

1288 5 00/2005-11



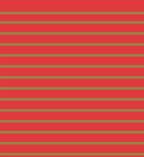
RISO



UK



workshop manual



Cod. 8140904

INTRODUCTION



SUMMARY

0.1. INTRODUCTION 3
0.1.1. FOREWORD 3
0.1.2. REFERENCE MANUALS 4
0.1.3. ABBREVIATIONS/SYMBOLS/CONVENTIONS 5



0.1. INTRODUCTION

0.1.1. FOREWORD

This manual provides the information required for normal servicing.

This publication is intended for use by **Moto Guzzi** Dealers and their qualified mechanics; many concepts have been omitted on purpose as their inclusion would be superfluous. Since complete mechanical explanations have not been included in this manual, the reader must be familiar with basic notions of mechanics, as well as with basic repair procedures. Without such familiarity, repairs and checks could be ineffective and even hazardous. Since the repair and vehicle check instructions are not exhaustive, special care must be taken to avoid damage and injury. **Moto Guzzi s.p.a.** undertakes to constantly improve the design of its products and their literature to ensure that the customer is satisfied of the product. The main technical modifications and changes in repair procedures are communicated to all **Moto Guzzi** dealers and agencies world-wide. Such modifications will be entered in subsequent editions of the manual. Should you need assistance or clarifications about the inspection and repair procedures, please contact the **Moto Guzzi** SERVICE DEPT., they will be glad to give you any information on the matter, or supply you with any detail on updates and technical changes applied to the vehicle.

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

All rights of storage using electronic means, reproduction and total or partial adaptation, whatever the means adopted, are reserved in all countries.

Third parties' products are only mentioned for information purposes, and constitute no engagement.

Moto Guzzi s.p.a. is not liable in any way for the performance or use of these products.

For further details, see (REFERENCE MANUALS).

First edition: November 2005

Produced and printed by:

VALLEY FORGE DECA

Ravenna, Modena, Torino

DECA s.r.l.

Legal and Administrative headquarters

Via Vincenzo Giardini, 11

48022 Lugo (RA) - Italy -

Tel. 0545 - -216611

Fax 0545 - -216610

E-mail: deca@vftis.spx.com

www.vftis.com

DECA s.r.l.

via Vincenzo Giardini, 11 - 48022 Lugo (RA) - Italy

Tel. +39 - 0545 216611

Fax +39 - 0545 216610

E-mail: deca@vftis.spx.com

www.vftis.com

On behalf of:

Moto Guzzi s.p.a.

via E.V. Parodi, 57- 23826 Mandello del Lario (Lecco) - Italy

Tel. +39 - 0341 - 709111

Fax +39 - 0341 - 709220

www.motoguzzi.it

www.servicemotoguzzi.com

0.1.2. REFERENCE MANUALS

PARTS CATALOGUES

guzzi part# (description)	I	F	D	M	E	UK	USA
GU078_00							

OWNER'S MANUALS

guzzi part# (description)	I	F	D	M	E	UK	USA
06.90.00.00							
06.90.00.01							

CHASSIS WORKSHOP MANUAL

guzzi part# (description)	I	F	D	M	E	UK	USA
8140900							
8140901							
8140902							
8140903							
8140904							
8140905							
8CM0095							
8CM0096							

ENGINE WORKSHOP MANUAL

guzzi part# (description)	I	F	D	M	E	UK	USA
8CM0093							
8CM0094							



0.1.3. ABBREVIATIONS/SYMBOLS/CONVENTIONS

#	= number
<	= less than
>	= greater than
≤	= less than or equal to
≥	= greater than or equal to
~	= approximately
∞	= infinity
°C	= degrees Celsius (centigrade)
°F	= degrees Fahrenheit
±	= plus or minus
A.C.	= alternating current
A	= Ampere
Ah	= Ampere per hour
API	= American Petroleum Institute
AT	= high voltage
AV/DC	= Anti-Vibration Double Countershaft
bar	= pressure measurement (1 bar = 100 kPa)
D.C.	= direct current
cc	= cubic centimetres
CO	= carbon monoxide
CPU	= Central Processing Unit
DIN	= German industrial standards (Deutsche Industrie Norm)
DOHC	= Double Overhead Camshaft
ECU	= Electronic Control Unit
rpm	= revolutions per minute
HC	= unburnt hydrocarbons
ISC	= Idle Speed Control
ISO	= International Standardization Organization
kg	= kilograms
kgm	= kilogram metre (1 kgm = 10 Nm)
km	= kilometres
km/h	= kilometres per hour
kΩ	= kilo Ohm
kPa	= kiloPascal (1 kPa = 0.01 bar)
KS	= clutch side (from the German "Kupplungsseite")
kW	= kilowatt
l	= litres
LAP	= racetrack lap
LED	= Light Emitting Diode
LEFT SIDE	= left-hand side
m/s	= metres per second
max	= maximum
mbar	= millibar (1 mbar = 0.1 kPa)
mi	= miles
MIN	= minimum
MPH	= miles per hour
MS	= flywheel side (from the German "Magnetoseite")
MΩ	= MegaOhm
N.A.	= Not Available
N.O.M.M.	= Motor Octane Number
N.O.R.M.	= Research Octane Number
Nm	= Newton metre (1 Nm = 0.1 kgm)
Ω	= ohm
PICK-UP	= pick-up
BDC	= Bottom Dead Centre
TDC	= Top Dead Centre
PPC	= Pneumatic Power Clutch
RIGHT SIDE	= right-hand side
SAE	= Society of Automotive Engineers
SAS	= Secondary Air System

TEST	= diagnostic check
T.B.E.I.	= crown-head Allen screw
T.C.E.I.	= cheese-head Allen screw
T.E.	= hexagonal head
T.P.	= flat head screw
TSI	= Twin Spark Ignition
UPSIDE- DOWN	= inverted fork
V	= Volt
W	= Watt
Ø	= diameter

GENERAL INFORMATION

1



SUMMARY

1.1 STRUCTURE OF THE MANUAL 3
1.1.1 CONVENTIONS USED IN THE MANUAL 3
1.1.2 SAFETY WARNINGS 4
1.2 GENERAL RULES 5
1.2.1 BASIC SAFETY RULES 5
1.3 DANGEROUS ELEMENTS 8
1.3.1 WARNINGS 8
1.4 RUNNING-IN 11
1.4.1 RUNNING-IN 11
1.5 POSITION OF THE SERIAL NUMBERS 12
1.5.1 POSITION OF THE SERIAL NUMBERS 12



1.1 STRUCTURE OF THE MANUAL

1.1.1 CONVENTIONS USED IN THE MANUAL

- This manual is divided in sections and subsections, each covering a set of the most significant components. For quick reference, see the summary of sections.
- Unless expressly specified otherwise, assemblies are reassembled by reversing the assembly procedure.
- The terms "left" and "right" are referred to the motorcycle when viewed from the riding position.
- Motorcycle operation and basic maintenance are covered in the "OWNER'S MANUAL".

In this manual any variants are identified with these symbols:

-  optional
-  catalytic version
- all versions
- MP national certification
- SF European certification (EURO 1 limits)

VERSION:

 Italy	 Greece	 Malaysia
 United Kingdom	 Holland	 Chile
 Austria	 Switzerland	 Croatia
 Portugal	 Denmark	 Australia
 Finland	 Japan	 United States of America
 Belgium	 Singapore	 Brazil
 Germany	 Slovenia	 South Africa
 France	 Israel	 New Zealand
 Spain	 South Korea	 Canada

1.1.2 SAFETY WARNINGS

The symbols and warnings used throughout this manual have the following meanings:



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



DANGER

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



WARNING

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

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

1.2 GENERAL RULES

1.2.1 BASIC SAFETY RULES

CARBON MONOXIDE

When an operation must be performed with the engine running, position the motorcycle outdoors in a well-ventilated area.

Never run the engine in an enclosed place.

Use an exhaust emission extraction system when working indoors.



DANGER

Exhaust gases contain carbon monoxide, a poisonous gas which, if inhaled, may cause loss of consciousness or even death.

FUEL



DANGER

The fuel used to operate engines is highly flammable and becomes explosive under particular conditions.

Refuelling and maintenance operations should be carried out in a well-ventilated area, with the engine off.

Do not smoke when refuelling or in the proximity of sources of fuel vapours. Avoid contact with bare flames, sources of sparks and any other source which may ignite fuel or lead to explosion.

DO NOT DISPOSE OF FUEL IN THE ENVIRONMENT.

KEEP AWAY FROM CHILDREN.

HOT COMPONENT PARTS

The engine and exhaust component parts become hot when the engine is running and will stay hot for some time after the engine has been stopped.

Wear insulating gloves before handling these components or allow for the engine and the exhaust system to cool down before proceeding.

USED GEARBOX AND FORK FLUIDS



DANGER

Wear latex gloves when servicing.

Prolonged or repeated contact with gear fluid may cause severe skin damage.

Wash your hands thoroughly after handling.

Dispose of it through the nearest waste oil reclamation firm or through the supplier.

Wear latex gloves when servicing.

DO NOT DISPOSE OF FLUID IN THE ENVIRONMENT.

KEEP AWAY FROM CHILDREN.

BRAKE FLUID



WARNING

Brake fluid can damage plastic, rubber or painted parts. When servicing the brake system, protect all such parts with a clean cloth.

Always wear safety glasses when servicing the brake system.

Brake fluid is highly irritant. Avoid contact with the eyes.

In case of contact with the eyes, rinse thoroughly with cool, clean water and immediately seek medical attention.

KEEP AWAY FROM CHILDREN.

HYDROGEN GAS AND BATTERY ELECTROLYTE

**DANGER**

The battery electrolyte is a toxic, caustic substance containing sulphuric acid and thus able to cause severe burns in case of contact.

Wear close-fitting gloves and protective clothing when handling this fluid.

In case of contact with the skin, rinse thoroughly with fresh water.

Always use eye protection as even a very small amount of the battery fluid can cause blindness. If battery fluid comes in contact with the eyes, flush thoroughly with water for fifteen minutes and contact an eye specialist immediately.

If battery fluid is swallowed accidentally, drink plenty of water or milk. Seek medical attention immediately and keep drinking milk of magnesia or vegetable oil in the meantime.

The battery gives off explosive gases. Keep the battery well away from any sources of ignition, such as flames, sparks, or any heat sources; do not smoke near the battery.

Make sure the area is well ventilated when servicing or refilling the battery.

KEEP AWAY FROM CHILDREN.

Battery fluid is corrosive.

Avoid spillage. Take special care not to spill battery fluid on plastic parts.

Make sure that the electrolyte fluid you are using is the suitable type for your battery.

GENERAL PRECAUTIONS AND INFORMATION

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

**DANGER**

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

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

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

Never use fuel instead of solvent to clean the motorcycle.

Do not clean rubber or plastic parts or the seat with alcohol, petrol or solvents. Use only water and mild soap.

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

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

For further warnings, see DANGEROUS ELEMENTS

BEFORE DISASSEMBLING ANY COMPONENTS

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

DISASSEMBLING THE COMPONENTS

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

REASSEMBLING THE COMPONENTS**DANGER**

Never reuse a circlip or snap ring. These parts must always be replaced with new ones once they have been removed.

When fitting a new circlip or snap ring, open the ends just enough to allow fitting to the shaft.

Make a rule to check that a newly fitted circlip or snap ring is fully housed in its groove.

Never use compressed air to clean bearings.

NOTE All bearings must run freely with no hardness or noise. Replace any bearings that do not meet these requirements.

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

ELECTRICAL CONNECTORS

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

Press the special safety hooks, where fitted.

**WARNING**

Never separate two connectors by pulling on the wiring.

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

NOTE A connector will fit properly only in the matching connector and when inserted in the correct fitting position.

- Reconnect the two connectors. Ensure that they are correctly coupled (if fitted with hooks, they should click audibly into place).

TIGHTENING TORQUES**DANGER**

Always remember that the tightening torques of all wheel, brake, wheel shaft and other suspension parts are essential to ensuring safe operation of the motorcycle and must be set to the indicated values. Ensure that these values are always within the specified limits.

Regularly check the tightening torques on all fastenings, and always use a torque wrench when fitting them.

Failure to observe these instructions can result in parts loosening or coming away, thus jamming a wheel or creating other problems which would affect the handling of the motorcycle, potentially resulting in serious injury or death.

1.3 DANGEROUS ELEMENTS

1.3.1 WARNINGS

FUEL

**DANGER**

The fuel used to operate engines is highly flammable and becomes explosive under particular conditions.

Refuelling and maintenance operations should be carried out in a well-ventilated area, with the engine off.

Do not smoke when refuelling or in the proximity of sources of fuel vapours. Avoid contact with bare flames, sources of sparks or any other source which may ignite the fuel or lead to explosion.

Take care not to spill fuel out of the filler, as it may ignite when in contact with hot engine parts.

In the event of accidental fuel spillage, ensure that the affected area is fully dry before starting the engine. Fuel expands from heat and when left under direct sunlight.

Never fill the fuel tank up to the rim. Tighten the filler cap securely after each refuelling.

Avoid contact with the skin. Do not inhale vapours. Do not swallow fuel. Do not transfer fuel between different containers using a hose.

DO NOT DISPOSE OF FUEL IN THE ENVIRONMENT.

KEEP AWAY FROM CHILDREN.

Use only premium grade unleaded petrol, min. O.N. 95 (RON) and 85 (MON).

LUBRICANTS

**DANGER**

Correct lubrication is essential to the safety of the motorcycle.

Failure to maintain the lubricant level or the use of incorrect, old or dirty lubricant can cause the engine or transmission to seize, resulting in accident, serious injury or death.

Prolonged or repeated contact with gear fluid may cause severe skin damage.

Wash your hands thoroughly after use.

Do not dispose of oil in the environment.

For disposal, contact the nearest waste oil reclamation firm or the supplier.

**WARNING**

Avoid spillage when filling the vehicle with oil. Immediately clean up any spilt oil, as it can damage painted parts.

Oil on the tyres can make them very slippery and dangerous to use.

In case of leaks, do not use the motorcycle. Identify the cause of the leak and repair it.

ENGINE OIL

**DANGER**

Prolonged or repeated contact with engine oil may cause severe skin damage.

Wash your hands thoroughly after handling.

Do not dispose of oil in the environment.

For disposal, contact the nearest waste oil reclamation firm or the supplier.

Wear latex gloves when servicing.

FRONT FORK FLUID

**DANGER**

Front suspension response can be modified to a certain extent by changing damping settings and/or selecting a particular grade of oil. Standard oil viscosity: SAE 20 W. Choose suitable oil grades according to the desired set-up (choose SAE 5W for a softer suspension, 20W for a stiffer suspension).

The two grades can also be mixed in varying solutions to obtain the desired response.

BRAKE FLUID

NOTE This vehicle is fitted with front and rear disc brakes. Each brake system is operated by an independent hydraulic circuit. The information provided below applies to both brake systems.

**DANGER**

Do not drive the vehicle if the brakes are worn or not operating correctly. The brakes are the vehicle's most important safety component and using the vehicle with the brakes in less than perfect operating condition comprises a high probability of traffic accident, which can result in serious injury or death. The brakes are significantly less effective on a wet road surface.

**DANGER**

If the road surface is wet, maintain a double braking distance, as both the brakes and the grip of the tyres are significantly less effective in such conditions.

Water on brakes, whether due to a recent wash or picked up from a wet road surface, puddles or drains, can result in significantly reduced brake efficiency.

Failure to observe these instructions can result in serious accidents, with the risk of serious personal injury or death.

The brakes are essential to your safety. Do not drive the vehicle if the brakes are not in perfect operating condition.

Always check the brakes before riding the motorcycle.

Brake fluid is an irritant. Avoid contact with the eyes or skin.

In the event of accidental contact, wash affected body parts thoroughly. In the event of accidental contact with the eyes, contact an eye specialist or seek medical attention.

DO NOT DISPOSE OF BRAKE FLUID IN THE ENVIRONMENT.

KEEP AWAY FROM CHILDREN.

Avoid spillage. Brake fluid can damage plastic or painted parts.

**DANGER**

Do not use brake fluids other than the specified type. Never mix different types of fluids to top up the level, as this will damage the brake system.

Do not use brake fluid from containers which have been kept open or in storage for long periods of time.

Any sudden changes in slack or hardness in the brake levers are warning signs of problems with the hydraulic circuits.

Make sure that the brake discs and brake linings have not come in contact with oil or grease. This is particularly important after servicing or inspections.

Make sure the brake lines are not twisted or worn.

Avoid accidental entry of water or dust into the circuit.

Wear latex gloves when servicing the hydraulic circuit.

DISC BRAKES**DANGER**

The brakes are the vehicle's most important safety component

To ensure your personal safety, they must be in perfect working order and should be checked before every ride.

A dirty disc soils the pads.

Dirty pads must be replaced. Dirty or oily discs must be cleaned with a high-quality degreasing product.

If the vehicle is often used on wet road surfaces or on dusty or rough tracks, or if used in competition, reduce the service intervals by half.

Check brake pads for wear.

When the brake pads are worn, the fluid level lowers to compensate for the wear.

The front brake fluid reservoir is on the right-hand side of the handlebar, next to the front brake lever.

The rear brake fluid reservoir is located under the right-hand side fairing.

Do not use the vehicle if the brake system leaks fluid.

TYRES

**WARNING**

An over-inflated tyre results in a hard, uncomfortable and less secure ride. Over inflation also affects grip, especially on curves and wet surfaces. An under-inflated tyre (insufficient pressure) can slip on the wheel rim, resulting in loss of control. Under inflation also affects grip and handling, as well as braking efficiency. Tyre changing and repair, and wheel servicing and balancing are delicate operations. They should be carried out using adequate tools and are best left to experienced mechanics. New tyres may be covered with a thin layer of protective coating which is slippery. Drive carefully for the first few kilometres (miles). Never use rubber treatment products on the tyres. In particular, do not allow the tyre to come in contact with liquid fuel, which rapidly deteriorates the tyre rubber. In case of contact with oil or fuel, do not clean but change the tyres.

**DANGER**

Some of the factory-assembled tyres of this vehicle are provided with wear indicators. There are various types of wear indicators. For more information on how to check the wear, contact your Dealer. Check wear visually and have the tyres replaced when they are worn. If a tyre deflates during a ride, do not attempt to continue the trip. Avoid sudden braking or steering manoeuvres, and do not decelerate abruptly. Slowly decelerate and move to the edge of the road braking with the engine until you come to a standstill. Failure to observe these instructions can result in accidents, with the risk of serious personal injury or death. Never use tube tyres on tubeless tyre rims, or vice versa.

1.4 RUNNING-IN

1.4.1 RUNNING-IN

Proper engine running in is essential to preserving engine life and performance over time.

Twisty roads and gradients are ideal for breaking in engine, suspension and brakes effectively.

Varying speed frequently is also recommended.

This will vary the amount of stress placed on vehicle components continuously, allowing engine parts to cool down when less stressed.

While it is important to put a certain amount of stress on engine components during the running-in period, it is equally important to spare the engine at this stage in the vehicle's life.



WARNING

Top acceleration performance is only obtained after covering the first 2000 km (1243 mi).

Follow these recommendations:

- Do not open the throttle completely when the engine is running at low speed, both during and after the running-in period.
- Until you have covered the first 100 km (62 mi), use the brakes gently and avoid harsh, prolonged braking. This will help the brake pads bed in properly against the brake disc.
- During the first 1000 km (621 mi), never exceed 5000 rpm (see table).



WARNING

After covering the first 1000 km (621 mi), perform the checks listed in the "After running-in" column (see REGULAR SERVICE INTERVALS CHART) to avoid personal injury to yourself or third persons, or vehicle damage.

- After the first 1000 km (621 mi) and until covering 2000 km (1243 mi), drive more briskly, varying speed and using maximum acceleration for just a few seconds, in order to ensure better component coupling; never exceed 6000 rpm (see table).
- After the first 2000 km (1243 mi) you may run the engine harder, however, without exceeding the maximum rpm allowed (7600 rpm).

Recommended maximum rpm	
Mileage km (mi)	rpm
0-1000 (621)	5000
1000-2000 (621-1243)	6000
Over 2000 (1243)	7600



1.5 POSITION OF THE SERIAL NUMBERS

1.5.1 POSITION OF THE SERIAL NUMBERS

These numbers are necessary for vehicle registration.

NOTE *Altering the vehicle's identification numbers is punishable by law with heavy fines and penalties. Altering the frame number voids the warranty.*

This number consists of figures and letters as shown in the example below.

ZGULP00005MXXXXXX

Key:

ZGU: WMI (World manufacture identifier) code;

LP: model;

000: version;

0: free digit

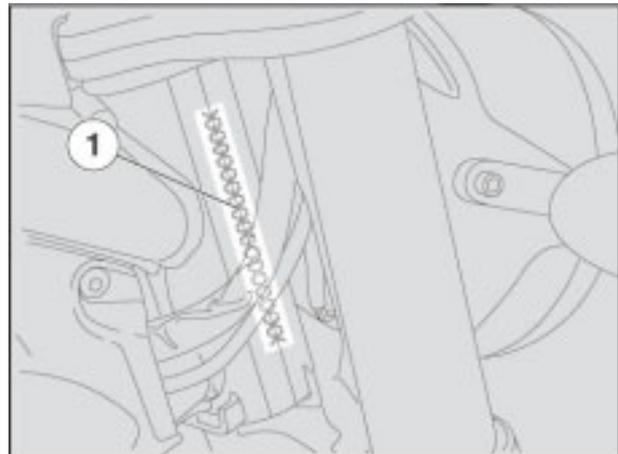
5 year of manufacture variable (5 = 2005)

M: manufacturing facility (M= Mandello del Lario);

XXXXXX: progressive number (6 digits);

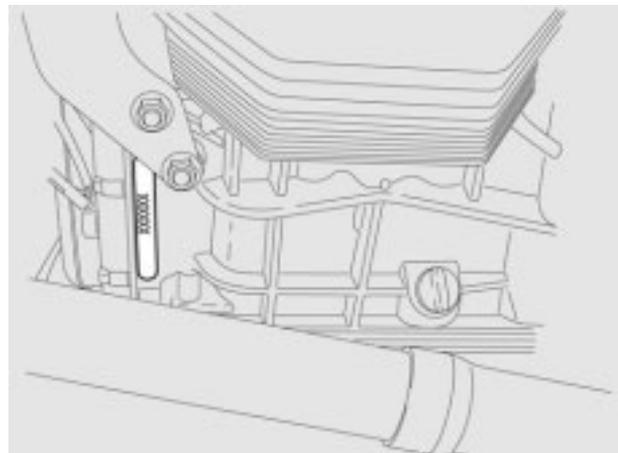
FRAME NUMBER

The frame number is stamped on the right-hand side of the headstock.



ENGINE NUMBER

The engine number is stamped on the left-side, near the engine oil level plug.



GENERAL TECHNICAL INFORMATION 2



SUMMARY

2.1	TECHNICAL INFORMATION.....	3
2.1.1	TECHNICAL DATA.....	3
2.1.2	SCHEDULED MAINTENANCE CHART	5
2.1.3	LUBRICANT TABLE	7
2.1.4	TIGHTENING TORQUE SETTINGS	8
2.1.5	SPECIAL TOOLS	12
2.1.6	ARRANGEMENT OF THE MAIN ELEMENTS.....	14
2.1.7	LOCATION OF INSTRUMENTS/CONTROLS.....	16
2.2	MAINTENANCE OPERATIONS	18
2.2.1	CHANGING ENGINE OIL AND OIL FILTER	18
2.2.2	TRANSMISSION OIL.....	20
2.2.3	GEARBOX FLUID.....	21
2.2.4	CLEANING THE AIR FILTER.....	22
2.2.5	ADJUSTING VALVE CLEARANCE	24
2.2.6	FRONT BRAKE	26
2.2.7	REAR BRAKE.....	28
2.2.8	GENERATOR BELT TENSIONING.....	31

2.1 TECHNICAL INFORMATION

2.1.1 TECHNICAL DATA

DIMENSIONS	
Max. length	2260 mm (88.98 in.)
Max. width	880 mm (34.64 in.)
Max. height	1070 mm (42.12 in.) (excluding the rear/view mirrors)
Seat height	800 mm (31.49 in.)
Wheelbase	1554 mm (61.18 in.)
Minimum ground clearance	185 mm (7.28 in.)
Weight in running order	240 kg (529.1 lb)
ENGINE	
Type	twin-cylinder, 90° V transversal, 4-stroke engine
Number of cylinders	two
Cylinder arrangement	V, 90°
Total displacement	1064 cu cm (65 cu in)
Bore/stroke	92 x 80 mm (3.6 x 3.1 in).
Compression ratio	9.6 : 1
Starting	electric
Engine idling speed	1100 ± 100 rpm
Clutch	dry, twin disc
Lubricating system	System under pressure, adjustment by valves and vane pump
Air filter	cartridge, dry
Cooling system	air cooled
TIMING SYSTEM	
Timing diagram:	2 valves, with rods and rocker arms
Values with inspection clearance between rocker arms and valve	intake 0.10 mm (0.0039 in.) exhaust 0.15 mm (0.0059 in.)
CAPACITIES	
Fuel (reserve included)	17.2 litres
Fuel reserve	3.3 litres
Engine oil	Engine oil and oil filter change 3600 cu. cm (219 cu in)
Gearbox fluid	500 cu cm (30.5 cu in)
Transmission fluid	380 cu cm (23.2 cu in)
Fork oil	520±2.5 cu cm (31.7 ± 1.5 cu in) (per leg)
Seats	2
Max. vehicle load	210 kg (462.97 lb) (rider + passenger + luggage)
TRANSMISSION SYSTEM	
primary drive	gear, ratio: 24/35 = 1:1.4583
gearbox	Mechanic, with 6 speeds, controlled by a pedal on engine left side
overall gear ratios:	
1st gear	17/38 = 1:2.2353
2nd gear	20/34 = 1:1.7
3rd gear	23/31 = 1:1.3478
4th gear	26/29 = 1:1.1154
5th gear	31/30 = 1:0.9677
6th gear	29/25 = 1:0.8621
final drive	with cardan joint
ratio	12/44 = 1:3.6667
FUEL SYSTEM	
Type	Electronic injection (Weber – Marelli) with stepper motor
Choke	Ø 36 mm (1.417 in.)
Fuel	Premium grade unleaded petrol, minimum octane rating 95 (RON) and 85 (MON).
FRAME	
Type	Tube, with double cradle in high-strength steel
Steering head angle	26°30'
Trail	108 mm (4.25 in.)

SUSPENSIONS	
Front	Hydraulic upside-down telescopic fork Ø 43 mm (1.69 in); spring preload, compression and rebound damping are adjustable.
Wheel travel	120 mm (4.72 in.)
Rear	single-sided with progressive linkage, monoshock with adjustable rebound and compression damping and spring preload
Wheel travel	110 mm (4.33 in.)
BRAKES	
Front	Twin stainless steel floating disc - Ø 320 mm (12.60 in), callipers with four separate opposed pistons
Rear	Stainless steel disc Ø 282 mm (11.10 in)
WHEEL RIMS	
Type	3 hollow spokes in aluminium alloy, chill cast
Front	3.5" x 17"
Rear	5.5" x 17"
TYRES	
Type	Dunlop D208 RR - Metzeler rennsport - Pirelli diablo corsa -Michelin pilot power
Front	Size: 120/70 - ZR 17" 58 W Inflating pressure: 2.3 atm (230 kPa) Inflating pressure with passenger: 2.3 atm (230 kPa)
Rear	Size: 180/55 - ZR 17" 73 W Inflating pressure: 2.5 atm (250 kPa) Inflating pressure with passenger: 2.7 atm (270 kPa)
SPARK PLUGS	
Internal (long life)	NGK PMR8B
External	NGK BPR6ES
Electrode gap	0.6 – 0.7 mm (0.024 – 0.028 in.)
ELECTRIC SYSTEM	
Battery	12 V – 18 Amp/h
Main fuses	30 A
Auxiliary fuses	3 A – 15 A – 20 A
Generator (with permanent magnet)	12 V – 550 W
BULBS	
Parking light	12 V – 5 W
Low beam bulb/high beam	12 V – 55 W / 60W H4
Turn indicator light	12 V – 10 W
Stop/rear parking lights	LED
Instrument panel lighting	LED
Number plate light	12 V – 5 W
WARNING LIGHTS	
Turn indicators	LED
Oil pressure	LED
Neutral	LED
Side stand down	LED
High beam	LED
Fuel reserve	LED
Alarm, gear shift indicator	LED

2.1.2 SCHEDULED MAINTENANCE CHART

OPERATIONS TO BE PERFORMED BY THE **Moto Guzzi** Authorised Dealer (AND CAN BE PERFORMED BY THE USER AS WELL).

- 1 = check and clean, adjust, lubricate or change, if necessary;
 2 = clean;
 3 = replace;
 4 = adjust.

NOTE Perform maintenance operations more frequently if the vehicle is used in rainy and dusty areas, on uneven ground, or for racing.

(*) = Change every 5000 Km (3125 mi), if used for racing

(**) = Check every two weeks or at indicated intervals.

Component	After running-in [1500 km (621 mi)]	Every 10000 km (6250 mi) or 12 months	Every 20000 km (12500 mi) or 24 months
External plugs (*)	-	3	-
Engine oil filter (*)	3	3	-
Fork	1	-	1
Headlight beam direction - operation	-	1	-
Light system	1	1	-
Safety switches	1	1	-
Brake fluid	-	1	-
Engine oil	3	3	-
Tyres	1	1	-
Tyre pressure (**)	4	4	-
Idling rpm	4	4	-
Battery terminal tightening	1	-	-
Head bolt tightening	4	-	-
Engine oil pressure warning light	at every starting: 1		
Brake pad wear	1	before every trip and every 2000 km (1250 mi): 1	
Emptying the oil drain hose from filter box end	Every 5000 km (3125 mi): 2		



OPERATIONS TO BE PERFORMED BY THE **Moto Guzzi** Authorised Dealer.

