



California **EV**

CALIFORNIA **EV**

California
SPECIAL

California
SPECIAL SPORT **///**

California
JACKAL

Stone
CALIFORNIA



WORKSHOP MANUAL
WERKSTATTHANDBUCH
ONDERHOUDS-EN
REPARATIEHANDBOEK





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Via Parodi, 57 22054 Mandello del Lario

TECHNICAL PUBLICATIONS / TECHNISCHE VERÖFFENTLICHUNGEN / TECHNISCHE UITGAVEN

Cod. 03 92 01 01

Impianto DECA Ravenna

Printed in Italy / Gedruckt in Italien / Printed in Italy da GraficheCola Lecco

500 K - 04/02

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CALIFORNIA EV (1997 - 2000)



CALIFORNIA EV 2001





CALIFORNIA JACKAL



CALIFORNIA STONE



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CALIFORNIA SPECIAL SPORT



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GENERAL INFORMATION

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ALLGEMEINE INFORMATIONEN

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ALGEMENE INLICHTINGEN

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1 HOW TO CONSULT THIS MANUAL

The purpose of this manual is to provide instructions for carrying out overhauls and repair work correctly.

The following data aim at providing an overview of the main tests to be carried out when overhauling the various units.

For this reason, the manual contains illustrations, drawings and diagrams necessary for carrying out disassembly, testing and assembly procedures.

The manual can also be a guide for those who require a deeper knowledge of the manufacturing details for the parts to be examined: it is essential that technicians in charge of repairs know these details for the work to be carried out correctly.

The manual has been sub-divided into sections and then into chapters for a faster and more direct consultation; the sections contain information and procedures regarding a particular motorbike system while the chapters analyse the parts making up these systems in more detail.

2 ABBREVIATIONS AND SYMBOLS

In order to make the manual immediately comprehensible, the paragraphs are earmarked by graphic illustrations identifying the subject to be dealt with.

This manual contains notes with important details:

 **Accident prevention regulations for the operator and those working in the vicinity.**

 **There is the possibility of causing damage to the vehicle and/or its components.**

 **Further information concerning the work in progress**

 **N.B.**
“Right-hand” and “left-hand” refer to controls seen from the driving position.

 **N.B.**
All the technical drawings contained in this manual use measurements expressed in mm. The tightening torques are expressed in Newton meter.



3 GENERAL SAFETY REGULATIONS

This manual does not contain general safety rules because they are considered part of standard management within workshops; it contains however, warnings and instructions of particular importance which, if not respected, could injure the operator or the vehicle.

It is however very important that the technicians, carrying out any operation contained in this manual, even if the specific tools recommended by "Moto Guzzi" are used, always check that the methods and tools employed for carrying out any procedure do not endanger the safety of the operator or the vehicle.

4 RULES FOR MAINTENANCE PROCEDURES

To make sure that the vehicle is always in perfect working condition, it is necessary to follow the instructions provided in the scheduled maintenance program, described in section D.

The first series of maintenance procedures must be carried out after 1500 Km, as described on the table in chapter 1 of section D; carrying out these operations is essential as they allow the operator to check the initial wear, which takes place during the running-in period. Furthermore, it is important to observe the following basic rules during maintenance procedures:

- Seal rings, gaskets, split pins, O rings and all the parts which ensure a seal must be replaced with new parts during reassembly procedures.
- It is necessary to use tools specifically designed for this motorbike, in order to avoid incorrect assemblies or damages
- During the maintenance operations only use decimal metric system material and tools as the nuts, bolts and screws in this system cannot be interchanged with the imperial system;
- When tightening nuts or bolts, it is a good practice to always start with those with a larger diameter or those positioned more internally; then proceed diagonally, step by step, unless a specific sequence has been prescribed.
- After reassembly operations make sure that all the reinstalled components work correctly.

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5 WARRANTY

When replacing parts, request and make sure that only **“Original Moto Guzzi Spare Parts”** are used.

The use of non original spare parts shall render any warranty claim void or null.

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MODEL FEATURES

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MODELLEIGENSCHAFTEN

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KARAKTERISTIEKEN MODEL

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2 LUBRICANTS AND REFILLING

Parts to be refilled	Liters	Prescribed products
Fuel tank (about 4 litres reserve)	19 aprox	Premium gasoline(97 No. - r.p.m.) Premium unleaded gasoline (95 No - r.p.m.)
Engine sump	3	"Agip 4T SUPER RACING SAE 20W50" oil
Gearbox housing	0,750	"Agip Rotra MP SAE 80 W/90" oil
Final Drive (bevel gear lubrication)	0,250 of which 0,230 0,020	"Agip Rotra MP SAE 80 W/90" oil "Agip Rocol ASO/R" oil ("Molikote type A")
Telescopic fork(per strut)	0,485 * 0,565 •	Shock-absorber oil (SAE10)(California Special 1 ST series,EV) Shock-absorber oil (SAE10)(California Jackal, Stone, For California Special 1 ND series, Special sport)
Front and rear braking system	-	"Agip Brake Fluid - DOT 4"

*For California Special 1ST series (adjustable fork) until chassis no. KD 131644

•For California Special 2ND Series(non-adjustable fork) from chassis no. KD 131645

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3 TECHNICAL SPECIFICATIONS

ENGINE

Two-cylinder with 4 stroke
 Cylinder arrangement at "V" of 90°
 Bore 92 mm
 Stroke 80 mm
 Total displacement 1064cc
 Compression ratio 9,5:1
 Maximum torque Kgm 9,6(94 Nm) at 5000 r.p.m.
 Maximum capacity CV 73,5 (Kw 54) at 6400 r.p.m.

TIMING SYSTEM

With rods and equalizers and 2 valves per cylinder. A camshaft in the crankcase is driven by a duplex chain with automatic chain tightener.

FUEL SUPPLY SYSTEM

MAGNETI MARELLI IAW 15M indirect electronic injection, sequential and timed type, "Alfa-N" system, no.2 ø40 mm throttle bodies with Weber IW031 injectors, electric pump with pressure adjuster, digital management for optimized injection times.

EXHAUST SYSTEM

In stainless steel - 2 two tubes connected to an expansion chamber and to two silencers.

LUBRICATION

Pressure system with gear pump. Mesh and cartridge filters fitted in the crankcase sump.
 Standard lubrication pressure is 3.8-4.2 Kg/sq cm (controlled by a special valve fitted in the crankcase sump).
 Electrical transmitter for indicating insufficient pressure in the crankcase.

ALTERNATOR GENERATOR

Installed on the front part of the crankshaft.
 Output capacity: 350 W at 5000 r.p.m./min. (14 V - 25 A)

IGNITION

"MAGNETI MARELLI" digital electronic ignition with inductive output
 spark plugs NGK BPR 6ES
 Distance between the spark plugs electrodes... mm 0,7
 no. 2 ignition coils fitted on the chassis



START-UP

Electric start-up through a starter motor (12V - 1,2 Kw) equipped with an electromagnetically controlled coupling. Ring gear fixed onto the motor.
Button control (START) “” located on the RH side of the handlebar.

TRANSMISSIONS

CLUTCH

Dry type clutch with two driven disks. Located on the engine flywheel.
Hydraulic control through the handlebar lever (LH side).

PRIMARY TRANSMISSION

With helical gearings, ratio 1:1,2353 (z=17/21)

GEARBOX

5-speed model with constant mesh gears with front clutch dogs.
Incorporated couplings.
Control with pedal lever positioned on the LH side of the vehicle.

GEAR RATIO

1st gear = 1: 2,0000 (14/28)
2nd gear = 1: 1,3889 (18/25)
3rd gear = 1: 1,0476 (21/22)
4th gear = 1: 0,8696 (23/20)
5th gear = 1: 0,7500 (28/21)

SECONDARY TRANSMISSION

Shaft with universal joint and gearings.
Ratio 1: 4,125 (z=8/33)
Total ratio (engine-wheel):

1nd gear = 1: 10,1912
2rd gear = 1: 7,0772
3th gear = 1: 5,3382
4th gear = 1: 4,4309
5th gear = 1: 3,8217

CHASSIS

Tubular type with double dismountable section made of high yield stress steel

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SUSPENSIONS

FRONT

CALIFORNIA EV -

CALIFORNIA SPECIAL 1ST SERIES UNTIL CHASSIS NO. KD 131644
Telescopic hydraulic fork with MARZOCCHI “ø45 mm” inverted stems whose extension and compression can be adjusted separately.

CALIFORNIA JACKAL - CALIFORNIA STONE -

**CALIFORNIA SPECIAL 2ND SERIES UNTIL CHASSIS NO. KD 131645-
CALIFORNIA SPECIAL SPORT**

MARZOCCHI “ø45 mm” non-adjustable telescopic hydraulic fork.

REAR

CALIFORNIA EV -

CALIFORNIA SPECIAL 1ST SERIES UNTIL CHASSIS NO. KD 131949
Swinging arm with two adjustable hydraulic shock absorbers for extension hydraulic braking.

CALIFORNIA JACKAL - CALIFORNIA STONE

Swinging arm with two adjustable hydraulic shock absorbers for spring pre-load.

CALIFORNIA SPECIAL SPORT -

CALIFORNIA SPECIAL 1ST SERIES UNTIL CHASSIS NO. KD 131950
Swinging arm with two non-adjustable hydraulic shock absorbers.

WHEELS

CALIFORNIA EV (1997-2000) -

CALIFORNIA SPECIAL 1ST SERIES UNTIL CHASSIS NO. KD 131644
Wheels with spokes and with “BBS” patented tubeless rims in the dimensions:

FRONT

18” x 2,50-B-40 H2 -T DOT or
18” x 2,50-B-40 H2 -TC e DOT

REAR

17” x 3,50-B-40 H2 -T DOT or
17” x 3,50-B-40 H2 -TR e DOT

CALIFORNIA JACKAL – CALIFORNIA STONE - CALIFORNIA SPECIAL 2ND SERIES UNTIL CHASSIS NO. KD 131645 –

CALIFORNIA SPECIAL SPORT

Wheels with steel rims in the dimensions:

FRONT

18” x 2,50-B-40 H2 -T DOT or
18” x 2,50-B-40 H2 -TC e DOT

REAR

17” x 3,50-B-40 H2 -T DOT or
17” x 3,50-B-40 H2 -TR e DOT



CALIFORNIA EV 2001

Wheels with tubeless rims in the dimensions:

FRONT

18" x 2,50-MT-DOTE

REAR

17" x 4,00-MT-DOTE

TIRES

CALIFORNIA EV (1997 -2000) - SPECIAL - JACKAL

FRONT

110/90 - 18 - 61H/61V/61VB

REAR

140/80 - 17 - 69H/69V/69VB

CALIFORNIA SPECIAL SPORT - STONE

FRONT

110/90 - 18 - 61V

REAR

140/80 - 17 - 69V

CALIFORNIA EV 2001

FRONT

110/90 - 18 - 61V

REAR

150/70 - 17 - 69V

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BRAKES

CALIFORNIA SPECIAL - CALIFORNIA SPECIAL SPORT - CALIFORNIA EV

Integral braking system with brake-power limiter and metering valve

FRONT

Stainless steel semi-floating double disk BREMBO “gold series” with differentiated 4 piston calipers, fixed type. Lever control positioned on the RH side of the handlebar. Hydraulic transmission independent from rear brake;
ø disco = 320 mm.
ø cilindro frenante = 30/34 mm.
ø pompa = 13 mm.

REAR

Fixed disk with 2-piston floating calliper. Pedal lever control in the centre on the RH side of the vehicle.
ø disk = 282 mm.
ø braking cylinder = 30/32 mm.
ø pump = 16 mm.
Rear brake is connected to front left brake through hydraulic transmission. Each single components of the front left brake has the same dimensions of those in the manual front right brake.

CALIFORNIA JACKAL - STONE

FRONT

Stainless steel semi-floating disk “BREMBO” with differentiated 4 piston calipers, fixed type. Lever control positioned on the RH side of the handlebar.
ø disk = 320 mm.
ø braking cylinder = 30/34 mm.
ø pump = 13 mm.

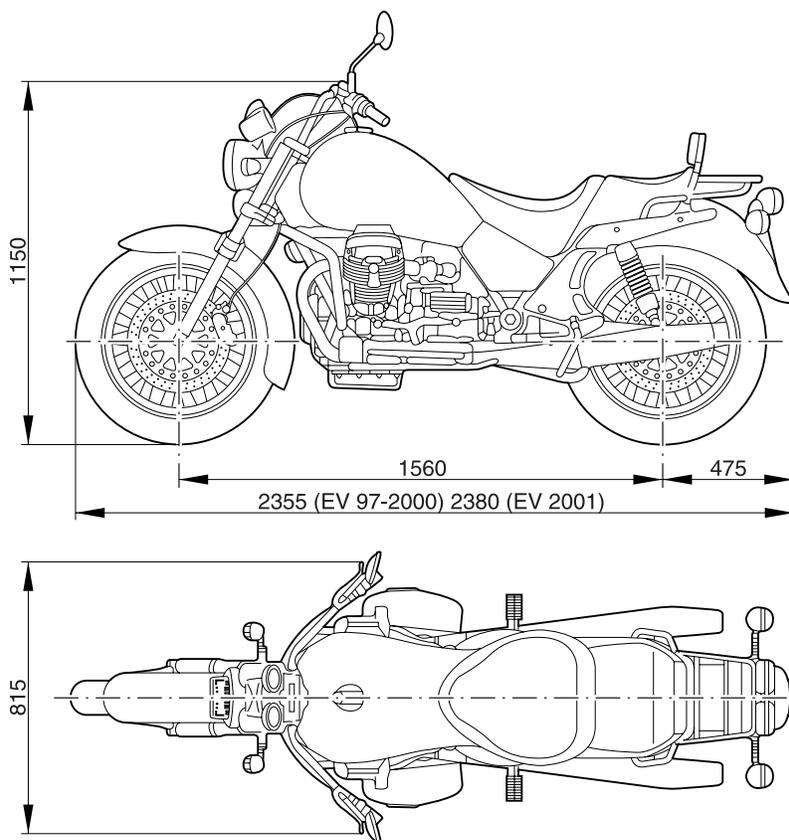
POSTERIORE

Fixed disk with 2-piston floating calliper. Pedal lever control in the centre on the RH side of the vehicle.
ø disk = 282 mm.
ø braking cylinder = 30/32 mm.
ø pump = 16 mm.

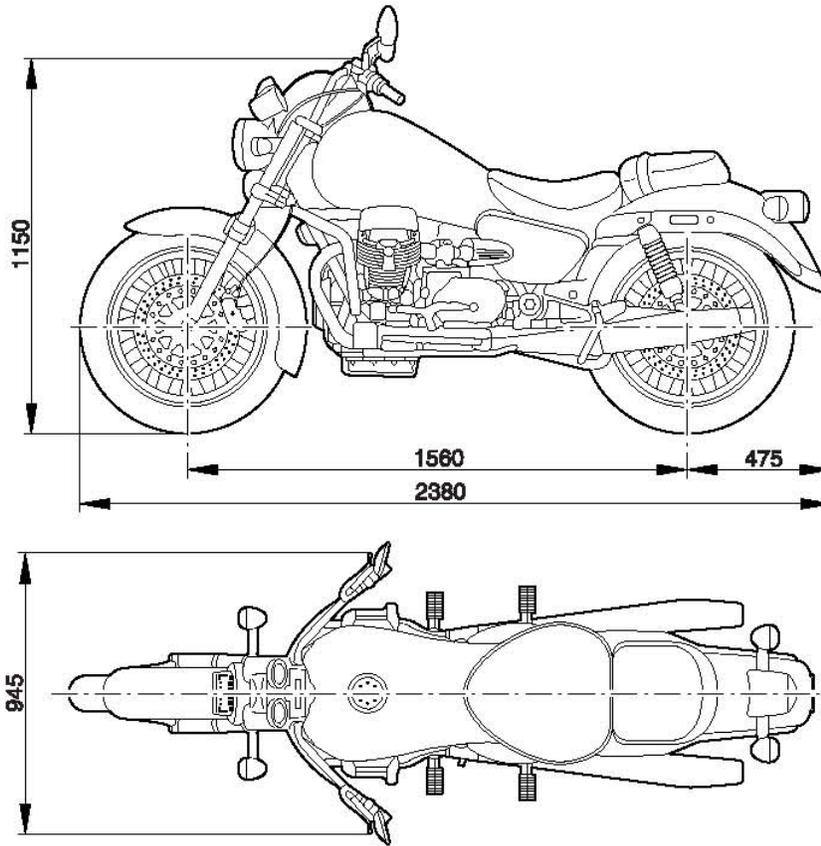


Dimensions and weight Abmessungen und Gewicht Afmetingen en gewicht	CALIFORNIA SPECIAL CALIFORNIA SPECIAL SPORT	CALIFORNIA EV	CALIFORNIA JACKAL CALIFORNIA STONE
Wheelbase (loaded) Achsabstand (belastet) Wielbasis (geladen)	1,560 m	1,560 m	1,560 m
Maximum length Max. Länge Maximale lengte	2,380 m	2,380 m Ev (2001) 2,355 m	2,355 m
Maximum width Max. Breite Maximale breedte	0,945 m	0,815 m	0,850 m
Maximum height (without windscreen) Max. Höhe (ohne Windschutzscheibe) Maximale hoogte (zonder windscherm)	1150 m	1,150 m	1,150 m
Rider's seat height Höhe des Fahrersitzes Hoogte berijderzadel	0,770 m	0,770 m	0,770 m
Ground clearance Min. Höhe vom Boden Minimumhoogte vanaf het wegdek	0,165 m	0,165 m	0,165 m
Weight (unloaded) Trockengewicht Gewicht (zonder brandstof)	251 Kg	251 Kg	246 Kg

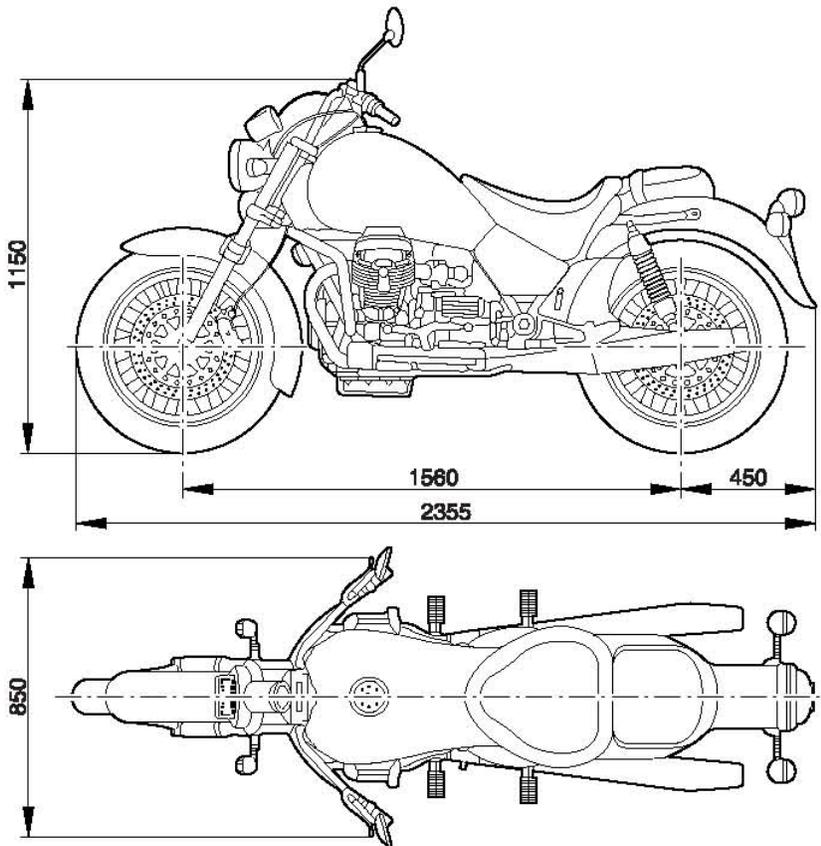
CALIFORNIA EV (1997-2000) - EV 2001



CALIFORNIA SPECIAL - SPECIAL SPORT



CALIFORNIA JACKAL - STONE



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4 TIGHTENING TORQUES

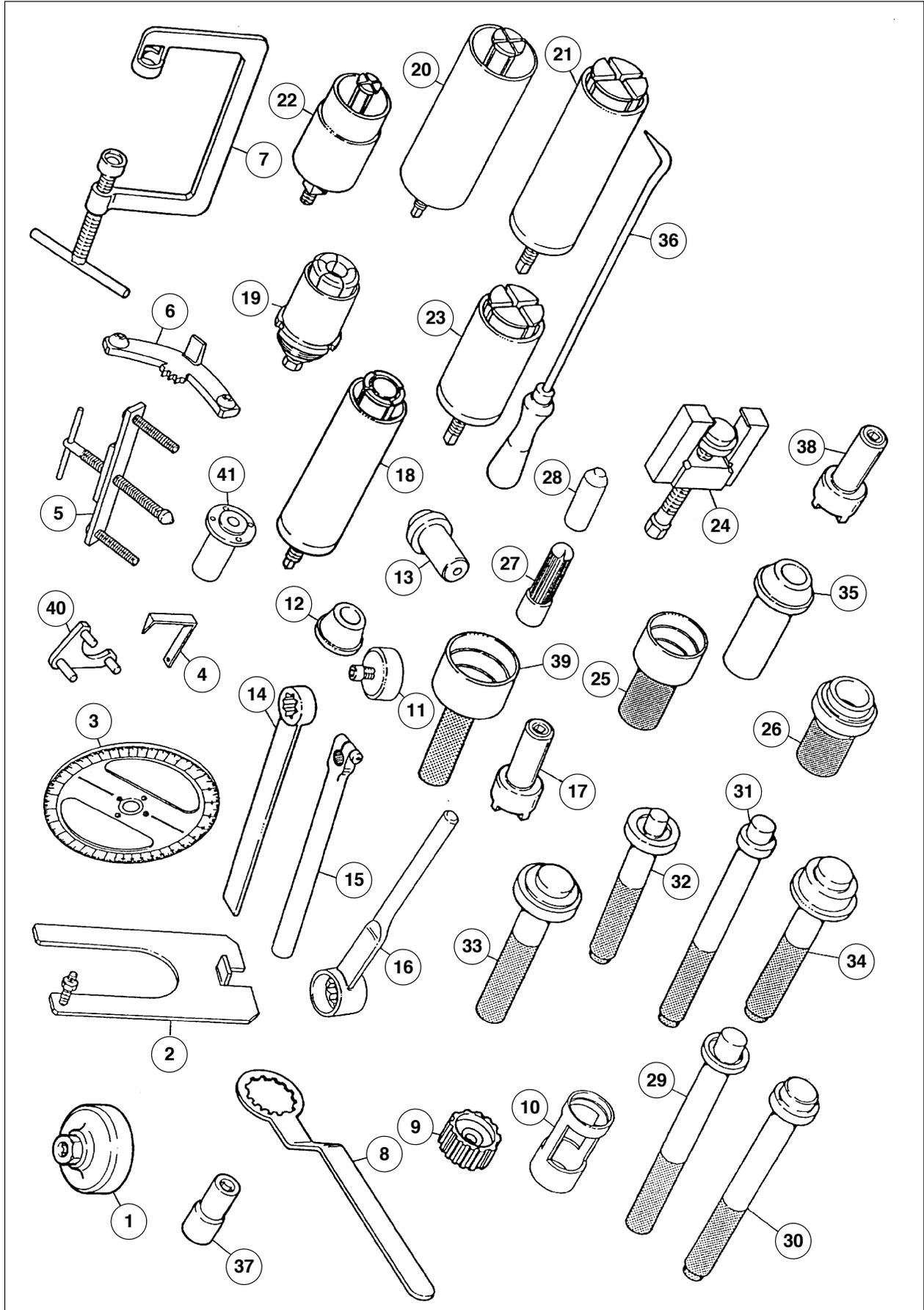
Description	Tightening torque (Nm)
Head to crankcase screws and stud bolts	40 ÷ 42
Spark plugs	25 ÷ 30
Fastening socket screw for oil fumes recovery pipe	38 ÷ 40
Fastening screws for rocker arms shafts	6 ÷ 8
Self-locking nut for con-rod caps fastening screws	46 ÷ 48
Flywheel to crankshaft fastening screws	25 ÷ 30
Gear to camshaft clamping nut	140 ÷ 150
Fastening screws for suction manifold	5 ÷ 8
Fastening socket screw for oil to heads delivery pipe	15 ÷ 18
Nut for engine to chassis front and rear tie rods	75 ÷ 80
Lock nut for secondary shaft	55 ÷ 60
Gearbox oil filler plug	25 ÷ 30
Gearbox oil level and drain plug	22 ÷ 25
Safety nut for secondary shaft	70 ÷ 80
Lock nut for bearing on bevel sprocket	180 ÷ 200
Fastening screws for rear sprocket to drilled shaft	25 ÷ 30
Fastening screws for frame section to chassis	70 ÷ 80
Nut for frame section to chassis fastening screws	70 ÷ 80
Cap nut for swinging arm support pivots	70 ÷ 80
Gearbox to swinging arm clamping nuts	25 ÷ 30
Upper plugs for front fork	120 ÷ 150
Nut for front and rear wheel shaft	140 ÷ 150
Bushing for steering lock	170 ÷ 180
N.B.: All values are checked for wet torque	

STANDARD VALUES	Tightening torque (Nm)
Screws and nuts ø 4	3 ÷ 3,5
Screws and nuts ø 5x0,8	6 ÷ 7
Screws and nuts ø 6x0,1	8 ÷ 12
Screws and nuts ø 8x1,25	25 ÷ 30
Screws and nuts ø 10x1,5	45 ÷ 50



5 TOOLS - AUSRÜSTUNG - UITRUSTING

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POS.	PART NO	DESCRIPTION
1	01 92 91 00	Wrench to remove small cover from sump and filter
2	14 92 96 00	Support for gearbox
3	19 92 96 00	Degree wheel for cam and ignition timing
4	17 94 75 60	Indicator for cam and ignition timing control
5	12 91 36 00	Flange disassembling tool - flywheel side
6	12 91 18 01	Locking tool for flywheel and starter gear
7	10 90 72 00	Valve disassembling and assembling tool
8	30 91 28 10	Locking tool for clutch inner body
9	30 90 65 10	Clutch assembling tool
10	12 90 59 00	Disassembling tool for clutch shaft components
11	14 92 71 00	Tool for sealing ring assembly on flange - flywheel side
12	12 91 20 00	Assembling tool for flange - flywheel side - complete with sealing ring on crankshaft
13	14 92 72 00	Tool for sealing ring assembling on timing system cover
14	12 90 71 00	Locking tool for secondary shaft
15	14 92 87 00	Range selector operating tool
16	14 90 54 00	Tool for secondary shaft locking nut
17	14 91 26 03	Gib head wrench for ring nut of clutch shaft inner body
18	14 91 31 00	Extractor for primary shaft needle bearing on housing and for clutch shaft on cover
19	14 92 85 00	Tool to unthread the inner bearing race of the clutch shaft
20	17 94 92 60	Extractor for clutch shaft bearing on housing and for secondary shaft on cover
21	17 94 50 60	Extractor for secondary shaft outer roller bearing race on housing and outer bearing races on case
22	14 90 70 00	Ball bearing extractor for primary shaft on cover
23	12 90 69 00	Extractor for roller bearing ring from gearbox
24	17 94 83 60	Extractor for needle bearing inner race on drilled shaft on the gearbox
25	17 94 84 60	Pressing tool for needle bearing inner race on drilled shaft on the gearbox
26	17 94 88 60	Punch for outer bearing race of gearbox sealing ring
27	17 94 54 60	Tool for placing the inner bearing ring on the primary and clutch shafts
28	14 92 86 00	Tool for placing the inner bearing ring on the secondary shaft
29	14 92 89 00	Punch for transmission shafts bearing pressing on cover
30	14 92 91 00	Punch for sealing ring pressing on front fork slider and inner sealing ring of the gearbox.
31	14 92 88 00	Punch for primary shaft roller bearing pressing on gearbox and for clutch shaft on cover
32	14 92 90 00	Punch for primary shaft roller bearing pressing on cover
33	14 92 94 00	Punch for sealing ring pressing on clutch shaft gearbox
34	14 92 95 00	Punch for sealing ring pressing on output shaft cover
35	17 94 51 60	Punch for outer bearing races pressing on gearbox
36	14 92 93 00	Positioning tool for sliding sleeves control forks
37	01 92 93 00	Wrench for ring nut of front wheel shaft
38	18 92 76 51	Wrench for gear to camshaft clamping nut
39	19 92 71 00	Tool for sealing ring assembly on flange - flywheel side
40	14 92 73 00	Tool for camshaft gear sealing
41	65 92 84 00	Hub for degree wheel

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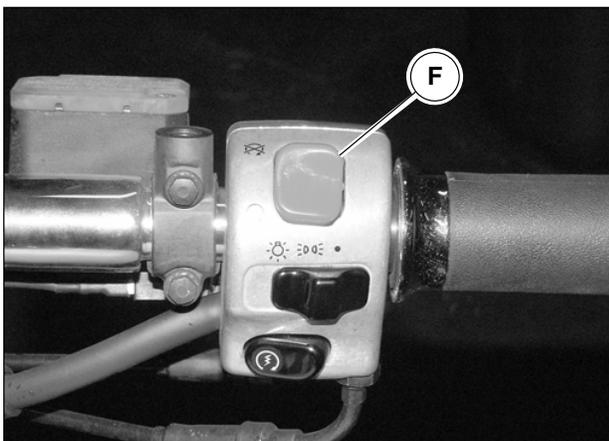
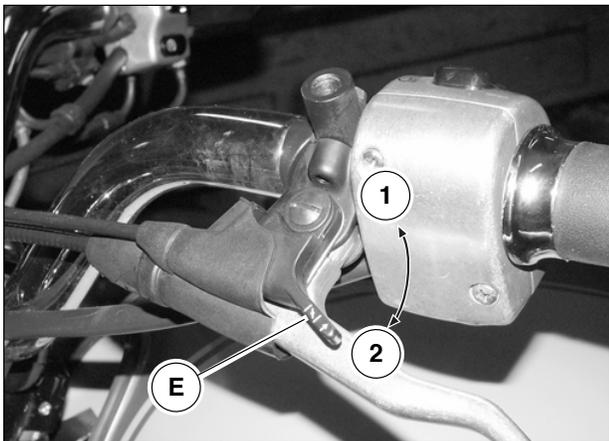
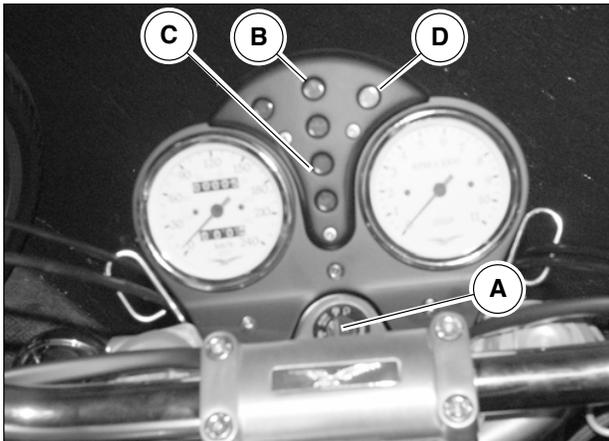
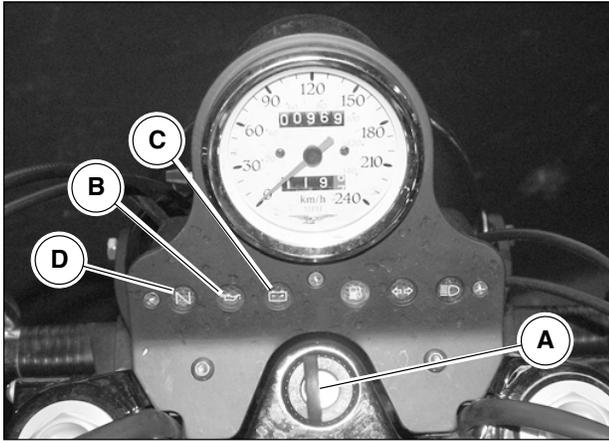
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CONTROL AND USE OF THE MORBIKE

KONTROLLE UND GEBRAUCH DES MOTORRADS

CONTROLE EN GEBRUIK VAN DE MOTORFIETS

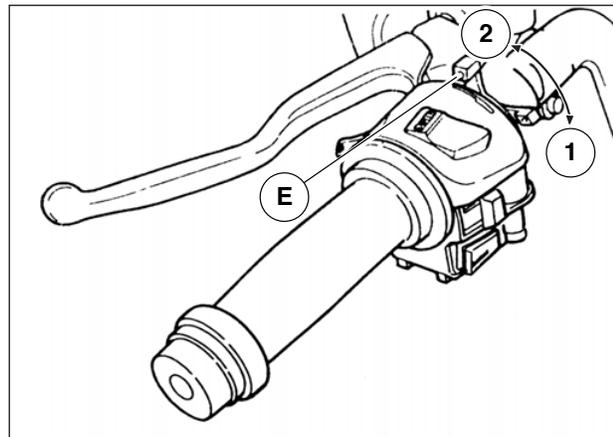
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1 PRELIMINARY TESTS

Before start-up check that:

- there is sufficient fuel in the tank;
- the oil in the crankcase sump is at the correct level;
- the key "A" in the ignition switch is in the ON "Q" position;
- the following warning lights are on:
 - **red**: insufficient oil pressure "B", insufficient generator voltage "C";
 - **green**: gearshift is in neutral "NEUTRAL" "D";
- the "E" "CHOKE" control, when the **engine is cold**, is in the start-up position "1";
- the switch "F" is in run position.



1 ERSTE KONTROLLEN

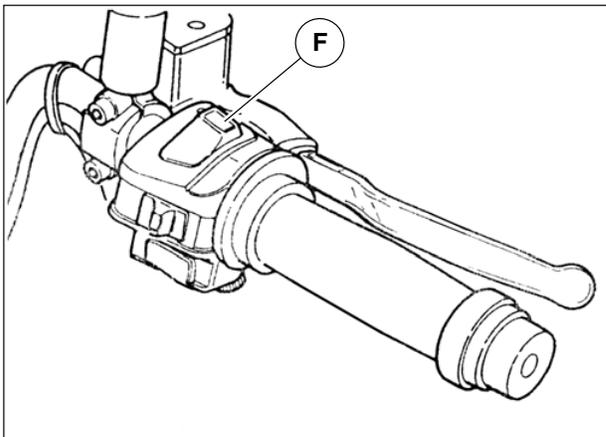
Vor dem Ingangsetzen kontrollieren, ob:

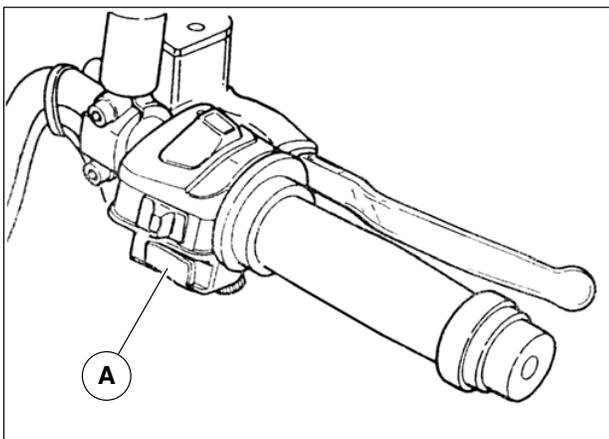
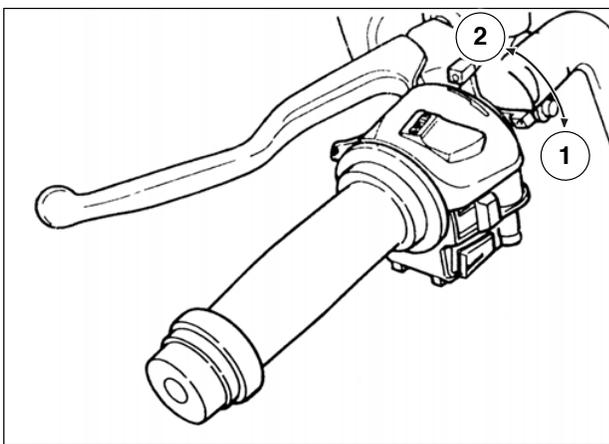
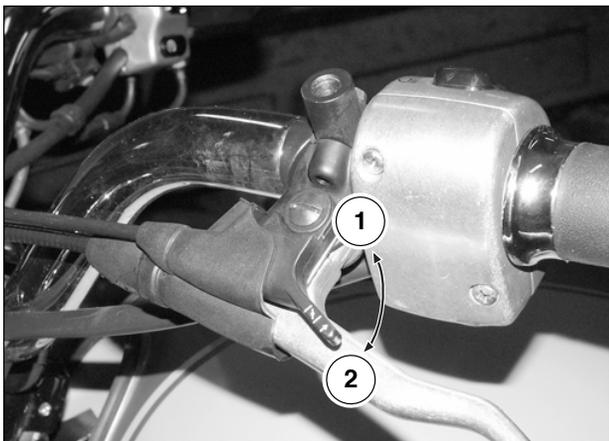
- eine ausreichende Kraftstoffmenge im Tank vorhanden ist.
- das Öl in der Wanne des Kurbelgehäuses den richtigen Pegel hat
- der Schlüssel "A" im Zündschalter in der Position ON ist "Ⓚ" ;
- die folgenden Kontrollleuchten eingeschaltet sind:
 - **rote Kontrollleuchten:** unzureichender Öldruck "B", unzureichende Generatorspannung "C";
 - **grüne Kontrollleuchten:** Leerlaufanzeiger "NEUTRAL" "D";
- der Schalter "E" "CHOKE" bei **kalttem Motor** in der Startposition "1" ist
- der Schalter "F" in der Position Run ist.

1 PRELIMINAIRE CONTROLES

Vóór het starten controleren of:

- er in de tank een voldoende hoeveelheid brandstof aanwezig is;
- de olie in de carter van het blok op het juist peil staat;
- de sleutel "A" op de aan-/uitschakelaar zich in de stand ON "Ⓚ" bevindt ;
- de volgende seinlampen verlicht zijn:
 - **rode:** onvoldoende oliedruk "B", onvoldoende spanning generator "C";
 - **groene:** indicator versnelling in losse stand "NEUTRAL" "D";
- de bediening "E" "CHOKE" met **koude motor** in de stand van start "1" staat;
- de schakelaar "F" in de stand run staat.





2 ENGINE IGNITION

COOL ENGINE

After having carried out the preliminary tests, pull the clutch lever fully and press the start button “A”. When the engine is running, before re-positioning the “CHOKE” control lever in running position “2”, let the engine idle, with a low r.p.m., for a few seconds in the hot season and for some minutes in the cold season.

WARNING

If the “green” warning light on the dashboard does not come on when the ignition switch is enabled, this means that a gear in the gearbox is engaged. starting the engine in these conditions may be dangerous; check that the gearbox is in the “neutral” position before starting the engine.

ENGINE WARM

The start-up procedures when the engine is warm are the same as for a cool engine, except that it is not necessary to place the “CHOKE” control lever in the start position.

WARNING

The starter motor must not be activated for over 5 seconds; if the engine does not start, wait 10 seconds before trying to start it once again. The start button must only be pressed when the engine is not running.

3 ENGINE WARMING-UP

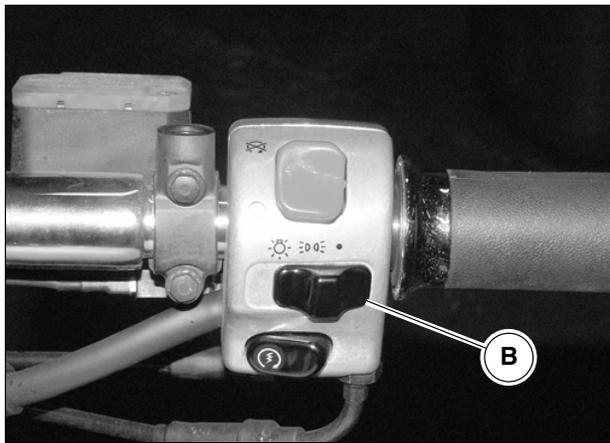
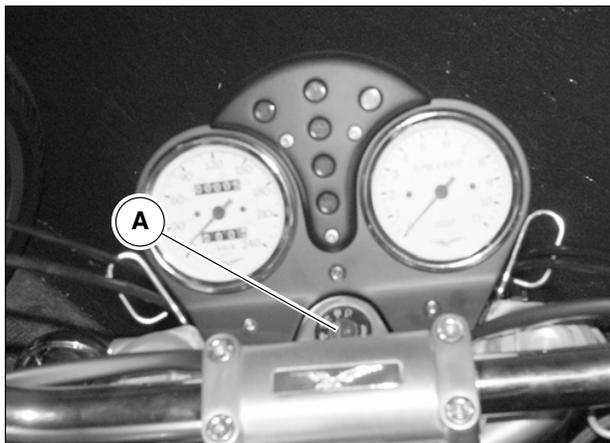
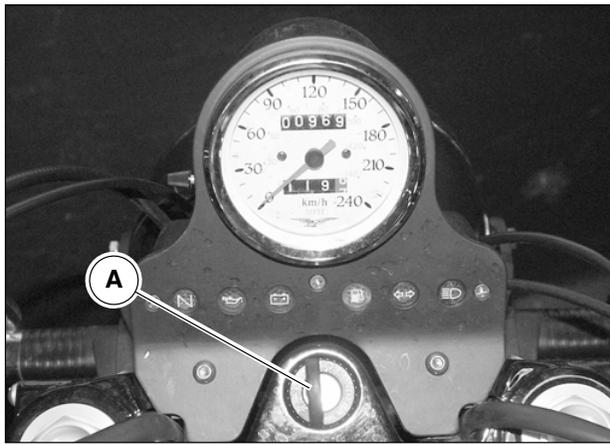
Having started the engine, let it idle at a low r.p.m. for a few seconds in the hot season and for some minutes in the cold season.

4 ENGINE RUNNING

To shift gear, turn off the gas, pull the lever fully and engage the next gear; gently let go of the clutch lever and accelerate at the same time.

The gearbox shift pedal should be activated decisively with your foot.

When shifting to a lower gear, gradually use the brakes and gas turn off control on the handlebar. This will avoid having the engine run at **runaway speed rates** when the clutch control lever is released.



5 STOPPING THE ENGINE

Turn throttle off, use the brake control levers and only when the motorbike is almost still, pull the clutch lever fully.

This manoeuvre must be carried out with great coordination in order to keep control of the motorbike.

For a regular speed reduction, the gearbox must be used correctly and the engine brake must be employed with great care so as not to have the engine run at **runaway speed rates**.

On wet and slippery roads, take care when braking, particularly when using the front brake.

To stop the engine, turn the switch key "A" to the OFF position "⏻".

6 PARKING

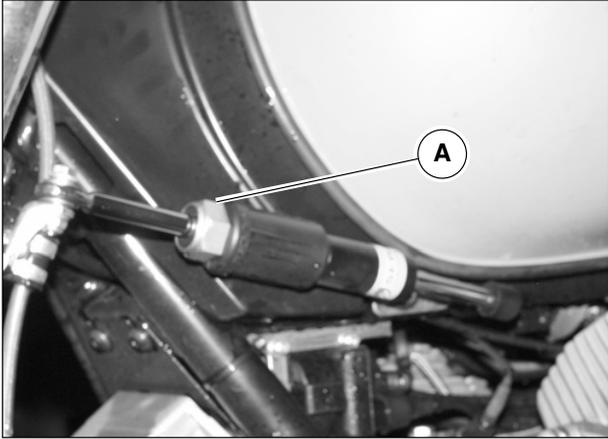
When parking in poorly lit streets, it is necessary to leave the parking lights on.

The starter key "A" must be in position "⏻" and the light switch "B" in position "☀️"; then remove the starter key.

■ IMPORTANT

Do not leave the switch on "☀️" for too long, otherwise the battery will run flat.





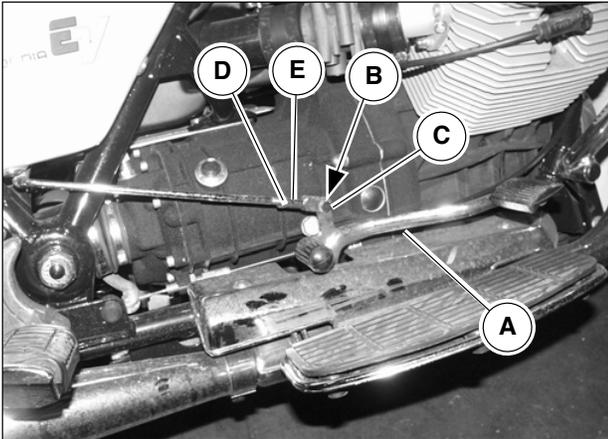
7 ADJUSTMENTS AND REGULATIONS

STEERING SHOCK ABSORBER

This is installed on the LH side of the vehicle, between the chassis and the steering column base.

To increase or reduce damping effect, screw or unscrew nut "A".

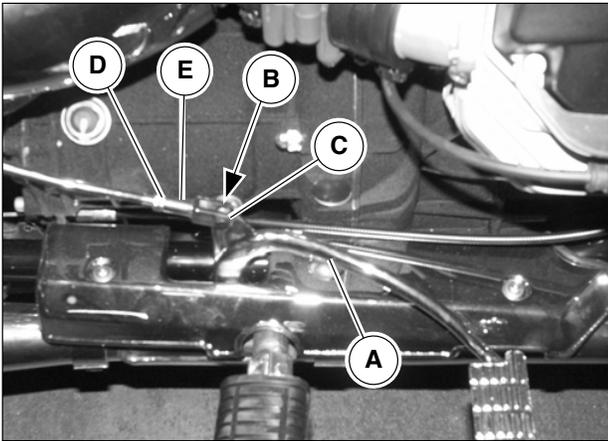
This ring-nut helps to render steering more precise and more stable, thereby improving the motorbike driving comfort in all conditions.



CLUTCH LEVER AND FRONT BRAKE LEVER ADJUSTMENT CALIFORNIA EV

In order to vary the position of brake pedal "A" proceed as follows:

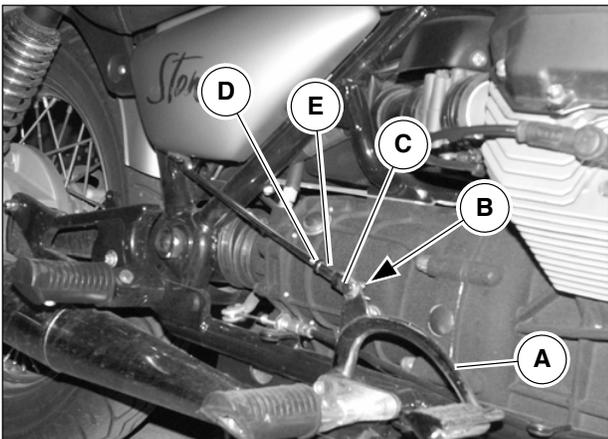
remove cotter pin "B", unthread pin "C", loosen counter nut "D" and screw or unscrew fork "E" until the desired brake pedal position is reached;
reassemble pin "C" and its cotter pin "B".



REAR AND FRONT LEFT BRAKE PEDAL ADJUSTMENT FOR CALIFORNIA SPECIAL AND CALIFORNIA SPECIAL SPORT

In order to vary the position of brake pedal "A" proceed as follows:

- remove cotter pin "B", unthread pin "C", loosen check nut "D" and screw or unscrew fork "E" until the desired brake pedal position is reached;
- reassemble pin "C" and its cotter pin "B".



REAR BRAKE PEDAL ADJUSTMENT FOR CALIFORNIA JACKAL AND CALIFORNIA STONE

In order to vary the position of brake pedal "A" proceed as follows:

- remove cotter pin "B", unthread pin "C", loosen check nut "D" and screw or unscrew fork "E" until the desired brake pedal position is reached;
- reassemble pin "C" and its cotter pin "B".



FRONT FORK ADJUSTMENT

(CALIFORNIA EV – CALIFORNIA SPECIAL 1ST SERIES)

The motorbike is equipped with a hydraulic telescopic fork whose shock-absorber braking capacity, in terms of extension and compression, can be adjusted separately. Adjust hydraulic damping capacity by means of adjusters “A” or “B”.

Left-hand adjuster “A” controls hydraulic extension adjustment; right-hand adjuster “B” controls compression adjustment.

Both adjusters have 15 adjusting positions (steps); damping capacity increases by rotating the adjusters clockwise (+), while it decreases by rotating them anti-clockwise (-).



N.B.

Do not force the adjustment screws into end-of-stroke positions.

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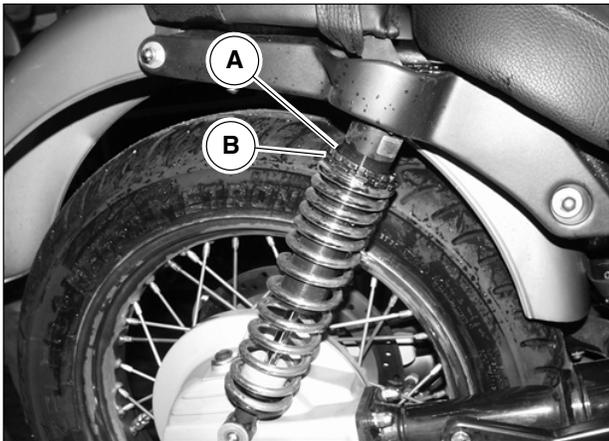
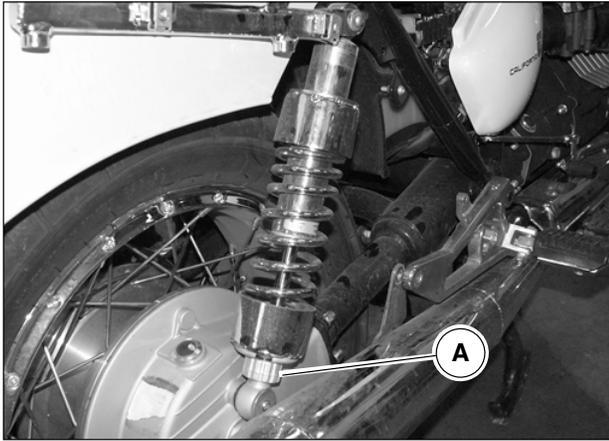
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REAR SHOCK ABSORBERS ADJUSTMENT (CALIFORNIA EV AND CALIFORNIA SPECIAL 1ST SERIES)

The motorcycle is fitted with shock absorbers featuring hydraulic extension adjustment.

Use the adjustment ring nut "A" in order to adjust the hydraulic extension of the shock absorber.

According to the needs and the load on the motorcycle, various adjusting positions are available; from position "1" very soft (minimal hydraulic damping) to position "11" very stiff (maximum hydraulic damping)

The shock absorber is set on position "4" from factory.

👁️ N.B. To reach a good stability of the vehicle, both shock absorbers must be set on the same position.

🔴 IMPORTANT! - Do not tamper with the components of the braking system and of the rear suspension assembly. The replacement of any component of the above-mentioned systems must be carried out with original spare parts care of our dealers' workshops.

REAR SHOCK-ABSORBERS ADJUSTMENT (CALIFORNIA JACKAL AND CALIFORNIA STONE)

The motorcycle is fitted with shock absorbers featuring spring pre-load adjustment.

To adjust the spring pre-load, loosen ring nut "A" and screw or unscrew ring nut "B" with the proper wrench; tighten the ring nut to increase spring pre-load.

👁️ N.B. To reach a good stability of the vehicle, both shock absorbers must be set on the same position.

🔴 IMPORTANT! - To avoid damaging the thread between the shock absorber body and the ring nut "B", use "SVITOL" oil or grease to lubricate the thread.

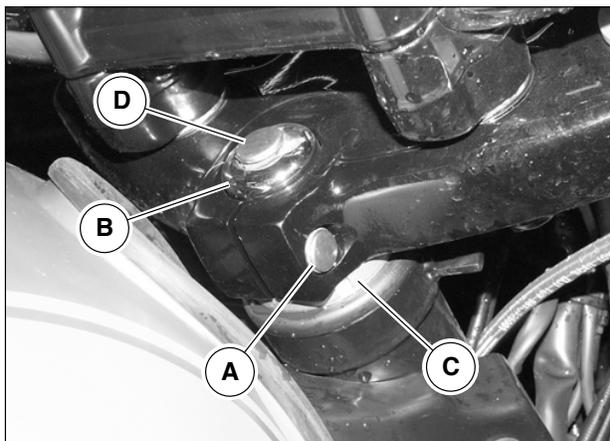
MAXIMUM ALLOWED LOAD

Non-compliance with the regulations concerning tire pressure or load limits can reduce handling, performance and control of your motobike.

The maximum allowed transportable weight for this motorbike is Kg 256: Passengers + luggage + accessories.

Subdivided as follows:

- Front axle Kg. 72
- Rear axle Kg. 184



STEERING ADJUSTMENT

For driving safety, the steering must be adjusted so as to let the handlebar move freely, but without play.

To adjust the steering, carry out the following procedures:

- Remove the small cover "A" and loosen the locking screw of the steering head;
- Remove the small cover "D";
- Unscrew the nut restraining the steering head "B";
- Tighten or unscrew the adjustment nut "C" until the backlash is correct.

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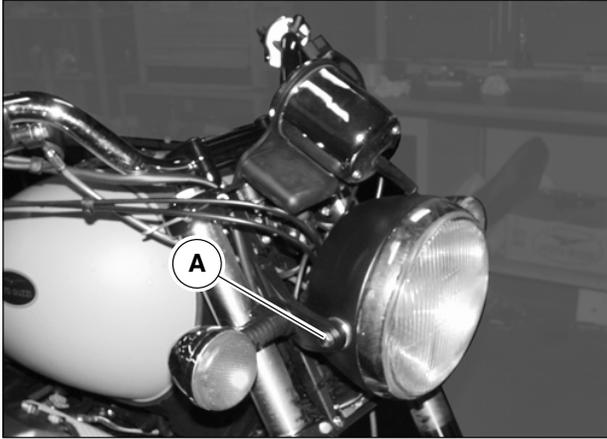
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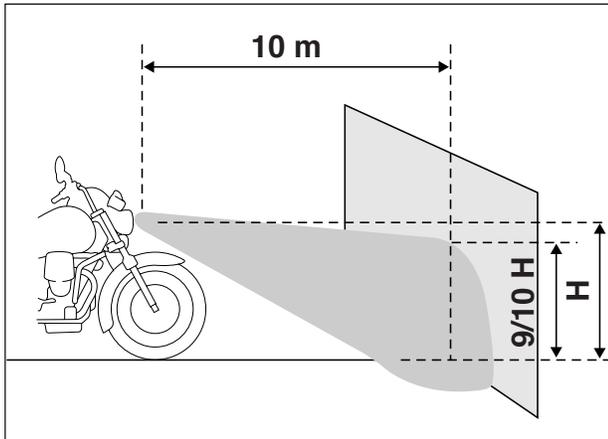


LIGHT BEAM ADJUSTMENT

The headlight must always be aimed at the correct height, for driving safety and in order not to cause troubles for on-coming vehicles.

For vertical aiming it is necessary to:

- Loosen screw "A" working from both sides of the headlight;
- Position the motorbike at about 10 m from a vertical wall and make sure that the ground is flat;
- Manually move the headlight upwards or downwards until reaching the height illustrated in the figure.



8 PREPARATION FOR LONG PERIODS AT REST

Should the vehicle not be used for a long period of time (eg. in the winter season) it is necessary to take the following precautions;

- Thoroughly clean all the vehicle;
- Empty the tank and the fuel system. If left in the tank for a long time, the fuel would evaporate leaving residue and deposits;
- Remove the spark plugs and put a little SAE 30 oil into the cylinders. Then make the engine shaft do some revolutions and refit the spark plugs;
- Reduce the tire pressure by about 20%;
- Position the vehicle so that the wheels do not touch the ground;
- Protect the unpainted parts with oil to prevent them from rusting;
- Remove the battery and keep it in a dry place where there is no danger of frost and where it is away from direct contact with sunlight; check its charge condition about every month;
- Cover the vehicle to protect it from dust but make sure that air can circulate.



9 CLEANING THE MOTORBIKE

PREPARATION FOR WASHING:

Before washing the vehicle, it is necessary to cover the following parts with nylon sheets:

- Exhaust silencer terminal parts;
- Clutch and brake levers;
- Gas control;
- LH light control device,
- RH ignition device;
- Starter switch;
- Shaft with transmission unions;
- ECU.

 **N.B. The ECU is placed under the left side body panel; it is placed under the passenger's seat only on California EV 1st series.**

WHILE WASHING:

Avoid spraying the instruments and the rear and front hub with high pressure water.

AFTER WASHING:

Remove all the nylon covers.
Thoroughly dry all the vehicle.
Try the brakes before using the vehicle.

 **N.B. To clean the propulsor unit's painted parts (engine, gearbox, transmission box etc.) the following products should be used:**

- Petroleum naphtha
- Diesel oil
- Oil
- Water-based neutral detergents for cars

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INSTRUCTIONS ON HOW TO CLEAN THE WINDSCREEN

The windscreen can be cleaned with most soap, detergents and polishes used for other plastic surfaces and for glass.

- **Do not wash or clean the windscreen when air temperature is too high and when sunlight exposure is too strong.**
- Never use solvents, lye or similar products.
- Do not use liquids containing abrasive substances, pumice, garnet paper, shave hooks etc.
- Polishes can be used only after having removed dust and dirt with a good wash. Small superficial scratches can be removed with soft polish.
- Fresh paint and cements can be easily removed by rubbing gently with solvent naphtha, isopropyl alcohol or butyl cellosolve (do not use methyl alcohol).
- Always use soft cloths, sponges, deerskin or absorbent cotton rubbing gently. Do not use paper towels or synthetic fibre cloths because they might scratch the windscreen. Deep scratches or abrasion marks cannot be removed by rubbing with strength or by using solvents.



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SCHEDULED MAINTENANCE

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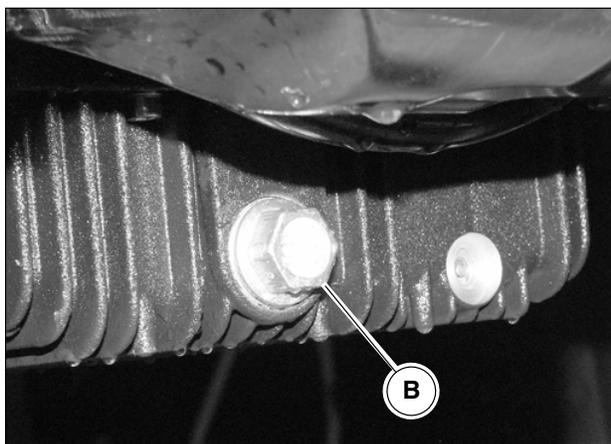
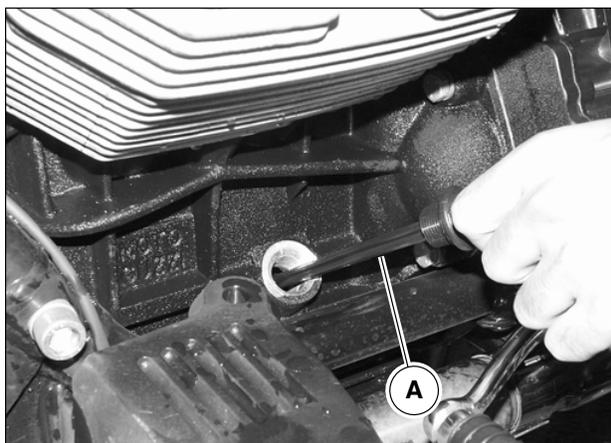
1 SCHEDULED MAINTENANCE - TABLE

MILIAGE COVERED	1000 mi. (1500 Km)	6000 mi. (10000 Km)	12000 mi. (20000 Km)	18000 mi. (30000 Km)	24000 mi. (40000 Km)	30000 mi. (50000 Km)
PROCEDURES						
Engine oil	R	R	R	R	R	R
Cartridge filter oil	R	R	R	R	R	R
Mesh oil filter	C	C	C	C	C	C
Air filter		R	R	R	R	R
Fuel filter			R		R	
Spark plugs	A	R	R	R	R	R
Valve play	A	A	A	A	A	A
Carburation	A	A	A	A	A	A
Tightening for bolts and nuts	A	A	A	A	A	A
Fuel tank, cock filter, piping		A		A		A
Gearbox oil	R	R	R	R	R	R
Final Drive	R	R	R	R	R	R
Shaft with drive couplings			A		A	
Front fork oil	R		R		R	
Starter motor and generator			A		A	
Braking system fluid	A	A	R	A	R	A
Brake pads	A	A	A	A	A	A
Wheel spokes tension	A	A	A	A	A	A
Tightening of cylinder head nuts*	A					

KEYS: **A** = Maintenance - Check - Adjustment- Eventual replacement. / **C** = Cleaning. / **R** = Replacement.
Check electrolyte level in the battery and lubricate the control linkages and Bowden cables at regular intervals;
Check engine oil level every 1000 km.
Replace anyway engine oil, oil filter and brake fluid at least once a year.
Check wheel spokes tension at regular intervals
 * Cylinder head nut tightening torque: 40-42 Nm

2 MAINTENANCE PROCEDURES

The various maintenance procedures are described below.



ENGINE OIL REPLACEMENT

A good engine oil has special qualities. Only use highly detergent engine oil whose container certifies that its quality corresponds to, or is higher than, SE,SF or SG operating requirements.

Viscosity

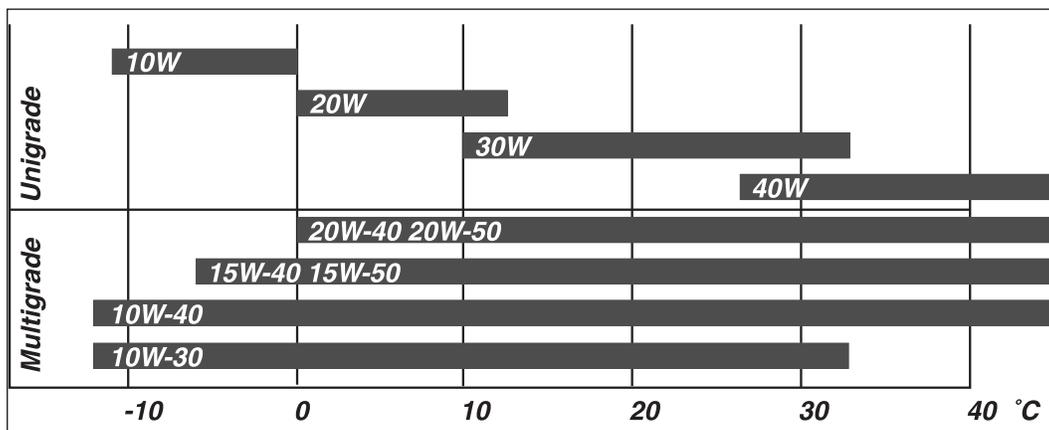
The other viscosity levels indicated in the table can be used if the average temperature of the motorbike's area of use is within the range indicated on the table.

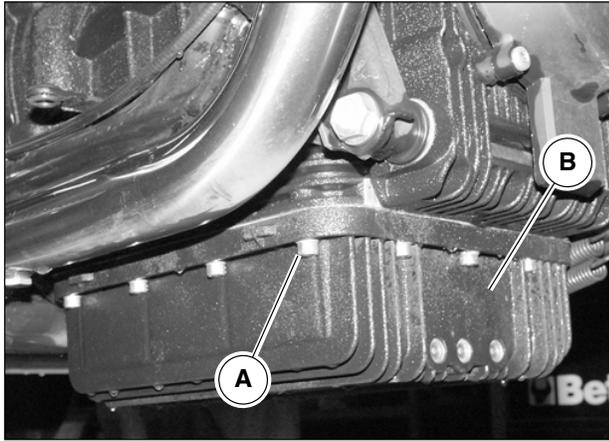
After the first 500/1500 km (300/1000 mi) and after about 10000 km (6000 mi), replace the oil.

Replacement should be carried out when the engine is warm to allow the oil to drain more quickly and thoroughly. To bring the engine up to the standard temperature, please see section C, chapter 3 in this manual.

Position a suitable pan under the oil sump to collect the used oil, then replace it following the below procedures:

- Unscrew the oil filler cap with dipstick "A";
- Unscrew the oil-draining plug "B";
- Drain all the used oil in the sump;
- Screw down the oil-draining plug once again and tighten it to the torque prescribed in the table, section B, chapter 4 of this manual;
- Pour in the quantity of new engine oil indicated in chapter 2, section B in this manual through the special hole;
- Refit the oil filler cap with dipstick in the special seat and bring it flush.

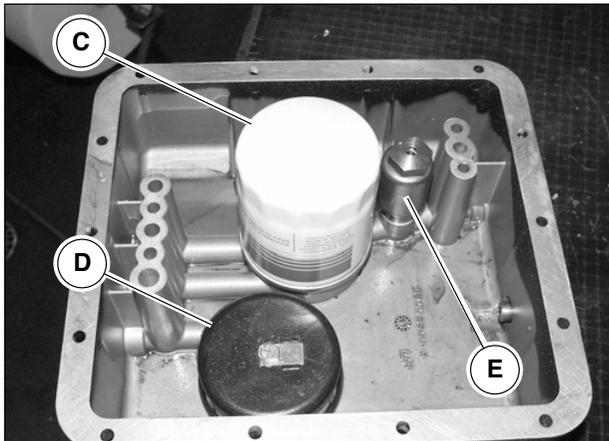




OIL CARTRIDGE FILTER REPLACEMENT

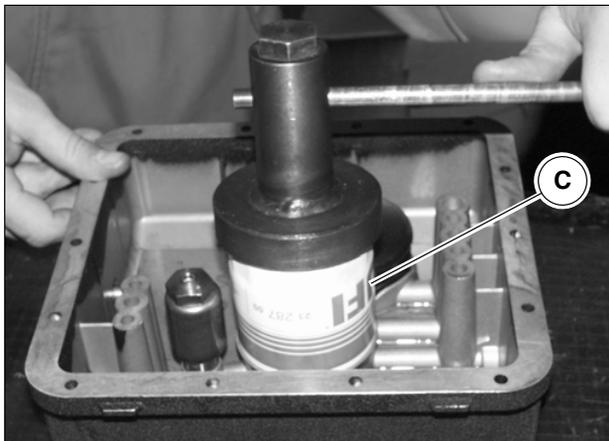
After the first 500/1500 km (300/1000 mi)(first oil replacement) and thereafter every 10000 Km (6000 mi), replace the filtering cartridge as follows:

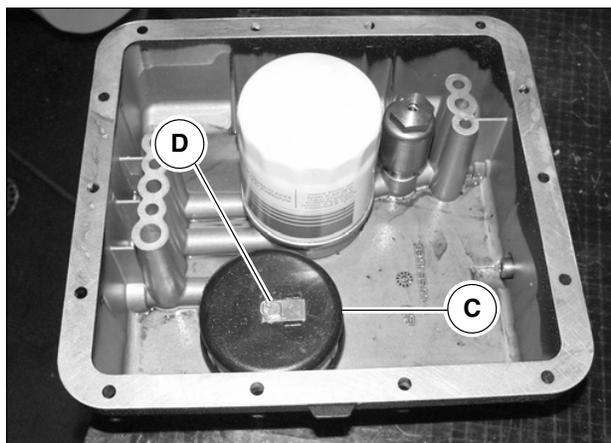
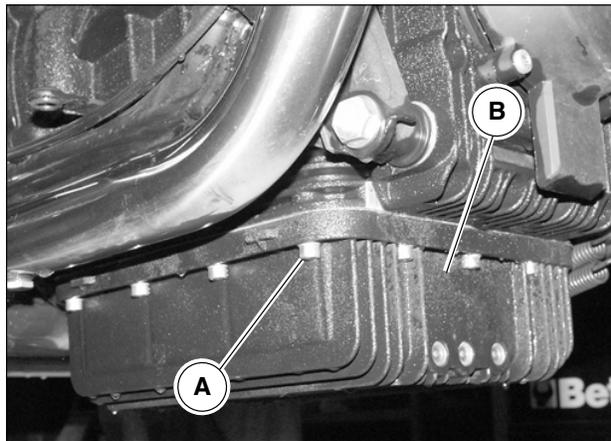
- Position a suitable pan under the oil sump to collect the used oil,
- Drain all the oil as described in the “Engine oil replacement” paragraph, chapter 2 in this section;
- Unscrew the screws 18 “A” and remove oil sump “B” from the crankcase with: cartridge filter “C”, mesh filter “D” and oil pressure regulating valve “E”;
- Unscrew filtering cartridge “C”,
- Place a new original cartridge in the relevant seat and tighten it by hand to avoid excessive tightening.



N.B.

Only use original Moto Guzzi spare parts





WASHING THE OIL MESH FILTER

After the first 500/1500 km (300/1000 mi)(oil cartridge filter change) and thereafter each time the oil cartridge filter is replaced, it is a good rule to wash the mesh filter. To wash the mesh filter, follow the below procedures:

- Position a suitable pan under the oil sump to collect the used oil
- Drain all the oil as described in the “Engine oil replacement” paragraph in this chapter;
- Unscrew the 18 screws “A” fastening the oil sump “B” to the crankcase;
- Remove the oil sump “B”;
- Unscrew screw “D”;
- Remove the mesh filter “C”
- Wash the mesh filter in a bath of gasoline;
- Blow-dry the filter using a jet of compressed air;
- After blowing the sump channels with compressed air, reassemble the mesh filter in the oil sump;
- Refit the oil sump onto the crankcase, tighten the 14 fastening screws to the prescribed (section B, chapter 4) torque and remember to insert the gasket;

N.B.



Always replace the oil sump gasket with a new one.

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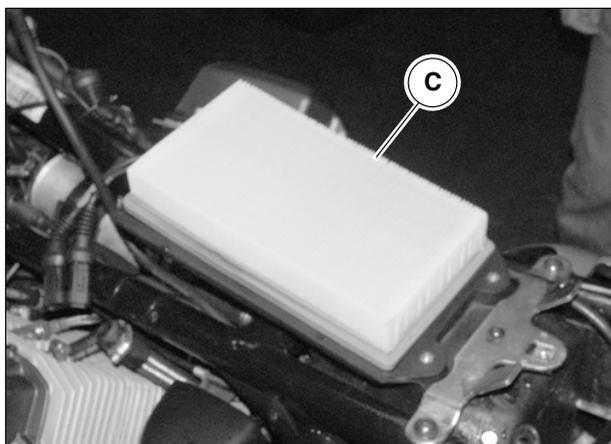
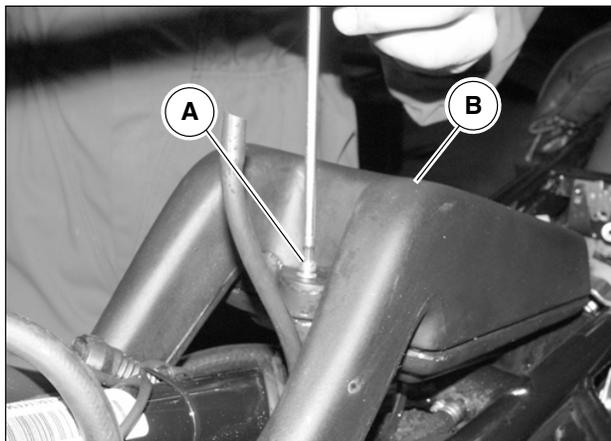
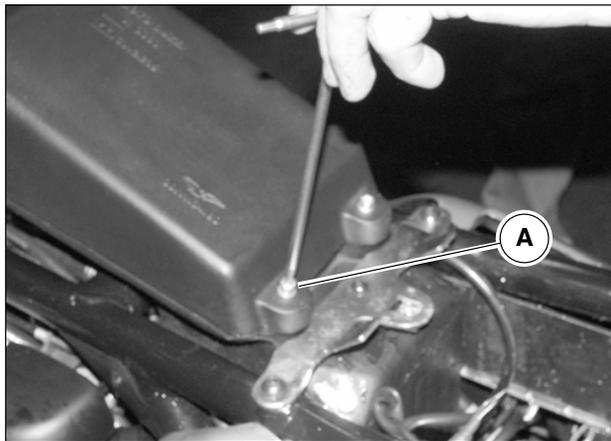
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AIR FILTER

Every 5000 km (3000 mi), check the condition of the filtering component and, if necessary, clean it using compressed air; it is necessary to replace it every 10000 km (6000 mi) as described in the scheduled maintenance table, section D, chapter 1. This filter is housed in a special housing fitted over the engine unit. It is necessary to remove the following parts to access it:

- The saddle, as described in section E, chapter 4
- The tank, as described in section I, chapter 3

Remove the cartridge filter in the following way:

- Unscrew the 2 upper screws "A" and lift the filter box cover "B"
- Remove the filter cartridge "C" and clean it. Replace with a new cartridge if necessary



N.B.

Only use original Moto Guzzi spare parts.

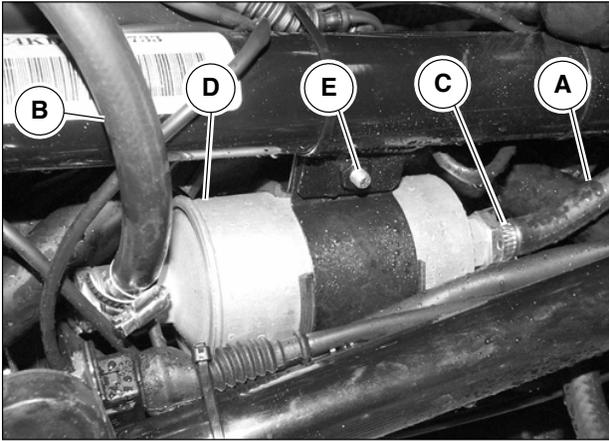
- Fit the cartridge into the filter housing, remembering to position it so that the flaps are turned upwards.
- Close the filter housing and remove all the previously removed parts.



IMPORTANT

A clogged filter reduces air inlet, thereby decreasing the engine capacity and causing deposits in the spark plugs.

Do not use the motorbike without the filter. Impurities found in the air could get into the engine and damage it.



FUEL FILTER

The filter is fitted under the fuel tank, between the pump and the throttle body unit.

It is necessary to replace it every 20000 km (12000 mi), as described in the scheduled maintenance table, chapter 1 in this section.

To replace the fuel filter it is necessary to proceed as follows:

- Remove the saddle, as described in section E chapter 4;
- Remove the tank, as described in section I, chapter 3;
- Detach the fuel inlet "A" and outlet "B" pipes from the filter by loosening the clamps "C";
- Remove the fuel filter "D" including the bracket, by unscrewing the 2 screws "E" fastening it to the chassis;
- Fit a new fuel filter paying attention to the direction indicated by the arrow "F" marked on it;
- Reassemble all the previously removed components.



N.B.

Do not fit the fuel filter in the opposite direction.

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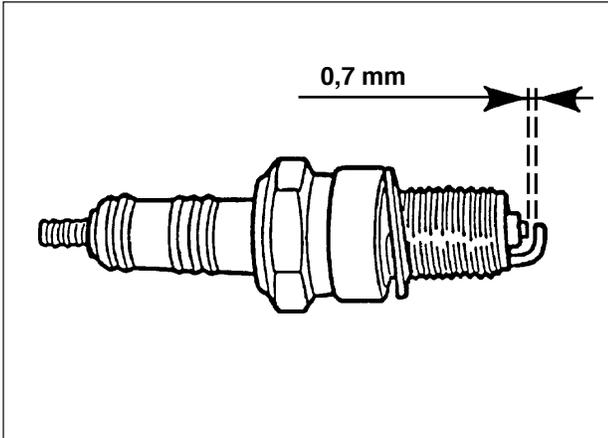
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SPARK PLUGS

The motorbike is equipped with **NGK BPR 6 ES** spark plugs with a distance of 0,7 mm between the electrodes. The spark plugs must be removed from time to time for cleaning and for checking the distance between the electrodes.

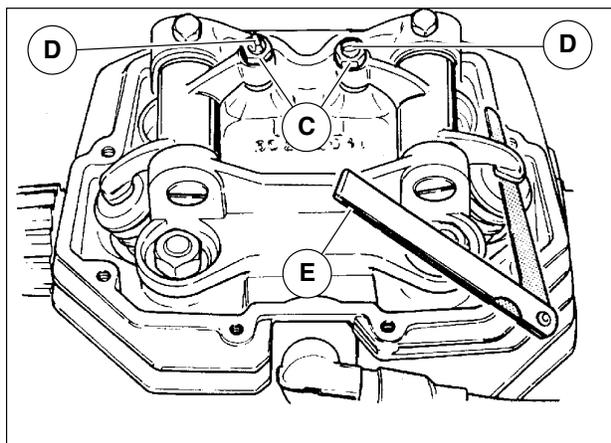
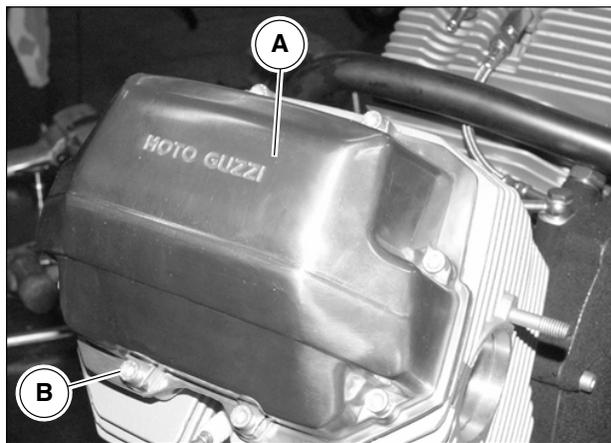
N.B.
Values lower than 0,7 mm can compromise the engine lifespan.

When reinserting the spark plugs, make sure that they fit perfectly and that they can be tightened easily in their seats; an incorrect fitting will damage the threading on the heads; it is therefore advisable to tighten them by hand for some turns and then, using the special key (supplied with the motorbike), tighten them to the torque prescribed in the table in chapter 4, section B.

N.B.
Always replace and refit the spark plugs only when the engine is cold.

Even if the spark plugs seem to be in excellent condition, after about 10000 km (6000 mi), they must be replaced as described in the periodical maintenance table, chapter 1 in this section.

WARNING
In order to prevent irregular functioning and inefficiency of the ignition system, make sure that the spark plug wire connections (spark-plug caps) and the spark plugs are the recommended type (like the original ones).
Do not check the current on the spark plugs without inserting the spark plug caps originally provided, as this operation could cause irreparable damage to the ECU.



TAPPET BACKLASH

After the first 500÷1500 km (300÷1000 mi) and after every 10000 km(6000 mi), or when the timing system becomes very noisy, check the backlash between the valves and the equalizers.

Adjustment must be carried out when the **engine is cold**, with the piston at top dead center (T.D.C), in compression stage (valves closed).

Work as follows:

- Remove the head cover "A" by unscrewing the eight screws "B"
- Loosen the nuts "C";
- Loosen or unscrew the adjustment screw "D" until you obtain the following backlashes:
 - Intake valve 0,10 mm;
 - Exhaust valve 0,15 mm

This measurement is effected by inserting a feeler gauge "E" between the rocker and the valve.

Remember that if the backlash is greater than the prescribed one, the tappets will be noisy. If it is less, the valves will not close well, thereby causing the following problems:

- Loss of pressure;
- Engine overheating;
- Valve burning-out, etc

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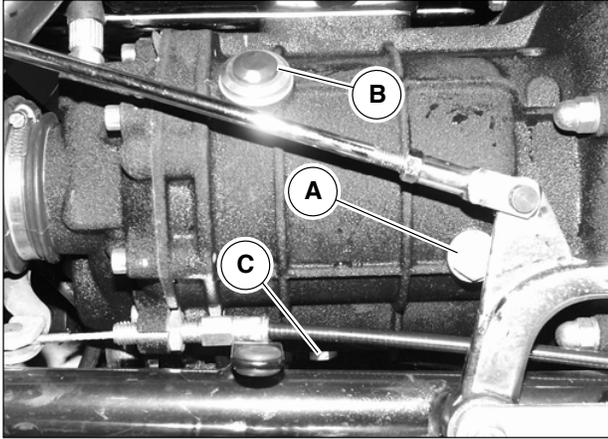
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GEARBOX LUBRICATION

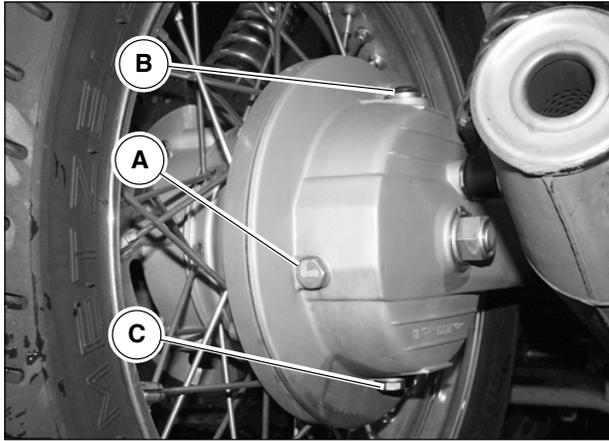
Every 5000 km (3000 mi) check that the oil almost reaches the hole in oil level plug "A".

Carry out the test with the vehicle in a perfectly vertical position and when the engine is hot; an incorrect position could cause a wrong the reading.

If the oil lies beneath this level, top up with the required oil indicated in the table in section B chapter 2 pouring it in through the hole "B".

About every 10000 km (6000 mi), it is necessary to replace the oil. This must be carried out when the engine is warm to allow the oil to drain more quickly and thoroughly. To bring it to temperature, followed the operations under listed:

- Place a pan under the gearbox to collect the used oil;
- Remove the oil filler cap "B" to let the oil drain more quickly;
- Unscrew the oil-draining plug "C" and let all the gearbox oil flow out;
- Screw-down the oil draining plug once again and tighten it to the torque prescribed in the table, section B, chapter 4;
- Unscrew oil level plug "A";
- Pour in the new oil indicated in the table of section B chapter 2 through the special hole until the level almost reaches the hole in the oil level plug "A".
- Refit and tighten the oil level plug "A" and the oil filler cap "B"



FINAL DRIVE LUBRICATION

Every 5000 km (3000 mi) check that the oil touches the hole for the level plug “A”; if the oil is below this level, top up with oil of the type prescribed in the table in section B, chapter 2.

About every 10000 Km (6000 mi) it is necessary to replace the oil. This must be carried out when the engine is warm to allow the oil to drain more quickly and thoroughly. To bring the rear transmission box up to temperature, drive for some kms and replace the oil following the below procedures:

- Place a pan under the final drive to collect the used oil.
- Remove the oil filler cap “B” to let the oil drain out more quickly.
- Unscrew the oil-draining plug “C” and let all the oil in the transmission box flow out.
- Tighten the oil-draining plug and tighten it to the torque prescribed in the table in section B, chapter 4.
- Unscrew the level plug “A”.
- Pour in new oil, of the type prescribed in the table in section B, chapter 2, through the inlet hole until the level touches the hole for the level plug.
- Refit and tighten the oil filler cap.
- Screw oil level plug once again.

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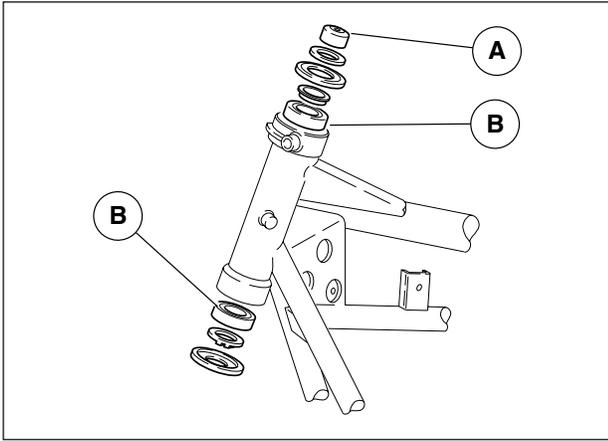
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STEERING BEARINGS

The steering pin is supported on the chassis sleeve by two tapered roller bearings "B".

A nut "A" screwed onto the steering pin, determines the fitting backlash for the bearings.

A test must be carried out every 20000 km (12000 mi).

Disassembly:

- Remove the steering head as reported in chapter 1, section H;
- Remove the fork, wheel and mud guard assembly;
- Remove the steering upper bearing and the relative washers along with the dust cover from the steering column;
- Remove the lower steering bearing using a special extractor;

Check;

Before checking the dimensions, it is necessary to check for the bearings' wear; this test must be carried out manually with the bearing fitted in its seat.

- Turn the inner ring in both directions: this must be capable of turning softly and silently, without interference.
- Push the inner ring outwards, continually changing position, to check if there is backlash.
- Remove and replace the bearings which do not turn softly and silently or which feature a backlash.

● IMPORTANT

Excessive wear can cause vehicle vibrations and instability.

Reassembly:

Carry out the disassembly procedures in reverse order, bearing in mind the following:

- When the new bearings are refitted, check that the seat shows no signs of denting or scratching.
- Lubricate the seat before refitting the bearing, then push it in its seat.
- Use a tubular punch to exert pressure only on the external bearing ring until it is completely inserted.

● IMPORTANT

Removed bearings must not be refitted.

FRONT FORK OIL REPLACEMENT

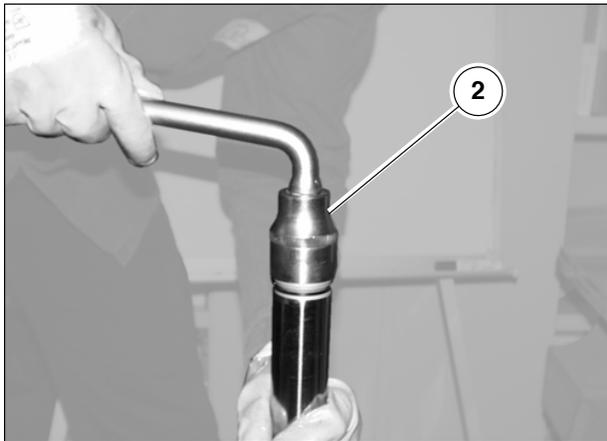
The motorbike is equipped with a hydraulic telescopic fork with separate extension and compression adjustment for the shock-absorbers' braking:

The RH rod works in extension while the LH one in compression.

Although the two rods work in different ways, their internal components are similar. Therefore, oil draining and refilling can be carried out following the same procedures; the below described procedures therefore apply to both rods.

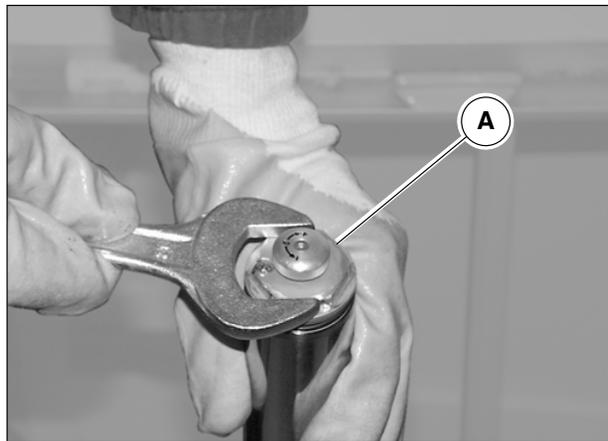
About every 20000 km (12000 mi), or at least once a year, it is necessary to replace the fork oil.

The quantity of oil required for each strut, as described in the table, chapter 2, section B.



N.B.

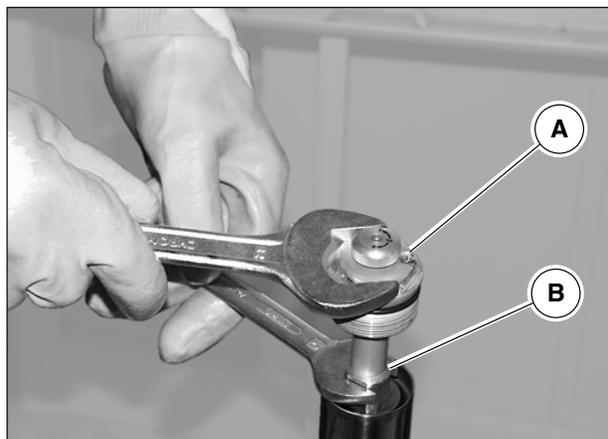
During the oil draining and refilling procedures, the rod and its internal parts must be locked in a vice; take care not to damage them by excessive tightening; always use aluminium jaw coverings



DRAINING

To drain the oil, it is necessary to follow the below described procedures which, despite the differences, are identical for both rods;

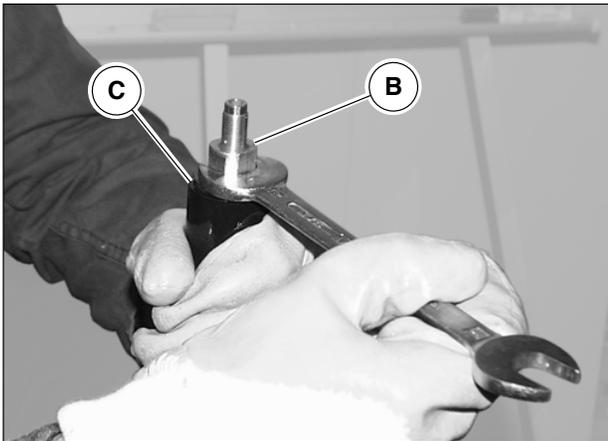
- Remove the two fork rods as described in chapter 6, section F;
- Lock the removed rod in a vice with aluminium jaw coverings in order to avoid damaging it;
- Unscrew upper closing plug "A" with a hexagon wrench of 36 mm, possibly closed, to have a better grip (see wrench "2" in the picture). Be careful not to damage the O-ring when pulling out. Push the stanchion inside the wheel holder.
- While holding plug "A" still with the wrench used before, release check nut "B" using a 19 mm hexagon wrench. Fully unscrew and remove plug "A" from the shock absorber rod end.



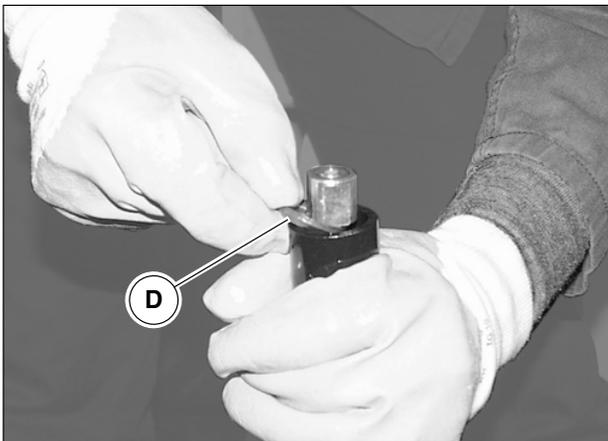
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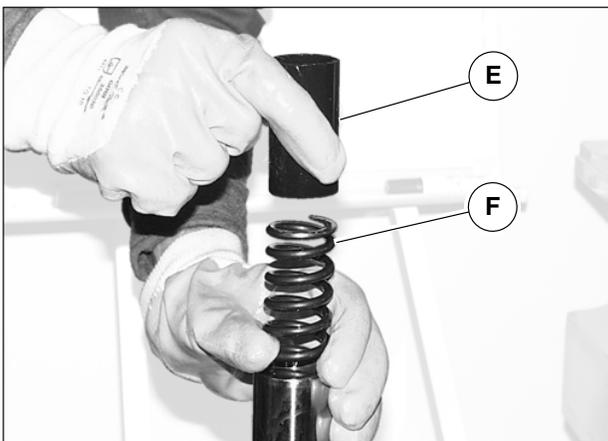
- Drain as much as possible of the oil contained in the rod in a special container;



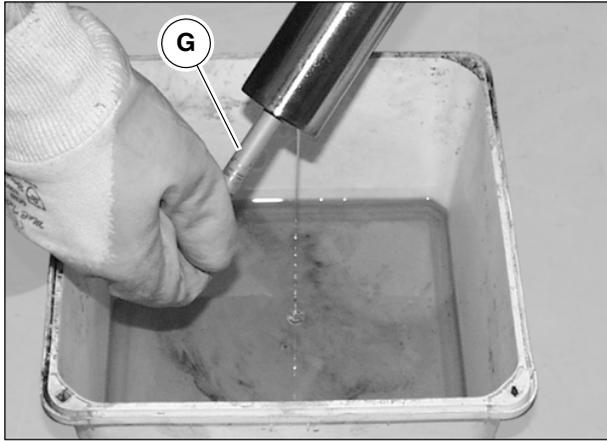
- Lock the rod again in the vice and while holding the tube in pre-load "C", unscrew check nut "B", but not fully, to release the inner spring;



- Remove open washer "D" to release the pre-load tube and the spring;



- Remove pre-load tube "E" and the spring "F";



- Drain again the oil contained in the rod and master cylinder by repeatedly pushing on the rod “G” of the shock absorber to facilitate the oil drainage in the shock absorber assembly.

⚠ WARNING

By pumping on the rod “G” of the shock absorber, a high-pressure oil jet comes out of the rod end. To avoid damages to objects and people direct the rod end towards a special container.

- Check the rod carefully and make sure there are no damages. If no parts are damaged or particularly worn, reassemble the rod otherwise replace the damaged parts.

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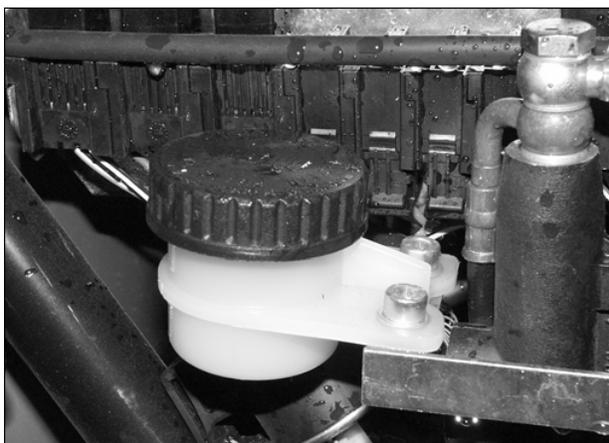
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FILLING:

- Refit the rod in reverse sequence with respect to the disassembly; remember not to screw down the cap;
- Lock the rod in a vice;
- Lift slightly the shock absorber with one hand and fill the fork with new oil in the prescribed quantity (see chapter 1 of this section);
- Slowly pump the shock absorber to fill it with oil. Continue until an even resistance can be perceived along the whole stroke when pulling upwards. Now the cartridge is drained.
- Screw the plug "A" again on the shock absorber rod.



CHECKING THE BRAKING AND CLUTCH SYSTEM FLUID

To obtain a high efficiency in the hydraulic system, follow the below rules :

- Frequently check the fluid level in the front brake, clutch and rear brake tank;
This level must never drop below the minimum level marked on the tanks, and must never exceed the maximum level.
- Periodically, or when necessary, top up the fluid in the above mentioned tanks.
When topping up, only use fluid taken from sealed cans, opened at the moment of use.
- About every 20000 km (12000 mi) or at least every year, completely replace the fluid in the braking and clutch systems, as described in the table of section, D, chapter 1.

To allow the systems to work correctly, it is necessary that the pipings are always full of fluid and without air bubbles; if the control lever stroke is long and elastic this indicates the presence of air bubbles.

To purge the braking circuits, only use new fluid.



WARNING

The use of alcohol or compressed air for subsequent drying is absolutely prohibited; it is advisable to use “trichloroethylene” for the metallic parts.

For any lubrications, the use of oils or mineral greases is absolutely prohibited. If you do not have suitable lubricants, it is advisable to grease the rubber and metallic components with system fluids.

Use “Agip Brake Fluid DOT4”.



WARNING

The fluid used in the braking system, besides damaging the paint, is extremely dangerous if it comes into contact with eyes or skin; In case of accidental contact, rinse the part in question with plenty of running water.

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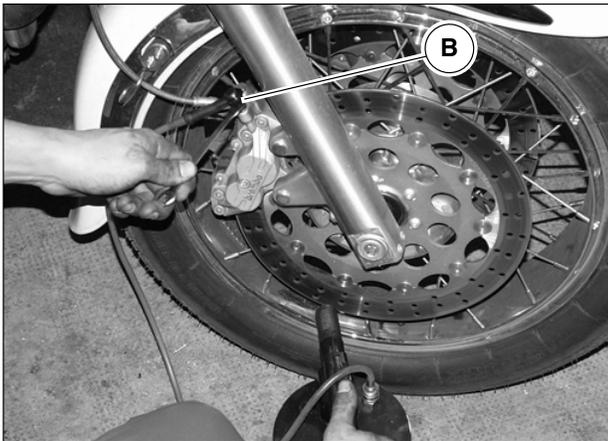
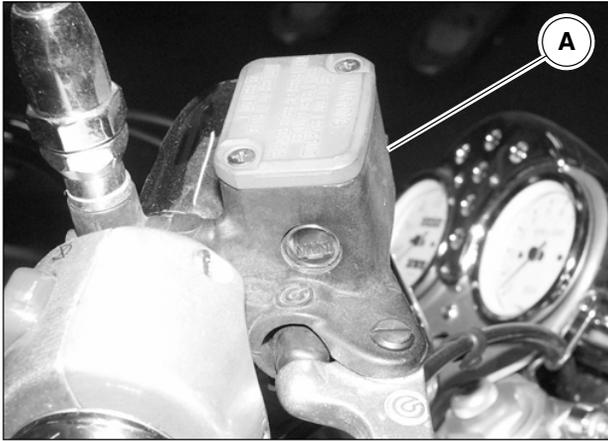
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BRAKE SYSTEM FLUID REPLACEMENT

FRONT BRAKING SYSTEM (CALIFORNIA EV - SPECIAL - SPECIAL SPORT)

Draining:

- Unscrew the cover together with diaphragm from the tank "A";
- Rotate the handlebar until the tank "A" is in a horizontal position;
- Remove the rubber cover from the draining union "B" and fit a commercially available brake drainer onto the union;
- Loosen the draining union and use the drainer to pump until no more fluid comes out of the system;

If no drainer is available, the fluid can be drained by connecting a flexible tube "C" to the draining union. The end of this tube must be immersed in a brake fluid container.

