

RS2.5Q

Chassis workshop manual



Index

Chassis

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Introduction

This workshop manual contains the main electromechanical checks, as well as the essential general checks and the fitting of components supplied separately, designed to prepare the factory-new moped for delivery.

It is very important to adhere strictly to the instructions set out in the manual. Interventions carried out superficially, or worse still, omitted entirely, may result in personal injury to the user, damage to the machine, etc., or may simply result in disagreeable complaints.

N.B.: **Rieju, S.A.** reserves the right to make changes at any time, without prior notification. For any enquiry, or for further complimentary information, please call the **Rieju S.A.** After-sales Service.

MANUAL UPDATES

Updates will be sent within a reasonable period of time. Each new CD-Rom will update previous information.

The contents list will be updated if the modifications and/or variations in the pages affect the ability to consult the manual.

IMPORTANT! This series of workshop manuals should be considered as work instruments in themselves and can only maintain their “value” over time if they are kept constantly up to date.

SYMBOLS USED IN THE MANUAL

CAUTION! Recommendations and precautions regarding rider safety and motor vehicle integrity.

**WARNING!**

Situations entailing the risk of personal injury to maintenance or repair mechanics, other workshop personnel or third parties, or damage to environment, vehicle or equipment.

**FIRE HAZARD**

Indicates operations which may constitute a fire hazard.

**RISK OF EXPLOSION**

Indicates operations which may constitute a risk of explosion.

**TOXIC**

Indicates a possibility of intoxication or inflammation of the upper respiratory tract.

**MECHANICAL MAINTENANCE**

Operations to be performed only by an expert mechanic.

**ELECTRICAL MAINTENANCE**

Operations to be performed only by an expert electrical / electronic technician.

**NO!**

Operations to be absolutely avoided.

**SERVICE MANUAL**

Indicates information which may be obtained by referring to said manual.

**SPARE PARTS CATALOGUE**

Indicates information which may be obtained by referring to said catalogue.

**ABBREVIATIONS USED IN THE MANUAL**

F	Figure
Pr Tr	Tightening torque
P	Page
Ap	Paragraph
S	Section
Es	Diagram
T	Table
Tr	Screw

Note:

The letter Tr in the illustrations refers to retaining or adjusting screws. The number following this letter refers to the number of the same type of screw in the unit or component described and illustrated. Letters not followed by a number indicate a single screw. In case of different screws being referred to in the illustration, the letter Tr is followed by a number and a small letter, for instance: (Tr4a).

Unless otherwise specified, units and components are reassembled by proceeding in the reverse order of removal.

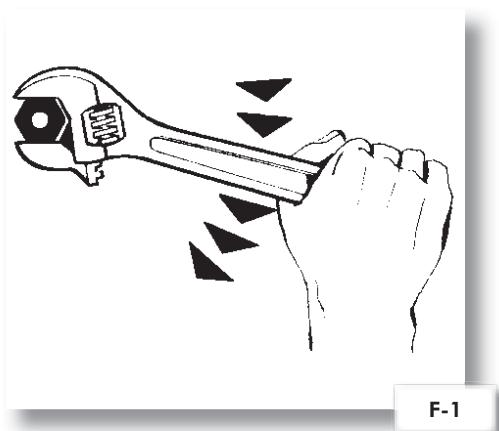
GENERAL WORK RULES

- The **advice**, **recommendations** and **warnings** given hereafter are aimed at ensuring maximum work safety as well as at considerably reducing the risk of accidents, personal injury, equipment damage and idle times. They should therefore be strictly adhered to.



ADVICE:

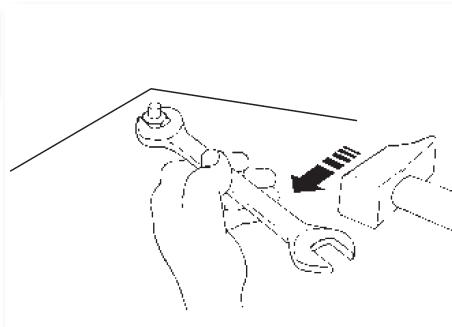
- Only use quality tools and equipment.
- Only use equipment conforming to EU Directives for lifting the vehicle.
- During operations, always keep tools and equipment at hand, possibly laying them out according to the sequence in which they are to be used. Absolutely avoid putting them on the vehicle itself, out-of-sight or in poorly accessible places.
- Always keep the work area clean and tidy.
- When tightening screws or nuts, start with the **larger diameter** or inner fasteners, and tighten them in progressive “**pulls**” in accordance to a “**criss-cross**” pattern.
- Preferably use open-end box wrenches by “**pulling**” and not “**pushing**”.
- Adjustable wrenches (F-1) should only be used in case of emergency, i.e. when a properly sized wrench is not available. They should preferably not be used as the movable jaw tends to open thus risking damaging or not properly tightening the bolt to the correct torque. In any case, when using an adjustable wrench, take care to proceed as shown in Figure I.
- Except for occasional customers, always make out and deliver to the customer a **work sheet** specifying the operations performed, with notes as to any future checks eventually required.



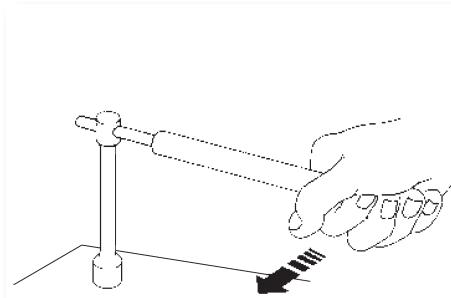


RECOMMENDATIONS

- Before carrying out any operation on the vehicle, wait for all parts to cool down.
- For operations requiring two mechanics, make sure that the various steps to be performed by each of them are clearly defined and coordinated beforehand.
- Make sure that each component has been properly fitted before proceeding with the next one.
- Lubricate all parts (where applicable) before reinstalling them.
- Gaskets, O-rings, circlips and split pins must be replaced at every refitting.
- The torque settings specified in the manuals refer to the “final torque”, which must be attained progressively by steps.
- Loosen and tighten aluminium alloy parts (covers) only after the engine has fully cooled down.
- Only use screwdrivers with sizes suitable to the screws to be loosened or tightened.
- Work in a comfortable position and ensure that the vehicle is stable.
- Never use a screwdriver as a lever or chisel.
- Never use pincers to loosen or tighten screws or nuts because, in addition to not providing a sufficient clamping force, they may also damage the screw head or nut hexagon.
- Never tap the wrench with a hammer or other similar tools to loosen or tighten screws and nuts (F. 2).
- Never attempt to increase the lever arm by fitting a tube into the wrench (F-3).



F-2



F-3

Introduction

Chassis



Never use open flames for any reason.



Never leave open containers or containers not suitable for holding fuel in passageways, close to heat sources, etc



Never use petrol to clean the vehicle or the floor of the workshop. Always use low flash point solvents to clean the vehicle components.



Never suck from or blow into the fuel pipe.

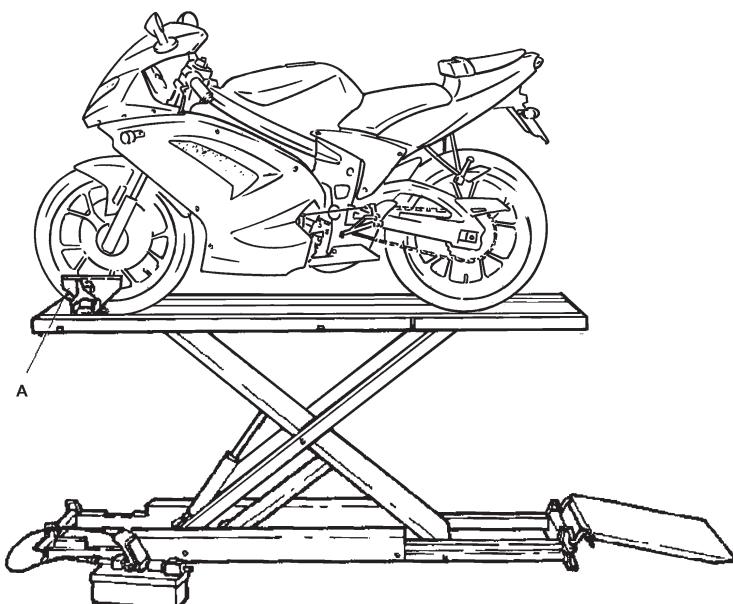
When welding, make sure that there are no flammable liquids in the vicinity. Always remove the tank, even if completely empty, and disconnect the negative cable (-) from the battery.

Never leave the engine running in closed or poorly ventilated areas.



Before any servicing, make sure that the motorbike is perfectly stable.

The front wheel should preferably be anchored to the equipment (A/F-4) integral with the lifting board.



F-4

Getting to know the motorbike

MAINTENANCE OPERATIONS	1ST SERVICE 1.000 KMS.	2ND SERVICE 3.000 KMS.	SER. EVERY 5.000 KMS.
Check the brake system	•	•	•
Check the transmission oil level	Change	•	Change
Check chain tension and wear	•	•	•
Check suspensions	•		•
Check, adjust and grease controls and cables	•	•	•
Clean and grease air filter	•	•	•
Check and adjust carburettor	•		•
Check and adjust or change spark plug	•	•	•
Check chassis – plastics nut and bolt tightness	•		•
Check electrical system	•		•
Check segment wear			•
Check radiator water level	•	•	•
Check exhaust system			•
Check oil pump functioning	•		•
Check battery condition and terminals	•	•	•



TECHNICAL SPECIFICATIONS

Dimensions	MATRIX	NAKED
Total length	1900 mm.	1900 mm.
Total width	620 mm.	725 mm.
Total height	1060 mm.	1060 mm.
Seat height	800 mm.	800 mm.
Distance between axles	1300 mm.	1300 mm.
Dry weight	MATRIX	NAKED
	109 kg.	102 kg.
Engine		
Type	2 stroke	
Number of gears	6 gears	
Make	Minarelli	
Model	AM 6 (EU 2)	
Cylinders, arrangement	1 forward tilting	
Cubic capacity	49.7 c.c.	
Diameter x stroke	40.3 x 39 mm.	
Starter system	Electrical	
Lubrication system	Pumped	
Type of oil	2 stroke injection	



Transmission oil	
Type	SAE 10W 40
Quantity	820 c.c.
Air filter	
	Wet-type sponge rubber
Fuel	
Type	95 octane lead-free petrol
Tank capacity	10 L.
Carburettor	
	Dellorto PHBN 16 HS
Spark plug	
Type	NGK BR 9 ES
Electrode gap	0,6 - 0,7 mm.
Clutch type	
	Multi-disk in oil bath
Primary transmission	
Clutch crown wheel	Z = 71
Drive pinion	Z = 20
Transmission ratio	I: 3,55
Secondary transmission	
Engine output pinion	Z = 11
Drag plate	Z = 47
Transmission ratio	I: 4,27
Chain	420 SR x 126 links

GEARCHANGE				
Speed	Primary shaft	Secondary shaft	Gear ratio	Output ratio
1 ^a	Z = 12	Z = 36	I: 3,00	I: 44,40
2 ^a	Z = 16	Z = 33	I: 2,06	I: 31,20
3 ^a	Z = 19	Z = 29	I: 1,53	I: 23,14
4 ^a	Z = 22	Z = 27	I: 1,23	I: 18,60
5 ^a	Z = 24	Z = 25	I: 1,04	I: 15,80
6 ^a	Z = 25	Z = 24	I: 0,96	I: 14,56



Suspension:		
Front	SHOWA inverted forks Ø 35mm stems. Oil capacity: 210 c.c. per stem Type of oil: SAE 10W	
Rear	PAIOLI forks Ø 37mm bars. Oil capacity – 380 c.c. per stem Type of oil: SAE 10W	
Rear	MONO-SHOCK shock absorber	
Brakes		
Front	Ø 280 mm disk brakes.	
Rear	Ø 220 mm disk brakes.	
Tyres		
Front	100/80 - 17, with Tubeless, 1'8 kg/cm ²	
Rear	130/70 - 17, with Tubeless, 2'0 kg/cm ²	
Electrical equipment		
Ignition	Electronic 12V 95W	
Generator	Ducati	
Ignition advance	20° 1'4mm. before P.M.S.	
Battery	12V 3 Ah	
Fuse	7,5 Ah	
Bulb voltage and wattage		MATRIX
Headlight	I2V 55W H3	I2V 60 / 55W H4
Rear sidelight	Leds	Leds
Turn indicators	I2V 10W	I2V 10W
Speedometer/milometer wiring	Leds	I2V 1,2W



UNPACKING

- Unpack the moped by following the instructions set out on the packing itself; the latter being then disposed of in accordance with existing regulations.

APPARANCE

- Check visually that all the plastic material components are correctly fitted and that the machine has no visible scratches, marks, etc.

DATA FOR IDENTIFICATION

Engine identification number

- Data for identifying the engine (A/F-1) can be seen on the left hand crankcase.



F-1

Machine identification number

- The machine identification number (B/F-2) is stamped onto the steering arm. This identification number is used to identify the moped.



F-2

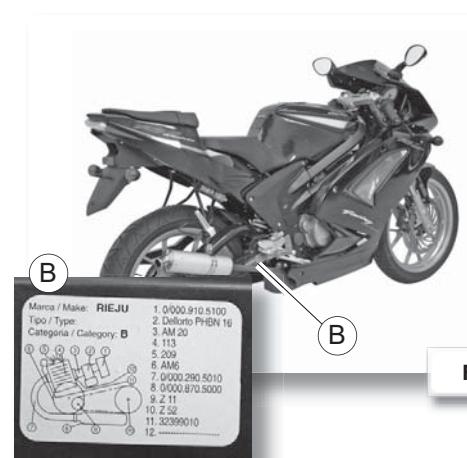
ANTI-TAMPERING LABEL

Contains the machine identification details (B/F-3) envisaged by Directive 97/24/CE.

