONS FOR TIGHTENING TORQUES

The table below shows standard tightening torques for screws and bolts with ISO metric threads.

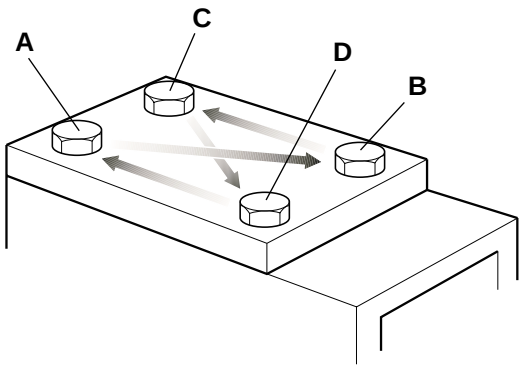
Screw/bolt	Spanners	Tightening torques threads	
		Nm (Ft-lb)	**Kgm**
M6	10	6 (4.4)	0.6
M8	12	15 (11.1)	1.5
M10	14	30 (22.1)	3.0
M12	17	55 (40.5)	5.5
M14	19	85 (62.7)	8.5
M16	22	130 (95.9)	13.0

For information on specific joints and connections of the vehicle in question, refer to the paragraph FASTENINGS.

Unless otherwise specified, tightening torques are given for clean, dry threads at room temperature.

IMPORTANT To avoid distortion and/or improper mating, tighten screws and bolts by following these steps:
- Screw in all fastenings manually.
- Tighten diametrically opposite fastenings A-B, C-D by applying half the prescribed torque.
- Repeat the operation by applying the prescribed tightening torque.

IMPORTANT This procedure allows the pressure exerted by the fastenings to be evenly distributed over the mating surface.



ABBREVIATIONS, SYMBOLS, ACRONYMS

= number
< = is less than
> = is greater than
≤ = is less than or equal to
≥ = is greater than or equal to
~ = approximately
∞ = infinity
°C = degrees centigrade
°F = degrees Fahrenheit
± = plus or minus
a.c. = alternating current
A = amperes
Ah = ampere-hour
API = American Petroleum Institute
HV = high voltage
bar = unit of pressure (1 bar = 100 kPa)
cm^3 = cubic centimetres
CO = carbon monoxide
DIN = Deutsche Industrie Norm
d.c. = direct current
rpm = revolutions per minute
ISC = idle speed control
kg = kilograms
kgm = kilogram-metres (1 kgm = 10 Nm)
km = kilometres
km/h = kilometres per hour
k = kilohms
kPa = kiloPascal (1 kPa = 0.01 bar)
kW = kilowatts
/ = litres
LED = light emitting diode
m/s = metres/second
MAX = maximum
mbar = millibars
mi = miles
MIN = minimum
MPH = miles per hour
MΩ = megohms
M.O.N. = “Motor” Octane Number
R.O.N. = “Research” Octane Number
Nm = Newton-metre (1 Nm = 0.1 kgm)
Ω = ohms
BDC = bottom dead centre
TDC = top dead centre
SAE = Society of Automotive Engineers
CSH = cheese socket head
F.L.H. = fillister head
H.H. = hexagon head
F.H. = flat head
UPSIDE-DOWN = upside-down fork rods
V = Volts
W = Watts
Ø = diameter

NOTES

Periodic Maintenance Operations

2

This section describes the operations to be performed periodically when servicing the main vehicle components.

⚠ CAUTION

Before performing any servicing or checks, switch off the engine, remove the key, allow the engine and the exhaust system to cool down, and if possible lift the vehicle on solid level flooring using specific equipment.
To avoid burns, be sure to keep away from hot engine and exhaust parts.
The vehicle is made up of inedible parts. On no account must any parts be bitten, sucked, chewed or swallowed.
Unless otherwise specified, the reassembly of parts is carried out by following the disassembling procedures in reverse order.

PERIODIC MAINTENANCE SCHEDULE

	COMPONENTS	End of running-in 1,000 km (600 mi)	Every 4,000 km (2,500 mi) or 12 months	Every 8,000 km (5,000 mi) or 24 months
u	Battery electrolyte level	C	C	
u	Spark plug	P	C	S
c	Carburettor			P
c	**Wheel alignment**		**C**	
c	Steering hub bearings and steering play	C	C	
c	Wheel bearings		C	
u	Air filter	C	P	
u	**Operation/adjustment of lights**		**C**	
u	Clutch play	R	R	
c	Braking systems	C	C	
c	Cooling system	C	C	
u	Lighting equipment	C	C	
u	Brake fluid		C	
c	Brake fluid		**Every 2 years: R**	
u	Coolant		Every 2,000 km (1,200 mi): C	
c	Coolant		**Every 2 years: R**	
u	Mixer oil level		Every 500 km (300 mi): C	
c	Exhaust silencer/terminal		P	
u	Transmission oil	S	C	S
c	Fork oil and oil seal	**Every 12,000 km (7,500 mi): R**		
c	Piston and piston rings	After first 8,000 km (5,000 mi): C / Every 16,000 km (10,000 mi): R		
u	Engine idle speed	R	C	
u	Wheels, tyres and inflating pressure		Every month: C	
c	**Wheels, tyres and inflating pressure**	**C**	**C**	
c	Tightening of bolts and nuts	C	C	
c	Mixer oil reserve LED indicator	C	C	
u	**Drive chain tension and lubrication**		**Every 500 km (300 mi): C**	
c	**Final drive (chain, front and rear sprockets)**		**C**	
c	Fuel lines		C	Every 4 years: R
c	Mixer oil line		C	Every 4 years: R
u	Wear of front and rear brake pads	C	Every 2,000 km (1,200 mi): C	
c	**Clutch wear**		**C**	
c	**Rear shock absorber**			**C**
c	***Brake discs***	***C***	***C***	
c	***Cables and controls***	***C***	***C***	
c	***General vehicle operation***	***C***	***C***	

C = check and clean, adjust, lubricate or replace as necessary; Cl = clean; R = renew; A = adjust.

The above operations must be performed at shorter intervals if the vehicle is used in rainy or dusty areas, or on rough roads.

*We recommend having the operations marked with a 'd' ONLY by an Official **aprilia** Dealer.*

u = user d = dealer

LUBRICATING POINTS

Proper lubrication is a key factor in ensuring smooth operation and long life of the vehicle.

IMPORTANT Before lubricating any parts, thoroughly clean them of any rust, grease, dirt or dust. All exposed parts that are subject to rust must be lubricated with engine oil or grease. Please refer to the TABLE OF LUBRICANTS.

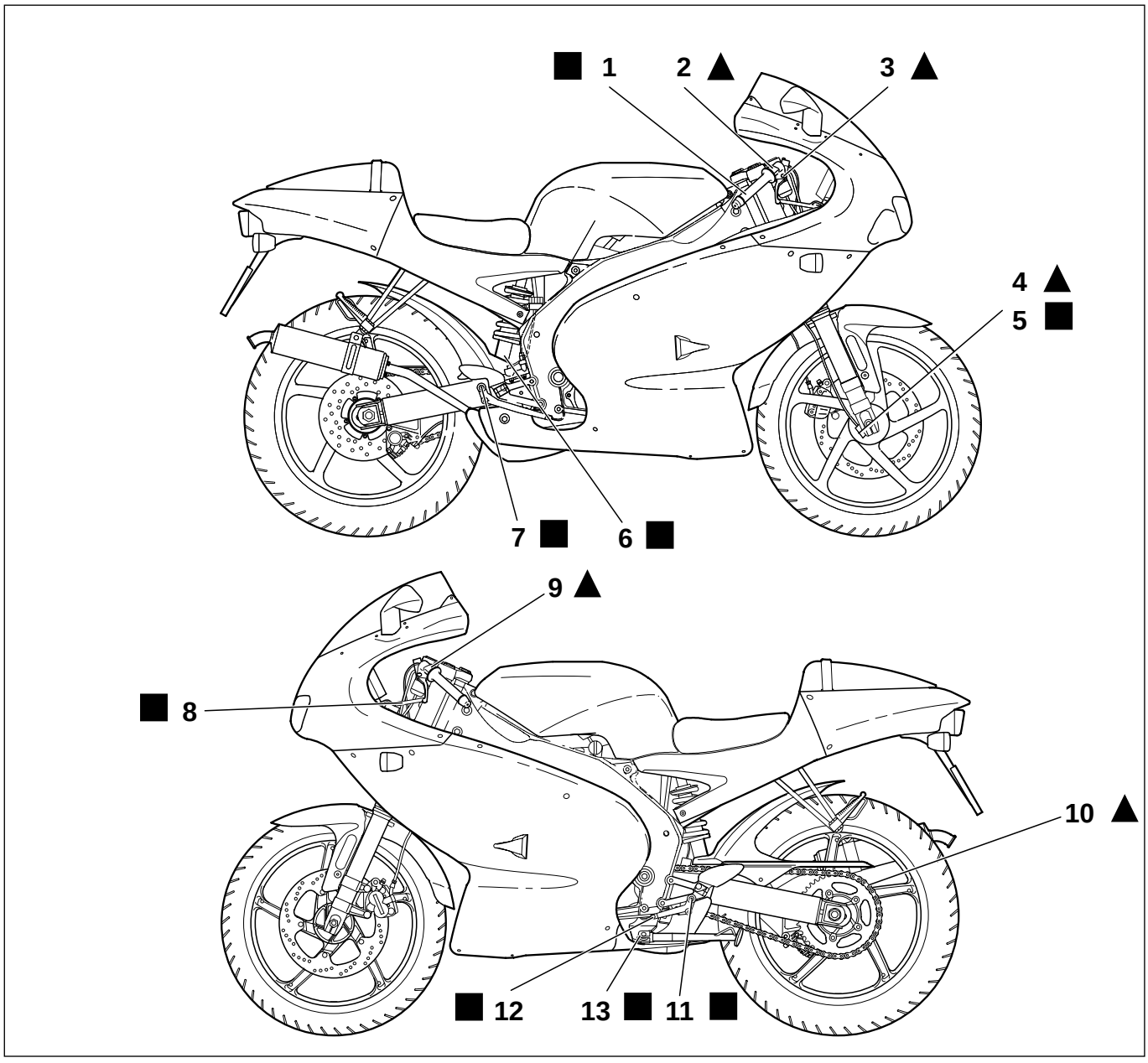
The points to lubricate are shown in the LUBRICATION CHART.

LUBRICATION CHART

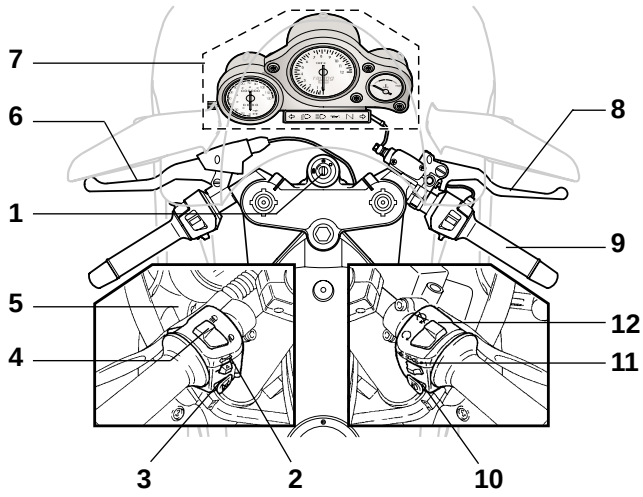
KEY TO LUBRICATION CHART

1) Throttle twist grip
2) Throttle cable
3) Brake lever pin
4) Speedometer cable
5) Speedometer gear
6) Fixing pin
7) Brake pedal pins
8) Steering bearings
9) Clutch lever pin
10) Drive chain
11) Gear lever pins
12) Gear lever pins
13) Side stand pin

■ = Grease
▲ = Oil



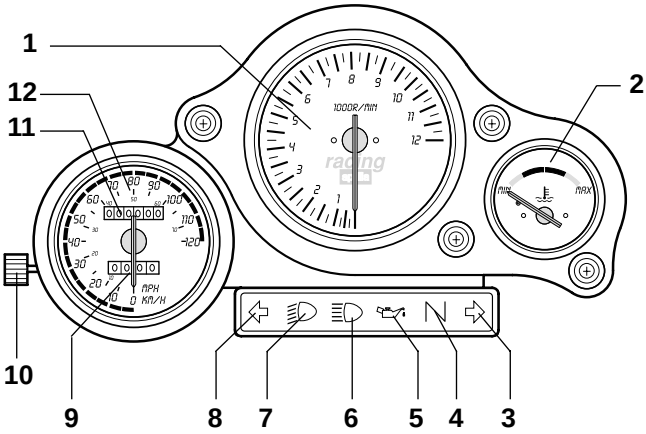
ARRANGEMENT OF THE INSTRUMENTS / CONTROLS



KEY

1) Ignition switch/steering lock (◯ - ⊗ - 🔒)
2) Direction indicator switch (⇦⇨)
3) Horn push button (📯)
4) Dimmer switch (≡D - ≡D)
5) High beam signalling push button (≡D)
6) Clutch lever
7) Instruments and indicators
8) Front brake lever
9) Throttle grip
10) Start push button (Ⓘ)
11) Light switch (☼ - ≡D - •) (not provided for ASD)
12) Engine stop switch (◯ - ⊗)
(in the countries where required)

INSTRUMENTS AND INDICATORS



KEY

1) Revolution counter
2) Coolant temperature indicator (🌡)
3) Green right direction indicator warning light (⇨)
4) Green neutral indicator warning light (N)
5) Red 2 stroke oil reserve warning light (🛢)
6) Blue high beam warning light (≡D)
7) Green low beam warning light (≡D)
8) Green left direction indicator warning light (⇦)
9) Partial kilometres odometer
10) Odometer trip control
11) Total kilometres odometer
12) Speedometer

BATTERY

Carefully read the section PRECAUTIONS AND GENERAL INFORMATION

There are two types of batteries on the market:
- low-maintenance batteries, in which the cells are stoppered by plugs;
- maintenance-free batteries, with no plugs and requiring no electrolyte checks or replenishing.

IMPORTANT This vehicle is equipped with a low-maintenance battery.

Always replace the battery with another of the same type.

Check the electrolyte level and the tightening of the terminals after the first 500 km (312 mi) and successively every 4000 km (2500 mi) or 8 months.

⚠ WARNING

The electrolyte in the battery is toxic and caustic and if it gets in contact with the skin it can cause burns, since it contains sulphuric acid. Wear protection clothes, a face mask and/or goggles during maintenance operations.

In case of contact with the skin, rinse with plenty of water.

In case of contact with the eyes, rinse with plenty of water for fifteen minutes, then consult an oculist without delay.

If the electrolyte is accidentally swallowed, drink a lot of water or milk, then continue drinking milk of magnesia or vegetable oil and consult a doctor without delay.

The battery gives off explosive gases; keep it away from flames, sparks, cigarettes and any other source of heat.

During the recharging or the use, make sure that the room is properly ventilated and avoid inhaling the gases released during the recharging.

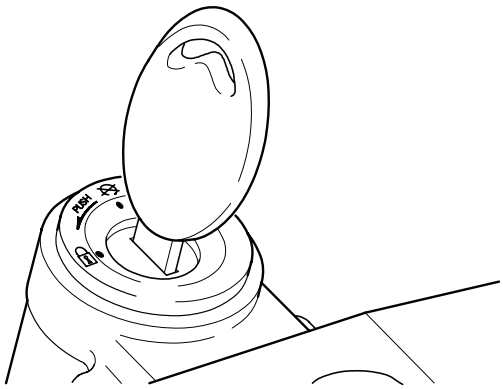
KEEP AWAY FROM CHILDREN.

Do not incline the vehicle too much, in order to avoid dangerous leaks of the battery fluid.

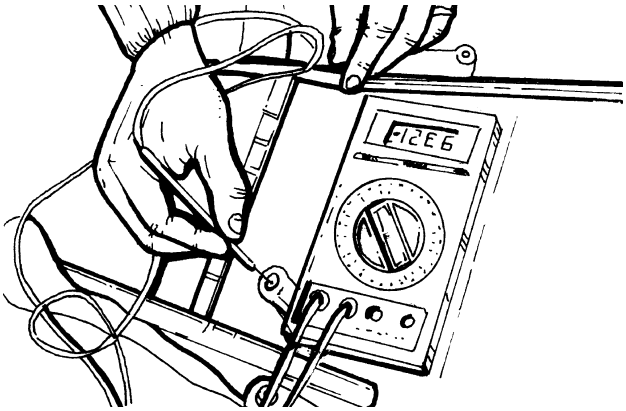
⚠ CAUTION

Never invert the connection of the battery cables.

Connect and disconnect the battery with the ignition switch in position "⊗".
Connect first the positive cable (+) and then the negative cable (–).
Disconnect following the reverse order.



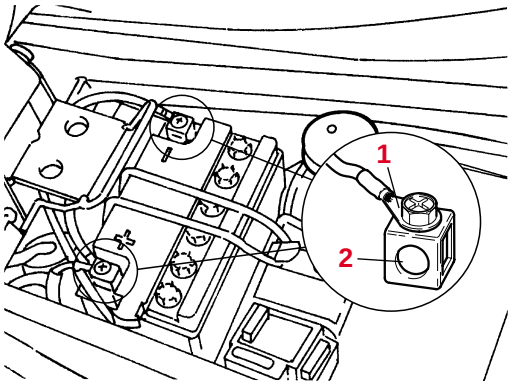
IMPORTANT Check the battery voltage with a portable multimeter. If the voltage is less than 12 V, the battery needs to be recharged.



CHECKING AND CLEANING THE TERMINALS

Carefully read (BATTERY).

Remove the rider saddle, see p. 50 (REMOVING THE RIDER SADDLE).
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:
Make sure that the ignition switch is in position "⊗".
Disconnect first the negative (–) and then the positive cable (+).
Brush with a wire brush to eliminate any sign of corrosion.
Reconnect first the positive (+) and then the negative cable (–).
Cover the terminals of the cables and of the battery with neutral grease or Vaseline.

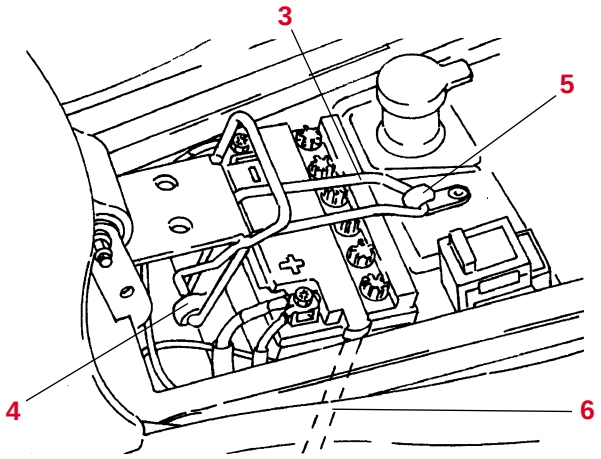


REMOVING THE BATTERY

Carefully read (BATTERY).
Make sure that the ignition switch is in position "⊗".
Remove the rider saddle, see (REMOVING THE RIDER SADDLE).
Release the rubber band (3) from the couplings (4) and (5) and take it.
Disconnect first the negative (–) and then the positive cable (+).
Remove the battery breather pipe (6).
Remove the battery from its compartment and put it on a flat surface, in a cool and dry place.

⚠ WARNING

Once it has been removed, the battery must be stored in a safe place and kept away from children.



CHECKING THE ELECTROLYTE LEVEL

Carefully read (BATTERY).

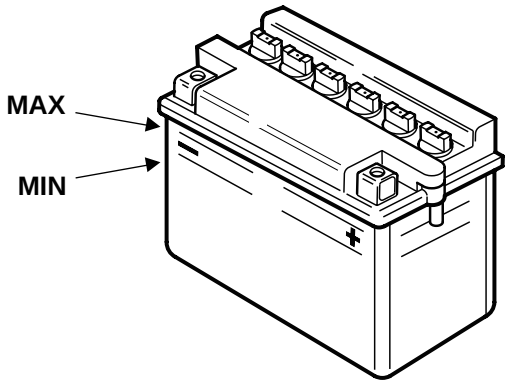
To check the electrolyte level, proceed as follows:
Remove the battery (REMOVING THE BATTERY).
Make sure that the fluid level is included between the two "**MIN**" and "**MAX**" notches stamped on the battery side.

Other-wise:

⚠ CAUTION

Remove the element plugs.
Top up with distilled water only.
Do not exceed the "MAX" mark, since the electrolyte level increases during the recharge.

Top up by adding distilled water.



RECHARGING THE BATTERY

Read through the paragraph BATTERY.

IMPORTANT When the battery is almost completely discharged, a vibrating sound is heard from the starting relay when the start button "ⓘ", is pressed.
IMPORTANT To avoid damage to the battery, never remove the plugs.

⚠ CAUTION

When recharging or using the battery, ensure that the place is adequately ventilated. Avoid inhaling the fumes released during recharge.

Turn on the battery charger.

Recharge	Voltage (amperes)	Time (hours)
Normal	1.2	8 - 10
Fast	12	0.5

⚠ CAUTION

After disconnecting the battery charger, wait 5-10 minutes before reinstalling the battery as the battery continues to release gases for a short time.

LONG BATTERY INACTIVITY

Read through the paragraph BATTERY.

Whenever the vehicle remains unused for longer than 15 days, the battery needs to be recharged in order to avoid sulphation (RECHARGING THE BATTERY).
Remove the battery (REMOVING THE BATTERY) and store it in a cool and dry place.
In the winter, or when the vehicle is not used for some time, periodically check the battery charge (about once a month) so as to avoid deterioration.
Recharge the battery completely using the normal method (RECHARGING THE BATTERY).
If the battery is not removed from the vehicle, be sure to disconnect the cables from the terminals.

SPARK PLUG

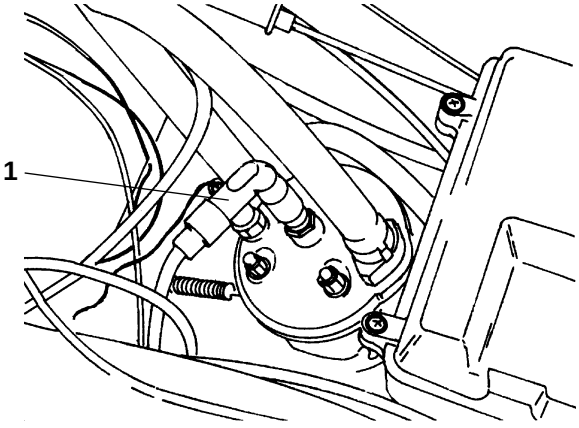
Carefully read the PERIODIC MAINTENANCE SCHEDULE.

Clean the spark plug after the first 500 km (312 mi) and successively every 500 km (312 mi); change it every 3000 km (1875 mi).

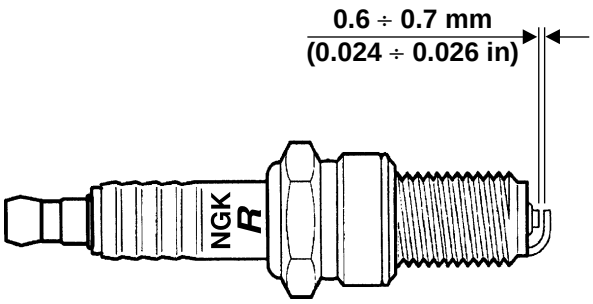
Periodically remove the spark plug and clean it carefully, removing carbon deposits; change it if necessary.

To reach the spark plug:
Lift the fuel tank, (LIFTING THE FUEL TANK).

To remove and clean the spark plug:
Take off the spark plug cap (1).
Remove all the dirt from the base of the spark plug, then unscrew it with the spanner you will find in the tool kit and extract it from its seat, taking care that neither dust nor other substances enter the cylinder.
Make sure that there are neither carbon deposits, nor corrosion marks on the electrode and on the central porcelain part; if necessary, clean them with the special cleaners for spark plugs, with an iron wire and/or a metal brush.



Energetically blow some air, in order to prevent the removed residues from getting into the engine.
If the spark plug has crackings on the insulating material, corroded electrodes or excessive deposits, it must be changed.
Check the spark plug gap with a thickness gauge.
The gap must be 0.6 ÷ 0.7 mm (0.024 ÷ 0.026 in); if necessary adjust it, carefully bending the earth electrode.
Make sure that the washer is in good conditions. With the washer on, screw the spark plug by hand in order not to damage 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.

⚠ CAUTION

If the spark plug is new, tighten it, then loosen it again, and finally retighten it with the prescribed torque.

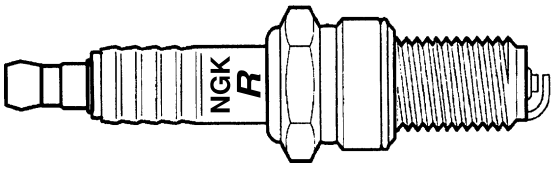
Spark plug driving torque:
20 Nm (2 kgm) [14.8 Ft-lb].

⚠ CAUTION

The spark plug must be well tightened, otherwise the engine may overheat and be seriously damaged.
Use the recommended type of spark plug only, (TECHNICAL DATA), in order not to compromise the life and performance of the engine.

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

SPARK PLUG Standard ..... NGK R BR9ES
Alternatively ..... CHAMPION RN1C
D NL ..... NGK R BR8ES



AIR CLEANER

⚠ WARNING

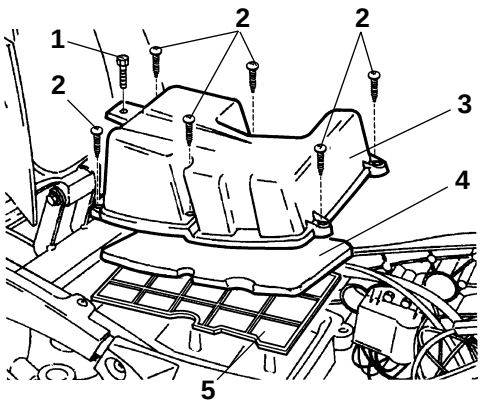
Do not use petrol or inflammable solvents to wash the air cleaner, in order to avoid fires or explosions.

Carefully read the PERIODIC MAINTENANCE SCHEDULE.

Check the conditions of the air cleaner and clean it monthly or every 4000 km (2500 mi), depending on the conditions in which the vehicle is used.
If the vehicle is used on dusty or wet roads, the cleaning operations and any replacement should be carried out more frequently.
Before the cleaning operation, it is necessary to remove the air cleaner from the vehicle.

REMOVAL

Lift the fuel tank, (LIFTING THE FUEL TANK).
Unscrew and remove the screw (1).
Unscrew and remove the six screws (2).
Remove the filter case cover (3).
Remove the filtering element (4).
Remove the grid (5).



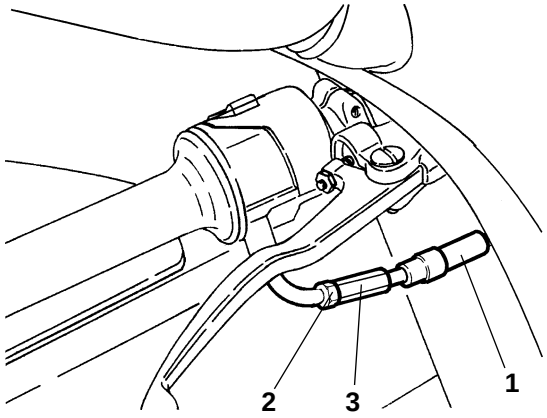
⚠ CAUTION

Plug the opening with a clean cloth, to prevent any foreign matters from entering the suction pipes.

CLEANING

Clean the filtering element (4) with clean, non-inflammable solvents or solvents with high volatility point, then let it dry thoroughly.
Apply a filter oil or a thick oil (SAE 80W-90) on the whole surface of the filtering element, then squeeze it to eliminate the oil in excess.
NOTE The filtering element (4) must be well impregnated, though not dripping.

ADJUSTING THE ACCELERATOR CONTROL

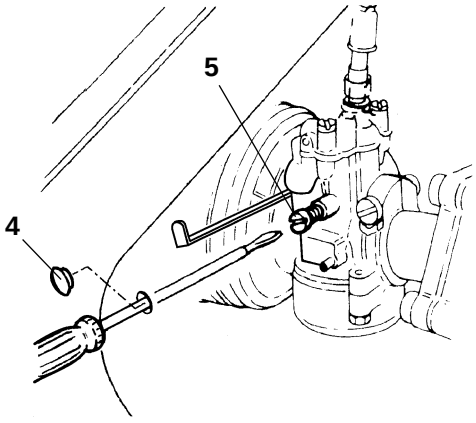


Carefully read the PERIODIC MAINTENANCE SCHEDULE.
The idle stroke of the throttle grip must be **2 ÷ 3 mm (0.079 ÷ 0.118 in)**, measured on the edge of the grip itself.
If this is not the case, proceed as follows:
Position the vehicle on the stand.
Withdraw the protection element (1).
Loosen the lock nut (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.
Put back the protection element (1).

⚠ WARNING

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

IDLING ADJUSTMENT



Carefully read the PERIODIC MAINTENANCE SCHEDULE.
Adjust the idling every time it is irregular.
To carry out this operation, proceed as follows:
Ride for a few miles until reaching the normal running temperature, (Coolant temperature indicator in the central portion of the scale).
Position the gear lever in neutral (green warning light "N" on).
Check the engine idling rpm on the revolution counter.
The engine idling speed must be about 1100 ±100 rpm.
If necessary:
Position the vehicle on the stand.
Remove the rubber plug (4) (right fairing).
Insert a flat-tip screwdriver in the hole and adjust the screw (5) positioned on the carburettor.
By SCREWING IT (clockwise), you increase the engine rpm.
By UNSCREWING IT (anticlockwise), you decrease the engine rpm.
Twist the throttle grip, accelerating and decelerating a few times to make sure that it functions correctly and to check if the idling speed is constant.

CONTROLS ON THE CARBURETTOR

COLD START LEVER

The cold start lever (1) is positioned on the right side of the carburettor. It can be reached from above through the opening positioned between the fairing and the frame.

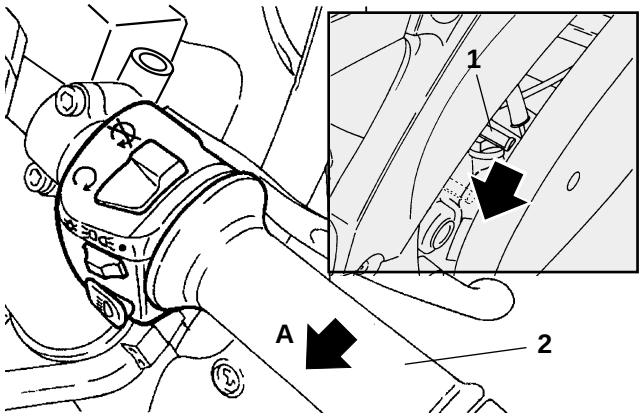
The starter for the cold start of the engine is operated by pushing the lever downwards.

When the engine has warmed up, to disconnect the starter proceed as follows:

⚠ CAUTION

Do not force the cold start lever (1) manually, since it automatically returns to its initial position when the throttle grip (2) is rotated.
Do not leave the cold start lever (1) pushed downwards.
Do not accelerate if it is not necessary.

Rotate the throttle grip (2) completely (Pos. A) and release immediately afterwards.
A metallic snap will signal that the cold start lever (1) has returned to its initial position.



CHECKING THE TRANSMISSION OIL LEVEL

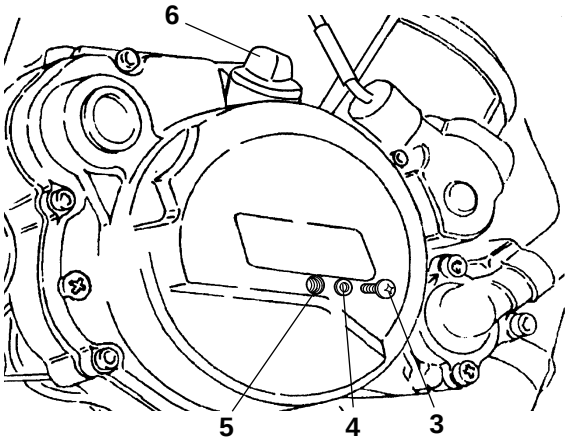
Read through the paragraph TRANSMISSION OIL and the PERIODIC MAINTENANCE SCHEDULE.

Check the transmission oil level every 4000 km (2500 mi), change it after the first 500 km (312 mi) and successively every 8000 km (5000 mi), (CHANGING THE TRANSMISSION OIL).

CHECKING

NOTE Position the vehicle on firm and flat ground.

Stop the engine and let it cool down for at least ten minutes, in order to allow the oil to flow back to the oil pan and to cool down.
Remove the right fairing, (REMOVING THE SIDE FAIRINGS).
Unscrew and remove the screw (3).
Take the sealing washer (4).



⚠ WARNING

Danger of fall or overturning.
When the vehicle is straightened from the parking position to the driving position, the stand goes automatically up.

Keep the vehicle in vertical position, with the two wheels resting on the ground.

NOTE The non-performance of the operations described above may result in a wrong measurement of the level.

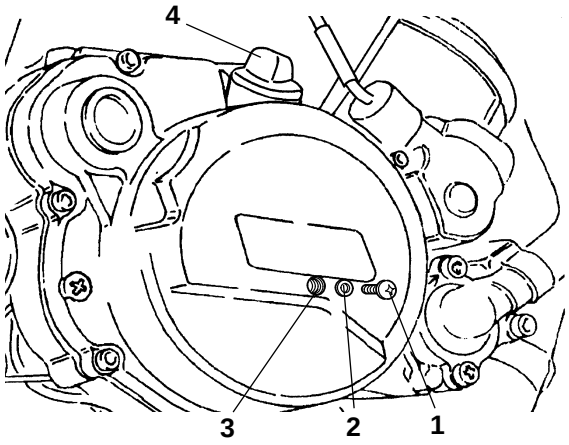
Visually check if the oil reaches the lower edge of the threaded hole (3).

If so, proceed as follows:
Check and if necessary change the sealing washer (2).
Tighten the screw (1).

Otherwise:
Provide for topping up.
See (LUBRICANT CHART).

TOPPING UP
If it were necessary to top up, proceed as follows:

Unscrew and remove the filling cap (4).
Pour a small quantity of oil and wait about one minute, to allow the oil to flow uniformly inside the pan.
Visually check if the oil reaches the lower edge of the threaded hole (3).
If this is not the case, top up again with small quantities of oil and repeat the check through the threaded hole (3), until reaching the prescribed level.
At the end of the operation, screw and tighten the filling cap (4).



⚠ WARNING

Tighten the filling cap thoroughly and make sure that there are no oil leaks.

Periodically check that there are no leaks in correspondence with the oil pan cover seal.

Do not use the vehicle with insufficient lubrication or with contaminated or unsuitable lubricants, since this would accelerate the wear of the moving parts and may also cause irreparable failures.

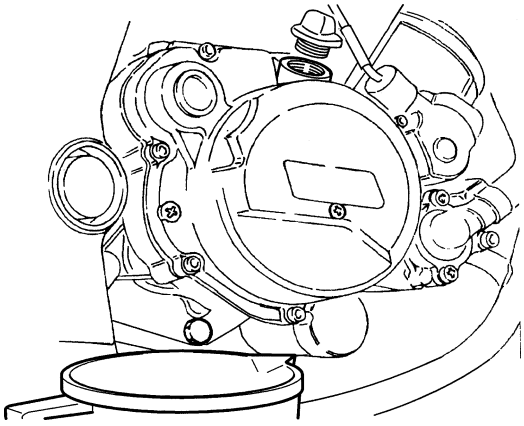
CHANGING THE TRANSMISSION OIL

Read through the paragraph TRANSMISSION OIL and the PERIODIC MAINTENANCE SCHEDULE.
Check the transmission oil level every 4000 km (2500 mi), change it after the first 500 km (312 mi) and successively every 8000 km (5000 mi).

CHANGING
Start the engine, see (STARTING) and let it idle for a few minutes, in order to facilitate the outflow of the oil during the draining phase.

NOTE Position the vehicle on firm and flat ground.

Stop the engine and let it cool down for at least ten minutes, in order to allow the oil to flow back to the oil pan and to cool down.



⚠ WARNING

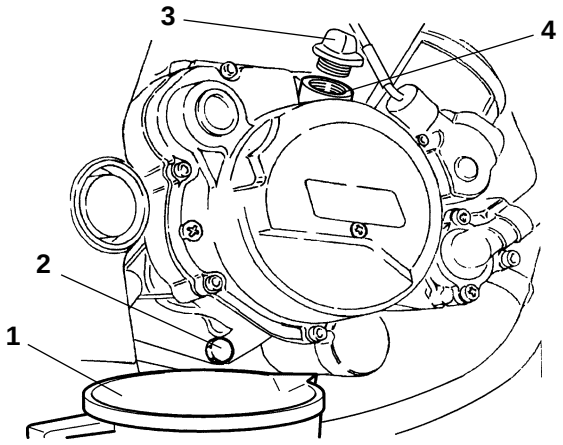
When warmed up, the engine contains hot oil; therefore, while carrying out the operations described here below be particularly careful, in order to avoid burns.

Remove the right fairing, see (REMOVING THE SIDE FAIRINGS).
Remove the exhaust silencer, see (REMOVING THE EXHAUST SILENCER).

⚠ WARNING

Danger of fall or overturning.
When the vehicle is straightened from the parking position to the driving position, the stand goes automatically up.

Keep the vehicle in vertical position, with the two wheels resting on the ground.
Put a container (1) with at least 900 cm^3 (55 $cu.in^3$) capacity in correspondence with the drain plug (2).
Unscrew and remove the drain plug (2).
Unscrew and remove the filling plug (3).
Drain the oil and let it drip into the container (1) for a few minutes.
Remove the metal residues from the drain plug (2) magnet.
Check and if necessary replace the sealing washer of the drain plug (2).



Screw and tighten the drain plug (2).

Drain plug (2) driving torque:
27 Nm (2.7 kgm) [19,9 Ft-lb].

Pour about 820 cm^3 (55 $cu.in^3$) of transmission oil through the filling opening (4), see (LUBRICANT CHART).
Tighten the filling plug (3).
Start the engine, see (STARTING) and let it idle for about one minute, in order to ensure the filling up of the transmission oil circuit.

Check the oil level and top up if necessary, see (CHECKING THE TRANSMISSION OIL LEVEL AND TOPPING UP).

⚠ WARNING

Tighten the filling plug and the drain plug thoroughly and make sure that there are no oil leaks.

Periodically check that there are no leaks in correspondence with the oil pan cover seal.

Do not use the vehicle with insufficient lubrication or with contaminated or unsuitable lubricants, since this would accelerate the wear of the moving parts and may also cause irreparable failures.

2 STROKE OIL TANK

Top up the 2 stroke oil tank every 500 km (312 mi).
The vehicle is provided with a separate mixer that ensures the mixing of petrol and oil for the engine lubrication, see (LUBRICANT CHART).
The 2 stroke oil reserve is indicated by the coming on of the 2 stroke oil reserve warning light "" positioned on the dashboard, see (INSTRUMENTS AND INDICATORS).

⚠ CAUTION

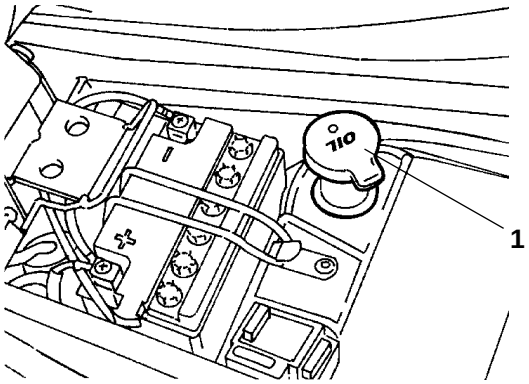
The use of the vehicle without 2 stroke oil causes serious damages to the engine.

Bleeding is necessary whenever the oil contained in the oil mixer reservoir runs out or the mixer oil pipe is removed.

This operation is indispensable, since the running of the engine with air in the mixer oil system may result in serious damage to the engine.

To introduce the 2 stroke oil in the tank, proceed as follows:
Remove the rider saddle, see (REMOVING THE RIDER SADDLE).
Remove the plug (1).

TANK CAPACITY: 1.6 l (3.4 gals)
TANK RESERVE: 0.35 l (0.7 gals)



⚠ CAUTION

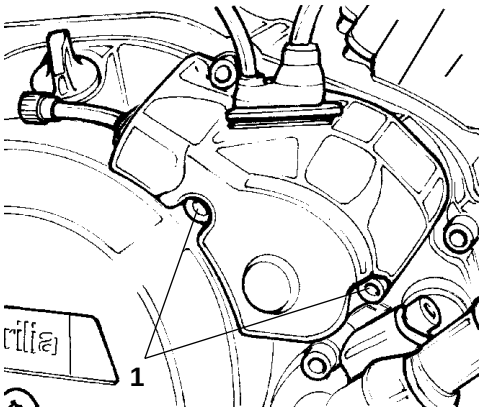
Carefully wash your hands after handling the oil. Do not dispose of the 2 stroke oil in the environment.

KEEP AWAY FROM CHILDREN.

REMOVING THE OIL FROM THE MIXER OIL RESERVOIR

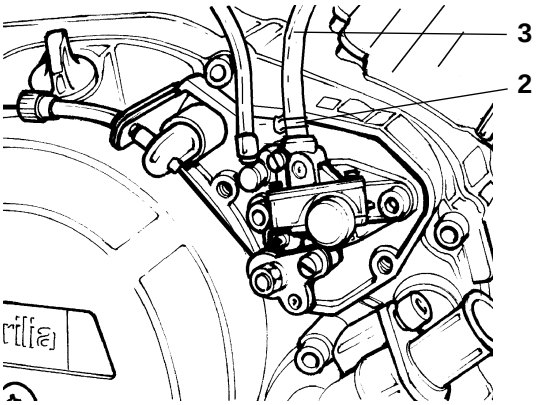
Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove the rider and passenger saddles (REMOVING THE RIDER AND PASSENGER SADDLES).
Remove the right-hand side fairing (REMOVING THE SIDE FAIRINGS).
Keep the vehicle in a vertical position using the rear stand OPT.

Remove the two screws (1) shown in the figure and take off the oil pump cover.



Prepare a container with a capacity of over of 2 l.

Remove clamp (2) and then disconnect oil feed pipe (3) and drain all the oil from the tank into the container.



Once the oil has completely drained, attach oil feed pipe (3) and fasten it with clamp (2).
Fit the oil pump cover and fasten it by means of screws (1).

Tightening torque for screws (1):
4 Nm (0,4 kgm) [2.9 ft-lb]

⚠ CAUTION

Carefully wash your hands after handling the oil. Do not dispose of the 2 stroke oil in the environment.

KEEP AWAY FROM CHILDREN.

COOLANT

⚠ CAUTION

Do not use the vehicle if the coolant is below the minimum prescribed level.

Check the coolant level every 2000 km (1250 mi) and after long rides; change it every 24 months.

⚠ WARNING

The coolant is noxious: do not swallow it; if the coolant gets in contact with the skin or the eyes, it can cause serious irritations.

If the coolant gets in contact with your skin or eyes, rinse with plenty of water and consult a doctor. If it is swallowed, induce vomit, rinse mouth and throat with plenty of water and consult a doctor without delay.

DO NOT DISPOSE OF THE BRAKE FLUID IN THE ENVIRONMENT.
KEEP AWAY FROM CHILDREN.

Be careful not to spill the coolant on the red-hot parts of the engine: it may catch fire and send out invisible flames.

In case maintenance operations are to be performed, it is advisable to use latex gloves.

The coolant is made up of 50% water and 50% antifreeze.
This mixture is ideal for most running temperatures and ensures good protection against corrosion.

It is advisable to keep the same mixture also in the hot season, since in this way losses due to evaporation are reduced and it is not necessary to top up very frequently.

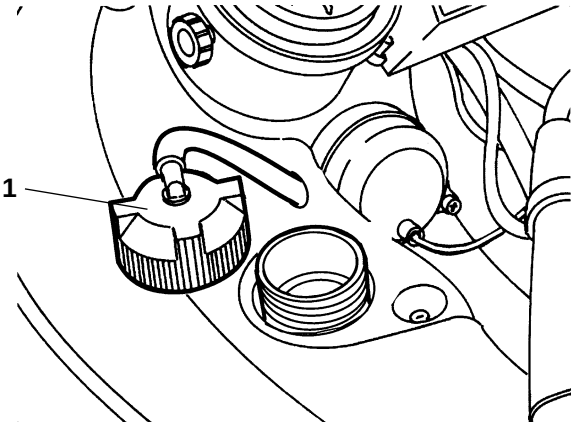
The mineral salt deposits left in the radiator by evaporated water are thus reduced and the efficiency of the cooling system remains unchanged.

If the outdoor temperature is below 0°, check the cooling circuit frequently and if necessary increase the antifreeze concentration (up to maximum 60%).

For the cooling solution use distilled water, in order not to damage the engine.

⚠ WARNING

Do not remove the filling plug (1) when the engine is hot, since the coolant is under pressure and its temperature is high.

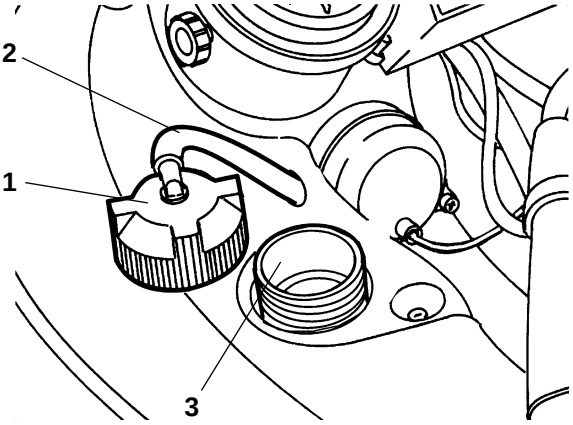


CHECKING AND TOPPING UP

Check the coolant level and top up the expansion tank with cold engine.

Stop the engine and wait until it has cooled down.

NOTE Position the vehicle on firm and flat ground.



⚠ WARNING

Danger of fall or overturning.
When the vehicle is straightened from the parking position to the driving position, the stand goes automatically up.

Keep the vehicle in vertical position, with the two wheels resting on the ground.
Loosen the filling plug (1) (by giving it two anticlockwise turns), without removing it.
Wait a few seconds in order to release any residual pressure.

NOTE A breather pipe (2) is connected to the plug (1). Neither force, nor disconnect the breather pipe (2).

Unscrew and remove the plug (1).

⚠ WARNING

The coolant is noxious: do not swallow it; if the coolant gets in contact with the skin or the eyes, it can cause serious irritations.
Do not use your fingers or any other object to check if there is enough coolant.

The seat of the plug (1) is characterized by a diameter reduction (3): visually check if the coolant reaches this reduction point.

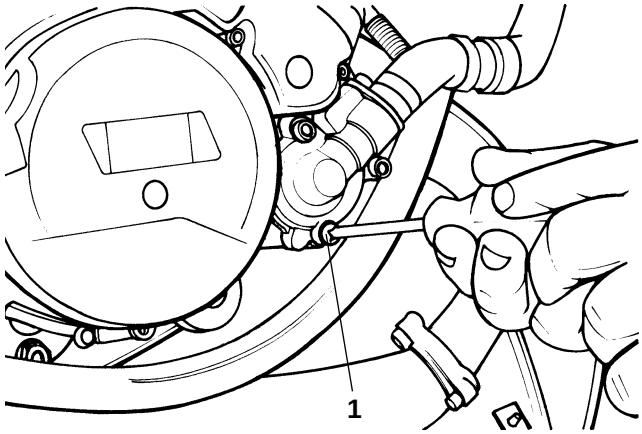
Otherwise:
Top up with coolant, see (LUBRICANT CHART) until the coolant level approximately reaches the diameter reduction point (3). Do not exceed this level, otherwise the coolant will flow out while the engine is running.
Put back the filling plug (1).

⚠ CAUTION

In case of excessive consumption of coolant and in case the tank remains empty, make sure that there are no leaks in the circuit.

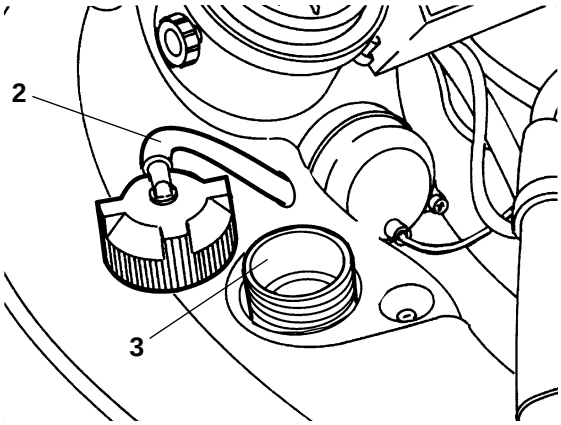
RENEWING THE COOLANT

Read through the paragraphs PRECAUTIONS AND GENERAL INFORMATION and COOLANT.
Renew the coolant every two years.
Remove the right-hand side fairing (REMOVING THE SIDE FAIRINGS).
Place a container with a capacity of over 1 l (2.1 gal) under drain screw (1).
Unscrew and remove drain screw (1), with the related copper washer.



⚠ WARNING

Never remove filler cap (2) when the engine is hot as the coolant is very hot and pressurized.
Remove filler cap (2) to facilitate the outflow of the liquid.
Allow the coolant to drain completely.
DO NOT DISPOSE OF THE COOLANT IN THE ENVIRONMENT.
Refit drain plug (1) with a new copper washer.
Tightening torque for drain screw (1):
6 Nm (0.6 kgm) [4.4 ft-lb]



Top up through filler (3).
Squeeze and release sleeves (4) with a hand several times to produce a slight pressure and allow the coolant to flow in the pipes.
Top up again.
IMPORTANT The level is correct when the coolant stabilizes immediately under filler (3).
Replace filler cap (2).
Start the engine and let it idle for a few minutes, then allow it to cool down and check the coolant level again.

If necessary top up (CHECKING AND TOPPING UP).

Total coolant capacity: 0.9 l (1.9 gals)

IMPORTANT The cooling system of this vehicle requires no air bleeding.

For further information refer to the chapter COOLING SYSTEM.

BRAKE FLUID-recommendations

NOTE This vehicle is provided with front and rear disc brakes, with separate hydraulic circuits.
The following information refers to a single braking system, but is valid for both.

⚠ WARNING

Sudden resistance or clearance problems on the brake lever may be due to troubles in the hydraulic system.
Make sure that the brake discs are neither oily nor greasy, especially after maintenance or checking operations.
Check that the brake cables are neither twisted nor worn out.
Prevent water or dust from accidentally getting into the circuit.
In case maintenance operations are to be performed on the hydraulic circuit, it is advisable to use latex gloves.

If the brake fluid gets in contact with the skin or the eyes, it can cause serious irritations.
Carefully wash the parts of your body that get in contact with the liquid.
Consult a doctor or an oculist if the liquid gets in contact with your eyes.

Do not dispose of the brake fluid in the environment.

KEEP AWAY FROM CHILDREN.

⚠ CAUTION

When using the brake fluid, take care not to spill it on the plastic or painted parts, since it can damage them.

⚠ WARNING

The brakes are the parts that most ensure your safety and for this reason they must always be perfectly working; check them before every trip.

The brake fluid must be changed once a year.

Use brake fluid of the type specified in the lubricant chart, see (LUBRICANT CHART).

⚠ WARNING

This vehicle is provided with front and rear hydraulic disc brakes.
When the disc pads wear out, the level of the fluid decreases to automatically compensate for their wear.

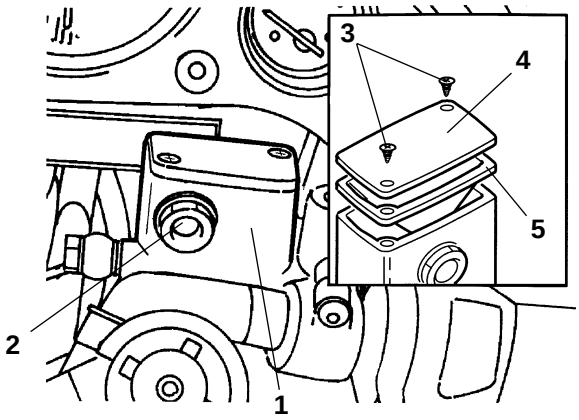
The front brake fluid tank is positioned on the right part of the handlebar, near the front brake lever coupling.

The rear brake fluid tank is positioned under the upper part of the fairing, on the right side of the vehicle.

FRONT BRAKE

CHECKING

NOTE Position the vehicle on firm and flat ground.
Position the vehicle on the stand.
Rotate the handlebar leftwards, so that the fluid contained in the reservoir is parallel to the reservoir edge (1).
Make sure that the brake fluid contained in the tank covers the glass gauge (2) completely.
If not, provide for topping up.



TOPPING UP

⚠ CAUTION

The brake fluid may flow out of the reservoir. Do not operate the brake lever if the screws (3) are loose or, most important, if the brake fluid tank cover has been removed.

Unscrew the two screws (3).
Remove the cover (4).
NOTE In order not to spill the brake fluid while topping up, keep the fluid in the reservoir parallel to the reservoir rim.

⚠ WARNING

Avoid any prolonged exposure of the brake fluid to the air.
The brake fluid is hygroscopic and when in contact with the air it absorbs its humidity.
Leave the brake fluid tank open ONLY for the time necessary for topping up.

Remove the gasket (5).