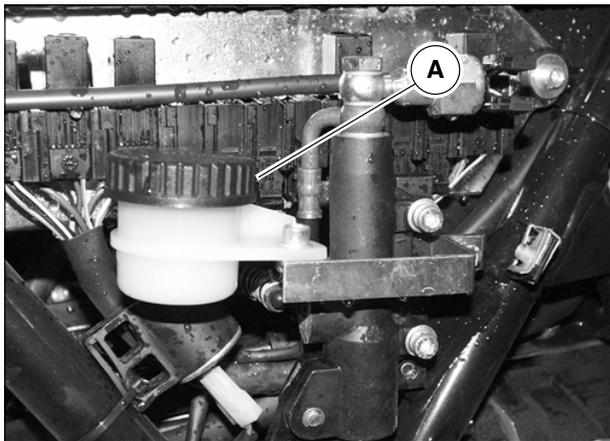
Unscrew the draining union by a 1/4 turn and activate the control lever until all the fluid has been drained;

Filling:

- Fill the tank with prescribed oil taken from a sealed container;
- Activate the control lever several times to fill the system and to eliminate any air;
- Connect a drainer to the draining union;
- Pump using a drainer and loosen the draining union, always checking that the level does not drop below the minimum level;
- Repeat this final procedure until there are no air bubbles in the transparent tube connected to the draining union;
- Lock the union to the torque prescribed in the table in chapter 4, section B.

If no drainer is available, connect a small transparent plastic tube to the draining union, as described for draining the system.

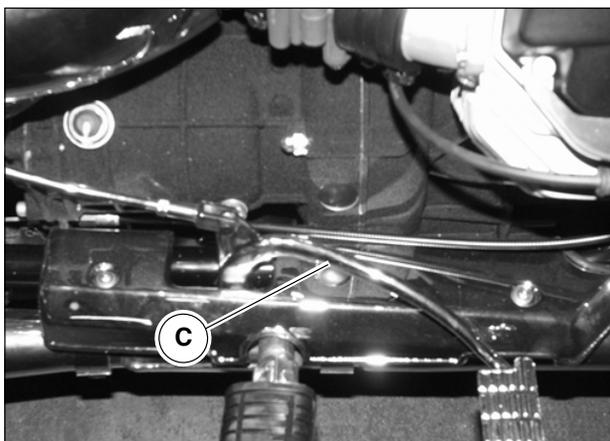
Open the draining valve by a 1/4 turn and activate the control lever until the fluid starts to come out from the valve.



LEFT-HAND FRONT AND REAR BRAKING SYSTEM (CALIFORNIA EV - SPECIAL - SPECIAL SPORT)

Draining:

- Unscrew the cover together with diaphragm from the tank "A";
- Rotate the handlebar until the tank "A" is in a horizontal position;
- Remove the rubber cover from the draining union "B" and fit a commercially available brake drainer onto the union;
- Loosen the draining union and use the drainer to pump until no more fluid comes out of the system;



If no drainer is available, the fluid can be drained by connecting a flexible tube "C" to the draining union. The end of this tube must be immersed in a brake fluid container.

Unscrew the draining union by a 1/4 turn and activate the control lever until all the fluid has been drained;

Filling:

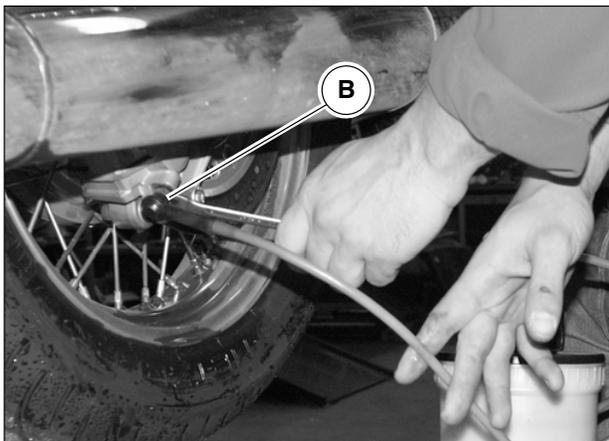
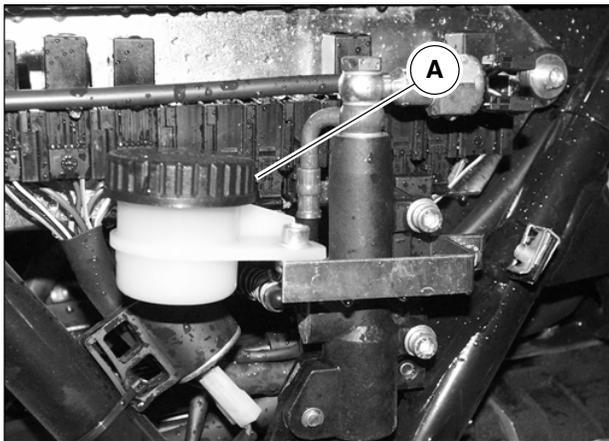
- Fill the tank with prescribed oil taken from a sealed container;
- Activate the control lever several times to fill the system and to eliminate any air;
- Connect a drainer to the draining union;
- Pump using a drainer and loosen the draining union, always checking that the level does not drop below the minimum level;
- Repeat this final procedure until there are no air bubbles in the transparent tube connected to the draining union;
- Lock the union to the torque prescribed in the table in chapter 4, section B.



If no drainer is available, connect a small transparent plastic tube to the draining union, as described for draining the system.

Open the draining valve by a 1/4 turn and activate the control lever until the fluid starts to come out from the valve.

N.B. The draining on the rear caliper must be carried out with the disassembled caliper in horizontal position.



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Draining:

- Remove the cover together with diaphragm from tank "A";
- Remove the rear caliper as described in chapter 5, section F;
- Position the caliper so that the draining union "B" is directed upwards;
- Remove the rubber cover from the draining union "B" and insert a commercially available brake drainer onto the union;
- Loosen the draining union and use the drainer to pump until no more fluid comes out of the system;

If no drainer is available, the fluid can be drained by connecting a flexible tube "C" to the draining union. The end of this tube must be immersed in a brake fluid container.

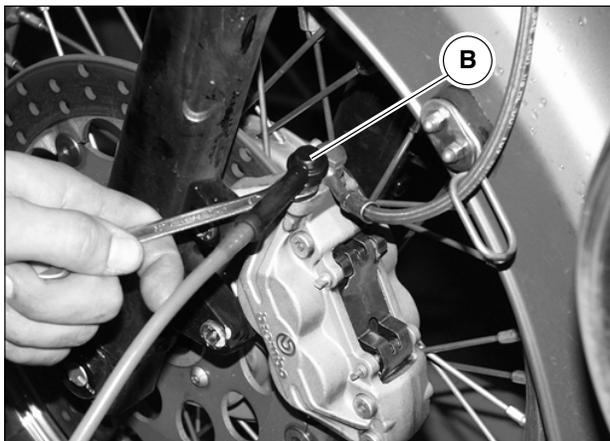
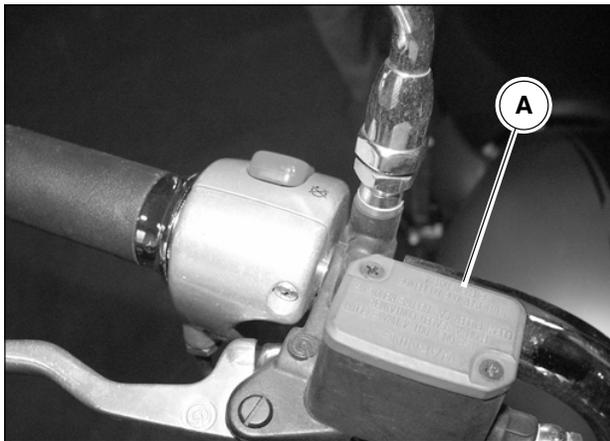
Unscrew the draining union and by a 1/4 turn and activate the control lever until all the fluid has been drained;

Filling:

- Fill the tank with prescribed oil taken from a sealed container
- Activate the control lever several times to fill the system and to eliminate air;
- Connect a drainer to the draining union;
- Pump using the drainer and loosen the draining union, always checking that the level does not drop below the minimum level;
- Repeat this final procedure until there are no air bubbles in the transparent tube connected to the draining union;
- Lock the union to the torque prescribed in the table in chapter 4, section B.

If no drainer is available, connect a small transparent plastic tube to the draining union, as described for draining the system.

Open the draining valve by a 1/4 turn and activate the control lever until the fluid starts to come out from the valve.



LEFT-HAND FRONT BRAKING SYSTEM (CALIFORNIA JACKAL – CALIFORNIA STONE)

Draining:

- Unscrew the cover together with diaphragm from the tank “A”;
- Rotate the handlebar until the tank “A” is in a horizontal position;
- Remove the rubber cover from the draining union “B” and fit a commercially available brake drainer onto the union;
- Loosen the draining union and use the drainer to pump until no more fluid comes out of the system;

If no drainer is available, the fluid can be drained by connecting a flexible tube “C” to the draining union. The end of this tube must be immersed in a brake fluid container.

Unscrew the draining union by a 1/4 turn and activate the control lever until all the fluid has been drained;

Filling:

- Fill the tank with prescribed oil taken from a sealed container;
- Activate the control lever several times to fill the system and to eliminate any air;
- Connect a drainer to the draining union;
- Pump using a drainer and loosen the draining union, always checking that the level does not drop below the minimum level;
- Repeat this final procedure until there are no air bubbles in the transparent tube connected to the draining union;
- Lock the union to the torque prescribed in the table in chapter 4, section B.

If no drainer is available, connect a small transparent plastic tube to the draining union, as described for draining the system.

Open the draining valve by a 1/4 turn and activate the control lever until the fluid starts to come out from the valve.

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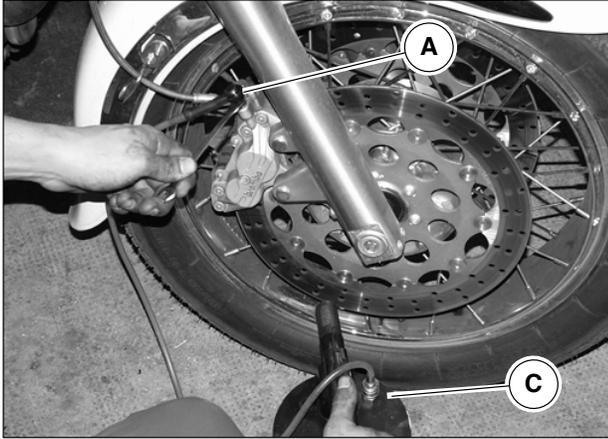
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DRAINING THE BRAKING SYSTEM FLUID

RIGHT-HAND FRONT BRAKING SYSTEM - CALIFORNIA EV – SPECIAL – SPECIAL SPORT

- Turn the handlebar until the tank is in a horizontal position;
- Fill the tank if necessary
- Remove the small rubber cover from the draining union “A” and fit a commercially available brake drainer “C” onto the union;
- Loosen the draining union and pump with the drainer until fluid, without air bubbles, comes out from the system;
- If no drainer is available, the fluid can be drained by connecting a flexible tube to the draining union. The free end of this tube must be immersed in a container with brake fluid;
- Loosen the draining union “A”;
- Fully pull the control lever on the handlebar, then release it and wait some seconds before pumping again.
- Repeat this procedure until fluid, without air bubbles, comes out from the tube in the transparent container;
- Keep the control lever fully pulled and lock the draining union “A” to the torque prescribed in the table, chapter 4, section B ;
- Refit the rubber cover onto the union.

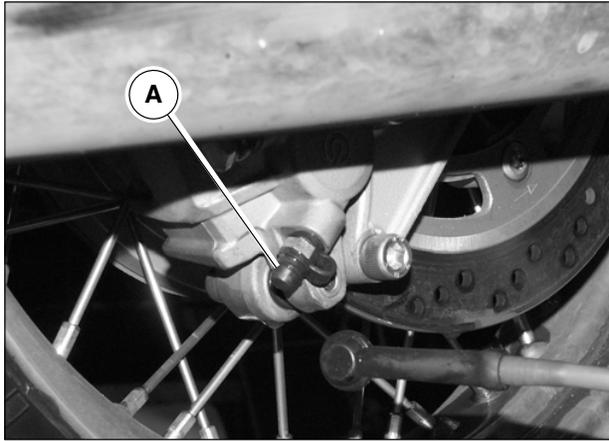
If the draining procedure has been effected correctly, a direct fluid action, without elasticity, should be noticed immediately after the control lever’s initial stroke.

If this is not the case, repeat the above described procedures.



WARNING

During the draining procedure, make sure that the fluid does not drop below the minimum level.



REAR BRAKING SYSTEM (CALIFORNIA JACKAL – CALIFORNIA STONE)

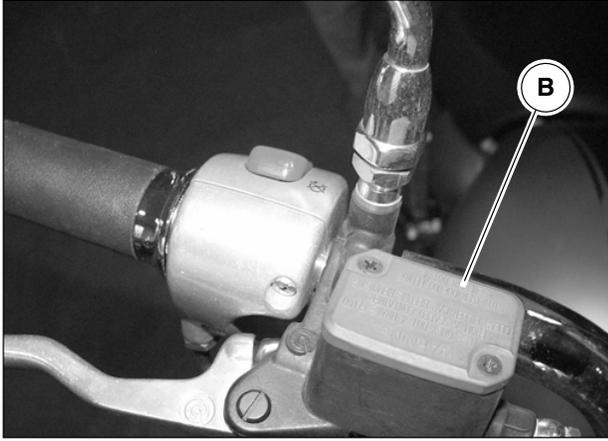
- Fill the tank if necessary
- Remove the caliper and hold it in horizontal position;
- Remove the small rubber cover from the draining union “A” and fit a commercially available brake drainer onto the union;
- Loosen the draining union and pump with the drainer until fluid, without air bubbles, comes out from the system;
- If no drainer is available, the fluid can be drained by connecting a flexible tube to the draining union. The free end of this tube must be immersed in a container with brake fluid;
- Loosen the draining union “A”;
- Fully pull the control lever on the handlebar, then release it and wait some seconds before pumping again.
- Repeat this procedure until fluid, without air bubbles, comes out from the tube in the transparent container;
- Keep the control lever fully pulled and lock the draining union “A” to the torque prescribed in the table, chapter 4, section B ;
- Refit the rubber cover onto the union.

If the draining procedure has been effected correctly, a direct fluid action, without elasticity, should be noticed immediately after the control lever’s initial stroke. If this is not the case, repeat the above described procedures.



WARNING

During the draining procedure, make sure that the fluid does not drop below the minimum level.

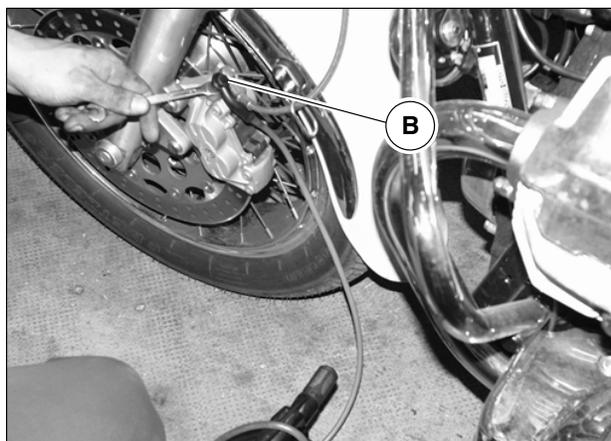
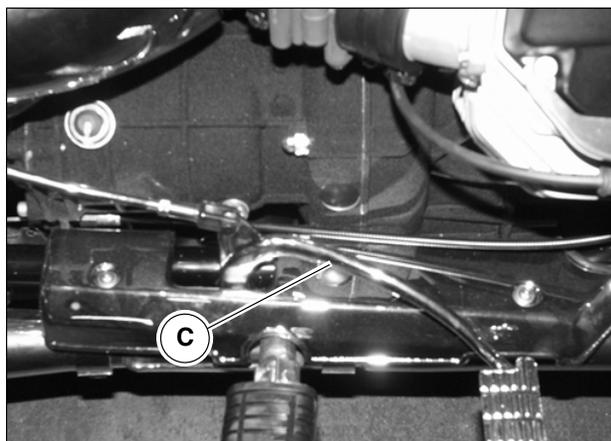
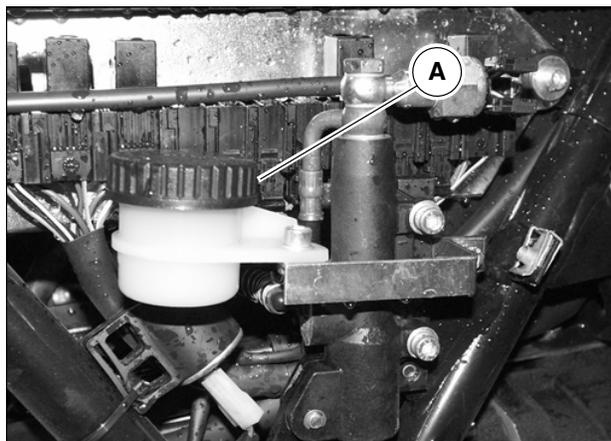


**LEFT-HAND FRONT BRAKING SYSTEM
(CALIFORNIA JACKAL – CALIFORNIA STONE)**

- Rotate the handlebar until the reservoir “B” is in horizontal position;
- Fill the tank if necessary
- Remove the small rubber cover from the draining union “A” and fit a commercially available brake drainer onto the union;
- Loosen the draining union and pump with the drainer until fluid, without air bubbles, comes out from the system;
- If no drainer is available, the fluid can be drained by connecting a flexible tube to the draining union. The free end of this tube must be immersed in a container with brake fluid;
- Loosen the draining union “A”;
- Fully pull the control lever on the handlebar, then release it and wait some seconds before pumping again.
- Repeat this procedure until fluid, without air bubbles, comes out from the tube in the transparent container;
- Keep the control lever fully pulled and lock the draining union “A” to the torque prescribed in the table, chapter 4, section B ;
- Refit the rubber cover onto the union.

If the draining procedure has been effected correctly, a direct fluid action, without elasticity, should be noticed immediately after the control lever’s initial stroke. If this is not the case, repeat the above described procedures.

⚠ WARNING
During the draining procedure, make sure that the fluid does not drop below the minimum level.



**LEFT-HAND FRONT AND REAR BRAKING SYSTEM
(CALIFORNIA EV - SPECIAL - SPECIAL SPORT)**

- Fill the tank “A” if necessary;
- Remove the small rubber cover from the draining union “B” and fit a commercially available brake drainer onto the union;
- Loosen the draining union and pump with the drainer until fluid, without air bubbles, comes out from the system;
- If no drainer is available, the fluid can be drained by connecting a flexible tube to the draining union. The free end of this tube must be immersed in a container with brake fluid;
- Loosen the draining union “B”;
- Fully pull the control lever on the handlebar, then release it and wait some seconds before pumping again.
- Repeat this procedure until fluid, without air bubbles, comes out from the tube in the transparent container;
- Keep the control lever fully pulled and lock the draining union “A” to the torque prescribed in the table, chapter 4, section B ;
- Refit the rubber cover onto the union.

If the draining procedure has been effected correctly, a direct fluid action, without elasticity, should be noticed immediately after the control lever’s initial stroke.

If this is not the case, repeat the above described procedures.

⚠ WARNING
During the draining procedure, make sure that the fluid does not drop below the minimum level.

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BRAKE PAD CHECK/REPLACEMENT

Every 3000 km (2000 mi) check for the thickness of the brake pads:

- The minimum thickness of friction material is 1.5 mm. If the minimum thickness of the friction material is less than this value, it is necessary to replace the pads.

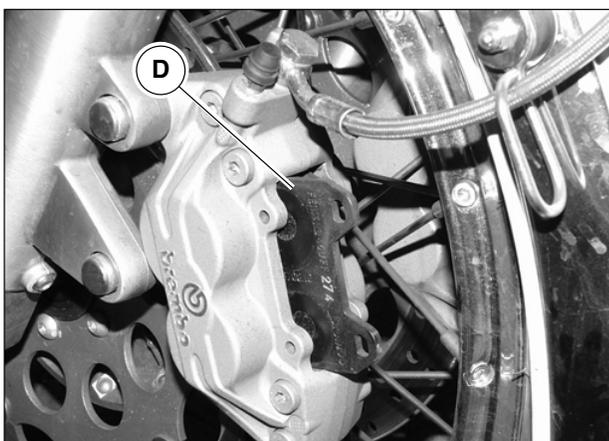
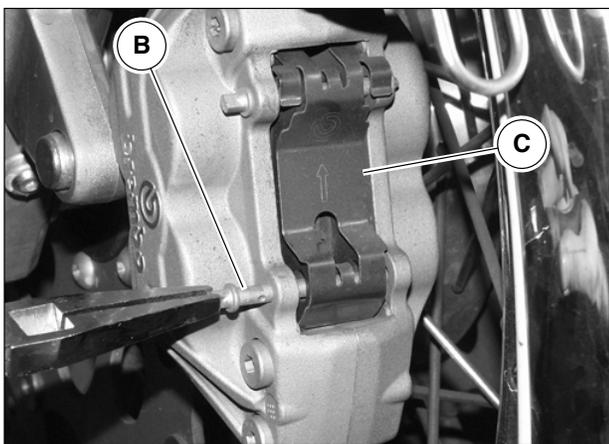
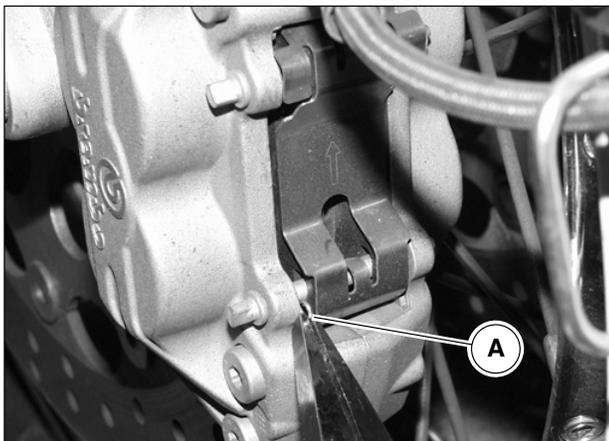
After replacement, it is not necessary to drain the braking system. Just activate the control lever repeatedly until the caliper pistons are brought to the normal position once again.

When replacing the pads, check the condition of the flexible tubings; they must be replaced immediately if damaged.

N.B.

After the pads have been replaced, it is necessary to use the brakes with moderation for the first 100 Km (60 mi) in order to allow them to bed-in correctly.

The motorbike is equipped with calipers which allow the pads to be replaced without having to be removed from their respective supports.



FRONT BRAKE CALIPER

Disassembly:

- Remove the 2 flexible split pins "A";
- Remove the 2 pins "B";
- Remove the external shield "C";
- Remove the 2 pads "D", if the pads are worn beyond the prescribed limit they must be replaced with new ones;

Reassembly:

- Fit the 2 pads into the caliper;
- Place the external shield in its position;
- Insert the pins, pads and external shield into their seats on the calipers;
- Insert the flexible split pins into the pins.



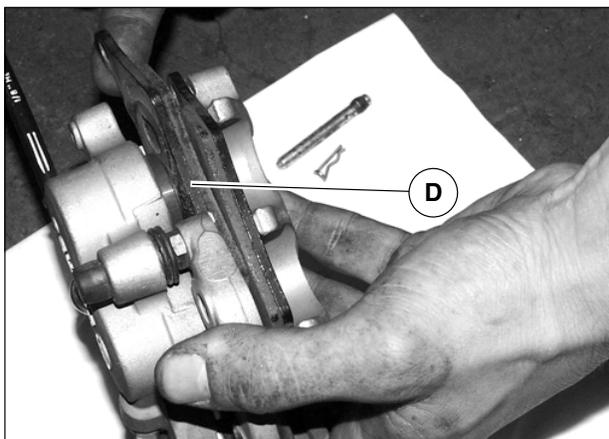
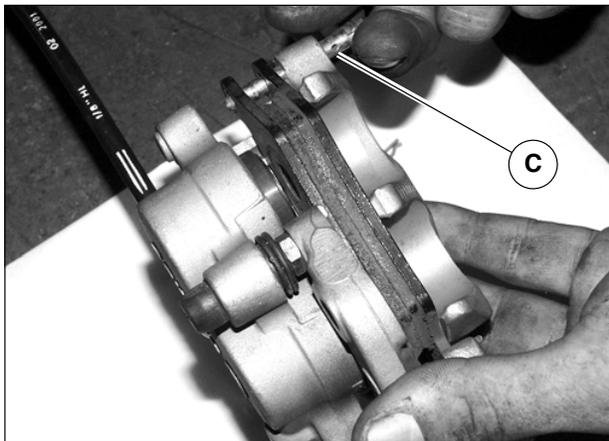
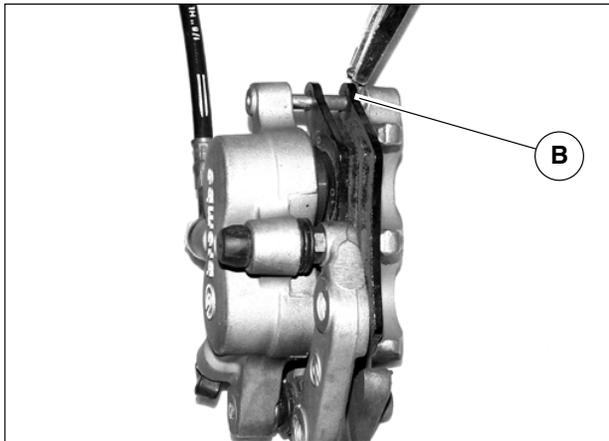
REAR BRAKE CALIPER

Disassembly:

- Unscrew screw "A";
- Remove brake caliper;
- Remove the spring "B";
- Remove pin "C" to let the brake pads "D" free;
- If the pads are worn beyond the prescribed limit, replace them.

Reassembly:

- Fit the 2 pads into the caliper;
- Insert the pin and fix it with the split pin;
- Reassemble the brake caliper onto the holder.



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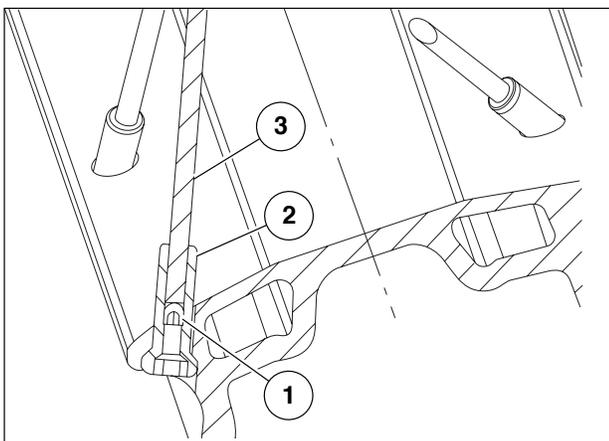
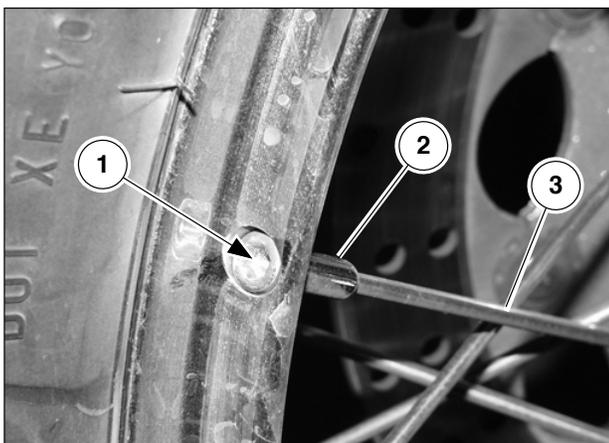
WHEEL SPOKES TENSION ADJUSTMENT

WARNING FOR WHEELS AND SPOKES (all models)

Check wheel spokes integrity and tension after the first 1500 Km (1000 mi) and then after every 10000 Km (6000 mi).

Driving with the wrong spokes tension or with one or more broken spokes may damage the wheel and cause risks to the vehicle safety and stability.

Always comply with the instructions on the maximum allowed load.



CALIFORNIA EV 2001:

- Place the vehicle on the stand;
- IMPORTANT:** to adjust spokes tension there is no need to remove the wheel.

Wheel spoke locking is achieved thanks to a tension adjustment nipple (2), inside which a nipple locking pin is screwed in. This locking pin presses on the wheel spoke (3) and blocks the nipple rotation (2)

WARNING

Even if the wheel spokes tension (3) is correct, a nipple might be unlocked

- Determine which wheel spokes (3) need tightening;

IMPORTANT: following operations refer to the adjustment of one spoke only.

- Loosen the locking pin (1);
- Adjust the concerned spoke tension (3) through the nipple (2);
- Screw the nipple in to tighten the spoke (3);
- Unscrew the nipple to loosen the spoke (3) (nipple indicative tightening torque 3.5 Nm);

IMPORTANT: if nipple (2) adjustment is hindered, loosen the locking pin (1) again.

- Tighten the locking pin (1) without forcing it too much (locking pin indicative tightening torque 3 Nm);
- Repeat the same operation for all spokes in sequence order;
- After adjusting the wheel spokes tension, check wheel rim axial and radial play, as described in chapter 3 section F.

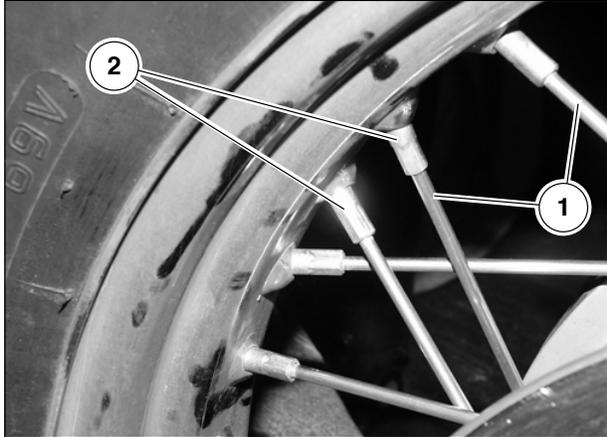
DANGER

It is important to lock the rotation of all nipples. Nipple loosening modifies the wheel spoke tension and jeopardizes the wheels safety and the vehicle stability

CALIFORNIA EV (1997-2000) - CALIFORNIA SPECIAL (1ST SERIES)

Same as **California EV 2001**, bearing in mind that the locking pin (1) is not fitted on **BBS** wheels and that **the nipples indicative tightening torque varies from 4Nm (minimum load) to 6Nm (maximum load)**.

CALIFORNIA SPECIAL (2ND SERIES) - CALIFORNIA SPECIAL SPORT - CALIFORNIA JACKAL - CALIFORNIA STONE



- Remove the wheel as described in **chapters 1-2 section F**;
- Remove the tire, the inner tube and the nipple covers;
- Determine which wheel spokes (1) need tightening;
- Adjust the concerned spoke tension (1) through the nipple (2);
 - Screw the nipple in to tighten the spoke;
 - Unscrew the nipple to loosen the spoke;
- **The nipples indicative tightening torque is:**
 - **4.5 Nm for the front wheel**
 - **Rear wheel: 4 Nm for the right-hand side nipples, 6 Nm for the left-hand side nipples;**
- Repeat the same operation for all spokes in sequence order;
- After adjusting the wheel spokes tension, check wheel rim axial and radial play, as described in chapter 3 section F.



DANGER

Do not adjust the wheel spokes tension with the tire fitted on the rim because it might break the nipple covers and cause a puncture in the inner tube.

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1 WING MIRRORS

Disassembly:

- Use two wrenches, as illustrated in the figure, to unscrew the upper nut "A", integral to the wing mirror, and to keep the lower one still "B";
- Unscrew the wing mirror to remove it.

Reassembly:

- Screw down the wing mirror into the special hole;
- Tighten the nut using the 2 wrenches used for disassembly.



2 FRONT AND REAR MUDGUARDS

FRONT MUDGUARD

Removal:

- Remove brake pipes from guides "A";
- Unscrew the 4 "B" screws fixing the anti-twist plate group and the mudguard to the fork;
- Remove the mudguard

Reassembly:

Carry out the procedures in reverse order.

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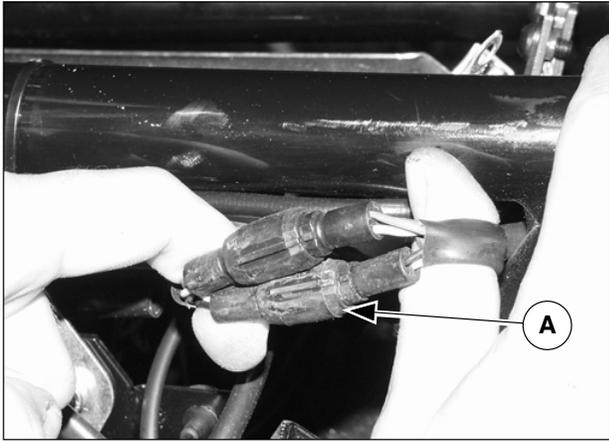
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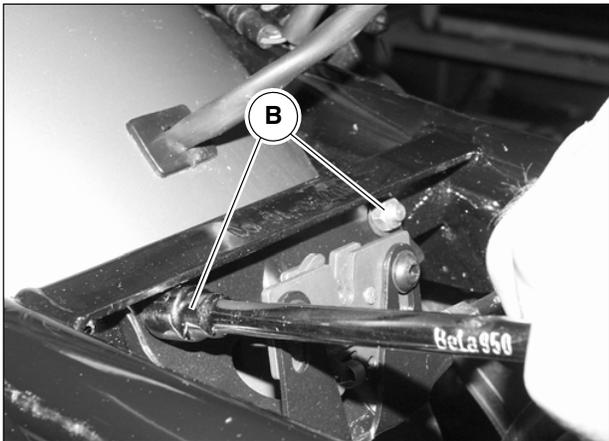
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REAR MUDGUARDS CALIFORNIA EV(1997-2000) - CALIFORNIA JACKAL - CALIFORNIA STONE

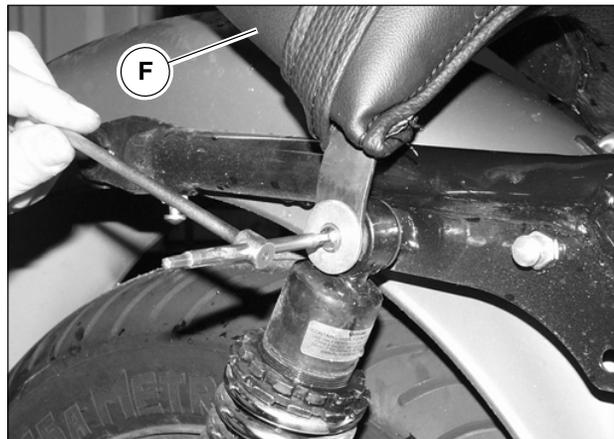
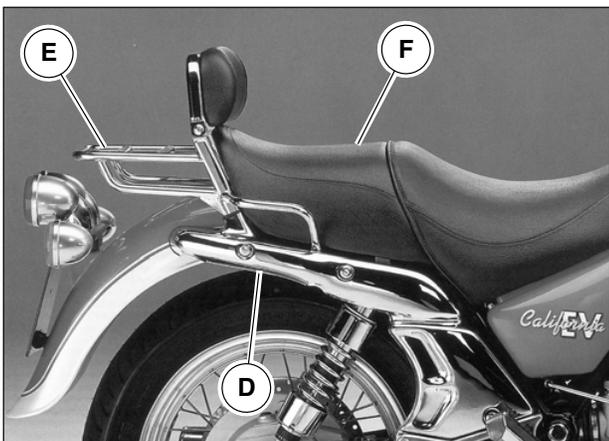
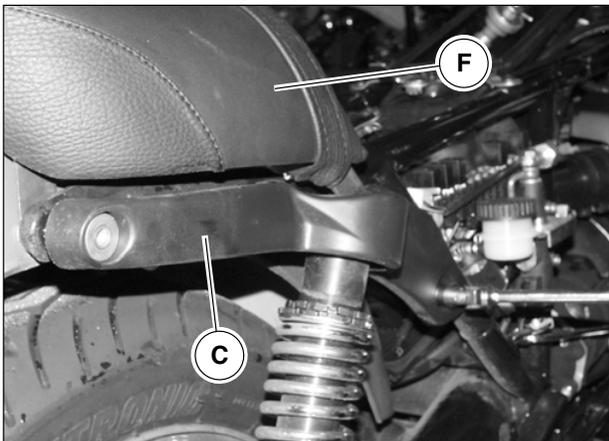
Removal:

- Remove front seat as described in **chapter 4 section E**;
- Disconnect electric wirings "A" between the main cable group and the tail-light wiring;
- Unscrew clamping nuts "B" between mudguard and chassis;
- Remove protections "C" on **CALIFORNIA STONE**;
- Remove protections "D" and luggage rack "E" on **CALIFORNIA EV**;
- Remove rear seat "F";
- Remove mudguard, with fitted tail-light, by moving it backwards.



Reassembly:

Carry out the procedures in reverse order.



HINTERES SCHUTZBLECH CALIFORNIA EV(1997-2000) - CALIFORNIA JACKAL - CALIFORNIA STONE**Abnehmen:**

- Den Vordersitz, wie in **Kap.4, Abschnitt E** beschrieben, abnehmen.
- Die elektrischen Anschlüsse „A“ zwischen der Hauptkabelgruppe und der Verkabelung des Rücklichts abtrennen.
- Die Muttern „B“ für die Befestigung des Schutzblechs am Rahmen lösen.
- Die Schutzabdeckungen „C“ für **CALIFORNIA STONE** entfernen.
- Die Schutzabdeckungen „D“ und den Gepäckträger für **CALIFORNIA EV** entfernen.
- Den Hintersitz „F“ entfernen.
- Das Schutzblech mit montiertem Rücklicht von hinten abnehmen und entfernen.

Wiedereinbau:

Den Ausbau in umgekehrter Reihenfolge ausführen.

ACHTERSTE SPATBORD CALIFORNIA EV(1997-2000) - CALIFORNIA JACKAL - CALIFORNIA STONE**Demontage:**

- Demonteer het voorste zadel zoals beschreven in **hoofdstuk 4 deel E**;
- Maak de elektrische aansluitingen „A“ tussen de hoofdbedrading en de achterlichtbedrading los;
- Schroef de moeren „B“ los waarmee het spatbord op het frame is vastgemaakt;
- Verwijder de schotten „C“ van de **CALIFORNIA STONE**;
- Verwijder de schotten „D“ en de bagagedrager „E“ op de **CALIFORNIA EV**;
- Demonteer het achterste zadel „F“;
- Trek het spatbord met achterlicht er naar achter af.

Remontage:

De operaties van demontage in omgekeerde volgorde uitvoeren.



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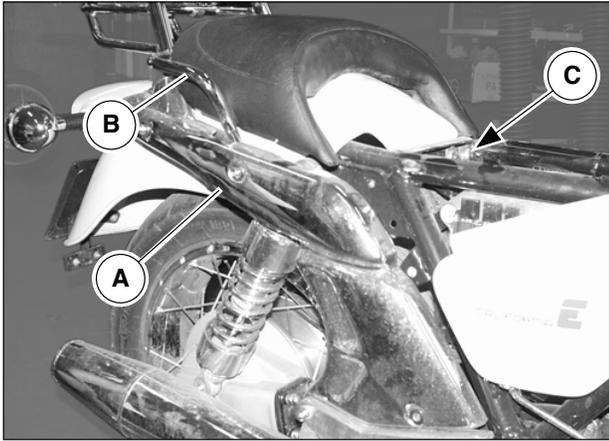
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REAR MUDGUARDS CALIFORNIA EV 2001 - CALIFORNIA SPECIAL - CALIFORNIA SPECIAL SPORT

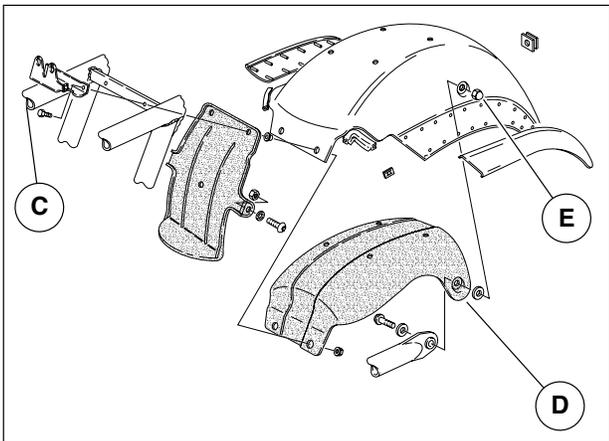
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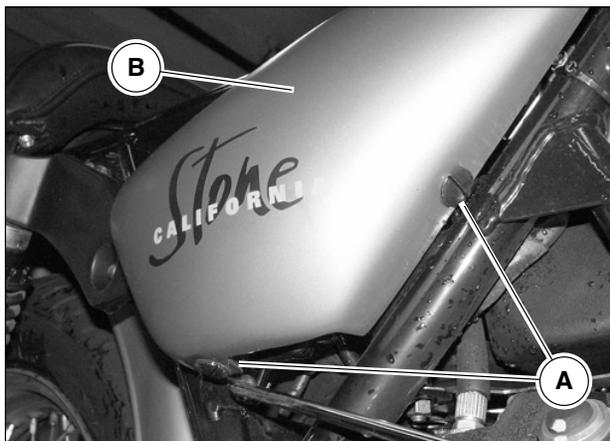
- Remove front seat as described in **chapter 4 section E**;
- Disconnect electric wirings between the main cable group and the tail-light wiring;
- Remove rear seat from mudguard;
- Remove side protections "A" (only on **EV 2001**) and "F" (only on **SPECIAL** and **SPECIAL SPORT**);
- Remove luggage rack "B" (only on **EV 2001**);
- Unscrew the 2 front screws "C" fastening the mudguard to its support "D"
- Unscrew the 2 side nuts "E".



Reassembly:

Carry out the procedures in reverse order.





3 SIDE PANELS

SIDE PANELS CALIFORNIA EV - CALIFORNIA JACKAL - CALIFORNIA STONE

Removal:

- Remove the 2 screws "A" fastening the chassis
- Remove the saddle cover "B".

Reassembly:

Carry out the procedures in reverse order.



SIDE PANELS CALIFORNIA SPECIAL - CALIFORNIA SPECIAL SPORT

Removal:

- Pull outwards to release the pressurized side body panel "B" (3 clamping pins)

Reassembly:

- Place the 3 clamping pins into the fastening rubber caps on the chassis and press on it.

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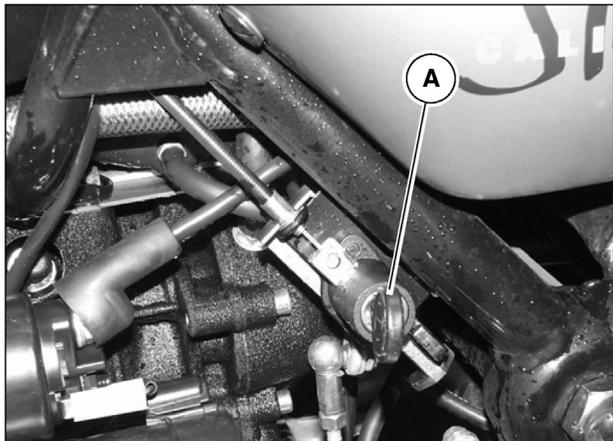
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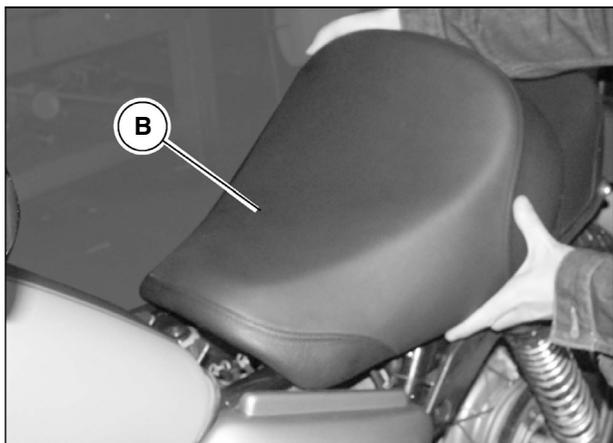


4 FRONT SEAT

To remove the saddle from the chassis it is necessary to:

- Release the saddle using the wrench "A";
- Slightly lift the rear part of the saddle;
- Detach the saddle "B" by moving it backwards

To refit the saddle, lock it in the front part and lower it until it is fixed in its bay.



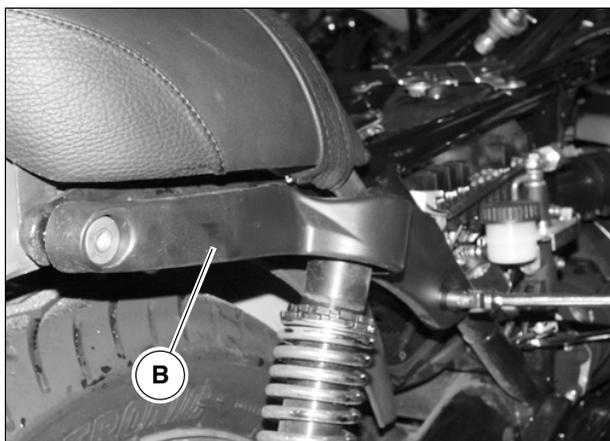


5 REAR SEAT

REAR SEAT CALIFORNIA EV(1997-2000) - CALIFORNIA JACKAL - CALIFORNIA STONE

Removal:

- Remove front seat as described in **chapter 4** of this section;
- Remove side protections "A" on **CALIFORNIA EV** and "B" on **CALIFORNIA STONE**;
- Loosen screws "C";
- Remove the seat.



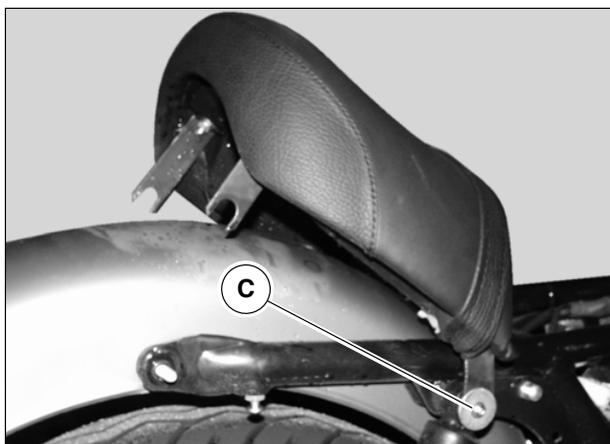
CALIFORNIA EV 2001 - CALIFORNIA SPECIAL - CALIFORNIA SPECIAL SPORT

Removal:

- Unscrew the 4 nuts fixing it to inner side of the rear mudguard.

Reassembly:

Carry out the procedures in reverse order.



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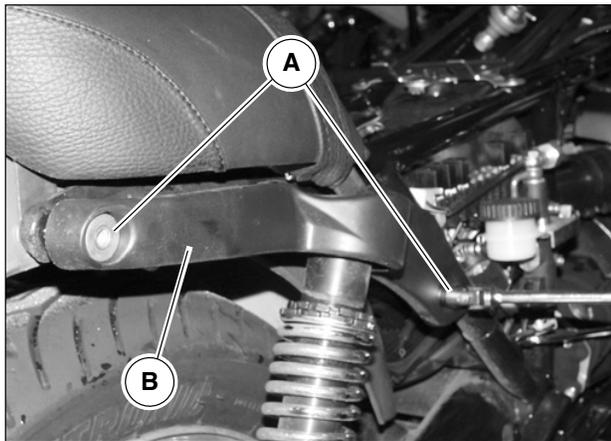
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6 REAR CHASSIS PROTECTIONS

CALIFORNIA STONE

Removal:

- Unscrew the 2 nuts "A" fixing it to the chassis;
- Remove protection "B".

Reassembly:

Carry out the procedures in reverse order.



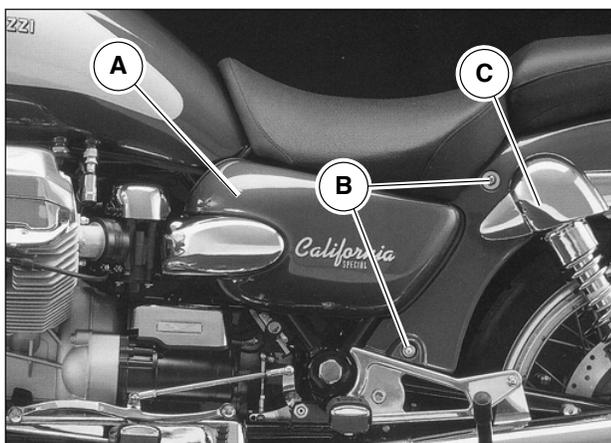
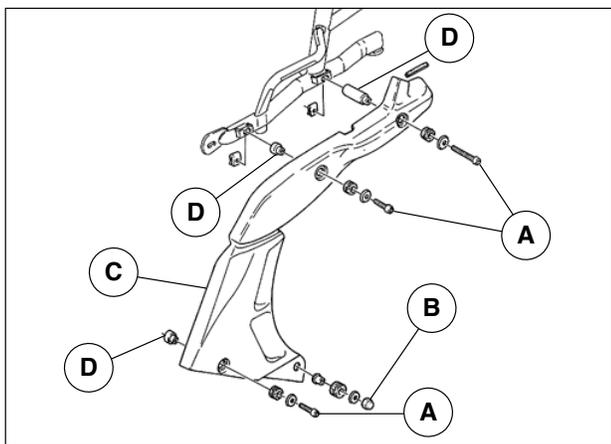
CALIFORNIA EV

Removal:

- Unscrew the 3 screws "A" and the lower nut "B";
- Remove protection "C" and the 3 spacers "D".

Reassembly:

Carry out the removal procedures in reverse order and remember to place again the 3 spacers "D" correctly



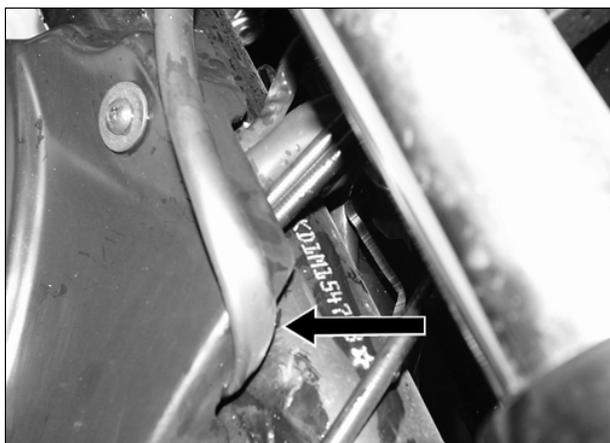
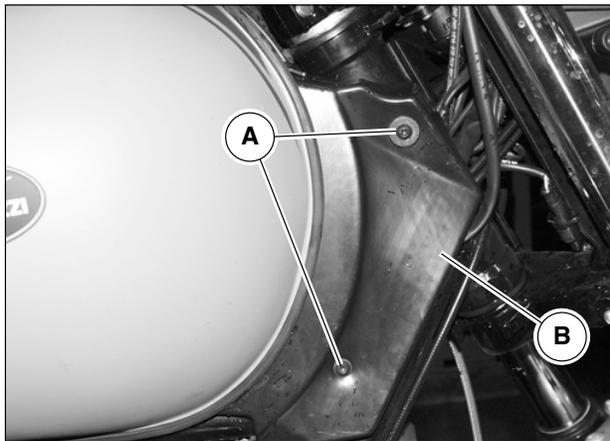
CALIFORNIA SPECIAL - CALIFORNIA SPECIAL SPORT

Reassembly:

- Remove side body panel "A" as described in **chapter 3** of this section;
- Loosen the 2 screws "B";
- Remove protection together with the shock absorber cover "C".

Reassembly:

Carry out the procedures in reverse order.



7 FRONT CHASSIS PROTECTIONS

Removal:

- Loosen the 2 screws "A";
- Remove protection "B".

Reassembly:

Carry out the removal procedures in reverse order and pay attention to the exact routing of the electric wiring on the steering tube.

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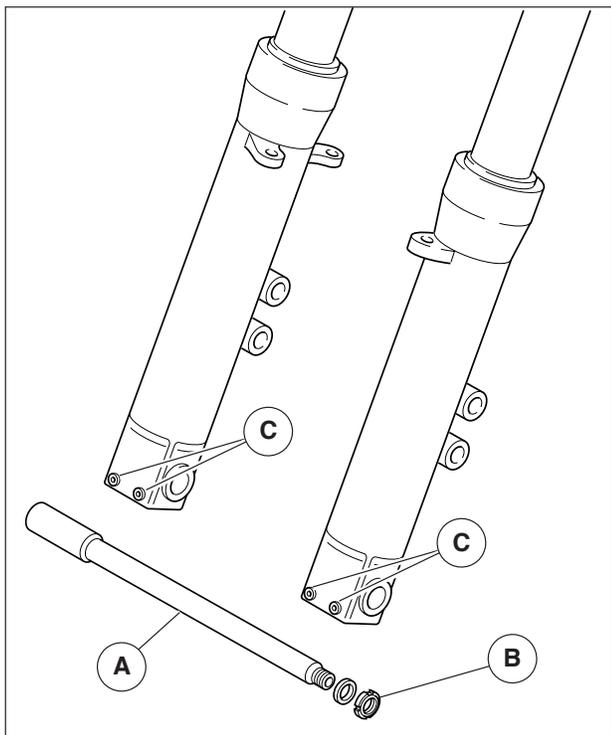
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1 FRONT WHEEL

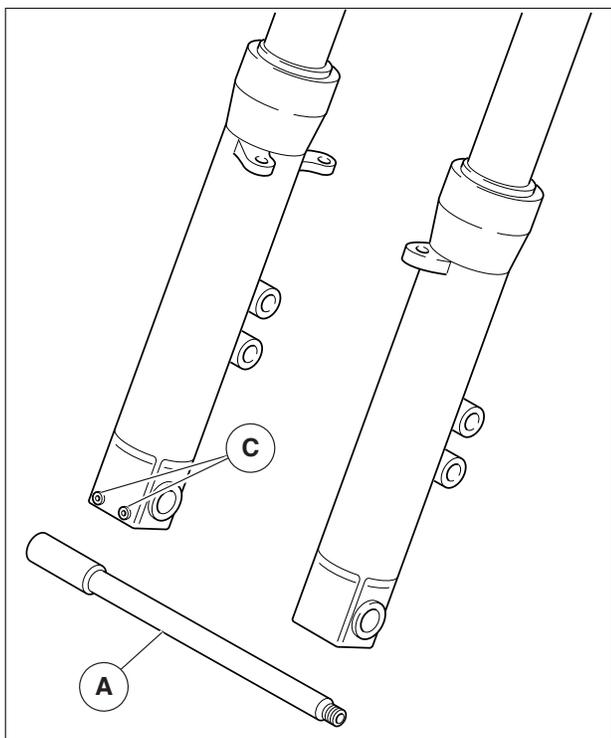
CALIFORNIA EV(1997-2000) - CALIFORNIA JACKAL - CALIFORNIA SPECIAL

The above-mentioned models can be fitted with 2 different types of wheel shaft fastening:

- 1) The threaded part of shaft "A" comes out of the left-hand leg and is then fixed with a nut "B", the screws "C" ensure tightening.

● **N.B. This type of assembly has been applied until chassis no.:**

- CALIFORNIA EV(1997-2000) KD115426;
- CALIFORNIA JACKAL KD152328;
- CALIFORNIA SPECIAL KD131644.



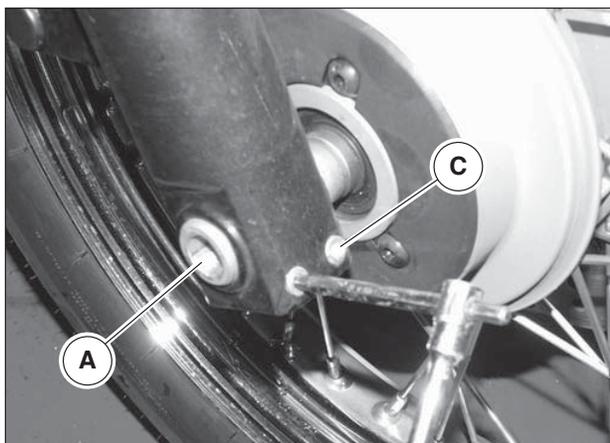
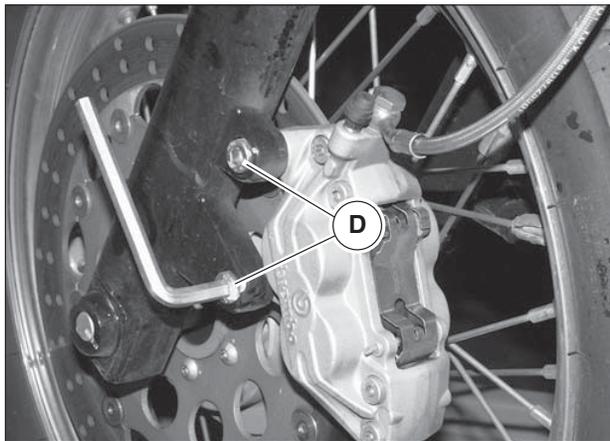
- 2) The shaft "A" is to be screwed on the threaded left-hand leg, the screws "C" ensure tightening.

● **N.B. This type of assembly has been applied from chassis no.:**

- CALIFORNIA EV(1997-2000) KD115427;
- CALIFORNIA JACKAL KD152329;
- CALIFORNIA SPECIAL KD131645.

CALIFORNIA EV 2001 - CALIFORNIA STONE - CALIFORNIA SPECIAL SPORT

The above-mentioned models have been fitted, since the first manufactured motorbike, with the shaft threaded directly on the leg.



REMOVAL1 (WITH THROUGH WHEEL SHAFT AND BACK NUT)

- Place the vehicle on the centre stand (if available).
- Place anyway a support under the motorbike to lift the front wheel from ground.
- Unscrew screws "D" fixing the caliper (JACKAL - STONE) or the calipers (EV - SPECIAL - SPECIAL SPORT) to the fork leg.
- Remove the caliper/s from the brake disks.
- Unscrew back nut "B" from the wheel shaft with the proper wrench part no. 01929300 (see picture on page 2 of this section).
- Loosen the 4 fastening screws "C" between the shaft and the fork leg.
- Remove shaft "A" with its spacers and then remove the wheel.

Refer to chapter 3 of this section for wheel overhaul.

REASSEMBLY1

After carrying out all necessary wheel checks, reassemble as follows:

- Place the complete wheel between the fork legs.
- Lubricate the shank and the thread of the wheel shaft with the suggested grease.
- Place the spacers and make the shaft rest on the wheel hub.
- Lubricate the thread and the underhead of the lock nut "B", then screw it on the wheel shaft end.
- Tighten the 4 screws "C" to the prescribed torque.
- Lock the nut "B" to the prescribed tightening torque.
- Check that the disks run freely inside the calipers and then operate the brake lever repeatedly to bring the calipers pistons to the normal position.

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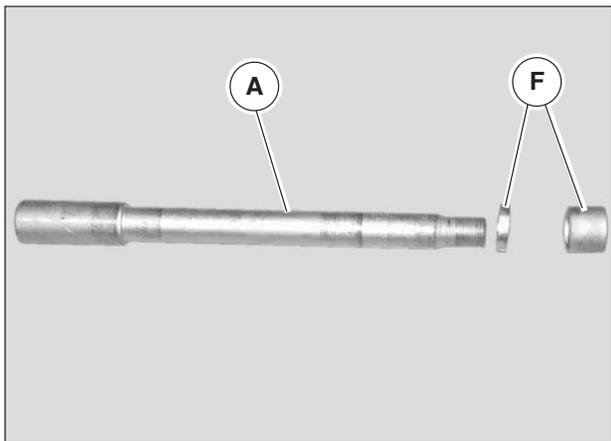
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REMOVAL 2 (WITH SHAFT SCREWED ON THE LEG)

- Place a support under the motorbike to lift the front wheel from ground.
- Remove calipers as described in removal (1).
- Loosen the 2 fastening screws between the shaft and the fork legs.
- Remove shaft "A", remove spacers "F" and then remove the wheel.

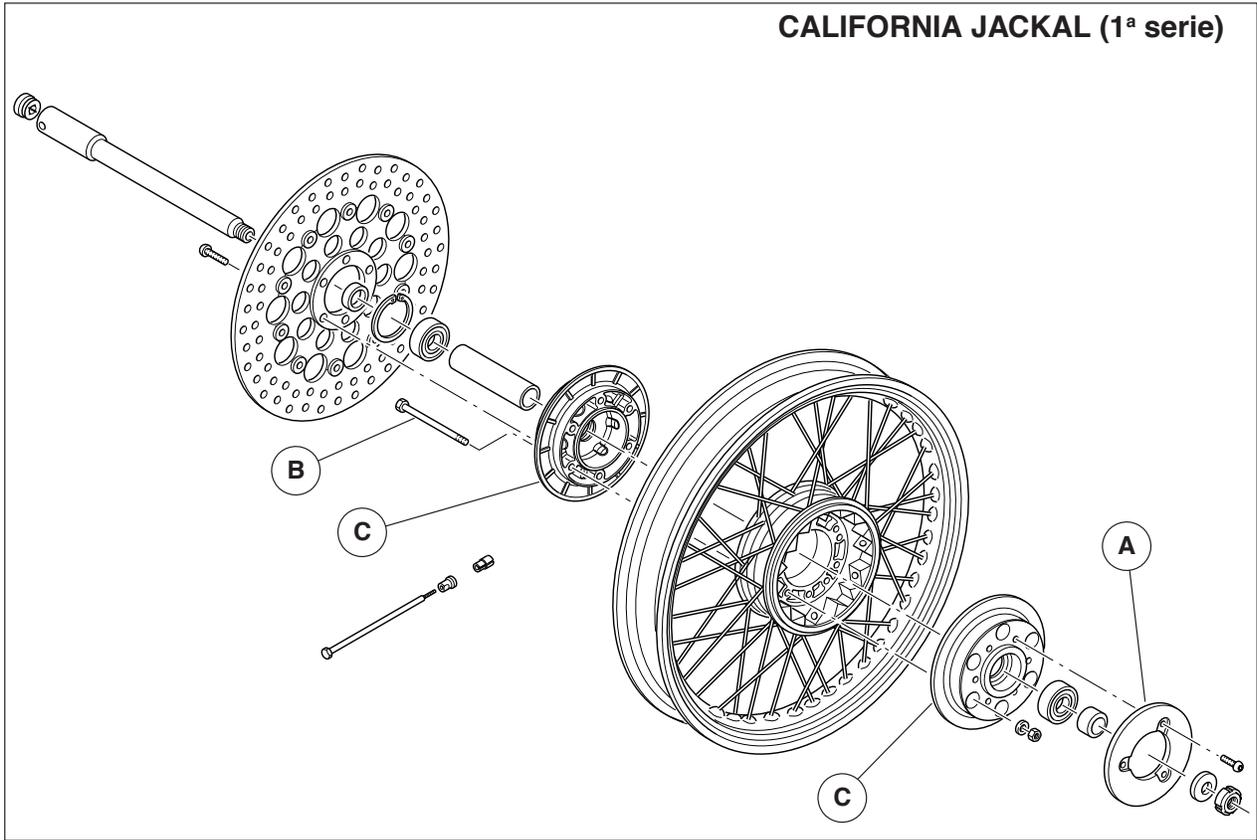
Refer to chapter 3 of this section for wheel overhaul.

REASSEMBLY 2

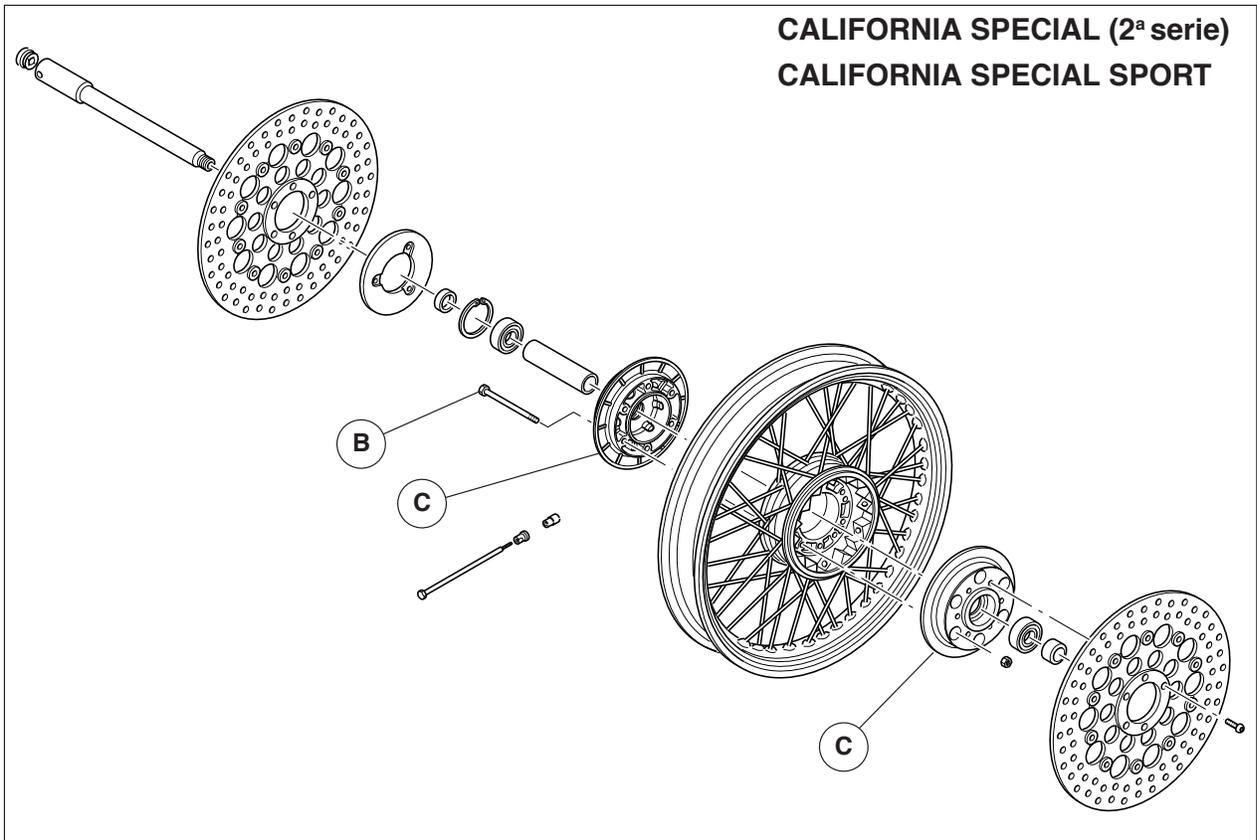
After carrying out all necessary wheel checks, reassemble as follows:

- Place the complete wheel between the fork legs.
- Lubricate the shank and the thread of the wheel shaft with the suggested grease.
- Lubricate the thread in the left-hand leg.
- Place the spacers and screw in the wheel shaft.
- Tighten the 2 screws fastening shaft and leg at the prescribed torque.
- Reassemble the brake caliper/s and tighten the fastening screws to the prescribed torque.
- Check that the disks run freely inside the calipers and then operate the brake lever repeatedly to bring the calipers pistons to the normal position.

CALIFORNIA JACKAL (1ª serie)



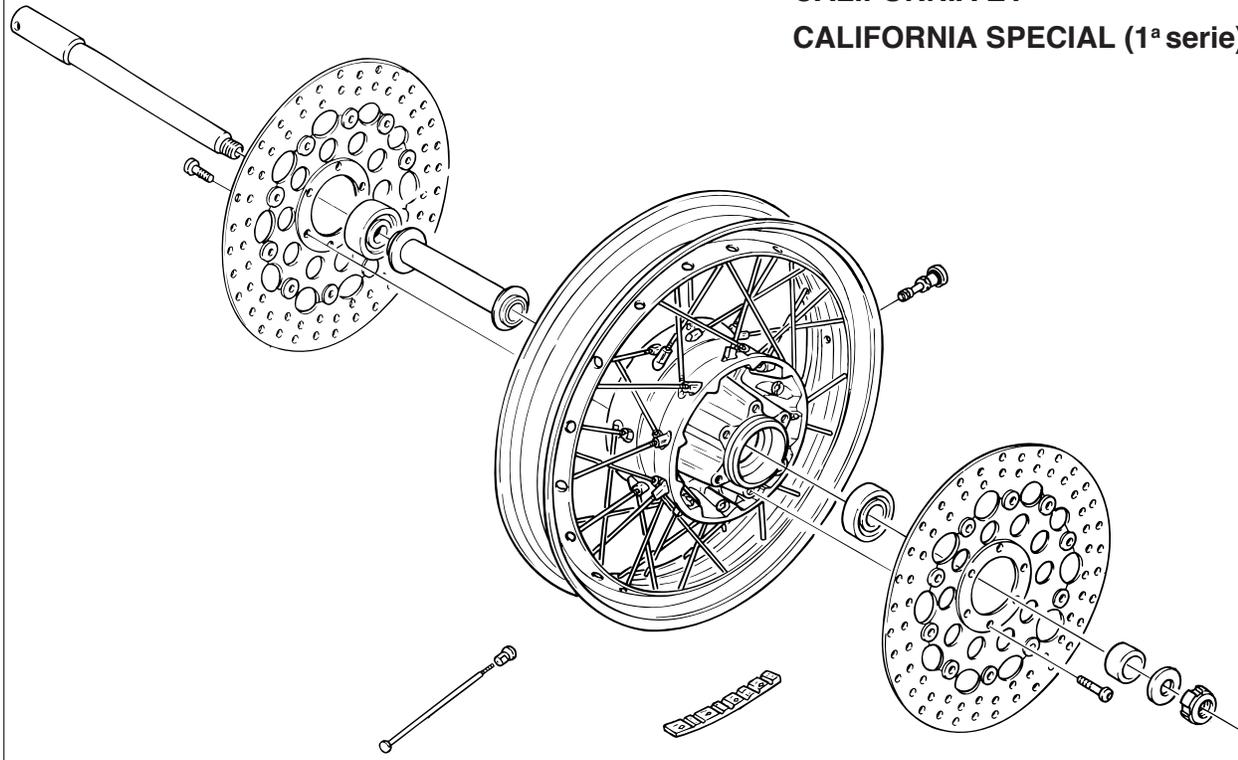
**CALIFORNIA SPECIAL (2ª serie)
CALIFORNIA SPECIAL SPORT**



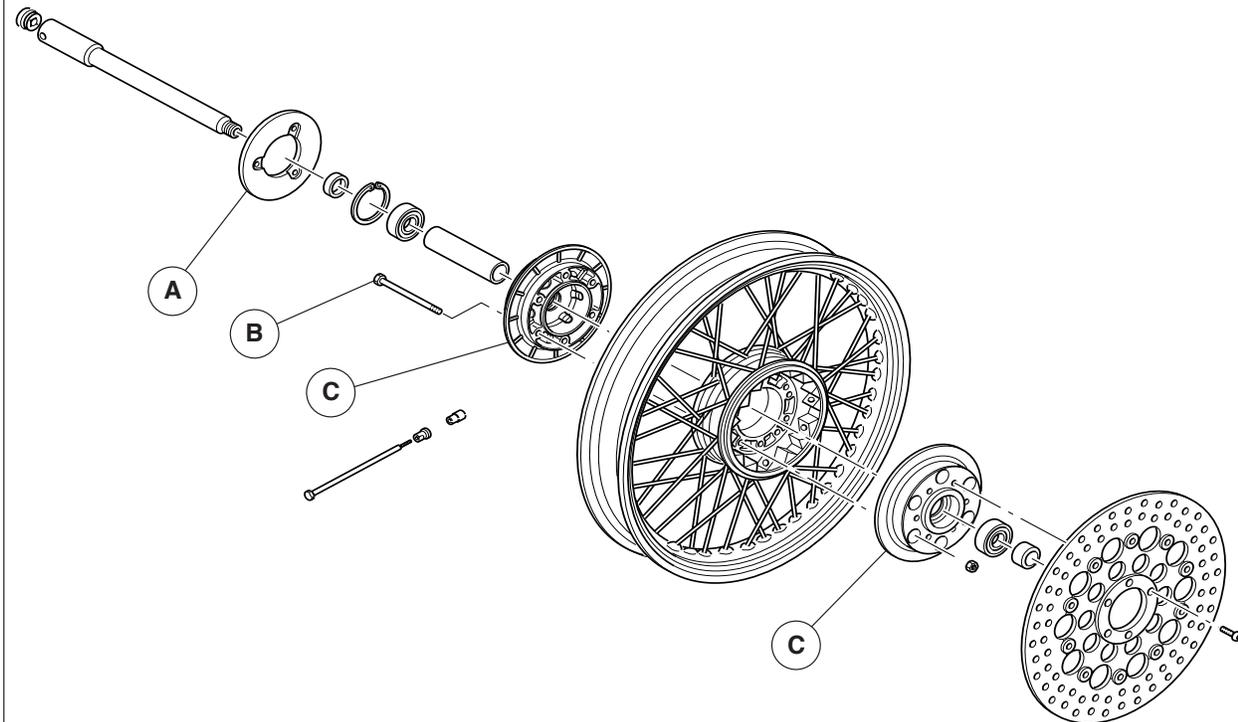
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**CALIFORNIA EV
CALIFORNIA SPECIAL (1ª serie)**



**CALIFORNIA JACKAL (2ª serie)
CALIFORNIA STONE**





BRAKE DISKS SPACING FLANGES

REMOVAL FOR CALIFORNIA JACKAL - CALIFORNIA STONE

- Remove wheel as described in chapter 1 of this section.
- Remove brake disk as described in chapter 4 of this section.
- Remove flange protection "A".
- Unscrew screws "B".
- Remove flanges "C".

 **N.B. See pages 8-9 of this section for reference.**

REASSEMBLY

- Carry out the removal procedures in reverse order.

REMOVAL FOR CALIFORNIA SPECIAL (2ND SERIES) - CALIFORNIA SPECIAL SPORT

- Remove the wheel as described in chapter 1 of this section.
- Remove the brake disks as described in chapter 4 of this section.
- Unscrew screws "B".
- Remove flanges "C".

 **N.B. See pages 8 of this section for reference.**

REASSEMBLY

- Carry out the removal procedures in reverse order.

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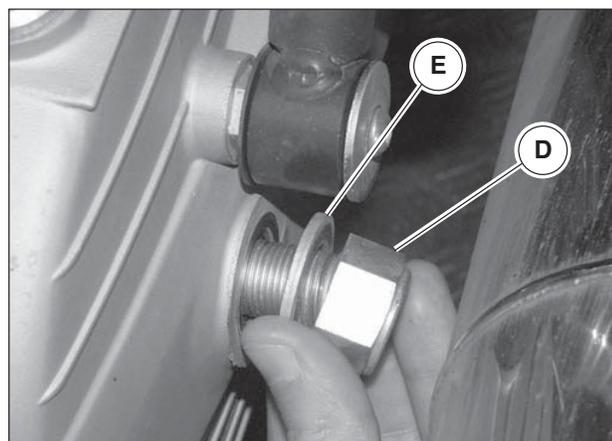
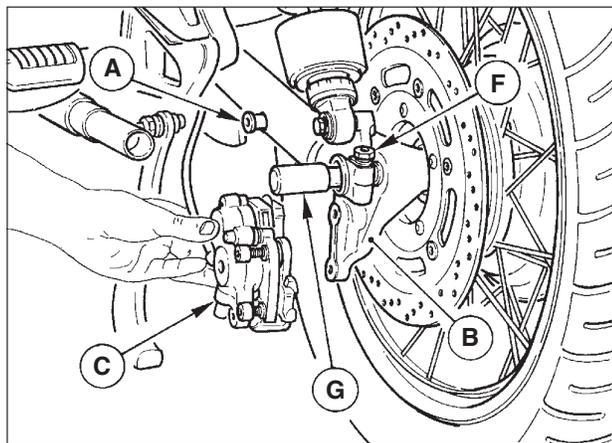
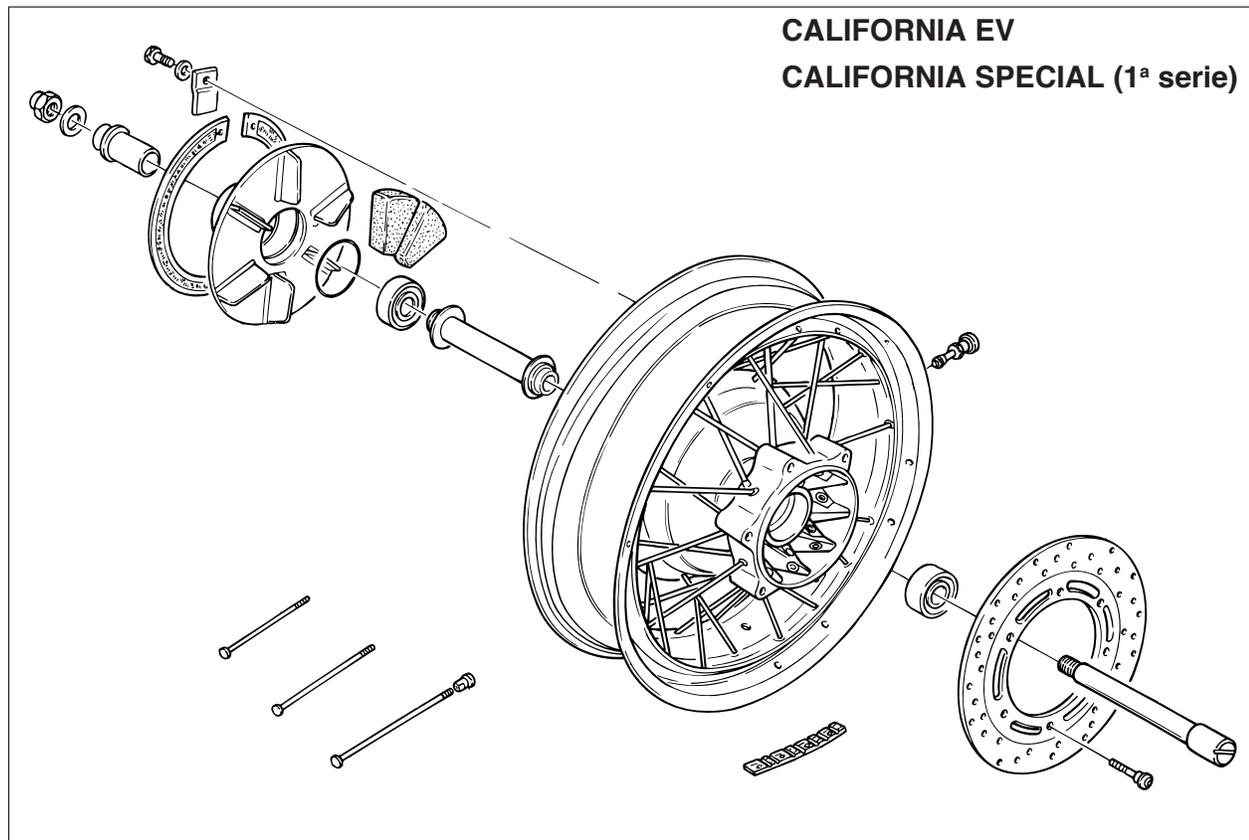
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2 REAR WHEEL



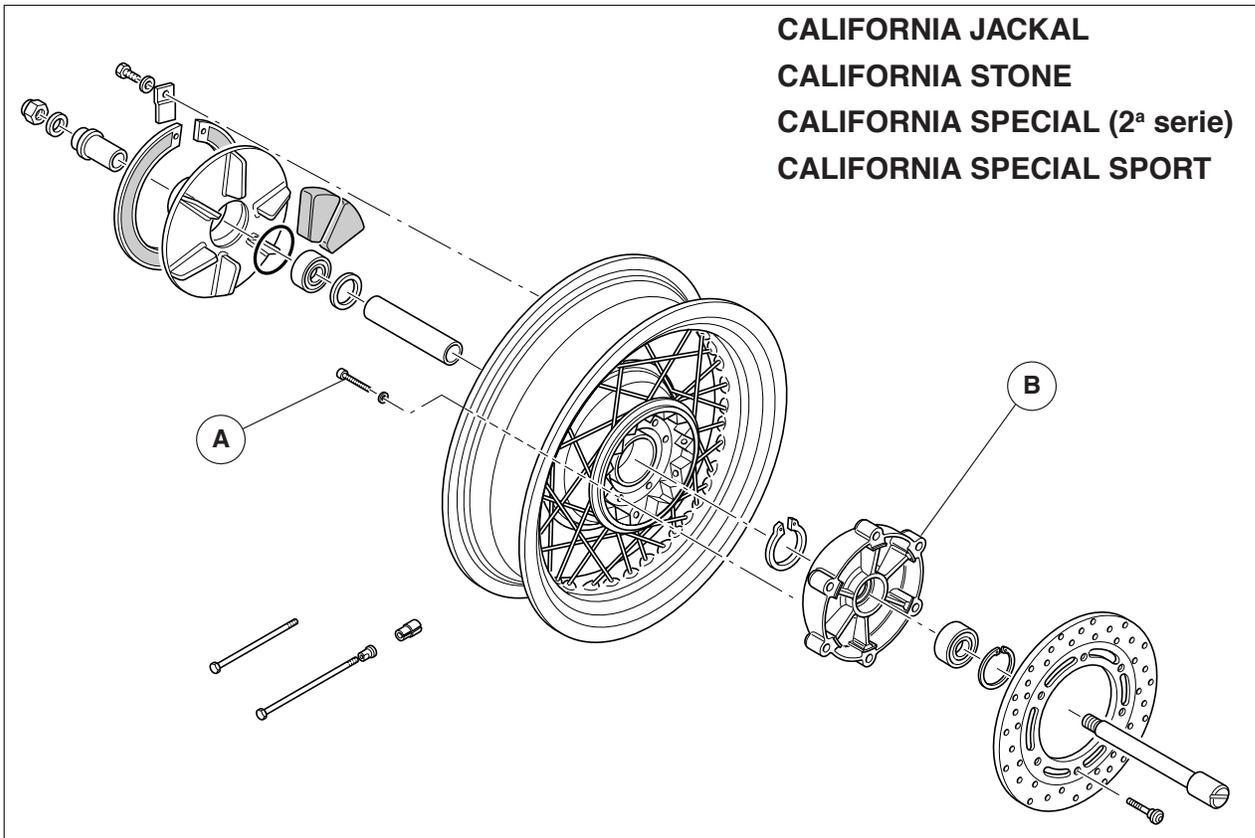
REMOVAL FOR CALIFORNIA EV (1997-2000) - CALIFORNIA SPECIAL - CALIFORNIA JACKAL

- Place a paddock stand under the swinging arm to keep the rear wheel lifted from ground.
- Remove left-hand silencer as described in chapter 2 section L.
- Unscrew setscrew "A" of the caliper support plate "B".
- Unscrew brake caliper "C" from the caliper support plate "B".
- Unscrew nut "D" with washer "E" on shaft, housing side.
- Loosen locking screw of shaft "F" on the swinging arm.
- Remove shaft "G" from housing, from hub and from swinging arm.
- Remove caliper support plate "B".
- Tilt the vehicle on the right hand side enough to be able to remove the wheel from the swinging arm and the transmission housing.

To reassemble the wheel, carry out the removal procedure in reverse order and remember to place the caliper support plate on the retainer "A" of the left section of the swinging arm.

2 HINTERRAD

2 ACHTERWIEL



CALIFORNIA JACKAL
CALIFORNIA STONE
CALIFORNIA SPECIAL (2^a serie)
CALIFORNIA SPECIAL SPORT

ABNAHME CALIFORNIA EV(1997-2000) - CALIFORNIA SPECIAL - CALIFORNIA JACKAL

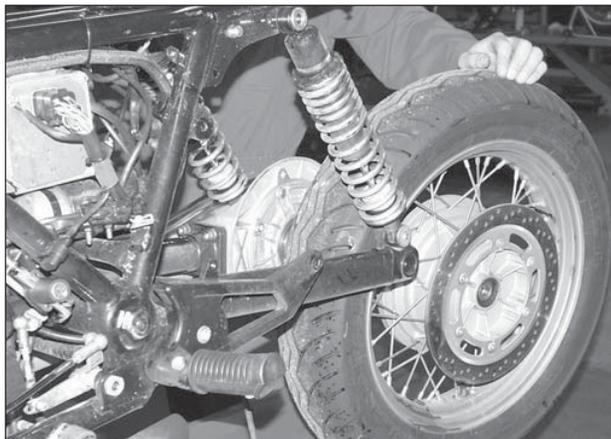
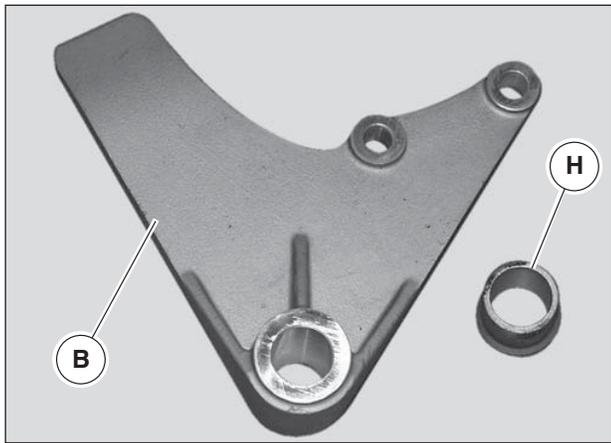
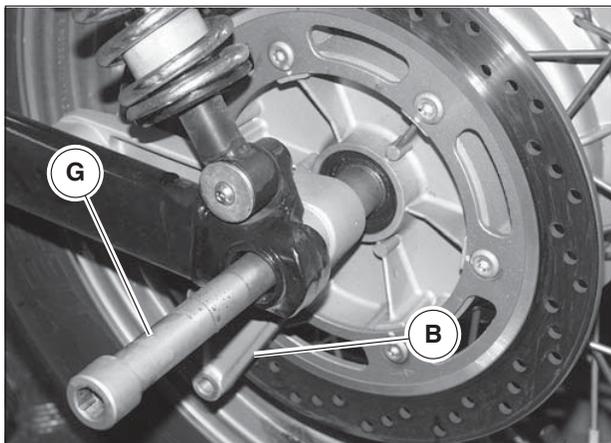
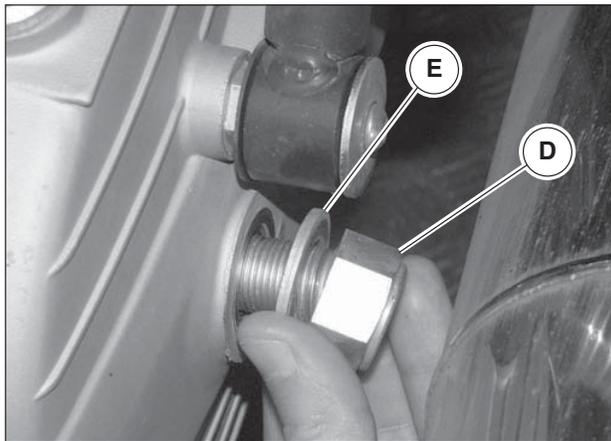
- Unter der Hinterradschwinge einen Motorradbock anordnen, so dass das Hinterrad angehoben werden kann.
- Den linken Dämpfer, wie in Kap. 2 Abschnitt L beschrieben, entfernen
- Die Achsfeststellschraube "A" für die Zangenträgerplatte "B" lösen.
- Die Bremszange "C" aus der Zangenträgerplatte "B" ausbauen.
- Die Mutter "D" mit der Unterlegscheibe "E" auf der Achse Gehäusesseite lösen.
- Die Achsbefestigungsschraube "F" auf dem Arm der Hinterradschwinge lockern.
- Die Achse "G" aus dem Gehäuse, der Nabe und dem Arm der Hinterradschwinge nehmen.
- Die Zangenträgerplatte "B" herausnehmen.
- Das Fahrzeug so weit auf die rechte Seite neigen, dass das Rad vom Arm der Hinterradschwinge und das Antriebsgehäuse herausgenommen werden können.

Den Einbau des Rades in umgekehrter Reihenfolge ausführen und berücksichtigen, dass die Zangenträgerplatte auf der Feststellvorrichtung „A“ der linken Hinterradschwinge montiert werden muss.

VERWIJDEREN: CALIFORNIA EV(1997-2000) - CALIFORNIA SPECIAL - CALIFORNIA JACKAL

- Onder de achtervork een steun of standaard plaatsen zodat het achterwiel van de vloer is opgetild;
- de linker knaldemper verwijderen zoals beschreven in het hoofdstuk 2 deel L
- de schroef-pen "A" losdraaien die de klauwplaat "B" blokkeert;
- de remklauw "C" van de klauwplaat "B" verwijderen;
- de moer "D" met het roosje "E" op de pen aan de kastkant eraf draaien;
- de borgmoer van de pen "F" op de achtervorkarm losdraaien;
- De pen "G" uit de kast, de as en de vorkarm halen;
- De plaat van de remklauw "B" eruit trekken;
- het voertuig net genoeg naar de rechterkant laten overhellen om het wiel uit de vorkarm en de transmissiekast te halen.

Om het wiel weer te monteren herhaalt u de demontageverrichtingen in de omgekeerde richting, maar vergeet u niet de plaat voor de remklauw op de stop "A" van de linker vorkarm te steken.

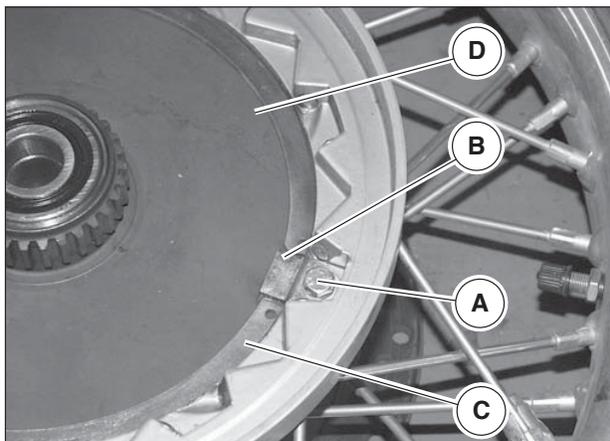


REMOVAL FOR CALIFORNIA EV 2001 -

CALIFORNIA STONE - CALIFORNIA SPECIAL SPORT

- Place a paddock stand under the swinging arm to keep the rear wheel lifted from ground.
- Remove left-hand silencer as described in chapter 2 section L.
- Unscrew brake caliper from the caliper "B" support plate.
- Unscrew nut "D" with washer "E" on the shaft – housing side.
- Remove shaft "G" from housing, from hub and from swinging arm.
- Remove calipersupport plate "B" and spacer "H".
- Tilt the vehicle on the right hand side enough to be able to remove the wheel from the swinging arm and the transmission housing.

To reassemble the wheel, carry out the removal procedure in reverse order and remember to place the caliper support plate on the retainer of the left section of the swinging arm.

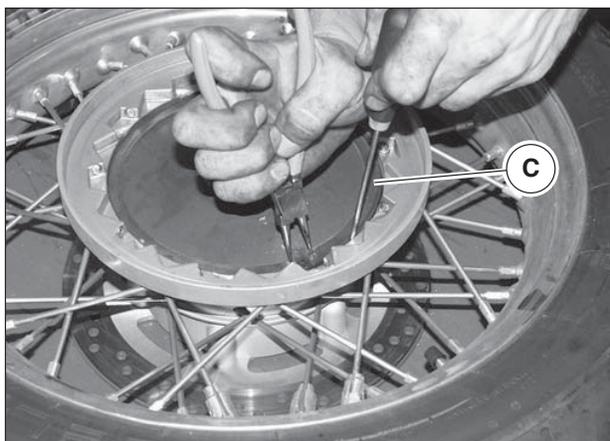


REAR WHEEL HUB REMOVAL – RUBBER CUSH DRIVE DAMPER SIDE

REMOVAL

- Unscrew the screw “A”.
- Remove the ring stop plate “B”.
- Remove the split ring “C” with special pliers and a screwdriver.
- Remove the rubber cush drive damper plate “D”.
- Once the plate has been removed, the rubber cush drive damper pads “E” will be visible. If these are damaged, replace them.

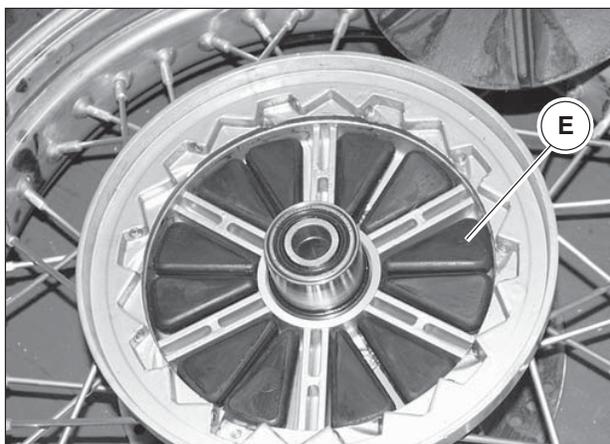
See chapter 3 of this section for a complete wheel overhaul.



REASSEMBLY

After carrying out all necessary wheel checks, reassemble as follows:

- Lubricate the shaft and the thread of the wheel shaft with the suggested grease and partially insert it in the swinging arm.
- Place the plate together with the caliper on the left-hand section of the swinging arm.
- Insert the spacer.
- Place the wheel in the swinging arm;
- Slide in the shaft fully;
- Screw in the nut with the washer and tighten it to the prescribed torque.





A

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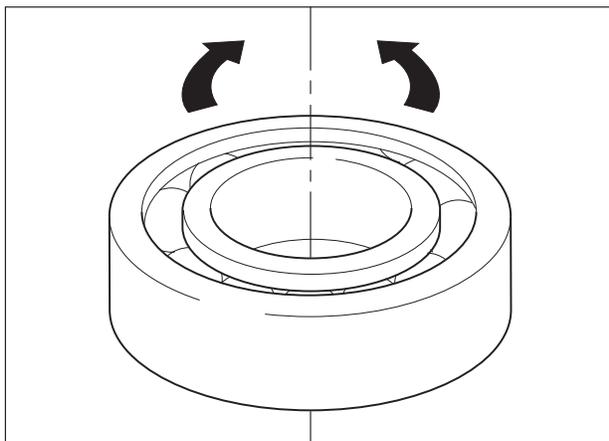
REAR BRAKE DISK SPACER FLANGE CALIFORNIA JACKAL
- CALIFORNIA STONE - CALIFORNIA SPECIAL 2ND SERIES
- CALIFORNIA SPECIAL SPORT

REMOVAL

- Remove the wheel as described in chapter 2 of this section.
- Remove the brake disk as described in chapter 4 of this section.
- Unscrew the screws "A" (see picture on page 13 of this section).
- Remove flange "B" (see picture on page 13 of this section).

REASSEMBLY

Carry out the removal procedures in reverse order.



3 WHEEL OVERHAUL

BEARINGS

Before checking the dimensions, it is necessary to check for the wear condition of the wheel hub bearings; this test must be carried out manually with the bearing fitted in its seat.

- Turn the inner ring in both directions: this must be capable of turning softly and silently, without interference.
- Push the inner ring outwards, continually changing position, to check if there is backlash.
- Remove and replace the bearings which do not turn softly and silently or which feature a backlash.

■ IMPORTANT

Excessive wear may be due to vehicle vibrations and instability.

- To remove the bearing, use a hammer and a spindle to exert pressure on the inner ring until the bearing is extracted;
- Continually move the pressure point in order to extract the part as linearly as possible.

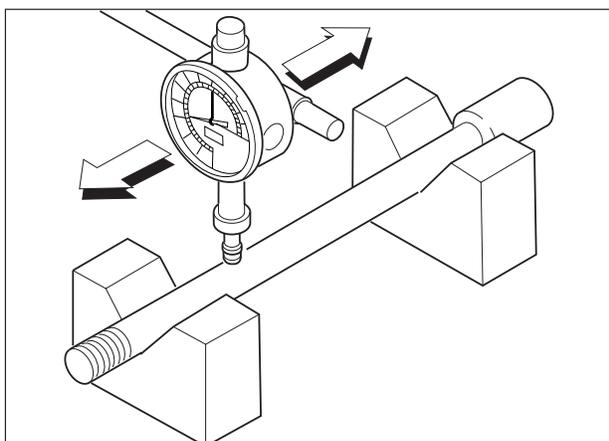
■ IMPORTANT

Removed bearings must not be refitted.

- When new bearings are fitted, check that the seats show no signs of denting or scratching.
- Lubricate the seat before refitting the bearing, then push it in its seat.
- Use a tubular punch to exert pressure only on the external bearing ring, until it is completely inserted.

👁 N.B.

