00/2004-05

MOTO GUZZI

Nevada Classic 750 ie

workshopmanual

UK

Cod. 32 92 01 64

INTRODUCTION 0

SUMMARY

0.1. INTRODUCTION

0.1.1. INTRODUCTION

- This manual provides the information required for normal servicing.
- This publication is intended for use by **Moto Guzzi** dealerships and their qualified mechanics; many concepts have been omitted inasmuch as their inclusion would be superfluous for such an audience. 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. To ensure maximum customer satisfaction with the vehicle, **Moto Guzzi spa** continuously improves its products and their documentation. The main technical modifications and changes in repair procedures are communicated to all **Moto Guzzi** dealerships and agencies worldwide. Such modifications will be entered in subsequent editions of the manual. In case of doubt regarding specific repairs or checks, contact the **Moto Guzzi** SERVICE DEPARTMENT; we will be pleased to provide all necessary information and assistance as well as keeping you updated on changes and modifications to the vehicle.

For more details see (REFERENCE MANUALS)

First edition: May 2004

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0.1.2. REFERENCE MANUALS

PARTS CATALOGUES

guzzi part# (description)	
GU07500	I F D E UK

OWNER'S MANUALS

guzzi part# (description)	
32.90.00.60	I F D
32.90.00.61	NL E UK
32.90.00.62	USA CND

CYCLE PARTS TECHNICAL MANUAL

guzzi part# (description)	
32.92.01.60	I
32.92.01.61	F
32.92.01.62	D
32.92.01.63	E
32.92.01.64	UK
32.92.01.65	USA

ENGINE TECHNICAL MANUAL

guzzi part# (description)	
32.92.02.10	I
32.92.02.11	F
32.92.02.12	D
32.92.02.13	E
32.92.02.14	UK
32.92.02.15	USD

0.1.3. ABBREVIATIONS/SYMBOLS/CONVENTIONS

#	= number
<	= less than
>	= greater than
≤	= less than or equal to
≥	= more than or equal to
~	= approximately
∞	= infinity
°C	= degrees Celsius (centigrade)
°F	= degrees Fahrenheit
±	= plus or minus
AC	= alternating current
A	= Ampere
Ah	= Ampere per hour
API	= American Petroleum Institute
HV	= high voltage
AV/DC	= Anti-Vibration Double Countershaft
bar	= pressure measurement (1 bar =100 kPa)
DC.	= 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
kph	= kilometres per hour
kΩ	= kilo Ohm
kPa	= kiloPascal (1 kPa =0.01 bar)
KS	= clutch side (from the German "Kupplungseite")
kW	= kiloWatt
l	= litres
LAP	= racetrack lap
LED	= Light Emitting Diode
LEFT SIDE	= left side
m/s	= metres per second
max	= maximum
mbar	= millibar (1 mbar =0.1 kPa)
mi	= miles
MIN	= minimum
MPH	= miles per hour
MS	= flywheel side (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 side
SAE	= Society of Automotive Engineers
TEST	= diagnostic check
T.B.E.I.	= crown-head Allen screw

T.C.E.I. = cheese-head Allen screw
T.E. = hexagonal head
TP = 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

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. Refer to the index of sections when consulting the manual.
- Unless expressly specified otherwise, assemblies are reassembled by reversing the dismantling procedure.
- The terms "right" and "left" are referred to the rider seated on the vehicle in the normal riding position.
- Motorcycle operation and basic maintenance are covered in the «OWNER'S MANUAL».

In this manual any variants are identified with these symbols:

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

VERSION:

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

1.1.2. SAFETY WARNINGS

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

Safety warning. This symbol appears, whether in the manual or on the vehicle itself, to indicate a personal injury hazard. Non-compliance with the indications given in the messages preceded by this symbol may result in grave risks for your and other people's safety and for the vehicle!

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

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

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

1.2. GENERAL RULES

1.2.1. BASIC SAFETY RULES

CARBON MONOXIDE
Should it be necessary to perform some operations with the vehicle running, make sure to work outdoors or in a well-aerated room.
Avoid starting the engine in closed or badly-ventilated rooms.
In case you are working indoors, make use of an exhaust gases scavenging system.

DANGER
Exhaust gases contain carbon monoxide, which is extremely toxic if inhaled and may cause loss of consciousness or even lead to death by asphyxia.

FUEL

DANGER
The fuel used to operate engines is highly flammable and becomes explosive under particular conditions. Refuelling and engine service should take place in a well-ventilated area with the engine stopped. Do not smoke when refuelling or in the proximity of sources of fuel vapours, avoid flames, sparks and any element that could ignite fuel or provoke explosions.

DO NOT DISPOSE OF FUEL IN THE ENVIRONMENT.

KEEP AWAY FROM CHILDREN.

HIGH-TEMPERATURE COMPONENTS
The engine and the exhaust system parts become hot and continue to be hot even for some time after the engine has been stopped.
Before handling these parts, wear insulating gloves or wait for the engine and the exhaust system to cool completely down.

USED GEARBOX AND FORK OILS

DANGER
In case any maintenance operation should be required, it is advisable to use latex gloves.
Gear oil may cause serious damage to the skin if handled daily and for long periods.
Wash your hands carefully after use.
Put it in a sealed container and take it to the filling station where you usually buy it or to an oil salvage center.
In case any maintenance operation should be required, it is advisable to use latex gloves.

DO NOT DISPOSE OF OIL IN THE ENVIRONMENT

KEEP AWAY FROM CHILDREN.

BRAKE FLUID

WARNING
When using the brake fluid, take care not to spill it on the plastic, rubber or painted parts, since it can damage them.
When carrying out the maintenance operations on the braking system, use a clean cloth to cover these parts.
Always wear safety goggles when working on the braking system.
The brake fluid is highly irritant. Avoid contact with your eyes.
If the brake fluid gets in contact with the skin or the eyes, carefully wash the parts of your body that get in contact with the fluid and consult a doctor.

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.
Always wear tight gloves and protective clothes when handling this fluid.
If the electrolyte gets in contact with the skin, carefully wash the parts of your body that get in contact with the fluid with abundant fresh water.
Always use a protection for your eyes since also a very small amount of the battery fluid can cause blindness. In the event of contact with your eyes, carefully wash them with water for fifteen minutes and then consult immediately an eye specialist.
Should you accidentally drink some fluid, drink abundant water or milk, then drink magnesia milk or vegetable oil and consult immediately a doctor. Battery releases explosive gases. Keep flames, sparks, cigarettes and any other heat source away from the battery. Make sure the room is well-aerated when servicing or recharging the battery.

KEEP AWAY FROM CHILDREN.

The battery fluid is corrosive
Do not pour it on the plastic parts.
Make sure that the electrolyte acid is suitable for the type of battery used.

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 any mechanical parts or other vehicle components in your mouth when you have both hands busy. None of the motorcycle components is edible. Some components are harmful to the human body or toxic.
Unless expressly specified otherwise, motorcycle assemblies are refitted or re-assembled by reversing the removal or dismantling procedure. Where a procedure is cross-referred to relevant sections in the manual, proceed sensibly to avoid disturbing any parts unless strictly necessary. Never attempt to polish matte-finished surfaces with lapping compounds.
Never use fuel instead of solvent to clean the motorcycle.
Do not clean any rubber or plastic parts or the seat with alcohol, petrol or solvents. Clean with water and neutral detergent.
Always disconnect the battery negative (–) lead before soldering any electrical components.
When two or more persons service the same motorcycle together, special care must be taken to avoid personal injury.
Read (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 slacken and/or tighten nuts and bolts. Always use a suitable spanner.
- Mark all connections (hoses, wiring, etc.) with their positions before disconnecting them. Identify each connection using a distinctive symbol or convention.
- Mark each part clearly to avoid confusion when refitting.
- Thoroughly clean and wash any components you have removed using a detergent with low flash point.
- Mated parts should always be refitted together. These parts will have seated themselves against one another in service as a result of normal wear and tear and should never be mixed up with other similar parts on refitting.
- Certain components are matched-pair parts and should always be replaced as a set.
- Keep the motorcycle and its components well away from heat sources.

REASSEMBLING THE COMPONENTS

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

NOTE *All bearings must rotate 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 achieving the specified torque.
- Replace any self-locking nuts, gaskets, seals, circlips or snap rings, O-rings, split pins, bolts and screws which have a damaged thread.
- Lubricate 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 operate the motorcycle in a private estate area or in a safe area away from traffic.
- Clean all joint surfaces, oil seal edges and gaskets before assembly. Apply a light coat of lithium grease along the edges of oil seals. Fit oil seals and bearings with the marking or serial number facing outwards (in view).

ELECTRICAL CONNECTORS

To disconnect the electrical connector, follow the procedures below. Failure to comply with these procedures may lead to irreparable damages to the connector and the wiring as well. If present, press the special safety hooks.

WARNING
Do not pull cables to disconnect the two connectors.

- Grasp the two connectors and disconnect them by pulling them in the two opposite directions.
- In case of dirt, rust, moisture, etc.., thoroughly clean the inside of the connectors with compressed air.
- Make sure that the cables are correctly fitted inside the connectors terminals.

NOTE *The two connectors have just one correct positioning. Make sure to position them in the right direction.*

- Then fit the two connectors. Make sure they are correctly coupled (a click will be heard).

TIGHTENING TORQUE SETTINGS

DANGER
Always remember that the tightening torque settings of all wheel, brake, wheel shaft and other suspension parts play a fundamental role to ensure vehicle safety. Make sure that these values are always within the specified limits.
Check fastening parts tightening torque settings at regular intervals. Upon reassembly, always use a torque wrench.
Failure to comply with these recommendations could lead to the loosening and detachment of one of these parts with a consequent locking of the wheel or other serious troubles affecting the vehicle maneuverability, and thus the risk of falls and serious injuries 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 engine service should take place in a well-ventilated area with the engine stopped. Do not smoke when refuelling or in the proximity of sources of fuel vapours. Avoid contact with bare flames, sources of sparks or any other source which may ignite the fuel or lead to explosion.
Take care not to spill fuel out of the filler, or it may ignite when in contact with hot engine parts. In the event of accidental fuel spillage, make sure the affected area is fully dry before starting the engine. Fuel expands from heat and when left under direct sunlight.
Never fill the fuel tank up to the rim. Tighten the filler cap securely after each refuelling.
Avoid contact with skin. Do not inhale vapours. Do not swallow fuel. Do not transfer fuel between different containers using a hose.
DO NOT RELEASE FUEL INTO THE ENVIRONMENT.
KEEP AWAY FROM CHILDREN.

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

LUBRICANTS

DANGER
A good lubrication ensures the vehicle safety.
Failure to keep the lubricants at the recommended level or the use of a non-suitable new and clean type of lubricant can lead to the engine or gearbox seizure, thus leading to serious accidents, personal injury or even death.
Gear oil may cause serious damage to the skin if handled daily and for long periods.
Wash your hands carefully after use.
Do not dispose of oil into the environment.
Take it to the filling station where you usually buy it or to an oil salvage center.

WARNING
When filling the vehicle with this oil, take care not to spill it out since it could damage the vehicle paintwork.
In case of contact with oil, the tyres surface will become very slippery, thus becoming a serious danger for your safety.
In case of leaks, do not use the vehicle. Check and trace the cause of leaks and proceed to repair.

ENGINE OIL

DANGER
Prolonged or repeated contact with engine oil may cause severe skin damage.
Wash your hands thoroughly after handling engine oil.
Do not release into the environment.
Dispose of engine oil through the nearest waste oil reclamation firm or through the supplier.
Wear latex gloves during 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 grade is SAE 20 W. Different oil grades can be selected to obtain a particular suspension response. (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 braking system is operated by an independent hydraulic circuit. The information provided below applies to both braking systems.*

DANGER
Do not use the vehicle in case brakes are worn out or do not work properly! The brakes are the parts that most ensure your safety and for this reason they must always be perfectly working. Failure to comply with these recommendations will probably lead to a crash or an accident, with a consequent risk of personal injury or death.
A wet surface reduces brakes efficiency.

DANGER
In case of wet ground the braking distance will be doubled, since both brakes and tyres drives on the road surface are extremely reduced by the water present on the road surface.
Any water on brakes, after washing the vehicle or driving on a wet road surface or crossing puddles or gips, can wet brakes so as to greatly reduce their efficiency.
Failure to comply with these recommendations may lead to serious accidents, with a consequent risk of severe personal injuries or death.
Brakes are critical safety components. Do not ride the vehicle in case brakes are not working at their best.
Check for brakes proper operation before every trip.
Brake fluid is an irritant. Avoid contact with eyes or skin.
In the event of accidental contact, wash affected body parts thoroughly. In the event of accidental contact with eyes, contact an eye specialist or seek medical advice.
DO NOT RELEASE BRAKE FLUID INTO THE ENVIRONMENT.KEEP AWAY FROM CHILDREN.
When handling brake fluid, take care not to spill it onto plastic or paint-finished parts or they will damage.

DANGER
Do not use any brake fluids other than the specified type. Never mix different types of fluids to top up level, as this will damage the braking system.
Do not use brake fluid from containers which have been kept open or in storage for long periods.
Any sudden changes in play or hardness in the brake levers are warning signs of problems with the hydraulic circuits.
Ensure that the brake discs and brake linings have not become contaminated with oil or grease. This is particularly important after servicing or inspections.
Make sure the brake lines are not twisted or worn.
Prevent accidental ingress of water or dust into the circuit.
Wear latex gloves when servicing the hydraulic circuit.

DISC BRAKES

DANGER
The brakes are the parts that most ensure your safety and for this reason they must always be perfectly working; check them before every trip.
A dirty disc soils the pads.
Dirty pads must be replaced, while dirty discs must be cleaned with a high-quality degreaser.
Perform the maintenance operations with half the indicated frequency if the vehicle is used in rainy or dusty areas, on uneven surfaces or on racetracks.
When the disc pads wear out, the level of the fluid decreases to automatically compensate for their wear.
The front brake fluid reservoir is located on the right handlebar, near the front brake lever.
The rear brake fluid reservoir is located under the right fairing.
Do not use the vehicle if the braking system leaks fluid.

COOLANT

DANGER
Coolant is toxic when ingested and is an irritant, contact with eyes or skin may cause irritation.
In the event of contact with eyes, rinse repeatedly with abundant water and seek medical advice. In the event of ingestion, induce vomiting, rinse mouth and throat with abundant water and seek medical advice immediately.
DO NOT RELEASE INTO THE ENVIRONMENT.
KEEP AWAY FROM CHILDREN.

DANGER
Take care not to spill coolant onto hot engine parts. It may ignite and produce invisible flames. Wear latex gloves when servicing.
Do not ride when coolant is below the minimum level.

Coolant mixture is a 50% solution of water and anti-freeze. This is the ideal solution for most operating temperatures and provides good corrosion protection.
This solution is also suited to the warm season, as it is less prone to evaporative loss and will reduce the need for top-ups.
In addition, less water evaporation means fewer minerals salts depositing in the radiator, which helps preserve the efficiency of the cooling system.
When temperature drops below zero degrees centigrade, check the cooling system frequently and add more anti-freeze (up to 60% maximum) to the solution.
Use distilled water in the coolant mixture. Tap water will damage the engine.
Refer to the chart given below and add water with the quantity of anti-freeze to obtain a solution with the desired freezing point:

Freezing point °C (-F°)	Coolant % of volume
-20° (-4)	35
-30° (-22)	45
-40° (-40)	55

NOTE *Coolants have different specifications. The protection degree is written on the label.*

WARNING
Use nitrate-free coolant only, with a protection until at least -35°C (-31°F).

TYRES

WARNING
If tyres are excessively inflated, the vehicle will be hard and uneasy to ride, thus making you feel not at your ease.
In addition the roadworthiness, mainly on wet surfaces and during cornering, will be impaired.
Flat tyres (insufficient pressure) can slip on the rim and make you lose the control of the vehicle.
In this case too, both vehicle roadworthiness, maneuverability and brake efficiency will be impaired.
Tyres changing, repair, maintenance and balancing must be carried out by specialized technicians using suitable equipment.
When new, tyres can have a thin slippery protective coating. Drive carefully for the first kilometers (miles). Never use rubber treating substances on tyres.
In particular, avoid contact with fluid fuels, leading to a rapid wear.
In case of contact with oil or fuel, do not clean but change tyres.

DANGER
Some of the factory-assembled tyres of this vehicle are provided with wear indicators.
There are several kinds of wear indicators.
For more information on how to check the wear, contact your Dealer.
Visually check if the tyres are worn and in this case have them changed.
If a tyre deflates while driving, stop immediately.
Avoid hard brakings or moves and do not close throttles too abruptly.
Slowly close throttle grip, move to the edge of the road and make use of the engine brake to slow down until coming to a halt.
Failure to comply with these recommendations can lead to serious accidents and consequent personal injuries or death.
Do not install tyres with air tube on rims for tubeless tyres and viceversa.

1.4. RUNNING-IN

1.4.1. RUNNING-IN RECOMMENDATIONS

The running-in of the engine is essential to ensure its duration and correct functioning.
If possible, drive on hilly roads and/or roads with many bends, so that the engine, the suspensions and the brakes undergo a more effective running-in.
During running-in, change speed.
In this way the components are first "loaded" and then "relieved" and the engine parts can thus cool down.
Even if it is important to stress the engine components during running-in, take care not to exceed.

WARNING
Only after the first 2000 km (1243 mi) of running-in you can expect the best performance levels from the vehicle.

Keep to the following indications:

- Do not open the throttle completely if the speed is low, both during and after the running-in.
- During the first 100 km (62 mi) pull the brakes with caution, avoiding sharp and prolonged brakings. This ensures a correct bedding-in of the pads on the brake disc.
- During the first 1000 km (621 mi) never exceed 5000 rpm (see table).

WARNING
After the first 1000 km (621 mi), Dealer carry out the checks indicated in the column "After running-in", see (REGULAR SERVICE INTERVALS CHART), in order to avoid hurting yourself or other people and/or damaging the vehicle.

- Between the first 1000 km (621 mi) and 2000 km (1243 mi) drive more briskly, change speed and use the maximum acceleration only for a few seconds, in order to ensure better coupling of the components; never exceed 6000 rpm (see table).
- After the first 2000 km (1243 mi) you can expect better performance from the engine, however, without exceeding the maximum allowed [7600 rpm].

Engine maximum rpm recommended	
Mileage km (mi)	rpm
0÷1000 (621)	5000
1000÷2000 (621÷1243)	6000
over 2000 (1243)	7600

1.5. LOCATION OF SERIAL NUMBERS

1.5.1. LOCATION OF SERIAL NUMBERS

These numbers are necessary for vehicle registration.

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

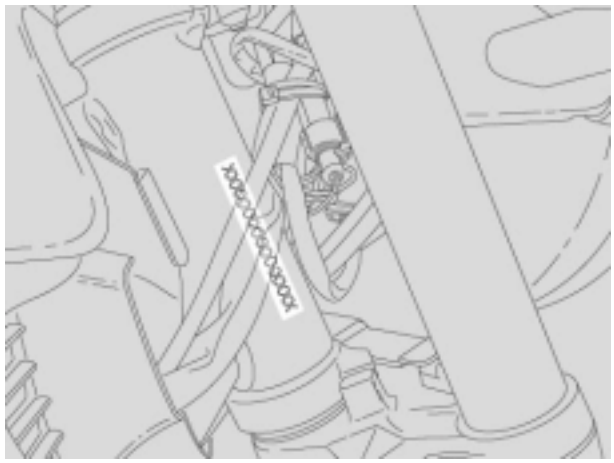
The serial number is composed of numbers and letters as shown in the following example.

ZGULM00004MXXXXXX.

Key:
ZGU: WMI code (World Manufacture Identifier).
LM: model;
000: version variant;
0: free digit
4 year of manufacture (variable) (4 – for 2004)
M: production plant;
XXXXXX: 6-figure sequential number;

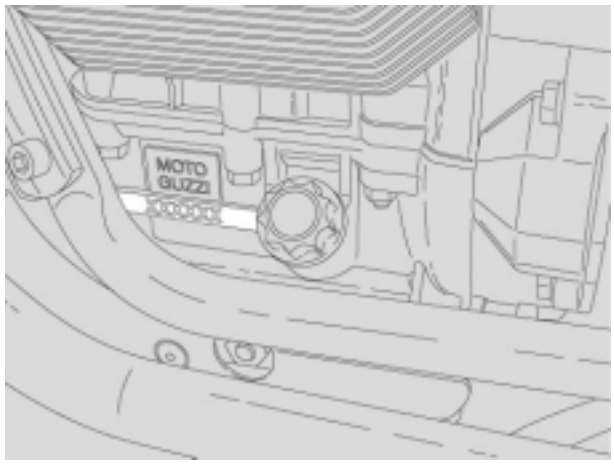
FRAME NUMBER

The frame number (Vehicle Identification Number) is punched on the right-hand side of the headstock.



ENGINE NUMBER

The engine number is punched on the right hand side of the engine next to the oil level plug.



PERIODIC MAINTENANCE 2

SUMMARY

2.1. GENERAL TECHNICAL INFORMATION

2.1.1. TECHNICAL DATA

ENGINE – TRANSMISSION

ENGINE	
Type	two-cylinder 4-stroke
Number of cylinders	two
Cylinder layout:	90° V
Pistons	forged, two compression rings, one oil control ring
Bore	80 mm (3.15 in)
Stroke	74 mm (2.91 in)
Total displacement	744 cm^3 (45.4 cuin)
Cooling	air
Air cleaner	dry cartridge type
Compression ratio	9.6:1
Maximum horsepower (CE correction)	35.5 kW at 6800 rpm
Maximum torque (CE correction)	54.7 Nm at 3600 rpm
Engine idling speed	1100 ± 100 rpm
TIMING	
Timing diagram:	2 valves with push-rods and rockers
intake valve opens	18° B.T.D.C.
intake valve closes	50° A.B.D.C
exhaust valve opens	53° B.T.D.C.
exhaust valve closes	15° A.B.D.C
Values valid with clearance between rockers and valve of	0,15 mm (0.0059 in) opens 0,20 mm (0.00787 in) closes
FUEL SUPPLY	
Type	Electronic injection (Weber – Marelli)
Choke	Ø 36 mm (1.417 in)
Fuel	Premium grade unleaded petrol, min. O.N. 95 (N.O.R.M.) and 85 (N.O.M.M.).
STARTING	electric
EXHAUST	Three-way manifold with catalyser
DRIVE	
- clutch	dry single disc with cush drive
- primary drive	gear-type, ratio: 16/21 = 1:1.3125
- transmission	5 gears
- gear ratios:	
1st	11/26 = 1:2.3636
2nd	14/23 = 1:1.6429
3rd	18/23 = 1:1.2778
4th	18/19 = 1:1.0556
5th	20/18 = 1:0.9
- final drive	cardan shaft type
- ratio	8/33 = 1:4.825
Lubrication	Pressure system, valve adjustment, lobe pump

VEHICLE

FRAME	
Type	Detachable tubular duplex cradle with high yield strength
Trail	138 mm (5.43 in)
Rake	27.5°
SUSPENSION	
Front	MARZOCCHI 40 mm (1.57 in). hydraulic telescopic fork
Front wheel travel	130 mm (5.12 in)
Rear	swing arm in light cast alloy with two dampers, spring adjustable for pre-load and rebound
Rear wheel travel	100 mm (3.94 in)
BRAKES	
Front	Stainless steel 320 mm (12.6 in) floating disc with 4 differentiated and opposing pistons
Rear	Stainless steel 260 mm (10.24 in) disc
Brake master cylinder diameter:	
- front brake	Ø 13 mm (0.512 in)
- rear brake	Ø 12 mm (0.47 in)
Calliper piston diameters:	
- front calliper	Ø 34/30 mm (1.34/1.18 in)
- rear calliper	Ø 32 mm (1.26 in)
Total friction surface area:	
- front	21,3 cm^2 (3.3 in^2)
- rear	16,1 cm^2 (2.5 in^2)
Brake pads compound	Frendo 222
WHEELS	
Type	spoke-type for tube tyres
Front rim	2.50” x 18”
Rear rim	3,50” x 16”
TYRES	
Type	
- front	METZELER ME 33 – Size:100/90 – V18 56V
- rear	METZELER ME 55 – Size:130/90 – 16 67V
Inflation pressure	220 Kpa (31.9 PSI)
Inflation pressure with pillion	+ 30 Kpa (4.35 PSI)
ELECTRICAL SYSTEM	
Battery	12 V – 14 Ah
Alternator (with permanent magnet)	12 V – 330 W
Main fuses	30 A
Secondary fuses	3 A – 10 A – 15 A
BULBS	
Headlamp low beam / high beam (halogen)	12V – 55/60 W H4
Front parking light	12V – 5 W
Direction indicators	12V – 10 W (RY 10W amber lamp)
Rear parking /brake lights	12V – 5/21 W
Instruments lighting	LED
EFI	LED
Number plate light	12V – 5 W
WARNING LIGHTS	
Neutral	LED
Direction indicators	LED
Fuel reserve	LED
High beam	LED
Engine oil pressure	LED

SPARK PLUGS	
Standard	NGK BR8ES
Gap	0,6 – 0,7 mm (0.024 – 0.028 in)
Resistance	5 KΩ
DIMENSIONS	
Length	2166 mm (85.3 in)
Width	805 mm (31.7 in)
Maximum height	1068 mm (42 in)
Seat height	770 mm (30.3 in)
Ground clearance	209 mm (8.23 in)
Wheelbase	1467 mm (57.8 in)
Dry weight	184 Kg (406 lb)
CAPACITIES	
Fuel (reserve included)	14 l (3.7 gal)
Fuel reserve	4 l (1.06 gal)
Engine oil	Oil and filter change 1.78 l (0.47 gal)
Transmission oil	170 cm^3 (10.37 in^3)
Gearbox oil	1000 cm^3 (61 in^3)
Front fork fluid	400 ± 2,5 cm^3 (15.75 ± 0.1 in) (each leg)
Seats	2
Vehicle max. load	180 Kg (397 lb) (rider + pillion + luggage)
ACCESSORIES	
Centre stand, side panniers, luggage rack, tank bag, tall windshield	

2.1.2. PERIODIC MAINTENANCE CHART

OPERATIONS PERFORMED BY THE Official **Moto Guzzi Dealer** (THAT CAN ALSO BE PERFORMED BY THE OWNER).

1 = inspect and clean, set or adjust, lubricate or replace as required;
2 = clean;
3= replace;
4= adjust.

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

(*) = Bij sportief rijden vervangen om de 3750 km (2343 mi)
(**) = Check every fifteen days or at the recommended intervals.