⚠ CAUTION

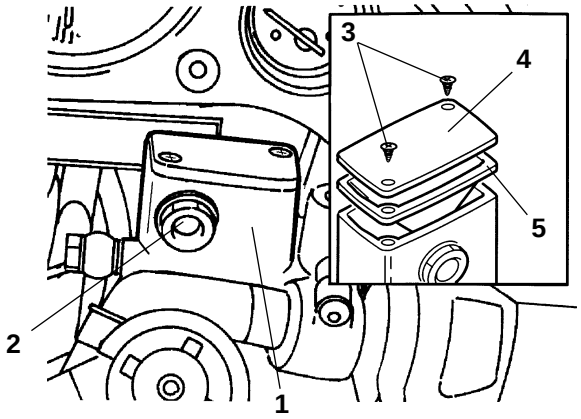
When topping up, never exceed the “MAX” level. It is advisable to top up until reaching the “MAX” level only with new pads.

When the disc pads wear out, the level of the fluid decreases progressively to compensate for their wear.

Do not reach the “MAX” level with worn out pads, since this will cause a fluid outflow when the pads are changed.

NOTE In order to reach the “MAX” level, top up until covering the glass (2) completely, with the brake fluid reservoir rim parallel to the ground.

Fill the tank with brake fluid, see (LUBRICANT CHART), until it covers the glass completely.
Put back the gasket (5) in its seat correctly.
Put back the cover (4).
Screw and tighten the two screws (3).

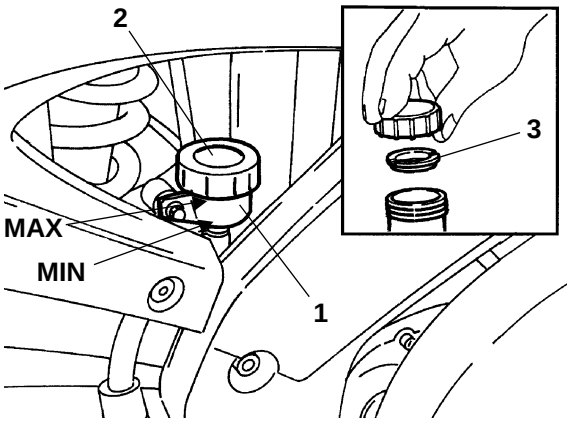


⚠ CAUTION

Check the braking efficiency.

In case of excessive stroke of the brake lever, of excessive elasticity or in case there is air in the circuit, since it may be necessary to bleed the system.

REAR BRAKE



CHECKING

NOTE Position the vehicle on firm and flat ground.

⚠ WARNING

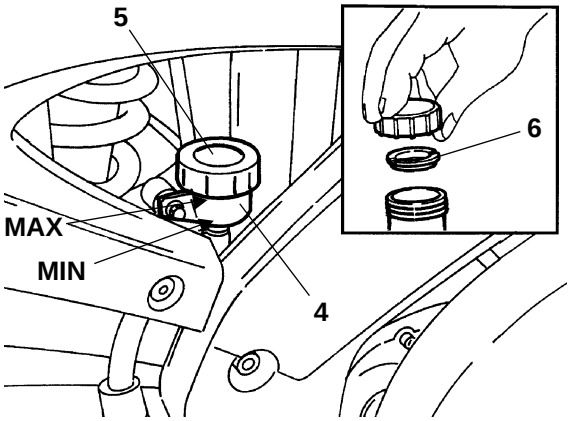
Danger of fall or overturning.
When the vehicle is straightened from the parking position to the driving position, the stand goes automatically up.

Keep the vehicle in vertical position, so that the fluid contained in the tank (1) is parallel to the plug (2).

Make sure that the fluid level exceeds the “MIN” mark.

If the fluid does not reach the “MIN” mark, provide for topping up.

TOPPING UP



⚠ CAUTION

The brake fluid may flow out of the tank. Do not operate the rear brake lever if the brake fluid tank plug is loose or has been removed.

Unscrew and remove the plug (5).

⚠ WARNING

Avoid any prolonged exposure of the brake fluid to the air.
The brake fluid is hygroscopic and when in contact with the air it absorbs its humidity.
Leave the brake fluid tank open ONLY for the time necessary for topping up.

NOTE In order not to spill the brake fluid while topping up, keep the fluid in the tank parallel to the tank rim (in horizontal position).

Remove the gasket (6).
By means of a syringe, top up the brake fluid tank (4), see (LUBRICANT CHART) until reaching the correct level between the “**MIN**” and “**MAX**” marks.

⚠ CAUTION

It is advisable to top up until reaching the "MAX" level only with new pads.
When the disc pads wear out, the level of the fluid decreases progressively to compensate for their wear.
Do not reach the "MAX" level with worn out pads, since this will cause a fluid outflow when the pads are changed.

To reassemble the components, follow the reverse order.

⚠ WARNING

Check the braking efficiency.

In case of excessive stroke of the brake lever, of excessive elasticity or in case there is air in the circuit, since it may be necessary to bleed the system.

RENEWING THE FRONT BRAKE FLUID

Read through the section PRECAUTIONS AND GENERAL INFORMATION and the paragraph BRAKE FLUID.

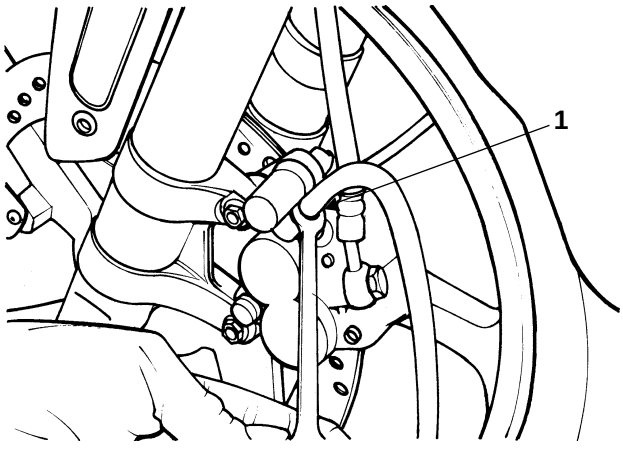
⚠ WARNING

Renew the front brake fluid every year.
Handle the brake fluid with care as it chemically alters painted, plastic and rubber parts.

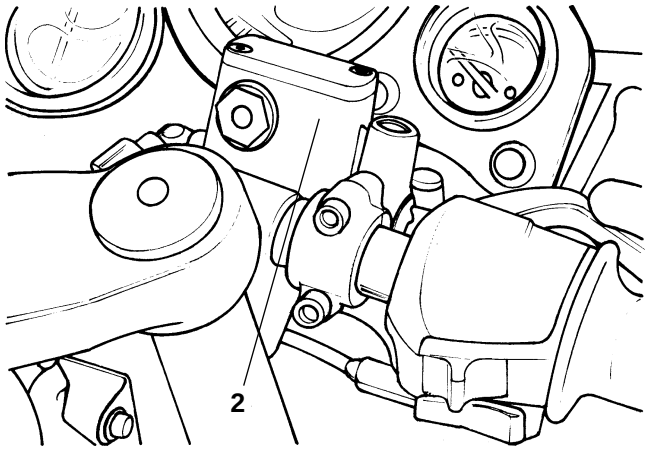
DO NOT DISPOSE OF THE FLUID IN THE ENVIRONMENT.

Remove the rubber cap.
Fit a transparent plastic tube on caliper bleeder (1) and place the other end of the tube in a container.
Loosen bleeder (1) by approximately one turn.

IMPORTANT During the operation, make sure of the constant presence of fluid in the reservoir, otherwise the system will need to be bled at the end of the operation (AIR-BLEEDING THE BRAKING SYSTEMS).



Watch the outflow of the fluid on reservoir (2) and tighten bleeder (1) before the reservoir has emptied.
Top up by pouring fluid into reservoir (2) (CHECKING AND RESTORING THE BRAKE FLUID LEVEL).
Loosen bleeder (1) of about a half turn.
Check the outflow of the fluid from the tube and, when the colour of the fluid changes (from a dark colour to a lighter colour), tighten bleeder (1) and remove the tube.



Replace the rubber cap.
Restore the level of the fluid in reservoir (2) (CHECKING AND RESTORING THE BRAKE FLUID LEVEL).

RENEWING THE REAR BRAKE FLUID

Read through the section PRECAUTIONS AND GENERAL INFORMATION and the paragraph BRAKE FLUID.

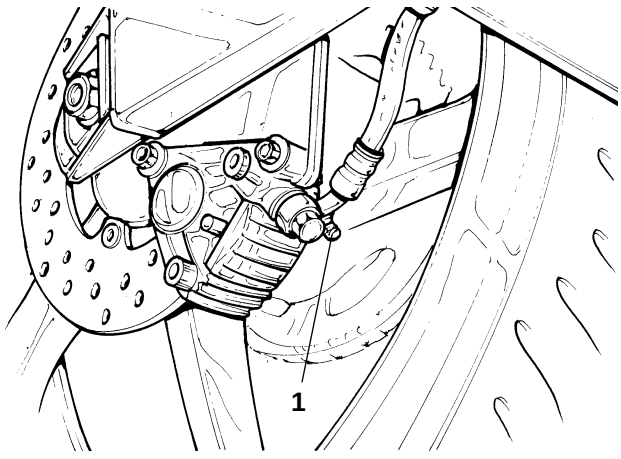
⚠ WARNING

Renew the rear brake fluid every year.
Handle the brake fluid with care as it chemically alters painted, plastic and rubber parts.

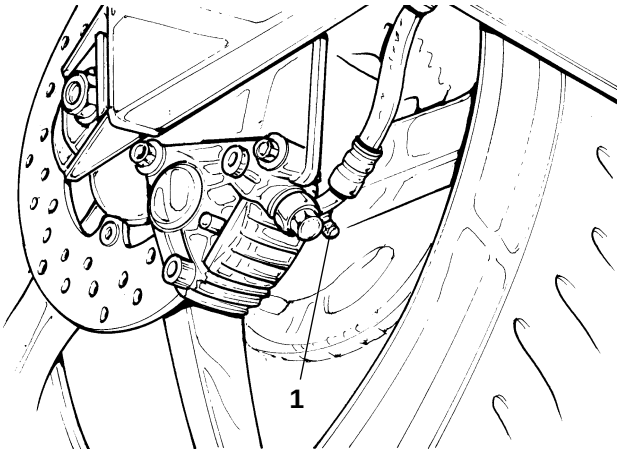
DO NOT DISPOSE OF THE FLUID IN THE ENVIRONMENT.

Remove the rubber cap.
Fit a transparent plastic tube on caliper bleeder (1) and place the other end of the tube in a container.
Loosen bleeder (1) by approximately one turn.

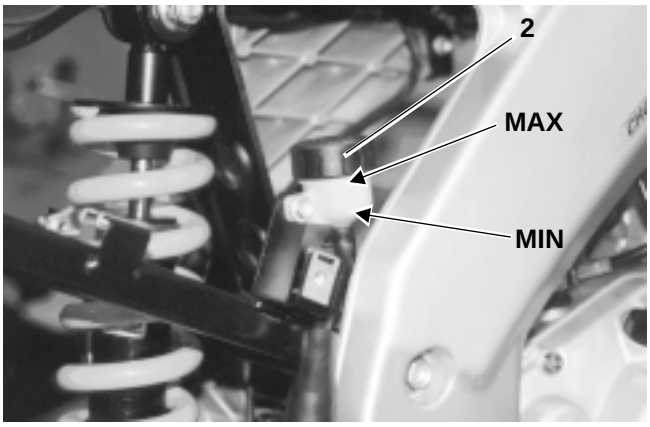
IMPORTANT During the operation, make sure of the constant presence of fluid in the reservoir, otherwise the system will need to be bled at the end of the operation (AIR-BLEEDING THE BRAKING SYSTEMS).



Watch the outflow of the fluid on reservoir (2) and tighten bleeder (1) before the reservoir has emptied.
Top up by pouring fluid into reservoir (2) (CHECKING AND RESTORING THE BRAKE FLUID LEVEL).
Loosen bleeder (1) of about a half turn.
Check the outflow of the fluid from the tube and, when the colour of the fluid changes (from a dark colour to a lighter colour), tighten bleeder (1) and remove the tube.



Replace the rubber cap.
Restore the level of the fluid in reservoir (2) (CHECKING AND RESTORING THE BRAKE FLUID LEVEL).



AIR-BLEEDING THE BRAKING SYSTEMS

Read through the section PRECAUTIONS AND GENERAL INFORMATION and the paragraph BRAKE FLUID.
Air-bleed the system after the first 500 km (300 mi).
Air trapped in the hydraulic circuit acts like a cushion, absorbing a large proportion of the pressure developed by the brake pump and interfering with the performance of the brake caliper.
The presence of air in the circuit is denoted by a “spongy” feel of the brake lever and a reduced braking action.

⚠ WARNING

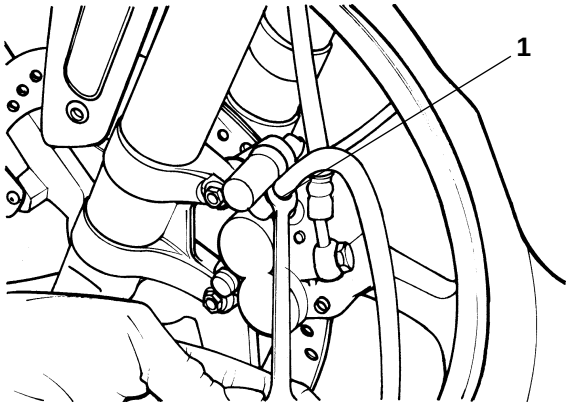
Handle the brake fluid with care as it chemically alters painted, plastic and rubber parts.
DO NOT DISPOSE OF THE FLUID IN THE ENVIRONMENT.

⚠ CAUTION

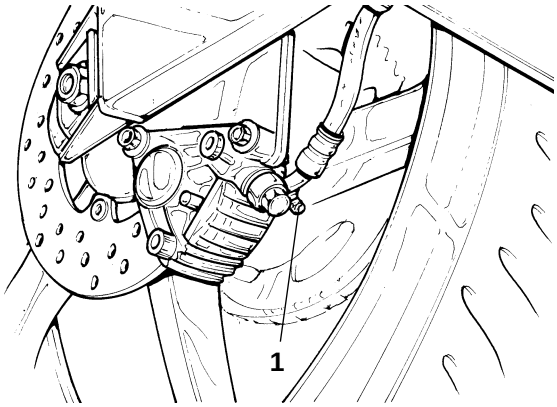
To avoid personal injury and damage to the vehicle, it is absolutely essential that, after refitting the brakes and restoring the braking system to the normal operating conditions, the hydraulic system should be bled of the air it contains by following the procedure described below.

Restore the brake fluid level in the reservoir (CHECKING AND RESTORING THE BRAKE FLUID LEVEL).

Remove the rubber cap.
Fit a transparent plastic tube on caliper bleeder (1) and place the other end of the tube in a container.
Actuate and release the brake lever several times in rapid succession and then keep it completely pulled.
Loosen the bleeder 1/4 of a turn to allow the brake fluid to flow into the container. This will remove the tension from the brake lever and allow it to reach its travel end.

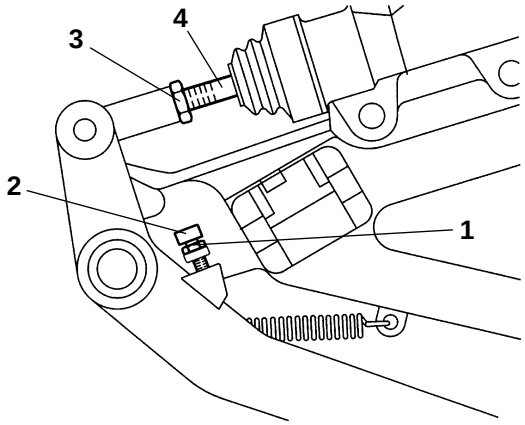


Tighten bleeder (1), actuate the brake lever several times, then keep it completely pulled and unscrew the bleeder again.
Repeat the operation until the fluid that flows into the container contains no air bubbles.
IMPORTANT While bleeding the hydraulic system, fill the reservoir with brake fluid as necessary. Ensure that brake fluid is always present in the reservoir throughout the operation.



Tighten the bleeder and remove the tube..
Restore the level of the brake fluid in the reservoir (CHECKING AND RESTORING THE BRAKE FLUID LEVEL).
Replace the rubber cap.

ADJUSTING THE REAR BRAKE



The brake pedal is positioned ergonomically during the assembly of the vehicle.
If necessary, it is possible to adjust the height of the brake pedal:

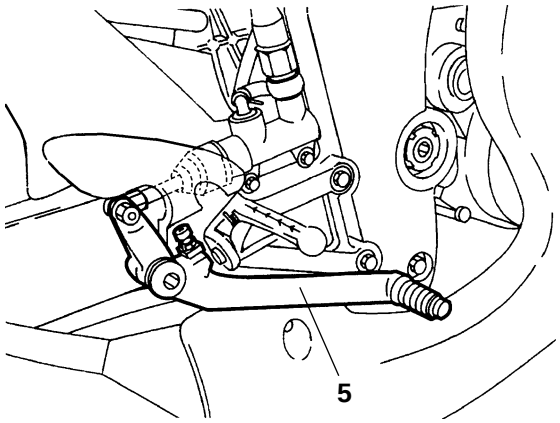
Position the vehicle on the stand.
Loosen the lock nut (1).
Unscrew the brake adjuster (2) completely.
Screw the lock nut (3) completely on the pump control rod (4).
Screw the pump control rod (4) completely, then unscrew it by giving 3-4 turns.
Screw the brake adjuster (2) until the brake pedal (5) reaches the desired height.
Lock the brake adjuster (2) by means of the lock nut (1).
Unscrew the pump control rod (4) and bring it in contact with the pump piston.
Screw the rod in order to ensure a minimum clearance of 0.5 ÷ 1 mm (0.02 ÷ 0.04 in) between the pump control rod (4) and the pump piston.

⚠ CAUTION

Make sure that there is a certain clearance between the brake adjuster and the point of contact, to prevent the brake from remaining operated and the consequent untimely wear of the braking elements.

Clearance between brake adjuster and point of contact: 0,5 ÷ 1 mm (0.02 ÷ 0.04 in).

Lock the pump control rod by means of the lock nut (3).



⚠ WARNING

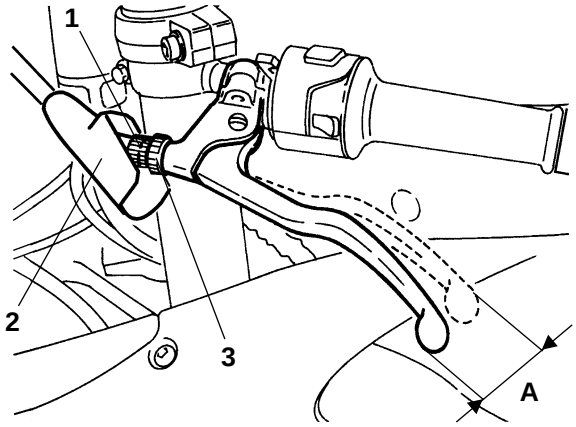
Check the braking efficiency.

After the adjustment, make sure that the wheel rotates freely with released brake.

ADJUSTING THE CLUTCH

Adjust the clutch and if the engine stops or tends to advance when the clutch lever is pulled and the gears are engaged, or if the clutch slips causing a delay in the acceleration in comparison with the engine speed.

Minor adjustments can be carried out by means of the adjuster (1):
Position the vehicle on the stand.
Withdraw the protection element (2).
Loosen the nut (3) (by screwing it).
Rotate the adjuster (1), until the idle travel at the end of the clutch lever equals A (A = 10-15 mm / 0.4-0.6 in).
Tighten the nut (3) (by unscrewing it) and lock the adjuster (1).
Check the idle stroke at the end of the clutch lever.
Put back the protection element (2).

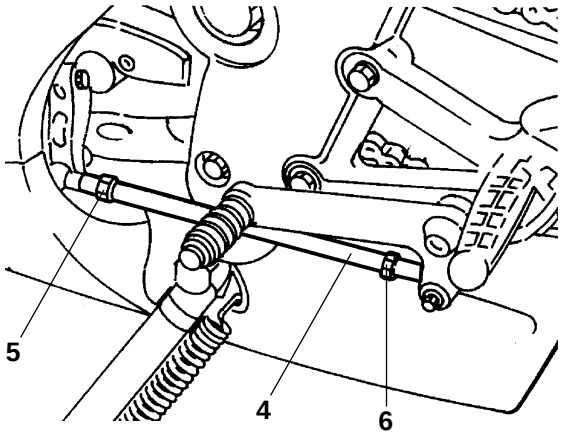


NOTE Make sure that the clutch cable is intact: the inner cable and outer sheat must not be worn or flattened at any point.

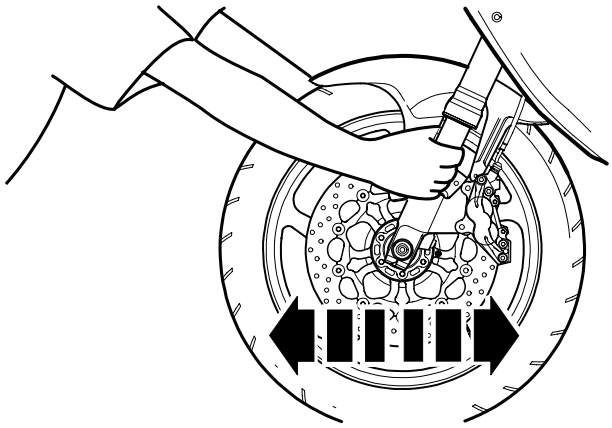
Periodically lubricate the clutch cable with a suitable lubricant, see (LUBRICANT CHART), in order to avoid its untimely wear and corrosion.

ADJUSTING THE SHIFTING LEVER

It is possible to adjust the position of the shifting lever by means of the rod (4), proceeding as follows:
Position the vehicle on the stand.
Loosen the nuts (5, 6).
Rotate the rod and adjust the shifting lever height.
Tighten the nuts (5, 6).
The gearshift lever pin is kept greased thanks to the appropriate slot.



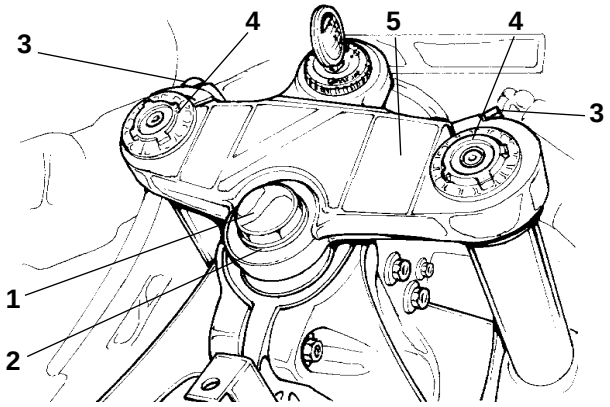
STEERING



Read through the section PRECAUTIONS AND GENERAL INFORMATION.
For ease of handling, the steering is equipped with rolling bearings.
The steering must be properly adjusted in order to ensure smooth handlebar rotation and riding safety.
Stiff steering prevents smooth rotation of the handlebar; on the other hand, loose steering results in poor vehicle stability.

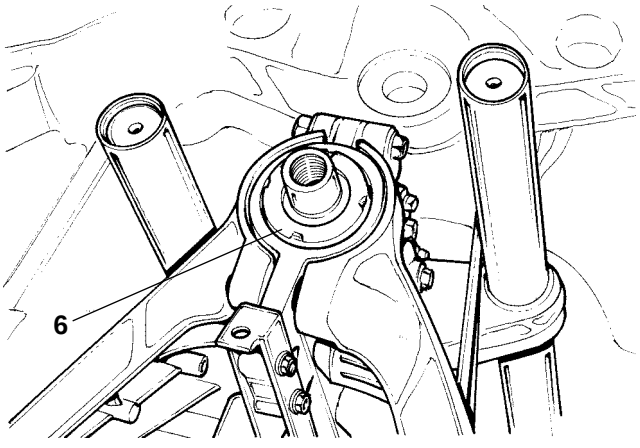
CHECKING THE PLAY OF THE BEARINGS
Place the vehicle on the rear stand OPT (PLACING THE VEHICLE ON THE REAR STAND OPT)
Shake the fork in the direction of motion.
If any play is felt, adjust the play of the bearings as described below.

ADJUSTING THE PLAY OF THE BEARINGS
Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Unscrew and remove head tube plug (1) and the related washer (2).
Loosen the two screws (3) fixing the fork upper plate.
Unscrew and remove fork plugs (4).

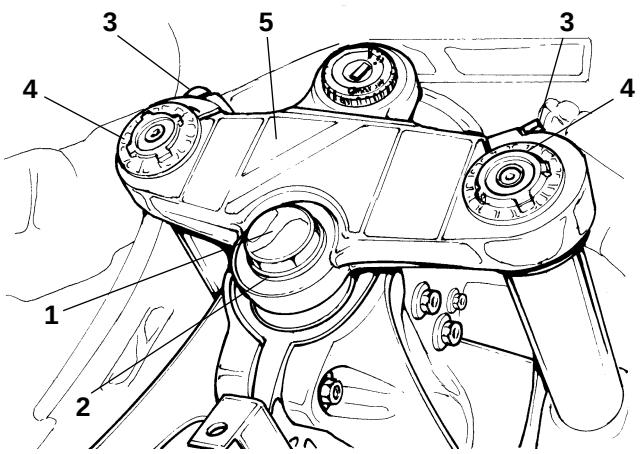


Keep the front wheel straight while removing the fork upper plate.
Remove fork upper plate (5) from its seat and then tighten ring (6).

Tightening torque for ring (6):
manual tightening until contact + 1/4 of a turn



Reposition fork upper plate (5).
Place washer (2) on the head tube and then screw in and tighten head tube plug (1).
Tightening torque for head tube plug (1):
80 Nm (8.0 kgm) [59 ft-lb]
Screw in and tighten screws (3).
Tightening torque for screws (3):
24 Nm (2.4 kgm) [17.7 ft-lb]
Screw in and tighten fork plugs (4).
Tightening torque for fork plugs (4):
5 Nm (0.5 kgm) [3.7 ft-lb]

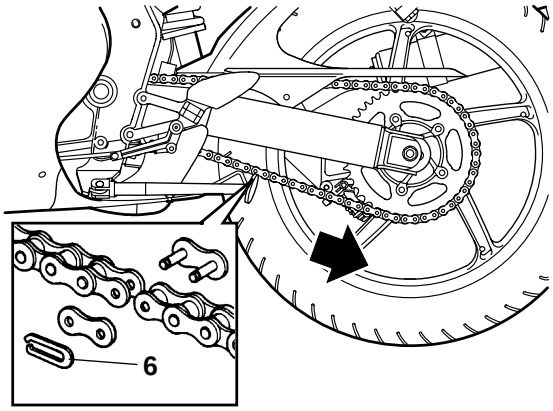


⚠ WARNING

At the end of the operation, to avoid damaging the sliding seats and losing manoeuvrability, check that the handlebars rotate smoothly.

DRIVE CHAIN

Carefully read the PERIODIC MAINTENANCE SCHEDULE.
The vehicle is equipped with a chain with ring link joint.
In case of disassembly and reassembly of the chain, make sure that the clip (6) of the ring link joint has its open side opposite the travelling direction (see figure).



⚠ WARNING

An excessive slackening of the chain can cause it to come off of the sprockets, which often results in accidents or serious damage to the vehicle. Periodically check the slack and adjust it if necessary, see (ADJUSTMENT).

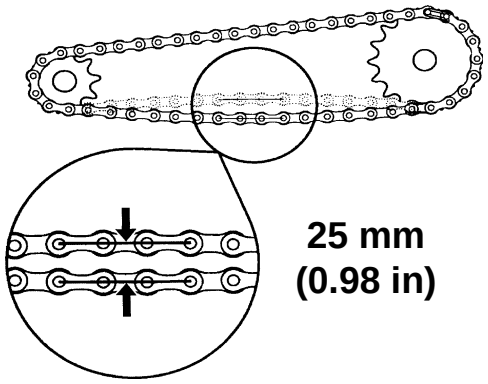
⚠ CAUTION

Incorrect maintenance may cause the untimely wear of the chain and/or damages to the pinion and/or the crown.
Carry out the maintenance operations more frequently if you use the vehicle in difficult conditions or on dusty and/or muddy roads.

CHECKING THE SLACK

To check the slack, proceed as follows:
Stop the engine.
Position the vehicle on the stand.
Position the shifting lever in neutral.
Make sure that the vertical oscillation, in an intermediate point between pinion and crown in the lower part of the chain, is about **25 mm (0.98 in)**.

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.



⚠ CAUTION

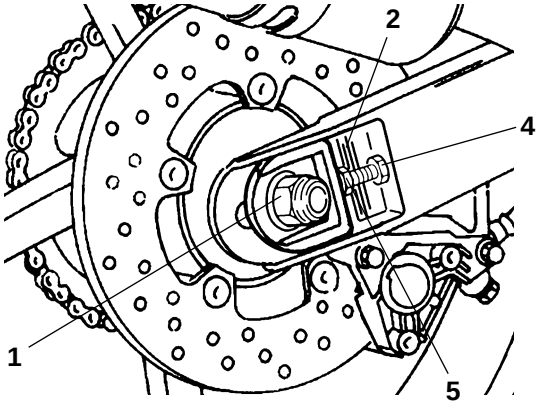
If in some positions the slack is higher than in others, this means that there are crushed or seized links. To prevent the risk of seizures, lubricate the chain frequently, see (CLEANING AND LUBRICATION).

If the slack is uniform, but higher or lower than **25 mm (0.98 in)**, adjust it, see (ADJUSTMENT).

ADJUSTMENT

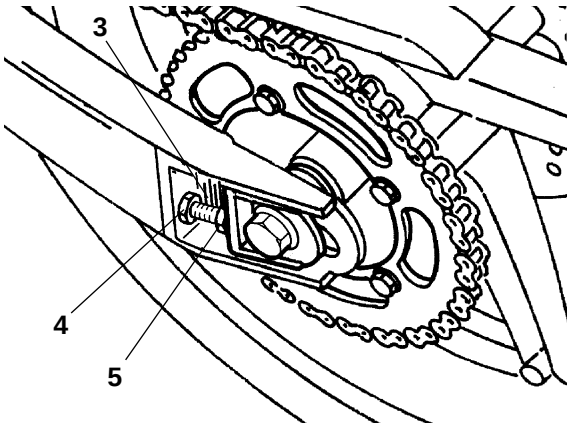
NOTE To adjust the chain it is necessary to use the appropriate rear support stand OPT.

If after the check it is necessary to adjust the chain tension, proceed as follows:
Position the vehicle on the appropriate rear support stand OPT, see (POSITIONING THE VEHICLE ON THE REAR SUPPORT STAND OPT).
Loosen the nut (1) completely.



NOTE For the wheel centering fixed reference marks (2-3) are provided, which can be seen inside the chain tightener seats on the rear fork arms, before the wheel pin.
Loosen the two lock nuts (4).
Act on the adjusters (5) and adjust the chain slack, making sure that the reference marks (2-3) are correctly positioned on both sides of the vehicle.
Tighten the two lock nuts (4).
Tighten the nut (1).
Wheel nut driving torque:
100 Nm (10 kgm) [73.8 Ft-lb].

Check the chain slack, see (CHECKING THE SLACK).



CHECKING THE WEAR OF CHAIN, PINION AND CROWN

Further, check the chain and sprockets and make sure that they do not present:
Damaged rollers.
Loose pins.
Dry, rusty, crushed or seized links.
Excessive wear.
Sprocket or teeth excessively worn or damaged.

⚠ CAUTION

If the chain rollers are damaged and/or the pins are loose, it is necessary to change the whole chain unit (both sprockets and chain).

⚠ CAUTION

Lubricate the chain frequently, especially if there are dry or rusty parts.
The crushed or seized links must be lubricated and made work again.

Finally, check the wear of the rear fork protection shoe.

CLEANING AND LUBRICATION

⚠ CAUTION

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

Lubricate the chain every 500 km (312 mi) or whenever necessary.

Lubricate the chain with spray grease for chains or with SAE 80W-90 oil.

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

PERIODIC MAINTENANCE AND ADJUSTMENTS

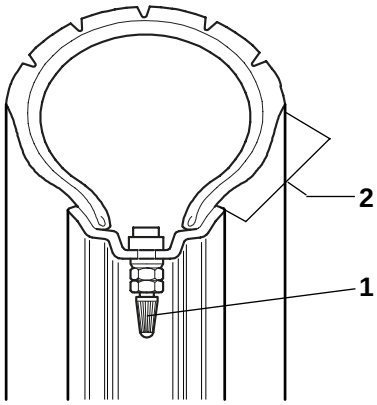
Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Check the condition of the vehicle after the first 1,000 km (625 mi), and then every 4,000 km (2,500 mi) or 8 months.
The inflating pressure must be checked monthly at room temperature.

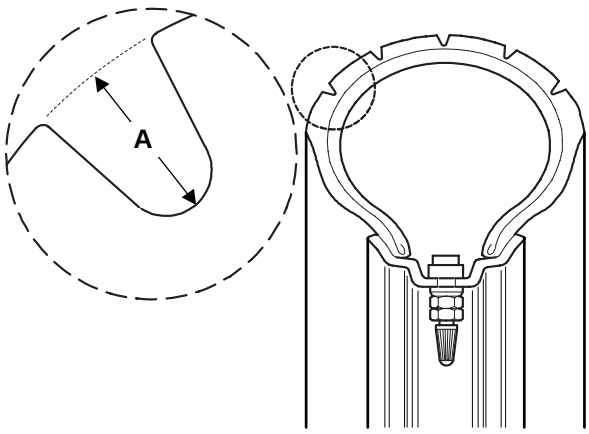
The vehicle is equipped with tubeless tyres.

TREAD CONDITION

⚠ WARNING

Check the surface condition and wear of the tyres. When the tyres are in poor condition, road holding and manoeuvrability decrease dramatically.
Replace a tyre if it is worn out or if a puncture in the tread area is wider than 5 mm (0.2 in).
Some of the tread types approved for this vehicle have wear indicators.
There are different types of wear indicators.
Contact your dealer for information on how to verify tread wear.
Do not fit tyres with inner tubes on rims designed for tubeless tyres and vice versa.
To avoid sudden deflation of the tyres, check that inflating valves (1) are always fitted with their caps.
All operations involving tyres - including replacements, repairs, servicing and balancing - are extremely important and must be performed by skilled personnel with suitable equipment.

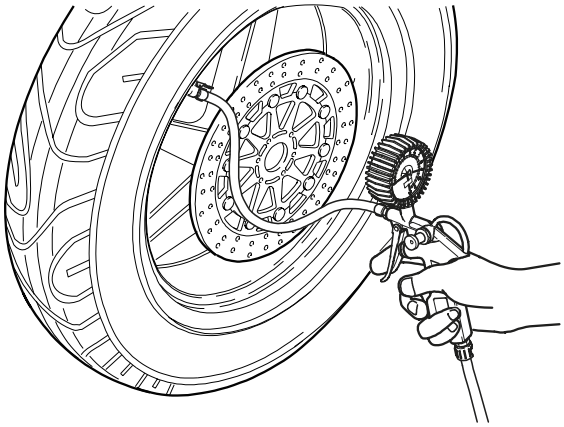




MINIMUM TREAD DEPTH (A):
front and rear ..... 1.5 mm (USA 3 mm)
0.0059 in (USA 0.118 in)

⚠ WARNING

Periodically check the tyre inflating pressures at room temperature. Hot tyres provide incorrect measurements.
In particular, measure the tyre pressures before and after covering long distances. If the inflating pressure is excessive, vibration from uneven road surfaces is not dampened and is transmitted to the handlebars. This reduces the riding comfort as well as road holding when cornering.
If, on the other hand, the inflating pressure is insufficient, excessive load is applied to tyre sides (2), which may cause the tyre to skid on or get detached from the rim, and the rider to lose control of the vehicle. In case of abrupt braking, the tyres may even come off the rims.
The vehicle may also skid when cornering.



Inflating pressures

FRONT: ..... 90/80 17” 46S
..... 90/80 17” 46P
Inflating pressures
rider only ..... 170 kPa (1,7 bar) [24.6 Psi]
Inflating pressures
rider and passenger (*) .....180±10 kPa (1,8±0,1 bar) [26±1.4 Psi]

REAR : ..... 110/80 17” 57S
..... 110/80 17” 57P
Inflating pressures
rider only ..... 190 kPa (1,9 bar) [27.5 Psi]
Inflating pressures
rider and passenger (*) .....210±10 kPa (2,1±0,1 bar) [30.4±1.4 Psi]

(*) = Countries were passenger is allowed.

⚠ WARNING

After repairing a tyre, always balance the wheel.
All operations involving tyres - including replacements, repairs, servicing and balancing - are extremely important and must be performed by skilled personnel with suitable equipment.
Do not apply unsuitable liquids over the tyres.

⚠ WARNING

Tyre sizes are specified in the registration document. The use of unsuitable tyres is a legal offence.

Tyres having dimensions other than those specified may alter the geometry of the vehicle and reduce manoeuvrability and riding safety.

Only fit the tyres originally chosen by aprilia (refer to the TECHNICAL DATA tables).

FUEL LINES

Read through the paragraph FUEL.
Check the fuel lines every 4,000 km (2,500 mi) or 8 months.
Replace them every 4 years.

Replace the fuel lines if they show signs of wear, cracks, etc.

For further information refer to the chapter FUEL SYSTEM.

BRAKE LINES

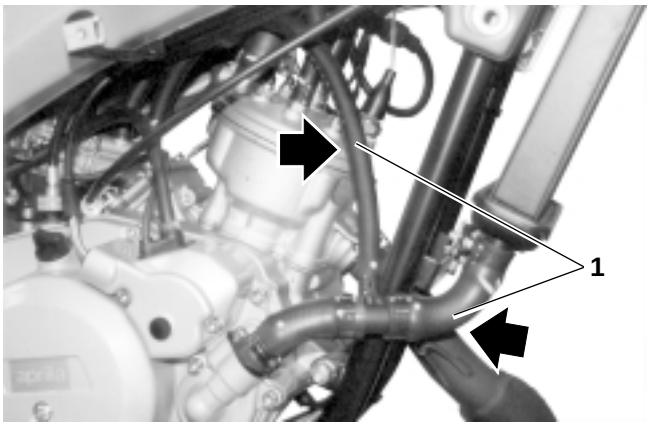
Read through the paragraph BRAKE FLUID.
Check the brake lines every 4,000 km (2,500 mi) or 8 months.
Replace them every 4 years.

Replace the brake lines if they show signs of wear, cracks, etc.

COOLANT LINES

Read through the paragraph COOLANT.
Check coolant lines (1) every 4,000 km (2,500 mi) or 8 months.

Replace the coolant lines if they show signs of wear, cracks, etc.



MIXER OIL LINES

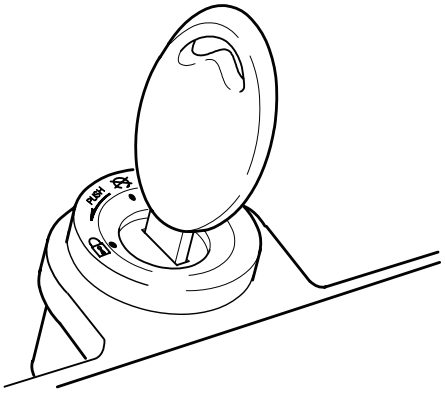
Check mixer oil lines (2) every 4,000 km (2,500 mi) or 8 months.
Replace them every 4 years.

Replace the mixer oil lines if they show signs of wear, cracks, etc.

BULBS

⚠ CAUTION

Carefully read (MAINTENANCE).
Before changing a bulb, turn the ignition switch to position "⊗".
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 prevent it from blowing.
DO NOT FORCE THE ELECTRIC CABLES.

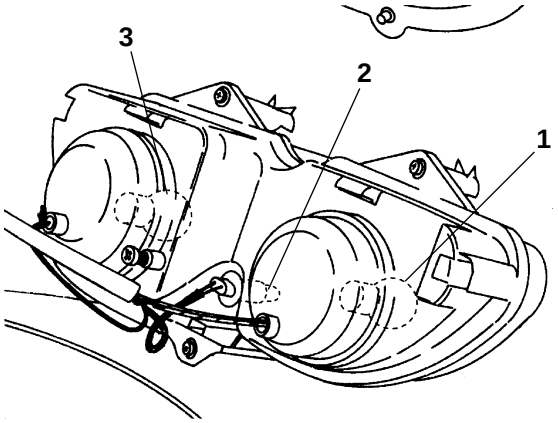


CHANGING THE HEADLIGHT BULBS

Carefully read (BULBS).
Position the vehicle on the stand.

NOTE Before changing a bulb, check the fuse, see (CHANGING THE FUSE).

The headlight contains:
One high beam bulb (1) (right side).
One parking light bulb (2) (lower side).
One low beam bulb (3) (left side).



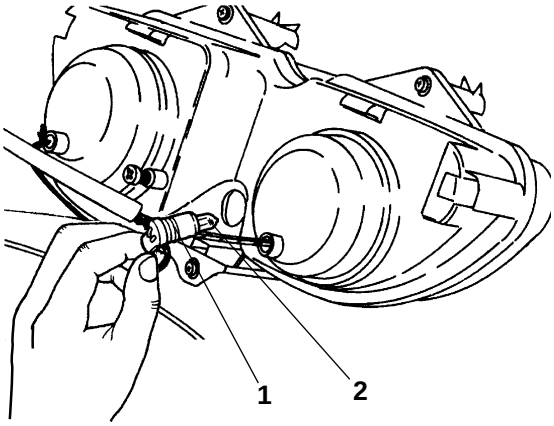
The high beam and the low beam bulbs are equal to each other.
If either of them is damaged and no spare bulb is available, it is possible to invert them.
This operation is intended only to make it easier for the rider to go back home or to reach a shop where he can by a new bulb, but the replacement of the damaged bulb remains indispensable.

CHANGING PARKING LIGHT BULB

⚠ CAUTION

To extract the bulb socket, do not pull the electric wires.

Working on the rear side of the front part of the fairing, seize the bulb socket (1), pull it and remove it from its seat.
Withdraw the parking light bulb (2) and replace it with one of the same type.



CHANGING HIGH BEAM BULBS

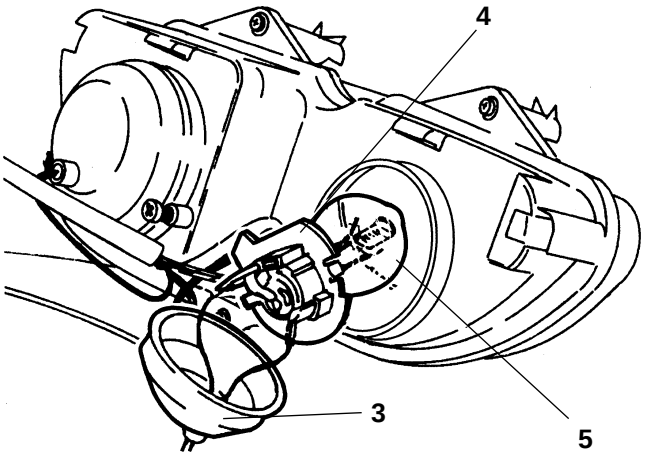
NOTE Extract the bulb sockets one by one, in such a way as to avoid positioning them incorrectly during the reassembly.

If the bulb sockets must be removed at the same time, take care to reassemble them in the correct position.

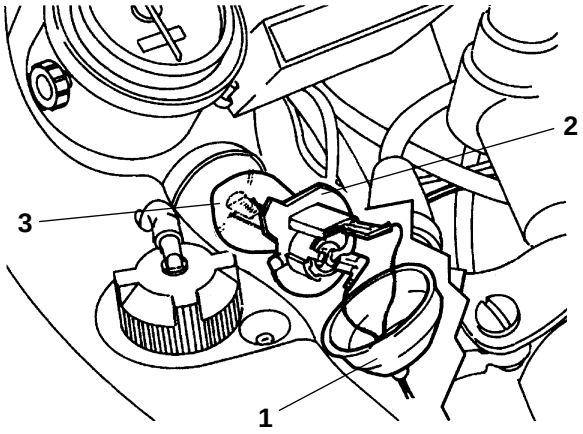
Working on the rear right side of the front part of the fairing, move the protection element (3) with your hands.
Rotate the bulb socket (4) anticlockwise and extract it.
Press the bulb (5) moderately and rotate it anticlockwise.
Extract the bulb from its seat.

NOTE Insert the bulb in the bulb socket, making the relevant positioning seats coincide.

Correctly install a new bulb of the same type.



CHANGING LOW BEAM BULB



NOTE Extract the bulb sockets one by one, in such a way as to avoid positioning them incorrectly during the reassembly.

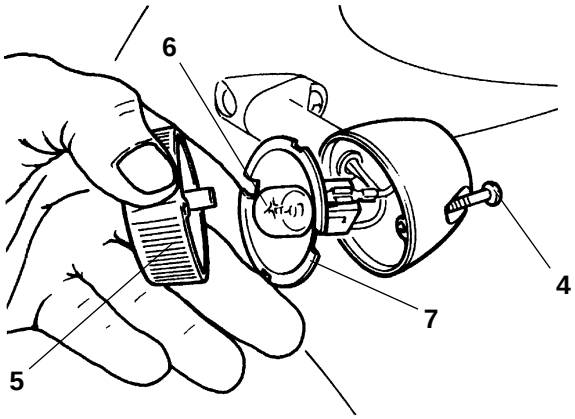
If the bulb sockets must be removed at the same time, take care to reassemble them in the correct position.

Working on the rear left side of the front part of the fairing, move the protection element (1) with your hands.
Rotate the bulb socket (2) anticlockwise and extract it.
Press the bulb (3) moderately and rotate it anticlockwise.
Extract the bulb from its seat.

NOTE Insert the bulb in the bulb socket, making the relevant positioning seats coincide.

Correctly install a new bulb of the same type.

CHANGING THE FRONT AND REAR DIRECTION INDICATOR BULBS

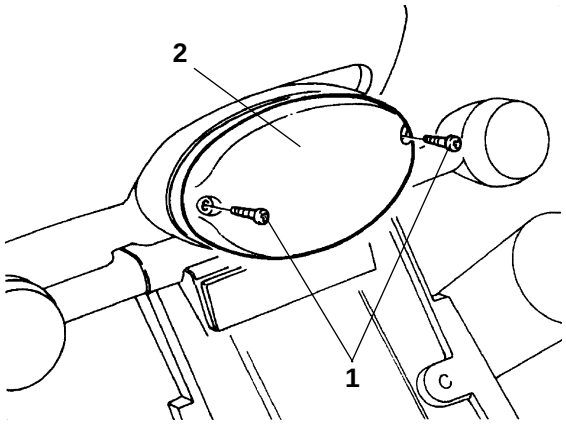


Carefully read (BULBS).
NOTE Before changing a bulb, check the fuse, see (CHANGING THE FUSE).
Position the vehicle on the stand.
Unscrew and remove the screw (4).
NOTE While removing the protection screen, proceed carefully in order not to break the cog.
Remove the protection screen (5).
NOTE Upon reassembly, correctly position the protection screen in its seat.

⚠ CAUTION

Tighten the screw (4) moderately and carefully, to avoid damaging the protection screen.
Press the bulb (6) slightly and rotate it anticlockwise.
Extract the bulb from its seat.
NOTE Insert the bulb in the bulb socket, making the two bulb pins coincide with the relevant guides on the socket.
Correctly install a new bulb of the same type.
NOTE If the bulb socket (7) goes out of its seat, insert it correctly, making the bulb socket opening coincide with the screw seat.

CHANGING THE REAR LIGHT BULB



Carefully read (BULBS).

NOTE Before changing a bulb, check the fuse, see (CHANGING THE FUSE) and the effective operation of the stoplight switches, see (CHECKING THE SWITCHES).

Position the vehicle on the stand.
Unscrew and remove the two screws (1).
Remove the protection screen (2).

NOTE Upon reassembly, correctly position the protection screen in its seat.

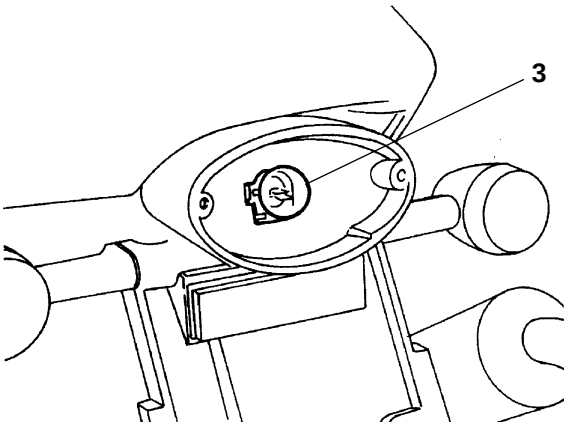
⚠ CAUTION

Upon reassembly, tighten the two screws (1) moderately and carefully, to avoid damaging the protection screen.

Press the bulb (3) slightly and rotate it anticlockwise.
Extract the bulb from its seat.

NOTE Insert the bulb in the bulb socket, making the two bulb pins coincide with the relevant guides on the socket.

Correctly install a new bulb of the same type.



TIGHTENING OF BOLTS AND NUTS

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Check the bolts and nuts after the first 1,500 km (900 mi), and then every 7,500 km (4,500 mi) or 8 months.

Carefully check all fastenings, and especially those that are critical for safety, namely:

- handlebars
- front brake lever
- clutch lever
- fuel delivery pipe
- front fork on plates
- fork clips / front wheel spindle
- front wheel
- front brake line connections
- front brake discs
- front brake calipers
- engine
- pinion
- rear brake lever
- swing arm
- swing arm leverage
- rear shock absorber
- rear wheel
- rear brake disc
- rear brake caliper
- rear brake line connections

⚠ WARNING

Fastenings must be tightened with the prescribed torques using LOCTITE(r) where appropriate (refer to the FASTENINGS section).

FASTENINGS

Check and if necessary tighten the fastenings after the first 1,000 km (625 mi), and then every 7,500 km (4,500 mi) or 8 months.

⚠ WARNING

The fastenings shown in the table below must be tightened using a torque spanner and, where appropriate, LOCTITE®.
Fastenings highlighted in grey ( ) play a key role in safety.