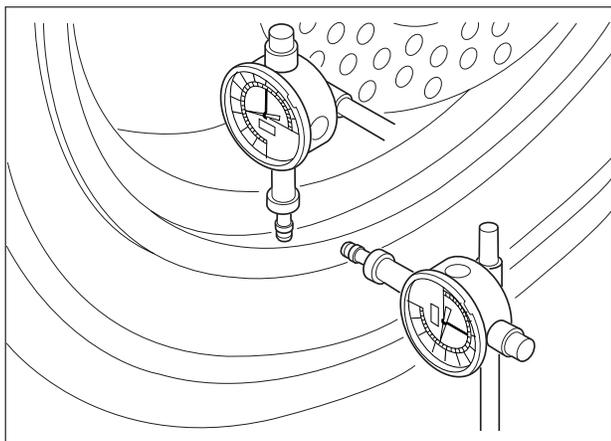
After every operation on the wheel, it is advisable to balance it.



WHEEL SPINDLE

Check the extent of the wheel spindle distortion : Turn the spindle on a checking plane and check the maximum distortion value using a feeler gauge;

- Operating limit over 100 mm: 0,2 mm.



WHEELS

Having made sure that the bearings are in good condition, it is necessary to check the rim following the below procedures:

- Check for any eventual irregularities, dents or cracks with a visual inspection: if these faults are present, replace the rim;
- Insert the spindle into the wheel and position it on two fixed checking planes;
- Insert a dial gauge, supporting it in order to measure the wheel rim's side skidding and radial runout with respect to the spindle axis.

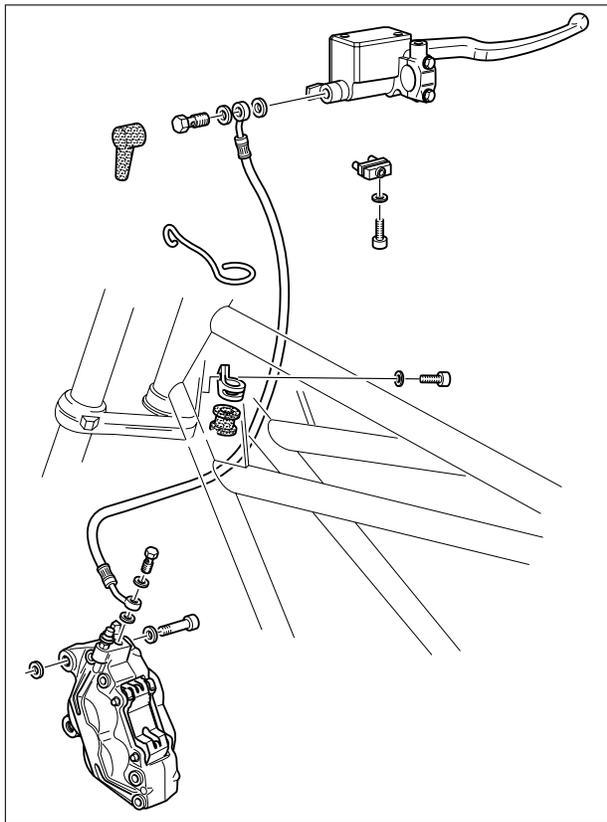
N.B.

The side skidding and actual radial runout shall be equal to half of the total value displayed by the measuring instrument.

Standard values:

- Side skidding: 0,5 mm
- Radial runout: 0,8 mm
- Operating limit: 2 mm

If the detected values are not within the limits, it is necessary to replace the rim.



4 FRONT LEFT-HAND HYDRAULIC BRAKE CALIFORNIA JACKAL - CALIFORNIA STONE

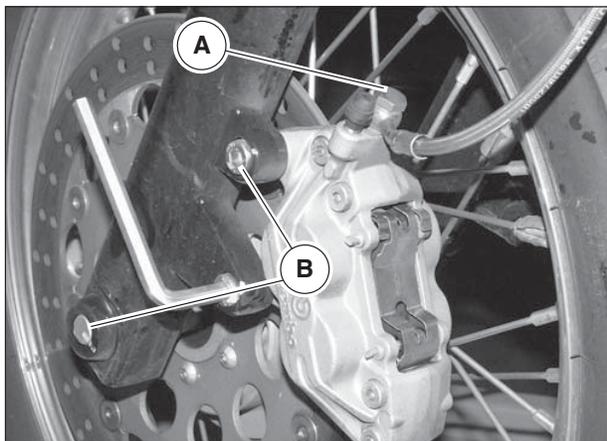
BRAKE CALIPERS

Disassembly:

- Drain the hydraulic system thoroughly, as described in chapter 2, section D;
- Unscrew the hollow screw "A" and remove the tube as well as the two gaskets from the two calipers;
- Unscrew the two screws "B" fastening the supports and remove the two calipers.

Reassembly:

- Carry out the disassembly procedures in reverse order;
- Fill the braking system with recommended fluid.
- Pump several times using the control lever until the pads bed in.



A

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C

D

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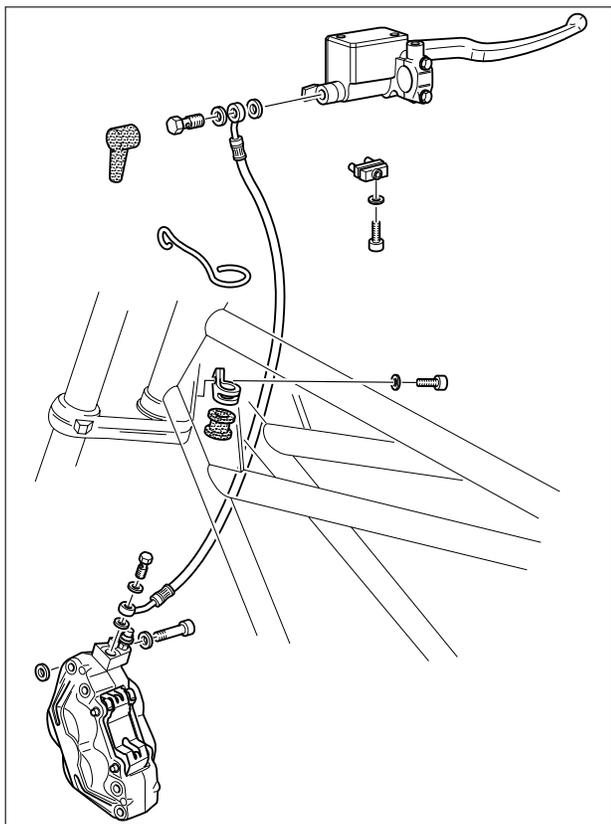
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5 FRONT RIGHT-HAND HYDRAULIC BRAKE CALIFORNIA EV - CALIFORNIA SPECIAL - CALIFORNIA SPECIAL SPORT

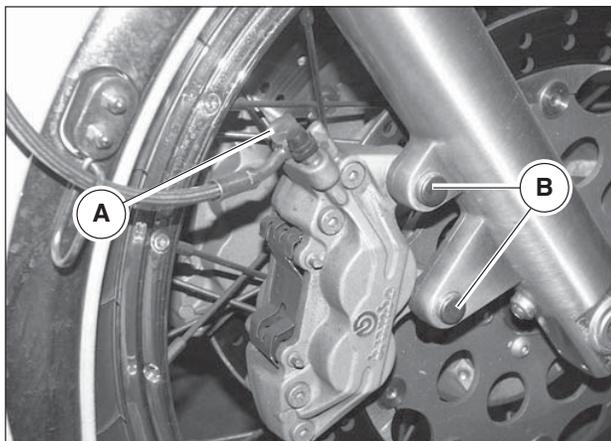
BRAKE CALIPERS

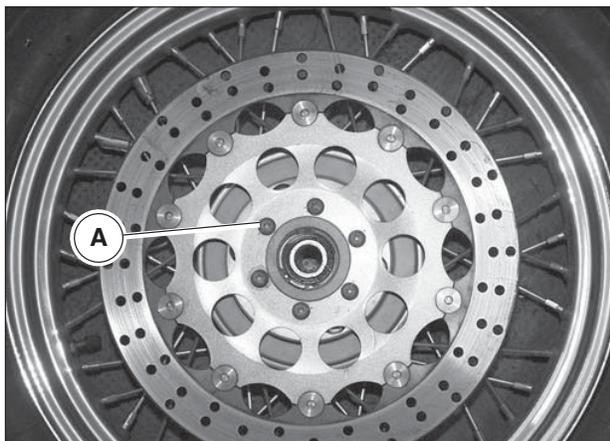
Disassembly:

- Drain the hydraulic system thoroughly, as described in chapter 2, section D;
- Unscrew the hollow screw “A” and remove the tube as well as the two gaskets from the two calipers;
- Unscrew the two screws “B” fastening the supports and remove the two calipers.

Reassembly:

- Carry out the disassembly procedures in reverse order;
- Fill the braking system with recommended fluid.
- Pump several times using the control lever until the pads bed in.





BRAKE DISKS

Disassembly:

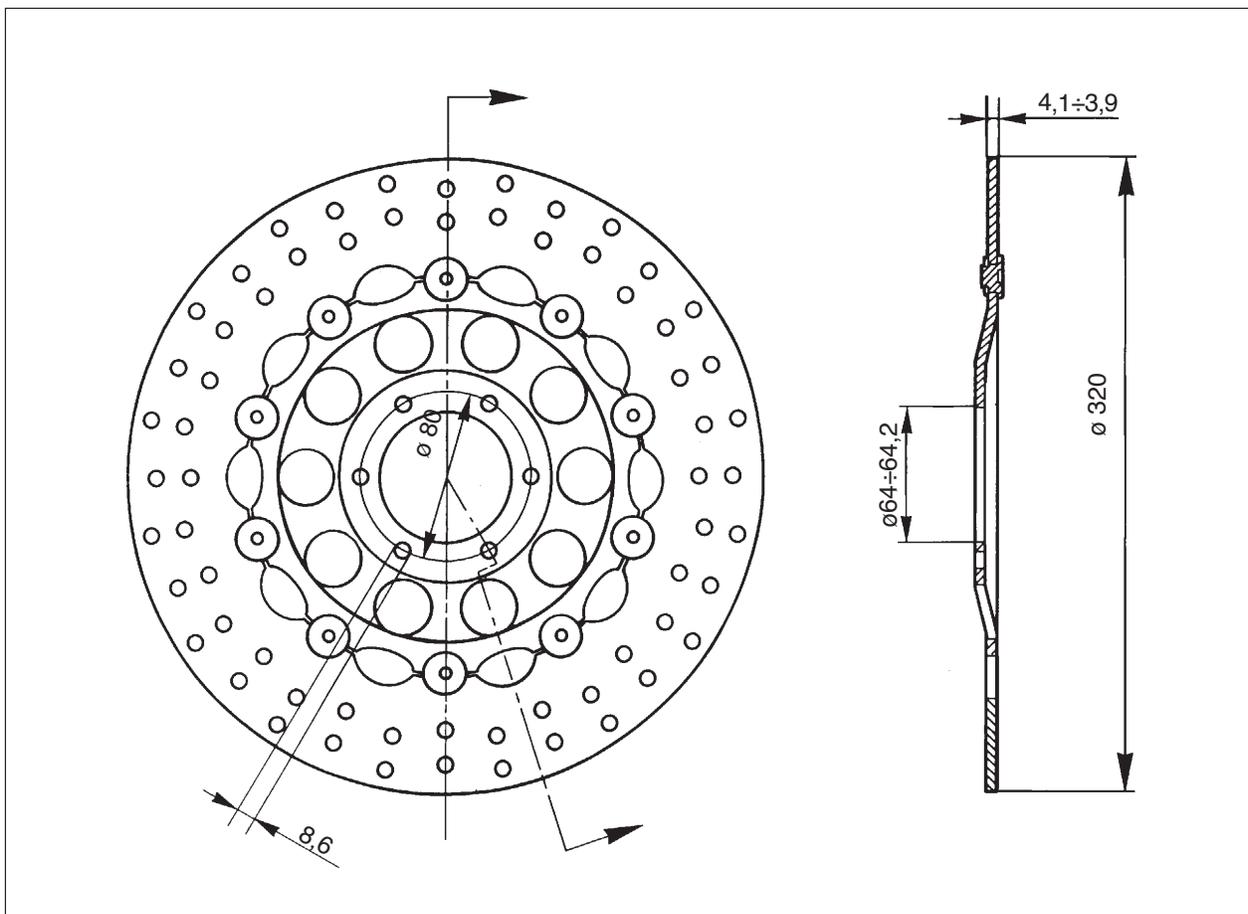
- Remove the brake calipers as described in this chapter;
- Remove the wheel from the motorbike as described in chapter 1 of this section;
- Unscrew the fastening screws "A" and remove the disk;

Check:

The disks must be perfectly clean, without rust, oil, grease or deposits and they must not have deep groovings. If the disks have one of these defects, clean thoroughly. If the defect cannot be removed they must be replaced.

- Front disk thickness: **4,1 mm.**
- Front disk thickness, wear limit: **3,9 mm.**

If the disk values are out of the above indicated measurements, it is necessary to replace them. The front disks are composed of one part which is integral to the wheel rim and of a floating brake band. If the disk must be replaced, it is necessary to replace both components.





A

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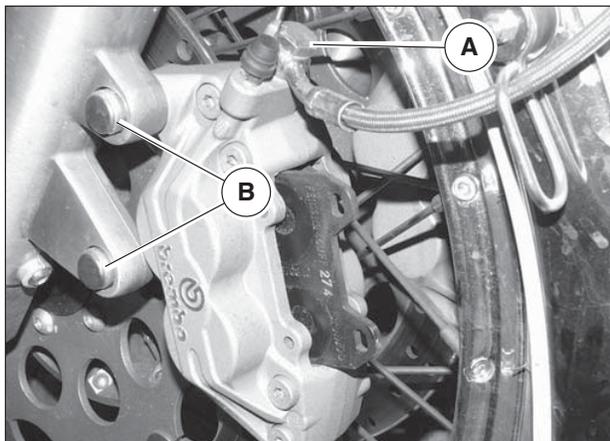
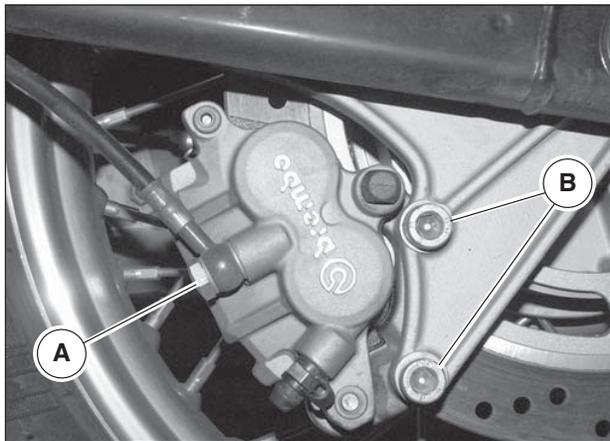
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Reassembly:

When reassembling, thoroughly clean the resting surfaces and lock the screws to the tightening torque prescribed in the table in chapter 4, section B. Apply Loctite 270 on the threading.



6 REAR AND FRONT LEFT-HAND HYDRAULIC BRAKE CALIFORNIA EV - CALIFORNIA SPECIAL - CALIFORNIA SPECIAL SPORT

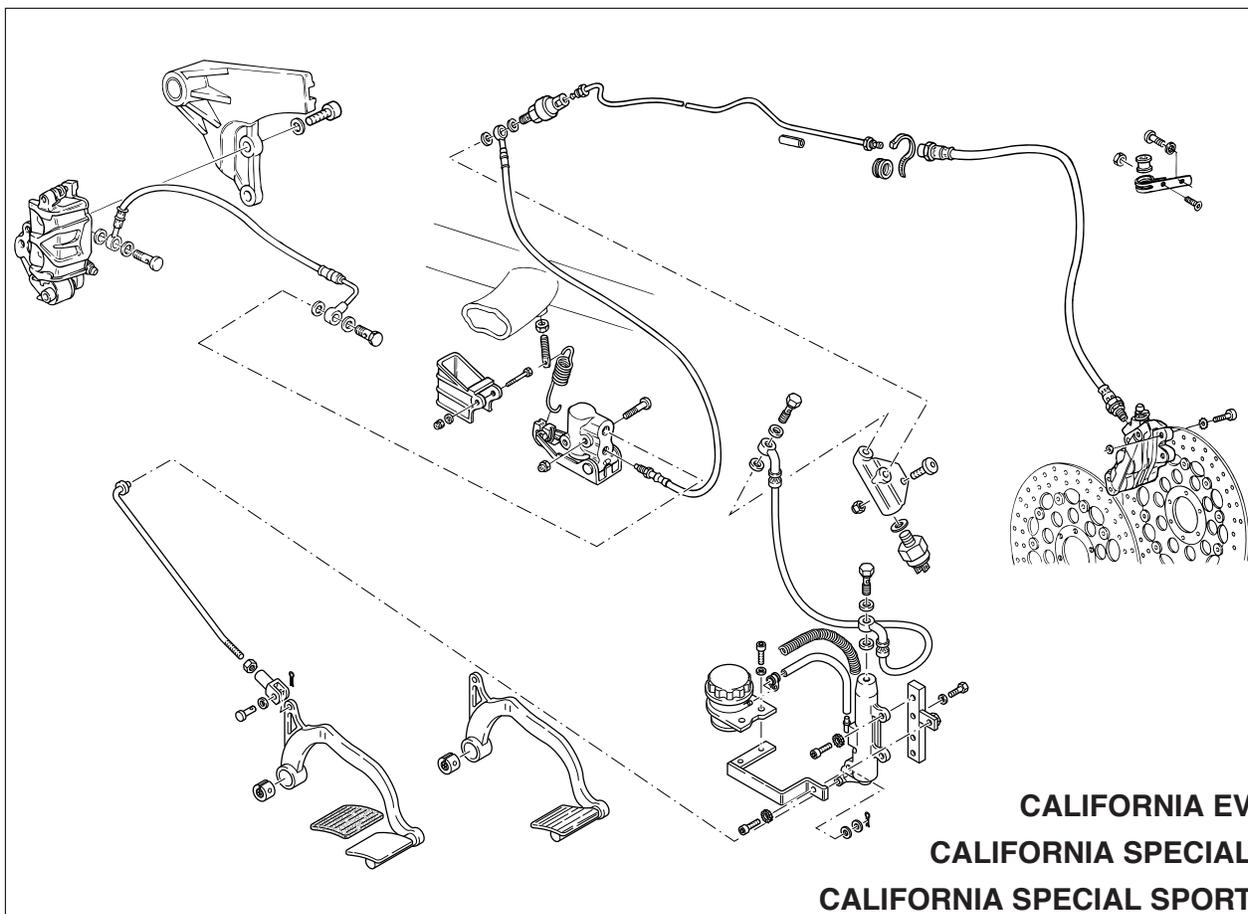
BRAKE CALIPERS

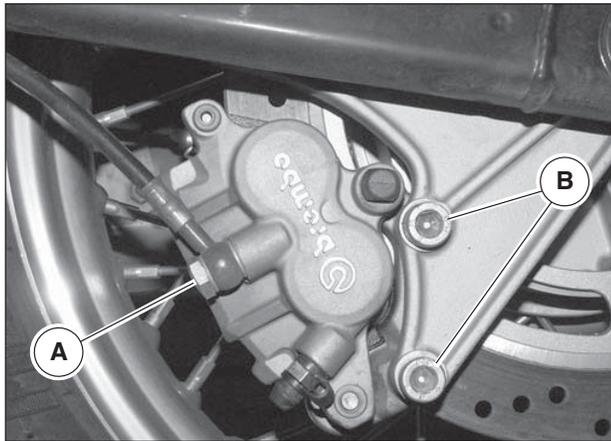
Disassembly:

- Drain the hydraulic system thoroughly, as described in chapter 2, section D;
- Unscrew the hollow screw “A” and remove the tube as well as the two gaskets from the two calipers;
- Unscrew the two screws “B” fastening the supports and remove the two calipers.

Reassembly:

- Carry out the disassembly procedures in reverse order;
- Fill the braking system with recommended fluid.
- Pump several times using the control lever until the pads bed in.





7 REAR HYDRAULIC BRAKE CALIFORNIA JACKAL - CALIFORNIA STONE

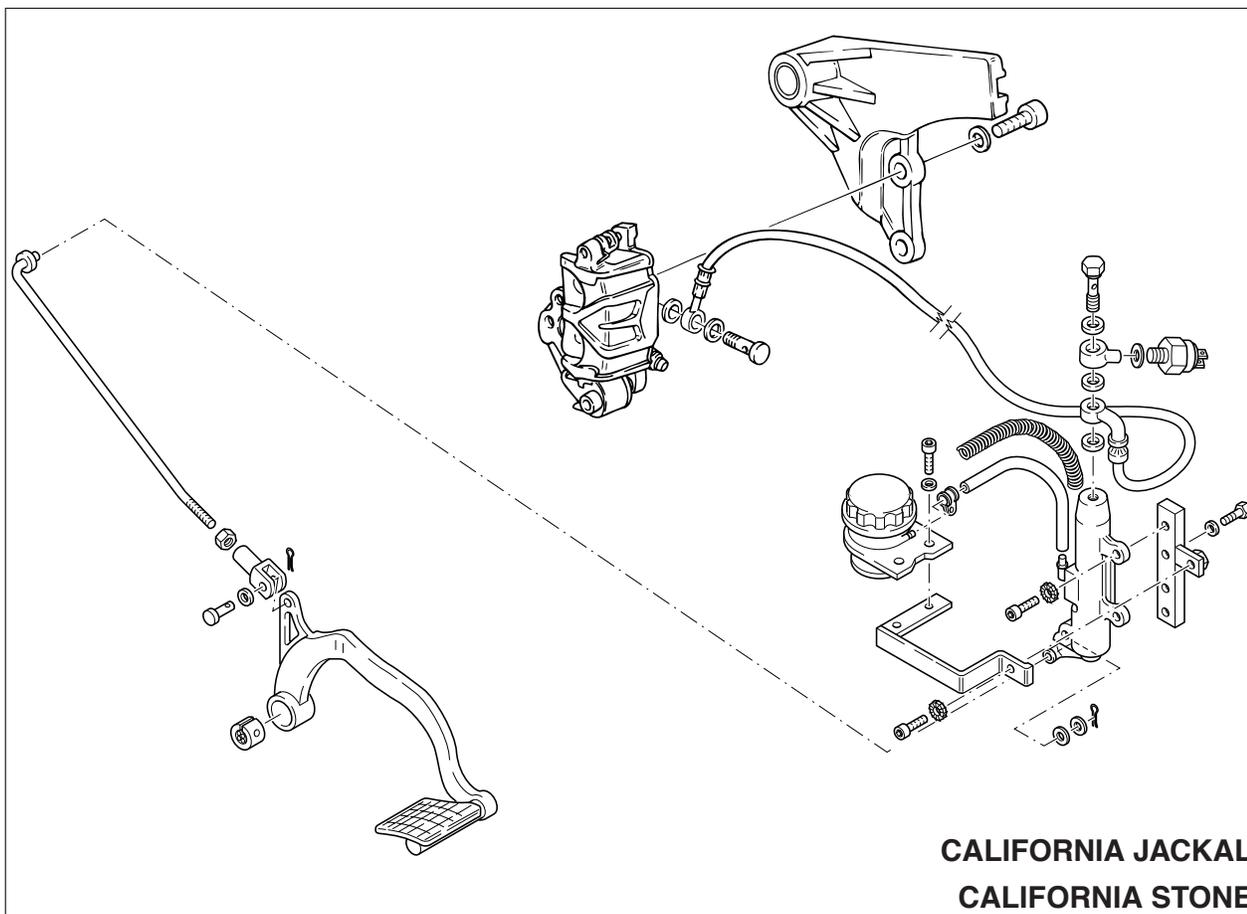
BRAKE CALIPER

Disassembly:

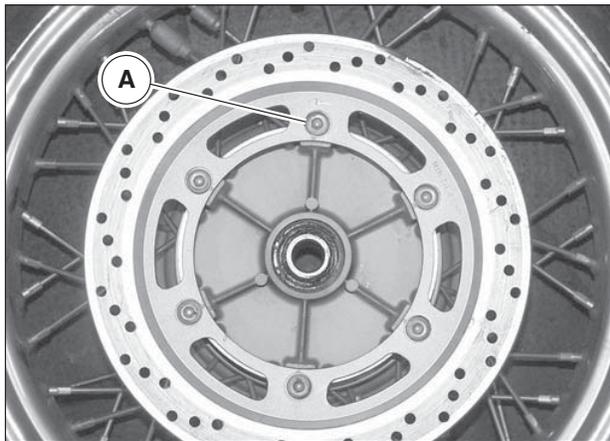
- Drain the hydraulic system thoroughly, as described in chapter 2, section D;
- Unscrew the hollow screw "A" and remove the tube as well as the two gaskets from the caliper;
- Unscrew the two screws "B" fastening the support and remove the caliper.

Reassembly:

- Carry out the disassembly procedures in reverse order;
- Fill the braking system with recommended fluid;
- Pump several times using the control lever until the pads bed in.



**CALIFORNIA JACKAL
CALIFORNIA STONE**



BRAKE DISK

Disassembly:

- Remove the wheel from the motorbike as described in chapter 2 of this section;
- Unscrew the screws "A" fastening it to the wheel rim;
- Remove the disk.

Check;

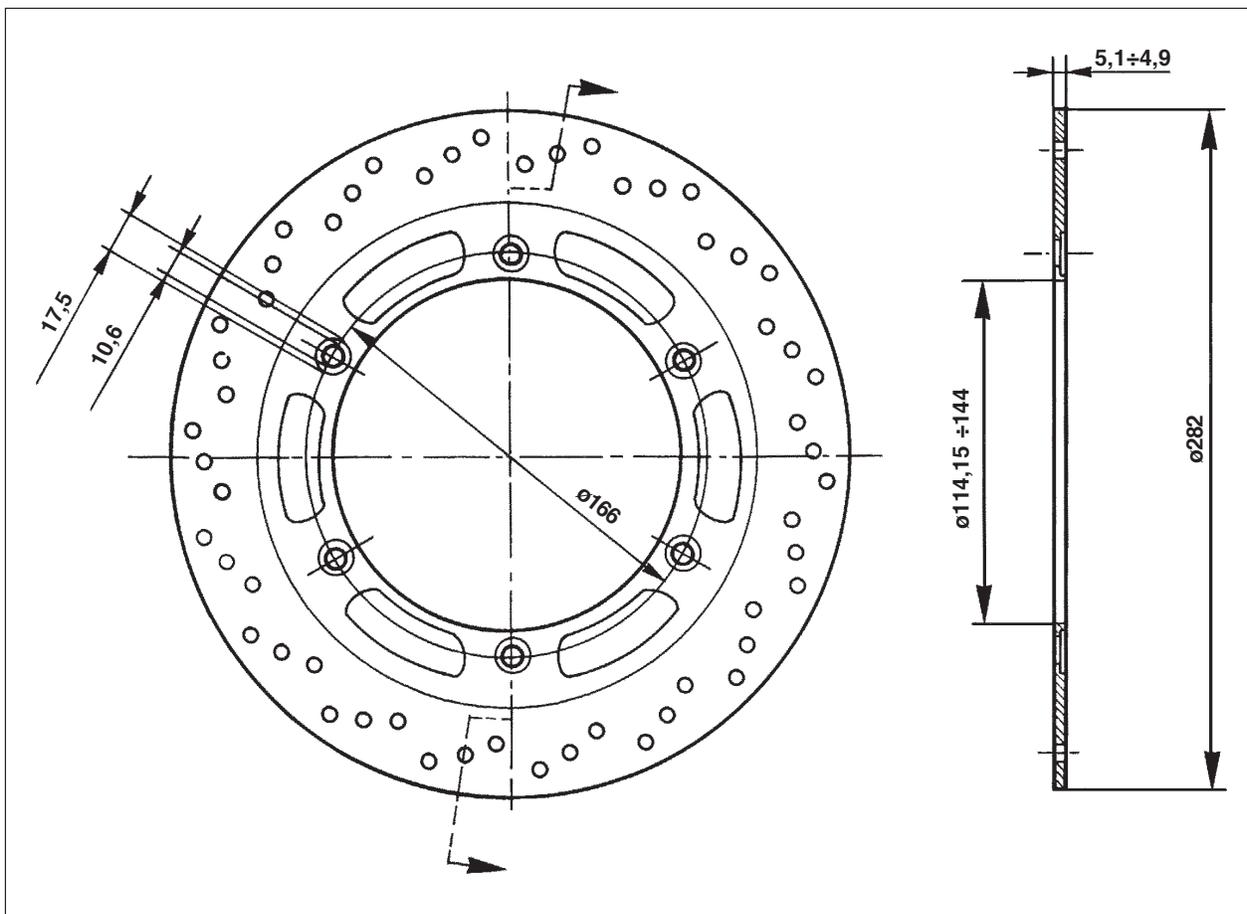
The brake disk must be perfectly clean, without rust, oil grease or deposits and it must not have deep groovings. If the disks have one of these defects clean thoroughly. If the defect can not be removed they must be replaced.

- Rear disk thickness: **5,1mm**
- Rear disk thickness at the wear limit: **4,9mm**

If the disk values are out of the above indicated measurements, it is necessary to replace them.

Reassembly:

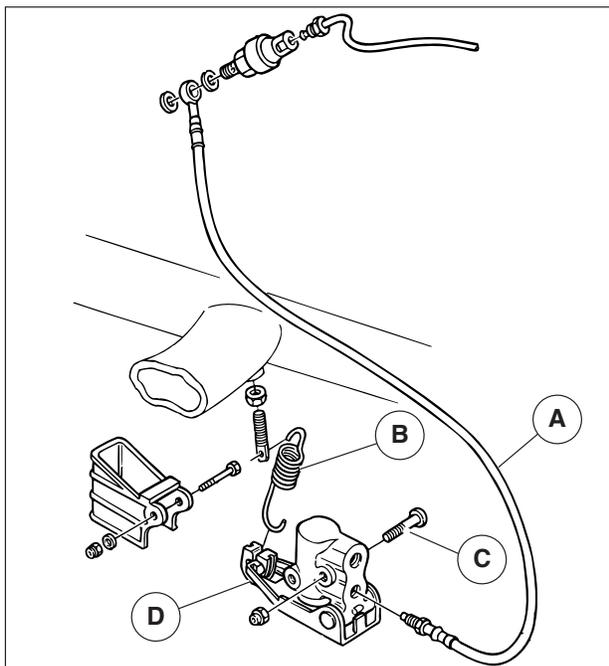
When reassembling, thoroughly clean the resting surfaces and lock the screws to the tightening torque prescribed in the table in chapter 4, section B. Apply Loctite 270 on the threading.





DISK BRAKE TROUBLES

Trouble cause	Trouble removal
<p>The brake squeaks The brake caliper is not fully tightened Positioning springs are faulty or missing Brake pads are worn beyond the limit</p> <p>Brake pads are dirty with oil or grease Wrong brake pads have been fitted</p>	<p>Tighten fastening screws Place new positioning springs Place new brake pads after checking disk condition Replace brake pads Replace brake pads</p>
<p>Brake disk overheats during normal operation</p> <p>Pistons are blocked; brake pads stick to the disk</p> <p>Brake lever has no backlash</p>	<p>Check pistons, clean brake pad seats in the caliper Adjust lever backlash according to instructions</p>
<p>Braking capacity is insufficient Brake disk is dirty with oil or other material Brake pads are too much worn or vitrified Brake pads are dirty with oil or grease Pistons are jammed</p>	<p>Clean the disk Replace brake pads and check the disk Replace brake pads Make pistons run smoothly</p>
<p>The brake is jammed Brake pads have a too high coefficient of friction Brake disk is highly oxidized</p>	<p>Fit proper brake pads Grind the disk or replace it</p>
<p>Brake pads are extremely worn Brake pads are locked in their seat and continuously in contact with the disk</p> <p>Pistons are blocked Brake disk is deeply scored</p>	<p>Clean the brake pad seat in the caliper and check the pads coupling with their guides</p> <p>Make pistons run smoothly Grind the brake disk or replace it</p>
<p>Brake pads wear irregularly and sideways</p> <p>Brake pad seats are dirty Piston movement is not smooth Brake pads positioning springs are faulty Caliper has been assembled sideways</p>	<p>Clean the seats Make the piston run smoothly Replace the springs Check and remove the fault</p>
<p>Brake lever stroke is too big Brake disk wobbles more than 0.2 mm The hydraulic system contains air Brake disk is extremely scored</p>	<p>Check the assembly, grind the disk or replace it Drain the system Grind the brake disk or replace it</p>
<p>Non-return of the pump float Jumper fastening screws are too tight Lever shoulder nut is too tight (non-original screw) Lever shim is bigger than the pump seat</p> <p>Brake fluid is dirty</p>	<p>Partially loosen the screws Partially loosen the screw</p> <p>Replace the lever</p> <p>Disassemble, clean and check all pump components (no seizing or scoring allowed) and replace the fluid</p>
<p>Fluid leakage from tank Membrane is misplaced</p> <p>Membrane is damaged Tank edge is dented</p>	<p>Place the membrane in its seat and gently close the plug Replace the membrane Replace the pump</p>



BRAKE-POWER LIMITER - CALIFORNIA EV - CALIFORNIA SPECIAL - CALIFORNIA SPECIAL SPORT

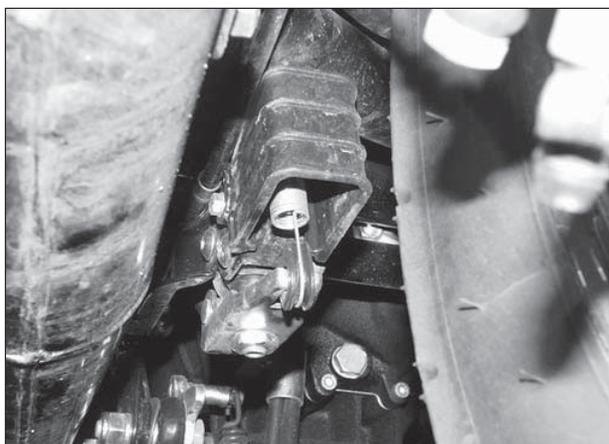
The brake-power limiter is a mechanic device connected to the rear swinging arm through a spring. According to its position (and therefore as a consequence of the load on the rear axle), the valve inside the limiter distributes the integral system brake oil pressure in variable proportion between front and rear caliper (if the load on the rear increases, the pressure on the rear caliper increases and vice-versa).

This allows a safer braking and limits the chances of wheel locking.

N.B. This system functions in accordance with the rear shock absorbers calibration; if the shock absorbers are replaced with others having different technical features, the system functioning is jeopardized

Disassembly:

- Drain the hydraulic system completely, as described in **chapter 2 section D**.
- Remove the brake pipe "A".
- Release the spring "B".
- Unscrew the screw "C".
- Remove the brake-power limiter "D".



Reassembly:

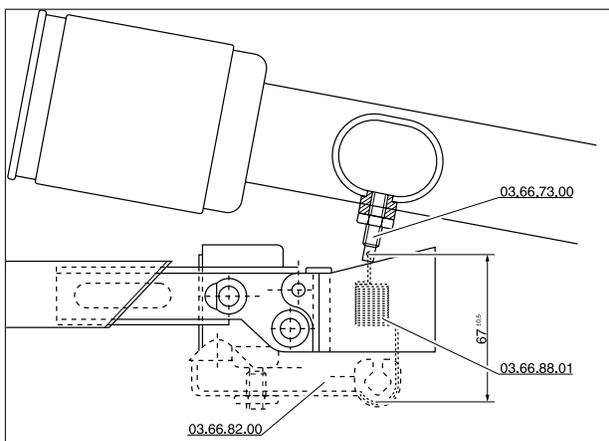
- Carry out the removal procedures in reverse order.
- Fill the braking system with the prescribed fluid.
- Pump a few times with the control lever to allow the brake pads to settle.
- Carry out the system adjustment as follows.

SYSTEM ADJUSTMENT

After assembling the spring, part no. 03.66.88.01, with the brake-power limiter, part no. 03.66.82.00, and on the swinging arm, make sure that the distance between the two fittings is 67 ± 0.5 mm.

Set part part no. 03.66.73.00 to adjust.

N.B. Place the motorbike on the centre stand or make sure the rear wheel bears no load, when adjusting the system.



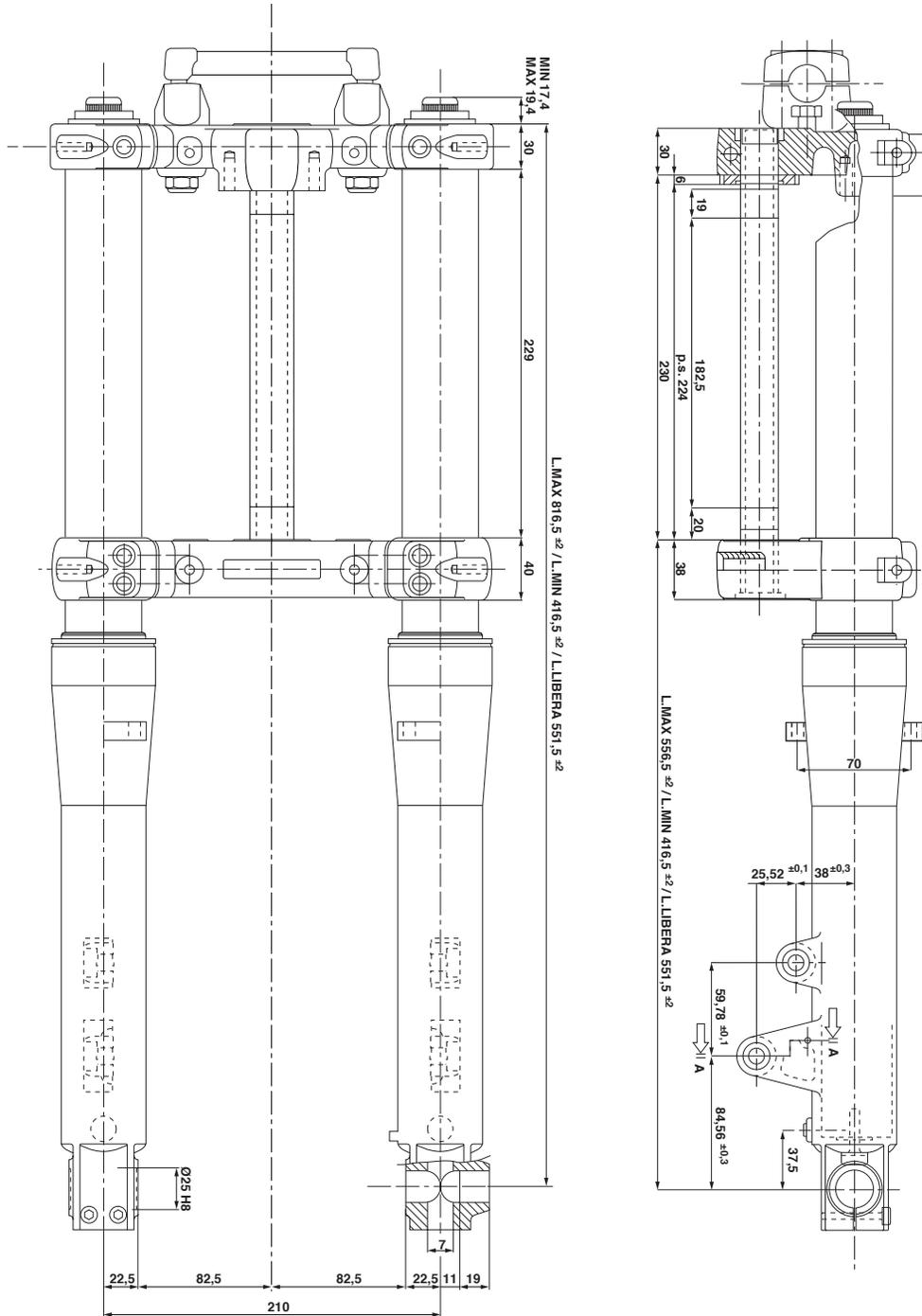
8 FRONT FORK



N.B.

Fork of the latest type with left-hand leg featuring a threaded hole, on which the wheel shaft shall be screwed
 Gabel letzter Typ mit linkem, eine Gewindeöffnung aufweisenden Holm, auf welcher die Radachse angeschraubt wird.
 Vork van het laatste type met linkersteel met schroefdraadopening waarin de wielspil wordt geschroefd

CALIFORNIA EV - CALIFORNIA SPECIAL 1^a SERIE



8 VORDERE GABEL

8 VOORSTE GAFFEL

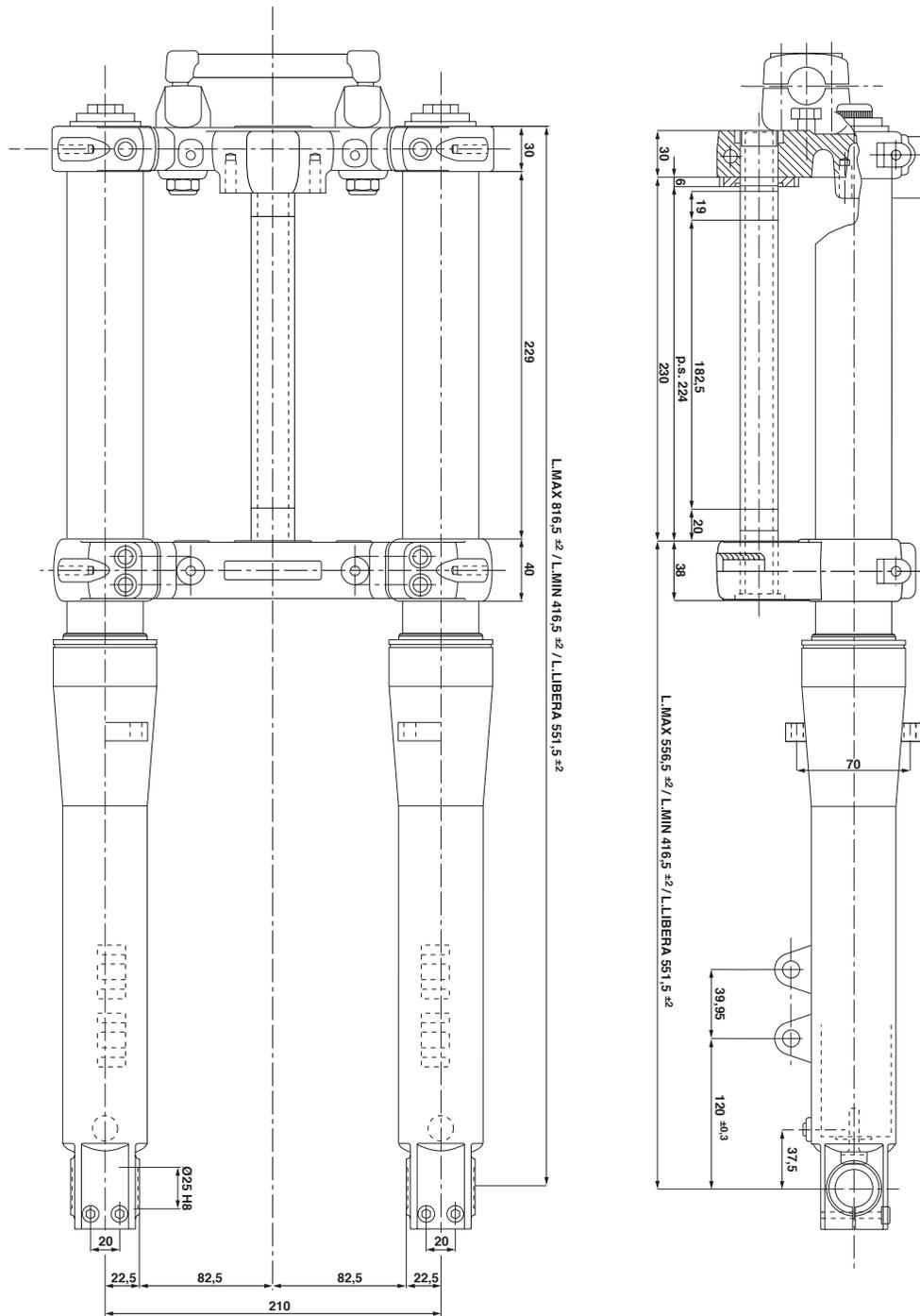


N.B.

Fork of the first type with left-hand leg featuring a through hole, as wheel shaft seat

Gabel erster Typ mit linkem, eine Durchgangsöffnung aufweisenden Holm für das Gehäuse der Radachse.

Vork van het eerste type met een doorsteekopening in de linkersteel waarin de wielspil wordt gestoken

CALIFORNIA JACKAL - CALIFORNIA SPECIAL - CALIFORNIA SPECIAL 2^a SERIE
CALIFORNIA SPECIAL SPORT

A

B

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D

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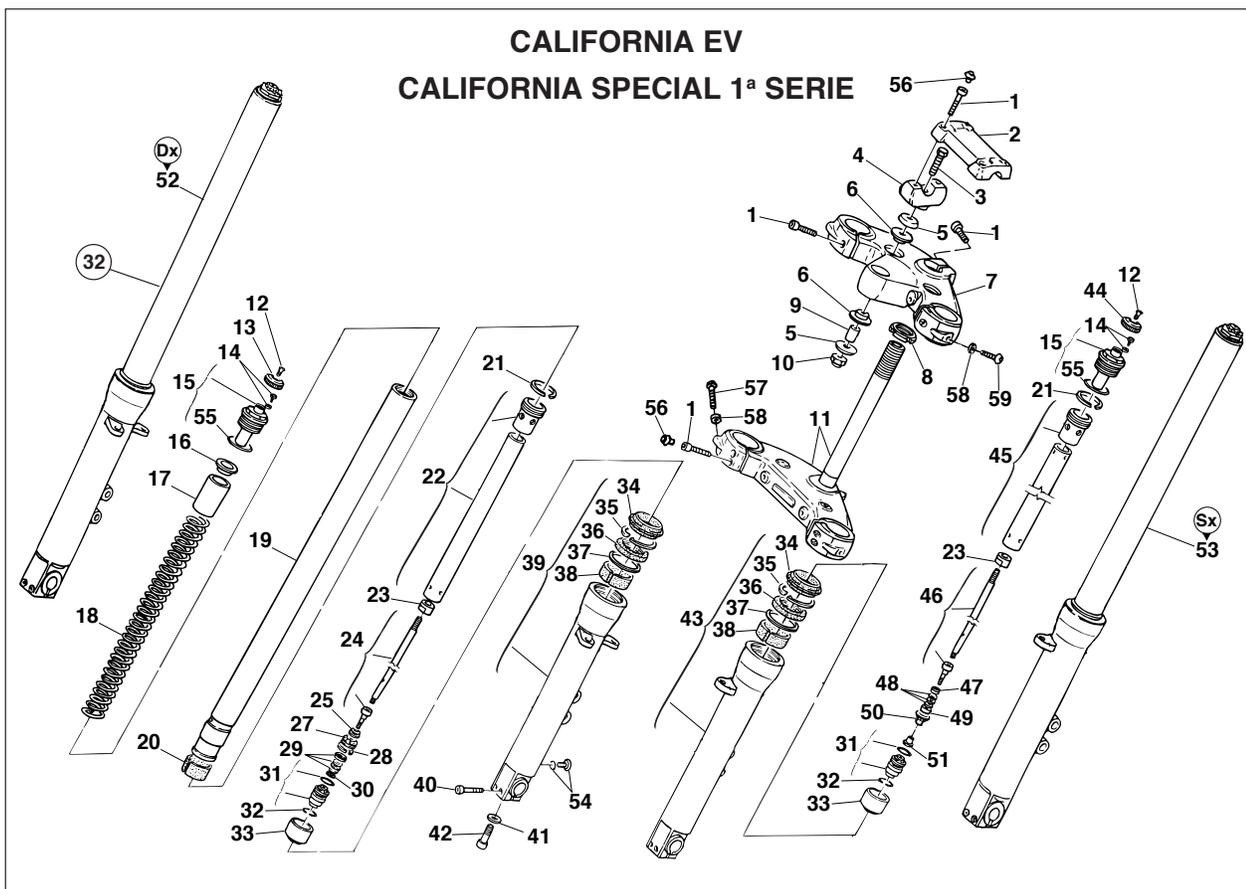
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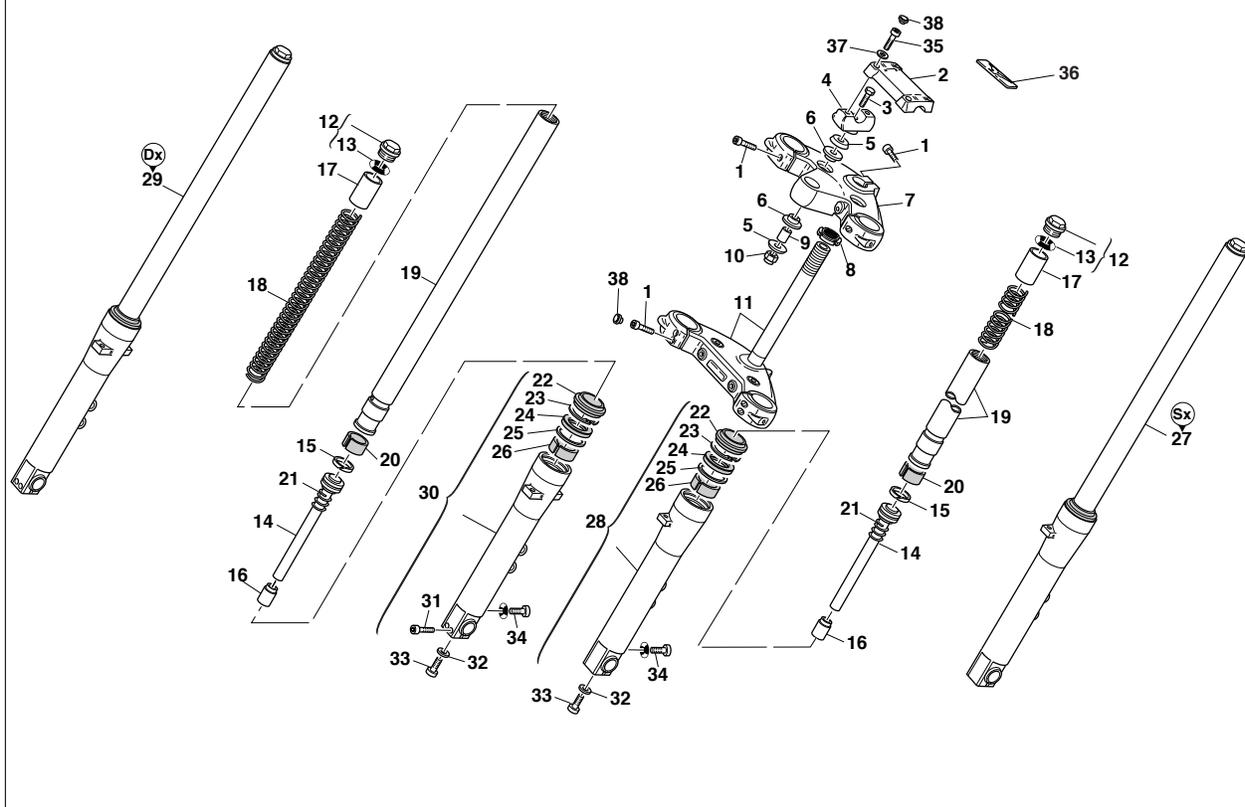
CALIFORNIA EV CALIFORNIA SPECIAL 1ª SERIE



Pos.	DESCRIPTION
1	Screw
2	Handlebar fastening jumper
3	Screw
4	Under jumper
5	Cap
6	Rubber pad
7	Fork head
8	Ring nut
9	Spacer tube
10	Nut
11	Fork base
12	Screw
13	RH adjuster (extension)
14	Screw with O-ring
15	Plug assembly
16	Retainer
17	Pre-load tube
18	Spring
19	Bare fork leg
20	Lower bushing
21	Ring
22	RH tube (extension)
23	Lock nut
24	RH rod (extension)
25	Rebound spring
26	RH piston (extension)
27	RH piston ring (extension)
28	RH pin (extension)
29	Calibration plate
30	Nut

Pos.	DESCRIPCIÓN
31	Foot valve assembly
32	O-ring
33	Adapter
34	Dust scraper
35	Stop ring
36	Seal ring
37	Retainer
38	Upper bushing
39	Full right-hand leg
40	Long screw
41	Washer
42	Screw
43	Full left-hand leg
44	LH adjuster (compression)
45	LH tube (compression)
46	LH rod (compression)
47	Cap
48	Calibration plate \varnothing 12 mm
48	Calibration plate \varnothing 15 mm
48	Calibration plate \varnothing 17 mm
49	LH pin (compression)
50	LH piston (compression)
51	Nut
52	RH complete fork leg
53	LH complete fork leg
54	Screw with O-ring
55	O-ring
56	Plug
57	Screw
58	Washer

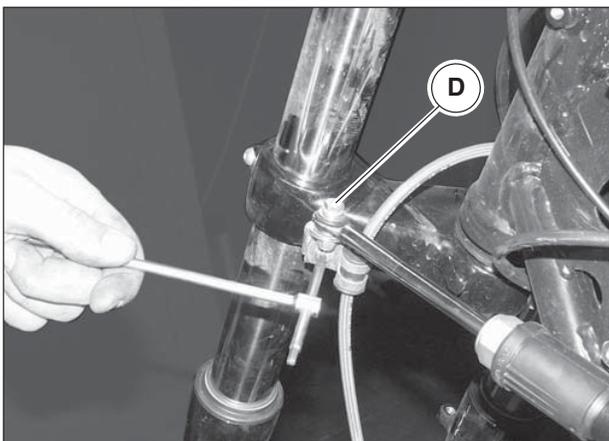
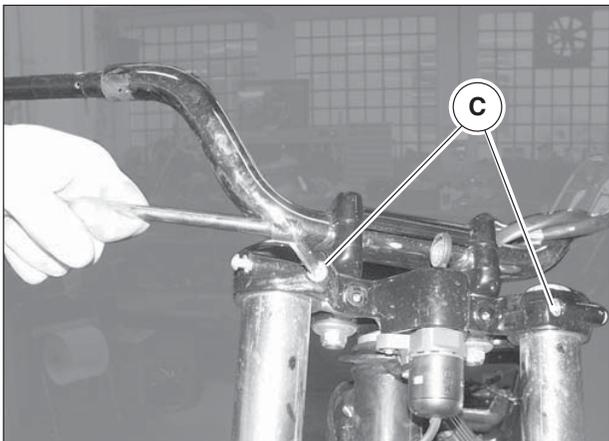
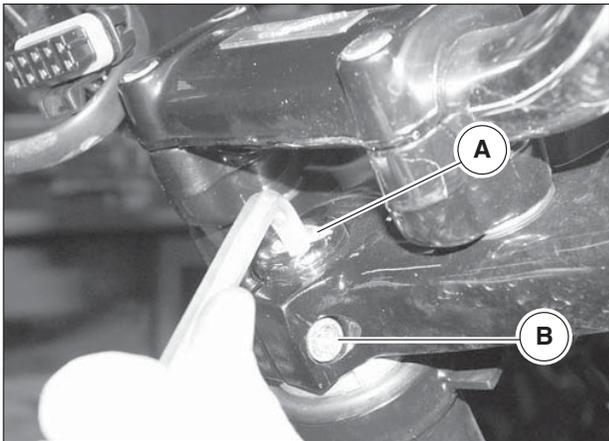
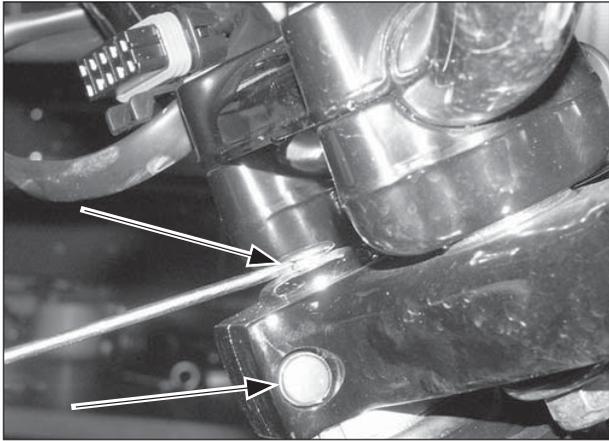
**CALIFORNIA JACKAL- CALIFORNIA STONE
CALIFORNIA SPECIAL 2ª SERIE- CALIFORNIA SPECIAL SPORT**



Pos.	DESCRIPTION
1	Screw
2	Handlebar fastening jumper
3	Screw
4	Lower jumper
5	Retainer
6	Rubber pad
7	Fork head
8	Ring nut
9	Spacer tube
10	Nut
11	Fork base
12	Plug assembly
13	O-ring
14	Rod
15	Ring
16	Buffer
17	Pre-load tube
18	Spring
19	Bare fork leg

Pos.	DESCRIPTION
20	Lower bushing
21	Rebound spring
22	Dust scraper
23	Stop ring
24	Seal ring
25	Cap
26	Bushing
27	LH complete fork leg
28	Complete left-hand leg
29	RH complete fork leg
30	Complete right-hand leg
31	Screw
32	Washer
33	Screw
34	Drain
35	Screw
36	Number plate
37	Washer
38	Chromium-plated plug

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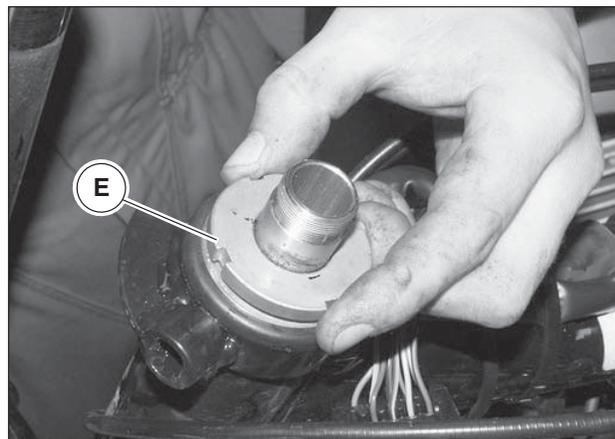
Motorbikes are fitted with a telescopic hydraulic fork with separate adjustment of extension and compression damping or with a non-adjustable fork:

In case of adjustable fork, the left-hand fork leg works in extension while the right-hand one works in compression. Although the two rods work in different ways, their internal components are similar and therefore disassembly, overhauling and reassembly are carried out following the same procedures; accordingly, the below described procedures apply to both the rods.

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

Complete fork removal:

- Place the motorbike on a stable support so that the front wheel is raised from the ground;
- Remove the brake calipers as described in chapter 4, section F, without disconnecting the oil tubings;
- Remove the front mud-guard as described in chapter 2, section E;
- Remove the front wheel as described in chapter 1, section F;
- Remove headlight and its supports as described in **chapter 4 section P**.
- Remove the chromium-plated plugs indicated by the arrows.
- Unscrew the nut "A".
- Unscrew the screw "B".
- Unscrew the 2 upper screws "C" of the fork legs.
- Remove the handlebar assembly and the fork head.
- Unscrew the fastening screw "D" of the steering damper.
- Unscrew the ring nut "E" and remove the dust protection washer assembly "F".
- Remove the fork from the chassis.



Die Motorräder sind mit einer Teleskopgabel mit separater Einstellung der Federbeindämpfung in Bezug auf die Ausdehnung und Kompression oder mit einer nicht einstellbaren Gabel ausgerüstet.

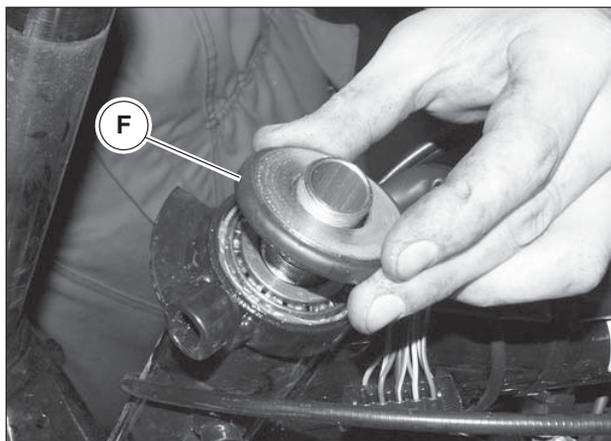
Kann die Gabel eingestellt werden, arbeitet der linke Schaft in der Ausdehnung und der rechte in der Kompression. Obgleich die beiden Schäfte in unterschiedlicher Weise arbeiten, sind die inneren Komponenten ähnlich; daher erfolgen der Ausbau, die Überholung und der Wiedereinbau mit Hilfe der gleichen Maßnahmen. Die unten aufgeführten Vorgänge gelten somit für beide Schäfte.

⚠ ACHTUNG

Während der im Folgenden beschriebenen Maßnahmen müssen die Schäfte und ihre inneren Komponenten in einem Spannstock festgeklemmt werden. Es ist darauf zu achten, dass sie nicht durch zu starkes Festklemmen beschädigt werden; stets Spannbackenabdeckungen aus Aluminium verwenden.

Abnahme der kompletten Gabel:

- Das Motorrad so auf einer stabilen Stützvorrichtung positionieren, dass das Vorderrad vom Boden abgehoben ist.
- Die Bremszangen ausbauen, wie in Kap. 4, Abschnitt F beschrieben, ohne die Ölleitungen abzutrennen.
- Das vordere Schutzblech ausbauen, wie in Kap. 2, Abschnitt E angegeben.
- Das Vorderrad ausbauen, wie in Kap. 1, Abschnitt F beschrieben.
- Den Scheinwerfer und die entsprechenden Träger, wie in **Kap. 4, Abschnitt P**, beschreiben, entfernen.
- Die verchromten Verschlüsse, wie durch die Pfeile angegeben, abnehmen.
- Die Mutter "A" lösen.
- Die Schraube "B" lösen.
- Die 2 oberen Befestigungsschrauben "C" der Gabelschäfte lösen.
- Die Lenkergruppe und den Gabelkopf entfernen.
- Die Halteschraube "D" des Anschlusses des Lenkungsdämpfers lösen.
- Die Mutter "E" lösen und die Staubschutz-Unterlegscheiben-Gruppe "F" herausnehmen.
- Die Gabel vom Rahmen entfernen.



De motorvoertuigen zijn uitgerust met een hydraulische telescopische voorvork met afzonderlijke reminstelling van de schokbrekers in de in- en uit-beweging of met een niet instelbare voorvork:

Als de motor een instelbare voorvork heeft, werkt de linkerzuigerstang in de uit-beweging (extensie), en de rechterstang in de in-beweging (compressie).

Ondanks het feit dat de twee stangen op verschillende wijze werken, zijn hun componenten gelijk en dus worden de demontage, de revisie en de remontage uitgevoerd met dezelfde operaties; daarom moeten de hierna aangegeven operaties voor beide stangen als geldig beschouwd worden.

⚠ OPGELET

Tijdens de hierna beschreven operaties moeten de stangen en hun interne componenten vastgeklemd worden in een schroefklem, waarbij men ze niet te vast mag klemmen om ze niet te beschadigen; altijd aluminium klauwkappen gebruiken.

De hele voorvork demonteren:

- De moto op een stabiele support plaatsen zodanig dat het voorwiel van de grond gehesen is;
- De tangen remmen wegnemen zoals beschreven wordt in hoofdstuk 4 sectie F;
- Het voorste spatbord wegnemen zoals wordt aangegeven in hoofdstuk 2 sectie E;
- Het voorwiel wegnemen zoals beschreven wordt in hoofdstuk 1 sectie F;
- De koplampen en -houders verwijderen zoals beschreven in **hoofdstuk 4 deel P**;
- De door de pijlen aangeduide gechromeerde doppen verwijderen;
- Moer "A" losdraaien;
- Schroef "B" losdraaien;
- De 2 schroeven "C" losdraaien waarmee de bovenste vorkstangen vastzitten;
- De stuurgroep en de vorkkop verwijderen;
- De schroef "D" waarmee de verbinding met de stuurschokbreker vastzit, losmaken;
- De schroefring "E" losdraaien en de stofweringringetjes "F" eraf halen;
- De vork van het frame halen.

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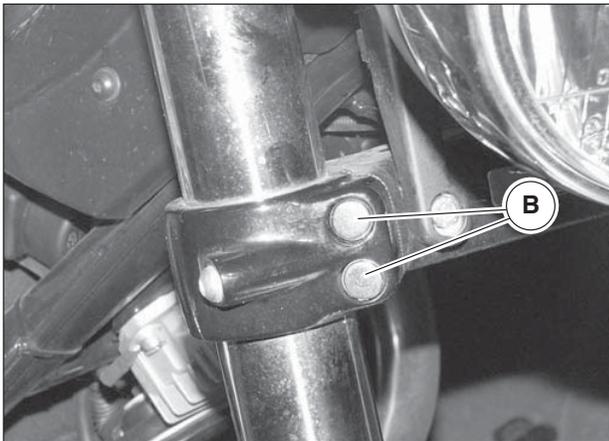
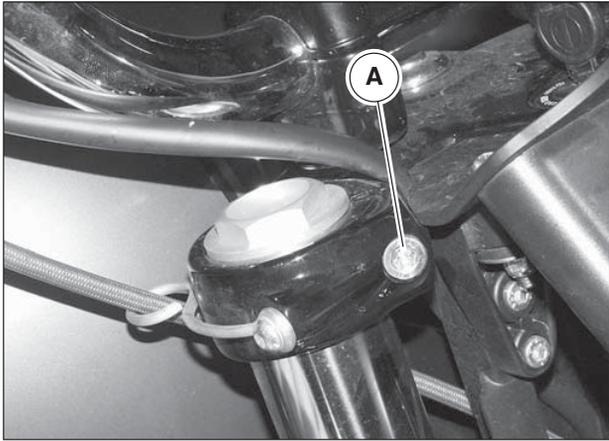
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FORK LEG REMOVAL

- Place the motorbike on a firm mount, so that the front wheel is lifted from the ground
- Remove the front brake calipers as described in **chapter 4 section F**, without disconnecting oil pipes;
- Remove the front mudguard as described in **chapter 2 section E**;
- Remove the front wheel as described in **chapter 1 section F**;
- Remove the small chromium-plated covers on the screws "A" and B";
- Unscrew the upper fastening screw "A";
- Unscrew the 2 lower fastening screws "B";
- Slide out the fork leg downwards while rotating it in one direction first, then in the opposite direction.

GENERAL RULES FOR A CORRECT OVERHAUL

- Use new gasket during reassembly, after a complete disassembly.
- Always follow the 1-2-1 sequence when tightening two screws or nuts close to each other, i.e. tighten again the first screw (1) after tightening the second (2).
- Use a preferably biodegradable and non-inflammable solvent for cleaning.
- Always place the pumping unit plates with the edge opposite to the piston bearing surface.
- Lubricate all the mating surfaces before reassembly.
- Always grease the seal ring lips before reassembly.
- Use only metric wrenches and not inch wrenches. Inch wrenches may have similar measures to the metric ones, but they might damage the screws and make unscrewing impossible.



TROUBLES – CAUSES - SOLUTIONS

The following paragraph lists some of the fork troubles, their causes and suggests the possible solution.
Always refer to this table before operating on the fork.

TROUBLES	CAUSES	SOLUTIONS
Oil leakage form the seal ring	<ol style="list-style-type: none">1. Seal ring is worn2. The stranchion is rigid3. The ring is dirty	<ol style="list-style-type: none">1. Replace the seal ringt2. Replace stanchion and ring3. Clean or replace it
Oil leakage form the bottom	<ol style="list-style-type: none">1. The foot gasket is faulty2. The foot screw is loose	<ol style="list-style-type: none">1. Replace the gasket2. Tighten the screw
The fork is too soft in each oil adjustment condition	<ol style="list-style-type: none">1. Oil lever is low2. Spring is faulty3. Oil viscosity is too low	<ol style="list-style-type: none">1. Top up the oil level2. Replace the spring3. Change oil viscosity
The fork is too hard in each oil adjustment condition	<ol style="list-style-type: none">1. Oil level too high2. Oil viscosity is too high	<ol style="list-style-type: none">1. Restore oil level2. Change oil viscosity
The fork does not react to the different adjustment	<ol style="list-style-type: none">1. Plug pin is blocked2. Oil is dirty3. Shock absorber valves are clogged	<ol style="list-style-type: none">1. Remove plug and clean it2. Clean and replace oil3. Remove and clean

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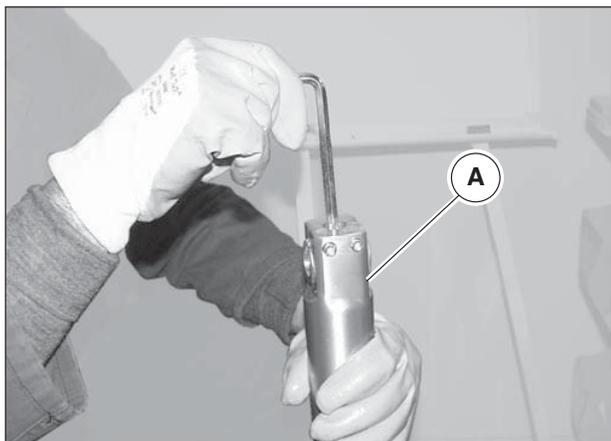
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DISASSEMBLY / OVERHAUL

● IMPORTANT

The components of the forks are similar. accordingly, the below described procedures apply to both the forks. (adjustable / not adjustable).

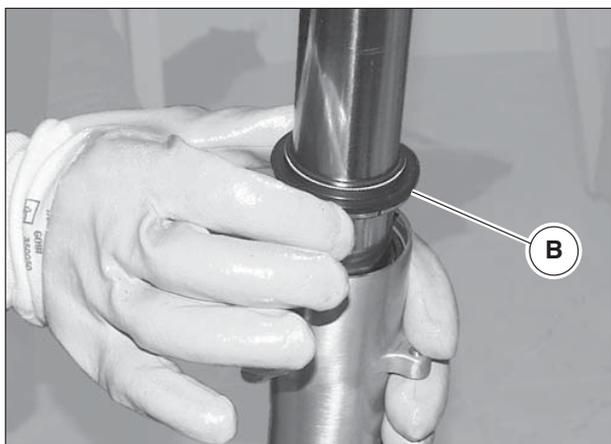
- Drain all the oil from the rod leg as described in **chapter 2 section D**.
- Lock the wheel-holder leg "A" in a vice and unscrew the foot screw with a wrench for 8 mm internal hexagons and remove the screw with its gasket.
- Remove the dust scraper "B" levering it with a screwdriver.



● WARNING

Be careful not to damage the leg edge and the dust scraper

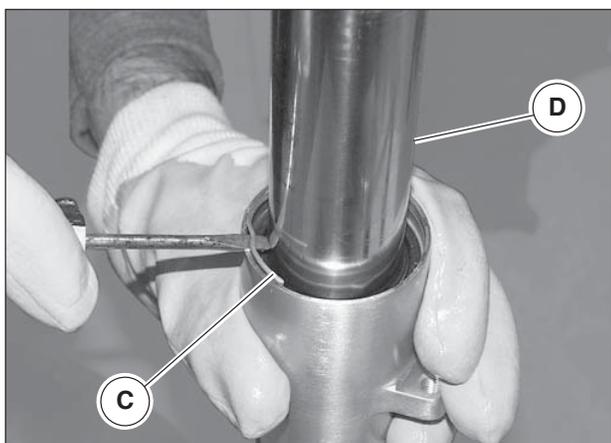
- Slide the dust scraper "B" upwards.

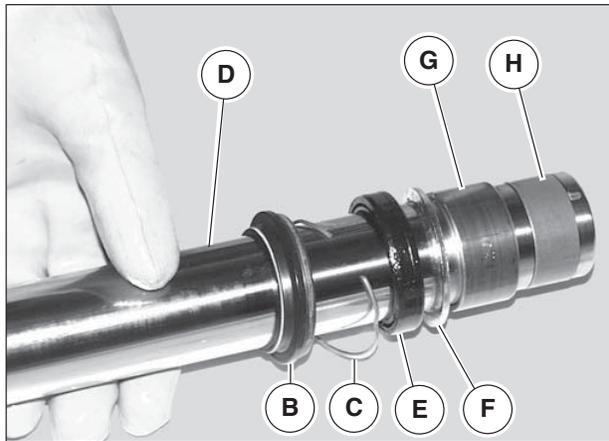


- Remove the stop ring "C" from inside the leg using a small screwdriver.

● WARNING

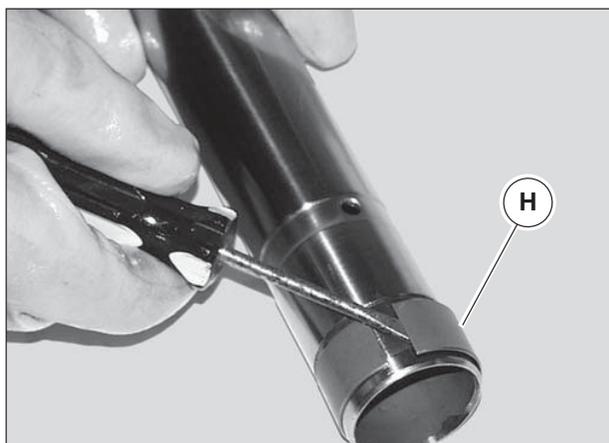
Be careful not to damage the leg edge





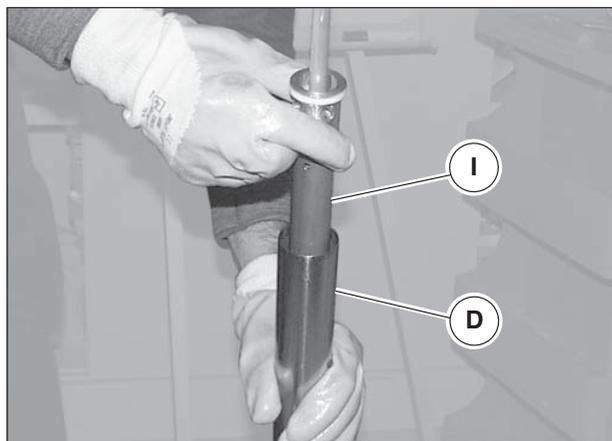
- Remove the stanchion "D" from the wheel-holder leg together with the seal ring "E", the cap "F", the upper bushing "G" on the leg and the lower bushing "H" on the stanchion.

👁 N.B. While removing stanchion "D" from the wheel-holder leg, the parts "E", "F" and "G" may remain inside the leg. If so, they shall be removed afterwards, paying attention not to damage the leg edge and the upper bushing "G" seat on the leg.



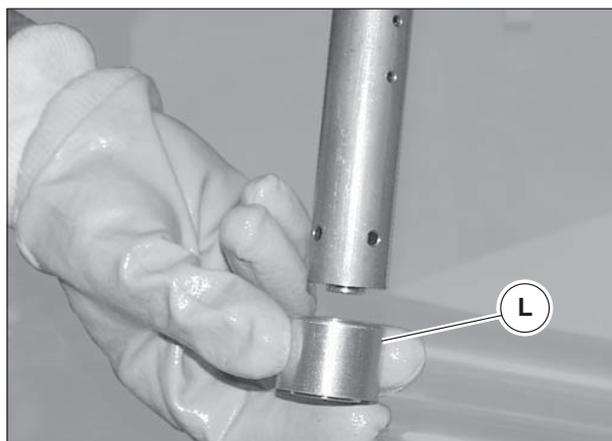
- Check all the parts removed from inside the leg, in particular the seal ring "E" and the dust scraper "B", since they provide the sealing. If they are damaged, replace them.
- Check bushing "H" on the stanchion; if damaged or worn, remove and replace it.

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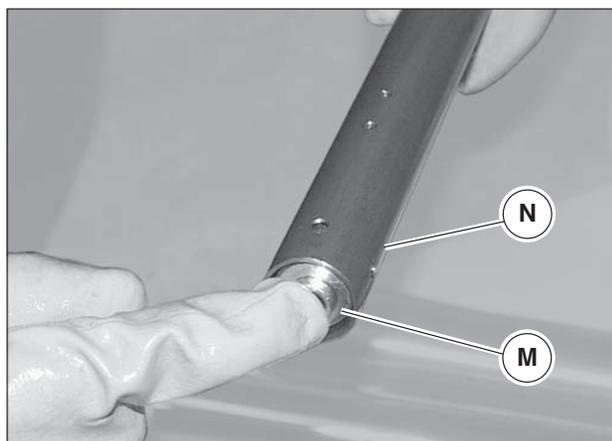


OVERHAUL OF THE “COMPRESSION” SHOCK ABSORBER

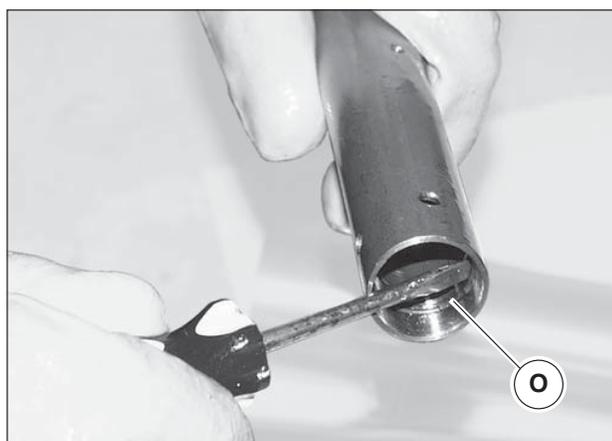
- Remove the shock absorber assembly “I” from the stanchion “D”.



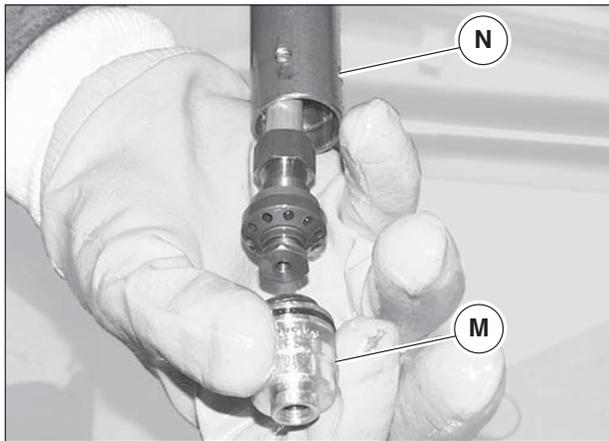
- Remove the bottom buffer “L”; this might remain fitted in the wheel-holder leg “A”, if so, remove it from the inside.



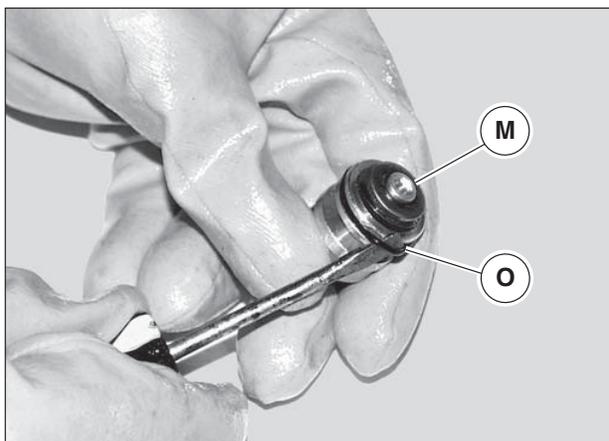
- Push the foot valve “M” inside the shock absorber case “N” with your fingers.



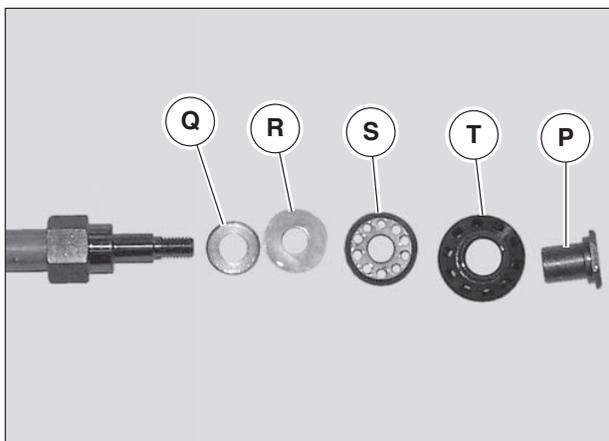
- Remove the stop ring “O” using a screwdriver.



- Push the foot valve “M” out of the case “N” with the shock absorber rod;



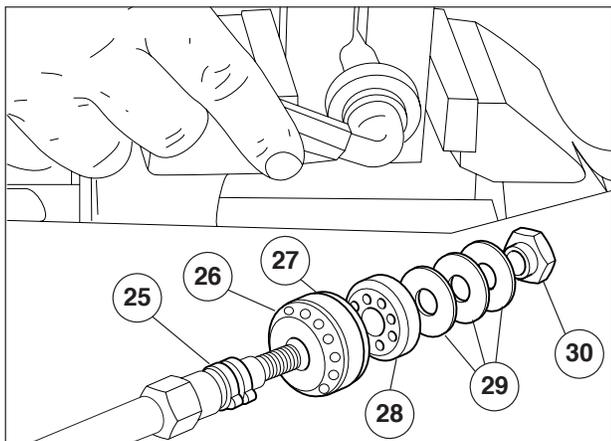
- Check the foot valve “M” and its O-ring “O”; if damaged, replace them;



- Remove the shock absorber rod together with the pumping unit from the case, after fully unscrewing the lock nut at its end.
- Remove the clamping nut “P” of the calibration assembly and remove all the components. Check and replace what necessary; reassemble following the order in the picture.
 - retainer “Q”;
 - plate pack “R”;
 - pin “S”;
 - piston “T”;
 - clamping nut “P”.

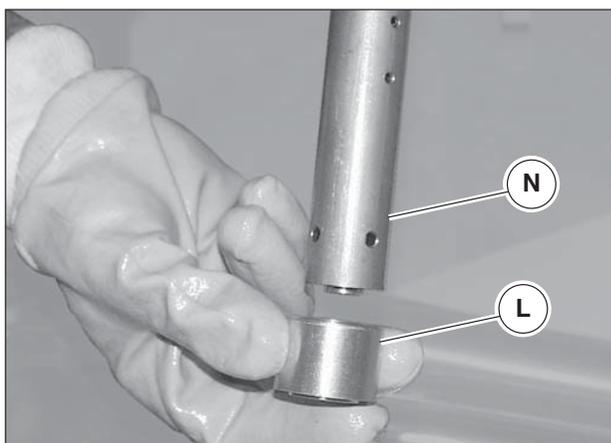
N.B.
 During the removal of the sealing assembly, take note of the direction of the plate position “R”

IMPORTANT
 The shock absorber rod can be locked in a vice, but without the aid of any support it might get crushed because it is internally hollow



OVERHAUL OF THE “REBOUND” SHOCK ABSORBER

- The removal procedure is the same as for the COMPRESSION shock absorber, with the only difference that the components of the pumping unit fixed on the shock absorber rod are:
 - pos. 25, rebound spring;
 - pos. 26, piston;
 - pos. 27, piston ring;
 - pos. 28, RH pin;
 - pos. 29, calibration plates;
 - pos. 30, clamping nut.

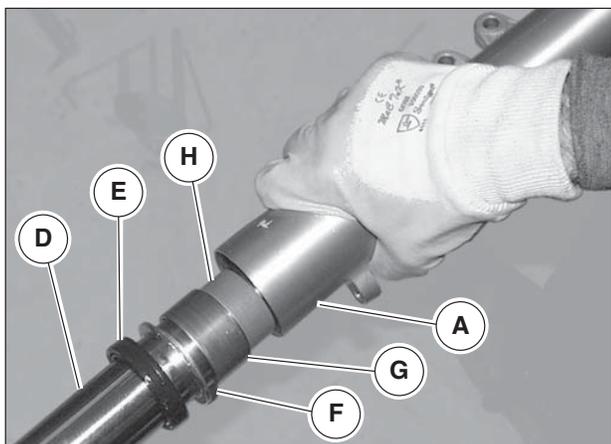


REASSEMBLY

WARNING

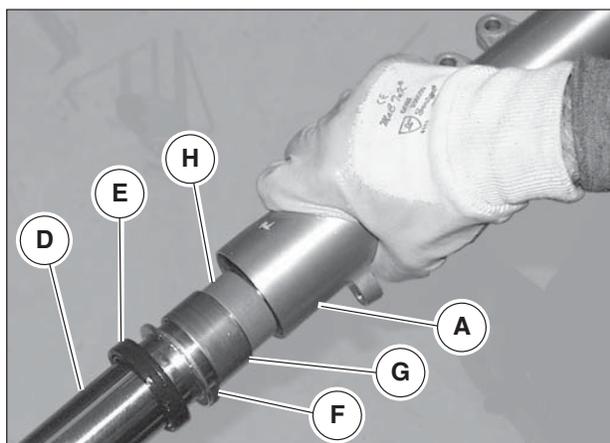
All components shall be carefully washed and dried with compressed air before reassembly. The upper plug and the foot valve shall be cleaned with special care

- Once all the overhaul procedures have been carried out, reassemble the piston-rod assembly in the shock absorber case;
- Place the foot valve “M” with a new O-ring at the base of the case “N” and push it further than the stop ring seat. Place the stop ring “O” in the case seat and push the foot valve on the ring with the rod;
- Screw the lock nut on the rod until the thread end and reassemble the bottom buffer “L” at the case bottom end. Reassemble the shock absorber assembly in the stanchion;
- Before reassembling the stanchion “D” in the wheel-holder “A”, check that the upper guide bushing “G” is fitted on the wheel-holder. Place the sliding bushing “H” in the seat on the stanchion. Slide the stanchion “D” in the wheel-holder “A” and push it fully home.

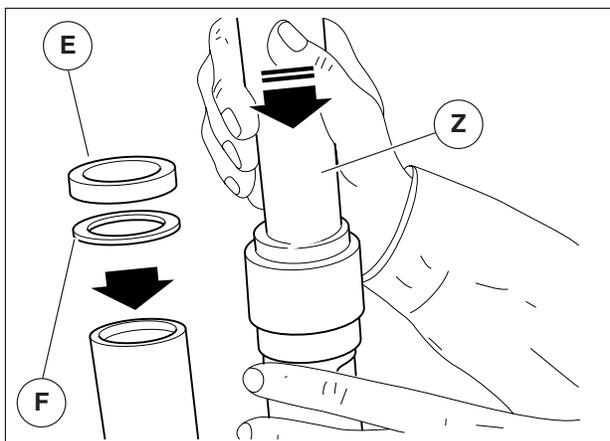




- Screw the foot screw in again with the gasket and tighten it to the torque of 50 Nm;



- Place the cap "F" and the lubricated seal ring "E" on the stanchion "D". Push the seal ring "E" inside the leg fully home by using a special tool "Z". Assemble the stop ring and the dust scraper;

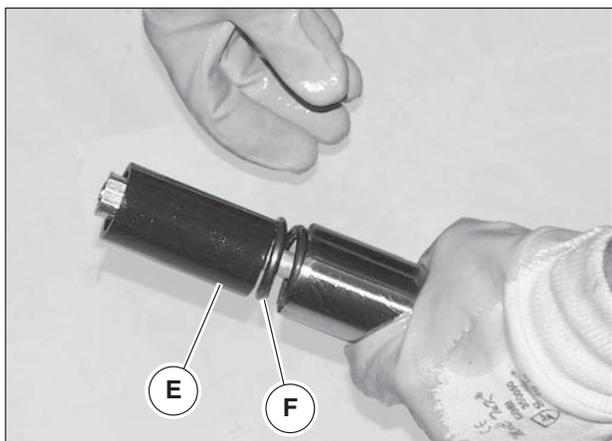


- Pour "MARZOCCHI" SAE 10 oil inside the stanchion, making sure it will fill the shock absorbers internal channels too.
Suggested oil quantity:
- adjustable fork 0.485 litre
- non-adjustable fork 0.560 litre

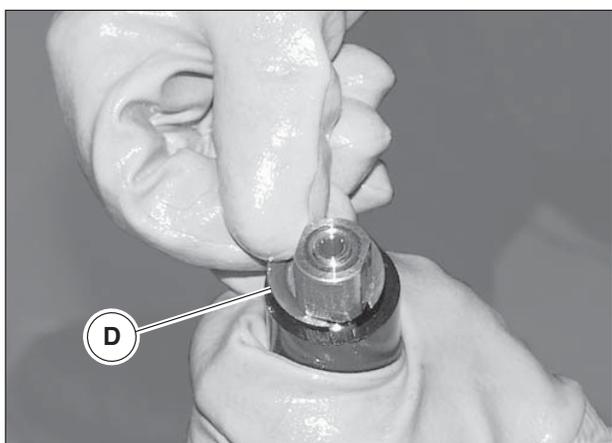
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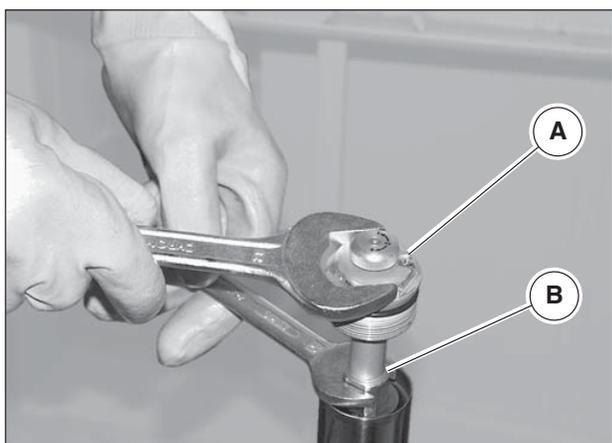
- Use the shock absorber rod to pump and keep the end hole closed. Make sure the oil has filled up the shock absorber cartridge;



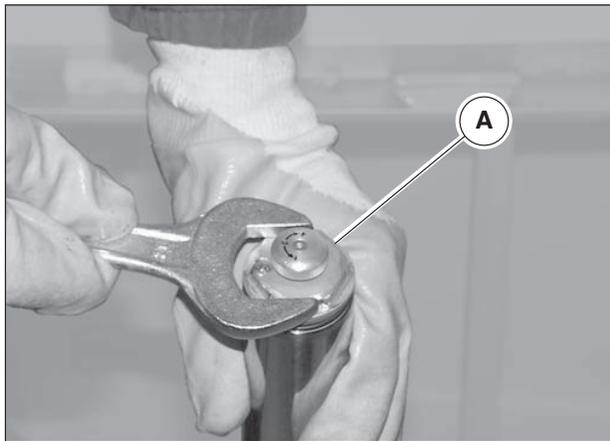
- Place the spring "F" and the pre-load tube "E";



- Place the open washer "D" between the pre-load tube and the lock nut;



- Screw the lock nut on the shock absorber rod thread until the plug "A" can be assembled. Screw it down and tighten the lock nut "B" against it at the torque of 30 Nm;



- Place the plug “A” on the pumping unit, being careful not to damage the O-ring.
Tighten the plug at the torque of 25 Nm.

Fork leg reassembly

- Place the fork leg on the motorbike and let the steering head pass through the bottom yoke;
- Tighten the screws on the steering head on the bottom yoke at the torque prescribed in the table of chapter 4 of section B;
- Reassemble the steering damper

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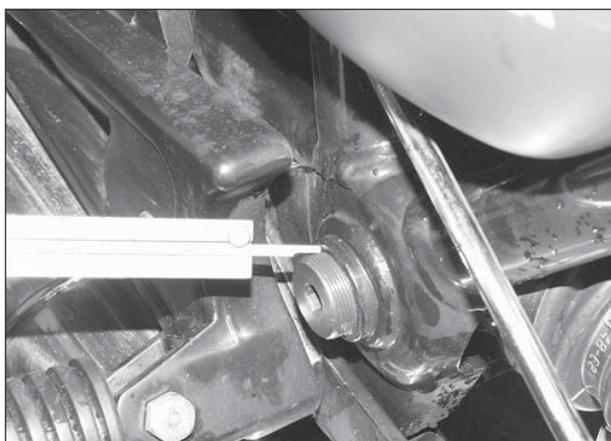
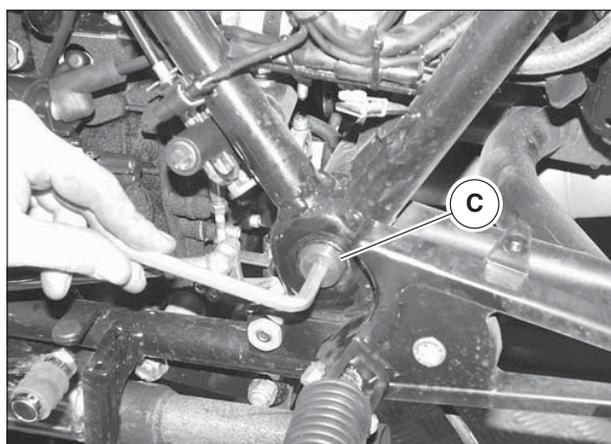
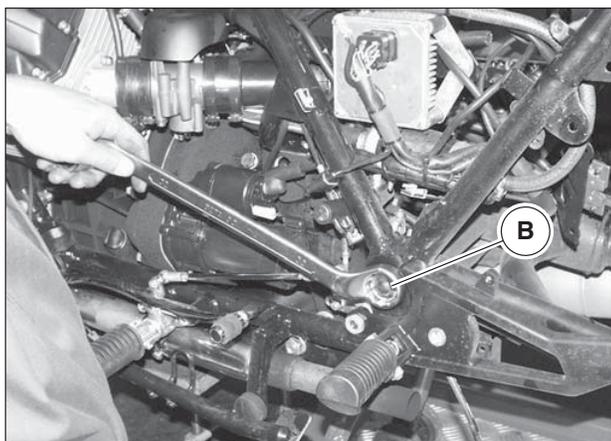
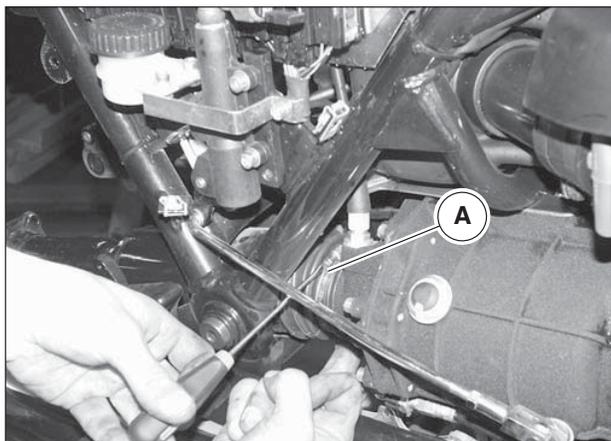
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9 REAR SWING ARM

Removal:

- Position the motorbike on a stable support;
- Remove the rear wheel as described in chapter 2 in this section;
- Remove the rear transmission box as described in chapter 1, section O;
- Disassemble the rear mud guard as described in chapter 2, section E;
- Loosen clamp "A" to release the protection cover;
- Remove the rear right-hand shock absorber;
- Keeping the fastening dowels "C" locked onto the chassis, unscrew and remove the two nuts "B";
- Take note of the fork's adjustment value because it must be reset during reassembly;
- Remove the two pins "C";
- Remove the swing arm.



Overhaul:

Check that the swinging arm has no bent or unsoldered parts, that the bearing seats are in good condition and that the connection surface between the right-hand arms and the housing has no deep scoring.

Check the wear of the bearings on the swinging arm pivot axis on the chassis and of the bearing on the right-hand section.

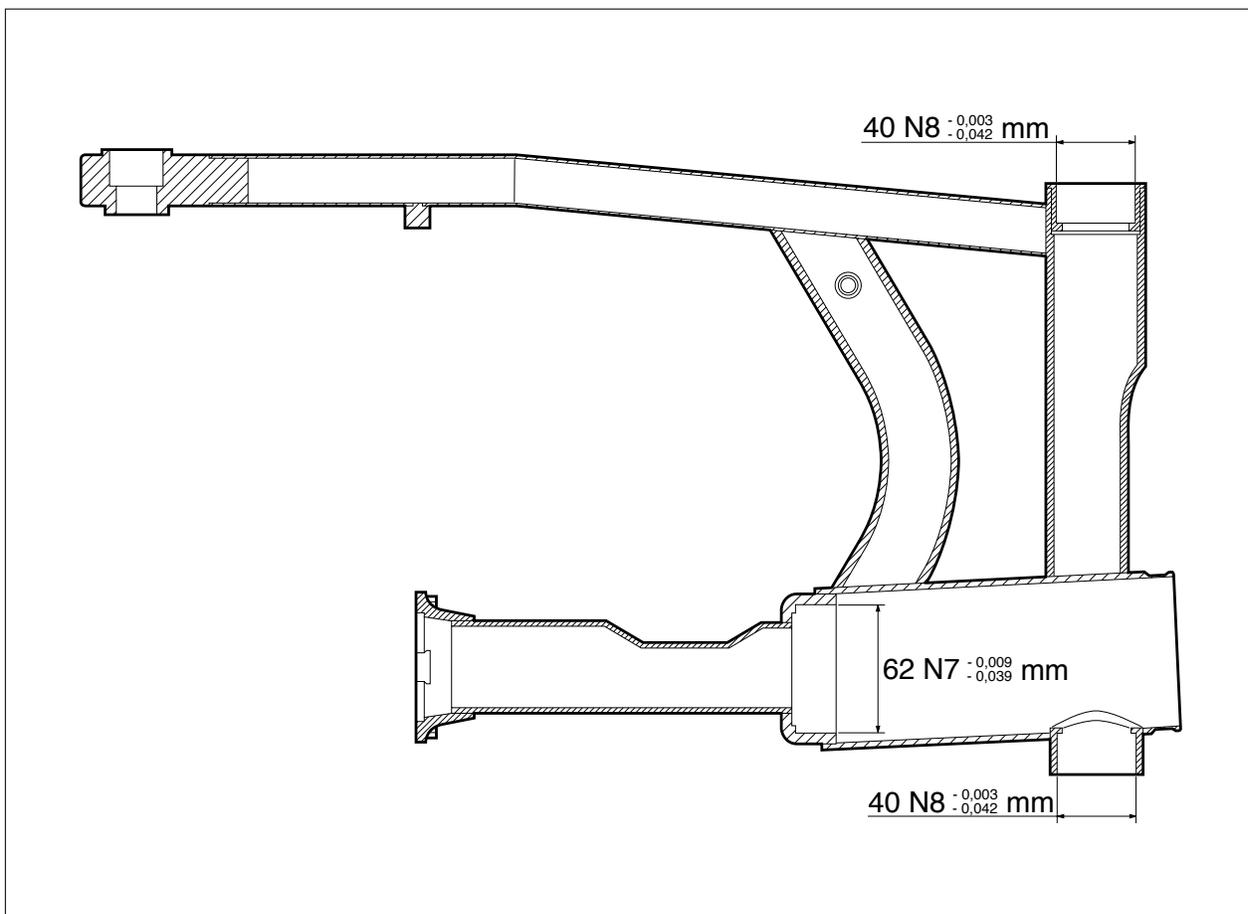
Use the proper extractor, part no. 18927250, to remove the U-joint bearing. Use the proper extractor, part no. 12904700, to remove the swinging arm shaft bearings.