- 1 = check and clean, adjust, lubricate or change, if necessary;
- 2 = clean;
- 3 = replace;
- 4 = adjust.

NOTE Perform maintenance operations more frequently if the vehicle is used in rainy and dusty areas, on uneven ground, or for racing.

(*) = Change every 5000 Km (3125 mi), if used for racing

(**) = Check every two weeks or at indicated intervals.

Component	After running-in [1000 km (621 mi)]	Every 10000 km (6250 mi) or 12 months	Every 20000 km (12500 mi) or 24 months
Gearbox fluid	3	3	-
Idle mixture (CO)	-	1	-
Transmission and control cables	1	1	-
Steering bearings and steering play	1	1	-
Wheel bearings	-	1	-
Brake discs	1	1	-
Air filter	-	1	3
Vehicle general operation	1	1	-
Brake systems	1	1	-
Brake fluid	-	-	3
Front fork fluid	after the first 10000 km (6250 mi) and then every 20000 km (12500 mi): 3		
Fork oil seals	after the first 30000 km (18750 mi) and then every 20000 km (12500 mi): 3		
Brake pads	every 2000 km (1250 mi): 1 - if worn: 3		
Adjusting the valve clearance	4	4	-
Wheels / Tyres	1	1	-
Tightening of nuts and bolts	1	1	-
Battery terminal tightening	1	-	-
Cylinder synchronisation	1	1	-
Suspensions and trim	1	-	1
Final transmission fluid	3	3	-
Fuel hoses	-	1	Every four years: 3
Brake lines	-	1	Every four years: 3
Clutch wear (*)	-	1	-
Internal spark plugs	-	-	4
Generator belt	every 20000 km (12500 mi): 4, every 50000 km (31250 mi): 3		
Head stud bolt tightening	4	-	-
Exhaust pipe flange bolts	1	-	-



2.1.3 LUBRICANT TABLE

LUBRICANT	PRODUCT
Engine oil	RECOMMENDED:  Agip RACING 4T 5 W 40 As an alternative to recommended oils, top brand oils meeting or exceeding CCMC G-4 A.P.I. SG specifications can be used.
Transmission fluid	RECOMMENDED:  Agip TRUCK GEAR 80 W 90
Gearbox fluid	RECOMMENDED:  Agip ROTRA MP/S 85 W 90
Front fork fluid	RECOMMENDED:  F.A. 5W or  F.A. 20W, as an alternative  Agip FORK 5W or  Agip FORK 20W.
Bearings and other lubrication points	RECOMMENDED:  BIMOL GREASE 481,  AUTOGREASE MP or  Agip GREASE SM2. As an alternative to recommended grease, use top brand rolling bearing grease that will resist a temperature range of -30°C to +140°C (-22°F to +284°F), with dripping point 150°C to 230°C (302°F to 446°F), high corrosion protection, good resistance to water and oxidation.
Battery terminals	Use neutral grease or Vaseline.
Brake fluid	RECOMMENDED:  Autofluid FR. DOT 4 (the braking system is also compatible with DOT5); or  Agip BRAKE 5.1 DOT 4 (the braking system is also compatible with DOT 5). As an alternative to the recommended product, top brand brake fluid meeting or exceeding SAE J1703, NHTSA 116 DOT 4, ISO 4925 specifications for synthetic brake fluid can be used. NOTE Use new brake fluid only. Do not mix different makes or types of oil without having checked bases compatibility.

2.1.4 TIGHTENING TORQUE SETTINGS

DESCRIPTION	Q.ty	SCREW / NUT	TIGHTENING TORQUE (Nm)	NOTE
FRAME				
Engine to frame front fastening	2	M12x50	80	
Gearbox to frame fastener (M12x250 + M12x230)	1+1	M12	50	
Gearbox rh plate fastener	2	M8X30	25	
Blow-by sec.plate fastener	1	M6X16	10	
Coil plate fastener	4	M6x20	10	
Electronic control unit fastener	2	M6x20	10	
Bushes to electronic control unit fastener	2	M6X35	10	Loctite 243
Rear reservoir rubber blocks to frame fastener	2	Silentblock M6	Man	Loctite 243
Air box pins fastener	2	M6	10	
Lh and rh footrest plate to frame top fastener	2 + 2	M8X30	25	stainl.steel – A4 –80
Lh and rh footrest plate to frame bottom fastener	2+2	M8x75	18	stainl.steel – A4 –70
Brake switch to plate fastener	1	M8	Man.	Pitch 1
Chromed ring to plate fastener	6	M5x10	6	
Cable rings to rh footrest plate fastener	3	M5x10	6	
FOOTRESTS AND LEVERS				
Footrest rubber mat fastener	8	M6x12	10	
Rider footrest safety pin M8	2	M8	25	
Passenger footrests support to side plates fastener	4	M10X30	38	stainl.steel – A4 –70
Rider heel guard to plates fastener	4	M5X15	6	
Passenger heel guard fastener	4	M4X10	3	
Linkage fastening nut	1+1	M6	10	Self-locking nut
Brake/gear change lever pin fastener	1+1	M6X16	10	
Pre-selector lever fastener	1	M6x20	10	
Brake/gear change lever pin fastener	1+1	M8	15	Apply Loctite 243
SIDE STAND				
Stand plate to engine top fastener	1	M10X25	50	
Stand plate to engine bottom fastener	2	M8X25	25	
Side stand securing pin	1	M10x1.25	10	
Switch screw	1	M6x20	10	Loctite 243
Lock nut	1	M10x1.25	30	
Stand cable guide to engine fastener	1	M10	50	
Side lever section fastener	2	M6X16	10	Loctite 243

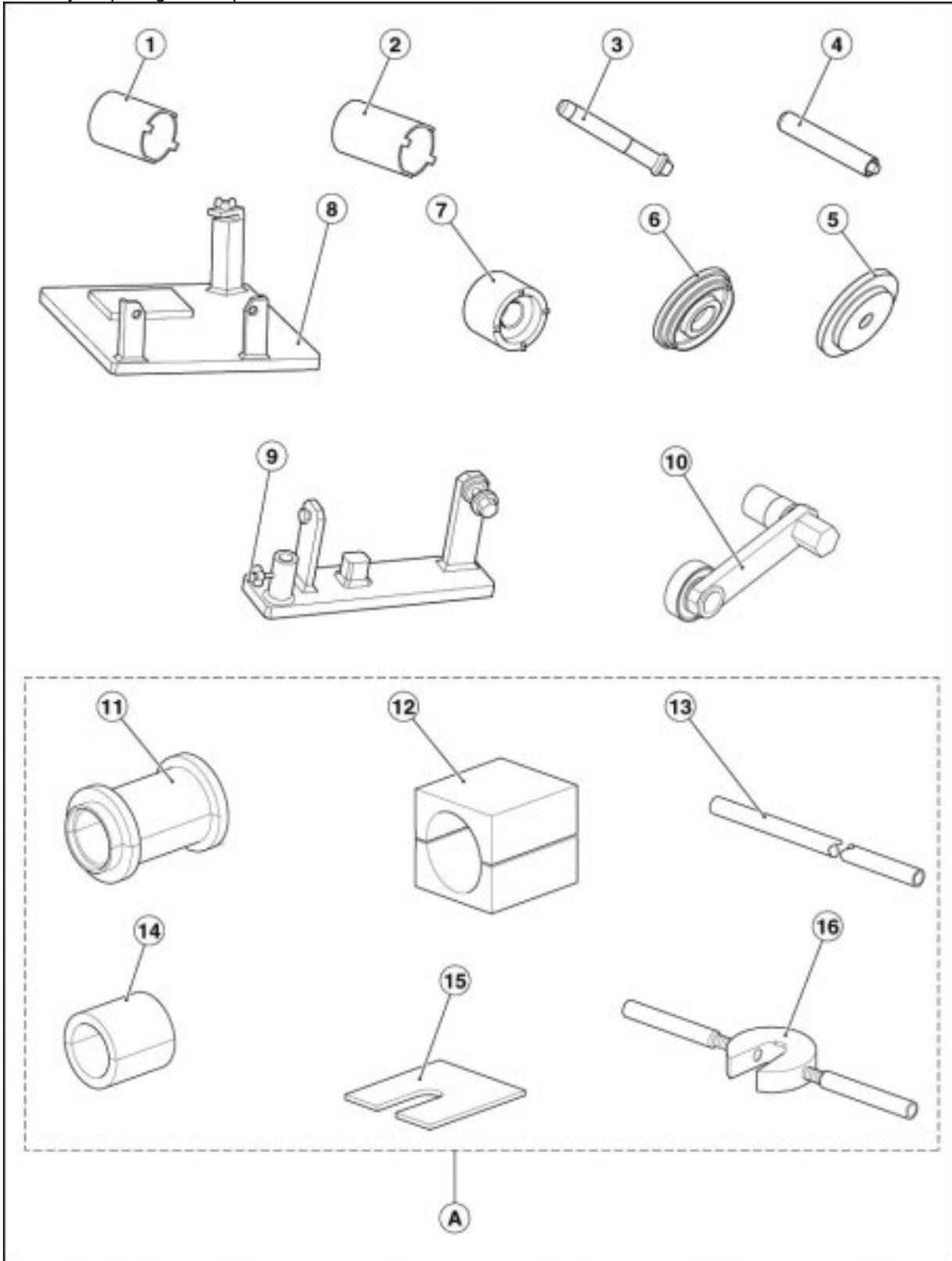
DESCRIPTION	Q.ty	SCREW / NUT	TIGHTENING TORQUE (Nm)	Note
SWINGING ARM				
Swinging arm clamp to bush fastener	2	6x25	10	
Swinging arm to bevel gears fastener	4	M10x35	50	
Linkage to bevel gears fastener	1	M10x50	50	
Linkage to frame fastener	1	M10x50	50	
Swinging arm shaft to swinging arm fastener	1	M12x1.25	60	
Preload bush to swinging arm shaft fastener	1	M25x1.5	10	
FRONT SUSPENSION				
FRONT FORK				
Tube stop plate to bottom yoke fastener	2	M5x16	6	
Fork leg to steering head fastener	2	M8X30	20	Stainl.steel A4 cl. 80
Fork leg to bottom yoke fastener	6	M8X30	22	First tighten top screw to 22 Nm
			22	Then tighten bottom screw to 22 Nm
			18	Then tighten centre screw to 18 Nm
Steering tube ring nut	1	M35x1	40	
Steering tube lock ring nut	1	M35x1	Man.	0 to 90 degrees
Steering head plug	1	M29x1	100	Use a torque wrench
Fork clamps blanking	2+2	M8X40	25	
REAR SUSPENSION				
SHOCK ABSORBER				
Shock absorber to frame fastener 8.8	1	M10x80	50	
CONNECTING RODS				
Double connecting rod/shock absorber fastener 10.9	1	M10x47	40	
Single connecting rod/double connecting rod fastener 10.9	1	M10x95	50	
Single connecting rod to frame fastener 8.8	1	M10x85	50	
Double connecting rod/swinging arm fastener 10.9	1	M10x82	50	
AIR BOX – BLOW BY				
Expansion tank spacer to engine fastener	1	M6	10	
Blow by expansion tank to spacer fastener	1	M6	10	
Air box to frame fastener	2	M6x20	10	
EXHAUST				
Exhaust pipe to engine fastener	4	M8x1.25	25	
Silencer connecting tube to frame fastener	1	M8X50	25	
Silencer to footrest support fastener	2	M8X45	25	
Protection to connection tube fastener	1	M6	10	
Oxygen sensor fastener	1	M18x1.5	38	
Clamp fastener	3	M6	10	

DESCRIPTION	Q.ty	SCREW / NUT	TIGHTENING TORQUE (Nm)	Note
FRONT WHEEL				
Wheel shaft nut	1	M25x1.5	80	
REAR WHEEL				
Disc fastener	6	M8x20	25	
Rear wheel fastener	4	M12x65	110	
BRAKING SYSTEM				
Front brake rh and lh callipers fasteners	2+2	M10x28	50	
REAR SYSTEM				
Rear brake calliper fastener	2	M10X30	50	
Rear brake fluid reservoir fastener	1	SWP5x20	3	
Rear brake reservoir support to plate fastener	1	M6X16	10	
Rear brake lever lock nut	1	M6	Man.	
Brake master cylinder fasteners	2	M6x20	10	Apply Loctite 243
HANDLEBAR AND CONTROLS				
Handlebar lower U-bolts to steering head fastener	2	M10X40	50	
Handlebar upper U-bolts fastener	2+2	M8X30	25	stainl.steel – A4 –80
Counterweights fasteners	2	M6x60	10	
Brake and clutch master cylinder U-bolts fasteners	2+2	M6	10	
Rh and Lh dip switch fasteners	2	M5	1.5	
Clutch master cylinder to gearbox fastener	3	M6	10	
Mirror	1+1	M10	Man.	
ELECTRIC SYSTEM				
Coil fastener	8	M4x25	2	
Horn fastener	2	M8	15	
Odometer sensor to bevel gears fastener	2	M4X10	3	
INSTRUMENT PANEL AND HEADLIGHT				
Instrument panel support to headlight support fastener	2	M6X16	10	
Instrument panel support to steer.head fastener	2	M6X16	10	
Instrument panel fasteners	3	SWP5x14	3	
Headlight support to bottom yoke fastener	2	M8x35	25	
Front+rear turn indicators fasteners	2+2	M6		
Headlight fasteners	2	M8X30	15	
Tail light to tail guard fastener	4	SWP5x14	3	

DESCRIPTION	Q.ty	SCREW / NUT	TIGHTENING TORQUE (Nm)	Note
FUEL TANK				
FUEL PUMP FLANGE				
Tank breather fitting	2	M6	6	
Pump support to tank fastener	6	M5x16	6	
TANK				
Union to tank fastener	4	M5x16	5	
Plug ring nut to tank fastener	4	M5X15	5	
Screws to plug ring nut (aesthetic)	4	M5X15	5	
Tank to frame front fastening	2	M6X35	10	
Battery box and tank to frame rear fastener	2	M6X25	6	
BODYWORK				
FRONT				
Front mudguard fastener	2+2	M5	6	
Electronic control unit fastener	2	M5	6	
Conveyor to frame upp. front fastener	1+1	M5	Man	
Conveyor to frame low. front fastener	1+1	M5	Man	
Conveyors to frame rear fastener	1+1	M5	Man	
Conveyors to conveyor clos.fastener	2X3	self-tapping	Man	
REAR				
Cat's eye to support fastener	1	M5	4	
Cat's eye support to number plate holder fastener	2	M5x12	4	
Reinforcement to number plate holder and light fastener	1	M5	4	
Number plate holder to low.clos. fastener	2	self-tapp.	Man	
Tail guard low.clos. to frame fastener	4	M8x35	25	
Fuse bracket and relay supp. fastener	4	M5	4	
ACCESSORIES				
Ignition switch fastener – shear bolt	2	M8x28		Shear completely

2.1.5 SPECIAL TOOLS

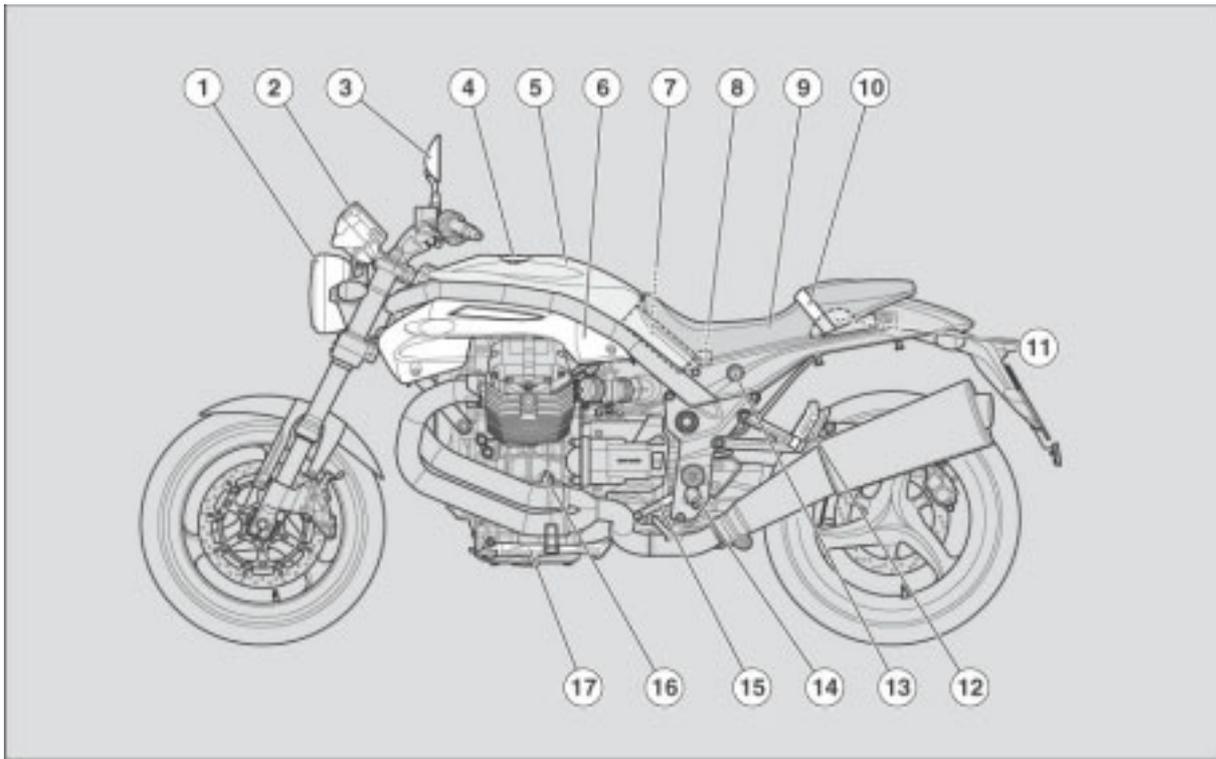
Suitable tools are required for correct disassembly and reassembly and a good set-up. The use of special tools avoids possible damage that could result from using unsuitable tools and/or improvised techniques. Following is a list of special tools designed specifically for this particular vehicle. If necessary, request generic special tools.



Pos.	Description	Part no.
1	Tool for swingarm shaft ring nut	05912630
2	Tool to tighten steering head	AP8140190
3	Drift grip	05902732
4	Ball joint seal drift	05902733
5	Transmission box oil seal drift	05902731
6	Sprocket oil seal drift	05902735
7	Sprocket nut spanner	05902734
8	Transmission box support	05902730
9	Bevel gear pair support	05902736
10	Belt tensioning tool	06948600
11	Tool for fitting Ø 41 mm seal	AP8140145
12	Disassembly operations protections	AP8140149
13	Drilled rod for bleeding air from damper rod	AP8140150
14	Weight to be applied to tool aprilia part# AP8140145 (tool for assembling the seal Ø 41 mm) and aprilia part# AP8140189 [tool for assembling the oil seal for hole Ø 43. Accessory to kit aprilia part# AP8140151 (complete fork tool kit)]	AP8140146
15	Shim/Damper rod separator plate	AP8140148
16	Tool to hold spacer	AP8140147
A	Complete fork tool kit	AP8140151

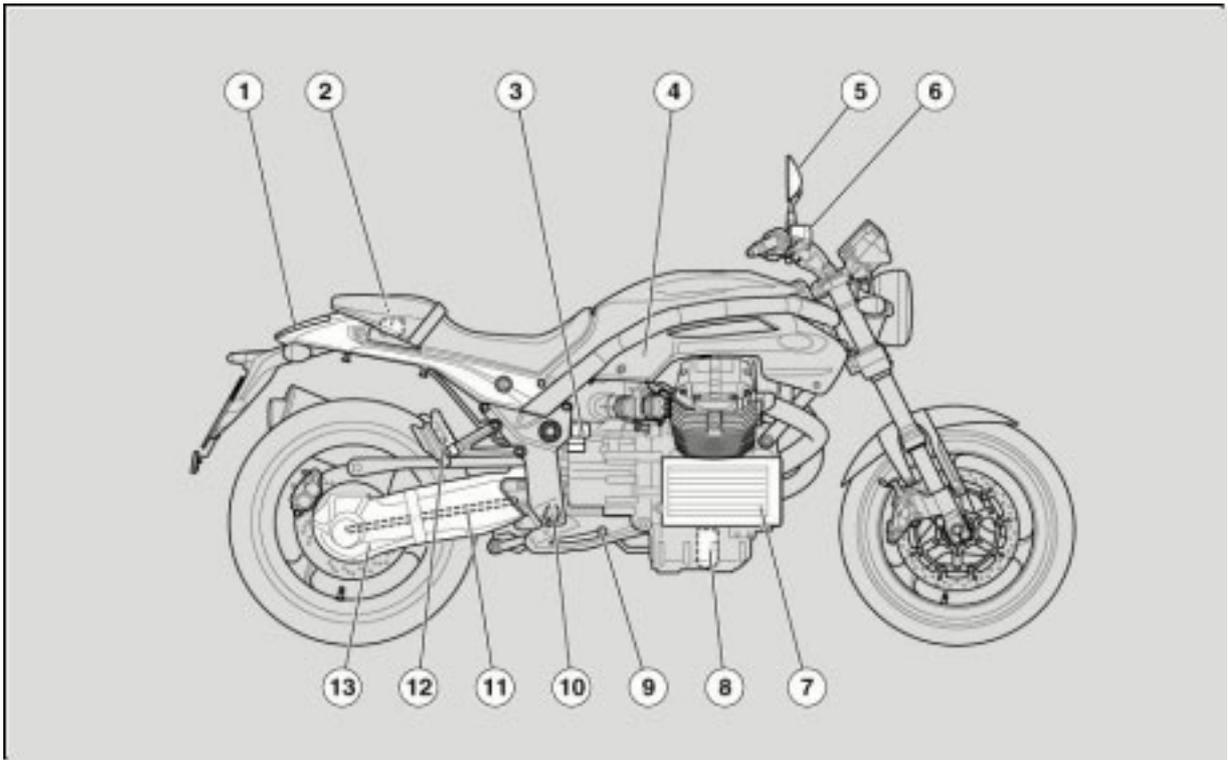
2.1.6 ARRANGEMENT OF THE MAIN ELEMENTS

LEFT SIDE

**Key:**

1. Headlight
2. Instrument panel
3. Left rear-view mirror
4. Fuel tank filler plug
5. Fuel tank
6. Left side body panel
7. Battery
8. Main fuse carrier (30A)
9. Rider/passenger seat
10. Passenger grab handle
11. Tool kit compartment
12. Passenger left footrest
13. Seat latch
14. Rider left footrest
15. Gearbox control lever
16. Engine oil level dipstick
17. Side stand

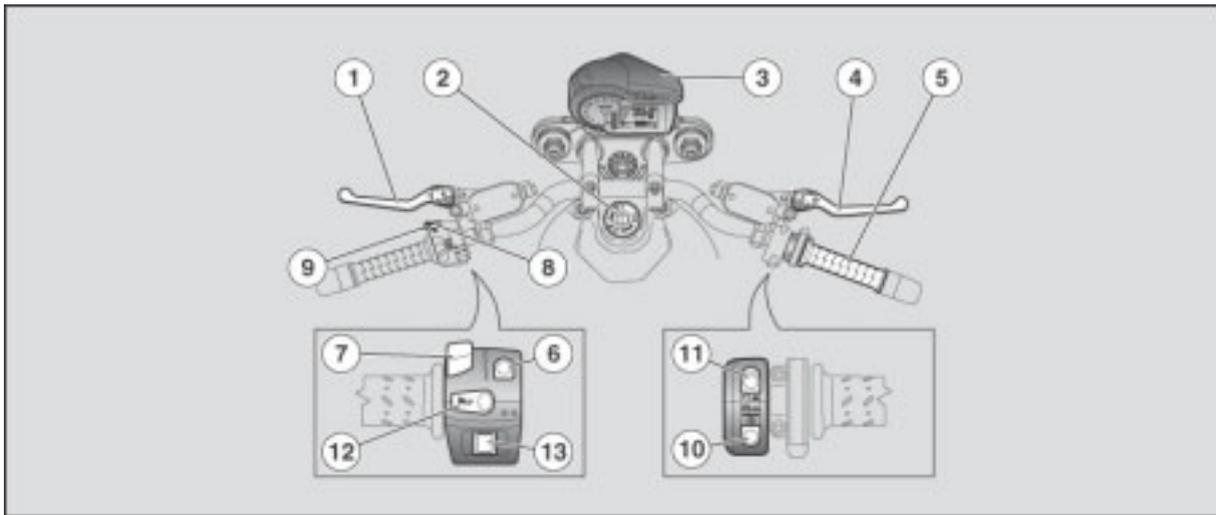
RIGHT SIDE

**Key:**

1. Rear stop switch
2. Glove compartment
3. Rear brake fluid reservoir
4. Right body panel
5. Right rear-view mirror
6. Front brake fluid reservoir
7. Oil cooler
8. Engine oil filter
9. Rear brake lever
10. Rider right footrest
11. Transmission with cardan shaft
12. Right passenger footrest
13. Single-sided swingarm

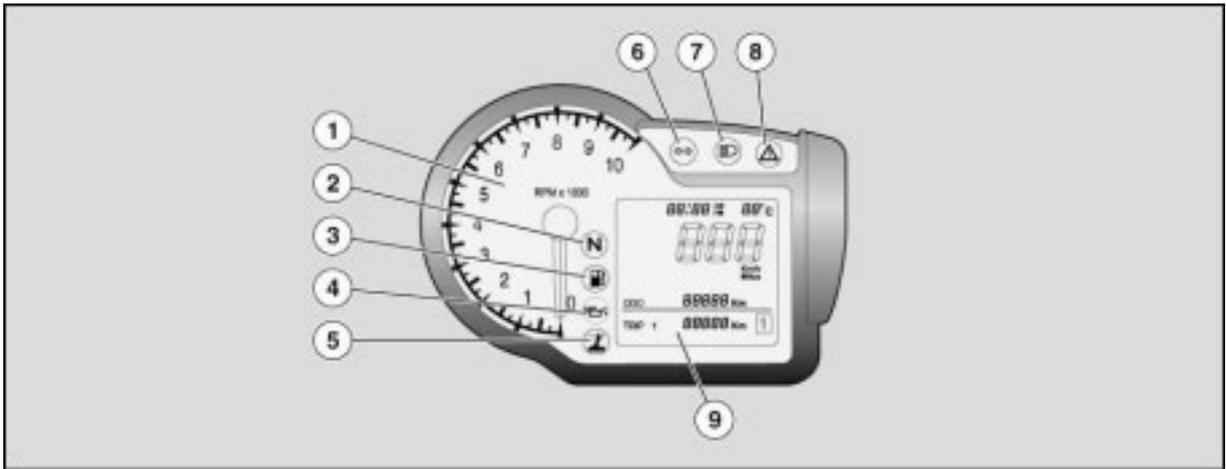
2.1.7 LOCATION OF INSTRUMENTS/CONTROLS

INSTRUMENTS AND CONTROLS

**Key:**

1. Clutch control lever
2. Ignition switch/steering lock (⏻-P)
3. Instruments and indicators
4. Front brake lever
5. Throttle grip
6. Light dimmer switch (☀ - ☿)
7. Display functions selector
8. High beam flasher button (☑)
9. SET button
10. Starter button (⏻)
11. Engine stop button (⏻-⏻)
12. Horn button (🔊)
13. Turn indicator switch (↔)

INSTRUMENTS AND INDICATORS

**Key:**

1. Rev counter
2. Green neutral light (N)
3. Orange fuel reserve warning light (⛛)
4. Red engine oil pressure warning light (⚙)
5. Yellow side stand warning light (⚓)
6. Green turn indicator warning light (↔)
7. Blue high beam warning light (☑)
8. Red alarms/immobiliser warning light (⚠)
9. Multifunction digital display.

2.2 MAINTENANCE OPERATIONS

2.2.1 CHANGING ENGINE OIL AND OIL FILTER

CHECKING AND TOPPING UP

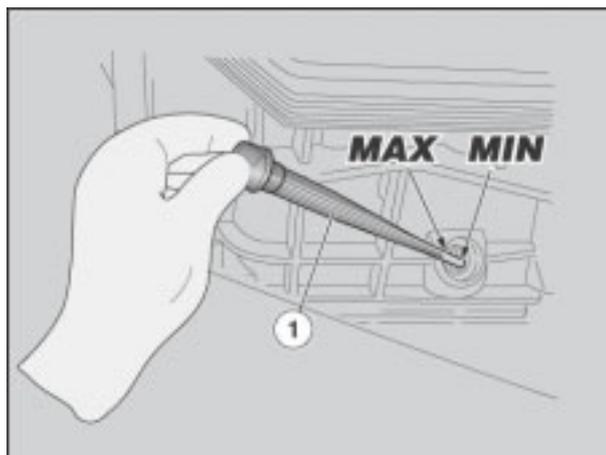


WARNING

Check the engine oil level when the engine is hot.

NOTE Letting the engine idle with the vehicle at standstill is not the correct procedure to warm the engine and engine oil up to operating temperature for an oil check. Oil is best checked after taking a short ride; 15 Km (10 mi) will be enough.