FRAME					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Saddle support to frame	2	HH FL. M8x25	24 (17.7)	2.4	8152287
Saddle support to frame	2	HH FL. M10x35	47 (34.7)	4.7	8152318
Cradle to frame, upper section	2	HH FL. M8x35	24 (17.7)	2.4	8152289
Cradle to frame, lower section	2	HH FL. M8x35	24 (17.7)	2.4	8152289
Fairing bracket	2	HH FL. M6x16	10 (7.4)	1	8152278
Bow to frame	2	HH FL. M6x30	15 (11.1)	1.5	8152281
Grommet to cradle	1	HH FL. M6x16	10 (7.4)	1	8152278
Radiator to cradle	1	HH FL. M6x12	7 (5.2)	0.7	8152277
Filter box to saddle support	1	HH FL. M6x16	5 (3.7)	0.5	8152278
Exh. silencer bracket to saddle support, right side	2	HH FL. M8x20	24 (17.7)	2.4	8152286

FOOTRESTS					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Plate to LH/RH footrest support	2	CSH M6x16	10 (7.4)	1	8150137
Footrest support to lower cross member	2	HH FL. M8x30	25 (18.4)	2.5	8152288
Footrest support to frame upper part	2	HH FL. M8x30	25 (18.4)	2.5	8152288

STAND					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Stand to frame	1	part no.11767	2.5 (1.8)	2.5	8152310

SWING ARM					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Adjusting bush adjuster	1	part no.102876	3 (2.2)	0.3	8221278
Rear mudguard/crankcase to swing arm	3	FSH M5x12	3 (2.2)	0.3	8152302
Swing arm pivot	1	part no.102875	70 (51.6)	7	8225332

FRONT SUSPENSION					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Steering head tube nut	1	M20x1.5 nut	80 (59)	8	8203579
Plugs to fork rods	2	CSH M5x16	5 (3.7)	0.5	8150280
Upper plate side screws	2	CSH M8	24 (17.7)	2.4	screws on plate
Stiffening plate to fork	4	HH FL. M6x16	10 (7.4)	1	8152278
Steering lock	1	CSH M8x16	24 (17.7)	2.4	8150211
Steering lock	1	tear-off screw			8150349

REAR SUSPENSION					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Shock absorber to swing arm	1	CSH M10x60	48 (35.4)	4.8	8150049
Shock absorber to saddle support	1	CSH M10x60	48 (35.4)	4.8	8150049

ENGINE					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Gear lever pin	1	part no. 5058	12 (8.8)	1.2	8121284
Joint to brake lever	1	M6 nut	5 (3.7)	0.5	8152299
Joint to gear intermediate control	1	M6 nut	5 (3.7)	0.5	8152299
Engine to frame	3	CSH M8x100	24 (17.7)	2.4	8150388
Choke lever	1		1 (0.7)	0.1	screw on carburettor
Carburettor screw	1		2 (1.5)	0.2	screw on carburettor
Neutral cable to engine switch	1		1 (0.7)	0.1	screw on engine
Gear lever rod	1	HH M6x20	10 (7.4)	1	8152279
Filter box sleeve to carburettor	1	clamp	3 (2.2)	0.3	8102401
Pinion guard	1	FSH M5x16	4 (2.9)	0.4	8152298

FILTER BOX					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Filter box support pin	2	part no. 103316	10 (7.4)	1	8221270

EXHAUST SYSTEM					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Silentbloc to cross member	1	M8 nut	25 (18.4)	2.5	8152300
Exhaust silencer to Silentbloc	1	CSH M8X12	12 (8.8)	1.2	8152112
Exhaust terminal to support	1	CSH M8X12	12 (8.8)	1.2	8152112

COOLING SYSTEM					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
H20 filler to dashboard fastener	1	FSH M5X16	4 (2.9)	0.4	8152298

FRONT WHEEL					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Front wheel spindle	1	M12x1.25 nut	80 (59)	8	8225195
Rod to wheel spindle	1	CSH M6	8 (5.9)	0.8	screw on fork

REAR WHEEL					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Rear wheel spindle	1	nut	80 (59)	8	8225208

FRONT BRAKE					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Front brake caliper	2	HH FL. M8x30	22 (16.2)	2.2	8152288
Front brake pump assembly	2		12 (8.8)	1.2	already on pump
Stoplight switch on front brake lever	2	FLH 2.2x12.7	0.5 (0.4)	0.05	8150238

REAR WHEEL					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Rear brake lever pin	1	part no. 5058	12 (8.8)	1.2	8121149
Rear brake pump	2	HH FL. M6x20	10 (7.4)	1	8152279
Brake lever adjuster	1	HH FL. M5x16	5 (3.7)	0.5	8152273
Rear brake caliper	2	HH FL.M8x20	22 (16.2)	2.2	8152286
Brake fluid reservoir	1	HH FL. M6x16	3 (2.2)	0.3	8152278

HANDLEBARS - CONTROLS - CABLES					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Clutch control	1		12 (8.8)	1.2	already on control
LH lights switch	2		2 (1.5)	0.2	already on switch
Throttle control	2	cover screws	2 (1.5)	0.2	already on carburettor
RH lights switch	2		2 (1.5)	0.2	already on switch

ELECTRICAL COMPONENTS					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Cradle voltage regulator	1	HH FL. M6x35	7 (5.2)	0.7	8152282
Transducer to frame	2	HH FL. M6x16	7 (5.2)	0.7	8152278
Thermistor	1		17 (12.5)	1.7	8222019
Rear light to support	2	FLH 4.2x25	2 (1.5)	0.2	8150423
Horn	1	HH FL. M6x12	12 (8.8)	1.2	8152277
Headlight to central fairing	3	FLH 4.2x20	2 (1.5)	0.2	8150270

TANKS - RESERVOIRS					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Mixer oil reservoir	4	FSH M6x16	6 (4.4)	0.6	8152246
Fuel cock	2	FSH M6x12	4 (2.9)	0.4	8152186
Aluminium filler to tank	6	FSH M6x12	4 (2.9)	0.4	8152186
Tank cover to saddle support (rear section)	1	HH FL. M6x70	7 (5.2)	0.7	8150314
Tank cover to fuel tank	2	FSH M6x15	3 (2.2)	0.3	8152108
Ring to tank cover	5	FSH M4x10	3 (2.2)	0.3	8152043

DASHBOARD					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Dashboard to bow	3	M6 nut	10 (7.4)	1	8150430

SADDLES					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Passenger strap	2	HH FL. M6x20	5 (3.7)	0.5	8152279
Passenger strap	2	M6 nut	5 (3.7)	0.5	8150333
Passenger saddle to rear fairing	7	SWP 3.9x10	2 (1.5)	0.2	8150444
Passenger saddle to rear fairing	2	M5 nut	2 (1.5)	0.2	8152306
Passenger strap	2	M6 nut	5 (3.7)	0.5	8152299
Saddle catch lever	1	FSH M6x8	5 (3.7)	0.5	8152213

BODYWORK					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Reflector on front mudguard	4	M4 nut	3 (2.2)	0.3	8150204
Front mudguard to stiffening plate	4	HH FL. M6x16	7 (5.2)	0.7	8152278
Front mudguard to fork	2	FSH M5x12	5 (3.7)	0.5	8152302
Rear fairing lower catch to saddle support	2	FSH M6x16	5 (3.7)	0.5	8152246
Rear fairing lower catch to saddle support	1	FSH M5x9	5 (3.7)	0.5	8152339
Rear reflector to number-plate holder	2	M4 nut	3 (2.2)	0.3	8150204
Rear light holder to number-plate holder	2	FLH 4.8x13	3 (2.2)	0.3	8150246
Rear fairing lower catch to number-plate	3	FSH M6x16	5 (3.7)	0.5	8152246
Dashboard catch to bow	1	FSH M5x12	4 (2.9)	0.4	8152302
Fairing front to bow	4	FSH M6x16	5 (3.7)	0.5	8152246
Saddle support cover to rear fairing (LH/RH)	4	FSH M5x12	3 (2.2)	0.3	8152302
Rear fairing assembly to saddle support	2	FSH M5x20	3 (2.2)	0.3	8152269
Rear fairing assembly to saddle support	2	FSH M5x12	3 (2.2)	0.3	8152302
Fairings to frame	4	FSH M5x12	3 (2.2)	0.3	8152302
Fairings to fairing insides and lower fairing	8	FSH M5x12	3 (2.2)	0.3	8152302
LH fairing extension to fairing	2	FSH M5x12	3 (2.2)	0.3	8152302
Fairing insides to fairings	4	FLH 3.9x14	1 (0.7)	0.1	8150413
Fairing insides to fairings	4	FLH 3.9x7.5	1 (0.7)	0.1	8150420

CHAIN					
Description	**Q.ty**	**Screw/nut**	**Nm (Ft-lb)**	**Kgm**	**Code**
Chain adjuster screw	2	M8 nut, low	1.5 (0.8)	1.5	8152305
Chain slide shoe to swing arm	1	FLH 4.8x13	3 (2.2)	0.3	8150246

Steel/aluminium fixing screws with similar moduli of elasticity

SCREW	Nm (Ft-lb)	kgm
M4	3 (2.2)	0.3
M5	6 (4.4)	0.6
M6	12 (8.8)	1.2
M8	25 (18.4)	2.5
M10	50 (36.9)	5.0
M12	80 (59)	8.0

NOTES

3 Engine

ENGINE COMPONENTS THAT CAN BE REMOVED WITHOUT REMOVING THE ENGINE FROM THE FRAME

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
The following parts can be removed and refitted without removing the engine from the frame.

⚠ WARNING

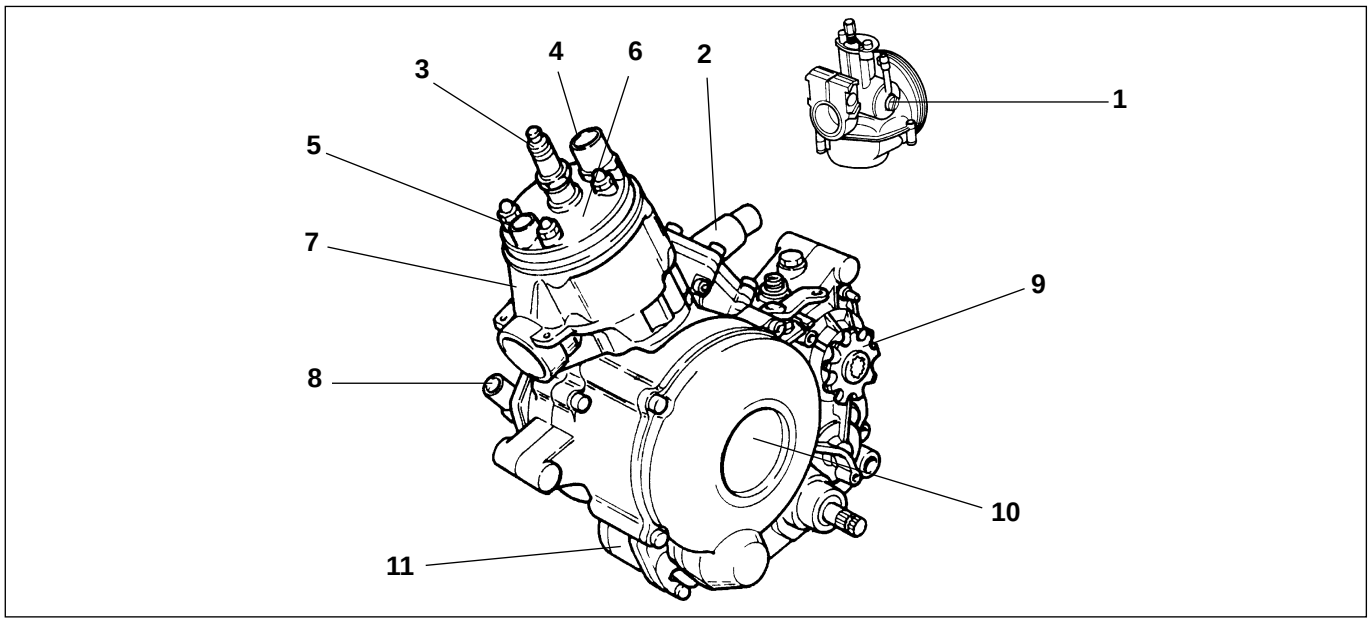
This chapter lists the different procedures sequentially.
Any overlapping operations in cross-references to other chapters should be interpreted logically so as to avoid unnecessary removal of components.
Only carry out the operations required to remove the part in question.

UPPER SIDE
Carburettor (1)
Reed unit (2)
Spark plug (3)
Thermostat (4)
Thermistor (5)

FRONT SIDE
Exhaust silencer
Cylinder head (6)
Cylinder (7)

RIGHT SIDE
Water pump (8)
Oil pump
Clutch cover
Clutch

LEFT SIDE
Pinion (9)
Flywheel-side cover (10)
Flywheel
Stator
Pick-up
Starter motor (11)



IMPORTANT For directions on how to remove the parts, refer to WORKSHOP MANUAL: No. 966 X (I)
No. 967 X (F)
No. 968 X (D)
No. 969 X (E)
No. 970 X (UK)
No. 971 X (USA)

REMOVING THE ENGINE ASSEMBLY FROM THE FRAME

⚠ WARNING

Read through the section PRECAUTIONS AND GENERAL INFORMATION.

⚠ WARNING

The removal of the engine is a very complex operation. Therefore, before proceeding, it is essential to thoroughly inspect the vehicle.

This chapter lists the different procedures sequentially.
Any overlapping operations in cross-references to other chapters should be interpreted logically so as to avoid unnecessary removal of components.
Only carry out the operations required to remove the part in question.
Before performing the operations described below, remember that the engine must be removed from the frame from below. Prepare the necessary equipment ready and position it properly.

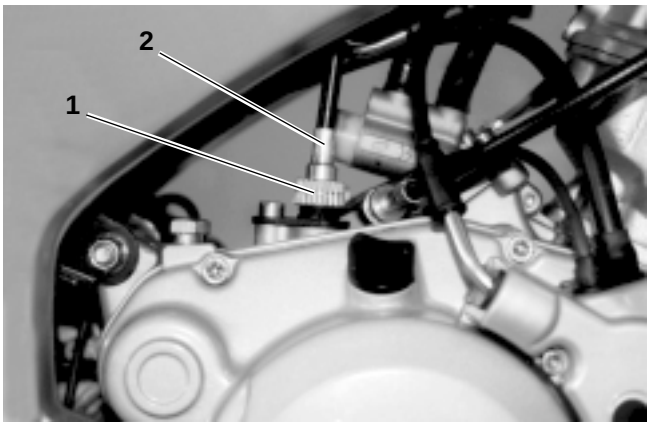
Turn the ignition switch to "⊗" .
Place the vehicle on the rear stand OPT (PLACING THE VEHICLE ON THE REAR STAND).
Remove the rider saddle (REMOVING THE RIDER AND PASSENGER SADDLES).
Disconnect the negative (-) cable and then the positive (+) cable from the battery.

⚠ WARNING

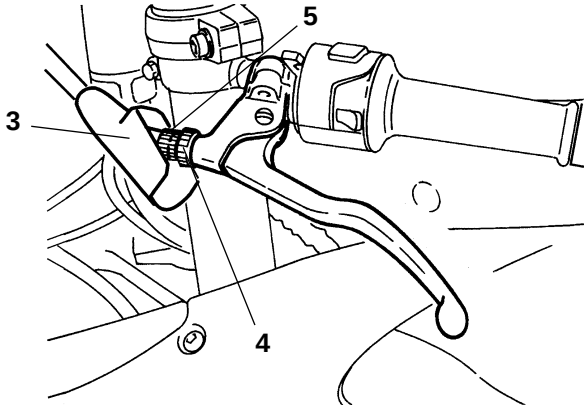
When reinstalling, connect the positive cable (+) and then the negative (-) cable.

Remove the fuel tank (REMOVING THE FUEL TANK).
Remove the side fairings (REMOVING THE SIDE FAIRINGS).
Remove the fairing bulges (REMOVING THE FAIRING BULGES).
Drain all the coolant from the cooling circuit (RENEWING THE COOLANT).
Remove the carburettor (REMOVING THE CARBURETTOR).
Remove the exhaust silencer assembly (REMOVING THE EXHAUST SILENCER).

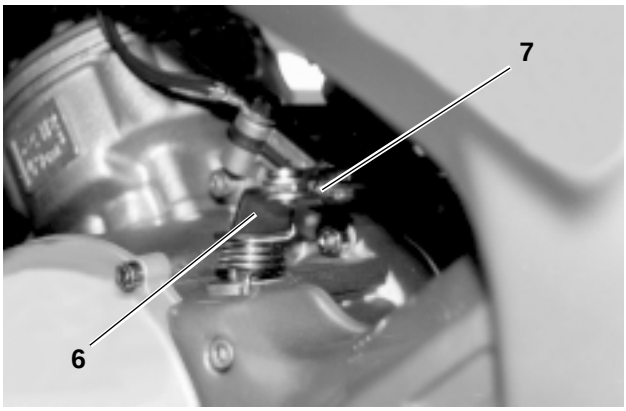
Unscrew ring (1) and remove tachometer cable (2).



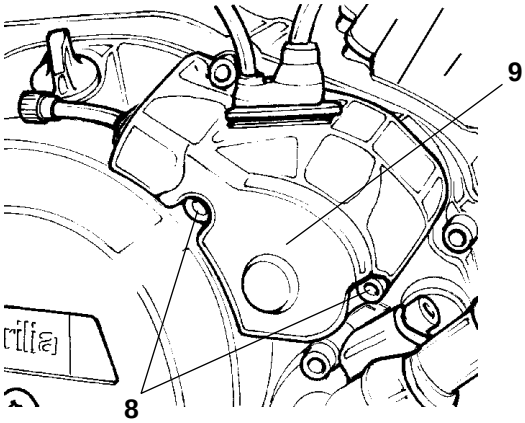
Remove protective hood (3).
Loosen nut (4) by turning it in.
Turn adjuster (5) to slacken the clutch cable.



Push clutch lever (6) on the engine and disconnect clutch control cable (7).

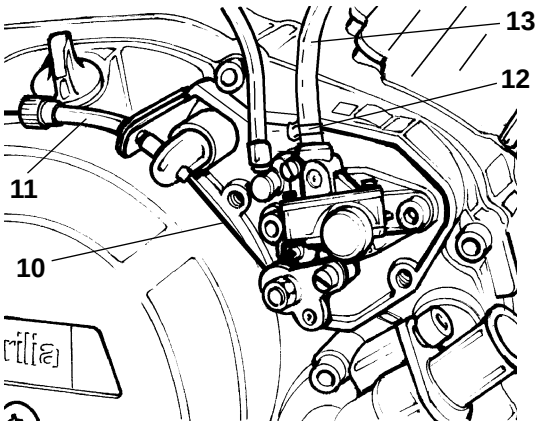


Loosen and remove the two oil pump cover fixing screws (8).
Remove oil pump cover (9).



Disconnect oil pump control cable (10) and remove the cable along with cable guide tube (11).
After removing the oil pipe rubber, loosen and remove clamp (12) and then remove oil feed pipe (13).

IMPORTANT To prevent the oil from coming out, immediately stopper oil feed pipe (13) using a screw of suitable diameter.

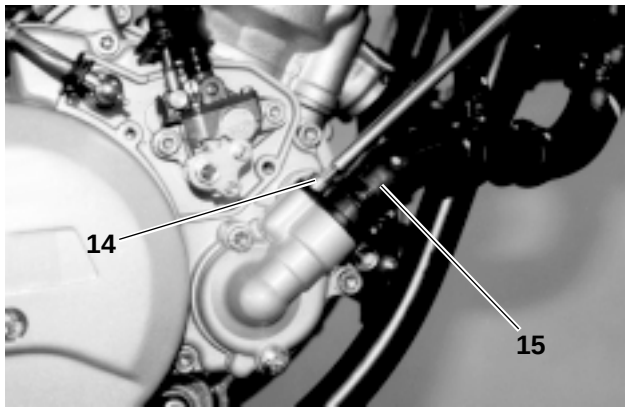


3

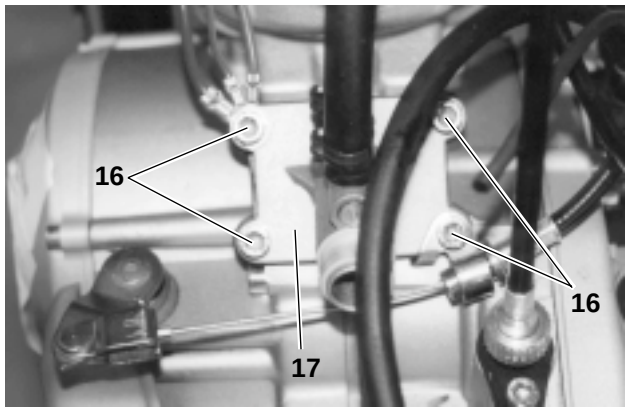
⚠ WARNING

Carefully wash your hands after handling oil. Do not dispose of the oil in the environment.
KEEP OUT OF REACH OF CHILDREN.

Remove screw (14) and then water pump inlet sleeve (15) with the related tube.



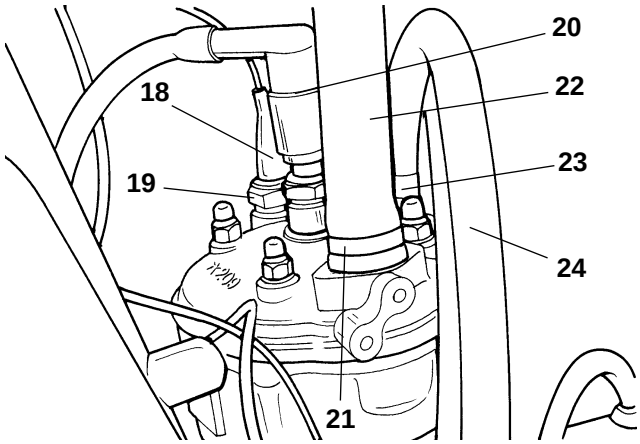
Remove the four screws (16) and then remove intake manifold (17).



Remove electrical connection (18) of thermistor (19).
Disconnect spark plug cap (20).
Remove clamp (21) from cylinder head-radiator coolant tube (22) and then remove the tube. Remove clamp (23) from heater tube (24) and then remove the tube.

⚠ WARNING

When refitting, replace clamps (21) and (23) with new ones.

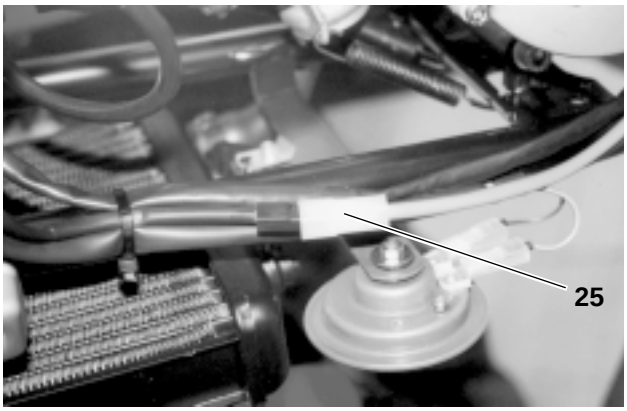


⚠ WARNING

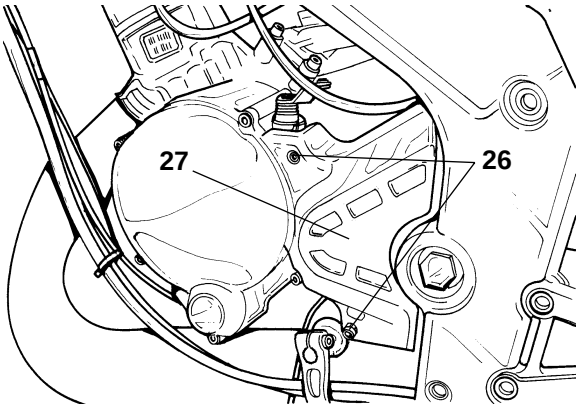
Disengage all the cables and pipes from the clamps along their paths.
Have new clamps ready for refitting.
Close all openings on the engine, tubes and sleeves so as to prevent foreign bodies from getting in.

Bundle up electrical cables and fasten them in position with adhesive tape in order to prevent them from getting in the way when the engine is removed from below.

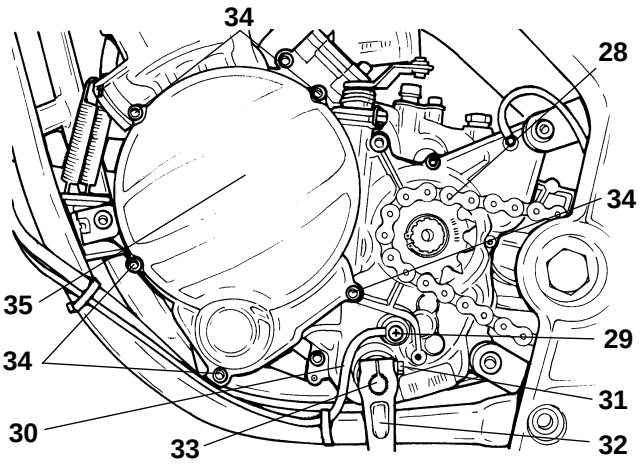
Detach electrical connector (25) of the starter motor and the related magnet.



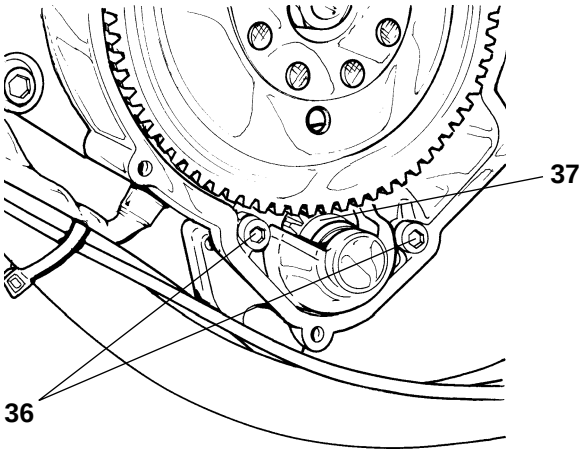
Unscrew and remove the two screws (26) and then remove pinion cover (27).



Remove drive chain (28) (REMOVING THE DRIVE CHAIN).
Loosen and remove screw (29) fixing earth cable (30).
Loosen screw (31) and remove gear intermediate control rod (32) from selector shaft (33).
Loosen and remove the five screws (34), and then remove flywheel casing cover (35).



Unscrew and remove the two screws (36) and the screw that supports the bracket at the back of the motor.
Remove starter motor (37).

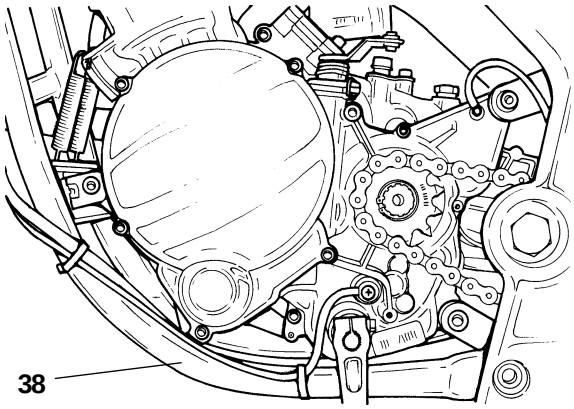


Remove engine cradle (38) (REMOVING THE ENGINE CRADLE).

Prepare a hoist and sling belts.

⚠ WARNING

The hoist and the belts must be strong enough to safely support the engine.
Attach the belts to the hoist and sling the engine.



⚠ CAUTION

Be sure to securely fasten the engine to the hoist so that all subsequent operations can be performed in complete safety.

Lift the hoist arm so as to tension the sling belts.

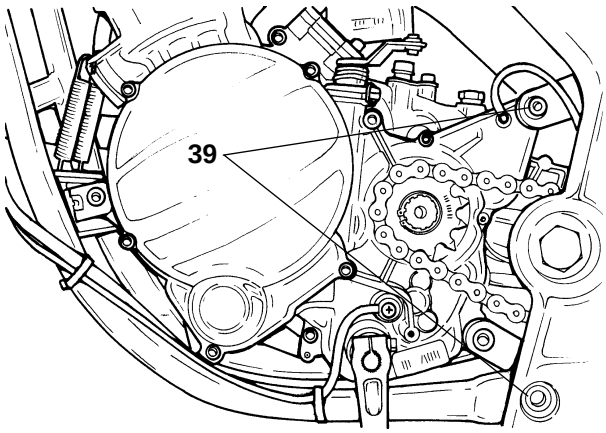
⚠ WARNING

The hoist arm must be lifted as much as required to hold the engine in position during the removal of the fastenings which secure the engine to the frame.

⚠ WARNING

Exercise extreme caution when removing the engine fastenings.

Remove the two screws (39) fastening the engine to the frame and gather the related washers and the self-locking nuts on the opposite side.



⚠ CAUTION

The engine is now completely unfastened. Handle it with great caution, paying particular attention to the fingers and limbs.
Carefully clean the area where the engine will be set down and clear it of any tools.

Lift the hoist arm a few millimetres so as to “release” the engine from the frame.
Lower the hoist arm until the engine rests on the ground.
Secure the engine in order to prevent it from overbalancing.
Release the belts from the hoist.
Remove the belts from the frame.
Reattach the belts to the engine.

⚠ WARNING

If no operation is to be performed on the engine, for reasons of safety it should be left on the ground, attached to the belts and the hoist.
Carefully clean the outside of the engine.

⚠ WARNING

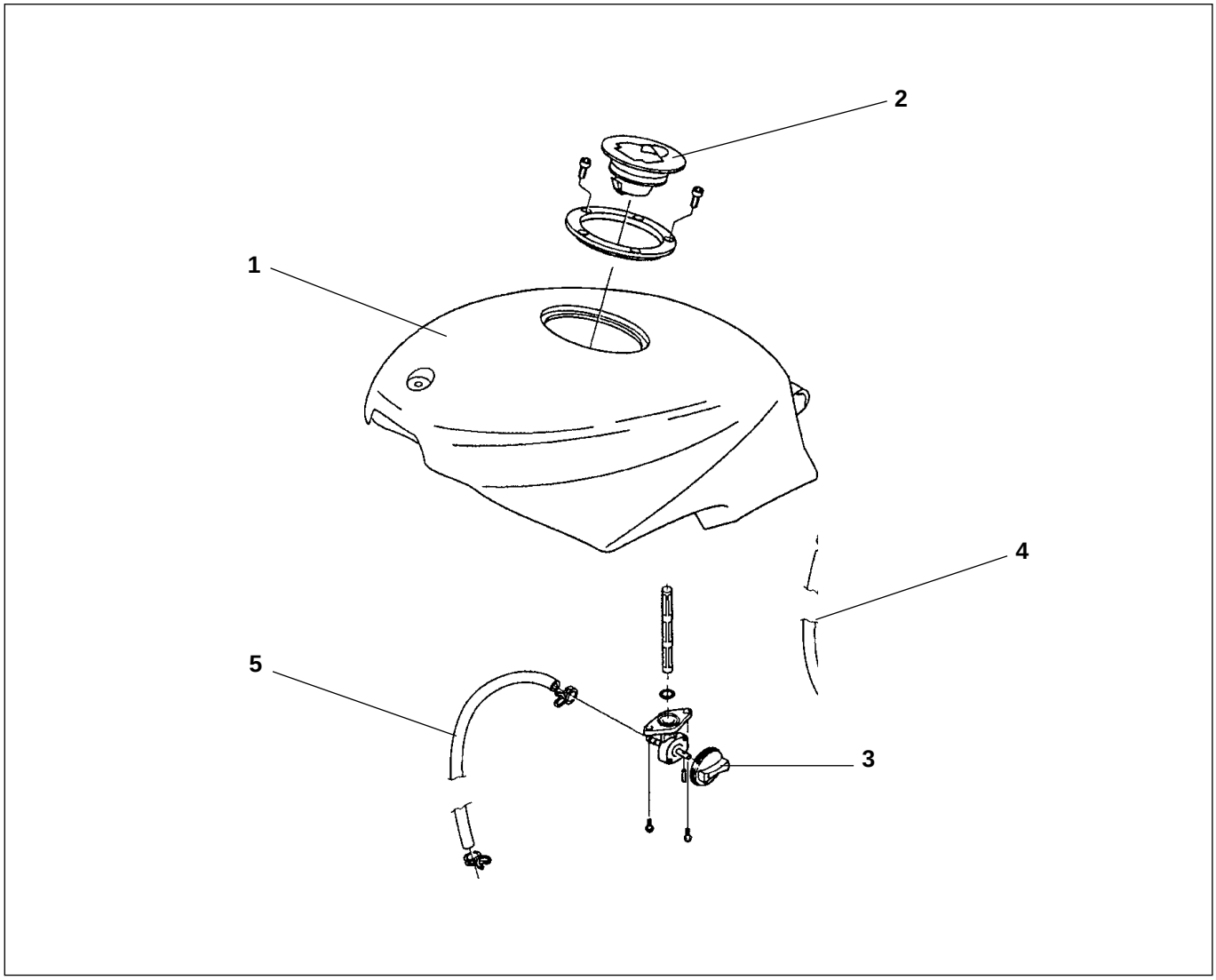
To clean the outside of the engine, use a detergent with a brush and rags.
Avoid damaging plastic and rubber parts by using unsuitable detergents or corrosive and penetrating solvents.

4

Fuel System

FUEL TANK

The fuel tank is fitted with a cap and a cock. The cock shown in the figure has three positions (OFF, ON and RES) which can be selected by means of the cock lever.
When the lever is in the ON position, the main passage is open. When the lever is turned to the RES position, an auxiliary passage is opened for the reserve fuel. When the lever is on the OFF position, both passages are closed.



Key

1) Fuel tank
2) Filler cap
3) Fuel cock
4) Water drain pipe
5) Fuel delivery pipe

Read through the section PRECAUTIONS AND GENERAL INFORMATION and the paragraph FUEL.

⚠ CAUTION

Fuel fumes are harmful.
Before beginning, ensure that the place where the operation is to be carried out is adequately ventilated.

Prevent the fuel from coming into contact with the skin.
Do not smoke and avoid using open flames.
Do not dispose of the fuel in the environment.

MAINTENANCE

To service the fuel tank, remove it as described in the paragraph REMOVING THE FUEL TANK and then wash it thoroughly.

CHECKING THE FUEL SUPPLY

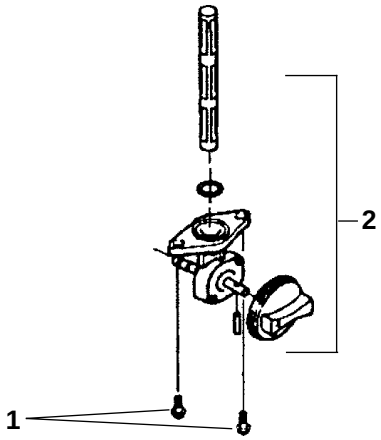
Check the fuel lines every 4,000 km (2,500 mi) or 8 months.
Always replace the fuel lines if they show any cracks or cuts.

Any fuel leaks in the cock area may be due to a damaged O-ring.

In that case, remove the fuel cock (REMOVING THE FUEL COCK), check the condition of the O-ring and if necessary replace it.

Remove the filler cap and check that the breather on the tank is not obstructed. If necessary, clear it using a compressed air jet.

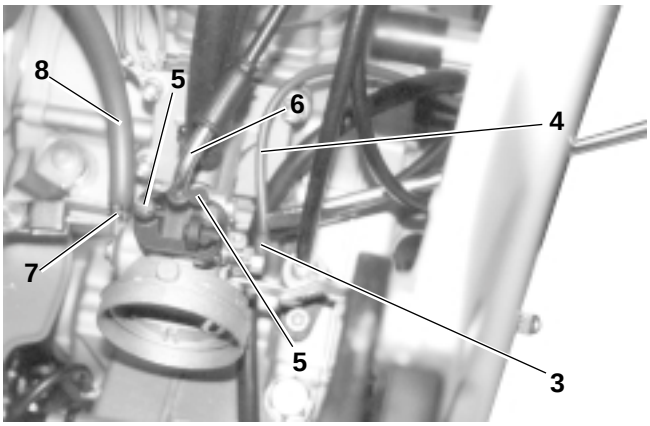
REMOVING THE FUEL COCK



Lift the fuel tank (LIFTING THE FUEL TANK).
Remove screws (1) and pull out fuel cock assembly (2).
Position fuel cock (2) under the tank and secure it by means of screws (1).

Tightening torque for screws (1):
4 Nm (0.6 kgm)

REMOVING THE CARBURETTOR



Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Partly remove the fuel tank (LIFTING THE FUEL TANK).
Remove the air filter box (REMOVING THE AIR FILTER BOX).
Remove clamp (3) from pipe (4) coming from the oil pump, and then remove the pipe itself.
Remove the two screws (5) from throttle control cover (6) and then remove the cover.
Remove clamp (7) from fuel pipe (8) and then disconnect the pipe.
Remove the screw from the carburettor manifold.

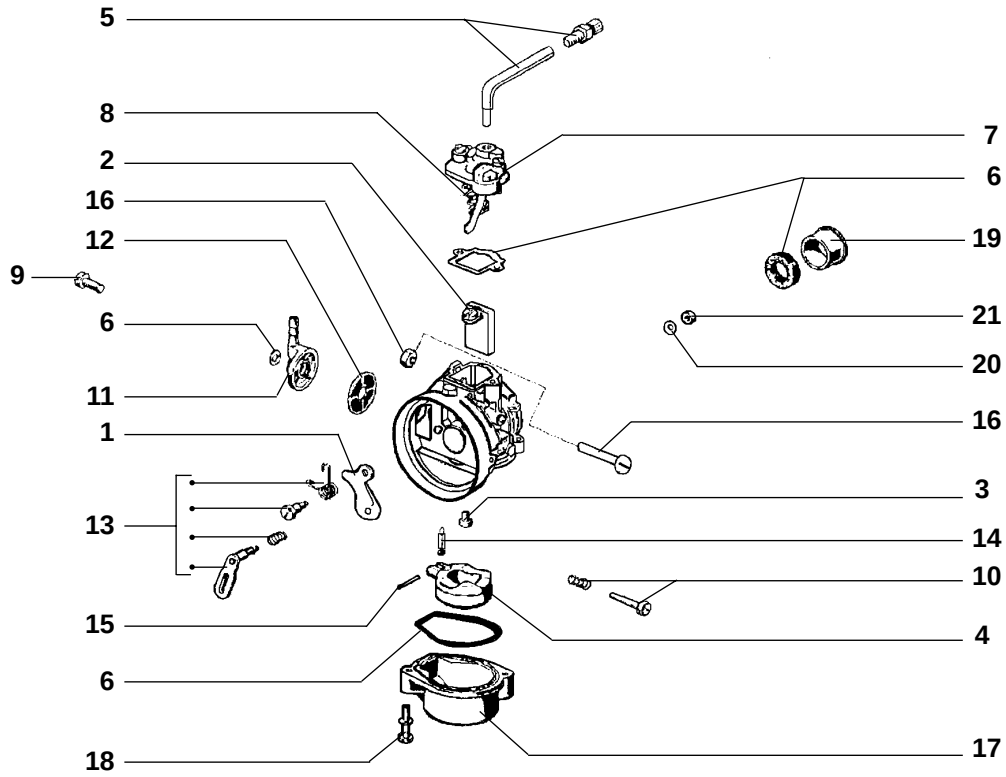
⚠ CAUTION

Danger of fuel outflow!
Close the free end of fuel pipe (8) and fasten it to vehicle in a vertical position.
Loosen the screw fixing the fuel pipe to the reed valve manifold and then remove the fuel pipe.

⚠ WARNING

Before refitting, check the fuel and oil lines (FUEL LINES, MIXER OIL LINES).

Insert the carburettor into the reed valve manifold and secure it using the fixing screw.
Connect carburettor pipe (8) and fasten it to the carburettor using clamp (7).
Connect oil feed pipe (4) coming from the pump and fix it using clamp (3).
Fit throttle control cover (6) and fix it with the two screws (5).



KEY

1) Air valve
2) Throttle valve
3) Main jet
4) Float
5) Deflector tube kit
6) Gaskets
7) Valve cover
8) Throttle valve pull-off spring
9) Pipette fixing screw
10) Throttle valve adjusting screw
11) Fuel pipe connecting pipette
12) Fuel filter
13) Air valve control shaft
14) Needle
15) Float pin
16) Sleeve clamping screw
17) Float chamber
18) Float chamber fixing screw
19) Adapter
20) Air shaft washer
21) Air shaft nut

Specifications

Version	Dell'Orto Carburettors	
Type	SHA 14/12M	
Choke tube	Ø12 mm	(0.47 in)
Main jet	63 mm	(2.48 in)
Float chamber level	4.0 mm	(0.16 in)
Float needle	1.2 mm	(0.05 in)
Float weight	3.5 gr	(0.12 oz)

REMOVING THE MIXER OIL RESERVOIR

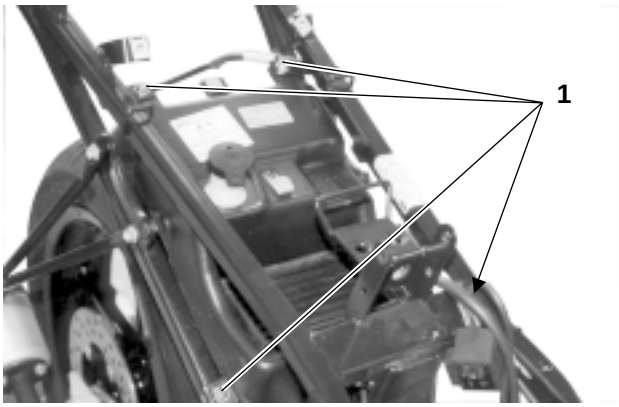
Read through the section PRECAUTIONS AND GENERAL INFORMATION.

Remove the rider and passenger saddles (REMOVING THE RIDER AND PASSENGER SADDLES).
Remove the fuel tank (REMOVING THE FUEL TANK).
Remove the rear fairing (REMOVING THE REAR FAIRING).
Remove the left and right saddle support covers (REMOVING THE SADDLE SUPPORT COVERS).

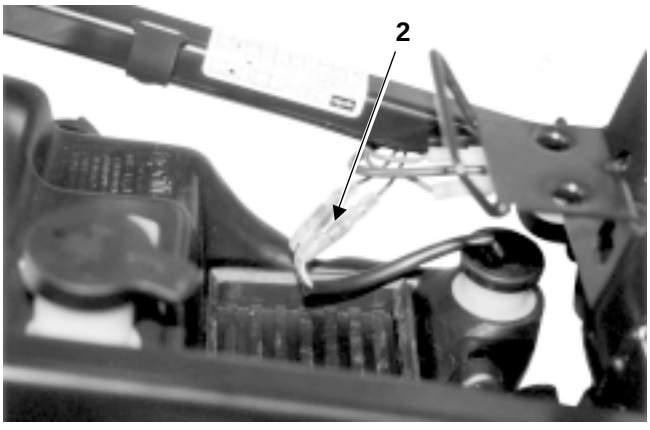
Remove the battery and the fuses (REMOVING THE BATTERY).

Remove the oil from the mixer oil reservoir (REMOVING THE OIL FROM THE MIXER OIL RESERVOIR).

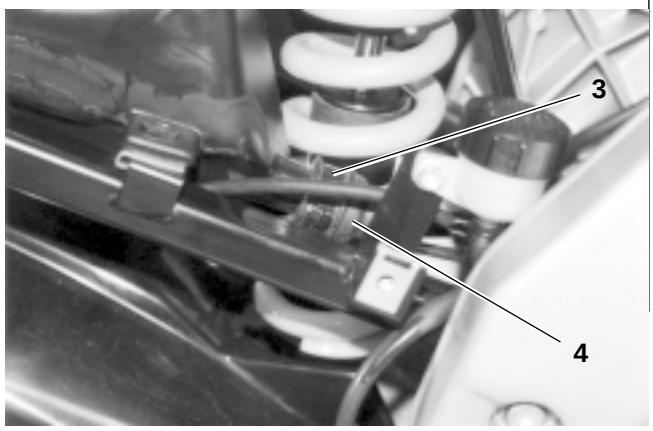
Loosen and remove the four flanged screws (1) fixing the mixer oil reservoir to the frame.



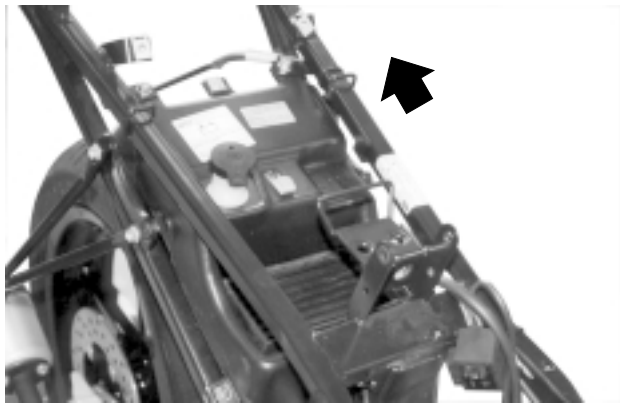
Detach oil reserve indicator electrical connections (2).



Remove clamp (3) and pull out pipe (4) delivering oil to the pump.



To remove mixer oil reservoir (5), rotate it while pulling it towards the rear part of the frame.



Replace the mixer oil reservoir in its seat and secure it to the frame by means of flanged screws (1).

Tightening torque for flanged screws (1):
6 Nm (0.6 kgm) [4.4 ft-lb]

Connect oil delivery pipe (4) to the reservoir and fix it with a new clamp (3).

Attach oil reserve indicator electrical connections (2).

NOTES

5

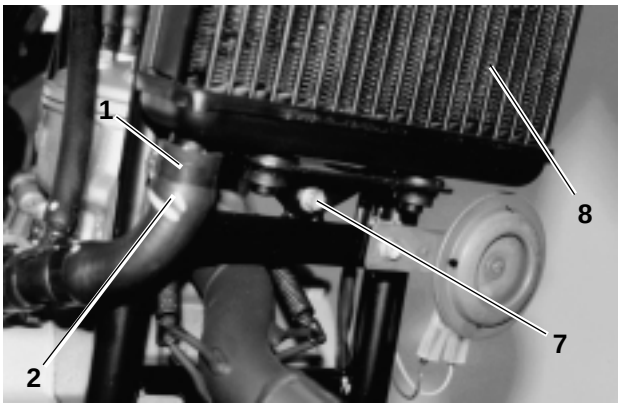
Cooling System

REMOVING THE RADIATOR

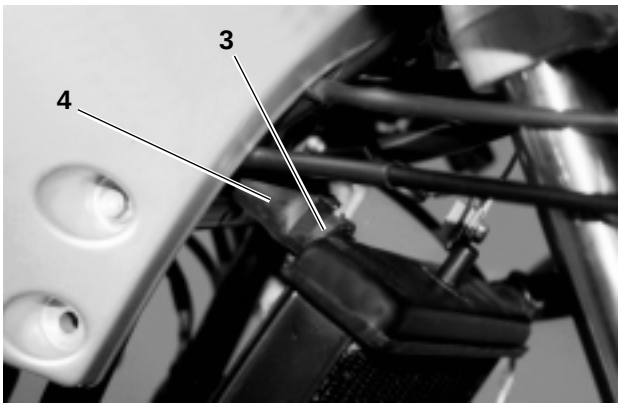
Read through the section PRECAUTIONS AND GENERAL INFORMATION and the paragraph COOLANT.

Remove the right-hand side panel (REMOVING THE SIDE FAIRINGS).
Remove the lower fairing tip (REMOVING THE FAIRING BULGES).
Drain all the coolant from the circuit (RENEWING THE COOLANT).

Remove clamp (1) from pump-radiator pipe (2) and then remove the pipe.



Remove clamp (3) from cylinder head-radiator pipe (4) and then remove the pipe.

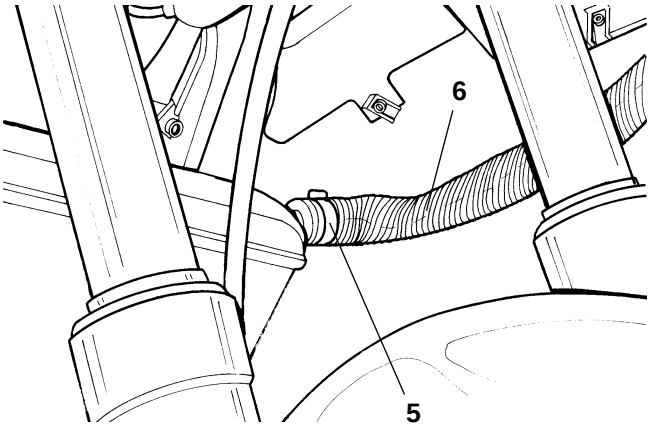


Remove clamp (5) from radiator load hose (6) and then remove the pipe.

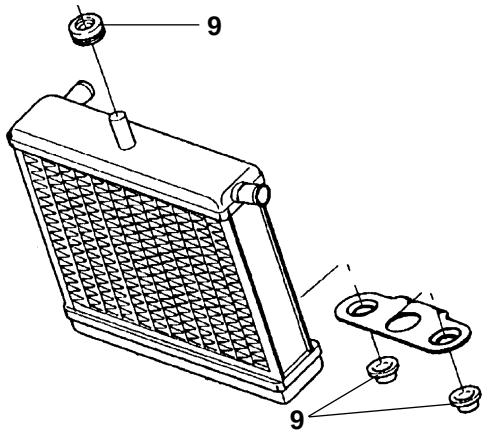
⚠ WARNING

Take care not to damage the radiator fins.

Remove radiator support flanged screw (7) and then pull out radiator (8) from below.



Close the manifold openings so as to prevent foreign bodies from getting in.



⚠ WARNING

IMPORTANT If rubbers (9) are damaged, replace them.

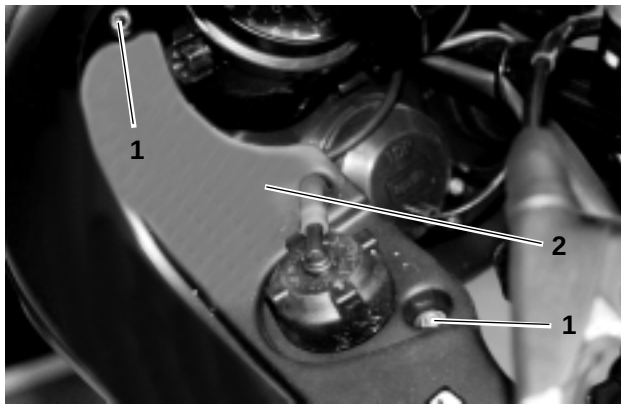
⚠ WARNING

Use a compressed air jet to remove dirt, foreign bodies, etc. sticking to the radiator fins.
Straighten any bent fins using the blade of a small screwdriver.
Replace the sleeves if they appear to be cracked and/or cut.
Before reinstalling the radiator, thoroughly wash its interior using clean water only.
To refit the radiator, perform the removing procedure in reverse order, replacing the hose clamps with new ones.

5

REMOVING THE FILLER CAP

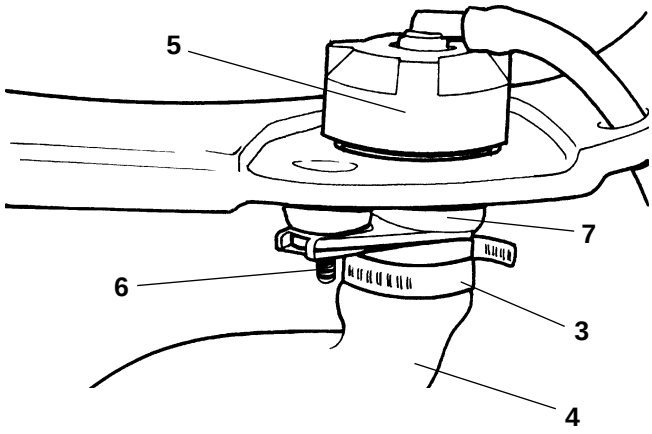
Read through the section PRECAUTIONS AND GENERAL INFORMATION and the paragraph COOLANT.
Remove the left-hand side panel (REMOVING THE SIDE FAIRINGS).
Remove screw (1) fixing dashboard support panel (2).



Loosen and remove clamp (3) from filler hose (4) and then remove the hose.
Unscrew filler cap (5), remove screw (6) and then remove filler (7).

⚠ WARNING

Close the manifold openings so as to prevent foreign bodies from getting in.
IMPORTANT If filler hose (4) is damaged, replace it.
To refit the parts, perform the removing procedure in reverse order.



NOTES

6

Electrical Equipment

INTRODUCTION

The following indications help to clarify the content of this section.

IMPORTANT The identification numbers appearing in the specific wiring diagrams correspond to those shown in the general wiring diagram.