● IMPORTANT

Once a bearing has been removed from its seat, it cannot be reused.

Reassembly:

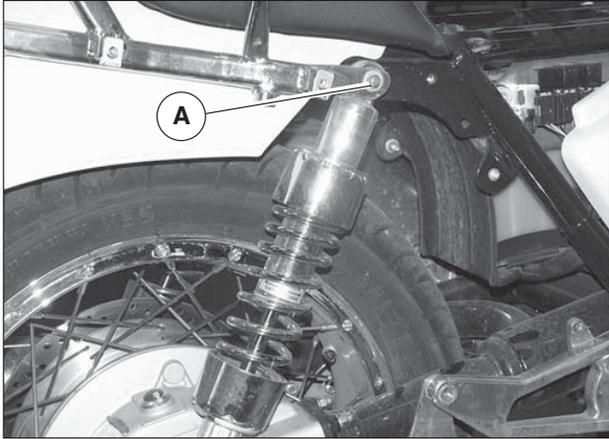
Carry out the removal procedures in reverse order. Use the proper drift, part no. 17945260, to press the cone bearing outer races for the support pins. Use the proper drift, part no. 17945360, to press the bearing on the right-hand arm.



10 REAR SHOCK ABSORBERS

Removal:

To remove the rear shock absorbers from the chassis proceed as follows:

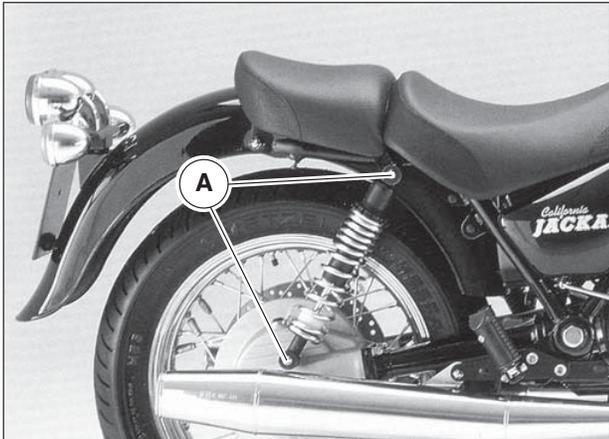


CALIFORNIA EV

- Remove the rear chassis-cover protections as described in chapter 6 section E;
- Unscrew the screws "A" and remove the shock absorbers.

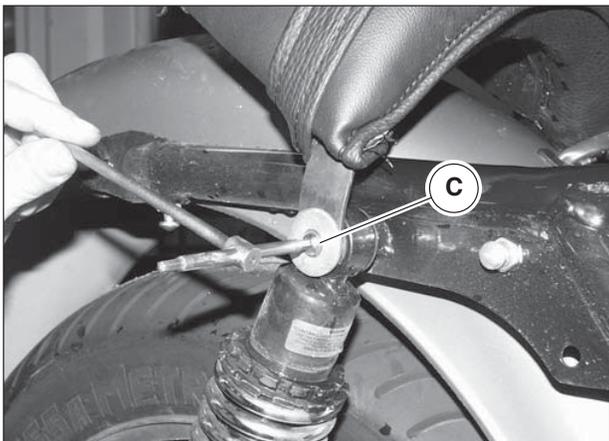
CALIFORNIA SPECIAL - CALIFORNIA SPECIAL SPORT

- Remove the painted side protections with the chromium-plated shock absorber covers fitted, as described in chapter 6 section E;
- Unscrew the screws "A" and remove the shock absorbers.



CALIFORNIA JACKAL

- Unscrew the screws "A" and remove the shock absorbers.



CALIFORNIA STONE

- Remove the rear seat as described in chapter 5 section E;
- Fully unscrew the screws "C" and remove the shock absorbers.

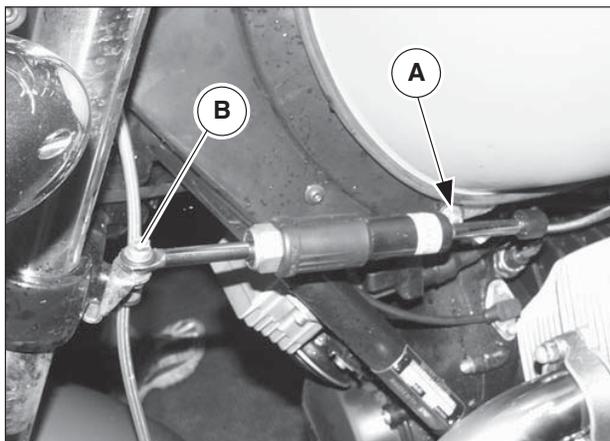
Carry out a sight-check of the shock absorber in order to spot possible oil leakages. Replace the shock absorber if leakages are found.

Reassembly:

Carry out the removal procedures in reverse order.

● IMPORTANT

Do not tamper with the components of the rear suspension assembly on models California EV - California Special - California Special Sport Use original spare parts if the above-mentioned components need to be replaced.



11 STEERING SHOCK ABSORBER

Its action helps to make the steering more precise and more stable, thereby improving the motorbike driving comfort in all conditions; it is fixed onto the front part of the motorbike, between the steering base and the chassis

Disassembly:

- Unscrew screw "A" fastening it to the chassis;
- Unscrew screw "B" fastening it to the steering base;
- Remove the steering shock-absorber.

Adjustment:

See chapter 7, section C.

Reassembly:

Carry out the procedures in reverse order.

12 TIRES

The tires are one of the most important components to be checked.

As a matter of fact, the following features depend on the tires:

stability, vehicle driving comfort and in some cases also the driver's safety.

Therefore, we recommend not to use tires whose tread is less than 2 mm.

Also an incorrect inflation pressure can cause stability defects and excessive tire wear.

The prescribed pressures are:

- Front wheel: 2.3 BAR with one or two passengers;
- rear wheel: with one person 2,5 BAR, with two people 2,6 BAR.

N.B.

The above-mentioned values are intended for normal leisure use. A pressure increase of 0.2 BAR in the front tire is suggested for continuous drive at maximum speed or on highways.



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● IMPORTANT

When replacing tires, it is advisable to use a high quality type and make.

Tire pressure must be measured when the tires are cold.

Removal and Refitting

The motorbike is equipped with light-alloy rims (California EV, Special 1st series) or with steel rims (California Special 2nd series, Special Sport, Jackal and Stone)

For the above procedures, it is therefore advisable to use iron tools which do not have grooves and sharp edges on the parts which come into contact with the edge of the rim.

The contact surface must be wide, well smoothed and with suitably rounded edges; using one of the special, commercially available lubricants will help the tire slide into and bed-in on the rim during disassembly and reassembly, and it will eliminate the need to heavily load the iron tools; for this reason, it is also very important that the tires' bead heels are well set in the rim's central channel.

Observe the rotation direction indicated by the arrow on the tire side when assembling the tires.

A

CONTROLS

B

SCHALTUNGEN

C

D

BEDIENINGEN

E

F

G

H

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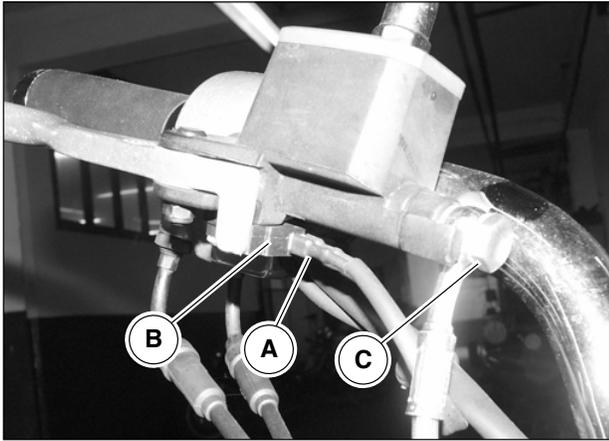
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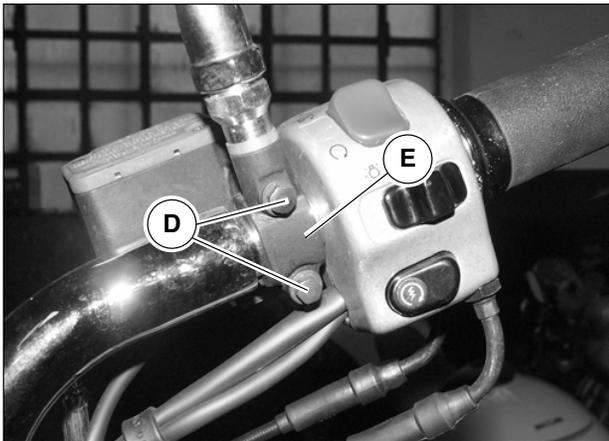
P



1 CLUTCH AND FRONT BRAKE CONTROL

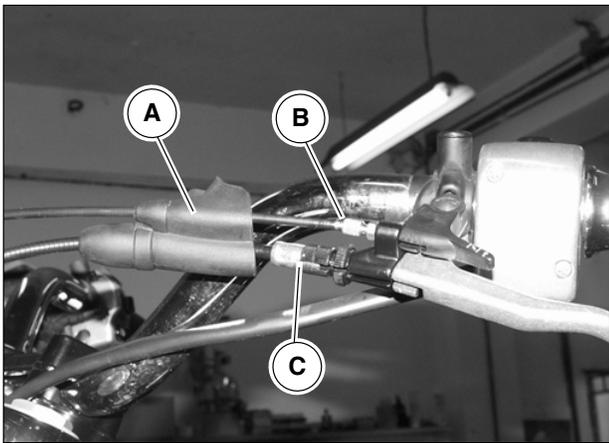
Removal of front brake lever with master cylinder:

- Drain the hydraulic system thoroughly, as described in chapter 2, section D;
- Detach the connections “A” for the micro-switch “B”
- Unscrew the hollow screw “C” fastening the tube to the pump;
- Remove the tube and the gaskets from the pump;
- Remove the rear-view mirror;
- Unscrew the two screws “D” which fasten the pump to the half-handlebar using a jumper “E”;
- Remove the pump together with the tank and lever;



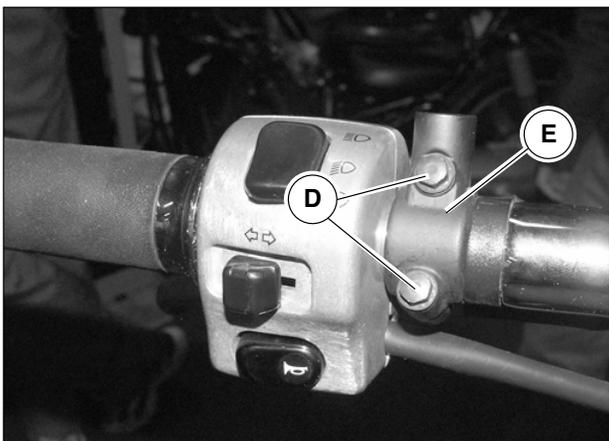
Reassembly:

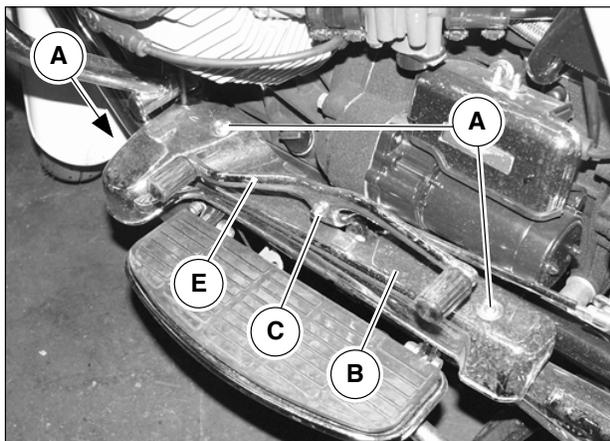
- Fit the pump onto the half-handlebar by tightening the two fastening screws;
- Reconnect the tube to the pump by tightening the hollow screw to the torque prescribed in the table in chapter 4, section B;
- Connect the electric wirings to the micro-switch on the master cylinder;
- Assemble the mirror;
- Fill the system with the prescribed hydraulic system fluid.



Removal of front clutch lever:

- Remove the rear-view mirror;
- Move the protective cover “A” and disconnect the CHOKE transmission “B” and the clutch “C” from their respective lever;
- Unscrew the 2 screws “D” fixing the clutch lever mounting to the handlebar using a U-bolt “E”.





2 GEARBOX CONTROL

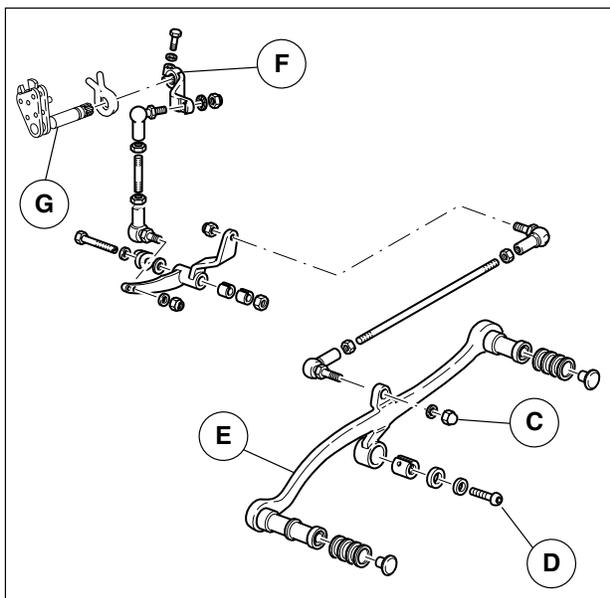
DISASSEMBLY OF CALIFORNIA EV:

- Unscrew the 3 screws "A";
- Remove the frame section cover "B";
- Unscrew nut "C";
- Unscrew screw "D";
- Remove the gear shift lever "E".



N.B.

To guarantee the proper reassembly, mark the position of lever "F" on the gear selector shaft "G" with a felt tip pen before disassembly

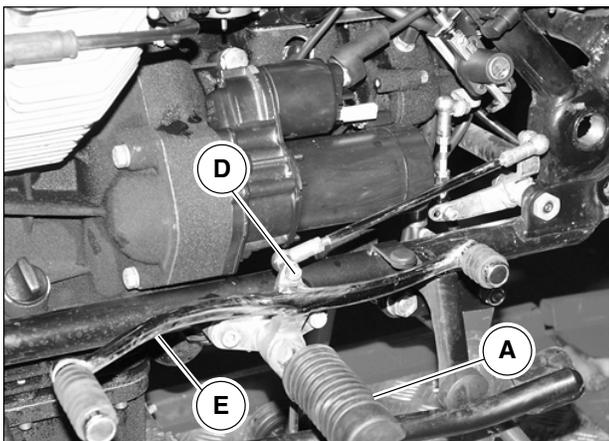


Reassembly:

- Carry out the disassembly procedures in reverse order;
- Remember to insert the lever onto the selector shaft in the correct position, using the markings made before disassembly.



A
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DISASSEMBLY OF CALIFORNIA JACKAL - CALIFORNIA STONE:

- Remove the left front footrest "A" as described in **chapter 3 section H**;
- Remove the footrest mounting "C" after loosening screw "B";
- Unscrew cap nut "D";
- Remove the gear shift lever "E".



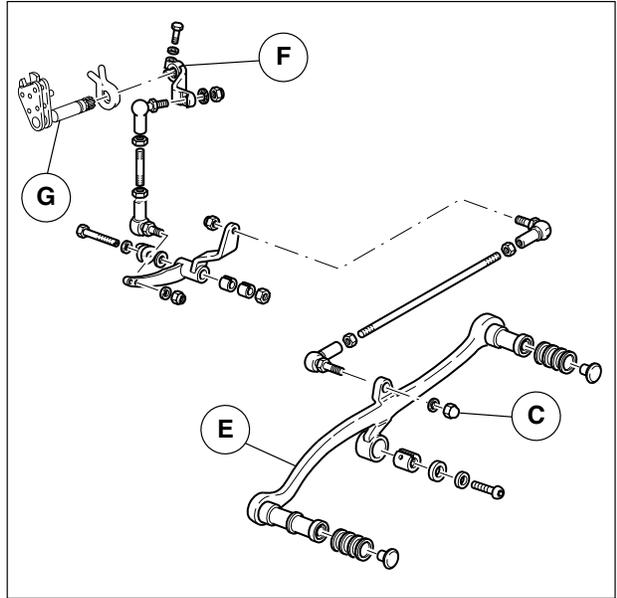
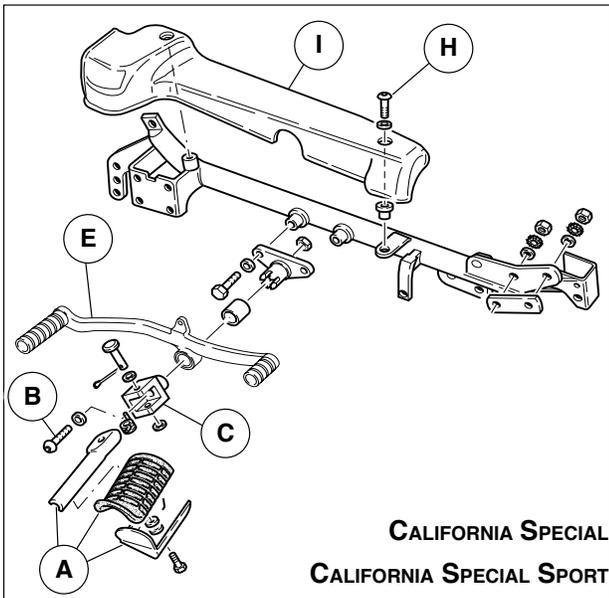
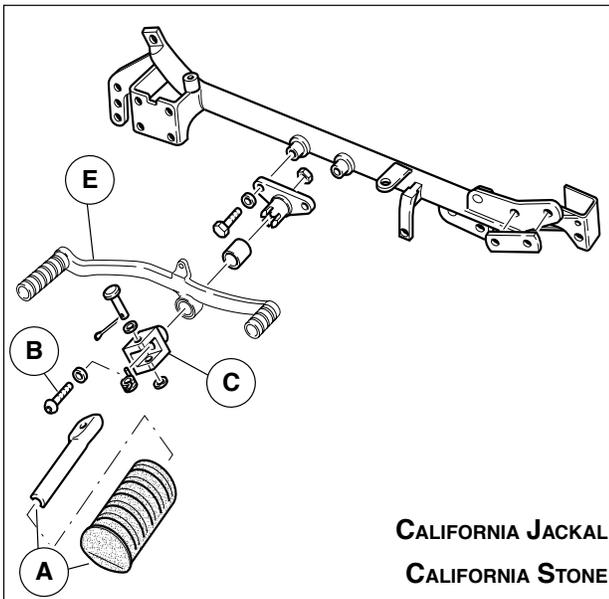
N.B.
To guarantee the proper reassembly, mark the position of lever "F" on the gear selector shaft "G" with a felt tip pen before disassembly

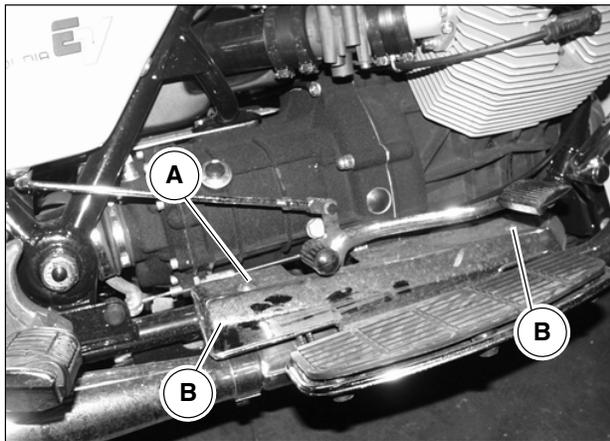
DISASSEMBLY OF CALIFORNIA SPECIAL - CALIFORNIA SPECIAL SPORT:

- Unscrew the 3 screws "H" and remove the frame section covers "I";
- For all other removal operations follow the indications for CALIFORNIA JACKAL - CALIFORNIA STONE.

Reassembly:

- Carry out the disassembly procedures in reverse order;
- Remember to insert the lever onto the selector shaft in the correct position, using the markings made before disassembly.





3 REAR BRAKE CONTROL

DISASSEMBLY OF CALIFORNIA EV:

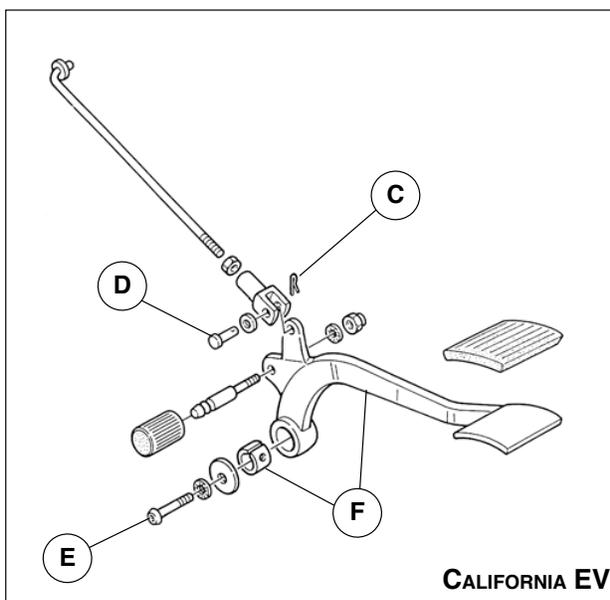
- Unscrew the 2 screws "A" and remove the frame section covers "B";
- Remove the split pin "C" and pull out pin "D";
- Unscrew the screw "E" and remove the brake lever "F".

DISASSEMBLY OF CALIFORNIA JACKAL - CALIFORNIA STONE:

- Remove the right front footrest and relevant mounting as indicated in **chapter 3, section H**;
- Remove the cotter pin "A" and pull out pin "B";
- Remove the brake lever "C" from the frame section.

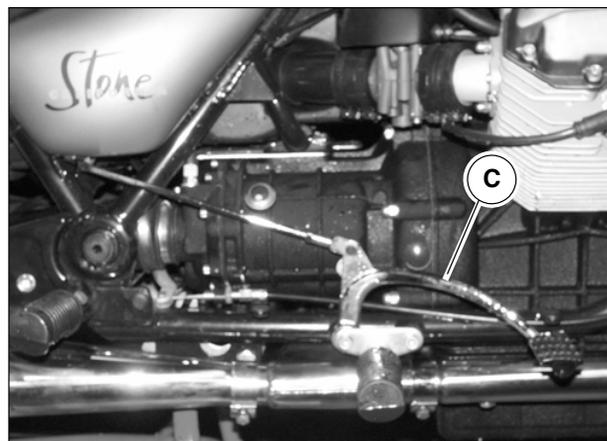
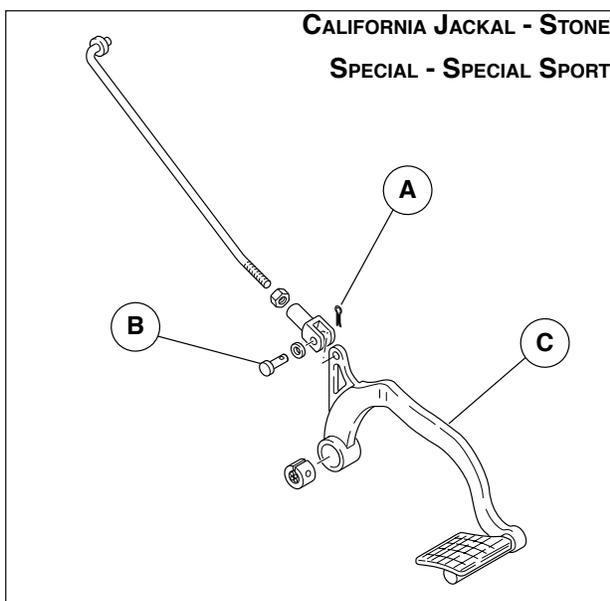
DISASSEMBLY OF CALIFORNIA SPECIAL - CALIFORNIA SPECIAL SPORT:

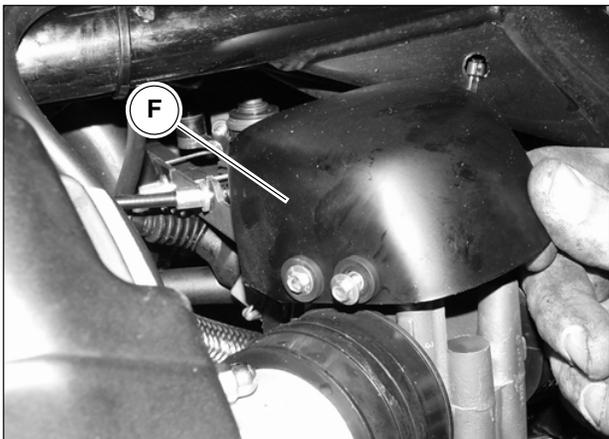
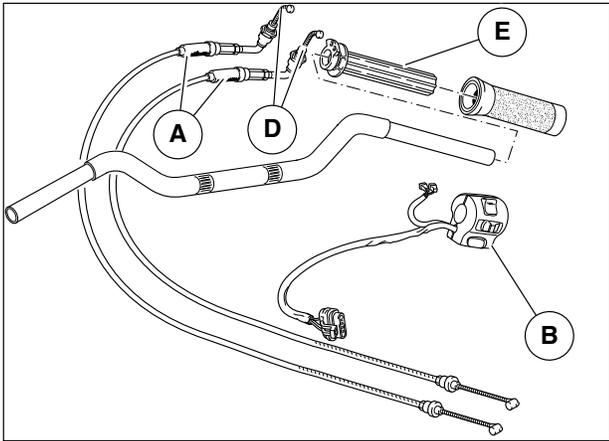
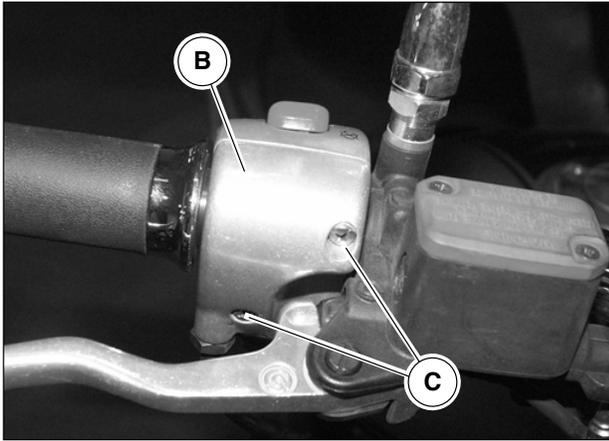
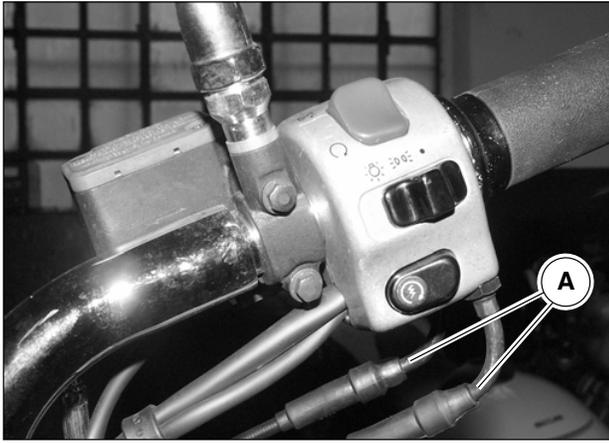
- Unscrew the 2 screws "A" and remove the frame section cover "B";
- For all other removal operations follow the indications for CALIFORNIA JACKAL - CALIFORNIA STONE.
- Unscrew the screw "E" and remove the brake lever "F".



Reassembly:

Carry out the procedures in reverse order.





4 ACCELERATOR / STARTER CONTROL

ACCELERATOR CONTROL

The accelerator control hand grip, in all steering positions, must feature a free travel, measured on the outer edge of the hand grip, of $1,5 \div 2$ mm.

If it needs adjustment: move the special adjusters "A" placed on the control itself.

Check, by pushing the control button, that the internal cables slide smoothly: if there is interference or hard spots, replace them.

MAINTENANCE OF ACCELERATOR CABLES:

- Remove the right-hand device "B" by loosening the two fastening screws "C";
- Grease the end of the cables "D" and the pulley "E";
- Close carefully the control while placing the cables "D" in the pulley of the gas control mobile body "E"
- Lock the right-hand device with the two fastening screws "C".

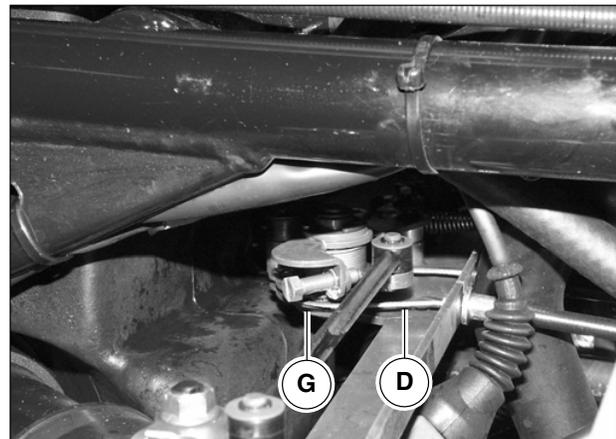
■ **N.B. The latest series of motorbikes model CALIFORNIA EV old type (1997-2000) includes the desmodromic gas control (double transmission) from chassis number KD115984.**

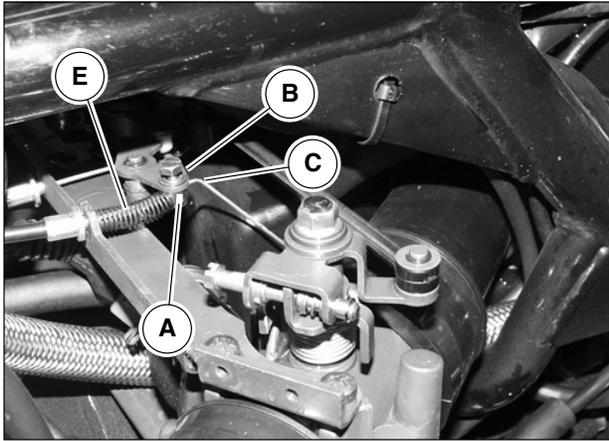
Disassembly

- Remove the lids of the throttle bodies covers "F";
- Remove the cables "D" from the drum "G" of the accelerator on the throttle body;
- Loosen the two screws "C" and pull out the accelerator control together with the cables from the handlebar.

Reassembly:

- Install the accelerator cables in the chassis in the same position they were before being removed;
- Place the accelerator control in the handlebar and tighten the screws "C";
- Connect the cables to the accelerator drum on the throttle body.





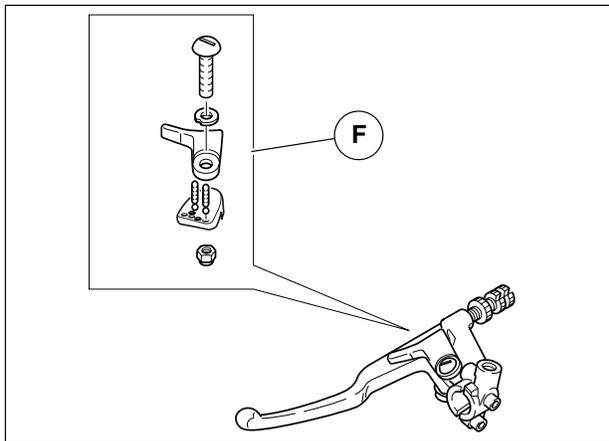
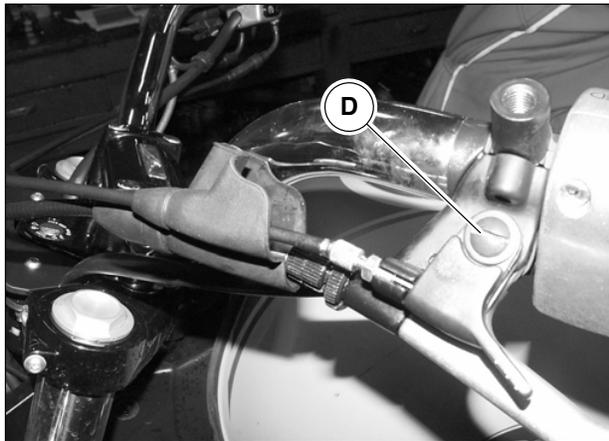
STARTER CIRCUIT

DISASSEMBLY OF CALIFORNIA EV 2001 - CALIFORNIA STONE - CALIFORNIA SPECIAL SPORT:

- Remove the right lid of the throttle body cover;
- With a wrench, hold the cable nut "A" still and with the other wrench unscrew the screw "B";
- Pull out the cable "C" from the nut;
- Pull out the spring "E" from the cable "C";
- Unscrew the choke lever fastening screw "D";
- Remove the choke lever and its components "F" together with the cable.

Reassembly:

Carry out the removal operations in reverse order, being careful to properly place all the components of the choke lever assembly "F" as indicated in the picture.

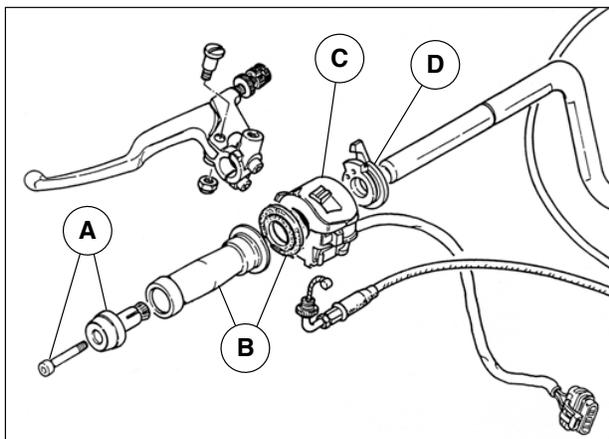


DISASSEMBLY OF CALIFORNIA EV (1997 - 2000) - CALIFORNIA JACKAL - CALIFORNIA SPECIAL:

- Remove the counterweight "A";
- Pull out the handgrip "B" with washer;
- Remove the left-hand light switch "C";
- Remove the clutch lever body as described in **chapter 1** of this section;
- Release the CHOKE cable and remove the CHOKE control "D".

Reassembly:

Carry out the removal operations in reverse order.



CHASSIS

RAHMEN

CHASSIS

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C

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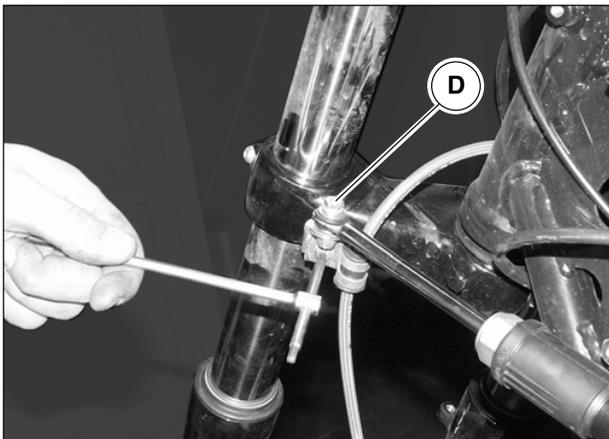
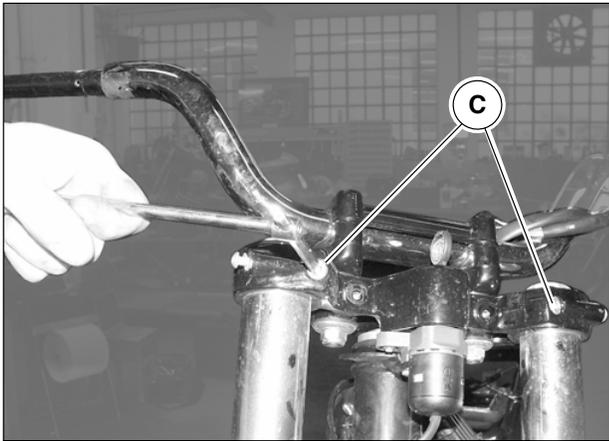
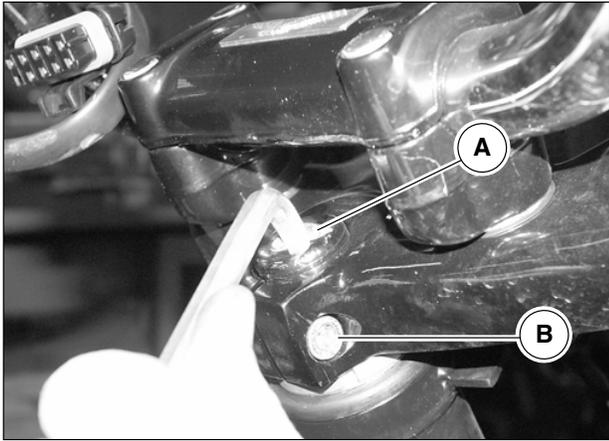
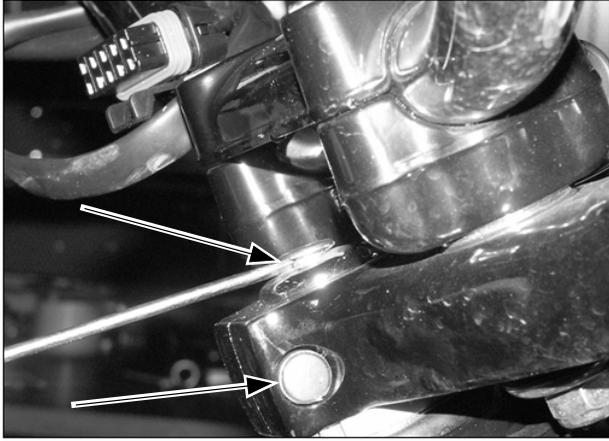
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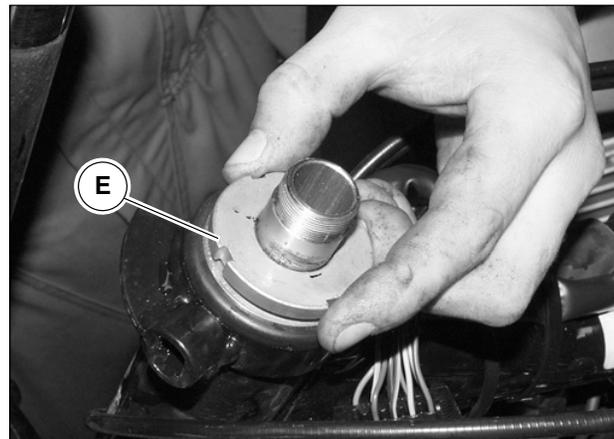
1 STEERING

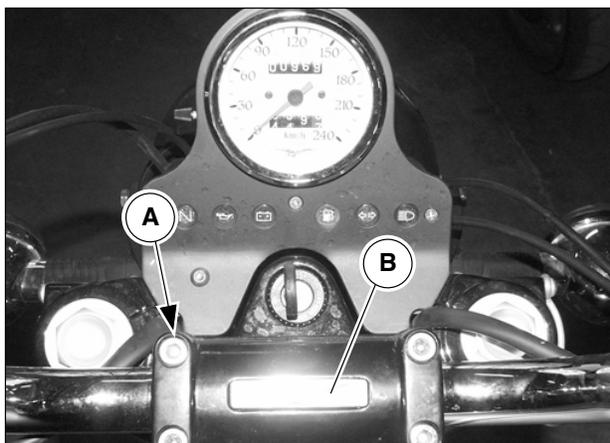
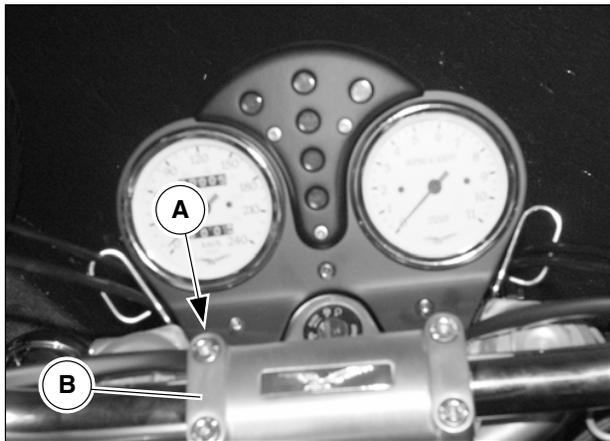
Disassembly:

- Place the motorbike on a firm mount, so that the front wheel is lifted from the ground;
- Remove the front brake calipers as described in chapter 4 section F;
- Remove the chromed plugs indicated with the arrows;
- Unscrew the nut "A";
- Unscrew the screw "B";
- Unscrew the two clamping screws "C" of the upper fork legs;
- Remove the handlebar assembly and the fork head;
- Unscrew the sealing screw "D" of the steering damper connection;
- Unscrew and pull out the lock nut together with the upper spring plate.
- Remove the fork, wheel and mudguard assembly.

Reassembly:

- Carry out the disassembly procedures in reverse order.





2 HANDLEBAR

Disassembly:

- Remove the mirrors as described in chapter 1 section E.
- Remove the accelerator control and starter / stop device as described in chapter 4 section G.
- Remove the front brake master cylinder as described in chapter 1 section G.
- Remove the left-hand controls assembly as described in chapter 4 section P.
- Remove the clutch lever assembly as described in chapter 1 section G.
- Remove the 4 chromed plugs "A";
- Unscrew the four sealing screws and remove the jumper "B".
- Remove the handlebar of the motorbike.

A

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C

D

E

F

G

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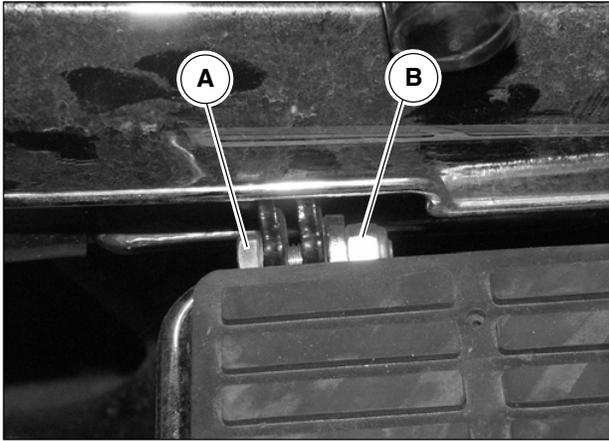
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3 FOOT RESTS

Disassembly of front footrests:

CALIFORNIA EV

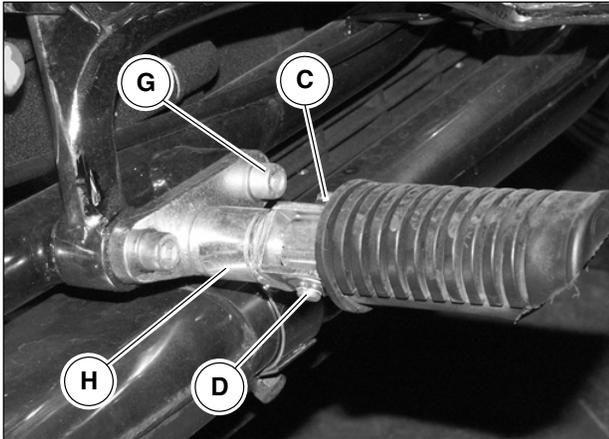
- Unscrew the 2 screws "A" while holding the nuts "B" .
- Remove the footrests.

CALIFORNIA SPECIAL, CALIFORNIA JACKAL, CALIFORNIA SPECIAL SPORT, CALIFORNIA STONE

- Remove the split pin "C".
- Pull out the pin "D" and the shims.

Reassembly of front footrests:

- Carry out the removal procedures in reverse order.



Disassembly of rear footrests (all models):

- Unscrew the 2 screws "E" while holding the nuts "F" .
- Remove the footrests.

Reassembly of rear footrests:

- Carry out the removal procedures in reverse order.

DISASSEMBLY OF FRONT FOOTRESTS SUPPORT FOR CALIFORNIA JACKAL - CALIFORNIA STONE - CALIFORNIA SPECIAL - CALIFORNIA SPECIAL SPORT:

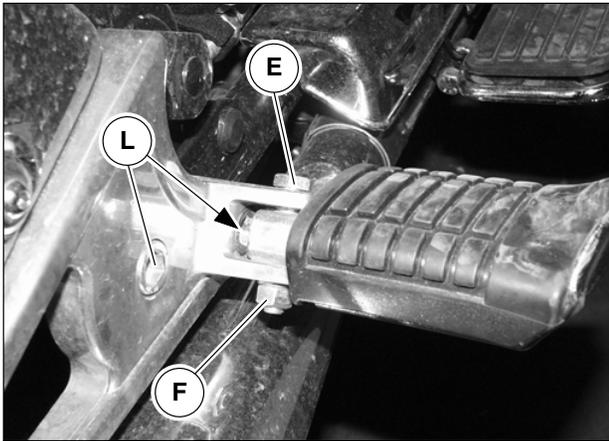
- Remove the footrest.
- Unscrew the 2 screws "G".
- Remove the support "H".

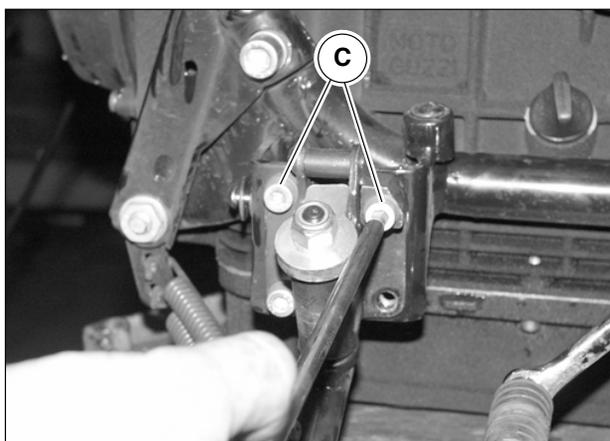
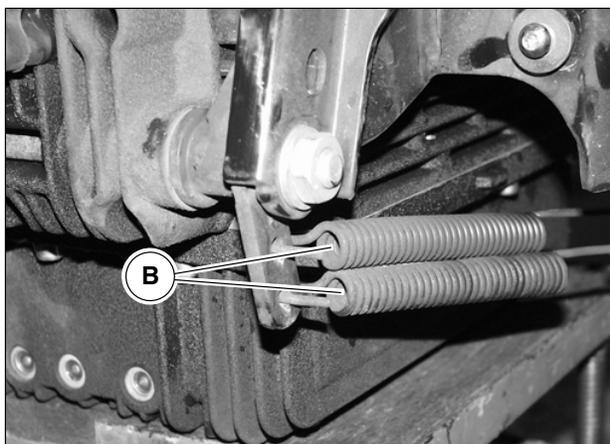
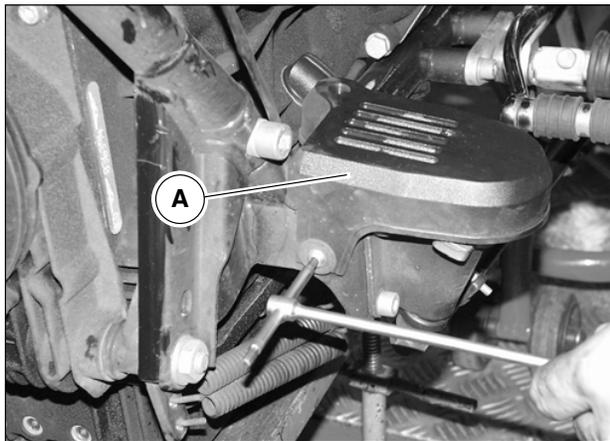
Disassembly of rear footrests support (all models):

- Unscrew the muffler fastening screw.
- Remove the footrest.
- Unscrew the 2 screws "L" while holding the nuts "F" in the rear .

Reassembly of rear footrests support:

- Carry out the removal procedures in reverse order.





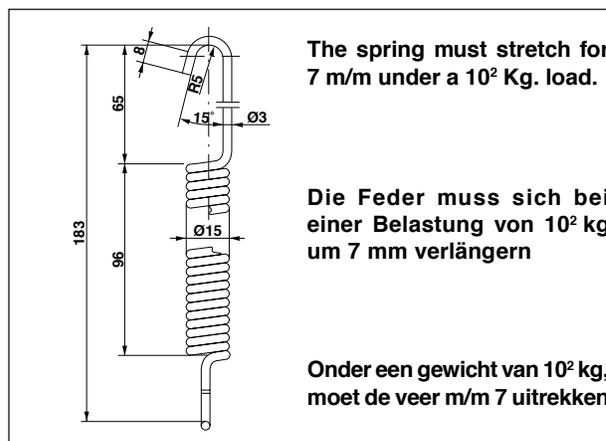
4 SIDE STAND

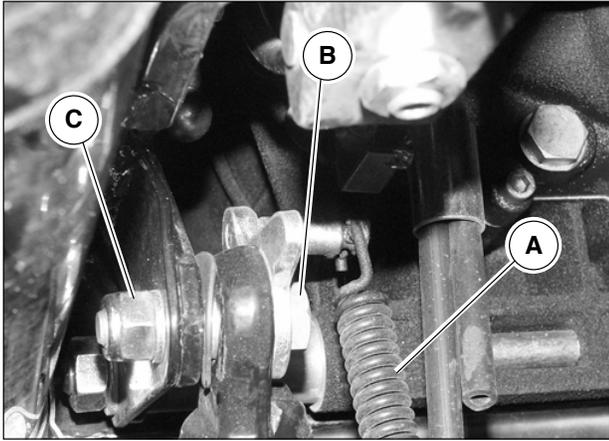
Stand removal:

- Place the motorbike on the center stand or, in case it is not fitted, on a firm mount;
- Remove the protection "A" (Stone) or the installed left-hand section frame cover, if any;
- Remove the side stand sensor support plate with the assembled sensor;
- Release the 2 springs "B";
- Unscrew the other screws "C" and remove the side stand with the support.

Reassembly:

- After checking that the stand is not deformed and that the springs are not yielded (if so, replace the necessary parts), carry out the removal procedures in reverse order.





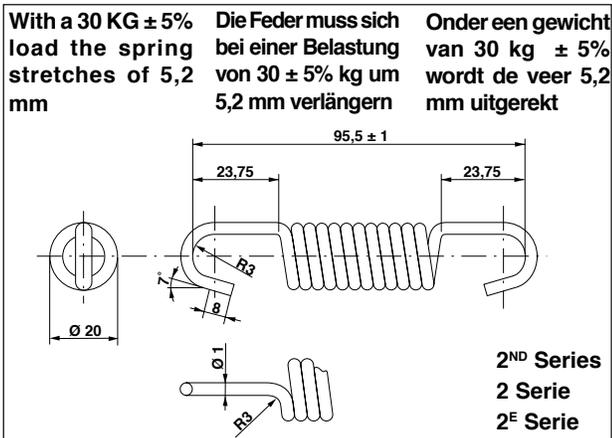
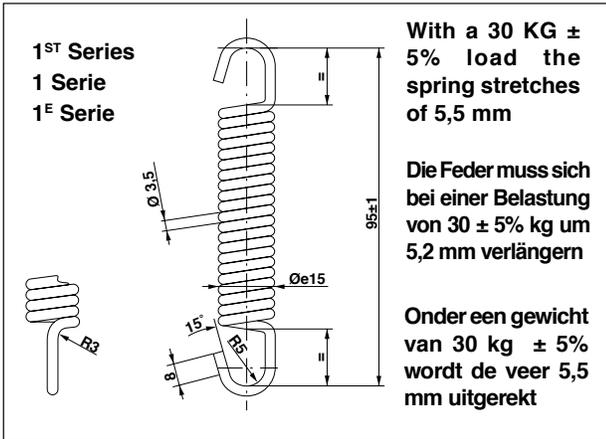
5 CHASSIS DIMENSIONS

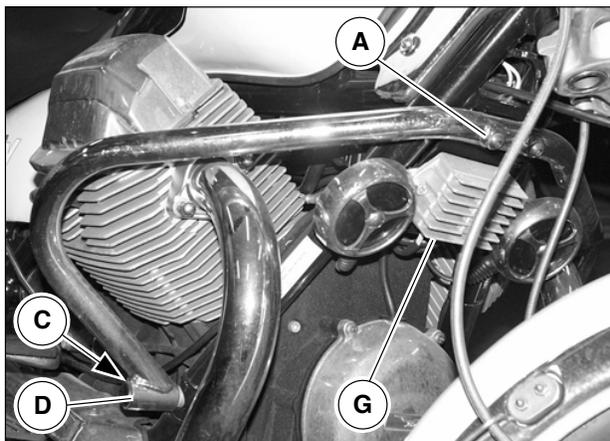
Overhauling:

- Place the motorbike on a firm mount so that the rear wheel is completely lifted from the ground;
- Release the 2 springs "A";
- With a wrench with fixed jaws hold the 2 screws "B" and simultaneously unscrew the nuts "C";
- Remove the stand.

Reassembly:

- After checking that the stand is not deformed and that the springs are not yielded (if so, replace the necessary parts), carry out the removal procedures in reverse order.





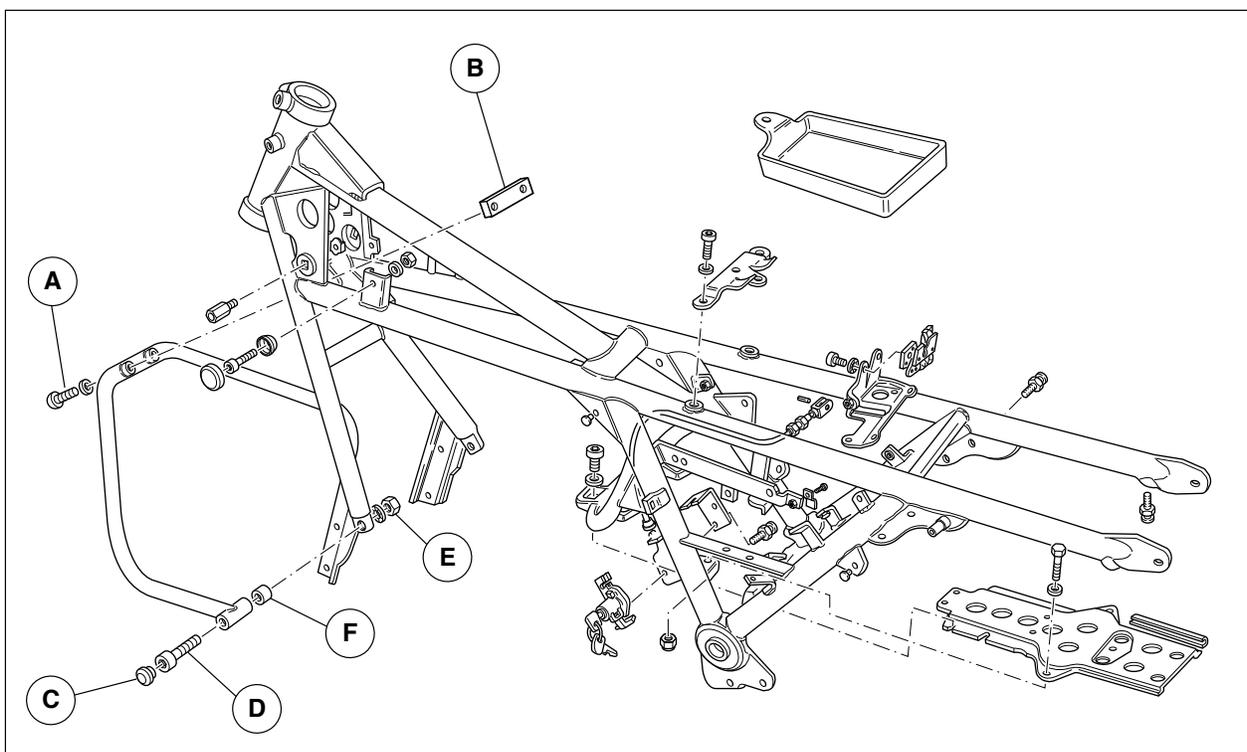
6 FRONT BUMPER

Overhauling:

- Unscrew the 2 screws "A";
- Remove the support plate "B";
- Remove the chromed plugs "C" and unscrew the screws "D" beneath, while holding the nuts "E" ;
- Remove the bumper.

Reassembly:

- Carry out the removal procedures in reverse order, being careful to properly reassemble the spacers "F" and the complete plate of the tension regulator "G".



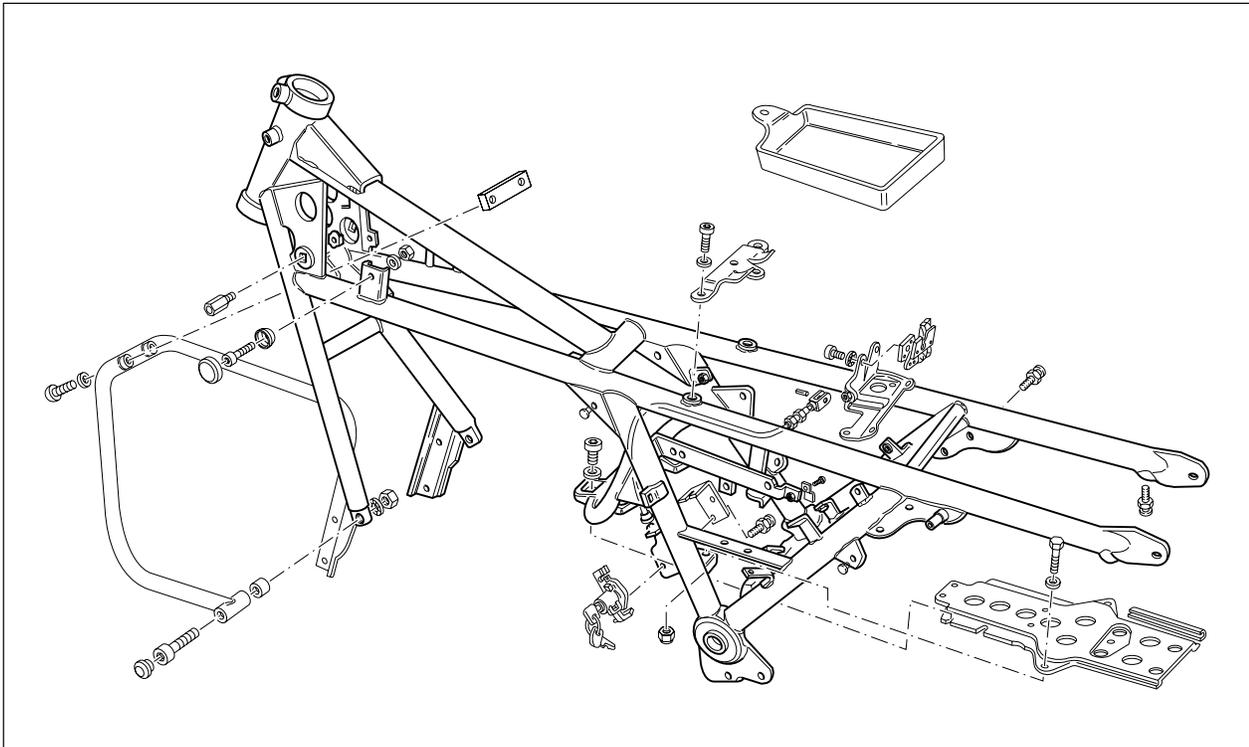
7 CHASSIS DIMENSIONS

Overhauling:

The chassis consists of two parts:
the frame itself and two lower side arms forming the engine frame section.

After a collision the chassis must be accurately checked according to the measures indicated in the technical drawing.

If the chassis's measurements are not in line with those indicated it must be repaired, if possible, or replaced.



7 RAHMENABMESSUNGEN

Überholung:

Der Rahmen besteht aus zwei Teilen:

Aus dem sogenannten Rahmen und aus zwei unteren Seitenarmen, die die Motorträgerwiege bilden.

Nach einem Stoß muss der Rahmen sorgfältig überprüft werden. Dabei sind die Abmessungen der technischen Zeichnung zu befolgen.

Wenn der Rahmen nicht den angegebenen Maßen entspricht, muss er, falls möglich, repariert oder anderenfalls ausgetauscht werden.

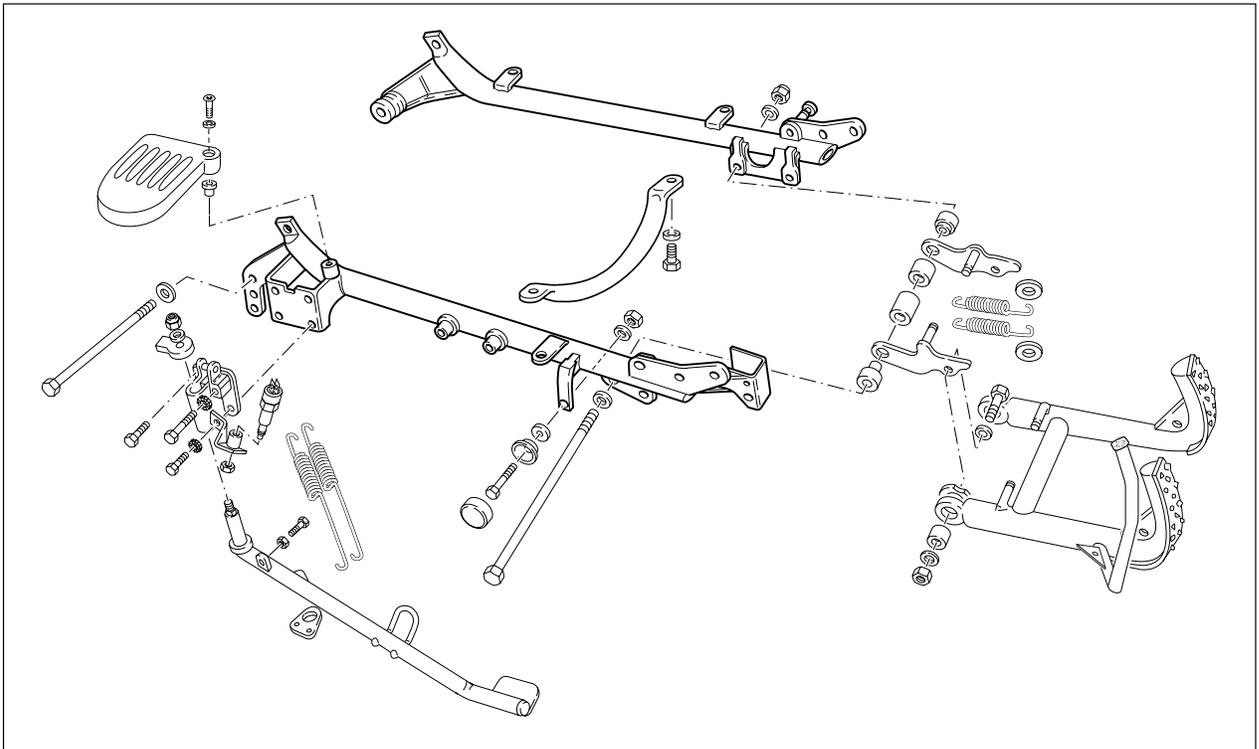
7 AFMETINGEN CHASSIS

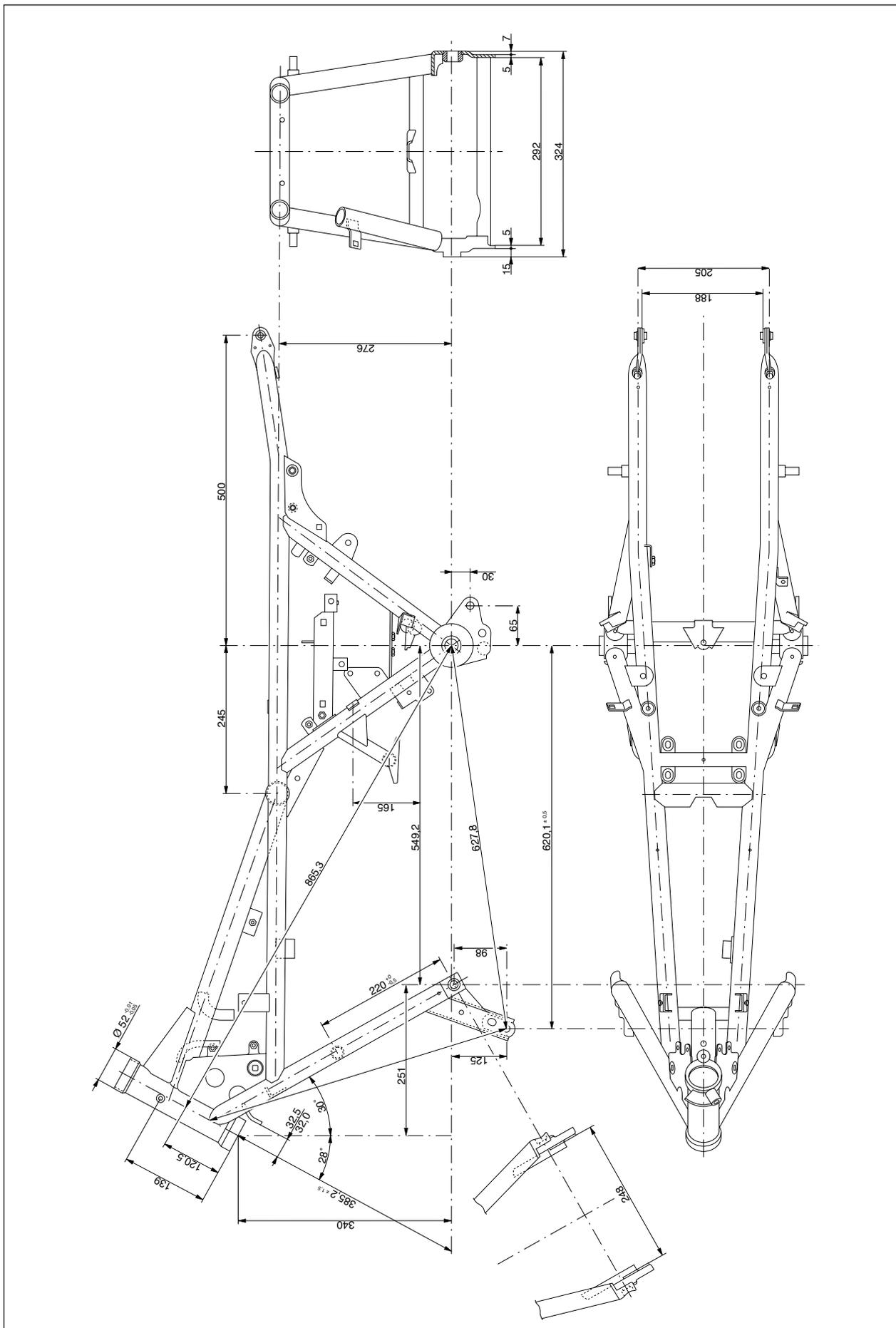
Revisie:

Het frame bestaat uit twee delen:

het eigenlijke frame en twee armen op de zijkanten onderaan die de "motorwiege" vormen.

Als tegen het frame wordt gebotst, moet het zorgvuldig worden gecontroleerd, en dienen hierbij de maten die op de technische tekening staan, te worden gerespecteerd. Indien het chassis niet binnen de aangegeven maten valt, het indien mogelijk herstellen, zoniet vervangen.





A

FUEL SYSTEM

B

KRAFTSTOFFZUFUHRANLAGE

C

VOEDINGSINSTALLATIES

D

E

F

G

H

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L

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N

O

P

1 GENERAL DESCRIPTION OF THE SYSTEM

 **N.B. The model California EV, manufactured in the years 1997-2000 until chassis number KD115749, is fitted with the type ignition system / injection with ECU P08 (big); should it be necessary, refer to the specific workshop manual code 29920160.**

The Weber injection-ignition system is an “alfa/N” type in which the engine r.p.m. and the throttle position are used to measure the quantity of air taken in; knowing the air quantity, the fuel quantity is measured according to the desired mixture ratio. Other sensors in the system allow the basic strategy to be adjusted under particular operating conditions.

The engine r.p.m. and the throttle angle make it possible to calculate the optimal spark advance for any operating condition.

The quantity of air taken in by each cylinder, per each cycle, depends on the density of air in the manifold, on the single displacement and on the volumetric efficiency. The volumetric efficiency is determined experimentally on the engine over the whole operating range (r.p.m. and engine load) and it is stored in a map inside the ECU.

The injector control, per cylinder, is a “timed sequence” type control; this means that the two injectors are controlled according to the intake sequence, while each cylinder supply can start directly from the expansion stage up to the already begun intake stage. The timing for the supply start is contained in a map inside the ECU.

The ignition is an inductive discharge static type with dwell control in the power modules (incorporated in the ECU) and a mapping of the spark advance stored in the ECU. The coils receive the commands from the ECU I.A.W. 15 M, which processes the spark advance, through the power modules (incorporated in the ECU).

The Weber Marelli 1.5 injection/ignition system main feature lies in the fact that it can be adjusted and diagnosed only through a special software. This can be ordered from the Motor Guzzi spare parts headquarters, quoting code no. 00 97 97 15.

This computer programme is called “Motorbike Diagnostic Software Toll” and can be installed on any PC (min. requirements 486 DX2 33Mhz). By connecting the latter through a special hardware key directly to the ECU, the software allows the user to adjust the carburation and the system diagnostics; for a detailed description about the programme use, please consult the user manual supplied with the software package.



2 SYSTEM COMPONENTS

The system is composed of three circuits:

- A fuel circuit
- B intake air circuit
- C electrical circuit

A FUEL CIRCUIT

The fuel is injected into each cylinder's intake duct, upstream of the intake valve.

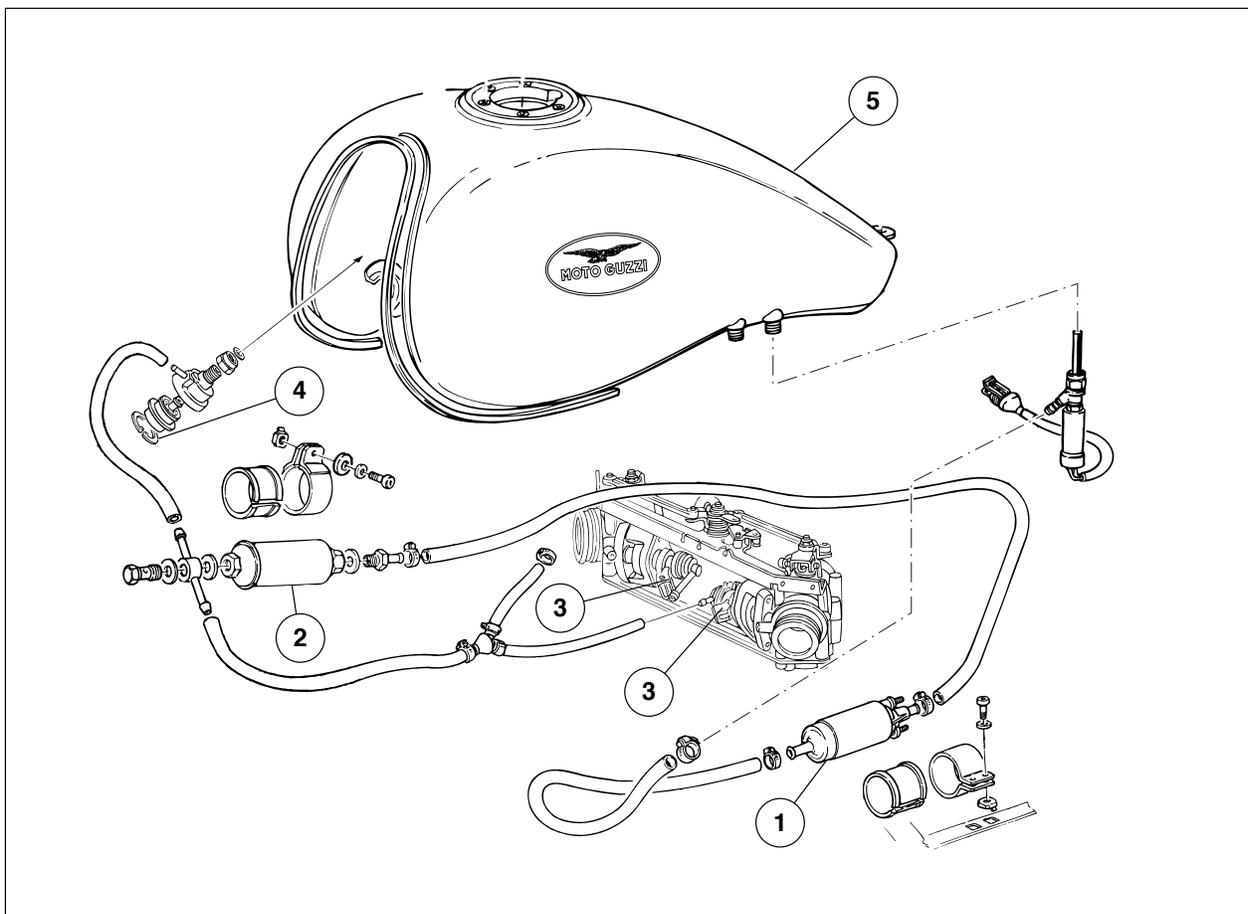
It includes: a tank, a pump, a filter, a pressure adjuster, electro-injectors.

The electric pump "1" sucks in fuel from the tank "S" and delivers it "2" to the electro-injectors "3" by means of a filter. The fuel pressure in the circuit is kept stable by the pressure adjuster "4". This controls the amount of fuel flowing back into the tank.

- 1 Electrical fuel pump
- 2 Fuel filter
- 3 Electro-injectors
- 4 Pressure adjuster
- 5 Tank

- 1 Elektrische Kraftstoffpumpe
- 2 Kraftstofffilter
- 3 Elektroinspritzventile
- 4 Druckregler
- 5 Kraftstoffbehälter

- 1 Elektrische pomp brandstof
- 2 Filter brandstof
- 3 Elektroinjectoren
- 4 Drukregelaar
- 5 Tank



2 ZUSAMMENSETZUNG DER ANLAGE

Die Anlage besteht aus drei Kreisläufen:

- A Kraftstoff-Kreislauf
- B Ansaugluft-Kreislauf
- C Elektrischer Stromkreis

A KRAFTSTOFF-KREISLAUF

Der Kraftstoff wird in den Einlasskanal jedes Zylinders oberhalb des Einlassventils eingespritzt.

Er umfasst: Kraftstofftank, Pumpe, Filter, Druckregler, Elektroinspritzventile.

Die Elektropumpe "1" saugt den Kraftstoff aus dem Tank "S" an und schickt ihn durch einen Filter "2" zu den Elektroinspritzventilen "3". Der Kraftstoffdruck im Kreislauf wird vom Druckregler "4" konstant gehalten, der den Zugang des in den Tank zurückfließenden Kraftstoffs kontrolliert.

2 SAMENSTELLING VAN DE INSTALLATIE

De installatie bestaat uit drie circuits:

- A circuit brandstof
- B circuit aangezogen lucht
- C lektrisch circuit

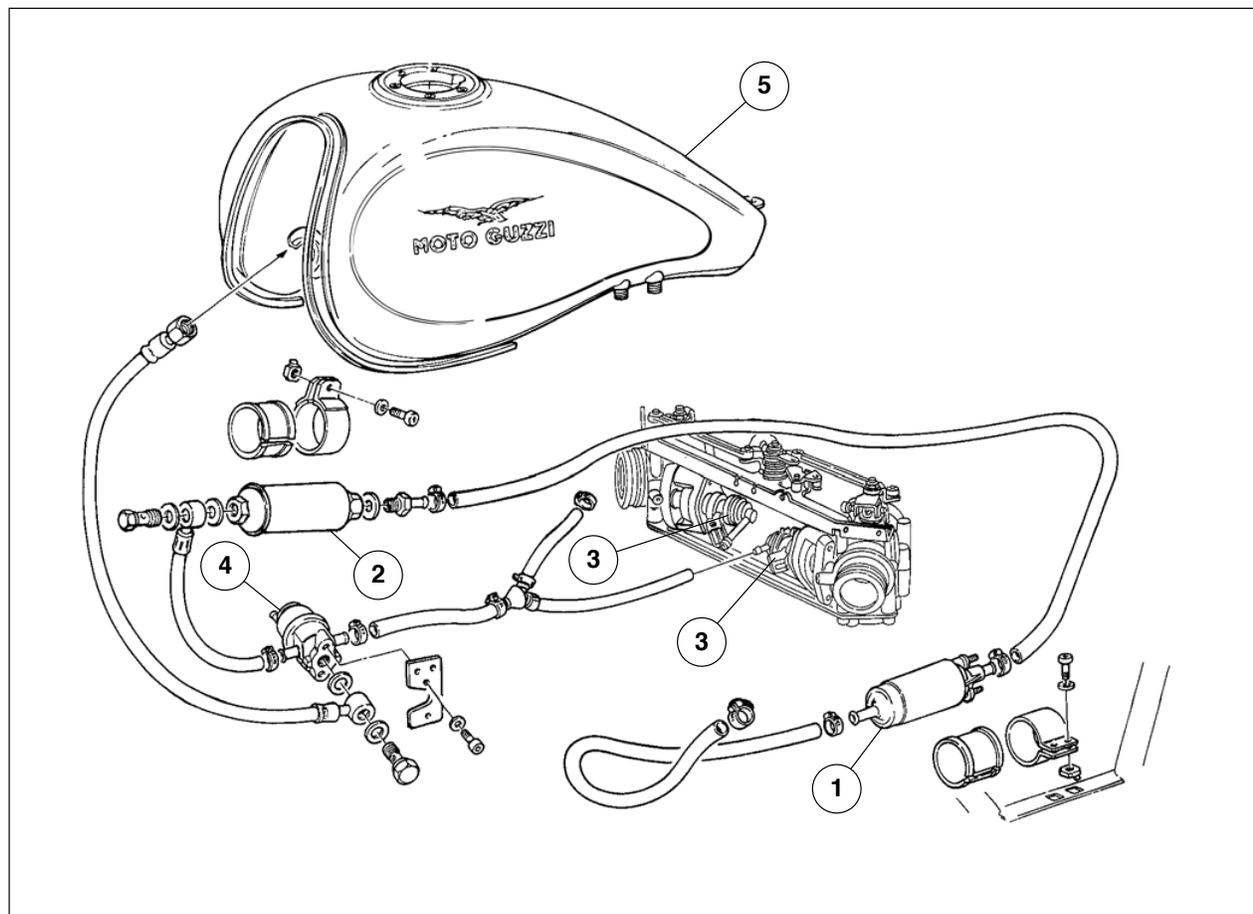
A CIRCUIT BRANDSTOF

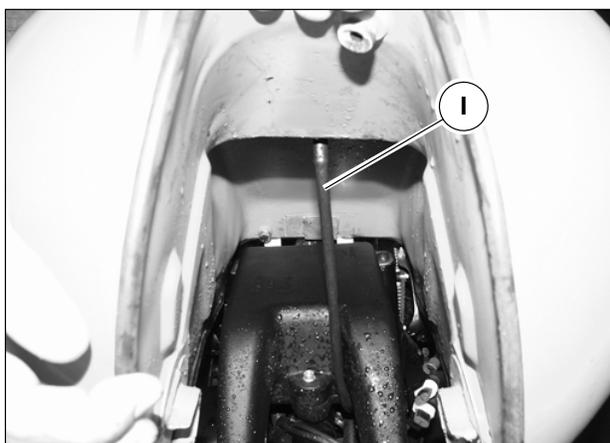
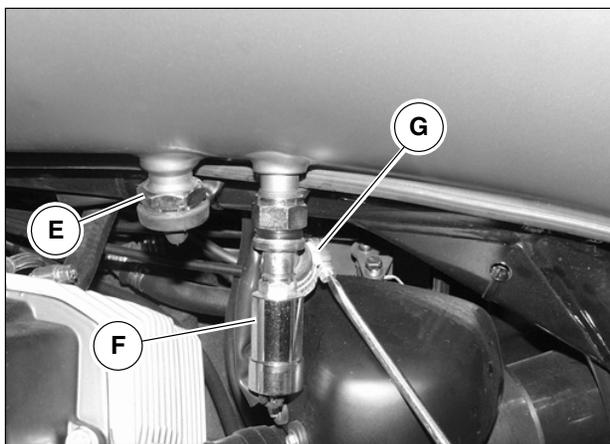
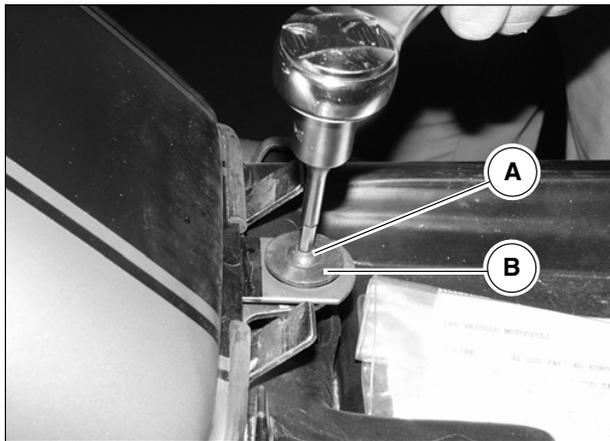
De brandstof wordt geïnjecteerd in het aanzuigkanaal van elke cilinder, voor de aanzuigklep.

Bevat: tank, pomp, filter, drukregelaar, elektroinjectors.

De elektropomp "1" zuigt de brandstof van de tank "S" aan en stuurt deze door een filter "2" naar de elektroinjectoren "3". De druk van de brandstof in het circuit wordt constant gehouden door de drukregelaar "4" die de toevoer van de brandstof controleert die terug naar de tank loopt.

CALIFORNIA EV 1ª SERIE (1997-2000) FINO AL TELAIO N° KD115749





3 TANK "5"

⚠ WARNING
 The fuel contained in the tank is highly inflammable.
 Flames, cigarettes and other objects emitting heat, if present during tank removal procedures or in places where fuel is stored, are a great risk for the operator.
 Always work in well ventilated places.

Disassembly:

- Remove the front seat as described in section E chapter 4;
- Unscrew and remove the fastening screw "A";
- Remove the washer "B";
- Detach in the front:
- Remove the tube from the pressure adjuster "D";
- On the LH side detach:
- The connection for the fuel level sensor "E" and the connection for the fuel solenoid valve "F";
- Loosen the clamp "G" and remove the tube from the fuel solenoid valve "F";
- Lift the front of the fuel tank and remove the breather pipe "I";
- Lift the rear part of the tank and remove it by sliding it backwards.

Reassembly:

To reassemble, first connect the breather pipe "I" and the pressure adjuster, then place the front end of the tank in the chassis and fix it with the proper screw in the rear side; reconnect all wirings and piping previously disassembled; reassemble the seat.

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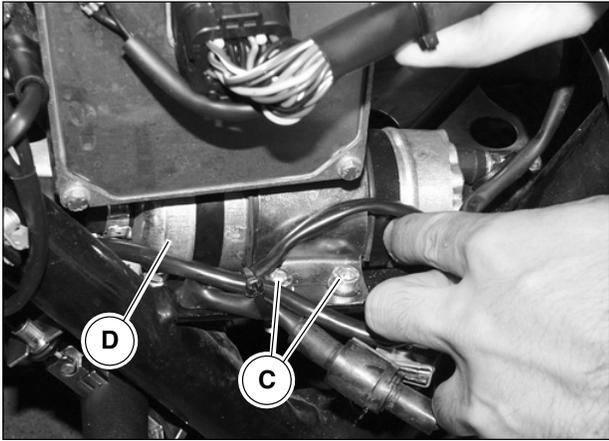
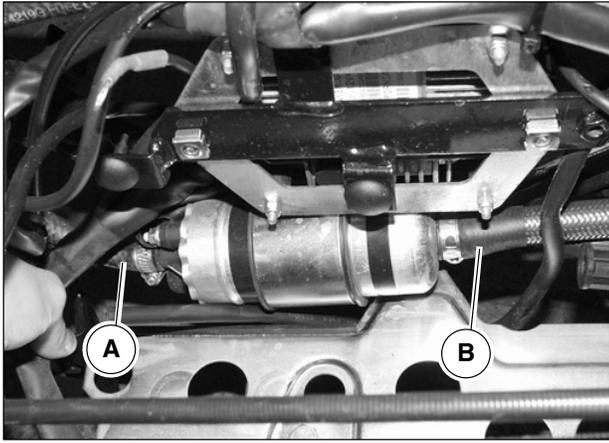
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4 ELECTRICAL FUEL PUMP “1”

The motorbike is equipped with a volumetric roller type electrical pump whose motor is immersed in the fuel.

The motor is composed of brushes with permanent magnet excitation.

When the impeller rotates, driven by the motor, it generates volumes which move from the intake gate to the delivery gate. These volumes are delimited by rollers which adhere to the external ring while the motor is rotating. The pump is fitted with a check valve which is necessary in order to prevent the fuel circuit from emptying when the pump is not working.

It is also equipped with an pressure valve, which short-circuits the delivery with the intake when the pressure exceeds ~5 bar, thereby preventing the electrical motor from overheating.



N.B.

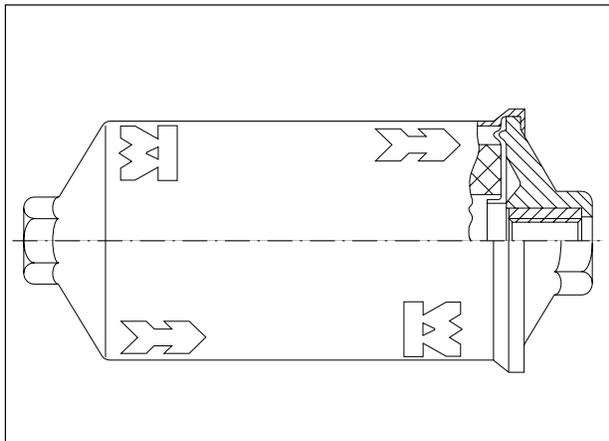
Always make sure the system is clean when disassembling and assembling the piping and the components.

Disassembly:

- Remove the left-hand side body panel as described in chapter 3 section E;
- Disconnect the two electric wirings from the pump and mark their position for the following reassembly;
- Remove the fuel inlet pipe “A” from the pump by loosening the respective clamp;
- Remove the fuel outlet pipe “B” from the pump by loosening the respective clamp;
- Unscrew and remove the 2 screws “C”;
- Remove the pump “D” from the chassis with the relevant support clamp.

Reassembly:

Carry out the procedures in reverse order.



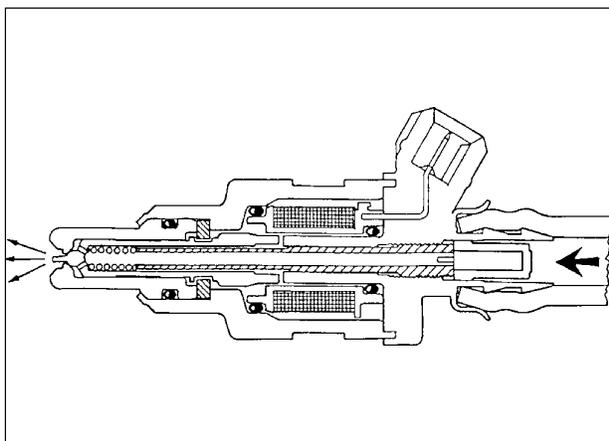
5 FUEL FILTER “2”

The filter is equipped with a paper filtering element, with a surface area of about 1200 cm², and a filtering capacity of 10 μm: these features are essential, given the injectors' high sensitivity to foreign bodies.

The filter is fitted under the fuel pump between the pump and the throttle body units and has an arrow on its external casing which indicates the fuel flow direction.

Disassembly:

See chapter 2, section D.



6 ELECTRO-INJECTORS “3”

The injector controls the fuel quantity delivered to the engine. It is an “all or nothing” device, in that it only has two modes: open or closed.

The injector is composed of a body and a jet needle which is integral to the magnetic armature.

The jet needle is pressed onto the restraining seat by means of a helical spring whose load is determined by an adjustable thrust spring.

The winding is housed in the rear part of the body. The injector snug is machined in the front part (retaining seat and guide for the needle).

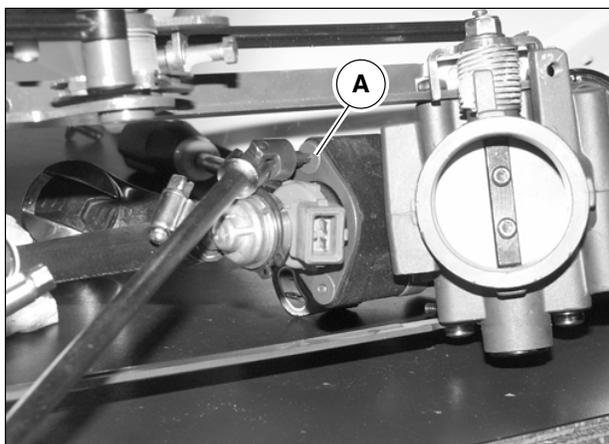
The control pulses established by the ECU create a magnetic field which attracts the armature and causes the injector's opening.

This time is determined by the control ECU according to the engine's conditions of use. Fuel metering is activated in this way.

Finally, from a hydraulic point of view, upon a fuel compression of $3 \pm 0,2$ bar, the jet brakes down as soon as it comes out from the nozzle (atomizing), thereby forming a cone of about 30°.

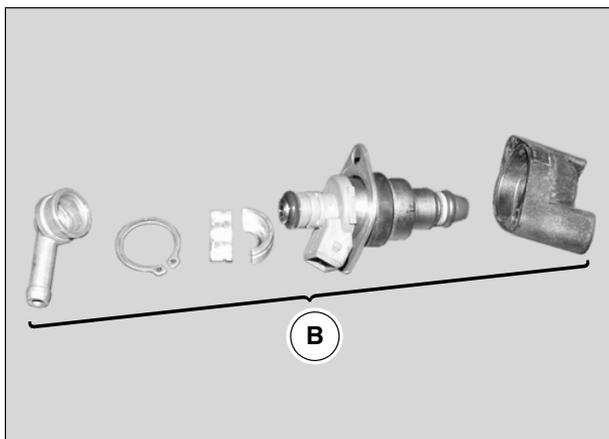
Resistance value: 12 ohm.

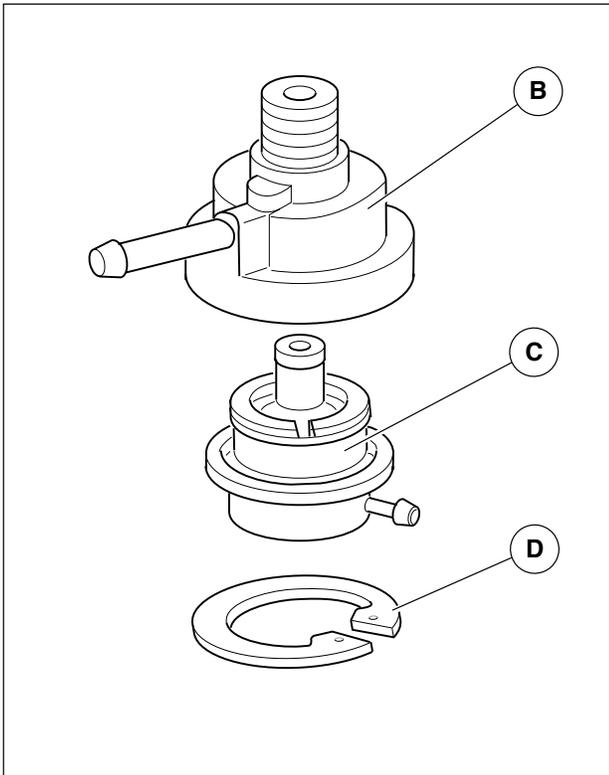
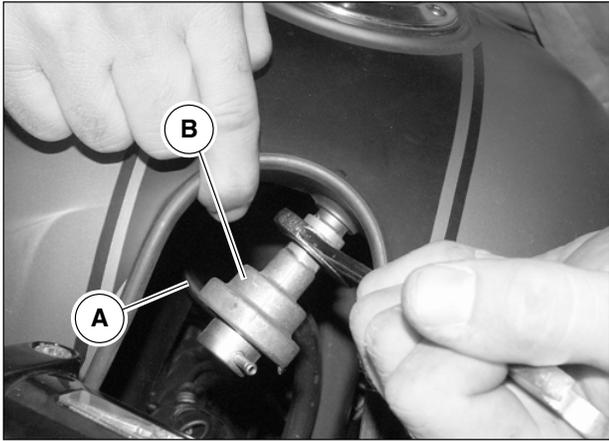
If you want to carry out an electrical test on the injector, apply a maximum voltage of 6 V for very short times.



Disassembly:

- Remove the throttle body as described in chapter 9 in this section;
- Unscrew the two fastening screws “A” and remove the electro-injector assembly “B”.





7 PRESSURE ADJUSTER “4”

The pressure adjuster is a device which is necessary for maintaining a constant pressure jump on the injectors. The pressure adjuster is a differential type with diaphragm, and is pre-set during assembly at $3 \pm 0,2$ bar. Upon exceeding the pre-set pressure, the internal duct opens to allow the excess fuel to flow back into the tank. Note that to keep the pressure jump to the injectors constant, the difference between the fuel pressure and the intake manifold pressure must also be constant.

Disassembly:

- Partly remove the fuel tank from the seat on the chassis as described in chapter 3 of this section;
- Loosen the sealing clamp and pull the fuel pipe “A” out of the pressure adjuster;
- Unscrew the pressure adjuster body holder “C” and remove it together with the pressure adjuster;
- To remove the pressure adjuster “D” from its body, it is necessary to remove the seeger ring “E”.

Reassembly:

Carry out the procedures in reverse order.



N.B.

On the model California EV 1st series years 1997 - 2000 until chassis number KD115749, the pressure adjuster is different and it is placed on the chassis under the fuel tank (see chapter 2 of this section).

B INTAKE AIR CIRCUIT

The circuit is composed of: an air filter, an intake manifold and a throttle body.