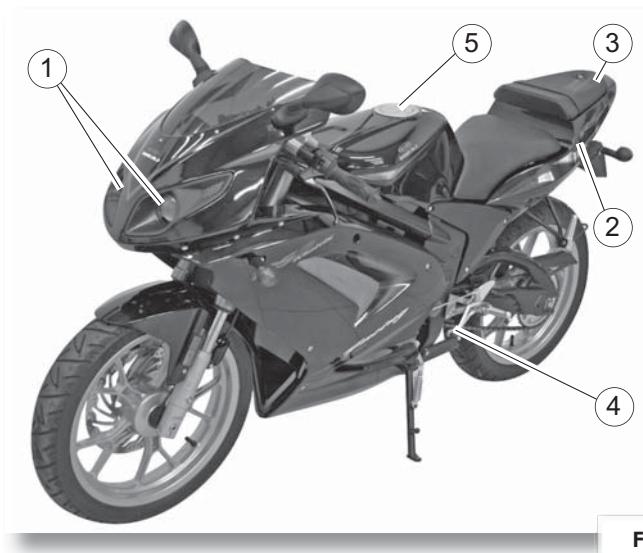
It is essential to indicate the machine identification details when ordering spare parts.

This label must not be substituted or modified in any way.

It is located on the right hand side of the swinging arm.

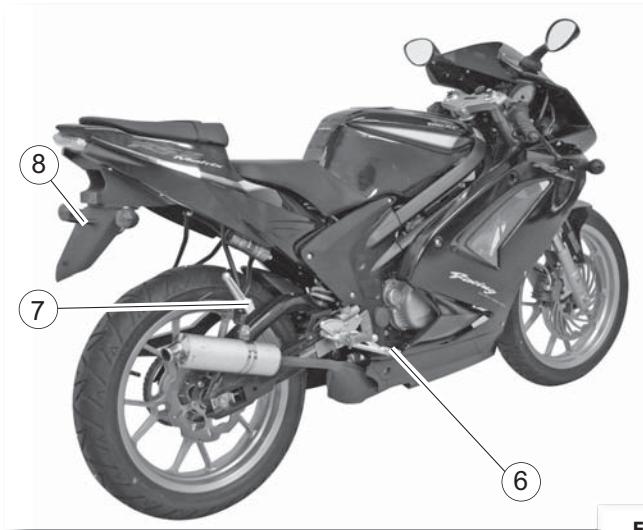


F-3

**IDENTIFYING THE MAIN ELEMENTS
(Left hand side)**

1. Headlight
2. Oil tank
3. Battery
4. Gear pedal
5. Fuel tank cap

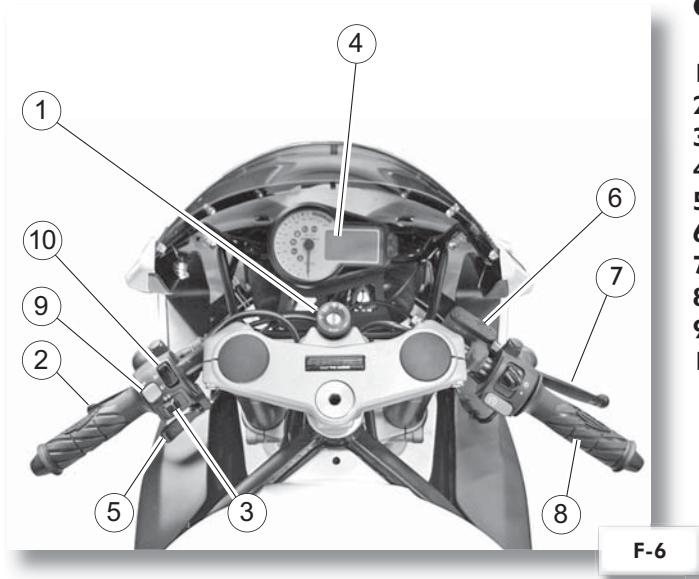
F-4

**IDENTIFYING THE MAIN ELEMENTS
(Right hand side)**

6. Rear brake pedal
7. Passenger footrests
8. Number plate light and plate holder

F-5

CONTROLS



Controls/instruments

1. Main switch
2. Clutch lever
3. Turn signal switch
4. Instrument panel
5. Manual starter lever
6. Front brake cylinder
7. Front brake lever
8. Throttle grip
9. Horn button
10. Dipswitch

KEYS

- The machine is supplied with two keys with a number code that enables:
 - The starter switch to be activated.
 - The steering to be locked.

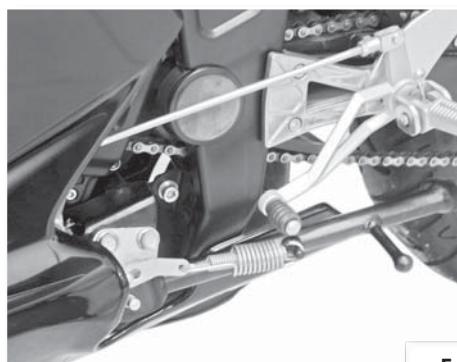
STEERING LOCK

Activation: With the handlebars turned to the left, insert the key fully and turn it to the left.

Deactivation: Turn the key to the right.

SIDE STAND

- Check that the side stand is properly fitted and moves correctly. It is also recommended that the retaining system, consisting of traction springs, be regularly checked.



INSTRUMENT PANEL

1- Turn indicator warning light

This warning light flashes when the turn indicator switch is moved to the left or to the right.

2- Coolant temperature warning light

This warning light comes on when the coolant temperature is too high. When the warning light comes on, stop the engine immediately.

3- Neutral position “N” warning light

This warning light comes on when the transmission is in neutral position.

4- Oil level warning light

This warning light comes on when the oil level is low.

5- Main beam warning light

This indicator lights up when the main headlight beam is in use.

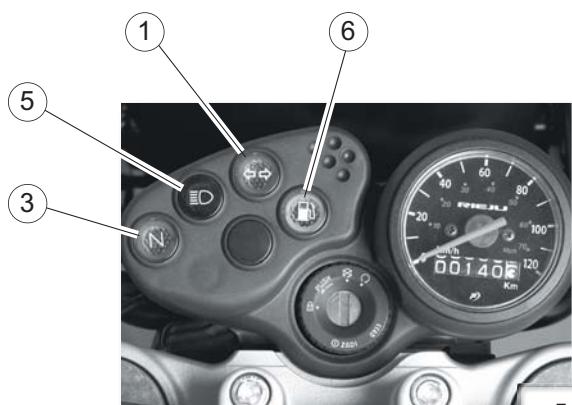
6- Fuel level warning light

This warning light comes on when the petrol level is low.



MATRIX RS2 version.

F-8



NAKED version.

F-9

TYRES**Dimensions**100/80 - 17, with Tubeless, 1'8 kg/cm²130/70 - 17, with Tubeless, 2'0 kg/cm²**CHECKING TYRE PRESSURES**

Tyre pressures must be checked and adjusted when the tyres are cold.



Wheel	bar
FRONT	1,8 kg / cm ²
REAR	2,0 kg / cm ²

F-10

FUEL TANK

Lift the cover (A/F-11), open the cap using the key, and refill the tank, taking care not to exceed the limit. If petrol splashes are to be seen on the moped after refilling, clean these off immediately.

Use normal lead-free petrol with a RESEARCH 95 octane number.

Fuel tank capacity:

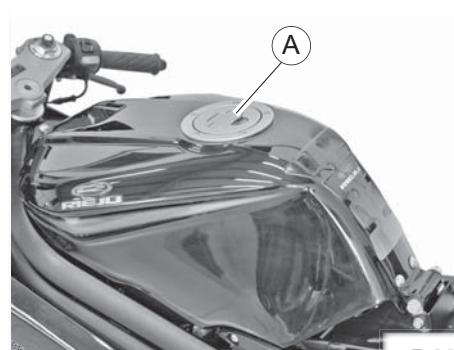
Total: 10 L.

**DANGER OF FIRE**

Operations that could start a fire.

**DANGER OF EXPLOSION**

Operations that could set off an explosion.

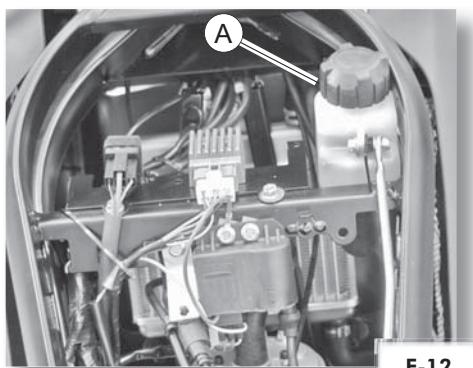


F-11

COOLANT

Check

1. Remove the radiator cap (A/F-12) with the engine cold and allowing the residual pressure to escape first.
2. Check the level of coolant with the engine cold, because this will vary depending on the temperature of the engine. The coolant level should cover the radiator panel.
3. If the level is lower than this, add coolant.
4. Refit the radiator cap.



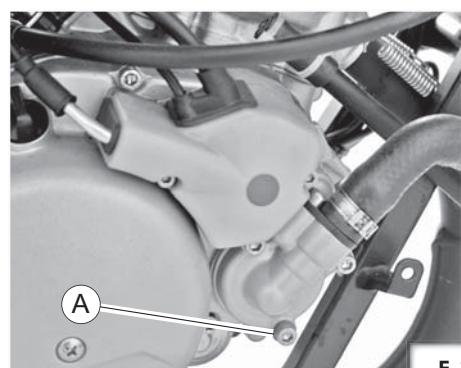
F-12

REPLACING COOLANT

Before performing this operation, place a container under the pipe.

1. Stand the machine on a flat surface and place a container under the radiator.
2. Drain the cooling circuit using the drain screw (A/F-13).

Should a larger than usual amount of coolant be required to reach the indicated level, or if replenishing needs to be done too often, check all the cooling circuit.



F-13

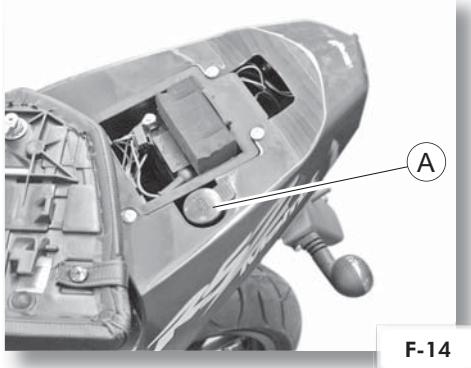
ENGINE OIL

Inside the tank there is an electrical contact that switches on the red reserve warning light on the instrument panel when the tank is low in oil.

Add oil, remove the cap (A/F-14) and refill carefully.

Recommended oil:

SYNTHETIC OIL FOR 2-STROKE ENGINES.



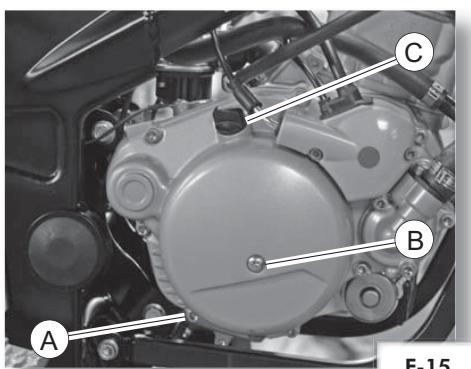
TRANSMISSION OIL

Change

1. Stand the machine on a flat service.
2. Warm up the engine for several minutes.
3. Stop the engine. Place a container under the engine to catch the oil and remove the filler cap (C/F-15).
4. Remove the drain plug (A/F-15) and the screw (B/F-15) to let the oil drain out.
5. Replace the drain plug (A/F-15) and tighten it.
6. Fill the engine with oil until it emerges from the level control hole (B/F-15). Replace the screw in the hole (B/F-15), replace the filler cap (C/F-15) and tighten it.

The use of 820cc of SAE 10W 40 oil is recommended.

Start up the engine and warm it up for a few minutes. While it is warming up, check that there are no oil leaks. If there are, stop the engine immediately and find out what is causing the leaks.

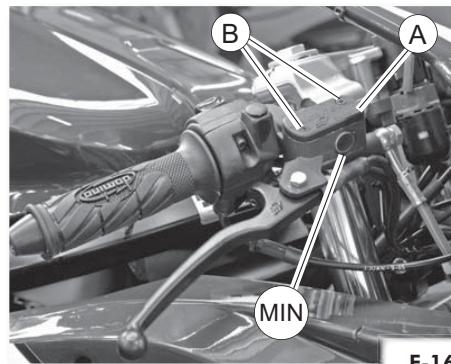


BRAKE FLUID

Check

When checking the level of the liquid, turn the handlebars to check that the top of the main cylinder is levelled.

Check that the brake fluid is over the minimum level in the rear brake reservoir, and check that there is enough fluid for the front brake by looking through the spy-hole in the cylinder.



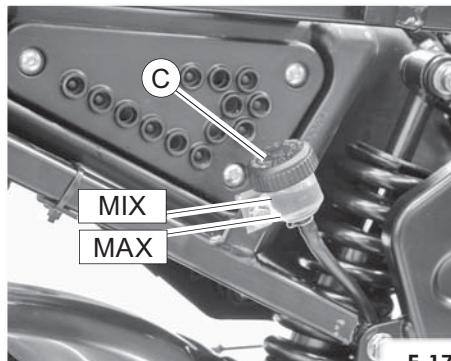
F-16

Change

For the front brake, remove the cover (A/F-16), having removed the bolts (B/F-16). For the rear brake, remove the cover (C/F-17).

The quality of the fluid used should conform to the specified regulations, since otherwise the rubber seals may deteriorate, leading to leaks and reducing the efficiency of the brakes.

Recommended brake fluid: DOT 4



F-17



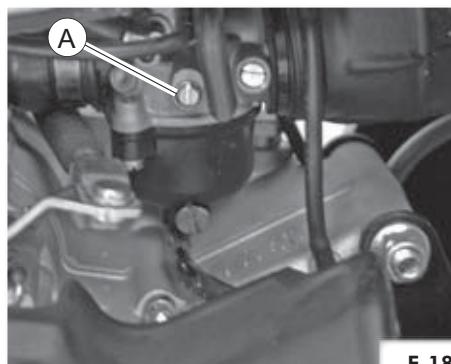
ATTENTION: Brake fluid is abrasive.