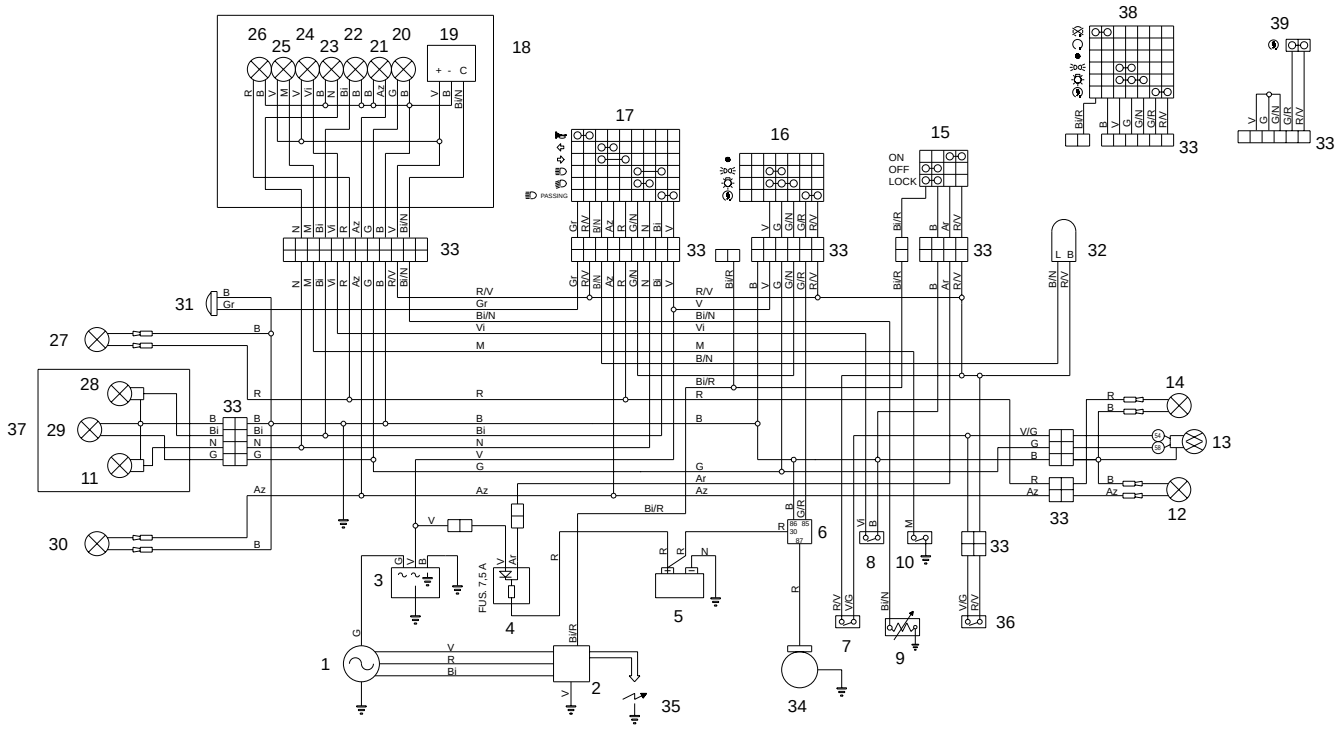
RECOMMENDED EQUIPMENT

Multimeter
Battery electrolyte densimeter
Stroboscopic gun for two-stroke engines, 10,000 rpm
0 ÷ 100A d.c. ammeter
130Ω 2W resistor

CABLE COLOURS

Ar orange
Az light blue
B blue
Bi white
G yellow
Gr grey
M brown
N black
R red
Ro pink
V green
Vi violet

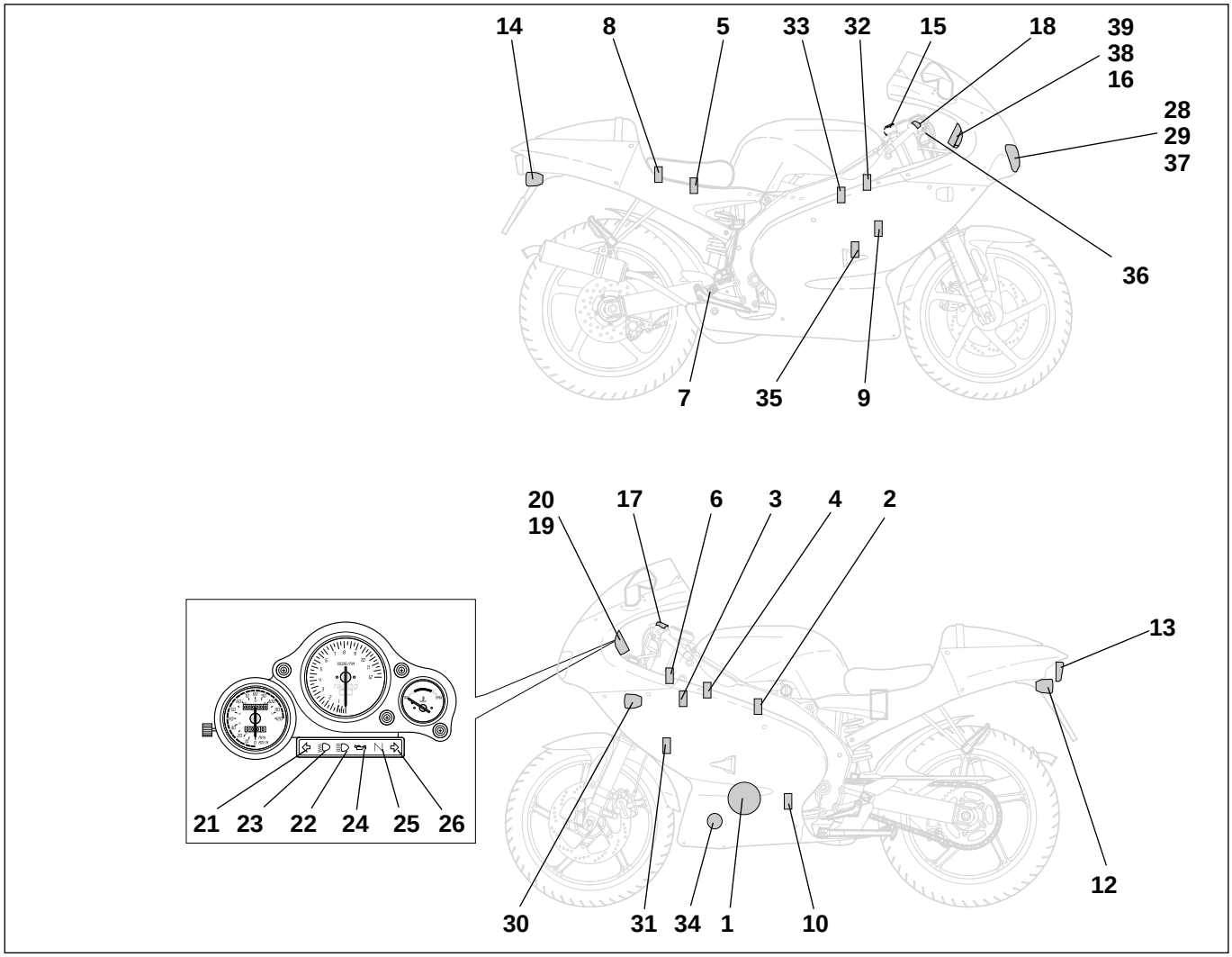
WIRING DIAGRAM



KEY TO GENERAL WIRING DIAGRAM

1) Generator
2) Ignition coil
3) Voltage regulator
4) Rectifier
5) Battery
6) Start relay
7) Rear stoplight switch
8) Mixer oil reserve sensor
9) Coolant temperature thermistor
10) Neutral sensor
11) Low beam bulb
12) Left-hand rear turn indicator
13) Rear light
14) Right-hand rear turn indicator
15) Ignition switch
16) Right-hand lights switch
17) Left-hand lights switch
18) Dashboard
19) Coolant temperature indicator
20) Dashboard light
21) Left-hand turn indicator warning light
22) High beam warning light
23) Low beam warning light
24) Mixer oil reserve warning light
25) Neutral indicator
26) Right-hand turn indicator warning light
27) Right-hand front turn indicator
28) High beam bulb
29) Front parking light bulb
30) Front left direction indicator
31) Horn
32) Flasher unit
33) Multiple connectors
34) Starter motor
35) Spark plug
36) Front stoplight switch
37) Front light
38) Right-hand lights switch with engine stop switch (for countries where required)
39) Right-hand lights switch ASD

LOCATION OF COMPONENTS



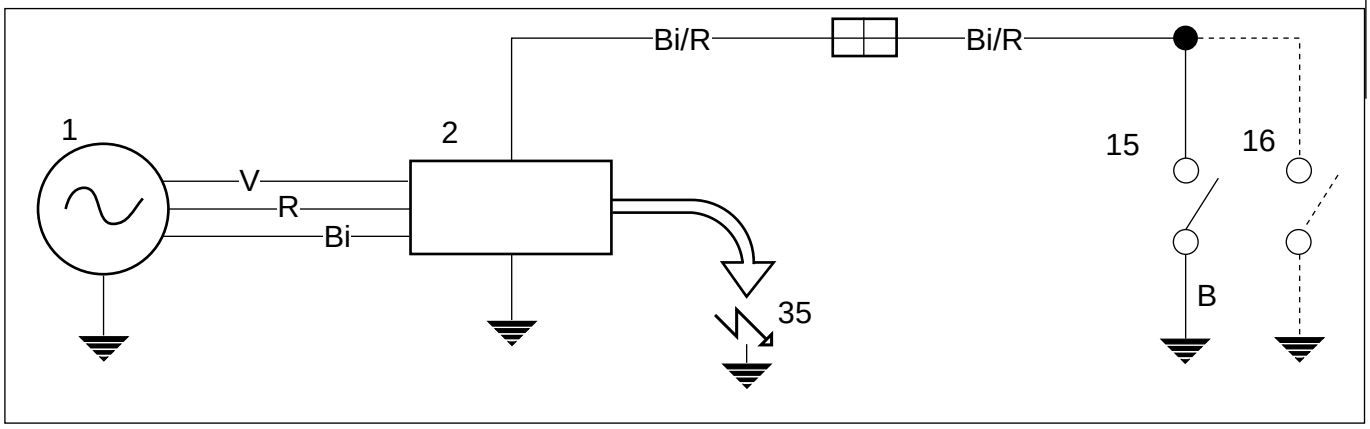
KEY

1) Generator
2) Ignition coil
3) Voltage regulator
4) Rectifier
5) Battery
6) Start relay
7) Rear stoplight switch
8) Mixer oil reserve sensor
9) Coolant temperature thermistor
10) Neutral sensor
11) Low beam bulb
12) Left-hand rear turn indicator
13) Rear light
14) Right-hand rear turn indicator
15) Ignition switch
16) Right-hand lights switch
17) Left-hand lights switch
18) Dashboard
19) Coolant temperature indicator
20) Dashboard lighting bulbs
21) Left-hand turn indicator warning light
22) High beam warning light
23) Low beam warning light
24) Mixer oil reserve warning light
25) Neutral indicator
26) Right-hand turn indicator warning light
27) Right-hand front turn indicator
28) High beam bulb
29) Front parking light bulb
30) Left-hand front turn indicator
31) Horn
32) Flasher unit
33) Multiple connectors
34) Starter motor
35) Spark plug
36) Front stoplight switch
37) Headlight
38) Right-hand lights switch with engine stop switch (for countries where required)
39) Right-hand lights switch ASD ASD

IGNITION CIRCUIT

Refer to the paragraph LOCATION OF COMPONENTS.

ELECTRICAL DIAGRAM



1) Generator
2) Transducer
35) Spark plug
15) Ignition switch
16) Right-hand lights switch USA

6

SPECIFICATIONS

Spark plug	NGK R BR9ES
Spark gap	0.6 ± 0.7 mm (0.02 ± 0.03 in)
Spark advance	14° ± 2° before TDC
Ignition type	capacitive-discharge, fixed-advance

TROUBLESHOOTING

A. ENGINE OPERATION IS IRREGULAR OR NO SPARK IS PRODUCED

Check and if necessary replace the spark plug.
Disconnect the white-red wire from the ignition switch, taking care not to earth the latter.
Check the connections of the cables.

If the trouble persists:
Check the high-voltage cable.
Check the spark plug cap.
Check the ignition flywheel (CHECKING THE IGNITION FLYWHEEL).
Replace the transducer with one that is certainly working.

If this solves the problem:
Check the ignition switch (CHECKING THE IGNITION SWITCH).

B. ENGINE DOES NOT SHUT OFF

Check the connection between the ignition switch and the white-red wire.

CHECKING DATA
Using a multimeter as an ohmmeter, check continuity between the different wires observing the polarity.

CHECKING THE IGNITION FLYWHEEL
Pick-up coil:
between red and white wires 120 Ω ÷ 20 %.

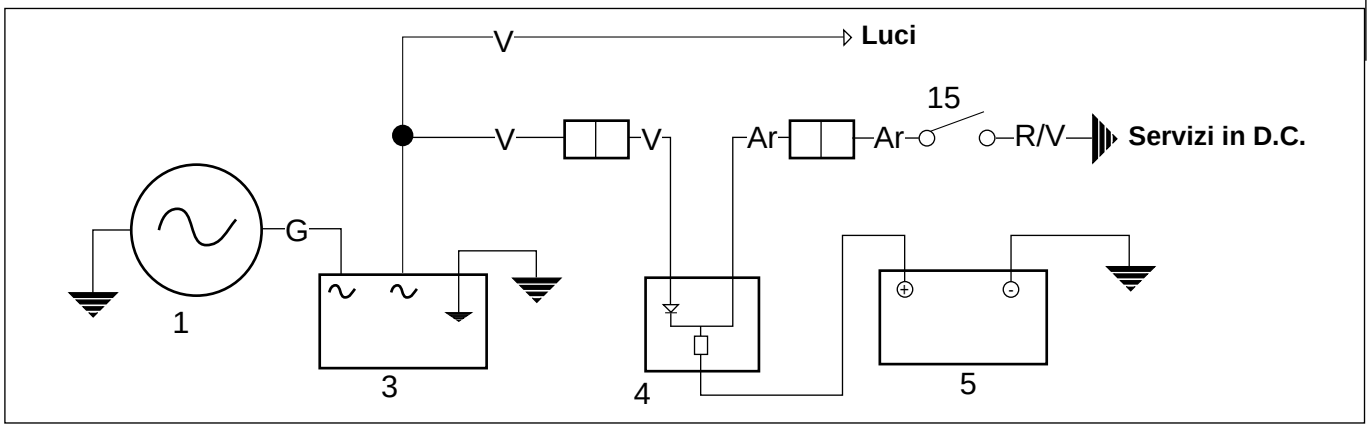
Capacitor charge coil:
between green and white wires 700 Ω ÷ 20 %.

CHECKING THE IGNITION SWITCH
Detach the ignition switch connector.
Using a multimeter as an ohmmeter, check continuity between the different wires in the various positions according to the wiring diagram (GENERAL WIRING DIAGRAM).

GENERAL FEEDING AND RECHARGE CIRCUIT

Refer to the paragraph LOCATION OF COMPONENTS.

ELECTRICAL DIAGRAM



1) Generator
3) Voltage regulator
4) Rectifier
5) Battery
15) Ignition switch

6

SPECIFICATIONS

Generator ..... 105 W a.c. at 6,000 rpm
Voltage regulator ..... 12 V a.c.
Battery ..... 4 Ah - 12V
Fuse ..... 7.5 A

RECHARGING CHECK

Start the engine.
Using a multimeter as a d.c. voltmeter, measure the voltage on the battery.
At 6,000 rpm the voltage should be 13.5 to 15 V with the low beam on.

TROUBLESHOOTING

A. BATTERY DOES NOT STAY CHARGED
Check and if necessary replace the fuse.
Replace the rectifier.
Check the wire connections on the regulator, the flywheel, the battery and the fuse.
Check the battery (CHECKING THE BATTERY).
Check the generator (CHECKING THE GENERATOR).

B. RECHARGE VOLTAGE EXCESSIVE
Check the voltage regulator (CHECKING THE VOLTAGE REGULATOR).
Check the connections of the wires.

C. NO VOLTAGE SUPPLIED TO D.C. LOADS (green/red wires)

Check and if necessary replace the fuse (REPLACING THE FUSE).
Check the connections of the wires on the regulator, the flywheel, the battery and the fuse.
Check the battery (CHECKING THE BATTERY).
Check the generator (CHECKING THE GENERATOR).
Check the ignition switch (CHECKING THE IGNITION SWITCH) and the related connections.

D. SYSTEM OPERATION IS IRREGULAR
Check the earth connections.

CHECKING DATA
CHECKING THE GENERATOR
Disconnect the yellow wire from the regulator.
Start the engine and increase its speed to 6,000 rpm.
Using a multimeter as an a.c. voltmeter, check that:
voltage between yellow wire and generator earth is greater than 35 V.
Using a multimeter as an a.c. ammeter, check that:
current between yellow wire and generator earth is greater 5 A.

CHECKING THE BATTERY

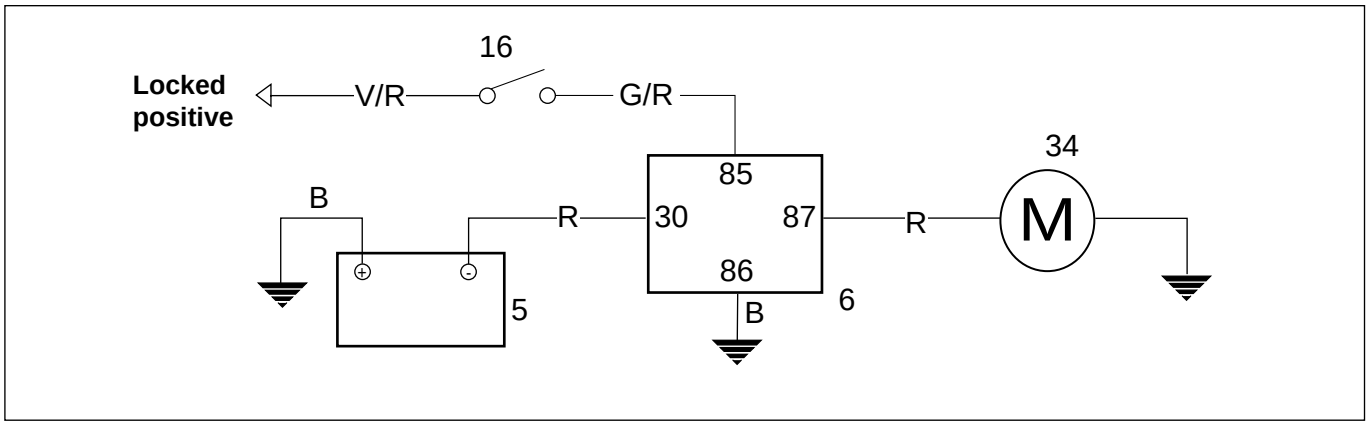
No-load voltage: 12.5 ± 1 V
Electrolyte density: 1.26 at 20° C (68° F)
Check the level of the electrolyte and if necessary top up with distilled water.
Check for any signs of sulphation and if necessary replace.

6

STARTING CIRCUIT

Refer to the paragraph LOCATION OF COMPONENTS.

ELECTRICAL DIAGRAM



5) Battery
6) Starting relay
16) Start button
34) Starter motor

SPECIFICATIONS

Starter motor ..... 12 V - 150 W
Brush wear limit..... 0.9 mm (0.03 in)
Starting relay ..... 12 V - 70 A
Battery ..... 12 V - 4 Ah

TROUBLESHOOTING

A. STARTER MOTOR DOES NOT TURN OR TURNS VERY SLOWLY

Check the battery (CHECKING THE BATTERY).
Check the continuity of the circuit (wiring and connectors).
Check the starting relay (CHECKING THE STARTING RELAY).
Check the start button "⏻" (CHECKING THE START BUTTON).
Check the general feeding circuit.

B. STARTER MOTOR TURNS BUT ENGINE DOES NOT TURN

Check the starter motor gears (CHECKING THE STARTER MOTOR).

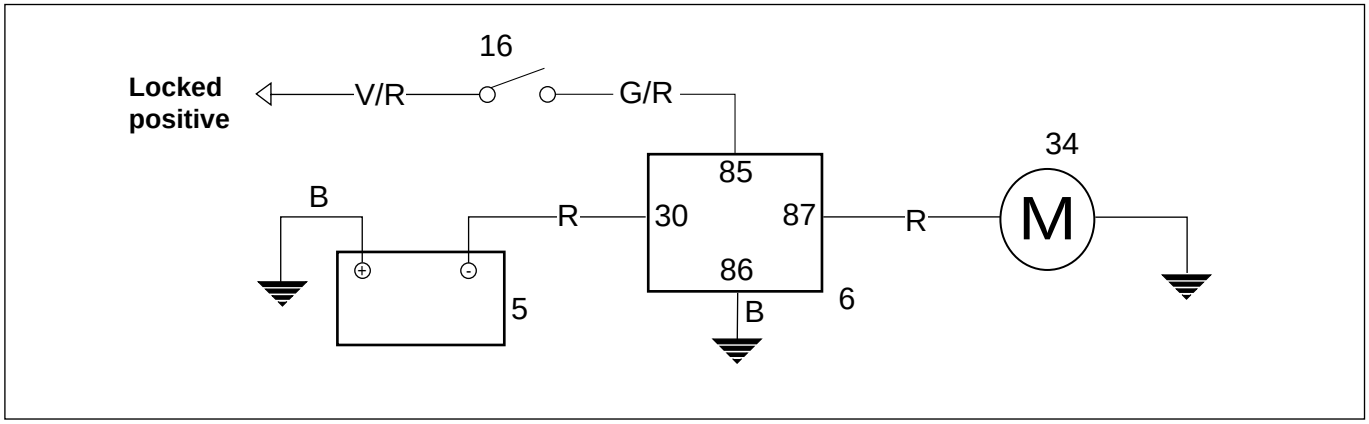
C. STARTER MOTOR TURNS EVEN IF NO OPERATION HAS BEEN PERFORMED

Check the connections of the starter motor wires.
Check the starting relay (CHECKING THE STARTING RELAY).
Check the start button "⏻" (CHECKING THE START BUTTON).

CHECKING DATA
CHECKING THE STARTING RELAY

Disconnect all relay wires.
Using a multimeter as an ohmmeter, measure continuity between terminals 30 and 87.
Correct value: infinite resistance.

Power terminal 85 and 86 with a 12 V battery.
Using a multimeter as an ohmmeter, measure continuity between terminals 30 and 87.
Correct value: 0 Ω.



5) Battery
6) Starting relay
16) Start button
34) Starter motor

CHECKING THE STARTER MOTOR

Using a 0±100 A a.c. ammeter, measure the current absorbed by the starter motor after removing the spark plug cap so as to prevent the engine from starting.
Normal values: 25 A take-off, 20 A at full rating ± 15%.

Using a multimeter as an ohmmeter, check the resistance between the starter motor positive and negative terminals.
Correct value: 0,5 Ω ± 10 %.

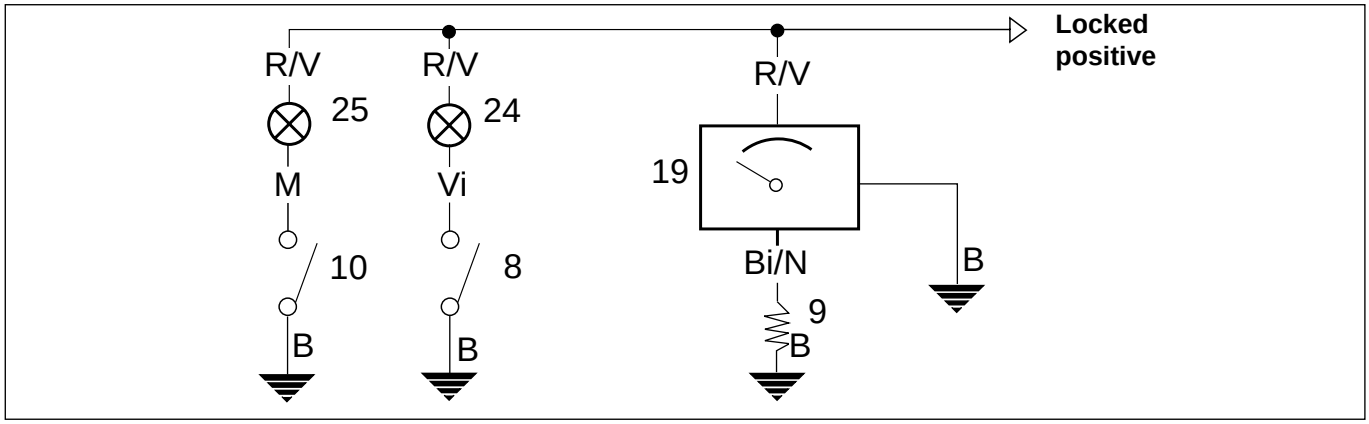
CHECKING THE START BUTTON "⏀"

Detach the button connector.
Using a multimeter as an ohmmeter, check continuity between the contacts in the pressed-in and home positions according to the wiring diagram (GENERAL WIRING DIAGRAM).

SENSORS CIRCUIT

Refer to the paragraph LOCATION OF COMPONENTS.

ELECTRICAL DIAGRAM



8) Oil reserve sensor
9) Water temperature thermistor
10) Neutral sensor
19) Water temperature indicator
24) Oil reserve warning light
25) Neutral indicator

SPECIFICATIONS

All-glass
warning light bulbs ..... 12 V - 2 W, W2,1x9,5d

MIXER OIL RESERVE WARNING LIGHT

TROUBLESHOOTING

A. WARNING LIGHT DOES NOT COME ON EVEN IF OIL LEVEL IS LOW

Check the bulb.
Ensure there is voltage on the green/red wire of the oil reserve warning light.
Check the connections of the wires.
Check the oil level sensor (CHECKING THE OIL LEVEL SENSOR).

B. WARNING LIGHT STAYS ON EVEN IF OIL LEVEL IS NORMAL

Check the connections of the wires.
Check the oil level sensor (CHECKING THE OIL LEVEL SENSOR).

CHECKING DATA

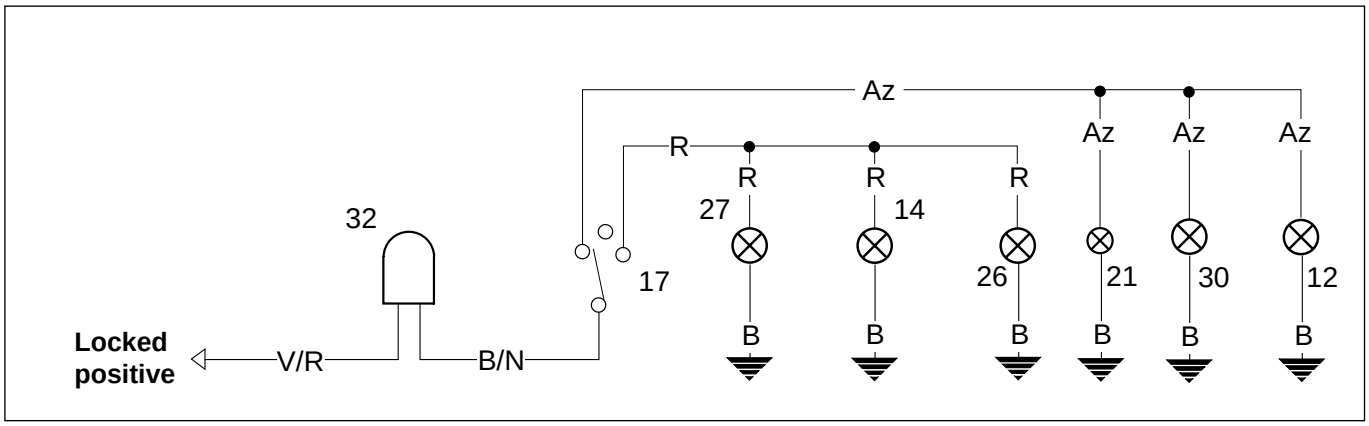
CHECKING THE OIL LEVEL SENSOR

Disconnect the sensor wires and remove the sensor from the reservoir.
Using a multimeter as an ohmmeter, connect the sensor wires:
Vertical position - Correct value: 0 W.
Upside-down position - Correct value: infinite resistance.

TURN INDICATORS CIRCUIT

Refer to the paragraph LOCATION OF COMPONENTS.

ELECTRICAL DIAGRAM



12) Left-hand rear turn indicator
14) Right-hand rear turn indicator
17) Turn indicator switch
21) Left-hand turn indicator warning light
26) Right-hand turn indicator warning light
27) Right-hand front turn indicator
30) Left-hand front turn indicator
32) Flasher unit

SPECIFICATIONS

Turn indicator bulbs ..... 12 V - 10 W B.A. 15 S
Flasher unit ..... 12 V - 22 W
All-glass turn indicator
warning light ..... 12 V - 2 W - W2,1x9,5d

TROUBLESHOOTING

A. TURN INDICATORS DO NOT WORK

Check the bulbs.
Check the connections of the wires.
Check the turn indicator switch.
Check the general feeding circuit.
Replace the flasher unit.

B. TURN INDICATORS STAY CONSTANTLY LIT (THEY DO NOT BLINK)

Check the specifications of the bulbs.
Check the battery (CHECKING THE BATTERY).
Replace the flasher unit.

CHECKING DATA

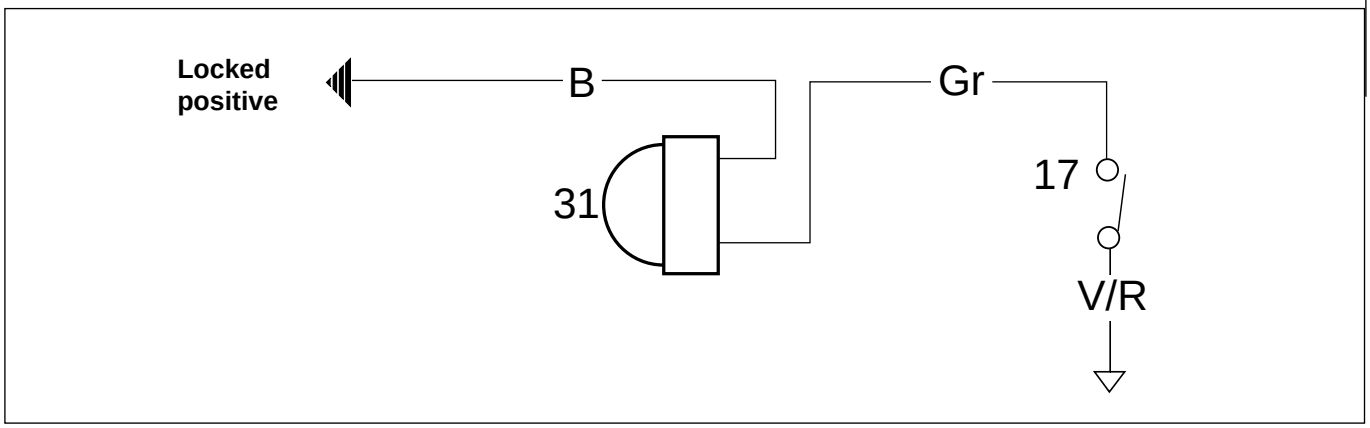
CHECKING THE TURN (INDICATOR) SWITCH

Check the bulbs.
Detach the switch connector.
Using a multimeter as an ohmmeter, check continuity between the different wires in the various positions according to the wiring diagram (GENERAL WIRING DIAGRAM).

HORN CIRCUIT

Refer to the paragraph LOCATION OF COMPONENTS.

ELECTRICAL DIAGRAM



17) Horn button
31) Horn

SPECIFICATIONS

Horn ..... 12 V c.c.

TROUBLESHOOTING

A. HORN GIVES OUT NO SOUND OR AN IRREGULAR SOUND

Check the battery (CHECKING THE BATTERY).
Check the connections of the wires.
Check the horn button (CHECKING THE HORN BUTTON).
Check the horn (CHECKING THE HORN).

B. HORN SOUNDS CONTINUOUSLY

Check the connections of the wires.
Check the horn button (CHECKING THE HORN BUTTON).

CHECKING DATA

CHECKING THE HORN

Disconnect the horn and power it directly with a 12 V battery.
If necessary, use the specially designed adjuster.

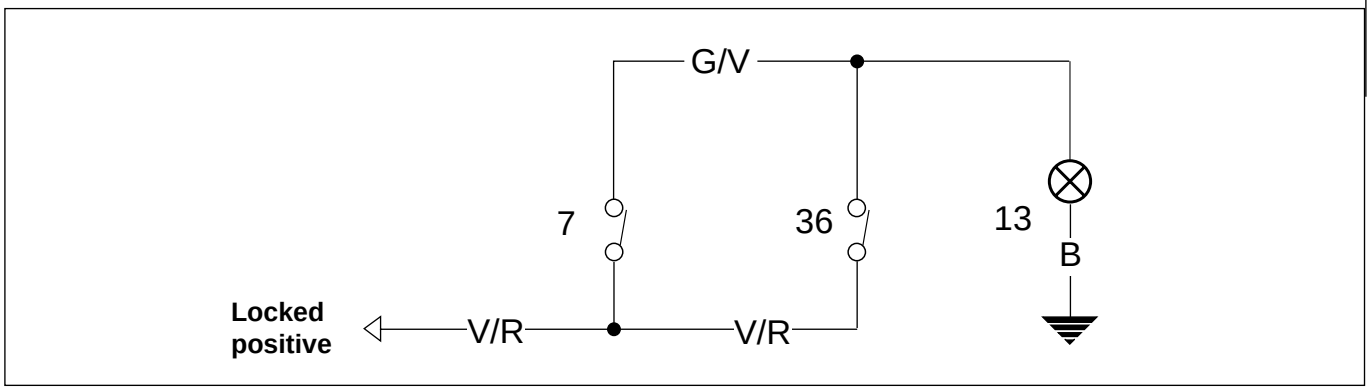
CHECKING THE HORN BUTTON

Detach the button connector.
Using a multimeter as an ohmmeter, check continuity between the contacts in the pressed-in and home positions according to the wiring diagram (GENERAL WIRING DIAGRAM).

STOPLIGHTS CIRCUIT

Refer to the paragraph LOCATION OF COMPONENTS.

ELECTRICAL DIAGRAM



7) Rear stoplight switch
13) Rear light (rear stoplight bulb)
36) Front stoplight switch

6

SPECIFICATIONS

Rear stoplight bulb ..... 12 V - 21 W

TROUBLESHOOTING

A. STOPLIGHT STAYS CONTINUOUSLY LIT

Check the rear light connections.
Check the front stoplight switch (CHECKING THE FRONT AND REAR STOPLIGHT SWITCHES).
Check the rear stoplight switch (CHECKING THE FRONT AND REAR STOPLIGHT SWITCHES).

B. STOPLIGHT DOES NOT WORK

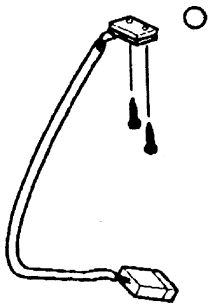
Check the bulb and the bulb holder.
Check the connections of the wires.
Check the general feeding circuit.
Check the front stoplight switch (CHECKING THE FRONT AND REAR STOPLIGHT SWITCHES).
Check the rear stoplight switch (CHECKING THE FRONT AND REAR STOPLIGHT SWITCHES).

CHECKING DATA

CHECKING THE FRONT AND REAR STOPLIGHT SWITCHES

For the front stoplight switch:
detach the two-way connector.

For the rear stoplight switch:
lift the cap and disconnect the two terminals.

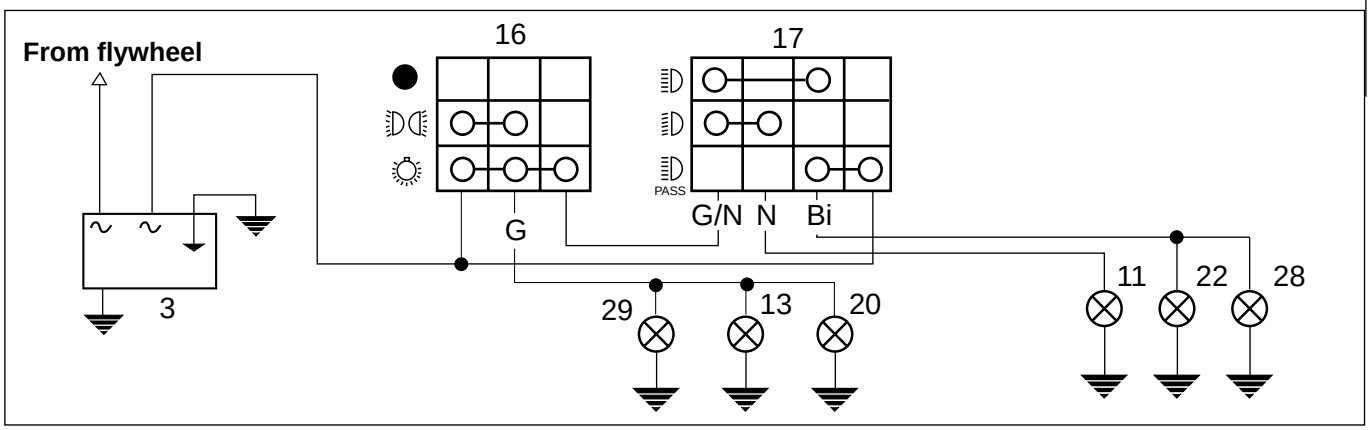


Apply the brake and, using a multimeter as an ohm-meter, check the resistance between the two wires on the connector.
Correct value when brake is applied: 0 Ω.
Correct value when brake is not applied: infinite resistance.

LIGHTING CIRCUIT

Refer to the paragraph LOCATION OF COMPONENTS.

ELECTRICAL DIAGRAM



3) Regulator
11) Low beam
13) Rear parking light
16) Right-hand lights switch
17) Left-hand lights switch
20) Instrument panel light
22) High beam warning light
28) High beam
29) Front parking light

SPECIFICATIONS

Low/high beam bulb ..... 12 V - 35 W

Rear parking light bulb ..... 12 V - 5 W - BAY 15d

Instrument panel light bulb ..... 12 V - 2 W W2,1x9,5 d all-glass

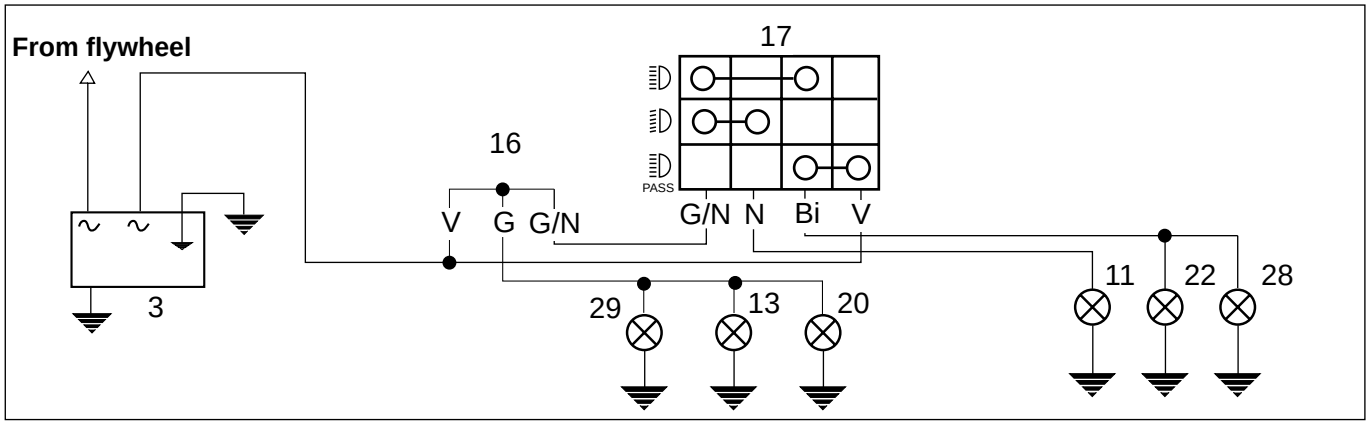
High beam warning light bulb .. 12 V - 2 W W2,1x9,5 d all-glass

Front parking light bulb ..... 12 V - 5 W W2,1x9,5d all-glass

LIGHTING CIRCUIT ASD

Refer to the paragraph LOCATION OF COMPONENTS.

ELECTRICAL DIAGRAM



3) Regulator
11) Low beam
13) Rear parking light
16) Right-hand lights switch
17) Left-hand lights switch
20) Instrument panel light
22) High beam warning light
28) High beam
29) Front parking light

SPECIFICATIONS

Low/high beam bulb ..... 12 V - 35 W

Rear parking light bulb ..... 12 V - 5 W - BAY 15d

Instrument panel light bulb ..... 12 V - 2 W W2,1x9,5 d all-glass

High beam warning light bulb .. 12 V - 2 W W2,1x9,5 d all-glass

Front parking light bulb ..... 12 V - 5 W W2,1x9,5d all-glass

TROUBLESHOOTING

A. A BULB DOES NOT WORK

Check the bulb.
Check if voltage is supplied to the bulb holder terminals.
Check the wiring connections.

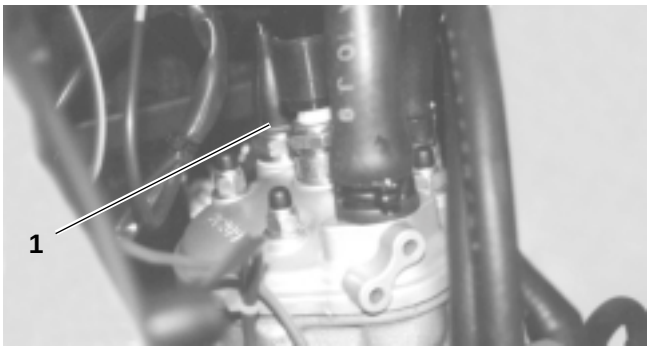
B. NO BULBS WORK

Check the lights switch.
Check the voltage regulator (CHECKING THE VOLTAGE REGULATOR).
Check the generator (CHECKING THE GENERATOR).

C. BULBS TEND TO BURN OUT FREQUENTLY

Ensure that the lights do not vibrate excessively and that they do not touch parts of the vehicle that are not elastically supported.
Check the connections of the wires.
Check the voltage regulator (CHECKING THE VOLTAGE REGULATOR).

COOLANT TEMPERATURE INDICATOR



TROUBLESHOOTING

A. TEMPERATURE READING IS TOO LOW

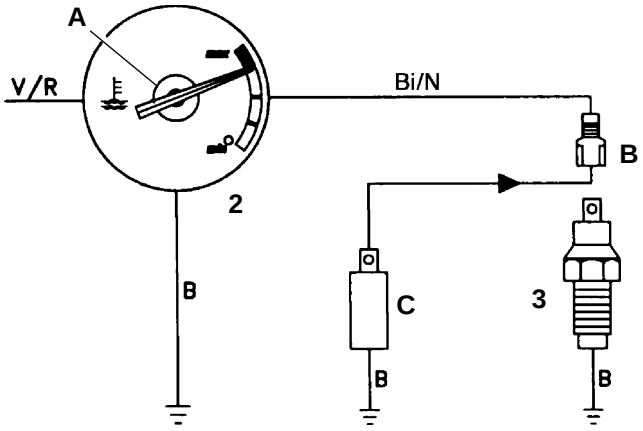
Check the connections.
Check that the green/red cable of the instrument is powered.
Check coolant thermistor (1).
Check coolant temperature indicator (2).

B. TEMPERATURE READING IS TOO HIGH

Check the cooling circuit.
Check the connections.
Check coolant thermistor (1).
Check coolant temperature indicator (2).

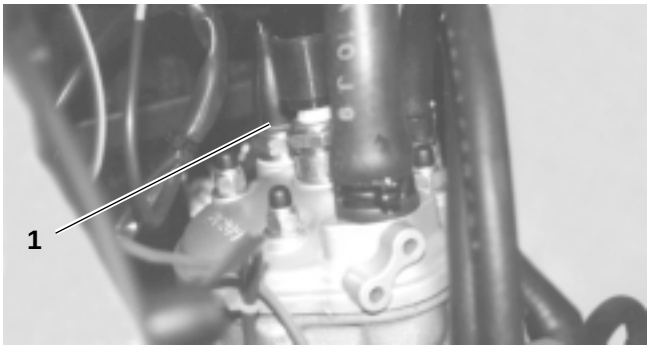
CHECKING DATA

CHECKING THE COOLANT TEMPERATURE INDICATOR



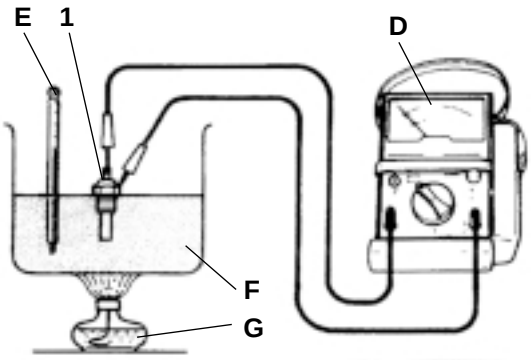
Lift the fuel tank.
Disconnect terminal (B) (white/black wire) from thermistor (3).
Connect terminal (B) to a 130 Ω (C).
Turn the ignition switch to "◯".
Check that pointer (A) positions itself at the beginning of the red area ("**Max**") with a tolerance of ±5°.

CHECKING THE THERMISTOR



Empty the cooling circuit (EMPTYING THE COOLING CIRCUIT).
Lift the fuel tank.
Disconnect terminal (B) (white/black wire) from thermistor (1).
Remove thermistor (1) as described in the ENGINE WORKSHOP MANUAL (part nos. 966 (I), 967 (F), 968 (D), 969 (E), 970 (UK), 971 (USA).

Connect a pocket multimeter (D) set as an ohmmeter to thermistor (1) (see figure).
Immerse thermistor (1) into a container (F) filled with coolant.
Dip a thermometer (E) measuring temperatures in the range 0° ± 150° C (32° ± 302° F) into the same container.
Place the container on a burner (G) and slowly heat up the liquid.
Check the temperature on the thermometer and the thermistor reading shown on the multimeter.



Check that the thermistor resistance changes with temperature as shown in the table below.

Coolant temperature °C (°F)	Standard values (Ω)
60° (140°)	approx. 510 ± 10%
100° (212°)	approx. 130 ± 10%

⚠ WARNING

If the resistance does not change, or if the readings differ widely from those shown in the table, replace the thermistor.

6

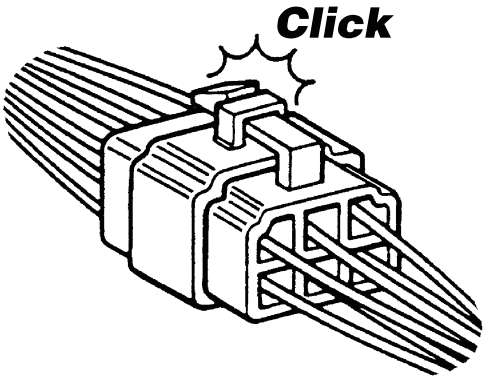
ELECTRICAL CONNECTORS

To separate two connectors, follow the procedure described below.
Where appropriate, press down the safety hooks.

⚠ WARNING

Never pull the wires when separating two connectors.

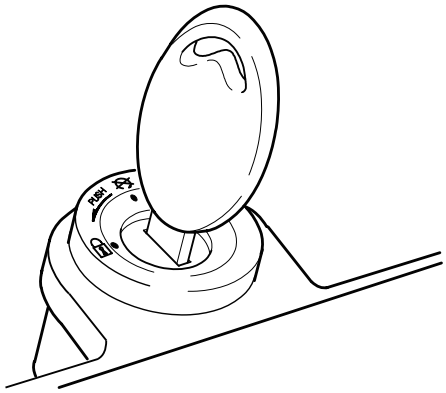
Hold the two connectors and separate them by pulling in opposite directions.
Using a compressed air jet, carefully clean the connector inside of any dirt, rust, humidity, etc.
Ensure that the wires are properly hooked on to the terminals inside the connectors.
IMPORTANT There is only one way to attach the two connectors. Before attempting to join them, make sure they are properly positioned in relation to one another.
After joining the connectors, ensure that they are securely fastened (a click should be heard if the connectors have safety fasteners).



BULBS

⚠ CAUTION

Carefully read (MAINTENANCE).
Before changing a bulb, turn the ignition switch to position "⊗".
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 prevent it from blowing.
DO NOT FORCE THE ELECTRIC CABLES.

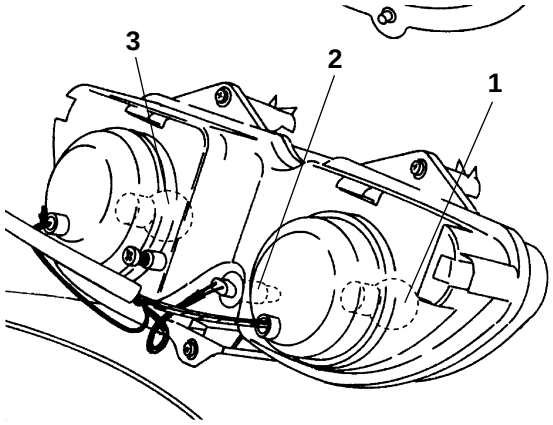


CHANGING THE HEADLIGHT BULBS

Carefully read (BULBS).
Position the vehicle on the stand.

NOTE Before changing a bulb, check the fuse, see (CHANGING THE FUSE).

The headlight contains:
One high beam bulb (1) (right side).
One parking light bulb (2) (lower side).
One low beam bulb (3) (left side).



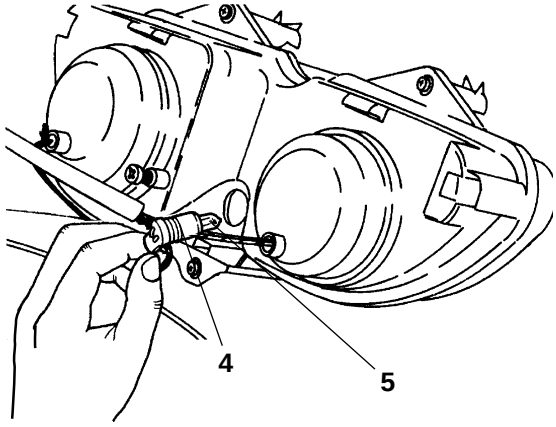
The high beam and the low beam bulbs are equal to each other.
If either of them is damaged and no spare bulb is available, it is possible to invert them.
This operation is intended only to make it easier for the rider to go back home or to reach a shop where he can by a new bulb, but the replacement of the damaged bulb remains indispensable.

CHANGING PARKING LIGHT BULB

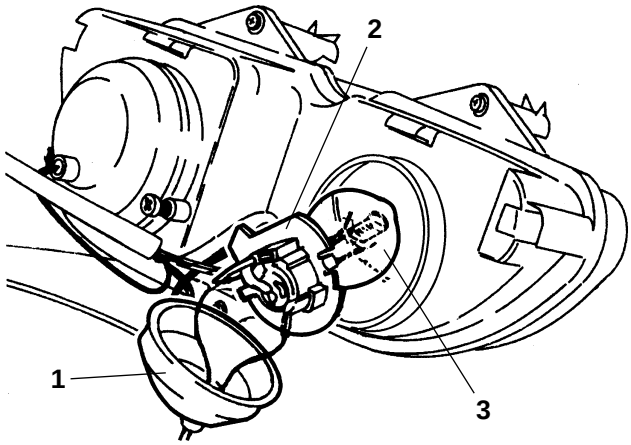
⚠ CAUTION

To extract the bulb socket, do not pull the electric wires.

Working on the rear side of the front part of the fairing, seize the bulb socket (4), pull it and remove it from its seat.
Withdraw the parking light bulb (5) and replace it with one of the same type.



CHANGING HIGH BEAM BULBS



NOTE Extract the bulb sockets one by one, in such a way as to avoid positioning them incorrectly during the reassembly.

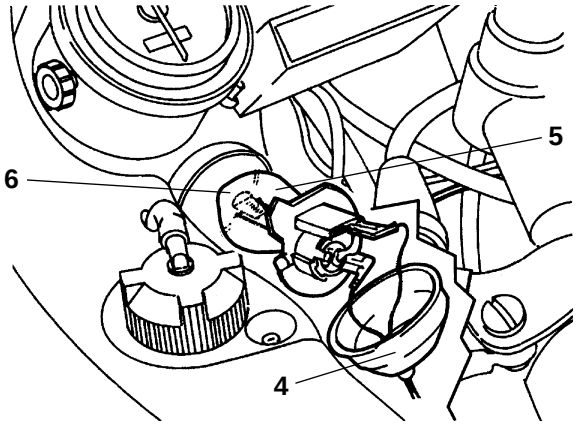
If the bulb sockets must be removed at the same time, take care to reassemble them in the correct position.

Working on the rear right side of the front part of the fairing, move the protection element (1) with your hands.
Rotate the bulb socket (2) anticlockwise and extract it.
Press the bulb (3) moderately and rotate it anticlockwise.
Extract the bulb from its seat.

NOTE Insert the bulb in the bulb socket, making the relevant positioning seats coincide.

Correctly install a new bulb of the same type.

CHANGING LOW BEAM BULB



NOTE Extract the bulb sockets one by one, in such a way as to avoid positioning them incorrectly during the reassembly.

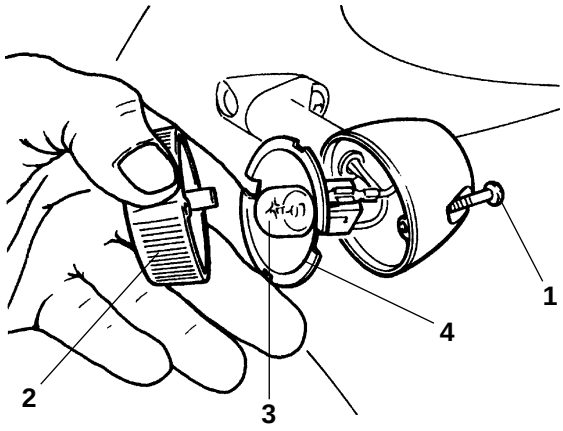
If the bulb sockets must be removed at the same time, take care to reassemble them in the correct position.

Working on the rear left side of the front part of the fairing, move the protection element (4) with your hands.
Rotate the bulb socket (5) anticlockwise and extract it.
Press the bulb (6) moderately and rotate it anticlockwise.
Extract the bulb from its seat.

NOTE Insert the bulb in the bulb socket, making the relevant positioning seats coincide.

Correctly install a new bulb of the same type.

CHANGING THE FRONT AND REAR DIRECTION INDICATOR BULBS



Carefully read (BULBS).

NOTE Before changing a bulb, check the fuse, see (CHANGING THE FUSE).

Position the vehicle on the stand.

Unscrew and remove the screw (1).

NOTE While removing the protection screen, proceed carefully in order not to break the cog.

Remove the protection screen (2).

NOTE Upon reassembly, correctly position the protection screen in its seat.

⚠ CAUTION

Tighten the screw (1) moderately and carefully, to avoid damaging the protection screen.

Press the bulb (3) slightly and rotate it anticlockwise.

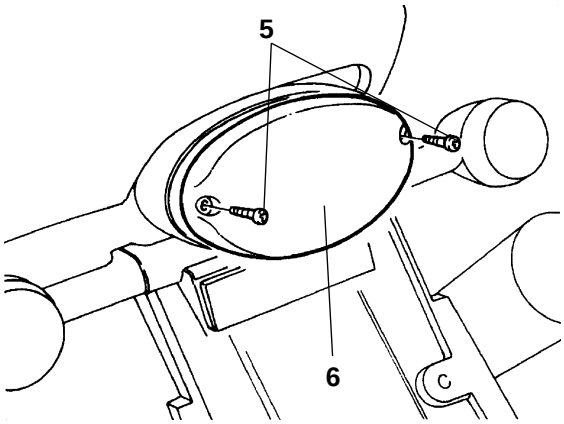
Extract the bulb from its seat.

NOTE Insert the bulb in the bulb socket, making the two bulb pins coincide with the relevant guides on the socket.

Correctly install a new bulb of the same type.

NOTE If the bulb socket (4) goes out of its seat, insert it correctly, making the bulb socket opening coincide with the screw seat.

CHANGING THE REAR LIGHT BULB



Carefully read (BULBS).

NOTE Before changing a bulb, check the fuse, see (CHANGING THE FUSE) and the effective operation of the stoplight switches, see (CHECKING THE SWITCHES).

Position the vehicle on the stand.

Unscrew and remove the two screws (5).

Remove the protection screen (6).

NOTE Upon reassembly, correctly position the protection screen in its seat.