The socket for the pressure adjuster is positioned downstream of the throttle valve;

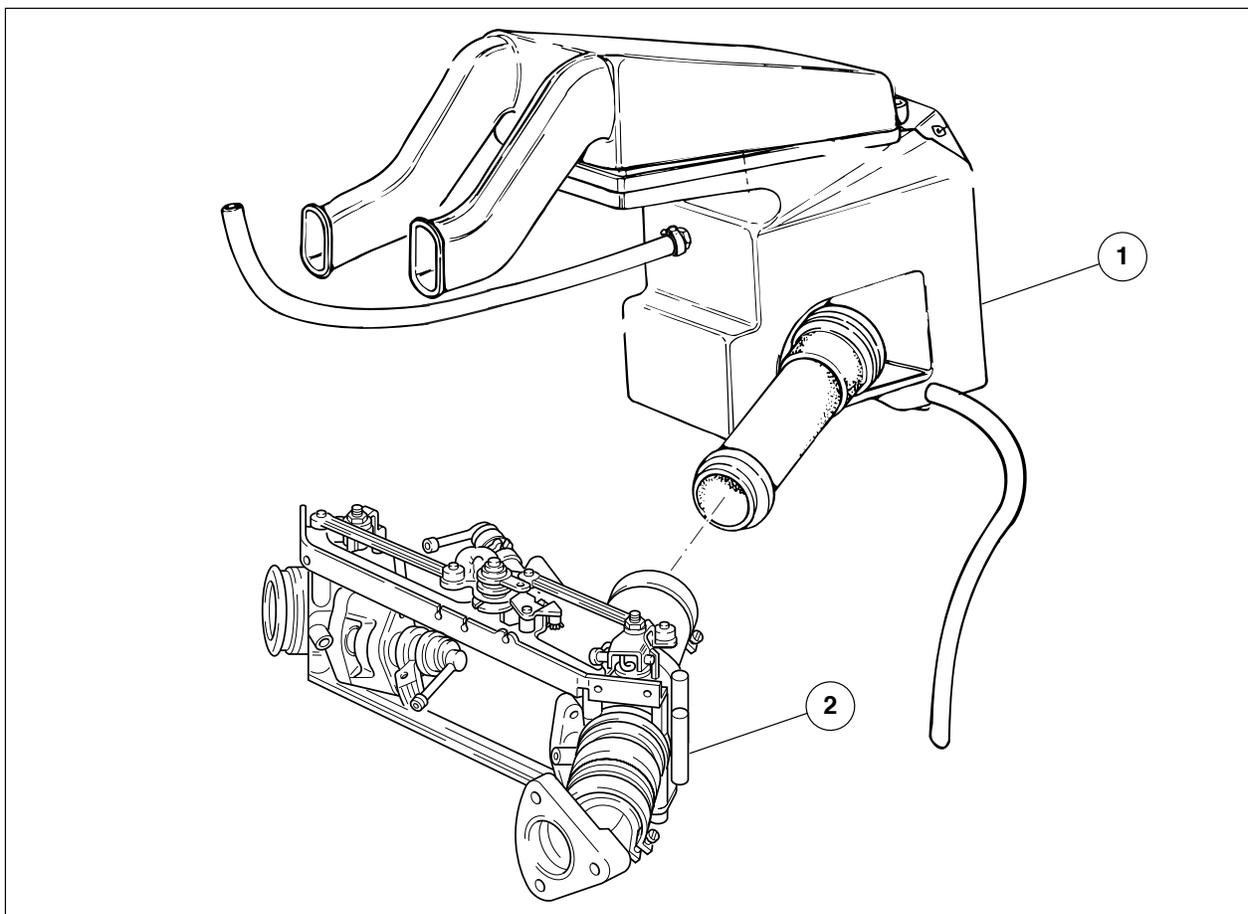
The throttle position potentiometer is splined onto the throttle shaft;

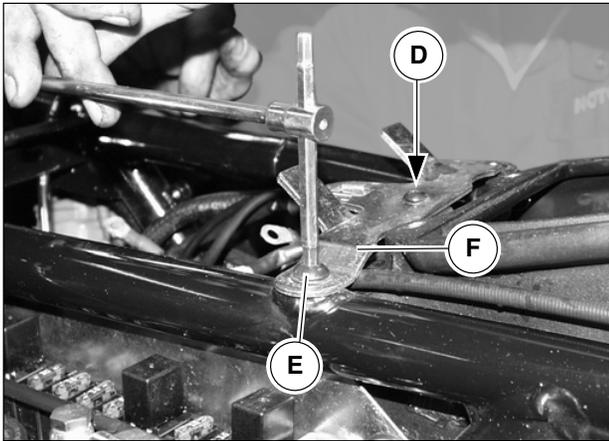
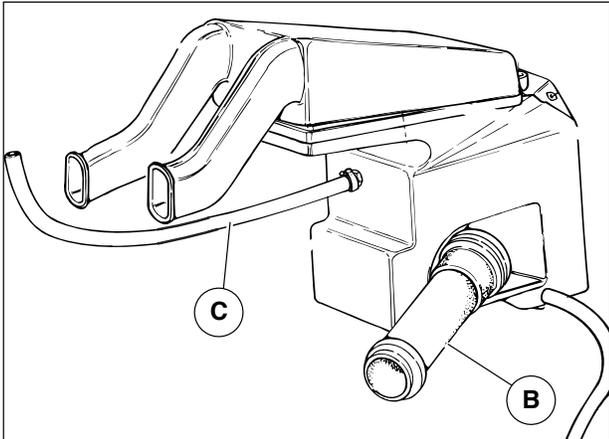
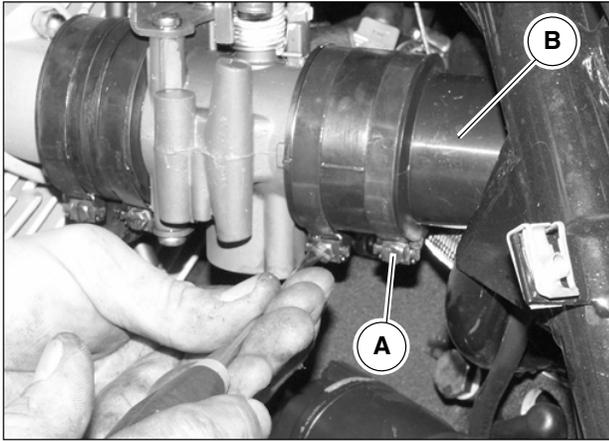
The absolute pressure sensor (integral to the ECU) and the air temperature sensor are positioned upstream of the throttle valve.

- 1 Air filter box
- 2 Throttle body

- 1 Luftfiltergehäuse
- 2 Klappenkörper

- 1 Kast luchtfilter
- 2 Smoorkleplichaam





8 AIR FILTER BOX "1"

Disassembly:

- Remove the front seat as described in section E chapter 4;
- Remove the fuel tank as described in section I, chapter 3
- Remove the side panels as described in section E, chapter 3

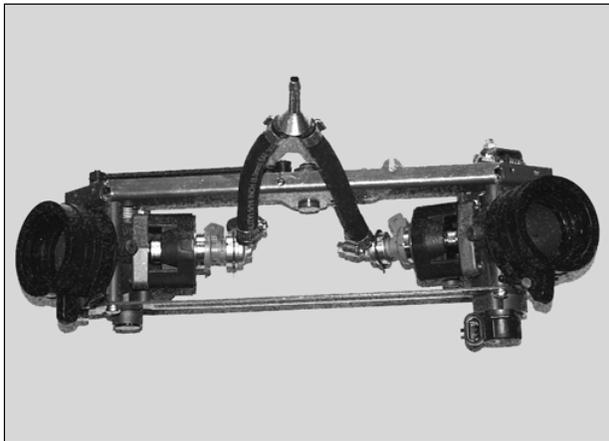
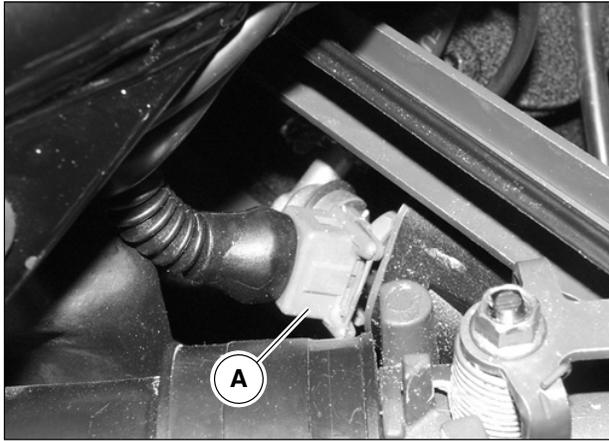
After having removed the above mentioned parts, proceed as follows:

- Loosen clamps "A" fastening the filter box to the throttle body, move the manifolds "B" outwards;
- Disconnect the bleeding pipe "C" positioned in the front part of the filter box;
- Unscrew screw "D" fastening it to the chassis;
- Unscrew the two screws "E" and remove the jumper "F";
- Rimuovere la scatola filtro.
- Remove the filter box.

To clean the air filter, see chapter 2, section D.

Reassembly:

Carry out the described procedures for disassembly in reverse order.



9 THROTTLE BODY “2”

The quantity of intake air is determined by the opening of the throttle positioned on the initial part of the intake manifold on every cylinder.

The air necessary for running at idling speed flows through a by-pass channel, equipped with an adjusting screw: turning this screw will vary the quantity of air which is introduced into the manifold and consequently also the idling speed.

A second screw allows the throttle closing to be adjusted correctly. This will avoid any interference with the surrounding duct; this screw must not be used to adjust the idling speed.

Disassembly:

- Remove the air filter box as described in chapter 8 of this section;
- Disconnect the following from the throttle body:
- The potentiometer wiring;
 - The wiring on the injectors “A”;
 - The accelerator control transmissions;
 - The choke control transmission as described in chapter 4 **section G**;
 - The fuel delivery and return piping;
 - Remove the throttle body from the motorbike.

■ IMPORTANT

Plug the intake manifold ducts to prevent foreign bodies from getting into the combustion chamber.

Reassembly:

- Carry out the procedures in reverse order.

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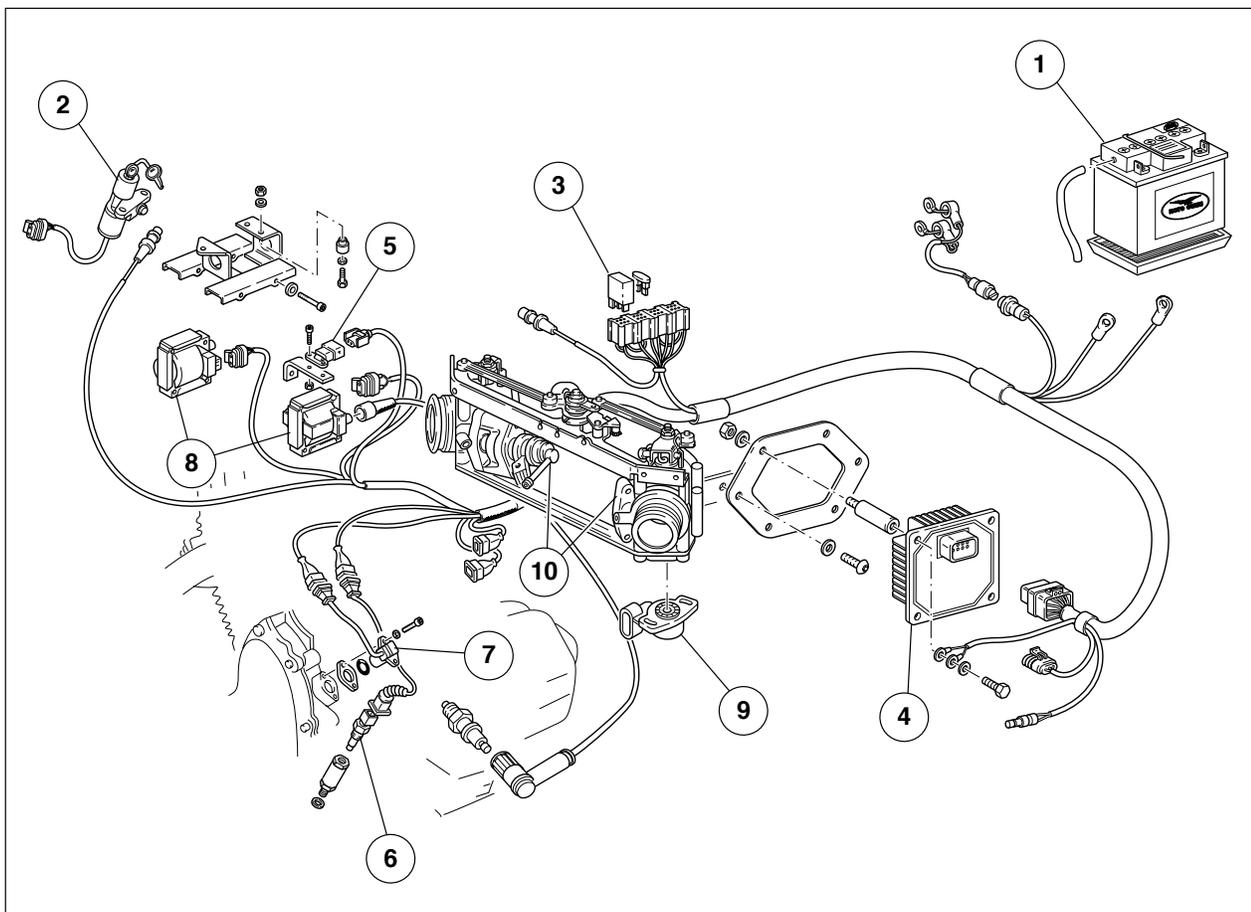
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C ELECTRICAL CIRCUIT

Through this circuit, the ECU detects the engine conditions and activates the fuel supply as well as the spark advance.

It includes: a battery, a starter switch, two relays, an ECU with an integrated absolute pressure sensor, an ignition unit, an air temperature sensor, a throttle position potentiometer, two injectors, an oil temperature sensor, a rev. timing sensor.

- | | | |
|-----------------------------------|---|---|
| 1 Battery | 1 Batterie | 1 Accu |
| 2 Starter switch | 2 Zündungsschalter | 2 Aan-/Uitschakelaar ontsteking |
| 3 Relay | 3 Relais | 3 Relais |
| 4 ECU I.A.W.15 M | 4 elektronisches Steuergerät I.A.W.15 M | 4 Elektronische centrale eenheid I.A.W.15 M |
| 5 Air temperature sensor | 5 Lufttemperaturfühler | 5 sensor temperatuur lucht. |
| 6 Oil temperature sensor | 6 Öltemperaturfühler | 6 Sensor temperatuur olie |
| 7 r.p.m. and T.D.C. sensor | 7 Drehzahlsensor und OT | 7 Sensor aantal toeren motor en P.M.S. |
| 8 Coils | 8 Spulen | 8 Bobines |
| 9 Throttle position potentiometer | 9 Potentiometer Drosselposition | 9 Potentiometer stand smookklep |
| 10 Injectors | 10 Einspritzventile | 10 Injectoren |



C STROMKREIS

Über den Stromkreis führt das Steuergerät die Messungen der Motorbedingungen aus und steuert die Kraftstoffabgabe und die Zündvorverstellung.

Er umfasst: Batterie, Zündungsschalter, zwei Relais, elektronisches Steuergerät mit integriertem Fühler für den absoluten Druck, Zündungsaggregat, Lufttemperaturfühler, Potentiometer Drosselposition, zwei Einspritzventile, Öltemperaturfühler, Phasen- und Drehzahlsensor.

- 1 Battery
- 2 Starter switch
- 3 Relay
- 4 ECU I.A.W.15 M
- 5 Air temperature sensor
- 6 Oil temperature sensor
- 7 r.p.m. and T.D.C. sensor
- 8 Coils
- 9 Throttle position potentiometer
- 10 Injectors
- 11 Timing sensor
- 12 Absolute sensor pressure
- 13 Power modules

- 1 Batterie
- 2 Zündungsschalter
- 3 Relais
- 4 elektronisches Steuergerät I.A.W.15 M
- 5 Lufttemperaturfühler
- 6 Öltemperaturfühler
- 7 Drehzahlsensor und OT
- 8 Spulen
- 9 Potentiometer Drosselposition
- 10 Einspritzventile
- 11 Phasensensor
- 12 Fühler für den absoluten Druck
- 13 Leistungsmodule

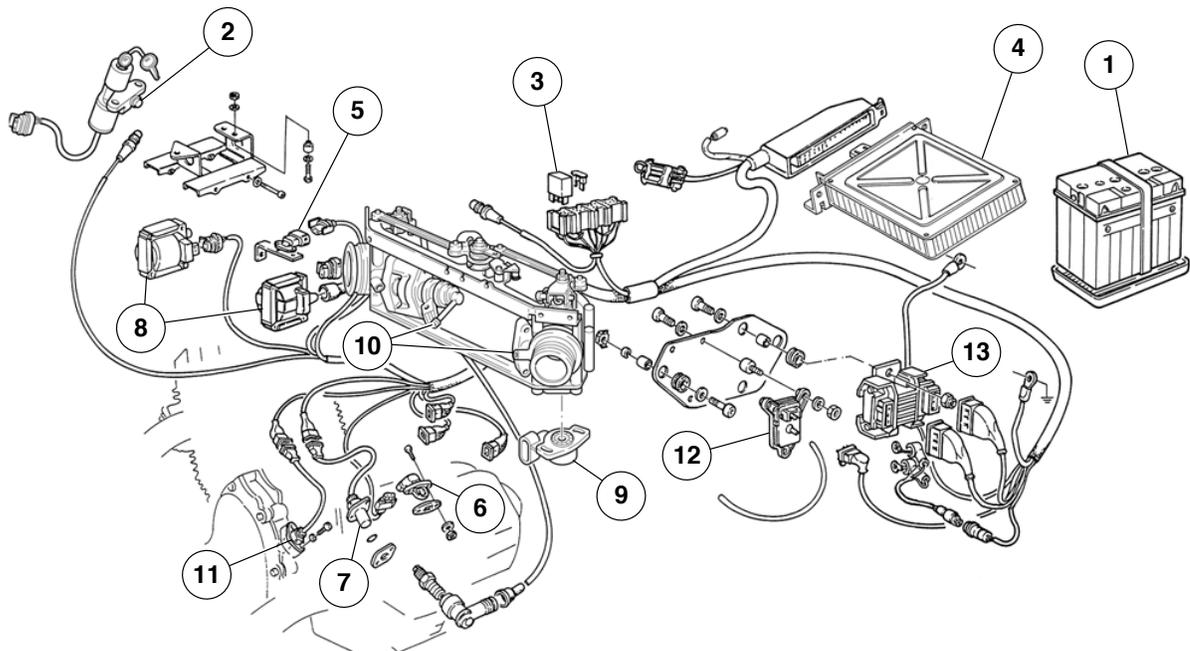
C ELEKTRISCH CIRCUIT

Dit is het circuit waardoor de elektronische centrale eenheid de opnames van de condities van de motor en de activering van de verdeling van de brandstof en van de vervroeging van ontsteking uitvoert.

Bevat: accu, aan-/uitschakelaar ontsteking, twee relais, elektronische centrale eenheid met een geïntegreerde sensor absolute druk, groep van ontsteking, sensor temperatuur lucht, potentiometer positie smookklep, twee injectoren, sensor temperatuur olie, sensor fase toeren.

- 1 Accu
- 2 Aan-/Uitschakelaar ontsteking
- 3 Relais
- 4 Elektronische centrale eenheid I.A.W.15 M
- 5 sensor temperatuur lucht.
- 6 Sensor temperatuur olie
- 7 Sensor aantal toeren motor en P.M.S.
- 8 Bobines
- 9 Potentiometer stand smookklep
- 10 Injectoren
- 11 Fasesensor
- 12 Absolute-druksensor
- 13 Vermogensmodules

CALIFORNIA EV 1997 - 2000 FINO AL TELAIO N°KD 115749



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10 BATTERY "1"

See chapter 2, section P.



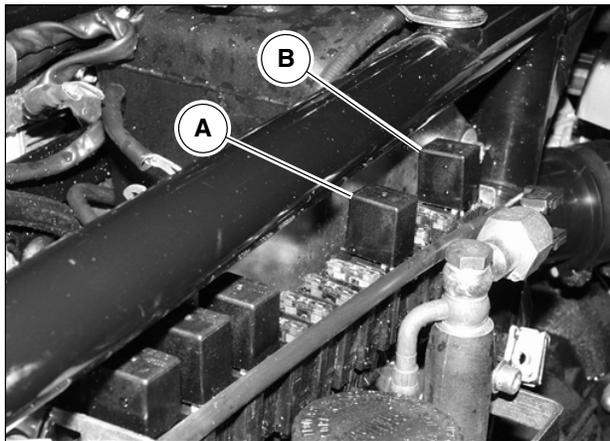
11 STARTER SWITCH "2"

For information on its use, see section C

Disassembly:

- After having removed the headlight and the dashboard as described in chapter 4, section P, the starter switch "A" is visible;
- Unscrew the two screws "B" and remove the starter switch.
- Disconnect the switch cable from the wiring.





12 RELAY “3”

In the Weber injection-ignition system two standard car type relays are used.

The connection to ground, for the relay excitation circuit, is actuated in the ECU using a protection against polarity inversion. the two relays have specific purposes in the fuel system and can be distinguished in the following way:

- pump relay, coils, electro-injectors “A”
- ECU control relay “B”

When replacing it is necessary to:

- Remove the right hand-side body panel as described in chapter 3 of section E;
- Replace the damaged relay.

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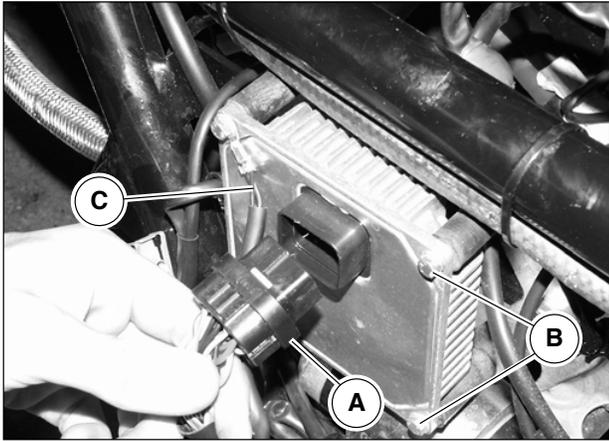
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13 ECU I.A.W. 15 M "4"

The Weber injection-ignition system is a digital type electronic control unit with micro-processor; it controls the parameters relating to the engine fuel supply and ignition:

- The quantity of fuel supplied to each cylinder in sequence (1-2) in a single delivery.
- The fuel delivery start (injection timing) with respect to each cylinder's intake;
- Spark advance. To calculate the above parameters, the unit uses the following input signals:
 - Absolute pressure;
 - Intake air temperature;
 - Oil temperature; (or engine temperature)
 - R.p.m. and timing;
 - Battery voltage;
 - Throttle position;

Disassembly:

- Remove the seat and the left hand-side body panel as described in chapter 4 and 3 of section E;
- Detach connection "A" from the ECU;
- Unscrew the 4 screws "B" together with the washers and remove the cable "C";
- Remove the ECU.



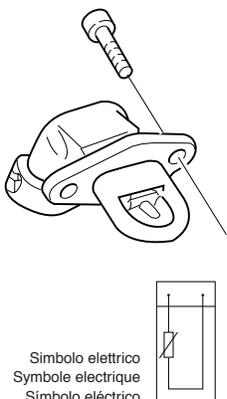
N.B.

During reassembly, remember to fit the ground cable terminal "C" into the screw shown in the figure.



N.B.

The model California EV manufactured in 1997 - 2000 until chassis number KD115749 is fitted with the ignition system / injection with ECU P08 (big) placed under the passenger seat.

Caratteristica teorica
Caractéristique théorique
Característica teórica

Temperatura °C Temperature °C Temperatura °C	Resistenza Kohm Resistance Kohm Resistencia Kohm
-40	100,950
-30	53,100
-20	29,121
-10	16,599
0	9,750
+10	5,970
+20	3,747
+25	3,000
+30	2,417
+40	1,598
+50	1,080
+60	0,746
+70	0,526
+80	0,377
+90	0,275
+100	0,204
+110	0,153
+125	0,102

Simbolo elettrico
Symbole électrique
Símbolo eléctrico

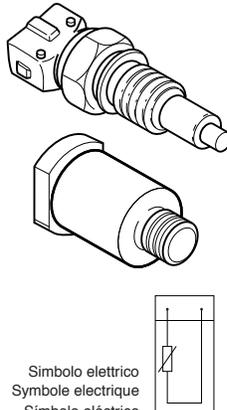
14 AIR TEMPERATURE SENSOR "5"

The sensor detects the air temperature. The obtained electrical signal reaches the ECU where it is used to activate an adjustment according to the air temperature. The sensor is composed of a plastic body containing a NTC type thermistor.

N.B.
NTC means that the thermistor's resistance drops when the temperature rises.

Disassembly:

- Detach the sensor wiring;
- Unscrew the two screws fastening it to the filter box and remove the sensor.



Caratteristica teorica
Caractéristique théorique
Característica teórica

Temperatura °C Temperature °C Temperatura °C	Resistenza Kohm Resistance Kohm Resistencia Kohm
-40	100,950
-30	53,100
-20	29,121
-10	16,599
0	9,750
+10	5,970
+20	3,747
+25	3,000
+30	2,417
+40	1,598
+50	1,080
+60	0,746
+70	0,526
+80	0,377
+90	0,275
+100	0,204
+110	0,153
+125	0,102

Simbolo elettrico
Symbole électrique
Símbolo eléctrico

15 OIL SENSOR TEMPERATURE "6"

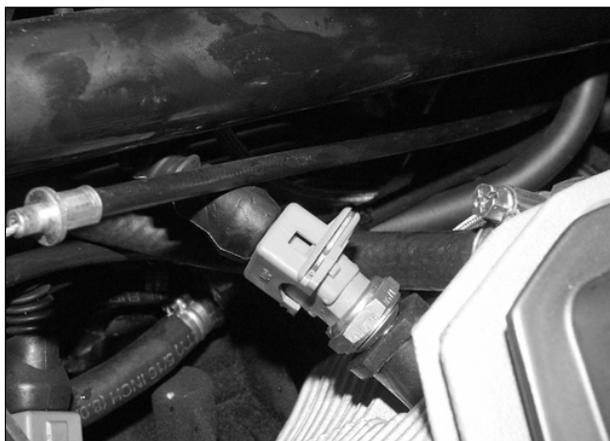
The sensor detects the oil temperature. The obtained electrical signal reaches the ECU, where it is used to activate an adjustment according to the oil temperature. The sensor is composed of a plastic body, containing a NTC type thermistor.

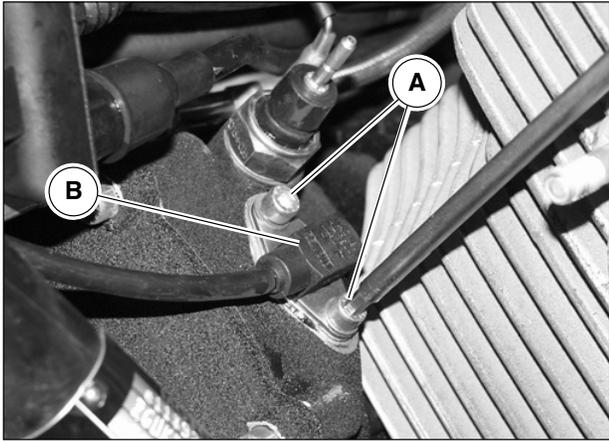
N.B.
NTC means that the thermistor's resistance drops when the temperature rises.

Disassembly:

- Detach connection "A" on the oil temperature sensor;
- Unscrew and remove, using a wrench, the sensor support together with the oil temperature sensor.

N.B.
The model California EV manufactured in 1997 - 2000 until chassis number KD115749 is fitted with the oil temperature sensor placed on the left-hand head cover (see electric circuit chapter on page 21 of this section).





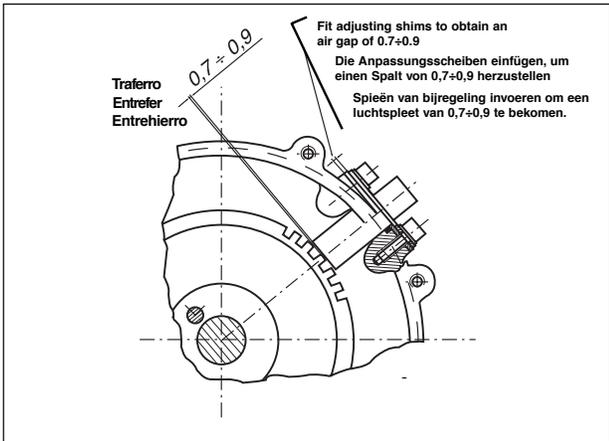
16 R.P.M. AND T.D.C. SENSOR "7"

The sensor reads the signal from a toothed wheel fitted on the camshaft.

The information about the r.p.m and the camshaft position is obtained from the frequency of this signal. This allows the position of the various cylinders with respect to their explosion T.D.C. to be detected.

Disassembly:

- Unscrew the two screws "A" fastening it to the engine;
- Remove the sensor "B" disconnecting the cable from the wiring.

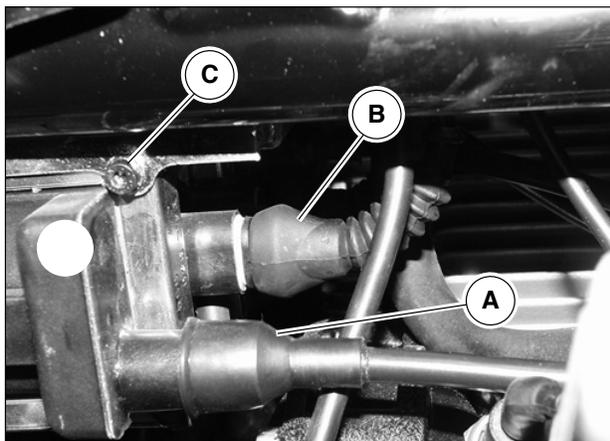


N.B.

The sensor gasket is supplied in various thicknesses for adjustment.

Refer to the table on the side for the order code.

SPACERS AVAILABLE IN mm: VERFÜGBARE SCHEIBEN IN mm: SPIEËN BESCHIKBAAR IN mm:	
mm mm mm	CODE KENNUMMER CODE
0,3	01 72 27 00
0,4	01 72 27 01
0,5	29 72 27 60
0,6	01 72 27 02
0,8	01 72 27 03
1	01 72 27 04
1,5	01 72 27 05



17 COILS "8"

The ignition used is an inductive discharge type. The coils receive the command from the ECU which processes the spark advance.

Disassembly:

- 1 Disconnect cable "A" for the spark plugs;
- 2 Detach connection "B";
- 3 Unscrew the two screws "C" and remove the coil;

It may be necessary to remove some clamps "D" for fastening the wiring.

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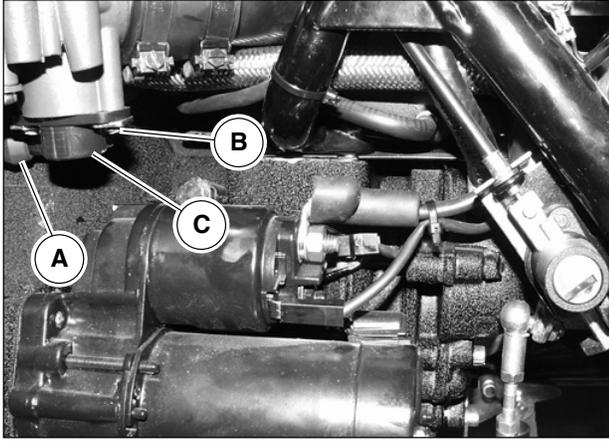
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18 THROTTLE POSITION POTENTIOMETER "9"

The potentiometer is powered by the ECU, to which it sends a signal identifying the throttle position. This information is used to correct the basic metering, transistors metering, and for possible corrections during the start-up stage.

Disassembly:

- Detach connection "A" on potentiometer "C";
- Unscrew and remove the two screws "B";
- Remove the potentiometer "C" from the throttle body.

Reassembly:

Carry out the procedures in reverse order.



N.B.

To regulate the potentiometer, see the carburation procedure in chapter n° 20 of this section.



19 OPERATING STAGES

NORMAL MODE

When the engine is thermally regulated, the I.A.W. 15 M ECU calculates the stage, the injection time and the spark advance exclusively by means of the interpolation on the relative stored maps, according to the r.p.m. and the throttle position.

The quantity of fuel determined in this way is supplied to the two cylinders in two sequential deliveries.

The moment supply is started, for each cylinder, can be determined by means of a map which depends on the r.p.m..

START-UP STAGE

The moment in which the starter switch is activated, the ECU I.A.W. 15 M powers the fuel pump for several seconds and acquires the throttle angle as well as the engine temperature.

Upon start-up, the ECU receives r.p.m. and timing signals which allow it to then control injection and ignition.

To facilitate ignition, the basic dosage is enriched according to the oil temperature.

After ignition, the ECU begins to control the spark advance.

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OPERATION DURING THE ACCELERATION STAGE

During acceleration, the system increases the quantity of fuel supplied in order to obtain optimal driving performances.

This condition is recognised when the throttle angle variation reaches considerable values; the enrichment factor takes the oil and air temperature into account.

WARNING

In order to avoid damaging the electronic injection/ignition system, follow the below precautions:

- When disassembling or reassembling the battery, make sure that the starter switch is in the OFF position;
- Do not detach the battery when the engine is running;
- Make sure that the connection cables are in perfect working condition;
- Do not make electro-weldings on the vehicle;
- Do not use supplementary electrical devices for start-up;

In order to avoid causing malfunctions and inefficiency in the ignition system, it is necessary that the spark plug cable connections (spark plug caps) as well as the spark plugs are the prescribed type (like the ones originally fitted);

- Do not test the current on the spark plugs without interposing the original spark plug caps, given that this procedure could irreparably damage the ECU;

When fitting alarm systems or other electrical devices, never interfere with the ignition/injection electric system;

In the electronic injection/ignition system it is not possible to vary the carburation setting (air/fuel ratio).

IMPORTANT

Do not tamper with the mechanical and electrical components in the electronic injection/ignition system.



20 DIAGNOSTICS

- This system indicates any error on both the input and output signals.
- As the errors are stored, they are indicated even if they are no longer present but occurred during engine running (“yellow” errors); the ECU is not “reset” by removing the key OFF contact.
- When a current error (“red” error) is resolved, it will then be displayed by the ECU as a “yellow” error.
- The ECU is not automatically reset after a certain number of ignitions, as was the case for the 1.6, but it must be reset using the specific software.
- If a signal from a sensor is interrupted, the ECU acquires its average value. This allows the motorbike to be used (even if it is not in perfect working condition).
- The following circuits can be diagnosed:
 - 1)Throttle valve potentiometer;
 - 2)Absolute pressure sensor (inside the ECU);
 - 3)Oil temperature sensor;
 - 4)Air temperature sensor;
 - 5)Battery voltage (indication for $V < 8$ and $V > 16$);
 - 6)Injectors 1 and 2;
 - 7)Coil 1 and 2 primary winding;
 - 8)Fuel pump relay;
 - 9)ECU;
 - 10)Timing sensor;
 - 11)Electronic revolution counter
- When the ignition key is turned to the OFF position, the ECU is no longer powered. It can therefore be disconnected immediately.

RESETTING THE ECU

The ECU resetting procedure is very simple and is the following: open the “Active Test” page and click on the **erase** key using the mouse. If the “**PASS**” status appears, the operation has been successful, if not, there are current errors present which can be viewed on the page: Dashboard Monitor.

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THROTTLE VALVE POTENTIOMETER CIRCUIT

When the **Throttle Pos.** error appears on the Dashboard Monitor page, this means that the electrical circuit going from the potentiometer to the ECU is interrupted; this means that:

- The wires are interrupted (check the circuit and the wire connections);
- If the circuit inside the potentiometer is interrupted, it is necessary to replace it as described in chapter 18 of this section;
- On the rare occasion that the circuit inside the ECU is interrupted: replace the ECU as described in chapter 13 of this section;

A further check can be carried out on the signal coming from the potentiometer through the Dashboard Monitor's front page. In fact, at the RH top of this page it is possible to view the opening angle for the throttle body. Taking into account that max. opening is 84° , the user can immediately trace any possible signal error.

In this situation the fault is found, in 90 % of cases, in an incorrect operation of the potentiometer, while the remaining 10% of cases refer to an incorrect ECU operation.

ABSOLUTE PRESSURE SENSOR CIRCUIT

As previously explained, the absolute pressure sensor is located inside the ECU; if the item **Pressure** on the page displays an error, this means that there is a cut-out in the circuit inside the ECU which goes to the sensor. In these cases, it is necessary to reset the ECU once again; if the error is still displayed, it must be replaced: follow the procedures described in chapter 13 in this section.



OIL TEMPERATURE CIRCUIT SENSOR

When the **Engine Temp.** item on the Dashboard Monitor page displays an error, this means that the electrical circuit going from the potentiometer to the ECU is interrupted; this means that:

- The sensor is damaged or the wires are cut out; it is therefore necessary to check the connections and the sensor's resistance; if the sensor is damaged, replace it as described in chapter 15 in this section;
- On the rare occasion that the circuit inside the ECU is interrupted: replace the ECU following the instructions described in chapter 13 in this section.

It is possible to carry out a further test on the signal coming from the sensor using the Dashboard Monitor front page. In fact, the engine temperature is displayed in the middle of the page. When the engine is cool, this can easily be compared with the external temperature.

AIR TEMPERATURE SENSOR CIRCUIT

When on the Dashboard Monitor page, the **Air Temp.** item displays an error, this means that the electrical circuit from the potentiometer to the ECU is interrupted; this means that:

- The sensor is damaged or the wires are cut.-out: check the connections the sensor's resistance. If the sensor is damaged replace it as described in chapter 14 in this section.
- On the rare occasion that the circuit inside the ECU is interrupted: replace the ECU following the instructions described in chapter 13 in this section.

BATTERY VOLTAGE

An icon will appear on the bottom LH part of the Dashboard Monitor front page. Here the user will easily view the voltage on the battery terminals, which can be therefore checked immediately.

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INJECTOR 1 AND 2 CIRCUIT

When on the Dashboard Monitor page the **Throttle Pos.** item displays an error, this means that the electrical circuit going from injector 1 or 2 to the ECU is interrupted; this means that:

- The internal circuit from the injector is interrupted: replace the injector as described in chapter 6 of this section;
- The wires are cut-out: check the connections;
- On the rare occasion that the circuit inside the ECU is interrupted, replace the ECU as described in chapter 13 of this section.

When the motorbike has carburation problems, it is useful to test the injection circuit; to do this, open the Active Test page and, resting your ear against the faulty injector, click the test key in the Injector icon: if you do not hear the injector open and close and the test on the ECU gives a positive result, this means that the injector is damaged and must be replaced; if the test result is negative, go back to one of the three above described cases.

CIRCUIT AND PRIMARY WINDING OF COILS 1 AND 2

When on the Dashboard Monitor page, the item **Coil 1 or 2** displays an error, this means that the electrical circuit going from coil 1 or 2 to the ECU is interrupted; this means that:

- The primary winding of the coil is interrupted or in short circuit and it is necessary to replace the coil as described in chapter 17 in this section;
- If the wires are cut-out, check the connections;
- On the rare occasion that the circuit inside the ECU is interrupted, replace the ECU: replace the ECU following the instructions described in chapter 13 in this section.

When the motorbike has ignition problems, it is useful to test the circuit and primary winding of the coils; it is therefore necessary to open the Active Test page, if the test gives a positive result and the motorbike continues to have problems, the defect is found upstream of the primary.

In this case, in order to trace the faulty part, test the following in sequence: the spark plug, the cap, the high voltage wire, the secondary coil winding.



FUEL PUMP RELAY CIRCUIT

When on the Dashboard Monitor page the item **Fuel Pump Relay** displays an error, this means that the power supply circuit for the injection to the ECU is interrupted; this means that:

- The fuel pump relay is defective: replace the relay as described in chapter 12 in this section;
- There is an interruption in the injection supply circuit (other errors in the injection supply system should appear)
- On the rare occasion that the circuit inside the ECU is interrupted, replace the ECU; replacement must be carried out following the procedures described in chapter 13 in this section.

If the fuel pump does not work, it is useful to test the fuel pump relay circuit; if the test result is positive and the pump does not start, it is faulty and must be replaced as described in chapter 3 in this section. If the test result is negative, go back to the previously illustrated cases.

ELECTRONIC CONTROL UNIT

When, on the Dashboard Monitor page, an error is displayed in the following items: **ECU microP, ECU EPROM, ECU ROM, ECU RAM**, this means that there is possibly a fault in the ECU. In this case, carry out another ECU resetting procedure; if the error is still displayed the ECU must be replaced because it is faulty: follow the procedures described in chapter 12 of this section.

TIMING AND ENGINE R.P.M. SENSOR CIRCUIT

When on the Dashboard Monitor page the **Crank/Cam** item displays an error, this means that the electric circuit going from the engine r.p.m/timing sensor to the ECU is interrupted; this means that:

- The sensor is damaged or the wires are interrupted: check the connections and the sensor's resistance. If the sensor is damaged, replace it following the instructions in chapter 16 of this section.
- On the rare occasion that the circuit inside the ECU is interrupted, replace the ECU.

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ELECTRONIC REVOLUTION COUNTER

If the electronic revolution counter does not work properly, it is useful to test it. To do this, open the Active Test page and, visually checking the revolution counter, click on the **Tacho test icon**

If the test result is positive and during the test the revolution counter does not settle around 3800÷4000, then the instrument is faulty or the yellow-black wire carrying the pulse is cut out; if the test result is negative the ECU does not send a correct signal. It must be reset by clicking on the **erase** icon. If, after the resetting procedure, the error is still displayed in the electronic revolution counter, the ECU must be replaced as described in chapter 13, in this section.

CARBURATION

Carburation is an extremely important operation for the motorbike to work optimally. It is greatly simplified by using this software.

To adjust the carburation and set the CO, the following software must be used: "**Motorbike Diagnostic Software Tool**"; since there is no adjustment screw on the ECU, adjusting the mixture is only possible by using this computer programme.

CARBURATION PROCEDURE

Check of the starter control cut-out

In the event that the throttle valve potentiometer has been replaced, removed or deregulated, before carrying out any carburation procedure it is necessary to adjust it once again, following the below instructions:

- Detach the connection rod between the throttle bodies;
- Using a tester, check that the potentiometer with the closed throttle body indicates 150 mV. If the values are different, loosen the two fastening screws and reposition it correctly;
- Adjust the throttle bodies using the adjustment screw until bringing the idling speed opening to 3,2°-3,6°;
- Attach the connection rod between the two throttle bodies;
- Check that the by-pass screws are completely closed;
- Bring the RH side body's adjustment screw flush;
- Connect a vacuummeter to the sockets on the intake manifolds;
- Adjust the cylinders' equalization using the throttle body adjustment screw;
- Check that the equalization is maintained in progression;
- Check that the engine's idling speed is 1050 r.p.m.;
- Bring the oil to a temperature of 80°C;
- With the engine idling, check that the CO value is between 3% and 3,5%. If this is not the case, adjust it by varying the **Trim.EPROM** value on the software's Active Test page.
- Check the r.p.m. and the equalization of the two cylinders once again.



N.B.

Between the cylinders, a maximum unbalance of 0,3% for the CO and of about 7 mbar for the vacuum should be taken into account.

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RULES FOR CARBURATION, REGULATION AND ADJUSTMENT

Connect the PC to the diagnosis socket and the vacuumeter

- Detach the throttle body rod, 1/2 turn by-pass;
- Using a throttle adjusting dowel, regulate the throttle potentiometer on the RH throttle body to a value of $3,6^{\circ} \pm 0,5$;
- Equal the vacuum in the two cylinders by regulating it if necessary, through the throttle adjustment dowel on the LH throttle body;
- Connect the throttle body rod;
- Check the vacuum at different r.p.m, if necessary synchronize it using the adjustment handwheel;
- Detach the vacuumeter.

The idling speed must be 1050/1150 RPM.



N.B.

If, after this procedure, the idling speed is not within the indicated range, check the potentiometer by fitting the special cable connected to the digital tester and positioning the completely closed throttle on the attached rod.

The correct value must be $150 \text{ mV} \pm 15 \text{ mV}$.

CO% CHECK

Should the engine warming-up procedure be carried out on the bench, the maximum speed shall range between 2000 and 3000 r.p.m.

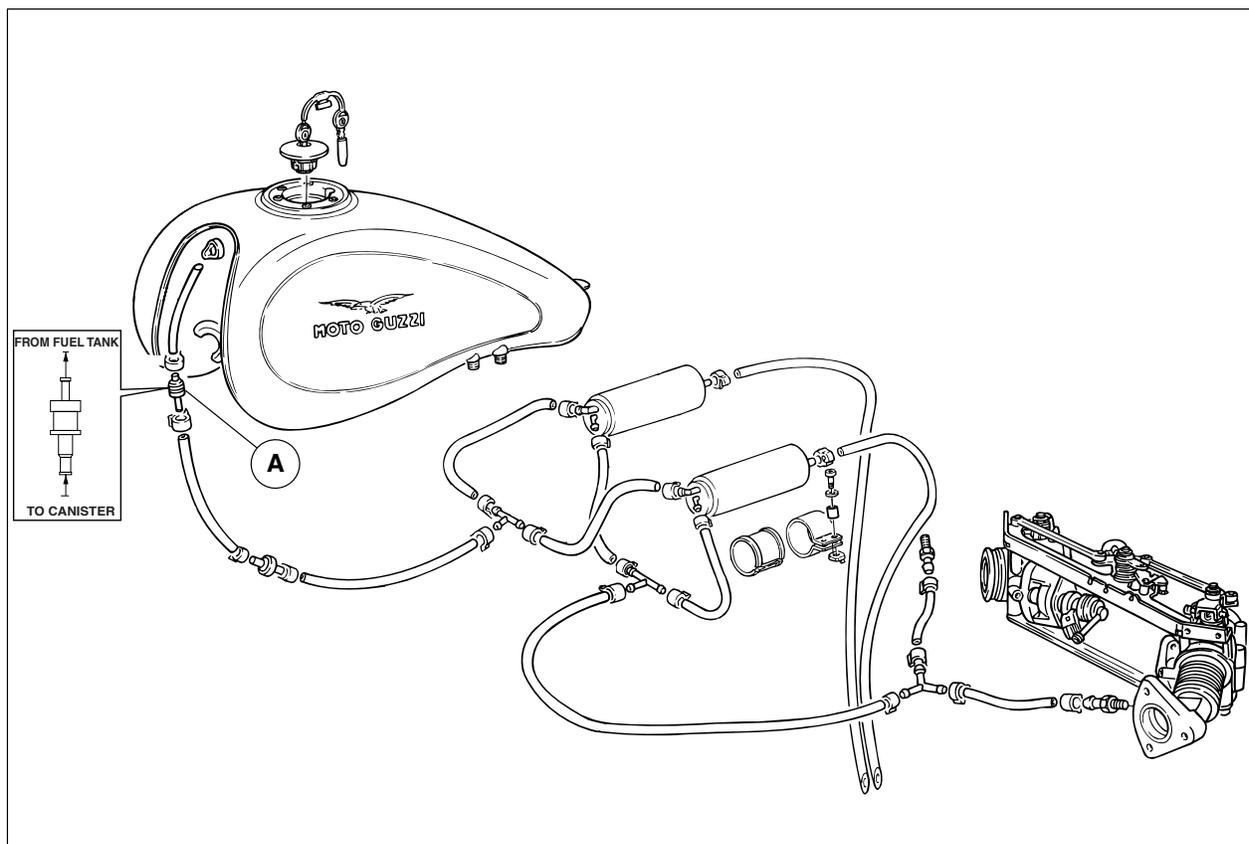
- Connect the PC to the diagnosis socket and the CO to the two special sockets on the exhaust manifolds
- The CO% test must be carried out when the engine is idling, at least 2 minutes after engine ignition (due to the automatic enrichment) and with an engine oil temperature of $70^{\circ} \pm 80^{\circ}$, indicated by the engine oil sensor. This can be viewed on the Dashboard page of the MDST programme.
- Check that a CO% value ranging between 3,5 and 4,5. is detected for both cylinders.
An unbalance of $\pm 0,5\%$ between the two cylinders is acceptable.
- If the CO% value does not correspond to the prescribed one, adjust the trimmer using the Active Test page and following the diagnostic adjustment procedure on the PC.



21 FUEL VAPOUR PURIFICATION AND RECIRCULATION SYSTEM (USA, SGP, CAN)

-  **N.B.**
The roll-over shut-off valve, ref. "A" must be fitted vertically $\pm 30^\circ$, with the gas breather inlet is positioned as illustrated in the figure.

(V11 EV USA) - (V11 JACKAL USA) - (V11 BASSA USA)
CALIFORNIA EV 1997-2000 - CALIFORNIA JACKAL - CALIFORNIA SPECIAL



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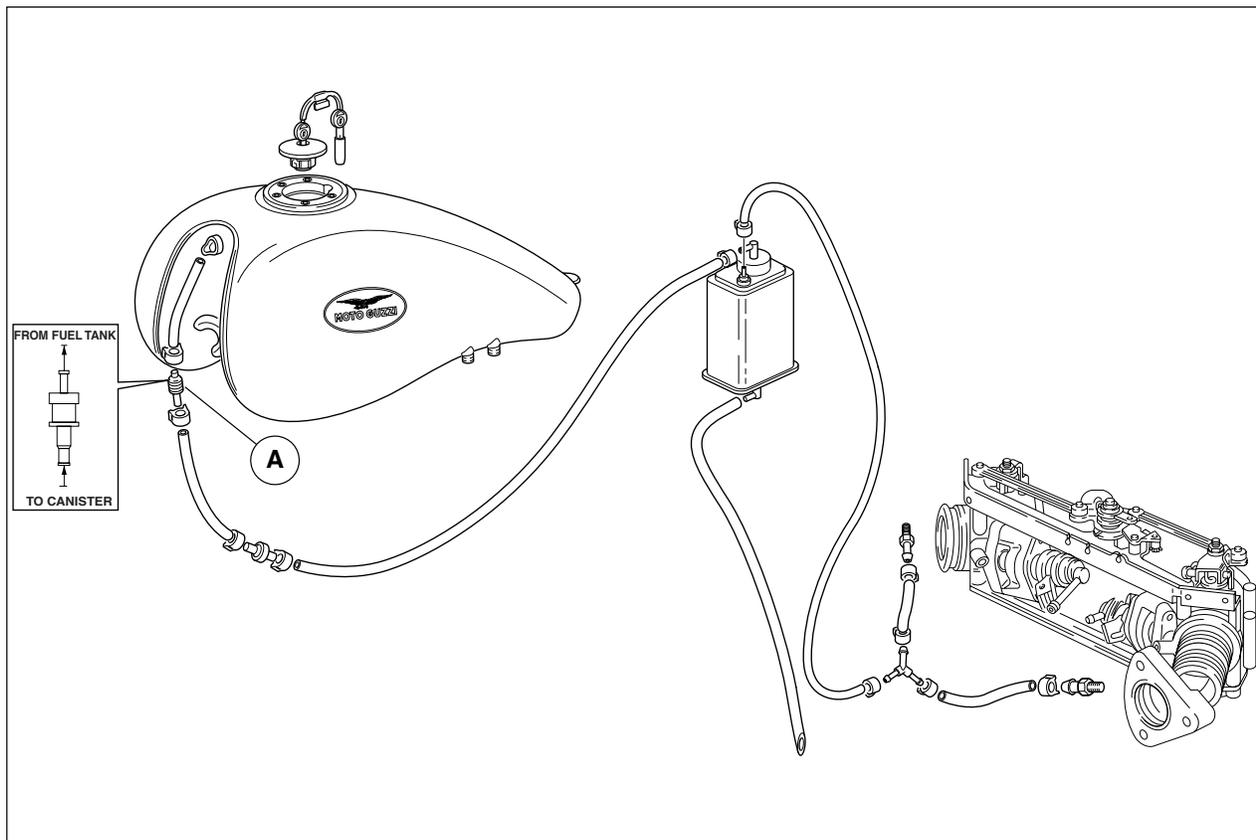
21 REINIGUNGS- UND RÜCKFÜHRSYSTEM DER BENZINDÄMPFE (USA, SGP, CAN)

- N.B.**
Das Kippschutzventil Bez. "A" muss vertikal $\pm 30^\circ$ montiert sein, mit wie in der Abbildung positioniertem Entlüftungsgaseingang.

21 SYSTEEM VOOR ZUIVERING EN HERCIRCULATIE BENZINEDAMPEN (USA, SGP, CAN)

- OPMERKING**
Het klepje tegen omkippen Ref. "A" moet verticaal gemonteerd worden $\pm 30^\circ$ met de ingang van het uitlaatgas geplaatst zoals op de figuur wordt aangeduid

CALIFORNIA EV 2001 - CALIFORNIA STONE - CALIFORNIA SPECIAL SPORT



EXHAUST SYSTEM

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1 SYSTEM FEATURES

The exhaust system is composed of 3 parts:

- Silencers;
- Exhaust pipes;
- Compensation chamber;

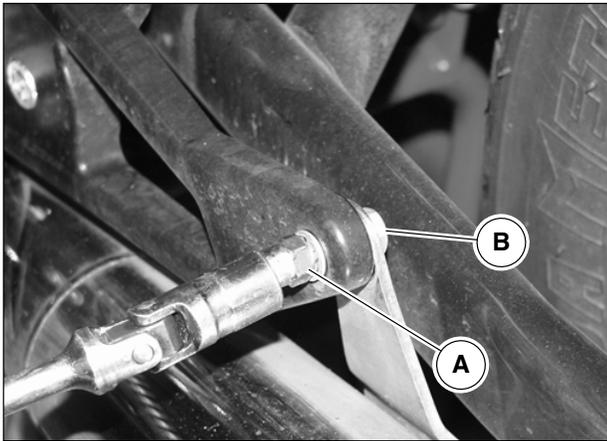
These three parts are joined together with clamps.



WARNING

Carry out the disassembly procedures only when the engine is cool, as the exhaust system reaches very high temperatures when the engine is running.

Use insulating gloves or wait for the parts to be removed to cool down.



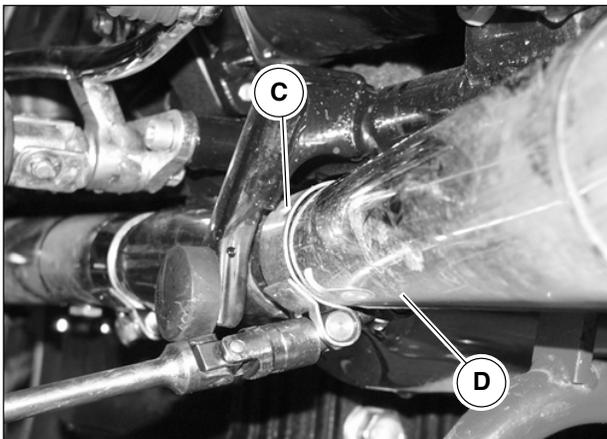
2 SILENCERS

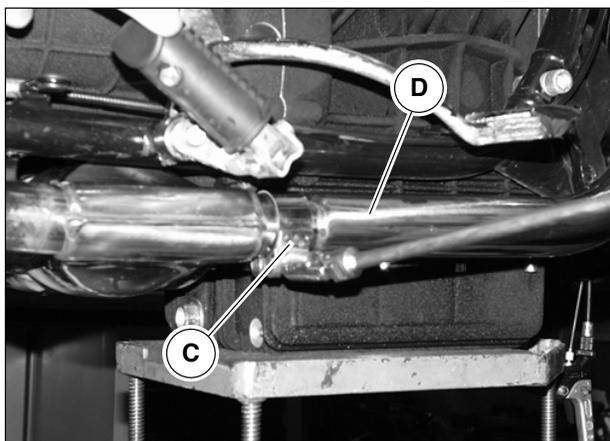
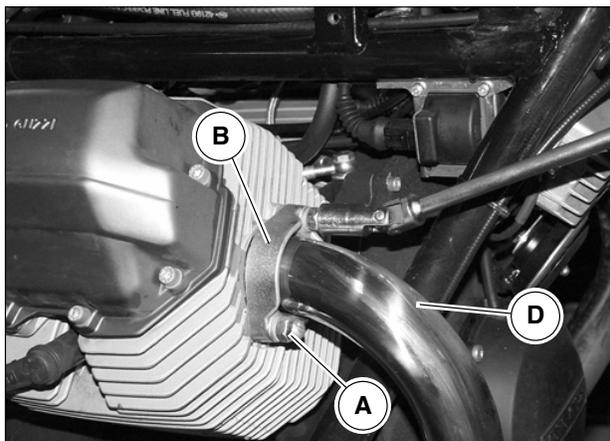
Disassembly:

- Unscrew the nut "A" while holding the screw "B"
- Slide out the screw fastening the silencer to the passenger foot-rest support bracket, taking care not to lose the grommets, the shim and the washers.
- Slide out the silencer "C".

Reassembly:

- Insert the silencer into the expansion chamber coupling;
- Position the fastening hole on the silencer plate in line with the one drilled in the footrest support brackets, insert the screw and the washer in the inner part and the shim, the grommets and the washer on the outer part; then tighten nut "A" to the torque prescribed in the table in chapter 4, section B;
- Tighten the clamp "B" for connection to the expansion chamber;





3 EXHAUST PIPES

Disassembly:

- Unscrew the 2 nuts “A” with the ring-nut fastening washer “B” on the heads;
- Remove the ring-nut “B”
- Remove the 2 half-bushings and the gasket positioned between the manifold and the exhaust pipe.
- Loosen the clamp “C” on the connection between the exhaust pipes and the expansion chamber;
- Remove the exhaust pipe “D”.

⚠ WARNING
Plug the exhaust ducts on the head to avoid foreign bodies getting into the combustion chamber.

Reassembly:

- Fit the exhaust pipe into the respective insertion seat on the expansion chamber;
- Place the gasket between the exhaust manifold and the head;
- Position the ring-nut “B” in its position and tighten the 2 nuts with washer to the prescribed torque;
- Tighten the clamp “C” for connection to the expansion chamber.

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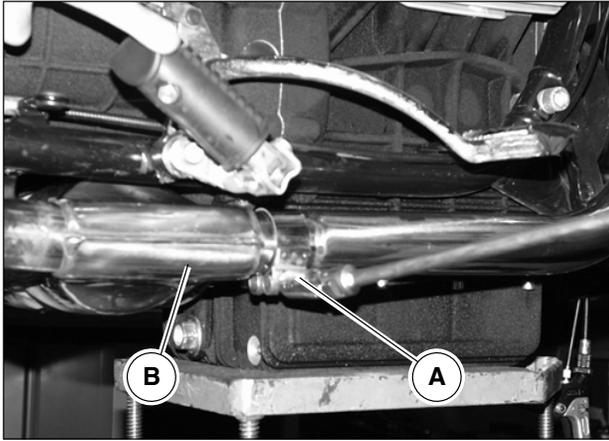
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4 EXPANSION CHAMBER

Disassembly:

- Remove the silencers from the motorbike as described in chapter 2 in this section;
- Loosen the 2 clamps "A" on the exhaust pipes;
- Remove the expansion chamber "B" by pulling it out of the exhaust pipes.

Reassembly:

Carry out the procedures in reverse order.

ENGINE

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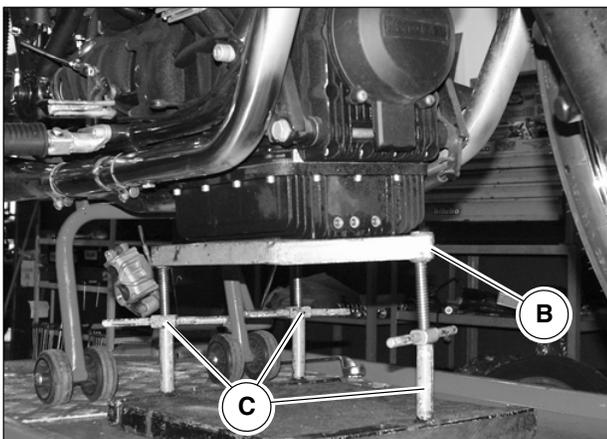
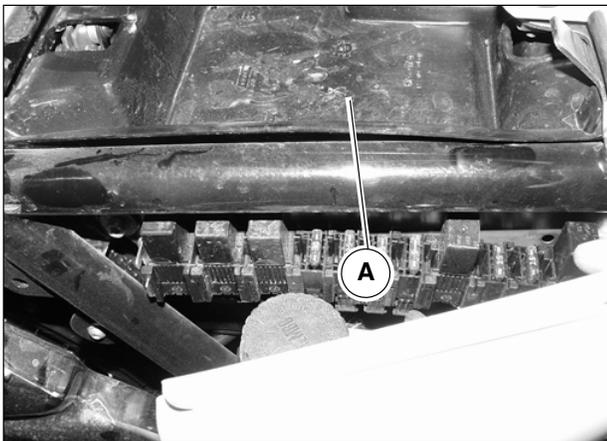
1 GENERAL RULES FOR ENGINE OVERHAUL

During fitting, take the Engine / gearbox assembly weight and center of gravity into account; support it accordingly. Take care of any dangerous points which may cause squeezing or cuts.

Engine and system maintenance involve a specific and acquired know-how as well as the use of special tools. All maintenance and repair procedures can be carried out by specifically trained technicians only.

IMPORTANT
Observe the instructions supplied by the vehicle manufacturer.

N.B.
During motorbike and engine disassembly, keep the different assemblies separate (swinging arm, shock absorbers, wheel, cylinder, connecting rod, right-hand side and left-hand side pistons) in order to facilitate reassembly and avoid possible mistakes.

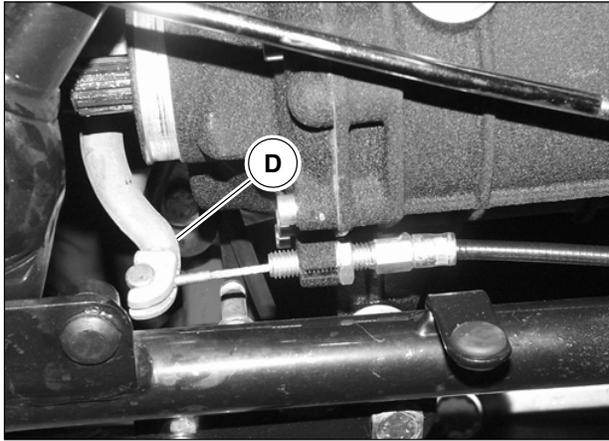


2 ENGINE UNIT REMOVAL - INSTALLATION / GEARBOX REMOVAL FROM CHASSIS

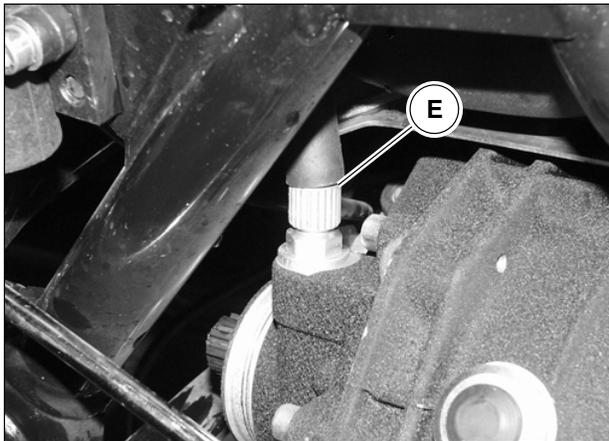
Removal:

To remove the engine / gearbox assembly from the motorbike proceed as follows:

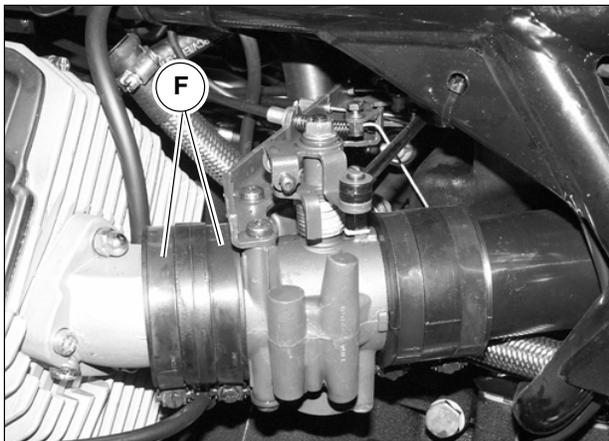
- Remove front seat (see **chapter 4 section E**) and remove toolbox "A"
- Disconnect the battery cables from the 2 poles (negative / positive) and remove the battery;
- Remove fuel tank as described in **chapter 3 section I**;
- Remove the exhaust system as described in **section L**;
- Place engine support "B" code 18912450 in position and tighten hand wheels "C";
- Disconnect all electric wirings between engine – gearbox assembly and chassis: timing sensor, oil pressure switch, alternator, oil temperature sensor, spark plug cable caps, starter motor, gearbox neutral switch, gearbox ground cable;



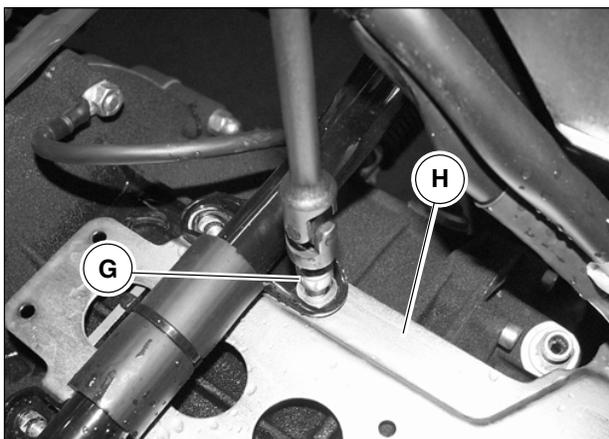
- Release clutch control transmission from lever “D” on the gearbox cover;



- Unscrew odometer control transmission “E” from the drive on the gearbox cover;



- Loosen the clamps “F” between the throttle body and the intake pipes;
- Remove the tie rods of the gear lever and rear brake lever controls as described in **chapter 2 and 3 section G**;
- Remove the oil drain pipes from the unions on the engine crankcase and heads by loosening their clamps, see **chapter 3** of this section.



- Unscrew screws “G” fixing the battery plate “H” to the gearbox and remove it;
- Remove the rear swinging arm as described in **chapter 9 section F**;

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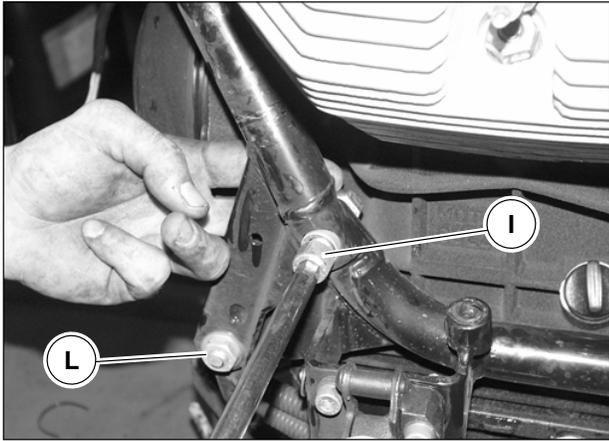
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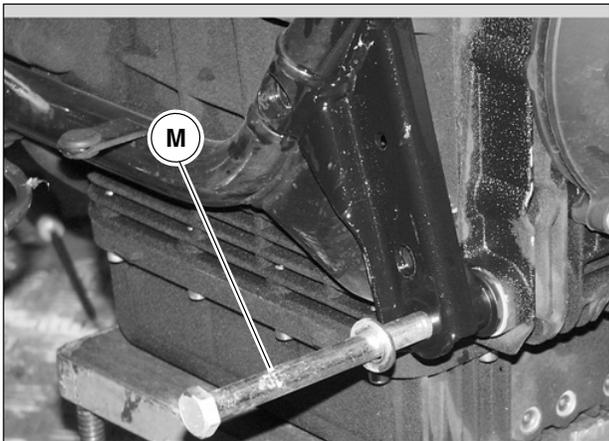
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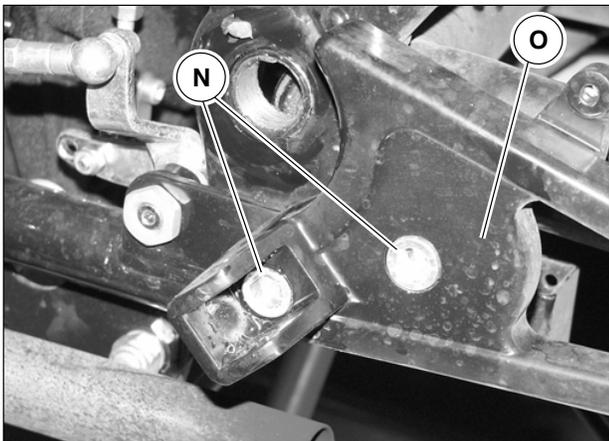
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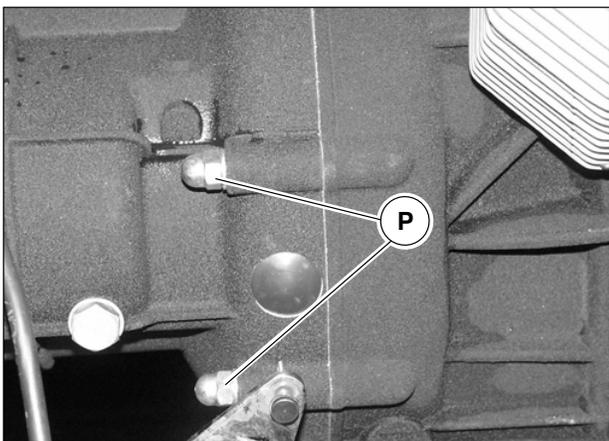
- Remove front bumper, if fitted, as described in **chapter 6 section H**; if the bumper has not been fitted, unscrew the 2 screws "I" to free from the front the 2 frame sections from the chassis;
- Unscrew nut "L" and remove front nut "M" fixing the engine to the chassis;



- Remove rear footrests as described in **chapter 3 section H**;



- Unscrew the 4 screws "N" (2 for each frame section) in order to remove the 2 footrest supports "O", and at the same time release the frame sections from the chassis from the rear end;
- Lift the rear end and remove the chassis together with the fork and the front wheel;
- once the chassis has been removed, disassemble the frame section arms from the engine – gearbox assembly;



- Detach the engine assembly from the gearbox assembly once the 6 nuts "P" have been unscrewed.

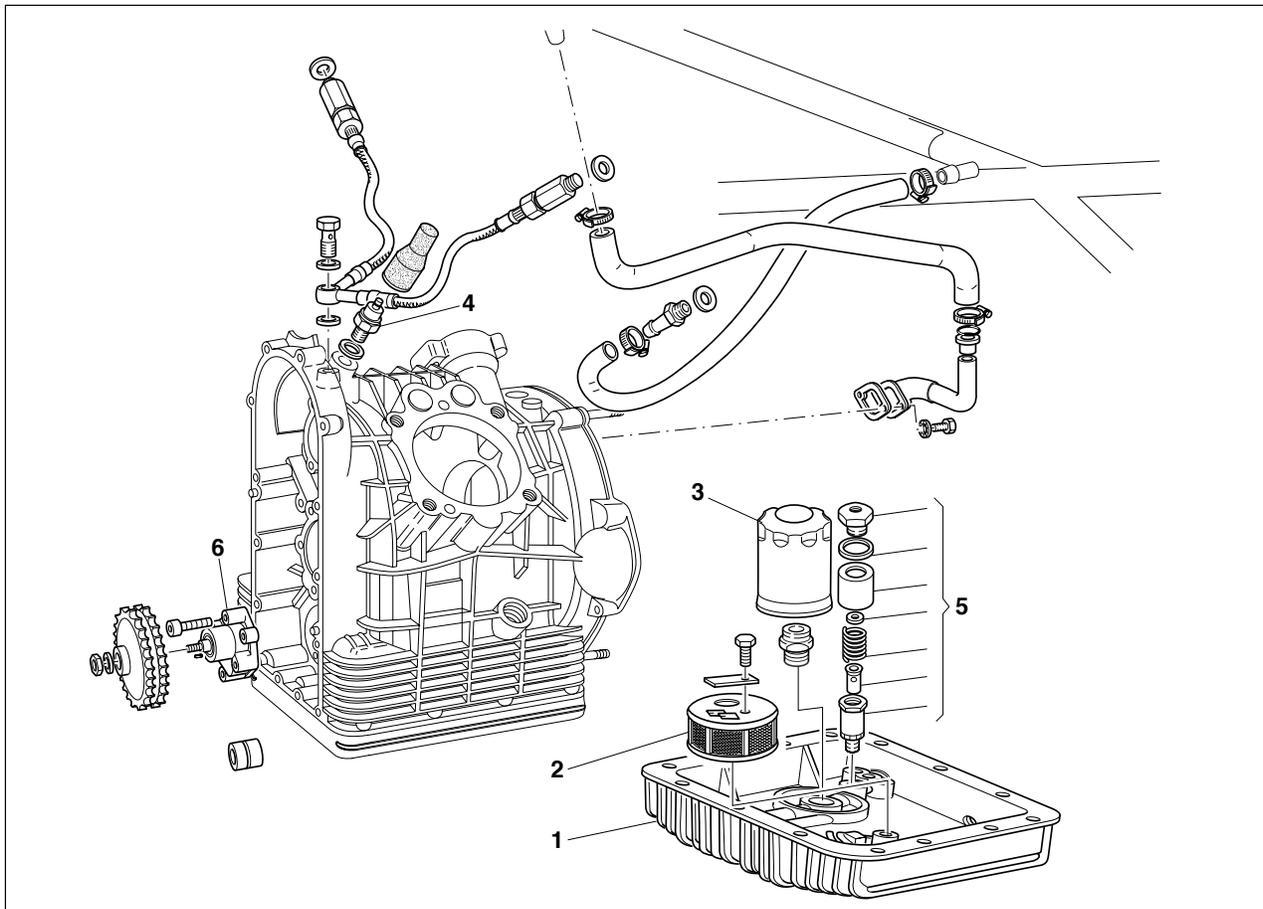
Reassembly of engine - gearbox assembly:

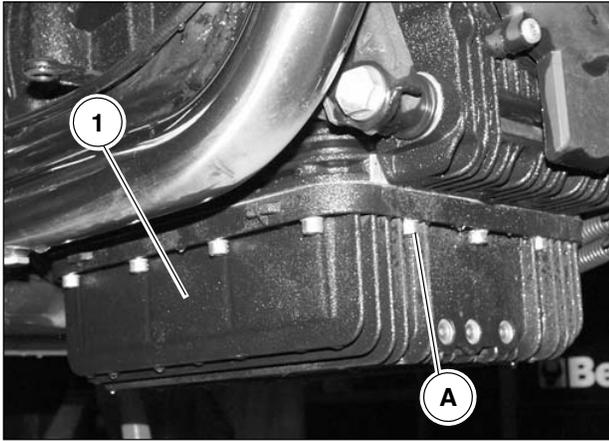
- Carry out the removal procedures in reverse order to reassemble the engine – gearbox assembly.

3 LUBRICATION SYSTEM

The lubrication system consists of the following components:

- 1 Oil sump
- 2 Oil mesh filter
- 3 Oil cartridge filter
- 4 Oil pressure transmitter
- 5 Engine oil pressure regulator valve
- 6 Oil pump





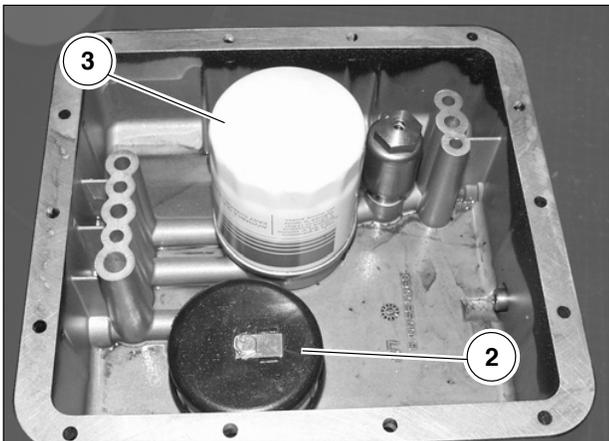
OIL SUMP "1"

The oil sump is positioned under the engine and is fastened onto it by means of 18 screws.

To remove the oil sump:

- Position a suitable pan under the sump for collecting the used oil;
- Drain all the oil as described in paragraph "Engine oil replacement", chapter 2 section D;
- Unscrew the 18 screws "A" fastening the oil sump to the engine crankcase;
- Remove the oil sump "1";

Between the oil sump and the crankcase, there is a gasket which must always be replaced after disassembly.

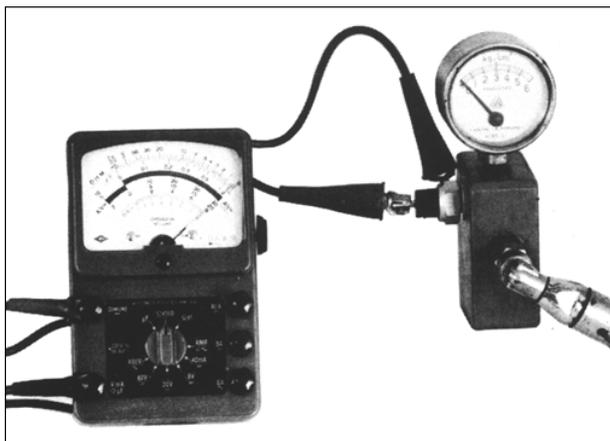


OIL MESH FILTER "2"

This is fastened inside the oil sump; for its maintenance, see paragraph "washing the oil mesh filter" in chapter 2 section D.

OIL CARTRIDGE FILTER "3"

This is fastened inside the oil sump; for its maintenance, see paragraph "replacing the oil cartridge filter" in chapter 2 section D;

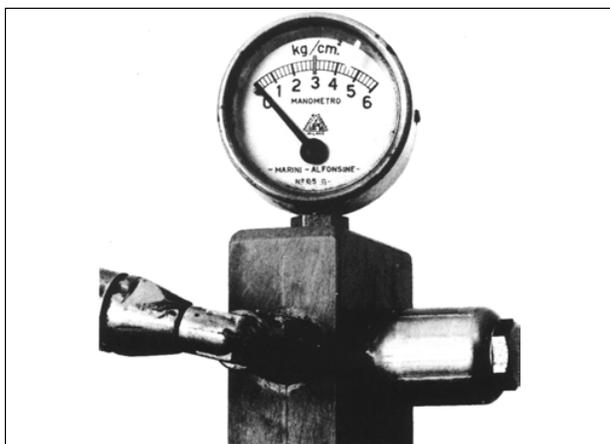


OIL PRESSURE TRANSMITTER "4"

This is fitted on the engine crankcase, and it is connected to the dashboard lamp by means of electric wires; it indicates when the pressure inside the lubrication system is insufficient.

When the lamp on the dashboard comes on (during running), it indicates that the pressure is below the preset limits; under these conditions, it is necessary to stop the vehicle immediately and check for the cause which originated the pressure drop.

To check the transmitter efficiency, mount it on the special tool fitted with a pressure gauge; connect the tester positive cable (+) to the transmitter and the negative cable (-) to ground. Then blow in compressed air through the union for the above mentioned tool, making sure that the tester arrow moves when the pressure (looking at the pressure gauge) reaches a value of Kg/cmq $0,15 \div 0,35$.



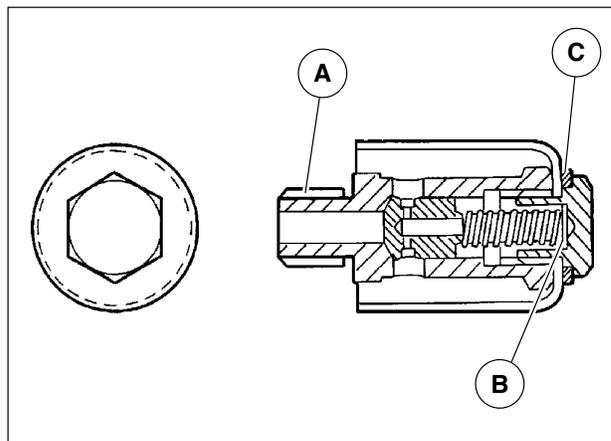
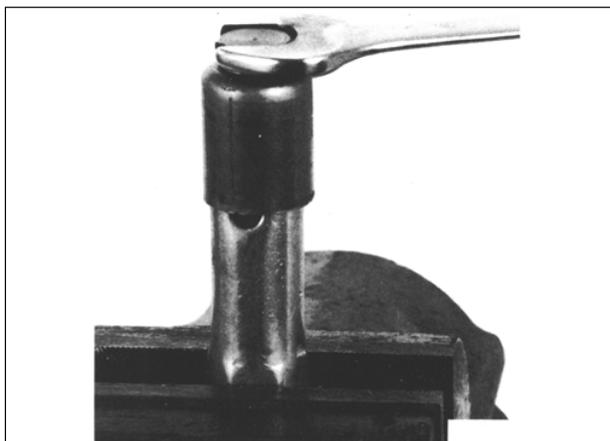
ENGINE OIL PRESSURE REGULATOR VALVE "5"

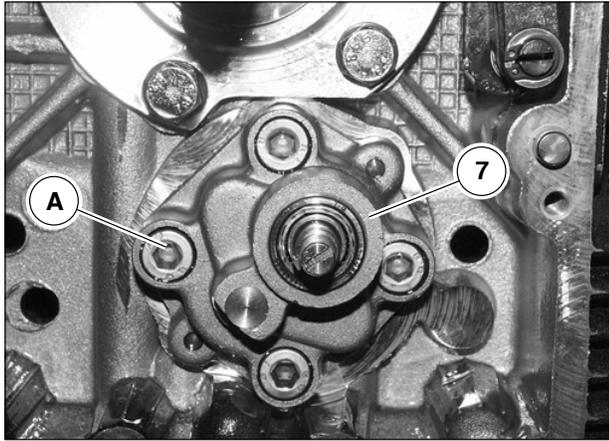
The valve for the engine oil pressure regulation "A" is fitted on the support for the cartridge oil filter: to remove it, it is necessary to remove the oil sump.

This must be preset, in order to allow a pressure in the delivery circuit of $3,8 \div 4,2$ Kg/cmq.

To check its setting, it is necessary to install the valve on a special tool fitted with a pressure gauge; blow in compressed air through the tool union and make sure that the valve opens exactly upon reaching the prescribed pressure.

If the valve opens at a lower pressure, insert one or more bottoms "B" under the spring; if the valve opens at a higher pressure, increase the number of washers "C".





OIL PUMP "7"

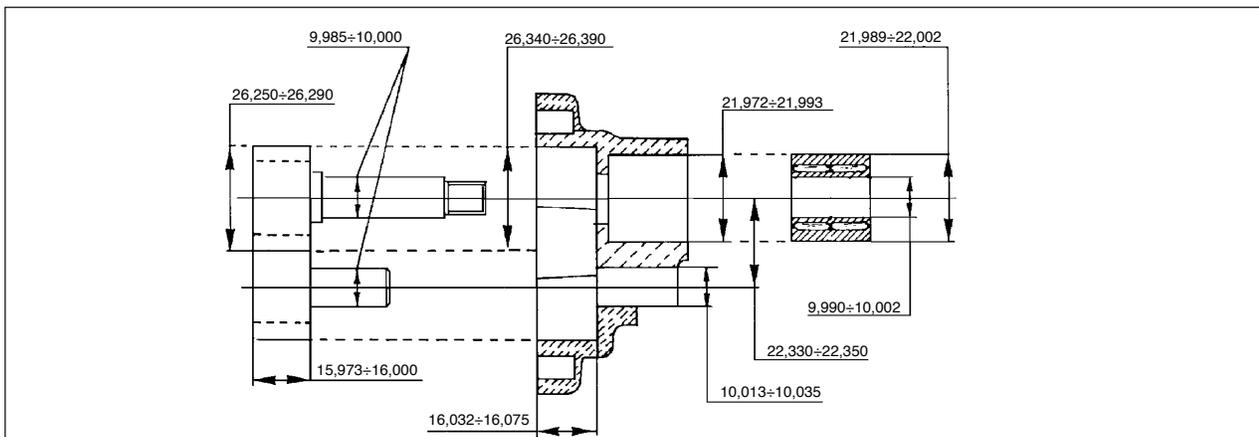
The oil pump used is a gear type pump and is driven directly by the crankshaft through a belt.

Removal:

- Drain all the engine oil as described in chapter 2 section D;
 - Remove the entire engine following the instructions reported in chapter 2 of this section;
 - Remove the alternator following the instructions reported in chapter 7 of this section;
 - Remove the timing system cover as described in chapter 4 of this section;
 - Remove the engine pinion, the timing system gearing and the oil pump gearing, together with the timing belt following the procedures described in chapter 4 of this section;
 - Remove the belt tensioner as described in chapter 4 of this section;
 - Remove the oil pump "7" by unscrewing the fastening screws "A" fissaggio. If defects due to the pump are found, check:
 - The gearing height, which must be between mm 15,973÷16,000;
 - The seat heights on the pump body, which must be between mm 16,032÷16,075;
- In the event that the above parts do not feature the above mentioned values, it is necessary to replace them.

Refitting:

- Carry out the procedures described for disassembly in reverse order.





CHECK FOR OIL LEAKAGES FROM THE ENGINE CRANKCASE (FLYWHEEL FLANGE SIDE)

In the event of oil leakages from the rear side of the engine crankcase (flywheel area), it is necessary to check that:

- The seal ring on the flange, flywheel side, is not worn;
- There are no blowholes in the engine crankcase. To carry out this check, rest the engine on a bench with the flywheel side facing upwards, after having removed the flywheel from the crankshaft;
- Fill the upper part of the crankcase with water;
- Blow low pressure compressed air through the bleeding pipe (in order to prevent the oil-seal ring from falling out), taking care to keep hold of the seal ring with two fingers;
- In case of porosity, small bubbles will be visible. In this event, plug the porosities using the special commercially available cement.

A

B

C

D

E

F

G

H

I

L

M

N

O

P

4 HEADS AND TIMING SYSTEM

The engine unit uses a timing system with rods and rockers, with 2 valves per cylinder.

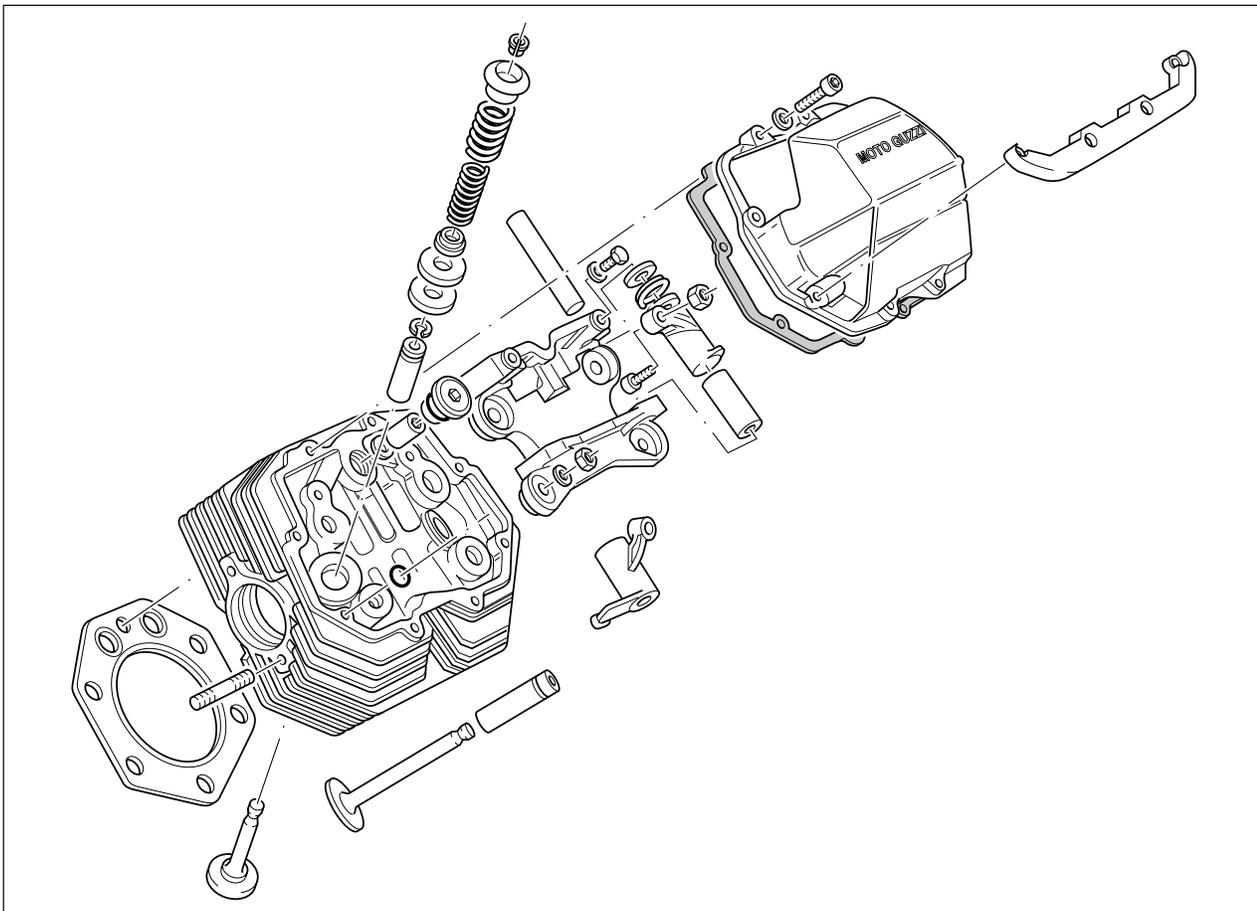
The valve opening and closing is controlled by a camshaft located in the crankshaft, which is driven by means of a duplex belt.

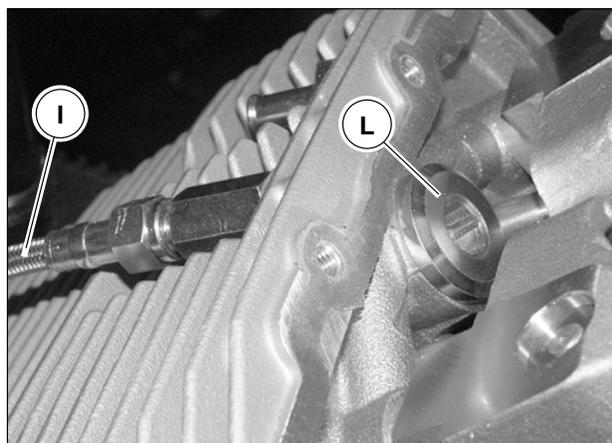
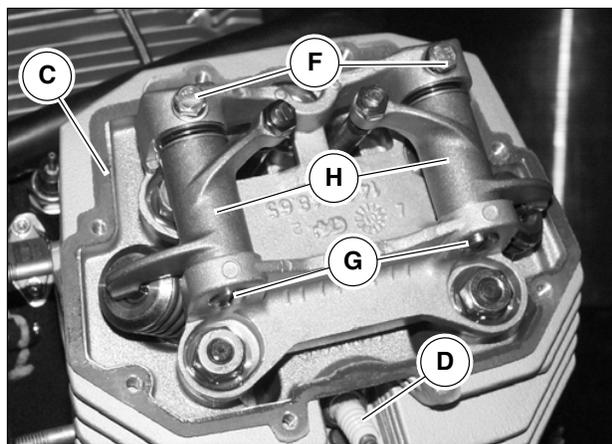
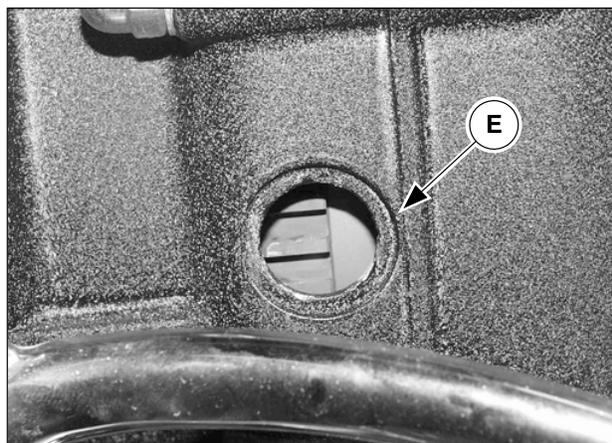
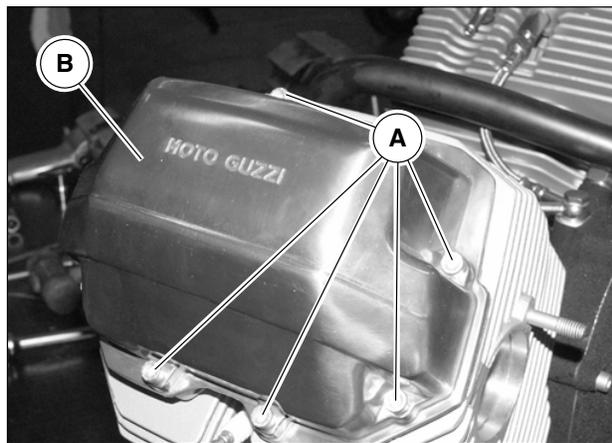
HEADS



N.B.

The procedures described below refer to the disassembly of only one head, but they are valid for both.





Removal:

- Remove the engine unit from the motorbike as described in chapter 2 of this section.
- Unscrew the fastening screws “A” on the head cover “B” and remove the latter.

REASSEMBLY NOTES

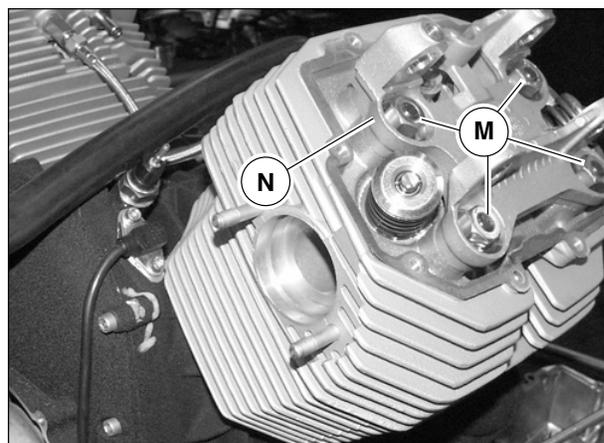
The upper fastening screws are equipped with a washer, while the lower ones are not. There is a gasket “C” between the covers and the heads, which must be replaced upon every reassembly.

- Unscrew the spark plug “D”;
- Rotate the crankshaft in the T.D.C. position during the combustion stage (valves closed) of the LH cylinder.

N.B.

This procedure can be carried out even when the gearbox is assembled with the engine block, as the notch position can be checked through the speciale hole “E”.

- Unscrew the 2 screws “F” and extract the rocker pins “G” helping their removal using a screw-driver;
- Remove the rockers “H” as well as the relative washers and bushings;
- Detach the piping delivering oil “I” to the head;
- Unscrew the threaded cap “L” and the underlying stud nut with its O-ring;
- Unscrew the nuts “M”;
- Remove the rocker support “N”;
- Slide out the rocker rods “O”;
- Slightly detach the head from the cylinder, remove the 4 o-ring seals on the stud bolts “P” and remove the head “Q”;
- Remove the gasket “R” between the head and the cylinder.



Ausbau:

- Das Motoraggregat aus dem Motorrad ausbauen, wie in Kap. 2 dieses Abschnitts beschrieben.
- Die Dichtungsschrauben "A" auf dem Zylinderkopfdeckel "B" abschrauben und den Deckel abnehmen.

👁️ HINWEIS FÜR DEN WIEDEREINBAU

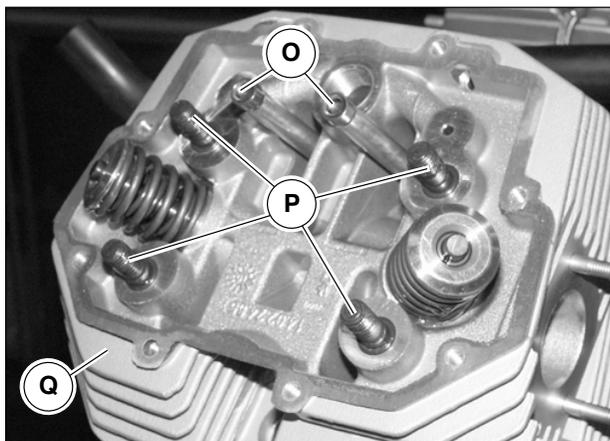
Die oberen Befestigungsschrauben haben eine Unterlegscheibe, die unteren nicht. Zwischen den Deckeln und den Zylinderköpfen befindet sich eine Dichtung "C", die bei jedem Wiedereinbau auszutauschen ist.

- Die Kerze "D" abschrauben.
- Die Pleuellwelle in die OT-Position in Explosionsphase (geschlossene Ventile) des linken Zylinders drehen.

👁️ N.B.

Diese Maßnahme kann auch dann ausgeführt werden, wenn das Getriebe am Motorblock montiert ist, da die Position der Markierung durch die spezielle Öffnung "E" überprüft werden kann.

- Die 2 Schrauben "F" abschrauben und die Bolzen der Pleuellwelle "G" herausziehen, was mit Hilfe eines Schraubenziehers unterstützt werden kann.
- Die Pleuellwelle "H" und die jeweiligen Unterlegscheiben und Buchsen entnehmen.
- Die Ölzufuhrleitung "I" zum Kopf abtrennen.
- Den Pleuellwelledeckel "L" abschrauben und die darunter befindliche Pleuellwelle mit O-Ring abschrauben.
- Die Pleuellwelle "M" abschrauben.
- Den Pleuellwellehalter "N" abnehmen.
- Die Pleuellwellenstangen "O" herausziehen.
- Während der Pleuellkopf leicht vom Zylinder gelöst wird, die 4 O-Ringe auf den Pleuellschrauben "P" entfernen und den Pleuellkopf "Q" herausnehmen;
- Die Dichtung "R" abnehmen, die sich zwischen Kopf und Zylinder befindet.



MOTOR

Demontage:

- De aandrijfgroep wegnemen van de moto zoals beschreven wordt in hoofdstuk 2 van deze sectie.
- De schroeven "A" van dichting op het deksel kop "B" losdraaien en het deksel zelf wegnemen.

👁️ OPMERKING VOOR DE REMONTAGE

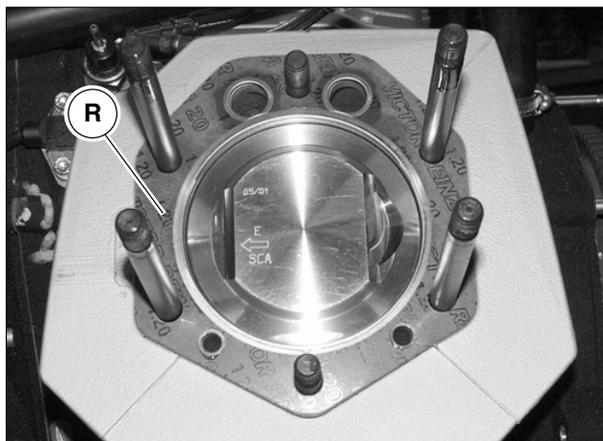
De bovenste schroeven voor vasthechting hebben een rozet terwijl de onderste er geen hebben. Tussen deksels en koppen is een dichting "C" aanwezig die bij elke remontage moet vervangen worden.