Components	**After running-in [1000 km (621 mi)]**	**Every 7500 km (4687 mi) or 12 months**	**Every 15000 km (9375 mi) or 24 months**
Spark plugs (*)	-	om de 7500 km 4687 mi: 3	
Engine oil filter (*)	3	3	-
Front fork	1	-	1
Efficiency/aiming of lights	-	1	-
Lights system	1	1	-
Safety switches	1	1	-
Brake fluid	-	1	-
Engine oil	3	3	-
Tyres	1	1	-
Tyre pressure (**)	4	4	-
Engine idling speed	4	4	-
Tightness of battery terminals	1	-	-
Cylinder head screws torque	4	-	-
Engine oil pressure LED	each time engine is started: 1		
Brake pads	1	before long trips and every 2000 km (1250 mi):1	

OPERATIONS TO BE PERFORMED BY THE Official **Moto Guzzi** Dealer

1 = inspect and clean, set or adjust, lubricate or replace as required;
2 = clean;
3= replace;
4= adjust.

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

(*) = Bij sportief rijden vervangen om de 3750 km (2343 mi)
(**) = Check every fifteen days or at the recommended intervals.

Components	**After running-in [1000 km (621 mi)]**	**Every 7500 km (4687 mi) or 12 months**	**Every 15000 km (9375 mi) or 24 months**
CO emissions at idle speed	-	1	-
Transmission cables and controls	1	1	-
Steering bearings and play	1	1	-
Wheel hub bearings	-	1	-
Brake discs	1	1	-
Air cleaner	-	1	3
General running of the vehicle	1	1	-
Braking systems	1	1	-
Brake fluid	Every two years: 3 or every 20000 km (12427 mi)		
Transmission oil	3	3	-
Front fork fluid	after the first 7500 km (4687 mi) and every 22500 km (14000 mi) thereafter: 3		
Fork oil seals	after the first 30000 km (18750 mi) and every 22500 km (14000 mi) thereafter: 3		
Brake pads	every 2000 km (1243 mi): 1 - If worn: 3		
Valve clearance adjustment	4	4	-
Wheels/Tyres	1	1	-
Tightening torque of nuts and bolts	1	1	-
Tightness of battery terminals	1	-	-
Tightness of Nipples/spokes	4	4	-
Cylinder timing	1	1	-
Suspension and ride height	1	-	1
Final drive transmission oil	3	3	-
Fuel lines	-	1	every four years: 3
Brake lines	-	1	every four years: 3
Clutch wear (*)	-	1	-

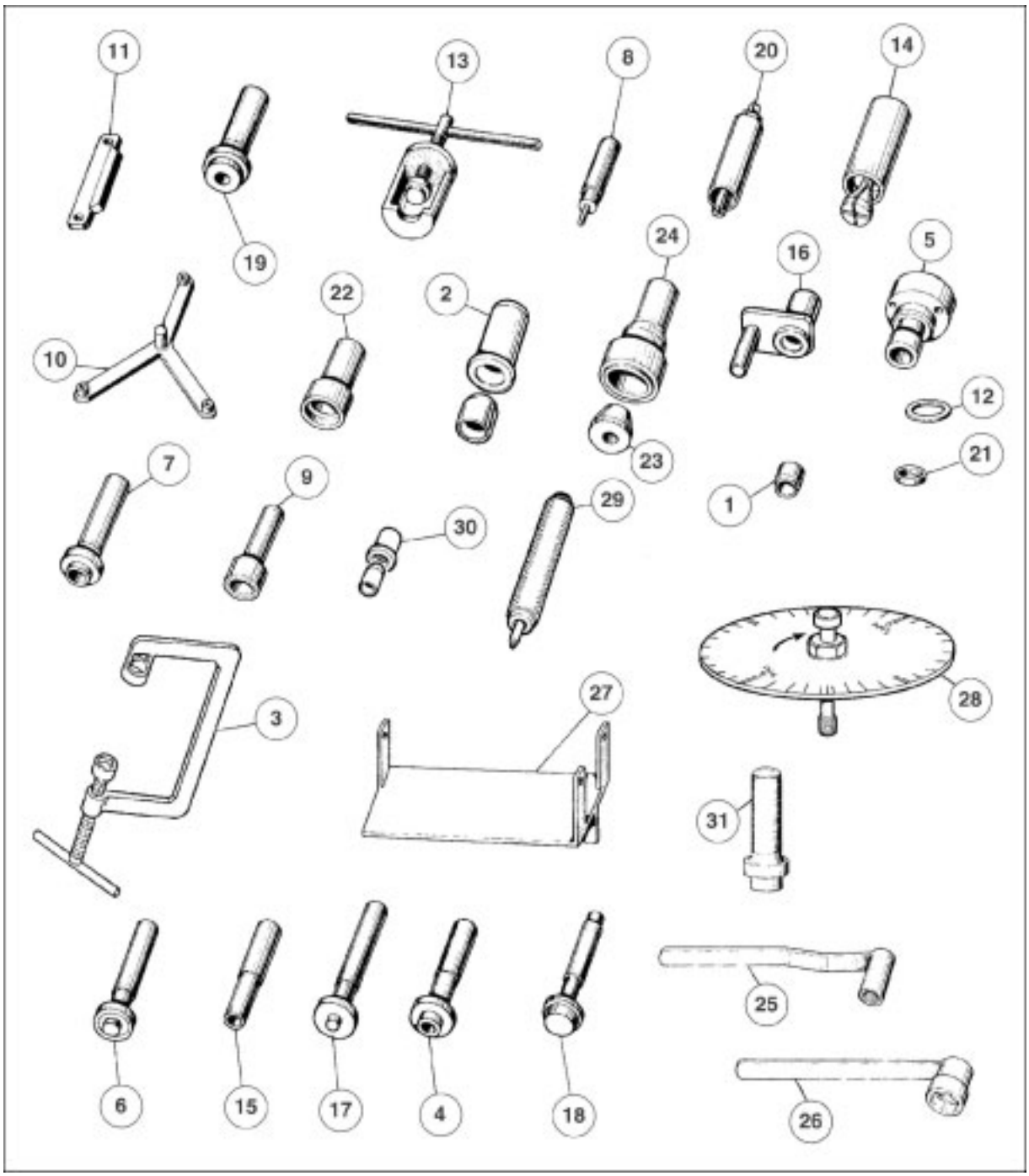
2.1.3. TABLE OF LUBRICANTS

LUBRICANT	PRODUCT
Engine oil	RECOMMENDED: Agip RACING 4T Alternatively, use brand name oil complying with or exceeding CCMC G-4 A.P.I. S.G. specifications.
Transmission oil	RECOMMENDED: Agip TRUCK GEAR 85 W 140
Gearbox oil	RECOMMENDED: Agip ROTRA MP/S 80 W 90
Front fork fluid	RECOMMENDED: IP F.A. 5W or IP F.A. 20W, alternatively use Agip FORK 5W or Agip FORK 20W.
Bearings and other lubrication points	RECOMMENDED: IP BIMOL GREASE 481, IP 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…+140°C, with dropping point 150°C…230°C, high corrosion protection, good resistance to water and oxidisation.
Battery terminals	Use neutral grease or Vaseline.
Brake fluid	RECOMMENDED: IP Autofluid FR. DOT 4 (the brake circuit is also compatible with DOT 5) or Agip BRAKE 5.1 DOT 4 (the brake circuit is also compatible with DOT 5) As an alternative to the recommended brake fluid, use brake fluids complying with or exceeding SAE J1703, NHTSA 116 DOT 4, ISO 4925 synthetic brake fluid specifications. ***IMPORTANT*** *Use new brake fluid only. Don't mix different brands or types of brake fluids unless you have ascertained their compatibility.*

2.1.4. TIGHTENING TORQUES

DESIGNATION	TIGHTENING TORQUES (Nm)
ENGINE CONNECTING PARTS	
Front tie rod nut	45
Nut for long and short screws	45
Clutch housing cover to engine fixing screws	25
REAR TRANSMISSION	
Bevel pinion to case fixing nut	100
Bevel gear to hollow shaft fixing screws	42
Cover to transmission case fixing screws	25
FRAME	
Semi-cradle, frame cradle fixing screws	45
FRONT SUSPENSION	
Centre stand to frame fixing screws	10
Lock nut	30
Fork head fixing screws	45
Fork base fixing screws	45
Slider to wheel spindle fixing screws	10
REAR SUSPENSION	
Rear suspension upper and lower sections fixing screws	20
FRONT WHEEL AND BRAKE DISC	
Wheel spindle	80
Brake disc to hub fixing screws	25
Brake calliper fixing screws	50
Nipples/spokes	45
REAR WHEEL AND BRAKE DISC	
Brake calliper fixing screw	30
Wheel spindle fixing nut	120
Wheel spindle fixing screws on swing arm	45
Brake disc fixing screws	25
Nipples/spokes	45
STEERING	
Steering head fixing screw	50
TANK	
Cap fixing screws	6
Breather screws	12
BODYWORK	
Pillion/rider footpeg support plate fixing screws	25
Brake fixing screw	25
Front mudguard fixing screws	25
Steering ringnut	7
Steering yoke fixing nut	80

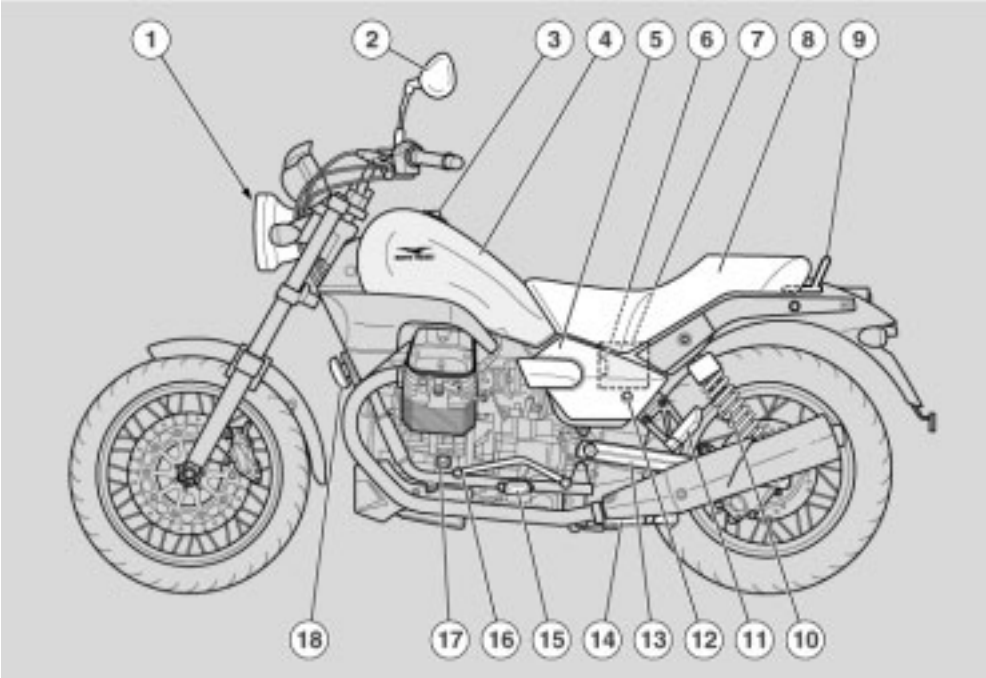
2.1.5. SPECIAL TOOLS



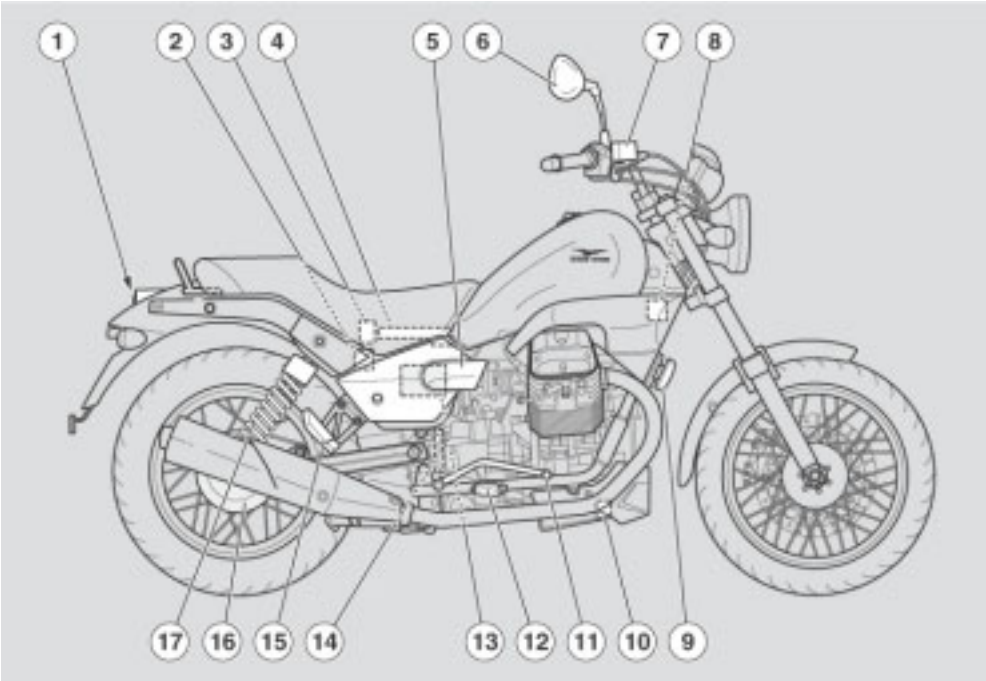
Key:

Position	Tool designation and application	Part number
1	Bush for fitting oil seal on secondary shaft	19 92 73 00
2	Tool for fitting oil seal on timing cover (crankshaft)	19 92 72 20
3	Valves disassembly / assembly tool	10 90 72 00
4	Punch for bevel gear pair pinion oil seal	19 92 61 00
5	Bevel gear pair alignment preassembly tool	19 92 88 00
6	Punch for clutch shaft bearing on case	19 92 94 00
7	Punch for transmission case oil seal	19 92 60 00
8	Punch for clutch shaft oil seal	19 90 59 00
9	Punch for assembling oil seal on gearbox cover for secondary shaft	19 92 72 00
10	Clutch disk assembly and centring tool	19 90 65 00
11	Flywheel holder tool	19 91 18 00
12	Spacer for installation of ring on secondary shaft	19 92 72 02
13	Puller for internal ring on hollow shaft	19 90 70 00
14	Puller for transmission case bearing external ring	19 92 75 00
15	Punch for bearing on bevel gear pair pinion	19 92 62 00
16	Intermediate gear holding tool for removal of gearbox	19 92 77 00
17	Punch for primary shaft bearing on gearbox	19 92 63 00
18	Punch for taper bearing outer race on bevel gear pair pinion holder body	19 92 64 00
19	Punch for transmission case bearing outer race	19 92 65 00
20	Puller for swing arm holder bearing on gearbox cover	19 92 76 00
21	Reducer bush for valve disassembly tool (this tool is marked with No. 10 90 72 00)	19 92 78 00
22	Punch for driving bearing inner race onto hollow shaft	19 92 79 00
23	Tool for assembling oil seal on crankshaft - flywheel side	12 91 20 00
24	Punch for driving oil seal onto flange and crankshaft – flywheel side	19 92 71 00
25	Clutch shaft holding tool	19 90 71 60
26	Clutch shaft nut holding wrench	19 90 54 60
27	Gearbox support	19 90 25 00
28	Graduated disk	19 92 96 00
29	Punch for mounting cap on valve guide	19 92 60 20
30	Tool for assembling oil seal to timing cover (camshaft)	19 92 73 20
31	Secondary shaft bearing outer race inserter tool	19 92 64 60

2.1.6. LOCATION OF MAIN PARTS

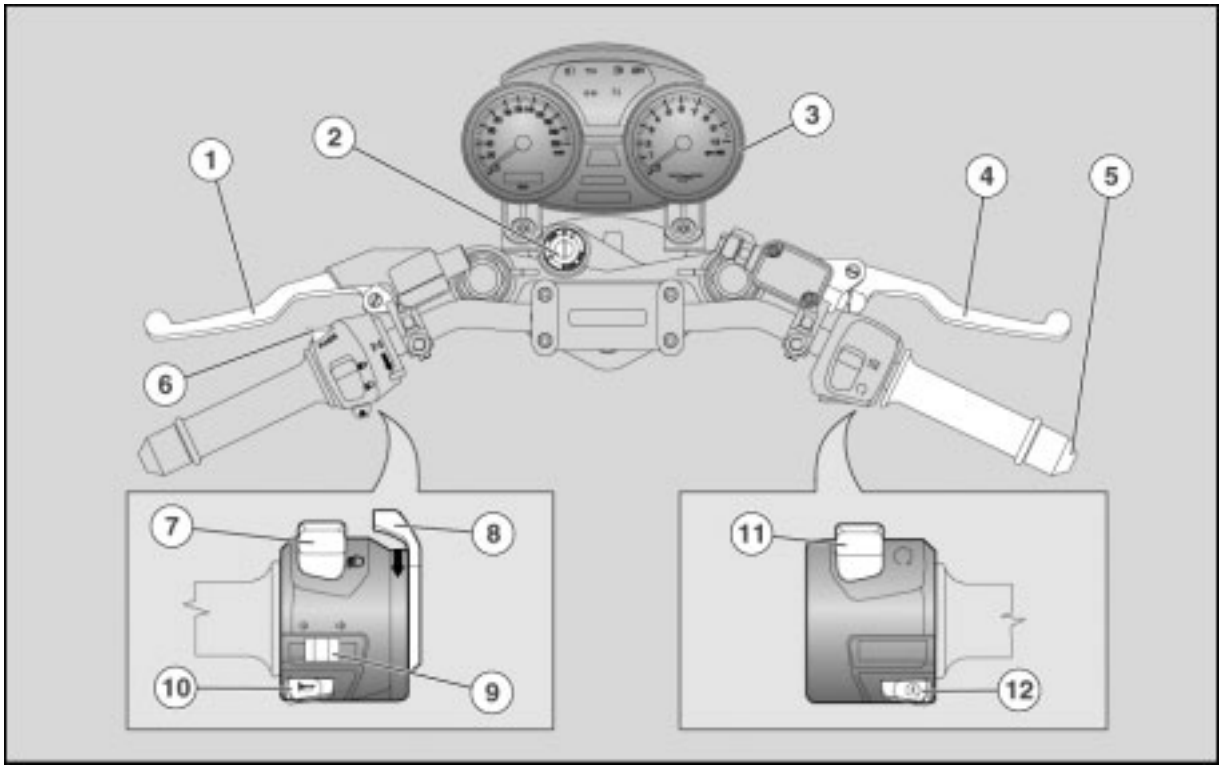


Key:
1. Headlight
2. Left rear-view mirror
3. Fuel filler cap
4. Fuel tank
5. Left side fairing
6. Main fuse-holder (30A)
7. Battery
8. Rider/pillion seat
9. Pillion grab handle
10. Rear left damper
11. Pillion left footpeg
12. Seat lock
13. Rear swing arm
14. Side stand
15. Rider left footpeg
16. Gear shift lever
17. Engine oil dipstick
18. Left horn



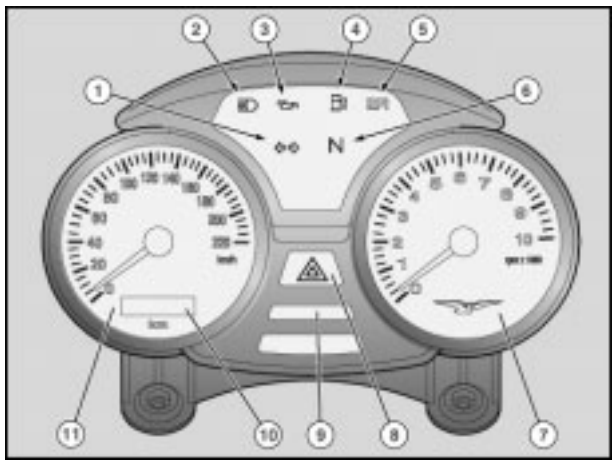
Key:
1. Tail light
2. Rear brake fluid reservoir
3. Secondary fuseholders
4. Glove/tool kit compartment
5. Right side fairing
6. Right rear-view mirror
7. Front brake fluid reservoir
8. Air cleaner
9. Right horn
10. Engine oil filter
11. Rear brake lever
12. Rider right footpeg
13. Engine Control Unit
14. Rear brake master cylinder
15. Pillion right footpeg
16. Driveshaft transmission
17. Right rear damper

2.1.7. LOCATION OF CONTROLS / INSTRUMENTS



Key:
1. Clutch lever
2. Ignition switch / steering lock (- -)
3. Instruments and indicators
4. Front brake lever
5. Throttle twistgrip
6. High beam flasher button ( )
7. Lights selector (-)
8. Choke lever ( )
9. Direction indicators switch ( )
10. Horn button ( )
11. Engine cut-out switch (-)
12. Starter button ( )

Key:
1. Direction indicator warning light ( ) green
2. High beam warning light ( ) blue
3. Engine oil pressure warning light ( ) red
4. Fuel reserve warning light ( ) amber yellow
5. "EFI" indicator light, red
6. Neutral gear warning light (N) green
7. Rev counter
8. Hazard lights button ( ) red
9. TRIP button (multifunction display)
10. Multifunction digital display
11. Speedo



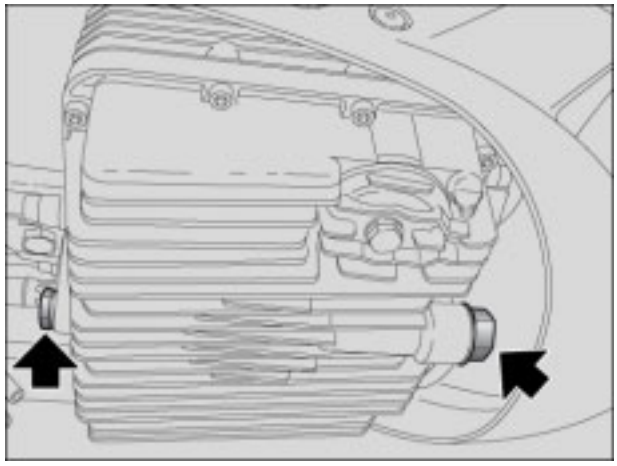
2.2. MAINTENANCE OPERATIONS

2.2.1. ENGINE OIL AND FILTER CHANGE

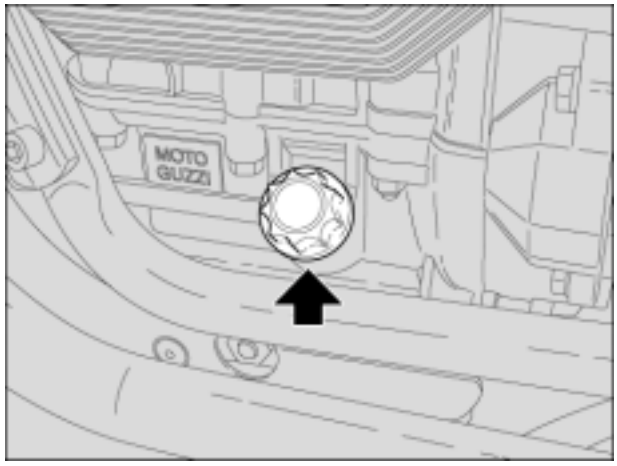
ENGINE OIL CHANGE

IMPORTANT *Oil flows more easily when warm. Let the engine warm up for about twenty minutes to facilitate total drainage.*

- Place a container of capacity greater than 4000 cm^3 (244 in^3) under the drain plug.
- Unscrew and remove the drain plugs.



- Unscrew and remove the filler plug.
- Drain the oil into the container allowing the last of the oil drip out for several minutes.
- Inspect the sealing washer of the drain plugs and replace if necessary.
- Clean off any metal debris sticking to the drain plug magnet.
- Refit and tighten the drain plugs.

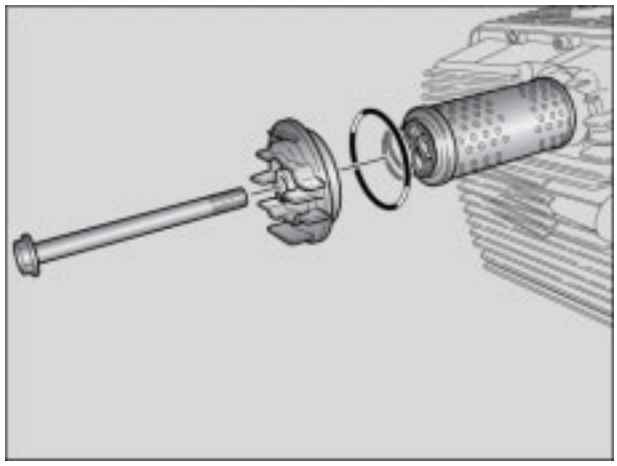


ENGINE OIL FILTER CHANGE

- Unscrew the screw and remove the cover.
- Remove the engine oil filter.

IMPORTANT *Do not use filters that have already been used.*

- Smear a film of oil onto the sealing ring of the new engine oil filter.
- Fit the new engine oil filter with the spring facing downwards.
- Refit the cover, screw down and tighten the two screws.

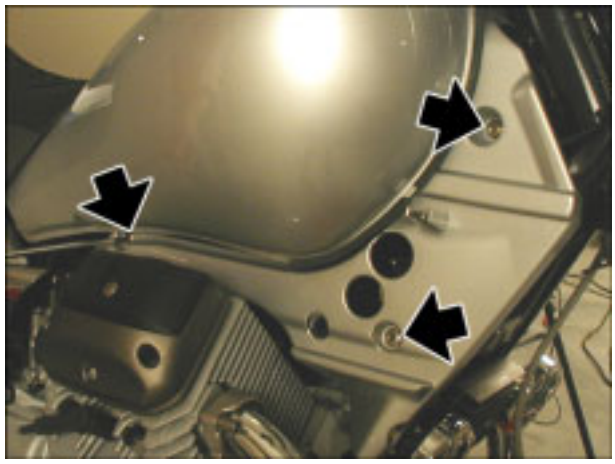


2.2.2. CLEANING THE AIR FILTER

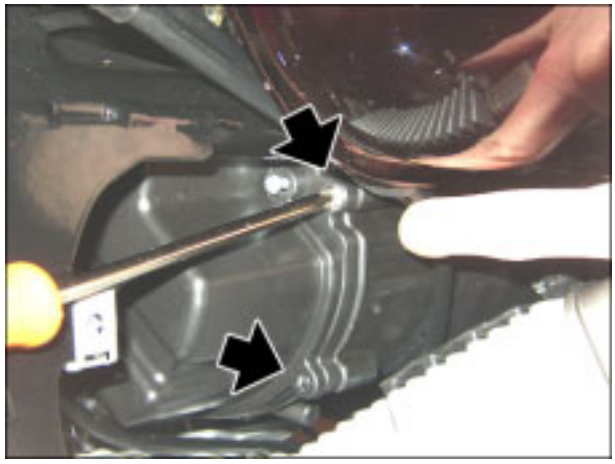
- Working on either side, loosen and remove outer air conveyor screw.