- Stop the engine.
- Keep the vehicle upright with both wheels on the ground.
- Unscrew and remove the dipstick (1).



- Check the oil level using the dipstick (1).
- The level is correct when it is near the **MAX** mark.

MAX= maximum level

MIN = minimum level.

If necessary, top up the engine oil level as follows:

- Unscrew and remove the dipstick (1).
- Top up with engine oil (see LUBRICANT TABLE) until the level is above the minimum mark **MIN**.



WARNING

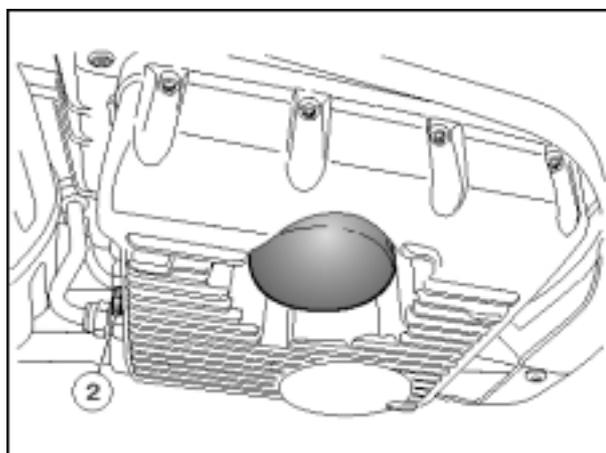
Do not add additives or other substances to the fluid.

If you use a funnel or other tool, ensure it is perfectly clean.

CHANGING ENGINE OIL

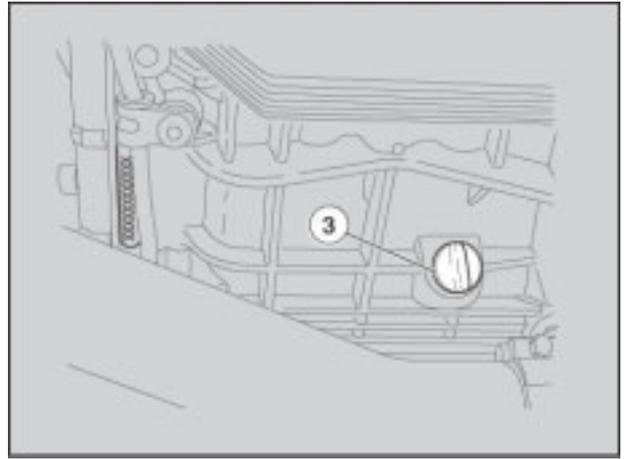
NOTE Change oil when it is hot, as it will be more fluid and will drain more easily.

- Place a container holding more than 4000 cu cm under the drain plug (2).
- Unscrew and remove the drain plug (2).



Griso V1100

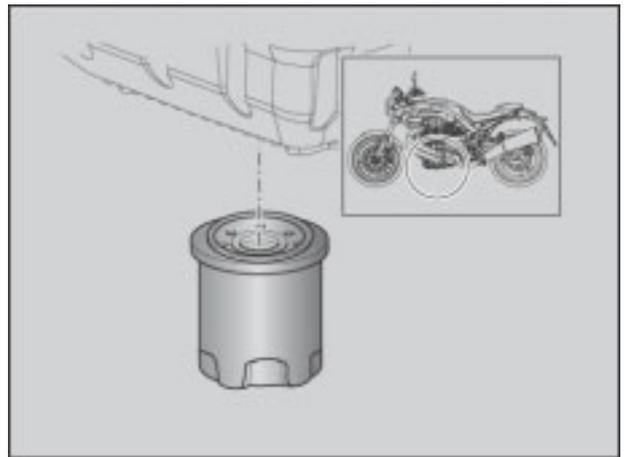
- Unscrew and remove the filler plug (3).
- Drain the oil into the container and let all remaining oil drip out for several minutes.
- Check the sealing washers of the drain plug (2) and replace them if worn.
- Clean off any metal debris sticking to the drain plug (2) magnet.
- Refit the drain plug (2) and tighten.
- Fill with fresh engine oil (see LUBRICANT TABLE) until the level is above the minimum mark **MIN**.

**CHANGING THE ENGINE OIL FILTER**

- Using the suitable wrench, remove the engine oil filter from its seat (unscrew).

NOTE Do not use filters that have already been used.

- Smear some oil on the new oil filter seal.
- Using the suitable wrench, fit and tighten the new oil filter to the torque of 18 – 20 Nm.



2.2.2 TRANSMISSION OIL

CHECKING AND TOPPING UP

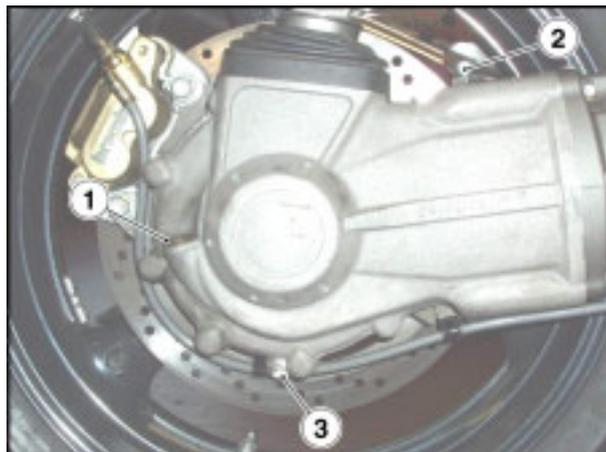
- Keep the vehicle upright with both wheels on the ground.
- Unscrew and remove the level plug (1).
- The correct level is just below the hole of the level plug (1).
- If the oil is below the specified level, top up (see LUBRICANT TABLE) until the level plug hole (1) is reached.



WARNING

Do not add additives or other substances into the fluid.

If you use a funnel or other tool, ensure it is perfectly clean.



CHANGING ENGINE OIL



WARNING

Change oil when the unit is hot, as oil will be more fluid and will drain more easily.

NOTE Letting the engine idle with the vehicle at standstill is not the correct procedure to warm the engine and engine oil up to operating temperature for an oil check. Oil is best checked after taking a short ride; 15 Km (10 mi) will be enough.

- Place a container holding more than 400 cm³ (25 in³) under the drain plug (3).
- Unscrew and remove the drain plug (3).
- Unscrew and remove the breather plug (2).
- Drain the oil into the container and let all remaining oil drip out for several minutes.
- Check the sealing washer of the drain plug (3) and replace it if worn.
- Clean off any metal debris sticking to the drain plug (3) magnet.
- Refit the drain plug (3) and tighten.
- Pour fresh engine oil in the inlet hole (1) - see LUBRICANT TABLE - until the level reaches the hole of the level plug (1).



WARNING

Do not add additives or other substances into the fluid.

If you use a funnel or other tool, ensure it is perfectly clean.

- Refit and tighten the plugs (1 – 2).

2.2.3 GEARBOX FLUID

CHECKING AND TOPPING UP



WARNING

Check the gearbox oil level when the engine is hot.

NOTE Letting the engine idle with the vehicle at standstill is not the correct procedure to warm the engine and engine oil up to operating temperature for an oil check. Oil is best checked after taking a short ride; 15 Km (10 mi) will be enough.

- Stop the engine.
- Keep the vehicle upright with both wheels on the ground.
- Unscrew and remove the inspection plug (1) on the right side of the gearbox.
- The correct level is just below the hole of the inspection plug (1).

If necessary:

- Top up with oil (see 2.1.3 LUBRICANT TABLE) until the level reaches the hole of the inspection plug (1).



WARNING

Do not add additives or other substances to the fluid.

If you use a funnel or other tool, ensure it is perfectly clean.

CHANGE

NOTE Change oil when it is hot, as it will be more fluid and will drain more easily.

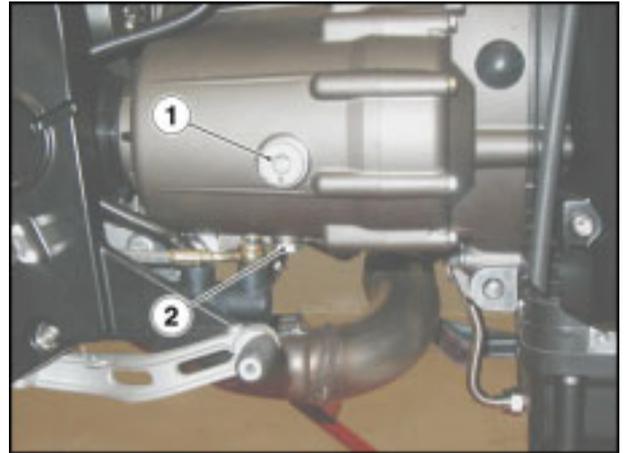
- Place a suitable container under the drain plug (2).
- Unscrew and remove the drain plug (2).
- Unscrew and remove the filler plug (1).
- Drain the oil into the container and let all remaining oil drip out for several minutes.
- Check the sealing washers of the drain plug (2) and replace if worn.
- Clean off any metal debris sticking to the drain plug (2) magnet.
- Refit the drain plug (2) and tighten.
- Fill with fresh oil (see 2.1.3 LUBRICANT TABLE) until the level reaches the hole of the inspection plug (1).
- Tighten the filler plug (1).



WARNING

Do not add additives or other substances to the fluid.

If you use a funnel or other tool, ensure it is perfectly clean.



2.2.4 CLEANING THE AIR FILTER

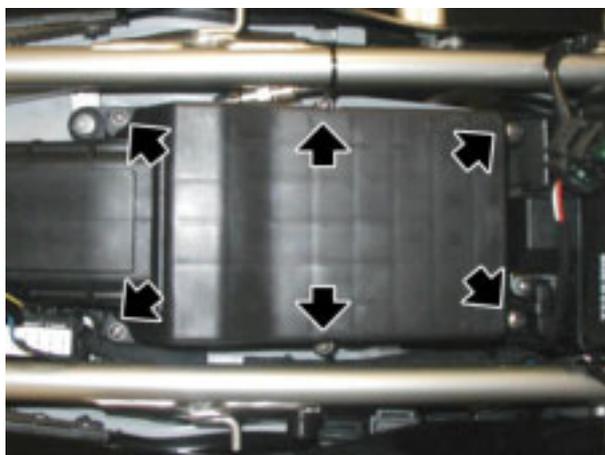
- Disconnect the connector on the end of the air temperature sensor.



- Slide out and move the main fuse box from its housing.



- Loosen and remove the six screws.

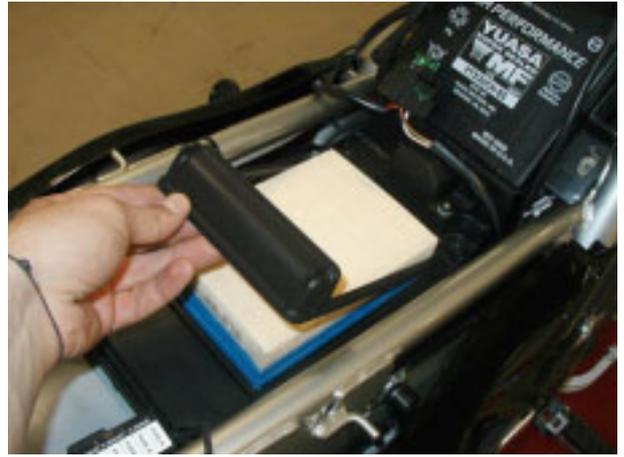


- Raise the air box cover.



Griso V1100

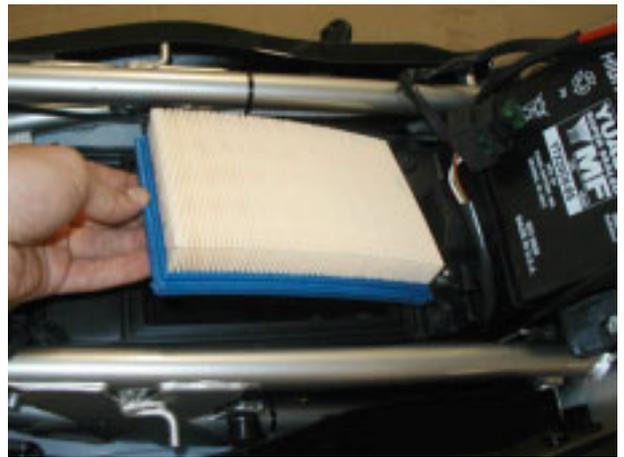
- Remove the air filter frame.



- Remove the air filter.
- Plug the intake duct with a clean cloth to prevent dirt from falling into the intake ducts.

**DANGER**

Do not start the engine when the air filter is not in place. Use compressed air to clean the filter and aim the jet of air inside out.

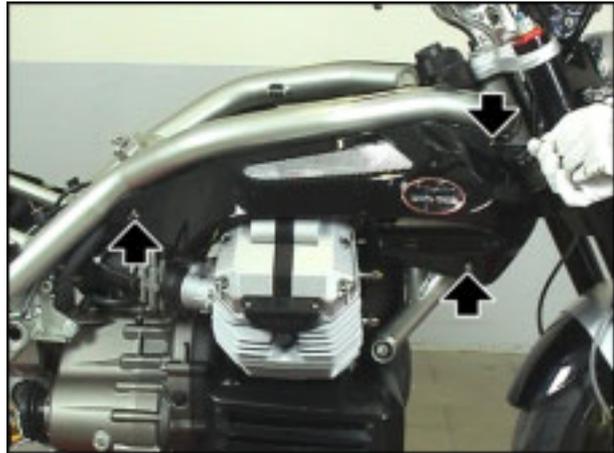


2.2.5 ADJUSTING VALVE CLEARANCE

When the timing system is noisy, check the clearance between valves and rocker arms.

NOTE Adjust clearance when the engine is cold, with the piston at top dead centre (TDC) during the compression stroke (valves closed).

- Loosen and remove the three screws and remove the side protection.
- Working on either side, loosen and remove the two outer screws and remove the spark plug protection.
- Working on either side, loosen and remove the two inner screws and remove the insert.
- Disconnect both spark plug caps.





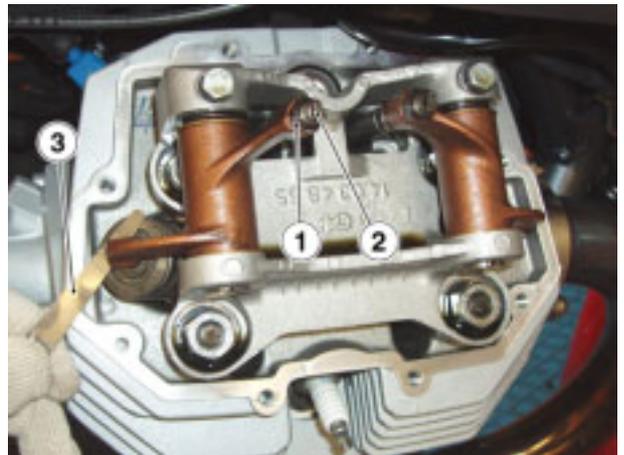
- Loosen and remove the eight screws.
- Remove the head cover.



- Loosen the nut (1);
- Turn the adjuster screw (2) with a screwdriver until the following clearances are set:
 - intake valve: 0.10 mm (0.0039 in)
 - exhaust valve: 0.15 mm (0.0059 in).
- Measure clearance using a suitable feeler gauge (3).

NOTE If clearance is greater than specified, the tappets will be noisy; clearance smaller than specified will prevent the valves from closing fully leading to:

- pressure leak;
- engine overheating;
- burnished valves, etc.



2.2.6 FRONT BRAKE

BLEEDING

Any air trapped in the hydraulic circuit will act as a cushion and take up most of the pressure applied by the master cylinder; this will impair the operation of the brake callipers and reduce braking efficiency.

A spongy feel of the brake lever and loss of braking mean that there is air in the circuit.



DANGER

This is a dangerous condition that makes the vehicle unsafe to ride; each time the brakes are removed, it is essential to bleed the hydraulic circuit once the brakes have been refitted and the brake system is back to normal operating conditions.

NOTE The following procedure applies to both front brake callipers. Place the vehicle on level ground before beginning the bleeding procedure. While bleeding the hydraulic circuit, top up the reservoir with brake fluid as required. Ensure that there is always some fluid in the reservoir throughout the process.

- Remove the rubber cap from bleeding valve and the reservoir plug.
- Insert one end of a transparent plastic tubing inside the front brake calliper bleed valve and the other end in a container.
- Turn the handlebar to the left, quickly pull and release several times the front brake lever, and keep it completely pulled.
- Slacken the bleed valve by 1/4 of a turn to let the brake fluid drain into the container; this will remove any tension from the lever and help it travel fully home.
- Retighten the bleed valve before the lever is fully squeezed in.
- Repeat this process until the fluid draining into the container is totally clear of air bubbles.

NOTE While bleeding the hydraulic circuit, top up the reservoir with brake fluid as required. Ensure that there is always some fluid in the reservoir throughout the process.

- Tighten the bleed valve and remove the tubing.
- Add brake fluid to the reservoir until the fluid has reached the correct level.
- Refit the rubber cap.

CHANGING THE PADS

- Remove the vibration damping plate and move the pistons apart.
- Turn the pins and slide out both split pins.



Griso V1100

- Remove both pins.



- Remove the vibration damper.



- Remove one pad at a time.

**WARNING**

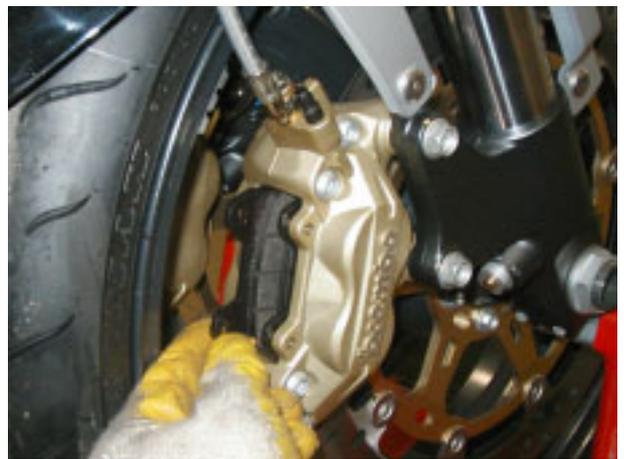
Do not operate the brake lever when the pads are not in place or the calliper pistons might come out of their housing, thus causing brake fluid leakage.

- Install two new pads, fit them so the holes match those on the calliper.

**WARNING**

Always change both pads and ensure that they are correctly in place inside the calliper.

- Fit the vibration damper; remember that the arrow must indicate the direction of travel.
- Insert both pins.
- Fit both split pins.
- Pull the brake lever several times to take the pistons against the pads.
- Check the brake fluid level.



2.2.7 REAR BRAKE

BLEEDING

Any air trapped in the hydraulic circuit will act as a cushion and take up most of the pressure applied by the master cylinder; this will impair the operation of the brake callipers and reduce braking efficiency.

A spongy feel of the brake lever and loss of braking mean that there is air in the circuit.



DANGER

This is a dangerous condition that makes the vehicle unsafe to ride; each time the brakes are removed, it is essential to bleed the hydraulic circuit once the brakes have been refitted and the brake system is back to normal operating conditions.

NOTE Place the vehicle on level ground before beginning the bleeding procedure. While bleeding the hydraulic circuit, top up the reservoir with brake fluid as required. Ensure that there is always some fluid in the reservoir throughout the process.

- Remove the bleed valve rubber cap.
- Insert one end of a transparent plastic tubing inside the rear brake calliper bleed valve and the other end in a container.
- Remove the rear brake reservoir plug.
- Push and slowly release of the rear brake lever several times, then keep it pushed completely.

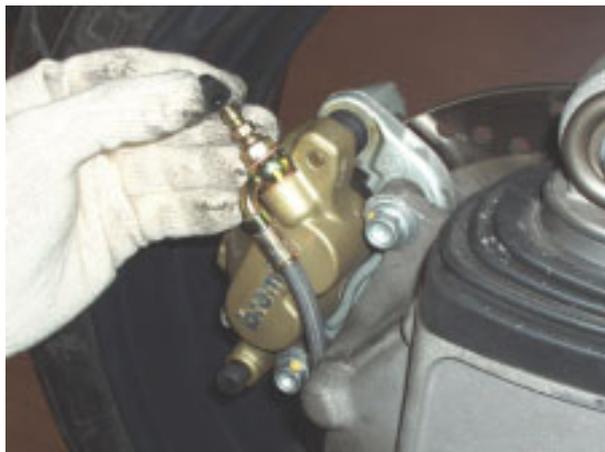
- Slacken the bleed valve by 1/4 of a turn to let the brake fluid drain into the container; this will remove any tension from the lever and help it travel fully home.
- Retighten the bleed valve before the lever is fully squeezed in.
- Repeat this process until the fluid draining into the container is totally clear of air bubbles.

NOTE While bleeding the hydraulic circuit, top up the reservoir with brake fluid as required. Ensure that there is always some fluid in the reservoir throughout the process.

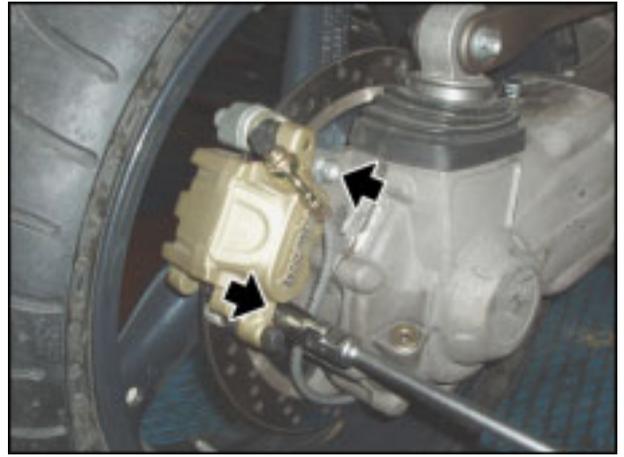
- Tighten the bleed valve and remove the tubing.
- Add brake fluid to the reservoir until the fluid has reached the correct level.
- Refit the rubber cap.

CHANGING THE PADS

- Release the brake line and the throttle cable from the ties.



- Loosen and remove the two screws.



- Turn the pin and slide out the split pin.
- Remove the split pin.



- Remove the pin.
- Move the pistons apart pushing on the worn pads.



- Remove one pad at a time.

**WARNING**

Do not operate the brake lever when the pads are not in place or the calliper pistons might come out of their housing, thus causing brake fluid leakage.

- Install two new pads, fit them so the holes match those on the calliper.

**WARNING**

Always change both pads and ensure that they are correctly in place inside the calliper.



- Insert the pin.
- Fit the split pin.
- Push the rear brake lever until the pistons are against the new pads.
- Check the brake fluid level.



- Fit the calliper to the disc and tighten the two screws.



- Fit new ties and secure the oil line and the speed sensor cable to the frame.



2.2.8 GENERATOR BELT TENSIONING

- Working on either side, loosen and remove the three screws securing the side body panels.



- Working on the right side, loosen and remove the two nuts securing the exhaust manifold, collect two washers per nut.



- Loosen the manifold clamp.
- Remove the right exhaust manifold.



- Loosen and remove the two screws securing the control unit protection.



- Loosen and remove the two screws securing the control unit.



- Remove the control unit.
- Disconnect the two connectors.



- Loosen and remove the ground cable bolt.



- Loosen and remove engine oil recovery tank screw.



Griso V1100

- Loosen and remove the spacer.



- Loosen and remove timing cover screw.



- Loosen and remove the four screws on timing cover.
- Remove the timing cover.



- Loosen the lock nut.



- Using the belt tensioning tool (part no. 06948600), tension the belt to the specified value.



- Tighten the adjuster.



- Tighten the lock nut.



- Follow the procedure as previously indicated, in the reverse order for refitting the removed components; start with installing the timing cover.

FUEL SYSTEM

3



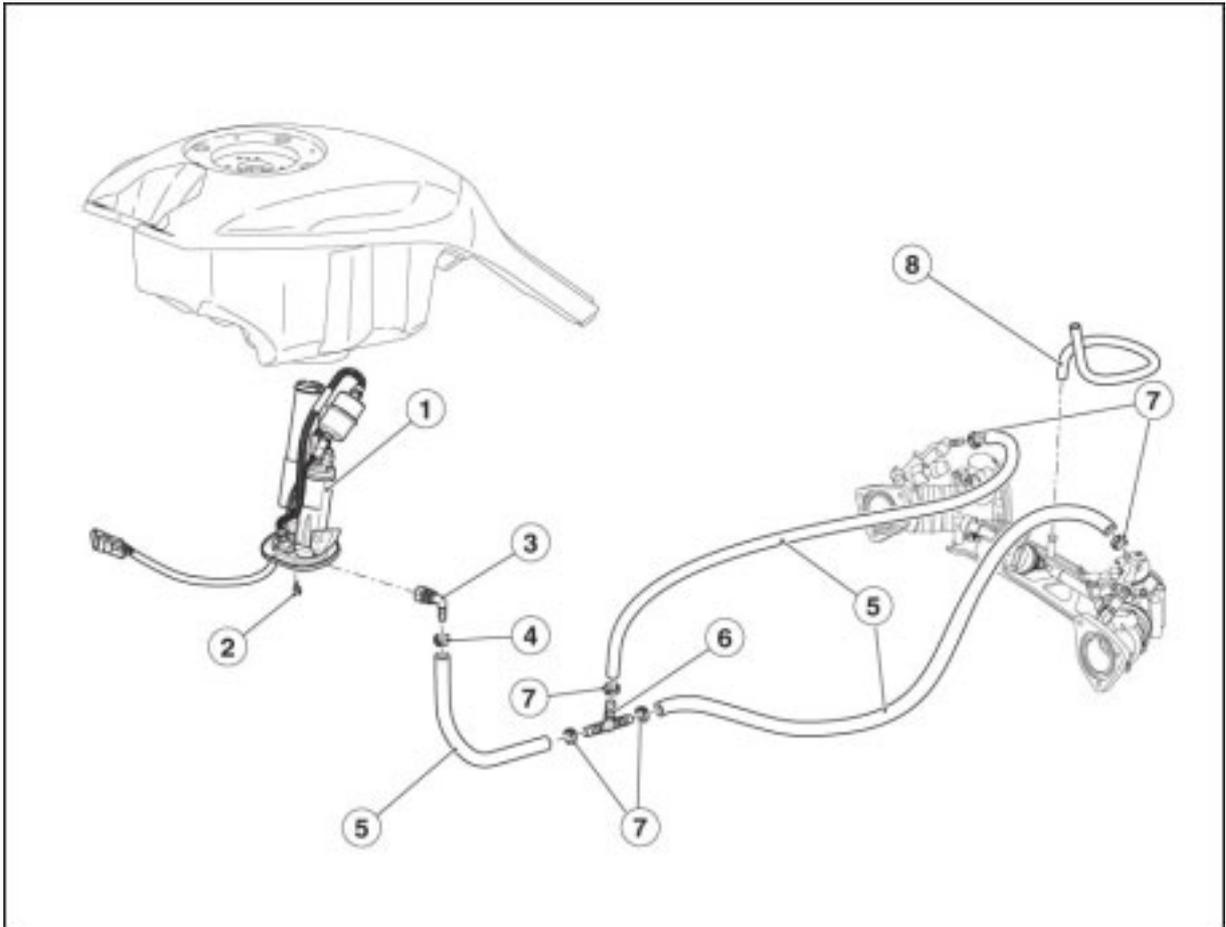
SUMMARY

3.1 FUEL SYSTEM 3
3.1.1 FUEL SUPPLY SYSTEM DIAGRAM 3
3.1.2 REMOVING THE FUEL TANK 4
3.1.3 REMOVING THE AIR BOX..... 7
3.2 INJECTION 9
3.2.1 INJECTION SYSTEM DIAGRAM 9



3.1 FUEL SYSTEM

3.1.1 FUEL SUPPLY SYSTEM DIAGRAM

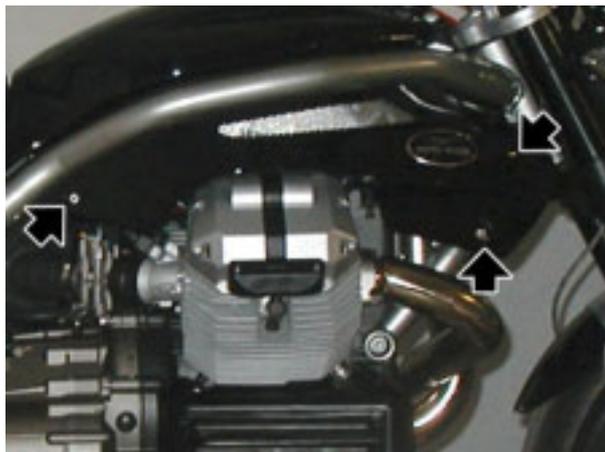


Key:

1. Complete fuel pump
2. Flanged screw M5x16
3. Fitting
4. Clamp
5. Fuel hose
6. Three-way union
7. Clamp 12.5x8
8. Hose

3.1.2 REMOVING THE FUEL TANK

- Working on either side, loosen and remove the three screws and remove the side body panel.