- De bougie "D" losdraaien;
- De aandrijfas in de stand van P.M.S. draaien in de fase van vonkontsteking (kleppen gesloten) van de linker cilinder.

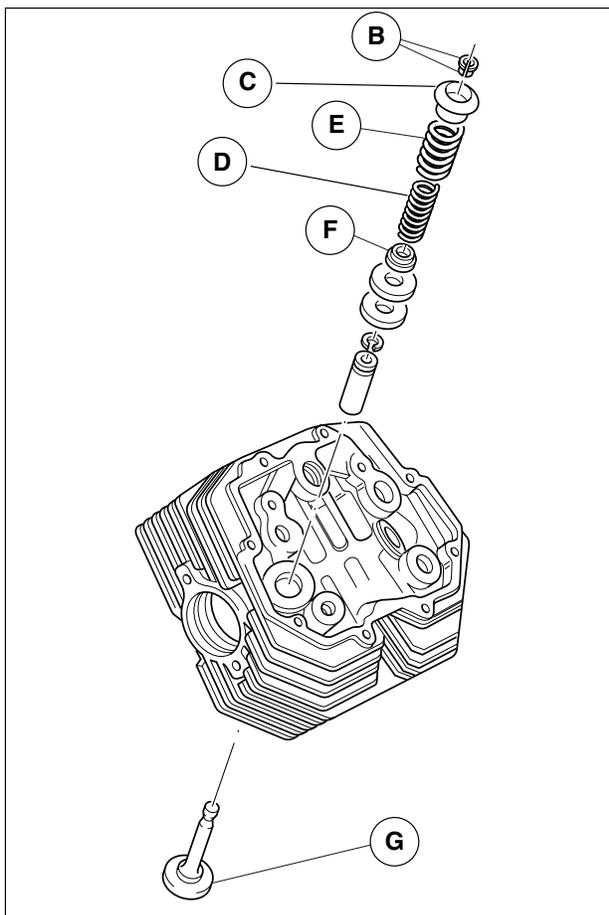
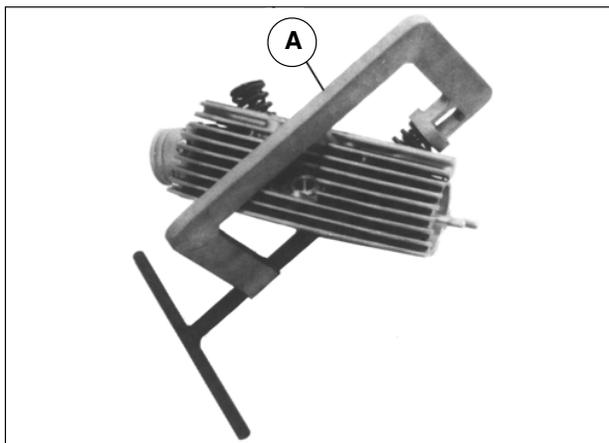
👁️ OPMERKING

Het is mogelijk deze operatie ook uit te voeren wanneer de versnelling geassembleerd is aan het motorblok omdat de positie van de streep geverifieerd kan worden doorheen de speciale opening "E".

- De 2 schroeven "F2" losdraaien en de stiften van de slingers "G" wegtrekken hetgeen gemakkelijker is wanneer men gebruik maakt van een schroevendraaier;
- De slingers "H" en de bijhorende sluitringen en moffen wegnemen;
- De buis van olietoevoer "I" aan de kop loskoppelen;
- De schroefdraden dop "L" losdraaien en de onderstaande moer met kolom met OR losdraaien;
- De moeren "M" losdraaien;
- De support slingers "N" wegnemen;
- De staven slingers "O" wegtrekken;
- Haal de kop een beetje van de cilinder, verwijder de 4 O-ringen op het cilinderkoptapeinde «P» en haal de kop "Q" eraf;
- De dichting "R" wegnemen die aanwezig is tussen de kop en de cilinder.



MOTOR



HEAD DISASSEMBLY



N.B.

The procedures described below refer to the disassembly of only one head, but they are valid for both.

To disassemble the heads and their components work as follows:

- Position tool "A" (code 10 90 72 00) on the upper plate and in the middle of the valve head that you want to remove;
- Screw down the tool screw until it is tightened, then hammer the tool head (where it works on the upper plate) using a mallet, so that the two half-cones "B" get detached from the upper plate "C";
- Once the two half-cones are detached "B", screw down until the two above mentioned half cones can be slid out from the valve seats; unscrew the tool and remove it from the head;
- Slide out the upper plate "C";
- Remove the inside spring "D";
- Remove the outside spring "E";
- Remove the lower plate "F" and, if necessary, the shimming washers;
- Remove the valve "G" from inside the head.

A

B

C

D

E

F

G

H

I

L

M

N

O

P

CHECK OF HEAD COMPONENTS

HEADS

Check that:

- The contact surfaces for the cover and cylinder are not grooved or damaged so as to jeopardize a perfect packing;
- The tolerance between the holes for the valve guides and the valve stems are within the prescribed limits;
- Check the condition of the valve seats;

Valve guides

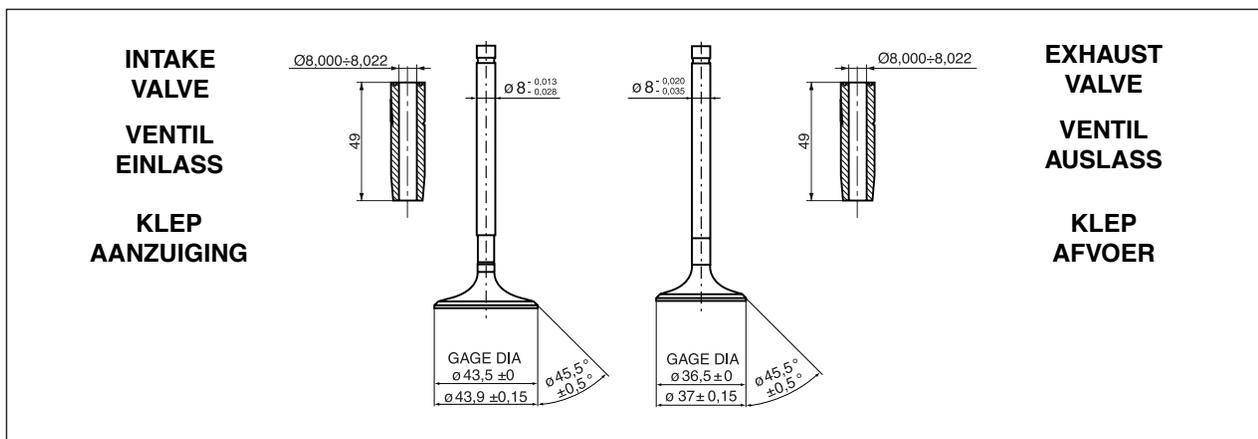
Use a punch to extract the valve guides from the heads. The valve guides must be replaced only in the event that the backlash between them and the stem cannot be eliminated by replacing the valves only.

To fit the valve guides on the head, proceed as described below:

- Warm up the head in a furnace at ca. 60°C;
- Lubricate the valve guides;
- Fit the flexible rings;
- Press the valve guides using a punch;
- True the holes where the valve stems slide using a reamer, thereby bringing the inside \varnothing to the prescribed size; interference between the head seat and the valve guide must be mm 0,046÷0,075.

DATA TABLE FOR VALVE AND GUIDE COUPLINGS

	\varnothing valves' internal guide mm	\varnothing valve rod mm	Assembly play mm
Intake	8,000÷8,022	7,972÷7,987	0,013÷0,050
Exhaust		7,965÷7,980	0,020÷0,057

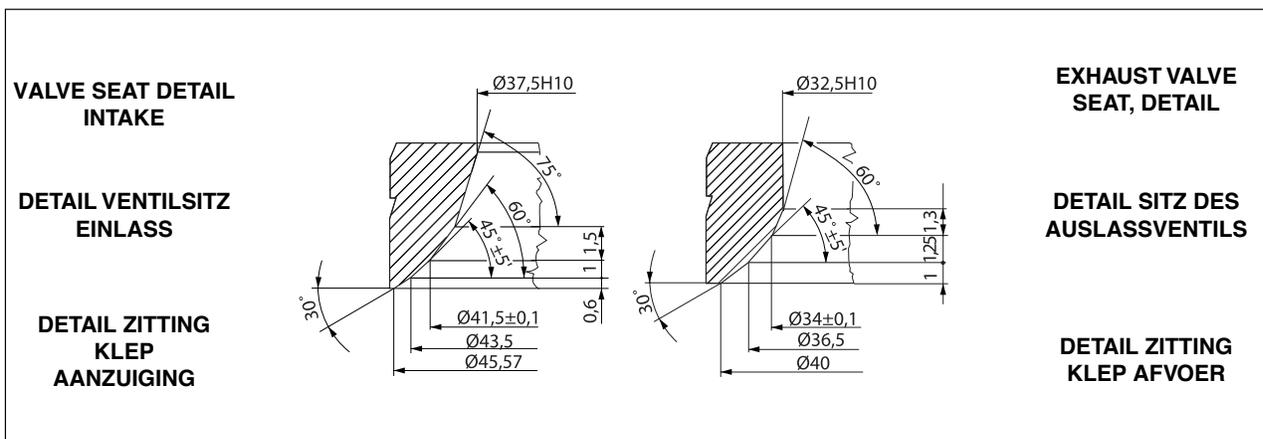


Valve seats

The valve seats must be trued using a miller. The tilt angle for the seat is $45^\circ \pm 5'$.

After milling, to obtain a good coupling and a perfect packing between the ring nuts and the valve heads, it is necessary to proceed with grinding.

A
B
C
D
E
F
G
H
I
L
M
N
O
P



VALVE SPRING INSPECTION

Check that the springs are not deformed and are still loaded.

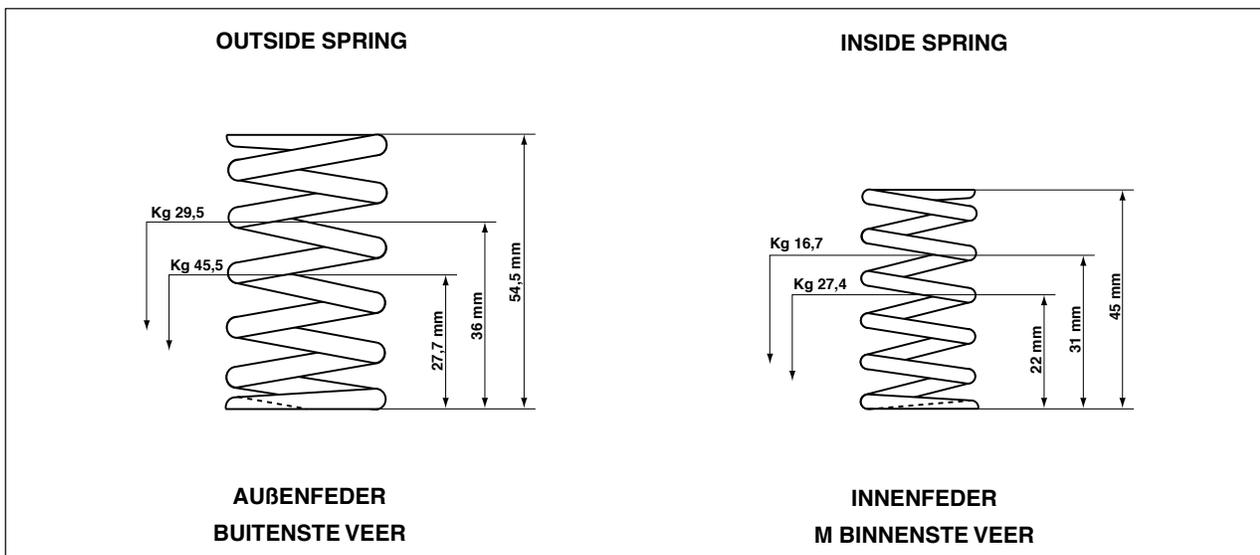
OUTSIDE SPRING:

- **When free**, it has a length of 54,5 mm;
- **When the valve is closed**, it has a length of mm 36 and must provide a load of Kg. 29,5 \pm 3%;
- **When the valve is open**, it has a length of mm 27 and must provide a load of Kg. 45,5 \pm 3%;
- **When packed**, it has a length of mm 22,75÷23,25.

INSIDE SPRING:

- **When free**, it has a length of 45 mm;
- **When the valve is closed**, it has a length of mm 31 and must provide a load of Kg. 16,7 \pm 3%;
- **When the valve is open**, it has a length of mm 22 and must provide a load of Kg. 27,4 \pm 3%;
- **When packed**, it has a length of mm 19,75÷20,25.

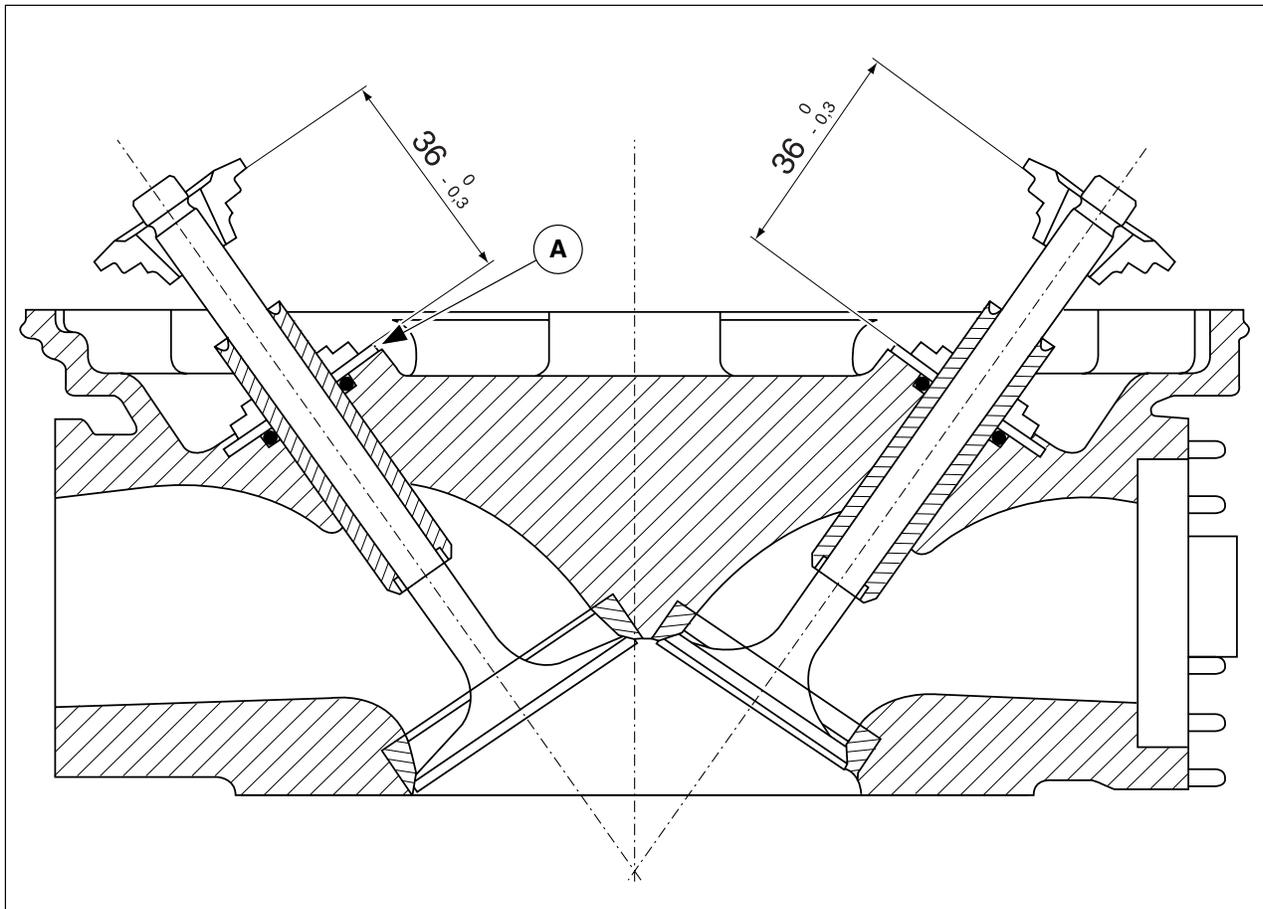
If the springs do not comply with the above-mentioned features, they shall be replaced.

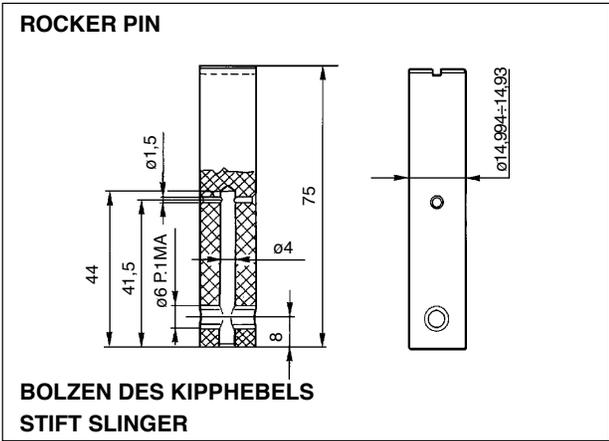
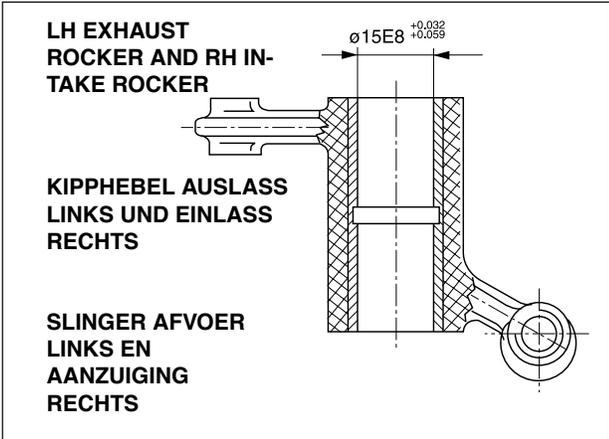
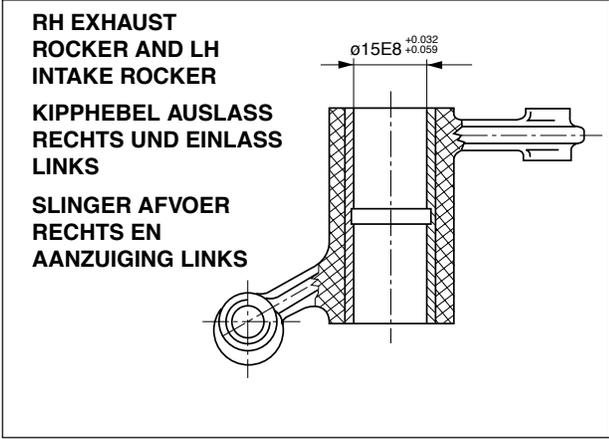


SPRING PACKAGE CHECK

When the valve seats on the heads are trued, after having fitted the valves on the heads, it is necessary to check that the above said springs are compressed between mm $35,700 \div 36,000$; to reach this value, fit washers "A" (code 14 03 73 00) with a 0.3 mm thickness.

After reaching the maximum opening, the springs shall still have a length of mm $1 \div 1.75$ before the inside spring is packed.





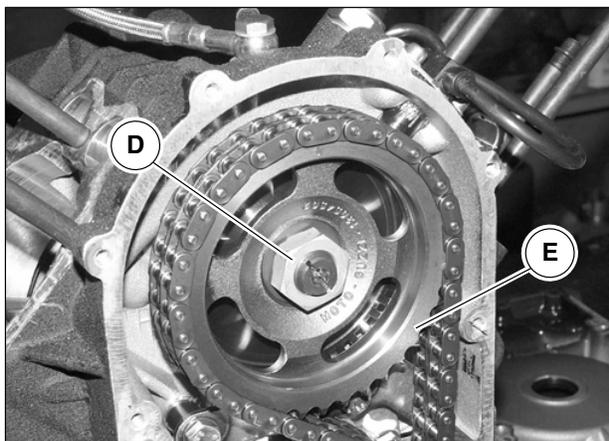
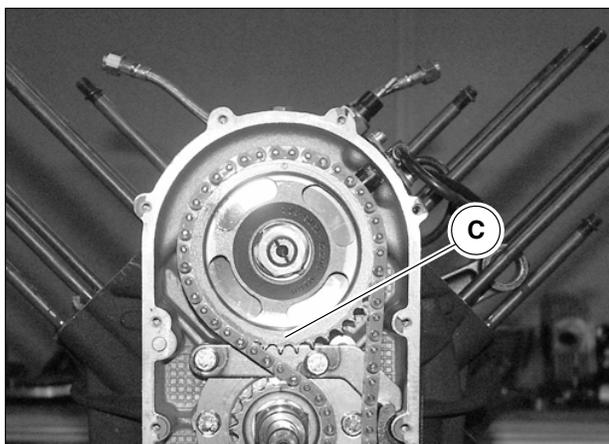
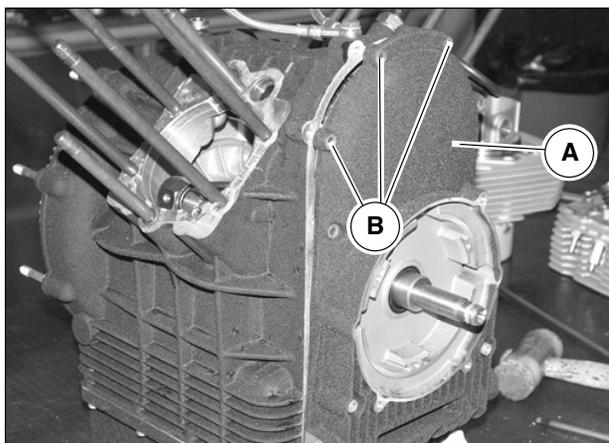
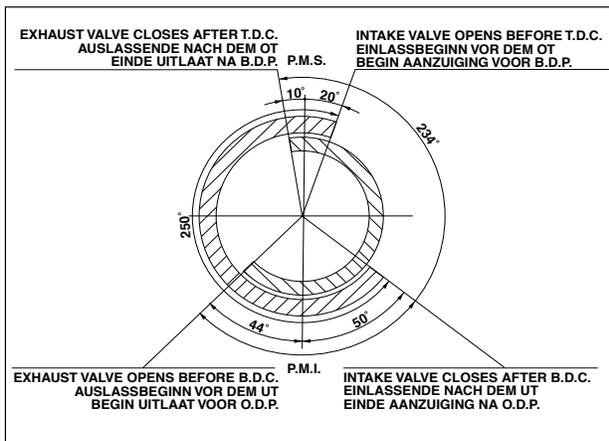
ROCKER AND PIN CHECK

Check the wear condition and the dimensions of the pins and of the rockers; if the read measures are not within the range indicated on the drawings, it is necessary to replace them.

Reassembly:

Carry out the disassembly procedures remembering to:

- Replace the O rings under the rocker support underframe with new O rings upon every reassembly;
- Replace the gasket between the head and cylinders with a new one every reassembly;
- Tighten the nuts and central stud bolt fastening the head to the cylinder to the torque indicated in the table in chapter 4, section B, working crosswise.



TIMING

Timing data:

INTAKE

- Opens 20° before the T.D.C.
- Closes 50° after the B.D.C.

EXHAUST

- Opens 44° before the T.D.C..
- Closes 10° after the T.D.C.

- Intake 0,10 mm ;
- Exhaust 0,15 mm;

Disassembly:

- Remove the engine unit from the motorbike, as described in chapter 2 in this section;
- Remove the alternator following the instructions described in chapter 7 in this section;
- Remove the timing cover "A" by unscrewing the 14 retaining screws "B".

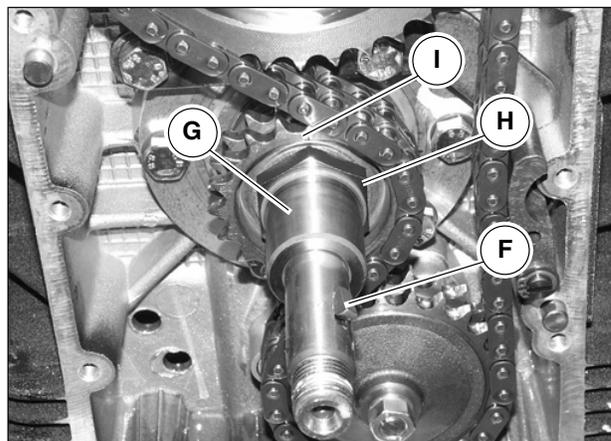
REASSEMBLY NOTE

Replace gasket between crankcase and timing system cover at each reassembly.

- Highlight timing marks "C" and restore them at the following reassembly;
- Unscrew central nut "D" fixing the gear "E" to the camshaft;
- Remove the key "F" and the spacer "G";
- Unscrew central nut "H" fixing the timing gear "I" to the crankshaft;

N.B. Check inner o-ring seal before reassembly.

- After unscrewing nut "L" of the oil pump control gear "M", remove the three gears together with the chain "N";



STEUERUNG

Steuerdaten:

EINLASS

- Öffnet 20° vor dem OT
- Schließt 50° nach dem UT

AUSLASS

- Öffnet 44° vor dem UT
- Schließt 10° nach dem UT

- Einlass 0,10 mm
- Auslass 0,15 mm

Ausbau:

- Das Motoraggregat aus dem Motorrad ausbauen, wie in Kap. 2 dieses Abschnitts beschrieben.
- Die Lichtmaschine ausbauen, dazu den Angaben in Kap. 7 dieses Abschnitts folgen.
- Den Steuerdeckel "A" ausbauen, dazu die 14 Dichtschrauben "B" abschrauben.

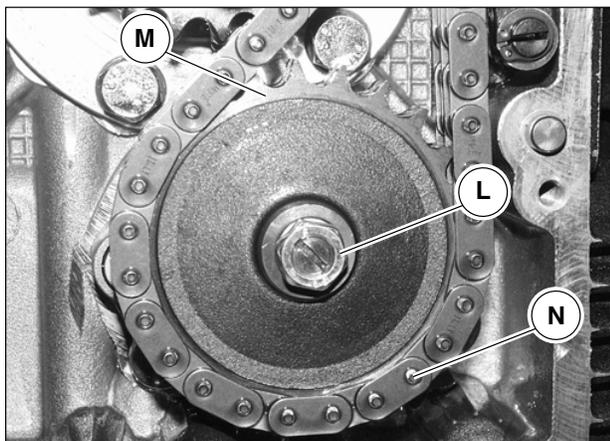
HINWEIS FÜR DEN WIEDEREINBAU

Bei jedem erneuten Einbau die Dichtung zwischen Gehäuse und Steuerdeckel austauschen.

- Die Steuerzeitenmarkierungen "C" der Ventilsteuerung hervorheben, die bei dem nachfolgenden Einbau zurückgestellt werden sollen.
- Die zentrale Dichtmutter "D" des Zahnrads "E" an der Nockenwelle abschrauben.
- Den Keil "F" entfernen und die Distanzscheibe "G" herausnehmen.
- Die zentrale Dichtmutter "H" des Steuerzahnrad "I" auf der Kurbelwelle abschrauben.

N.B. Vor dem Wiedereinbau den O-Innenring kontrollieren.

- Nachdem die Dichtmutter "L" des Zahnrads "M" der Ölpumpensteuerung gelöst wurde, die Dreierzahnäder zusammen mit der Kette "N" herausnehmen.



MOTOR

DISTRIBUTIE

Gegevens van de distributie:

AANZUIGING

- Opent 20° voor de P.M.S.
- Sluit 50° na de P.M.I.

AFVOER

- Opent 44° voor de P.M.I.
- Sluit 10° na de P.M.S.

- Aanzuiging mm 0,10;
- Afvoer mm 0,15;

Demontage;

- De aandrijfgroep wegnemen van de moto zoals beschreven wordt in hoofdstuk 2 van deze sectie;
- De stroomwisselgenerator wegnemen volgens de instructies aangegeven in hoofdstuk 7 van deze sectie;
- Het deksel van distributie "A" wegnemen en hierbij de 14 schroeven "B" van

OPMERKING BIJ HET OPNIEUW MONTEREN

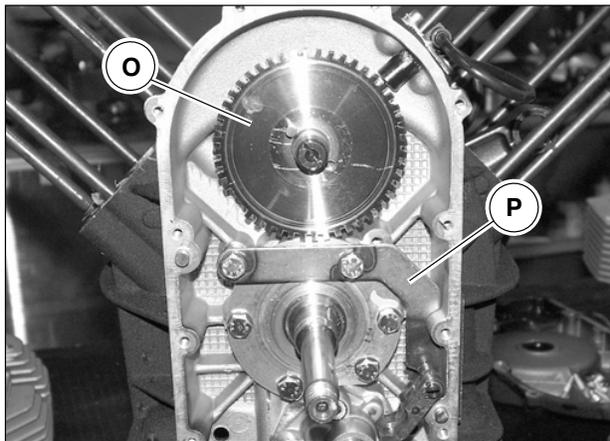
Bij elke nieuwe montage de pakking tussen het blok en het distributiedeksel vervangen.

- De distributiefasen "C" markeren tijdens het demonteren;
- De middelste moer "D" losdraaien waarmee het raderwerk "E" op de nokkenas vastzit;
- De sluitpen "F" verwijderen en de afstandhouder "G" eruit halen;
- De middelste moer "H" losdraaien waarmee het distributieraderwerk "I" op de motoras vastzit;

OPMERKING De O-ring binnenin controleren voordat u opnieuw monteert.

- Nadat u de moer "L" op het raderwerk "M" voor de aandrijving van de oliepomp hebt losgeschroefd, haalt u er de drie raderwerken samen met de ketting "N" uit;

MOTOR

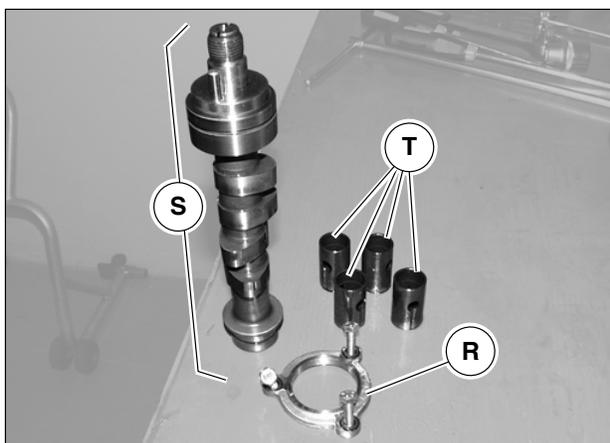
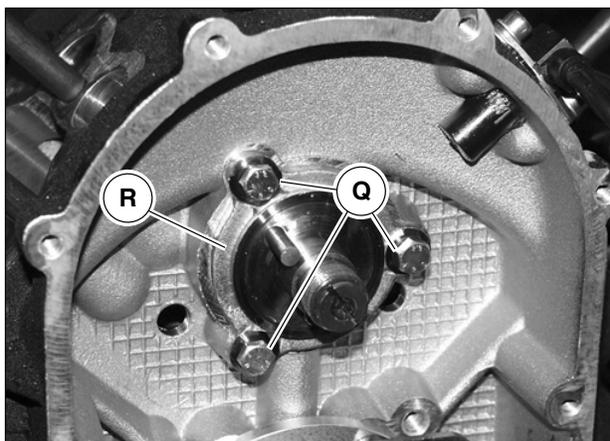


- Remove the toothed wheel “O”;
- Disassemble the timing chain tensioner “P” by unscrewing the relative fastening screws;
- Unscrew the 3 screws “Q” fastening the flange “R” retaining the camshaft “S” and extract the latter after having removed the tappets from their seats “T”;

Having removed all timing components, it is necessary to check them, and if they are not in perfect condition they must be replaced.

Reassembly:

- Carry out the procedures in reverse order.
- To assemble the toothed wheel, see the specific paragraph in this section.



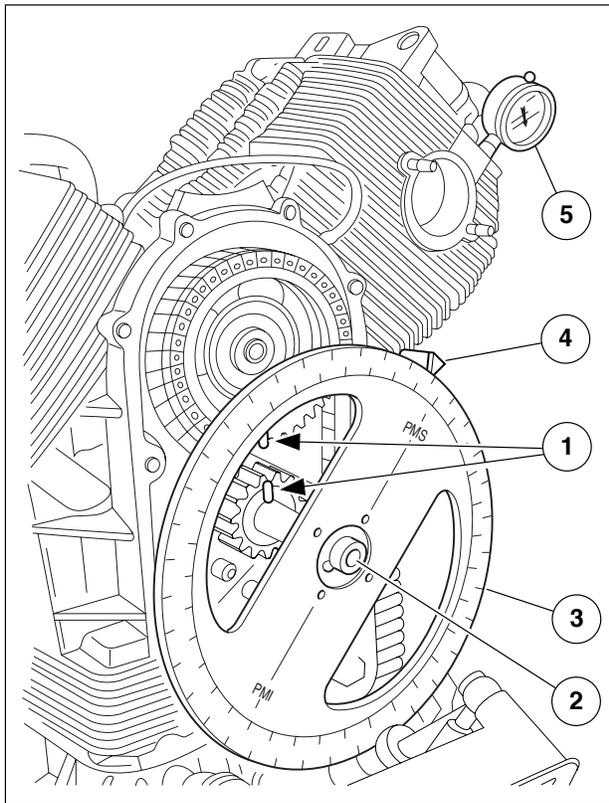


DIAMETERS FOR THE CAMSHAFT SUPPORTS AND RELATIVE SEATS ON THE CRANKCASE

	Ø SHAFT SUPPORT mm	Ø SEATS ON THE CRANK- CASE mm	ASSEMBLY BACKLASH mm
Timing side	47,000÷46,984	47,025÷47,050	0,025÷0,066
Flywheel side	32,000÷31,984	32,025÷32,050	

COUPLING DATA FOR THE TAPPETS AND RELATIVE SEATS ON THE CRANKCASE

	SEATS Ø mm	OUTER TAPPET Ø mm	ASSEMBLY BACKLASH mm
Production	22,021÷22,000	21,996÷21,978	0,004÷0,043
Ø oversize mm 0,05	22,071÷22,050	22,046÷22,028	0,004÷0,043
Ø oversize mm 0,10	22,121÷22,100	22,096÷22,078	0,004÷0,043



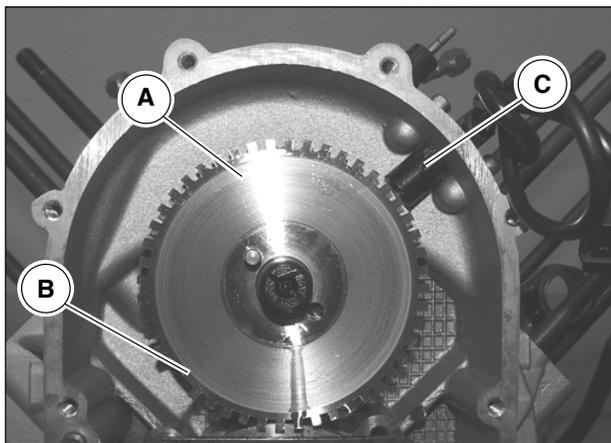
CHECK OF THE TIMING SYSTEM SETTING.

To check the engine timing setting, work as follows:

- Set valve clearance to 1,5 mm between rockers;
- Unscrew the engine pinion's fastening nut;
- Fit the hub, Code 65 92 84 00 "2", onto the engine shaft slot, having fitted the index plate, Code 19 92 96 00 "3", and fastening it to the engine shaft by means of a screw;
- When it is half-screwed down, fasten arrow code 17 94 75 60 "4" to the crankcase threaded hole;
- Fit a dial gauge support "5" onto the LH cylinder's spark plug hole. Then fit the gauge into the latter;
- Turn the disk in a clockwise direction until the LH cylinder piston is at top dead center (with valves closed). Reset the gauge and make sure that the marks (on the timing gearing and on the engine pinion) "1" are perfectly aligned. Look through the inspection hole on the gearbox housing to make sure that the line with the letter "S" is perfectly aligned with the mark made on the centre of the hole;
- At this point align, the tip of the arrow with the "T.D.C." zero on the index plate,
- Check the setting according to the timing diagram.
- Tighten the support with dial gauge onto the spark plug hole on the RH cylinder head;
- Fit the control arrow onto the RH side of the crankcase;
- Turn the disk in a clockwise direction until the "D" marking is in line with the mark in the center of the inspection hole on the gearbox housing (valves closed);
- Repeat the same procedures as for the LH cylinder.

Having completed the test and if everything looks correct:

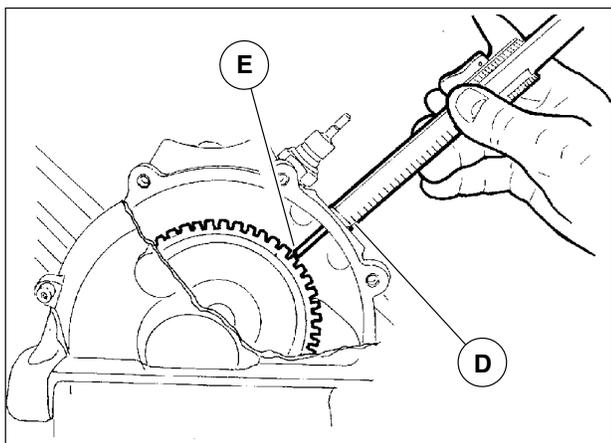
- Restore the operating backlash between the rockers and the valves (intake 0.10 mm; exhaust 0.15 mm;)
- Remove the index plate from the crankshaft and the arrow from the crankcase;
- Remove the support together with the dial gauge from the hole on the cylinder head, refit the spark plug and complete the assembly.



REASSEMBLY OF THE TOOTHED WHEEL AND MEASURING OF THE AIR GAP

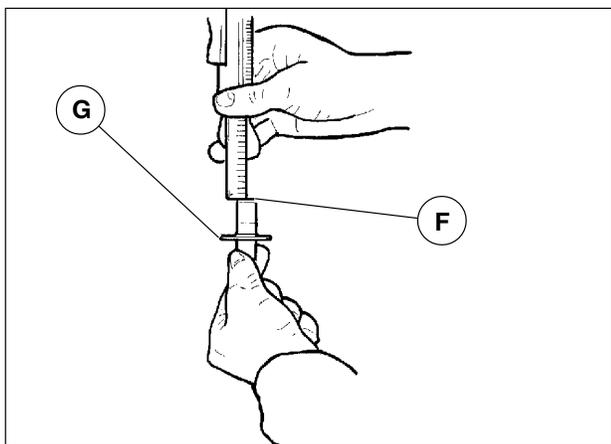
- Position the toothed wheel “A” with the milled tothing “B” on the opposite side to the timing sensor one “C”;
- Insert a feeler gauge between the timing sensor terminal and the toothed wheel’s toothed surface, to make sure the air gap is between 0.7 and 0.9 mm.

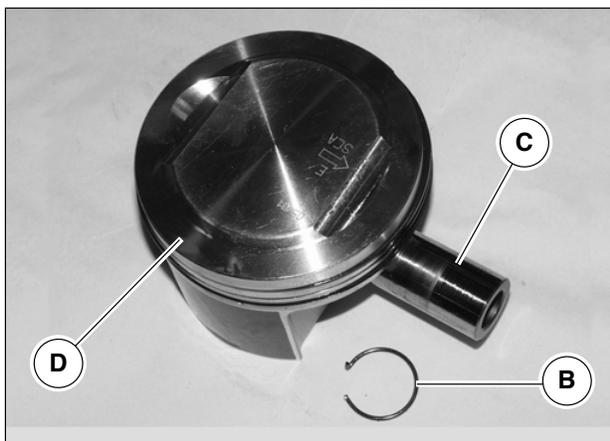
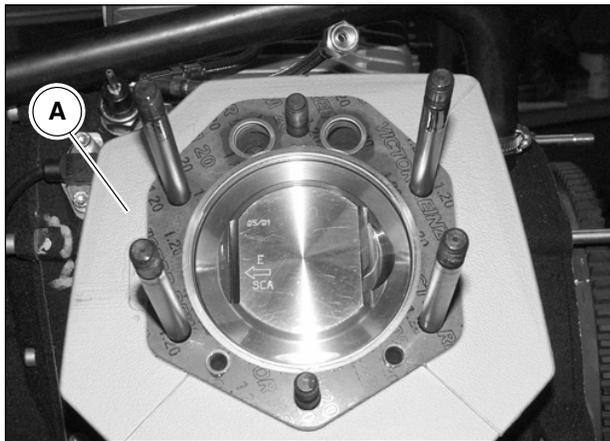
To determine the air gap when the engine is fitted, proceed as follows:



- Using a gauge, measure the distance between the striking point on the crankcase “D” and the tooth surface on the flywheel “E”;
- Measure the value between the end “F” of the sensor and the sensor’s striker plate “G”. The difference between the two measured values gives the actual air-gap. If necessary, increase the thickness of the sensor’s striking point, following the instructions described in chapter 16, section I.

5 CYLINDERS AND PISTONS





N.B.



The procedures described below refer to the disassembly of only one head, but they are valid for both.

Disassembly:

- Remove the engine unit, as described in chapter 2 in this section;
- Remove the head, as described in chapter 4 in this section;
- Remove cylinder "A" from the stud bolts;
- Remove the clamps "B" for the piston pin "C";
- Remove the piston pin "C" using the special tool, commercially available;
- Remove the piston "D";

CHECK OF COMPONENTS

Cylinder wear control:

The cylinders' diameter must be measured at three heights, turning the dial gauge by 90°. Check that the cylinders and pistons belong to the same selection category (A,B,C) until engine KD030428 or (D,E,F) from engine KD030429.

Piston check:

GRADING CYLINDER DIAMETER SINCE ENGINE N° KD 030428

GRADE A	GRADE B	GRADE C
92,000÷92,006	92,006÷92,012	92,012÷92,018

GRADING CYLINDER DIAMETER UP TO ENGINE N° KD 030429

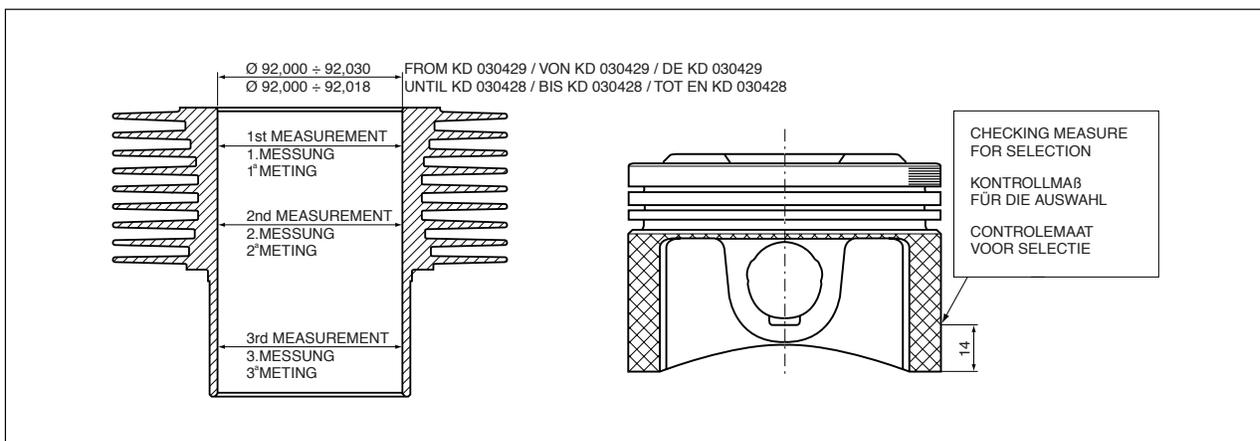
GRADE D	GRADE E	GRADE F
92,000÷92,010	92,010÷92,020	92,020÷92,030

GRADING PISTON DIAMETER SINCE ENGINE N° KD 030428

GRADE A	GRADE B	GRADE C
91,966÷91,972	91,972÷91,978	91,978÷91,984

GRADING PISTON DIAMETER UP TO ENGINE N° KD 030429

GRADE D	GRADE E	GRADE F
91,953÷91,963	91,963÷91,973	91,973÷91,983



During overhaul, descale the crown, the pistons and the seats for the flexible rings; check the backlash between the cylinders and pistons on the selection diameter; if this exceeds the prescribed value, the cylinders and the pistons must be replaced.

The engine pistons must be balanced; a weight difference of 1.5 grams is acceptable.

Check the compression and oil scraper rings.

The following is fitted on each piston:

- 1 upper compression ring;
- 1 intermediate stepped compression ring ;
- 1 oil-scraper compression ring.

The end parts of the compression rings must be fitted “out of step” with each other.

Assembly backlashes measured between the ring shims and their seats on the piston;

- Seal and oil-scraper rings 0.030 ÷ 0.065 mm

Span between the ends of the compression rings fitted in the cylinder:

- Upper seal ring and stepped ring 0.40 ÷ 0.65 mm.
- Oil scraper ring 0.30 ÷ 0.60 mm.

Reassembly

- Carry out the disassembly procedures in reverse order.

N.B.

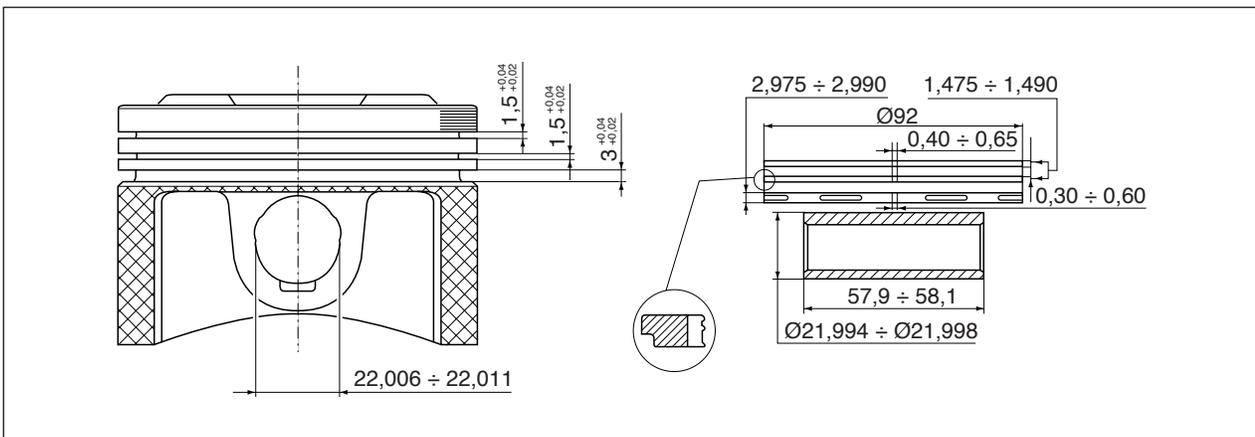
Check the assembly direction for the piston: the arrow “A” marked on the crown indicates the exhaust side. Check that the pistons and the cylinders are in the correct group categories (A with A, B with B, C with C, D with D, E with E, F with F);

Do not couple pistons and cylinders which do not belong to the same selection group.

6 CLUTCH

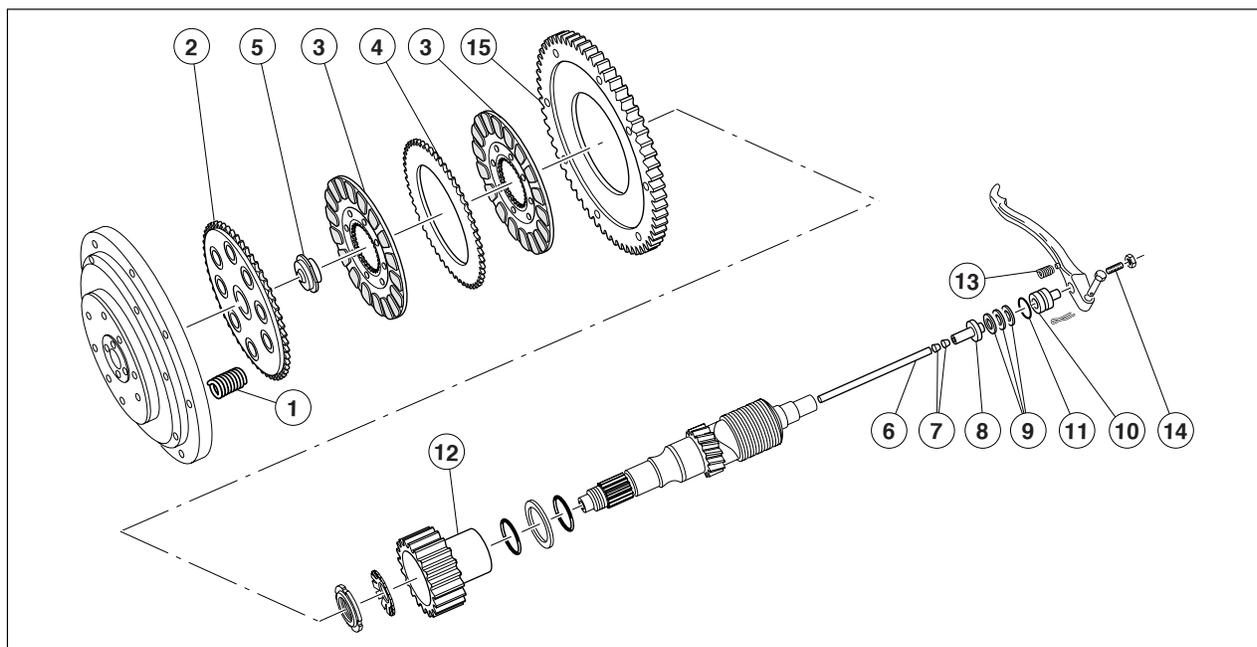
COUPLING DATA

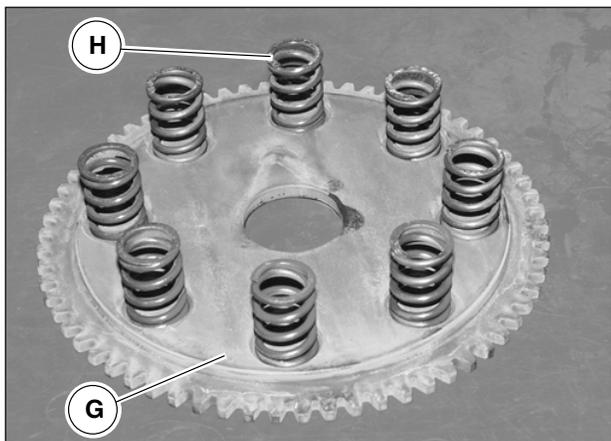
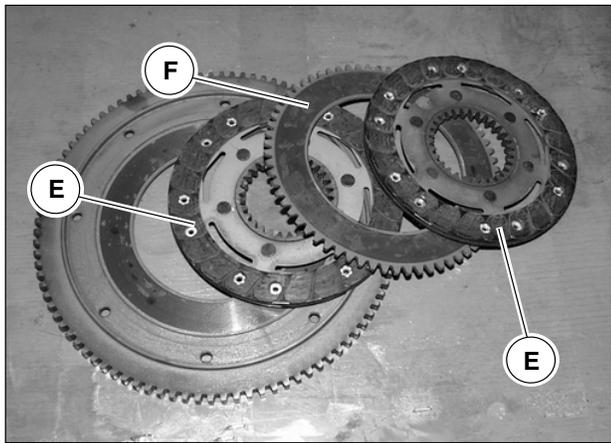
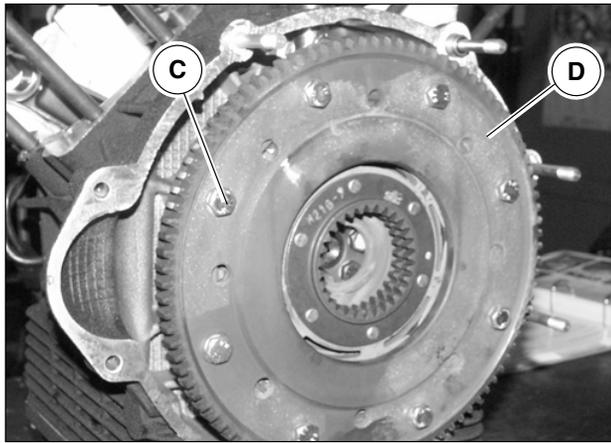
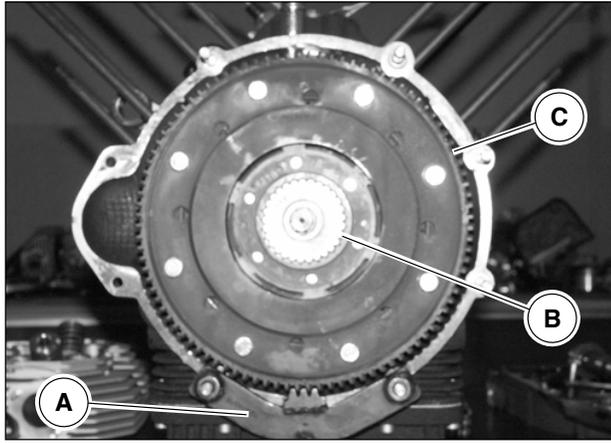
Ø PISTON PIN mm	Ø PISTON HOLES mm	BACKLASH BETW. PIST. PIN AND HOLES ON THE PIST. mm
21,994	22,006	0,008÷0,017
21,998	22,011	



The clutch is a dry type and is housed inside the engine flywheel.
It is composed of two driven disks, one intermediate disk, one spring pressure washer and 8 springs.

Disassembly:

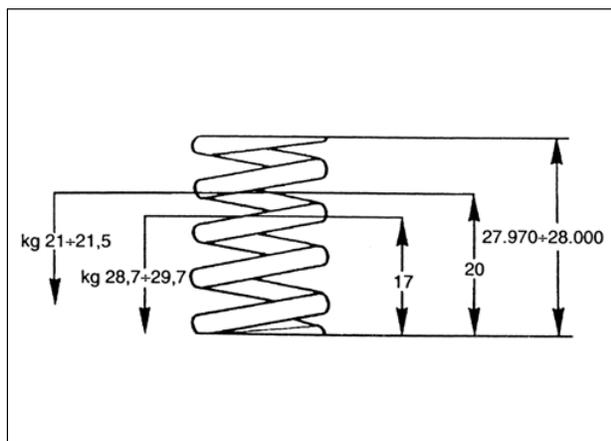




Remove the engine unit from the motorbike as described in chapter 2 in this section;

- Remove the alternator as described in chapter 7 in this section;
- Apply the locking tool "A" (cod. 12 91 18 01) to the engine flywheel and tool "B" (cod. 30 90 65 10) for clutch spring compression;
- Unscrew the 8 retaining screws "C" for the toothed crown "D" fitted on the engine flywheel;
- Remove the toothed crown "D";
- Extract the clutch disks "E", the intermediate disk "F", the spring pressure washer "G" and the relative springs "H" from inside the engine flywheel;

CHECK OF COMPONENTS



Clutch springs “1”

Check that the springs have not lost their elasticity and are not deformed:

- Springs compressed to 20 mm must give a load of 21 ÷ 21.5 Kg ;
- Springs compressed to 17 mm must give a load of 28.7 ÷ 29.7 Kg;

Spring pressure plate “2”

Check that the disk hole, where the control retainer operates, does not show signs of wear, and that the resting surfaces for the driven disk are perfectly flat. Check that the tothing inside the fly wheel is in perfect condition.

Driven disks “3”

Check that the coupling surfaces with the driven disks are completely smooth and flat and that the external tothing which works inside the flywheel is not ruined, otherwise replace the disk.

Toothed crown for ignition “15”

Check that the coupling surface with the driven disk is perfectly smooth and flat. Also check that the tothing, where the starter motor pinon works, is not ginned or damaged, otherwise replace it.

Clutch internal body “12”

Check that the teeth do not show signs of impression in the area in contact with the disks.

Reassembly:

A

B

C

D

E

F

G

H

I

L

M

N

O

P



A

B

C

D

E

F

G

H

I

L

M

N

O

P

Also check:**Intermediate plate “4”**

Check that the surfaces touching the driven plates (with friction material) are perfectly smooth and even and that the external teeth inside the flywheel is not damaged, otherwise replace the plate.

Control transmission

Check that the transmission cable has no damaged wires, otherwise replace the transmission.

Clutch adjustment screw on lever “14”

Make sure that the screw is in good condition and that the part on the plate control outer body is not flattened, otherwise replace it.

Lever return spring on gearbox “13”

Check that the spring is not deformed or has not lost elasticity, otherwise replace it.

Outer body “10”

Check where the adjustment screw head works; if the mark is very deep, replace it.

Thrust bearing “9”

Make sure that the bearing is in good condition, otherwise replace it.

Inner body “8”

Check the surface where the thrust bearing lies, if damaged, replace it.

Cone bearings in the clutch shaft “7”

Check that the bearings are in good condition, and are not hardened or crushed; squeaking or oil leakages in the clutch plate may be caused by the above-mentioned bearings.

Push-rod “6”

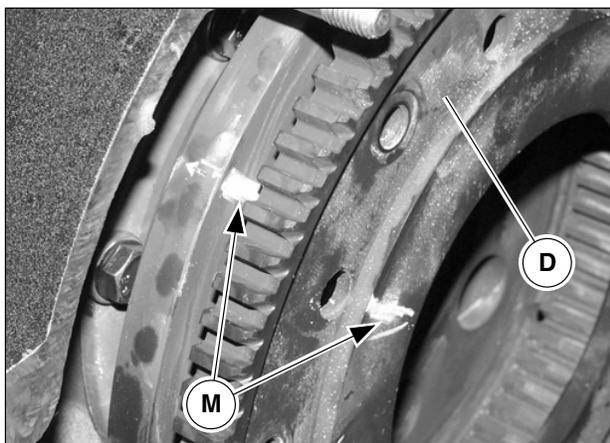
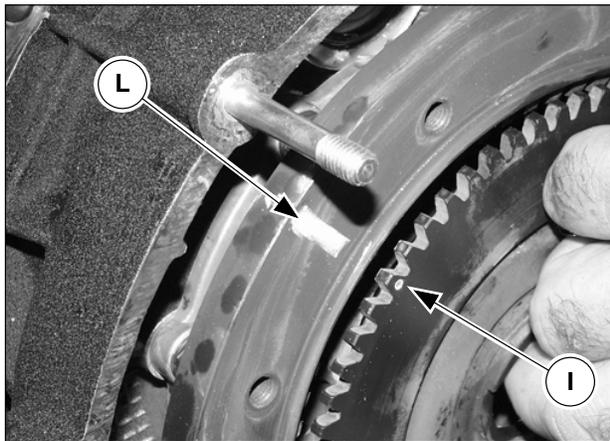
Check that it is not deformed, damaged or shortened; replace it if necessary.

Retainer on the push-rod “5”

Check that the sides working on the spring pressure plate are not too much worn, otherwise replace them.

O-ring seal on the outer body “11”

Check that it is not damaged or that it has not lost elasticity, otherwise replace it.



Carry out the removal procedures in reverse order, remembering that:

- When refitting the clutch assembly, make sure that reference "I" marked on one of the spring pressure plate's teeth is aligned with reference "L", marked on the flywheel;
- For centering the clutch disks use the special tool (code 30 90 65 10);
- Observe the markings "M" when fitting the ignition crown "D" on the flywheel ;
- Tighten the screws "C" fastening the ignition crown to the flywheel to the torque prescribed in the table in chapter 4, section B.

A

B

C

D

E

F

G

H

I

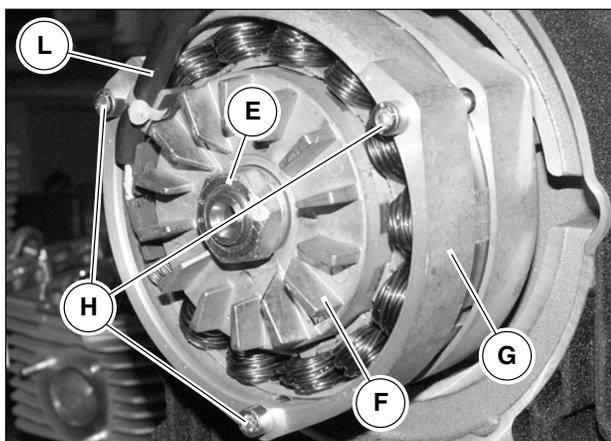
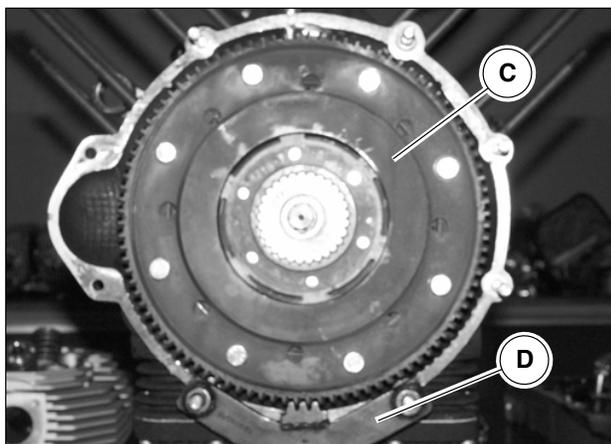
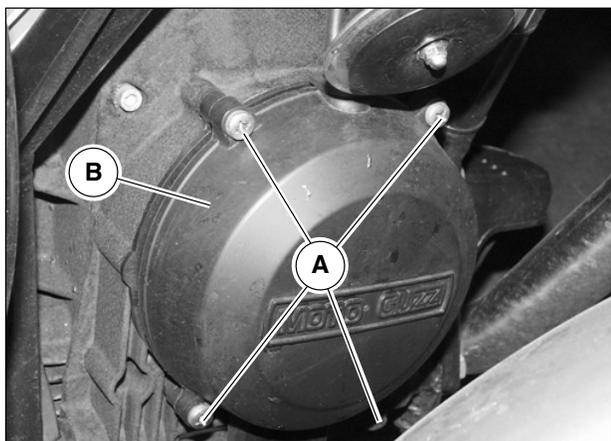
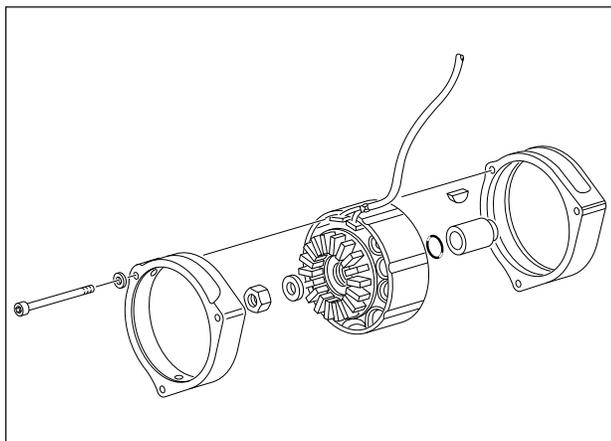
L

M

N

O

P



7 ALTERNATOR AND FLYWHEEL

ALTERNATOR

The alternator is composed of two elements:
The stator, which is fastened on the timing cover, and the rotor, which is fitted on the crankshaft.
The output power supplied by the alternator is equal to 350 W at 5000 r.p.m. (14V - 25A)

Disassembly:

With the engine unit removed

- Unscrew the 4 screws "A" and remove the alternator cover "B";
- Remove the grommet and the plastic flange.
- Apply the special locking tool "D" (code 12 91 18 01) onto the engine flywheel "C";
- Unscrew the central nut "E" restraining the rotor "F";
- Remove the stator "G" by unscrewing the three fastening screws "H";
- Remove the washer "I" and extract the rotor "F";



N.B.

To avoid demagnetization, insert the rotor into the previously removed stator once again.

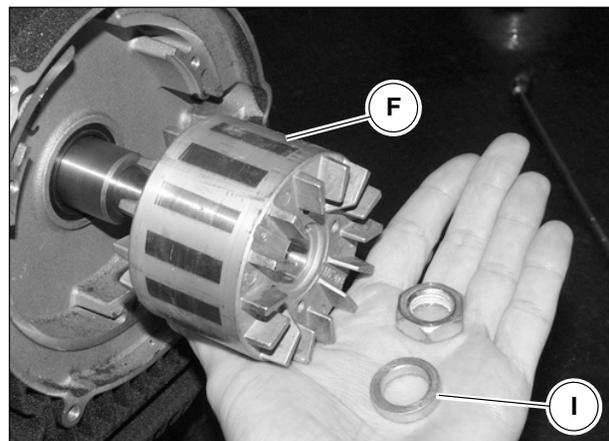
Reassembly:

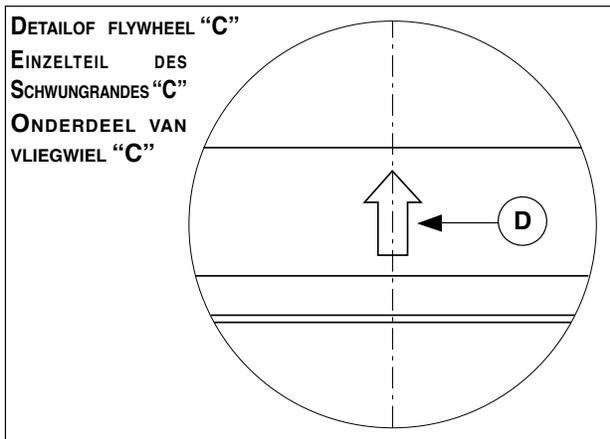
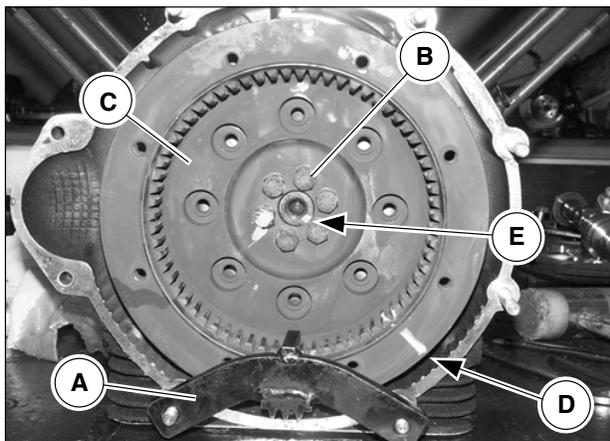
- Carry out the disassembly procedures in reverse order;



N.B.

Fit the stator onto the timing cover as shown in the figure, paying attention to the position of cable "L", which would otherwise not pass through the hole drilled in the alternator cover.





FLYWHEEL

The flywheel is fitted on the crankshaft on the opposite side to the alternator; the clutch is housed inside it.

Disassembly:

- Remove the engine unit from the motorbike following the instructions described in chapter 2 in this section.
- Remove the clutch, as described in chapter 6 in this section;
- Position the locking tool "A" (code 12 91 18 01) on the flywheel "C" as illustrated in the figure;
- Unscrew the 6 screws "B" fastening the flywheel to the crankshaft;
- Remove the flywheel "C".



N.B.

Screws "B" must be replaced with new ones upon the following reassembly, due to the high load and stresses they are subject to; (apply thread locking product, Loctite, medium strength, to the screws and tighten to torques of Nm 40 ÷ 42).

Reassembly:

- Carry out the procedures in reverse order.

N.B.



When reassembling the flywheel on the crankshaft, make sure that the position reference marks shown in the picture match (the marking "D" on the engine flywheel shall be lined up with the marking "E" on the crankshaft).

A

B

C

D

E

F

G

H

I

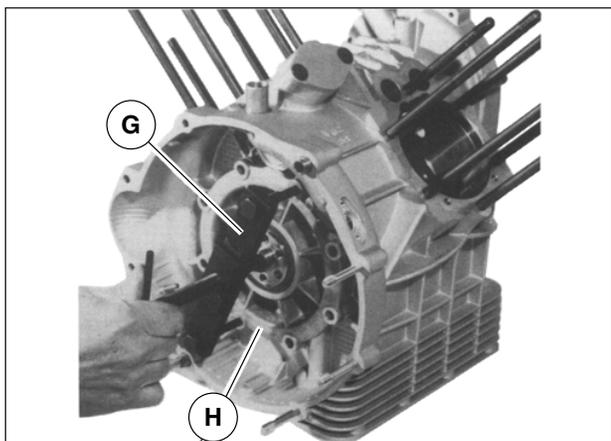
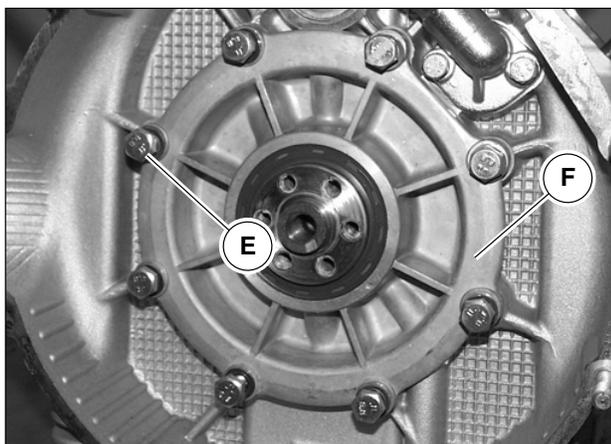
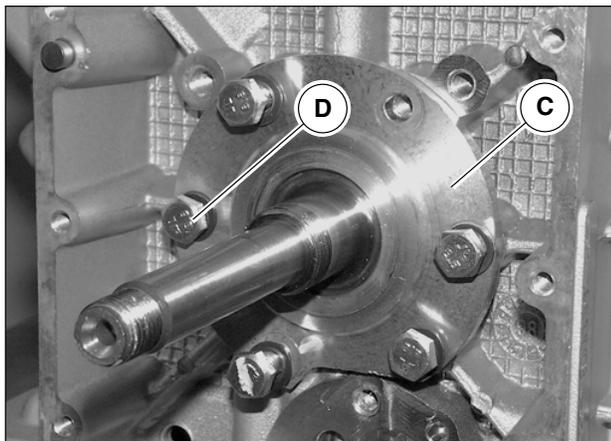
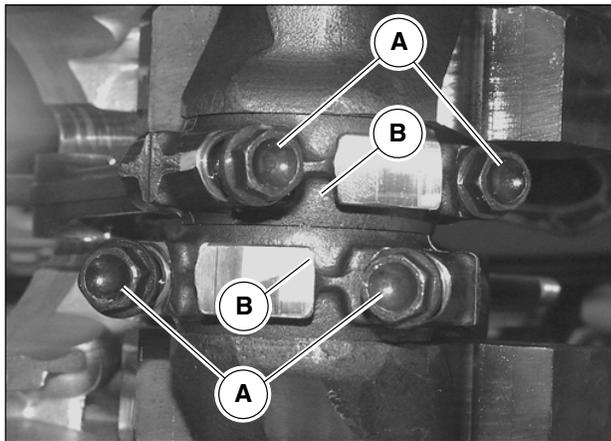
L

M

N

O

P



8 CRANKSHAFT AND CONNECTING RODS

Disassembly:

- Remove the engine unit from the motorbike, following the instructions described in chapter 2 in this section;
- Remove the heads, as described in chapter 4 in this section;
- Remove the cylinders and pistons following the instructions described in chapter 5 in this section;
- Remove the clutch as described in chapter 6 in this section;
- Remove the alternator and the flywheel following the descriptions in chapter 7 in this section;
- Remove the timing system as described in chapter 4 in this section;
- Remove the oil sump as described in chapter 3 in this section;
- Unscrew screws "A" from the crankcase inner side and remove connecting rods "B";
- Unscrew screws "D" and remove the crankshaft flange "C" (alternator side);
- Unscrew the fastening screws "E" of the crankshaft rear flange "F";
- Use the tool "G" (code 12 91 36 00), as illustrated in the picture, to remove the rear flange "H";
- Remove the crankshaft from the rear side;



COMPONENT OVERHAUL



WARNING

During this procedure, inflammable vapours and metal particles which may be expelled at high speed are produced. It is therefore recommended to work in an environment free of naked flames or sparks. The operator must wear protective goggles.

A

B

C

D

E

F

G

H

I

L

M

N

O

P

CONNECTING RODS

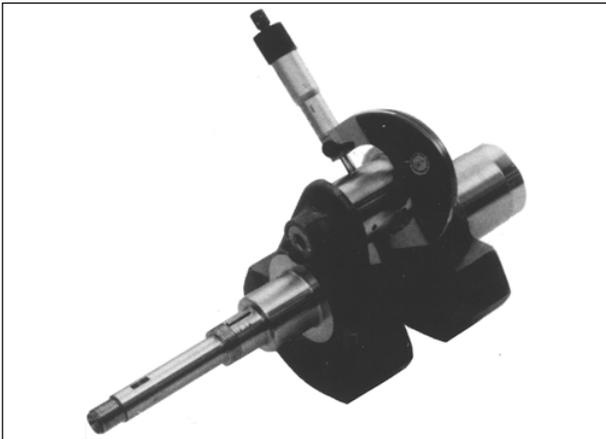
Carry out the following controls when overhauling the connecting rods:

- The bushing conditions and the backlash between them and the piston pins;
- Axis parallelism;
- Connecting rod bearings.

The bearings are slim-shell type, with anti-friction alloy which means they cannot be adjusted; if there are signs of seizing or wear they must be replaced.

When replacing the bearings it may be necessary to true the crank pin.

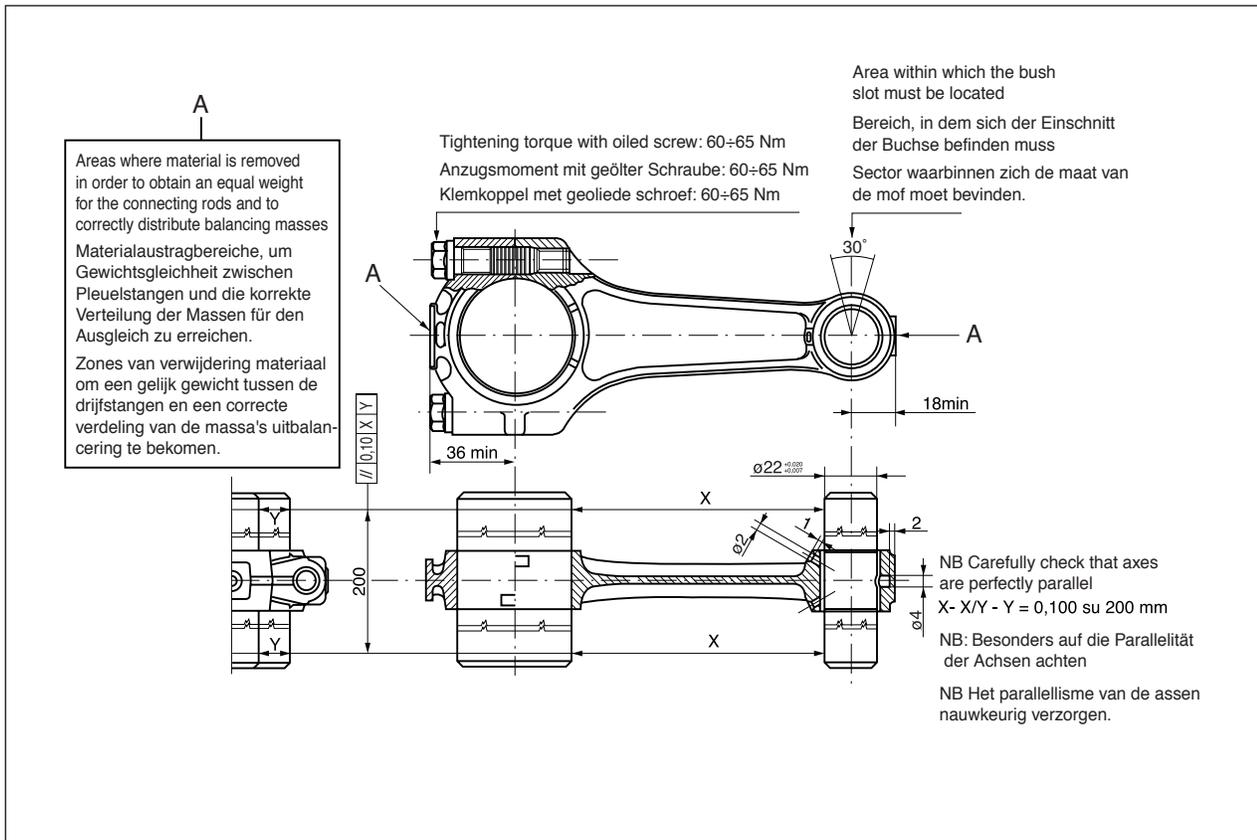
Before correcting the crank shaft pin, it is necessary to measure the diameter of the pin where it shows maximum wear, as illustrated in the figure; this is to establish which undersize category the bearing belongs to and how much the pin must be reconditioned.



Check the axis parallelism

Before fitting the connecting rods, it is necessary to check their quadrature. This means checking that holes for the connecting rod small and big end are parallel and coplanar.

The maximum parallelism and coplanarity error for the two axis for the connecting rod small and big end, measured at a distance of 200 mm, must be $\pm 0,10$ mm.



PLEUELSTANGEN

Bei der Überholung der Pleuelstangen die folgenden Kontrollen ausführen:

- Zustand der Buchsen und Spiel zwischen den Buchsen und den Bolzen.
- Parallelismus der Achsen.
- Pleuellager.

Die Lager besitzen eine dünne Hülle, und sind aus einer reibgeschützten Legierung, die keine Anpassung ermöglicht; sind Fressspuren oder Verschleiß festzustellen, müssen sie ausgetauscht werden.

Beim Austausch der Lager kann es erforderlich sein, den Bolzen der Kurbelwelle auszubessern.

Vor der Berichtigung des Kurbelbolzens sollte der Durchmesser des Bolzens selbst gemessen werden, wie in der Abbildung gezeigt dort, wo der größte Verschleiß besteht. Dies dient zur Bestimmung, welcher Untermaßklasse das Lager angehören muss und auf welchen Durchmesser der Bolzen berichtigt werden muss.

Kontrolle des Achsen-Parallelismus

Vor dem Einbau der Pleuelstange ist ihre Quadratur zu überprüfen. Es muss also kontrolliert werden, ob die Kopf- und Fußöffnungen der Pleuelstangen parallel und schlagfrei sind.

Die Abweichung des Parallelismus und der Koplanarität der beiden Achsen des Pleuelkopfes und -fußes, im Abstand von 200 mm gemessen, darf höchstens $\pm 0,10$ mm betragen.

DRIFSTANGEN

Bij de revisie van de drijfstangen de volgende controles uitvoeren:

- Conditioes van de moffen en speling tussen deze en de pinnen;
- Parallellisme van de assen;
- Kussenblokken van drijfstang.

De kussenblokken zijn van het type met dunne huls, met een legering tegen frictie die geen enkele aanpassing toestaat; indien men sporen van in elkaar grijpen of slijtage vaststelt, moeten ze in ieder geval vervangen worden.

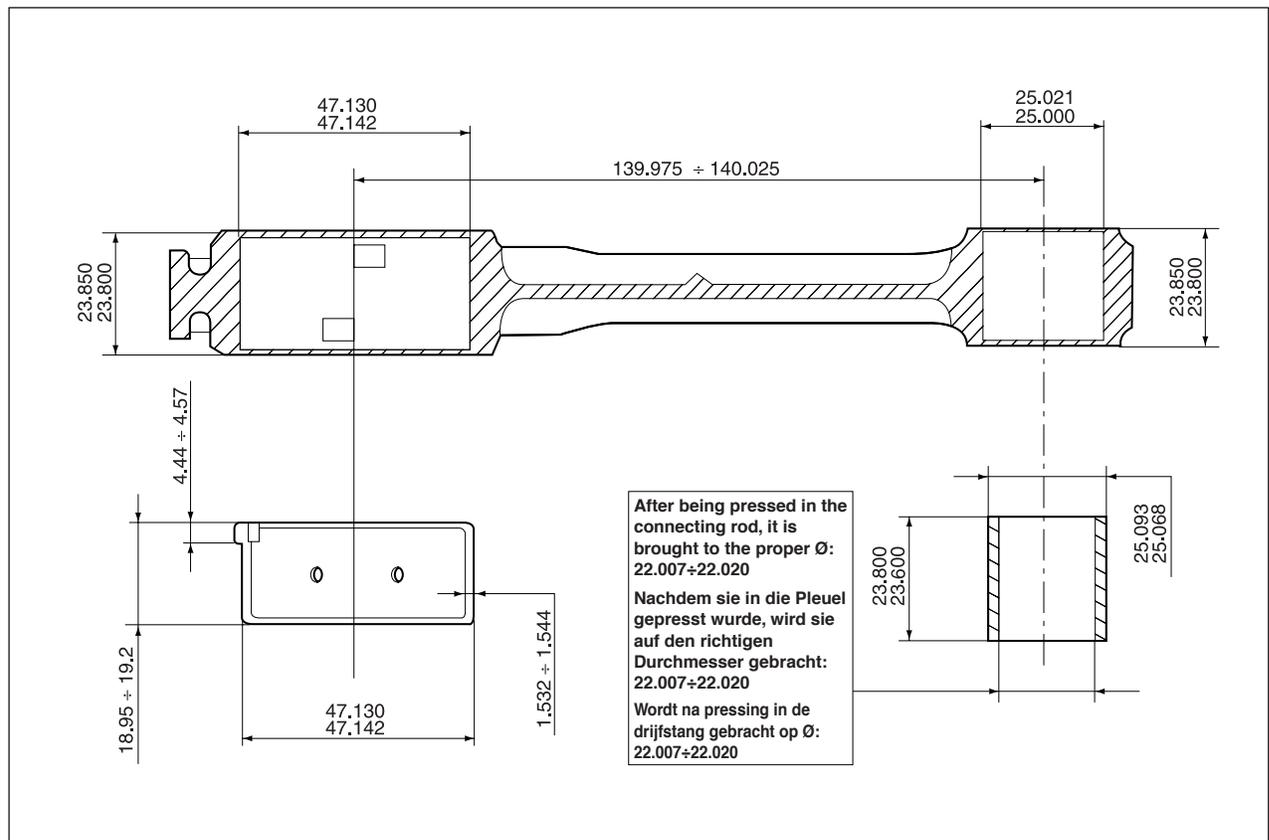
Bij de vervanging van de kussenblokken kan het nodig blijken de stift van de as van de zwengel terug te moeten behandelen.

Vooraleer de bijregeling van de stift van de zwengel uit te voeren, moet men de diameter van de stift zelf meten ter hoogte van de maximum slijtage zoals aangeduid op de figuur; dit om te bepalen tot welke klasse van verkleining het kussenblok moet behoren en aan welke diameter de stift moet bijgesteld worden.

Controle parallellisme van de assen.

Vooraleer de drijfstangen te monteren, moet men de kwadratuur verifiëren. Men moet dus controleren of de openingen kop en voet van de drijfstang parallel en complanair zijn.

De maximum fout van parallellisme en complanariteit van de twee assen van de kop en voet drijfstang gemeten op een afstand van mm 200 moet mm $\pm 0,10$ zijn.





A

B

C

D

E

F

G

H

I

L

M

N

O

P

Connecting rod bearing thickness

Standard Bearing (Production) mm	Bearings for Ø mm undersized connecting rod pin		
	0,254	0,508	0,762
from 1,535 to 1,544	1,662 1,671	1,789 0,798	1,916 1,925

Crankpin diameter

Standard Ø	Undersized mm 0,254	Undersized mm 0,508	Undersized mm 0,762
44,008÷44,020	43,754÷43,766	43,500÷43,512	43,264÷43,258

Coupling data between the piston pin and bushing

Ø Inter. diam. for the fitted and mach. bush. mm	Ø piston pin mm	Backlash between the pis- ton pin and bushing mm
22,007 22,020	21,994 21,998	0,009 ±:0,026

Table of connecting rod weights, until engine:

n° KD 28719 CALIFORNIA JACKAL - CALIFORNIA SPECIAL
n° KD 20066 CALIFORNIA EV 1ST SERIES

Connecting rod total weight	Big end weight (Rotating)	Small end weight (Rotating)	Weight selection colouring
634 ± 2	160	474 ± 2	Orange
630 ± 2		470 ± 2	Light blue
626 ± 2		466 ± 2	White

Table of connecting rod weights, from engine:

n° KD 28720 CALIFORNIA JACKAL - CALIFORNIA SPECIAL
n° KD 280067 CALIFORNIA EV 1ST SERIES
from the 1st number of CALIFORNIA EV 2001
CALIFORNIA STONE - CALIFORNIA SPECIAL SPORT

Connecting rod total weight	Big end weight (Rotating)	Small end weight (Rotating)	Weight selection colouring
642 ± 2,5	165 + 1	476 + 3,5	White
647 ± 2,5		479,5 + 3,5	Light blue
652 ± 2,5		483 + 3,5	Orange

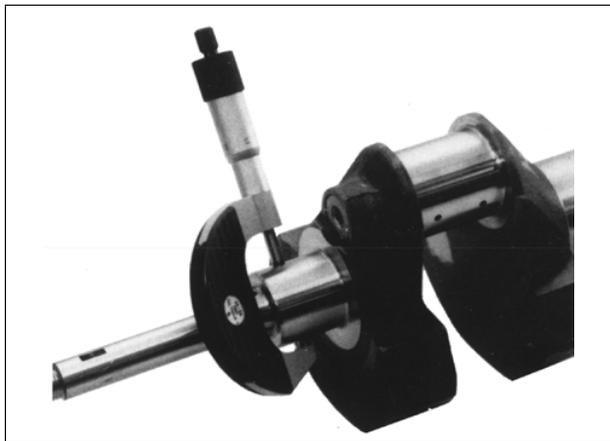
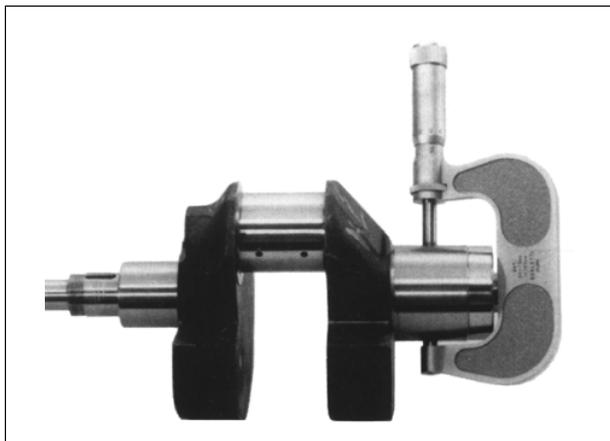


Main bearing journal diameter, flywheel side

PRODUCTION STANDARD mm	UNDERSIZED BY mm		
	0.2	0.4	0.6
52.970	53.770	53.570	53.370
53.951	53.751	53.551	53.351

Main bearing journal diameter, timing system side

PRODUCTION STANDARD mm	UNDERSIZED BY mm		
	0.2	0.4	0.6
37.975	37.775	37.575	37.375
37.959	37.759	37.559	37.359



CRANKSHAFT

Examine the surfaces for the main bearing journals; if they show signs of grooving or ovality, it is necessary to recondition the pins (observing the undersize tables), and to replace the flange together with the main bearing journals.

The undersize table for the main bearing journals is the following: 0,2-0,4-0,6.

The assembly backlashes are the following:

- 0.028÷0.060 mm between the bearing and the main bearing journal, distribution side;
- 0.040÷0.075 mm between the bearing and the main bearing journal, flywheel side;
- 0.022÷0.064 mm between the bearing and the connecting rod pin.

IMPORTANT

When reconditioning the crankshaft pins, it is necessary to make sure that the union's radius value on the shoulders is:

2÷2.5 mm for the connecting rod pin,

3÷3.2 mm for the main bearing journal, flywheel side

1.5÷1.8 mm for the main bearing journal, timing system side.



WEIGHT CONTROL FOR CRANKSHAFT BALANCING

The weight of the connecting rods together with screws must be balanced.

A difference of 4 grams is permissible.

To balance the engine shaft from a static point of view, it is necessary to apply the following weight to the crank pin:

- 1st series until engines:
 n° KD 28719 (gr.1790) CALIFORNIA JACKAL - SPECIAL
 n° KD 20066 (gr.1790) CALIFORNIA EV 1^a SERIE
- 2nd series from engines:
 n° KD 28720 (gr.1810) CALIFORNIA JACKAL - SPECIAL
 n° KD 20067 (gr.1810) CALIFORNIA EV 1^a SERIE
 from 1st engine (gr.1810) CALIFORNIA EV 2001 -
 SPECIAL SPORT - STONE

inside ϕ for spare main bearings Innendurchmesser der Ersatz-Hauptlager ϕ binnenkant van de kussenblokken van bank voor vervanging	Identification code for undersize Identifikationskürzel der Untermaße Afkorting identificatie verminderingen									
<table border="1"> <tr> <td>0.2</td> <td>53.800-53.819</td> </tr> <tr> <td>0.4</td> <td>53.600-53.619</td> </tr> <tr> <td>0.6</td> <td>53.400-53.419</td> </tr> </table>	0.2	53.800-53.819	0.4	53.600-53.619	0.6	53.400-53.419	<table border="1"> <tr> <td>M 2</td> </tr> <tr> <td>M 4</td> </tr> <tr> <td>M 6</td> </tr> </table>	M 2	M 4	M 6
0.2	53.800-53.819									
0.4	53.600-53.619									
0.6	53.400-53.419									
M 2										
M 4										
M 6										
<table border="1"> <tr> <td>0.2</td> <td>37.800-37.816</td> </tr> <tr> <td>0.4</td> <td>37.600-37.616</td> </tr> <tr> <td>0.6</td> <td>37.400-37.416</td> </tr> </table>	0.2	37.800-37.816	0.4	37.600-37.616	0.6	37.400-37.416	<table border="1"> <tr> <td>M 2</td> </tr> <tr> <td>M 4</td> </tr> <tr> <td>M 6</td> </tr> </table>	M 2	M 4	M 6
0.2	37.800-37.816									
0.4	37.600-37.616									
0.6	37.400-37.416									
M 2										
M 4										
M 6										

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0.2	37.800-37.816									
0.4	37.600-37.616									
0.6	37.400-37.416									
M 2										
M 4										
M 6										

$\phi 53.970 \div 53.951$
 $\phi 54.000 \div 54.019$
 $\phi 44.008 \div 44.020$
 $48 \div 48.1$
 $\phi 37.959 \div 37.975$
 $38.969 \div 40.031$
 $\phi 38.000-38.016$

BACKLASH WITH THE CRANKSHAFT = m/m
 0,040-0,075
 KUPPLUNGSSPIEL MIT DER MOTORWELLE = m/m 0,040-0,075
 SPELING VAN KOPPELING MET DE AANDRIJFAS = m/m 0,040-0,075

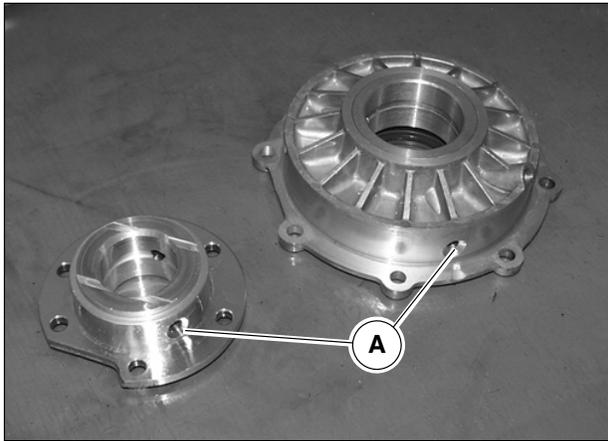
BACKLASH WITH THE CRANKSHAFT = m/m
 0,028-0,060
 KUPPLUNGSSPIEL MIT DER MOTORWELLE = m/m 0,028-0,060
 SPELING VAN KOPPELING MET DE AANDRIJFAS = m/m 0,028-0,060

REASSEMBLY

CONNECTING RODS

Carry out the removal procedures in reverse order, remembering that:

- Given the high load and stresses to which the fastening screws for the crankshaft connecting rods are subjected, they must be replaced with new screws.
- The assembly backlash between the bearing and the connecting rod pin is 0,022 minimum, 0,064 maximum;
- The backlash between the shimmings for the connecting rods and those for the crankshaft is $0,30 \div 0,50$ mm;
- Tighten the screws on the caps using a torque wrench to the torque prescribed in the table in chapter 4, section B.



CRANKSHAFT

Carry out the removal procedure in reverse order, remembering to:

- Correctly position the crankshaft support flange, following the assembly direction marked by the holes "A";
- Apply teflon tape on the two lower fastening screws for the rear flange to avoid oil leakages.

A

GEARBOX

B

GETRIEB

C

VERSNELLING

D

E

F

G

H

I

L

M

N

O

P

1 MAIN FEATURES

5-speed gear model with constant mesh gears with front clutch dogs. Built-in rubber cush drive damper pads. Pedal control placed on the LH side of the vehicle.

Gearbox speeds:

1st gear = 1:2 (Z = 14/28)

2nd gear = 1:1.3889 (Z = 18/25)

3rd gear = 1:1.0476 (Z = 21/22)

4th gear = 1:0.8696 (Z = 23/20)

5th gear = 1:0.7500 (Z = 28/21)

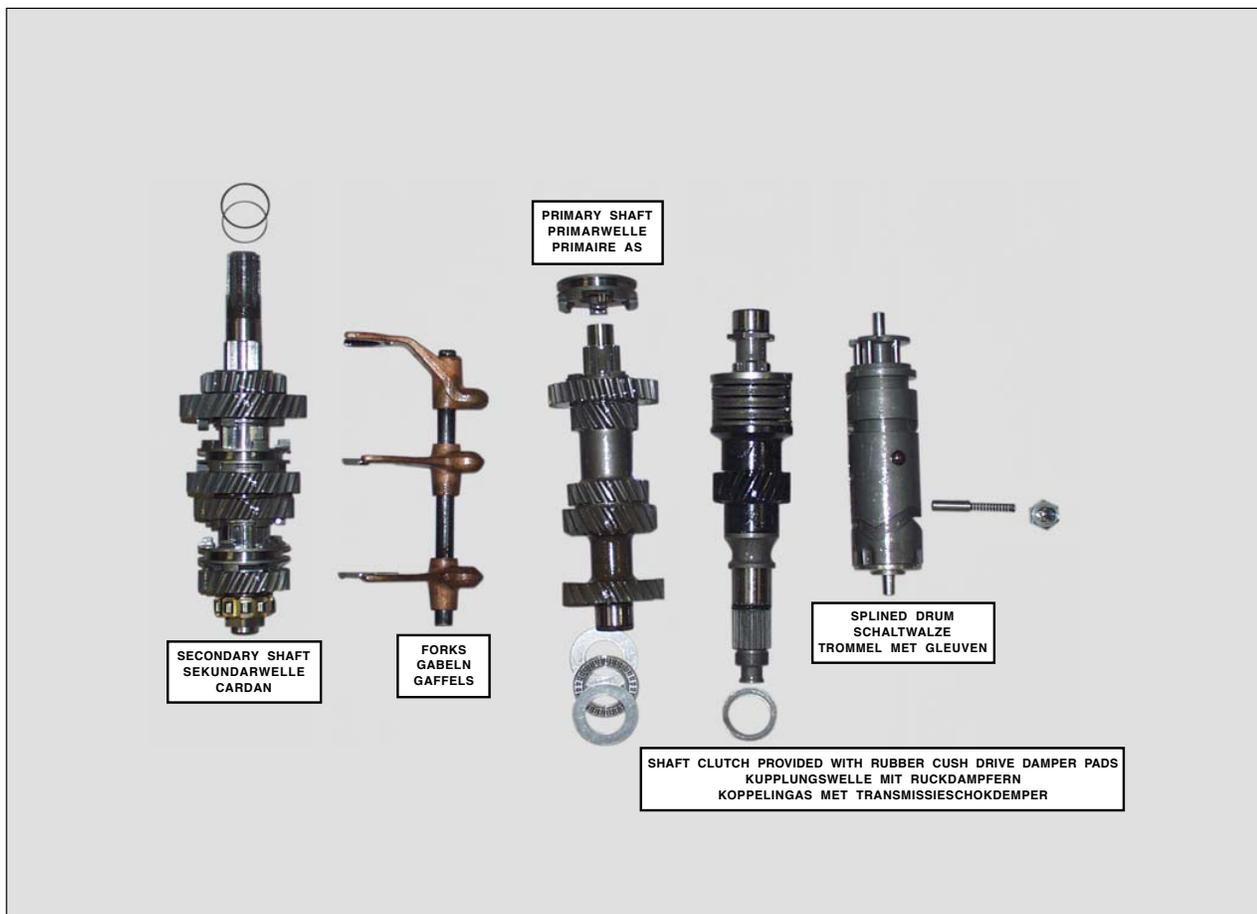
N.B. For the CALIFORNIA EV 1^a SERIES - CALIFORNIA SPECIAL - CALIFORNIA JACKAL models starting from gear no. CD - 015565 and in a limited previous series listed below, the 5-clutch dog gears were assembled instead of the 6-clutch dog gears.