- Remove both outer air conveyors, pay attention to the fasteners.

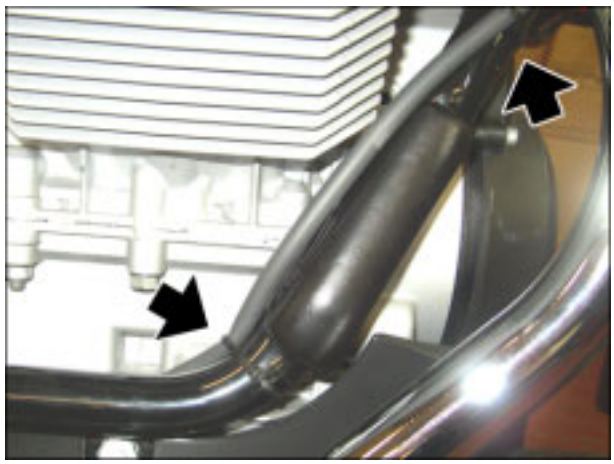
- Working on either side, loosen and remove inner air conveyor three screws.
- Remove both inner air conveyors.



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



- Remove the ties from air breather hose.



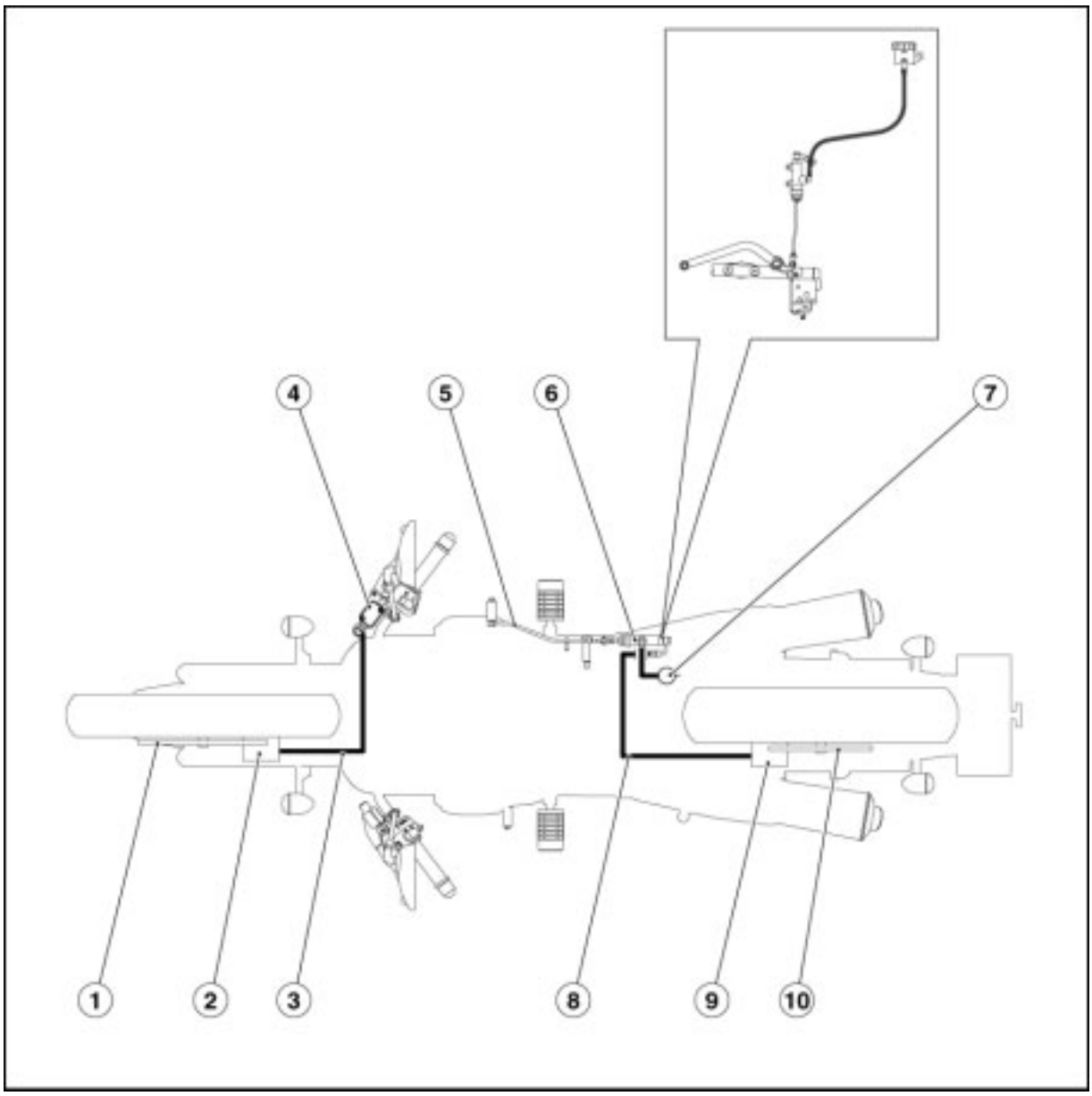
- Remove the airbox cover from the vehicle right-hand side.

- Remove the air filter.

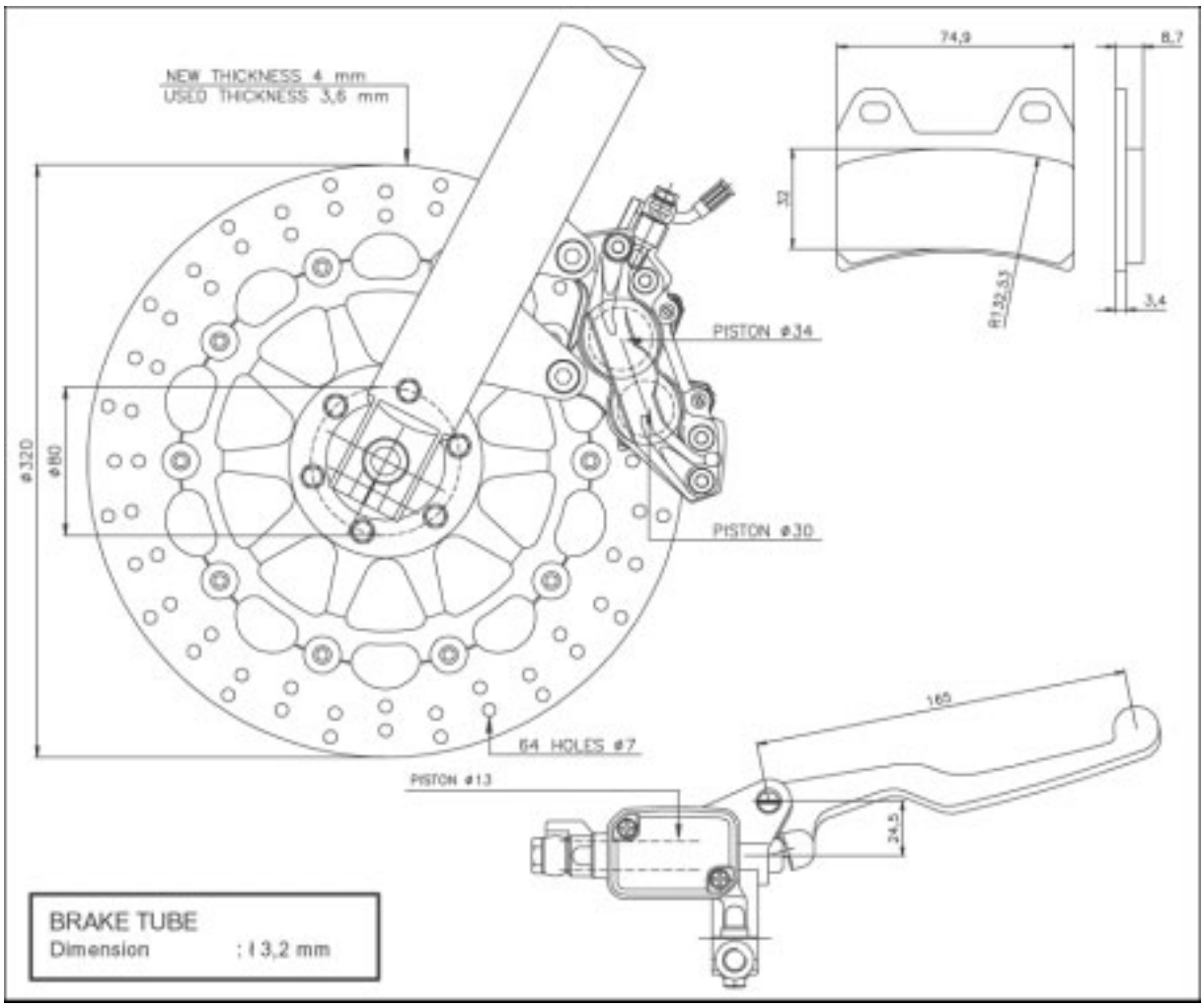
2.3. SYSTEMS LAYOUT

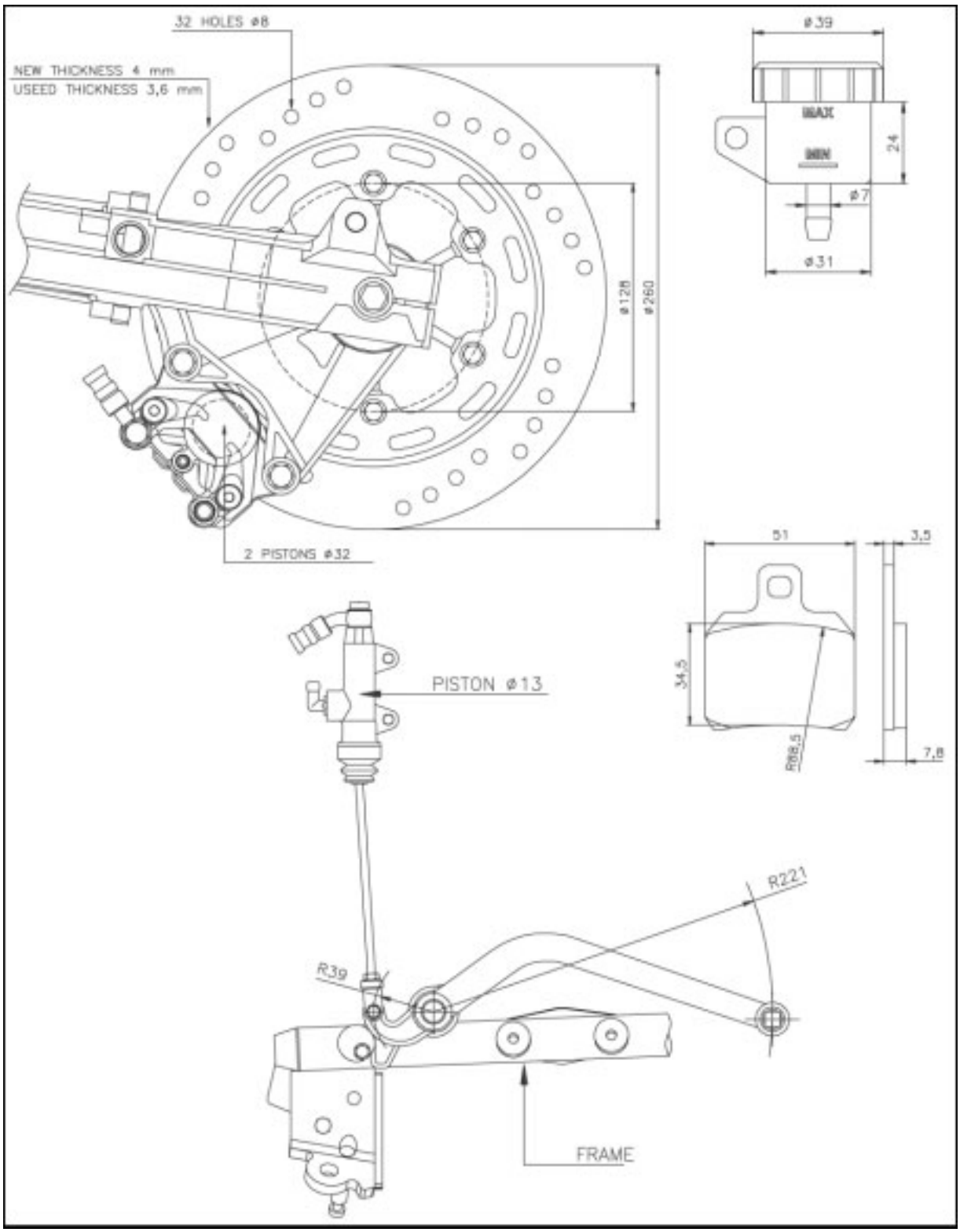
2.3.1. SYSTEMS LAYOUT

BRAKES SYSTEM

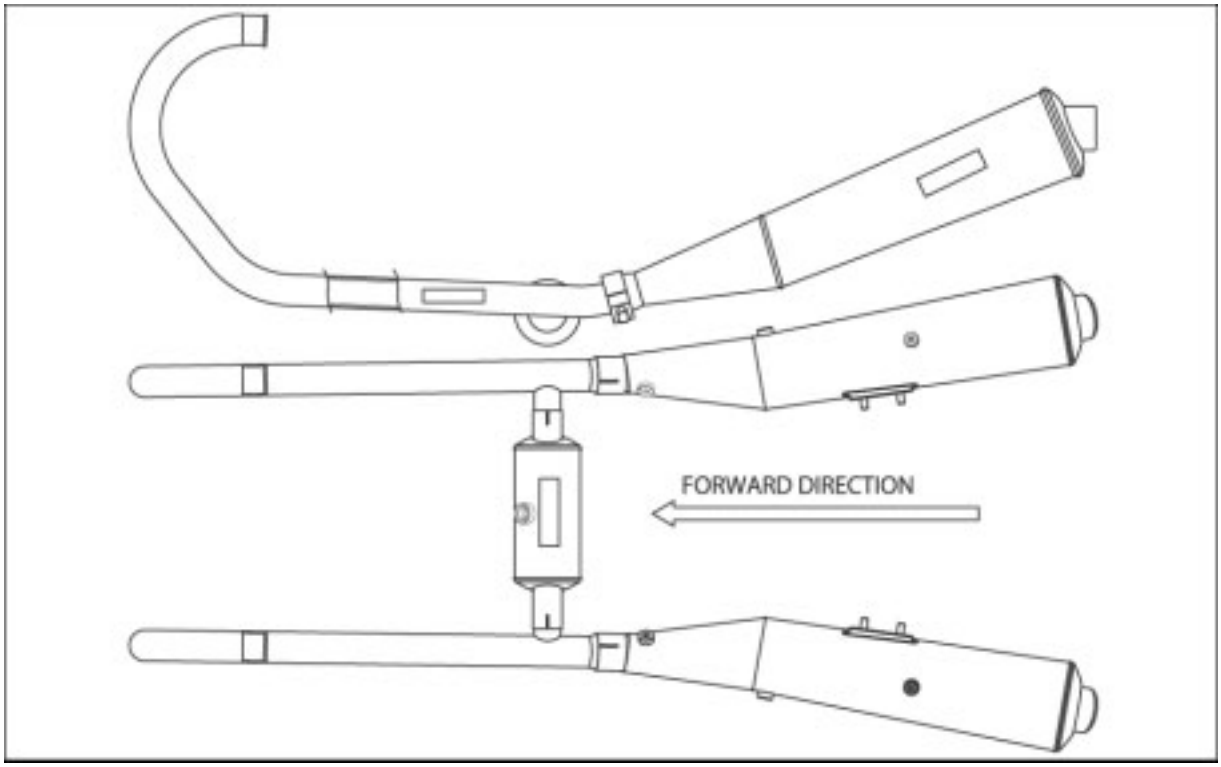


Key:
1. Front brake disc
2. Front calliper.
3. Front brake line.
4. Front brake master cylinder with lever and reservoir.
5. Rear brake lever
6. Rear brake master cylinder
7. Rear brake reservoir.
8. Rear brake lines.
9. Rear brake disc
10. Rear calliper

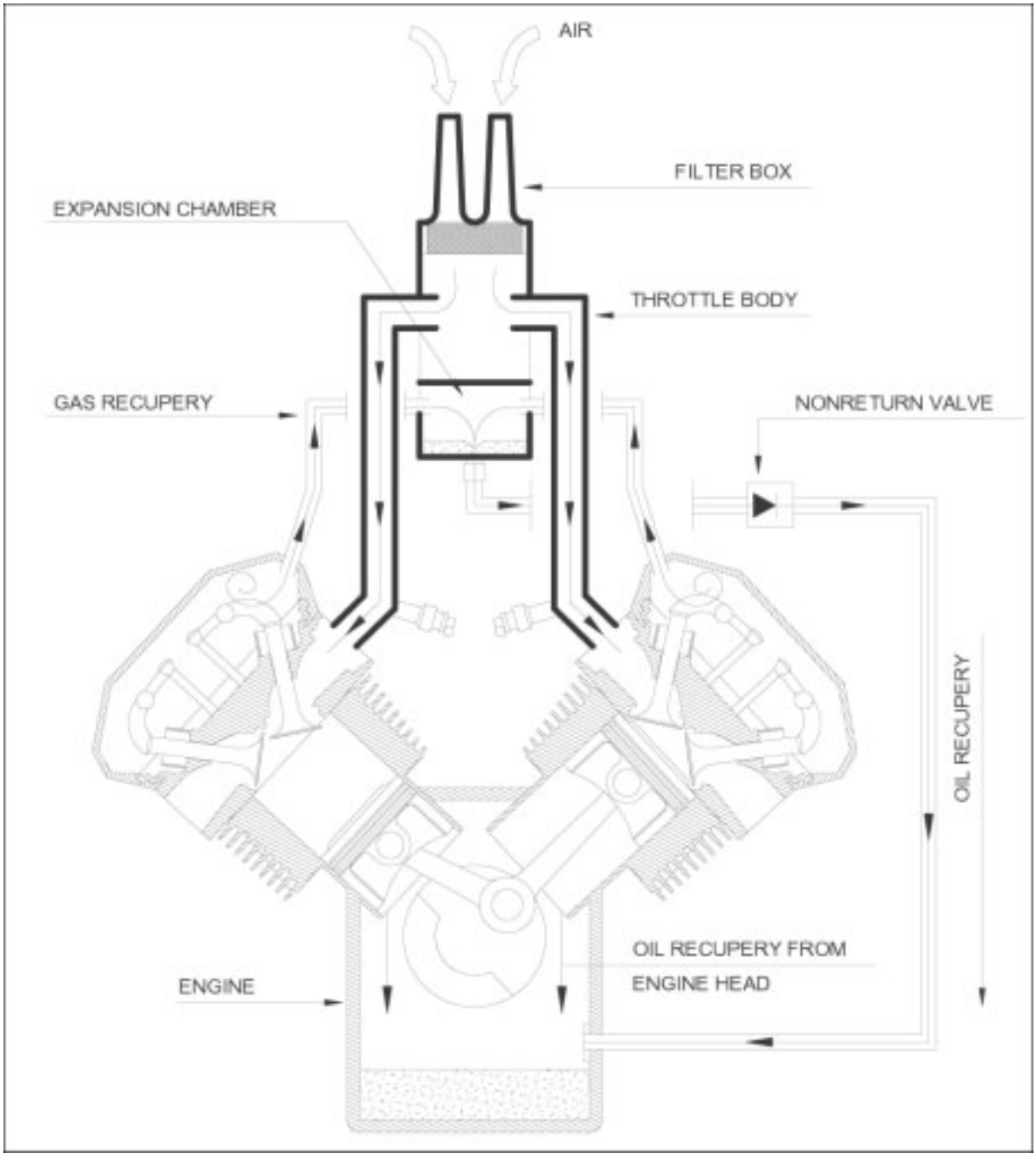

NEW THICKNESS 4 mm
USED THICKNESS 3,6 mm
74,9
8,7
32
R132,51
3,4
PISTON ø34
PISTON ø30
ø320
ø80
64 HOLES ø7
165
PISTON ø13
24,5
BRAKE TUBE
Dimension : I 3,2 mm


32 HOLES ø8
NEW THICKNESS 4 mm
USEED THICKNESS 3,6 mm
ø128
ø260
2 PISTONS ø32
ø39
MAX
MIN
24
ø7
ø31
51
3,5
34,5
R88,5
7,8
PISTON ø13
R221
R39
FRAME

EXHAUST SYSTEM



CRANKCASE OIL AND EXHAUST GAS RECOVERY SYSTEM

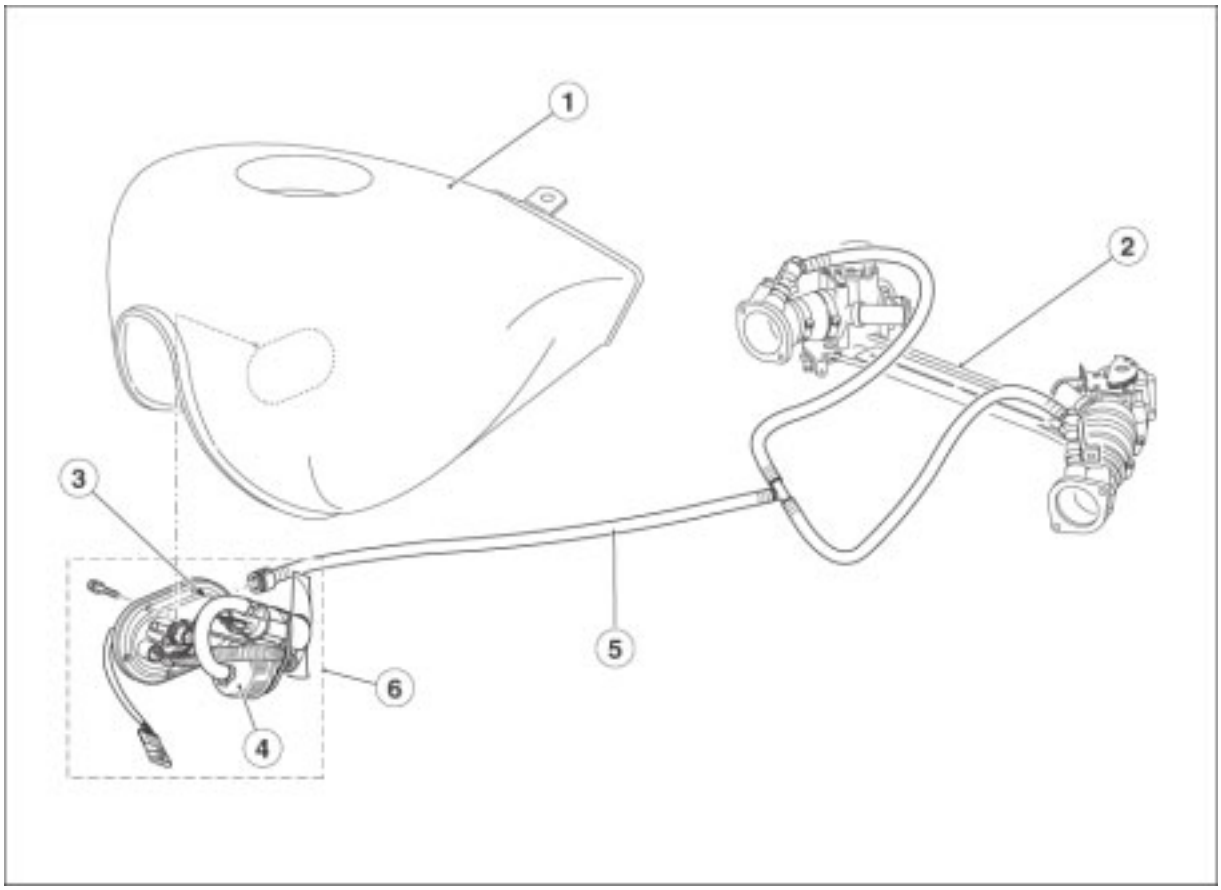


FUEL SYSTEM 3

SUMMARY

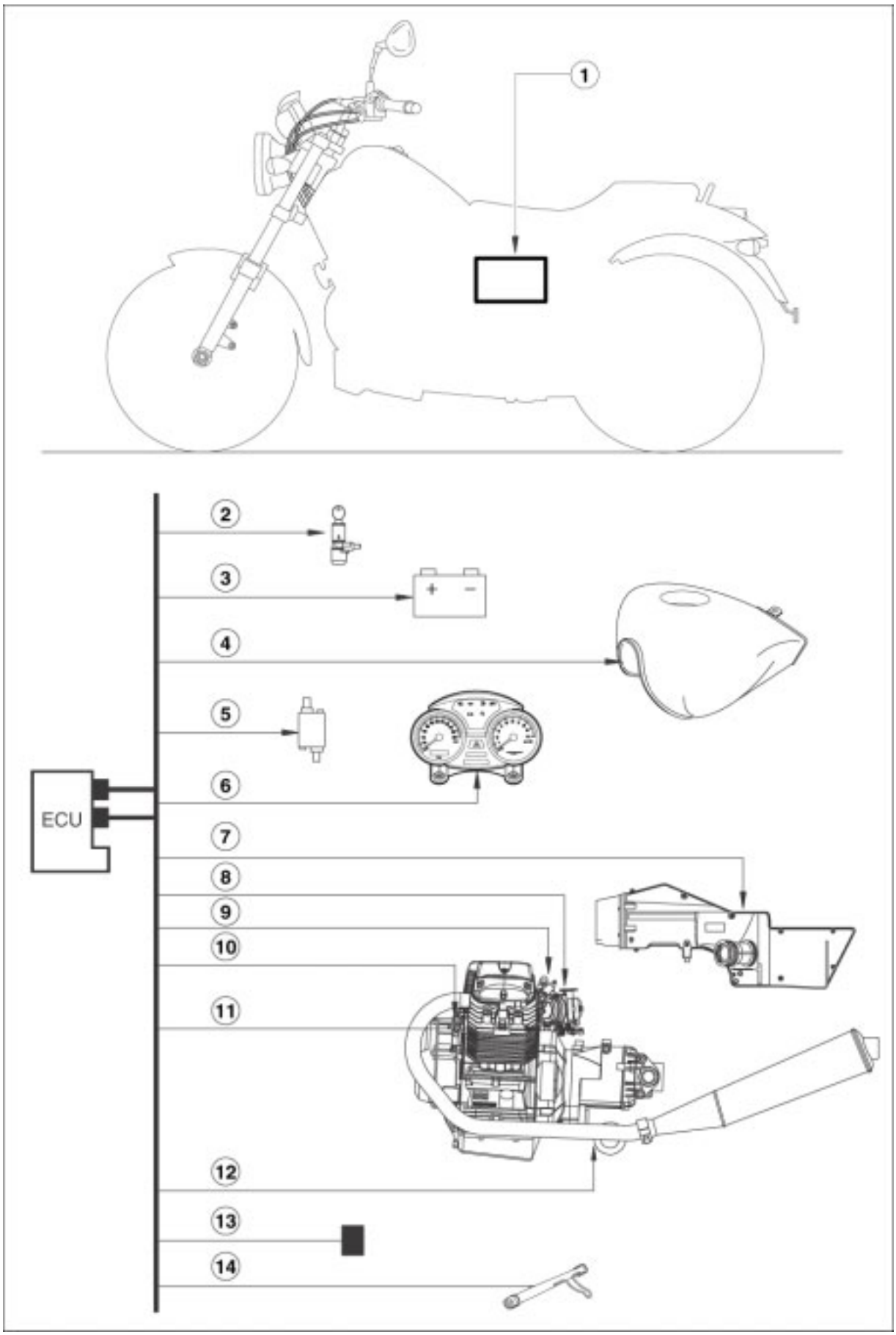
3.1. FUEL SYSTEM

3.1.1. FUEL SYSTEM LAYOUT



Key:
1. Fuel tank
2. Throttle body
3. Level check thermistor
4. Fuel filter
5. Fuel delivery line
6. Fuel pump assembly

3.1.2. INJECTION SYSTEM LAYOUT

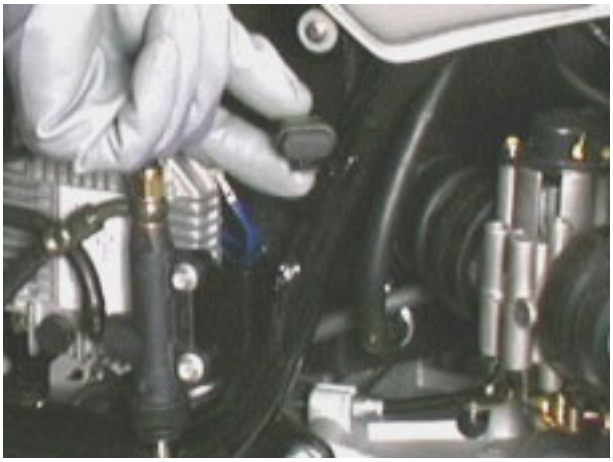


Key:

1. Engine control unit
2. Ignition switch
3. Battery
4. Fuel pump
5. Coil
6. Dashboard
7. Air temperature sensor
8. Throttle valve position sensor
9. Injectors
10. Crankshaft position sensor
11. Engine temperature sensor
12. Lambda sensor
13. Bank angle sensor
14. Side Stand

3.1.3. CYLINDER SYNCHRONISATION

- With the vehicle engine switched off, connect the Axone 2000 instrument to the diagnostics connector and the vehicle battery.