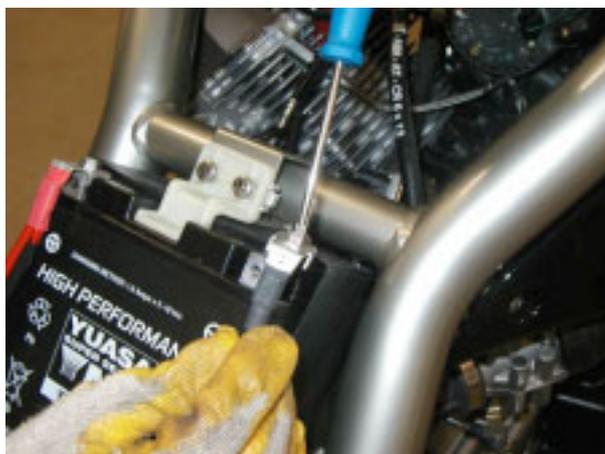
- Remove the seat.
- Loosen and remove the two screws.



- Loosen and remove the two screws and set aside the two T-shaped spacers.

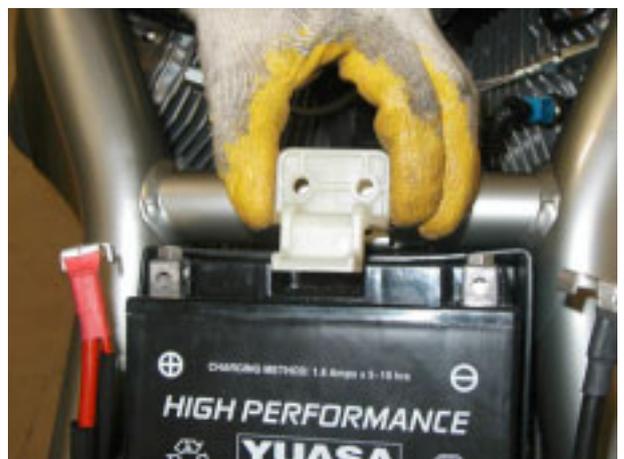
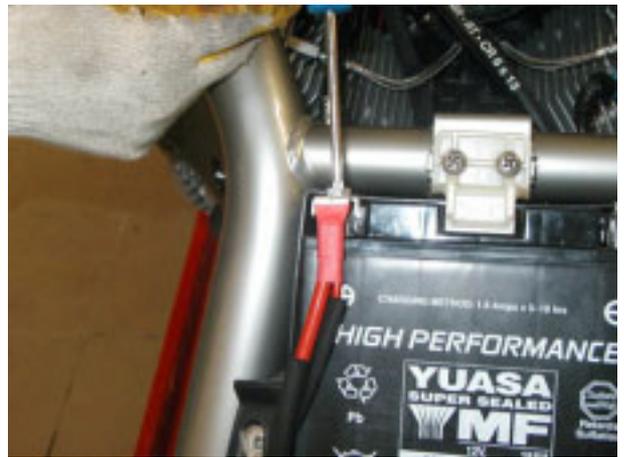


- Disconnect the battery negative (-) lead.



Griso V1100

- Disconnect the battery positive (+) lead.
- Loosen and remove the two screws.
- Remove the battery bracket.
- Remove the battery and the cover, collect the breather hose.



- Raise the fuel tank from the front, then from behind, and rest it onto the brackets welded to the frame, provided with rubber blocks.
- Disconnect the quick-release fitting.



- Disconnect the connector.
- Remove the fuel tank.



- For fuel tank installation procedure, follow the preceding instructions in the reverse order.

3.1.3 REMOVING THE AIR BOX

- Remove the fuel tank (see REMOVING THE FUEL TANK).
- Disconnect the connector on the end of the air temperature sensor.



- Slide out and move the main fuse box from its housing.



- Loosen and remove the four screws.



- Slide out and move the auxiliary fuse box from its housing.



- Loosen and remove the two screws.



- Disconnect the vacuum tube.
- Disconnect the blow-by reservoir breather hose.



- Remove the hose ties.

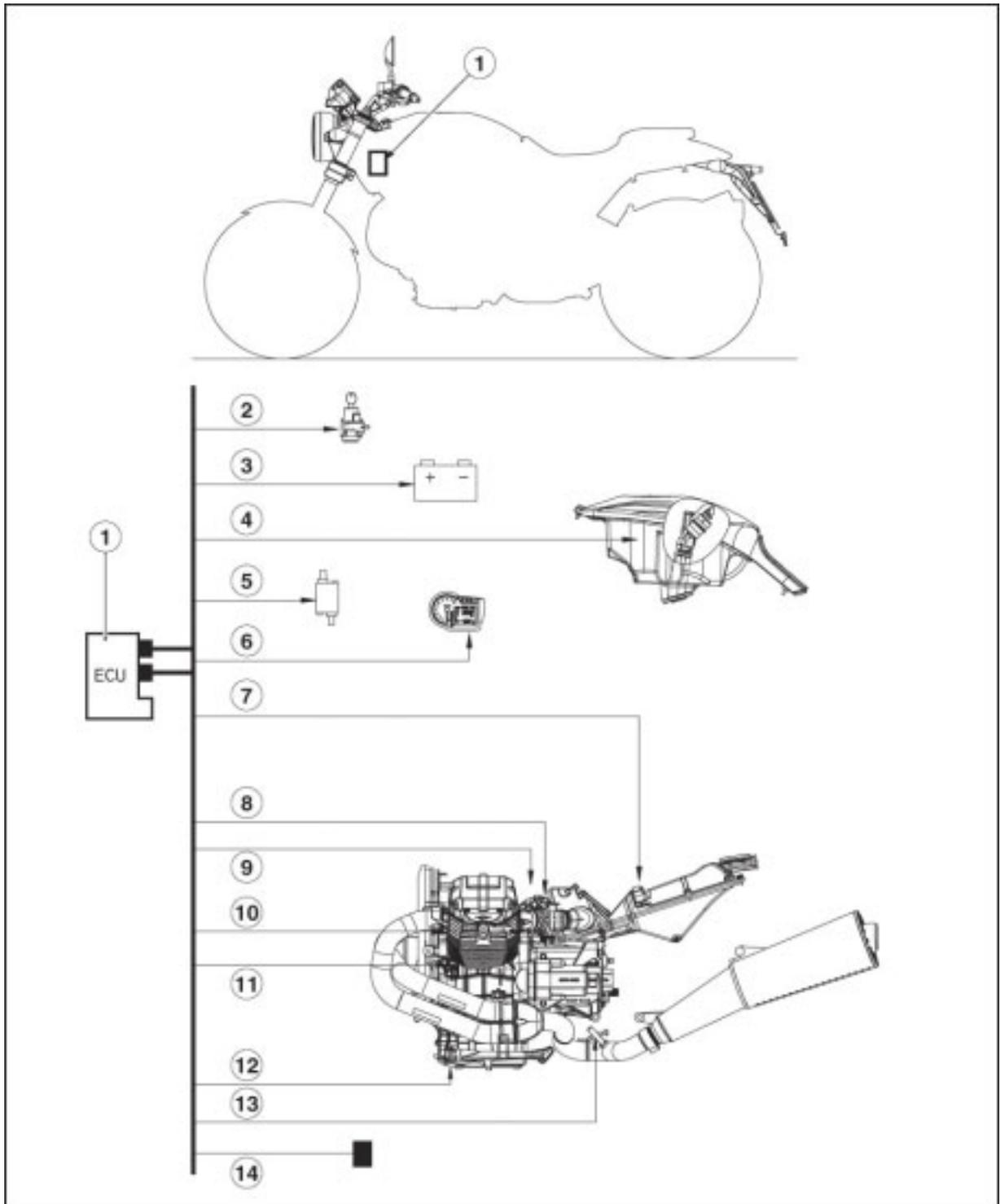


- Remove the tie from water breather hose on air box right side and remove the hose.
- Working on either side, loosen and remove the tie.
- Remove the air box from behind, collect the blow-by drain hose.



3.2 INJECTION

3.2.1 INJECTION SYSTEM DIAGRAM



Key:

1. Electronic control unit
2. Ignition switch
3. Battery
4. Fuel pump
5. Coils
6. Instrument panel
7. Air temperature sensor
8. Throttle position sensor
9. Injectors
10. Engine temperature sensor
11. Crankshaft position sensor
12. Side stand
13. Oxygen sensor
14. Bank angle sensor

LUBRICATION SYSTEM

4



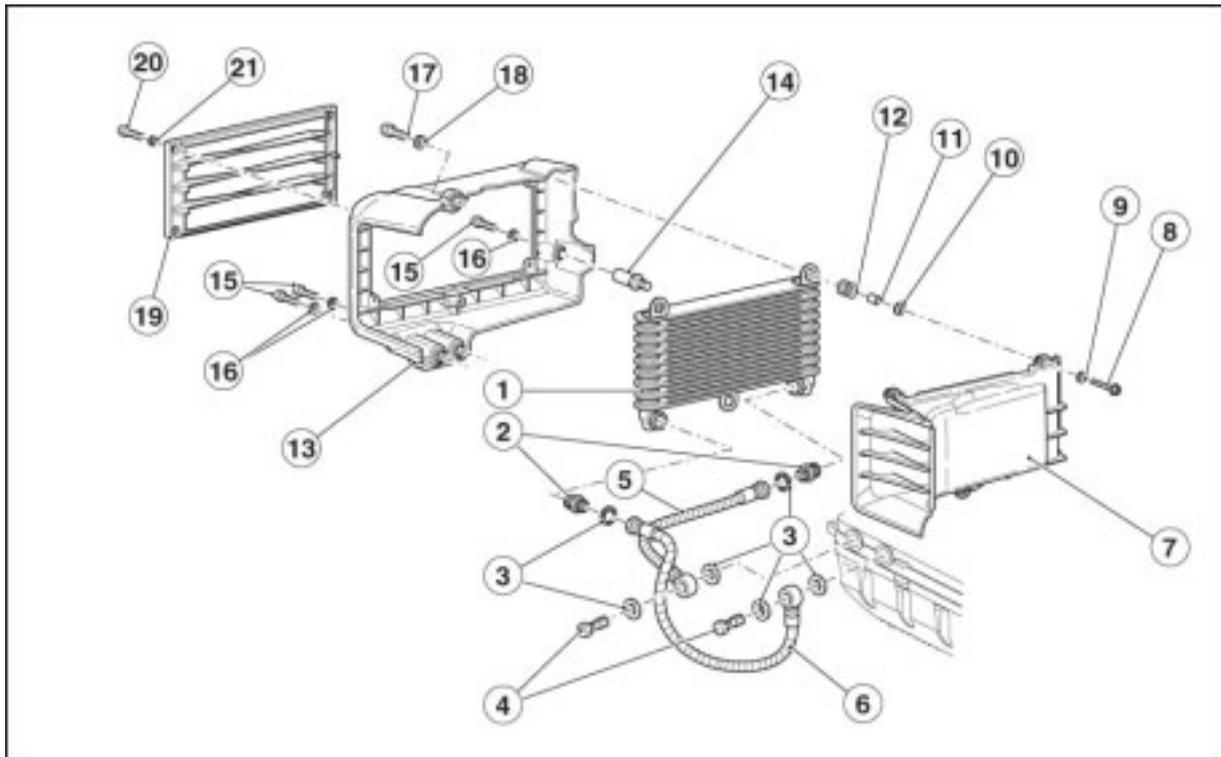
SUMMARY

4.1 LUBRICATION SYSTEM 3
4.1.1 LUBRICATION SYSTEM DIAGRAM 3
4.1.2 REMOVING THE OIL COOLER 4



4.1 LUBRICATION SYSTEM

4.1.1 LUBRICATION SYSTEM DIAGRAM



Key:

1. Complete oil cooler
2. Restrictor
3. Aluminium gasket
4. Drilled screw
5. Right tube
6. Left tube
7. Conveyor
8. Flanged TE screw M6x30
9. Washer
10. Bushing
11. Spacer
12. Rubber seal
13. Cover
14. Spacer
15. TCC screw M8x30
16. Washer
17. TCC screw M10x30
18. Washer
19. Cooler cowling
20. TBEI screw M5x12
21. T-bushing

4.1.2 REMOVING THE OIL COOLER

- Prepare a container and empty the lubrication system.
- Loosen and remove the screw and set aside the washer.



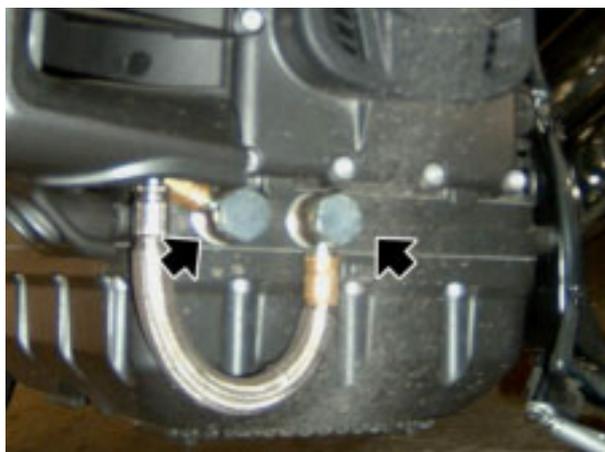
- Loosen and remove the two screws and set aside the washers.



- Loosen and remove the screw and set aside the washer.



- Loosen and remove the two screws and set aside the tubes and the four washers.



Griso V1100

- Remove the oil cooler.



ENGINE

5



SUMMARY

5.1. REMOVING AND REFITTING THE ENGINE 3
5.1.1. REMOVING THE ENGINE FROM THE FRAME 3
5.1.2. FITTING THE ENGINE ON THE FRAME 15



5.1. REMOVING AND REFITTING THE ENGINE

5.1.1. REMOVING THE ENGINE FROM THE FRAME

- Support the vehicle front end using the suitable stand and its rear end using slings and a hoist.
- Position the engine support stand under the oil sump.



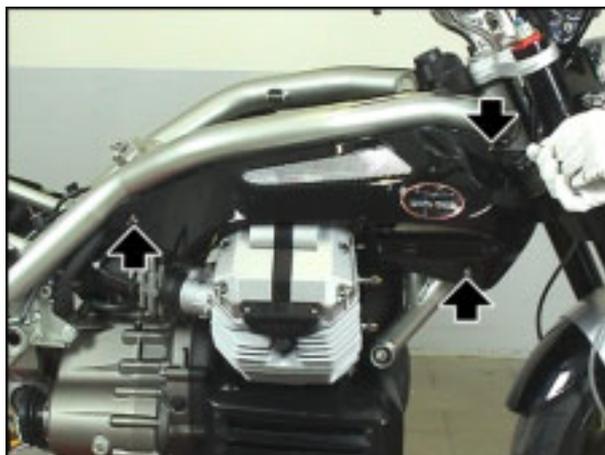
- Remove the complete exhaust system and the air box prior to removing the crankcase.



- Remove the swinging arm together with cardan joint.



- Working on either side, loosen and remove the three screws and remove the side body panel.



- Working on either side, loosen and remove the two outer screws and remove the spark plug protection.



- Working on either side, loosen and remove the two inner screws and remove the insert.



- Working on either side, disconnect both spark plug caps.





- Working on either side, disconnect the injector connectors.



- Disconnect the throttle cables.



- Disconnect the idle motor connector.



- Disconnect the engine temperature sensor connector.



- Disconnect the throttle position sensor connector.



- Loosen and remove the two screws and collect the washer.



Griso V1100

- Disconnect the rpm sensor connector and connect the gasket.



- Disconnect the generator connectors.



- Disconnect the neutral sensor connector.



- Loosen and remove the two screws and collect the washers.
- Remove the starter motor protection.



- Unscrew and remove the screw.
- Disconnect the ground cables.



- Disconnect the starter motor connectors.

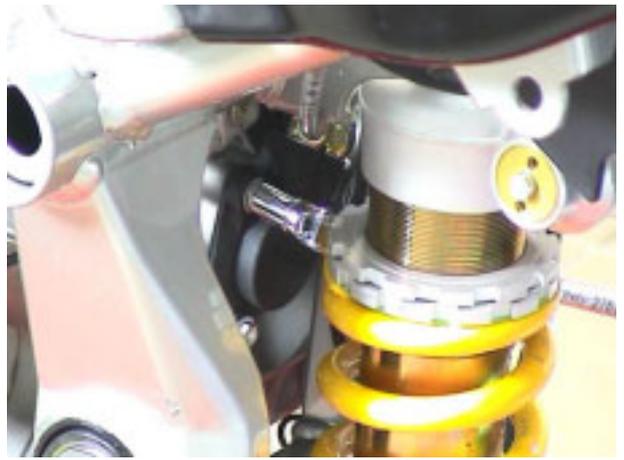


- Prepare a container.
- Release the clutch bleed hose.
- Let clutch fluid fully drain out.



Griso V1100

- Loosen and remove the three screws and move aside the clutch slave cylinder.



- Slide out the gearbox fluid breather line.



- Working on either side, disconnect the clamp and slide out the oil breather line.



- Loosen and remove the two screws securing the oil vapour hose.
- Move aside the oil vapour hose.



- Disconnect the stand sensor connector and move it until clear of the ties.



- Loosen and remove the two screws and remove the control unit protection.



- Loosen and remove the two screws and move the control unit down.



Griso V1100

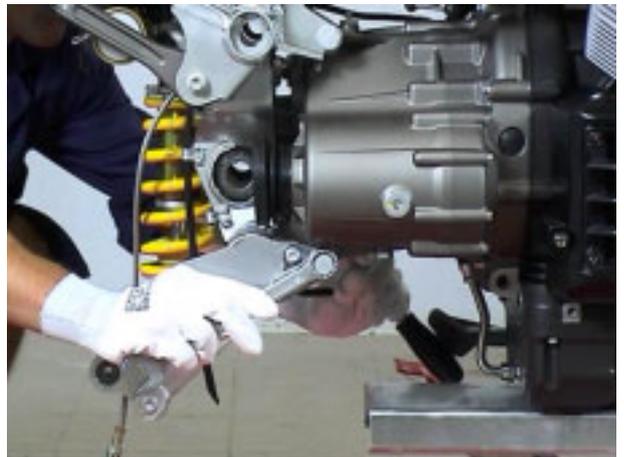
- Loosen and remove the screw and move aside the oil vapour recovery tank.



- Unscrew and remove the stud bolt.



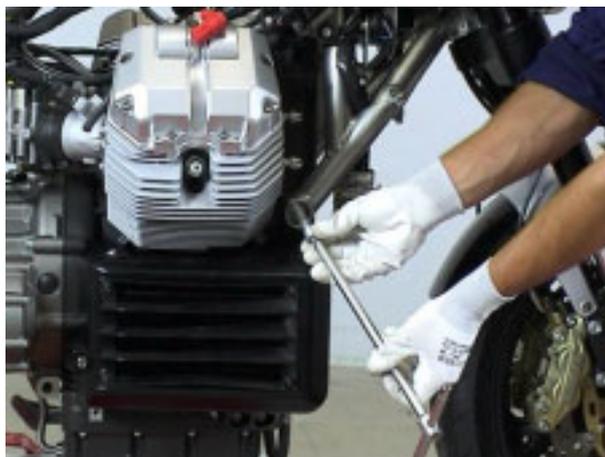
- Loosen and remove the engine lower nut and collect the washer.



- Remove the lower shaft, collect the washer.



- Working on either side, loosen and remove the front screw and collect the washer.



- Loosen and remove the engine upper nut and collect the washer.



- Remove the upper shaft, collect the washer.



- Loosen and remove the nut and set aside the screw and the cable guide.



Griso V1100

- Loosen and remove the screw and remove the plate.



NOTE The following operations shall be performed together with a second operator.

- Partially lower the engine.



- Disconnect the oil pressure sensor connector.



- Completely lower the engine.



- Raise the vehicle rear end.



- Remove the front stand.



- Release the slings from the hoist supporting the vehicle rear end and remove the frame from the engine.



5.1.2. FITTING THE ENGINE ON THE FRAME

- Secure the vehicle frame to a lift; lift the engine and set in position.



- Connect the oil pressure sensor connector.



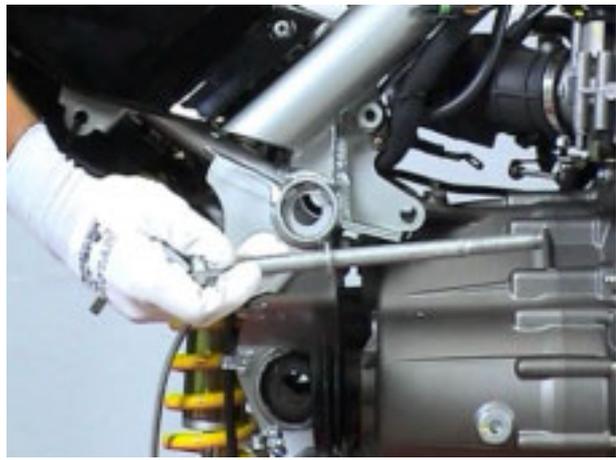
- Position the plate and tighten the screw.



- Position the screw, the cable guide and tighten the nut.



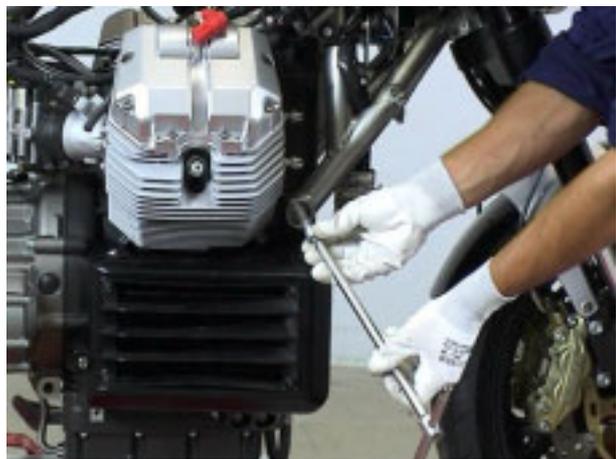
- Working on the right side, fit the washer and the upper pin.



- Fit the washer and fit the engine top nut.



- Working on either side, position the washer and fit the screw.



- Working on the right side, fit the washer and the lower pin.

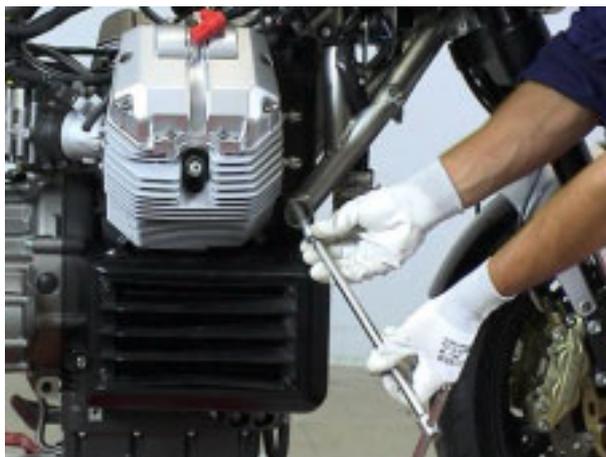


Griso V1100

- Fit the washer and tighten the engine bottom nut.



- Working on either side, tighten the screw to the specified torque.



- Tighten the stud bolt.



- Fit the oil vapour tank and tighten the screw.



- Fit the ECU and tighten the two screws.



- Fit the ECU guard and tighten the two screws.

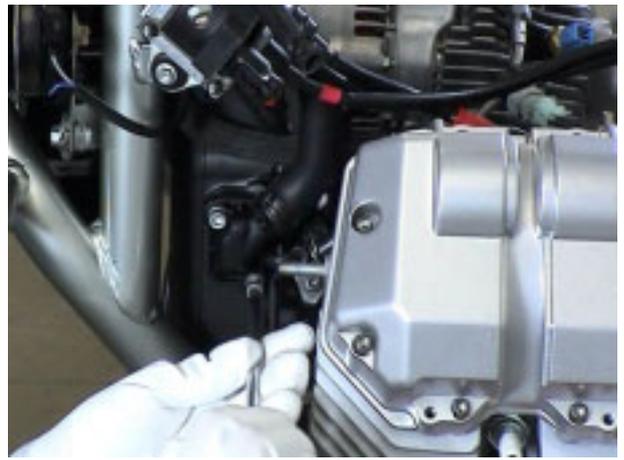


- Connect the stand sensor connector and secure it to the frame with new ties.



Griso V1100

- Fit the oil vapour hose and tighten the two screws.



- Fit the oil bleed hose and secure it with a new tie.



- Fit the gearbox fluid breather tube.



- Fit the clutch slave cylinder.
- Tighten the three screws.



- Position the clutch bleed hose in the cable guide.
- Fill the clutch system with fluid.



- Connect the starter motor connectors.



- Connect the earth cables and tighten the screw.



Griso V1100

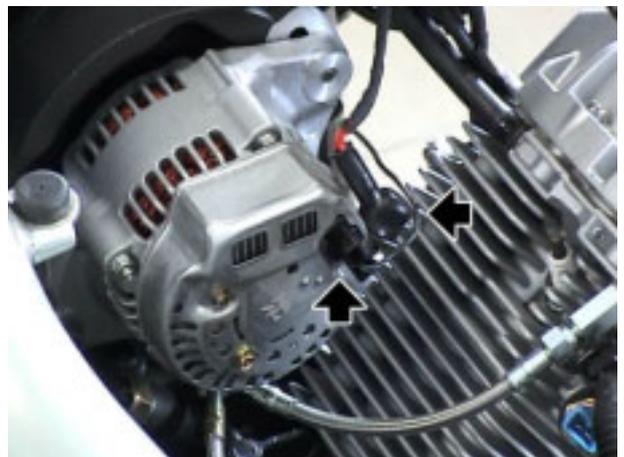
- Fit the starter motor protection.
- Fit the two washers and tighten the two screws.



- Connect the neutral sensor end connector.



- Connect the generator connectors.



- Fit the gasket and connect the rpm sensor connector.



- Fit the washer and tighten the two screws.



- Connect the connector on the throttle position sensor end.



- Connect the engine temperature sensor connector.



- Connect the stepper motor connector.



Griso V1100

- Connect the throttle cables.



- Working on either side, connect the injector connectors.



- Working on either side, connect both spark plug caps.





- Working on either side, fit the insert and tighten the two internal screws.



- Working on either side, fit the spark plug protection and tighten the two external screws.



- Install the fuel tank, see (REMOVING THE FUEL TANK).
- Install the seat.
- Working on either side, fit the side body panel and tighten the three screws.



Griso V1100

- Fit the swingarm together with the cardan joint.



- Fit the complete exhaust system, the air box, the tank and the seat.



CHASSIS

6

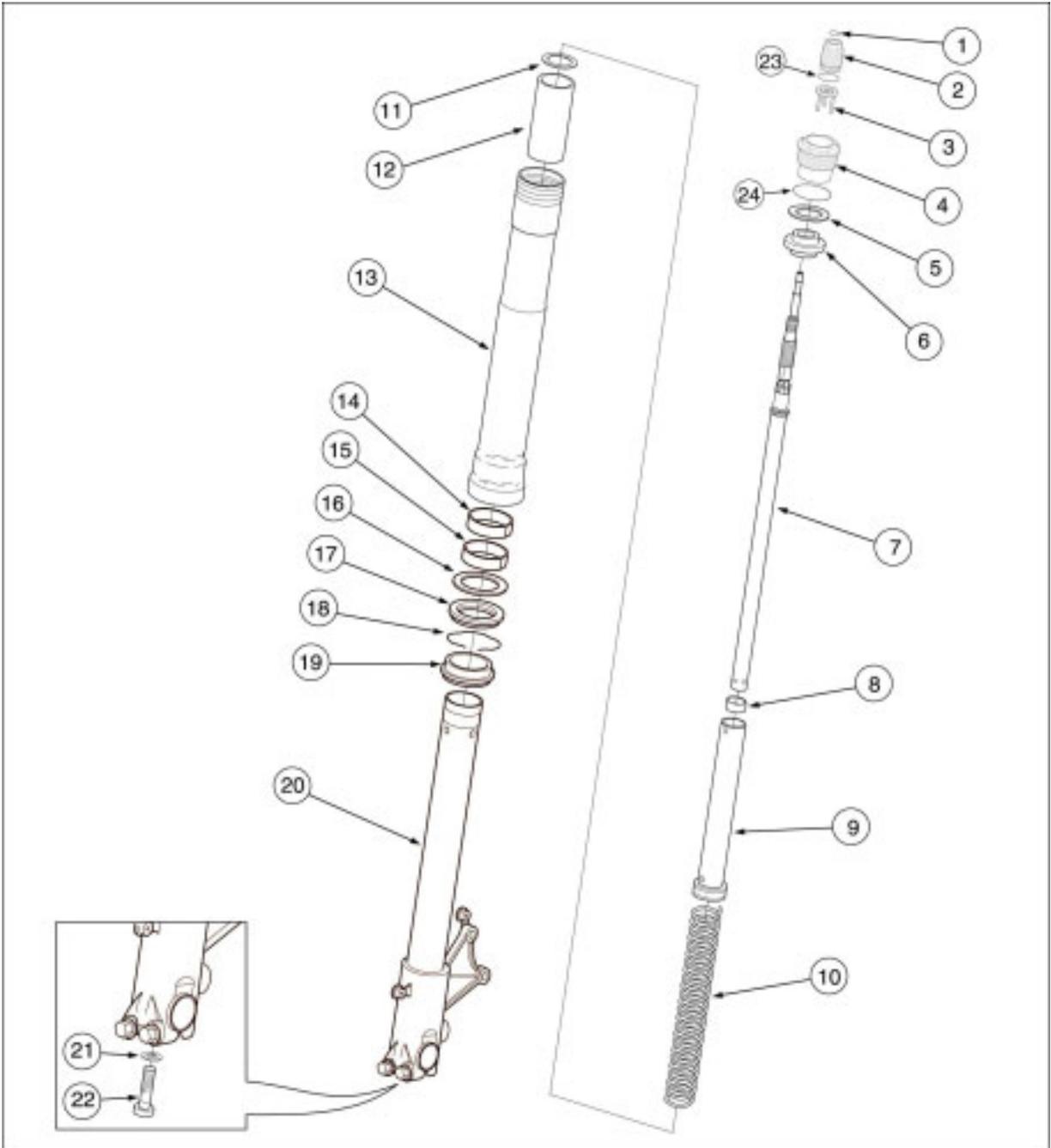


SUMMARY

6.1	FRONT FORK.....	3
6.1.1	FRONT FORK DIAGRAM.....	3
6.1.2	REMOVING THE FORK LEGS.....	4
6.1.3	INSTALLING THE FORK LEGS	7
6.1.4	DRAINING THE FORK OIL	10
6.1.5	FILLING THE FRONT FORK FLUID	13
6.1.6	REMOVING THE OIL/DUST SEALS	16
6.1.7	REFITTING THE OIL/DUST SEALS.....	23
6.1.8	CHECKING THE COMPONENTS	30
6.1.9	ADJUSTMENTS	32
6.2	ADJUSTING THE STEERING BEARINGS PLAY.....	33
6.2.1	ADJUSTING THE STEERING BEARINGS PLAY	33
6.3	REAR SUSPENSION	38
6.3.1	REAR SUSPENSION DIAGRAM.....	38
6.3.2	REMOVING THE REAR SUSPENSION.....	39
6.4	FRAME	41
6.4.1	REMOVING THE RIGHT FOOTREST PLATE	41
6.4.2	REMOVING THE LEFT FOOTREST PLATE.....	44

6.1 FRONT FORK

6.1.1 FRONT FORK DIAGRAM



Key

- 1. Snap ring
- 2. Spring preload adjuster
- 3. Spring preload pusher
- 4. Sleeve upper plug
- 5. Washer
- 6. Slider
- 7. Complete damper rod
- 8. Centring bushing
- 9. Spring spacer tube
- 10. Spring
- 11. Spring rest washer
- 12. Lower collar

- 13. Sleeve
- 14. Sliding bushing
- 15. Guide bushing
- 16. Stop ring
- 17. Gasket
- 18. Snap ring
- 19. Dust seal gasket
- 20. Stanchion
- 21. Copper washer
- 22. Centre screw
- 23. O-ring gasket
- 24. O-ring gasket

6.1.2 REMOVING THE FORK LEGS

- Working on either side, loosen and remove the two front brake calliper screws and remove the calliper from its housing.