ADJUSTING THE MINIMUM REV SETTING

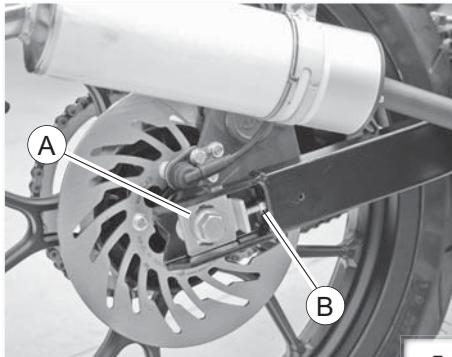
Start the engine and warm it up for a few minutes at a rate of 1000 to 2000 rpm, revving it from time to time up to 4000 to 5000 rpm. When the engine responds quickly to the throttle movement, this means that the engine has warmed up.

Adjust the minimum revs of the engine by turning the fuel regulating screw (A/F-18). Turn the screw to the right to increase the revs, and to the left to decrease them.

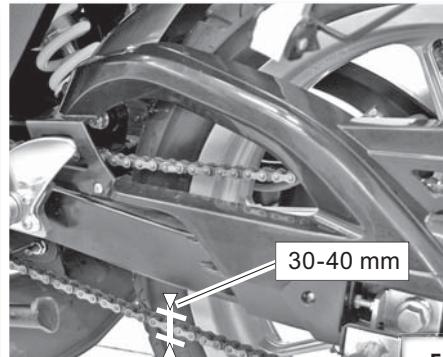
Check the ideal revs for the engine using an electronic tachometer connected to the spark plug lead.



F-18

ADJUSTING TRANSMISION CHAIN TENSION

F-19



F-20

Checking and adjusting the chain requires adjustment to the rear wheel axle, attempting at all times to work at the maximum point of chain tension.

To check the play, turn the rear wheel several times and check the tension at various points to find the tightest point.

The moped should be placed with both wheels on the ground, and chain play should be between 30 and 40 mm. (F-20)

The chain is adjusted by loosening the rear wheel axle (A/F-19) and screwing the nuts and bolts (B/F-19) adjacent to the axle in or out, ensuring that there is always the same distance on both sides of the axle.

Poor alignment of the chain and wheel may cause the chain to detach, as well as problems with the machine's stability.

The chain needs to be cleaned and greased periodically. The chain is made up of a large number of parts that work with each other. If the chain is not properly maintained, it will wear rapidly, and therefore it is highly advisable to grease it regularly, using special chain lubricating oil.

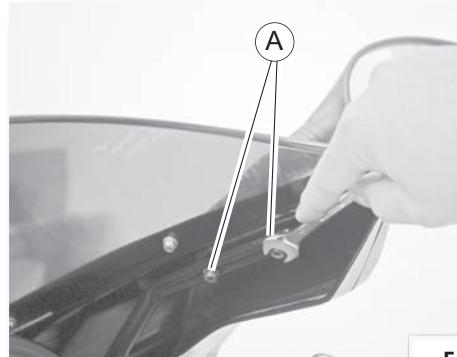
Before lubrication, the chain needs to be cleaned to remove the dirt and mud from the chain, using a brush and cloth, and the lubricant is then applied between the side plates, and on all the central rollers.

Disassembly



I. REARVIEW MIRRORS

Unscrew the 2 side bolts (A/F-1) and remove the rear-view mirror from the top.



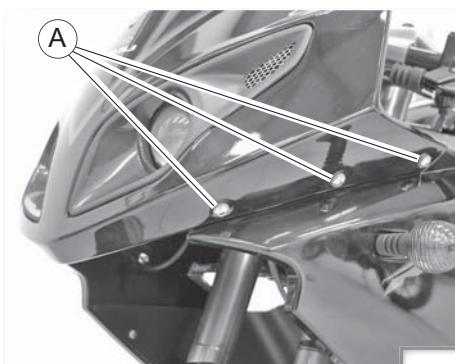
F-1

2. FRONT HEADLIGHT HOLDER

* Remove the rear-view mirrors.

Unscrew the 3 screws (A/F-2) on both sides of the headlight holder.

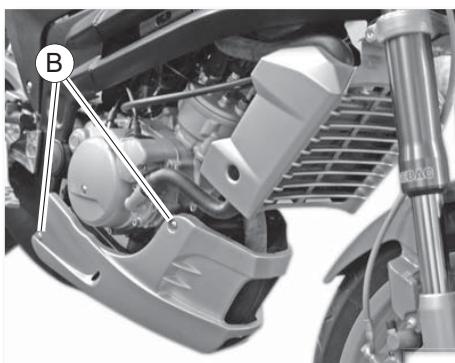
Then pull out the unit to remove it.



F-2



F-3



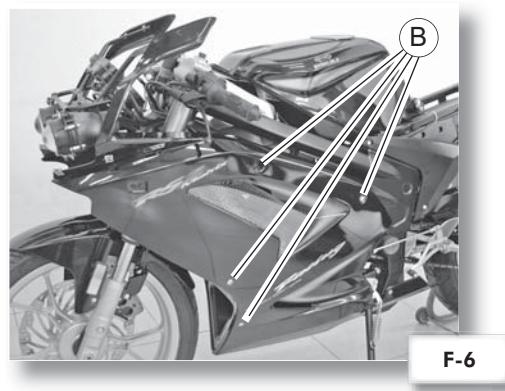
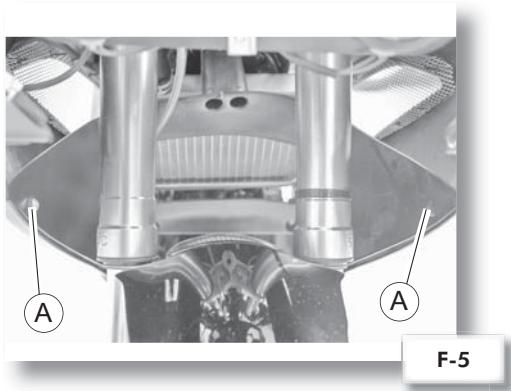
NAKED version.

Unscrew the 2 screws (B/F-4) on both sides.



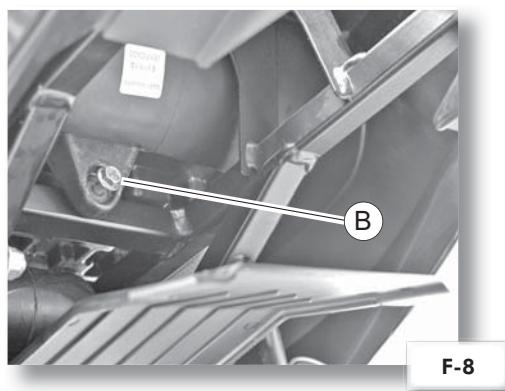
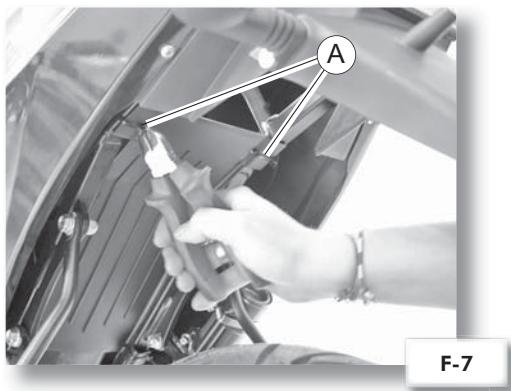
3. FRONT SIDE COVERS

* Remove the headlight holder and the front turn indicator lights.
Unscrew the 2 side screws (A/F-5) and the screw located at the front,
the 2 screws (B/F-6) at the bottom and the 4 screws (B/F-6) on the side of the cover.



4. SEAT

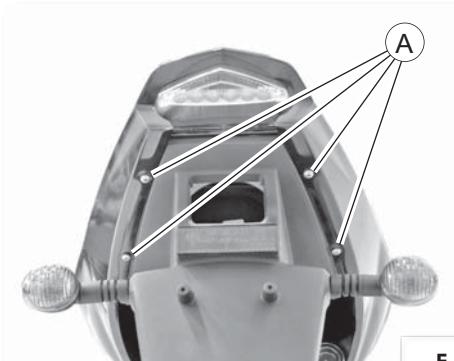
Cut the two top straps (A/F-7) on the rear mudguard to access the seat securing bolt.
Then, unscrew the bolt (B/F-8) securing the seat.





5. NUMBER PLATE HOLDER

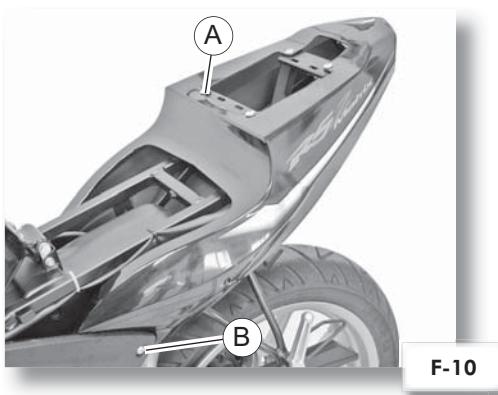
* Remove the rear turn indicator lights.
Unscrew the 4 screws (A/F-9) located at the bottom.



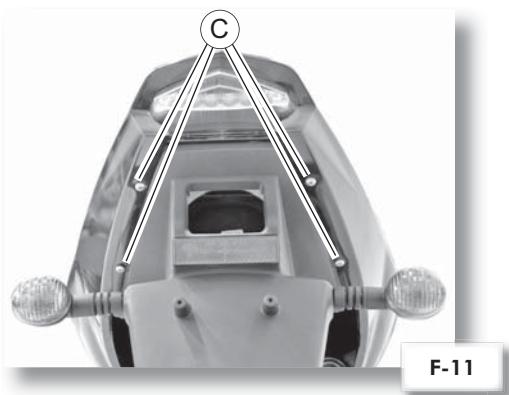
F-9

6. REAR COVER

*Remove the rider's seat and the pillion passenger seat.
Unscrew the 4 top bolts (A/F-10), the 2 side bolts (B/F-10)
and the 4 bolts (C/F-11) securing the number plate holder.
Then pull out the unit to remove it.



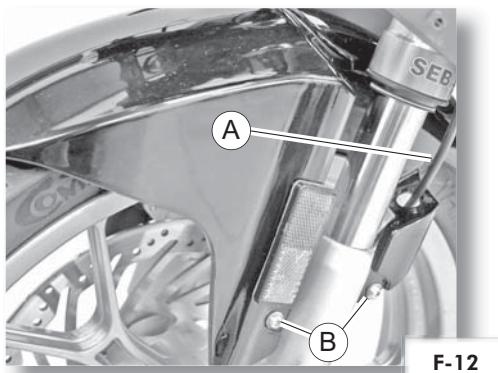
F-10



F-11

7. FRONT MUDGUARD

Disconnect the speedometer cable (A/F-12) from the control panel and withdraw it through the hole in the mudguard.
Then unscrew the 2 screws (B/F-12) located at both sides of the mudguard.



F-12

8. FUEL TANK

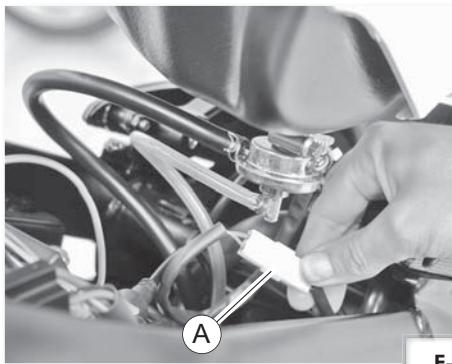
Remove the clips securing the pipe (B/F-14).

Remove the pipes from the tap.

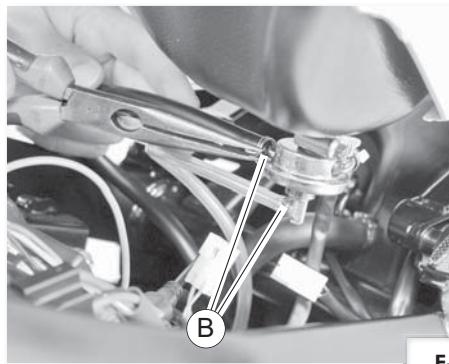
Disconnect the fuel level sensor (A/F-13).

Unscrew the bolt (C/F-15) securing the tank to the chassis.

Then remove the tank by pulling it upwards.



F-13



F-14



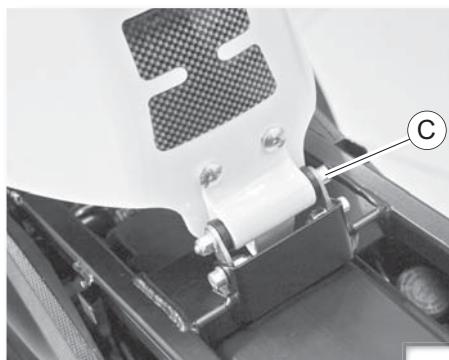
DANGER OF FIRE

Operations that could start a fire.



DANGER OF EXPLOSION

Operations that could set off an explosion.

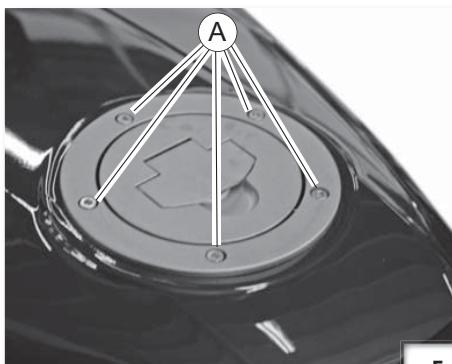


F-15

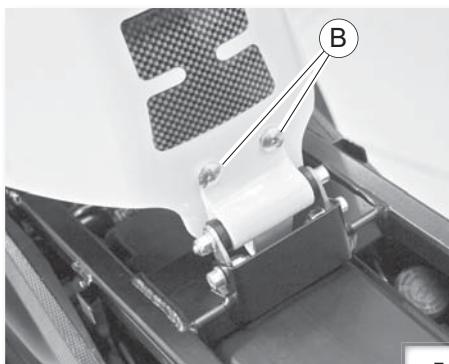
9. FUEL TANK PROTECTOR

Unscrew the 5 screws (A/F-16) at the top.