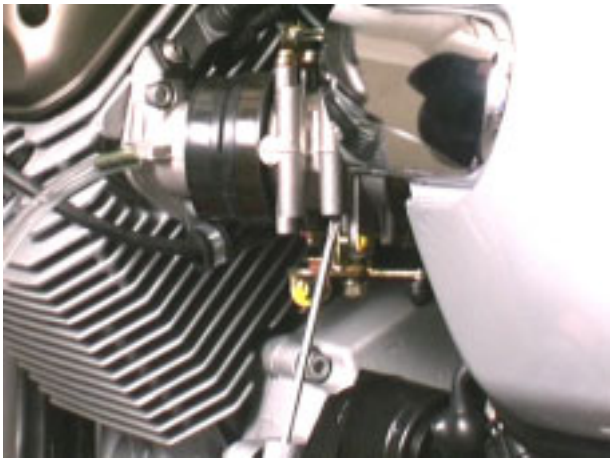
- Switch on the instrument.
- Screw the unions for connection of the vacuum meter lines to the threaded bores on the intake pipes.
- Connect the vacuum meter lines to the respective unions.

- Set Axone to the adjustments-setup page
- Make sure that the throttle is at the stroke end position
- Execute the throttle position self-teach procedure

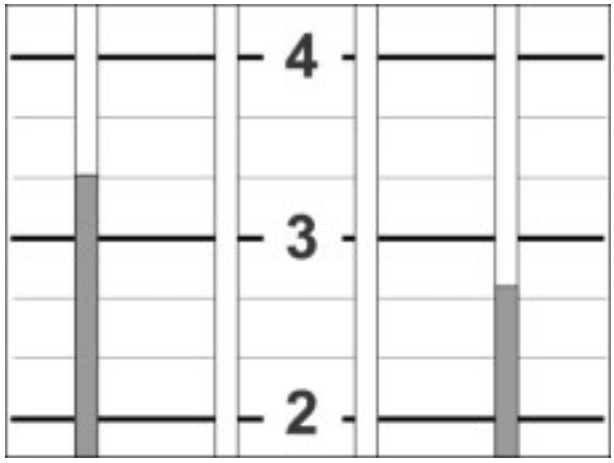
- Set the ignition key to "OFF" and leave it in this position for at least 30 seconds

IMPORTANT *Do not touch the throttle end stop screw, otherwise the throttle body must be renewed. Check that the throttle return cable is not taut*

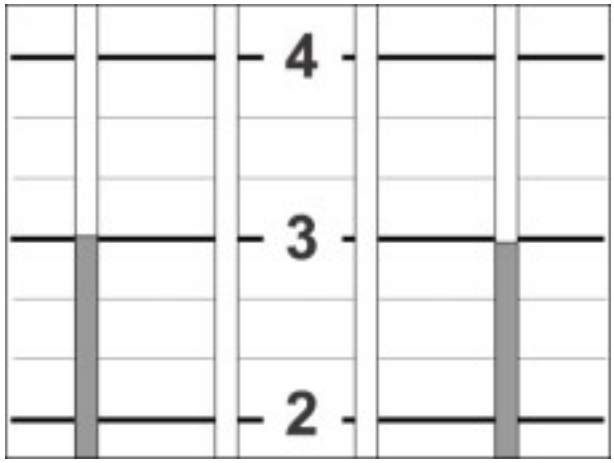
- Start the engine.
- Bring the engine to the prescribed temperature: **50 °C (122 °F).**
- Completely close the two bypass screws on the throttle bodies.



- Bring the engine to just above idle speed:
  2000 – 3000 rpm.
- Check cylinder balancing on the vacuum meter.

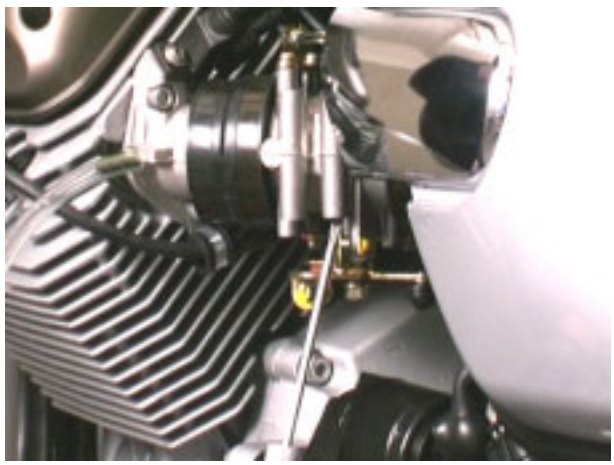


- Balance the cylinders by turning throttle bodies control rod adjuster, on vehicle left-hand side, until cylinders are balanced.



Now adjust engine idle speed:

- Bring the engine to the prescribed temperature:
  70 – 80 °C (158 - 176 °F).
- Adjust idle speed by means of the bypass screws:
  1100 ± 50 rpm.



3.1.4. SETTING THE CO RATE

The CO setting (injectors opening time) cannot be adjusted; the only facility is that of resetting the self-adaptive parameters in the event of replacement of the throttle body due to wear.

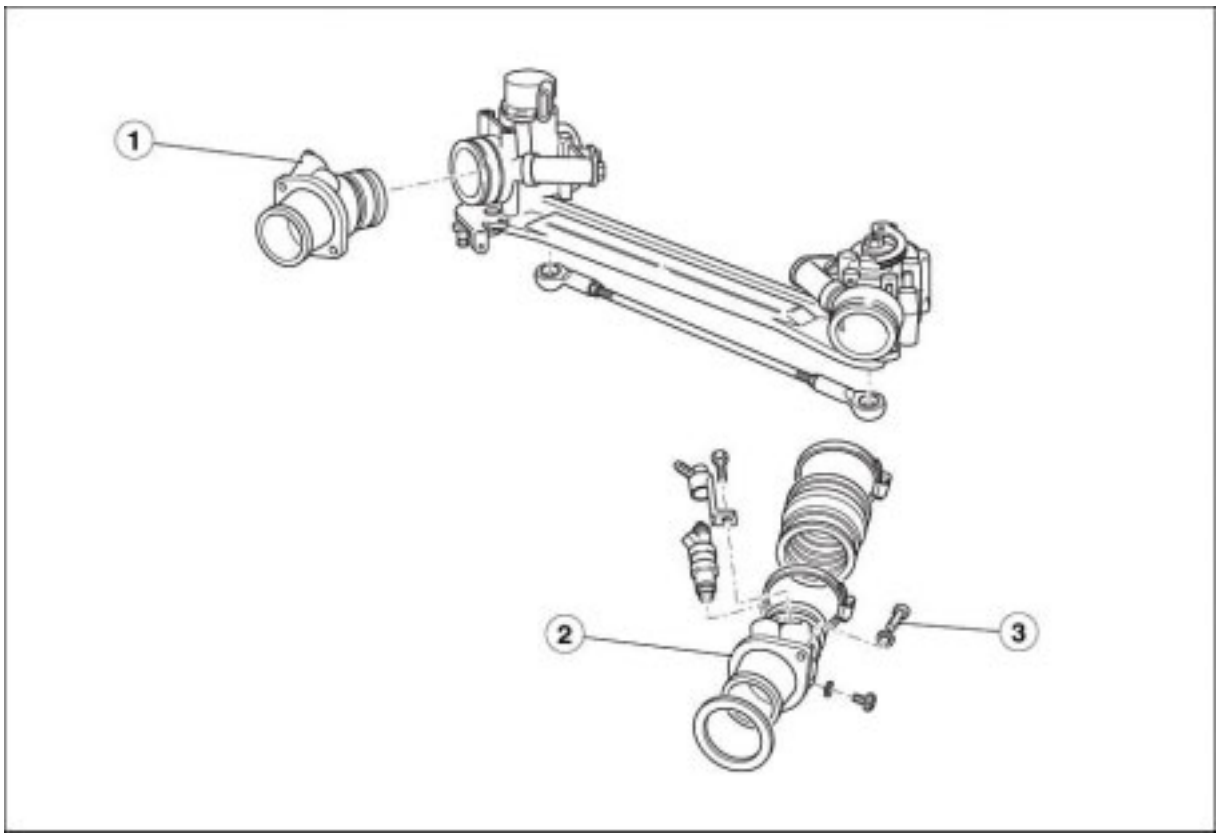
3.1.5. AXONE 5.0.0

ICON	DISPLAY
	ENGINE PARAMETER READING
	DEVICE STATUS (generally on/off)
	DEVICE ACTIVATION
	ERRORS DISPLAY
	ADJUSTABLE PARAMETERS

DISPLAY	DESCRIPTION
ENGINE PARAMETER READING	Throttle potentiometer
	Trimmer TPS
	Exact throttle position
	Lambda sensor
	Lambda integr.
	Partial charge autoad.
	Idle control self-adj
	Mult. richness adj.
	Non sync.phas.1 tooth
	Non syn.phas.>1 tooth
	rpm
	Injection time
	Ignition advance
	Atmospheric press
	Air temperature
	Engine temperature
	Battery voltage
DEVICE STATUS	Engine state
	Signal panel
	Idle/full load
	Lambda sensor
DEVICE ACTIVATION	Error clearing
	Fuel pump
	Left coil
	Right coil
	Rev counter
	Left Injector
	Right Injector

ERRORS DISPLAY	Engine temperature
	Left coil
	Right coil
	Left Injector
	Right Injector
	Lambda sensor
	Air temperature
	Throttle
	Pressur
	Battery voltage
	Fuel pump relay
	Autoadapt.parameters
	RAM Memory
	ROM Memory
	EEPROM
	Microprocessor
	Signal panel
ADJUSTABLE PARAMETERS	Throttle pos.self-teac
	Selfadapt.param.reset

3.1.6. INTAKE MANIFOLDS



- When fitting intake manifolds (1-2) tighten screws (3) simultaneously.

ENGINE 4

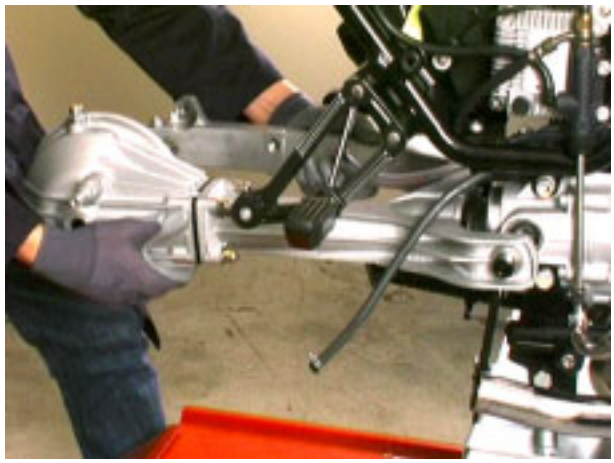
SUMMARY

4.1. DROPPING AND REFITTING THE ENGINE

4.1.1. DROPPING THE ENGINE FROM THE FRAME

- To drop the engine block first remove the superstructures, the battery, the exhaust tailpipes, the dampers and the rear wheel.
- Disconnect the speed sensor and remove the cable from the harness.

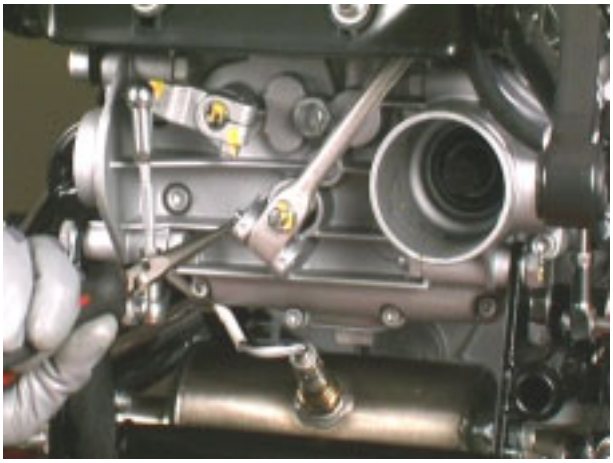
- Remove the swing arm complete with bevel gear set.

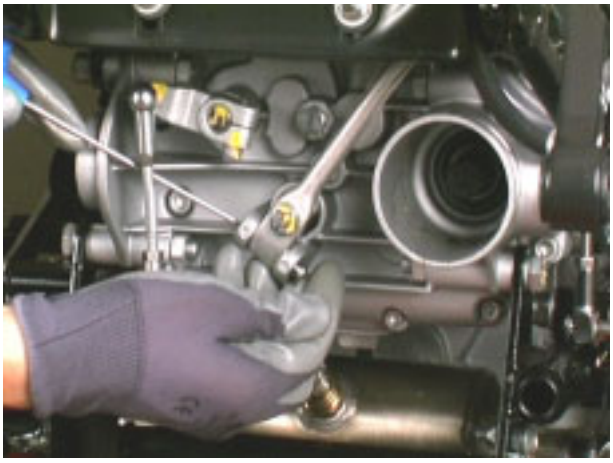


- Disconnect the alternator electrical connections.

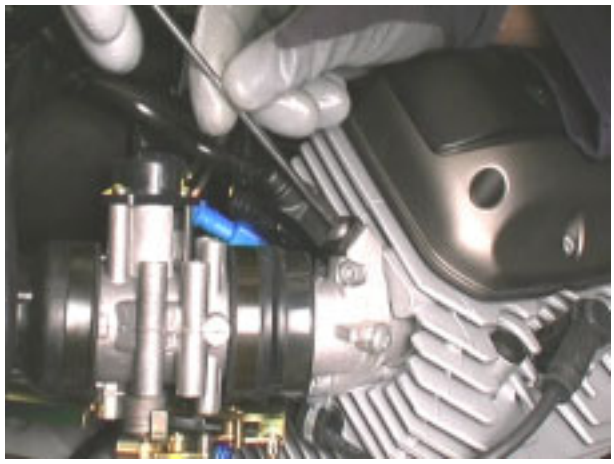
- Remove the rpm sensor without disconnecting the wiring.

- Remove the spindle, with cotter, responsible for securing the clutch linkage to the engine block, and then free the control cable.





- Remove the injectors retainer and withdraw the injectors from their seat on the intake manifolds.



- Disconnect the spark plug leads from the coils and separate them from the frame.

- Loosen the clamps on the intake manifolds.

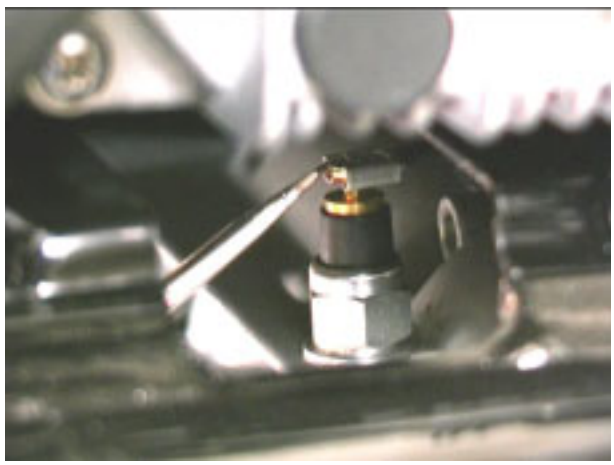
- Detach the oil breather pipes on the cylinder heads.

- Remove the engine temperature sensor connection.

- Disconnect the starter motor and the lambda sensor.

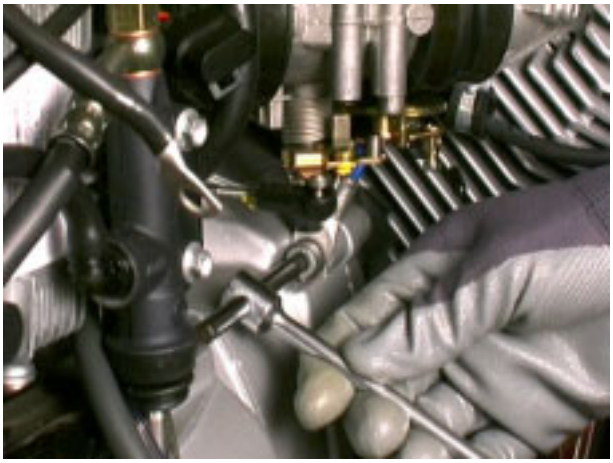
- Open the clamp and detach the airbox oil breather tube.

- Disconnect the neutral indicator.

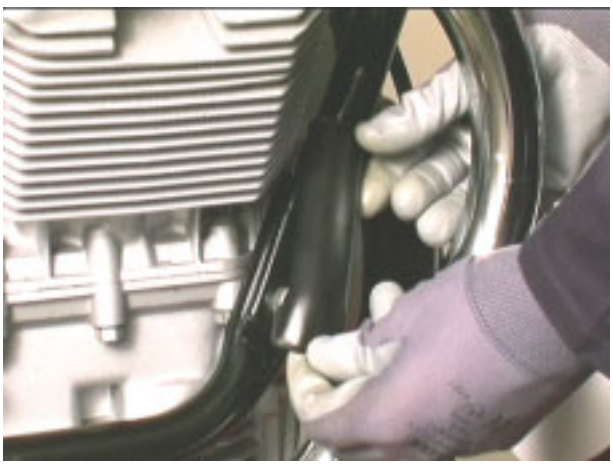


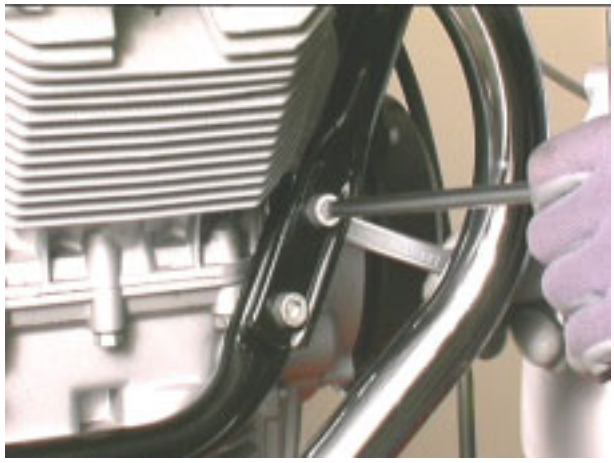
- Disconnect the sidestand safety switch connector and separate the wiring from the frame.

- Unscrew the screw that secures the earth lead lug to the engine block.



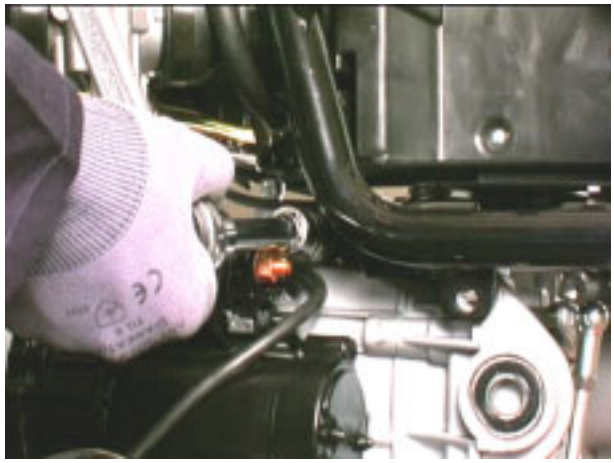
- Support the bike frame on a motorcycle lift.
- Unscrew the four Allen screws that secure the frame front arms to the engine cradle.





- Remove the upper screws joining the frame and the gearbox cover.

- Remove the tie rod between the frame and gearbox.



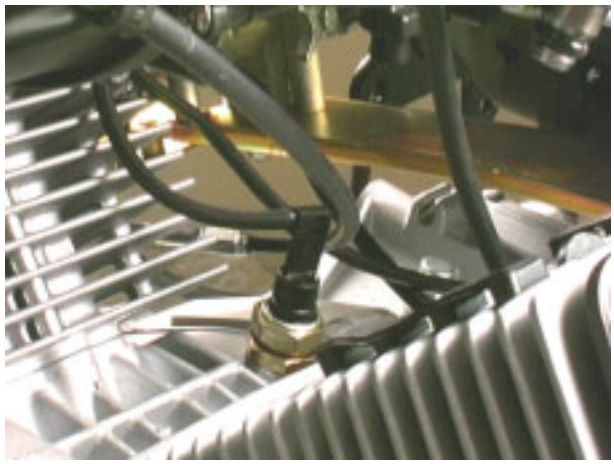
- Proceed to drop the engine: during the procedure check that the throttle body hoses detach properly from the intake manifolds without sustaining damage.

- Lower the engine checking that it separates correctly from the frame.

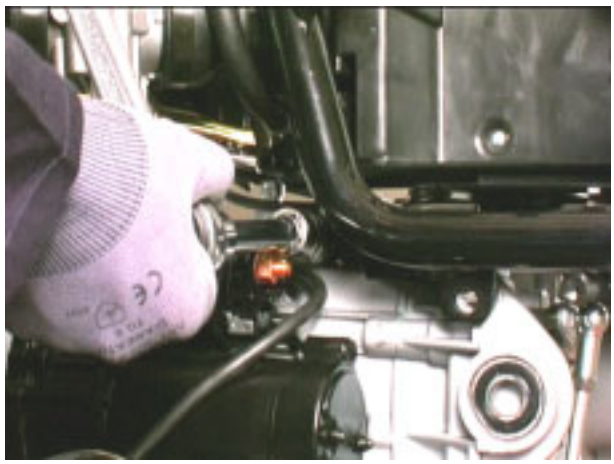
- During the operation detach the oil pressure transmitter connection.

4.1.2. REFITTING THE ENGINE IN THE FRAME

- With the motorcycle frame secured on a lift, jack up the engine into position.
- During this procedure reconnect the oil pressure transmitter and check that the throttle body hoses engage correctly over the intake manifolds.

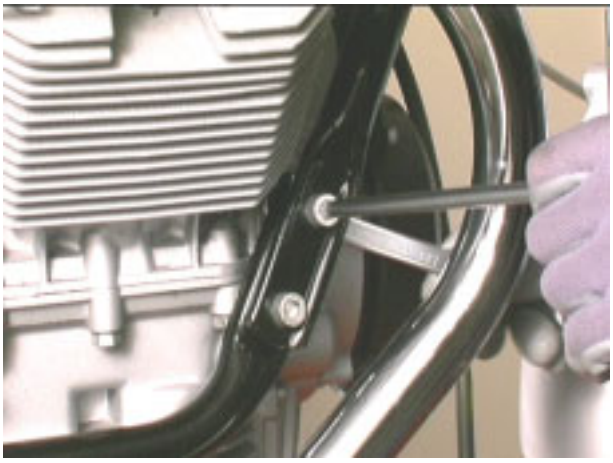


- With the engine in position, fit the frame-to-gearbox fixing tie rod and torque to the prescribed value.



- Fit the upper screws that secure the frame to the gearbox cover and torque to the prescribed value.

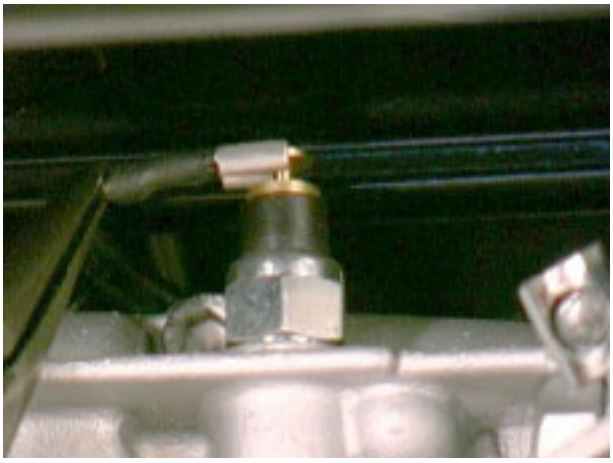
- Secure the frame front arms to the engine cradle by means of the four Allen screws and torque the screws to the prescribed value.



- Fit the screw responsible for securing the earth lead lug to the engine block.

- Reconnect the sidestand safety switch.

- Connect the neutral indicator.



- Insert the oil breather pipe into the airbox and secure it with the specific clamp.