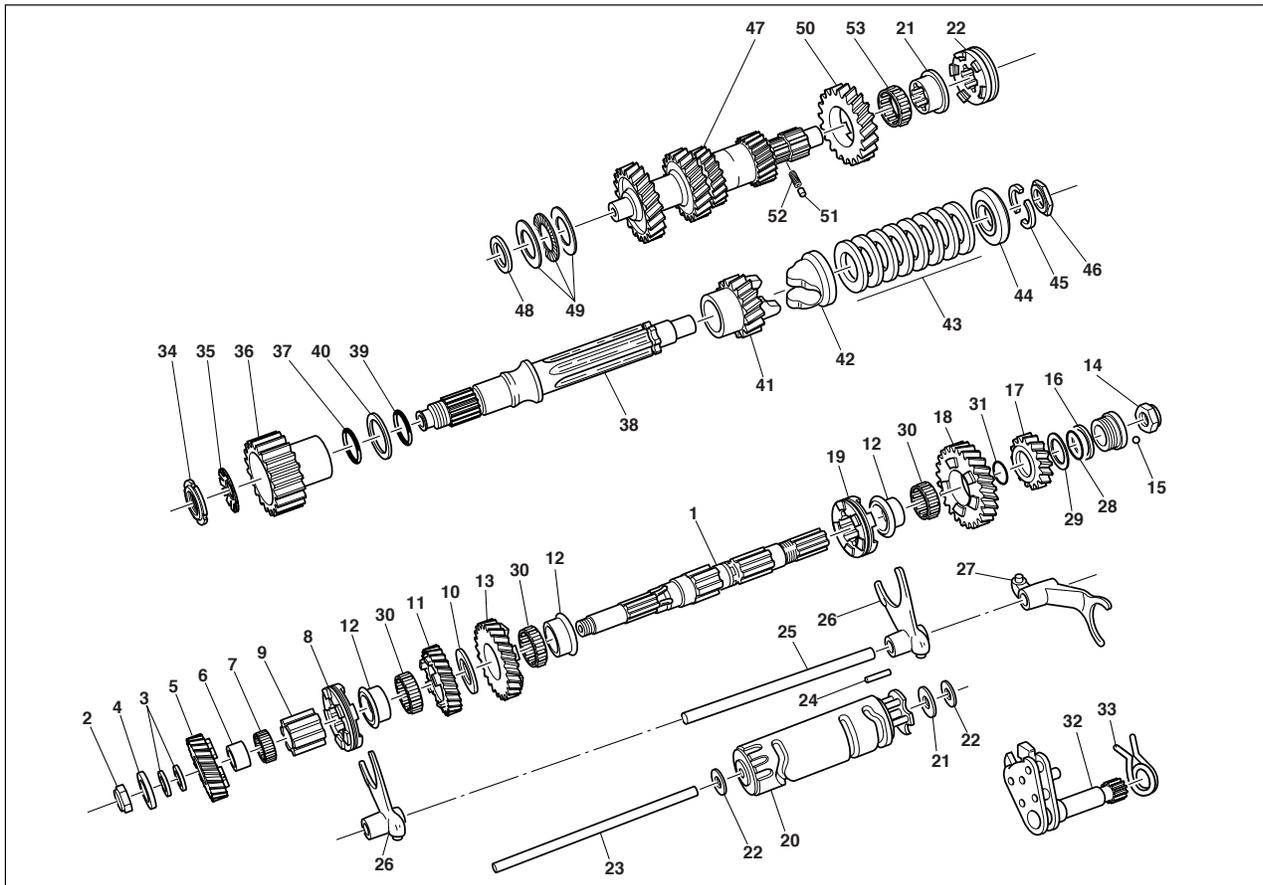
Gearboxes fitted with new 5-clutch dog gears

CD 15306-15426- 15466- 15549-15555-15559-15561
from CD 15365 to CD 15409 except 15386-15401-15402-
15405-15406-15407

from CD 15496 to CD 15534 except 15506-15526
from CD 15565 and more.

N.B. The CALIFORNIA EV 2001 - CALIFORNIA SPECIAL SPORT - CALIFORNIA STONE models are fitted with the 5-clutch dog gears since the 1st gearbox.

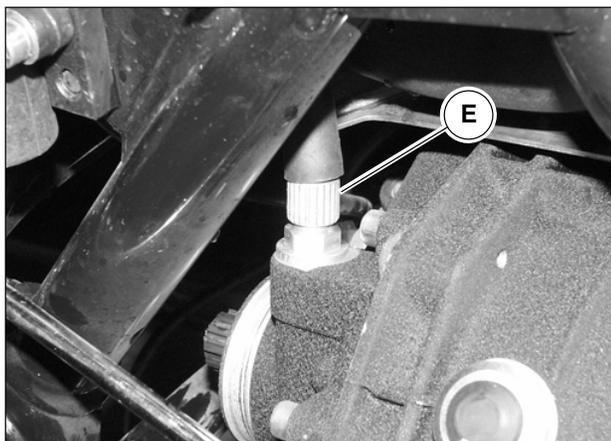
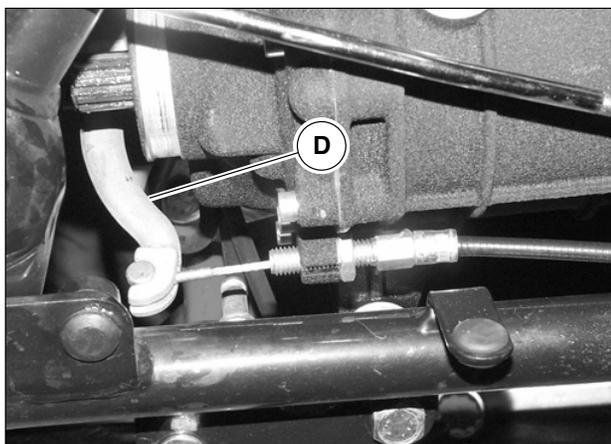
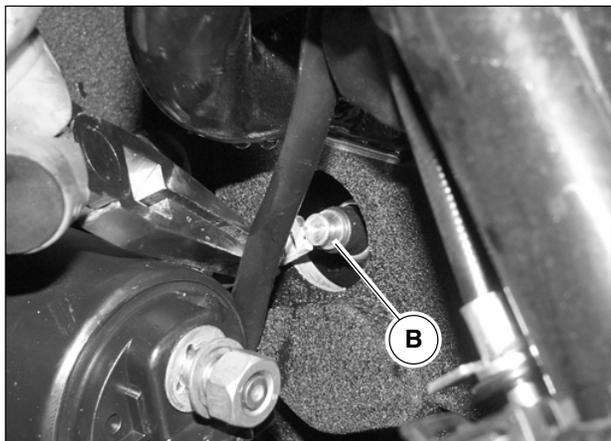
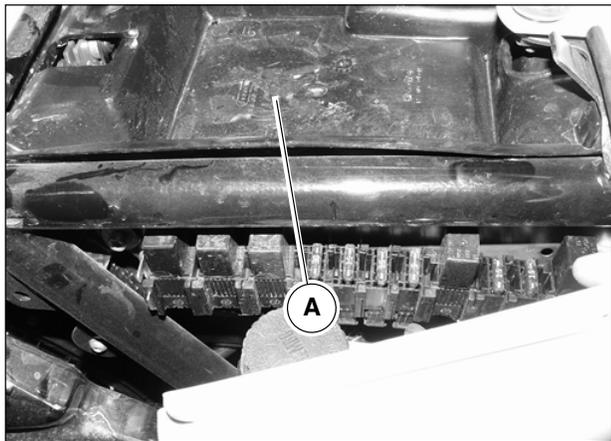




Pos.	DESCRIPTION	Q.TY
1	Secondary shaft	1
2	Nut	1
3	Adjustment washer	2÷4
4	Abutments washer	1
5	Gear 4th S.S. (z=20)	1
6	Internal ring 4 th gear	1
7	Roller bearing cage 4 th S.S.	1
8	Sleeve 3 rd -4 th S.S.	1
9	Sleeve	1
10	Washer	1
11	Gear 3 rd S.S. (z=22)	1
12	Bushing 1 st - 2 nd -3 rd S.S.	2
13	Gear 2 nd S.S. (z=25)	1
14	Nut	1
15	Ball	1
16	Washer	1
17	Gear 5 th S.S. (z=21)	1
18	Gear 1 st S.S. (z=28)	1
19	Sliding sleeve 1 st - 2 nd S.S.	1
20	Splined drum	1
21	Washer	1
22	Adjustment washer 0.6 mm	2
22	Adjustment washer 0.8 mm	2
22	Adjustment washer 1 mm	2
22	Adjustment washer 1.2 mm	2
23	Rod	3
24	Pin	1
25	Rod	4
26	Fork 1 st -2 nd -3 rd -4 th	1
27	Fork 5 th	2
28	O-ring	1

Pos.	DESCRIPTION	Q.TY
29	Washer	1
30	Roller bearing cage	1
31	O-ring	1
32	Complete range selector	1
33	Range selector return spring	1
34	Ring nut	1
35	Washer	1
36	Clutch internal body	1
37	O-ring	1
38	Clutch shaft	1
39	O-ring	1
40	Lubricating washer	1
41	Transmission gear (Z=17)	1
42	Sleeve	1
43	Bellevilel washer	8
44	Cup	1
45	Half-sections	2
46	Shim	1
47	Primary shaft	1
48	Washer thickness 2	1
48	Washer thickness 2.1	1
48	Washer thickness 2.2	1
48	Washer thickness 2.4	1
49	Needle bearing	1
50	Gear 5 th P.S. (z=28)	1
51	Bushing retaining roller	1
52	Spring	1
53	Roller bearing cage	1
54	Bushing for 5 th (P.S.)	1
55	Sliding sleeve 5 th	1

A
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2 REMOVAL AND INSTALLATION

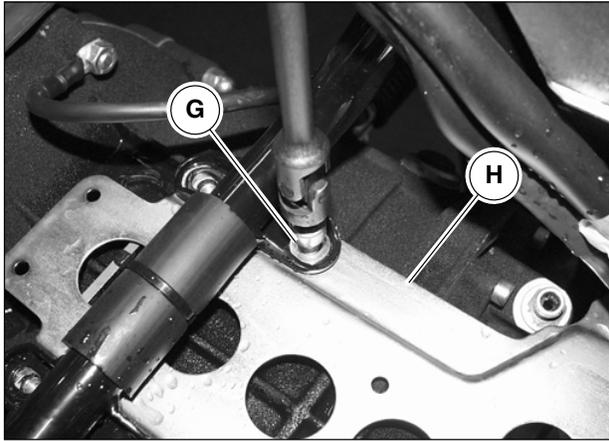
Removal:

To remove the gearbox from the motorcycle proceed as follows:

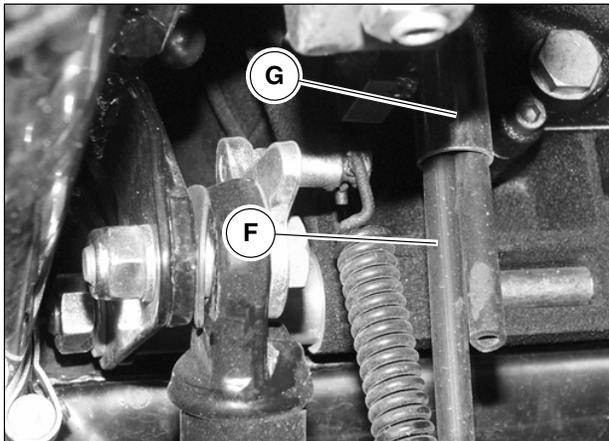
- Remove the seat (see chapter 4 section E) and the toolbox "A".
- Disconnect the battery cables from the 2 poles (negative/positive) and remove the battery.
- Remove the fuel tank as described in chapter 3 section I.
- Remove the exhaust system as described in section L.
- Remove the ground cable.
- Disconnect the cable of the neutral indicator "B".

- Release the transmission of the clutch control lever "D" on the gearbox cover.

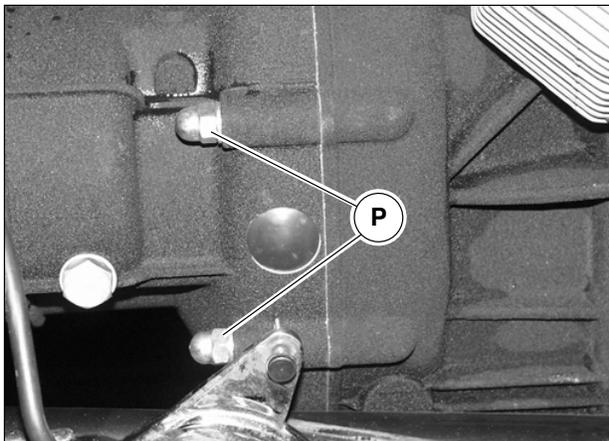
- Unscrew the transmission of the odometer control "E" from the drive on the gearbox cover.



- Remove the tie rod of the gear lever control, as described in chapters 2 and 3 of section "G".
- Unscrew the screws "G" fixing the battery plate "H" to the gearbox and remove it.
- Remove the rear foot rests as described in chapter 3 section "H".
- Remove the rear swinging arm as described in chapter 9 section "F".



- Remove the drain pipes "F" from guide "G".



- Detach the gearbox assembly from the engine assembly once the 6 nuts "P" have been unscrewed.

Installation

- To install the gearbox assembly, carry out the removal procedures in the reverse order.

A

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C

D

E

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G

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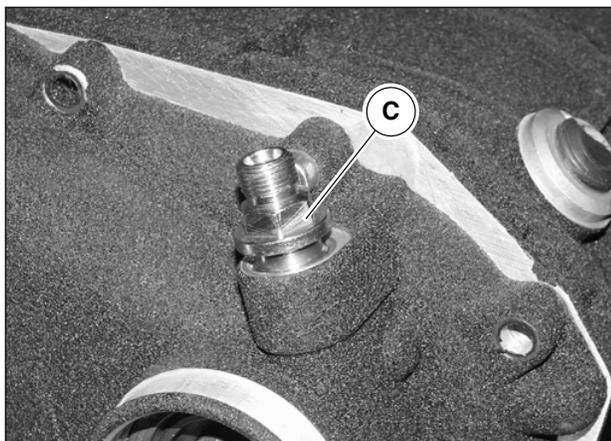
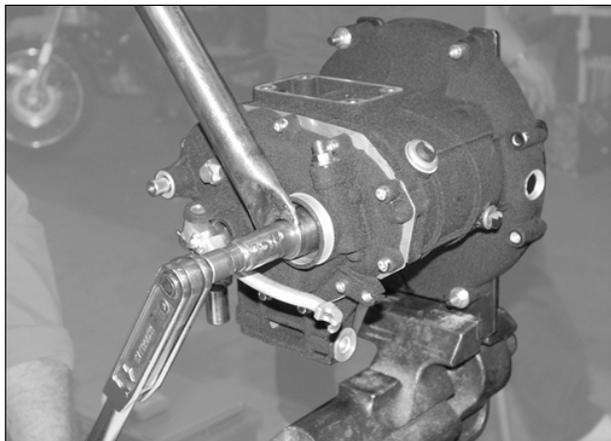
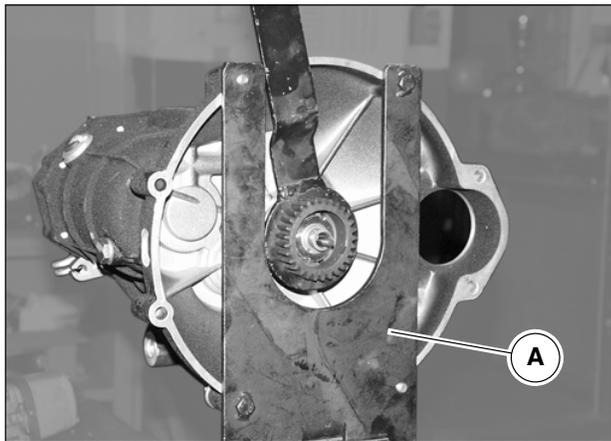
M

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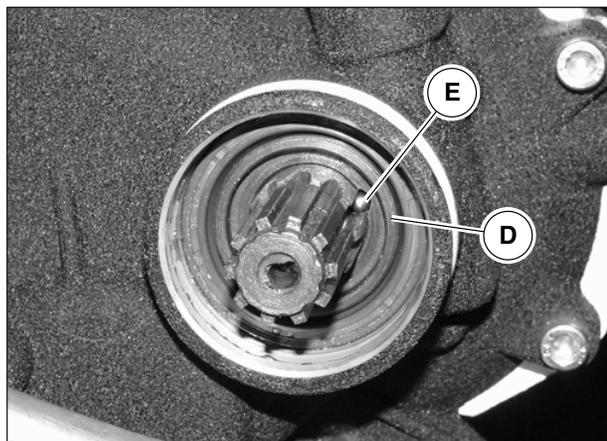
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3 DISASSEMBLY

To disassemble the gearbox in all its components proceed as follows:

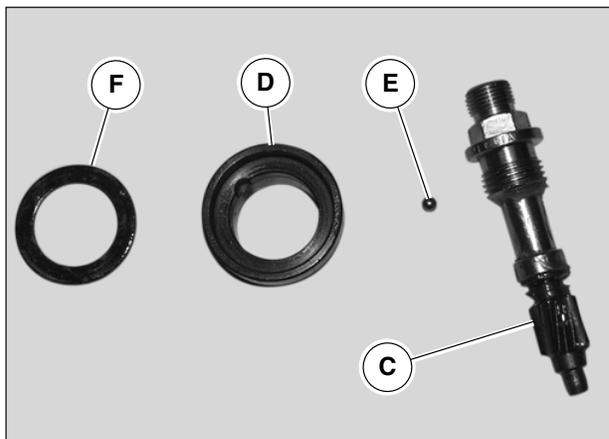
- Lock with a vice the gearbox support tool "A" code 14929600 and assemble the complete gearbox on its support.
- To simplify the removal operations, it is recommended that the gear is in neutral.
- Drain the oil from the gearbox by following the instructions described in chapter 2 section D.
- Remove the caulking on the securing nut "B" in the secondary shaft.
- Unscrew the nut "B" by using, if available, the proper wrenches code 12907100 to lock the secondary shaft and code 14905400 to unscrew the nut.
- Unscrew the speed drive fitment "C" and remove it from the gearbox cover.
- Remove the crown gear "D" together with the ball "E" and the abutments washer "F".



3 ZERLEGUNG

Für die Zerlegung des Getriebes in seine Einzelteile, wie folgt, vorgehen:

- Die Getriebehaltevorrichtung "A" Kennnr. 14929600 blockieren und auf dem Halter das komplette Getriebe einbauen.
- Für die Erleichterung der Ausbauarbeiten sollte das Getriebe auf Leerlauf gestellt werden.
- Das ganze Öl aus dem Getriebe ablassen und die in Kap. 2 Abschnitt D beschriebenen Anweisungen befolgen.
- Die Verstemmung an der Klemmmutter "B" der Sekundärwelle entfernen.
- Die Mutter "B" lösen, und falls vorhanden, die entsprechenden Schlüssel Kennnr. 12907100 für das Festklemmen der Sekundärwelle und Kennnr. 14905400 für das Lösen der Mutter verwenden.
- Das Vorgelege des Kilometerzählers "C" lösen und aus dem Getriebedeckel herausnehmen.
- Den Zahnkranz "D" mit der Kugel "E" und der Ausgleichsscheibe "F" entfernen.



GETRIEB

3 ONTBINDING

Alle componenten van de versnellingsbak demonteren:

- Het gereedschap om de versnellingsbak te ondersteunen vastklemmen ("A" codenummer 14929600) en op het versnellingsbakblok monteren;
- Zet de versnelling in de neutrale stand om deze gemakkelijker te kunnen demonteren;
- Tap alle olie af volgens de aanwijzingen die zijn beschreven in hoofdstuk 2 deel D;
- Haal het afkantsel van de moer "B" waarmee de cardan is vastgemaakt;
- Draai de moer "B" los met de speciale sleutels, indien ter beschikking, codenummer 12907100 om de as tegen te houden en codenummer 14905400 om de moer los te draaien;
- Draai de transmissie van de toerenteller "C" los en haal deze uit de versnellingskast;
- Verwijder de kroon "D" samen met de kogel "E" en de volgring "F";

A

B

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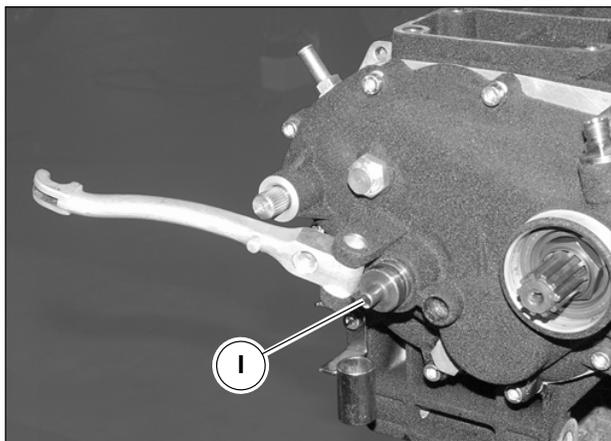
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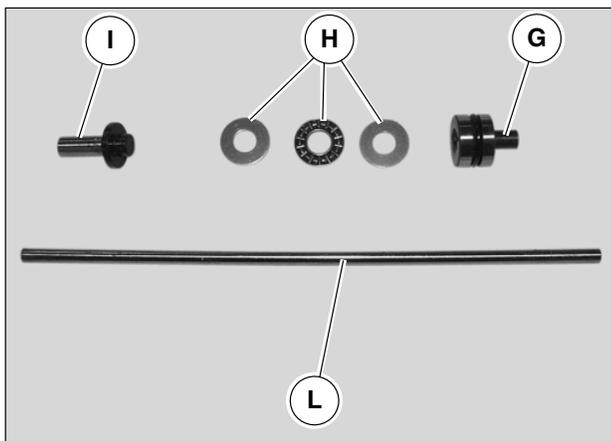
VERSNELLING



- Remove the external clutch body “G” from its seat on the cover, remove the thrust bearing “H”, the internal body “I” and the clutch control rod “L”.

Removal of the internal clutch body “M”

- On the clutch side, unscrew the internal body lock ring nut “N” by means of the proper tool “O” code 30912810 and the gib head wrench code 14912603 after straightening out the ring nut retainer safety washer rib “P”, then remove the “M” body.

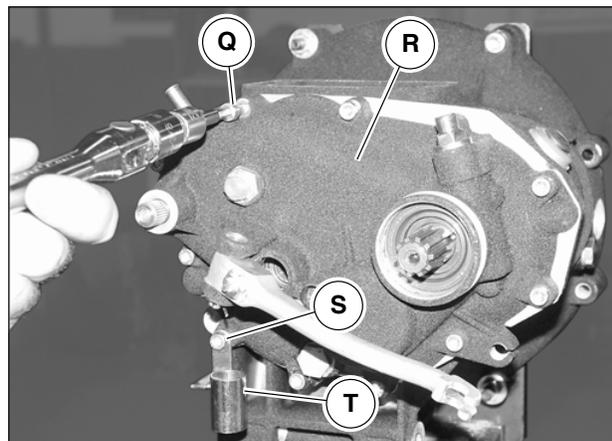
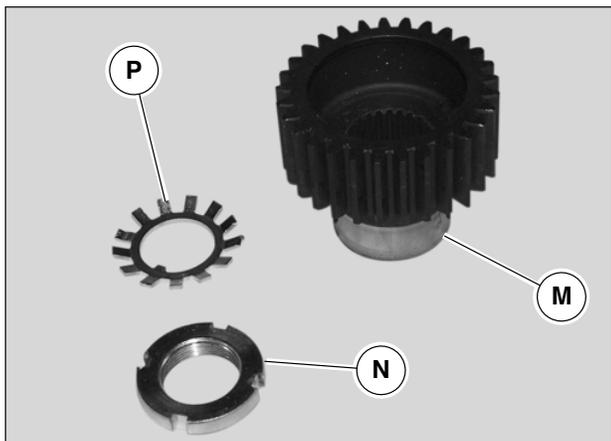
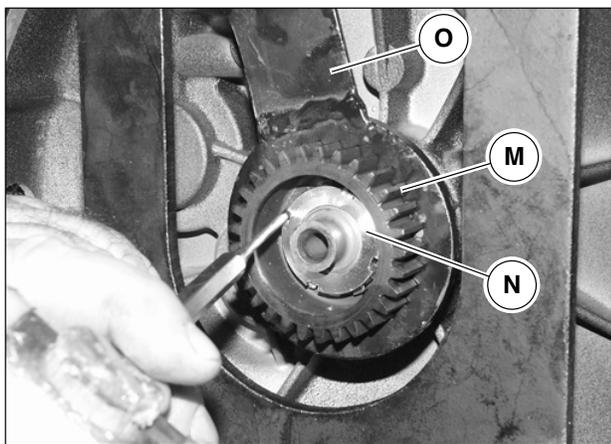


Removal of the gearbox cover “R”

- Unscrew the 11 screws “Q” and remove the cover “R”.

N.B. When unscrewing the screw “S”, pay attention to the position of the breather pipes support, which shall be reassembled in the same place.

- Remove the gear selector cover “U” provided with “V” spring.



- Den Kupplungsaußenkörper „G“, das Drucklager „H“, den Innenkörper „I“ und den Kupplungssteuerstab „L“ aus dem Sitz auf dem Deckel entfernen.

Entfernen des inneren Kupplungskörpers „M“

- Von der Kupplungsseite die Klemmmutter „N“ des Innenkörpers mit dem geeigneten Werkzeug „O“ Kennnr. 30912810 und dem Nasenkeil Kennnr. 14912603 lösen, nachdem der Flügel der Sicherheitsscheibe „P“ des Mutterfeststellwerkzeugs entfernt wurde. Danach den Körper „M“ ausbauen.

Entfernen des Getriebedeckels „R“

- Die 11 Schrauben „Q“ lösen und den Deckel „R“ entfernen.

👁 N.B. Beim Lösen der Schraube „S“ den Entlüftungsschlauchhalter beachten, der beim Wiedereinbau an der gleichen Stelle positioniert werden muss.

- Den Gangvorwähler „U“ mit der Feder „V“ entfernen.

- Haal het uitwendige gedeelte van de koppeling „G“ uit de kast, het taatslager „H“, het inwendige gedeelte „I“ en de stang „L“ die de versnelling bedient;

Het inwendige gedeelte van de koppeling „M“ verwijderen

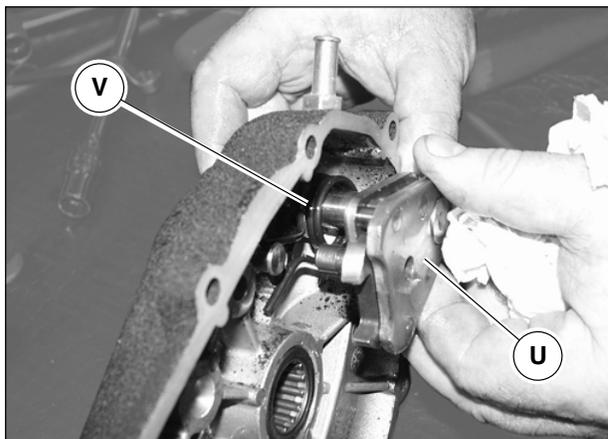
- Draai aan de kant van de koppeling de schroefring „N“ los met het speciale gereedschap „O“ codenummer 30912810 en de stiftsleutel codenummer 14912603, nadat u eerst de ribben van de veiligheidsring „P“ die de schroefring blokkeert, recht hebt gebogen, en verwijder het inwendige gedeelte „M“.

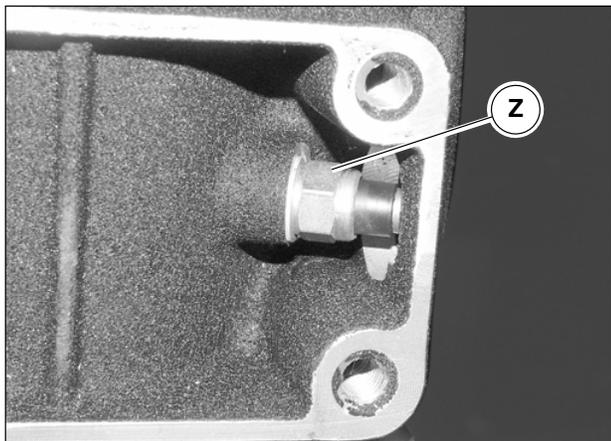
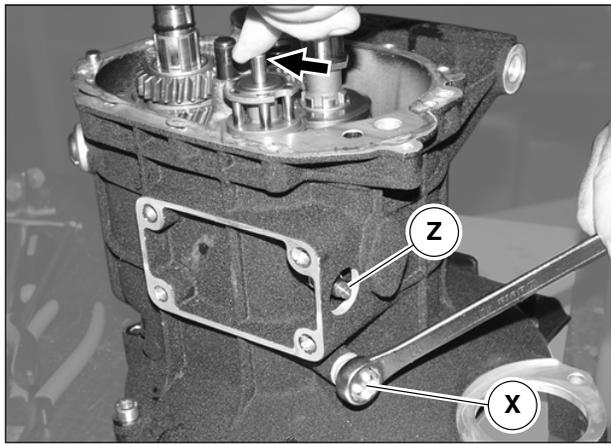
Het deksel van de versnellingskast „R“ verwijderen

- De 11 bouten „Q“ losdraaien en het deksel „R“ eraf halen;

👁 OPMERKING: Let tijdens het losdraaien van de bout „S“ op het steunstuk van de luchtbuizen dat bij het monteren op dezelfde plaats moet komen.

- Haal de voorkeuzeschakelaar „U“ samen met de veer „V“ van het deksel.



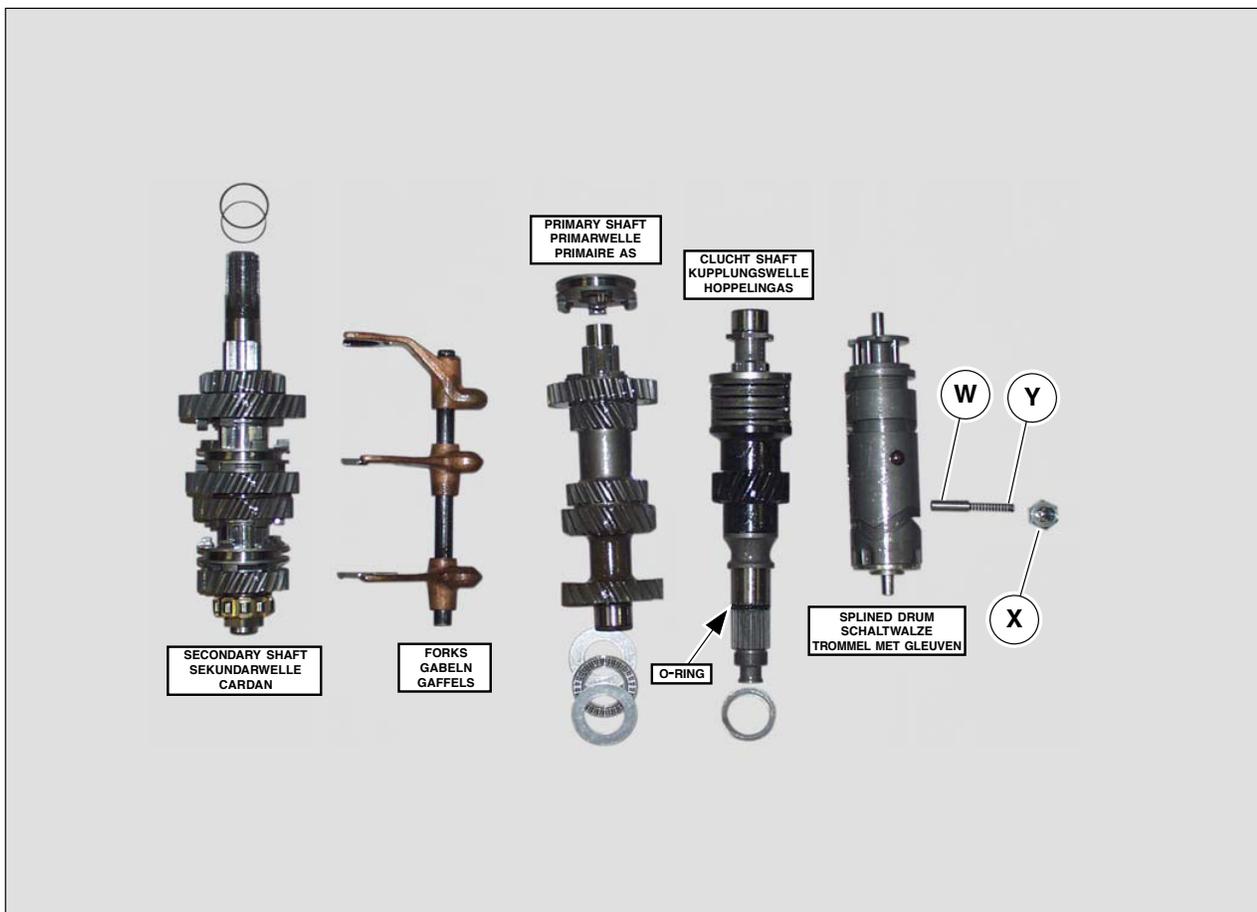


Removal of shaft assembly and splined drum

- Unscrew and remove the neutral indicator "Z".
- Unscrew and remove the plug "X" (it is used to retain the "W" gear pawl on the splined drum).
- Remove the spring "Y".

N.B. The pawl "W" remains in the housing hole and will be collected after disassembling the gearbox assembly.

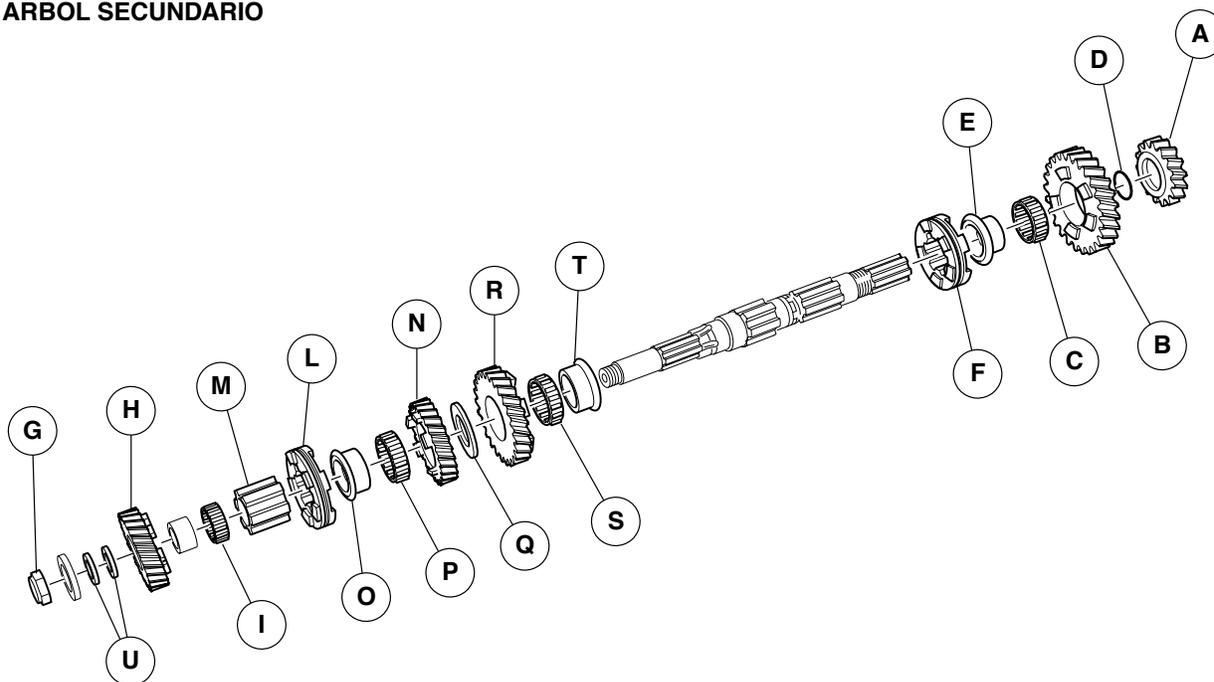
- Then remove the secondary shaft complete with gears and forks, the primary shaft and the splined drum with guiding rod.
- Remove the clutch shaft from the bearing on the housing, if necessary slightly hit the shaft head with a leather mallet and remove the O-ring fitted on it.

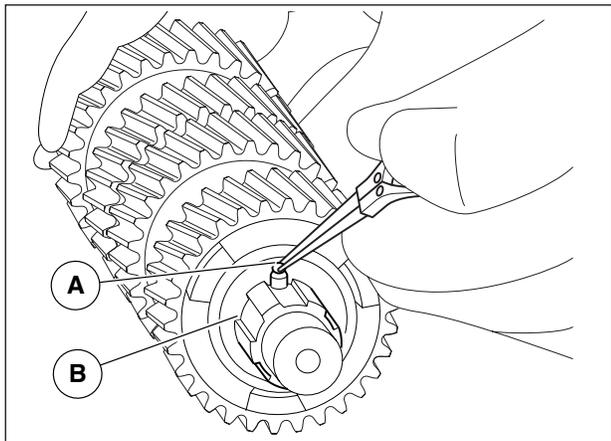


Disassembly of the secondary shaft

- Remove the 5th-speed gear "A"
- Remove the 1st-speed gear "B" with the relevant roller bearing cage "C", remove the rubber seal ring, the bushing "E" and the sliding sleeve "F" of the 1st and 2nd speed.
- Lock the shaft in a vice interposing jaws in ductile metal.
- Unscrew the retaining nut "G" in a clockwise direction.
- Remove the bearing, the 4th-speed gear "H" with washers "U" and remove the roller bearing cage "I".
- Remove the sliding sleeve "L" of the 4th and 3rd speeds, remove the splined fixed sleeve "M" and the 3rd-speed gear "N" with bushing "O", roller bearing cage "P" and intermediate washer "Q".
- Remove lastly the 2nd-speed gear "R" with its roller bearing cage "S" and its bushing "T".

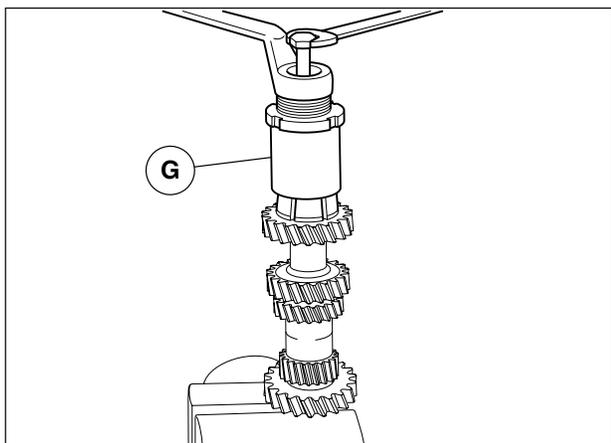
ALBERO SECONDARIO ARBRE SECONDAIRE ARBOL SECUNDARIO



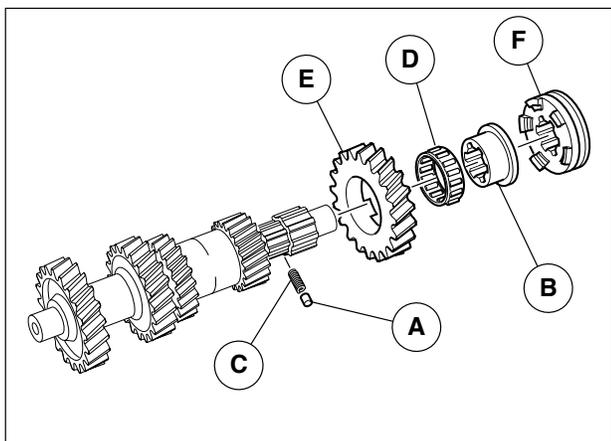


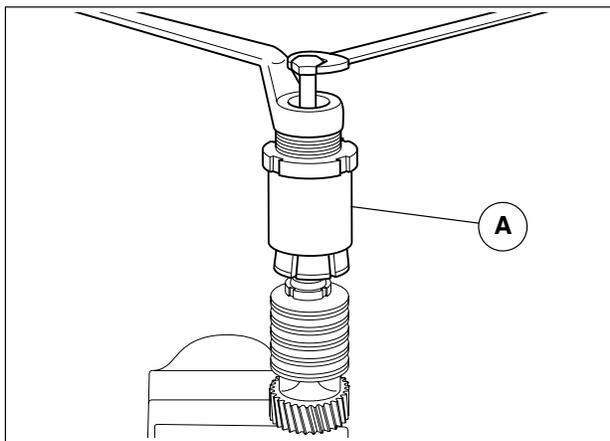
Disassembly of the primary shaft

- Remove the sleeve of the 5th speed "F".
- With a proper punch push down the retainer pawl "A" and rotate the bushing "B" in order to disengage it from grooves.



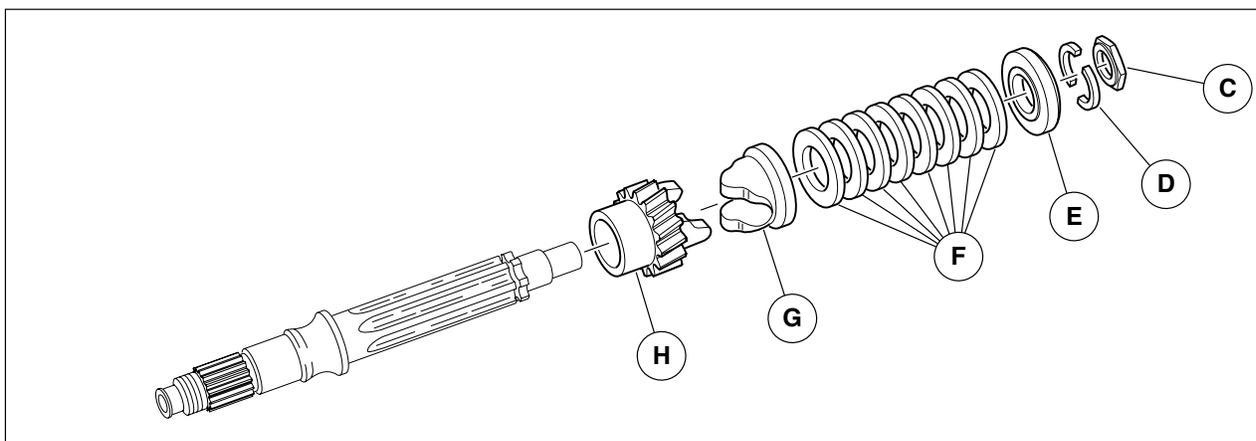
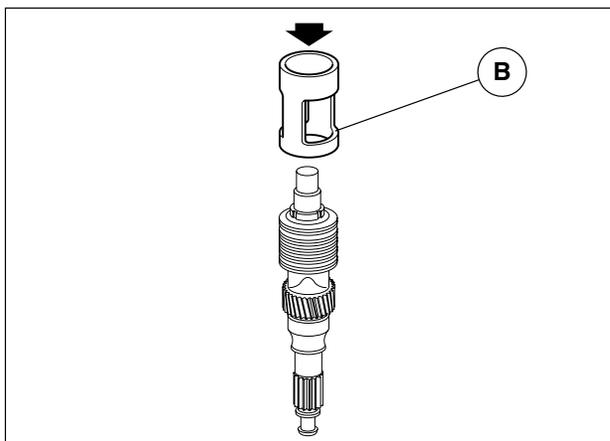
- Remove the bushing "B" and the pawl "A", the spring "C", the roller bearing cage "D" and the 5th-speed gear "E";
- Using extractor "G" code 14928500 remove the needle bearing inner race.





Disassembly of clutch shaft

- Using extractor "A" code 14928500, remove the roller bearing inner race and the nut "C".
- Then place the complete shaft on a press and by means of extractor "B" code 12905900, press the spring enough to remove the two half-sections "D" retaining the cush driver damper pads cup and then remove:
 - cup "E";
 - springs "F";
 - sleeve "G";
 - transmission gear "H".



Bearing removal

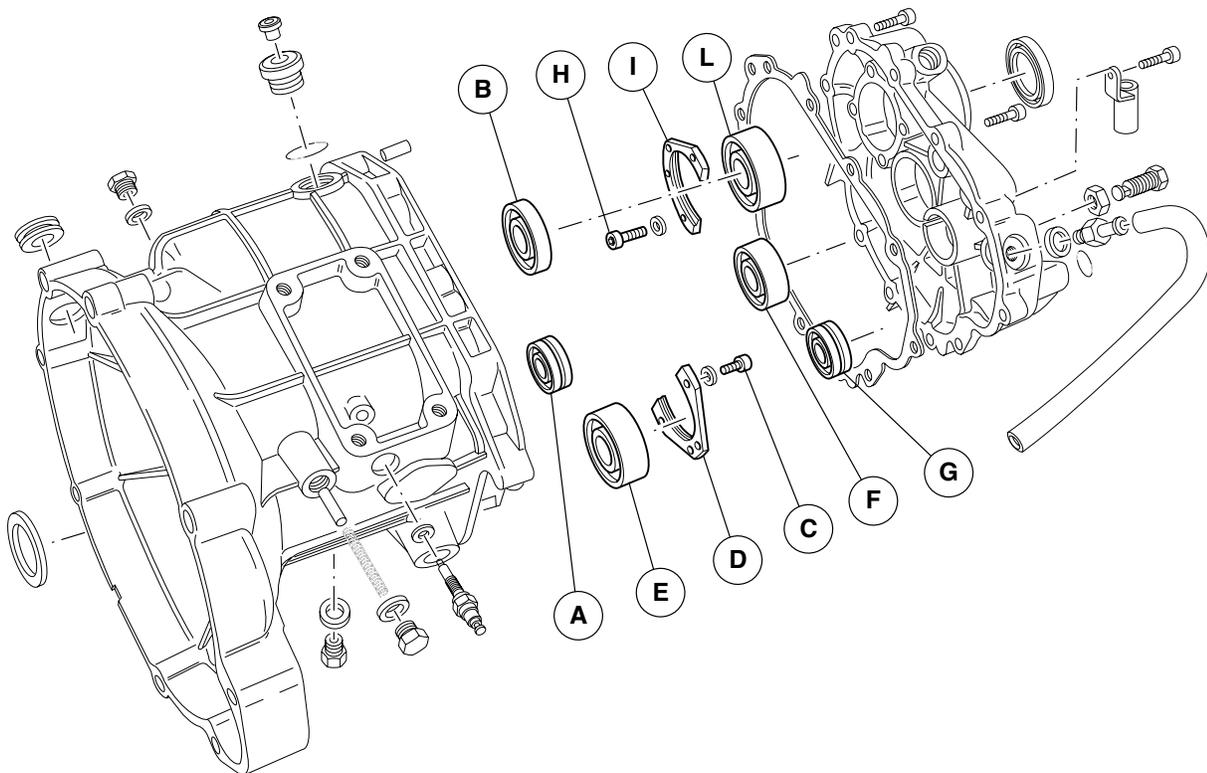
From the gearbox:

- To remove bearings, warm up the gearbox at a temperature of approximately $150^{\circ} \div 160^{\circ} \text{ C}$.
- Remove the primary shaft needle bearing "A" with the extractor code 14913100, see chapter 5 section B.
- Remove the external ring of the secondary shaft roller bearing "B" with extractor code 17945060, see chapter 5 section B.
- Unscrew the screws "C" and remove the locking plate "D".
- Remove the clutch shaft bearing "E" with the extractor code 17949260, see chapter 5 section B.

From the gearbox cover:

- Always warm up the cover at a temperature of $150^{\circ} \div 160^{\circ} \text{ C}$.
- Remove the primary shaft ball bearing "F" with the extractor code 14907000, see chapter 5 section B.
- Remove the clutch shaft roller bearing "G" with the extractor code 14913100, see chapter 5 section B.
- Unscrew the screws "H" and remove the locking plate "I".
- Remove the secondary shaft bearing "L" with the extractor code 17949260.

GEAR BOX HOUSING AND COVER GETRIEBEGEHAUSE UND DECKEL VERSNELLINGSBAK EN DEKSEL





4 CHECK AND OVERHAUL

Gearbox housing and cover

The gearbox housing and cover shall not show any cracks. The surfaces jointing base and cover shall not be scored nor damaged; the knob threading shall not be stripped.

Seal rings

If the seal rings are removed from their seats, they shall be replaced in order to seal properly.

Roller ball bearings

All bearings should be in perfect condition. Balls or rollers shall be intact and smooth all over their surface.

Primary shaft

Check the gear teeth, they shall not be damaged nor extremely worn out otherwise replace the shaft.

5th-speed gear on the primary shaft

Check the gear teeth, they shall not be damaged nor extremely worn out otherwise replace the gear.

Bushing for 5th-speed gear

Check that the roller working surface is smooth and not scored nor dented. Check also the bushing internal slots that shall be smooth.

Bushing retainer roller for 5th-speed gear

Check that it is smooth and not scored nor dented, otherwise replace it.

Pressure spring for bushing retainer roller for 5th-speed gear

Check that it is not deformed and that it has not lost elasticity.

The 8-mm compressed spring shall have a load of $1.40 \pm 5\%$ Kg.

If the spring does not meet the above-mentioned features, replace it.

Secondary shaft

The shaft shall not be dented. The surfaces touching the bushings shall be very smooth and the threads unstripped.

Engaging gear sleeve

The sliding surfaces shall be smooth and the front engaging notches shall not be damaged nor dented.

A

B

C

D

E

F

G

H

I

L

M

N

O

P



A

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Secondary shaft gears

They shall not be extremely worn out on the toothing and on the front engaging notches. The surfaces touching the teeth shall be smooth, not dented nor damaged, otherwise replace the gears.

Roller bearing locking nut on the secondary shaft

Check that the thread is in good condition, not dented nor damaged, otherwise replace the nut.

Roller bearing cage bushings on 1st-2nd-3rd-4th-speed gears on the secondary shaft

Check that the working surface of the roller bearing cages is smooth, not dented nor scored, otherwise replace the bushings.

Roller bearing cages on 1st-2nd-3rd-4th-speed gears on the secondary shaft

Check that the cage rollers are in perfect condition, otherwise replace the cages.

Engaging gear sleeve control forks

Check that the fork working surfaces are smooth and not so worn out to lose their temper characteristics, and that the retaining keys working in the drum splines are not worn out, otherwise replace the forks.

Engaging gear splined drum

Check that the splines in which the retaining keys of engaging gear sleeve control forks slide are not extremely damaged nor worn out, otherwise replace the splined drum.

Splined drum pins

Check that they are straight and not worn out, otherwise replace them.

Drum holder rods and gearbox control forks

Check that the rods are perfectly straight and not worn out where the engaging gear forks work, otherwise replace the rods.

Clutch shaft

Check that splines, threads and sector slots are not worn out nor dented, otherwise replace the shaft.

Internal body locking ring nut on the clutch shaft

Check that the thread is intact, otherwise replace the ring nut.

Safety washer for locking ring nut of the clutch shaft fixed body

Check that the washer ribs are in good conditions otherwise replace the washer.



Seal ring between clutch fixed body and bearing on the clutch shaft

Check that they are neither crushed nor rigid, otherwise replace them.

Clutch fixed body on the clutch shaft

The teeth shall not be worn out nor broken, the touching surfaces of teeth shall be smooth, otherwise replace the body.

Half-section locking the cush drive damper pads cup on the clutch shaft

They shall not be cracked nor deformed, otherwise replace them.

Cush drive damper pads cup on the clutch shaft

No checks required, except checking that the internal splines are smooth.

Cush drive damper pad springs on the clutch shaft

Check that they are neither deformed nor rigid, otherwise replace them.

Sleeve on the clutch shaft

Check that all internal splines are smooth and that the coupling surface is not extremely worn out.

Transmission gear on the clutch shaft

The teeth shall not be extremely worn out nor damaged. The touching surfaces of the teeth and of the internal splines shall be smooth, otherwise replace the gear.

Gearbox control range selector

Check that the control rocker arm on the splined drum pins is not hardened and that the two retaining keys are not ungeared, otherwise replace it.

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5 GEARBOX UNIT REASSEMBLY ON THE BENCH

After all the checks, tests and replacements reassemble the gearbox as follows:

Bearing assembly on the gearbox housing and on the cover



N.B. Warm up the gearbox housing and cover at a temperature of roughly 150° ÷ 160°C before assembly

Firstly, carefully clean the bearing seats and rings with solvent (trichloroethylene). Then use a brush to spread a slight layer of “Loctite” on the outside of the bearing external ring, within the gearbox housing and cover, where the bearings should be placed.

Make sure that there is no “Loctite” among the bearing balls or rollers.

The bearings to be assembled with “Loctite” are the following:

- Clutch shaft bearing on the housing.
- Secondary shaft bearing on the housing.
- Secondary shaft bearing on the cover.

Bearing pressing within their seats on the gearbox housing

To press the bearings on the gearbox housing proceed as follows:

- After being covered with “Loctite”, the clutch shaft bearing shall be pressed with the relevant punch code 14928900 see chapter 5, section B.
- After being covered with “Loctite”, the secondary shaft bearing external ring shall be pressed with the relevant punch code 14929100, see chapter 5 section B.
- The primary shaft bearing shall be pressed with the relevant punch code 14928800, see chapter 5 section B.

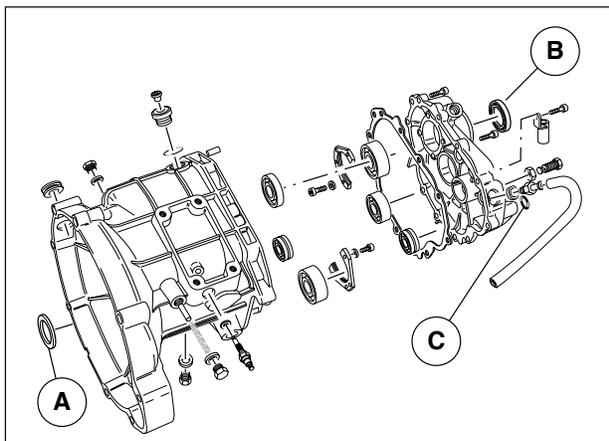
Bearing pressing within their seats on the gearbox housing cover

To press the bearings on the gearbox housing proceed as follows:

- After being covered with “Loctite”, the secondary shaft bearing shall be pressed with the relevant punch code 14928900, see chapter 5 section B.
- The primary shaft bearing shall be pressed with the relevant punch code 14929000, see chapter 5 section B.
- The clutch shaft bearing shall be pressed with the relevant punch code 14928800, see chapter 5 section B.



N.B. Once the bearings have been pressed in their seats, on the gearbox housing and on its cover, it is necessary to leave them settle for 12 hours. This allows the “Loctite” to dry before starting the gearbox assembly.

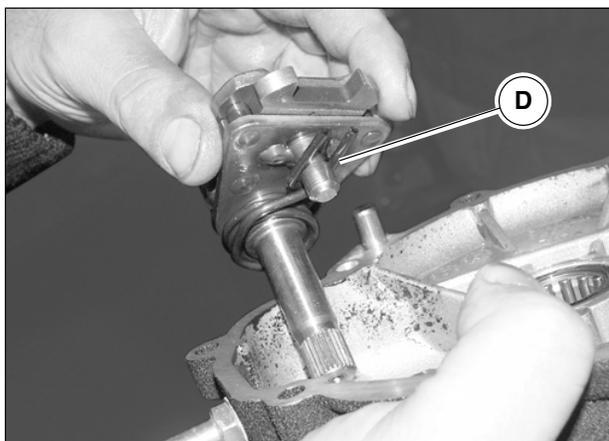


Locking plate assembly on the clutch shaft bearing on the housing and on the secondary shaft cover.

Make sure that they perfectly stick to the bearing external ring nut.
Before screwing the retaining screws, the locking plates on the housing and cover, cover the threaded part with "Loctite".

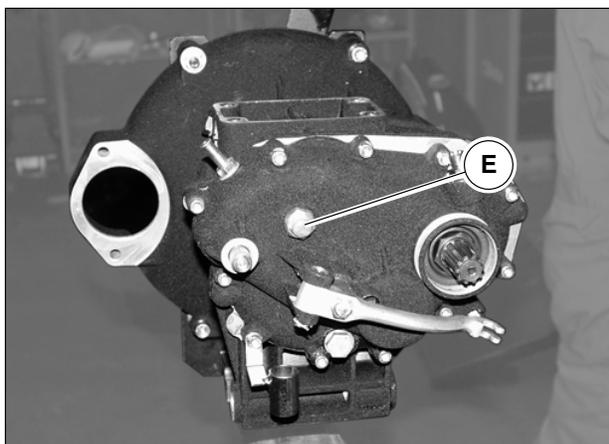
Seal rings assembly on the clutch shaft gearbox housing and on the cover of the secondary shaft and range selector shaft.

The clutch shaft seal ring "A" assembly on the gearbox housing shall be carried out with the relevant punch code 14929400, see chapter 5 section B.
The secondary shaft seal ring "B" assembly on the gearbox housing cover shall be carried out with the relevant punch code 14929500, see chapter 5 section B.
The range selector shaft O-ring "C" shall be placed in the relevant seat on the gearbox cover.



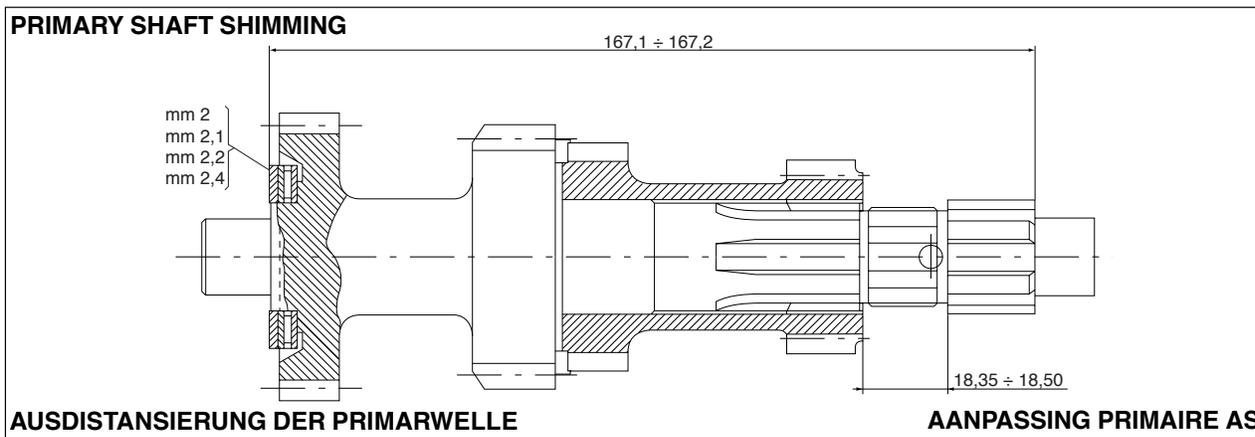
Range selector assembly on the gearbox cover

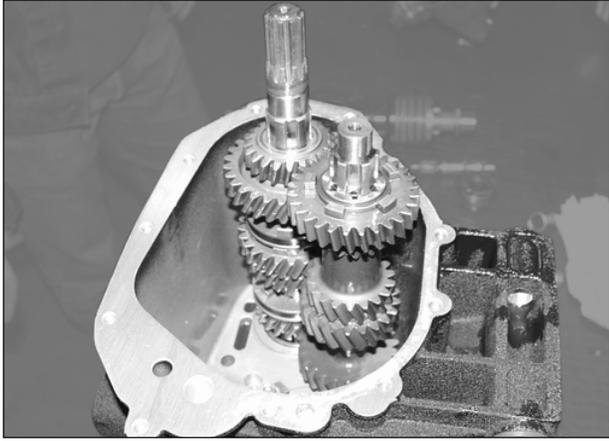
Check that the spring "D" is assembled on the range selector as in the picture on the side, then insert the range selector pin on the cover and screw the eccentric screw "E" with lock nut.



Primary shaft reassembly on the housing

Before being reassembled on the housing, the primary shaft shall be shimmed so that between the bearing on the housing and the bearing on the cover there is a distance of mm 167.1 ÷ 167.2.
Use suitable washers to obtain this measure. These washers are supplied in 2 – 2.1 – 2.2 – 2.4 mm sizes.
This washer shall be assembled between housing bearing and thrust bearing.
Once shimmed, press the inner roller bearing race on the shaft (on the housing side) by means of the specific tool code 17945460.





Secondary shaft reassembly on the housing

Follow the procedure below to reassemble gears and sleeves on the very shaft.

On the shaft, housing side, insert the following:

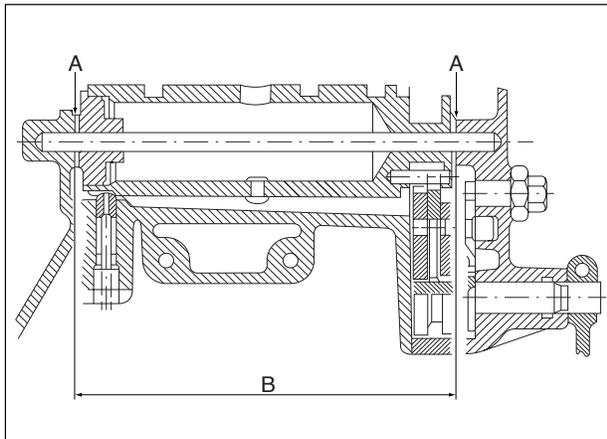
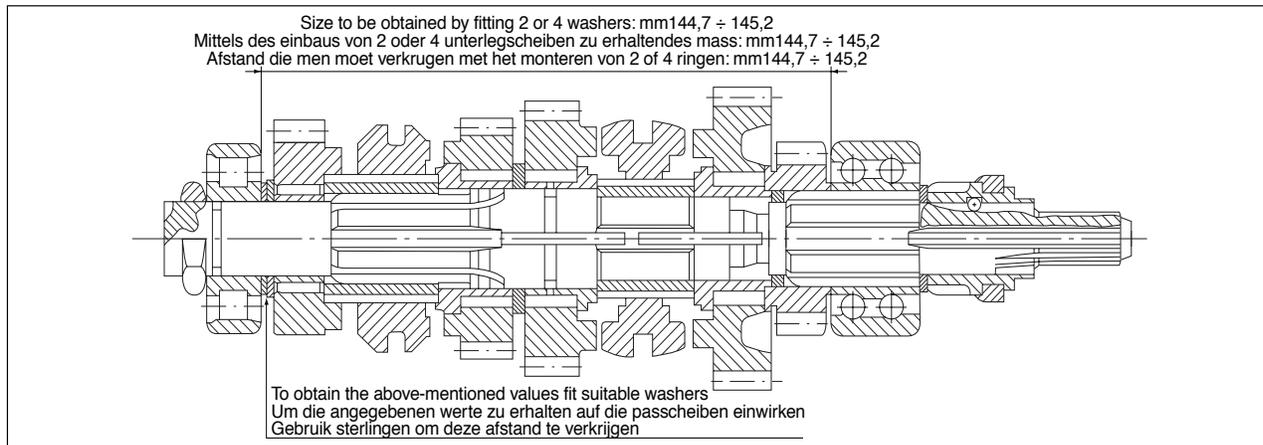
- The bushing for the 2nd-speed gear on the shaft; make sure that the head of the bushing faces the cover.
- The roller bearing cage for the 2nd-speed gear on the bushing.
- The 2nd-speed gear on the roller bearing cage, making sure that the front engaging notches face the cover.
- The washer between the 2nd-speed and the 3rd-speed gear.
- The 3rd-speed gear on the roller bearing cage, making sure that the front engaging notches face the housing side.
- The bushing for 3rd-speed gear on the shaft with head facing the mobile sleeve.
- The fixed sleeve, making sure that the lowered internal part is assembled facing the 3rd-speed gear.
- The inner bearing race, 4th-speed gear side, with tool code 14928600, see chapter 5 section B.
- The mobile sleeve to engage the 3rd and 4th gear making sure that the lowered part faces the 3rd-speed gear.
- The roller bearing cage on the bushing.
- The 4th-speed gear on the shaft, making sure that the front engaging notches face the mobile sleeve.

On the shaft, cover side, insert the following:

- 1st and 2nd gear sleeve on the shaft.
- The bushing for 1st-speed gear with head towards the 2nd-speed gear.
- The roller bearing cage for 1st-speed gear on the bushing.
- The 1st-speed gear on the roller bearing cage.
- The seal ring within the groove on the shaft.
- The 5th-speed gear making sure that the lowered part is assembled on the seal ring.

Secondary shaft shimming

- Assemble the abutments washer on the 4th-speed side, then the adjustment washers until the established distance of 144.7 ÷ 145.2 mm is reached between the adjustment washers and the 5th-speed gear. (To measure remove the O-ring between the 1st and 5th-speed gear) (see page 16 of this section)
- Assemble the roller bearing on the shaft, 4th-speed side.
- Screw the nut on the secondary shaft, 4th-speed side, by using “Loctite” and then caulk it.
- Assemble the complete secondary shaft on the gearbox housing.



Control forks and splined drum assembly on the gearbox housing

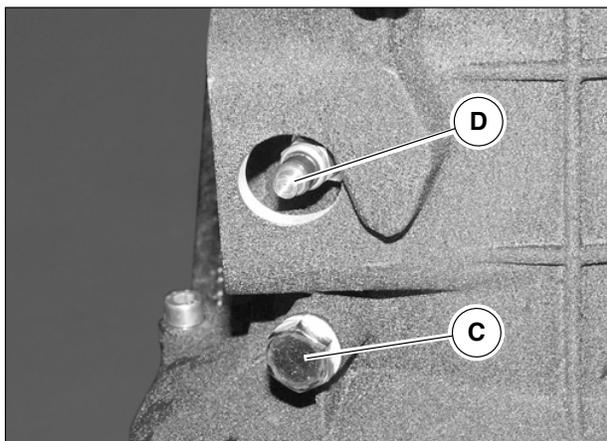
Before reassembling the splined drum in the gearbox, it is necessary to measure the distance between the two side stops “A” of the drum housing, and between housing and cover.

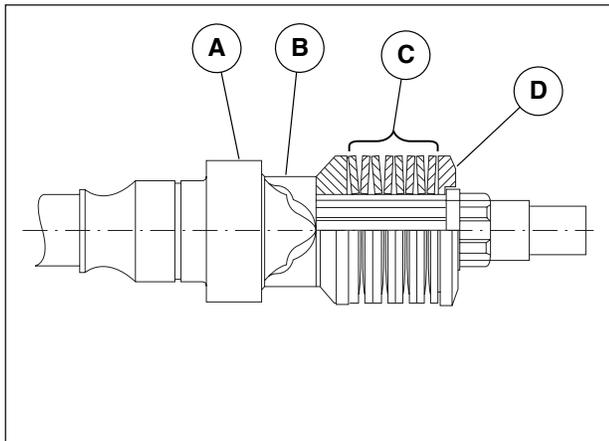
This measurement shall be carried out with a depth gauge in the housing and in the cover and shall include also the gasket thickness.

Measure now the “B” unit of the splined drum after inserting the rod, the 1-mm base washer from the clutch housing side (see picture page 42 of this section) and the pin retaining washer on the opposite side. Then insert on the pin retaining washer a shim with a thickness that allows a size of 0.2 – 0.3 mm lower than the measure of the side stops between housing and cover.

Insert the splined drum complete with shims in the housing and assemble:

- The 1st-2nd-3rd-4th speed control forks on the sliding sleeves on the secondary shaft.
 Looking through the hole of the gear retainer pawl, one of the six grooves for gear retainer on the drum in line with the said hole shall be visible.
- The fork retaining keys within the drum splines; to place the fork retaining keys in the drum splines, use the relevant tool code 14929300 see chapter 5 section B.
- The pawl in the hole on the housing, the spring and the plug “C” by screwing it temporarily. Insert the support rod on the sleeve control forks.
- Assemble the neutral indicator “D” on the housing.





Clutch shaft reassembly on the housing

Proceed as follows to reassemble the following parts on the clutch shaft:

- Insert the transmission gear “A” on the shaft with clutch dog towards the cover.
- Insert the clutch dog sleeve “B” on the shaft with the clutch dogs towards the transmission gear.
- Insert the disk springs “C” following the assembly position as shown in the picture.
- Assemble the cush drive damper pads cup “D”.
- By means of the relevant tool code 12905900 placed on the cush drive damper pads cup, press the springs with until the two sealing half-sections can be assembled in the specific slot on the clutch shaft.
- Assemble the spacer nut on the shaft.
- Insert the needle bearing inner race with the relevant tool code 17945460 to press it on the shaft itself.

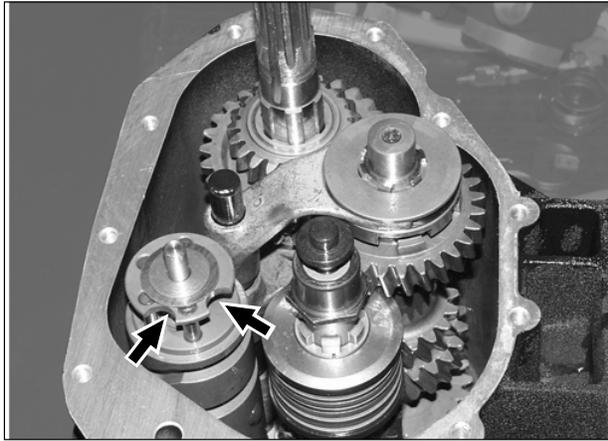
Then assemble on the shaft, housing side:

- The seal ring within the groove on the shaft.
- The lubricating ring between the shaft and the bearing on the housing.
- Lastly insert the complete clutch shaft on the bearing and on the seal ring on the housing.

5th-speed gear and relevant engaging sleeve assembly on the primary shaft

To assemble the 5th-speed gear on the primary shaft, proceed as follows:

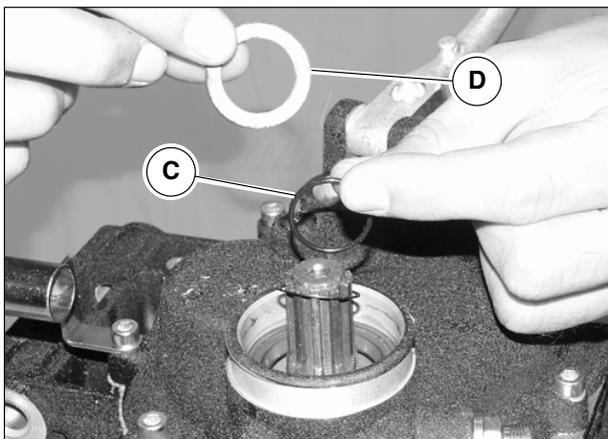
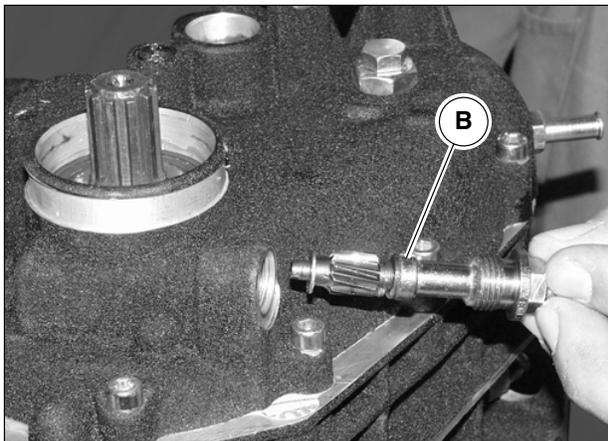
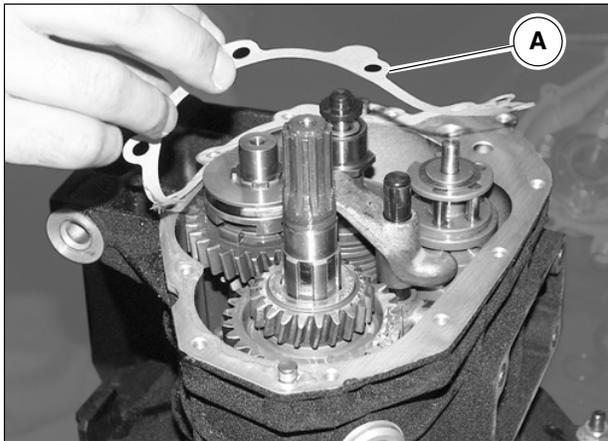
- Assemble the roller bearing cage and the 5th-speed gear on the bushing.
- Insert the gear assembly, the roller bearing cage and the bushing on the splined part of the primary shaft, and let it slide until the hole is reached.
- Insert the clip in the shaft hole and then place the retaining roller on the clip.
- Press the roller with a specific tool (made of one pin and one tube) or with the thumb of the left hand, while pushing down with the right hand the complete bushing as described above for the cage and the gear.
- Rotate the bushing to the right or to the left until the roller engages in one of the six internal splines of the bushing.
- Assemble the 5th-speed engaging sleeve with the fork on the shaft, then the fork on the rod and the fork retaining key in the spline of the splined drum.



Cover assembly on the gearbox housing

👁 N.B. While reassembling the cover complete with range selector, make sure that the gearbox control splined drum is in neutral. If not so, the retaining keys of the range selector would interfere with the drum crown instead of settle freely in the control notches indicated by the arrows.

- Place the gasket "A" on the housing.
- Temporarily secure the cover with four screws.
- Insert the transmission shaft "B" on the cover by screwing it carefully.
- Insert the o-ring seal "C" on the secondary shaft, the shim washer "D", the crown of the speed drive fitment and the crown retaining ball on the secondary shaft.
- Temporarily screw the nut on the secondary shaft.
- Assemble the operating tool code 14928700 on the range selector shaft.



A

B

C

D

E

F

G

H

I

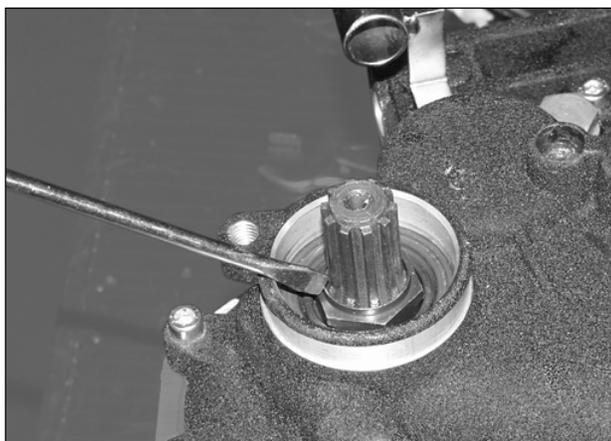
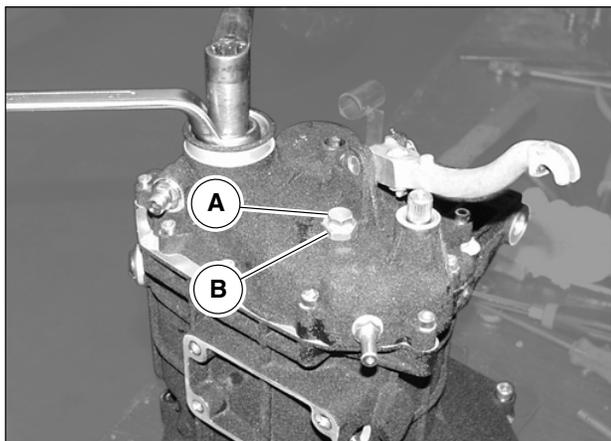
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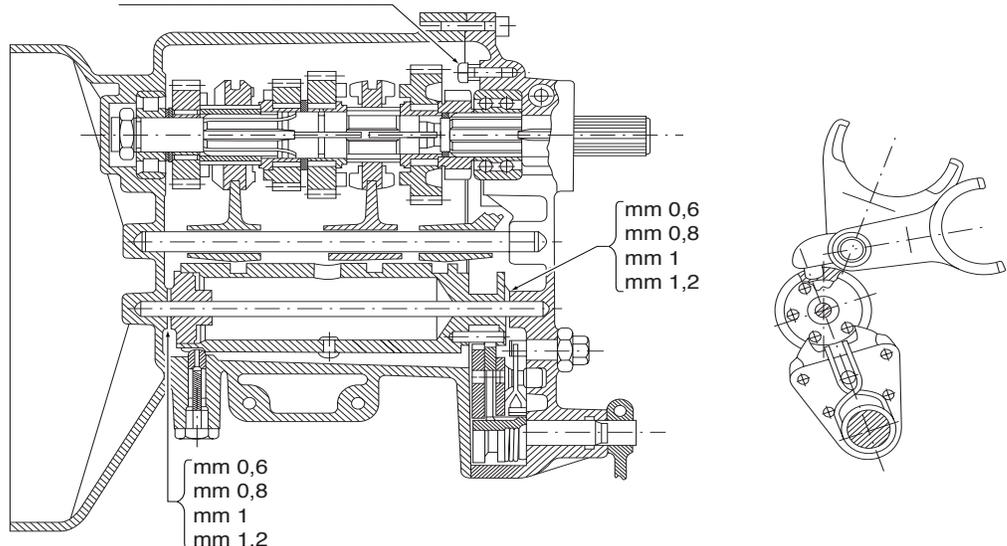
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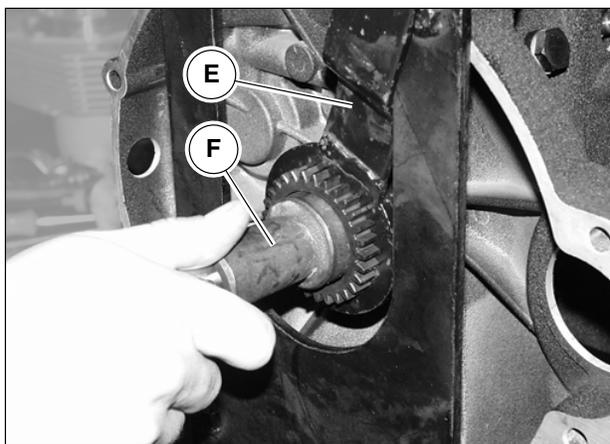
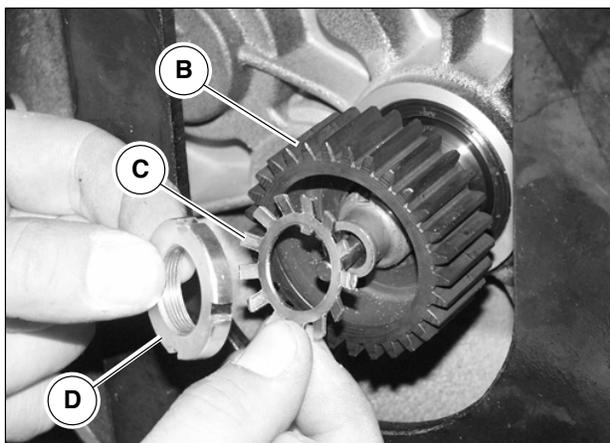
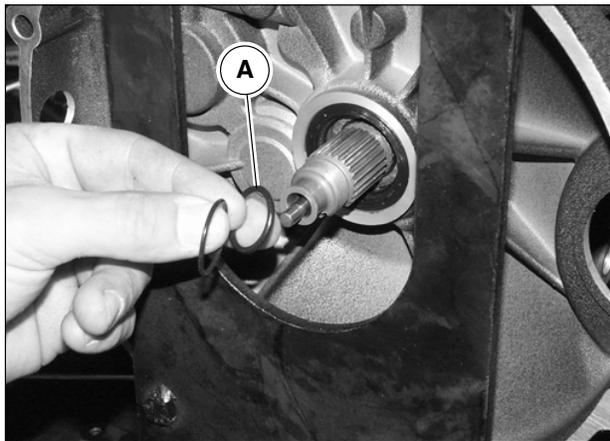


- Adjust the gearbox control by means of the eccentric screw "A" after unscrewing the lock nut "B" until the gear engages smoothly.
 - Try to engage the gears from 1st to 5th and shift down from 5th to 1st and then in neutral. If the gears engage with difficulties, it is necessary to disassemble the cover and to fit a suitable shim between the housing and the drum in case of difficulties between 1st and 3rd gear, and between the drum and the cover between 2nd and 4th gear. Shims are supplied in the following sizes: 0.6 – 0.8 - 1 – 1.2 mm.
- Once shimmed, reassemble the cover following the above-mentioned instructions and try to engage the gears again. Make sure that the gears engage properly; lock the nut on the secondary shaft with the specific tool code 14905400 and the secondary shaft retaining tool code 12907100.
- Lock the nut, with a graver hit the nut end near the shaft spline in order to retain the nut itself.
- Carefully screw the screws that secure the cover to the housing and remove the operating tool from the range selector shaft.
- Insert the control lever on the range selector shaft by locking it with a screw.
- Carefully lock the pawl fastening plug.

SPLINED DRUM SHIMMING
AUSDISTANZIERUNG DER SCHALTWALZE
DE TROMMEL MET GLEUVEN AANPASSEN

Assembly with Loctite 601
 Einbau mit Loctite 601
 Monteren met Loctite 601



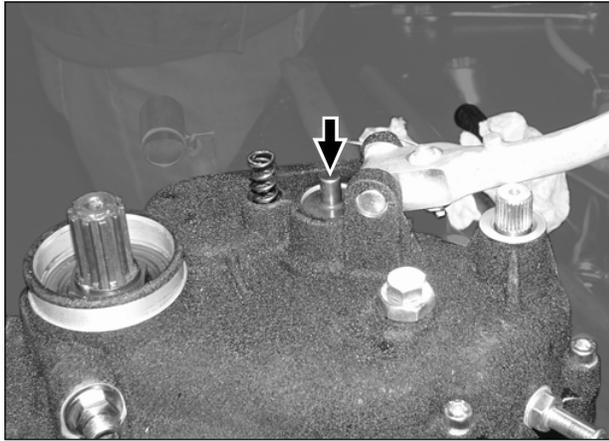


Reassembly of the clutch internal body on the shaft and of the clutch control unit on the shaft housing side

Reassemble:

- The O-ring "A" between the bearing and the clutch internal body.
- The clutch internal body "B" on the shaft.
- The safety washer "C".
- The internal body locking ring nut "D" on the clutch shaft. To lock the ring nut use tool "E" code 30912810 and the gib head wrench "F" code 14912603.
- Bend a rib of the safety washer in one slot of the ring nut.

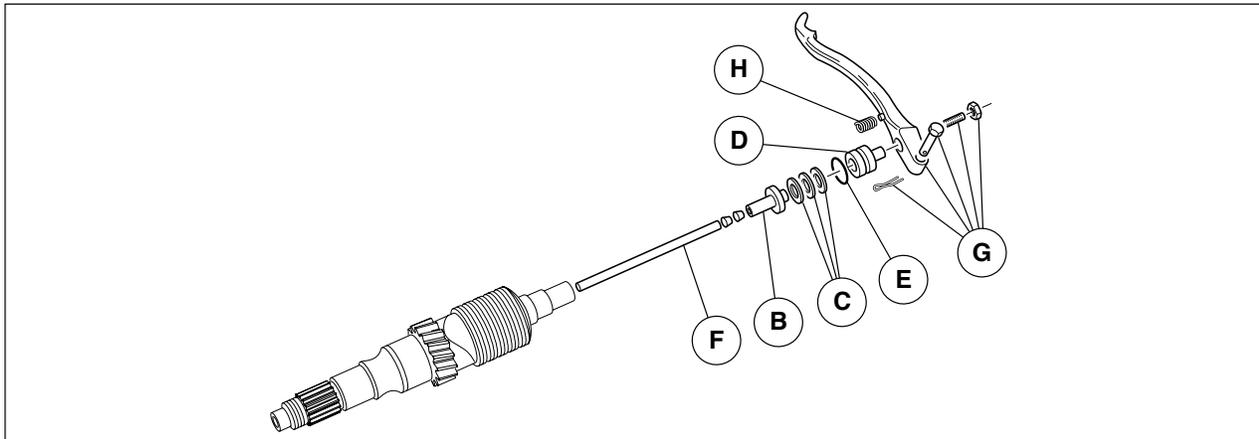
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Reassembly of the clutch control unit in the clutch shaft and on the gearbox housing cover

Reassemble:

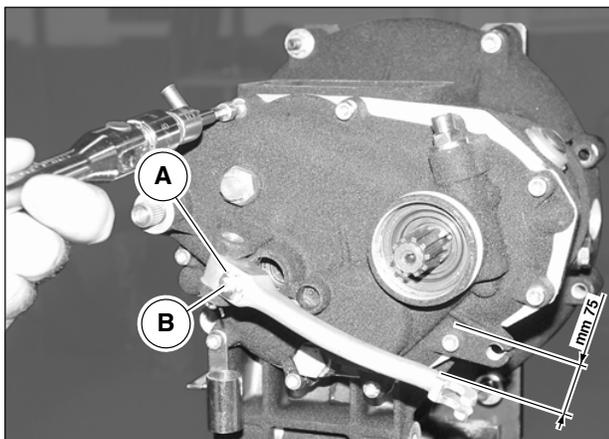
- The internal body "B" on the shaft.
- The thrust bearing "C" on the internal body end.
- The external body "D" provided with the cover seal ring "E".
- The control rod "F" in the shaft housing side.
- The lever on the cover complete with adjuster and lock nut by means of pin and splint pins "G".
- The lever return spring in its seat on the cover "H".



Gearbox housing assembly complete with shafts and gears on the engine

To reassemble the gearbox housing on the engine, proceed as follows:

- Insert the gearbox housing on the stud bolts assembled on the engine, carefully placing the clutch internal body on the two clutch plates previously installed.
- Screw and lock the nuts on the stud bolts and the fastening screws of the gearbox housing on the engine.



Clutch control lever adjustment on the housing

Once assembled the gearbox housing on the engine, move on to the clutch control lever adjustment proceeding as follows:

- Screw or unscrew the adjuster "B" after loosening the lock nut "A". A distance of 75 mm shall be obtained between the gearbox cover surface and the centre of the spherical slot where the roller has to be placed on the transmission.

A

FINAL DRIVE HOUSING AND SHAFT

B

C

ANTRIEBSWELLE UND -GEHÄUSE HINTEN

D

E

AS EN KAST VAN ACHTERSTE OVERBRENGING

F

G

H

I

L

M

N

O

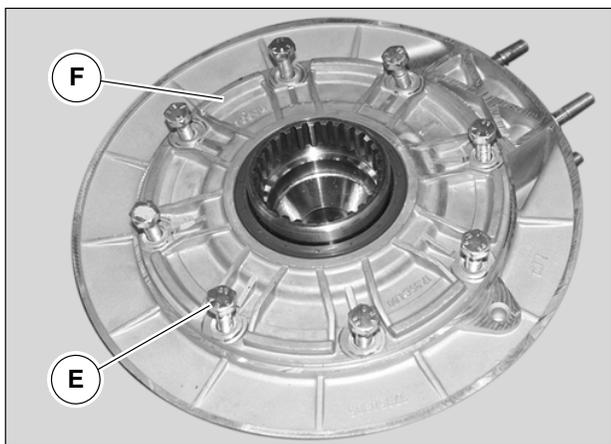
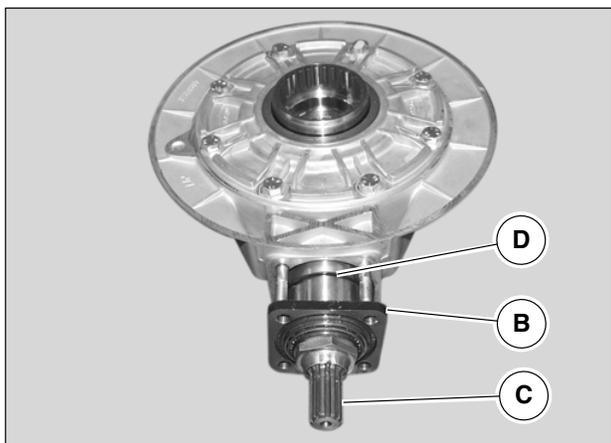
P



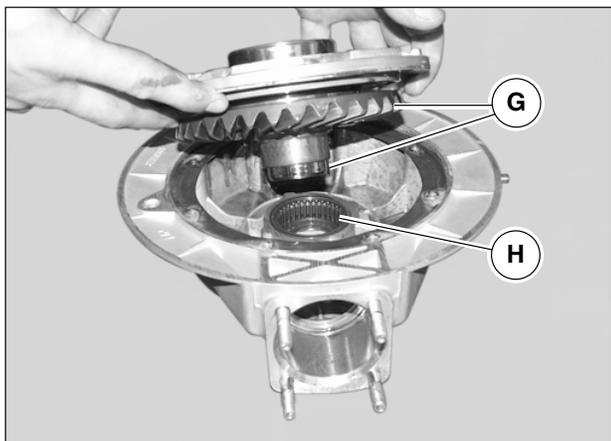
1 FINAL DRIVE HOUSING

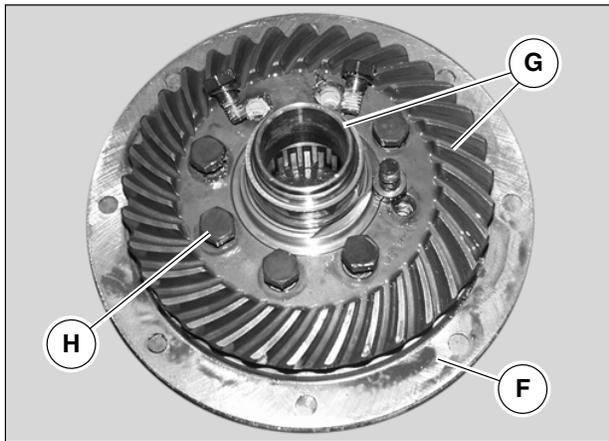
Disassembly:

- Remove the rear wheel as described in chapter 2, section F;
- Drain the oil from the final drive housing as described in chapter 2 section D.
- Unscrew and remove the 4 nuts "A".
- Remove the final drive housing.
- Remove case "B" with pinion "C" and O-ring "D" from the housing.

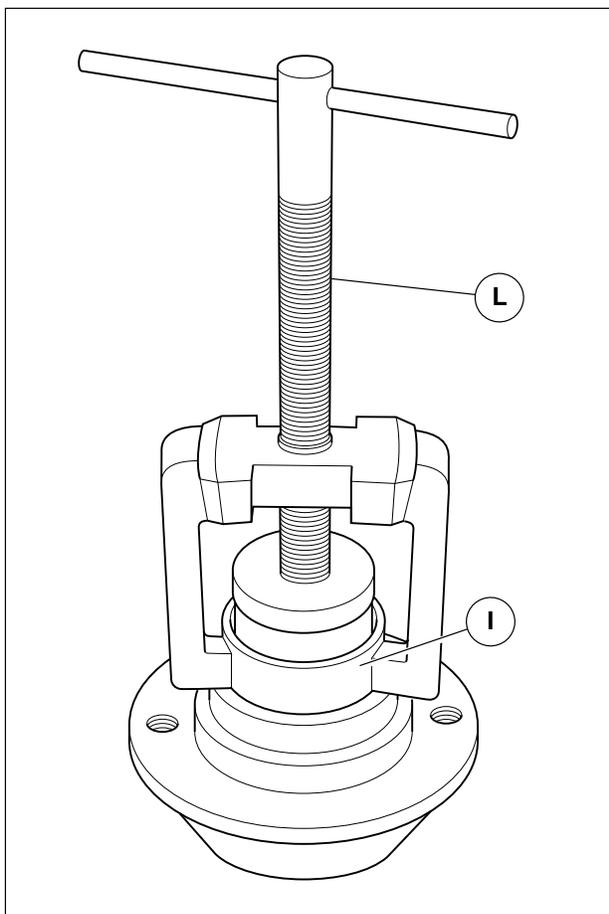
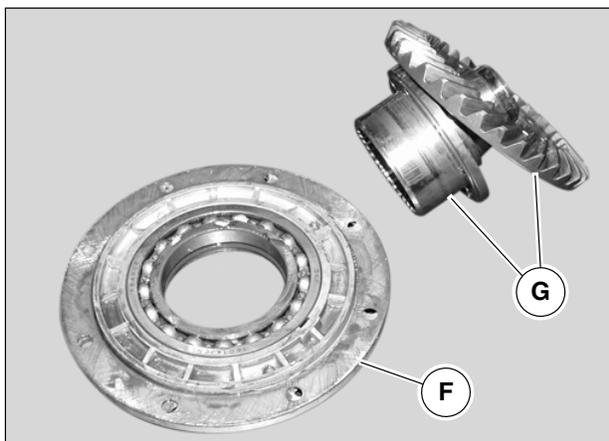


- Unscrew the 8 fastening screws "E" and remove flange "F" together with the crown assembly "G".
- Remove the roller bearing cage "H" from the housing
- Use extractor code 12906900 (see chapter 5 section B) to remove the outer race of the roller bearing cage "H" from the housing.

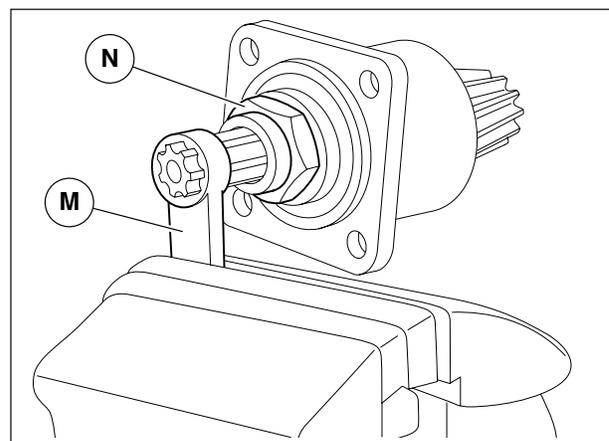




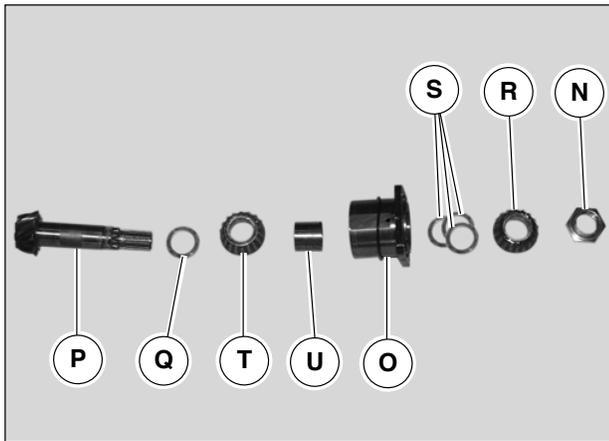
- Remove the crown – pin assembly “G” from the flange “F”.
- Unscrew the 8 screws “H” and remove the crown.



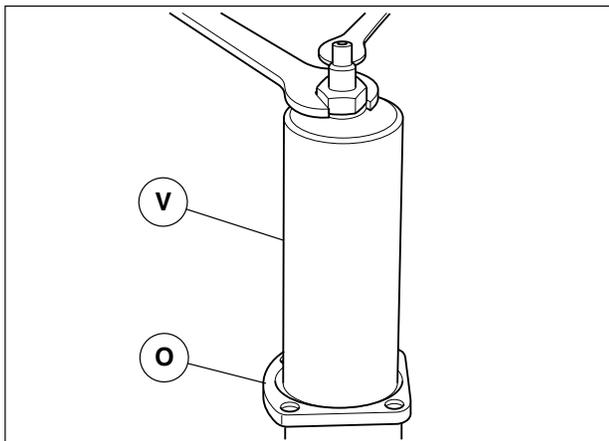
- Remove the roller bearing inner race “I” with the extractor “L” code 17948360.
- Use the proper locking tool “M” of the pinion shaft, code 12907100, to unscrew the back nut “N”.



A
B
C
D
E
F
G
H
I
L
M
N
O
P



- Remove the pinion “P”, the washer “Q”, the outer roller cone bearing cage “R”, the adjustment washers “S”, the roller bearing cage “T” - pinion side, and the spacer “U” from the case “O”.
- Use extractor “V”, code 17945060, to remove the outer race of the roller cone bearing cages “T” and “R” from the case “O”.



CHECK AND OVERHAUL

Final Drive housing

Check that:

- The housing has no cracks or leakages, otherwise seal it or replace it.
- The bearing seat is not scored or damaged.
- The mating surfaces are not scored or damaged.
- The sealing ring is intact, not damaged, and has not lost elasticity.

Gaskets shall be replaced even if in good conditions.

Flange on the Final Drive housing

Check that:

- It has no cracks.
- The mating surface is not scored or damaged.
- The bearing seat and the sealing ring seat are not scored or damaged;
- The sealing ring is intact, not damaged, and has not lost elasticity.

Adjustment shims of the Final Drive housing flange

Shims are supplied in six different sizes, that is: 0.8 – 0.9 - 1 – 1.1 – 1.2 – 1.3 mm.

Check that the mating surfaces are not scored or damaged.

Drilled shaft with internal teeth as a connection to the rear wheel

Check that:

- The surface, on which the ball bearing is pressed, is intact and very smooth;
- The internal toothing is not damaged or dented.

Bevel gear

The bevel gear consists of a pinion and a "Gleason" crown wheel. The crown toothing shall not be ungeared or excessively worn.

The pinion shank shall not be dented and the end fits shall be smooth and not dented.

Cage sealing ring

The surfaces shall not be damaged, dented or worn, otherwise replace them.

Spacer for rear wheel shaft

Check that the supporting surfaces are not damaged.

Bearing case

Check that:

- The mating surfaces are not scored or dented.
- The bearing seats are not scored or damaged.

The gasket shall always be replaced, even if in good conditions.

Spacer between the bearings

Check that the supporting surfaces are smooth and not damaged.

Adjustment washers between spacer and bearing

Adjustment washers are supplied in two different thickness measures.

Check that they are even and without wear or dents.