Then unscrew the 2 bolts (B/F-17) at the back and remove the protector.



F-16



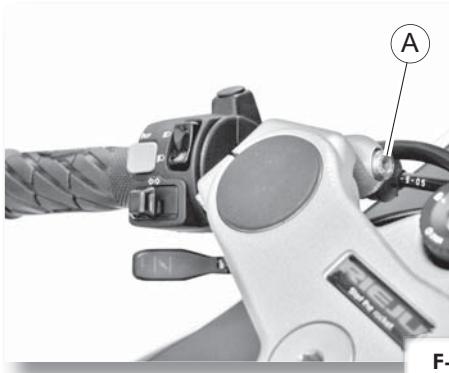
F-17



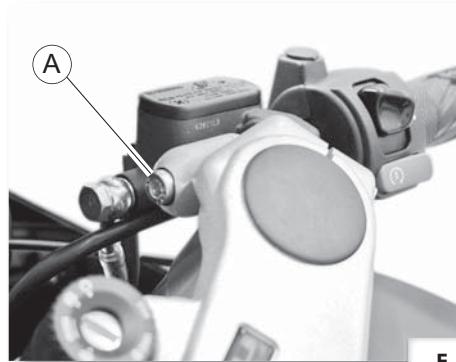
10. HANDLEBARS

* Remove the controls on each end.

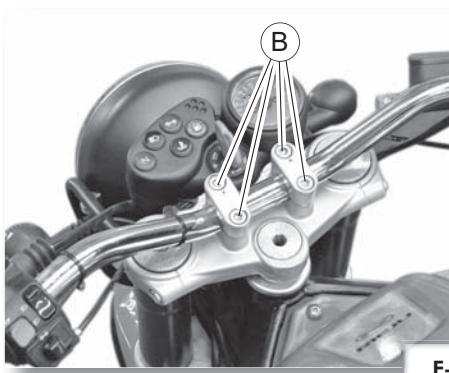
Unscrew the 2 side bolts (A/F-18-19) and remove the right and left handlebars.



F-18



F-19

**NAKED version.**

* Remove the controls on both sides.
Unscrew the 4 screws (B/F-20).

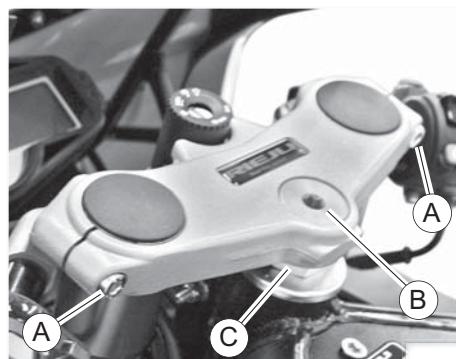
F-20

11. STEERING

Unscrew the 2 bolts (A/F-21) on the sides of the handlebars.

Extract the top nut (B/F-21) and remove the top plate.

To extract the shaft, unscrew the nut (C/F-21).

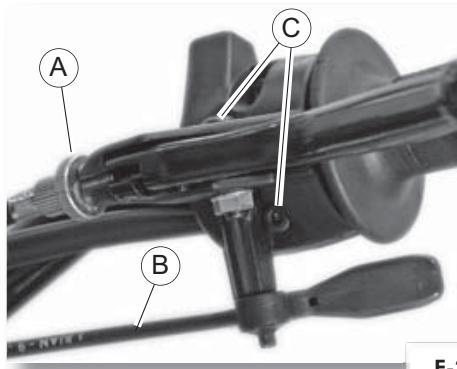


F-21

12. CLUTCH LEVER

Disconnect the clutch cable (A/F-22) and the choke cable (B/F-22).

Then unscrew the 2 bolts (C/F-22) and remove the lever.



F-22



13. FRONT BRAKE CYLINDER

Disconnect the brake light microswitch terminals.

Unscrew the connector (A/F-23) securing the pipe to the brake cylinder.

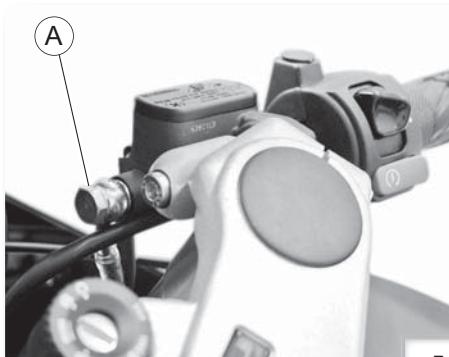
Then, unscrew the 2 bolts (B/F-24) and remove the front brake cylinder.



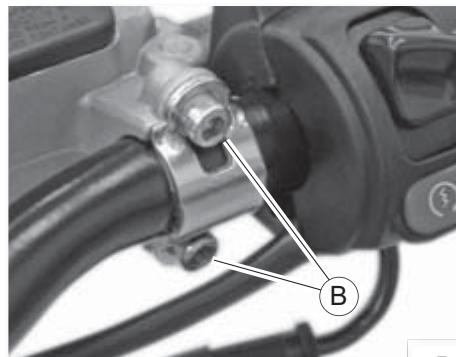
ATTENTION: when reassembling, it is recommended to renew the copper seals and bleed the circuit.



ATTENTION: Brake fluid is abrasive.



F-23



F-24

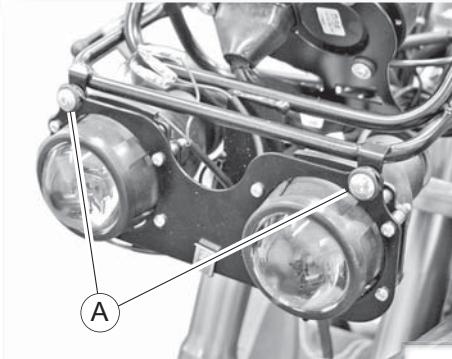


14. FRONT HEADLIGHT

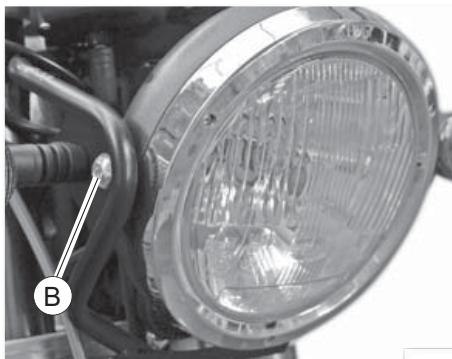
* Remove the front headlight holder.
Disconnect the wires.
Then unscrew the 2 bolts (A/F-25) securing the headlight to the headlight holder.



ATTENTION: Pay attention to the position of the wires, to enable subsequent re-assembly.



F-25



NAKED version.

Disconnect the headlight from the general wiring.
Then unscrew the 2 screws (B/F-26) on the sides.

F-26

15. FRONT INDICATOR LIGHTS

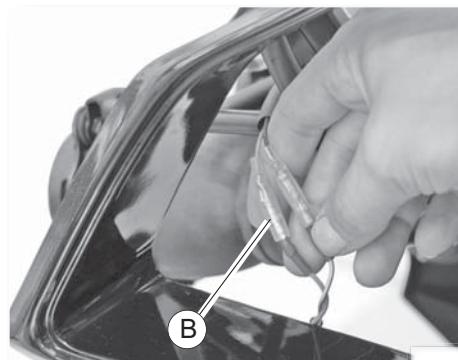
Unscrew the bolt (A/F-27), while holding the nut on the inside.
Then disconnect the light (B/F-28) from the general wiring.



ATTENTION: Pay attention to the position of the wires, to enable subsequent re-assembly.



F-27



F-28

I6. REAR LIGHT



* Remove the rear cover.

Cut the clip securing the wires and disconnect from the general wiring.

Then loosen the 2 bolts (A/F-30) securing the light to the mudguard.

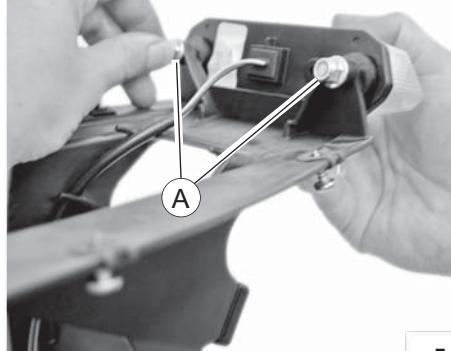
To extract it, pull the wire to withdraw the light.



ATTENTION: Before proceeding to dismantle the lights, pay attention to the sequence of the terminals, to enable subsequent re-assembly (see wiring diagram).



F-29



F-30

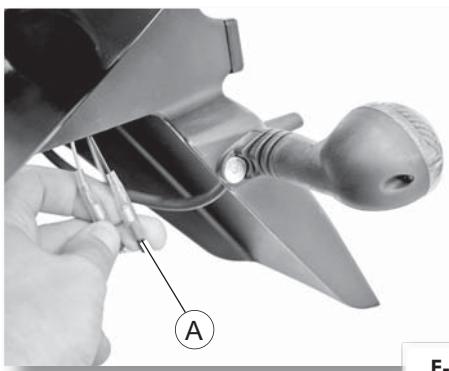
I7. REAR INDICATOR LIGHTS

Cut the clip securing the wires (A/F-31) and disconnect from the general wiring.

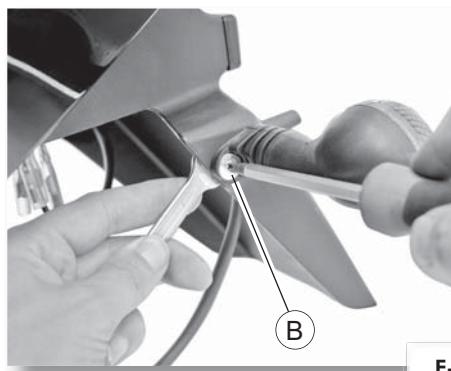
Then loosen the screw (B/F-32) and pull the wire to withdraw the light.



ATTENTION: Before proceeding to dismantle the lights, pay attention to the sequence of the terminals, to enable subsequent re-assembly (see wiring diagram).



F-31



F-32

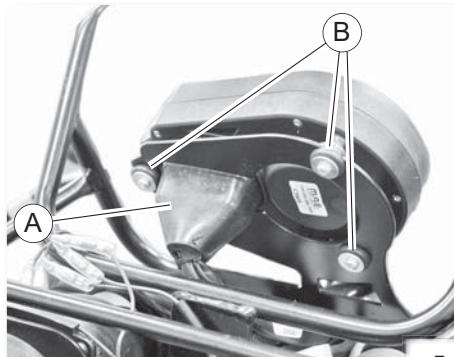


18. INSTRUMENT PANEL

* Remove the front headlight holder.

Disconnect the speedometer cable (A/F-33).

Then unscrew the 3 bolts (B/F-33) securing the screen to the support.



RS2 MATRIX version.

F-33



NAKED version.

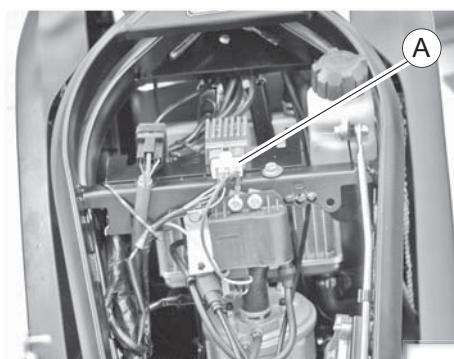
Disconnect the instrument panel.

Then unscrew the 2 screws.

F-34

19. TURN INDICATOR REGULATOR

Disconnect the regulator from the wiring (A/F-35).



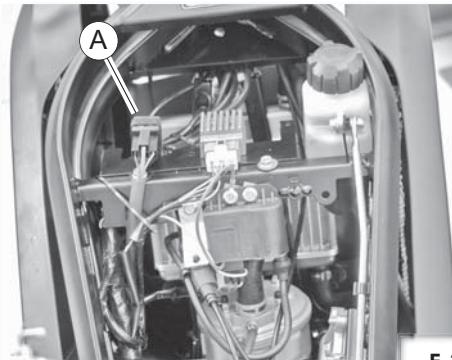
F-35



ATTENTION: Remember to reconnect the earth wire when reassembling.

20. CONTACT RELAY

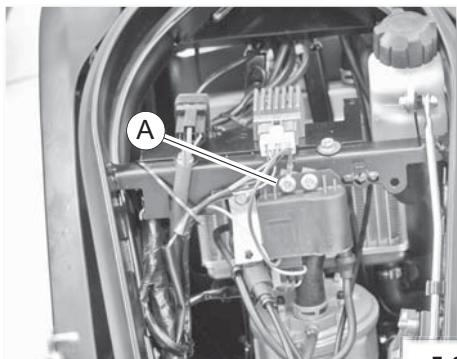
Disconnect the contact relay (A/F-36) from the general wiring.
Then extract it from the holding rubber.



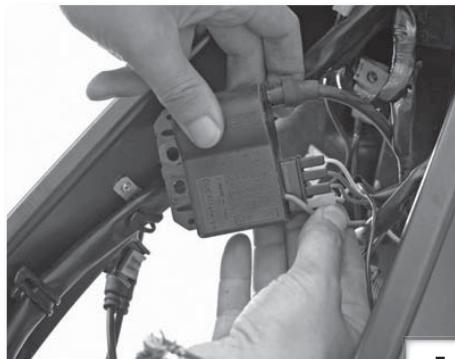
F-36

21. CONTROL UNIT (CDI)

Unscrew the 2 securing screws (A/F-37) and then disconnect from the wiring.



F-37

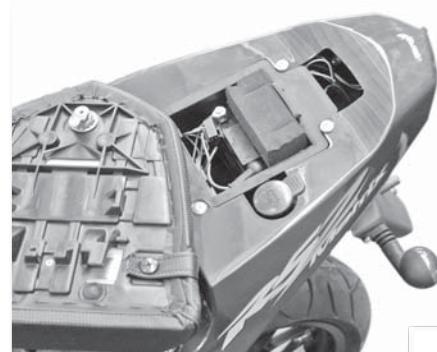


F-38



22. BATTERY

* Remove the pillion passenger seat.
Disconnect the two wires (red positive and black negative).
Withdraw the securing rubber and then remove the battery by pulling it upwards.