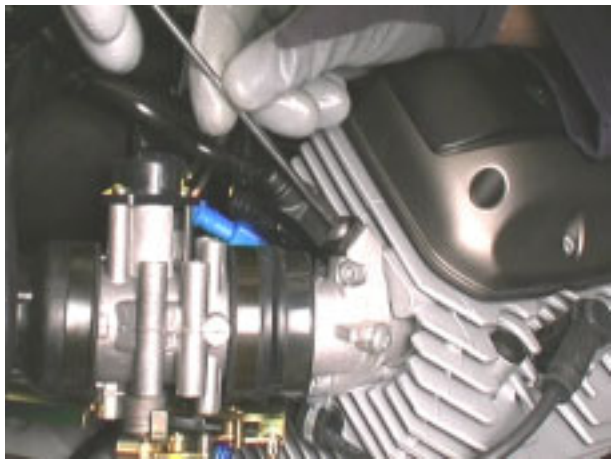
- Connect the starter motor and the lambda sensor.

- Reconnect the engine temperature sensor.

- Fit the breather pipes in the cylinder heads and secure them with the specific clamps.

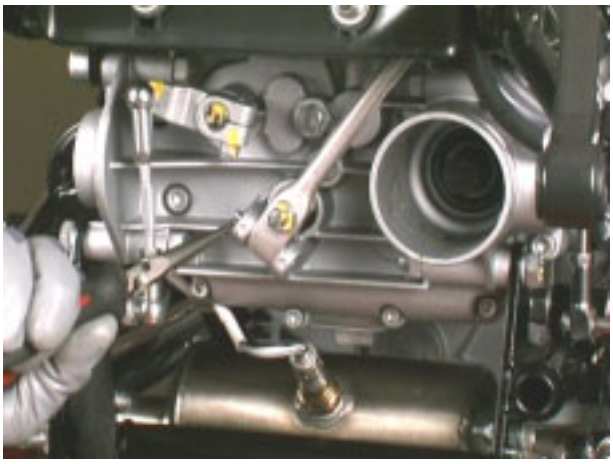
- Tighten the clamps on the intake manifolds.

- Fit the injectors into their seats and assemble the retainer, tightening the screw to the prescribed torque value.

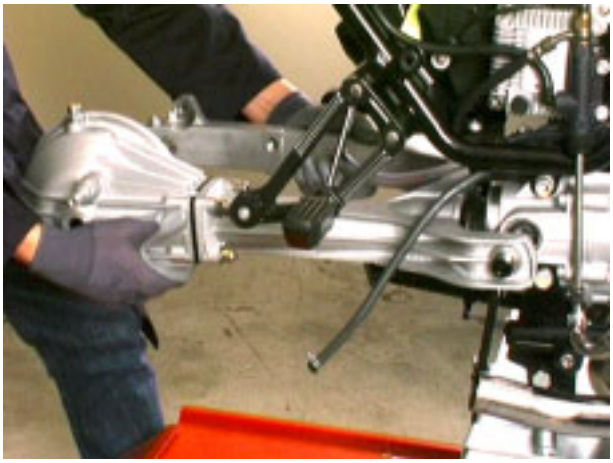


- Connect the spark plug leads to the ignition coils.

- Position the clutch linkage and fit the spindle to the engine block, fixing with the relative cotter.



- Refit the swing arm complete with bevel gear set.



- Fit the rpm sensor and torque the screws to the prescribed value.

- Remake the alternator electrical connections.

- Reconnect the vehicle speed sensor.

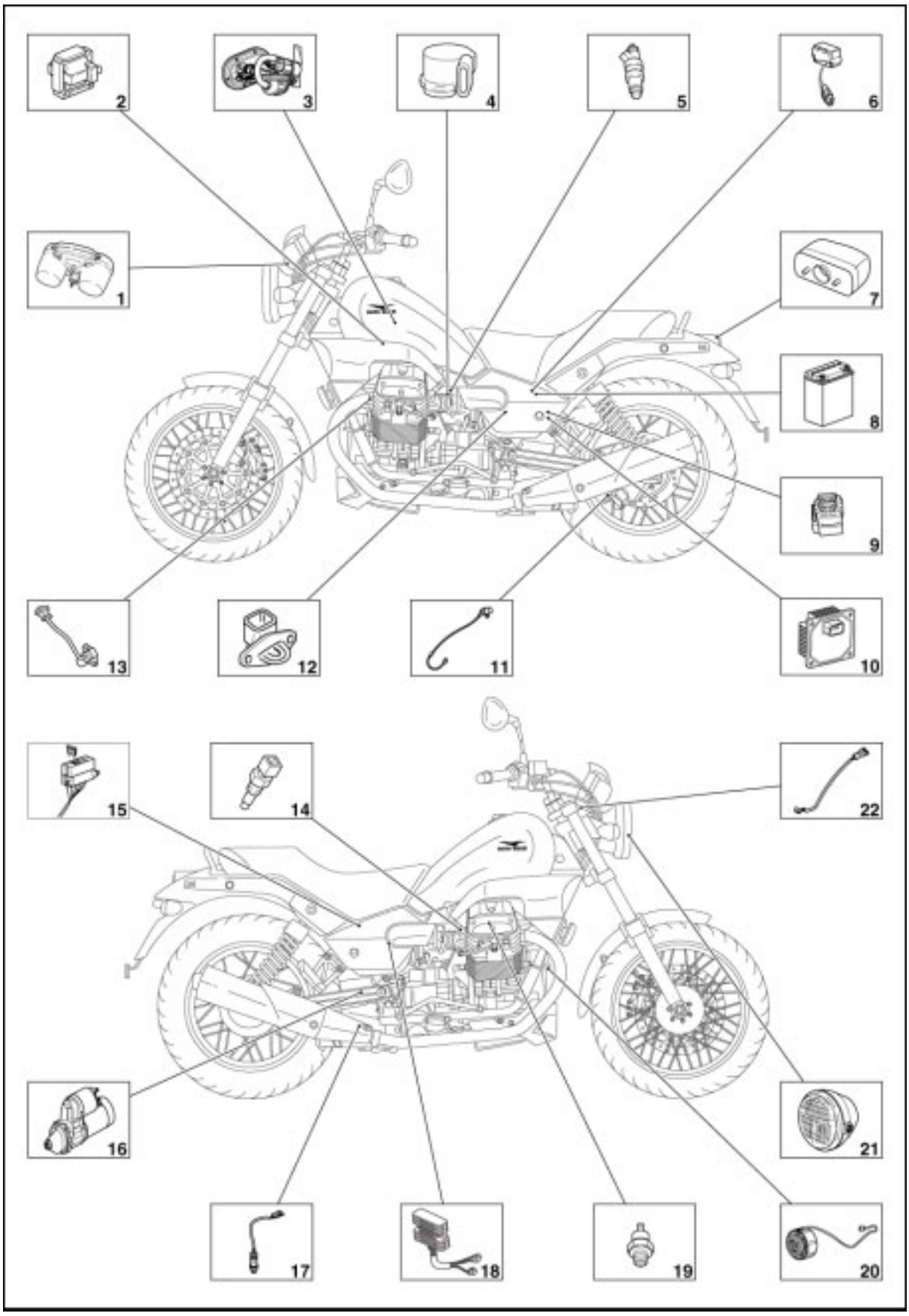
4.1.3. TIGHTENING TORQUES

ENGINE CONNECTING PARTS	
Front tie rod nut	45 Nm
Nut for long and short screws	45 Nm
Clutch housing cover to engine fixing screws	25 Nm

ELECTRICAL SYSTEM 5

SUMMARY

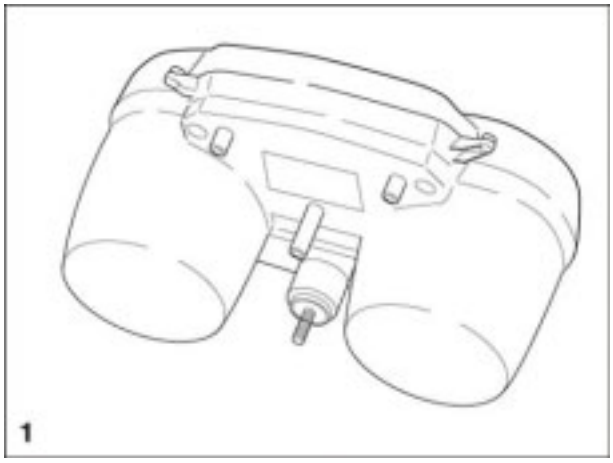
5.1.1. COMPONENTS CHECK



1 DASHBOARD

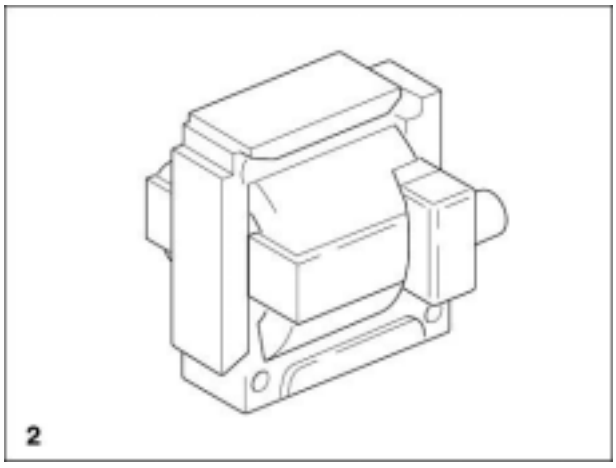
DASHBOARD PINOUT

Pin	Designation	Signal type
1	Right turn signal switch	Digital input
2	Vehicle speed sensor power supply	Power output
3	Right turn signal switch	Digital input
4	Dashboard power supply (+15)	Power input
5	Engine speed signal	Frequency input
6	Fuel level sensor signal	Analog input
7		
8	Fuel level sensor ground	Analog input
9		
10	Vehicle speed sensor power supply	Power output
11	Air temperature sensor ground	Analog input
12	Vehicle speed sensor signal	Frequency input
13	Air temperature sensor signal	Analog input
14		
15		
16		
17		
18	Neutral gear indicator	Digital input
19		
20	Oil pressure sensor signal	Digital input
21		
22	Engine control unit fault signal	Digital input
23		
24		
25	Dashboard power supply (ground)	Power input
26	High beam indicator lamp control	Power input
27	Dashboard power supply (+30)	Power input
28	Left turn signal control	Power output
29	Dashboard power supply (+30)	Power input
30	Right turn signal control	Power output


1

2 COIL

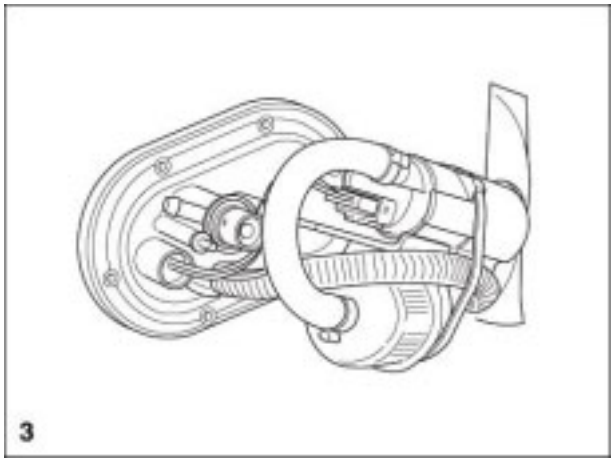
primary resistance: 0.5-0.6 Ω
secondary resistance: 3.3 KΩ


2

3 FUEL PUMP

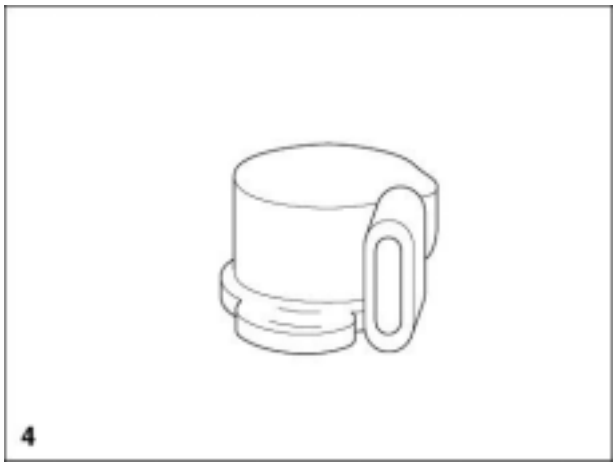
Fuel pump
power draw 4A (with power supply of 12V measured across pins 1 and 2)

Fuel level sensor:
resistance 1.4KΩ (measured across pins 3 and 4 with fuel level 0 litres)


3

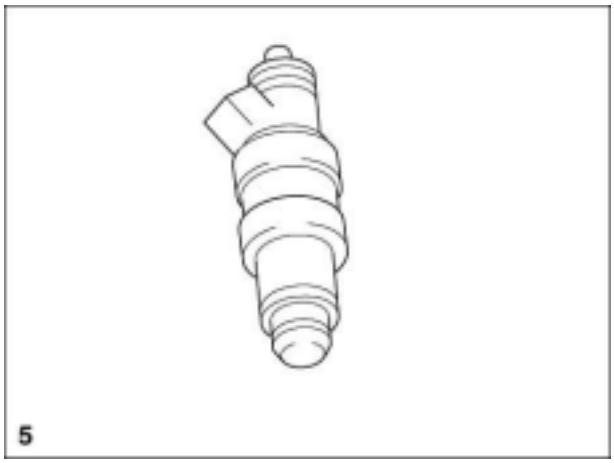
4 THROTTLE POTENTIOMETER (TPS)

resistance 1290 Ω (measured across pins A and B)
resistance 1110-2400 Ω (in accordance with the throttle position; measured across pins A and C)
output voltage 0.15-4.4 V (in accordance with the throttle position, measured across pins C and A)


4

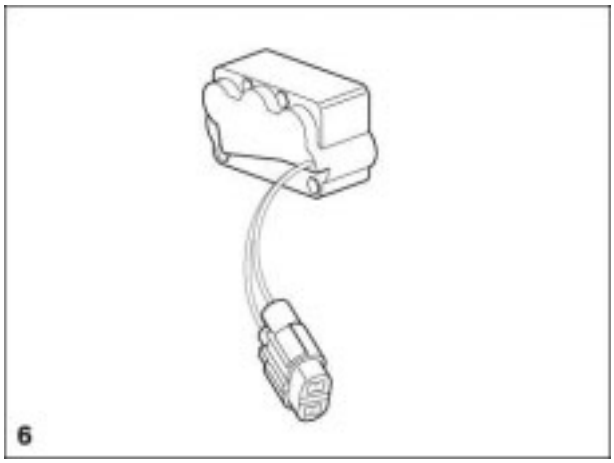
5 INJECTOR

resistance 16 Ω

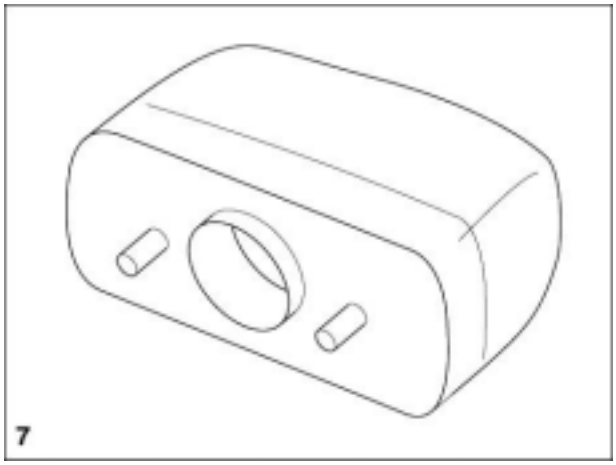

5

6 BANK ANGLE SENSOR

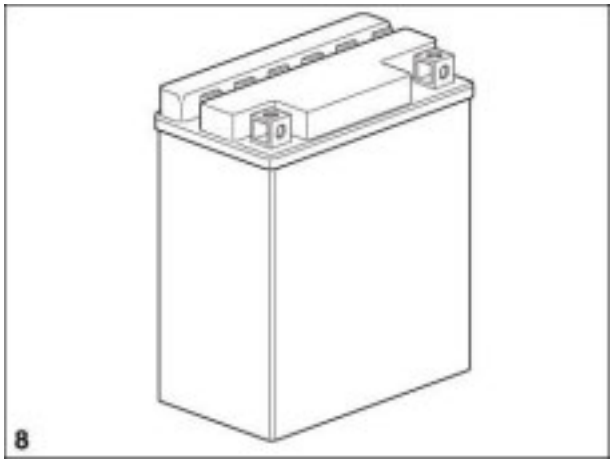
normally open contact
resistance 0 Ω when sensor is rotated through an angle of 90° with respect to its mounting position.


6

7 TAIL-LIGHT
rear parking light/brake light: 12V – 5/21 W
number plate light 12V – 5 W

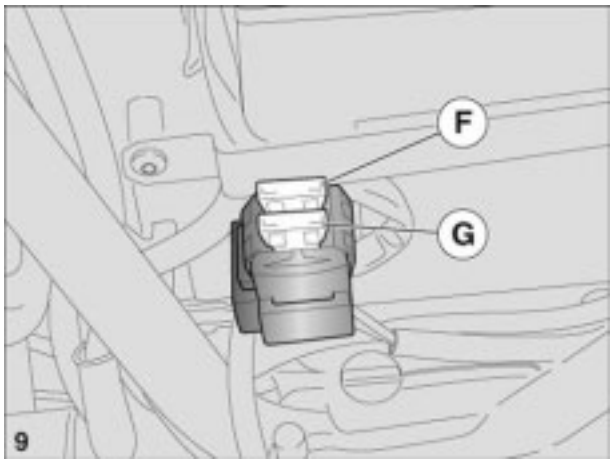

7

8 BATTERY
12 V – 14 Ampere/hour


8

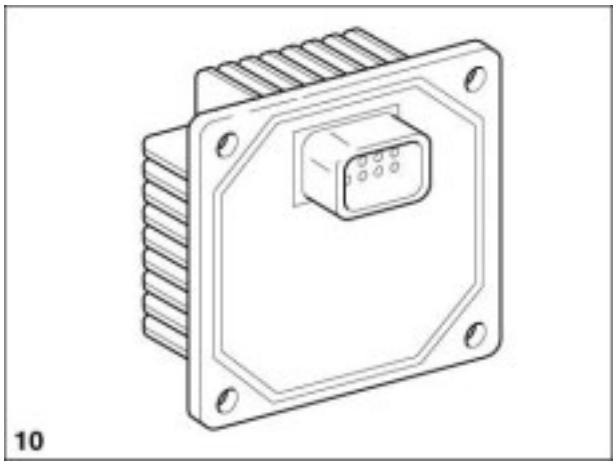
9 MAIN FUSES
F – From battery to voltage regulator (30 A).
G – From battery to ignition key and fuses C and D (30 A).

IMPORTANT *One spare fuse is supplied.*

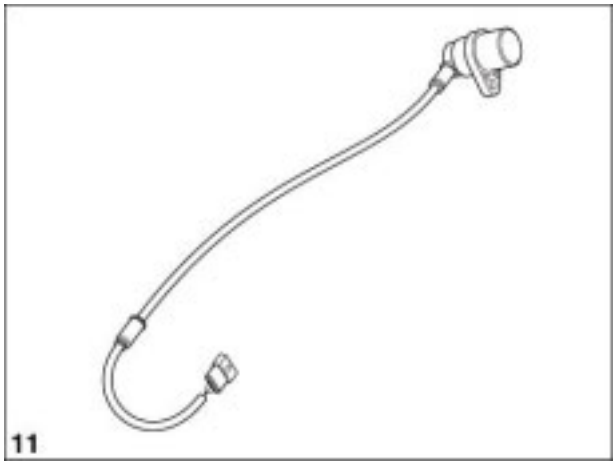


9

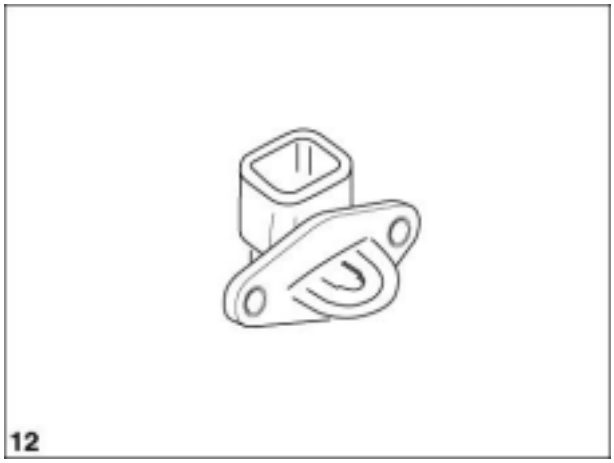
10 ENGINE CONTROL UNIT
Magneti Marelli 15 RC engine control unit


10

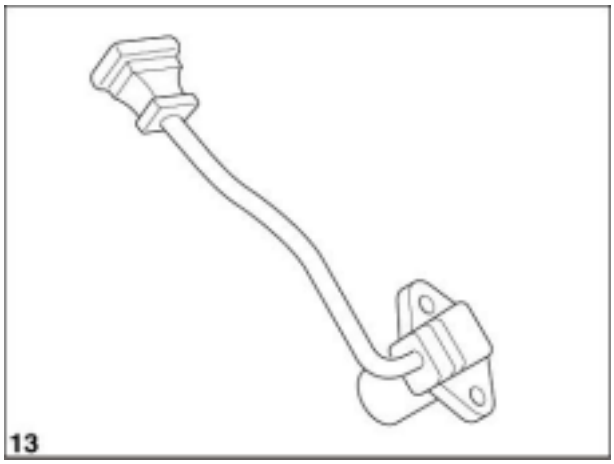
11 SPEED SENSOR
hall effect sensor with 6 pulse/revolution square wave output



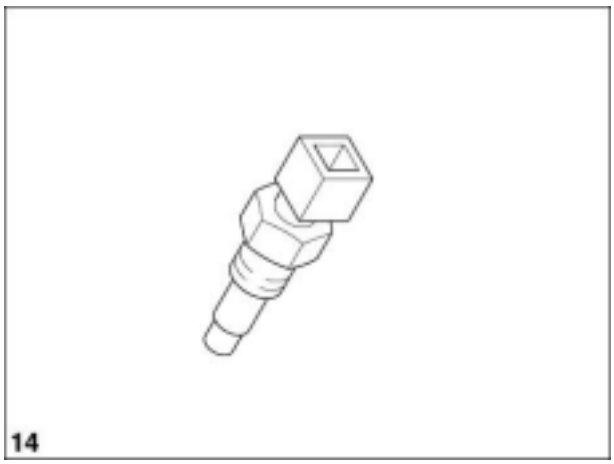
12 INTAKE AIR TEMPERATURE SENSOR
NTC type sensor
resistance 3.7 KΩ (temperature 20°C – 68°F)



13 ENGINE SPEED SENSOR
inductive type sensor
winding resistance 650 Ω (measured across pins 1 and 2)
output voltage 0-5 V (measured during drive)



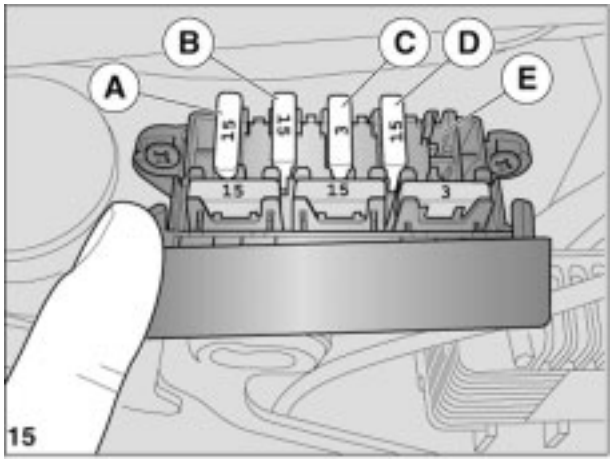
14 CYLINDER HEAD TEMPERATURE SENSOR
NTC type sensor
resistance 3.7 KΩ (temperature 20°C – 68°F)
resistance 220 Ω (temperature 100°C – 212°F)



15 SECONDARY FUSES

A – From ignition key to safety logic / starting (15 A).
B – From ignition key to lights, brake lights, horn, turn signals (15 A).
C – From battery to injection permanent power supply (3 A).
D – From battery to injection (15 A).
E – Free

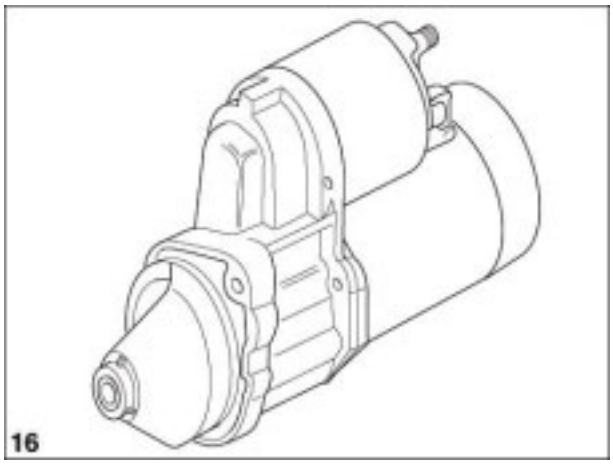
IMPORTANT *Three spare fuses are supplied (3, 15, 15 A).*



15

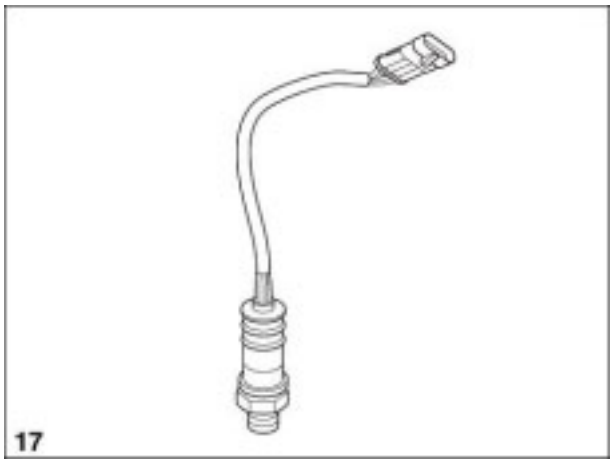
16 STARTER MOTOR

peak power draw approximately 100 A


16

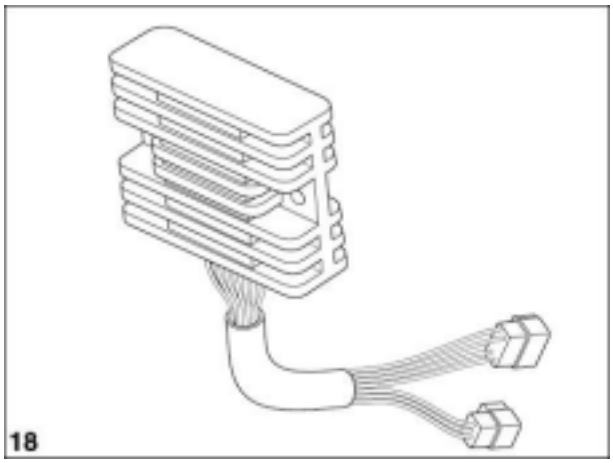
17 LAMBDA SENSOR

oxygen sensor with heater
sensor output between 0 and 0.9 V (measured across pins 1 and 2)
heater resistance 12.8 Ω (measured across pins 3 and 4 at temperature of 20°C – 68°F)