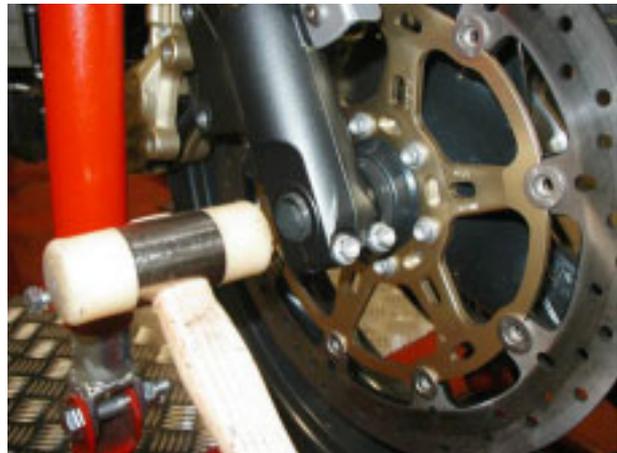
- Support the front end of the vehicle.
- Loosen and remove the wheel shaft fixing nut and set aside the washer.



- Working on either side, loosen the screws of the wheel shaft clamps.



- Lightly tap the wheel shaft with a rubber mallet until the holes on the opposite side are uncovered.



Griso V1100

- Remove the wheel shaft using a screwdriver inside the shaft holes.
- During this operation, support and remove the wheel.



- Remove the front wheel spacer on the right side.



- Working on either side, loosen and remove the two screws.



- Remove the front mudguard.



- Support the fork and loosen the top and bottom yoke screws.



- Slide out the fork leg.



6.1.3 INSTALLING THE FORK LEGS

NOTE The operations below apply to both fork legs.

- Fit the fork leg.
- Support the fork leg and tighten the screws on the top and bottom yokes to the specified torque.



- Fit the front mudguard.



- Working on either side, tighten the two screws.



- Fit the spacer in its housing, on the right-hand side of the front wheel.



- Fit the front wheel and insert the wheel shaft by lightly tapping it with a rubber mallet.



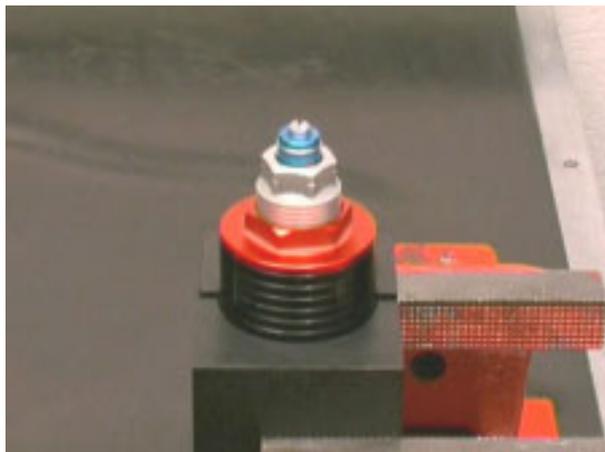
Griso V1100

- Working on either side, take fully home the wheel shaft pinch bolts.
- Support the front end of the motorcycle, then fit and tighten the wheel shaft nut and sealing washer.
- Tighten the wheel shaft pinch bolts to the specified torque.
- Working on either side, tighten the two front brake calliper screws.

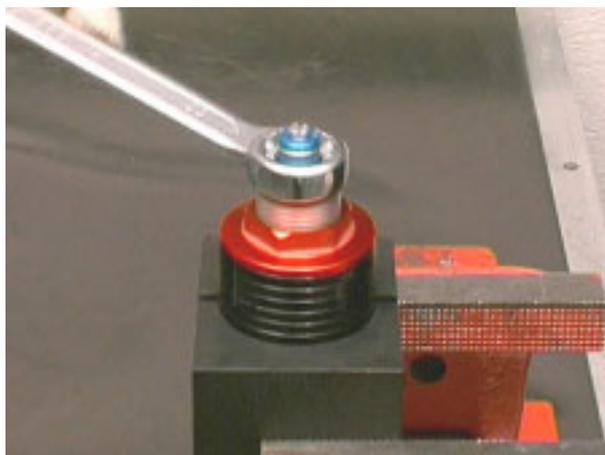


6.1.4 DRAINING THE FORK OIL

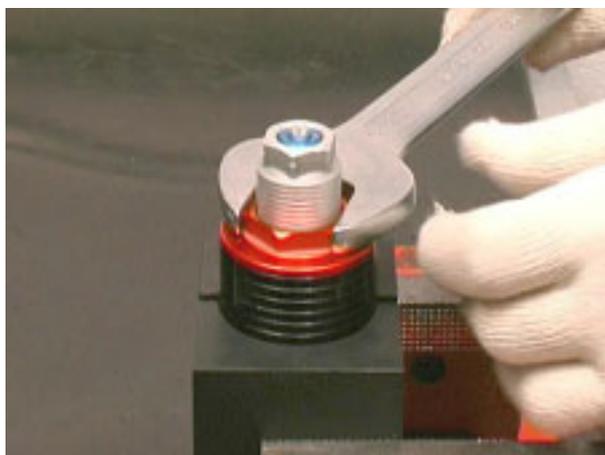
- Vice the outer sleeve using the suitable tool (part no. AP8140149).



- Set the spring preload to its minimum.



- Unscrew the sleeve upper plug.



- Clamp the fork bottom end with care to avoid damaging it.



- Fit the suitable tool (part no. AP8140191) to spring joint.



- Push the tool downward to compress the spring and then fit the tool spacer under the cartridge check nut.



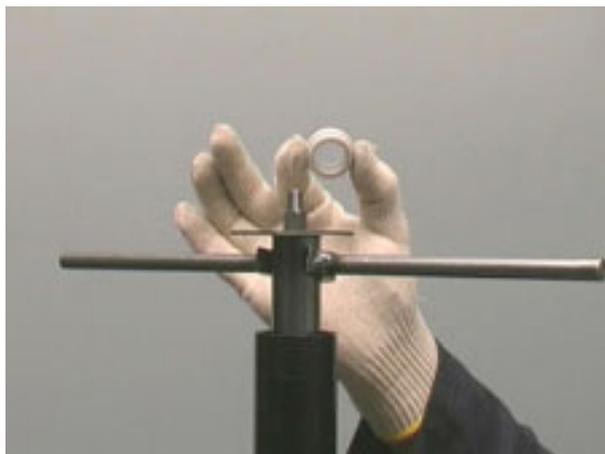
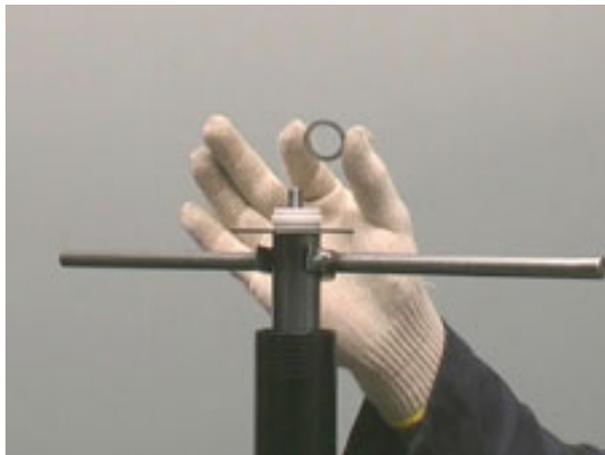
- Loosen the plug by applying a wrench to the flats and holding the check nut steady.



- Remove the complete plug.



- Remove the spacer and the washer.
- Press downward against spring force and slide out the spacer.



- Slide out the spring joint.

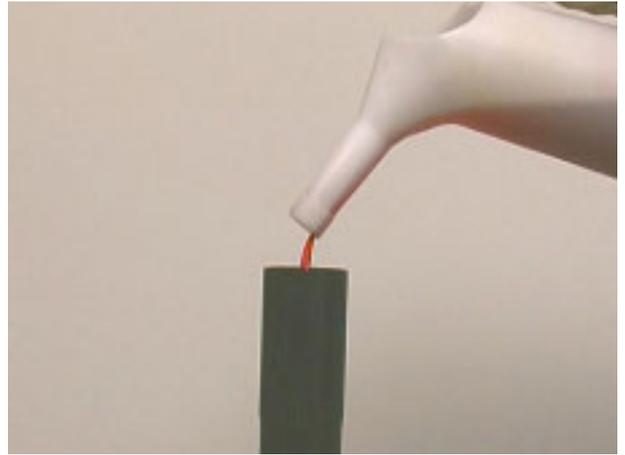


- Empty the oil into a container and remove the spring.



6.1.5 FILLING THE FRONT FORK FLUID

- Fill the fork so the air bubbles trapped inside are released.



- Fit the spring joint.



- Fit the relevant tool (part no. AP8140147) to the spring joint so as to lock the cartridge rod.

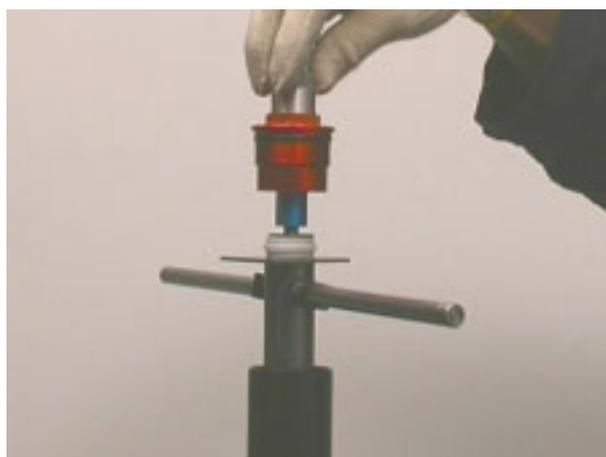


- Fit the spacer and the washer.

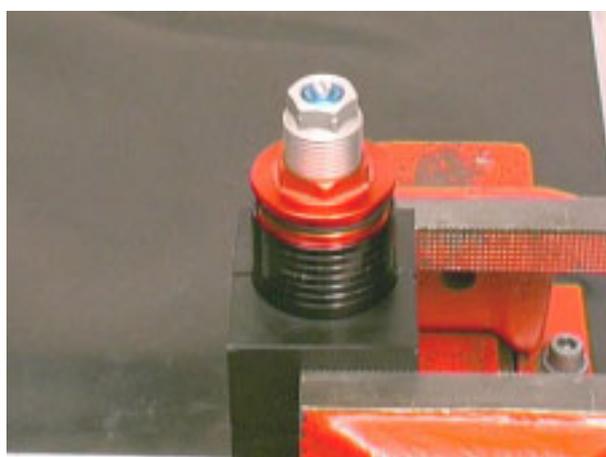




- Tighten the upper plug on the cartridge rod.

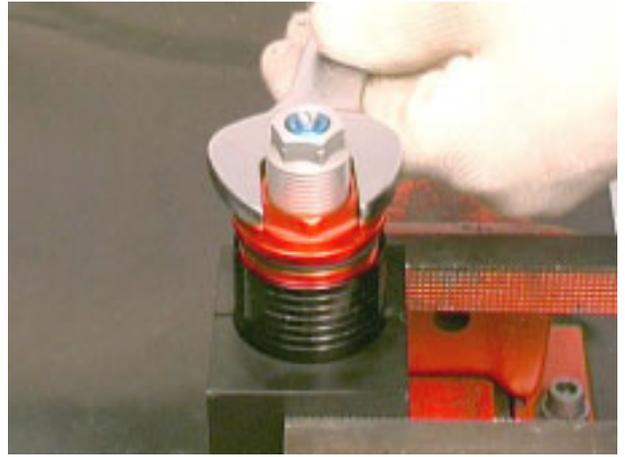


- Vice the outer sleeve using the suitable tool (part no. AP8140149).



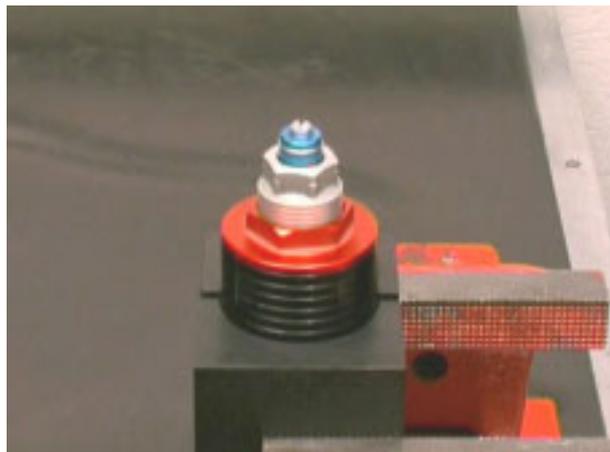
Griso V1100

- Tighten the upper plug to the indicated torque.

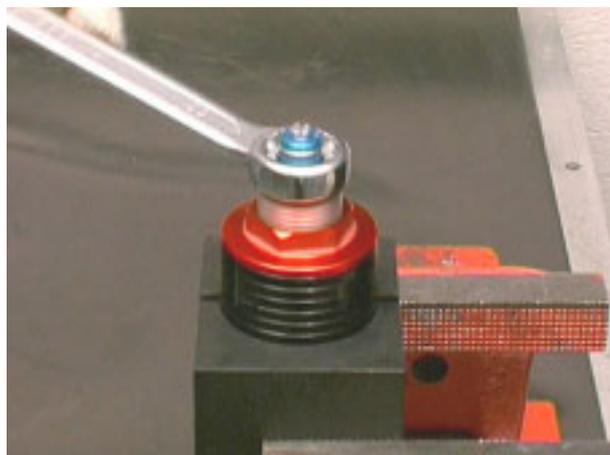


6.1.6 REMOVING THE OIL/DUST SEALS

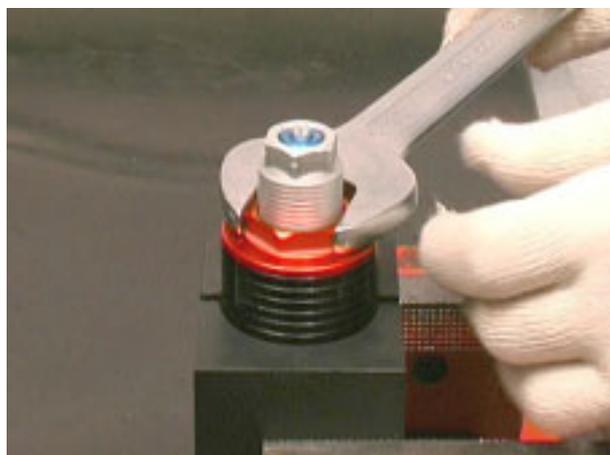
- Vice the outer sleeve using the suitable tool (part no. AP8140149).



- Set the spring preload to its minimum.



- Unscrew the sleeve upper plug.

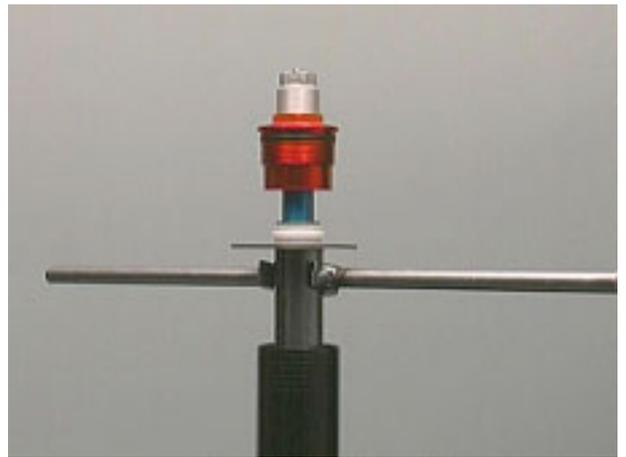


- Clamp the fork bottom end with care to avoid damaging it.

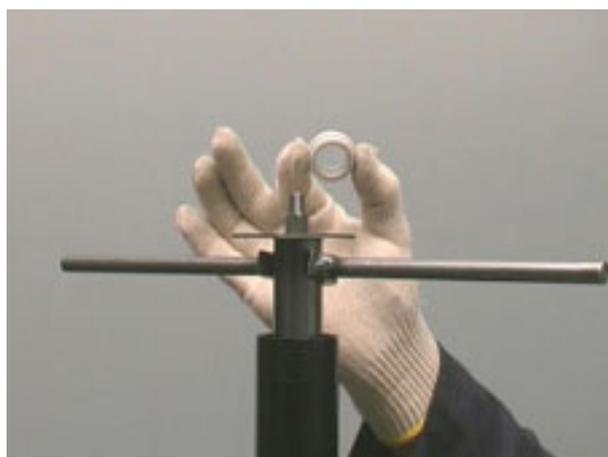


Griso V1100

- Fit the recommended tool (part no. AP8140147) to spring joint.
- Push the tool downward to compress the spring and then fit the tool spacer under the cartridge check nut.
- Loosen the plug by applying a wrench to the flats and holding the check nut steady.
- Remove the complete plug.



- Remove the spacer and the washer.
- Press downward against spring force and slide out the spacer.



- Slide out the spring joint.



- Empty the oil into a container and remove the spring.



Griso V1100

- Remove the lower spacer and the washer.



- Loosen the cartridge fixing screw on the fork bottom end.



- Set aside the centring bushing.



- Slide out the sleeve dust seal using a screwdriver for leverage.
- When doing this take care not to damage the edge of the sleeve.



- Remove the snap ring.



- Remove the sleeve from the slider using the sleeve as a stop.



- Remove the sliding bushing fixed to the slider, the movable bushing, the ring and the oil seal.





- Remove the ring and the dust seal.



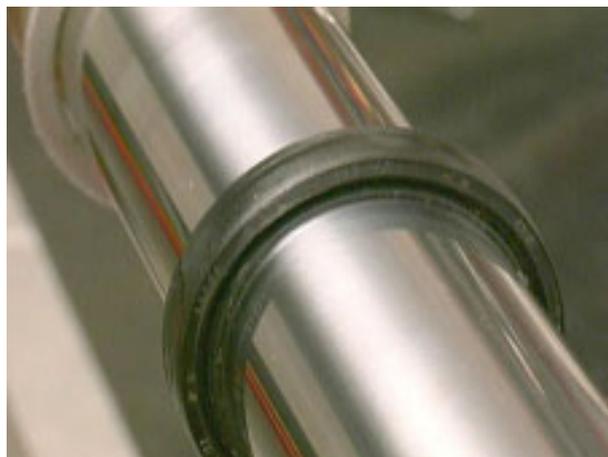


6.1.7 REFITTING THE OIL/DUST SEALS

- Clamp the leg in a vice with care to avoid damaging its surfaces.
 - Protect the ends of the leg with adhesive tape.
 - Lubricate the sliding edges with fork fluid or seal grease.
-
- Fit the dust seal, the snap ring and the sealer ring on the slider.



- The stamped side of the sealer ring must be facing the dust seal.



- Proceed to fit the ring, the movable bushing and, after having removed the tape, the fixed bushing.



Griso V1100

- Fit the sleeve on the leg and, using the specific tool, place the oil guard in position.



- Insert the snap ring in its housing.



- Fit the dust seal with the specific tool.



- Fit the centring bushing on the cartridge and place the complete assembly in the fork.



- Tighten the cartridge fixing screw on the fork bottom end to the specified torque.



- Fit the lower spacer and the washer.

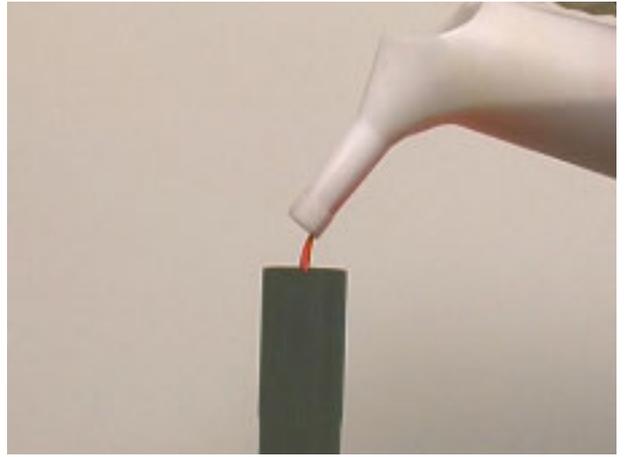


- Fit the fork spring.



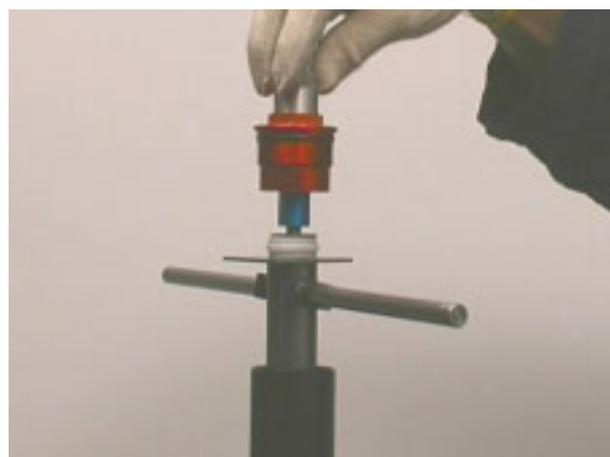
Griso V1100

- Fill the fork so the air bubbles trapped inside are released.
- Fit the spring joint.
- Fit the suitable tool (part no. AP8140147) to the spring joint so as to lock the cartridge leg in position.
- Fit the spacer and the washer.

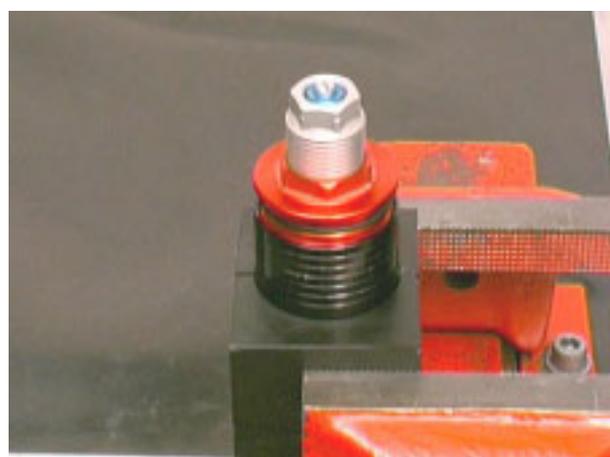




- Tighten the upper plug on the cartridge rod.

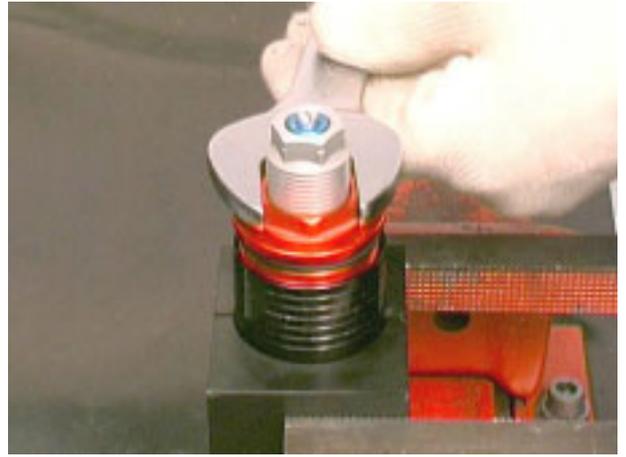


- Vice the outer sleeve using the suitable tool (part no. AP8140149).



Griso V1100

- Tighten the upper plug to the indicated torque.

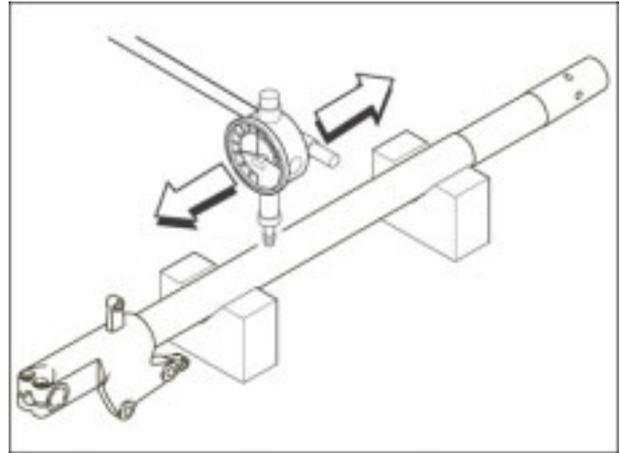


6.1.8 CHECKING THE COMPONENTS

STANCHION

Inspect the sliding surface for scoring and/or scratching.
Eliminate minor scoring with wet sand paper (grain size 1).
Replace the stanchion if badly scored.
Check for stanchion buckling using a dial gauge.
Replace the stanchion if buckled beyond the service limit.

Buckling limit: 0.2 mm (0.079 in).



DANGER

NEVER attempt to straighten a buckled stanchion as this would weaken the overall structure leading to a dangerous riding condition.

SLEEVE

Inspect for damage and/or cracking. Replace if damaged.

SPRING

Check spring condition and ensure that the length is within the specified limits.
If the length does not correspond, replace the spring.



Minimum length of the uncompressed spring: 284 mm.

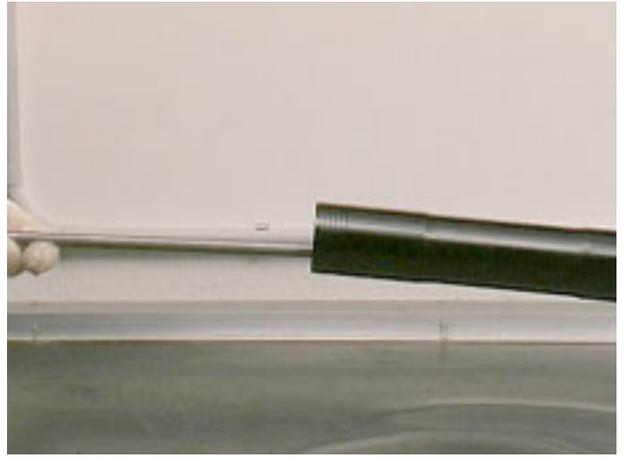
Check the condition of the following parts:

- sliding bushing;
- guide bushing;



Griso V1100

- damper rod.
- Change any component that is badly worn or damaged.



WARNING
Remove any impurities from the bushing; pay attention not to damage the surface.

When reassembling, replace the following components with new ones:

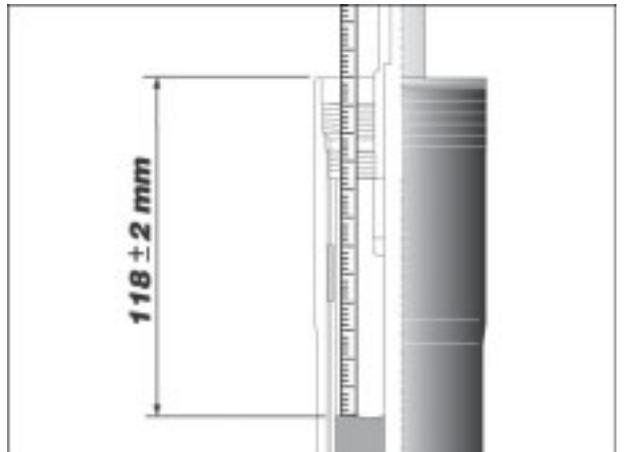
- gasket;
- dust seal gasket;



- the two O-rings on the regulator.