F-39

23. OIL SENSOR

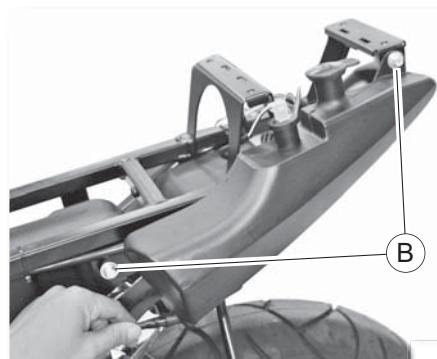
* Remove the seat and the rear cover.
Disconnect the sensor from the wiring and pull the sensor upwards to remove it.



F-40

24. OIL TANK

* Remove the seat and the rear cover, and disconnect the level sensor.
Disconnect the pipe from the tank.
Then unscrew the 2 bolts (B/F-41) securing the tank to the chassis and remove it.



F-41

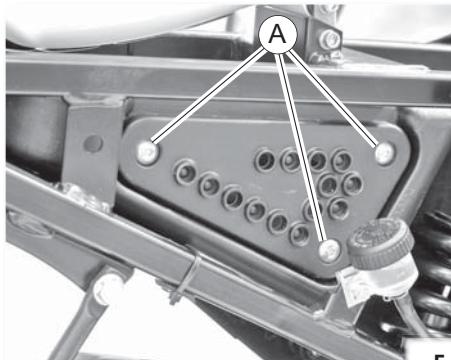


ATTENTION: Before proceeding with the dismantling, drain the oil from the tank.

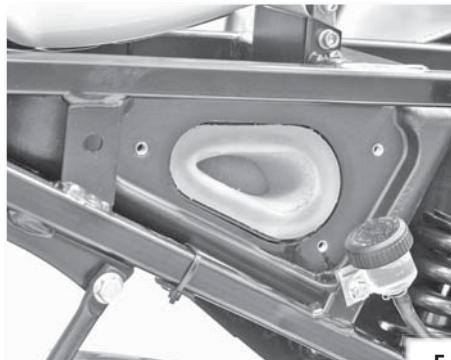


25. AIR FILTER

* Remove the seat and the rear cover.
Unscrew the 3 filter cover bolts (A/F-42) and remove the filter.



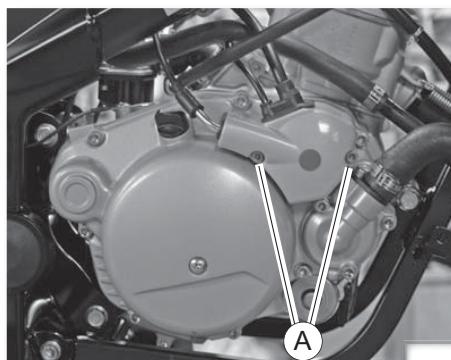
F-42



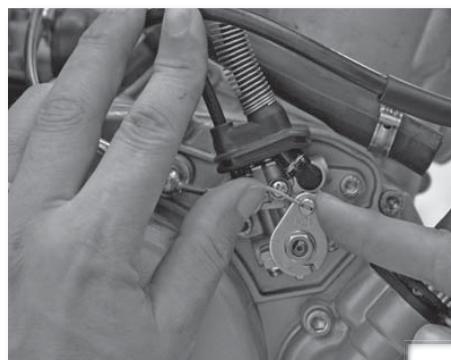
F-43

26. FUEL TRANSMISSION/OIL MIXER

Unscrew the 2 cover screws (A/F-44).
Pull back the sensor and remove the fuel cable.



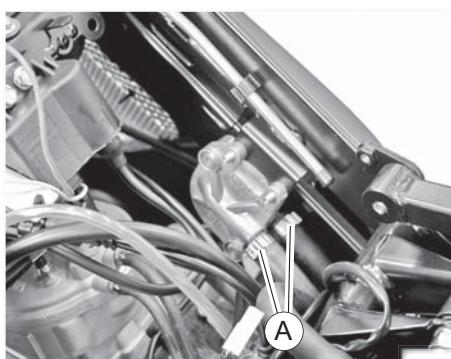
F-44



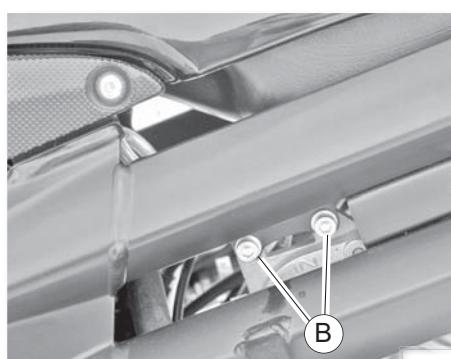
F-45

27. "AIS" SYSTEM (Secondary air valve)

Disconnect clips (A/F-46).
Unscrew the 2 securing bolts (B/F-47).



F-46



F-47



28. EXHAUST

Disconnect the breather pipe (AIS system) (A/F-48) and remove the exhaust pipe by pulling out forwards.

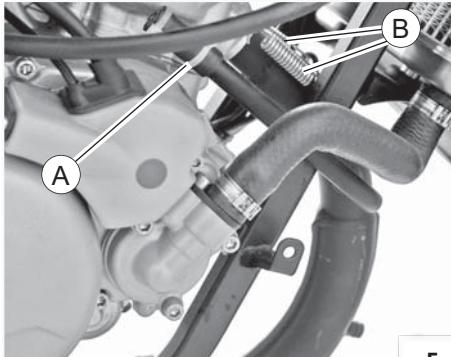
Remove the 2 springs (B/F-48) securing the exhaust pipe to the engine at the front.

Unscrew the screw (F/F-51) securing the exhaust.

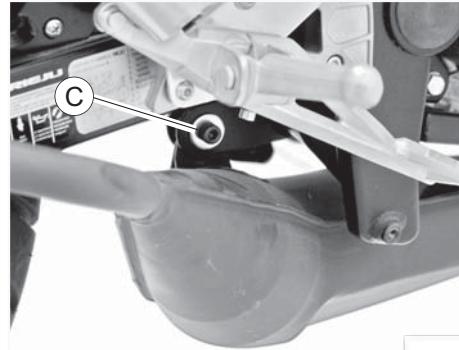
Unscrew the clip (C/F-49) securing the exhaust pipe to the chassis.



ATTENTION: Before proceeding to dismantle the exhaust pipe, make sure it has cooled down.



F-48



F-49

29. SILENCER

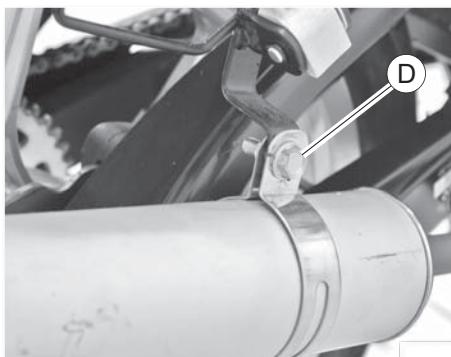
Unscrew the bolt (D/F-50) securing the silencer to the chassis.

Then, Loosen the 3 nuts (E/F-51) securing the silencer to the exhaust pipe.

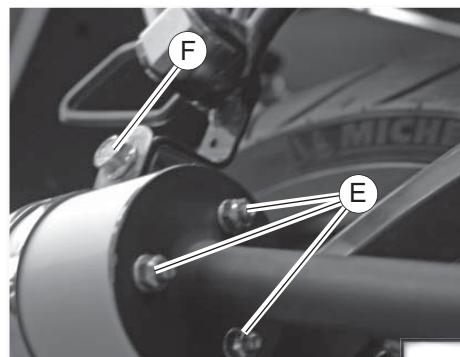
To extract the silencer, pull it backwards.



ATTENTION: Before proceeding to dismantle the silencer, make sure it has cooled down.



F-50



F-51



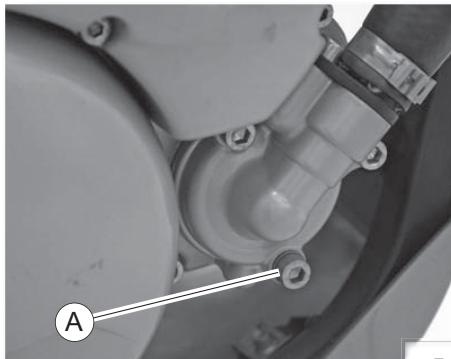
30. RADIATOR

*Remove the front side covers.

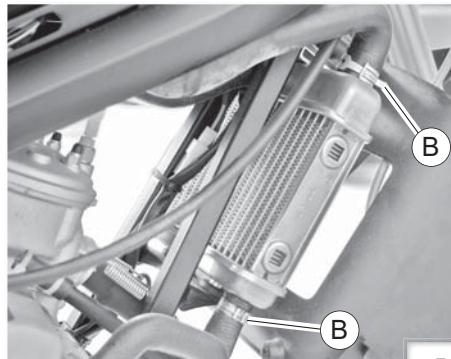
Drain the cooling circuit using the drain screw (A/F-52).

Loosen the clips holding the engine and radiator hoses (B/F-53).

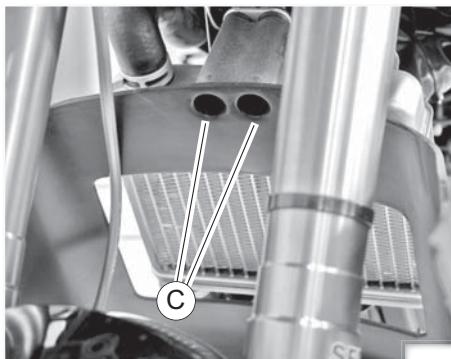
Then unscrew the 2 bolts (C/F-54) securing the air inlet and the radiator to the chassis.



F-52



F-53



F-54



ATTENTION: Place a container underneath to collect the oil from the tank.

31. CARBURETTOR

Cut the clamp (A/F-55) holding the carburettor to the filter box.

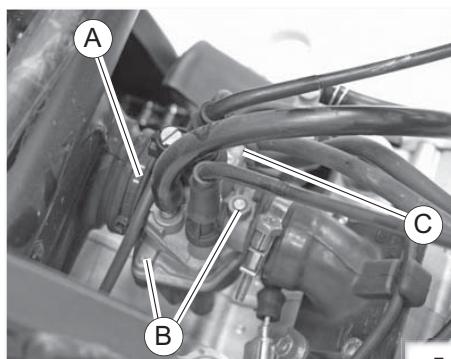
Unscrew the top cover of the carburettor (B/F-55) and extract it with the outlet.

In addition, unscrew the bolt securing the cable to the crankcase (C/F-55) and extract it.

Disconnect the suction hose and the other pipes.



ATTENTION: Pay attention to the position of the pipes, to enable subsequent re-assembly.

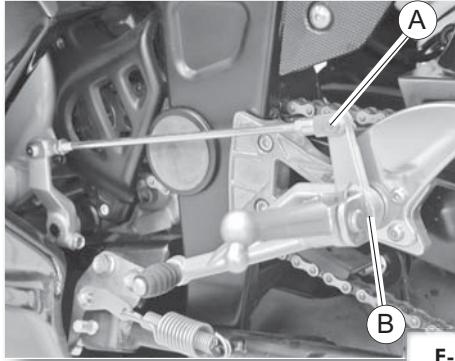


F-55



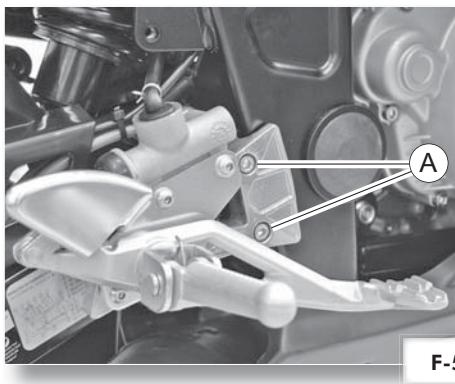
32. GEAR CHANGE LEVER

Remove the cotter pin (A/F-56) from the rod.
Then unscrew the bolt (B/F-56) securing the gear-change lever to the chassis.



33. REAR BRAKE LEVER

Unscrew the 2 bolts (A/F-57) and withdraw the rear brake lever assembly.

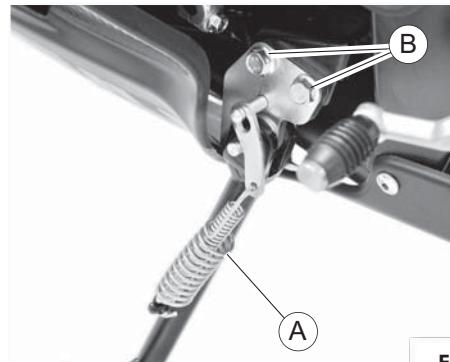




34. SIDE STAND

ATTENTION: Ensure the moped is suitably secured before performing this operation.

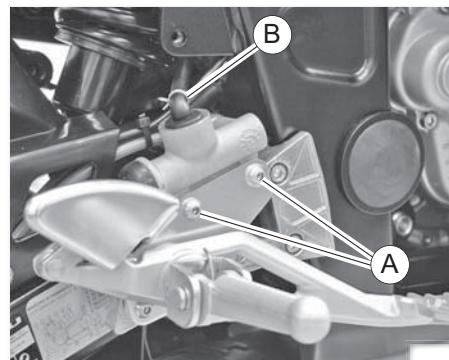
Remove the tensioning spring (A/F-58).
Then, unscrew the 2 bolts (B/F-58).



F-58

35. REAR BRAKE CYLINDER

Unscrew the 2 bolts (A/F-59) securing the brake cylinder to the support.



F-59



ATTENTION: Brake fluid is abrasive.