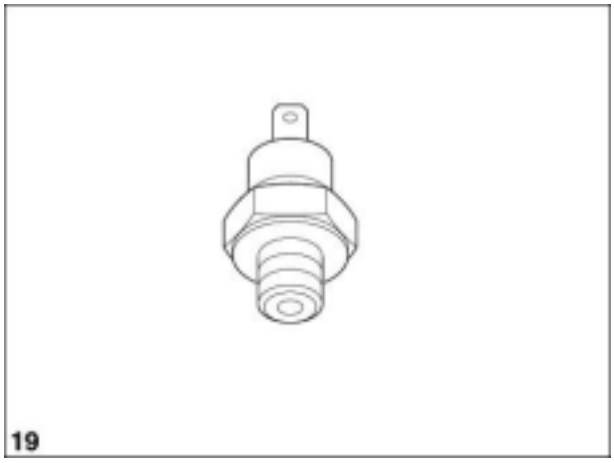

17

18 VOLTAGE REGULATOR

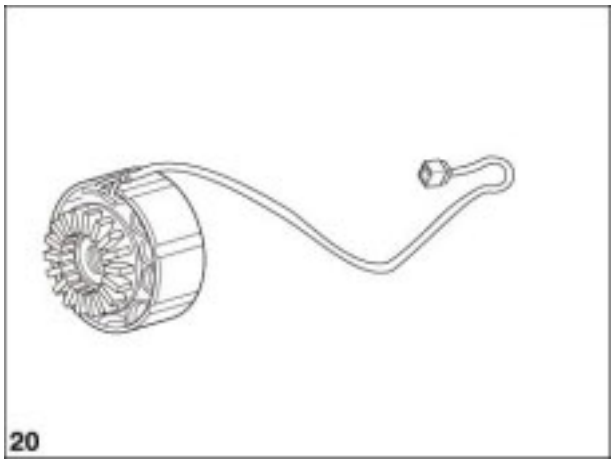
voltage to measure at battery poles (from 13.5 to 14V with engine at 4000 rpm depending on load)


18

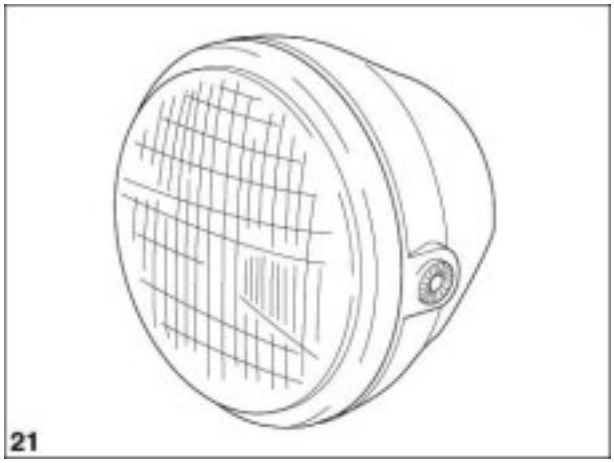
19 ENGINE OIL PRESSURE SENSOR
normally open contact


19

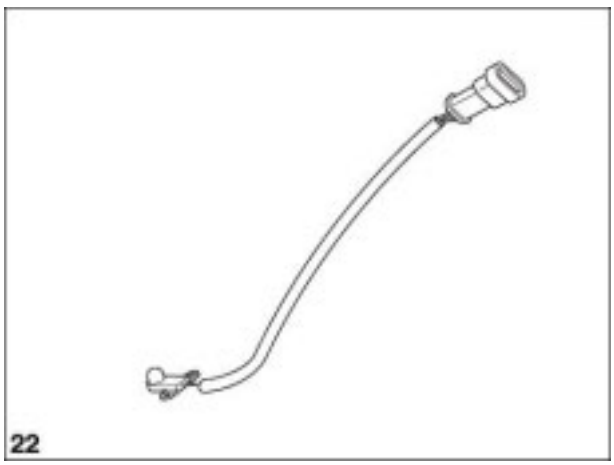
20 ALTERNATOR
12 V 330 N
single phase alternator
winding resistance 0.2-0.3 Ω
output voltage 20 V AC (measured with alternator disconnected from electrical system and engine idling)
output voltage 65 V AC (measured with alternator disconnected from electrical system and engine at 4000 rpm)


20

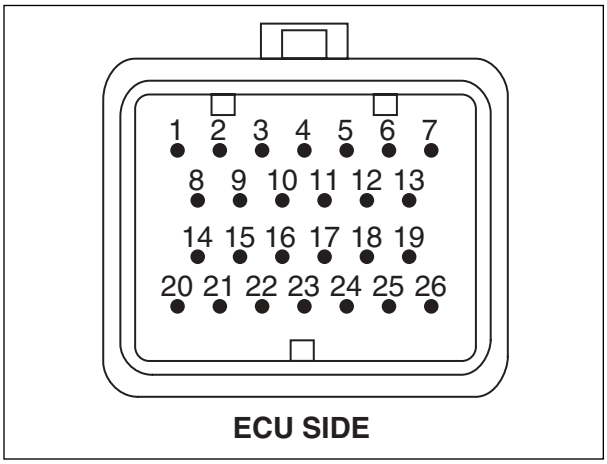
21 HEADLIGHT
headlamp low beam / high beam (halogen): 12V – 55/60 W H4
front parking light: 12V – 5 W


21

22 DASHBOARD AIR TEMPERATURE SENSOR
resistance 32510 Ω (temperature 0°C + 2% – 32°F + 2%)
resistance 9960 Ω (temperature 25°C + 3% – 77°F + 3%)

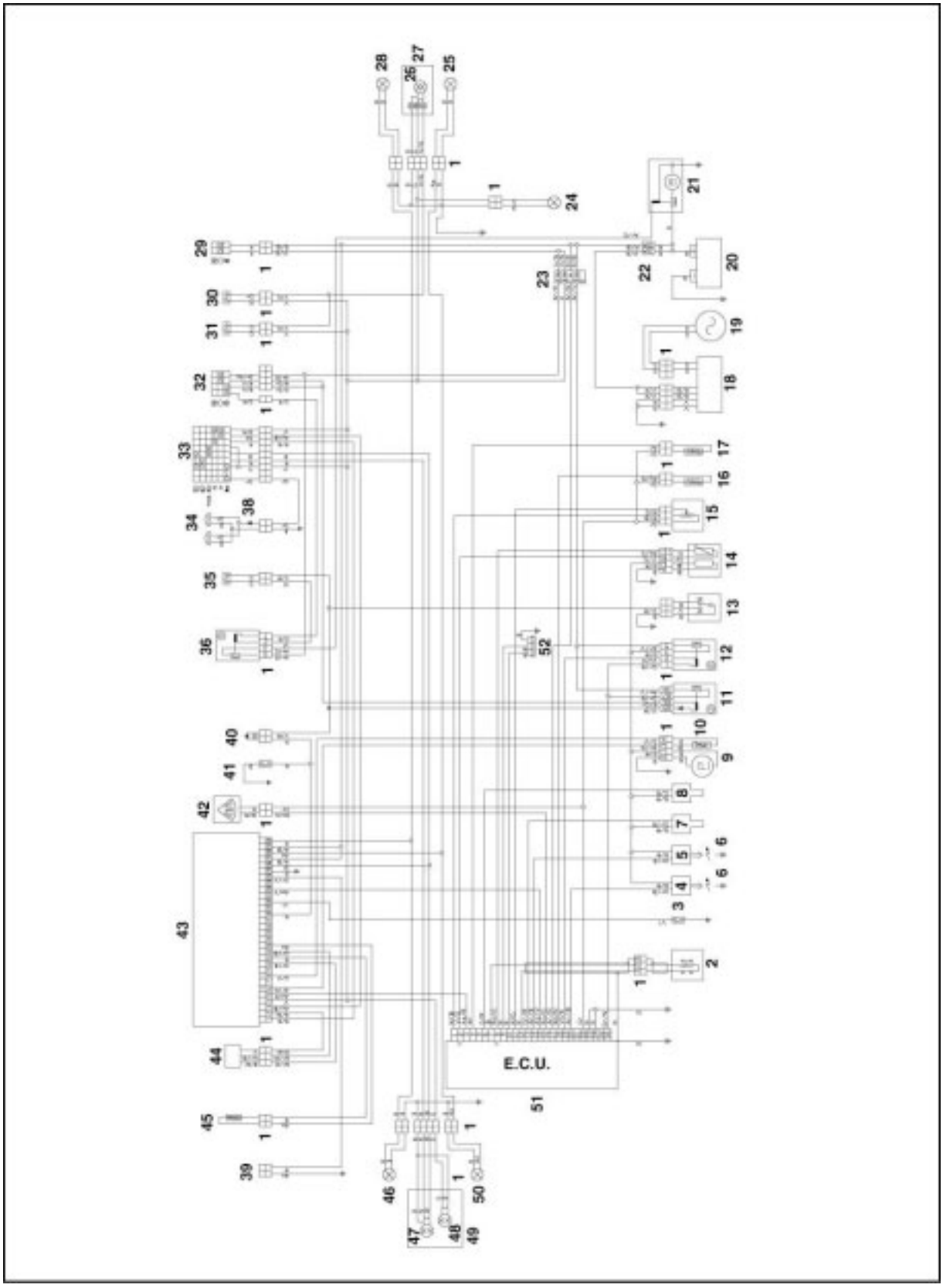

22

5.1.2. ECU CONNECTIONS



PIN	DESIGNATION	SIGNAL TYPE
1	Throttle position sensor power supply	Power output
2	Lambda sensor signal (ground)	Analog input
3	Rev counter control	Frequency output
4	Cylinder head air temperature sensor signal	Analog input
5		
6	Right-hand injector control	Power output
7	Engine speed sensor	Frequency input
8	Lambda sensor signal (positive)	Analog input
9	Diagnostics line (K)	Communication line
10	Diagnostics line (L)	Communication line
11	Throttle position signal	Analog input
12	Engine speed sensor	Frequency input
13	Right-hand injector control	Power output
14	Right-hand coil control	Power output
15	Injection indicator light control	Digital output
16	Bank angle sensor signal	Digital input
17	Engine control unit power supply	Power input
18	Intake air temperature sensor signal	Analog input
19	Injection relay control	Digital output
20	Left-hand coil control	Power output
21		
22	Sensors power supply (ground)	Power output
23	Engine control unit power supply (ground)	Power input
24	Engine control unit power supply (ground)	Power input
25		
26	Engine control unit power supply (+15)	Power input

5.1.3. WIRING DIAGRAM



Key:

1. Multiple connectors
2. RPM sensor
3. Oil pressure sensor
4. Left coil
5. Right coil
6. Spark plugs
7. Left injector
8. Right injector
9. Fuel pump
10. Low fuel sensor
11. Main inj. relay (Polarised)
12. Secondary injection relay
13. Side stand switch
14. Oxygen sensor
15. Throttle sensor
16. Engine air thermistor
17. Head T sensor
18. Voltage regulator
19. Flywheel
20. Battery
21. Starter motor
22. Main fuses
23. Auxiliary fuses
24. Number plate light
25. Rear left turn indicator
26. Stop - parking light
27. Tail light
28. Rear right turn indicator
29. Key-operated switch
30. Front stop light switch
31. Rear stop light switch
32. Right dimmer switch
33. Left dimmer switch
34. Warning horn
35. Clutch switch
36. Starter relay
37. -
38. Horn diode
39. Antitheft system LED connector
40. Diode
41. Neutral switch
42. Bank angle sensor
43. Instrument panel
44. Speed sensor
45. Instrument panel air T thermistor
46. Front right turn indicator
47. High - low beam bulb
48. Front parking light bulb
49. Headlight
50. Front left turn indicator
51. E.C.U.
52. Diagnostics socket

WIRE COLOURS:

Ar	Orange
Az	Light blue
B	Blue
Bi	White
G	Yellow
Gr	Grey
M	Brown
N	Black
R	Red
V	Green
Vi	Violet
Ro	Pink

TRANSMISSION 6

SUMMARY

6.1. SWING ARM COMPLETE WITH TRANSMISSION ASSY

6.1.1. REMOVAL

- Remove the left silencer.

- Remove the rear brake caliper, release the brake line from the swingarm fastener.

- Loosen and remove the brake caliper holder screw.

- Remove both rear suspensions.

- Loosen and remove the nut, collect the washer.

- Loosen the screw securing the wheel shaft.

- Remove the wheel shaft, collect the spacer.

- Remove the rear wheel.

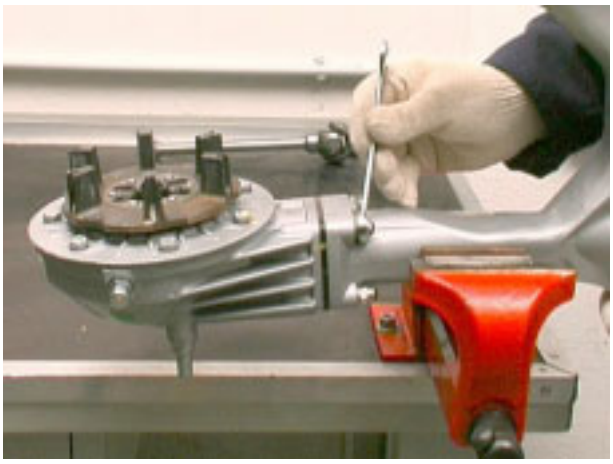
- Loosen the tie.
- Remove the protection.

- Loosen the nuts.

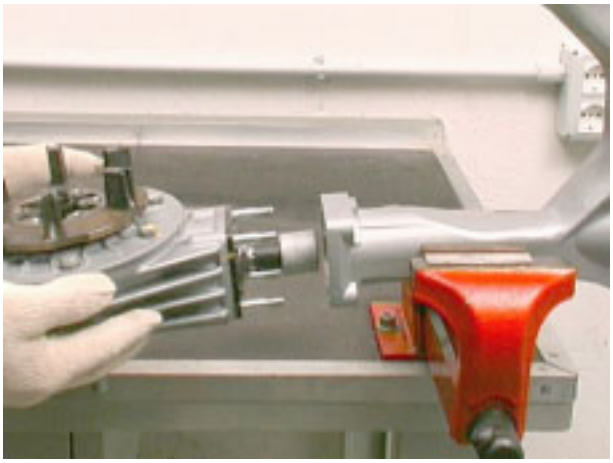
- Loosen the shafts so that the swingarm can be detached from the gearbox.

- Remove the shim between swingarm right section and gearbox.

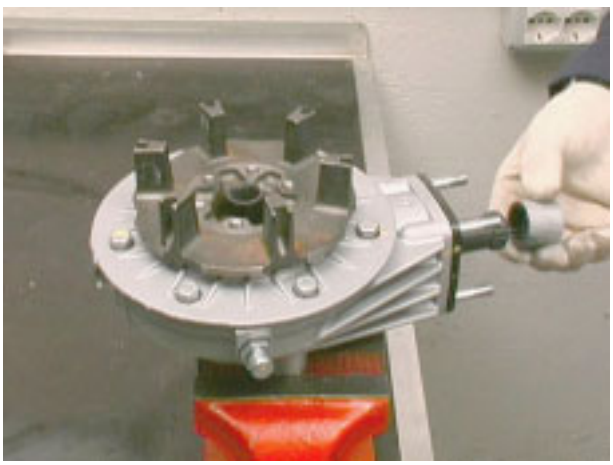
- Unscrew the four nuts and recover the washers.



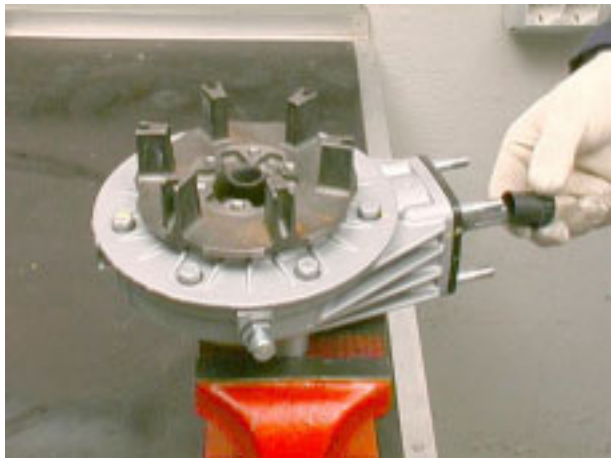
- Remove the complete transmission case from the swing arm.



- Remove the sleeve from the pinion.
- Remove the spring.
- Remove the seal ring.
- Remove the cap.



- Withdraw the gear.

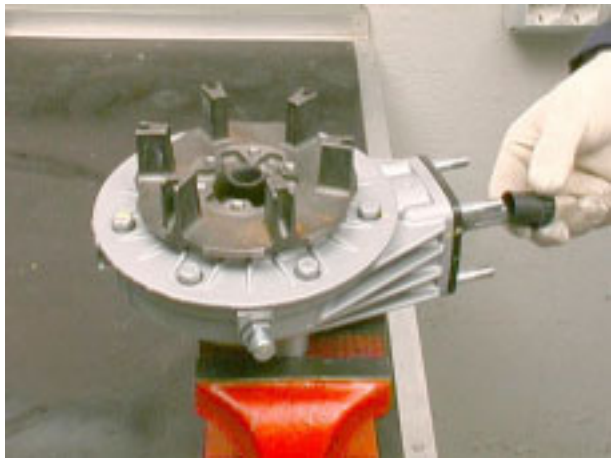


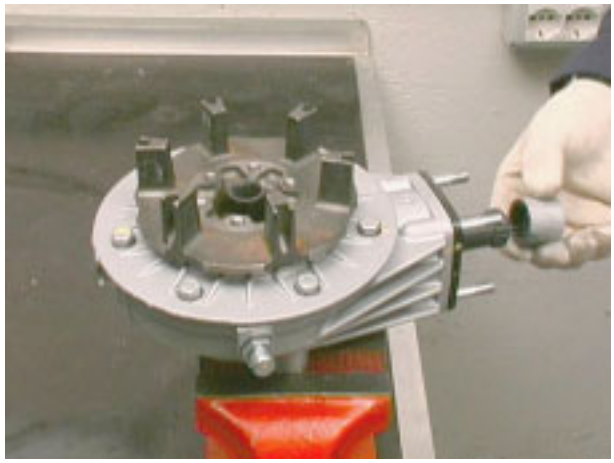
6.1.2. INSPECTION

- Check that the cardan coupling is in good condition, that the gear teeth that mesh with the sleeve splines and the coupling splines are not damaged or excessively worn; otherwise, renew the coupling.
- Check that the rubber boot is not cut or pierced, renew if necessary.
- Check that the threads of the swing arm fixing pins and nuts are in good condition and not stripped; renew if necessary.
- Check that the sleeve splines are in good condition and undamaged; renew if necessary.
- Check that the spring is not distorted; renew if necessary.
- Check that the circlip has not lost its elasticity and is not distorted.
- Check that the external teeth and internal splines of the sleeve are undamaged.

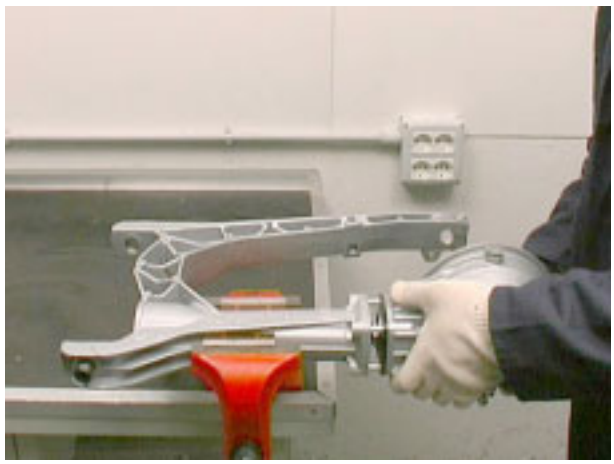
6.1.3. REASSEMBLY

- Equip the transmission case bevel pinion with the sleeve and cap





- Fit the transmission case studs correctly into the corresponding holes in the swing arm.



- Snug the nuts complete with washers without tightening.

- Fit the spacer and wheel axle and tighten the nuts fully working in crosswise sequence.
- Fit the dust cover with internal circlip in the front of the swing arm.
- Fit the spring in the relative bore in the cardan coupling and apply grease to hold it in position.

- Insert the cardan coupling into the swing arm through the dust boot.
- Take care to ensure that the spring does not fall out of place when inserting the sleeve into the coupling.

IMPORTANT *Now reassemble the swing arm as follows:*

- Screw in the pin on the right-hand side until it protrudes from the swing arm sufficiently to hold the shim.

- Insert the swing arm into the transmission case cover.
- Tighten the left-hand pin fully down until the shim on the right-hand side is located against the bearing fitted to the transmission case cover.

- Snug the pin on the right-hand side without tightening.
- Articulate the swing arm to ensure that it moves freely without play.

- Fit the nuts onto the studs and tighten them fully down.

- Tighten the jubilee clamp.

- Fit the rear wheel.

6.1.4. TIGHTENING TORQUES

ENGINE CONNECTING PARTS	
Front tie rod nut	45 Nm
Nut for long and short screws	45 Nm
Clutch housing cover to engine fixing screws	25 Nm

6.2. TRANSMISSION CASE

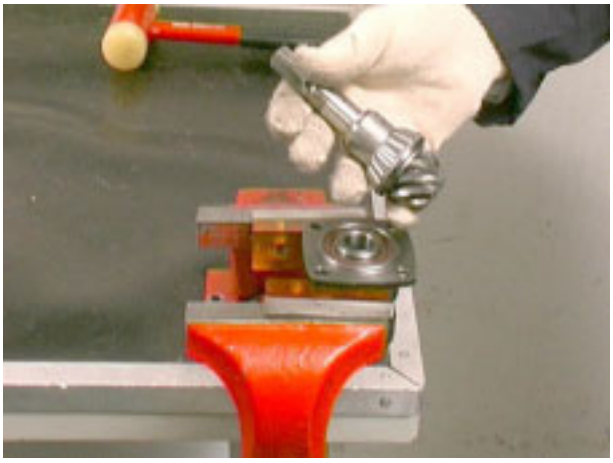
6.2.1. REMOVING THE PINION HOUSING

- Remove the swing arm case.
- Withdraw the complete pinion housing from the transmission case.

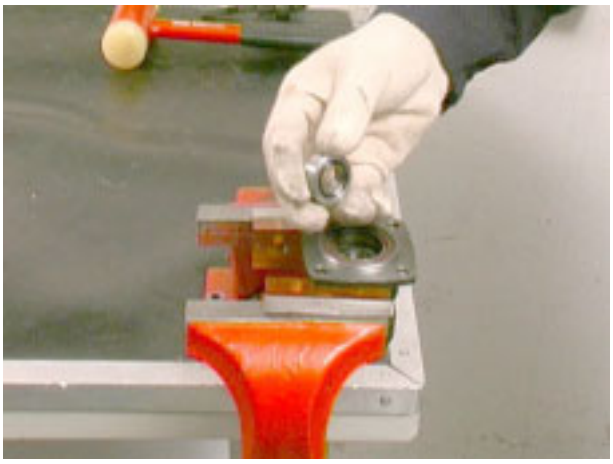
- Clamp the bevel gear set holder tool (19907100) in a vice.

- Insert the splined shaft of the pinion in the tool and unscrew the nut.

- Remove the distance collar.
- Remove the pinion.



- Remove the clearance washer.
- Remove the O-ring.



- Remove the oil seal.

- Remove the taper roller bearing from the housing.
- Remove the O-ring.
- Remove the distance collar.
- Remove the two washers.

- Remove the taper roller bearing from the housing.

6.2.2. INSPECTION

- Check that the pinion teeth are in good condition, not excessively worn and undamaged; if necessary renew the bevel gear set.
- Check that the two taper roller bearings are in good condition, that the rollers are undamaged and not excessively worn; renew if necessary.
- Check that the clearance washers are not distorted or chipped; renew if necessary.
- Check that the seal rings are compact, undamaged, and not excessively worn; renew if necessary.

6.2.3. REASSEMBLY

- If you need to renew the bevel pinion then you must also renew the bevel gear mounted on the transmission case. The pinion and gear in the set must be stamped with the same identification number.

- Use the specific punch (19926400) to drive the outer race of the taper roller bearings into the bevel pinion housing.

- Fit the clearance washer.

- Use the specific punch (19926200) to fit the bearing inner race to the pinion.

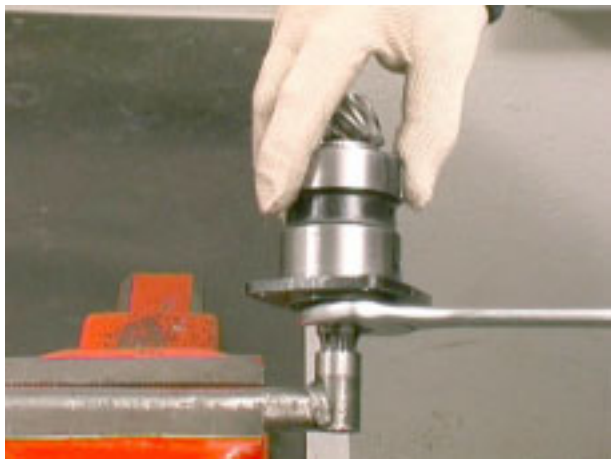
- Equip the pinion with the two clearance washers
- Equip the pinion with the distance collar
- Fit the O-ring.

- Use the specific punch (19926100) to drive the complete pinion into the housing.

- Fit the oil seal;
- Fit the O-ring.

- Fit the distance collar.

- Insert the splined shaft of the pinion in the special tool (19907100) and tighten the nut.