Oil quantity: 520 ± 2.5 cu cm (31.7 ± 0.15 cu in).
Oil level: 118 ± 2 mm (4.6 ± 0.079 in) (from sleeve edge).

NOTE To correctly measure the oil level the sleeve must be perfectly vertical. The oil level must be the same on both legs.



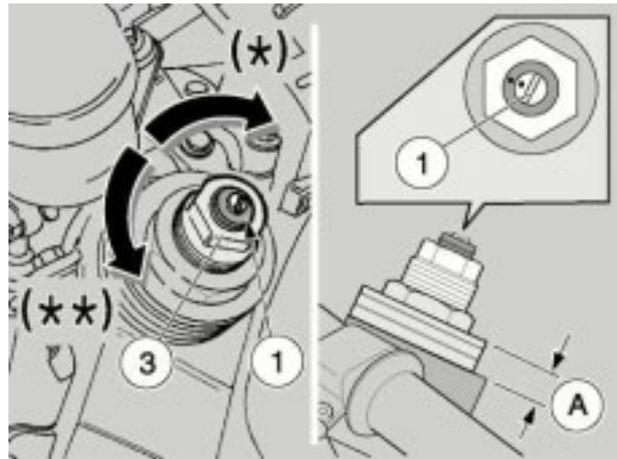
6.1.9 ADJUSTMENTS

The standard adjustment of the fork meets most conditions of high and low speed riding, whether the vehicle is travelling with a full load or not. It is however possible to customise the adjustment, depending on how the vehicle is used.



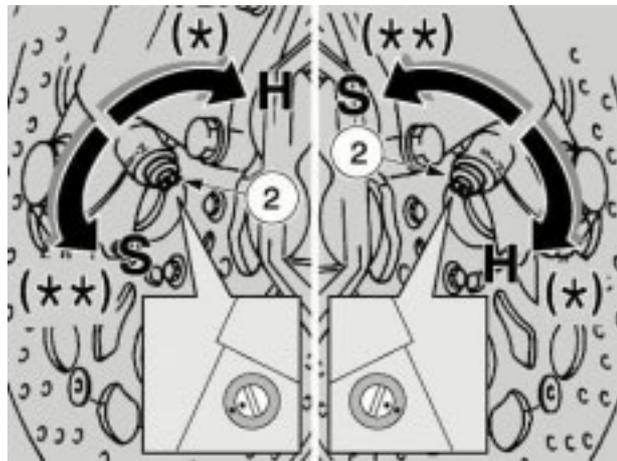
WARNING

When proceeding with the adjustment, always start from the stiffest setting [adjusters 1 and 2 turned completely clockwise]. As a reference for adjusting compression and rebound damping, use the marks on the adjusters (1-2). Gradually turn the adjusters (1-2) by 1/8 of a turn each time.



DANGER

Racing adjustments must be made exclusively during organised races or sporting events held on tracks far from road circulation and with the authorisation of the proper authorities. It is strictly prohibited to make racing adjustments and ride the vehicle with said setting on roads and motorways



Front suspension	Standard adjustment	Racing adjustment
Rebound damping adjustment, screw (1)	from completely closed (*) open (**) 1.25 turns	from completely closed (*) open (**) 0.5 – 1 turn
Compression damping adjustment, screw (2)	from completely closed (*) (H) open (**) (S) 1 turn	from completely closed (*) (H) open (**) (S) 0.5 – 1 turn
Spring preload, nut (3)	from completely closed (*) open (**) 4 – 5 projection notches	
Leg projection (A) (***) from top yoke (excluding plug)	4 projection notches	5 projection notches

(*) clockwise

(**) anticlockwise

(***) For this type of adjustment please contact exclusively a **Moto Guzzi** Authorised Dealer.



6.2 ADJUSTING THE STEERING BEARINGS PLAY

6.2.1 ADJUSTING THE STEERING BEARINGS PLAY

- Release and remove the two front screws.



- Loosen and remove the two outer screws and move the instrument panel forward.



- Loosen and remove the two screws and collect the right U-bolt.



- Supporting the handlebar, loosen and remove the two screws and collect the left U-bolt.



- Move the handlebar forward ensuring not to tip over the front brake and clutch fluid tanks.



- Unscrew and remove the screw.
- Keep the right handlebar support.



- Loosen and remove the fork top plate plug and collect the shim.





- Working on either side, loosen and remove the screw securing the top plate to fork legs.



- Raise the fork top plate sliding it off the fork legs.



- Straighten the safety washer on steering tube.



WARNING
When reassembling, renew the safety washer.

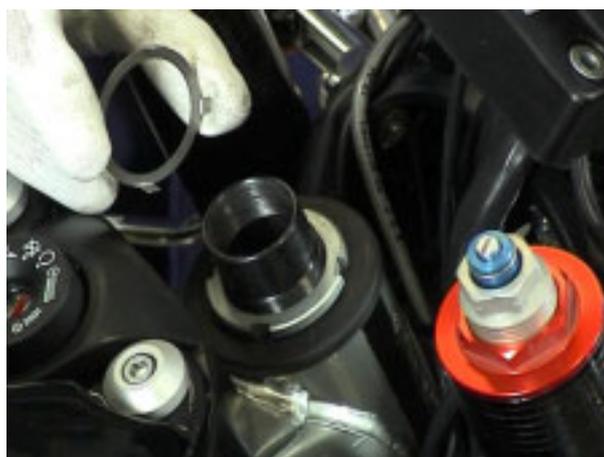


NOTE Use only the specific special tool: AP8140190 (tool to tighten steering head).

- Loosen and remove the upper ring nut with the specific tool.



- Remove the safety washer.



- Set the steering bearing preload using the special tool.



- Fit the safety washer.



Griso V1100

- Tighten the top ring nut finger tight and then continue tightening until ring nut notches are aligned.



- Bend the safety washer.



- Position the fork top plate on the fork legs.

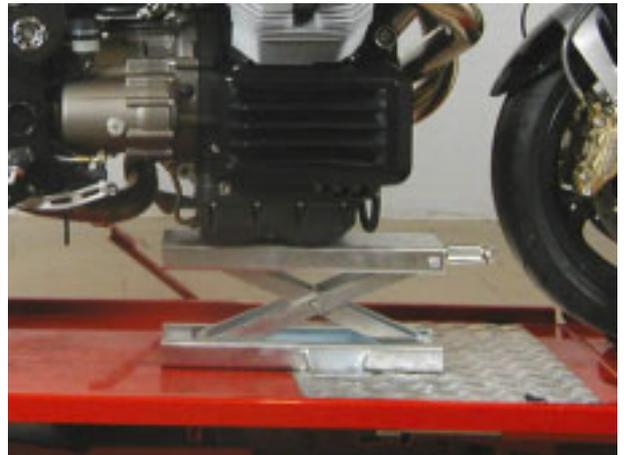


6.3.2 REMOVING THE REAR SUSPENSION

- Fasten the handlebar at the front using a hoist.



- Support the bottom of the vehicle with suitable means.



- Support the front of the vehicle with a suitable stand.



- Loosen and remove the nut.



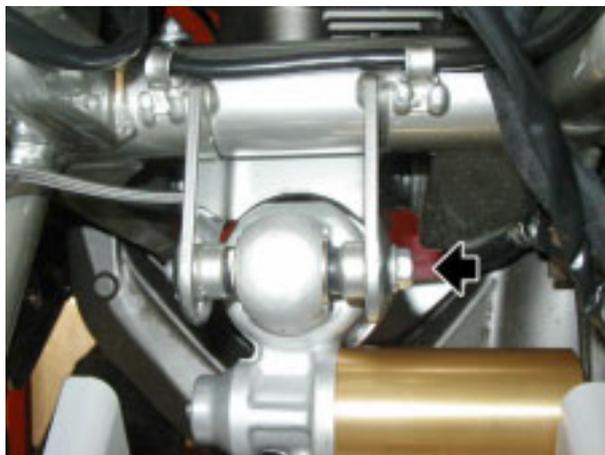
- Remove the screw by lightly tapping it with a rubber mallet and ease the connecting rod assembly out of its housing.



Loosen and remove the screw.



- Loosen and remove the screw and slide out the complete suspension from the top.



6.4 FRAME

6.4.1 REMOVING THE RIGHT FOOTREST PLATE

- Loosen and remove the two lower screws and set aside the nuts and the spacers.



- Remove the ties and cable guide from the brake line.



- Loosen and remove the two screws.
- Remove the rear brake calliper from the disc.



- Loosen and remove the upper screw and set aside the nut.



- Loosen and remove the upper screw.



Griso V1100

- Remove the air box (see REMOVING THE AIR BOX).
- Disconnect the rear brake lever switch connector and remove the ties.



- Remove the right footrest plate, keeping the brake fluid reservoir in vertical position.



6.4.2 REMOVING THE LEFT FOOTREST PLATE

- Remove the exhaust silencer.
- Loosen and remove the screw and set aside the nut and the spacer.



- Loosen and remove the screw and set aside the nut.



- Loosen and remove the screw.



- Loosen and remove the screw and remove the left footrest.



ELECTRIC SYSTEM

7



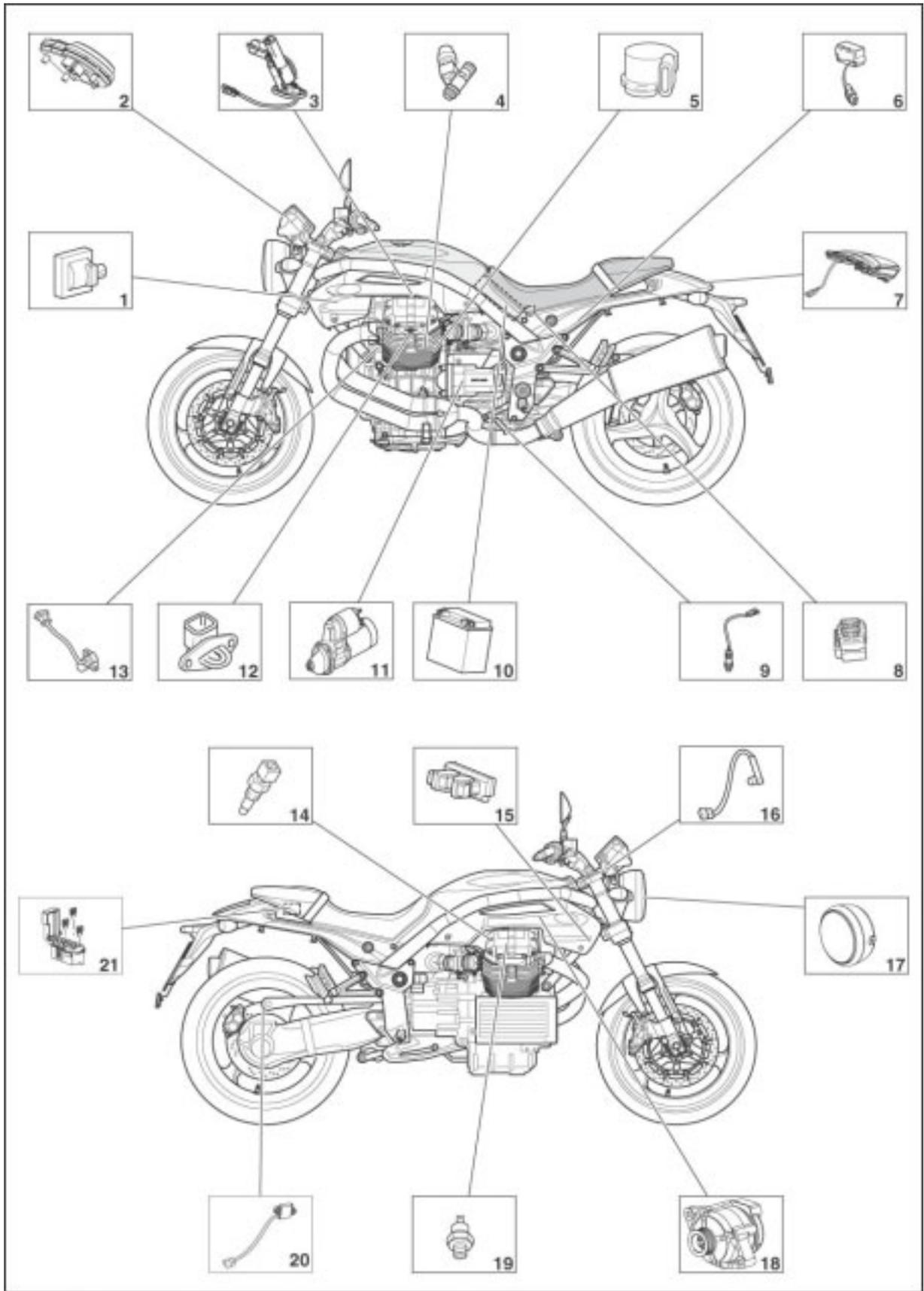
SUMMARY

7.1 ELECTRIC SYSTEM 3
7.1.1 ELECTRICAL PARTS CHECKS TABLE..... 3
7.1.2 WIRING DIAGRAM..... 11



7.1 ELECTRIC SYSTEM

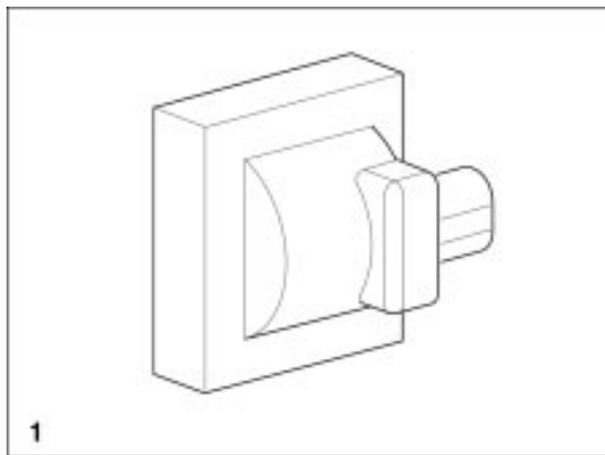
7.1.1 ELECTRICAL PARTS CHECKS TABLE



1 Coil

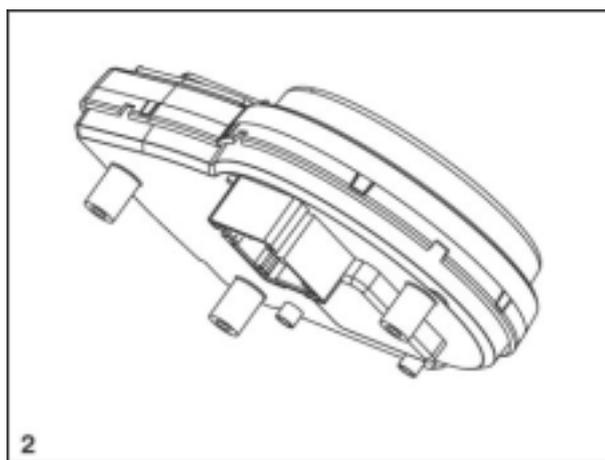
primary resistance: 0.9 – 1.1 Ω (measured across pins 1 and 15)

secondary resistance: 6.5 – 7.2 K Ω .

**2 Instrument panel**

The pinout of the grey connector is as follows:

Pin	Service
1	+ KEY
2	RIGHT INDICATOR CONTROL
3	HIGH BEAM INPUT
4	-
5	-
6	K-LINE
7	-
8	SELECT 1 - SET
9	FUEL LEVEL SENSOR
10	AIR TEMPERATURE SENSOR
11	+ BATTERY
12	LEFT INDICATOR CONTROL
13	-
14	-
15	-
16	GENERAL EARTH
17	OIL PRESSURE SENSOR INPUT
18	SENSOR EARTH
19	GENERAL EARTH (OPTIONAL)
20	GENERAL EARTH (OPTIONAL)



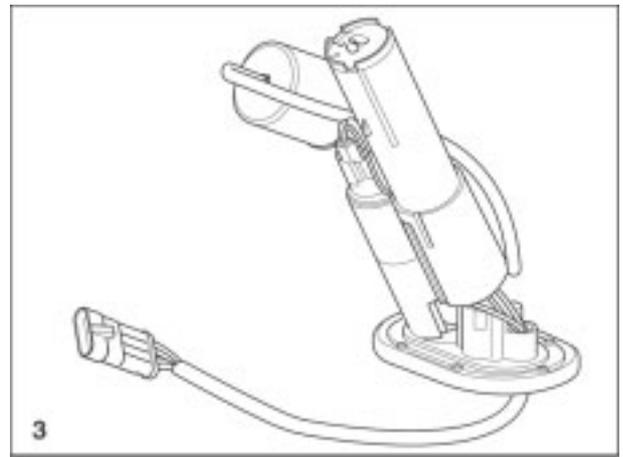
The pinout of the black connector is as follows:

Pin	Service
21	+ BATTERY
22	FRONT LH INDICATOR CONTROL
23	REAR LH INDICATOR CONTROL
24	ANTENNA 1
25	-
26	CAN H
27	-
28	LIGHTS RELAY CONTROL
29	-
30	SELECT 2
31	+ BATTERY
32	FRONT RH INDICATOR CONTROL
33	REAR RH INDICATOR CONTROL
34	ANTENNA 2
35	-
36	CAN L
37	-
38	-
39	-
40	SELECT 3

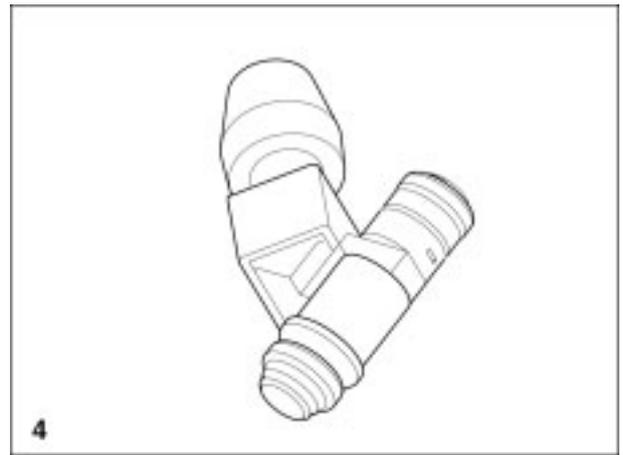
Griso V1100**3 FUEL PUMP**

Fuel pump:
Power input: 3.5 A (to be measured across pins 1 and 2 with 12V)

Fuel sensor
Resistance: 250-300 Ω (to be measured across pins 3 and 4 with fuel level equal to 0 litres)

**4 INJECTOR**

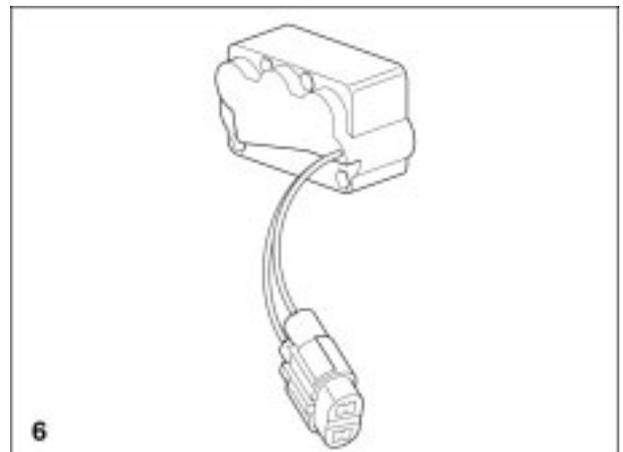
Resistance: $14\Omega \pm 2\Omega$ measured at 20°C (68°F)

**5 THROTTLE POSITION SENSOR**

output voltage 0.55-4.4 V (variable according to the throttle position, to be measured across pins C and A)

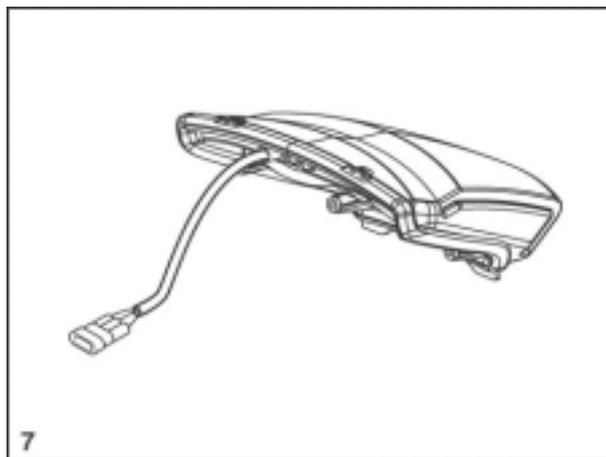
**6 BANK ANGLE SENSOR**

NO contact
Resistance: 0 Ω when turning the sensor by 90° with respect to assembly position.



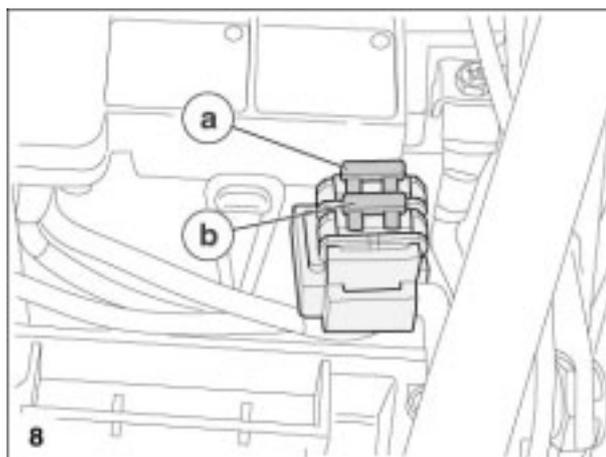
7 TAIL LIGHT

LED

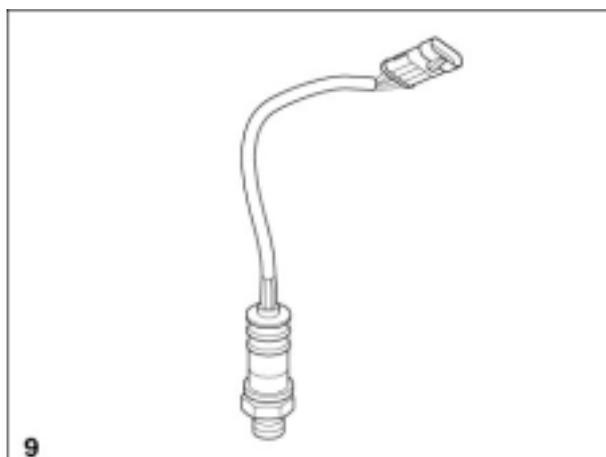
**8 MAIN FUSES**

a - From battery to voltage regulator (30 A).
 b - From battery to key and auxiliary fuses c - d (30 A).

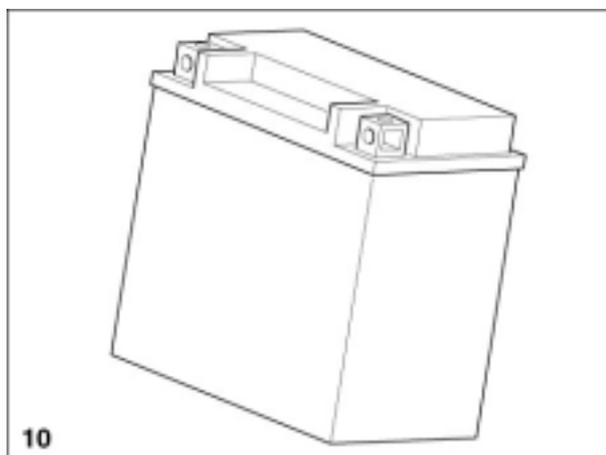
NOTE There is one spare fuse.

**9 OXYGEN SENSOR**

Oxygen sensor with heater.
 Sensor voltage between 0 and 0.9 V (to be measured across pins 1 and 2).
 Heater resistance 12.8 Ω (to be measured across pins 3 and 4 at 20°C – 68°F).

**10 Battery**

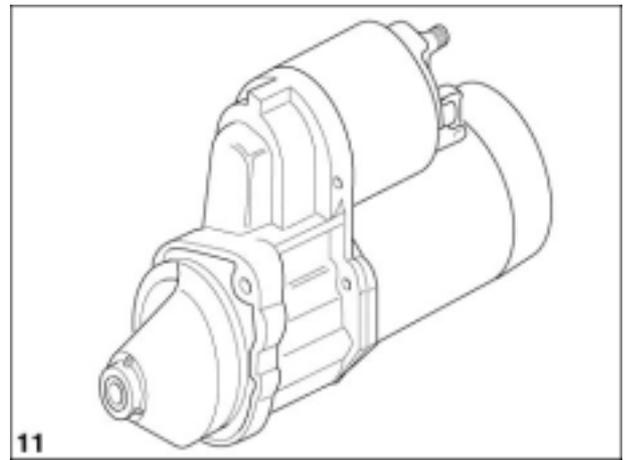
12 V – 18 Ampere/hour



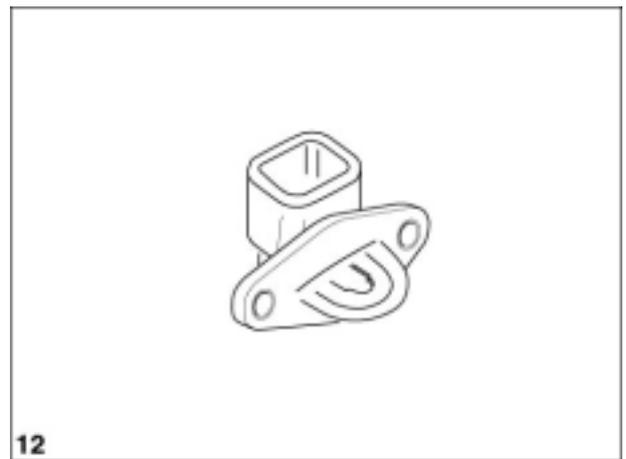
Griso V1100

11 STARTER MOTOR

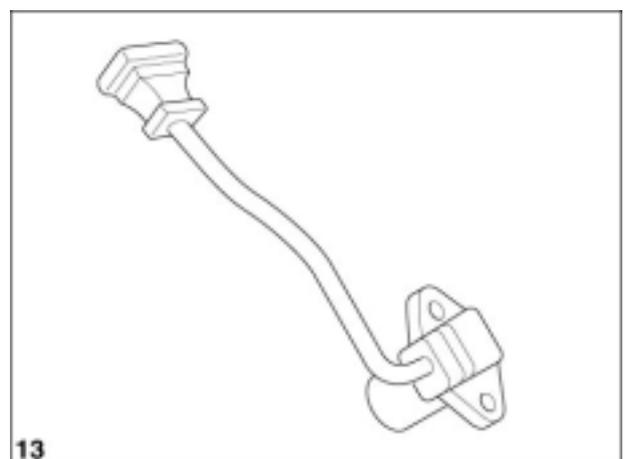
starting input: about 100 A

**12 INTAKE AIR TEMPERATURE SENSOR**

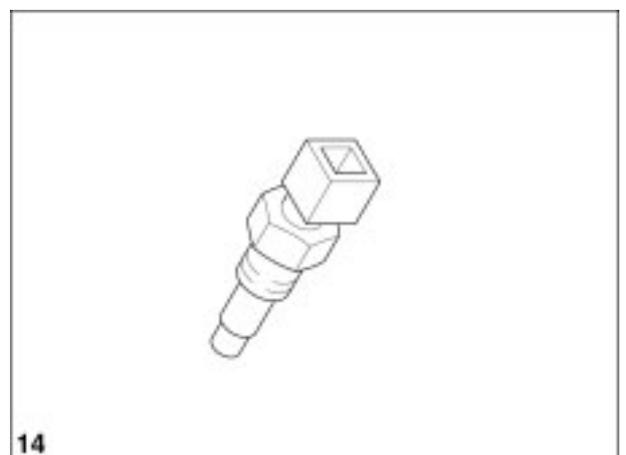
NTC-type sensor
resistance: 3.7 K Ω (at 20°C – 68°F)

**13 ENGINE SPEED SENSOR**

Inductive-type sensor, with shielding cable.
Winding resistance: 650 Ω (to be measured across pins 1 and 2).
Output voltage: 0-5 V (to be measured when cranking).
Air gap: 0.5 – 0.7 mm (0.0197 – 0.0276 in).