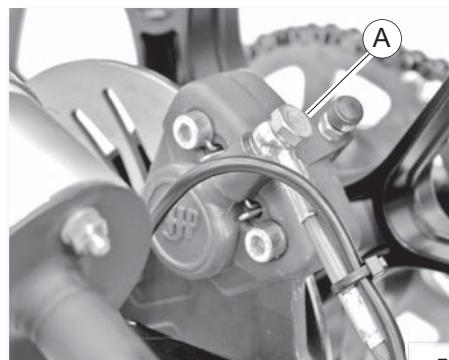
36. REAR BRAKE CALLIPER

* Remove the rear wheel.

Unscrew the connector using the bolt (A/F-60).



ATTENTION: When reassembling, it is recommended to renew the copper seals and bleed the circuit.



F-60



37. ENGINE

Disconnect the 2 pipes from the cylinder head heater, unscrew the screws from the suction pipe (A/F-61) and separate the connector from the spark plug.

Disconnect the heat switch wire.

Disconnect the neutral position wire (G/F-64), located at the bottom of the engine, the magneto wires and the central unit wires.

Unscrew the screws from the oil mixer cover and disconnect the transmission (A/F-44) - see page 39.

Drain the cooling circuit using the drain screw (B/F-62).

Disconnect the hose (C/F-62) from the cylinder head to radiator and pump to radiator.

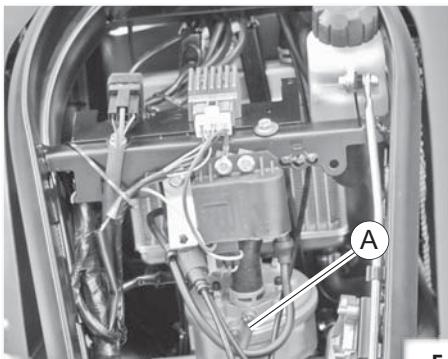
Remove the 2 self-locking nuts and remove the 2 bolts (D/F-63) securing the engine.

Loosen the bolt (E/F-64) and tilt the bracket forwards.

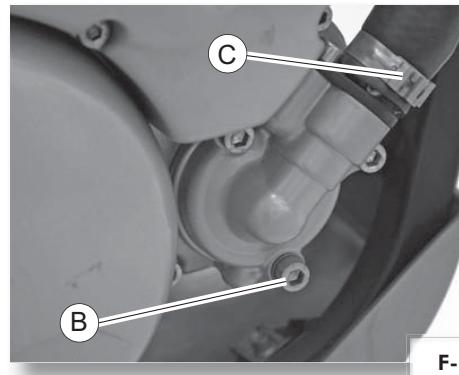
Then remove the self-locking nut (F/F-64) and remove the bolt securing the engine.



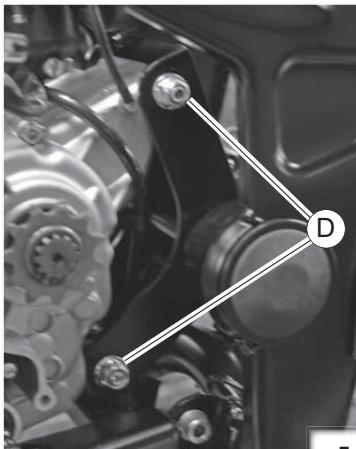
ATTENTION: Leave the bottom bolt until last.



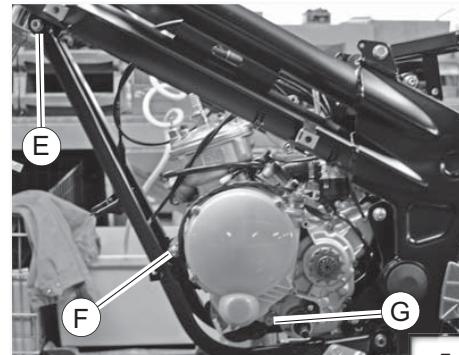
F-61



F-62



F-63

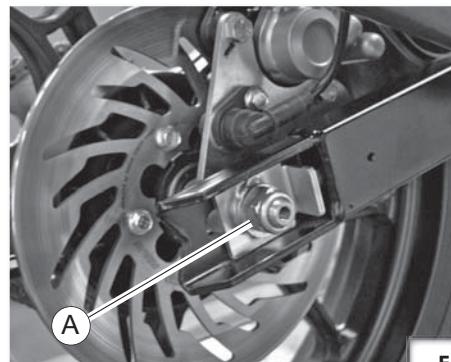


F-64

38. REAR WHEEL

Loosen the driving chain and withdrawing it from the dish of the wheel.

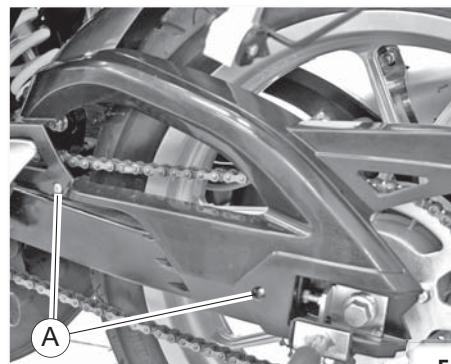
Then unscrew the axle (A/F-65) and to pull it to withdraw it.



F-65

**39. CHAIN PROTECTOR**

Unscrew the 2 bolts (A/F-66) on both sides and remove the protector.



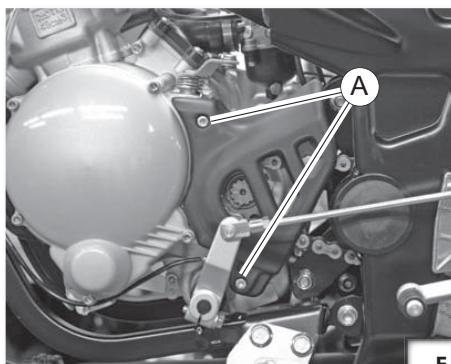
F-66

40. DRIVE CHAIN

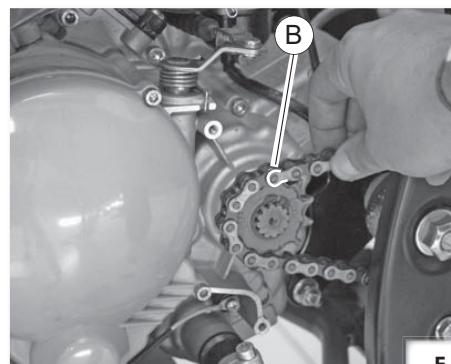
Remove the 2 protector securing bolts (A/F-67) and remove it.

Extract the link securing clip (B/F-68) and remove it.

Chain tensioning (See page 26).



F-67



F-68



41. SHOCK ABSORBER

* Remove the rear cover.

Unscrew the 2 bolts (A/F-69) securing the shock absorber to the chassis.

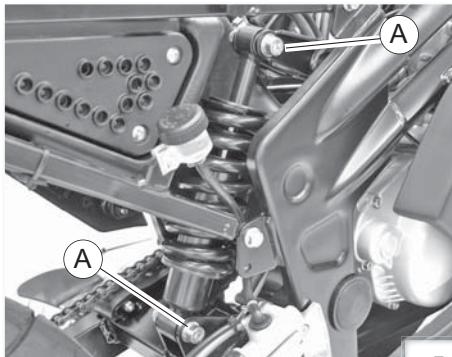
Then extract it from behind.



ATTENTION: Before dismantling, secure the chassis at the bottom to prevent the swinging arm and wheel from falling.



ATTENTION: Pay attention to the position of the shock absorber, to enable subsequent re-assembly.

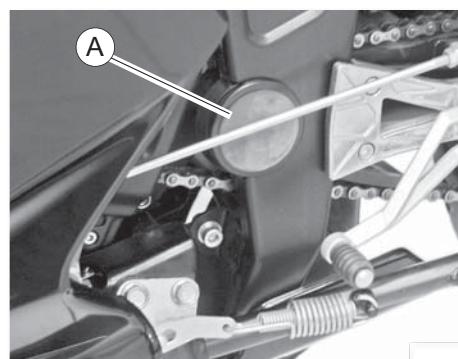


F-69

42. SWING ARM

* Remove the chain, rear wheel, rear brake calliper and shock absorber.

Remove the caps on both sides, unscrew the nut (A/F-70) and remove the axle from the right hand side.

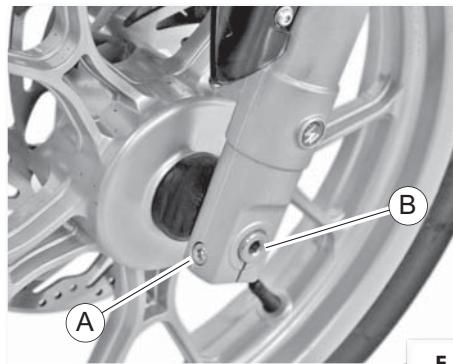


F-70

43. FRONT WHEEL

ATTENTION: Loosen the axle securing bolts (A/F-71) located on the forks.

Unscrew the axle (B/F-71) from the wheel and withdraw it.



F-71

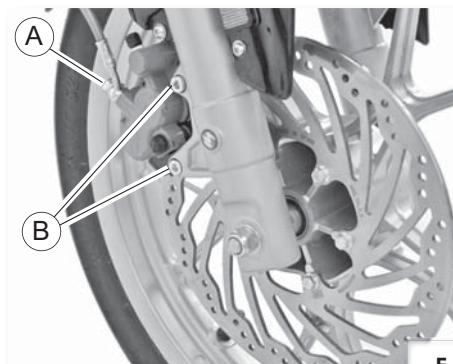
**44. FRONT BRAKE CALLIPER**

Unscrew the connector using the bolt (A/F-72).

Then unscrew the 2 bolts (B/F-72) securing the calliper to the front forks.



ATTENTION: When reassembling, it is recommended to renew the copper seals and bleed the circuit.

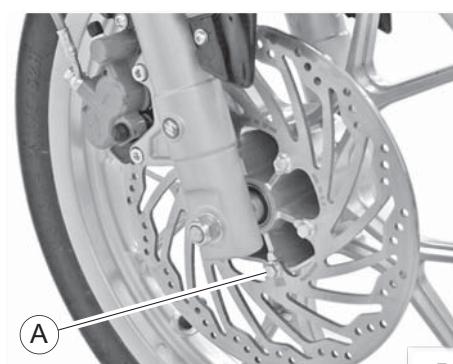


F-72

45. FRONT BRAKE DISK

*Remove the front wheel.

Unscrew the bolts (A/F-73) securing the disk.

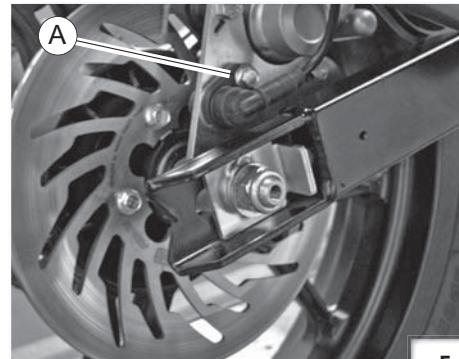


F-73



46. SPEED SENSOR

Unscrew the bolt and disconnect from the other end.



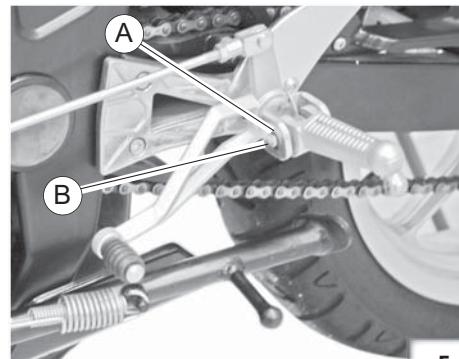
F-74



47. FRONT FOOTRESTS

Remove the clip (A/F-75) and then withdraw the cotter pin (B/F-75) in order to extract the footrest.

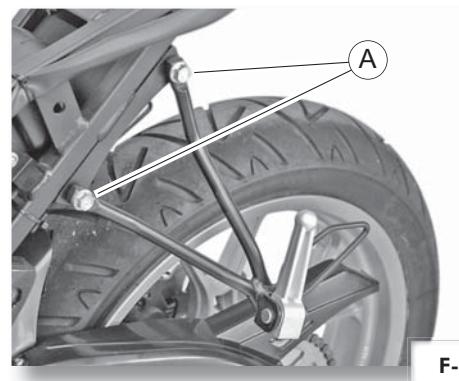
ATTENTION: Make a note of the position of the spring to enable subsequent reassembly.



F-75

48. REAR FOOTRESTS BRACKET

Unscrew the 2 bolts (A/F-76) securing the bracket to the chassis.



F-76

49. TIGHTENING TORQUES**TIGHTENING TORQUE TABLE**

Element	N*m	Kg*m	Notes
Front wheel bolt	38 - 52	3,8 - 5,2	
Front wheel bolt lock	17 - 23	1,7 - 2,3	 G
Rear wheel bolt	72 - 98	7,2 - 9,8	 G
Front/rear brake calliper	24 - 36	2,4 - 3,6	
Silencer	6 - 10	0,6 - 1,0	
Exhaust silencer side coupling	6 - 10	0,6 - 1,0	
Engine mounting bolts	20 - 26	2,0 - 2,6	
Handlebar controls bolt	2 - 4	0,2 - 0,4	
Shock absorber bolts	38 - 52	3,8 - 5,2	
Front wheel bolt	51 - 69	5,1 - 6,9	 G
Handlebar securing bolt	18 - 24	1,8 - 2,4	
Top steering nut	18 - 24	1,8 - 2,4	
Intermediate steering nut	25 - 34	2,5 - 3,4	 G
Swinging arm bolt	60 - 75	9,0 - 7,5	

 Gauze

RS2 50 Matrix

Electric system



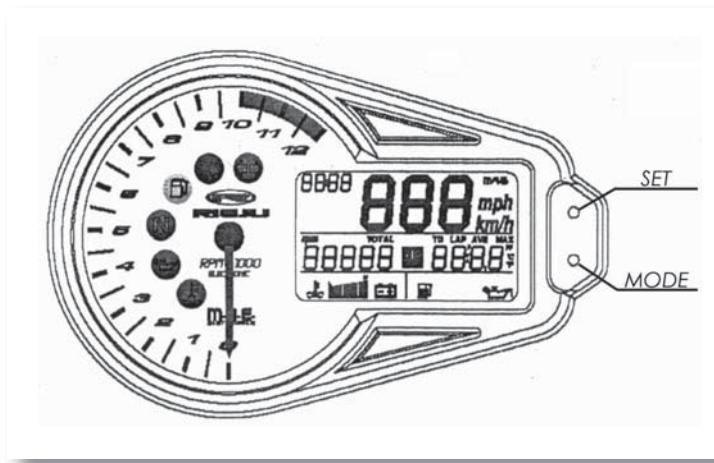
Index**Chassis****ELECTRIC SYSTEM**

1. DASHBOARD PROGRAMMING	3
2. ELECTRIC DIAGRAM 2003	5
3. ELECTRIC DIAGRAM 2006	6



I. DASHBOARD PROGRAMMING

DASHBOARD



The dashboard contains two buttons in its right side, the upper one is to select “SET” and the lower one for the function “MODE.”