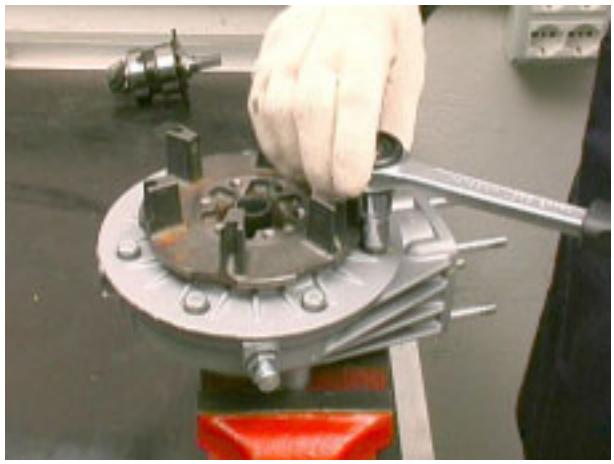
6.2.4. TIGHTENING TORQUES

REAR TRANSMISSION	
Bevel pinion to case fixing nut	100 Nm
Bevel gear to hollow shaft fixing screws	42 Nm
Cover to transmission case fixing screws	25 Nm

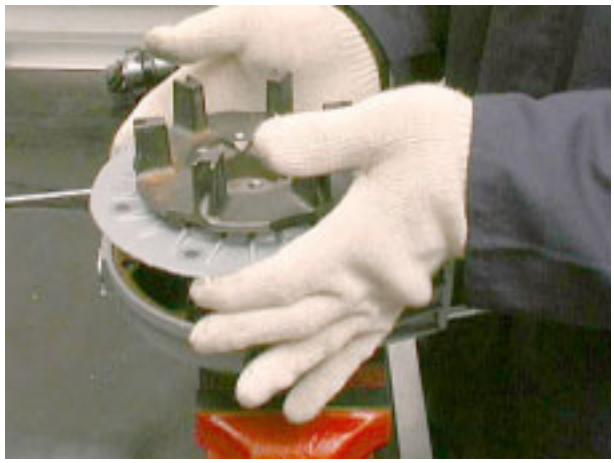
6.3. DISASSEMBLING THE TRANSMISSION CASE

6.3.1. DISASSEMBLING THE TRANSMISSION CASE

- Unscrew the screws and set the washers aside.



- Remove the brake disk from the hollow shaft.
- Unscrew the screws and set aside the square washers and spring washers.
- Remove the complete cover.
- Remove the gaskets.
- Remove the spacer.

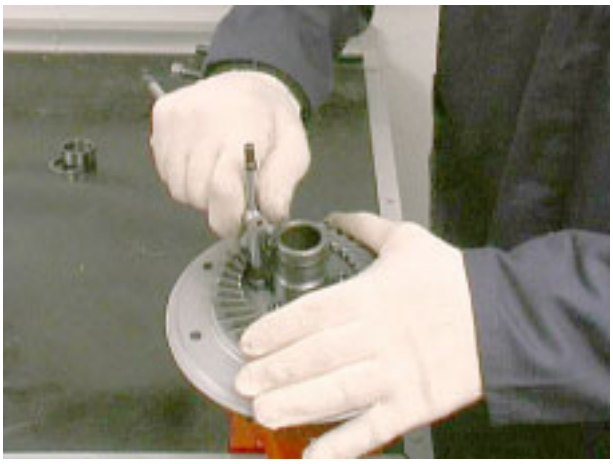


- Remove the circlip from the groove in the hollow shaft.

Remove the following parts from the cover:

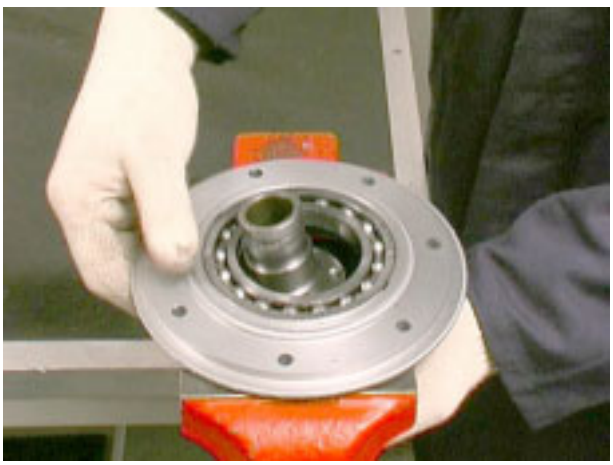
- The roller bearing.
- Use the specific punch (19907000) to drive out the taper roller bearing inner race.
- Remove the washer.
- Remove the washer.

- Unscrew the screws and set the locking tabs aside;

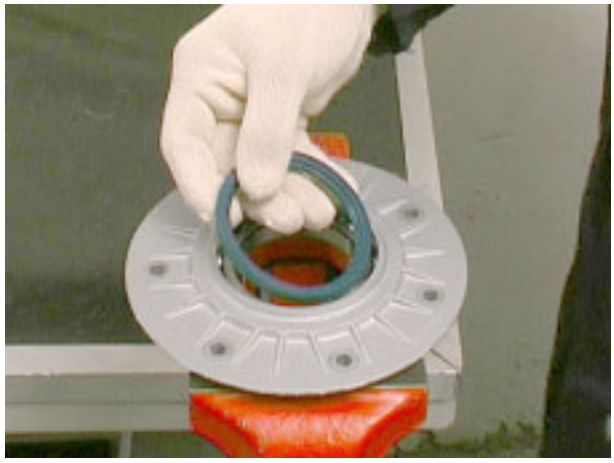


- Remove the bevel gear

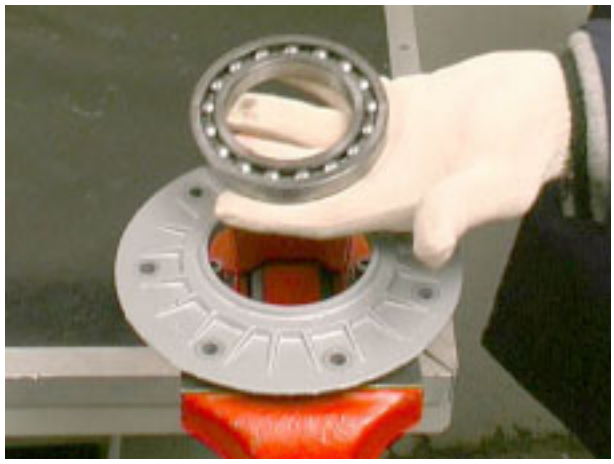
- Withdraw the hollow shaft from the bearing.



- Remove the seal ring.

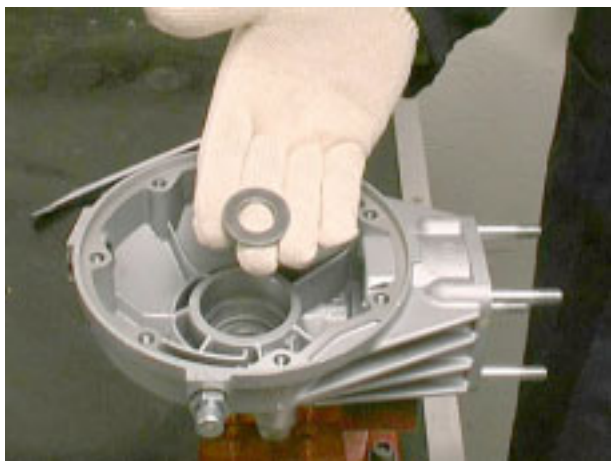


- Use the specific punch to drive the bearing out of the cover.



- Use the specific puller (19927500) to remove the taper roller bearing outer race from the transmission case.

- Remove the seal ring and the washer.



6.3.2. INSPECTION

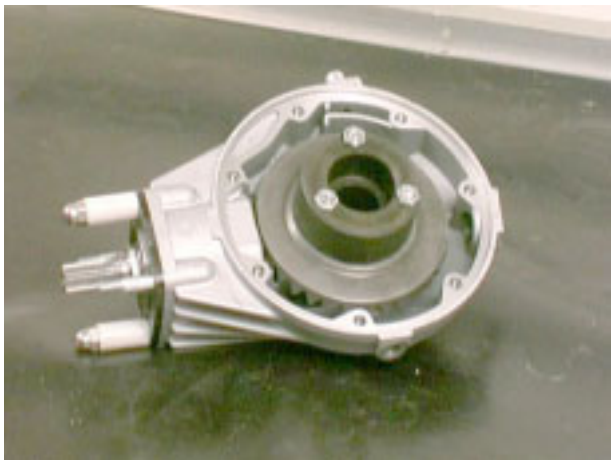
- Check that the fins of the hollow shaft subject to the action of the torque dampers are not damaged; check that the contact surfaces of: the seal ring, the bearing on the cover, the outer race of the bearing on the transmission case, the circlip groove on the hollow shaft: are not excessively worn, damaged, or pitted, otherwise renew the parts.
- Check that the seal ring on the case is compact and has not suffered a reduction of its elastic properties, otherwise renew;
- Check that the roller bearing on the transmission case shows no signs of out of round or worn rollers, otherwise, renew the bearing;
- Check that all the components are in perfect working order and that the mating surfaces of transmission case and cover are not scored or damaged.

6.3.3. PINION – GEAR MESHING (BEVEL GEAR SET)

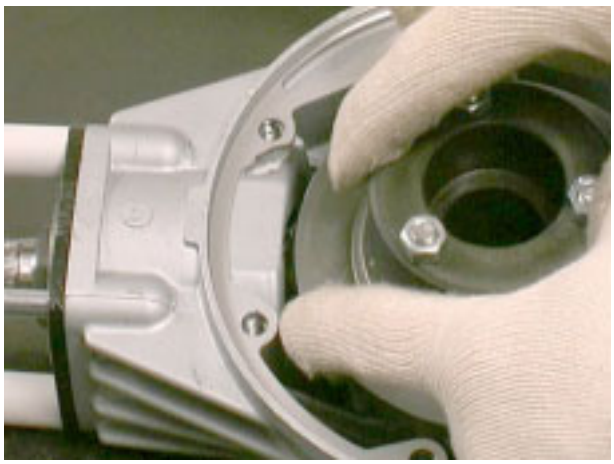
Perform these operations to mesh the pinion and gear:

- Use two nuts and suitable spacers to temporarily secure the housing complete with pinion to the transmission case;
- Fit the specific tool (19928800) to the gear.

- Insert the tool onto the transmission case roller bearing.

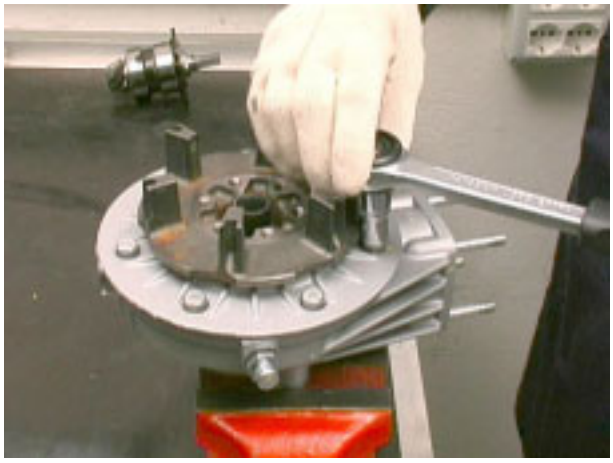


- Check the alignment between the pinion teeth and the gear teeth;
- If the teeth are not properly aligned adjust the thickness of the ring interposed between the pinion and the taper roller bearing.
- You must also check the contact area between the pinion teeth and the gear teeth as follows:



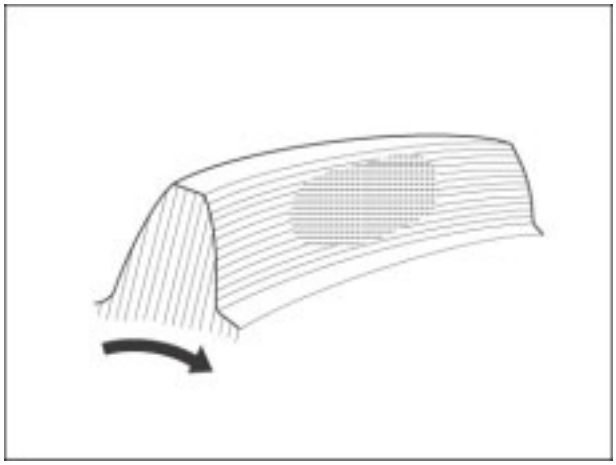
Coat the pinion teeth with a specific commercial marker dye.

- Fit the gear-hollow shaft assy., cover and relative spacers and gaskets to the transmission case and temporarily screw down the fixing screws.

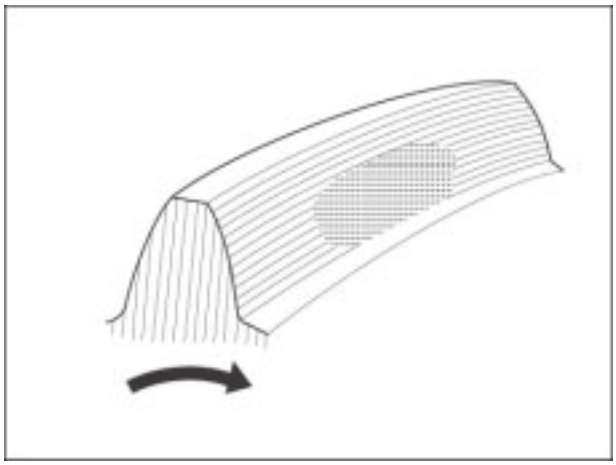


- Equip the gear holder hollow shaft with a Universal puller tool having central spacers in such a way as to maintain the gear so that it exerts slight pressure towards the brake disk side.
- Turn the pinion in the direction of run while braking the gear so that the rotation takes place under load and the contact areas are marked on the pinion tooth surfaces.

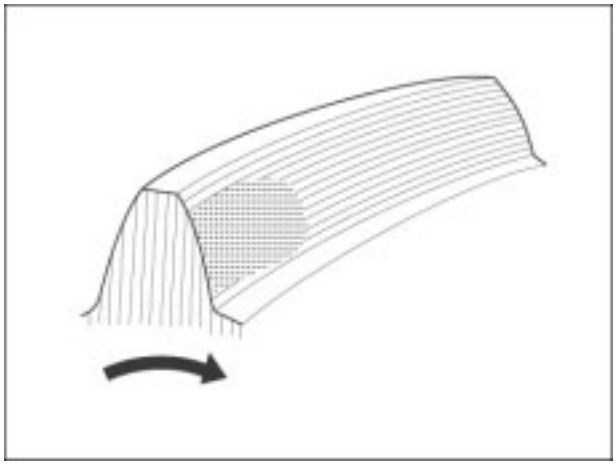
- If the contact is correct the marking on the pinion teeth should appear as shown. Note that the pinion is viewed from the driving shaft side



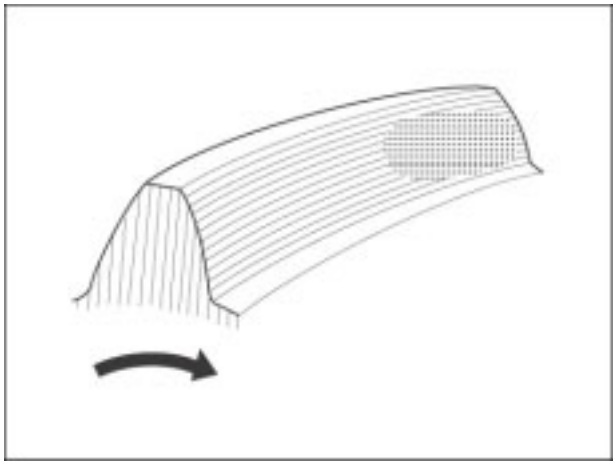
- If the contact markings are as shown here, the gear is too close to the pinion axis of rotation: move the gear back by increasing the thickness of the shim



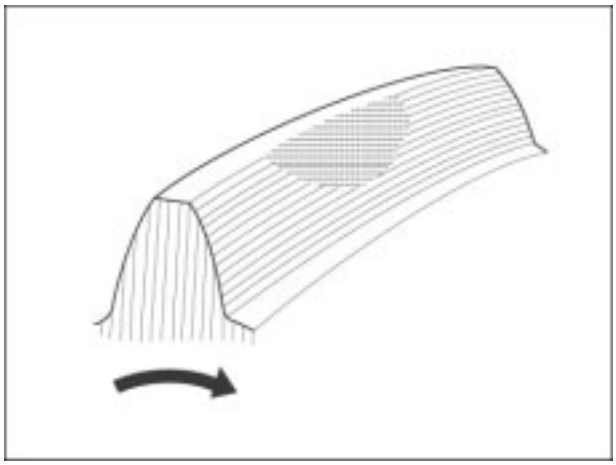
- If the contact markings are as shown here, the pinion is too close to the gear axis of rotation: move the pinion backwards by reducing the thickness of the shim



- If the contact markings are as shown here, the pinion is too far from the gear axis of rotation: move the pinion forwards by increasing the thickness of the shim.

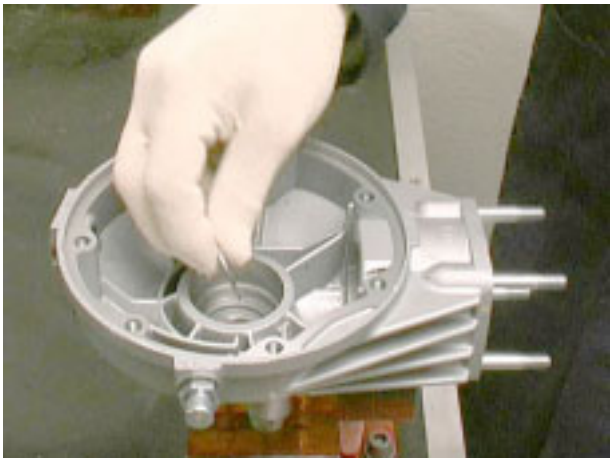


- If the contact markings are as shown here, the gear is too far from the pinion axis of rotation: move the gear forwards by reducing the thickness of the shim.

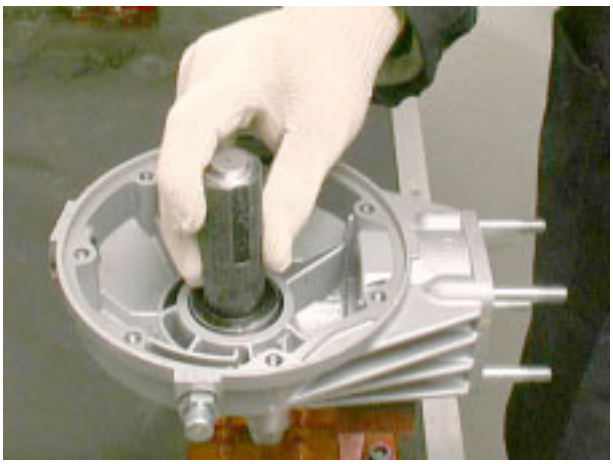


6.3.4. REASSEMBLY

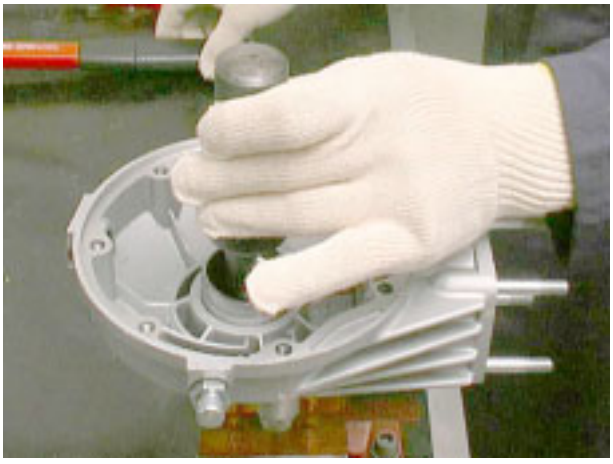
- Fit the washer on the transmission case.



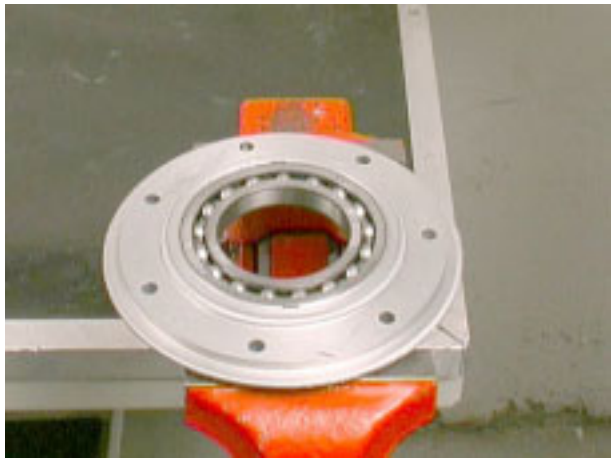
- Use the specific punch (19926000) to fit the seal ring on the transmission case.



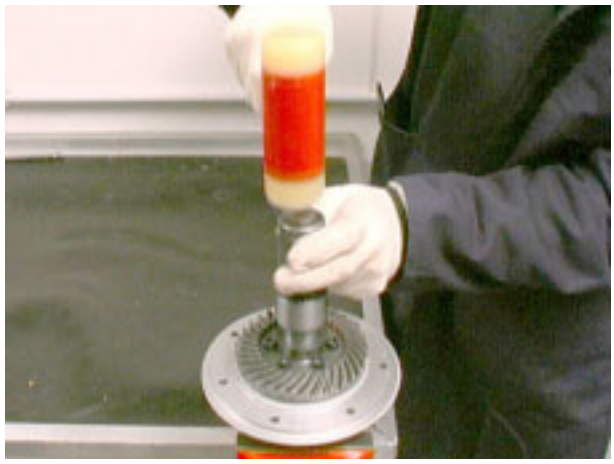
- Use the specific punch (19926500) to fit the roller bearing outer race to the transmission case.



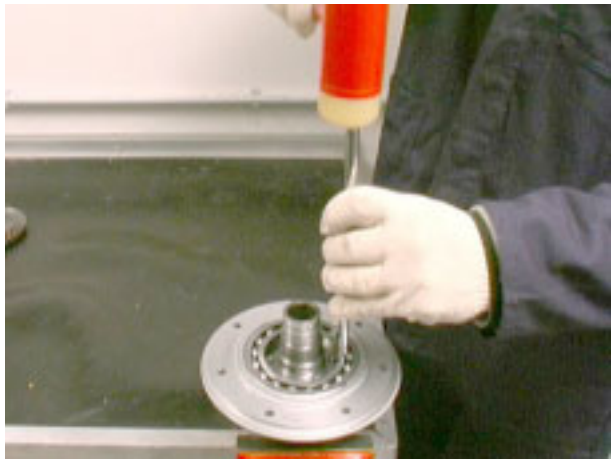
- Use the specific punch to fit the bearing to the cover.



- Use the specific punch (19927900) to fit the roller bearing inner race to the hollow shaft;
- Fit the seal ring to the hollow shaft..

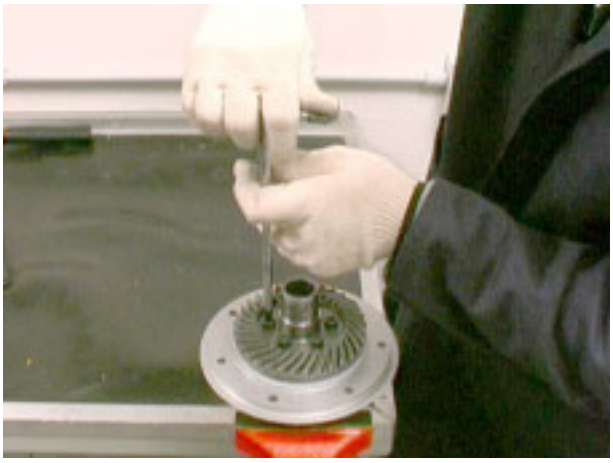


- Assemble the hollow shaft to the cover.



- Fit the gear.

- Insert the square locking tabs and tighten the screws.



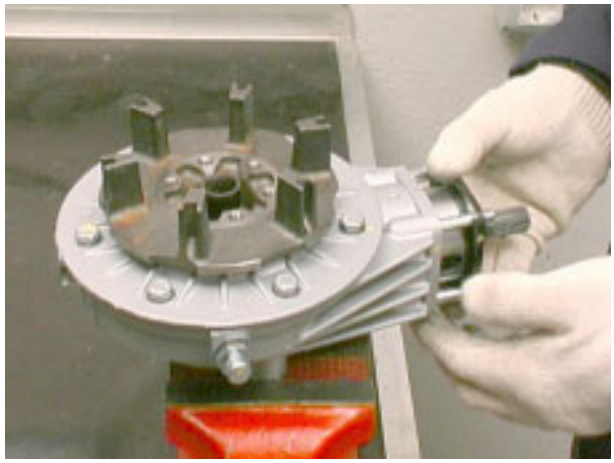
- Fit the washer.

- Fit the washer.

- Fit the circlip.
- Fit the gaskets and spacer to the cover.
- Tighten the screws complete with square locking tabs and washers.

- Fit the brake disk to the hollow shaft and use a torque wrench to tighten the screws complete with washers.

- When reassembling the bevel pinion housing to the transmission assy. take account of the fact that the oil flow channels with holes must be assembled in a vertical line (observing the channels, one must be facing upwards and the other facing downwards).



6.3.5. TIGHTENING TORQUES

REAR TRANSMISSION	
Bevel pinion to case fixing nut	100 Nm
Bevel gear to hollow shaft fixing screws	42 Nm
Cover to transmission case fixing screws	25 Nm

6.4. REAR SWING ARM

6.4.1. DISASSEMBLY

- Remove the left silencer.

- Remove the rear brake caliper, release the brake line from the swingarm fastener.

- Loosen and remove the brake caliper holder screw.

- Remove both rear suspensions.

- Loosen and remove the nut, collect the washer.

- Loosen the screw securing the wheel shaft.

- Remove the wheel shaft, collect the spacer.

- Remove the rear wheel.

- Loosen the tie.
- Remove the protection.