⚠ CAUTION

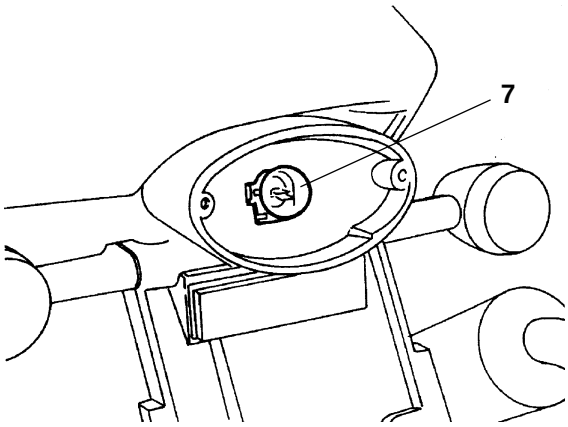
Upon reassembly, tighten the two screws (5) moderately and carefully, to avoid damaging the protection screen.

Press the bulb (7) slightly and rotate it anticlockwise.

Extract the bulb from its seat.

NOTE Insert the bulb in the bulb socket, making the two bulb pins coincide with the relevant guides on the socket.

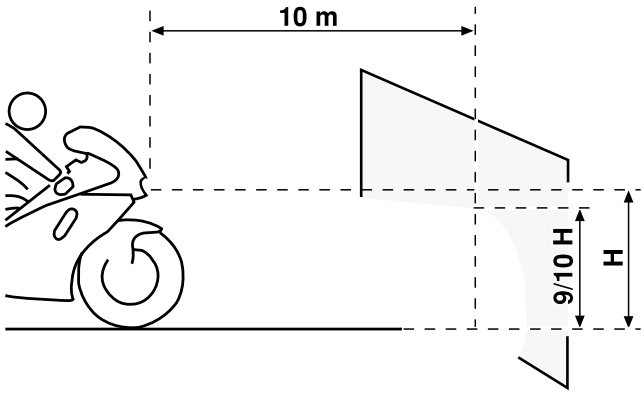
Correctly install a new bulb (7) of the same type.



ADJUSTING THE VERTICAL 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).

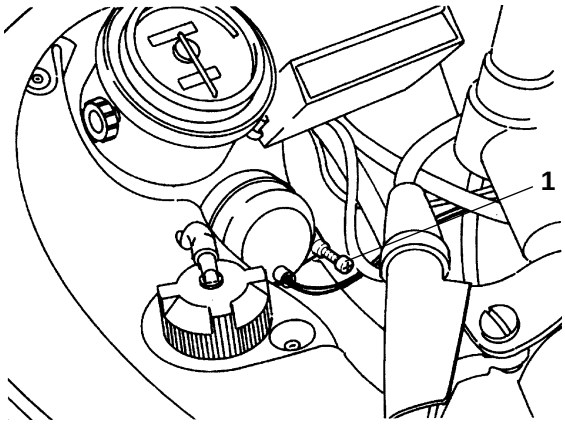


To adjust the headlight beam:

Working on the rear left side of the front part of the fairing, adjust the appropriate screw (1) by means of a short crosstip screw driver.

By SCREWING IT (clockwise), you set the beam upwards.

By UNSCREWING IT (anticlockwise), you set the beam downwards.



CHANGING THE FUSE

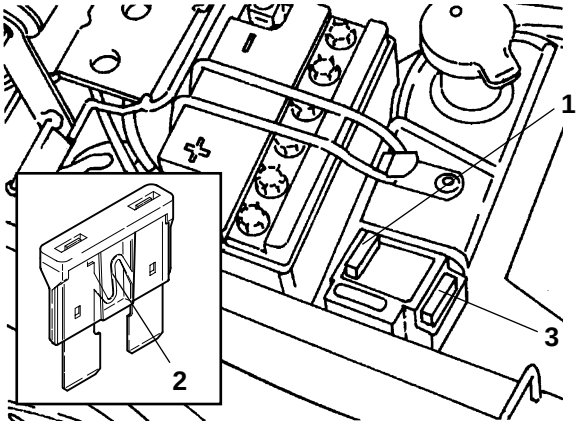
Carefully read the PERIODIC MAINTENANCE SCHEDULE.

⚠ CAUTION

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.

NOTE 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 (1).



For the checking:
Turn the ignition switch to position "⊗", to avoid any accidental short circuit.
Remove the rider saddle, see (REMOVING THE RIDER SADDLE).
Extract the fuse (1) and check if the filament (2) is broken.
Before replacing the fuse, try to find out the cause of the trouble, if possible.
Then replace the damaged fuse with the spare fuse (3) or with a new one having the same amperage.

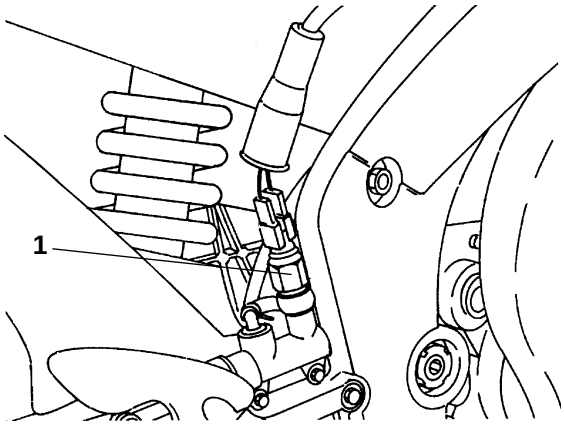
NOTE If you use one of the spare fuse (3), put a new fuse in the suitable seat.

ARRANGEMENT OF THE FUSE
7.5 A fuse from the battery to:
all the electric loads, excluding the light circuit, which is fed with alternate current.

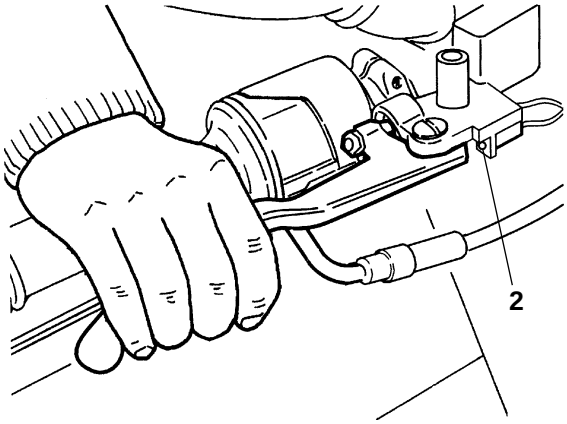
CHECKING THE SWITCHES

Carefully read the PERIODIC MAINTENANCE SCHEDULE.

The vehicle is provided with two switches:
Stoplight switch on the rear brake control lever (1).



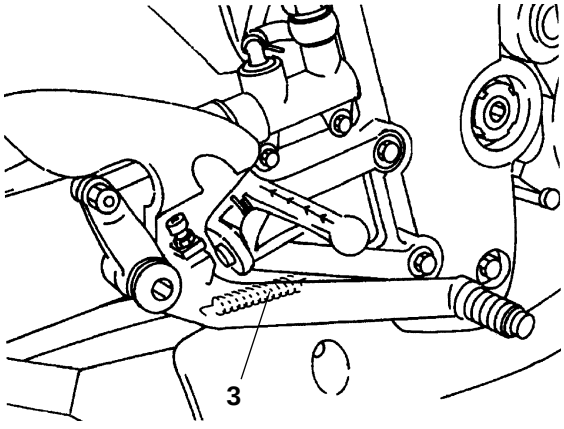
Stoplight switch on the front brake control lever (2).



Make sure that there are no dirt or mud deposits on the switch; the pin must be able to move without interferences, returning automatically to its initial position.

Make sure that the cables are connected correctly.

Check the spring (3): it must not be damaged, worn or weakened.



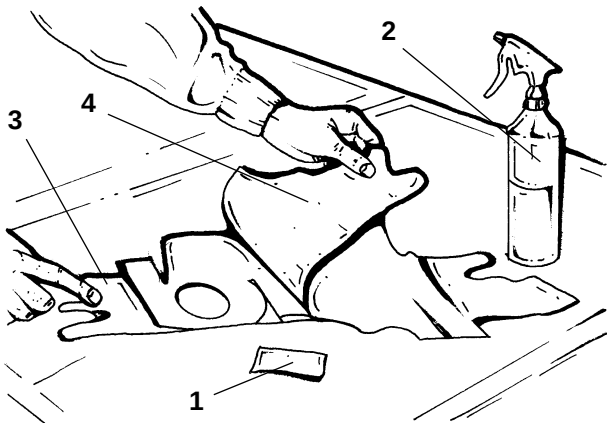
NOTES

7

Cycle Parts

HOW TO APPLY TRANSFERS

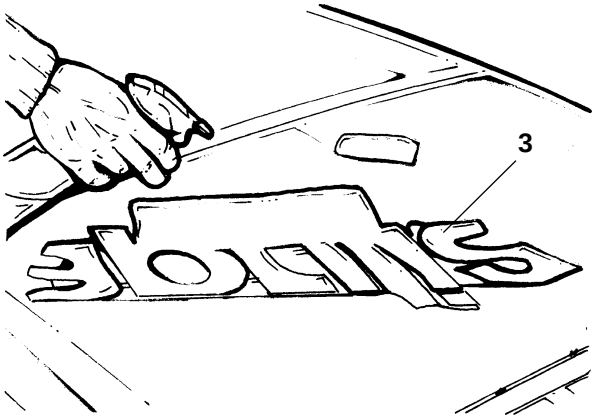
If any parts of the bodywork are removed:



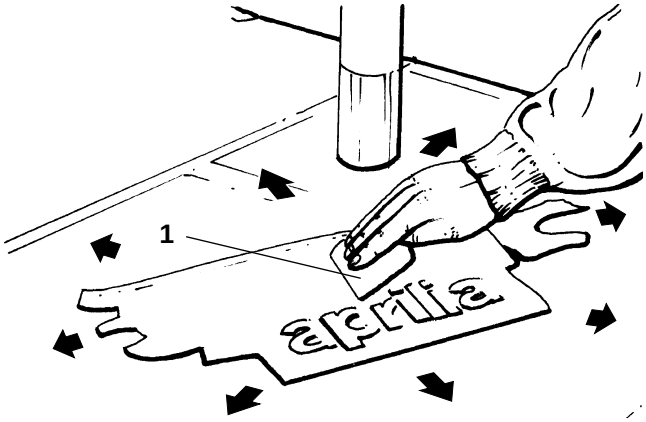
⚠ WARNING

If any parts of the bodywork are removed, take care not to score or damage plastic and painted parts when handling them.
Proceed with caution.
Take care not to damage the catches and/or their seats.
To apply transfers, carefully follow the instructions provided below.

We recommend using the following tools:
A spatula (1) of medium rigidity.
IMPORTANT Supple spatulas (glass wipers) are generally incapable of completely removing the water from underneath the transfer.
A sponge or a spray bottle (2) filled with water.
IMPORTANT Add a little detergent (1-3%) to the water and shake to produce a lather.
To apply the transfers, follow these steps:
Place transfer (3) upside down on a worktable.
While keeping the transfer spread out on the worktable, completely remove protective sheet (4).

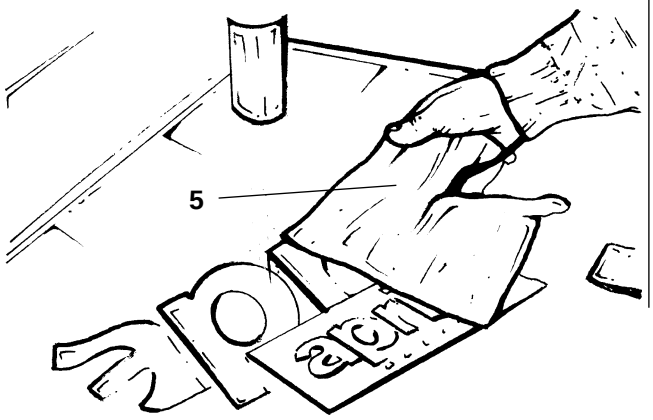


IMPORTANT We recommend using a spray bottle (2).
If a sponge is used, sponge down the surface without pressing so as to avoid damaging the adhesive.
Wet the surface of the adhesive with soapy water.
Apply transfer (3) over the surface to be decorated and move it into position.
IMPORTANT Always use the spatula from the centre towards the edges of the transfer, with continual strokes.
Using spatula (1), apply a light pressure over the surface of the transfer to remove the excess soapy water from underneath.

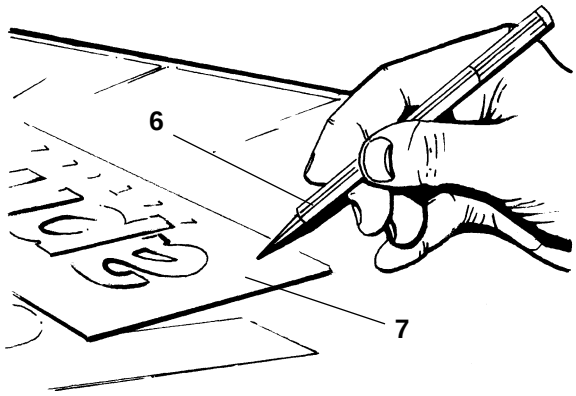


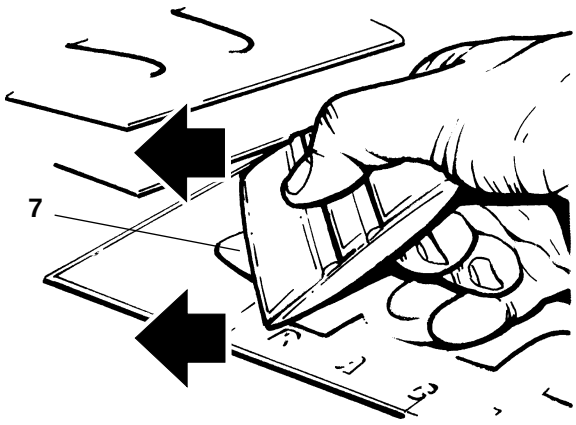
IMPORTANT Never lift the corners and/or sides of the transfer.
Using an absorbing cloth, wipe the transfer from the centre to the edges.
Use the spatula again all over the transfer, with firm and even strokes and pressing as much as possible.
Move the spatula from the centre to the edges of the transfer. Pay special attention to the edges and corners so as to ensure uniform sticking of the transfer all over the surface.

IMPORTANT If an application tape (1) is present, remove it 20-30 minutes after applying the transfer.
The application tape is used to facilitate the application and positioning of marks and letters and to make the sticker thicker and easier to handle.
Remove application tape (5) from the transfer.
To ensure adequate adhesion, use the spatula again all over the transfer, paying particular attention to the edges and corners.

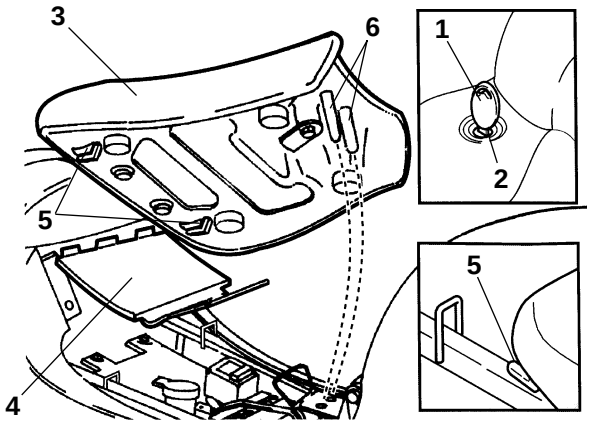


IMPORTANT When the wet method is used, the final adhesion of a transfer is obtained about 48 hours after application.
After removing the application tape, ensure that no air bubbles are left under the transfer.
In any air bubbles are visible on the surface of the transfer, puncture air bubble edge (7) with a pin or a cutter (6).
Using spatula (1) from the bubble edge opposite the puncture, expel all the air from the bubble.





REMOVING THE RIDER SADDLE



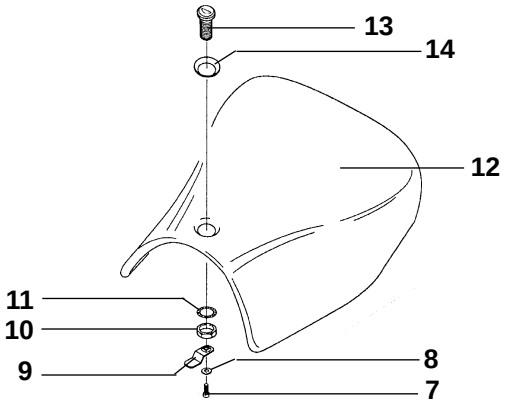
Carefully read the PERIODIC MAINTENANCE SCHEDULE.
Position the vehicle on the stand.
Insert the key (1) in the lock (2).
Rotate the key (1) clockwise.
Raise and remove the saddle (3).
Remove the flap (4).

Upon reassembly:
Position the flap (4) correctly.
Insert the rear tangs (5) of the saddle in the appropriate seats (see figure).
Lower the saddle and insert the two pins (6) in the relevant seats.
Turn the key (1) anticlockwise, locking the saddle.

⚠ WARNING

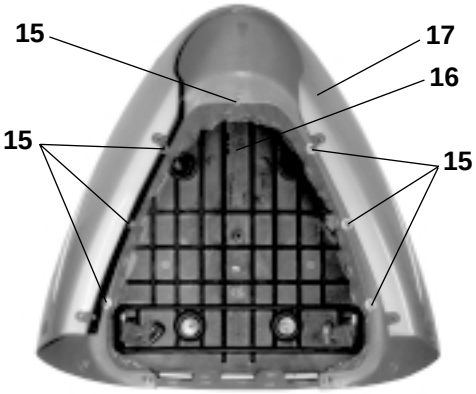
Before leaving, make sure that the saddle (3) is properly positioned and locked.

REMOVING THE SADDLE LOCK



Unscrew and remove screw (7).
Proceeding from the bottom, remove washer (8), saddle lock plate (9), nut (10), and toothed washer (11).
Remove lock (13) and related cup (14) from the top of saddle (12).
Lift and remove saddle (12).

REMOVING THE PASSENGER SADDLE



Remove the rear fairing (REMOVING THE REAR FAIRING). Place the rear fairing and the passenger saddle on a flat surface.

⚠ WARNING

Take care not to scratch the rear fairing and its transfers.

Unscrew and remove the seven screws (15) fixing passenger saddle (16) to rear fairing (17).
Separate passenger saddle (16) from rear fairing (17).
Tightening torque for screws (1):
2 Nm (0,2 kgm) [1.5 Ft-lb].

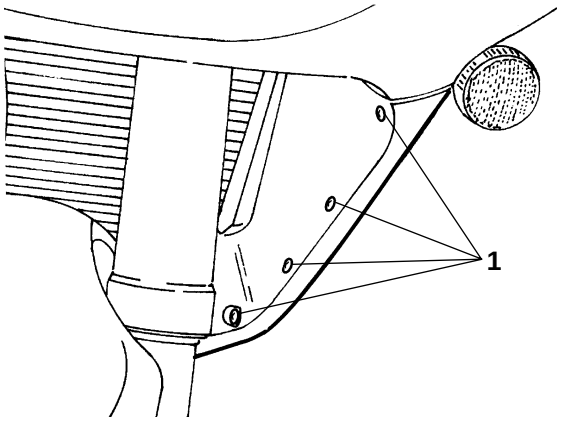
REMOVING THE FAIRINGS

Carefully read the PERIODIC MAINTENANCE SCHEDULE.

⚠ WARNING

Before carrying out the following operations, let the engine and the exhaust silencer cool down until they reach room temperature, in order to avoid burns.

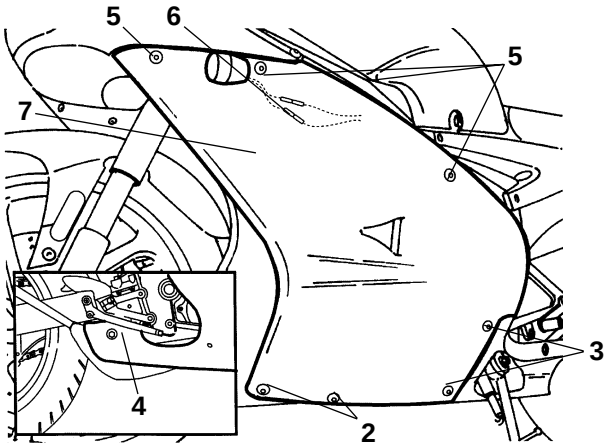
Position the vehicle on the stand.
Unscrew and remove the four screws (1).
Unscrew and remove the two lower screws (2).
For the left fairing: unscrew and remove the two rear screws (3).
For the right fairing: unscrew and remove the rear screw (4).
Unscrew and remove the three screws (5).



⚠ CAUTION

Handle the plastic and painted components with care and avoid scraping or damaging them.
Do not force the electric cables.

Disconnect the two electric terminals (6) of the direction indicator.
Remove the side fairing (7).



7

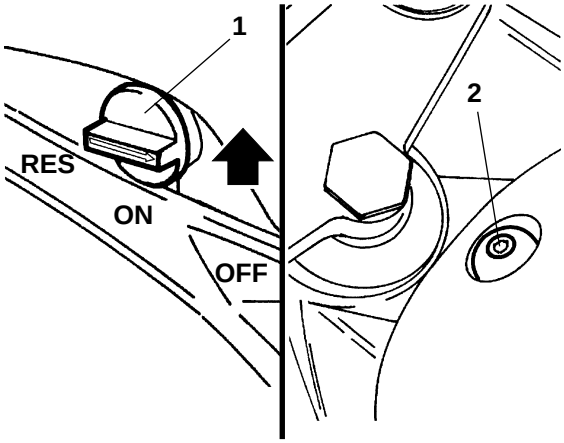
REMOVING THE FUEL TANK

Carefully read the paragraph FUEL and the PERIODIC MAINTENANCE SCHEDULE.

⚠ WARNING

Risk of fire.
Wait until the engine and the exhaust silencer have completely cooled down.
Fuel vapours are noxious for your health.
Before proceeding, make sure that the room in which you are working is properly ventilated.
Do not inhale fuel vapours.
Do not smoke and do not use naked flames.
DO NOT DISPOSE OF FUEL IN THE ENVIRONMENT.

Move the fuel tap lever (1) to position “OFF”.
Remove the rider saddle, see (REMOVING THE RIDER SADDLE).
Unscrew and remove the screw (2) and take the bushing.
Drain the fuel tank completely, see (DRAINING THE FUEL TANK).
Position a spongy cloth (3) on the front support of the rider saddle (4).



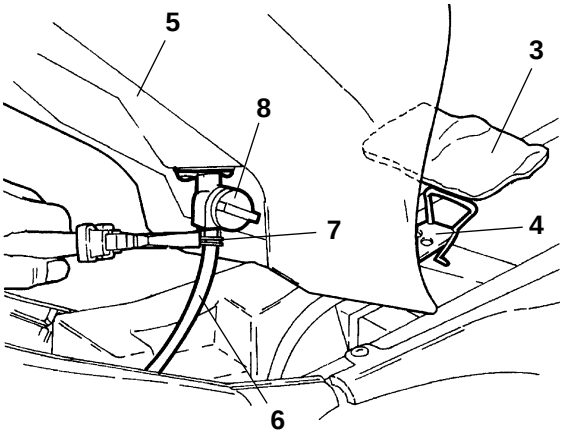
⚠ CAUTION

Handle with care.
While lifting the fuel tank (5), DO NOT force the fuel pipe (6).

Grasp the front part of the fuel tank (5) and lift it partially.
Withdraw the clamp (7) by means of a spanner.

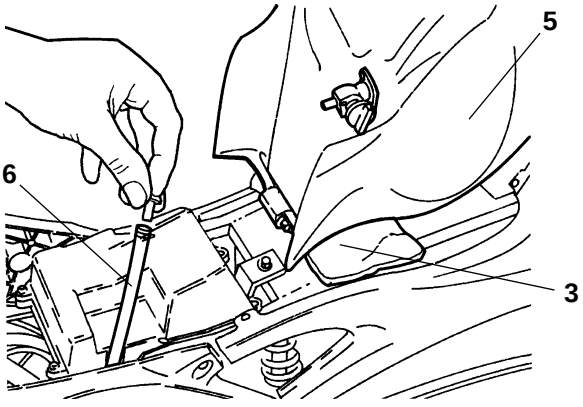
⚠ CAUTION

Upon reassembly, reintroduce the fuel pipe (6) completely and position the clamp (7) correctly.
Withdraw the fuel pipe (6) from the fuel tap (8).

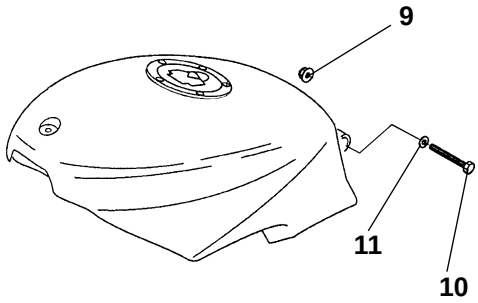


⚠ WARNING

Danger! The fuel may flow out.
Plug the free end of the fuel pipe (6) and fix it to the vehicle in vertical position.



Reinstall the tank in its working position.
Loosen and remove nut (9) while locking screw (10).
Remove screw (10) from the tank fixing seat on the frame.
Collect washer (11).



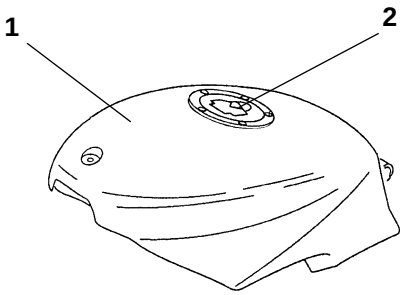
EMPTYING THE FUEL TANK

Read through the paragraph FUEL.

⚠ CAUTION

Fire hazard!
Allow the engine and the exhaust terminal to cool down completely. Fuel fumes are harmful.
Before beginning, ensure that the place where the operation is to be carried out is adequately ventilated. Do not inhale the fuel fumes.
Do not smoke and avoid using open flames.
DO NOT DISPOSE OF THE FUEL IN THE ENVIRONMENT.

Place the vehicle on the stand.
Switch off the engine and allow it to cool down.
Take a container with capacity in excess of the quantity of fuel to be drained from fuel tank (1), and place it on the ground to the left of the vehicle.
Remove fuel cock pipe (2) and empty the fuel tank.



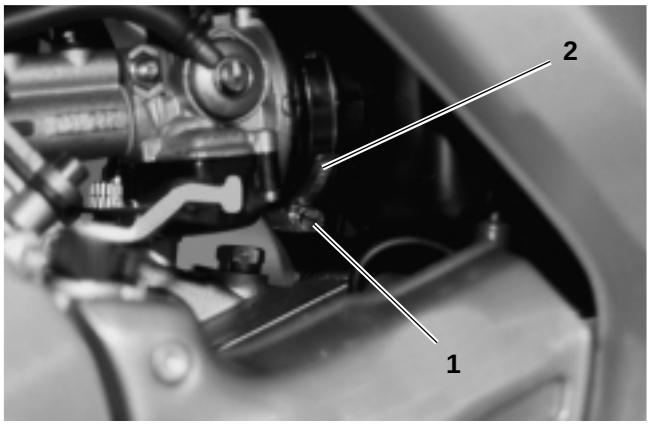
⚠ CAUTION

After draining all the fuel, reconnect the fuel cock pipe.

7

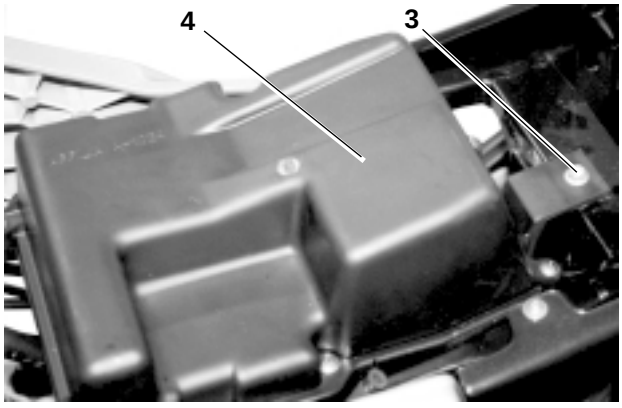
REMOVING THE AIR FILTER BOX

Read through the PERIODIC MAINTENANCE SCHEDULE.
Remove the fuel tank (REMOVING THE FUEL TANK).
Turn out screw (1) to loosen clamp (2) on the carburettor intake sleeve.



Unscrew and remove screw (3) fixing air filter box (4) to the frame.

Tightening torque for screw (3):
5 Nm (0,5 kgm) [3.7 Ft-lb].



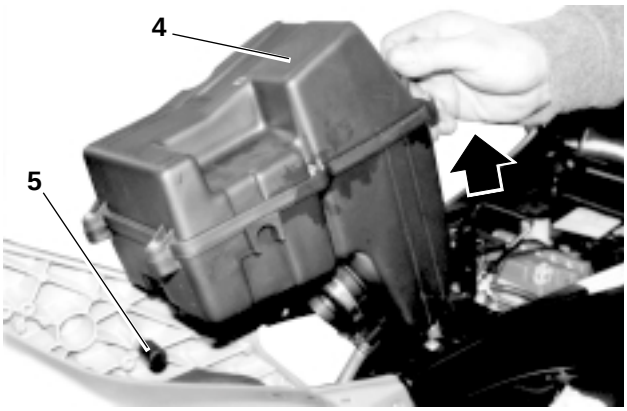
⚠ CAUTION

Exercise extreme caution when removing air filter box (4).

Lift the rear section of the air filter box so it can be removed from the carburettor and from box supporting pin (5).

⚠ WARNING

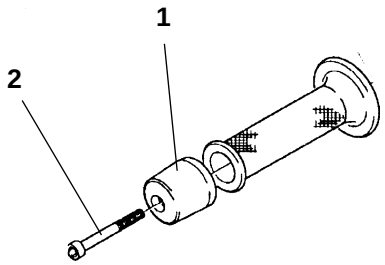
Close the openings with a clean cloth to prevent any foreign bodies from getting into the intake ducts.



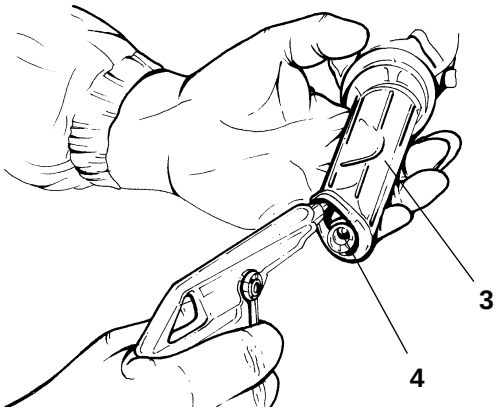
When replacing the air filter box, position it on support pins (5) and then insert the intake sleeve into the carburettor, secure the box by means of screw (3) and tighten clamp (2) on the carburettor.

REMOVING THE HANDGRIP FROM THE LEFT HANDLEBAR

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Turn the ignition switch to "⊗".
Lock counterpoise (1) and then loosen and remove screw (2).
Remove counterpoise (1).

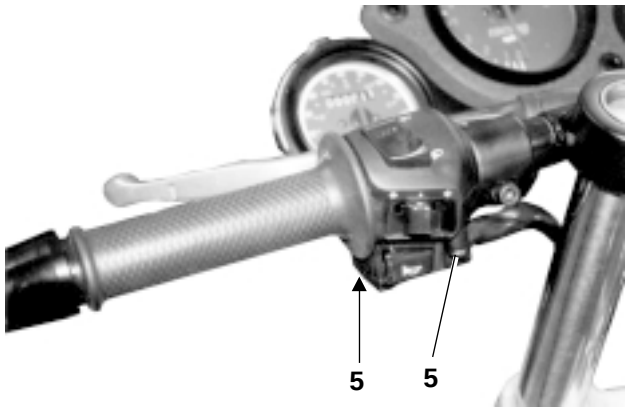


Insert the tip of a compressed air gun between handgrip (3) and handlebar (4).
Blow in air while rotating the air gun tip. At the same time, grip handgrip (3) with the other hand and pull it off.



REMOVING THE ELECTRICAL CONTROLS FROM THE LEFT HANDLEBAR

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Turn the ignition switch to "⊗".
Unscrew and remove the two screws (5) securing the two half shells from below.
Separate the two half shells.
Disengage the wiring from the straps fixing it to the frame.

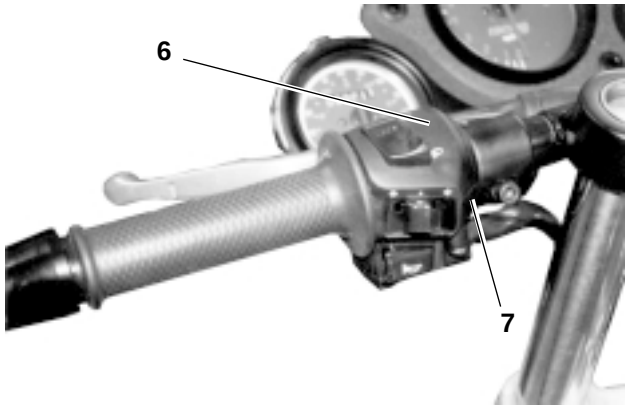


IMPORTANT Have the same number of straps ready for refitting.

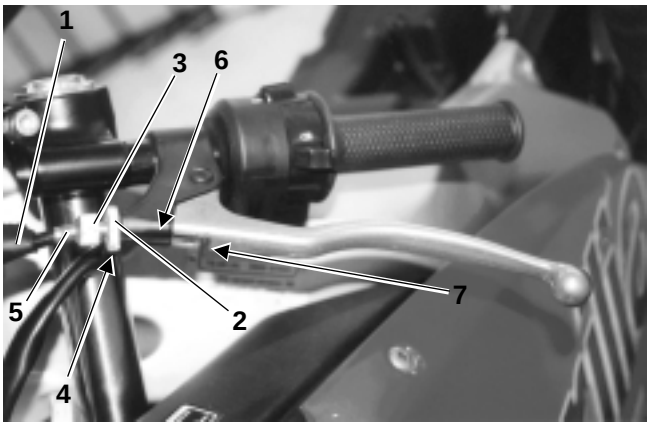
Detach the left-hand lights switch connector.

⚠ WARNING

When refitting, make sure the connector is properly reattached.
Remove the two half shells (6) and (7).



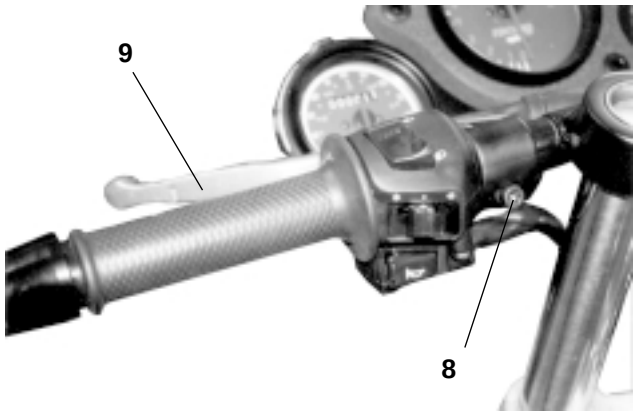
REMOVING THE CLUTCH LEVER



Read through the section PRECAUTIONS AND GENERAL INFORMATION.

Place the vehicle on the stand.
Turn the ignition switch to "⊗" .
Remove protective hood (1).
Loosen nut (2) by turning it in until it comes into contact with adjuster (3).
Align the notches in nut (2) and adjuster (3) with notch (4) on clutch lever clevis (5).
Pull out clutch control cable (6) and remove it from its housing in clutch lever (7).

Loosen and remove screw (8).

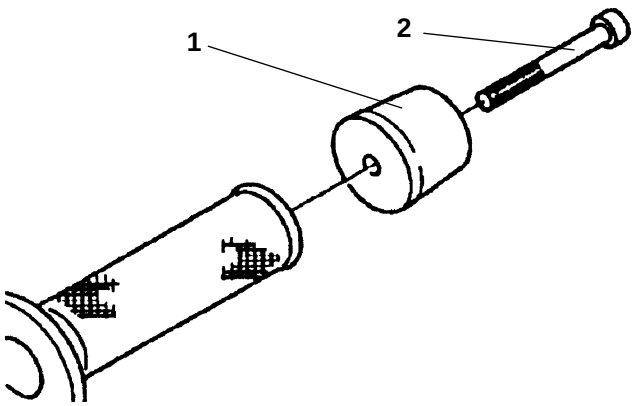


Tightening torque for screw (8):
12 Nm (1,2 kgm) [8.8 Ft-lb].

Remove clutch lever (9).

REMOVING THE THROTTLE CONTROL

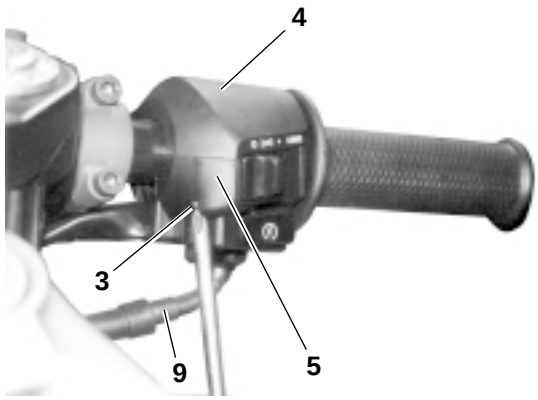
Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Turn the ignition switch to "⊗" .
Lock counterpoise (1) and then loosen and remove screw (2).



Unscrew and remove the two screws (3).

Tightening torque for screws (3):
2 Nm (0,2 kgm) [1.5 Ft-lb].

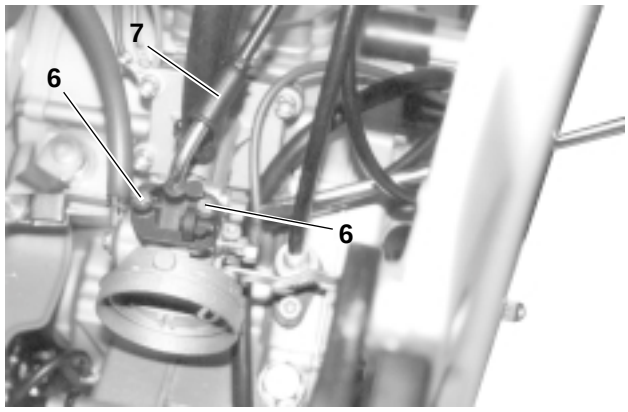
Remove upper half shell (4) of right-hand lights switch (5).



Remove the fuel tank (REMOVING THE FUEL TANK).
Unscrew and remove screws (6) from the carburettor valve cover.

Tightening torque for screws (6):
2 Nm (0,2 kgm) [1.5 Ft-lb].

Remove throttle control cable (7) from the throttle valve.

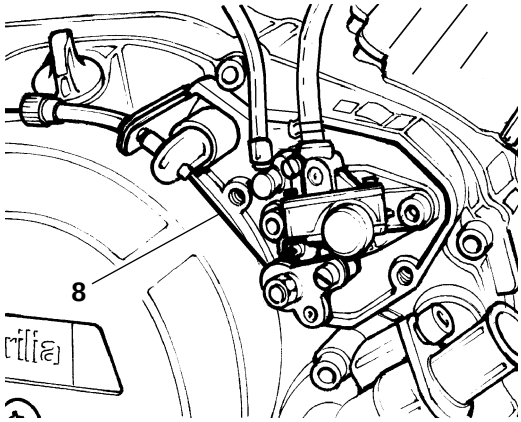


Disconnect oil pump control cable (8).

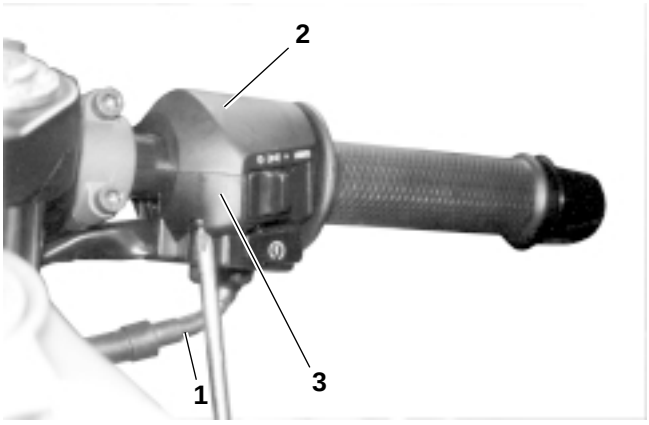
Disconnect the throttle control cable and the oil pump control cable located inside lights switch (5).
Remove throttle control (9).

⚠ WARNING

When refitting, ensure that the two throttle control cable adjusters are properly attached to their respective connections.



REMOVING THE ELECTRICAL CONTROLS FROM THE RIGHT-HAND HANDLEBAR



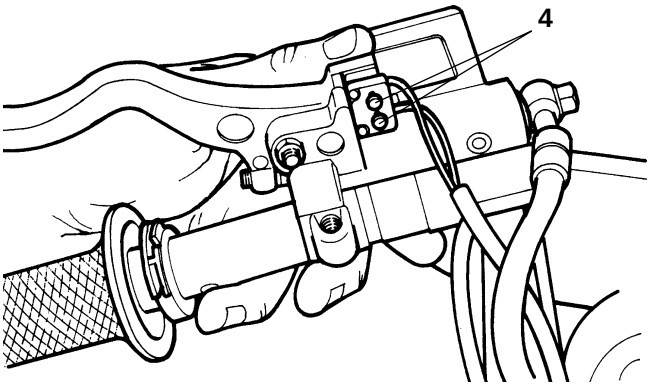
Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Turn the ignition switch to "⊗".
Simply disconnect throttle cable (1) from the block.
Disengage the wiring from the straps fixing it to the frame.

IMPORTANT Have the same number of straps ready for refitting.

Detach the right-hand lights switch connector.
Remove the two half shells (2) and (3).

When refitting, ensure that the connector is properly reattached.

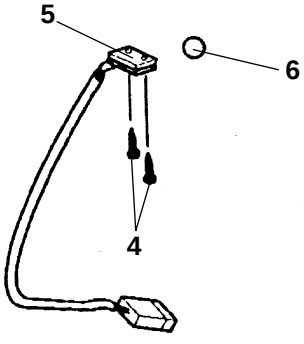
REMOVING THE STOPLIGHT SWITCH



Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Turn the ignition switch to "⊗" .
Loosen and remove the two screws (4).

⚠ WARNING

Before performing the following operation, put a hand under the stoplight switch and be prepared for the falling of ball (6).
Remove stoplight switch (5), disengaging it from the electrical connection, and collect ball (6).



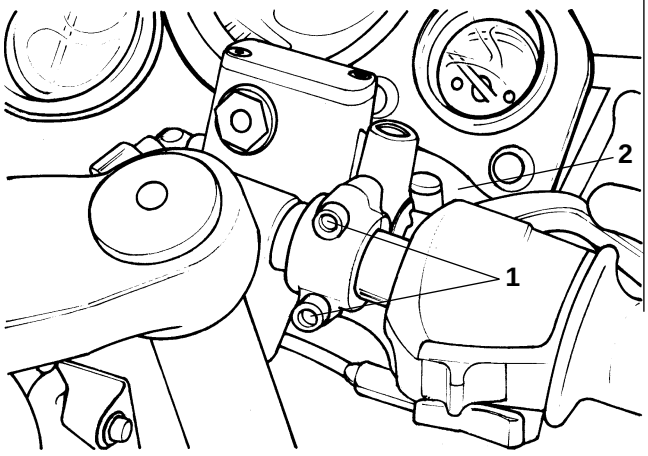
⚠ WARNING

When refitting, ensure that the electrical connection is properly reattached.

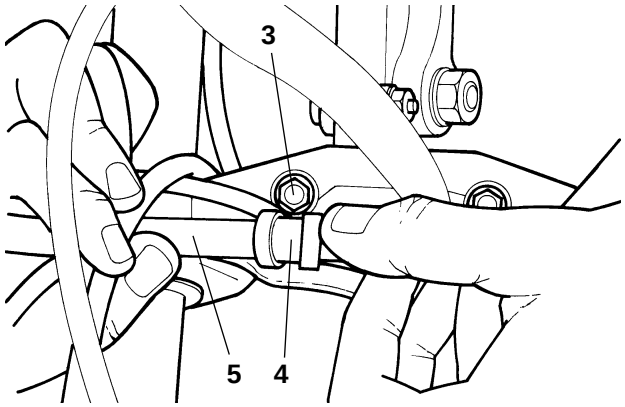
REMOVING THE FRONT BRAKE CONTROL

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Turn the ignition switch to "⊗".
Loosen and remove the two screws (1) securing front brake control (2).

Tightening torque for screws (1):
12 Nm (1,2 kgm) [8.8 Ft-lb].

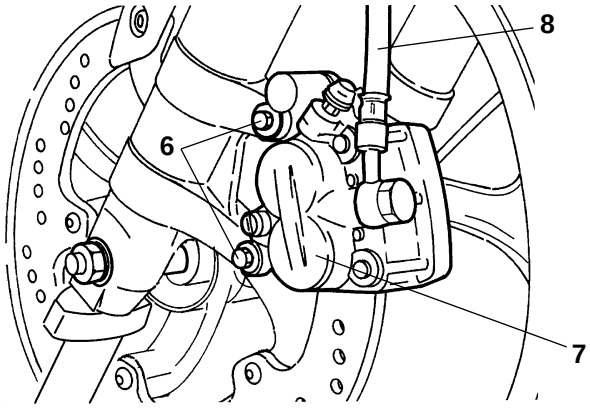


Disengage brake fluid pipe (5) by loosening and removing screw (3) securing tube clamp (4) to the fork lower plate.



Tightening torque for brake caliper screws (6):
22 Nm (2,2 kgm) [16.2 Ft-lb].

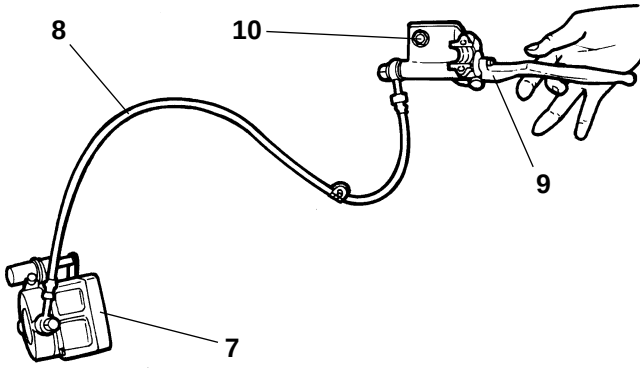
Unscrew and remove the two screws (6) fixing front brake caliper (7).
Pull brake caliper (7) away from the brake disc, leaving it attached to pipe (8).



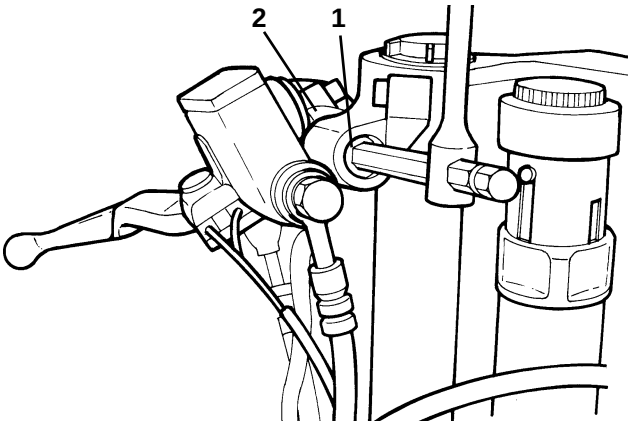
Remove front brake control (9), brake fluid reservoir (10), and front brake caliper (7).

⚠ WARNING

When refitting, ensure that brake fluid pipe (8) does not get crushed.



REMOVING THE RIGHT HANDLEBAR

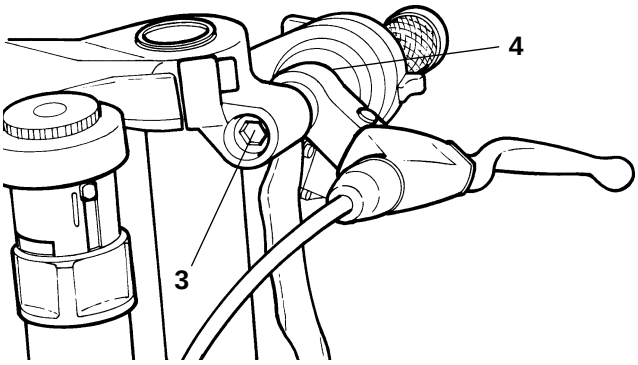


Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Loosen and remove screw (1).

Collect the related washer.
Pull off right handlebar (2) with all the controls.

IMPORTANT If necessary remove the front brake control (REMOVING THE FRONT BRAKE CONTROL), the electrical controls (REMOVING THE ELECTRICAL CONTROLS FROM THE RIGHT HANDLEBAR), and the throttle control (REMOVING THE THROTTLE CONTROL).

REMOVING THE LEFT HANDLEBAR

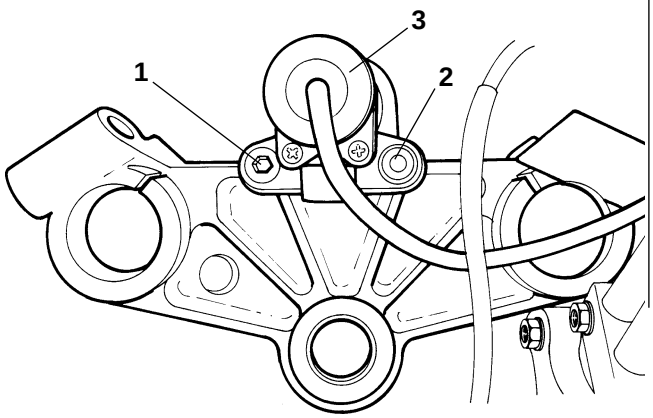


Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Loosen and remove screw (3).

Collect the related washer.
Pull off left handlebar (4) with all the controls.

IMPORTANT If necessary remove the handgrip (REMOVING THE HANDGRIP FROM THE LEFT HANDLEBAR), the electrical controls (REMOVING THE ELECTRICAL CONTROLS FROM THE LEFT HANDLEBAR), and the clutch control (REMOVING THE CLUTCH CONTROL).

REMOVING THE IGNITION SWITCH/ STEERING LOCK



Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Turn the ignition switch to "⊗".
Remove the left and right handlebars (REMOVING THE LEFT HANDLEBAR, REMOVING THE RIGHT HANDLEBAR).
Clear the fork upper plate by following the steps described in the paragraph ADJUSTING THE PLAY OF THE BEARINGS.
Disengage the wires from the straps.

IMPORTANT Have the same number of straps ready for refitting.
Detach the electrical connector relating to the ignition switch/steering lock.

⚠ WARNING

When refitting, ensure that the connector is properly reattached.

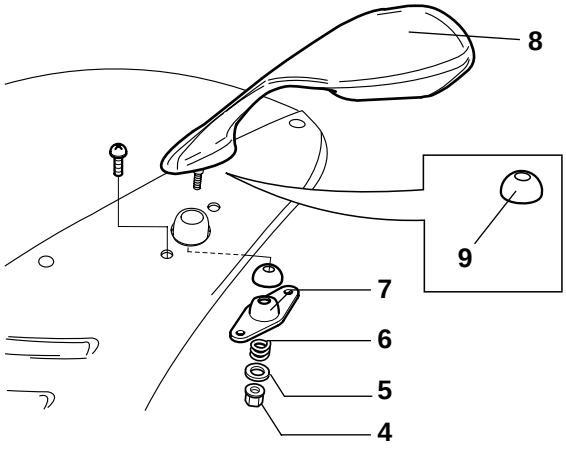
Unscrew and remove screw (1).
Using a chisel, cut the head of special screw (2) and then loosen the screw by turning it.
Manually turn out and remove screw (1).

IMPORTANT When refitting, use a new screw of the same type and tighten it until the head comes off.

Remove ignition switch/steering lock (3) from below.

7

REMOVING THE REARVIEW MIRRORS



Place the vehicle on the stand.
Loosen and remove nut (4) and collect washer (5), spring (6) and hemisphere (7).

⚠ WARNING

When handling plastic and painted parts, take care not to score or damage them.

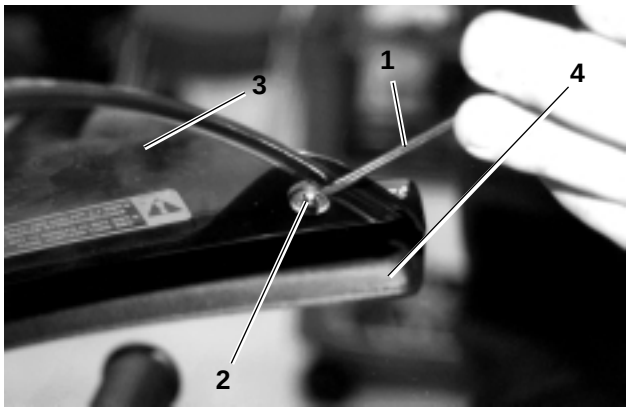
Remove rearview mirror (8).
Collect cup (9) if it has come out of its seat.

IMPORTANT If necessary, repeat the same operations to remove the other rearview mirror.

⚠ WARNING

After refitting the rearview mirrors, adjust them and then secure them by tightening the fastening nuts.

REMOVING THE FRONT FAIRING GLASS



Place the vehicle on the stand.
Using a screwdriver (1), remove the seven washers (2) fixing front fairing glass (3) to front piece (4).
Remove front fairing glass (3).