SET THE CLOCK

- Put the key in the IGNITION position, with the engine turned off.
- Wait three seconds and the INITIAL screen will appear on the DISPLAY.
- Press the button “Mode” for 6 seconds, and the digit to be selected (hours) will be flickered.
- With the button “Set”, select the suitable number.
- Once the hour is selected, press the button “Mode” again and the digits corresponding to the minutes will be flickered.
- Select with the button “Set” and press the button “Mode” again turning back to the Initial screen.

INSERTION OF THE PARAMETERS OF CALCULATION IN THE ODOMETER MEMORY

- Development of the wheel that sets the signal sensor.
- Pulses of the signal sensor.
- Pulses of Revolutions.

Put the key in the IGNITION position with the engine turned off.

- Wait three seconds and the INITIAL screen will appear on the DISPLAY.

- Press the button “MODE”, and without releasing it, press the button “SET” for one second, automatically the word “SET” will be displayed on the screen to be able to insert the values.



- The first value is the development of the wheel and it should be inserted in mm.
- Pressing the button “SET” we select the digit, and with the button “MODE” pressed for three seconds we pass to the next digit, and using this sequence we insert the fixed development to that wheel.
- Keeping the button “Mode” pressed for 3 seconds, the screen of the Display will request us for the pulses, with the word “PULSE”, following the sequence insert the value.
- We keep the button “Mode” pressed and the option of miles, (mph) and kilometres hour (km / h) will be displayed, then we will choose km / h with the button “SET”.
- Following the sequence, the word “PULSE” will appear on the screen and above it “RPM”, we will insert the value corresponding to the RPM.

Keeping the button “MODE” pressed for 3 seconds more, we will turn back to the INITIAL screen.

TO CHECK IF THE INPUT DATA IS THE RIGHT ONE, WE SHOULD TURN ON THE IGNITION, START THE ENGINE AND IN TWO SECONDS THE ENTERED DATA WILL BE DISPLAYED ON THE SCREEN DURING TWO SECONDS, VERIFYING THAT IT IS CORRECT, IMMEDIATELY AFTER THE INITIAL SCREEN WILL APPEAR.

The dashboard is ready to be used giving the right information.

SET OF VALUES

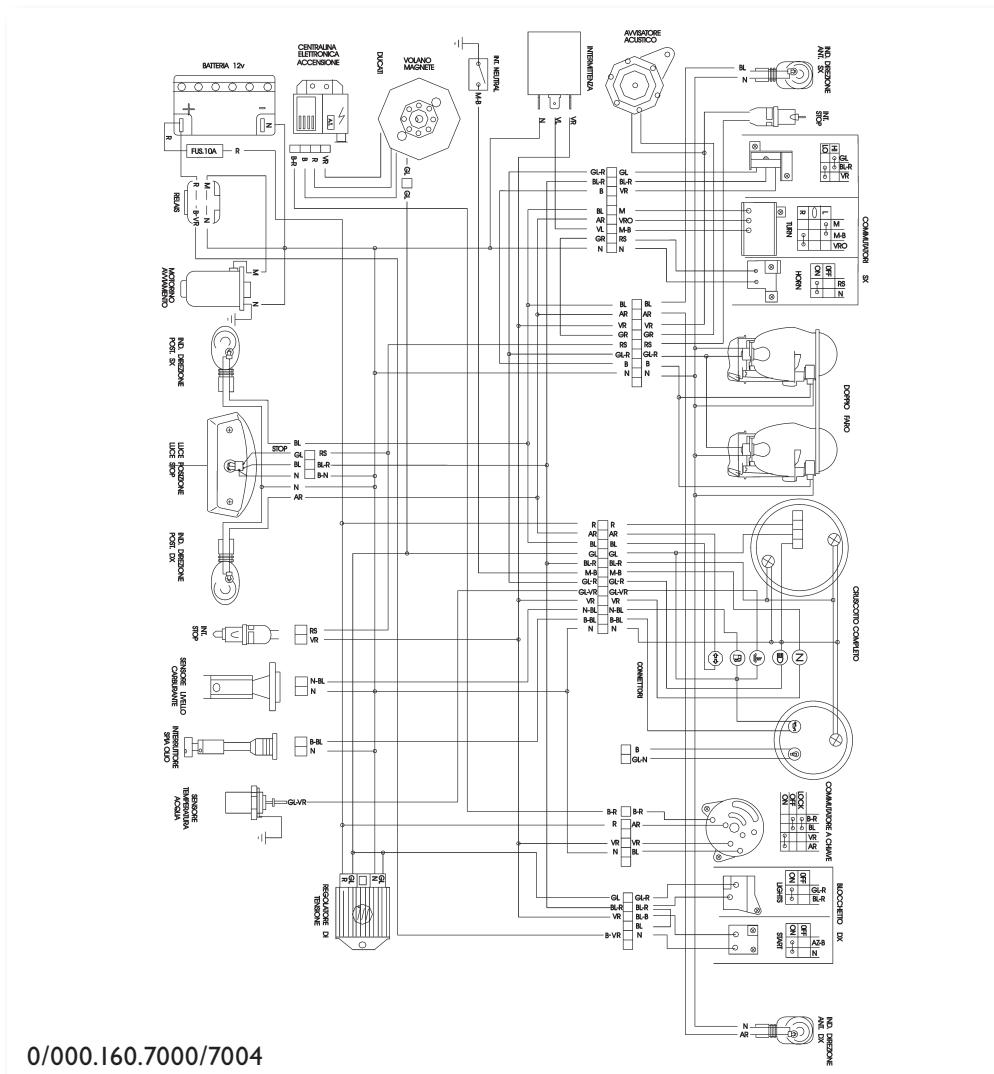
VALUES TO BE INSERTED IN THE DISPLAY CONFIGURATION

	RS2 50 cc. MATRIX RS2 50 cc. MATRIX PRO
Rear Tyre	130/70-17
Circumference Wheel	1930
Pulses of the Sensor (screws)	5
Pulses of RPM	3

Electric system

Chassis

2. ELECTRIC DIAGRAM 2003

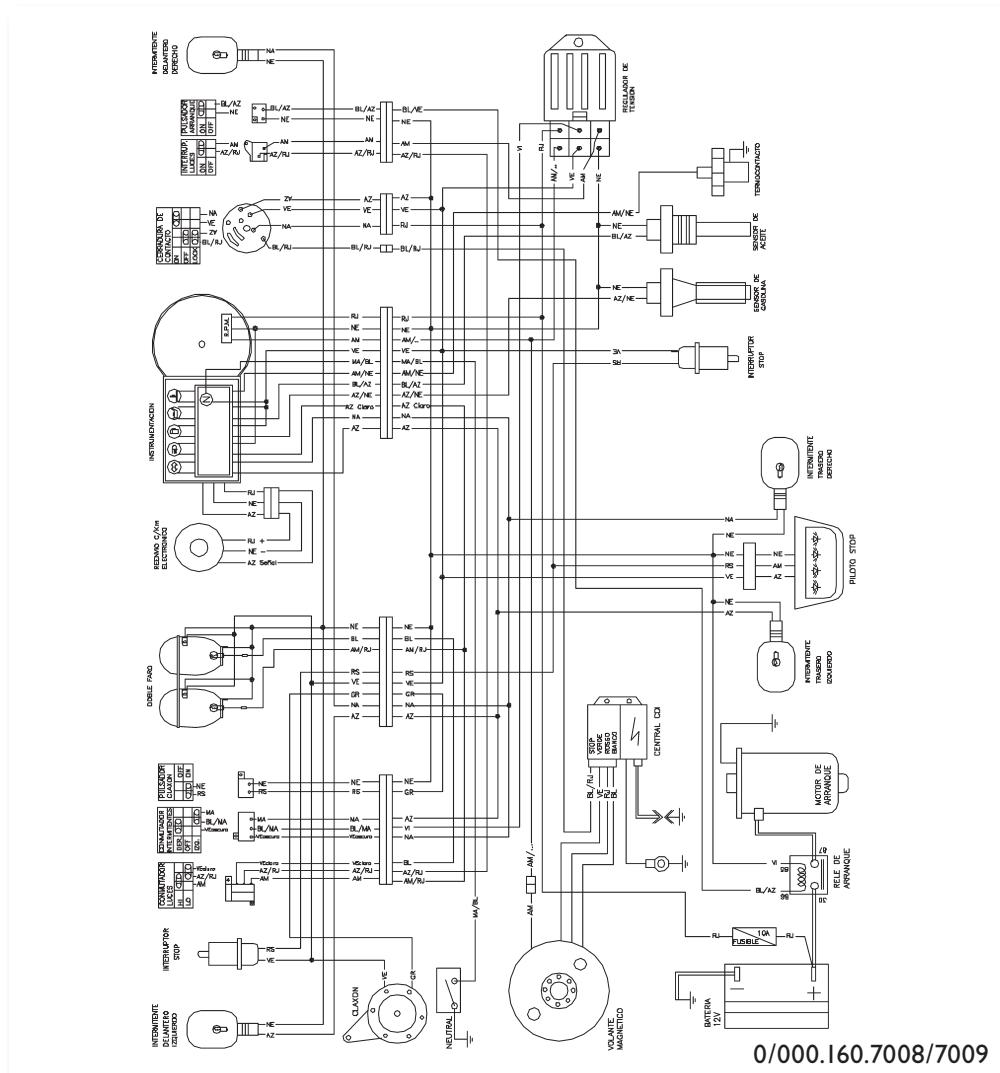


0/000,160,7000/7004

A_B ARANCIONE
 A_{B-B} ARANCIO BIANCO
 AZ AZZURRO
 AZ-BL AZZURRO BLU
 B BIANCO
 B-VR BIANCO VERDE
 B-BL BIANCO BLU
 B-N BIANCO NERO
 B-R BIANCO ROSSO
 BL BLU
 BL-R BLU ROSSO
 GL GIALLO
 GL-R GIALLO ROSSO
 GL-N GIALLO NERO
 GL-VR GIALLO VERDE
 GR GRIS
 M-B MARRONE BIANCO
 N NERO
 N-R NERO ROSSO
 N-BL NERO BLU
 R ROSSO
 RS ROSA
 VI VIOLA
 VR VERDE
 VRO VERDE OLIVA
 M MARRONIE



3. ELECTRIC DIAGRAM 2006



NE	NEGRO
RJ	ROJO
AZ	AZUL
RS	ROSA
VE	VERDE
BL	BLANCO
VI	VIOLETA
GR	GRIS
AM	AMARILLO
MA	NARRON
NA	NARANJA

RS2 5Q

Engine workshop manual



Index**Engine****INTRODUCTION**

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ENGINE RIEJU

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Introduction

- All **checks, maintenance, repairs or replacements**, etc. on the vehicles manufactured by Maggiori are to be performed by skilled and expert technical personnel with specific experience in state-of-the-art technology and full knowledge of the quickest and most rational procedures, technical characteristics, setting values and tightening torques, which may only be properly and exhaustively provided by the manufacturer.
- This set of **WORKSHOP MANUALS** concerning two-stroke engines provides **technicians of the sector** (Authorised Service Centres, etc.), the essential information for operating in accordance with the latest **good working practices and work safety regulations**.
- These publications provide all necessary information for routine procedures on all the **RIEJU**-motor vehicles equipped with two-stroke engines currently in production at the date of issue. The information provided deals with the motor vehicle **ENGINES**. Some basic technical information has been intentionally omitted as it is considered to be common knowledge.
- Additional information is available in the **SPARE PARTS CATALOGUES** of each model.
- **It is important** that before referring to the specific engine manual, the information given in this general section be carefully read as it provides all the essential hints and guidelines for best consulting the various topics and main technical subjects.

Note:

These manuals provide the necessary information and instructions for routine maintenance and servicing. This information has been given to us by the engine manufacturers. We therefore decline all responsibility for any error, omission or misrepresentation. **RIEJU** reserves the right to make any changes and modifications hereto it deems necessary without prior notice. For further information and details, please contact the **RIEJU, S.A.** Service Division.

I.I MANUAL UPDATES

- **The updates** will be sent by us (in a reasonable time). Every Cd-Rom you will receive, will supersede the one already in your hands.
- **The table of contents** will be duly updated in the event that new pages are inserted, which render the consultation of the manual difficult.
- **IMPORTANT!** The Workshop Manuals are to be considered as essential **tools** to be properly kept up-to-date so as to maintain their "validity" over time.

EDITING SYMBOLS



CAUTION! Recommendations and precautions regarding rider safety and motor vehicle integrity.



WARNING!

Situations entailing the risk of personal injury to maintenance or repair mechanics, other workshop personnel or third parties, or damage to environment, vehicle or equipment.



FIRE HAZARD

Indicates operations which may constitute a fire hazard.



RISK OF EXPLOSION

Indicates operations which may constitute a risk of explosion.



TOXIC

Indicates a possibility of intoxication or inflammation of the upper respiratory tract.



MECHANICAL MAINTENANCE

Operations to be performed only by an expert mechanic.



ELECTRICAL MAINTENANCE

Operations be performed only by an expert electrical / electronic technician.



NO!

Operations to be absolutely avoided.



ENGINE SERVICE MANUAL

Indicates information which may be obtained by referring to said manual.



SPARE PARTS CATALOGUE

Indicates information which may be obtained by referring to said catalogue.