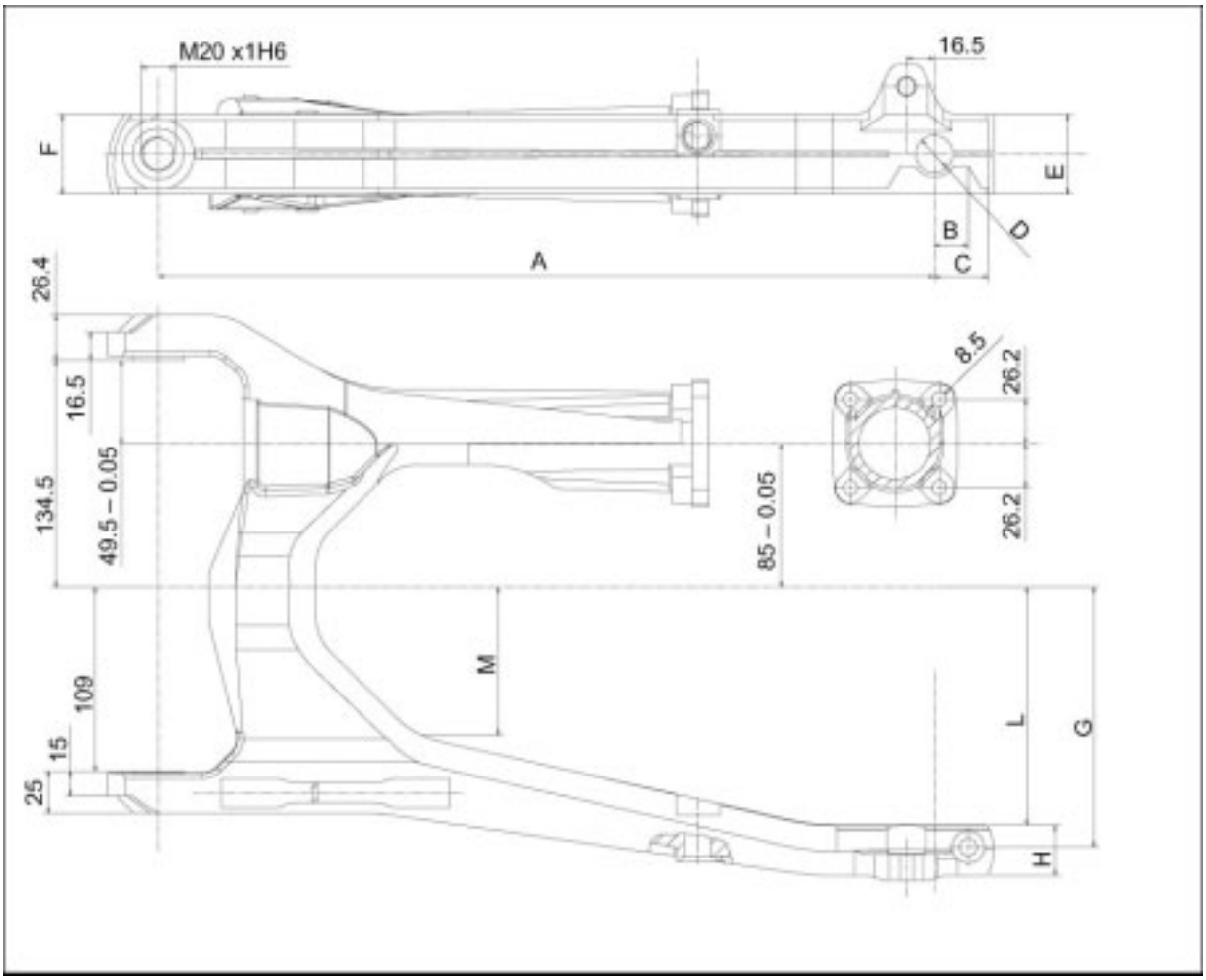
- Loosen the nuts.

- Loosen the shafts so that the swingarm can be detached from the gearbox.

- Remove the shim between swingarm right section and gearbox.

6.4.2. INSPECTION

- Check that the arms of the swing arm assy. show no signs of cracking or distortion; otherwise, if possible, true up the swing arm assy. observing the measurements shown in the drawing.

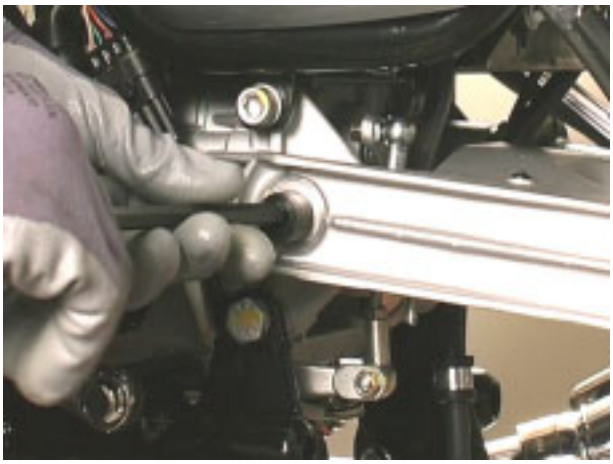


	mm	in
A	458 ± 0,1	18.031 ± 0.004
B	20	0.787
C	31,8	1.252
D	Ø 22,000 – 22,052	Ø 0.866 – 0.868
E	47	1.850
F	47	1.850
G	154	6.063
H	30	1.181
L	141	5.551
M	87,8	3.457

6.4.3. REASSEMBLY

- Screw in the pin on the right-hand side until it protrudes from the swing arm sufficiently to hold the shim.

- Insert the swing arm into the transmission case cover.
- Tighten the left-hand pin fully down until the shim on the right-hand side is located against the bearing fitted to the transmission case cover.



- Snug the pin on the right-hand side without tightening.
- Articulate the swing arm to ensure that it moves freely without play.

- Fit the nuts onto the studs and tighten them fully down.

- Tighten the jubilee clamp.

- Fit the rear wheel.

6.4.4. TIGHTENING TORQUES

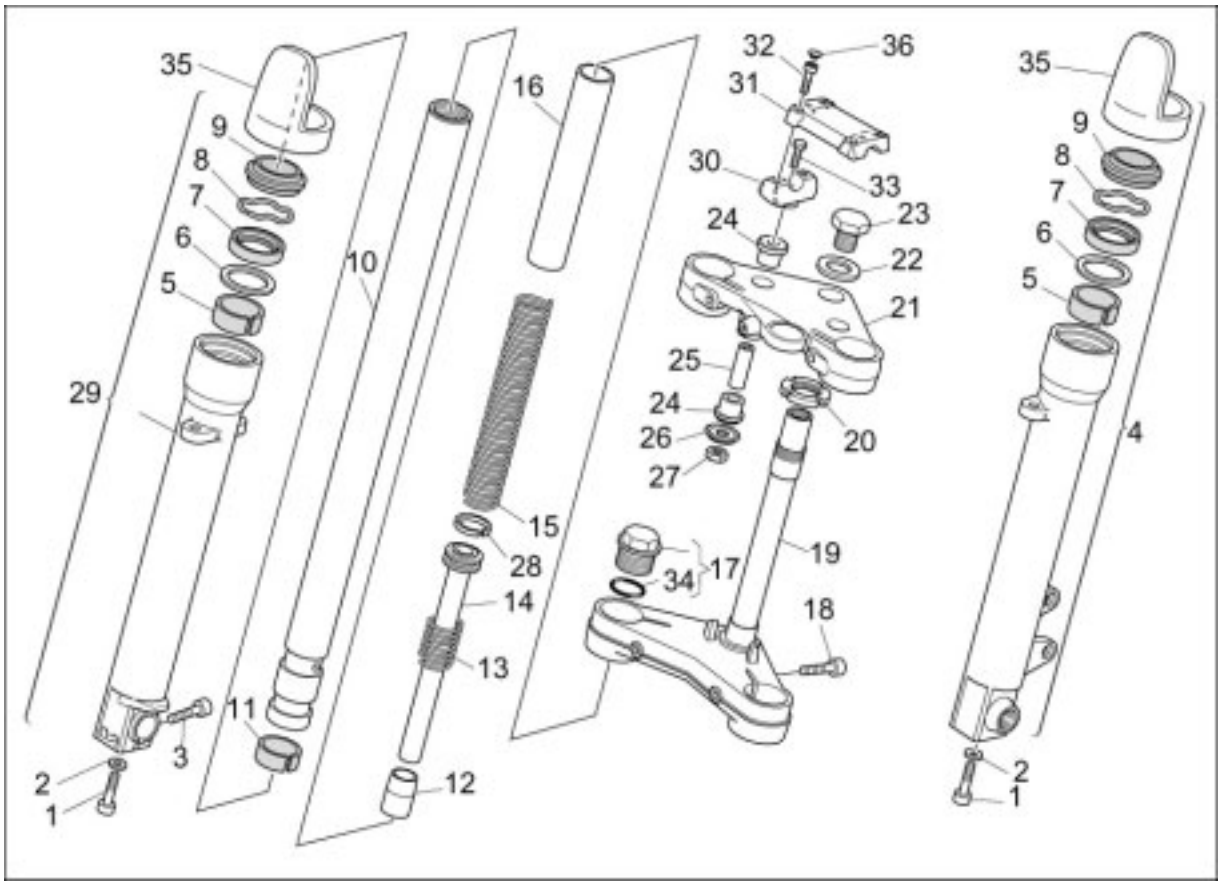
REAR SUSPENSION	
Rear suspension upper and lower sections fixing screws	20 Nm

CYCLE PARTS 7

SUMMARY

7.1. FRONT FORK

7.1.1. DIAGRAM



Key:

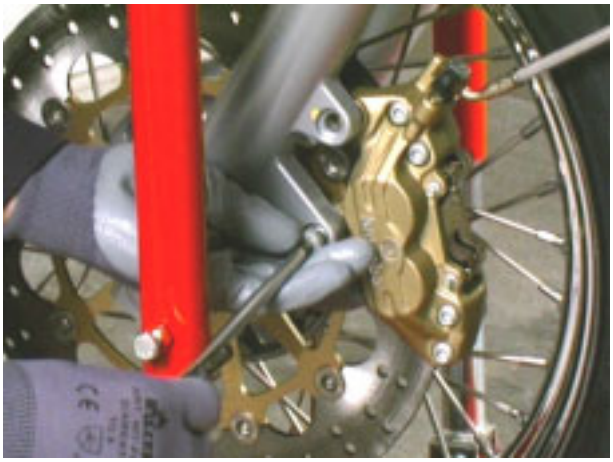
1. Screw
2. Washer
3. Screw
4. Complete left-hand slider
5. Upper Bushing
6. Cap
7. Seal ring
8. Stop ring
9. Wiper seal
10. Fork tube
11. Lower bushing
12. Oil lock piece
13. Counter spring
14. Rod
15. Spring
16. Pre-load tube
17. Plug assembly
18. Screw
19. Fork base
20. Ring nut
21. Fork bridge
22. Washer
23. Nut
24. Rubber plug
25. Spacer tube
26. Retainer
27. Nut
28. Ring
29. Complete right-hand slider
30. Lower clamp
31. Handlebar clamp
32. Screw
33. Screw
34. O-ring
35. Rod protection
36. Plug

7.1.2. FORK LEG REMOVAL

The motorcycle is equipped with a non-adjustable fork.
The procedures described below apply to both the fork legs.

WARNING
During the following procedures, the legs and their internal components must be clamped in a vice. Take great care not to damage them by overtightening; always use aluminium jaw coverings

- Place the motorcycle on a stable stand so that the front wheel is lifted from the ground.
- Remove the front brake calliper without disconnecting the brake fluid line.



- Remove the front wheel.

- Remove the front mudguard.

- Working on either side, remove the plastic rivet.

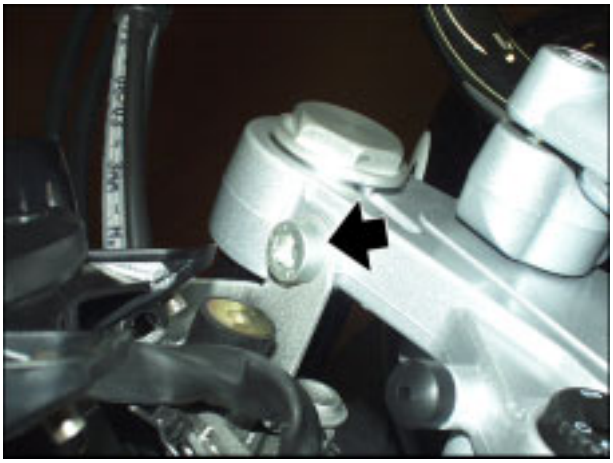
- Remove the instrument panel protection.

- Loosen and remove the two screws, collect the washers.

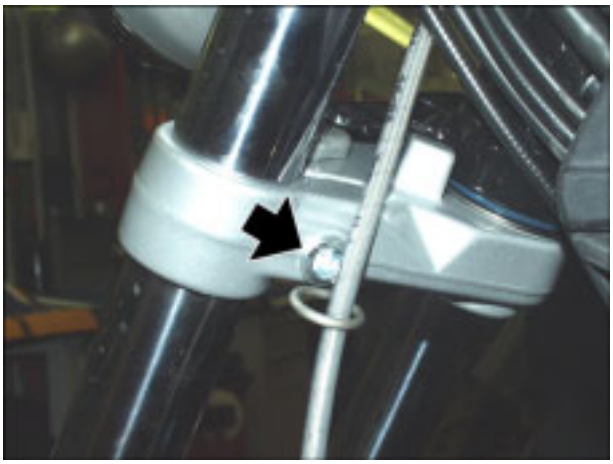
- Loosen and remove the nut under the instrument panel, collect the washer.

- Move the instrument panel forward.

- Unscrew the two lower clamping screws



- Loosen the lower screw.



- Slide out the fork leg downwards while rotating it first in one direction then in the opposite direction.

7.1.3. OVERHAUL

- Use new gaskets during reassembly after complete disassembly.
- Use a non-inflammable and preferably biodegradable solvent for cleaning.
- Lubricate all the contact surfaces before reassembly.
- Always smear grease on the seal ring lips before reassembly.

7.1.4. TROUBLESHOOTING

The following paragraph lists some potential problems with the fork and their causes complete with suggested solutions.
Always refer to this table before working on the fork.

PROBLEM	CAUSE	SOLUTION
Oil leakage from the seal ring	1. Worn seal ring 2. Scored stanchion 3. The ring is dirty	1. Replace the seal ring 2. Replace stanchion and ring 3. Clean or replace
Oil leakage from the bottom	1. Defective foot gasket 2. The foot screw is loose	1. Replace gasket 2. Tighten screw
Fork suspension too soft	1. Low oil level 2. Defective spring 3. Oil viscosity too low	1. Restore correct fork oil level 2. Replace spring 3. Change oil with oil of correct viscosity
Fork suspension too stiff	1. Oil level too high 2. Oil viscosity too high	1. Restore correct fork oil level 2. Change oil with oil of correct viscosity

7.1.5. FRONT FORK OIL CHANGE

IMPORTANT *The following procedures apply to both legs.*

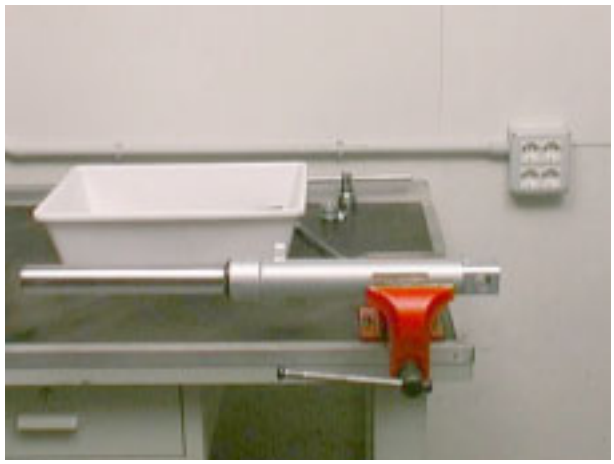
The fork oil must be changed periodically, see (PERIODIC MAINTENANCE TABLE).

IMPORTANT *During oil drainage and filling operations, the fork leg and its internal parts must be clamped in a vice; take care to avoid damaging the parts by overtightening; always use aluminium jaw coverings.*

OIL DRAINAGE

To drain the oil follow the procedures described below:

- Disassemble the fork leg.



- Clamp the removed fork leg in a vice with aluminium jaw facings in order to avoid damaging it.

- Unscrew the upper oil plug. Beware of the force exerted by the spring on the plug once it is unscrewed.

- Take care not to damage the O-ring during removal.
- Push the stanchion into the slider.
- Remove the pre-load tube and the spring;

- Drain the oil contents from the interior of the fork leg

To facilitate the drainage of oil from inside the plunger rod, pump out the oil by repeatedly pushing the stanchion into the slider.

- Check the fork leg carefully and make sure there are no signs of damage.
- If no parts are damaged or particularly worn, reassemble the leg otherwise renew the damaged parts.

FILLING:

- Clamp the slider in a vice;
- Pour oil into the stanchion ensuring that it also fills the internal passages of the plunger rod.

- Pump the stanchion up and down to ensure the plunger rod is completely filled with oil.

- Insert the spring and pre-load tube.

- Fit the plug on the stanchion tube taking care not to damage the O-ring.

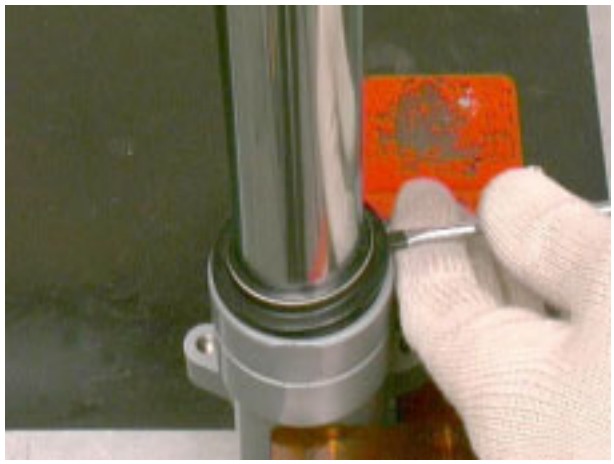
- Tighten the plug to the prescribed torque.

7.1.6. DISASSEMBLY / OVERHAUL

- Drain all the oil from the fork leg.
- Clamp the slider in a vice.
- Unscrew the foot screw and remove it with the relative seal.

- Remove the dust wiper seal by prising it with a screwdriver.

WARNING
Work carefully to avoid damaging the slider rim and the dust wiper seal.



- Remove the dust wiper seal by sliding it upwards.

- Remove the stop ring from inside the slider using a small screwdriver.

WARNING
Be careful not to damage the slider rim

- Remove the stanchion tube from the slider together with the seal ring, the cap, the upper bushing and the lower bushing.

IMPORTANT *While removing the stanchion tube from the slider several parts may remain inside the slider, in which case they must be removed afterwards taking care not to damage the rim of the slider or the upper bushing seat on the slider*

7.1.7. INSPECTION

- Check all the parts removed from inside the slider, specifically: the seal ring and the dust wiper seal since these parts ensure the oiltight properties; these parts must be renewed if damaged;
- Check the bushing on the stanchion; if damaged or worn, remove and renew;
- Extract the plunger assembly from the stanchion tube; renew the counter-spring and the plunger ring if damaged.

7.1.8. REASSEMBLY

WARNING
Before reassembly all components must be carefully washed and dried with compressed air.

- Perform all the necessary overhaul procedures
- Insert the plunger assy. into the stanchion tube complete with counter-spring and ring.

- Check that the slider is equipped with the upper guide ring.

- Fit the lower sliding bushing in the seat on the stanchion.

- Now reassemble the stanchion tube and slider.

- Slide the stanchion into the slider and push it fully home.

- Screw in the foot screw with its seal and tighten it to the prescribed torque.

- Place the retainer and the well-lubricated seal ring on the stanchion tube.
- Push the seal ring fully home inside the slider by using the specific inserter tool.

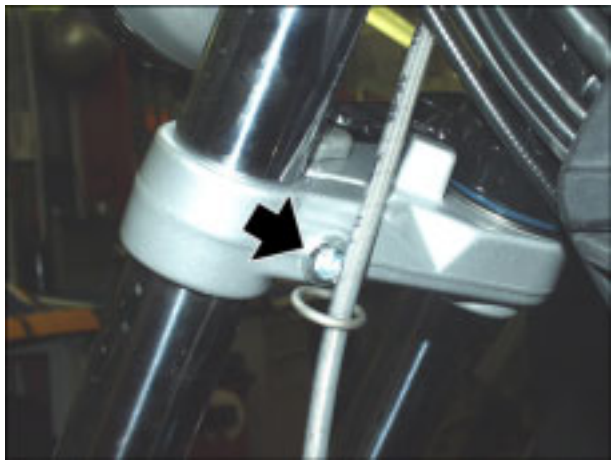
- Install the retaining ring.

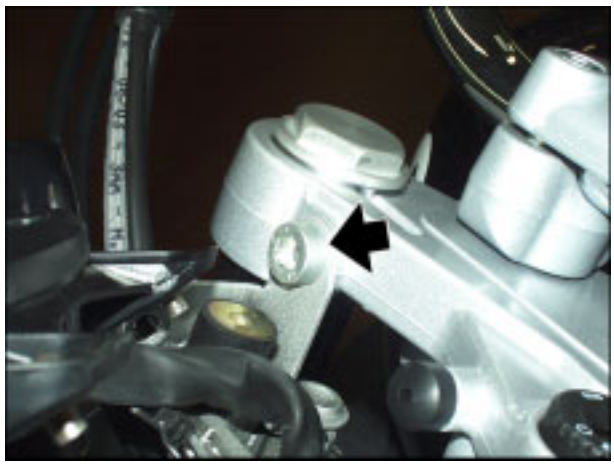
- Install the wiper seal.
- Pour oil into the stanchion ensuring that it also fills the internal passages of the plunger rod.
- Pump the stanchion up and down to ensure the plunger rod is completely filled with oil.
- Insert the spring and preload tube.
- Fit the plug on the stanchion tube taking care not to damage the O-ring. Tighten the plug to the prescribed torque.

7.1.9. REASSEMBLY OF THE FORK LEG

- Fit the fork leg to the motorcycle, passing it through the lower plate and the upper plate.

- Tighten the screws to the prescribed torque.





7.1.10. TIGHTENING TORQUES

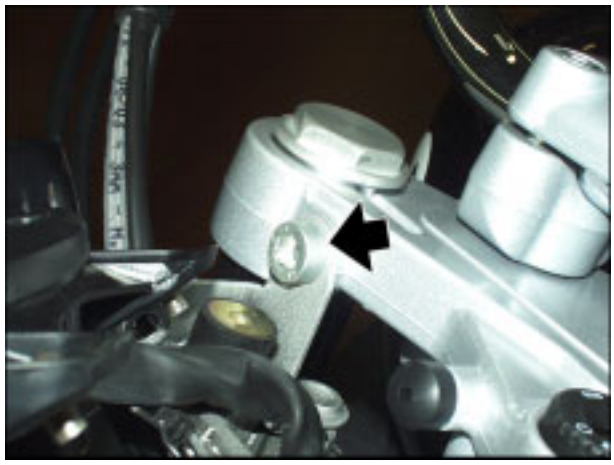
FRONT SUSPENSION	
Centre stand to frame fixing screws	10
Lock nut	30
Fork head fixing screws	45
Fork base fixing screws	45
Slider to wheel spindle fixing screws	10

7.2. ADJUSTING PLAY IN THE STEERING BEARINGS

7.2.1. ADJUSTING PLAY IN THE STEERING BEARINGS

- Remove the handlebars
- Remove the dashboard

- Working on both sides, unscrew and remove the screw that secures the top plate to the front forks



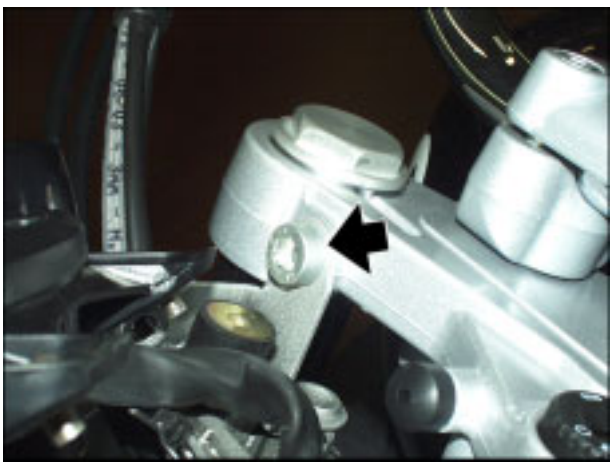
- Unscrew and remove the central nut

- Remove the top plate from the front fork

- Adjust the ringnut
- Position the top plate on the front fork

- Tighten the central nut

- Working on both sides unscrew and remove the screw that secures the top plate to the front forks
- Fit the handlebars
- Fit the dashboard.



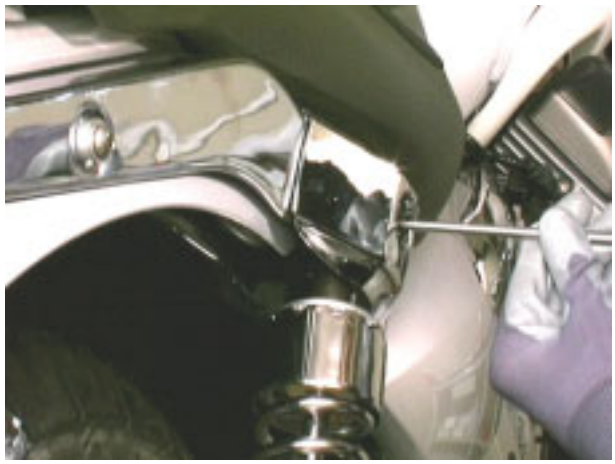
7.2.2. TIGHTENING TORQUES

STEERING	
Steering head fixing screw	50 Nm

7.3. REAR SUSPENSIONS

7.3.1. REMOVING THE REAR SUSPENSION

- Loosen the screws securing the suspension guards to the frame.
- Remove the suspension guards.



- Loosen the suspension lower screw.

- Remove the suspensions from the shafts.

7.3.2. INSPECTION

- Check the condition of the springs and the dampers (always inspect in pairs in order to ensure they present identical preload to avoid unequal forces being exerted on the rear swing arm and the transmission case); if necessary, renew either the springs or the complete suspension struts.
- Check that the flexible bushes on the struts for possible degradation or hardening and renew if necessary. If you notice irregularities in the cushioning action of the dampers, they must be renewed.

CAUTION
To ensure good stability of the motorcycle, both the suspension springs must be adjusted to the same position.

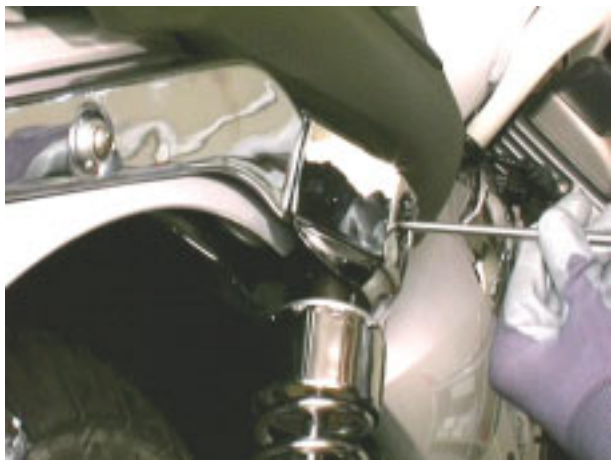
7.3.3. REFITTING THE REAR SUSPENSION

- Position the suspension to shafts.

- Tighten the rear suspension lower screw.

- Refit the suspension guards.

- Tighten the screws securing the suspension guards to the frame.



7.3.4. TIGHTENING TORQUES

REAR SUSPENSION	
Rear suspension upper and lower sections fixing screws	20 Nm

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