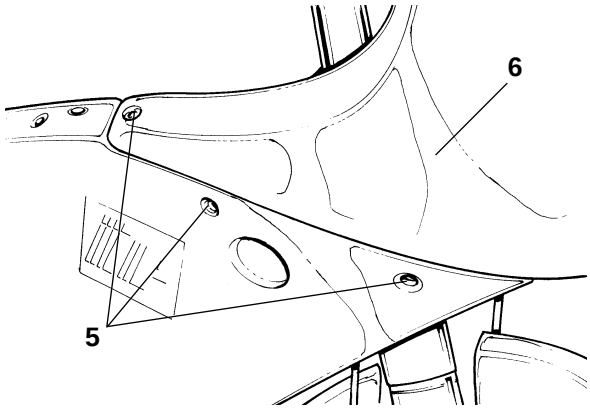
⚠ WARNING

Be careful not to damage the plastic parts.

⚠ WARNING

When refitting, replace washers (2) with new ones.

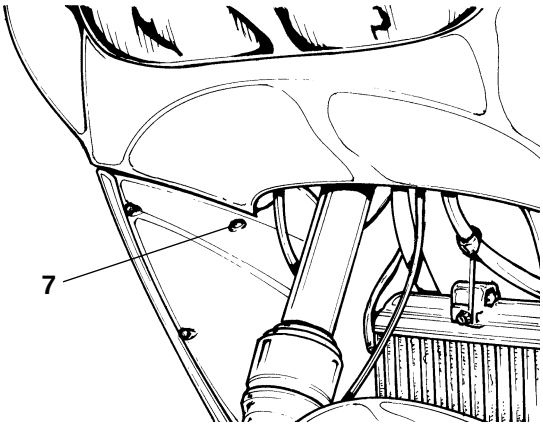
REMOVING THE FRONT FAIRING



Place the vehicle on the stand.
Turn the ignition switch to "⊗" .
Remove the rearview mirrors (REMOVING THE REARVIEW MIRRORS).
Loosen and remove the three outer screws (5) on the right side of front fairing (6).

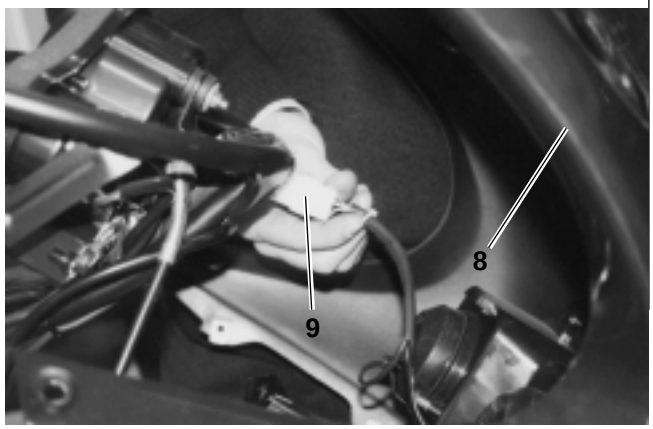
Tightening torque for screws (5):
5 Nm (0.5 kgm) [3.7 Ft-lb].

Loosen and remove inner screw (7).



Tightening torque for screw (7):
1 Nm (0.1 kgm) [0.7 ft-lb]
IMPORTANT For the left side of the front fairing, it is necessary to remove the dashboard support panel (REMOVING THE FILLER CAP).

Slightly shift front fairing (8) forward.
Detach headlight connector (9).



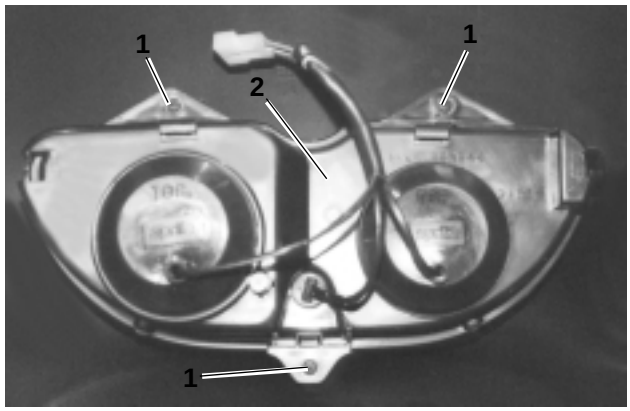
⚠ WARNING

When refitting, ensure that connector (9) is properly reattached.
When handling plastic and painted parts, take care not to score or damage them.

Remove the headlight (REMOVING THE HEADLIGHT).

REMOVING THE HEADLIGHT

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Turn the ignition switch to "⊗" .
Remove the front fairing (REMOVING THE FRONT FAIRING).
Loosen and remove screws (1).
Remove headlight (2).

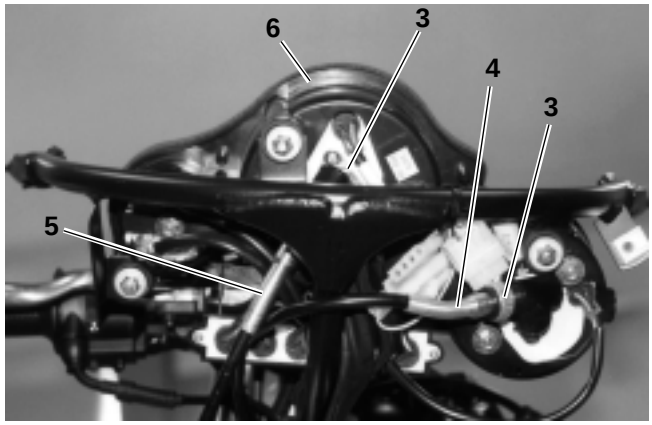


⚠ WARNING

When handling plastic and painted parts, take care not to score or damage them.
When refitting, ensure that the headlight connector is properly reattached.

REMOVING THE DASHBOARD

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove the front fairing (REMOVING THE FRONT FAIRING).
Loosen rings (3) of speedometer cable (4) and tachometer cable (5).
Remove the two cables.
Detach the electrical connections of dashboard (6).



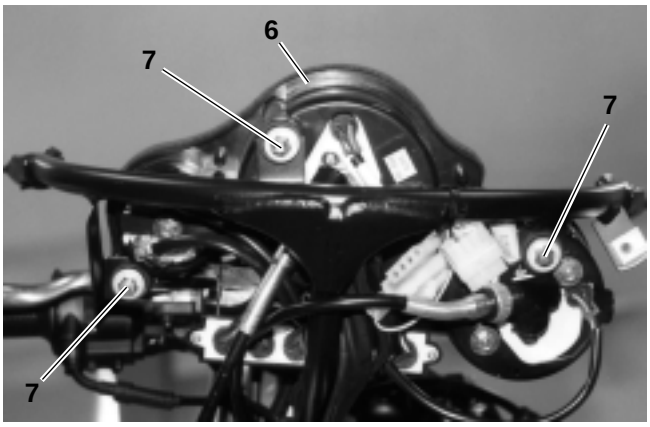
⚠ WARNING

When refitting, be sure to properly reattach the electrical connections.

Loosen and remove the three self-locking nuts (7) with the related washers.

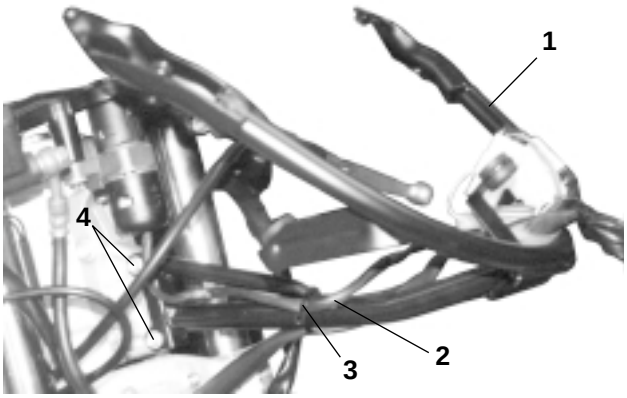
Tightening torque for nuts (7):
10 Nm (1 kgm) [7.4 Ft-lb].

Remove dashboard (6).
IMPORTANT If the rubbers are damaged, replace them.



REMOVING THE INSTRUMENT PANEL FRAME

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Turn the ignition switch to "⊗" .
Remove the front fairing (REMOVING THE FRONT FAIRING).
Remove the dashboard (REMOVING THE DASH-BOARD).
Disengage instrument panel frame (1) from wiring (2) by cutting straps (3).

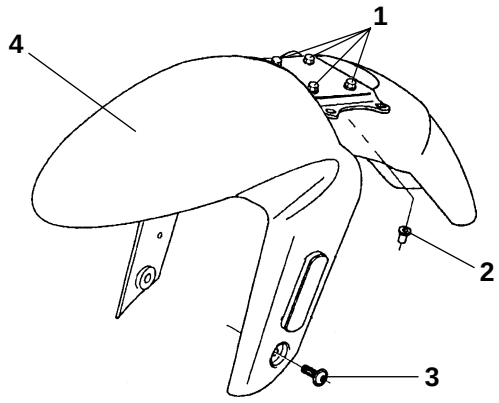


⚠ WARNING

When refitting, replace straps (3) with new ones.
Loosen and remove the two screws (4), collecting the related self-locking flanged nuts on the other side.

Tightening torque for screws (4):
15 Nm (1.5 kgm) [11.1 Ft-lb].

REMOVING THE FRONT MUDGUARD



Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Loosen and remove the four screws (1).
Tightening torque for screws (1):
7 Nm (0.7 kgm) [5.2 ft-lb]

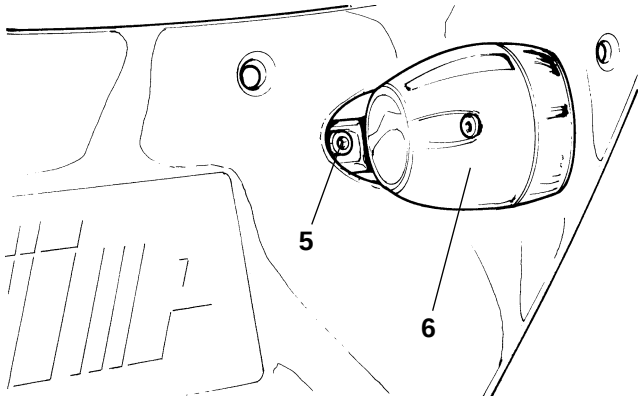
Collect the related self-locking nuts (2).
Loosen and remove the two screws (3) (left and right sides).
Tightening torque for screws (3):
5 Nm (0.5 kgm) [3.7 ft-lb]

⚠ WARNING

When handling plastic and painted parts, take care not to score or damage them.

Remove mudguard (4) from the front.

REMOVING THE FRONT TURN INDICATORS



Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Turn the ignition switch to "⊗" .
Remove the side fairings (REMOVING THE SIDE FAIRINGS).
Loosen and remove screw (5) (left and right sides).
Collect the related nuts on the other side.
Remove turn indicator (6).

⚠ WARNING

When removing turn indicator (6), help the electrical wire with the related connector through the slot in the fairing.

REMOVING THE LOWER FAIRING

Read through the section PRECAUTIONS AND GENERAL INFORMATION.

⚠ WARNING

When handling plastic and painted parts, take care not to score or damage them.
Place the vehicle on the rear stand OPT.

⚠ WARNING

Allow the engine and the exhaust terminal to cool down completely.

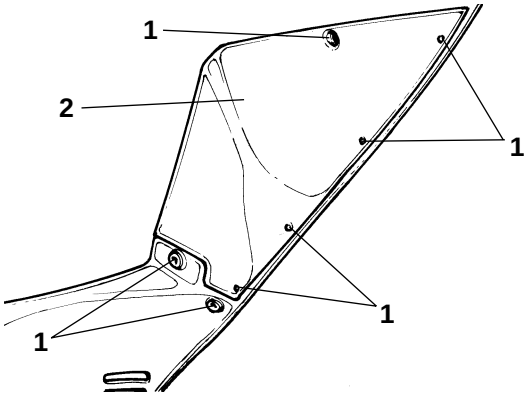
Loosen and remove the seven screws (1).

Tightening torque for screws (1):
3 Nm (0.3 kgm) [2.2 ft-lb]

Remove inner fairings (2).

⚠ WARNING

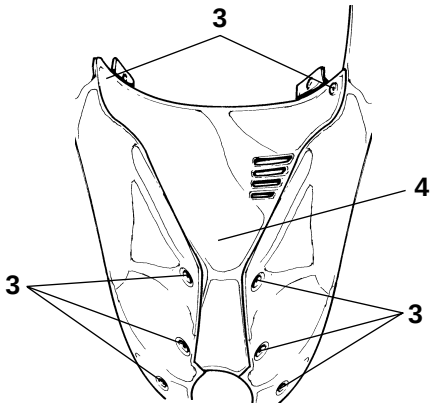
Also remove the other fairing.



Loosen and remove the eight screws (3).

Tightening torque for screws (3):
3 Nm (0.3 kgm) [2.2 ft-lb]

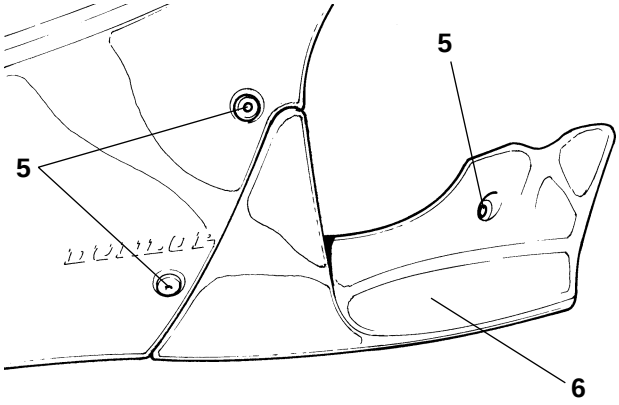
Remove tip (4).



Loosen and remove the three screws (5).

Tightening torque for screws (5):
3 Nm (0.3 kgm) [2.2 ft-lb]

Lower the side stand.
Remove left-hand side panel extension (6).



REMOVING THE REAR FAIRING

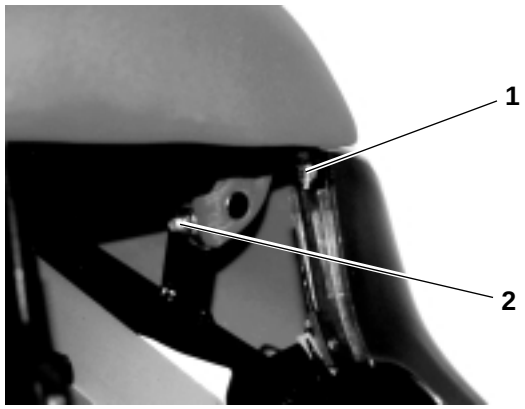
Read through the section PRECAUTIONS AND GENERAL INFORMATION.

⚠ WARNING

Allow the engine and the exhaust terminal to cool down completely.
Remove the rider saddle (REMOVING THE RIDER SADDLE).

Loosen and remove nut (1) fixing the passenger saddle to the rear fairing.
Tightening torque for nut (1):
2 Nm (0.2 kgm) [1.5 ft-lb]

Loosen and remove passenger strap nut (2).
Tightening torque for nut (2):
5 Nm (0.5 kgm) [3.7 ft-lb]



Loosen and remove the two screws (3).
Tightening torque for screws (3):
3 Nm (0.3 kgm) [2.2 ft-lb]

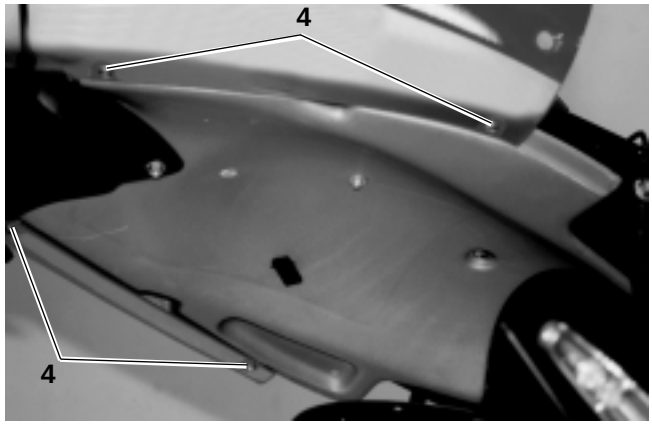
⚠ WARNING

Also remove nuts (1) and (2) and screws (3) on the right side of the vehicle.

Loosen and remove the four screws (4) fixing the passenger saddle to the rear fairing.
Tightening torque for screws (4):
3 Nm (0.3 kgm) [2.2 ft-lb]

Remove rear fairing (5).

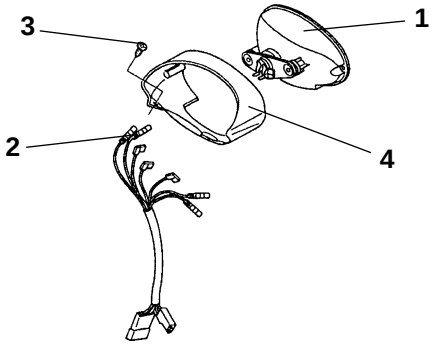
IMPORTANT If necessary, remove the passenger saddle (REMOVING THE PASSENGER SADDLE).



REMOVING THE REAR LIGHT

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Turn the ignition switch to "⊗".
Replace the rear light bulb (REPLACING THE REAR LIGHT BULB).

Pull out and slightly loosen reflector (1).
Detach bulb electrical connection (2).
Remove reflector (1).
Loosen and remove the two fixing screws (3).
Tightening torque for screws (3):
2 Nm (0.2 kgm) [1.5 ft-lb]



Remove rear light support (4).

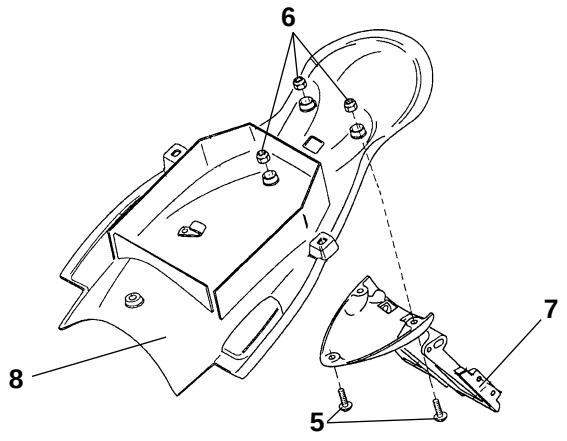
⚠ WARNING

When reassembling, to avoid damaging rear light support (4), carefully tighten the two screws (3) by applying a moderate torque.

REMOVING THE NUMBER-PLATE HOLDER

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Turn the ignition switch to "⊗" .
Remove the rear fairing (REMOVING THE REAR FAIRING).
Remove the rear light (REMOVING THE REAR LIGHT).
Remove the rear turn indicators (REMOVING THE REAR TURN INDICATORS).

Loosen and remove the three screws (5).
Collect the three self-locking nuts (6).
Remove number-plate holder (7) from saddle support lower panel (8).



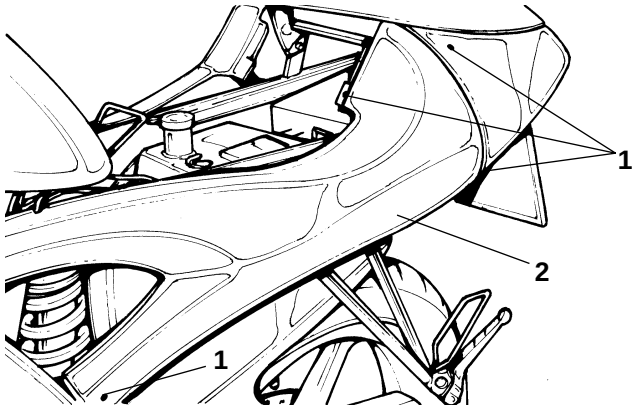
REMOVING THE SADDLE SUPPORT COVER

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove the rider saddle (REMOVING THE RIDER SADDLE).
Lift the fuel tank (LIFTING THE FUEL TANK).

Loosen and remove the four screws (1).

⚠ WARNING

When handling plastic and painted parts, take care not to score or damage them.
Remove saddle support cover (2).
Use the same procedure for the saddle support cover on the right side.

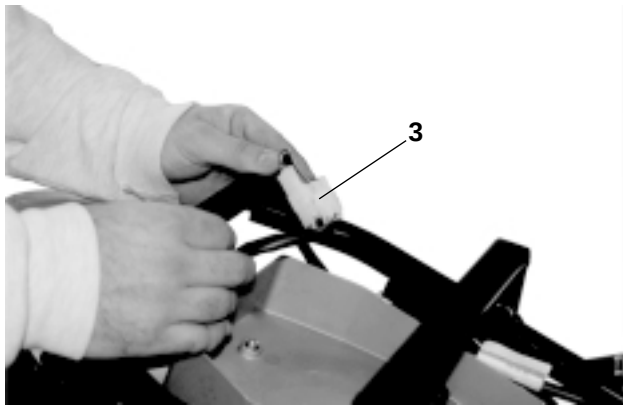


REMOVING THE REAR TURN INDICATORS

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove the rear fairing (REMOVING THE REAR FAIRING).
Detach electrical connections (3).

⚠ WARNING

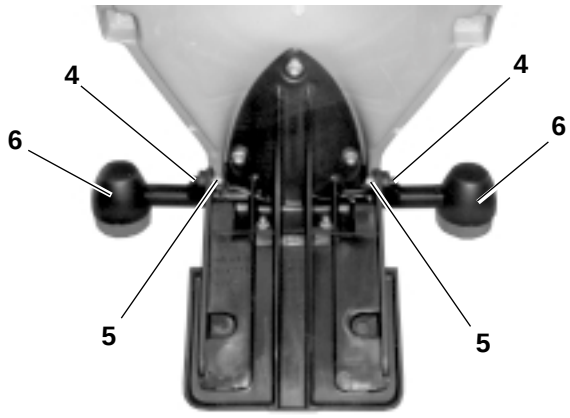
When refitting, ensure that electrical connector (3) is properly reattached.



Loosen and remove screws (4).
Collect nuts (5).
Remove turn indicators (6).

⚠ WARNING

When removing turn indicator (6), help the electrical wire with the related connector through the slot in the saddle support lower panel and the number-plate holder.



REMOVING THE REAR MUDGUARD

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.

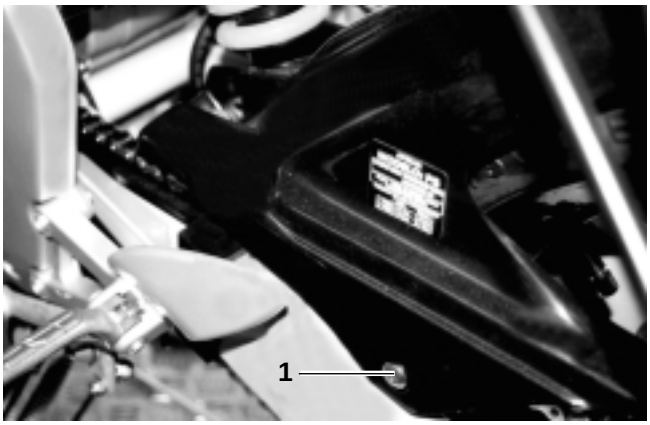
⚠ WARNING

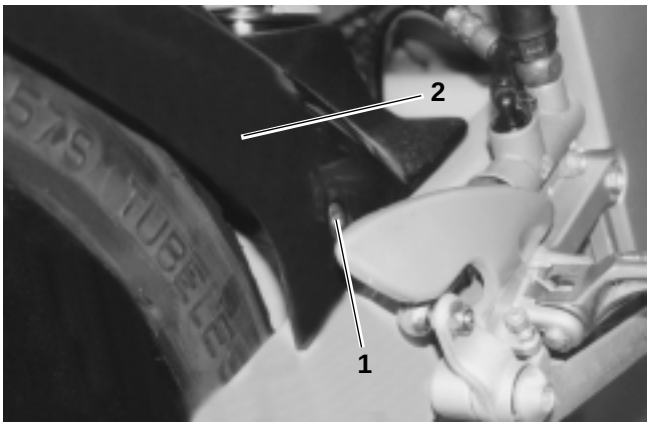
Allow the engine and the exhaust terminal to cool down completely.

Remove the two screws (1).

Tightening torque for screws (1):
5 Nm (0.5 kgm) [3.7 ft-lb]

Remove rear mudguard (2).





REMOVING THE PASSENGER FOOTREST SUPPORT

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.

⚠ CAUTION

Allow the engine and the exhaust terminal to cool down completely.

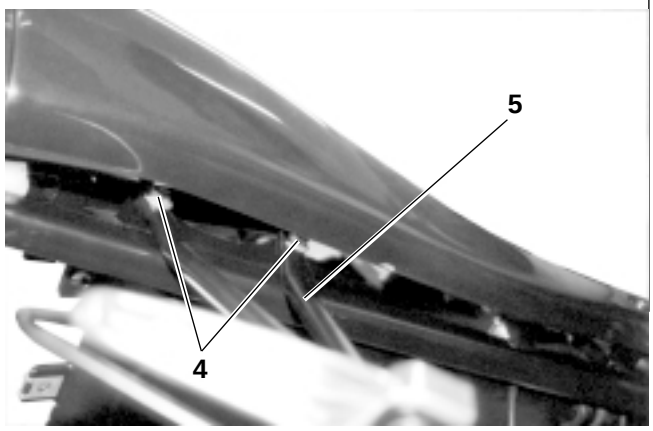
Loosen and remove screw (3) (operation to be performed only for the passenger footrest on the right side).

Tightening torque for screw (3):
12 Nm (1.2 kgm) [8.8 ft-lb]

Loosen and remove screws (4) under the saddle support cover.

Tightening torque for screws (4):
24 Nm (2.4 kgm) [17.7 ft-lb]

Remove footrest support (5) complete with the footrest.
If necessary remove the footrest (REMOVING THE PASSENGER FOOTREST).



REMOVING THE PASSENGER FOOTREST

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.

⚠ CAUTION

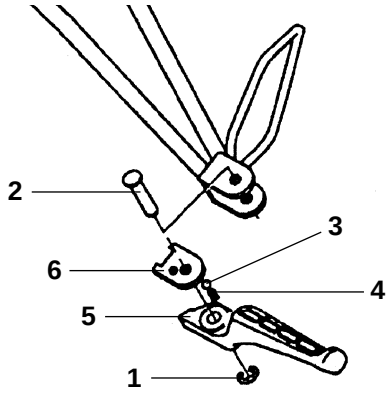
Allow the engine and the exhaust terminal to cool down completely.

Remove circlip (1).
Pull out pin (2).

⚠ WARNING

Take care not to lose ball (3), which is pushed out by spring (4).

Remove footrest (5) and collect shim (6), ball (3) and spring (4).
IMPORTANT If necessary repeat the procedure to remove the other footrest.



REMOVING THE RIDER FOOTREST SUPPORT (LEFT SIDE)

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.

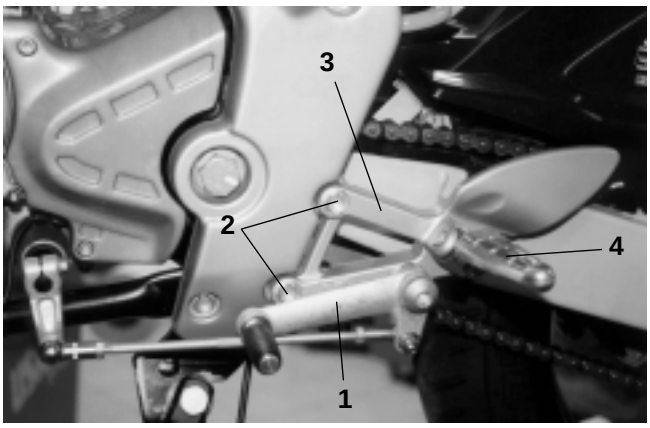
⚠ CAUTION

Allow the engine and the exhaust terminal to cool down completely.

Remove gear lever (1) (REMOVING THE GEAR LEVER).

Loosen and remove screws (2).
Tightening torque for screws (2):
25 Nm (2.5 kgm) [18.4 ft-lb]

Remove rider footrest support (3) complete with footrest (4).
If necessary remove the footrest (REMOVING THE RIDER FOOTREST).



REMOVING THE RIDER FOOTREST SUPPORT (RIGHT SIDE)

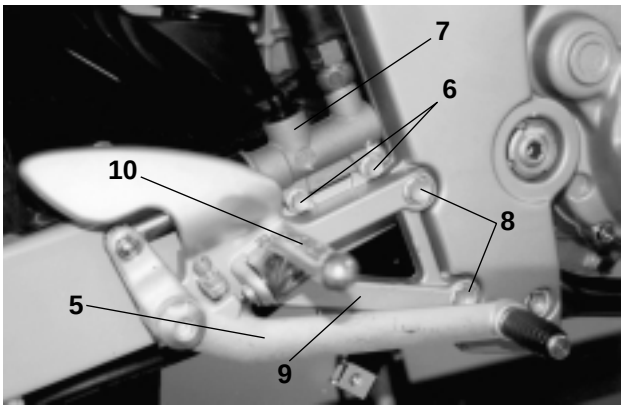
Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.

⚠ CAUTION

Allow the engine and the exhaust terminal to cool down completely.

Remove rear brake control lever (5) (REMOVING THE REAR BRAKE).
Loosen and remove screws (6).
Tightening torque for screws (6):
10 Nm (1.0 kgm) [7.4 ft-lb]

Fasten rear brake pump (7) to the frame in a vertical position using adhesive tape.



Loosen and remove screws (8).
Tightening torque for screws (8):
25 Nm (2.5 kgm) [18.4 ft-lb]

Remove rider footrest support (9) complete with footrest (10).
If necessary remove the footrest (REMOVING THE RIDER FOOTREST).

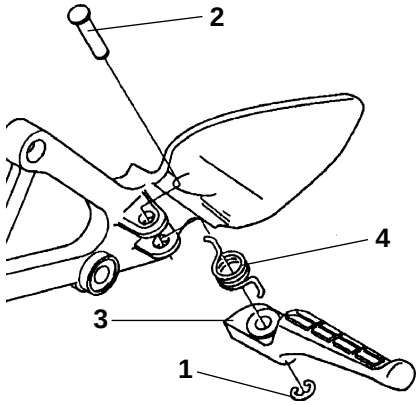
REMOVING THE RIDER FOOTREST

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.

⚠ CAUTION

Allow the engine and the exhaust terminal to cool down completely.

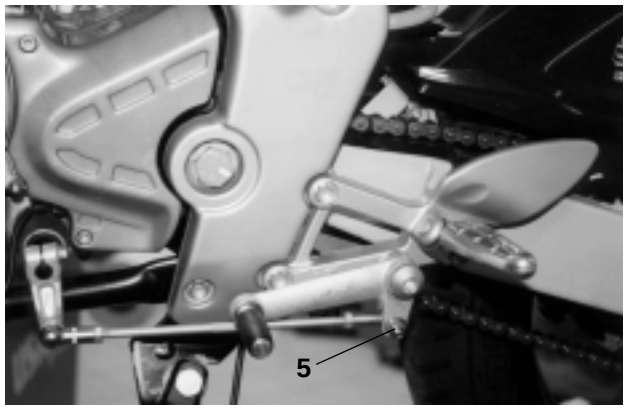
Remove circlip (1).
Remove pin (2).
Collect footrest (3) and spring (4).
IMPORTANT If necessary repeat the procedure for the other rider footrest.



REMOVING THE GEAR LEVER

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Loosen and remove nut (5).

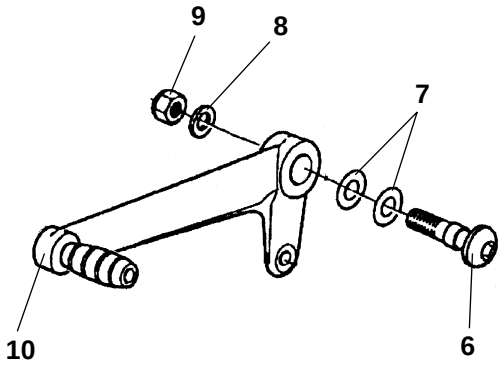
Tightening torque for nut (5):
5 Nm (0.5 kgm) [3.7 ft-lb]



Loosen and remove gear lever pin (6).

Tightening torque for gear lever pin (6):
12 Nm (1.2 kgm) [8.8 ft-lb]

Collect the two Belleville springs (7), washer (8) and nut (9).
Remove gear lever (10).



REMOVING THE REAR BRAKE LEVER

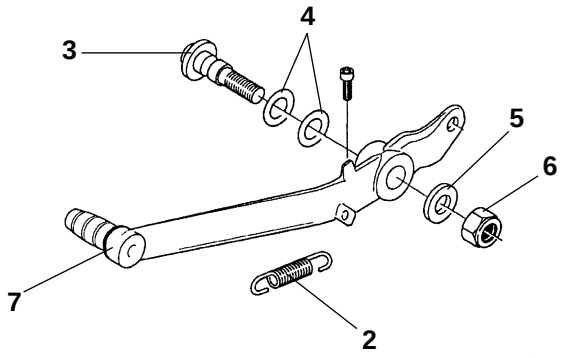
Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Loosen and remove nut (1).

Tightening torque for nut (1):
5 Nm (0.5 kgm) [3.7 ft-lb]

Unhook spring (2).
Loosen and remove brake lever pin (3).

Tightening torque for brake lever pin (3):
12 Nm (1.2 kgm) [8.8 ft-lb]

Collect the two Belleville springs (4), washer (5) and nut (6).
Remove rear brake lever (7).
To refit the lever, follow the removing procedure in reverse order and if necessary proceed to adjust the rear brake (ADJUSTING THE REAR BRAKE).



REMOVING THE EXHAUST SILENCER

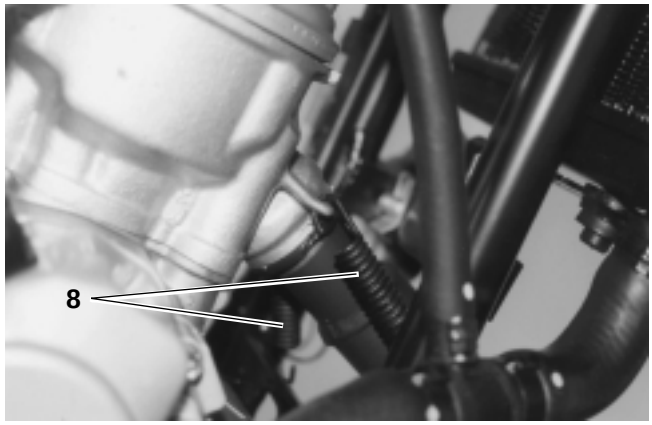
Carefully read the section PRECAUTIONS AND GENERAL INFORMATION.
The cleaning of the exhaust silencer final pipe and of the exhaust terminal tailpipe must be carried out every 4000 km (2500 mi).

⚠ CAUTION

The use of the vehicle without exhaust silencer and/or exhaust terminal is forbidden by the law. It is also forbidden to replace these components with non-homologated spare parts.

⚠ WARNING

Before carrying out the following operations, let the engine and the exhaust silencer cool down until they have reach room temperature, in order to avoid any burns.
Remove the side fairings (REMOVING THE SIDE FAIRINGS).
Remove the lower fairing tip (REMOVING THE LOWER FAIRING).
Unhook the two springs (8), attaching the exhaust silencer to the cylinder exhaust manifold.

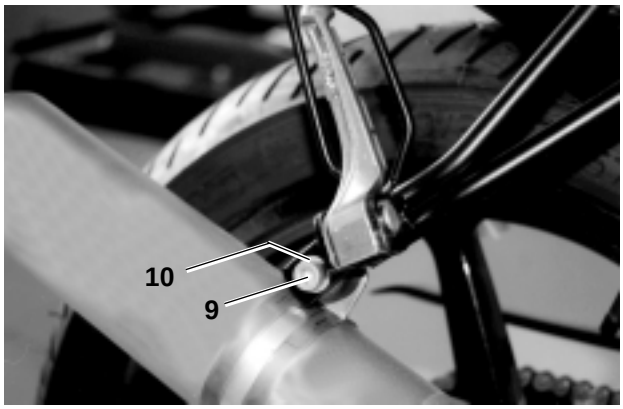


⚠ WARNING

Check the two springs (8) and, if they are damaged, replace them.

Loosen and remove screw (9).
Tightening torque for screw (9):
12 Nm (1.2 kgm) [8.8 ft-lb]

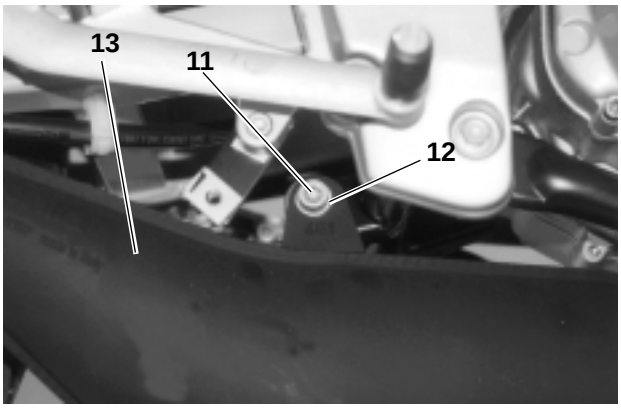
Collect washer (10).



Loosen and remove screw (11) while supporting the exhaust silencer.
Tightening torque for screw (11):
12 Nm (1.2 kgm) [8.8 ft-lb]
Collect washer (12).

⚠ WARNING

Cover the opening of the exhaust pipe so as to prevent foreign bodies from getting in.
Remove exhaust silencer (13) by pulling it downwards. If necessary clean the exhaust silencer (CLEANING THE EXHAUST SILENCER AND THE EXHAUST TERMINAL).



7

REMOVING THE EXHAUST TERMINAL

Carefully read the section PRECAUTIONS AND GENERAL INFORMATION and the PERIODIC MAINTENANCE SCHEDULE.
The cleaning of the exhaust silencer final pipe and of the exhaust terminal tailpipe must be carried out every 4000 km (2500 mi).

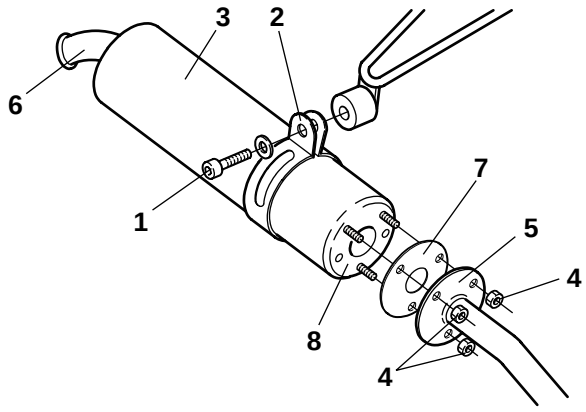
⚠ CAUTION

The use of the vehicle without exhaust silencer and/or exhaust terminal is forbidden by the law. It is also forbidden to replace these components with non-homologated spare parts.

⚠ WARNING

Before carrying out the following operations, let the engine and the exhaust silencer cool down until they have reach room temperature, in order to avoid any burns.

Unscrew and remove the screw (1) and take the washer.
Take the support (2).



⚠ CAUTION

Support the exhaust terminal (3), in order to prevent it from accidentally falling down.

Loosen the three nuts (4); unscrew and remove them.

NOTE Upon reassembly, first screw the three nuts (4) (without tightening them) and then tighten them.
Withdraw the exhaust terminal (3) from the flange (5).

NOTE Upon reassembly, insert the exhaust terminal (3) in the flange (5), making sure that the tailpipe (6) is directed downwards.
Remove the gasket (7).

NOTE Upon reassembly, replace the gasket (7) with a new one.
Remove any deposit from the flange (5) and the gasket seat (8).

⚠ CAUTION

Cover the opening of the exhaust pipe so as to prevent foreign bodies from getting in.

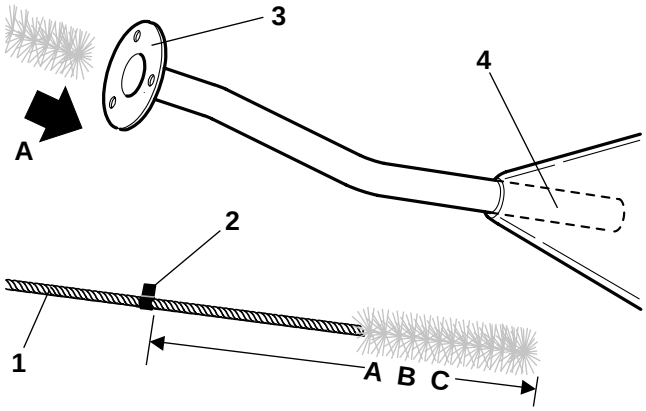
CLEANING THE EXHAUST SILENCER AND THE EXHAUST TERMINAL

Carefully read the section PRECAUTIONS AND GENERAL INFORMATION and the PERIODIC MAINTENANCE SCHEDULE.
Remove the exhaust terminal (REMOVING THE EXHAUST TERMINAL).

NOTE Prepare a flexible cleaning brush (1) with suitable diameter.

⚠ CAUTION

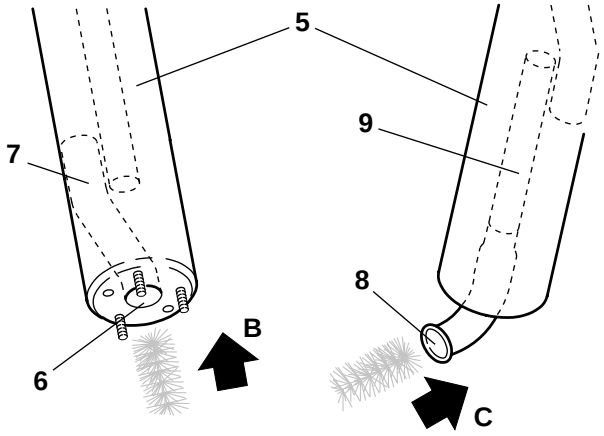
Do not use any object or tool other than the cleaning brush.
Do not insert any object, especially if small, in the exhaust silencer or in the exhaust terminal.
Do not insert the cleaning brush too deeply. Keep to the indicated depth.



Apply a reference mark (2) (like a piece of coloured adhesive tape) on the cleaning brush, in order to indicate the depth to be respected.
Depths to be indicated on the cleaning brush:
A) = 320 mm (12.6 in); **B)** = 125 mm (4.9 in); **C)** = 250 mm (9.8 in)

NOTE After every cleaning operation, remove the reference mark and remove any deposit from the cleaning brush.

Insert the cleaning brush in the flange hole (3), without exceeding the depth **(A)**.



NOTE Use the cleaning brush pushing it forward and backward.
Clean the final pipe of the exhaust silencer (4) by means of the cleaning brush.

NOTE For the following operations, position the exhaust terminal (5) vertically and insert the cleaning brush from the lower side.
Insert the cleaning brush in the inlet hole (6), without exceeding the depth (B).
Clean the inlet pipe (7) by means of the cleaning brush.
Rotate the exhaust terminal by 180° (356°F).
Insert the cleaning brush in the outlet hole (8), without exceeding the depth (C).
Clean the outlet pipe (9) by means of the cleaning brush.

REMOVING THE SIDE STAND

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the rear stand OPT.

Rear stand: 8705021.

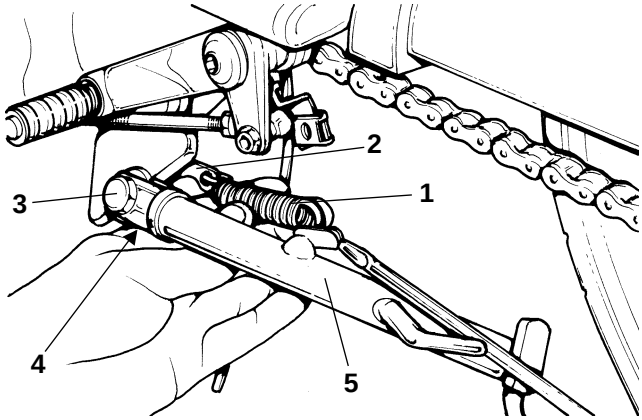
⚠ CAUTION

Take care not to injure your hands while performing the following operation.
Using a spring puller, unhook the two springs (1) and then remove them.

⚠ WARNING

When refitting, take care to properly position the two springs (1).

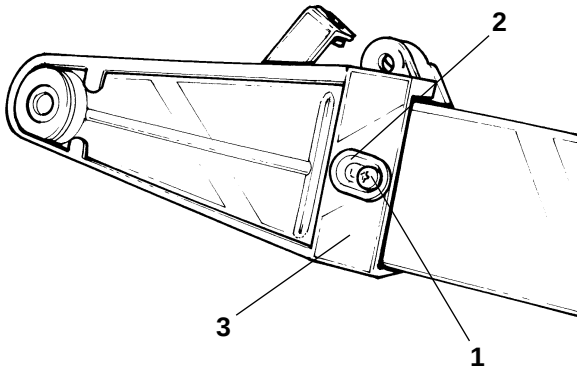
Remove stand return plate (2).
Work with the stand in home position.
Loosen and remove screw (3).
Tightening torque for screw (3):
25 Nm (2.5 kgm) [18.4 ft-lb]
Collect the related fastening nut (4), on the opposite side to screw (3).
Remove stand (5).



REMOVING THE CHAIN GUIDE SHOE

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove the swing arm (REMOVING THE SWING ARM).
Loosen and remove screw (1).

Tightening torque for screw (1):
3 Nm (0.3 kgm) [2.2 ft-lb]



Collect cup (2).
Remove chain guide shoe (3).

REMOVING THE SADDLE SUPPORT

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove the fairings (REMOVING THE SIDE FAIRINGS).
Place the vehicle on the stand.
Remove the rider saddle (REMOVING THE RIDER SADDLE).
Remove the fuel tank (REMOVING THE FUEL TANK).
Remove the battery (REMOVING THE BATTERY).

Remove the rear fairing with the passenger saddle (REMOVING THE REAR FAIRING).
Remove the saddle support covers (REMOVING THE SADDLE SUPPORT COVERS).
Remove the passenger footrest supports (REMOVING THE PASSENGER FOOTREST SUPPORTS).
Remove the saddle support lower panel with the number-plate holder and the rear light (REMOVING THE SADDLE SUPPORT LOWER PANEL).
Remove the mixer oil reservoir (REMOVING THE MIXER OIL RESERVOIR).

Cut and remove straps (4) fastening the wiring to the saddle support.

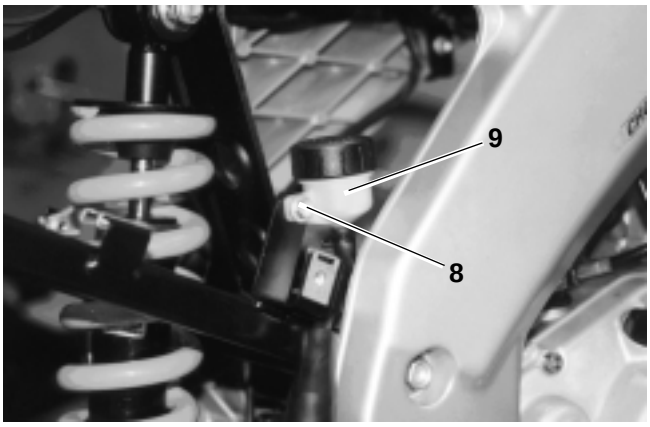
IMPORTANT Have new straps (4) ready for refitting.

Detach electrical connection (5) from the fuses.
When refitting, make sure the electrical connection is properly reattached.
Remove fuse-holding rubber (6) with fuses (7).

Loosen and remove screw (8).

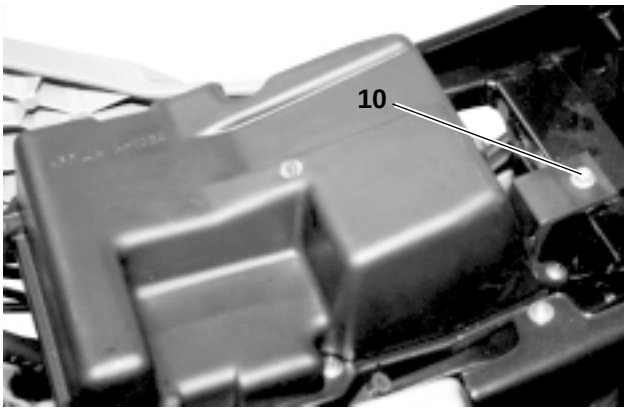
Tightening torque for screw (8):
3 Nm (0.3 kgm) [2.2 ft-lb]

To avoid spilling the brake fluid, fasten brake fluid reservoir (9) to the frame in a vertical position using adhesive tape.



Loosen and remove screw (10).

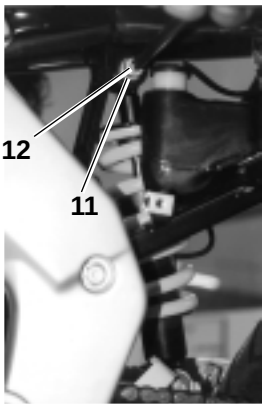
Tightening torque for screw (10):
5 Nm (0.5 kgm) [3.7 ft-lb]



Loosen and remove screw (11) and remove the rear suspension from its seat.

Tightening torque for screw (11):
48 Nm (4.8 kgm) [35.4 ft-lb]

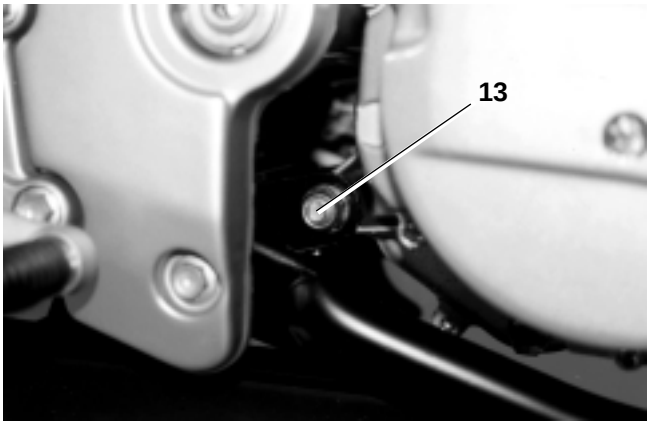
Collect washer (12) and the related nut.



Loosen and remove nut (13).

Tightening torque for nut (13):
24 Nm (2.4 kgm) [17.7 ft-lb]

Remove the related screw fixing the engine to the saddle support.

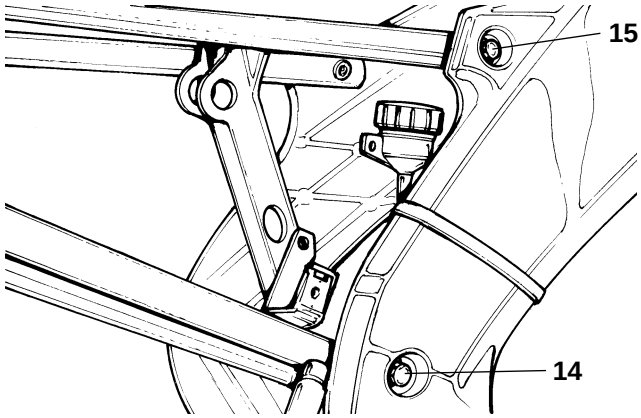


IMPORTANT The following operation must also be performed on the other side of the vehicle.

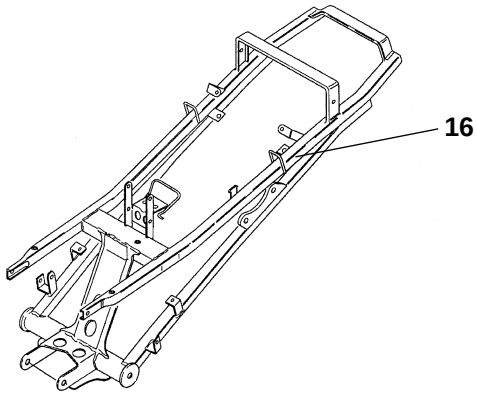
Loosen and remove the two screws (14) and (15).