Lock nut for bevel gear pinion on the bearing case

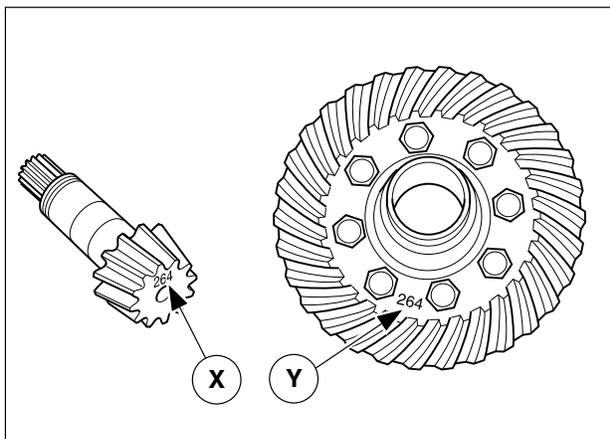
During assembly the tang is crushed into a spline of the pinion shank, it is therefore suggested to replace this nut when reassembling.

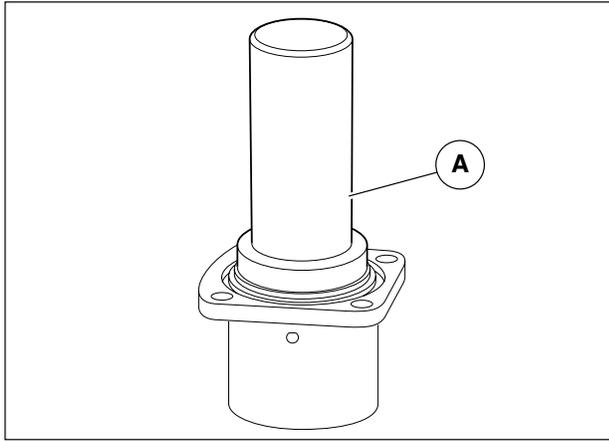
Final Drive shaft and bevel sprocket sleeve

Internal fits shall be intact, not damaged or dented, otherwise replace the sleeve.

Pinion – crown sorting

Pinion and crown shall have the same number (see "X" and "Y")





Reassembly

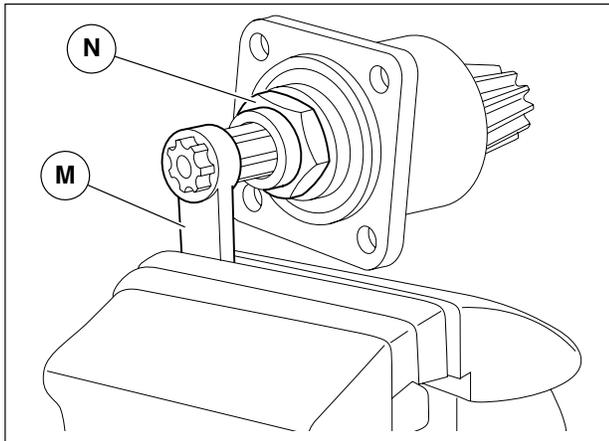
Before reassembly, check each component accurately, as described in the chapter "Check and overhaul" of this section.

Outer races of the cone bearings on the case

Use proper punch "A", code 17945160, to assemble the cone bearings outer races on the case.

Case components

To reassemble, carry out the removal procedures in reverse order, checking that the number of shim rings between spacer and bearing and between bearing and bevel sprocket is the same, if no part has been replaced. If a part has been replaced, a new shimming is required. Nut "N" locking shall be carried out with the locking tool "M", code 12907100, and with a wrench with torque 18 ± 20 Nm and Loctite. If the pinion is shimmed correctly, it shall turn freely but without play.

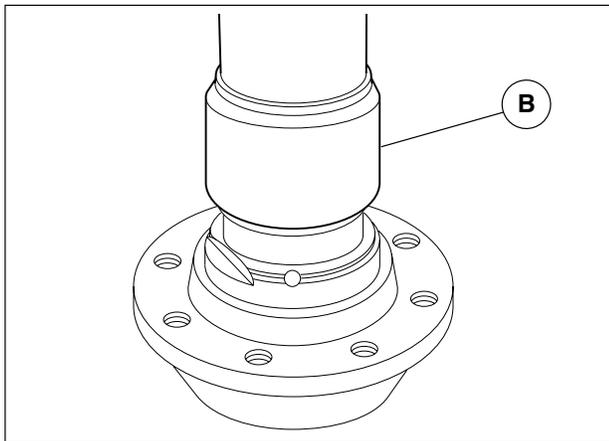


Assembly of the needle bearing inner race on the drilled shaft

Use the proper tool "B", code 17948460, to press the needle bearing inner race on the drilled shaft.

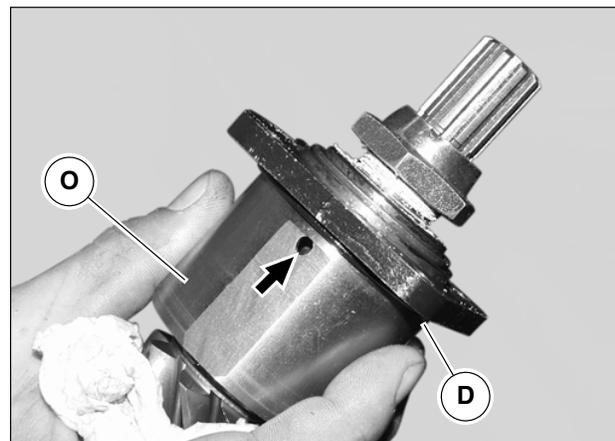
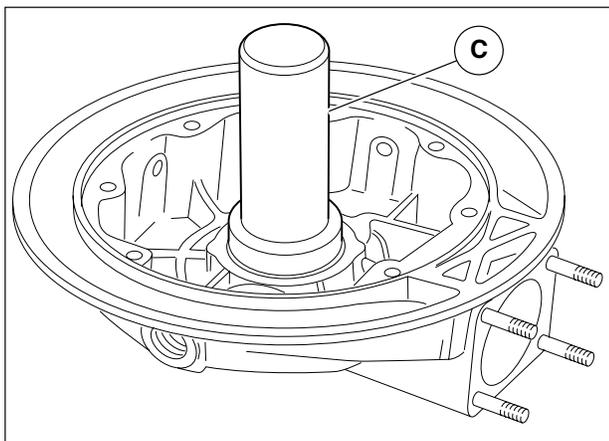
Assembly of the needle bearing outer race on the housing

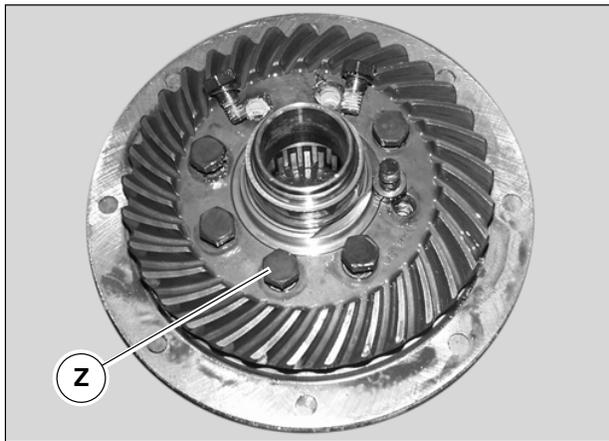
Use the proper tool "C", code 17948660, to press the needle bearing outer race on the housing.



Housing case

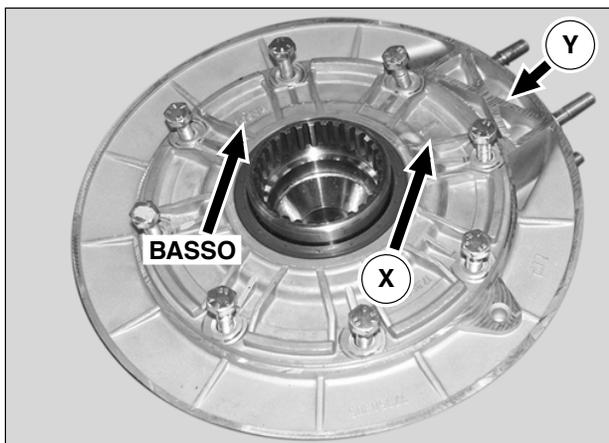
While assembling the case "O" on the transmission housing, make sure that the lubrication holes marked with an arrow on the housing and on the case are lined up. Remember to place the O-ring "D" between the case and the housing.





Crown on the drilled shaft

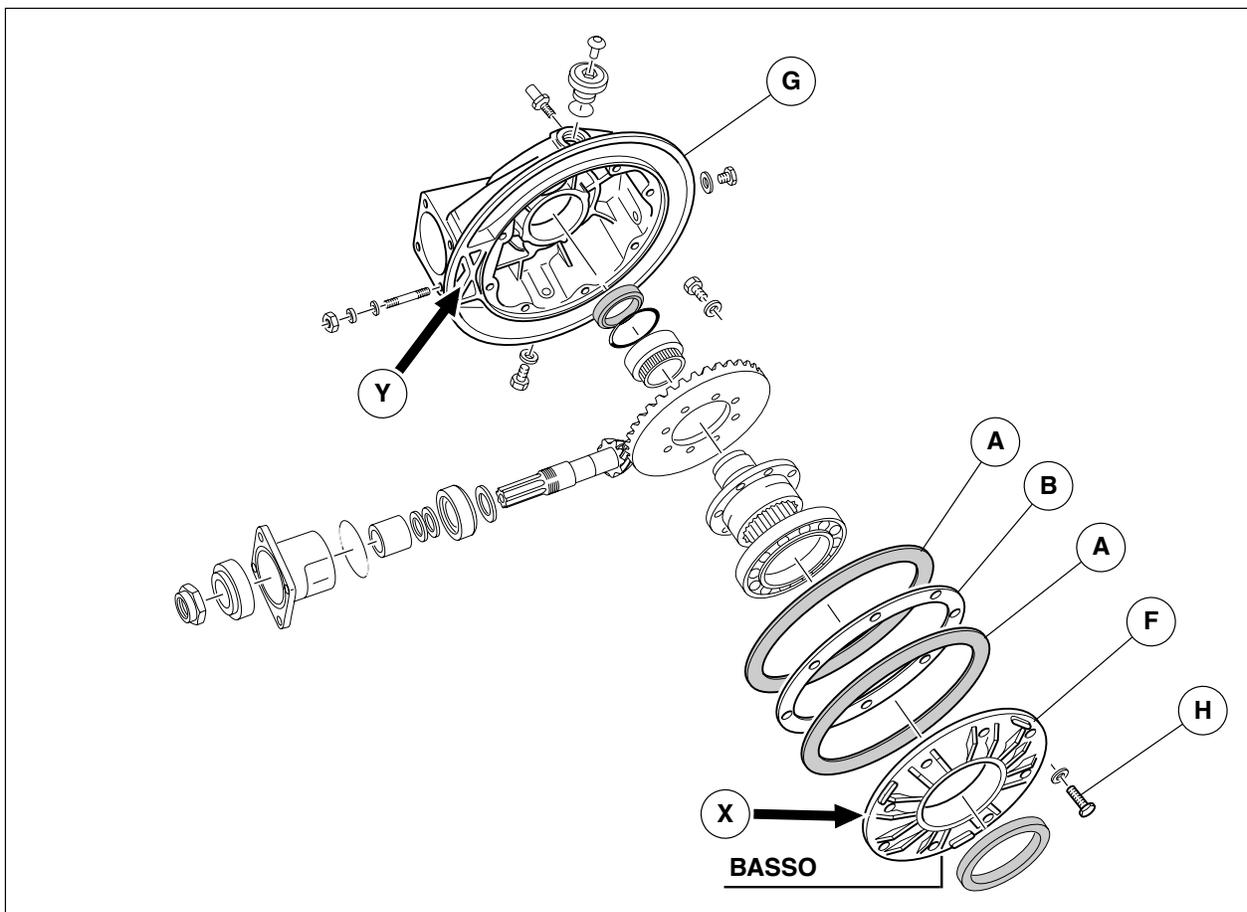
Reassemble the crown on the drilled shaft and remember to always replace the 8 screws "Z". Clean the drilled shafts threads accurately with trichloroethylene to guarantee a good adherence of the sealant "Loctite 601" that was previously applied on the screw thread. Tighten to a torque of $40 \div 42$ Nm.

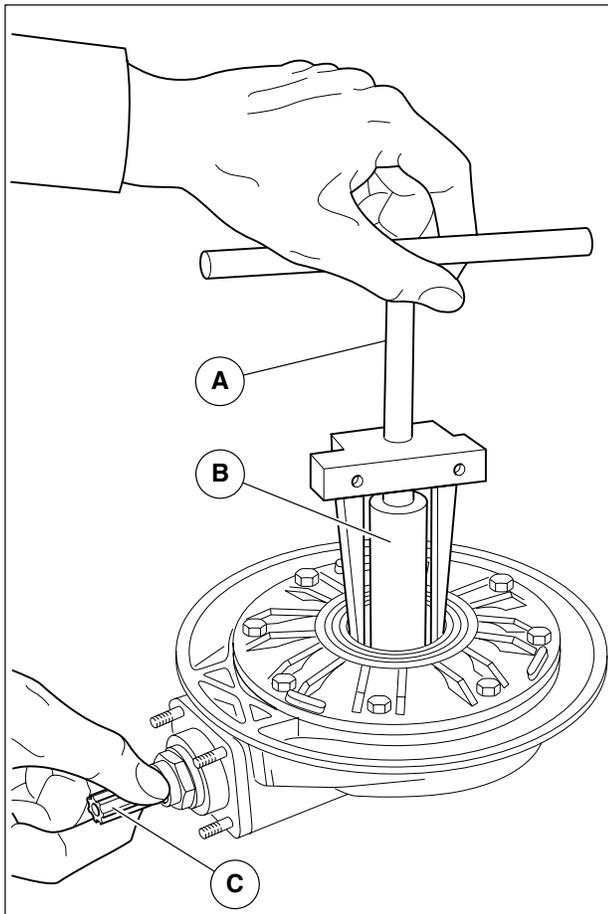


Cover on the transmission housing

Assemble the cover "F" on the housing as follows:

- Place gasket "A" on the housing, then the shim ring "B" and then the other gasket "A". Make sure the holes are lined up with those on the housing. The cover shall be assembled on the housing making sure that the "BASSO" sign faces the ground. The arrow "X" on the cover "F" shall be lined up with the arrow "Y" marked on the housing "G", then tighten up screws "H".





Pinion – crown coupling

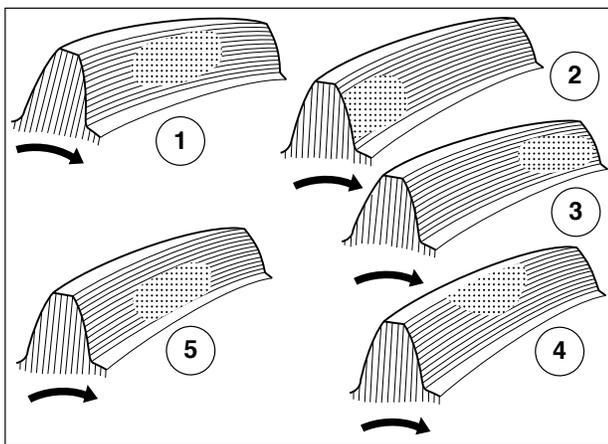
To check the pinion and crown coupling, grease the pinion tooting, drive side, with red lead grease.

Using an armed extractor “A” and a suitable shim “B” keep the hub-crown unit slightly forced towards the cover; turn the pinion “C” by hand in the sense-of-travel, using the tool to keep the crown still.

Remove the extractor, disassemble the cover and check the contact area on the pinion tooting.

CONTACT IMPRESSION CHECK

- If the contact is correct, the pinion tooting impression will be as illustrated in figure “1” (the pinion is viewed from the drive shaft side)
- If the contact is like illustration “2”, the crown is too near the pinion’s rotating axis: loosen the crown by increasing the thickness of the shim “P”, previous page, between the box and the cover;
- If the contact is like illustration “3”, the pinion is too near to the crown’s rotation axis: move the pinion farther by reducing the thickness of the shim between the bearing and the pinion;
- If the contact is like illustration “4”, the pinion is too far from the crown’s rotation axis: bring the pinion closer by increasing the thickness of the shim, between bearing and pinion;
- If the contact is like illustration “5”, the crown is too far from the pinion’s rotation axis: bring the crown closer by reducing the thickness of the spacer “P”, previous page, between the housing and the cover;
- The backlash must be within 0.10÷0.15 mm, if the coupling between the pinion tooting and the crown tooting is correct.



2 FINAL DRIVE SHAFT

Disassembly:

- Remove rear swinging arm as described in chapter 9 section F.

CHECK AND OVERHAUL

Sleeve for transmission shaft and bevel sprocket "A"

Internal fits shall be intact, not damaged or dented, otherwise replace the sleeve.

Snap rings on transmission shaft "B"

Check that the rings are not cracked and have not lost elasticity, otherwise replace them.

Transmission shaft "C"

Shaft fits shall be intact, not damaged or dented.

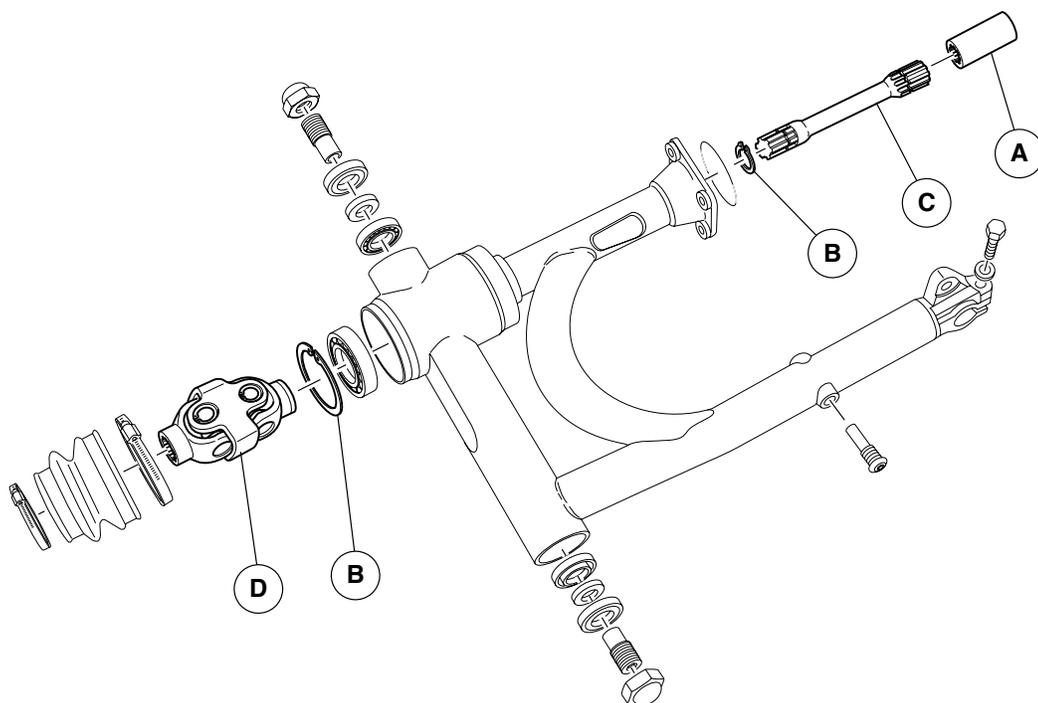
Double U-joint "D"

U-joint fits shall be intact, not damaged or dented. Check that the joint is not hardened or excessively loosened, otherwise replace it.

Reassembly:

Carry out the removal procedures in reverse order.

CALIFORNIA EV 1ª SERIE (1997-2000) - CALIFORNIA JACKAL - CALIFORNIA SPECIAL



2 ANTRIEBSWELLE

Ausbau:

- Die Hinterradschwinge, wie in Kap. 9, Abschnitt F, beschrieben, entfernen.

KONTROLLE UND ÜBERHOLUNG

Muffe für Antriebswelle und konisches Ritzel "A"

Die internen Verbindungsbereiche müssen unversehrt sein. Sie dürfen keine Beschädigungen oder Verbeulungen ausweisen. Andernfalls austauschen.

Seeger-Ringe auf der Antriebswelle "B"

Überprüfen, dass die Ringe keine Risse aufweisen oder an Elastizität verloren haben. Andernfalls austauschen.

Antriebswelle "C"

Die Verbindungsbereiche müssen unversehrt sein und dürfen keine Beschädigungen oder Verbeulungen ausweisen.

Doppelkardangelnk "D"

Die Verbindungsbereiche des Kardangelnks müssen unversehrt sein und dürfen keine Beschädigungen oder Verbeulungen ausweisen.

Überprüfen, dass das Gelenk nicht verhärtet oder übermäßig gelockert ist. Andernfalls austauschen.

Wiedereinbau:

Den Ausbau in umgekehrter Reihenfolge ausführen.

2 ÁRBOL DE TRANSMISIÓN

Demontage:

- De achtervork verwijderen zoals beschreven in hoofdstuk 9 deel F.

CONTROLE EN REVISIE

Verbindingpijp voor transmissieas en conisch tandwiel "A"

De uitsparingen binnenin moeten perfect in orde zijn; als er slijtage op zit, of ze zijn vervormd, dient u ze te vervangen.

Seegerringen op de transmissieas "B"

Controleren of deze ringen niet verduurd zijn of niet elastisch meer zijn; eventueel vervangen.

Transmissieas "C"

De sluitgroeven op beide uiteinden moeten perfect in orde zijn (niet gekarteld of verbogen).

Dubbele cardankoppeling "D"

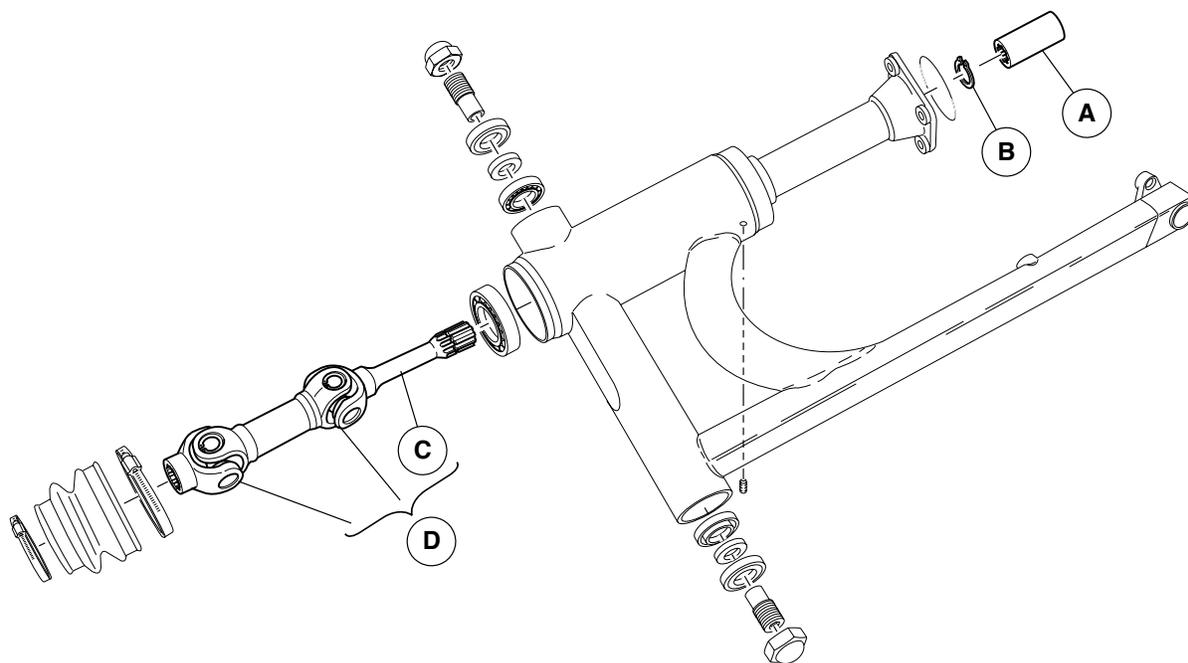
De sluitgroeven binnenin moeten perfect in orde zijn (niet gekarteld of verbogen).

Controleren of het scharnierpunt niet te stroef of te los zit; eventueel vervangen.

Remontage:

Monteren in de omgekeerde volgorde.

CALIFORNIA EV 2001 - CALIFORNIA STONE - CALIFORNIA SPECIAL SPORT



A

ELECTRICAL SYSTEM

B

ELEKTROANLAGE

C

D

ELEKTRISCHE INSTALLATIE

E

F

G

H

I

L

M

N

O

P



A

B

C

D

E

F

G

H

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L

M

N

O

P

1 ELECTRICAL SYSTEM DESCRIPTION

The electrical system is composed of:

- Battery
- Electro-magnetic control starter motor;
- Generator - Alternator, fitted on the front part of the crankshaft;
- Indicator device for low fuel;
- Headlight control switch;
- Starter coils;
- Electronic Control Unit;
- Timing and r.p.m. sensor
- Solenoid starter for side stand.
- Voltage regulator;
- Fuse holder terminal board;
- ECU control relay;
- Control relay for pump, coils and electro-injectors;
- Starter control relay;
- Headlight;
- Taillight;
- Direction indicators;
- Switch for connected devices activation;
- Control devices for indicator lights, horn and flash-light;
- Intermittance
- Engine starter and stop device;
- Electric horns – Horn solenoid starter.
- Warning lights on the dashboard: Gearbox in neutral (green); Dipped lights on “city” (green); Oil pressure check (red); High beams (blue); Insufficient generator voltage (red); Low fuel (orange); Indicator lights (green).

LIGHTS

Headlight:

- High beams and low beams
- City or parking light

Taillight:

- Licence plate, dipped, stop light
- Indicators
- Warning lights for speedometer and revolution counter.
- Dashboard warning lights

KEYS FOR ELECTRICAL SYSTEM DIAGRAM CALIFORNIA EV 2001 - STONE - SPECIAL SPORT

- A
B
C
D
E
F
G
H
I
L
M
N
O
P
- 1 High beam 60 W (H4 halogen with high beam)
 - 2 Dipped light 4 W
 - 3 Low beam 55 W (H4 halogen with high beam)
 - 4 4-way Amp connector, headlight
 - 5 RH front direction indicator 10 W
 - 6 Connector Cannon 2 way RH direction indicator
 - 7 LH front direction indicator 10 W
 - 8 Connector Cannon 2 way LH direction indicator
 - 9 Dashboard
 - 10 10-way A Pakard connector (dashboard)
 - 11 10-way B Pakard connector (dashboard)
 - 12 Oil pressure switch
 - 13 Neutral switch
 - 14 Oil level switch
 - 15 Warning horn tone L
 - 16 Warning horn tone H
 - 17 10-way Pakard connector (LH device)
 - 18 LH device: Lights, direction indicators, horn
 - 19 12 V 350 W Alternator
 - 20 Voltage regulator
 - 21 Intermittance
 - 22 Relay lights(N.A. MINI-REALY)
 - 23 Relè di start-up (MINIRELE' DEVIATORE)
 - 24 Starter motor
 - 25 12 V 30 Ah Battery
 - 25 12 V 16 Ah Battery (USA,SGP,CAN)
 - 26 Rear Stop light switch
 - 27 Connector Cannon 3 way for direction indicator and rear STOP.
 - 28 Connector Cannon 2 way for rear parking light.
 - 29 LH rear direction indicator 10 W
 - 30 RH direction indicator rear 10 W
 - 31 Rear STOP light , 21 W (with parking light)
 - 32 Rear dipped light, 5 W (with STOP light)
 - 33 Licence plate light, 5 W (USA-type licence plate on request)
 - 34 Solenoid valve (electrical valve)
 - 35 Set of safety fuses (see table)
 - 36 Side safety relay switch (N.A. MINIRELAY)
 - 37 Connector Cannon 2 way side stand
 - 38 Side stand safety switch
 - 39 RH device (Start.-Run, Start, light)
 - 40 10-way Pakard connector (Pos. RH)
 - 41 Front Stop light switch
 - 42 Key Starter switch
 - 43 4-way Amp connector
 - 44 ECU IAW 15M
 - 45 Air temperature sensor
 - 46 3-way diagnosis connector
 - 47 LED diode light connector (NOT ASSEMBLED)
 - 48 AT coil for cylinder start LH (BAE850AK)
 - 49 AT coil for cylinder start RH (BAE850AK)
 - 50 Injection relay (MINI - RELAY N.A.)
 - 51 Protection diode
 - 52 ECU relay (MINI-RELAY N.A.)
 - 53 Fuel pump
 - 54 LH injector (IW031)
 - 55 RH injector (IW031)
 - 56 Timing sensor (SEN813)
 - 57 Engine Oil temperature sensor (NTC WTS05)
 - 58 Throttle potentiometer (PF3C)
 - 59 Absolute pressure sensor inside ECU
 - 60 1-way Amp connector (key operated power supply)
 - 61 1-way Amp connector (revolution counter, injection side)

COLOUR TABLE

Arancio = Orange
Azzurro = Blue
Bianco = White
Giallo = Yellow
Grigio = Grey
Marrone = Brown
Nero = Black
Rosa = Pink
Rosso = Red
Verde = Green
Viola = Purple
Bianco-Azzurro = White-Blue
Bianco-Giallo = White-Yellow
Bianco-Marrone = White-Brown
Bianco-Nero = White-Black
Blu-Nero = Blue-Black
Giallo-Nero = Yellow-Black
Nero-Grigio = Black-Grey
Rosso-Bianco = Red-White
Rosso-Blu = Red-Dark blue
Rosso-Giallo = Red-Yellow
Rosso-Nero = Red-Black
Rosso Verde = Red-Green
Verde-Grigio = Green-Grey
Verde-Nero = Green-Black
Rosa-Nero = Pink-Black
Marrone-Nero = Brown-Black
Bianco-Blu = White-Dark blue
Bianco-Verde = White-Green

FUSES

- | |
|--|
| F1 Battery charger (30A) |
| F2 Key-operated switch (15A) |
| F3 High beam, low beam, warninghorn (15A) |
| F4 Direction indicator, parking light(5A) |
| F5 ECU (5A) |
| F6 Pump, coils, injectors (10A) |

KEYS FOR ELECTRICAL SYSTEM DIAGRAM CALIFORNIA EV (1997 - 2000)

- A
B
C
D
E
F
G
H
I
L
M
N
O
P
- 1 High beam and low beam light bulb 60/55W
 - 2 Front parking light bulb 3W
 - 3 RH direction indicator warning light bulb
 - 4 Speedometer light bulb
 - 5 Revolution counter light bulb
 - 6 LH direction indicator warning light bulb
 - 7 Microprocessor control unit
 - 8 Fuel level warning light bulb
 - 9 Oil pressure warning light bulb
 - 10 Generator warning light bulb
 - 11 Neutral warning light bulb
 - 12 Parking light warning light bulb
 - 13 High beams warning light bulb
 - 14 Electric cock
 - 15 RH front direction indicator
 - 16 Front brake stop switch
 - 17 Ignition switch
 - 18 LH front direction indicator
 - 19 Dual tone horns
 - 20 Engine starter and stop device
 - 21 Neutral switch
 - 22 Oil pressure switch
 - 23 Flasher (12V/46W)
 - 24 Control device: lights, warning horn, and direction indicator
 - 25 Fuel pump
 - 26 Light-emitting diode (Check lamp)
 - 27 Pump control relay
 - 28 Rear brake switch
 - 29 Fuse holder terminal board
 - 30 Fuel level warning light transmitter
 - 31 Dc regulator Jumper 12Vdc 25A (DUCATI)
 - 32 Alternator 14V-25A (DUCATI)
 - 33 Side stand switch
 - 34 Battery 12V-30Ah
 - 35 Solenoid starter
 - 36 Starter motor
 - 37 RH rear direction indicator
 - 38 Licence plate and STOP light bulb
 - 39 Rear direction indicator
 - 40 Dual-tone horn solenoid starter
 - 41 Dip switch starter for side stand
 - 42 Light solenoid starter
 - 43 6-way Molex connector
 - 44 Injector control relay and ECU
 - 45 Throttle potentiometer
 - 46 Oil temperature sensor
 - 47 Crankshaft position sensor
 - 48 Engine rpm sensor
 - 49 Air temperature sensor
 - 50 Absolute pressure sensor
 - 51 Injectors
 - 52 Electric ignition module cylinder 1
 - 53 Ignition coil cylinder 1
 - 54 Electric ignition module cylinder 2
 - 55 Ignition coil cylinder 2
 - 56 Connector for IAW system diagnosis

COLOUR TABLE

Arancio = Orange
Azzurro = Blue
Bianco = White
Giallo = Yellow
Grigio = Grey
Marrone = Brown
Nero = Black
Rosa = Pink
Rosso = Red
Verde = Green
Viola = Purple
Bianco-Azzurro = White-Blue
Bianco-Giallo = White-Yellow
Bianco-Marrone = White-Brown
Bianco-Nero = White-Black
Blu-Nero = Blue-Black
Giallo-Nero = Yellow-Black
Nero-Grigio = Black-Grey
Rosso-Bianco = Red-White
Rosso-Blu = Red-Dark blue
Rosso-Giallo = Red-Yellow
Rosso-Nero = Red-Black
Rosso Verde = Red-Green
Verde-Grigio = Green-Grey
Verde-Nero = Green-Black
Rosa-Nero = Pink-Black
Marrone-Nero = Brown-Black
Bianco-Blu = White-Dark blue
Bianco-Verde = White-Green

KEYS FOR ELECTRICAL SYSTEM DIAGRAM CALIFORNIA SPECIAL

- A
B
C
D
E
F
G
H
I
L
M
N
O
P
- 1 High beam 60 W (H4 halogen with high beam)
 - 2 Dipped light 4 W
 - 3 Low beam 55 W (H4 halogen with high beam)
 - 4 4-way Amp connector, headlight
 - 5 RH front direction indicator 10 W
 - 6 Connector Cannon 2 way RH direction indicator
 - 7 LH front direction indicator 10 W
 - 8 Connector Cannon 2 way LH direction indicator
 - 9 Dashboard
 - 10 10-way A Pakard connector (dashboard)
 - 11 10-way B Pakard connector (dashboard)
 - 12 Oil pressure switch
 - 13 Neutral switch
 - 14 Oil level switch
 - 15 Warning horn
 - 16 Relay Warning horn (MINI - RELAY SIEMENS)
 - 17 10-way Pakard connector (LH device)
 - 18 LH device: Lights, direction indicators, horn
 - 19 12 V 350 W Alternator
 - 20 Voltage regulator
 - 21 Intermittance
 - 22 Relay lights(SIEMENS MINI-RELY)
 - 23 Relè di start-up (MINIRELE' DEVIATORE)
 - 24 Starter motor
 - 25 12 V 30 Ah Battery
 - 26 Rear Stop light switch
 - 27 Connector Cannon 3 way for direction indicator and rear STOP.
 - 28 Connector Cannon 2 way for rear parking light.
 - 29 LH rear direction indicator 10 W
 - 30 RH direction indicator rear 10 W
 - 31 Rear STOP light , 21 W (with parking light)
 - 32 Rear dipped light, 5 W (with STOP light)
 - 33 Licence plate light, 5 W (USA-type licence plate on request)
 - 34 Solenoid valve (electrical valve)
 - 35 Set of safety fuses (see table)
 - 36 Side safety relay switch (SIEMENS MINIRELAY)
 - 37 Connector Cannon 2 way side stand
 - 38 Side stand safety switch
 - 39 RH device (Start.-Run, Start, light)
 - 40 10-way Pakard connector (Pos. RH)
 - 41 Front Stop light switch
 - 42 Key Starter switch
 - 43 4-way Amp connector
 - 44 ECU IAW 15M
 - 45 Air temperature sensor
 - 46 3-way diagnosis connector
 - 47 LED diode light connector (NOT ASSEMBLED)
 - 48 AT coil for cylinder start LH (BAE850AK)
 - 49 AT coil for cylinder start RH (BAE850AK)
 - 50 Injection relay (MINI - RELAY SIEMENS)
 - 51 Protection diode
 - 52 ECU relay (MINI-RELAY SIEMENS)
 - 53 Fuel pump
 - 54 LH injector (IW031)
 - 55 RH injector (IW031)
 - 56 Timing sensor (SEN813)
 - 57 Engine Oil temperature sensor (NTC WTS05)
 - 58 Throttle potentiometer (PF3C)
 - 59 Absolute pressure sensor inside ECU
 - 60 1-way Amp connector (key operated power supply)
 - 61 1-way Amp connector (revolution counter, injection side)

COLOUR TABLE

Arancio = Orange
Azzurro = Blue
Bianco = White
Giallo = Yellow
Grigio = Grey
Marrone = Brown
Nero = Black
Rosa = Pink
Rosso = Red
Verde = Green
Viola = Purple
Bianco-Azzurro = White-Blue
Bianco-Giallo = White-Yellow
Bianco-Marrone = White-Brown
Bianco-Nero = White-Black
Blu-Nero = Blue-Black
Giallo-Nero = Yellow-Black
Nero-Grigio = Black-Grey
Rosso-Bianco = Red-White
Rosso-Blu = Red-Dark blue
Rosso-Giallo = Red-Yellow
Rosso-Nero = Red-Black
Rosso Verde = Red-Green
Verde-Grigio = Green-Grey
Verde-Nero = Green-Black
Rosa-Nero = Pink-Black
Marrone-Nero = Brown-Black
Bianco-Blu = White-Dark blue
Bianco-Verde = White-Green

FUSES

- | |
|--|
| F1 Electric cock (15A) |
| F2 Parking lights, direction indicators (15A) |
| F3 Starter motor, warning horn (15A) |
| F4 High beam, low beam, stop light (15A) |
| F5 ECU (15A) |
| F6 Pump, coils, injectors (15A) |

KEYS FOR ELECTRICAL SYSTEM DIAGRAM CALIFORNIA JACKAL

- A
B
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- 1 High beam 60 W (H4 halogen with high beam)
 - 2 Dipped light 5 W
 - 3 Low beam 55 W (H4 halogen with high beam)
 - 4 4-way Amp connector, headlight
 - 5 RH front direction indicator 10 W
 - 6 Connector Cannon 2 way RH direction indicator
 - 7 LH front direction indicator 10 W
 - 8 Connector Cannon 2 way LH direction indicator
 - 9 Dashboard
 - 10 10-way A Pakard connector (dashboard)
 - 11 10-way B Pakard connector (dashboard)
 - 12 Oil pressure switch
 - 13 Neutral switch
 - 14 Oil level switch
 - 15 Warning horn
 - 16 Relay Warning horn (MINI - RELAY SIEMENS)
 - 17 10-way Pakard connector (LH device)
 - 18 LH device: Lights, direction indicators, horn
 - 19 12 V 350 W Alternator
 - 20 Voltage regulator
 - 21 Intermittance
 - 22 Relay lights(SIEMENS MINI-REALY)
 - 23 Relè di start-up (MINIRELE' SIEMENS)
 - 24 Starter motor
 - 25 12 V 30 Ah Battery
 - 26 Rear Stop light switch
 - 27 Connector Cannon 3 way for direction indicator and rear STOP.
 - 28 Connector Cannon 2 way for rear parking light.
 - 29 LH rear direction indicator 10 W
 - 30 RH direction indicator rear 10 W
 - 31 Rear STOP light , 21 W (with parking light)
 - 32 Rear dipped light, 5 W (with STOP light)
 - 34 Solenoid valve (electrical valve)
 - 35 Set of safety fuses (see table)
 - 36 Side safety relay switch (SIEMENS MINIRELAY)
 - 37 Connector Cannon 2 way side stand
 - 38 Side stand safety switch
 - 39 RH device (Start.-Run, Start, light)
 - 40 10-way Pakard connector (Pos. RH)
 - 41 Front Stop light switch
 - 42 Key Starter switch
 - 43 4-way Amp connector
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 - 59 Absolute pressure sensor inside ECU
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FUSES

- | |
|--|
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| F2 Parking lights, direction indicators (15A) |
| F3 Starter motor, warning horn (15A) |
| F4 High beam, low beam, stop light (15A) |
| F5 ECU (15A) |
| F6 Pump, coils, injectors (15A) |

2 BATTERY

The battery's voltage is 12 V with a capacity of 30 Ah; it is charged by the generator.

INSTRUCTIONS TO OPERATE DRY BATTERIES

- Remove the plugs.
- Fill every battery element with sulphuric acid, density 1.28 (1.23 for tropical countries) up to 15 mm above the separation plates.
- Leave to rest at least 20 minutes.
- Check the electrolyte level, if it is necessary top up with the same acid bringing the level to the previously indicated level (never fill up to the rim).
- Refit the plugs.

MAINTENANCE INSTRUCTIONS FOR BATTERIES CHARGED WITH ACID

The dry batteries activated after being recharged or received charged with acid must be handled with care, following these warnings:

- At least every month add DEMINERALIZED or DISTILLED WATER (never acid) so that when at rest the acid level is 15 mm above the separators.
- Keep the terminals clean and tightened and greased with Vaseline.
- Keep the battery upper part dry by preventing the acid from getting spilled; this reduces isolation and corrodes frames and housings.
- Make sure that the charging system does not convey excessive or insufficient charges, always remembering that the acid density shall lie between 1.21 and 1.28. If not, it is necessary to overhaul the isolation and the working order of the ignition and charging system.
- If the voltage at the poles is lower than 12.3 v (electrolyte density < 1.21), the battery shall be recharged.
- The batteries stored charged with acid need to be periodically recharged with intensity at 1/10 of its capacity, by maintaining the proper level or density of 1.28 at 25°C.
- Batteries must be assembled on the vehicle, well secured by the locking devices and keeping the vibration damping pads on.

 **N.B. For batteries that will be used in tropical climates (average temperature higher than 33°C) it is recommended that the acid density be reduced to 1.23.**



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BATTERY CHARGE INSTRUCTIONS

- Remove the plugs.
- Recharge the battery only with direct current.
- Connect the battery charger positive cable (+) to the battery positive pole (+) and the battery charger negative cable (-) to the battery negative pole (-).
- Recharge the battery with a voltage of 1/10 of the battery rated capacity (Ah) until the acid density reaches the value of 1.28.
- Turn off the battery charger before disconnecting the battery.
- Level the acid, seal up and clean carefully.



IMPORTANT!

A bent or twisted drainer may increase the battery pressure and damage it.



WARNING

The battery contains sulphuric acid (electrolyte). Avoid any contact with skin and eyes since it may cause serious burns.

In case your skin should come into contact with the electrolyte, wash the concerned part with abundant water.

In case of contact with your eyes, wash them with running water for at least 15 minutes and call a doctor immediately.



WARNING

Batteries generate explosive gases:
Keep them away from heat sources and fire.

Charge the battery in a ventilated area.
Always wear protection glasses and gloves when you operate near the battery.



WARNING

Keep the battery out of reach of children.



2 BATTERY (USA - SGP – CAN VERSION)

The battery's voltage is 12 V with a capacity of 16 Ah; it is charged by the generator.

The battery used on the motorbike is a sealed type lead acid battery (without maintenance) which does not require any checks.

CHARGING INSTRUCTIONS

WARNING

- It contains toxic substances (Pb e H₂ SO₄);
- Extremely high currents, avoid short circuits;
- Do not recharge in the sealed container;
- Using different battery chargers (not at constant voltage) will cause irreparable damage to the battery.

GENERAL NOTES

Charging lead acid or pure-tin sealed accumulators, just as other re-chargable accumulators, is a question of saving the energy supplied during discharge. As this process is in some ways inefficient, it is necessary to bring back to the accumulator from 105% to 110% of the amperes-hour supplied during discharge. The quality of the power necessary to completely re-charge the battery depends on the flatness of the accumulator, on the method, re-charging time and temperature.

It is important that the battery is capable of supplying all or nearly all of its capacity before receiving the required over-charging. However, to obtain an optimal duration in terms of cycle numbers, the battery must periodically receive the required over-charging.

Charging can be carried out in different ways. The aim is to convey current through the battery in the direction opposite to the discharge. Constant voltage charging is the standard method used to charge lead acid type accumulators.

Constant voltage charging

The voltage charging method is the most efficient for charging sealed lead- acid pure-tin accumulators. Using this charging method, it is not necessary to limit the maximum current supplied by the charger. The voltage must however be adjusted so that it is within the values prescribed below. This feature is due to the internal resistance of the battery. It is extremely low and features a high recombination efficiency during charging. We recommend to observe the following values for constant voltage charging:

A

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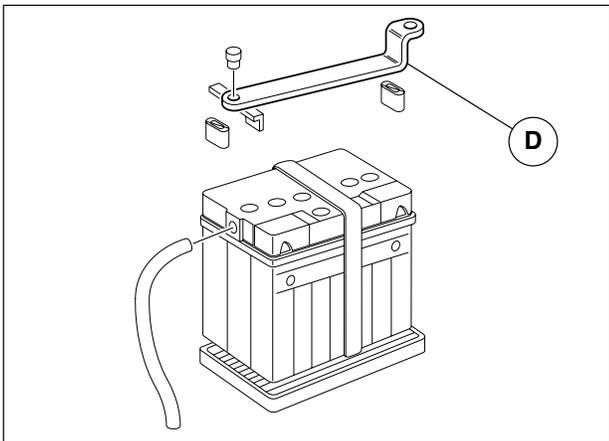
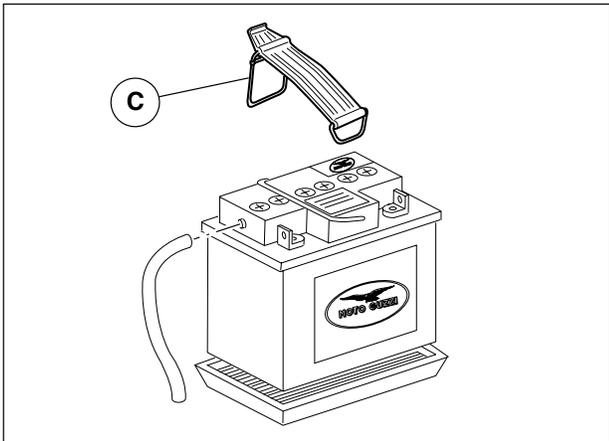
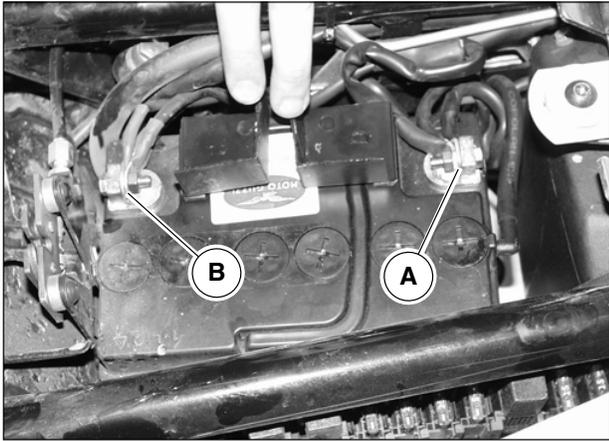
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CYCLIC USE:

From 14.7V to 15.0V per battery, at 25°C. No current limit requested.

BUFFER USE:

From 13.50V to 13.80V per battery, at 25°C. No current limit requested.

Removal:

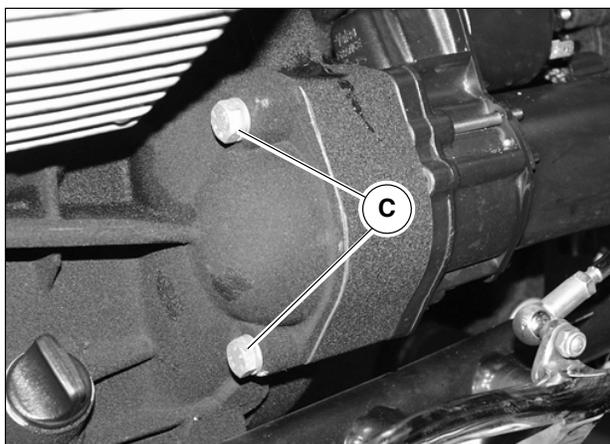
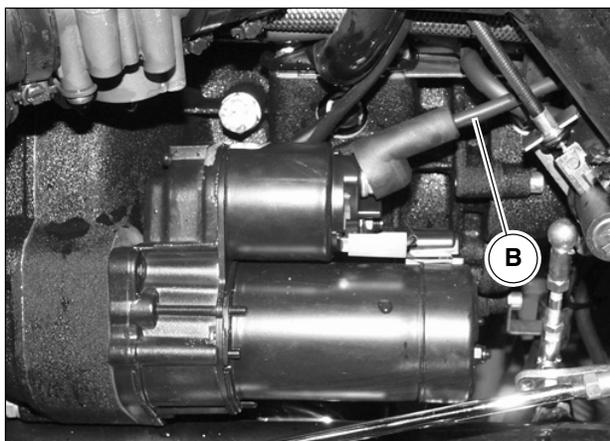
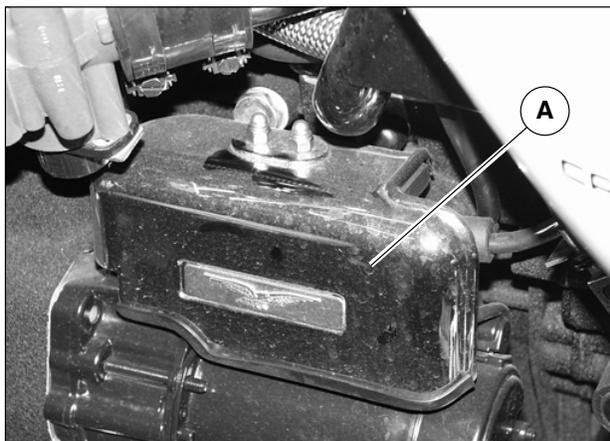
- Remove the saddle as described in chapter 4 section E;
- Release the locking belt "C" or bracket "D" ;
- Disconnect the negative terminal "A", then the positive "B" by unscrewing the nuts;
- Remove the battery from the motorbike.

■ **N.B. Always disconnect the negative terminal first "A" then the positive one "B".**

■ **N.B. The negative terminal "A" is black , while the positive one "B" is red.**

Refitting:

- Apply protective spray for electrical contacts on the battery terminal board;
- Insert the battery in its seat on the motorbike;
- Connect the positive terminal "B" then the negative one "A";
- Hook the locking belt "C" or bracket "D" once again.
- Refit the saddle.



3 STARTER MOTOR

General features:

Voltage	12 V
Power	1,2 Kw
Torque with no load	11 Nm
Torque with load	4,5 Nm
Pinion	z=9 mod. 2,5
Pinion side rotation	Anti-clockwise
Speed	1750 r.p.m.
Current with no load	600 A
Current with load	230 A
Weight	2,8 Kg

Removal:

- Remove the cover "A" (if any);
- Disconnect the cable "B" from the starter motor;
- Unscrew the two screws "C" with washer, fastening the starter motor to the engine crankcase;
- Remove the complete starter motor from the motorbike.

Refitting:

Refit following the removal procedures in reverse order.

⚠ WARNING

The starter motor must not be activated for over 5 seconds; if the engine does not start, wait about 10 seconds before carrying out a subsequent ignition.

The start button (START "ⓘ") must only be used when the engine is off.

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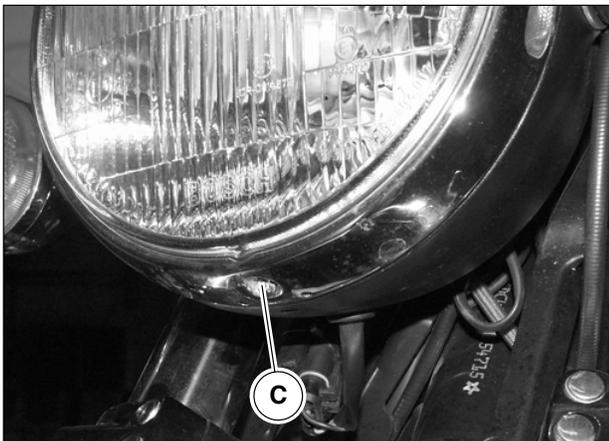
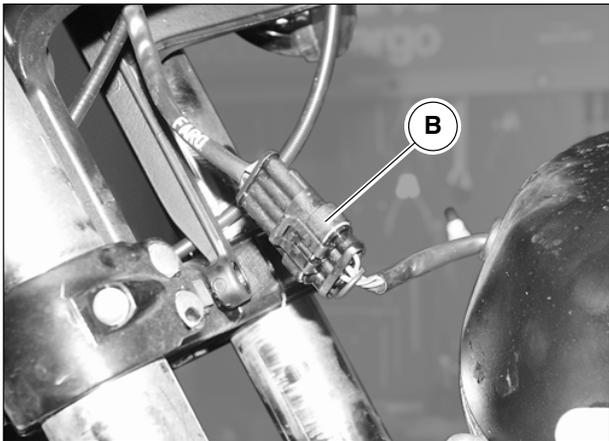
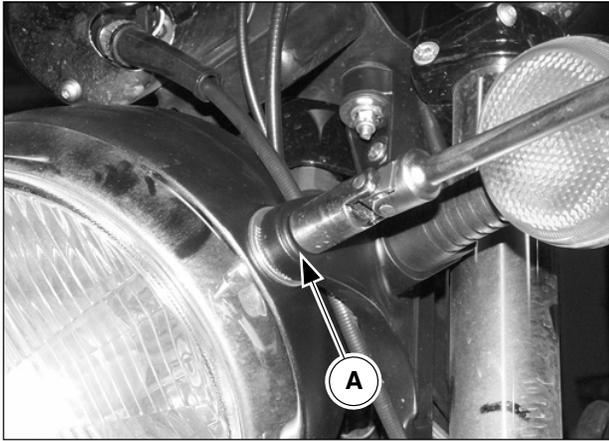
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4 LIGHT AND ACOUSTIC SYSTEMS / DASHBOARD / CONTROLS

HEADLIGHT

Removal:

- Unscrew the two screws "A" and remove them together with the two washers;
- Remove the headlight and the inner shims;
- Detach connector "B";

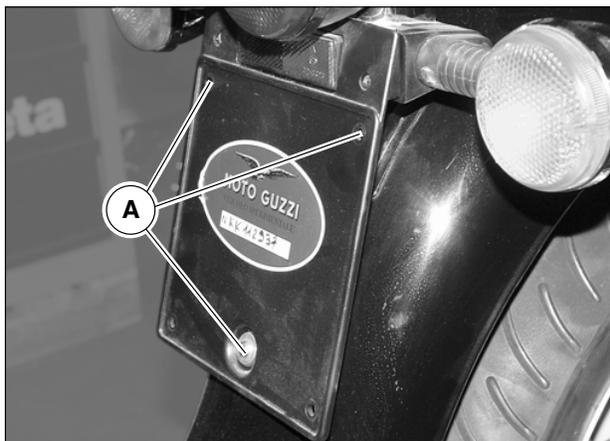
Refitting:

Refit following the removal procedures in reverse order.

Replacing the light bulbs:

- Unscrew the screw "C" located at the bottom of the optic unit;
- Remove the optic unit;
- Detach the light bulb holders and replace the bulbs;
- Refit the removed parts.

 **N.B. When replacing the front light bulb (high beam-low beam) take care not to touch the bulb directly with your fingers.**

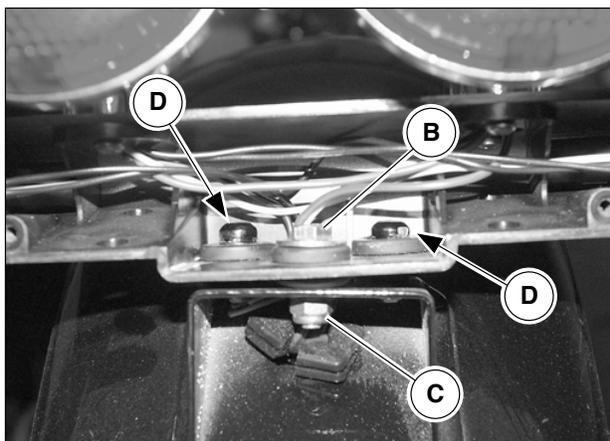


TAILLIGHT ASSEMBLY (CALIFORNIA EV 1997-2000 - JACKAL - STONE)

Removal:

- Unscrew the 3 screws "A" and remove the licence plate holder.
- Unscrew the screw "B" by retaining the nut "C".
- Remove the lock rings "D".
- Remove the taillight assembly.

 **N.B. For a complete removal it is necessary to disconnect all the electric wiring inside the taillight and the direction indicators after disassembling the relevant rear reflectors and parabola.**

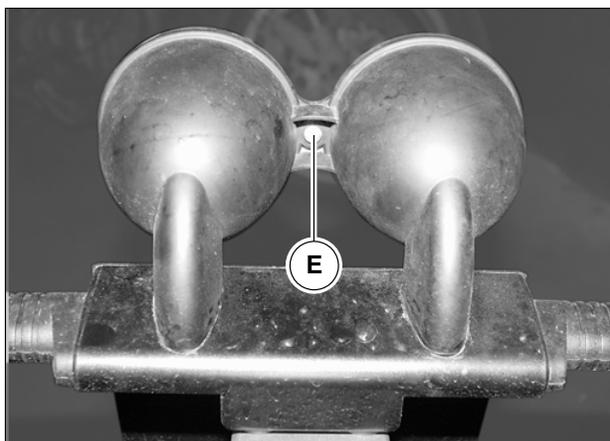


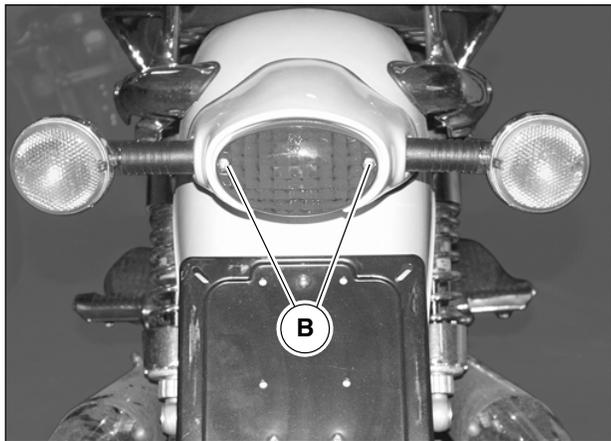
Refitting:

Refit following the removal procedures in reverse order.

Replacement of the taillight body bulbs:

- Unscrew the screw "E" securing the rear reflector to the taillight body.
- Remove the retro-reflector "F";
- Press the light-bulb towards the inside, turning it at the same time, and detach it from the light-bulb holder;
- Fit a new light-bulb.





TAILLIGHT ASSEMBLY (CALIFORNIA EV 2001 - SPECIAL - SPECIAL SPORT)

Removal:

- Unscrew the 3 screws "A" placed within the rear mudguard.
- Remove the taillight assembly.

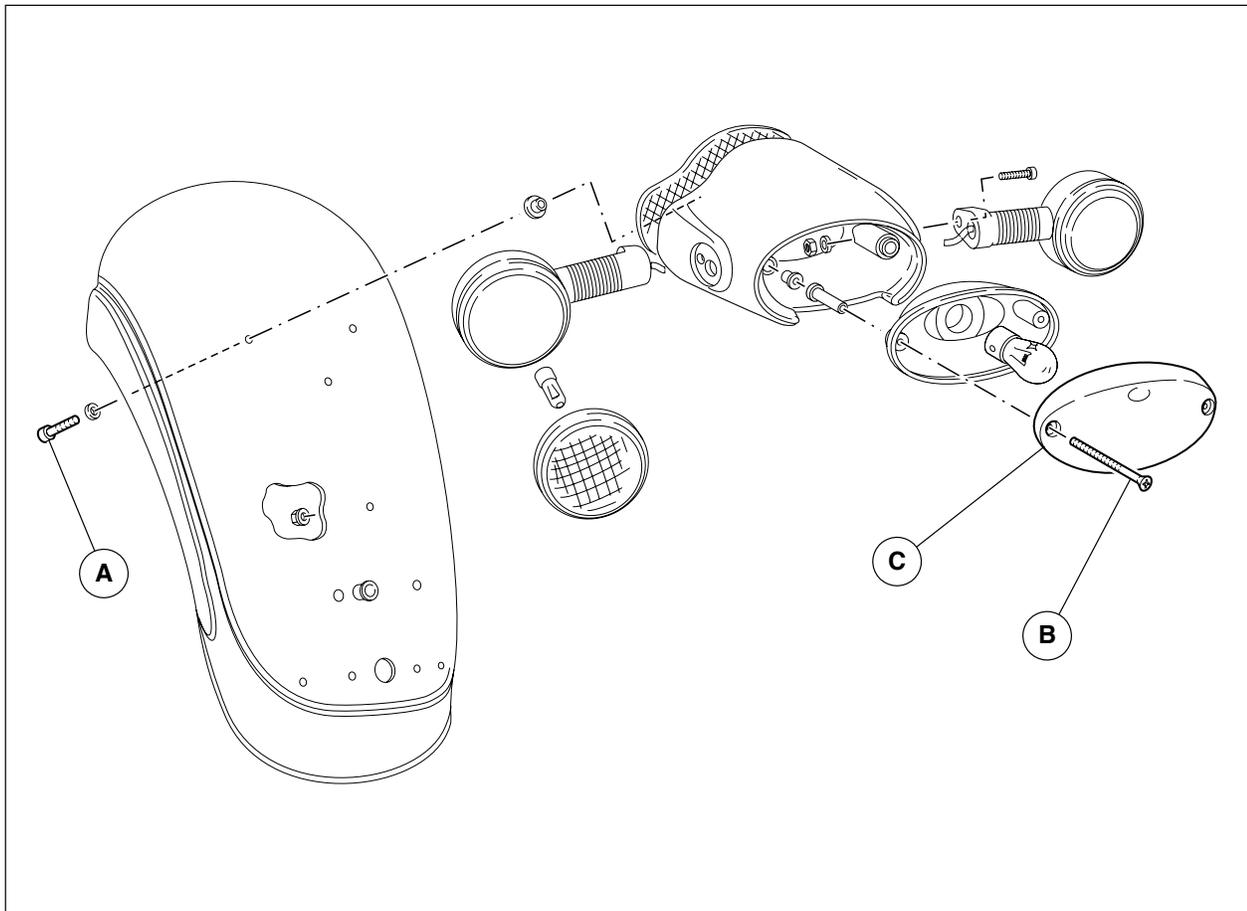
👁 N.B. For a complete removal it is necessary to disconnect all the electric wiring inside the taillight and the direction indicators after disassembling the relevant rear reflectors and parabola.

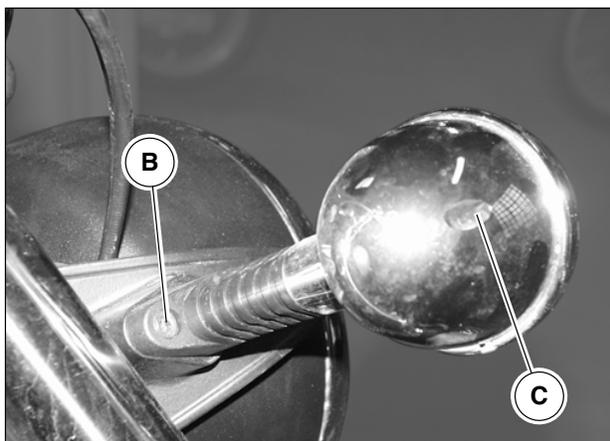
Refitting:

Refit following the removal procedures in reverse order.

Replacement of the taillight body bulbs:

- Unscrew the screws "B" securing the rear reflector to the taillight body.
- Remove the retro-reflector "C";
- Press the light-bulb towards the inside, turning it at the same time, and detach it from the light-bulb holder;
- Fit a new light-bulb.





FRONT DIRECTION INDICATORS

Removal:

- Remove the headlight, as described in this chapter;
- Disconnect the wiring "A" for the indicator to be removed;
- Unscrew the screw "B";
- Remove the indicator, taking care not to damage the cable.

 **N.B. To remove the cable, it is necessary to disconnect the electric wiring inside the indicator after disassembling the rear reflector and the parabola.**

Refitting:

Refit following the removal procedures in reverse order.

Light-bulb replacement:

- Unscrew the screw "C" fastening the retro-reflector to the direction indicators;
- Remove the retro-reflector
- Press the light-bulb towards the inside, turning it at the same time, and detach it from the light-bulb holder;
- Fit a new light-bulb.

 **N.B. Do not tighten the plastic retro-reflector fastening screws excessively as this could break them.**

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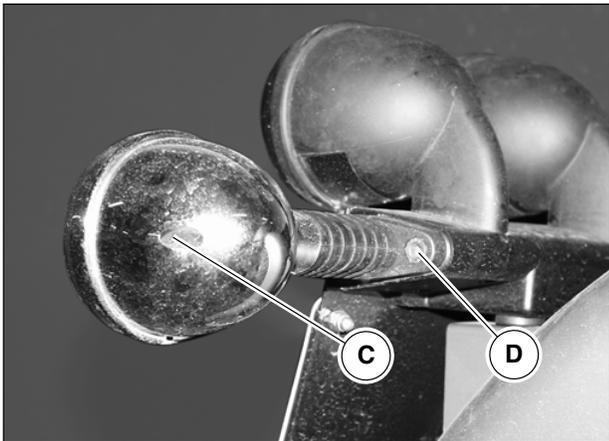
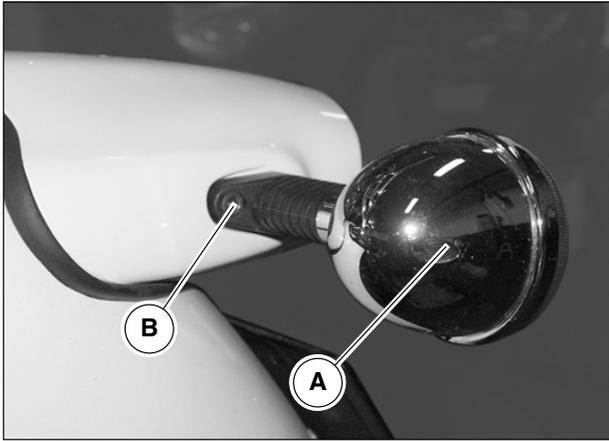
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REAR DIRECTION INDICATORS.

Removal CALIFORNIA SPECIAL - SPECIAL SPORT - EV 2001:

- Remove the taillight assembly as described in this section.
- Unscrew the screw "A" and remove the rear reflector.
- Disconnect the electric wiring on the parabola.
- Unscrew the screw "B" by retaining the nut inside with a 10-mm face spanner.
- Remove the indicator.

Removal CALIFORNIA EV (1997-2000) - JACKAL - STONE:

- Unscrew the screw "C" and remove the rear reflector.
- Disconnect the electric wiring on the parabola.
- Unscrew the screw "D" and remove the indicator.

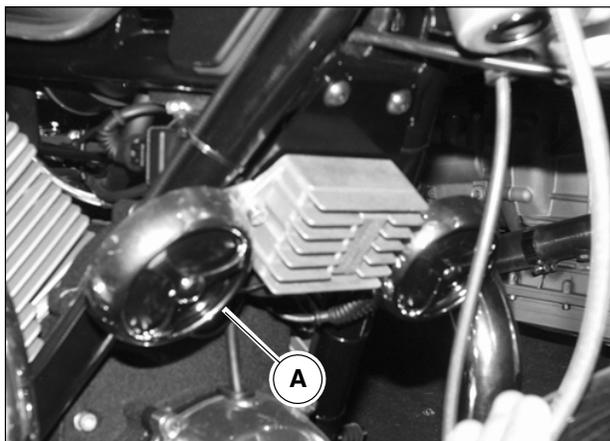
Refitting:

Refit following the removal procedures in reverse order.

Light-bulb replacement:

- Unscrew the screws "C" fastening the retro-reflectors to the direction indicators;
- Press the light-bulb towards the inside, turning it at the same time and detach it from the light-bulb holders;
- Fit the new bulbs.

 **N.B. Do not tighten the plastic retro-reflector fastening screws excessively as this could break them.**



ACOUSTIC SYSTEM

The acoustic system is composed of two horns; 1 high tone (H) and one low tone (L). The one on the RH side is the low tone.

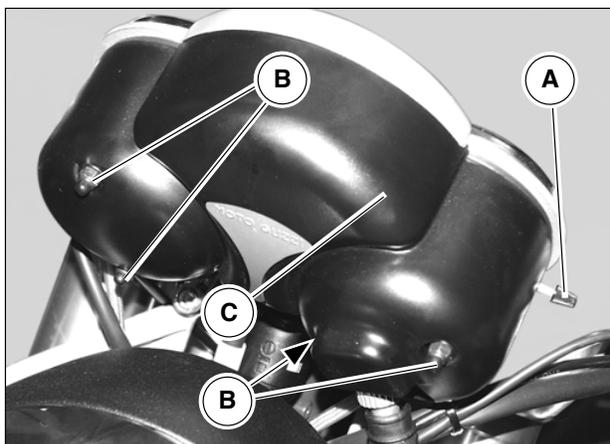
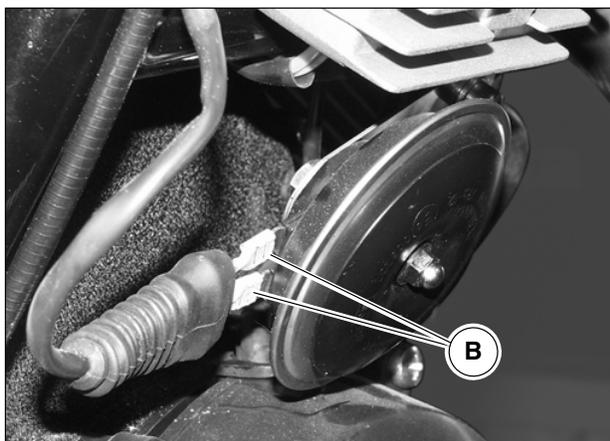
Removal:

- Remove the horn cover "A".
- Detach the two connectors "B";
- Unscrew the securing screw and remove it together with the washers.
- Remove the horn.

Refitting:

Refit following the removal procedures in reverse order.

N.B. On the "JACKAL" and "STONE" models, the sound system consists of one single standard horn; the second is optional.

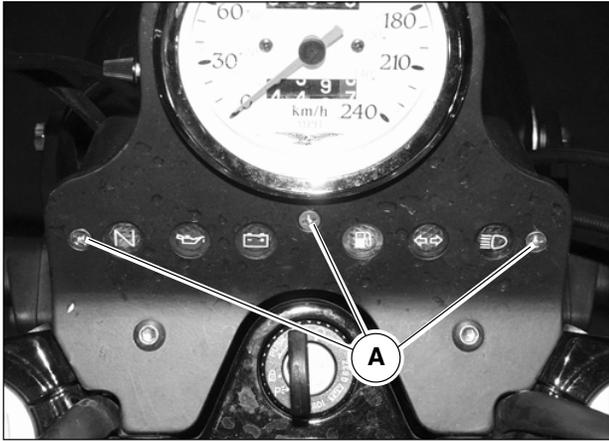


DASHBOARD WARNING LIGHTS CALIFORNIA SPECIAL SPORT

Replacement:

- Remove the headlight, as described in this chapter;
- Detach the resetting pin "A";
- Unscrew the 4 nuts "B";
- Remove the dashboard lower cover "C";
- Extract the light-bulb holders "D" and replace the light-bulbs "C".

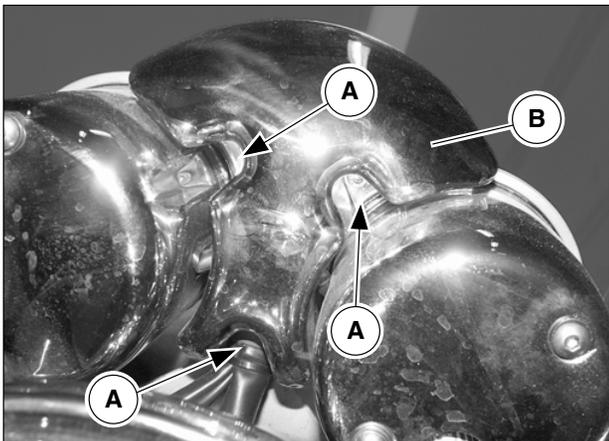
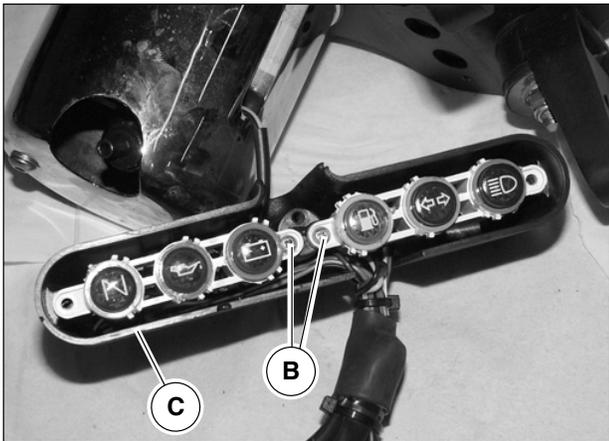




DASHBOARD WARNING LIGHTS CALIFORNIA JACKAL - STONE

Removal:

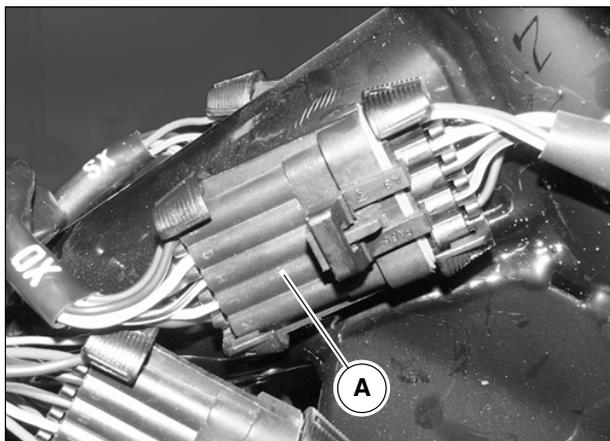
- Disassemble the headlight.
- Disassemble the lower warning light support "C" after unscrewing the 3 screws "A".
- Unscrew the screws "B".
- Extract the bulb holder and replace the bulb.



DASHBOARD WARNING LIGHTS CALIFORNIA EV - SPECIAL

Removal:

- Disassemble the headlight.
- Unscrew the 3 screws "A" securing the lower cover "B".
- Remove the lower cover "B".
- Extract the bulb holder and replace the bulb.



CONTROLS

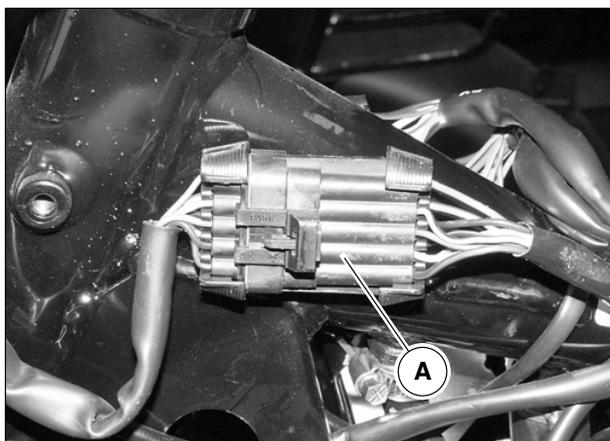
RH SIDE

Removal:

- Remove the accelerator control as described in chapter 4 section G;
- Remove the saddle as described in chapter 4 section E;
- Remove the tank as illustrated in chapter 3 sect. I;
- Detach the RH control cable from the main connector "A";
- Remove the cable from the chassis by cutting all the clamps fastening it;

Refitting:

Follow the removal procedure in reverse order and fasten the cable onto the chassis using new clamps.



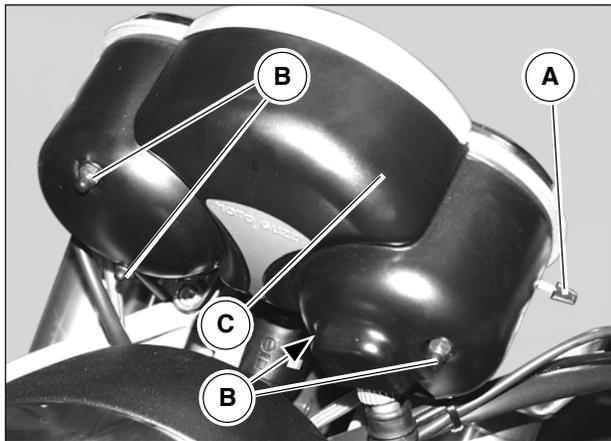
LH SIDE

Removal:

- Remove the saddle as described in chapter 4 section E;
- Remove the tank as illustrated in chapter 3 sect. I;
- Disconnect the LH control cable from the main connector "A"
- Release the cable from any eventual clamps;

Refitting:

Follow the removal procedure in reverse order.



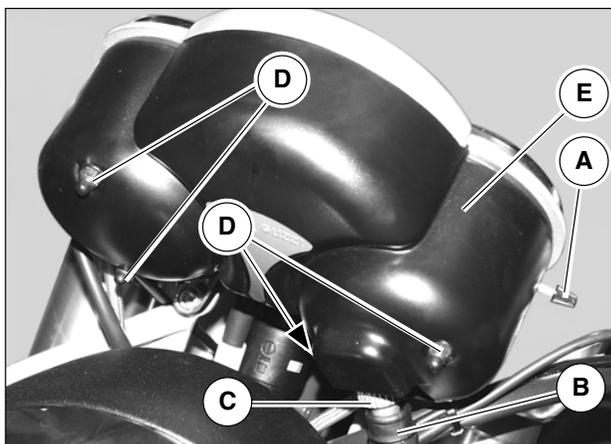
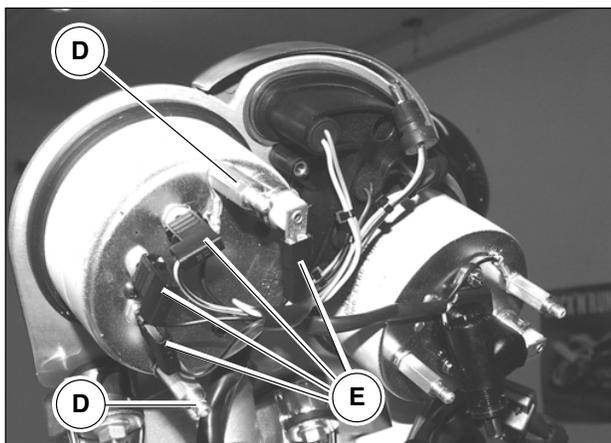
REVOLUTION COUNTER - ODOMETER CALIFORNIA SPECIAL SPORT

Revolution counter removal:

- Remove the headlight , as described in this chapter;
- Detach the resetting pin "A";
- Unscrew the 4 nuts "B";
- Remove the dashboard lower cover "C";
- Unscrew the stud bolts "D";
- Detach all the connectors "E" on the revolution counter;
- Detach the revolution counter by pulling it upwards and remove it.

Refitting:

Follow the removal procedure in reverse order.

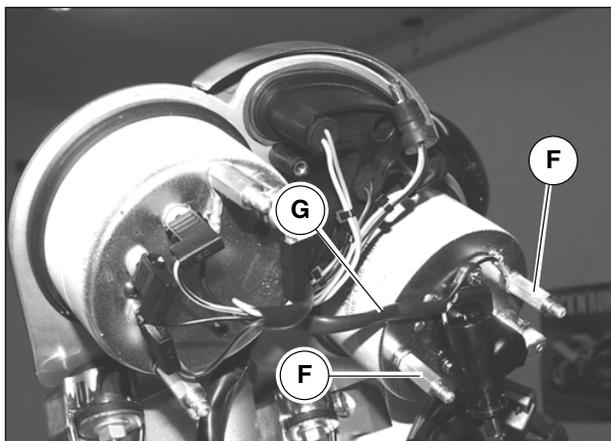


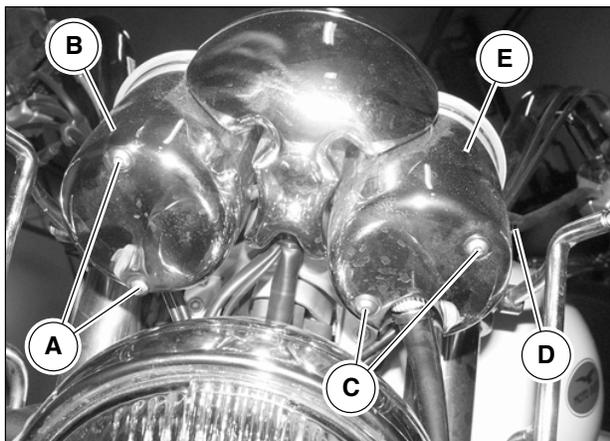
Odometer removal:

- Remove the headlight , as described in this chapter;
- Detach the resetting pin "A";
- Disconnect the odometer transmission "B" by unscrewing the knurled ring nut "C";
- Unscrew the 4 nuts "D";
- Remove the dashboard lower cover "E";
- Unscrew the stud bolts "F";
- Disconnect all the connectors on the revolution counter so as to be able to remove the wiring "G";

Refitting:

Follow the removal procedure in reverse order.





REVOLUTION COUNTER - ODOMETER CALIFORNIA EV - CALIFORNIA SPECIAL

Revolution counter removal:

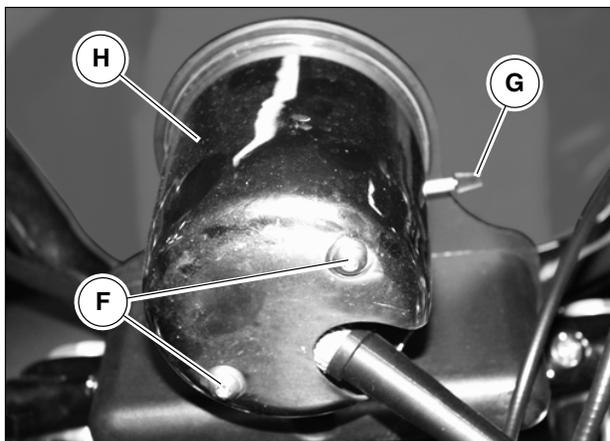
- Unscrew the screws "A".
- Remove the revolution counter "B".
- Extract the bulb holder and replace the bulb.

Odometer removal:

- Disassemble the headlight.
- Unscrew the screws "C".
- Remove the resetting pin "D".
- Remove the odometer "E".
- Extract the bulb holder and replace the bulb.

Refitting:

Follow the removal procedure in reverse order.



ODOMETER CALIFORNIA JACKAL - STONE

Odometer removal:

- Unscrew the screws "F".
- Remove the resetting pin "G".
- Remove the odometer "H".
- Extract the bulb holder and replace the bulb.

Refitting:

Follow the removal procedure in reverse order.

A

B

C

D

E

F

G

H

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L

M

N

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P

A

B

C

D

E

F

G

H

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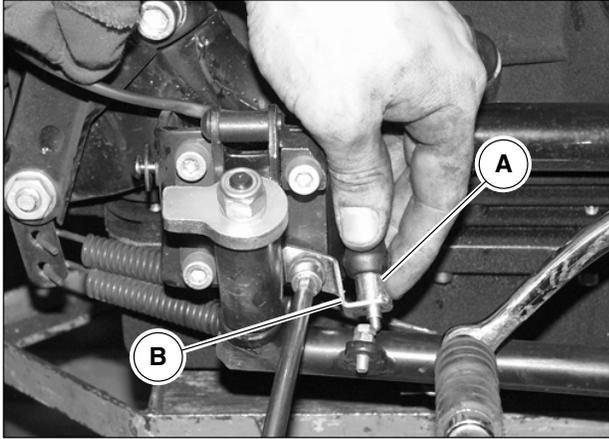
L

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P



5 SIDE STAND SWITCH

The motorbike is equipped with an arm which serves a side support for parking.

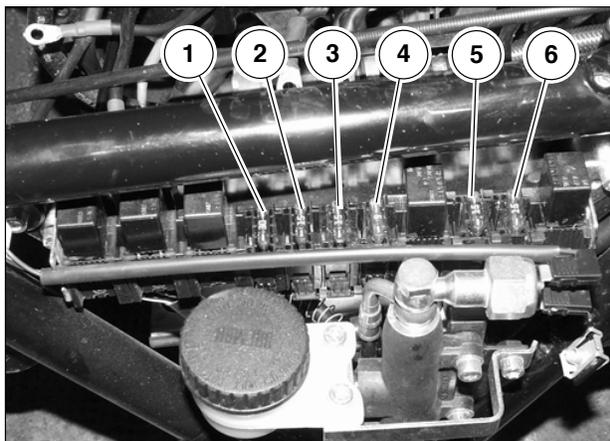
When the stand is in parking position (completely down), the micro-switch "A" activates a solenoid starter, which interrupts the power supply to the starter motor. In these conditions the engine cannot be started.

Removal:

- Remove the frame section cover.
- Disconnect the cable of the stand micro-switch.
- Unscrew and remove the micro-switch "A" from the support bracket "B".

Refitting:

- Insert the stand micro-switch within the bracket "B" and fully screw it in.
- Reconnect the wiring.



6 FUSE TERMINAL BOARD

CALIFORNIA EV 2001 - STONE - SPECIAL SPORT

6 fuses are fitted on the terminal board.
Before replacing a fuse or the fuses, it is necessary to eliminate the failure which caused melting.

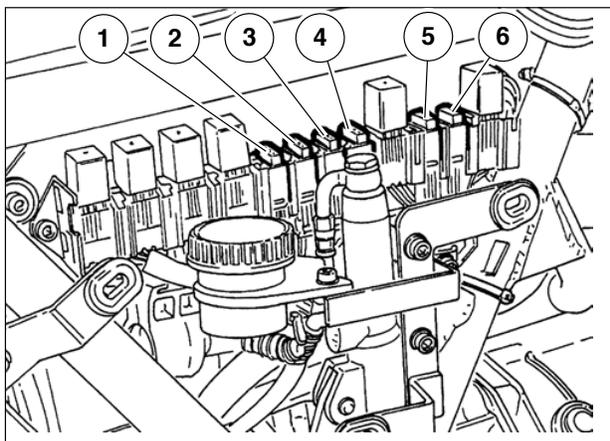
The 6 fuses are listed below:

FUSE "1": Battery charger	30 A
FUSE "2": Key-operated switch	15 A
FUSE "3": High beam, low beam, warning horn	15 A
FUSE "4": Direction indicator, parking light	5 A
FUSE "5": ECU.....	5 A
FUSE "6": Pump, coil, injectors.....	10 A

Replacement:

- Remove front seat as described in chapter 4 section E.
- Remove the RH side cover.
- Replace the damaged fuses.

TABELLA FUSIBILI					
F1 = 30A	F2 = 15A	F3 = 15A	F4 = 5A	F5 = 5A	F6 = 10A
RICARICA BATTERIA	COMMUTATORE A CHIAVE	L.ABB / ANABB AVV. ACUST.	INDIC. DIREZ. L. POSIZIONE	ECU	POMPA BOBINE INIETTORI
BATTERY RECHARGER	KEY SWITCH	L.HB / LB HORN	DIREC. INDIC. DIPPED L.	ECU	PUMP COIL INJECTORS



CALIFORNIA EV (1997-2000) - JACKAL - SPECIAL

6 fuses are fitted on the terminal board (15A).
Before replacing a fuse or the fuses, it is necessary to eliminate the failure which caused melting.

The 6 fuses are listed below:

FUSE "1": Electric cock
FUSE "2": Parking light, dashboard light, direction indicators
FUSE "3": Horn solenoid starter, starter motor
FUSE "4": High beam, low beam, passing
FUSE "5": ECU solenoid starter
FUSE "6": Fuel pump solenoid starter, coils, electro-injectors

Replacement:

- Remove front seat as described in chapter 4 section E.
- Remove the RH side cover.
- Replace the damaged fuses.

TABELLA FUSIBILI 15A (FUSES)					
1	2	3	4	5	6



A

B

C

D

E

F

G

H

I

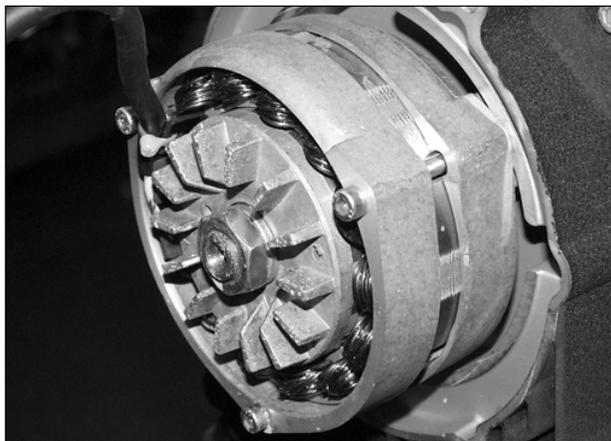
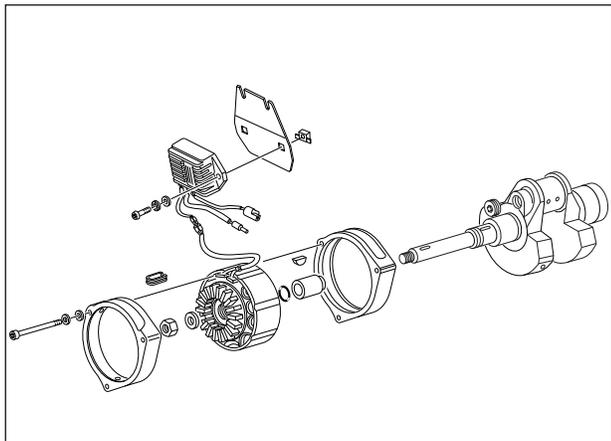
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7 ALTERNATOR - REGULATOR



WARNING

If connections are inverted the regulator will be irreversibly damaged.

Check that the regulator earth connections are efficient. Possible checks to be carried out on the alternator or regulator if the battery fails to re-charge or the power supply is no longer regulated.

ALTERNATOR

With the engine switched off, disconnect the two yellow generator cables from the rest of the system and then carry out the following tests with a ohmmeter:

CHECK THE WINDING ISOLATION TOWARDS EARTH

Connect one connecting point of the ohmmeter to one of the two yellow cables and the other connecting point to earth (laminar pack).

The instrument should indicate a value above 10 MΩ.

CHECK THE WINDING CONTINUITY

Connect the two connecting points of the ohmmeter to the two yellow cables.

The instrument should indicate a value of 0.2÷0.3 Ω.

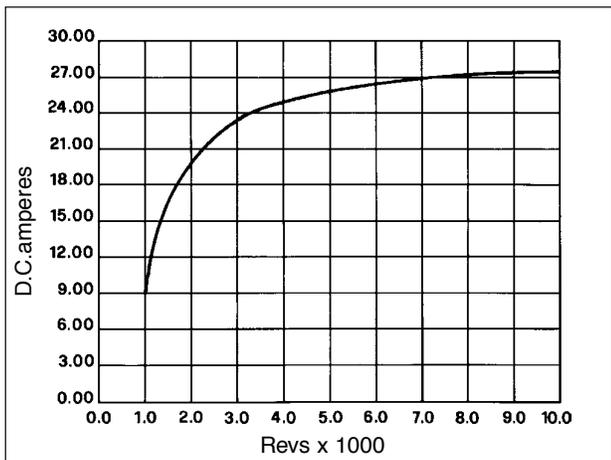
CHECK THE VOLTAGE OUTPUT

Connect an alternate 200 Volt capacity voltmeter to the two yellow cables.

Start the motor and check that the voltage output is included within the values indicated on the following tables:

r.p.m.	1000	3000	6000
A.C. volts	15	40	80

**CURRENT INTENSITY DIAGRAM
GRAFIK DER STROMSTÄRKE
DIAGRAM STROOMINTENSITEIT**



r.p.m.	D.C. Amps
1000	9,50
1200	13,00
1500	16,50
2000	20,00
3000	23,50
4000	25,00
6000	26,50
10000	27,50

7 ALTERNATOR - REGLER

⚠ ACHTUNG

Eine eventuelle Umkehrung der Anschlüsse beschädigt den Regler.

Sicherstellen, daß der Erdungsanschluß des Reglers einwandfrei funktioniert.

Mögliche Kontrolle des Wechselstromgenerators und des Reglers müssen ausgeführt werden, falls sich die Batterie nicht mehr auflädt oder die Spannung nicht mehr reguliert wird.

WECHSELSTROMGENERATOR

Bei stillstehendem Motor die zwei gelben Kabel des Wechselstromgenerators vom Rest der Anlage abziehen und mit einem Widerstandsmesser die folgenden Kontrolle durchführen:

KONTROLLE ISOLIERUNG DER WICKLUNG ZUR ERDUNG

Ein Ende des Widerstandsmessers mit einem der beiden gelben Kabel verbinden, das andere Ende mit der Erdung (Lamellenpaket).

Das Meßgerät muß einen Wert über 10MΩ anzeigen.

KONTROLLE DURCHGANG DER WICKLUNG

Widerstandsmesser an die beiden Enden der gelben Kabel anschließen.

Das Meßgerät muß einen Wert von 0.2÷0.3Ω anzeigen.

KONTROLLE AUSGANGSSPANNUNG

Einen Wechselstrommesser von 200 Volt an die Enden der zwei gelben Kabel anschließen.

Motor anlassen und überprüfen, ob die Ausgangsspannungen den Werten entsprechen, die in der nachfolgenden Tabelle aufgeführt sind:

Umdr/min.	1000	3000	6000
VAC	15	40	80

7 DYNAMO - WORDEN

⚠ OPGELET

Als de aansluitingen eventueel verwisseld worden kan de spanningsregelaar hierdoor onherstelbaar beschadigd worden.

Verzeker u ervan dat de massa-aansluiting van de spanningsregelaar absoluut deugdelijk is.

Mogelijke controles die op de dynamo en de spanningsregelaar verricht moeten worden indien het laden van de accu stopt of indien de spanning niet meer geregeld wordt.

DYNAMO

Koppel terwijl de motor stilstaat de beide gele kabels van de dynamo van de rest van de installatie los en verricht met een ohmmeter de volgende controles:

CONTROLE VAN DE ISOLATIE VAN DE WIKKELINGEN NAAR DE MASSA

Sluit één uiteinde van de ohmmeter aan op één van de beide gele kabels en het andere uiteinde op de massa (gelamelleerde groep).

Het instrument moet een waarde boven de 10MΩ uitwijzen.

CONTROLE VAN DE CONTINUÏTEIT VAN DE WIKKELINGEN

Sluit de ohmmeter aan op de uiteinden van de beide gele kabels.

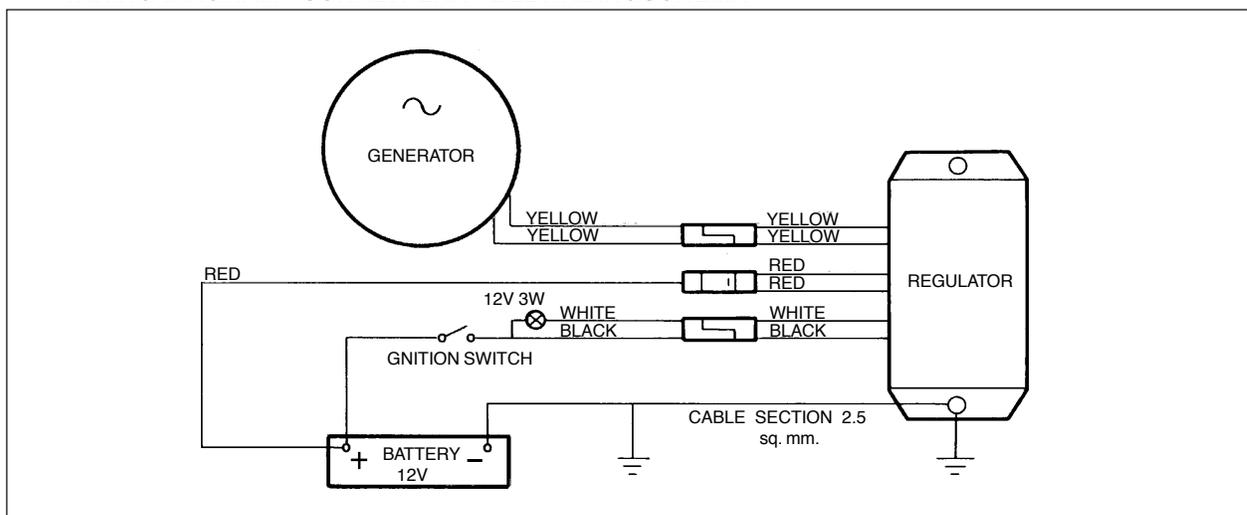
Het instrument moet een waarde van 0.2-0÷3 Ω uitwijzen.

CONTROLE VAN DE UITGANGSSPANNING

Sluit een wisselstroomdynamo met een vermogen van 200 Volt aan op de uiteinden van de beide gele kabels.

Start de motorfiets en controleer of de uitgangsspanning binnen de in onderstaande tabel aangegeven waarden blijft:

Toeren p. min.	1000	3000	6000
A. C. volt	15	40	80

WIRING DIAGRAM - SCHALTPLAN - BEDRADINGSHEMA

A

B

C

D

E

F

G

H

I

L

M

N

O

P



REGULATOR

The regulator has been calibrated in order to maintain the battery voltage at a value between 14÷14.6 Volts. The pilot light (illuminated when the engine is not running, but the key is in ON position) will switch off when the generator begins to charge, (approx. 700 r.p.m.)

REGULATOR CHECKS

Normal work-shop tools are generally insufficient for regulator checking, however, listed below are certain operations that can be carried out in order to detect regulators that are defective.

THE REGULATOR IS CERTAINLY DEFECTIVE IF:

After having isolated it from the rest of the system short circuits can be detected between the earth (aluminum casing) and any of the output cables.