**14 HEAD TEMPERATURE SENSOR**

NTC-type sensor
resistance: 3.7 K Ω (at 20°C – 68°F)
resistance: 220 Ω (at 100°C – 212°F)

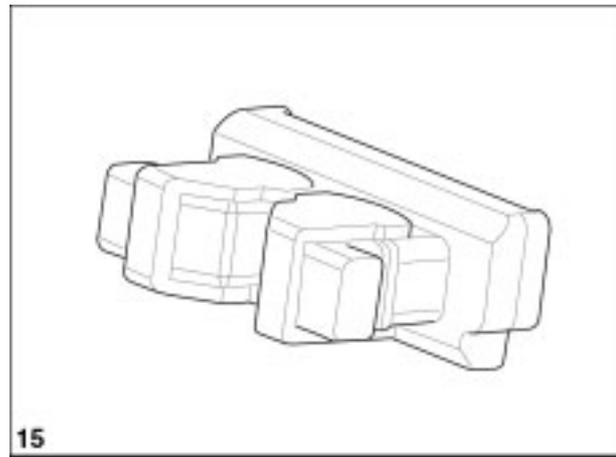


15 ECU

Model: Magneti Marelli IAW 5 AM2

Black connector pinout (engine)

Pin	Service
1	Not used
2	Not used
3	TPS signal
4	Not used
5	Engine temperature signal
6	Not used
7	Not used
8	Not used
9	Stepper motor (+)
10	Right cylinder coil control
11	Not used
12	Not used
13	Not used
14	Air temperature signal
15	Not used
16	Not used
17	Stepper motor (+)
18	Stepper motor (-)
19	Stepper motor (-)
20	Power supply 5V (NTC sensors)
21	Not used
22	Not used
23	Neutral sensor signal
24	Not used
25	Engine speed sensor signal
26	Not used
27	Not used
28	Left cylinder injector control
29	TPS power supply
30	Not used
31	Not used
32	TPS negative
33	Not used
34	Rpm sensor wave trap
35	Engine speed sensor signal
36	Not used
37	Right cylinder injector control
38	Left cylinder coil control

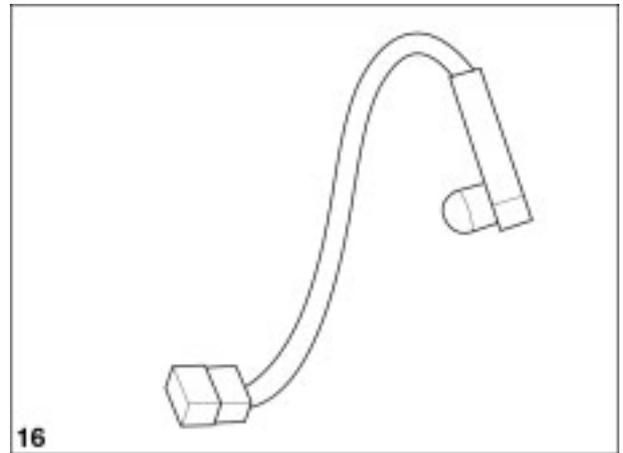
**Grey connector pinout (chassis)**

Pin	Service
1	Starter relay control pin 85
2	Not used
3	Not used
4	Protected power supply from instrument panel
5	Not used
6	Secondary relay control pin 86
7	Immobilizer line
8	Starter relay control pin 85
9	Not used
10	Not used
11	Oxygen sensor negative control
12	Not used
13	Not used
14	Not used
15	Not used
16	K line (diagnosis)
17	Power supply from main relay

continued

Griso V1100

Pin	Service
18	Not used
19	Not used
20	CAN – H line (ECU/instrument panel)
21	Not used
22	Oxygen sensor signal
23	Not used
24	Vehicle speed signal input
25	Not used
26	Not used
27	"Engine stop" signal input
28	Starting signal input
29	CAN – L line (ECU/instrument panel)
30	Not used
31	Not used
32	Oxygen sensor power supply
33	Clutch sensor signal
34	Not used
35	Bank angle sensor signal
36	Not used
37	Not used
38	Side stand sensor signal

16 INSTRUMENT PANEL AIR TEMPERATURE SENSORResistance: 32.5 k Ω (at 0°C – 32°F)Resistance: 10 k Ω (at 25°C – 77°F)**17 Headlight**

Parking light: 12V - 5W

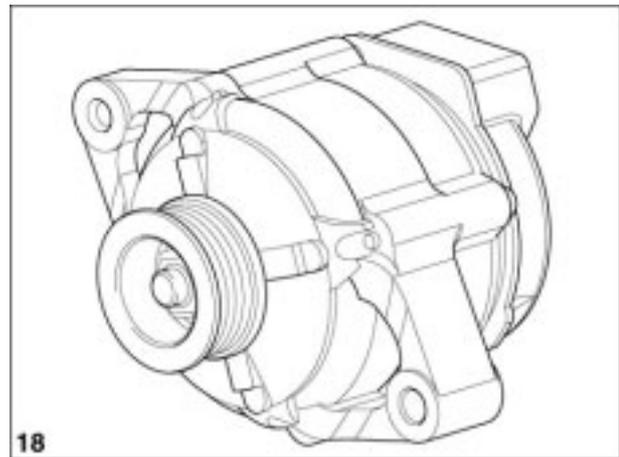
Low beam: 12V - 55W

High beam: 12V - 60W H4



18 GENERATOR

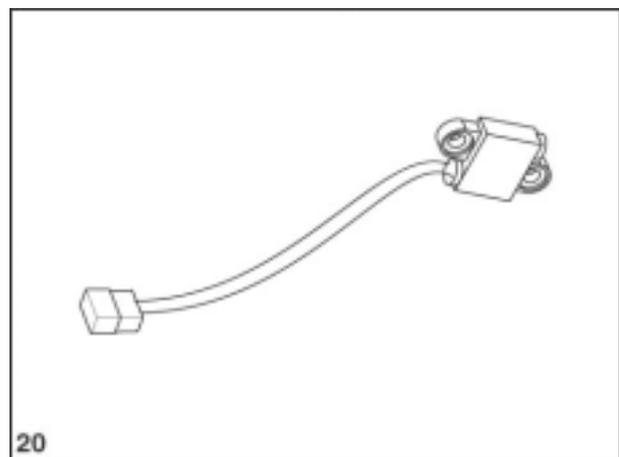
Single-phase generator with regulated voltage
 Maximum charge 40A (550W)
 Charge voltage 14.2 - 14.8 V (5000 rpm)

**19 OIL PRESSURE SENSOR**

NO contact

**20 SPEED SENSOR**

Active inductive sensor
 3-pin connector (Power supply - Signal-Ground)

**21 AUXILIARY FUSES**

c – Stop, horn, Hazard button light, light relay coil (15 A).

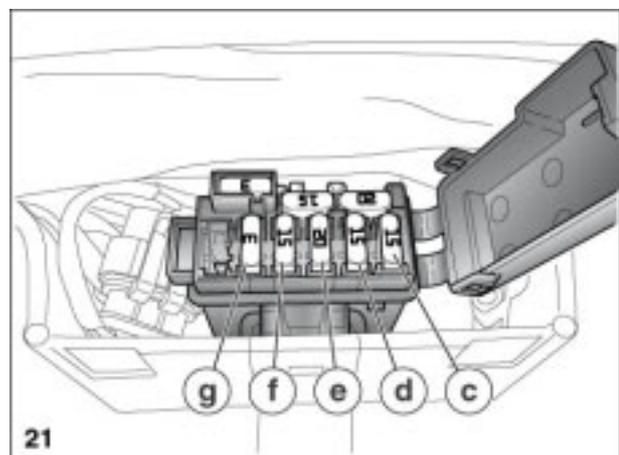
d – Parking lights, starter relay coil, passing (15 A).

e – Fuel pump, coils, injectors (20 A).

f – Lambda heater, secondary injection relay coil, starter relay coil, speed sensor power supply (15 A).

g – Permanent positive, ECU power supply (3A).

NOTE There are three spare fuses (3, 15, 20 A).



Key:

1. Multiple connectors
2. Diode arrangement
3. Starter relay
4. Clutch switch
5. Light relay
6. Right dimmer switch
7. Designed to fit a capacitor
8. Warning horn
9. Left dimmer switch
10. Instrument panel air temperature thermistor
11. Instrument panel
12. Instrument panel diagnosis
13. Key-operated switch
14. Immobilizer antenna
15. Rear right direction indicator
16. Tail light (LED)
17. Rear left direction indicator
18. Number plate light
19. Rear brake switch
20. Front brake switch
21. Diagnosis connector (ECU)
22. Auxiliary fuses
23. Main fuses
24. Starter motor
25. Battery
26. –
27. Generator
28. Injection main relay
29. Injection auxiliary relay
30. Oil pressure bulb
31. Gearbox in neutral switch
32. Oxygen sensor
33. Side stand switch
34. Fuel reserve sensor
35. Fuel pump
36. Intake air temperature thermistor
37. Head temperature thermistor
38. Automatic choke
39. Throttle sensor
40. Right cylinder internal spark plug
41. Right cylinder external spark plug
42. Left cylinder internal spark plug
43. Left cylinder external spark plug
44. Right cylinder twin coil
45. Left cylinder twin coil
46. Right cylinder injector
47. Left cylinder injector
48. Speed sensor
49. Bank angle sensor
50. Flywheel pick-up
51. Pick-up cable shielding
52. ECU
53. Front left direction indicator
54. Parking light bulb
55. Low beam bulb
56. Headlight
57. Front right direction indicator
58. –
59. –
60. –
61. –
62. –
63. –
64. –
65. –

Wire colour coding:

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

TRANSMISSION

8



SUMMARY

8.1 REAR TRANSMISSION..... 3
8.1.1 DISASSEMBLING THE SWINGARM 3
8.1.2 CHECK 7
8.1.3 REASSEMBLING THE SWINGARM 8
8.2 TRANSMISSION BOX..... 11
8.2.1 REMOVAL 11
8.2.2 REASSEMBLY 13
8.2.3 DISASSEMBLY 14



8.1 REAR TRANSMISSION

8.1.1 DISASSEMBLING THE SWINGARM

- Support the vehicle front end using the suitable stand and its rear end using slings and a hoist.
- Position the engine support stand under the oil sump.



- To remove the swingarm, first remove both footrest plates and the exhaust silencer.



- Remove the cover.



- Engage the first gear.
- Loosen and remove the four retaining screws; set aside the spacers.
- Remove the rear wheel



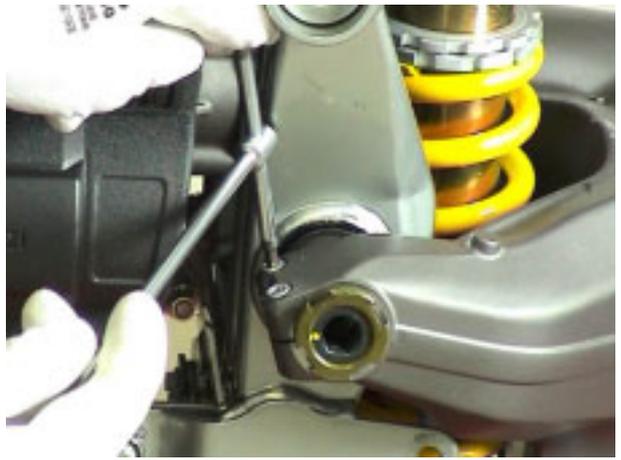
- Loosen and remove the reinforcement bar nut.
- Remove the screw.
- Secure the reinforcement bar to the frame using a clamp.



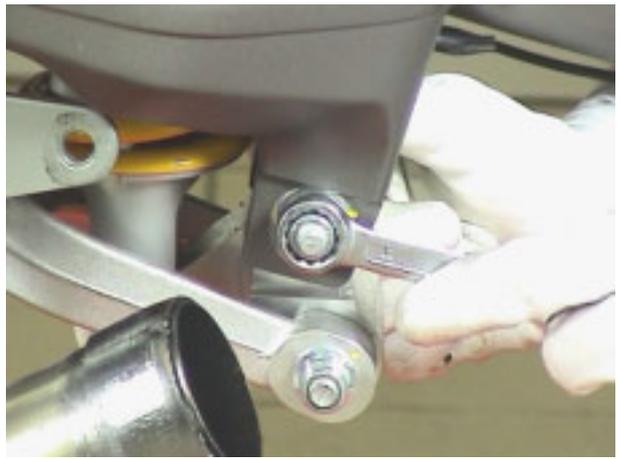
- Remove the dust cover clamp.



- Loosen the two screws on the swingarm clamp.



- Loosen and remove the connecting rod securing nut, set aside the screw.



- Disconnect the speed sensor connector and remove the ties securing the cable to the frame.



- Loosen the ring nut using the suitable special tool (part no. 05.91.26.30).



- With the help of a second person, slide out the shaft and remove the swingarm together with the cardan joint.



8.1.2 CHECK

- Check that the cardan joint is in good condition, that the gear teeth engaging in the union grooves and the joint grooves are not damaged or worn. If so, change the joint.
- Check that the rubber bellow is not cut or pierced. Change if necessary.
- Check that the threadings of the swingarm shafts and nuts are in good condition, are not damaged or flat. If so, change them.
- Check that the union grooves are in good condition, and in no way damaged or worn. If so, change them.
- Check that the union outer teeth and inner grooves are not damaged.



8.1.3 REASSEMBLING THE SWINGARM

- Smear some grease all along the swingarm shaft.
- Fit the ring nut on the swingarm shaft and tighten finger tight.



- Working on either side, grease cardan joint grooves with the recommended product, see (LUBRICANTS TABLE).
- Support the swingarm, fit the cardan joint, match the holes and, simultaneously, fit the shaft completely with the help of a second person.
- Tighten the swingarm shaft.

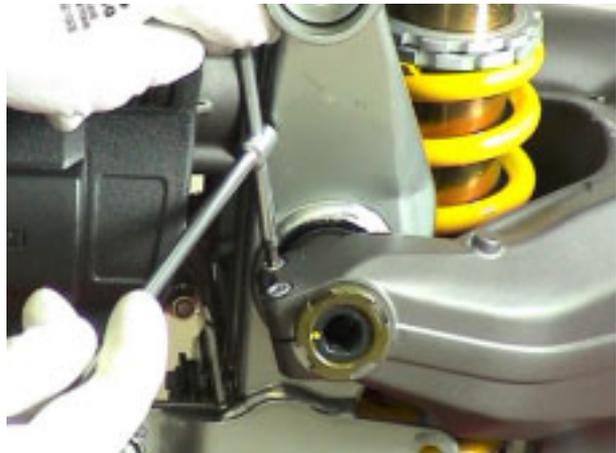


NOTE Prepare the suitable special tool (OPT):

- **guzzi** part# 05.91.26.30 (tool for tightening swingarm shaft ring nut).
- Tighten the ring nut using the suitable box spanner.



- Tighten the two screws on the swingarm clamp.

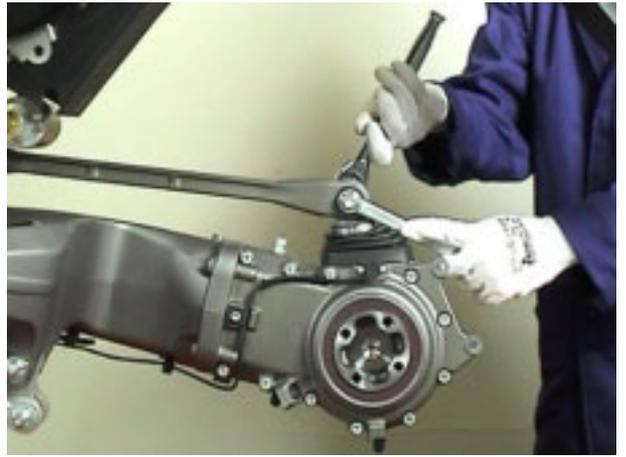


Griso V1100

- Fit the dust cover onto the gearbox.
- Secure the dust cover using a new clamp.



- Fit the reinforcement bar in its seat.
- Fit the screw.
- Tighten the reinforcement bar nut.



- Fit the connecting rod to the swingarm.
- Fit the screw.
- Tighten the connecting rod nut.



- Connect the speed sensor connector and secure the cable with ties.



- Fit the rear wheel on the swingarm.
- Tighten the four screws together with the spacers.
- Fit the cover.



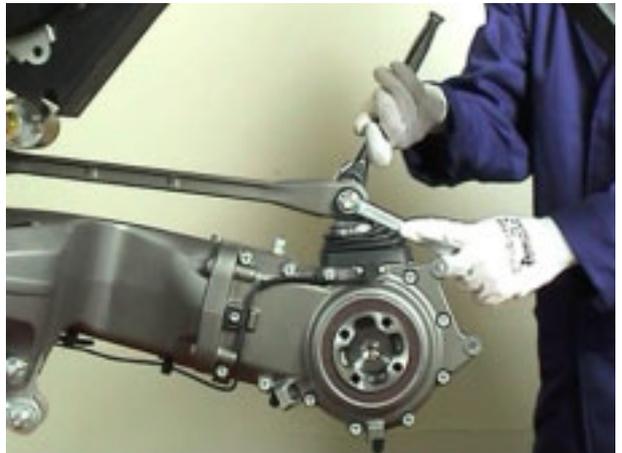
8.2 TRANSMISSION BOX

8.2.1 REMOVAL

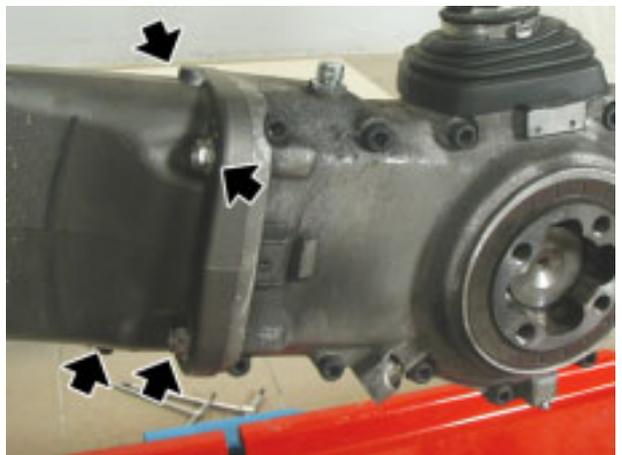
- Before removing the transmission box, first remove the exhaust silencer and the rear wheel.



- Loosen and remove the reinforcement bar nut.
- Remove the screw.
- Secure the reinforcement bar to the frame using a clamp.



- Loosen and remove the four screws.



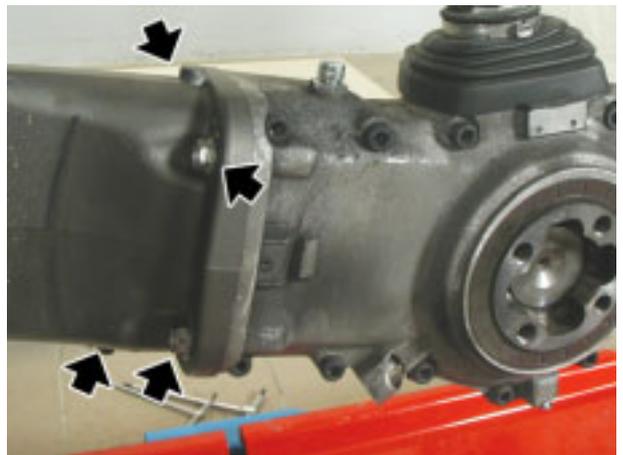
- Remove the cardan joint and the transmission box.



8.2.2 REASSEMBLY

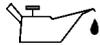
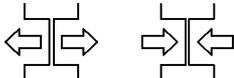
NOTE Grease cardan joint grooves using the recommended product, see (LUBRICANT TABLE).

- Fit the transmission box on the swingarm; ensure that the cardan joint fits correctly.
- Tighten the four screws to the specified torque; follow a cross pattern.
- Place the reinforcement bar in its seat.
- Insert the screw.
- Tighten the reinforcement bar nut.
- Fit the rear wheel on the swinging arm.
- Tighten the four screws together with the spacers.
- Fit the cover.

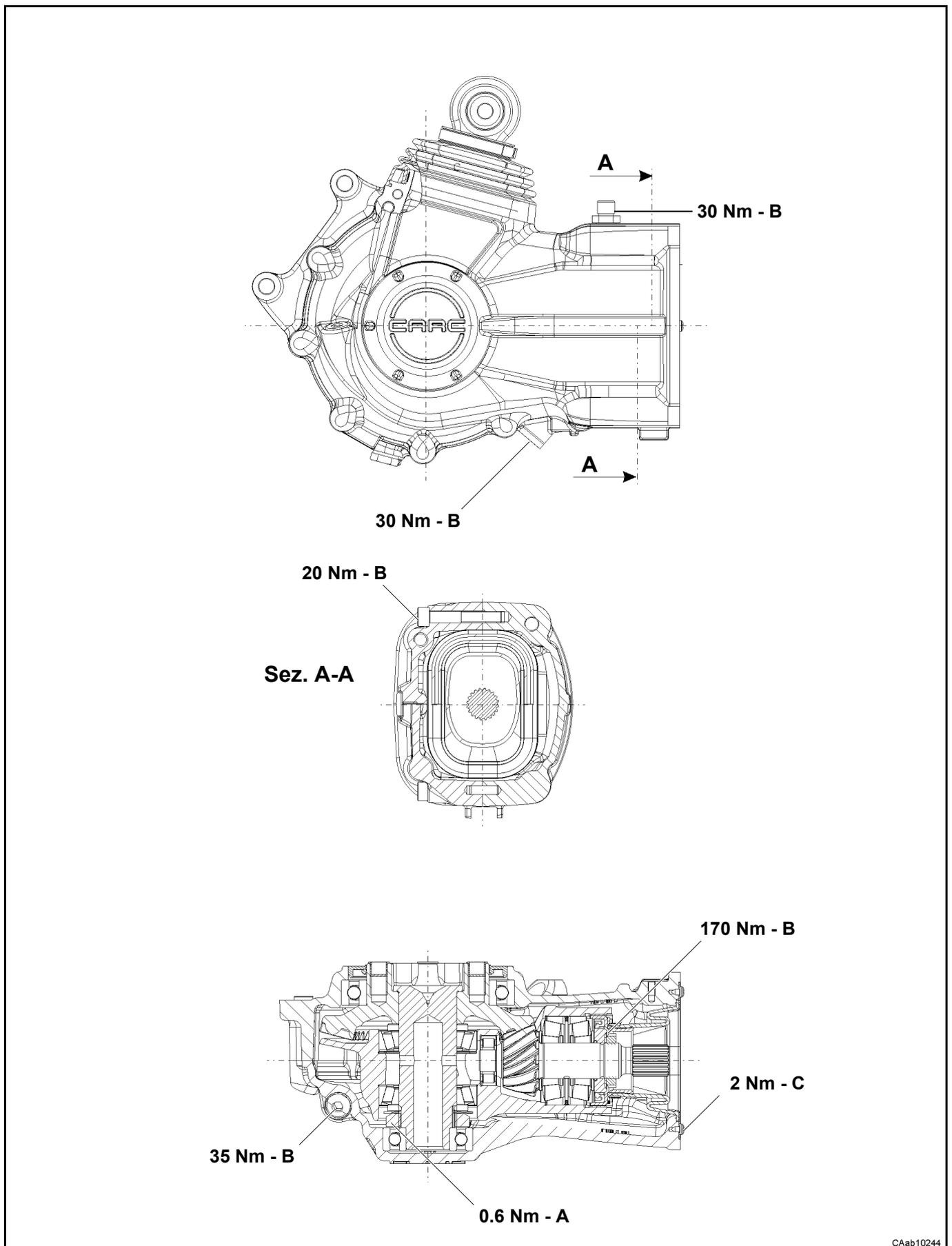


8.2.3 Disassembly

SYMBOLOLOGY

DESCRIPTION	SYMBOLS
WARNING/DANGER	
REMOVE/INSTALL seals-gaskets-filters	
OIL FILLING OR OIL LEVEL/OIL DRAIN	
LUBRICATION/GREASING	
ADJUSTMENTS/MEASUREMENTS tightening torques-preloads-backlash	
SPECIAL TOOLS	
SEALING/LOCKING FLUIDS APPLICATION	
MARKING	
DISASSEMBLY/ASSEMBLY OF BULKY PARTS OR SUBASSEMBLIES	
WARNING: respect assembly orientation	
CLEANING CAREFULLY	
APPLY PRESSURIZED FLUID	

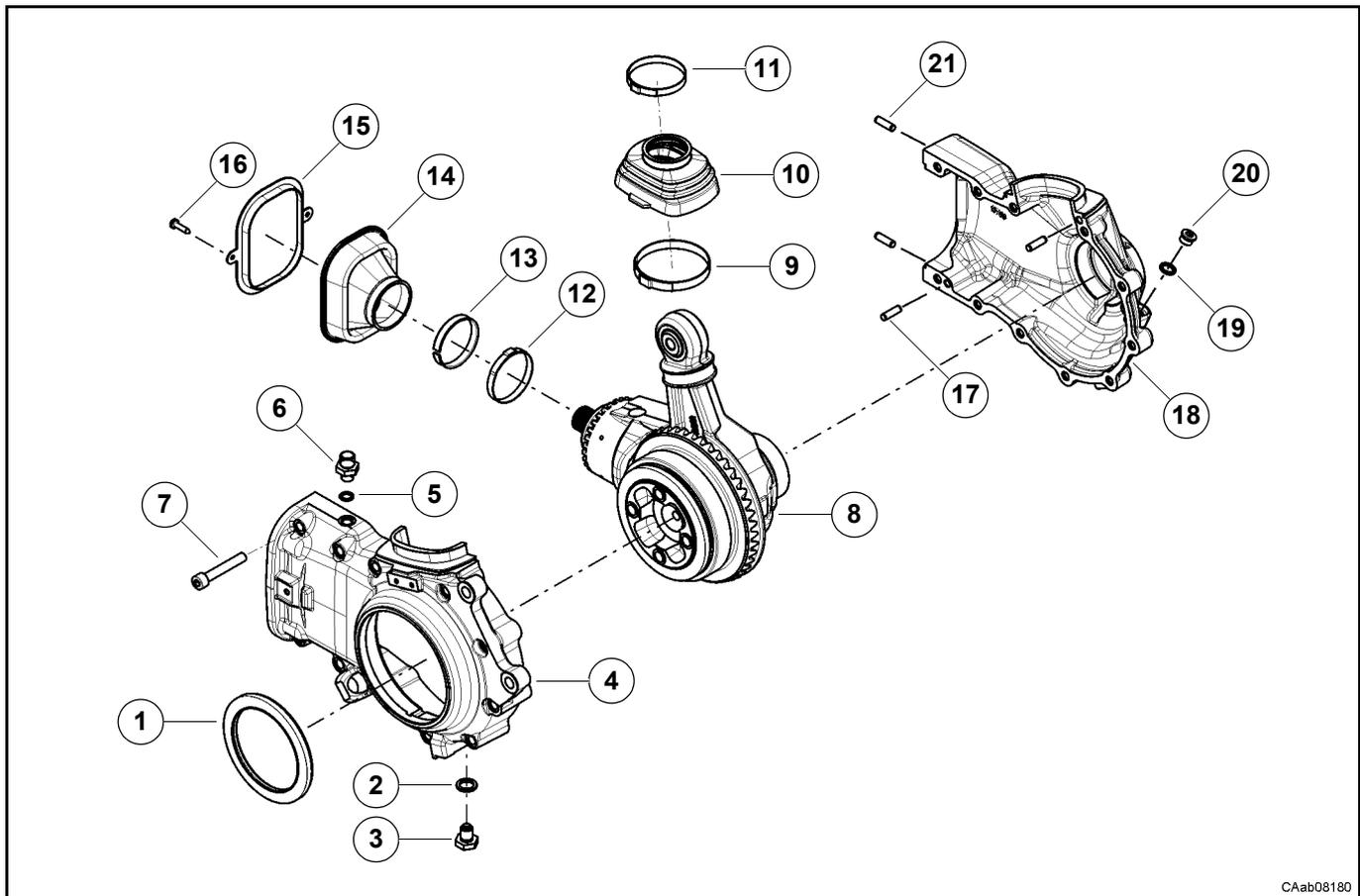
TIGHTENING TORQUES



CAab10244



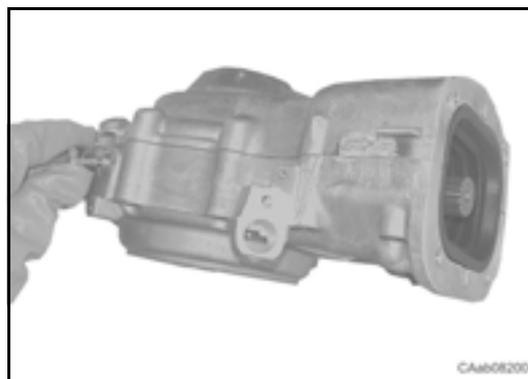
HOUSING GROUP



CAab08180

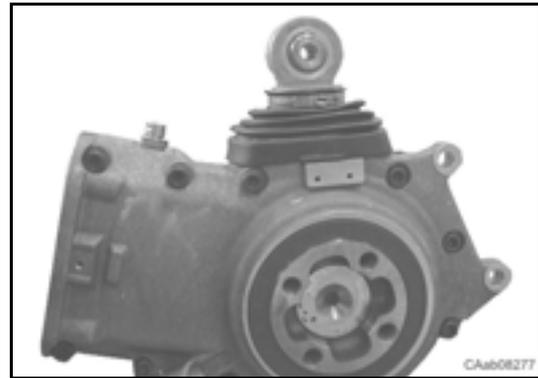
DISASSEMBLY

Remove the plug (20).
Remove the plug (3) to drain the oil.

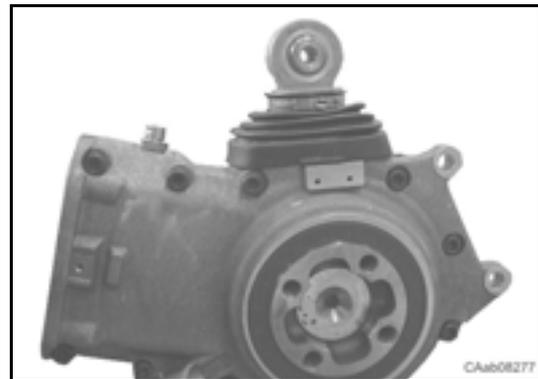


CAab08200

Lift the boot (10).



Remove the clamps (9) and (11).
Remove the boot (14).