Tightening torque for screw (14):
24 Nm (2.4 kgm) [17.7 ft-lb]

Tightening torque for screw (15):
47 Nm (4.7 kgm) [34.7 ft-lb]

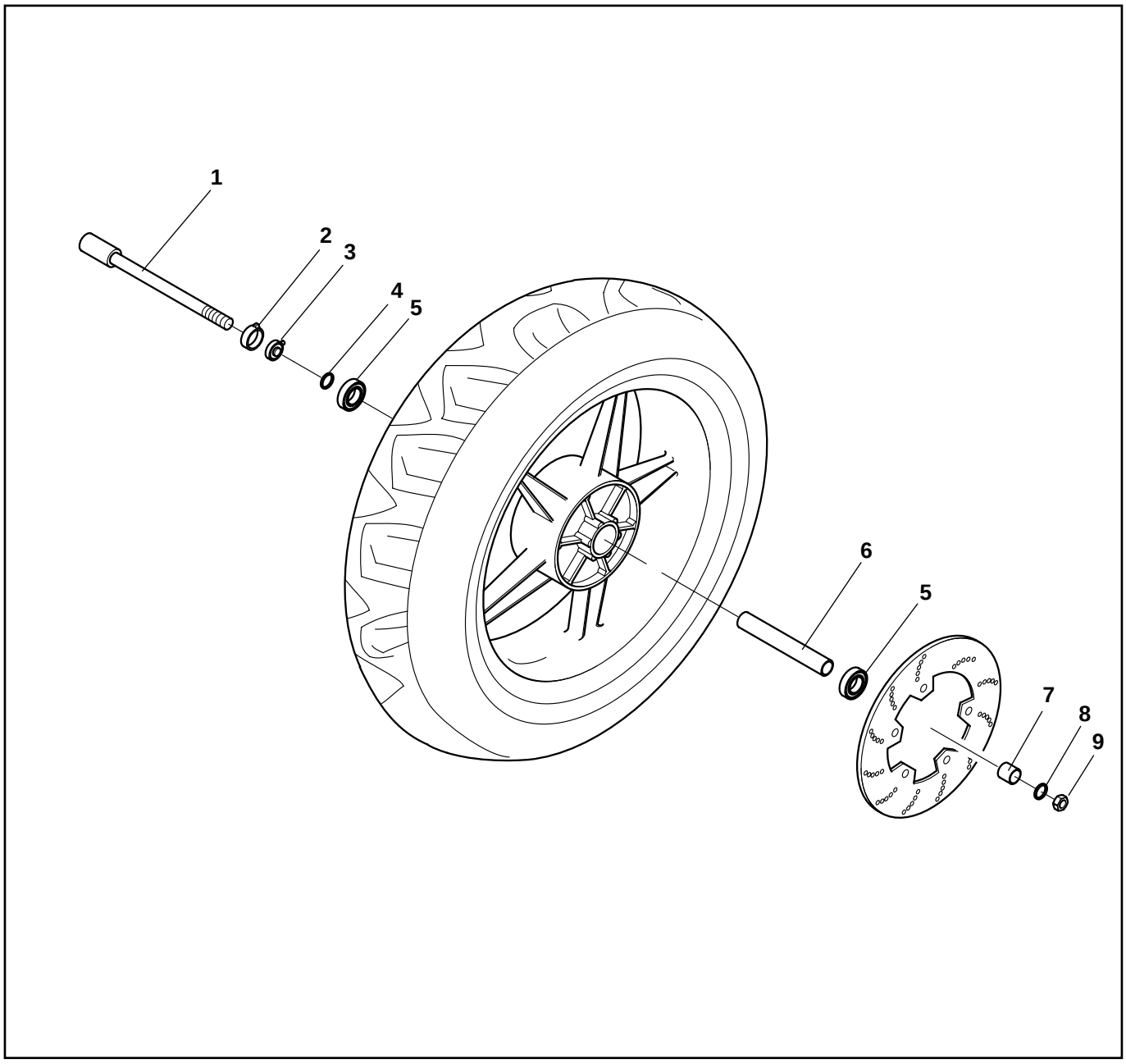


Remove saddle support (16) by pulling it backwards.



7

FRONT WHEEL



Key

1) Wheel spindle.
2) Speedometer gear cover
3) Speedometer gear
4) Washer
5) Bearing
6) Inner spacer
7) Outer spacer
8) Washer
9) Nut

REMOVING THE FRONT WHEEL ASSEMBLY

Carefully read the PERIODIC MAINTENANCE SCHEDULE.
While disassembling and reassembling the wheel, be careful not to damage the brake pipes, the discs and the pads.

NOTE To remove the front wheel it is necessary to use the appropriate rear support stand.

Rear support stand: 8705021.

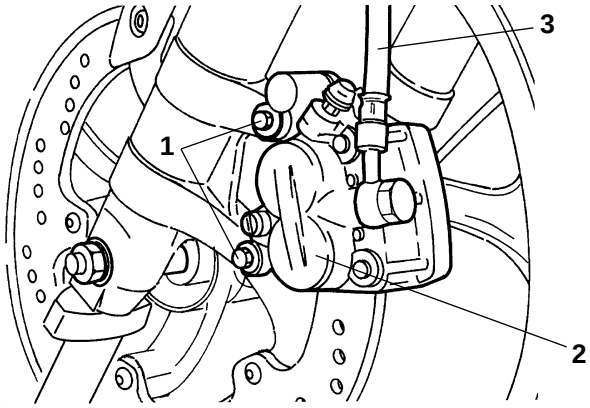
Position the vehicle on the appropriate rear support stand, (POSITIONING THE VEHICLE ON THE REAR SUPPORT STAND OPT).

⚠ WARNING

Make sure that the vehicle is stable.

Brake caliper screw (1) driving torque: 22 Nm (2,2 kgm) [16.2 Ft-lb].

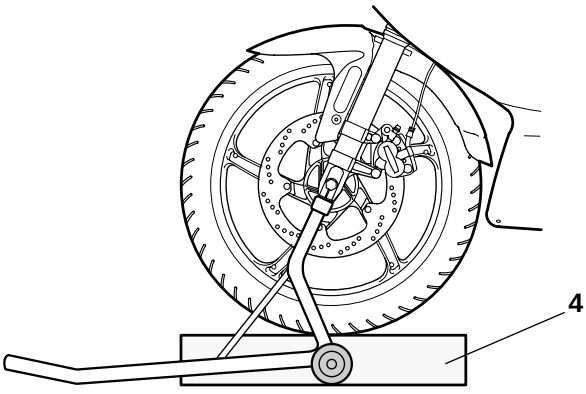
Unscrew and remove the two screws (1) that fasten the front brake caliper (2).
Withdraw the brake caliper (2) from the disc, leaving it attached to the pipe (3).



⚠ CAUTION

Never pull the front brake lever after removing the brake caliper, otherwise the caliper pistons may go out of their seats, thus causing the outflow of the brake fluid.

Put a support (4) under the tyre, in such a way as to keep the wheel in its position after loosening it.



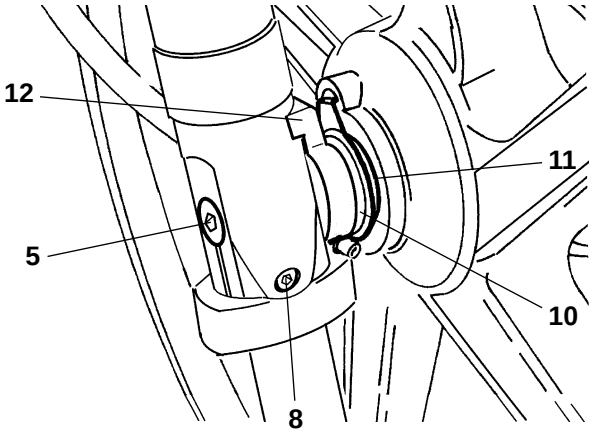
Lock the wheel pin (5) by means of a spanner.
Unscrew and remove the nut (6), taking the washer (7).

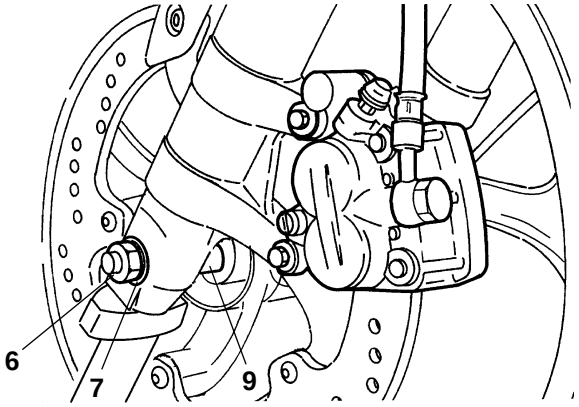
Wheel nut driving torque (6):
80 Nm (8 kgm) [59 Ft-lb].

Loosen the screw (8) of the wheel pin clamp.
Push the wheel pin (5), by carefully acting on the threaded end and using a rubber hammer if necessary.

NOTE Check the arrangement of the speedometer drive (9) and of the spacer ring (10), in order to be able to reassemble them correctly.

Support the front wheel and extract the wheel pin manually.
Take the spacer ring (10).
Remove the wheel by withdrawing it from the front.
Disconnect the odometer control (9).
Take the washer (11).
Take the odometer control cover (12).





DISASSEMBLING THE FRONT WHEEL

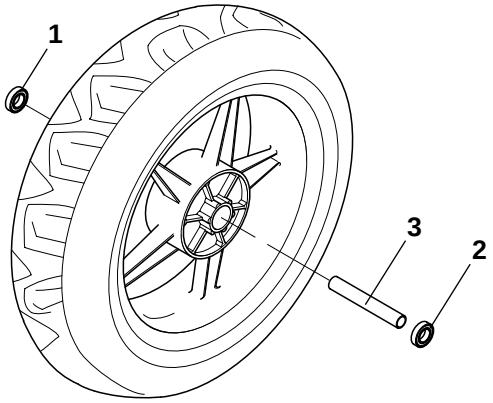
Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Take down the wheel (REMOVING THE FRONT WHEEL ASSEMBLY).
Clean the two hub sides with a cloth.
Using a suitable extractor, remove right-hand bearing (1) and left-hand bearing (2).

⚠ WARNING

The bearings must be checked (CHECKING COMPONENTS) and if necessary replaced every time they are removed.

Collect spacer (3).
Thoroughly clean the hub inside.

IMPORTANT Wash all components with a clean detergent.



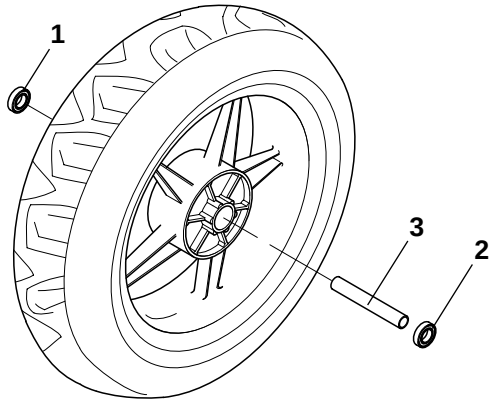
⚠ WARNING

When reassembling, fit the bearings using a drift of the same diameter as the outer race of the bearings.
Do not strike on the balls and/or the inner race.

Be sure to drive the following parts fully home:
- Right-hand bearing (1) on the hub.
- Spacer (3) on right-hand bearing (1).
- Left-hand bearing (2) on spacer (3).

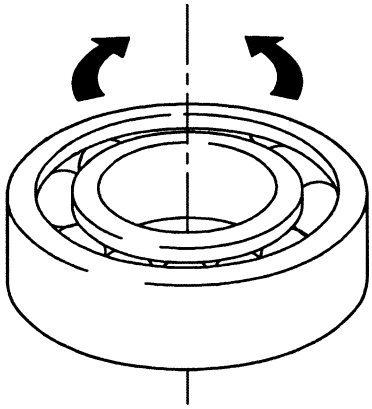
⚠ WARNING

Check the condition of all components, and in particular of those listed below.



BEARINGS

Manually rotate inner race (1) making sure it turns smoothly and silently.
There should be no axial plays.
Any bearings showing the above defects must be replaced.



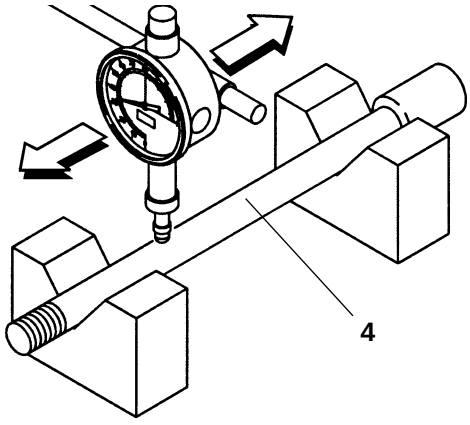
WASHERS

Check the condition of the washers and replace them if they are damaged.

WHEEL SPINDLE

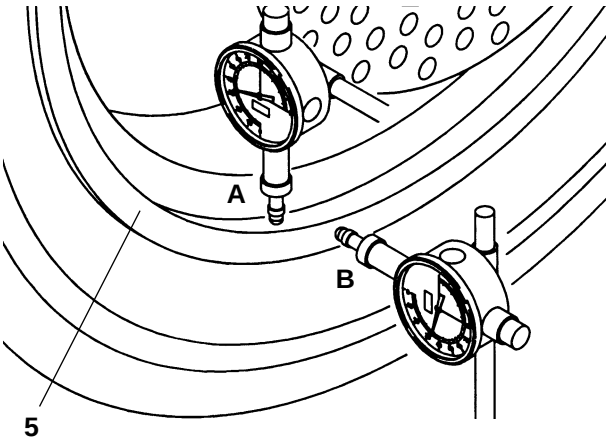
Using a comparator, check the runout of wheel spindle (4). If the runout exceeds the prescribed limit, replace the spindle.

Maximum runout: 0.25 mm (9.8 in)



RIM

Using a comparator, check that radial runout (A) and axial runout (B) of rim (5) do not exceed the prescribed limit.
Excessive runout is generally due to bearing wear or damage.
If, after the bearings have been replaced, the runout still exceeds the limit, replace rim (5).
Maximum radial and axial runout: 2 mm (0.08 in).



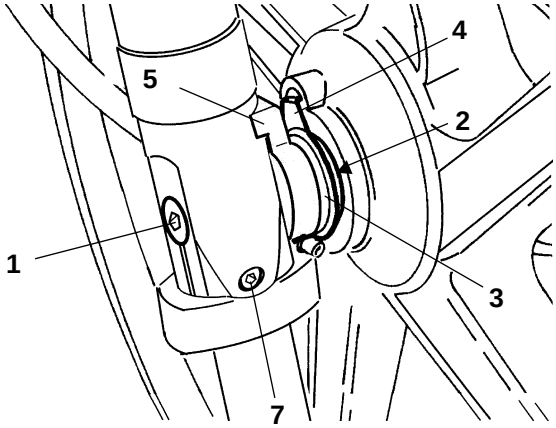
TYRE

Check the condition of the tyre (TYRES).

REASSEMBLY FRONT WHEEL

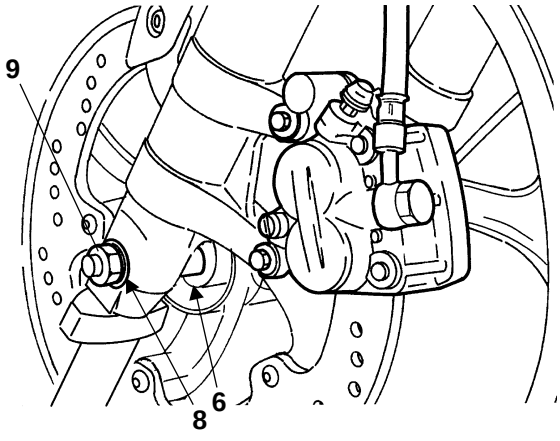
Carefully read PERIODIC MAINTENANCE SCHEDULE.

Spread a film of lubricating grease on the whole length of the wheel pin (1), (LUBRICANT CHART).
Join the washer (2) to the odometer control (3) (tang side (4).
Position the tang (4) of the odometer control (3) in the appropriate seat on the wheel hub.
Correctly insert the cover (5) on the odometer control (3).
Position the spacer ring (6) in its seat on the wheel.
Position the wheel between the fork rods on the support (7).



⚠ WARNING

Danger of injury. Do not introduce your fingers to align the holes.
Move the wheel until its central hole and the holes on the fork are aligned.
Introduce the wheel pin (1) completely.
Position the washer (8) and tighten the nut (9) manually.
Make sure that the cover (5) is correctly coupled to the fork.
Lock the wheel pin (1) rotation.
Tighten the nut (9) thoroughly.
Nut (9) driving torque:
80 Nm (8 kgm) [59 Ft-lb].



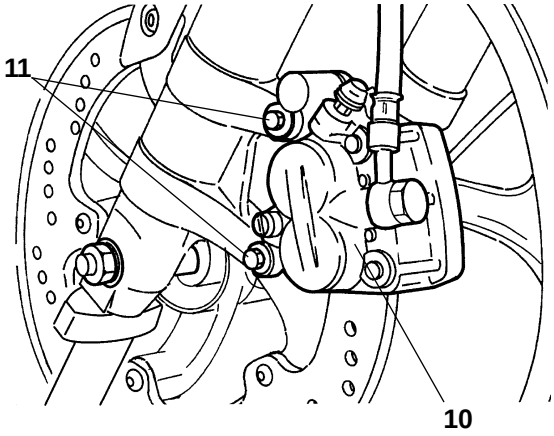
⚠ CAUTION

While reassembling the wheel, be careful not to damage the brake pipe, the disc and the pads.

Insert the brake caliper (10) on the disc and position it so that its fastening holes and the holes on the support are aligned.

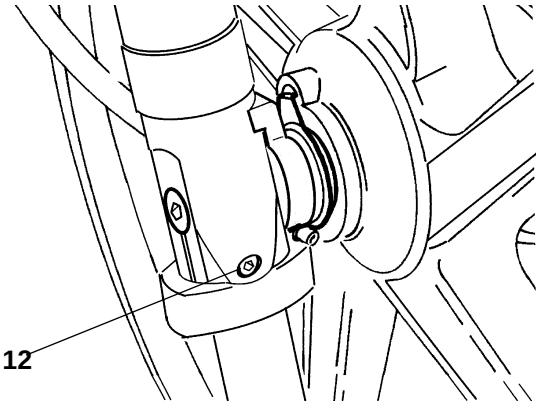
NOTE Upon reassembly of the brake caliper, replace the caliper fastening screws (11) with two new screws of the same type.

Screw and tighten the two screws (11) that fasten the brake caliper.
Brake caliper screw (11) driving torque:
22 Nm (2,2 kgm) [16.2 Ft-lb].



Remove the front support stand OPT.
Remove the rear support stand OPT.
With pulled front brake lever, press the handlebar repeatedly, thrusting the fork downwards. In this way the fork rods will settle properly.
Tighten the screw (12) of the wheel pin clamp.

Screw (12) driving torque:
8 Nm (0.8 kgm) [5.9 Ft-lb].

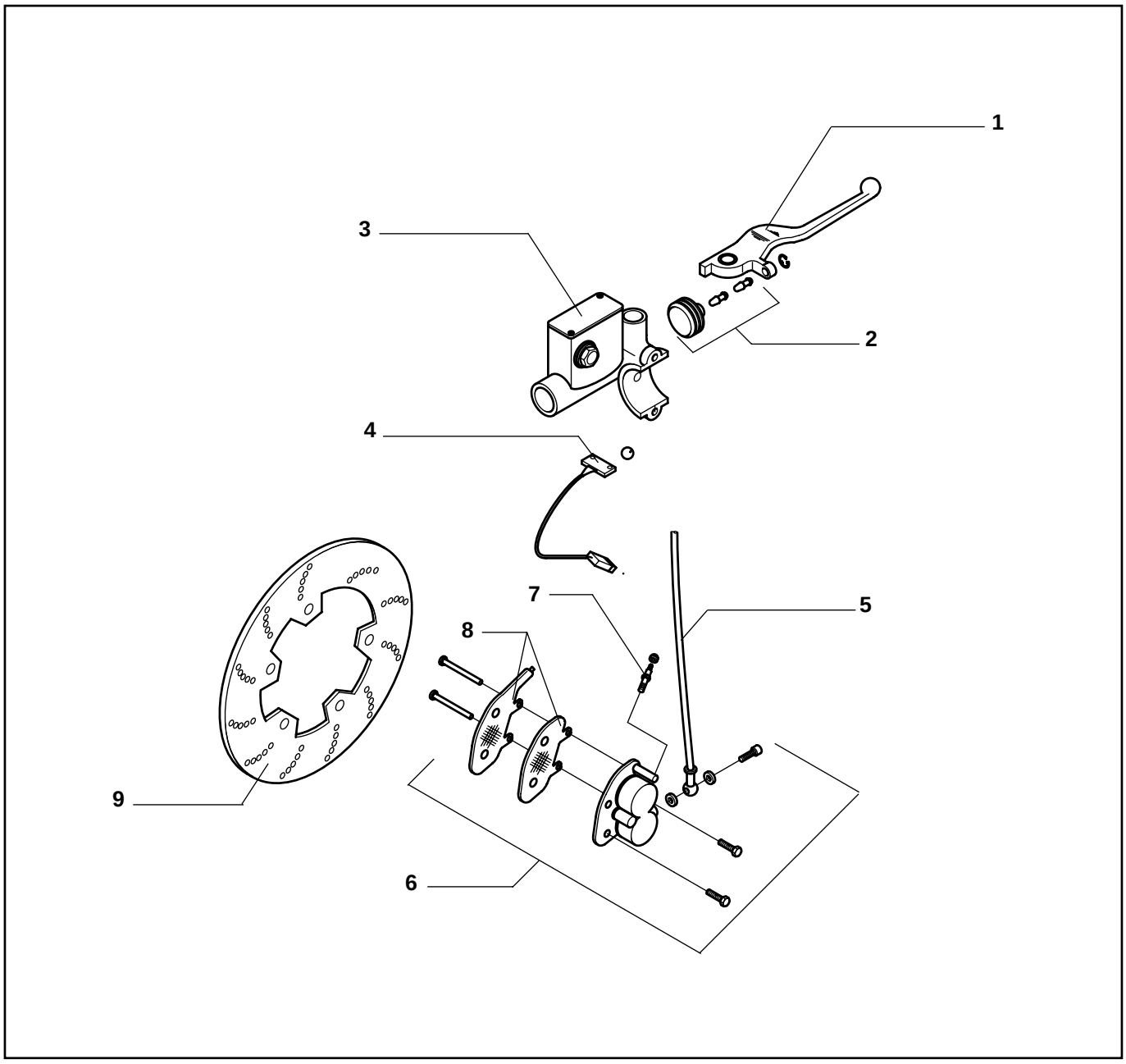


⚠ WARNING

After reassembly, pull the front brake lever repeatedly and check the correct functioning of the braking system.

Check the wheel centering.

FRONT BRAKE



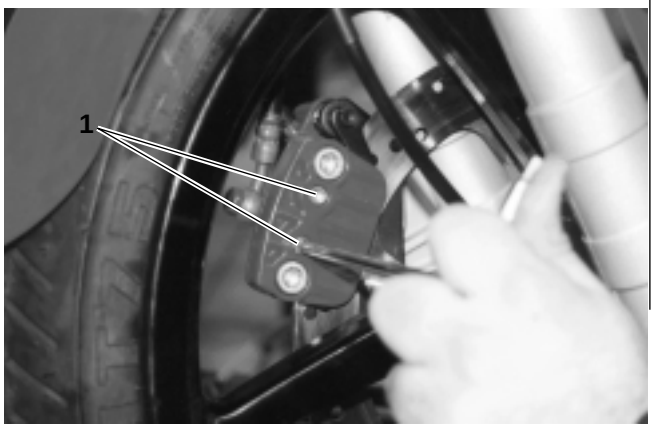
Key

1) Brake lever
2) Front brake pump
3) Brake fluid reservoir
4) Stoplight switch
5) Brake fluid line from pump to caliper
6) Brake caliper
7) Air bleeder screw
8) Brake pads
9) Brake disc

REPLACING THE FRONT BRAKE PADS

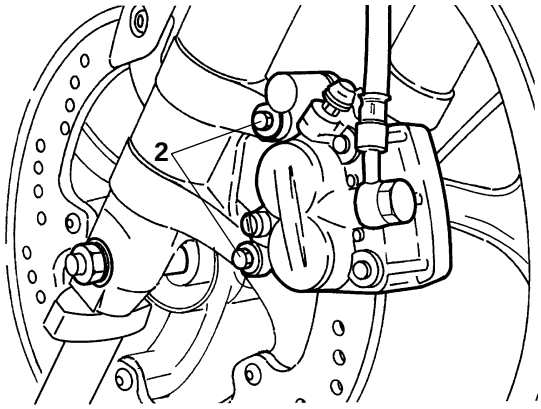
Read through the section PRECAUTIONS AND GENERAL INFORMATION and the paragraph CHECKING THE WEAR OF THE BRAKE PADS.

Place the vehicle on the stand.
Using a hexagonal spanner, loosen and remove screws (1) fixing the pads to the front brake caliper.



Loosen and remove brake caliper screws (2).

Tightening torque for brake caliper screws (2): 22 Nm (2.2 kgm) [16.2 ft-lb]

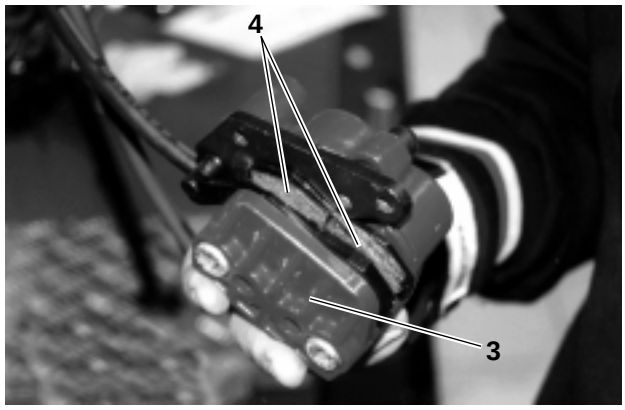


Remove front brake caliper (3) and manually pick pads (4).

⚠ WARNING

Do not operate the brake lever after removing the pads as the brake caliper pistons may come out of their seats, causing a brake fluid leak.

Fit two new pads taking care to align the holes in the pads with those in the caliper.



⚠ WARNING

Always replace both pads and ensure that they are properly positioned in the caliper.
Fit screws (1) fixing the pads to front brake caliper (3) without tightening them.
Refit the front brake caliper and secure it by means of screws (2).
Finally tighten screws (1).
Check the brake fluid level (CHECKING AND RESTORING THE FRONT BRAKE FLUID LEVEL).

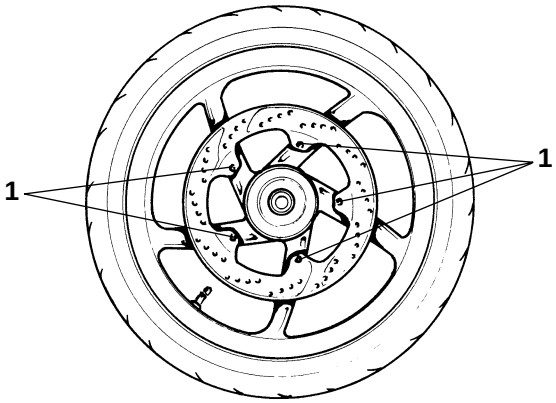
REMOVING THE FRONT BRAKE PUMP

Refer to the paragraph REMOVING THE FRONT BRAKE CONTROL.

REMOVING THE BRAKE DISC

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove the front wheel (REMOVING THE FRONT WHEEL ASSEMBLY).
IMPORTANT To remove screws (1), it is advisable to use an air driver gun, which is capable of giving the screws a sharp blow, allowing them to be released from the LOCTITE®.

Unscrew and remove the five brake disc screws (1).

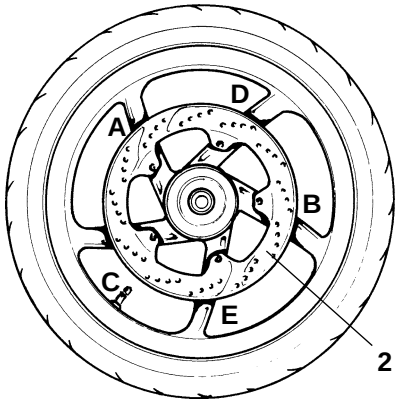


⚠ WARNING

When refitting, apply LOCTITE® over the threads of brake disc screws (1).

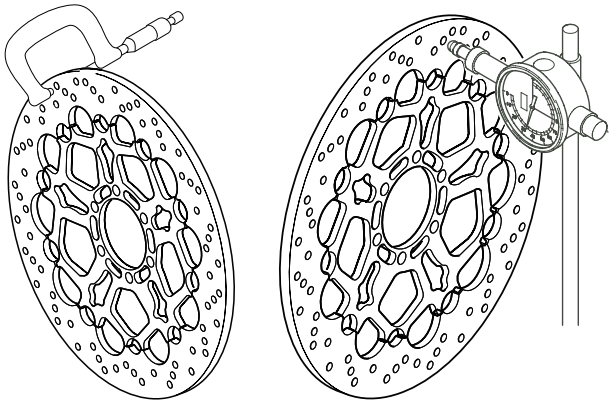
IMPORTANT When refitting, turn in all screws (1) manually, and then tighten them diagonally in the following order: A-B-C-D-E.

Remove brake disc (2).

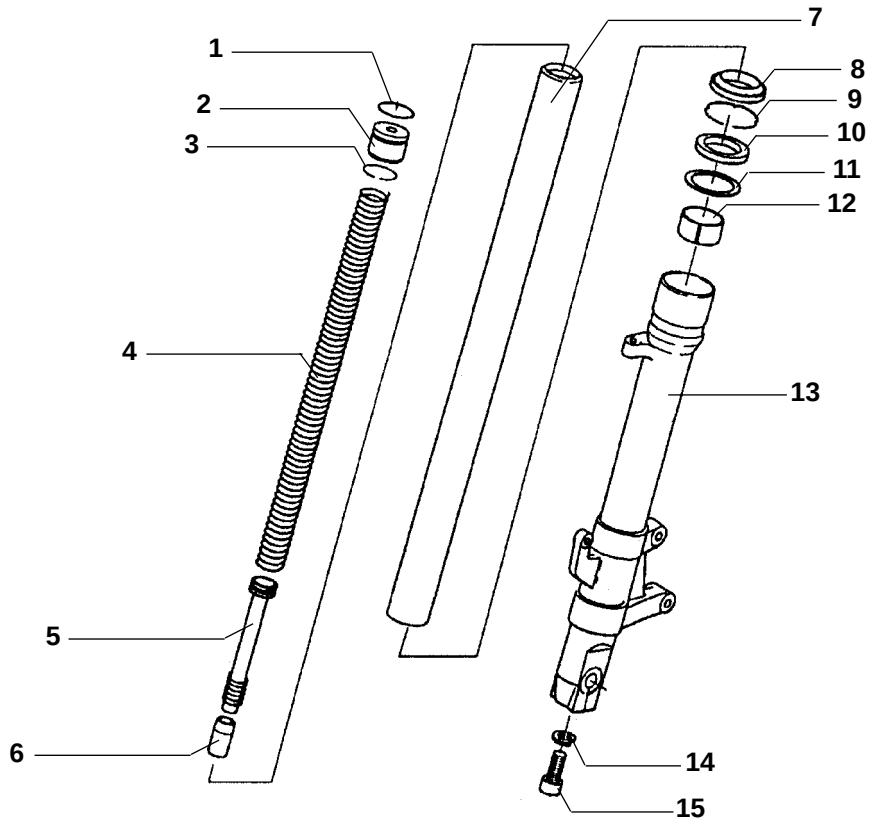


CHECKING THE BRAKE DISCS

IMPORTANT The following operations must be performed when the disc brakes are fitted on the wheel.
Check the wear of the disc by measuring its minimum thickness at several points with a micrometer.
If the minimum thickness at any point is less than the prescribed limit, replace the disc.
Minimum allowable disc thickness: 3.5 mm (0.1 in).
Using a comparator, check that the disc maximum swing does not exceed the allowance, otherwise replace the disc (REMOVING THE BRAKE DISC).



FRONT FORK



Key

1) Seeger ring
2) Rod plug
3) O-ring
4) Spring
5) Plunger assembly
6) Stop pad
7) Rod
8) Dust ring
9) Retaining ring
10) Seal ring
11) Cup
12) Sliding bushing
13) Sheath
14) Sealing washer
15) Oil drain screw

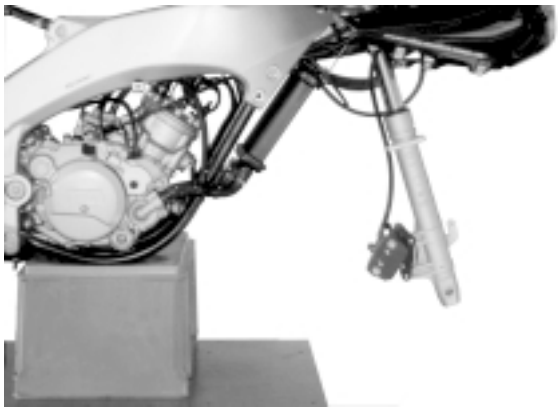
REMOVING THE FRONT FORK

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove the fairings (REMOVING THE SIDE FAIRINGS).
Remove the lower fairing tip (REMOVING THE LOWER FAIRING).
Remove the front wheel (REMOVING THE FRONT WHEEL ASSEMBLY).
Remove the front mudguard (REMOVING THE FRONT MUDGUARD).

⚠ CAUTION

Never remove a fork before placing under the vehicle a support of suitable size. Failure to take this precaution may cause the vehicle to tip over.

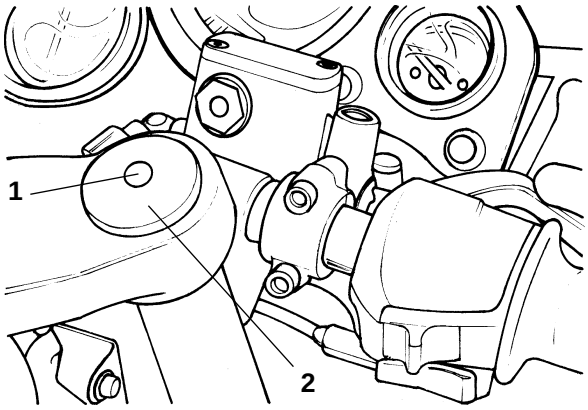
IMPORTANT Before attempting to remove the fork, ensure there is enough room under it.



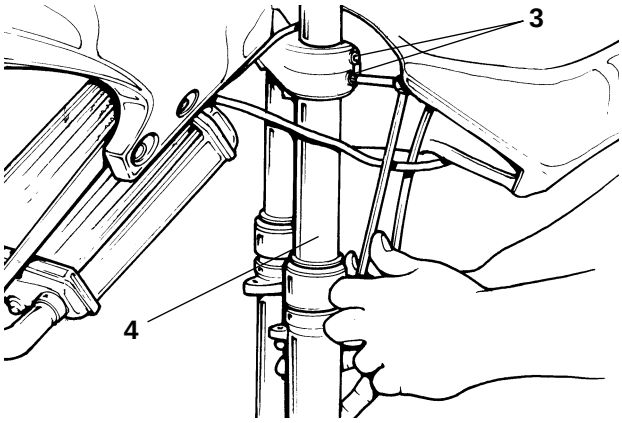
Loosen and remove screw (1).

Tightening torque for screw (1):
5 Nm (0.5 kgm) [3.7 ft-lb]

Remove fork rod plugs (2).



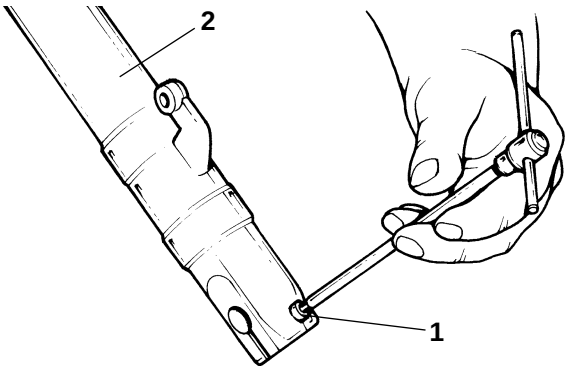
IMPORTANT Before loosening both screws (3), support the fork to prevent it from accidentally falling and being damaged.
Loosen screws (3).
Remove fork (4) from the upper plate and from the base with the head tube.
IMPORTANT Before removing the left fork, remove the front brake caliper fixed to the sheath.



DISASSEMBLING THE FORK

Read through the section PRECAUTIONS AND GENERAL INFORMATION and the paragraph FORK OIL.
IMPORTANT The left and right forks both have the same outside components. The operations described below refer to a single fork but apply to both.
Remove the front fork (REMOVING THE FRONT FORK).
Thoroughly clean the fork.

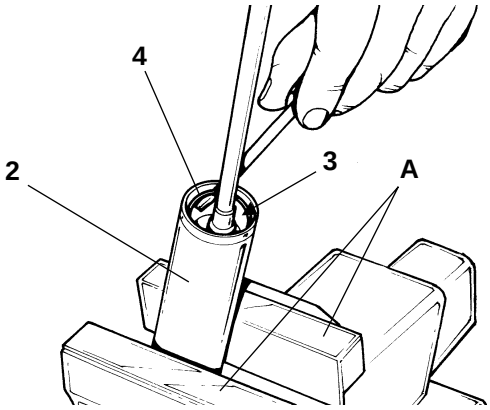
IMPORTANT Before performing the operations described below, prepare two jaws (A) of soft material, a screw (B) with an M4 thread, and a container with a capacity in excess of 350 cm^3 (21.3 $cu.in^3$).



⚠ WARNING

Be very careful when removing the fork.
Loosen and remove screw (1) fixing the fork to the wheel spindle.

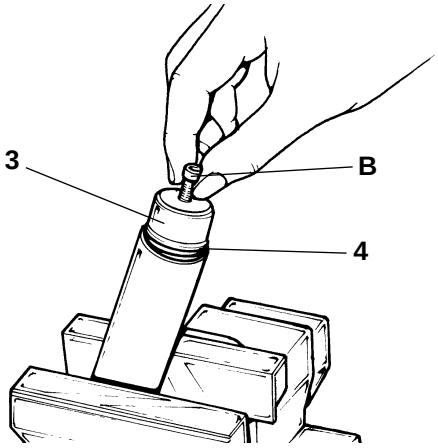
Put fork (2) in a vice between the two jaws (A) and clamp it moderately.
While pressing rod plug (3) with a suitable drift, extract seeger ring (4) using a wedge-shaped tool (e.g. the blade of a screwdriver).
After removing seeger ring (4), release rod plug (3).



⚠ WARNING

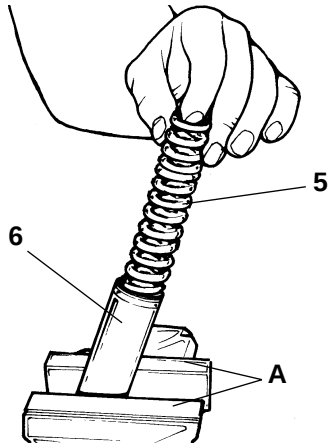
The fork contains oil. During the removal take care not to overturn or tilt it excessively.

Slightly turn in screw (B) on rod plug (3).
Using screw (B), remove rod plug (3) and the related O-rings (4) fixed to the rod plug.

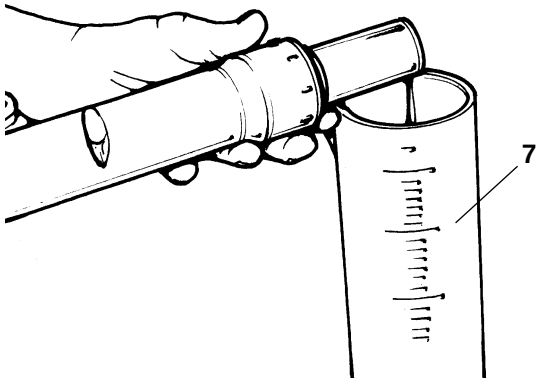


IMPORTANT Before completely removing spring (5), keep it just outside rod (6) for a few seconds so that part of the oil can drip into the rod.

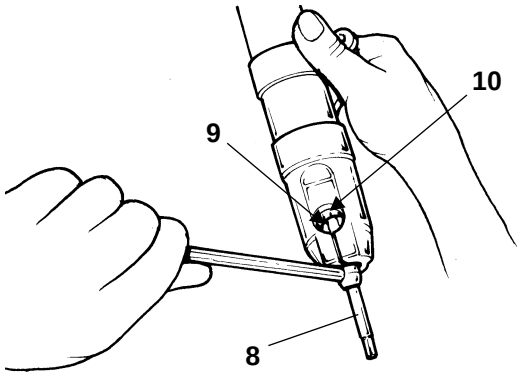
Remove spring (5).



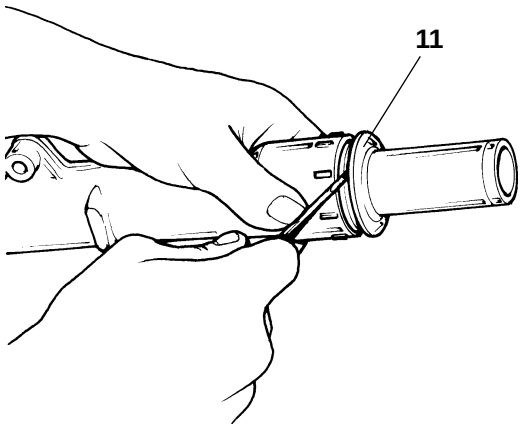
Tip the fork and pour the oil into container (7). Wait for the fork to be completely empty.



Holding the fork by the sheath, place it in the vice between the two jaws (A).
Using an Allen key (8), loosen and remove plunger fixing screw (9).
Collect copper washer (10).

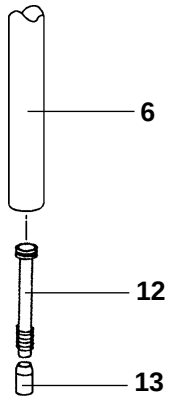


Remove dust ring (11) by levering with the blade of a screwdriver at several points.



⚠ WARNING

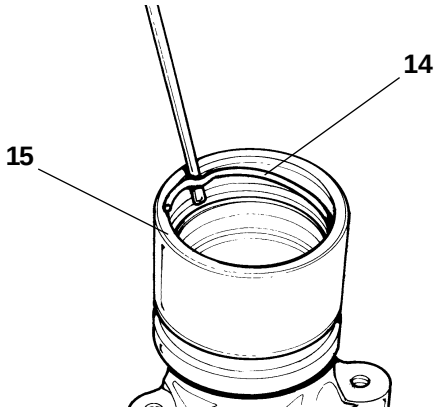
The following operation must be carried out with firmness.
Remove rod (6) complete with plunger (12) and stop (13).



⚠ WARNING

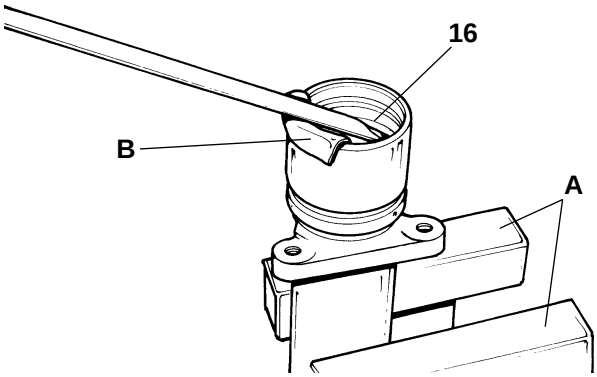
Plunger (12) must not be removed.
Remove dust ring (11) (refer to previous figure) from rod (6).

Remove retaining ring (14) from sheath (15) by levering with the blade of screwdriver on the concave side of the ring.



⚠ WARNING

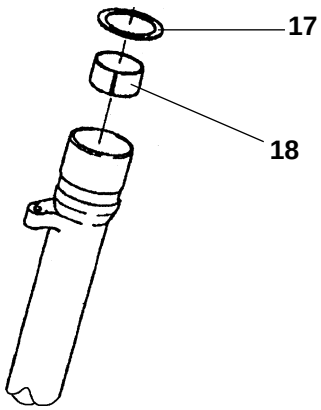
Reposition the sheath in the vice between the two jaws (A).
Place a piece of rubber (B) on the sheath rim so as to prevent it from being damaged during the following operation.
Remove oil seal (16) by levering alternately at several points with the blade of a screwdriver.



Remove cup (17) and sliding bushing (18) in this order from the sheath.

⚠ WARNING

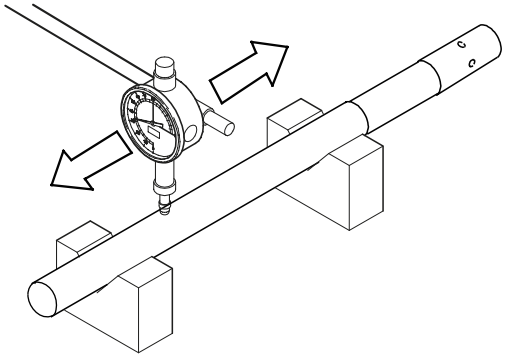
Wash all components with a clean detergent.



CHECKING COMPONENTS

ROD

Ensure that the sliding surface shows no signs of scoring and/or scratches. Very slight scoring can be removed by rubbing the surface with wet sandpaper (grain 1).



⚠ WARNING

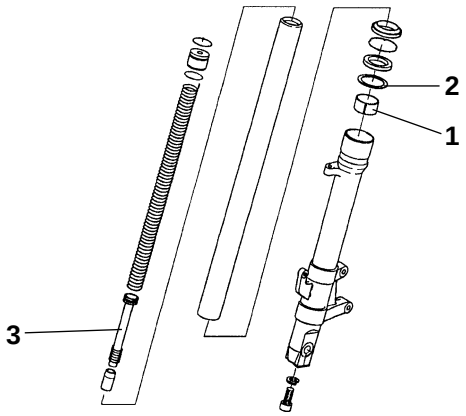
A bent rod must NEVER be straightened because its structure would be weakened, making the vehicle unsafe.

SHEATH

Check that the sheath is not damaged and/or cracked, otherwise replace it.

Check the condition of the following components:
- sliding bushing (1)
- cup (2)
- plunger (3)

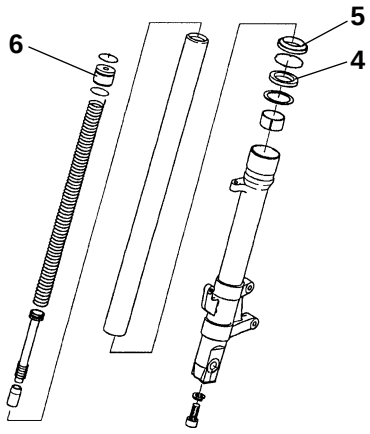
Replace any components that show signs of wear or damage.



⚠ WARNING

Remove any dirt from the bushings taking care not to scratch their surface.

Replace the following components with new ones:
- oil seal (4)
- dust ring (5)
- the two O-rings on rod plug (6)



REASSEMBLING THE FORK

Read through the section PRECAUTIONS AND GENERAL INFORMATION.

⚠ WARNING

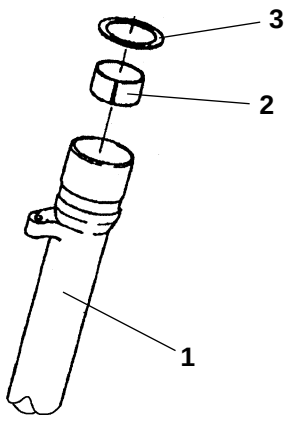
During reassembly, take special care in ensuring that the sliding surfaces are in perfect condition (there should be no signs of wear, scoring, etc.), otherwise replace the damaged components. Take care not to let in any foreign bodies.

Do not use the previously drained oil.

Always replace the gaskets.

Be very careful throughout the reassembly.

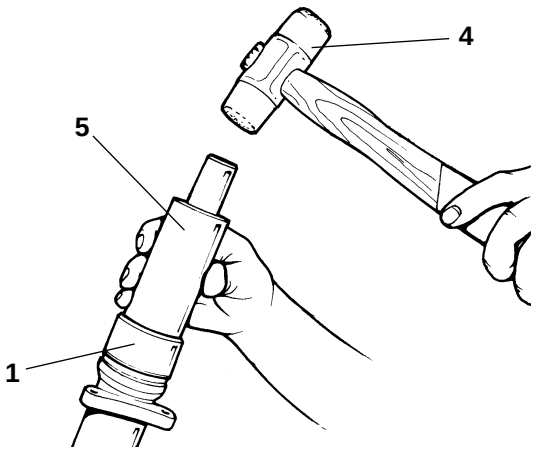
IMPORTANT Before performing the operations described below, prepare two jaws (A) of soft material (aluminium), a screw (B) with an M4 thread, and a container with a capacity in excess of 350 cm^3 (21.3 $cu.in^3$).
Before refitting the gaskets and the bushings, cover them with a film of fork oil (refer to the TABLE OF LUBRICANTS).
Clamp sheath (1) in a vice with the opening facing upwards after interposing two jaws of soft material (aluminium).
Insert sliding bushing (2) into sheath (1), and then insert cup (3).



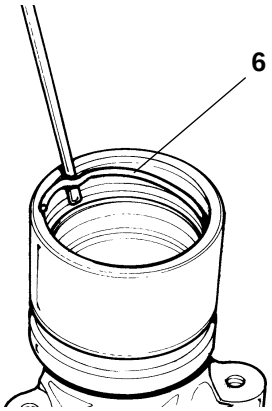
⚠ WARNING

For the following operation use a plastic mallet (4).

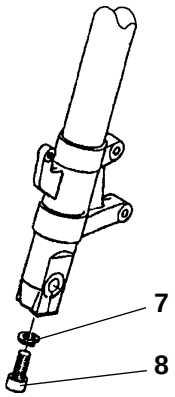
Using a drift (5) of suitable diameter, fit a new oil seal in sheath (1) by striking a few blows with plastic mallet (4).



Insert retaining ring (6) into the sheath until it clicks into the groove.



Fit a new sealing washer (7) and then turn in and tighten screw (8).

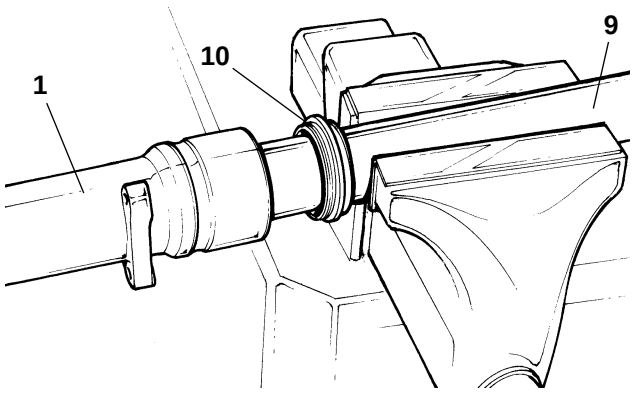


⚠ WARNING

Take care not to drop the plunger while performing the following operations.
Fit the plunger assembly into rod (9) and position a new dust ring (10).
Insert the rod into sheath (1) and push it all the way in until it clicks into place.
Tighten screw (8).

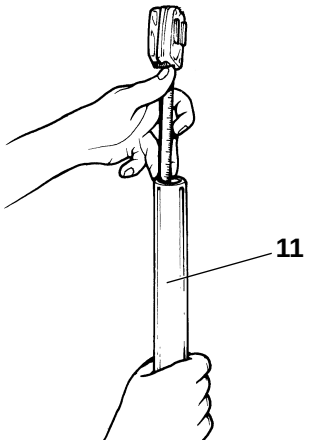
⚠ WARNING

Rod (9) must slide freely and smoothly inside sheath (1).

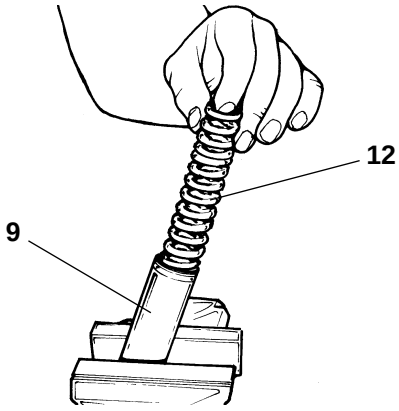


With the rod in extended position, jam dust ring (10) onto sheath (1) (refer to previous figure).
Hold fork (11) in a vertical position.
Pour in fork oil (see TABLE OF LUBRICANTS) until it reaches the correct measurable level.
Oil quantity: 285 ± 2 cm³ (17.4 ± 0.1 cu.in³).
Oil level: 140 mm (5.5 in) (from rod rim).

IMPORTANT To ensure that the oil level measurement is correct, keep fork (11) in a perfectly vertical position. The oil level must be the same on both rods



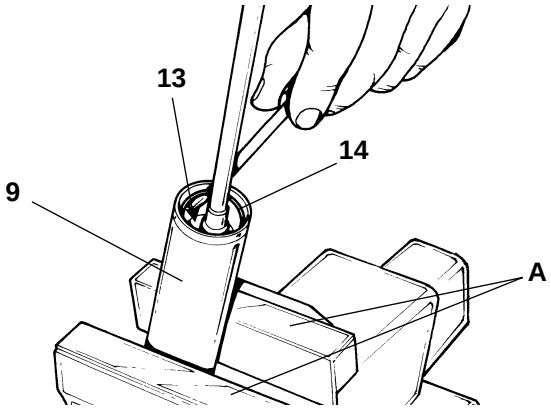
While still keeping rod (9) in extended position, insert spring (12).



Position fork (11) in another vice after interposing the two pads (A), and then clamp the fork moderately.