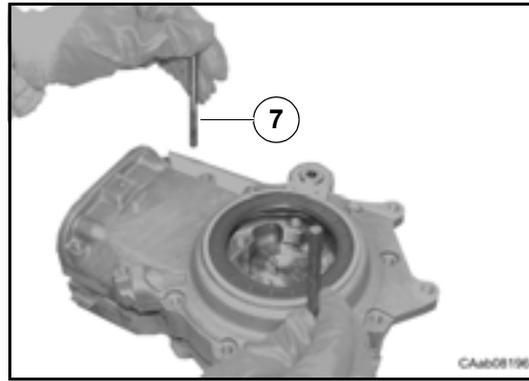
Remove the screws (16).



Collect the ring (15).



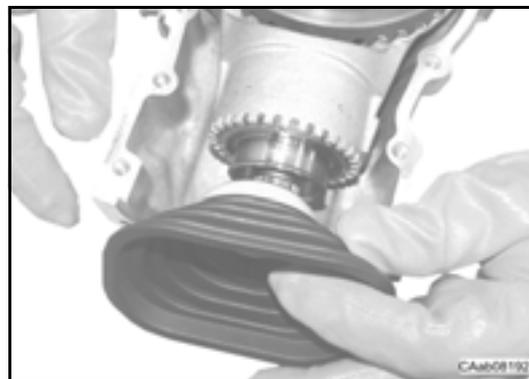
Remove the bolts (7).
Remove the housing (4).



Remove the clamp (12).



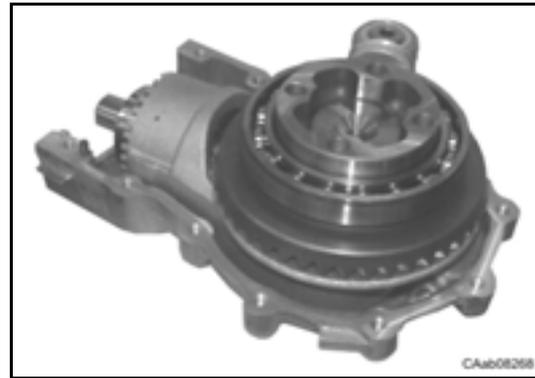
Remove the boot (14).



Collect the ring (13).

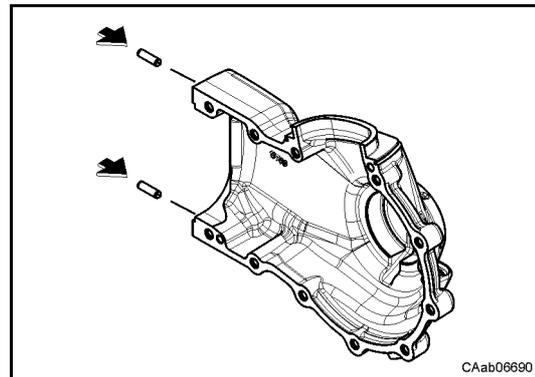


Remove the support group (8).

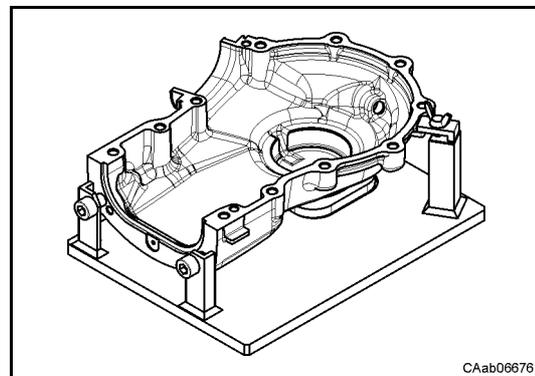


ASSEMBLY

Assemble the dowel pin (21) to the housing (18) with the special tool and a hammer.



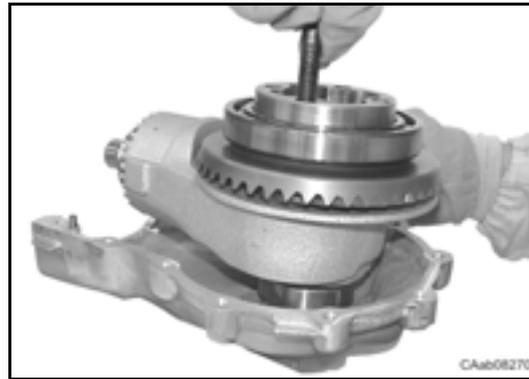
Assemble the housing (18) on the special fastening tool.
Clean with care the housings contact surfaces.



Heat the housing (18).



Insert the support group (8) into the housing (18).



Assemble the ring (13) with the boot (14).



Assemble the boot (14) to the support (8).

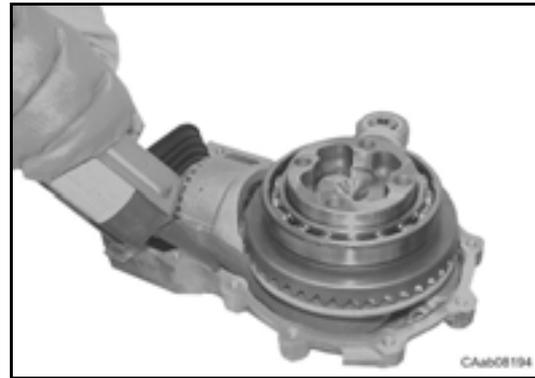
Assemble the clamp (12).



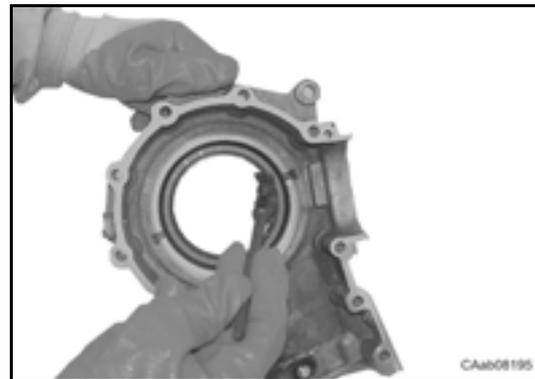
Lock the clamp (12) with suitable plier.



Apply the prescribed sealant to the housing (18).



Assemble a new seal ring (1) using the special tool.
Lubricate the seal ring (1).



Assemble two stud bolts with thread in the threaded holes on the housing (18), as shown in figure.

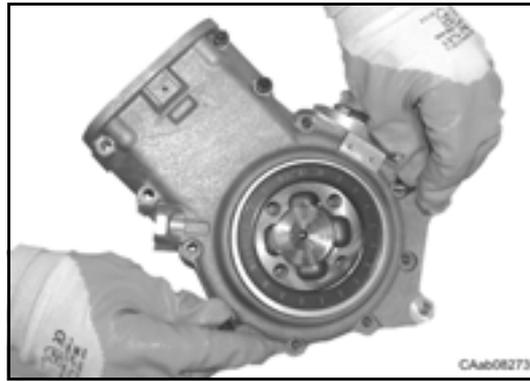


Assemble the housing (4).
Remove the two dowel pin.





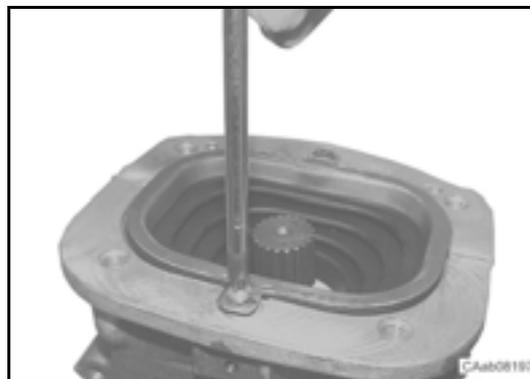
Assemble the fastening screws (7).
Tighten the screws (7) to the prescribed torque.
Remove the exceeding sealant.



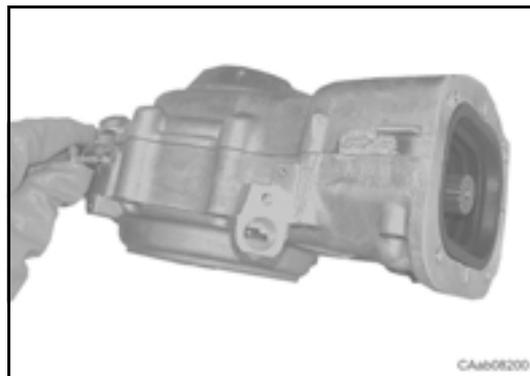
Assemble the ring (15) to the housing.



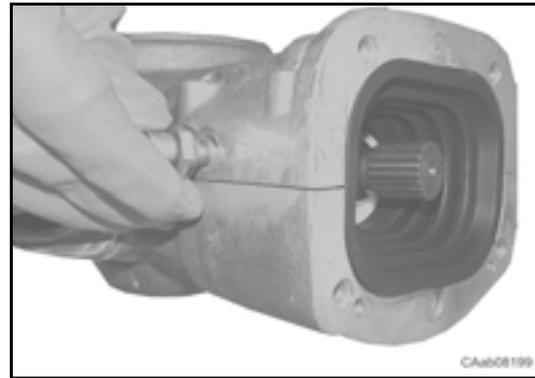
Assemble the fastening screws (16) to the prescribed torque.



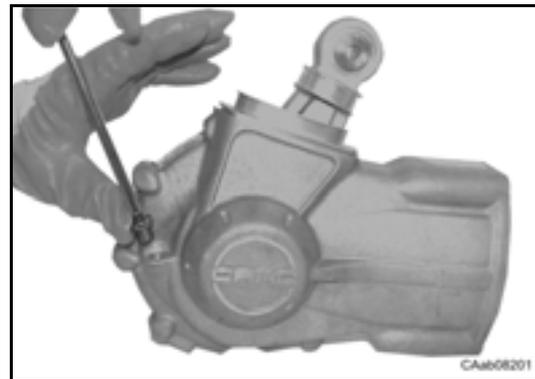
Assemble the plug (3) and the washer (2).
Tighten the plug to the prescribed torque.



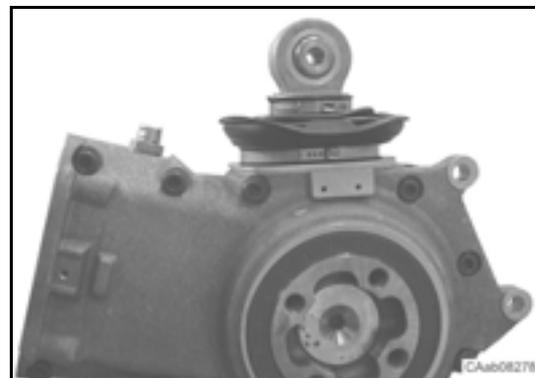
Assemble the breather (6) and the washer (5).
Tighten the breather (6) to the prescribed torque.



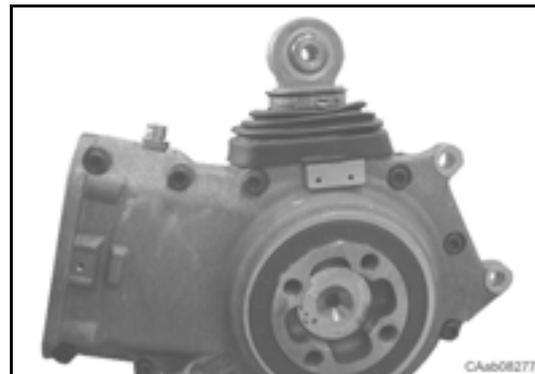
Fill the transmission with the prescribed oil.
Assemble the plug (3) and the washer (2).
Tighten the plug to the prescribed torque.



Assemble the boot (14) with the clamps (9) and (11).



Fit the boot (10) on its seat.



WHEEL SHAFT GROUP

DISASSEMBLY



Remove the bearing (1) from the wheel shaft (3) with suitable extractor.



Overturn the group.

Remove the bearing (10) from the wheel shaft (3) with suitable extractor.



ASSEMBLY

Heat the bearings (1) and (10) at 100°C.



Assemble the bearing (1) to the wheel shaft (3).



Overturn the group.

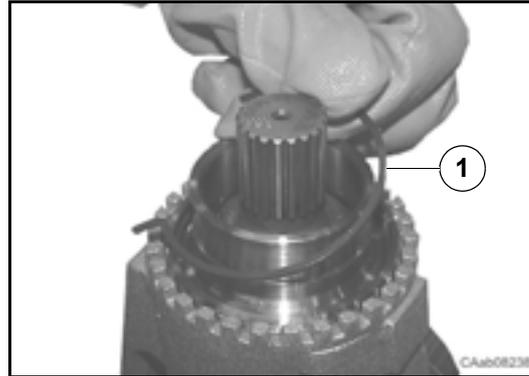
Assemble the bearing (10) to the wheel shaft (3).



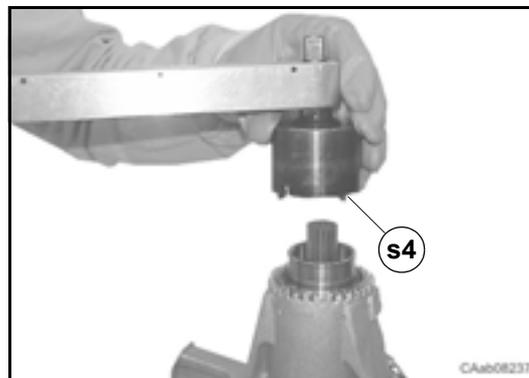
PINION GROUP

DISASSEMBLY

Remove the lock ring (1) from the ring nut (2).



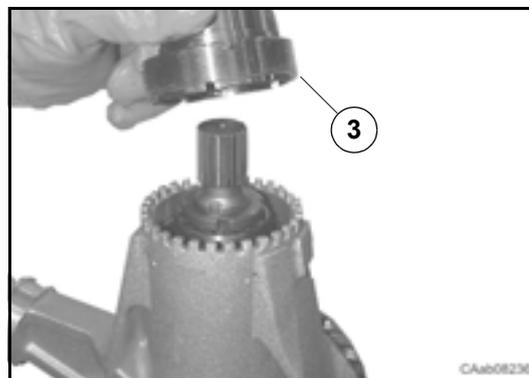
Unscrew the ring nut (2) with the special wrench (s4).



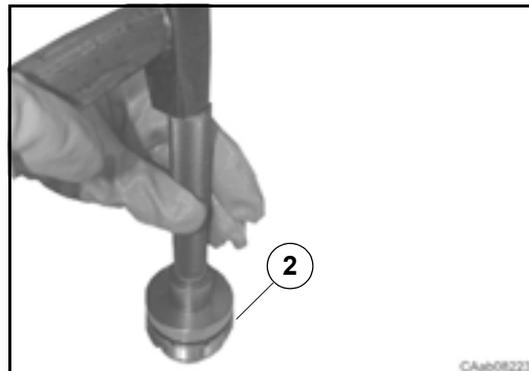
Remove the ring nut (2), then remove the seal ring from the ring nut.



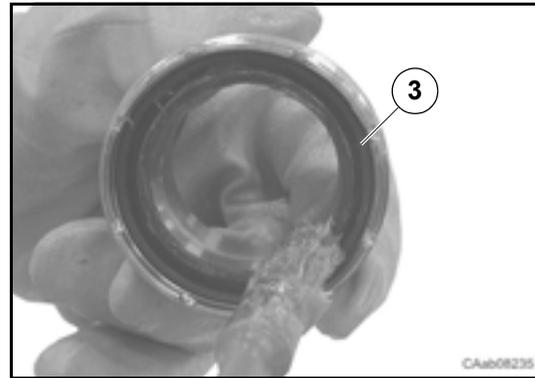
Nota: destructive operation for the seal ring.



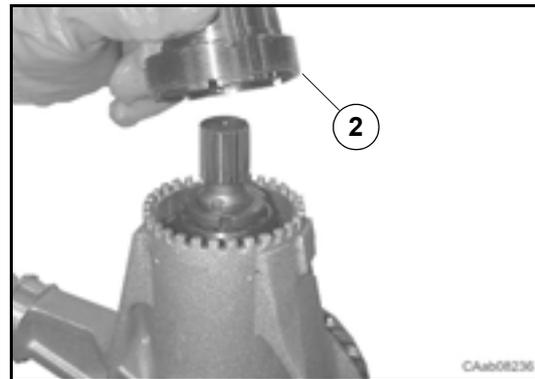
Assemble the seal ring (3) to the ring nut (2) with the special tool and a hammer.



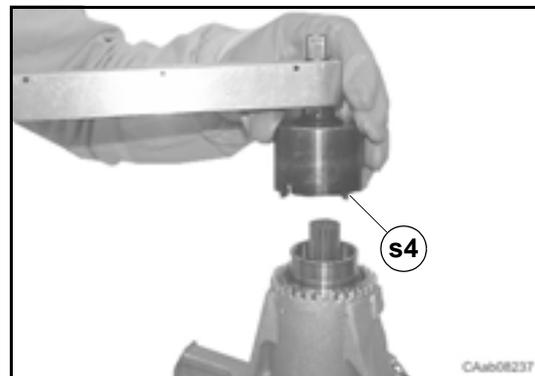
Grease the seal ring (3).



Assemble the ring nut (2).

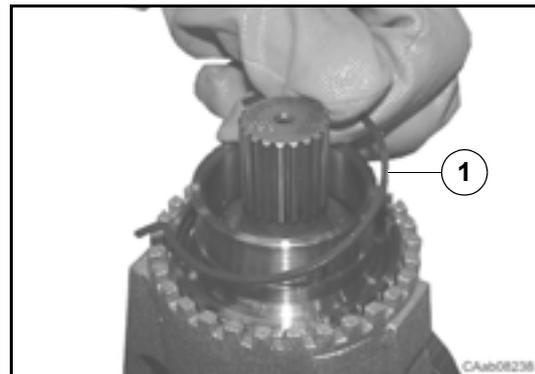


Tighten the ring nut (2) with the special wrench (s4) to the prescribed torque.



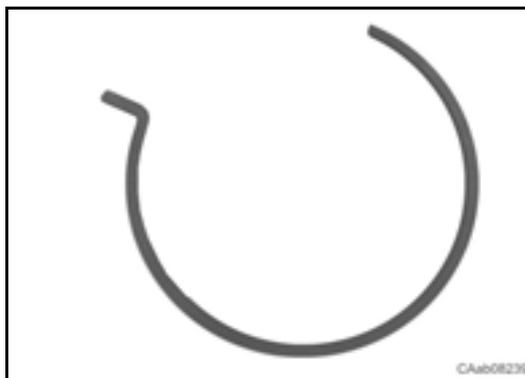
Insert the locking ring (1) into the ring nut (2) in the shown position.

Vedi: next step

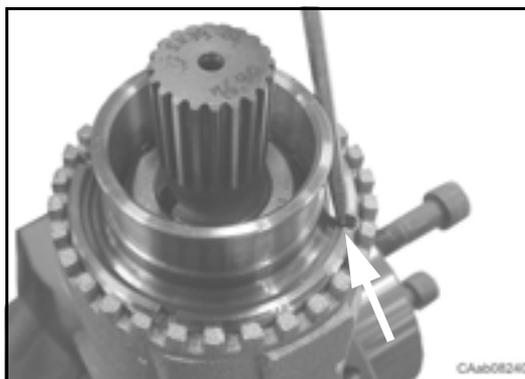




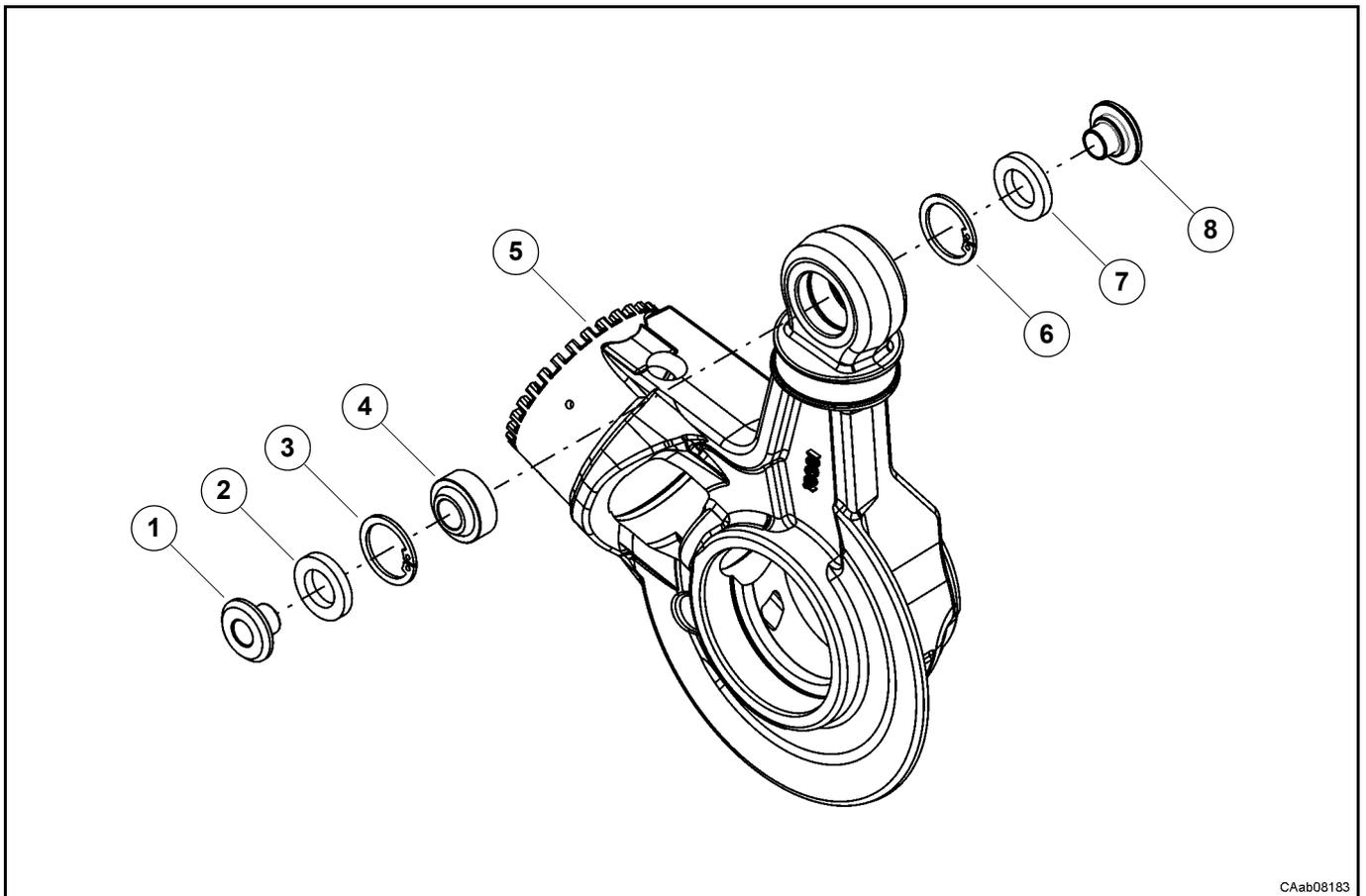
Assembly position of the locking ring (1).



Warning:
the locking ring (1) must be pushed in its seat.



SUPPORT GROUP



CAab08183

DISASSEMBLY

Remove the bush (1) with a punch.

Overturn the support (5) and remove the other bush (8).



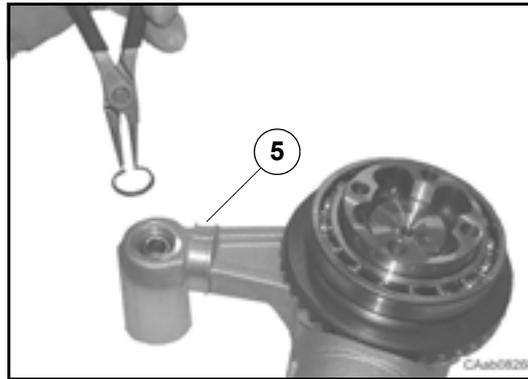
CAab08265



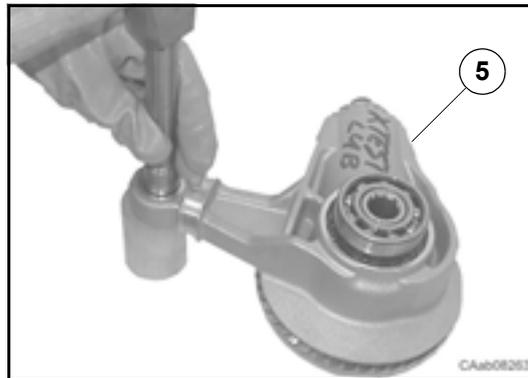
Remove the seal ring (2) and (7) with a screwdriver.

Nota: destructive operation for the seal ring.

Remove from the support (5) the lock rings (3) and (6) with a suitable pliers.

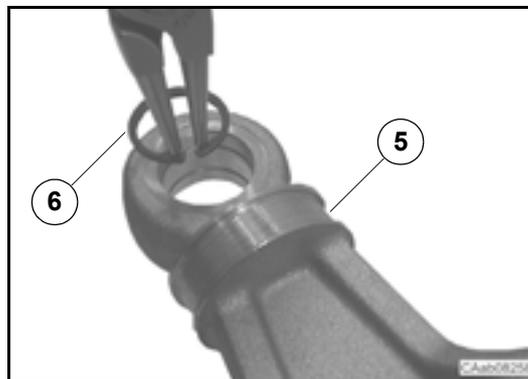


Remove the spherical joint (4) with a suitable pad and a hammer.



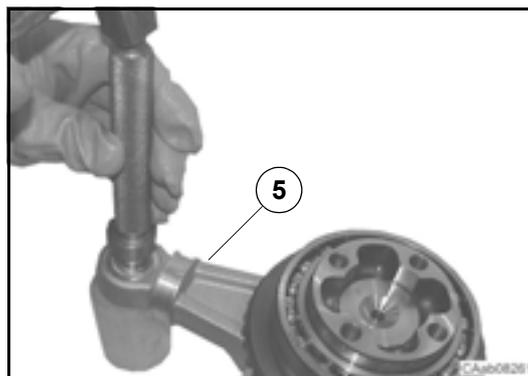
ASSEMBLY

Insert into the support (5) the lock ring (6) with a suitable pliers.

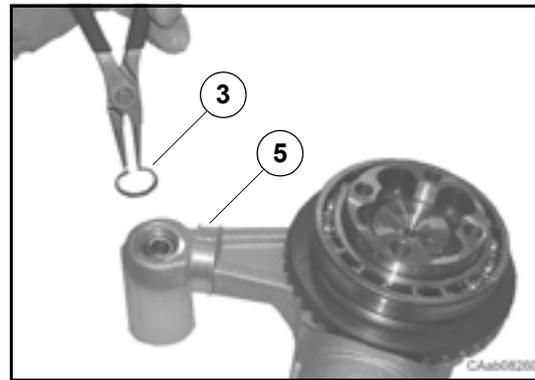


Overturn the support (5).

Assemble the spherical joint (4) with the special tool and a hammer.



Insert into the support (5) the lock ring (3) with a suitable pliers.



Assemble the new seal rings (2) and (7) by hand.
Assemble the bush (1).



Drive in the bush (1) with a plastic hammer.
Overturn the support (5) and assemble the other bush (8)



TROUBLESHOOTING

This chapter is a descriptive and explanatory guide to common transmission problems. This guide suggests the correct repair procedures to be followed.

Problem	Cause	Action
<i>Oil leakage from the wheel shaft</i>	<ol style="list-style-type: none"> 1. Radial shaft seal incorrectly mounted or damaged 2. Running surface of the wheel shaft seal damaged 	<ol style="list-style-type: none"> 1. Replace and mount radial shaft seal correctly 2. Replace wheel shaft
<i>Oil leakage from housing</i>	<ol style="list-style-type: none"> 1. Housing is not sealed 2. Bolts not sealed off or not tightened to specified torque 	<ol style="list-style-type: none"> 1. Open and seal off half-housings with sealant 2. Tighten bolts to specified torque
<i>Oil leakage from the oil fill plug or oil drain plug</i>	<ol style="list-style-type: none"> 1. Dirt between sealing ring and housing 2. An old sealing ring was used 3. Plug not tightened to specified torque 	<ol style="list-style-type: none"> 1. Clean and tighten to prescribed torque 2. Use new sealing ring 3. Tighten plug to specified torque
<i>Oil leakage between housing and fork</i>	<ol style="list-style-type: none"> 1. Damaged boot 2. Loosen locking clamp or cover 3. Radial seal damaged or incorrectly assembled 4. Damaged running surface of the wheel spacer seal 	<ol style="list-style-type: none"> 1. Replace boot 2. Tighten clamp with proper tool 3. Replace and assemble the seal using an appropriate tool 4. Replace the spacer
<i>Oil leakage from outer boot</i>	<ol style="list-style-type: none"> 1. Damaged boot 2. Loosen outer or inner locking clamp 	<ol style="list-style-type: none"> 1. Replace boot 2. Lock the clamp using an appropriate tool
<i>Bevel gear group noise</i>	<ol style="list-style-type: none"> 1. Bevel gear incorrectly assembled 2. Damaged gear crown toothing 	<ol style="list-style-type: none"> 1. Replace bevel gear
<i>Excessive wheel shaft backlash</i>	<ol style="list-style-type: none"> 1. Wheel shaft ball bearings damaged 	<ol style="list-style-type: none"> 1. Replace wheel bearings



Moto Guzzi S.p.a.

Via E.V. Parodi, 57
23826 Mandello del Lario (LECCO) Italy
Tel. +39 0341 709111
Fax +39 0341 709220
www.motoguzzi.it
www.servicemotoguzzi.com