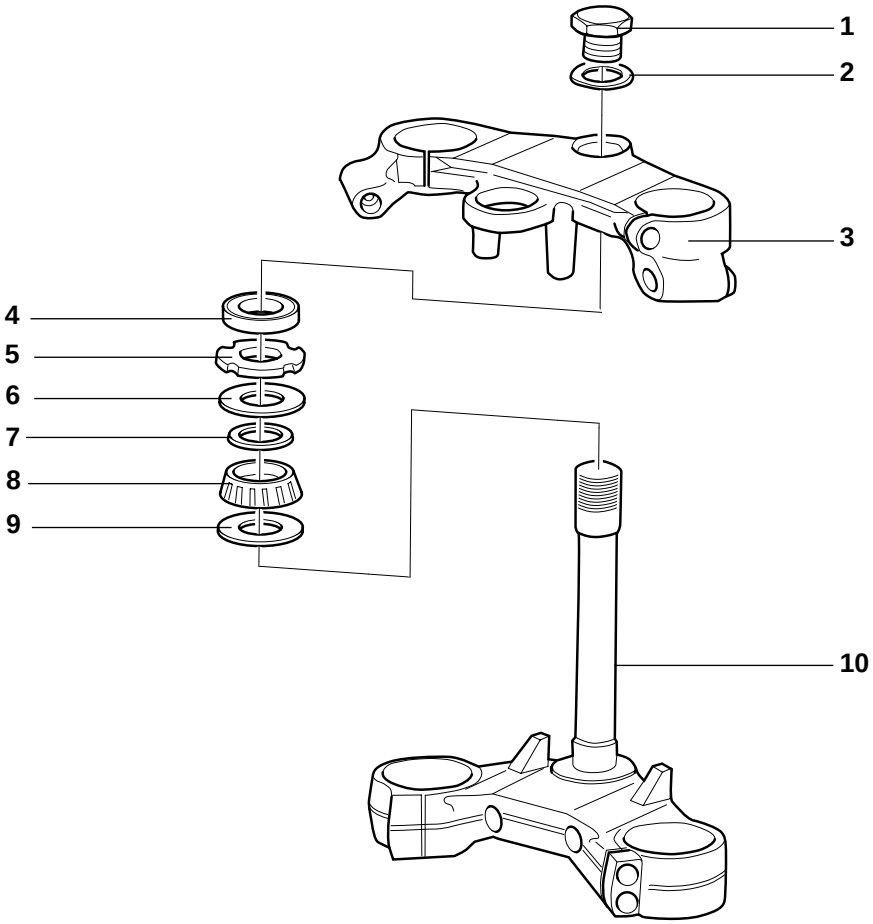
⚠ WARNING

Fit two new O-rings on rod plug (13).
Press down rod plug (13) and fit seeger ring (14).
Gradually release the rod plug until seeger ring (14) clicks into place inside rod (9).



7

STEERING



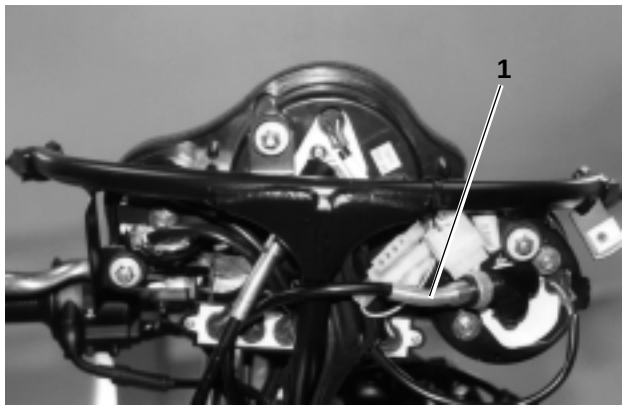
Key

1) Head tube plug
2) Washer
3) Upper plate
4) Ball bearing
5) Ring
6) Seal ring
7) Washer
8) Roller bearing
9) Washer
10) Lower plate with head tube

REMOVING THE STEERING

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the rear stand OPT on an elevating platform (PLACING THE VEHICLE ON THE REAR STAND OPT).
Remove the fairings (REMOVING THE SIDE FAIRINGS).
Remove the lower fairing tip (REMOVING THE LOWER FAIRING).
Remove the exhaust silencer (REMOVING THE EXHAUST SILENCER).
Remove the front fairing (REMOVING THE UPPER FAIRING).
Remove the front braking system (REMOVING THE FRONT BRAKE CONTROL).

Loosen and remove speedometer cable (1) to allow the removal of the front fork.

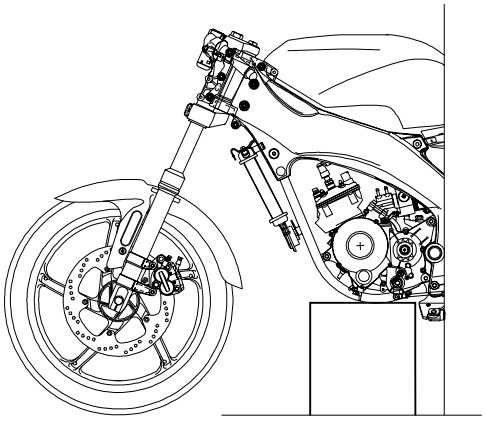


⚠ WARNING

Owing to the weight of the front end, the following operations require the presence of a second operator. The procedure should be agreed upon beforehand. Carry out the removal with the utmost care. Support the front end to prevent it from accidentally falling.

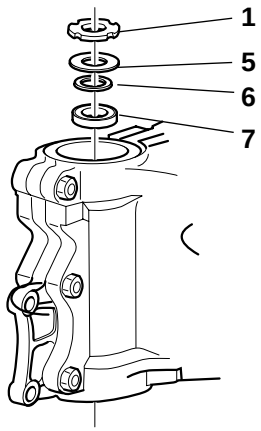
⚠ WARNING

Place a support of suitable height and hardness under the engine cradle so that the front wheel projects beyond the front edge of the platform. Fix the rear part of the vehicle to the platform with suitable straps to prevent it from tipping over during disassembly and reassembly.



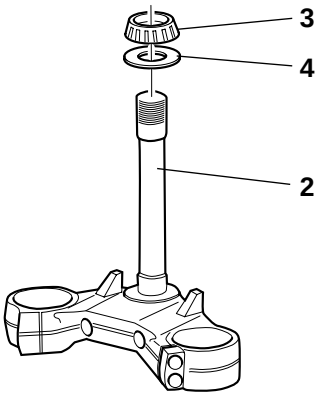
Remove the front fork together with the front wheel (REMOVING THE FRONT FORK).
Remove the fork upper plate as described in the paragraph ADJUSTING THE PLAY OF THE BEARINGS.

Loosen and remove adjusting ring (1).
Remove roller bearing (3) and seal ring (4) from underneath the lower plate with head tube (2).
Collect seal ring (dust ring) (5) and washer (6).
Using a suitable extractor, remove bearing (7) from its seat in the frame.
Position the lower plate with head tube (2) in another vice after interposing two pads of soft material (e.g. aluminium).
With the aid of a wedge and a hammer, strike a few blows in a circular manner to remove roller bearing (3) and seal ring (4) from the lower plate.



⚠ WARNING

When reassembling, fit the bearings with a drift of the same diameter as the outer race of the bearings. Do not strike on the balls and/or the inner race. Ensure that the bearings are driven fully home. Wash all the components with a clean detergent.



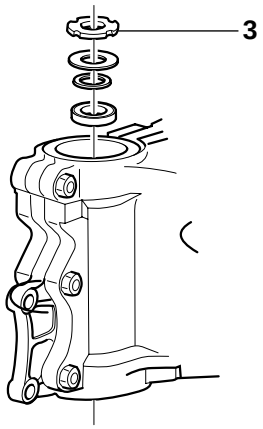
CHECKING COMPONENTS

⚠ WARNING

Check the condition of all components and in particular of those listed below.

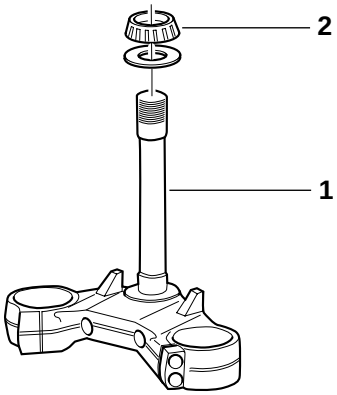
BEARINGS AND GASKETS (see CHECKING COMPONENTS).

REFITTING THE STEERING



IMPORTANT During reassembly, the vehicle and its front end must be positioned as during disassembly. Then proceed by following the removing procedure in reverse order.

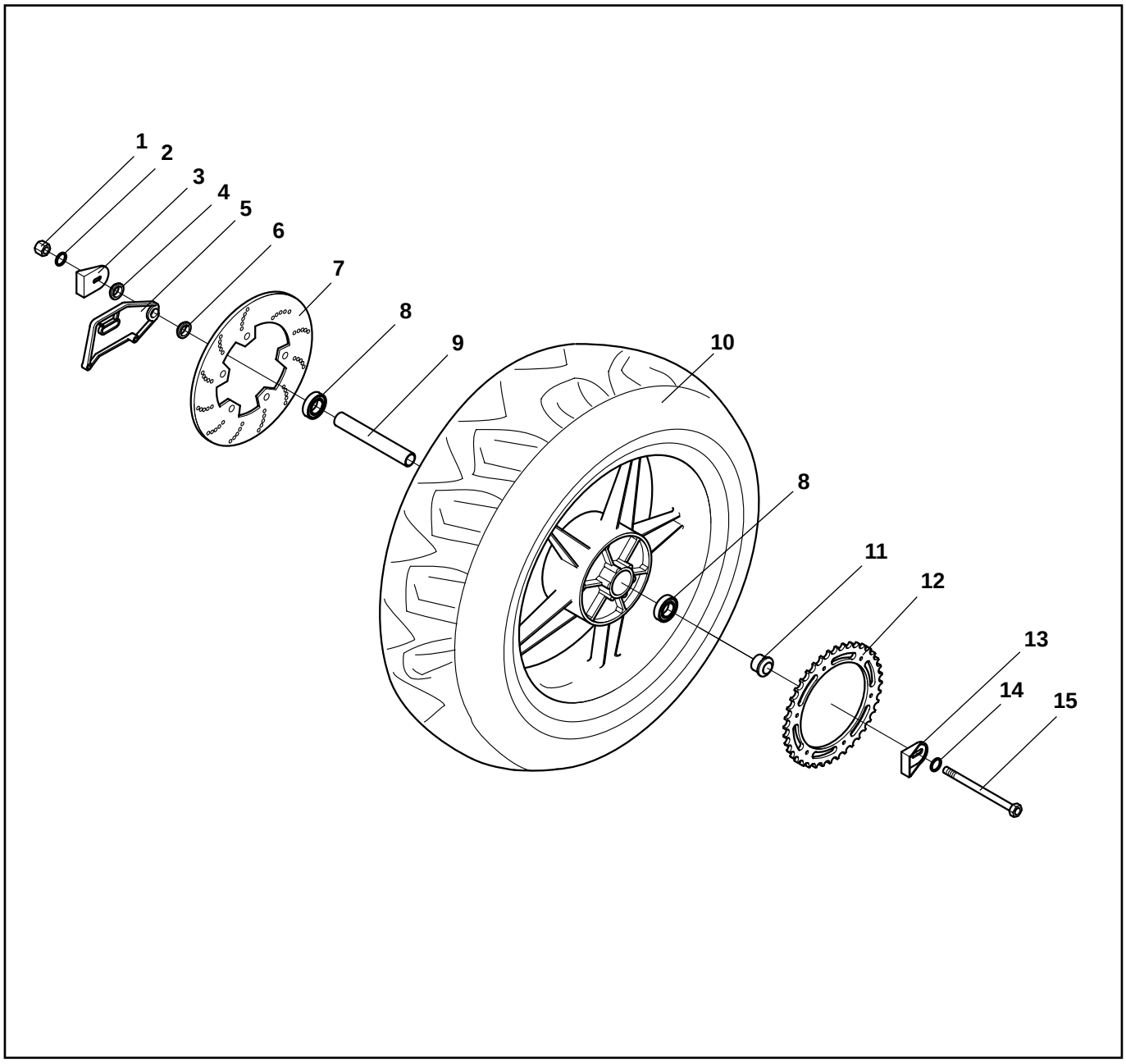
Apply a film of grease throughout the length of pin (1) and over roller bearing (2) (refer to the TABLE OF LUBRICANTS).
Manually tighten ring (3) until it makes contact and then complete the tightening by turning it another quarter of turn.



Adjust the play of the bearings (ADJUSTING THE PLAY OF THE BEARINGS).
Turn the handlebars to ensure that the cables and pipes are not stretched and/or twisted improperly.

7

REAR WHEEL



Key

1) Nut
2) Washer
3) Chain guide shoe
4) Spacer
5) Caliper fixing plate
6) Spacer
7) Brake disc
8) Bearings
9) Spacer
10) Wheel assembly
11) Shim
12) Rear sprocket
13) Chain guide shoe
14) Washer
15) Wheel spindle

REMOVING THE REAR WHEEL ASSEMBLY

Carefully read the PERIODIC MAINTENANCE SCHEDULE.
Before carrying out the following operations, let the engine and the exhaust silencer cool down until they reach room temperature, in order to avoid burns.

⚠ CAUTION

While disassembling and reassembling the wheel, be careful not to damage the brake pipe, the disc and the pads.

NOTE To remove the rear wheel it is necessary to use the appropriate rear support stand OPT.

DISASSEMBLY

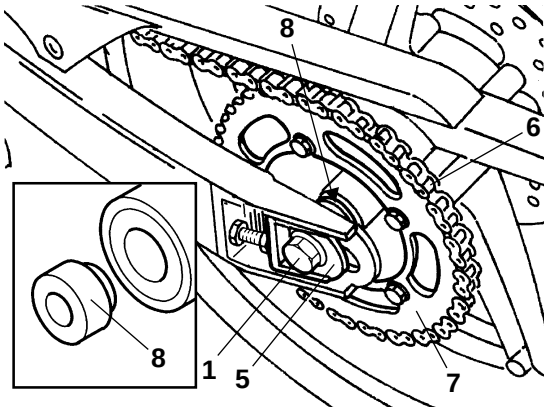
Position the vehicle on the appropriate rear support stand, see (POSITIONING THE VEHICLE ON THE REAR SUPPORT STAND OPT).

Rear support stand: 8705021.

Lock the wheel pin (1) rotation.

Wheel nut (2) driving torque:
80 Nm (8 kgm) [59 Ft-lb].

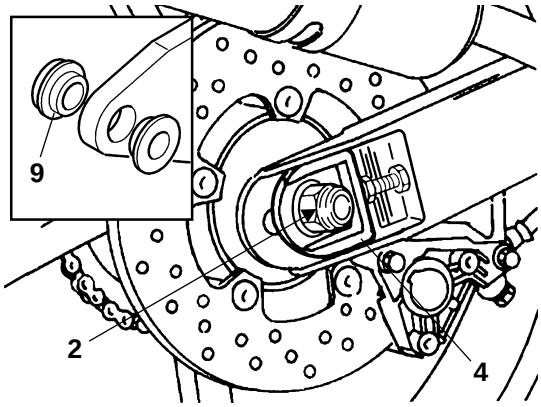
Loosen and remove the nut (2), taking the washer.
Put a support (3) under the tyre, in such a way as to keep the wheel in its position after loosening it.
Withdraw the wheel pin (1) from the left side.



NOTE Check the arrangement of the right (4) and left (5) chain tighteners, in order to be able to reassemble them correctly.
Take the right (4) and left (5) chain tighteners.

NOTE Lower the drive chain (6) outside the crown gear (7).

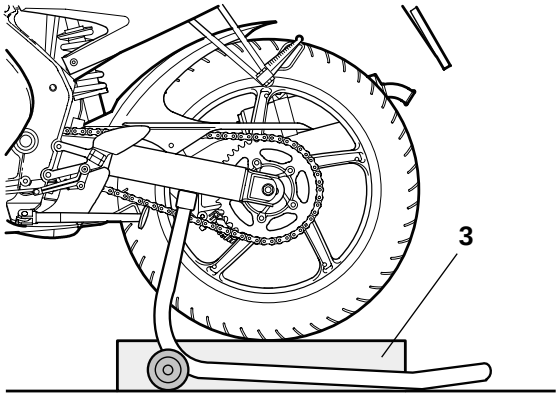
Make the wheel advance and release the drive chain (6) from the crown gear (7).
Withdraw the wheel from the rear fork from behind, carefully withdrawing the disc from the brake caliper.



⚠ CAUTION

Never push the rear brake lever after removing the wheel, otherwise the caliper pistons may go out of their seats, this causing the outflow of the brake fluid.

NOTE Check the arrangement of the spacer rings (8) and (9), in order to be able to reassemble them correctly.
Take the left spacer ring (8).
Take the right spacer ring (9).



DISASSEMBLING THE REAR WHEEL

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove the wheel (REMOVING THE REAR WHEEL ASSEMBLY).
Perform the operations described in the paragraph DISASSEMBLING THE FRONT WHEEL.
Also remove the rear sprocket (REAR SPROCKET).

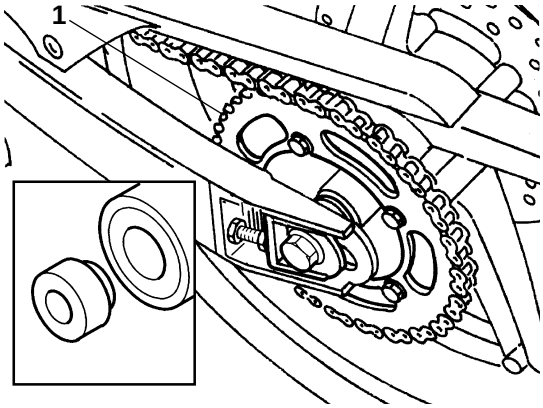
CHECKING COMPONENTS

Refer to the paragraph CHECKING COMPONENTS.

REAR SPROCKET
Check the condition of the teeth of rear sprocket (1) and of the front sprocket.
If they are worn out, replace the front and rear sprockets and the drive chain (REMOVING THE DRIVE CHAIN).

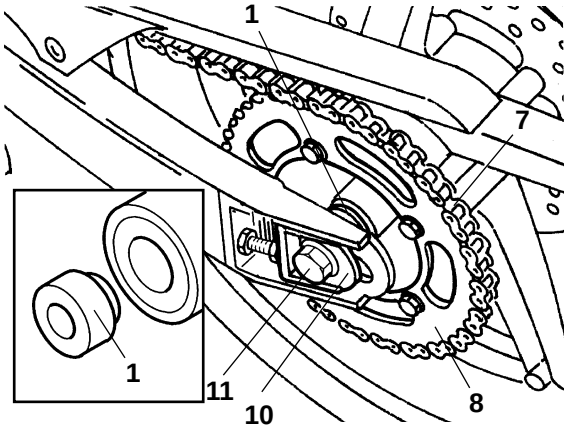
⚠ WARNING

To avoid premature wear and tear of the new components, always replace the three of them as a set.



REINSTALLING THE REAR WHEEL

Read through the PERIODIC MAINTENANCE SCHEDULE.
Moderately grease the wheel hub outer seats.

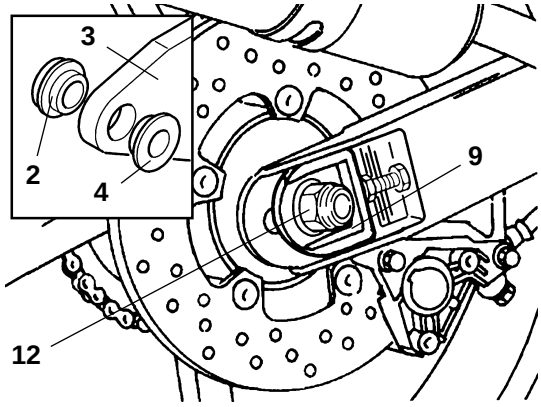


⚠ WARNING

The spacers differ in diameter. Take care not to invert them and to position them properly (see figure).
Fit the wheel hub, left spacer (1) and right spacer (2) in their respective seats.
Refit spacer (4) if it has come out of its seat in brake plate (3).

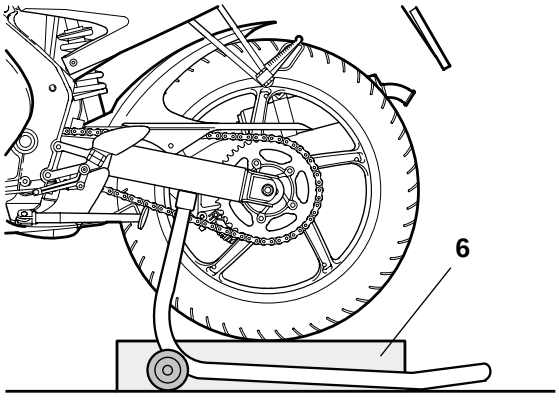
⚠ WARNING

Before proceeding, ensure that plate (3) supporting brake caliper (4) is properly positioned. The slotted hole in the plate must fit around stop peg (5) on the inside of the swing arm right side.
Be careful when inserting the disc into the brake caliper.
Position the wheel between the swing arm sides on support (6).



⚠ CAUTION

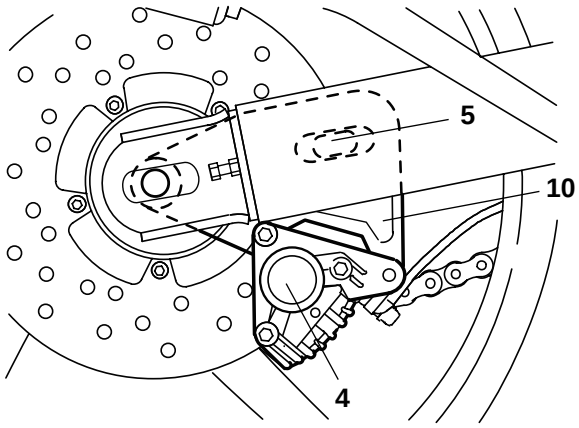
Avoid inserting the fingers between the drive chain and the rear sprocket.
Shift the wheel forward and fit drive chain (7) on rear sprocket (8).



⚠ CAUTION

Danger of personal injury.
Avoid inserting the fingers to align the holes.
Shift the wheel backwards until the central hole is aligned with the holes in the swing arm.
Rotate support plate (3) complete with brake caliper (4), with the fulcrum on stop peg (5), until it is aligned with the holes.

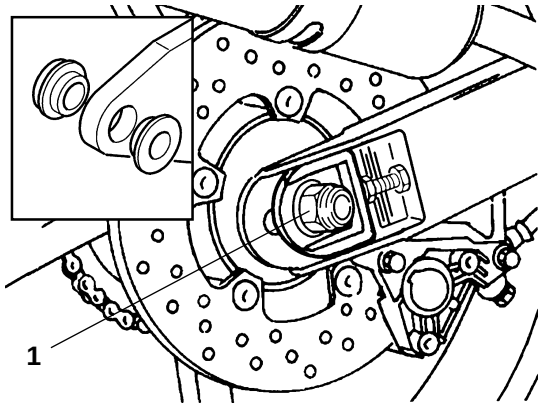
Fit the left (10) and right (9) chain tensioners in their respective seats in the swing arm.
Apply a small quantity of grease over wheel spindle (11), taking care to spread it evenly.
Fully insert wheel spindle (11) from the left side.
IMPORTANT Ensure that wheel spindle (11) is fully inserted with the head in the specially designed seat in left chain tensioner (10).
Fit the washer and manually tighten nut (12).
Check the tension of the drive chain (DRIVE CHAIN).



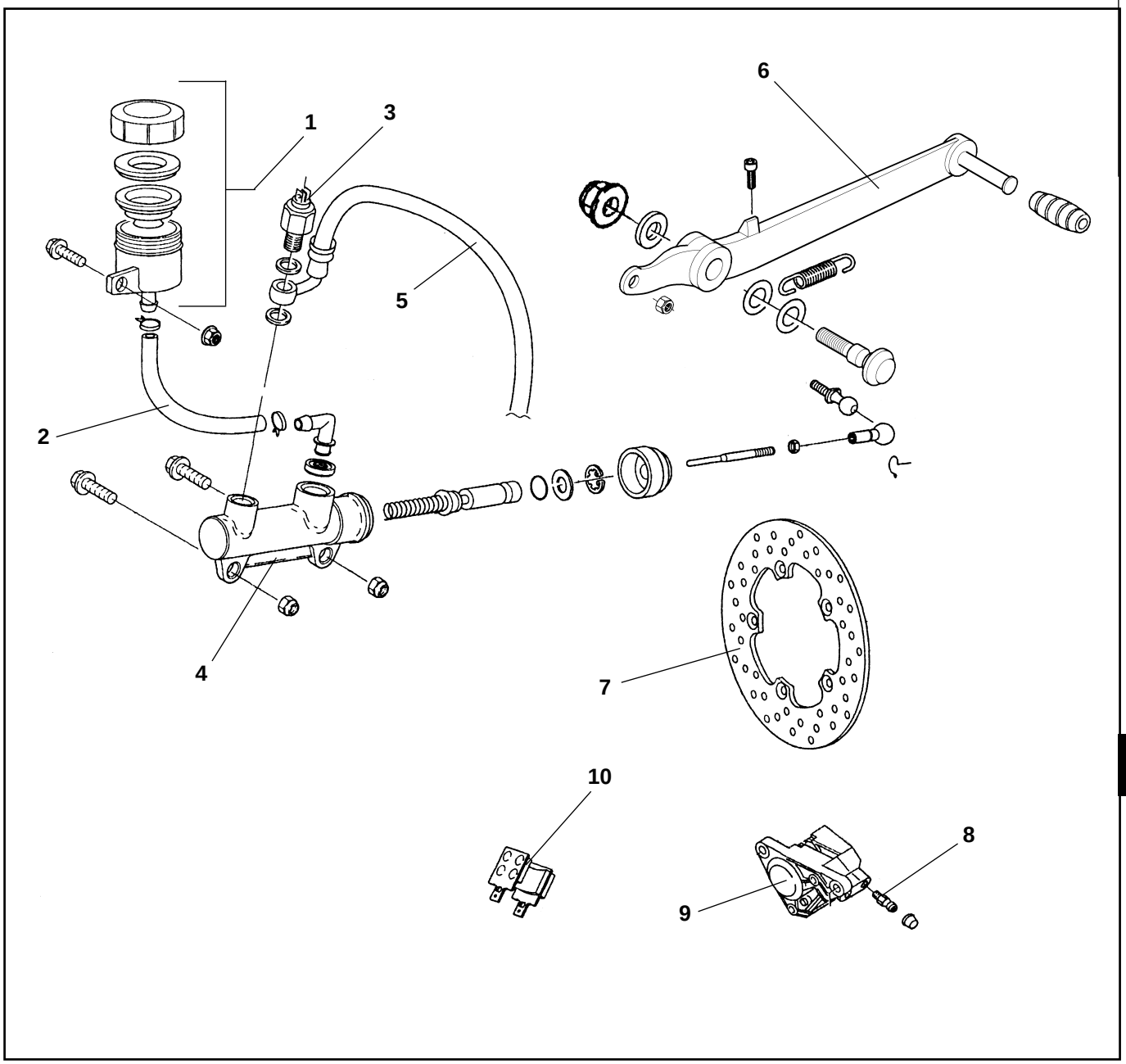
Tighten nut (1).
Tightening torque for nut (1):
80 Nm (8 kgm) [59 ft-lb]

⚠ CAUTION

After reinstalling the wheel, repeatedly actuate the rear brake lever and check the operation of the braking system.
Check the alignment of the wheel.



REAR BRAKE

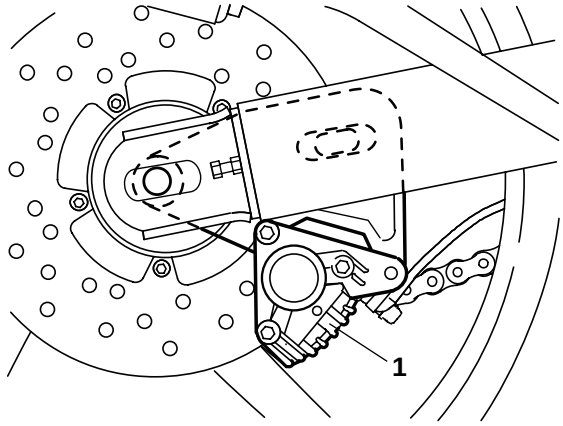


Key

1) Brake fluid reservoir
2) Brake fluid line from reservoir to pump
3) Stoplight switch
4) Brake pump
5) Brake fluid line from pump to caliper
6) Rear brake lever
7) Brake disc
8) Bleeder valve
9) Brake caliper
10) Brake pads

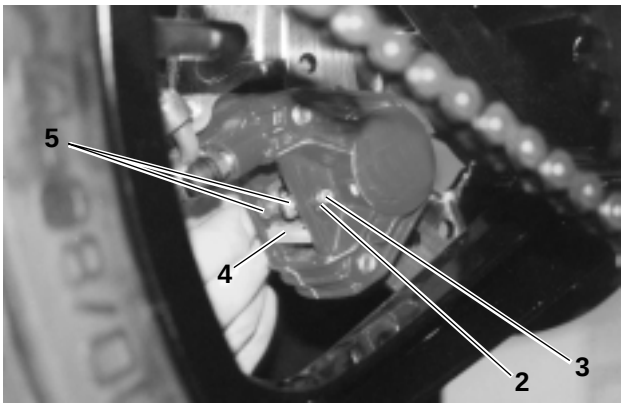
REPLACING THE REAR BRAKE PADS

Read through the section PRECAUTIONS AND GENERAL INFORMATION and the paragraph CHECKING THE WEAR OF THE BRAKE PADS.
Place the vehicle on the stand.
Remove brake caliper cover (1).



⚠ WARNING

Before removing pin (3), check the position of safety spring (4). When refitted, it must be replaced in the same position, with the arrow stamped on its back facing downwards.
Remove circlip (2).
Extract pin (3) and collect safety spring (4).
Pull out the two brake pads (5).



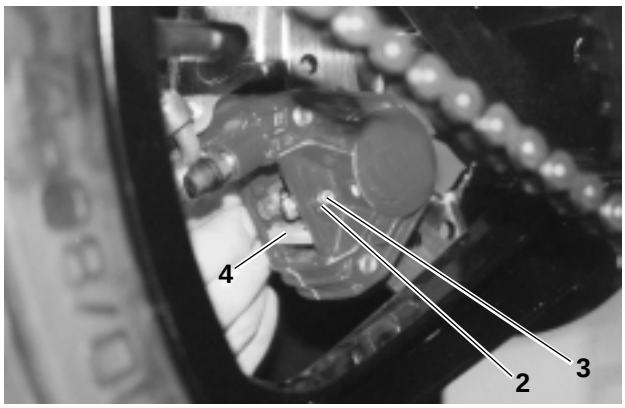
⚠ WARNING

Do not operate the brake lever after removing the pads, as the brake caliper pistons may come out of their seats and cause a brake fluid leak.
Fit two new pads taking care to align their holes with the holes in the caliper.

⚠ WARNING

Always replace both pads and ensure that they are properly positioned inside the caliper.

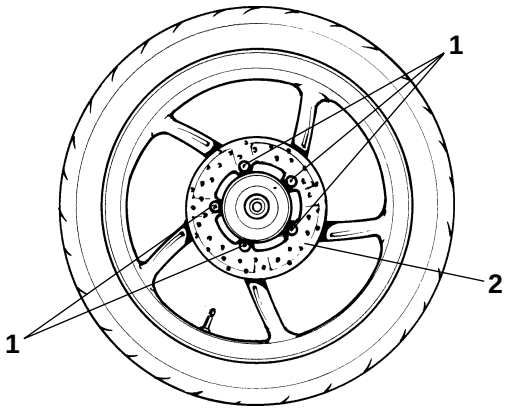
Fit safety spring (4).
While pressing the central portion of spring (4), insert pin (3) so that it passes over the spring.
Fit circlip (2).
Fit brake caliper cover (1).
Check the brake fluid level (CHECKING AND RESTORING THE REAR BRAKE FLUID LEVEL).



REMOVING THE REAR BRAKE DISC

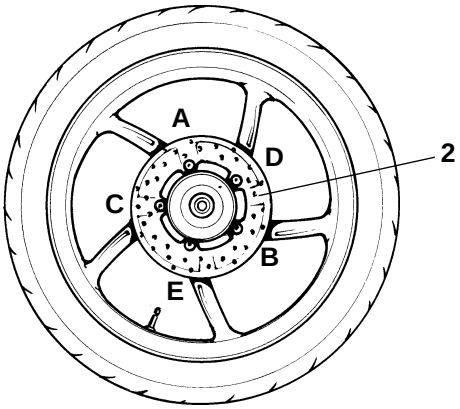
Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove the rear wheel (REMOVING THE REAR WHEEL ASSEMBLY).
IMPORTANT To remove screws (1), it is advisable to use an air driver gun, which is capable of giving the screws a sharp blow, allowing them to be released from the LOCTITE®.

Unscrew and remove the five brake disc screws (1).



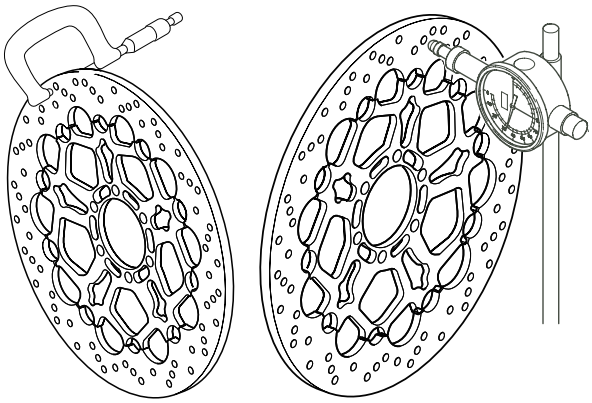
⚠ WARNING

When refitting, apply LOCTITE(r) over the threads of the brake disc screws.
IMPORTANT When refitting, turn in all screws (1) manually, and then tighten them diagonally in the following order: A-B-C-D-E.
Remove brake disc (2).



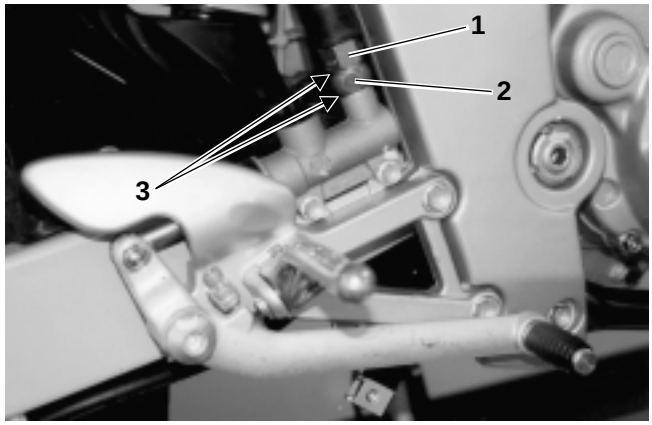
CHECKING THE BRAKE DISC

IMPORTANT The following operations must be performed when the disc brake is fitted on the wheel.
Check the wear of the disc by measuring its minimum thickness at several points with a micrometer.
If the minimum thickness at any point is less than the prescribed limit, replace the disc (REMOVING THE BRAKE DISC).
Minimum allowable disc thickness: 3.5 mm (0.1 in).



REMOVING THE REAR BRAKE PUMP

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the stand.
Air-bleed the braking system as described in the paragraph (RENEWING THE REAR BRAKE FLUID).
Once the brake fluid has completely drained, unscrew and remove stoplight switch (1), shift pipe (2) and collect sealing washers (3).

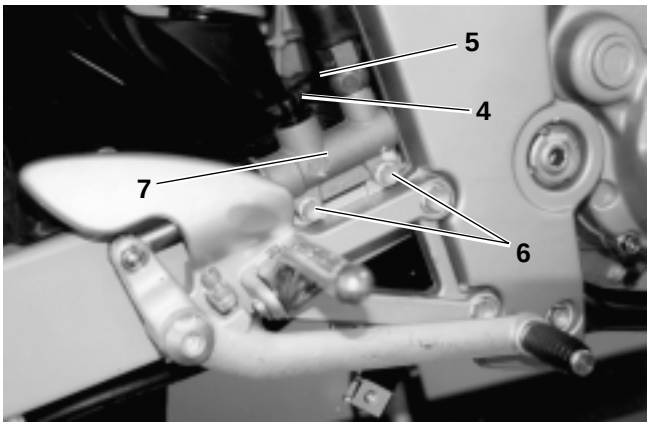


Loosen and shift hose clamp (4).
Remove pipe (5) and the two screws (6).

Tightening torque for screws (6):
10 Nm (1.0 kgm) [7.4 ft-lb]

Remove pump (7) by pulling it forward.

IMPORTANT When refitting the pump, restore the brake fluid level (CHECKING AND RESTORING THE REAR BRAKE FLUID LEVEL) and air-bleed the braking system (AIR-BLEEDING THE BRAKING SYSTEMS).



REMOVING THE REAR SUSPENSION

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove the rear mudguard (REMOVING THE REAR MUDGUARD).
Remove the saddle support covers (REMOVING THE SADDLE SUPPORT COVERS).

⚠ WARNING

Place a support of suitable thickness between the rear wheel and the lower part of the subframe.

Loosen and remove nut (1) and partly push out screw (2).

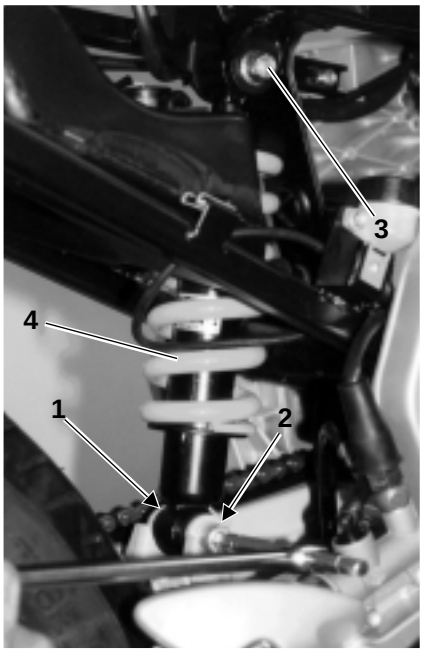
Tightening torque for nut (1):
48 Nm (4.8 kgm) [35.4 ft-lb]

Remove screw (2) and pull the rear suspension forwards. Collect the related washer.
Remove the support from between the rear wheel and the lower part of the subframe so that the wheel can rest on the subframe itself.

Loosen and remove nut (3) and partly push out screw (2).

Tightening torque for screw (2):
48 Nm (4.8 kgm) [35.4 ft-lb]

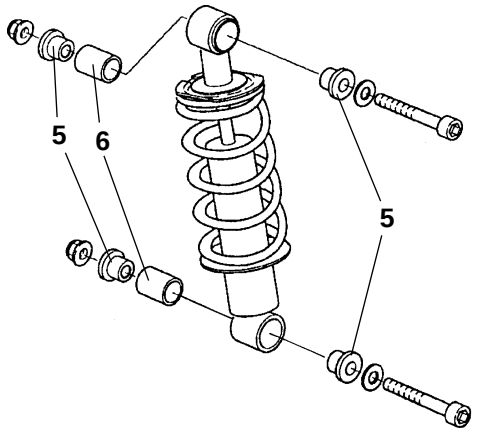
Remove screw (2) and collect the related washer.
Grip suspension (4) and remove it from under the vehicle.



Remove the four T bushes (5) and the two Silentblocs (6).

IMPORTANT Wash all the components with a clean detergent.

Check the components (CHECKING THE SUSPENSION COMPONENTS).



CHECKING THE SUSPENSION COMPONENTS

⚠ WARNING

Ensure that no components are visibly distorted, broken, cracked and/or dented. Replace any damaged components.

GASKETS

Check the condition of the gaskets. If they are damaged or worn out, replace them.

SHOCK ABSORBER

Ensure that the spring has not yielded and that the shock absorber excursion is smooth and gradual.
Check that no oil is leaking from the rod.
If necessary replace the shock absorber.

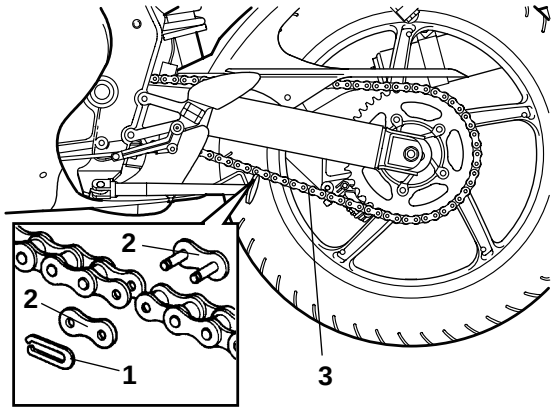
REMOVING THE DRIVE CHAIN

Carefully read the PERIODIC MAINTENANCE SCHEDULE and the section PRECAUTIONS AND GENERAL INFORMATION.
Place the vehicle on the rear stand OPT (PLACING THE VEHICLE ON THE REAR STAND OPT).
Rear stand: 8705021.

⚠ CAUTION

Before removing the drive chain, ensure that the gears are in neutral. Mind your hands!

Using a wedge (e.g. the blade of a screwdriver), remove clip (1) from the joining link.
Collect joining link (2).
Remove drive chain (3) towards the rear of the vehicle.



⚠ WARNING

When refitting drive chain (3), ensure that joining link clip (1) is fitted with the open end facing away from the direction of motion (see figure).

⚠ WARNING

An excessive slackening of the chain can cause it to come off of the sprockets, which often results in accidents or serious damage to the vehicle. Periodically check the slack and adjust it if necessary, see (ADJUSTMENT).

⚠ CAUTION

Incorrect maintenance may cause the untimely wear of the chain and/or damages to the pinion and/or the crown.
Carry out the maintenance operations more frequently if you use the vehicle in difficult conditions or on dusty and/or muddy roads.

REMOVING THE SWING ARM

Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove the side fairings (REMOVING THE SIDE FAIRINGS).
Remove the lower fairing tip (REMOVING THE LOWER FAIRING).
Remove the exhaust silencer (REMOVING THE EXHAUST SILENCER AND THE EXHAUST TERMINAL).

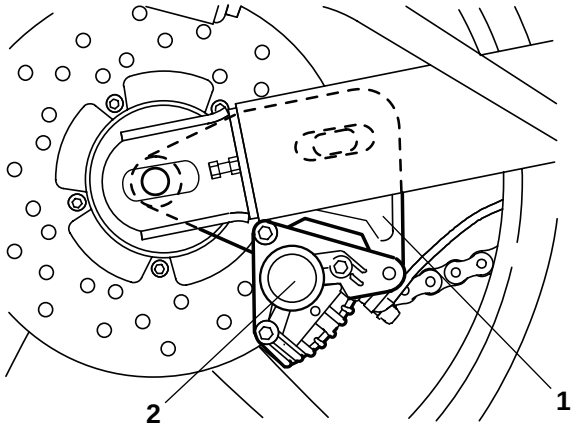
⚠ CAUTION

Place a support of suitable height and hardness under the engine cradle so as to ensure that the vehicle remains steady while removing and refitting the swing arm.
Exercise extreme caution during the removal.

Remove the drive chain (REMOVING THE DRIVE CHAIN).
Remove the rear wheel (REMOVING THE REAR WHEEL ASSEMBLY).
Remove caliper fixing plate (1) complete with rear brake caliper (2), taking care not to detach the pipe connections.

⚠ WARNING

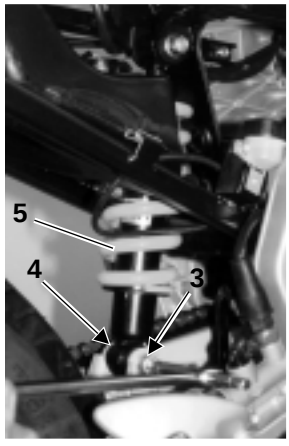
Do not operate the rear brake lever after removing the caliper, otherwise the piston may come out of its seat and cause a brake fluid leak.



Loosen and remove nut (3) and partly push out screw (4).

Tightening torque for nut (3):
48 Nm (4.8 kgm) [35.4 ft-lb]

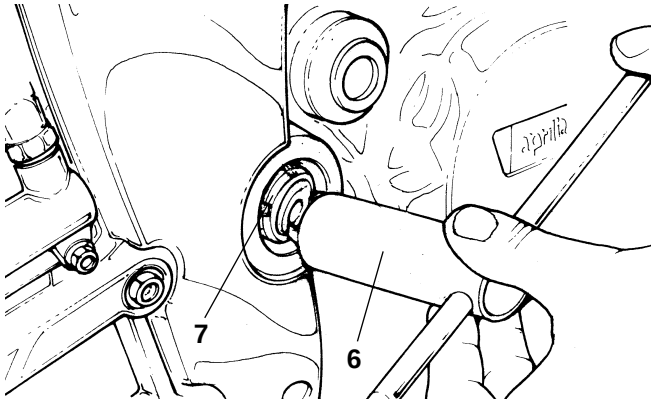
Remove screw (4) and then remove rear suspension (5) by moving it forwards.



IMPORTANT Have the specially designed tool OPT ready (swing arm pivot adjusting bush spanner).

Using bush spanner OPT (6) loosen and remove lock ring (7).

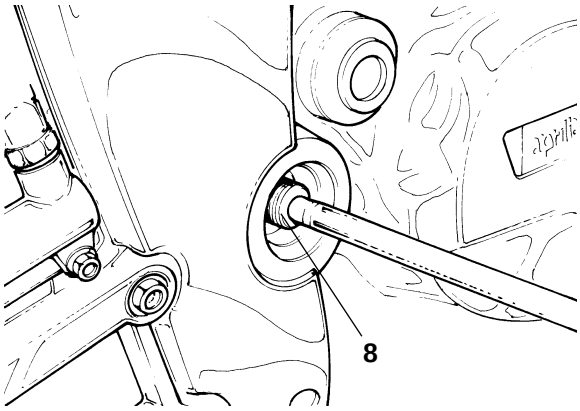
Swing arm pivot adjusting bush spanner: 8101945



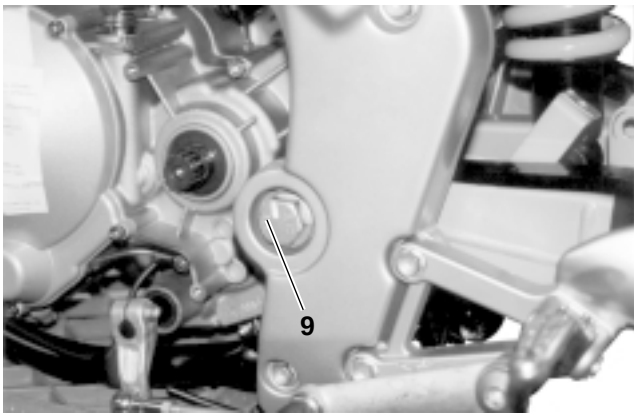
⚠ WARNING

Owing to the weight of the rear end, the following operations require the presence of a second operator.
The procedure should be agreed upon beforehand.
Exercise extreme caution during the removal.
Support the front end of the swing arm to prevent it from accidentally falling.

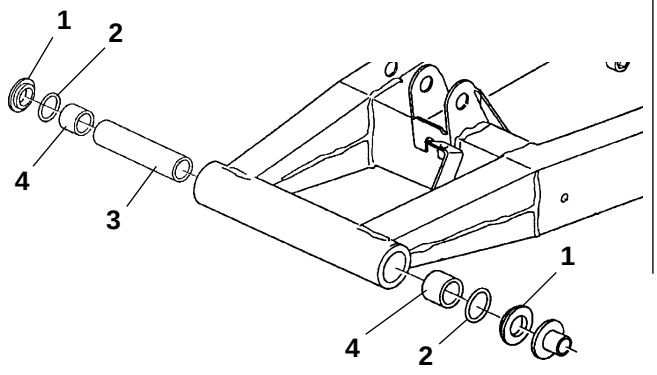
Working on the right side of the vehicle, turn adjusting bush (8) clockwise and loosen it completely.



While supporting the front end of the swing arm, pull out swing arm pivot (9) from the left side.
Remove the swing arm assembly from the rear, and collect pivot (9) and the two washers.
Using a drift of suitable diameter, remove bush (8) on the left side of the vehicle.
If necessary remove the chain guide shoe (REMOVING THE CHAIN GUIDE SHOE).



DISASSEMBLING THE SWING ARM



Read through the section PRECAUTIONS AND GENERAL INFORMATION.
Remove bushes (1).
Remove O-rings (2).

⚠ WARNING

When reassembling, fit two new O-rings (2).
Remove inner spacer (3).

Using a drift of suitable diameter, remove inner bushes (4).

IMPORTANT Wash all components with a clean detergent.

⚠ WARNING

To refit inner bushes (4), use a drift of suitable diameter.

CHECKING COMPONENTS

⚠ WARNING

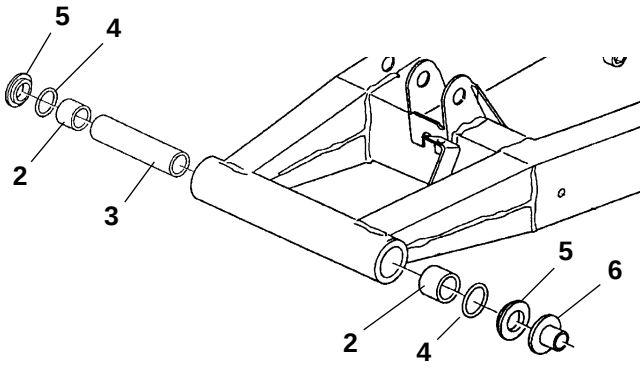
Ensure that no components are visibly distorted, broken, cracked and/or dented.

GASKETS

Check the condition of the gaskets. If they are damaged or worn out, replace them.

REASSEMBLING THE SWING ARM

Read though the section PRECAUTIONS AND GENERAL INFORMATION.
Apply a film of lubricating grease throughout the length of swing arm pivot (1) (TABLE OF LUBRICANTS).
Using a drift of suitable diameter, drive home inner bushes (2).

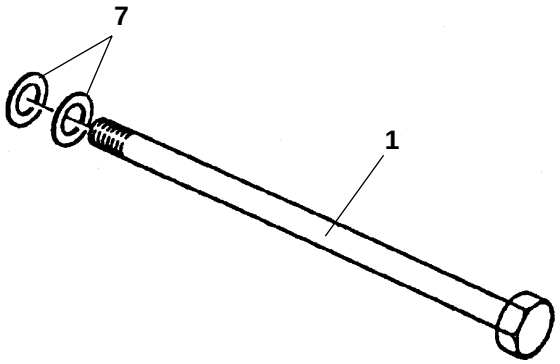


Fit inner spacer (3).
Fit two new seal rings (O-rings) (4).
Finally fit bushes (5) to keep the internal components in place.
Fit bush (6) in the left side of the frame and push it fully home.

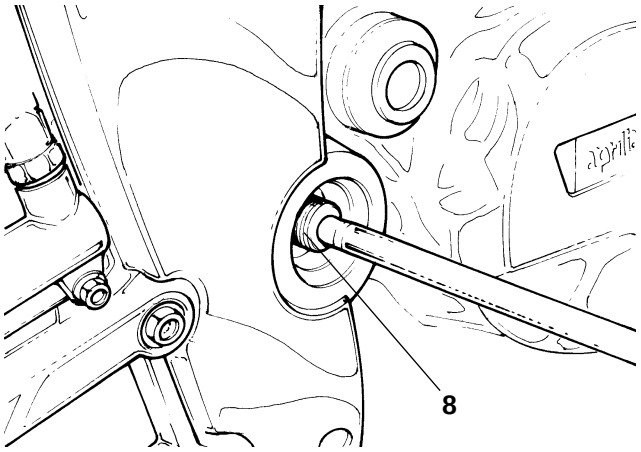
Fit the two washers (7) on pivot (1).

⚠ WARNING

Owing to the weight of the rear end, the following operations require the presence of a second operator.
The procedure should be agreed upon beforehand.



Support the swing arm and bring it into position so that the holes are aligned.
Insert adjusting bush (8) and push it in until it comes into contact with the swing arm.
While still supporting the swing arm, insert pivot assembly (1).

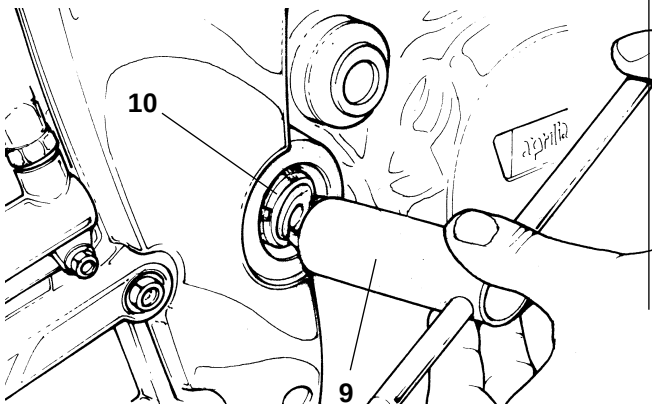


IMPORTANT Have the specially designed tool OPT (9) ready (swing arm pivot adjusting bush spanner).

Swing arm pivot adjusting bush spanner: 8101945.

Fit and manually tighten adjusting ring (10) using tool (9).

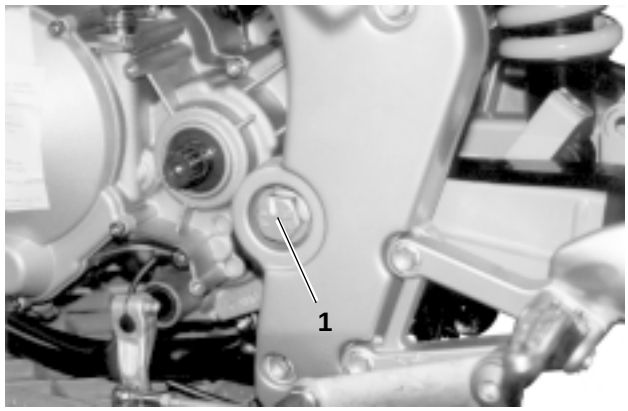
IMPORTANT The flat side of adjusting ring (10) must be in contact with the frame.



Firmly tighten pivot (1).
Tightening torque for pivot (1):
70 Nm (7.0 kgm) [5.2 ft-lb]

⚠ WARNING

From this point onwards the reinstallation of the swing arm must be carried out by following the removing procedure in reverse order (REMOVING THE SWING ARM).



7

NOTES

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