F	Figure
Pr Tr	Tightening torque
P	Page
Ap	Paragraph
S	Section
Es	Diagram
T	Table
Tr	Screw

Note:

The letter **Tr** in the illustrations refers to retaining or adjusting screws. The number following this letter refers to the number of the same type of screw in the unit or component described and illustrated. Letters not followed by a number indicate a single screw. In case of different screws being referred to in the illustration, the letter **Tr** is followed by a number and a small letter , for instance: (**Tr4a**).

Unless otherwise specified, units and components are reassembled by proceeding in the reverse order of removal.

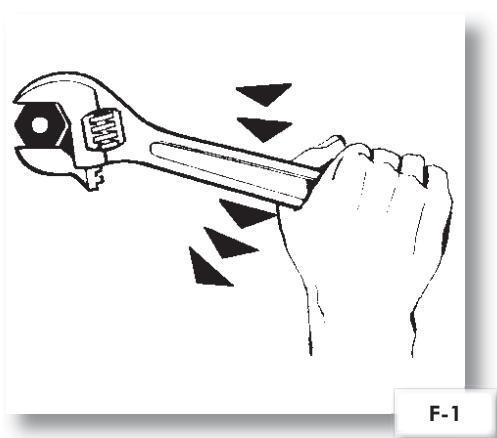
OPERATIONAL SYMBOLS**L)** Loctite**O)** Oil lubrication**G)** Greasing

1.3 GENERAL WORK PROCEDURES

- The **advice, recommendations** and **warnings** given hereafter are aimed at ensuring maximum work safety as well as at considerably reducing the risk of accidents, personal injury, equipment damage and idle times. They should therefore be strictly adhered to.

**ADVICE:**

- Only use quality tools and equipment.
- Only use equipment conforming to EU Directives for lifting the vehicle.
- During operations, always keep tools and equipment at hand, possibly laying them out according to the sequence in which they are to be used. Absolutely avoid putting them on the vehicle itself, out-of-sight or in poorly accessible places.
- Always keep the work area clean and tidy.
- When tightening screws or nuts, start with the **larger diameter** or inner fasteners, and tighten them in progressive “**pulls**” in accordance to a “**criss-cross**” pattern.
- Preferably use open-end box wrenches by “**pulling**” and not “**pushing**”.
- Adjustable wrenches (F-1) should only be used in case of emergency, i.e. when a properly sized wrench is not available. They should preferably not be used as the movable jaw tends to open thus risking damaging or not properly tightening the bolt to the correct torque. In any case, when using an adjustable wrench, take care to proceed as shown in Figure I.
- Except for occasional customers, always make out and deliver to the customer a **work sheet** specifying the operations performed, with notes as to any future checks eventually required.

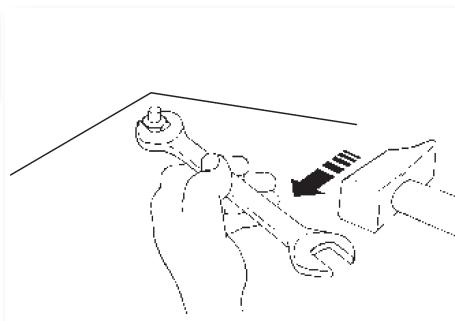


F-1

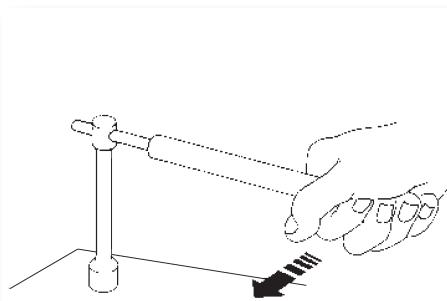


1.4 WARNINGS

- Before carrying out any operation on the vehicle, wait for all parts to cool down.
- For operations requiring two mechanics, make sure that the various steps to be performed by each of them are clearly defined and coordinated beforehand.
- Make sure that each component has been properly fitted before proceeding with the next one.
- Lubricate all parts (where applicable) before reinstalling them.
- Gaskets, O-rings, circlips and split pins must be replaced at every refitting.
- The torque settings specified in the manuals refer to the “final torque”, which must be attained progressively by steps.
- Loosen and tighten aluminium alloy parts (covers) only after the engine has fully cooled down.
- Only use screwdrivers with sizes suitable to the screws to be loosened or tightened.
- Work in a comfortable position and ensure that the vehicle is stable.
- Never use a screwdriver as a lever or chisel.
- Never use pincers to loosen or tighten screws or nuts because, in addition to not providing a sufficient clamping force, they may also damage the screw head or nut hexagon.
- Never tap the wrench with a hammer or other similar tools to loosen or tighten screws and nuts (F-2).
- Never attempt to increase the lever arm by fitting a tube into the wrench (F-3).



F-2



F-3

Introduction

Engine



Never use open flames for any reason.

Never leave open containers or containers not suitable for holding fuel in passageways, close to heat sources, etc



Never use petrol to clean the vehicle or the floor of the workshop. Always use low flash point solvents to clean the vehicle components.



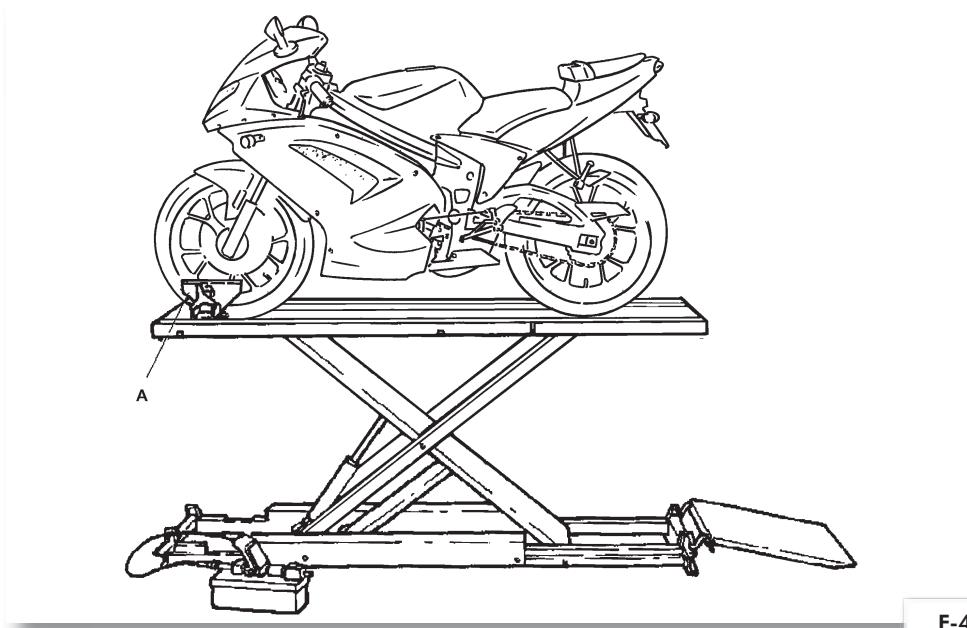
Never suck from or blow into the fuel pipe.

When welding, make sure that there are no flammable liquids in the vicinity. Always remove the tank, even if completely empty, and disconnect the negative cable (-) from the battery.

Never leave the engine running in closed or poorly ventilated areas.



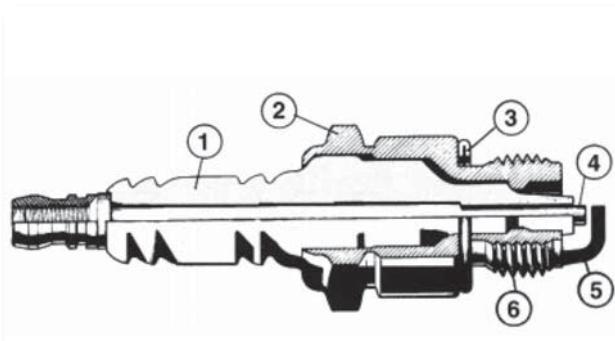
Before any servicing, make sure that the motorbike is perfectly stable. The front wheel should preferably be anchored to the equipment (A/F-4) integral with the lifting board.



F-4



1.5 SPARK PLUGS



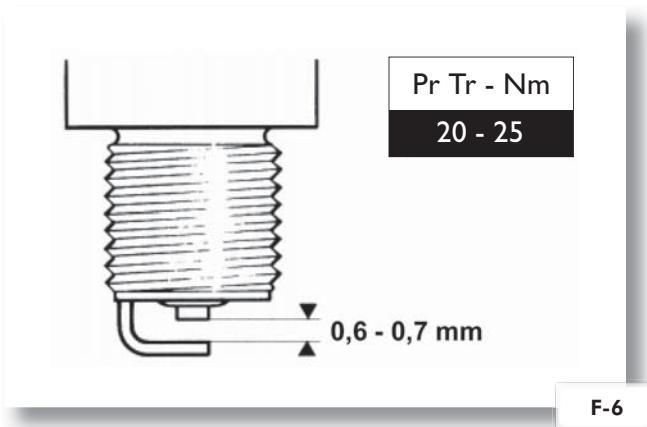
1. Insulator
2. Body
3. Gasket
4. Electrode
5. Earth electrode
6. Threads

F-5

SPARK PLUG CHECK

1,000 km

- Remove the spark plug while the engine is hot (taking utmost care to avoid scalding!).
- The carbon deposits and the colour of the insulator (around the central electrode) provide good information as to the heat range of the spark plug and to carburetion, lubrication and general condition of the engine.
- A light brown colour of the insulator indicates that engine working conditions are generally correct.
- Sooty black deposits, that are dry (to the touch) and opaque, are a sign that working temperature is too low, i.e. that the heat range of the spark plug is too high, mixture too rich or ignition defective.
- A whitish colour of the insulator is indicative of too lean a mixture or of too low a heat range of the spark plug (i.e. spark plug too "hot").
- Check electrode gap (F-6) (even if the spark plug is new) by means of a calibrated thickness gauge. If necessary, adjust by acting only on the earth electrode.



F-6



SPARK PLUG MAINTENANCE

- Spark plug maintenance consists essentially of a periodical visual inspection. Remove the spark plug and check for proper condition and gap.
- Clean the electrodes and the insulator thoroughly by means of a wire brush.
- Remove any residual dirt with a strong jet of compressed air.
- Lubricate spark plug thread with engine oil or graphitised grease, and install it by hand until finger tight.
Tighten to the specified torque with a spark plug wrench (see F-6).



It is imperative that any spark plug exhibiting cracks on the insulator or corroded electrodes be replaced.

SPARK PLUG REPLACEMENT 5000 km

- Upon prescribed mileage being reached, always **replace the spark plug**. Use **RIEJU, S.A.** recommended spark plugs.
- When replacing exhausted spark plugs, visually inspect spark plug condition as described above to ascertain whether or not the engine is running properly.

ENGINE REMOVAL

- For removal of the engine from the chassis, refer to the “**Chassis**” **Workshop Manual**, which lists all the operations required.

ENGINE DISASSEMBLY



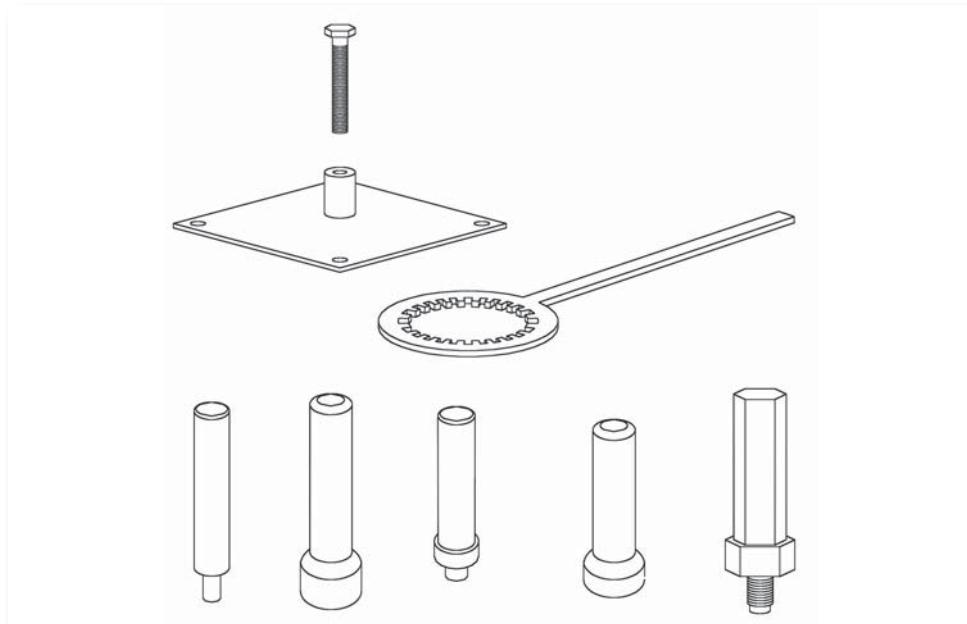
The manufacturer declines all responsibility for damage of any kind caused by disassembly and reassembly of the engine and its parts if unsuitable tools are used.

Use only **ORIGINAL RIEJU SPARE PARTS**.

Engine RIEJU



2.1 EQUIPMENT KIT



Code RIEJU 0/000.640.9999

2.2 LUBRICANTS

LUBRICANTS TABLE

LUBRICANTS FOR TWO-STROKE ENGINE

- 1) Synthetic mix oil
- 2) Gearbox oil SAE 10W30, type SE

GENERAL PURPOSE LUBRICANTS

- 3) Grease for moving parts

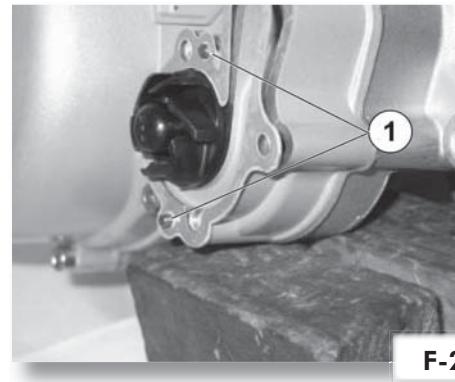
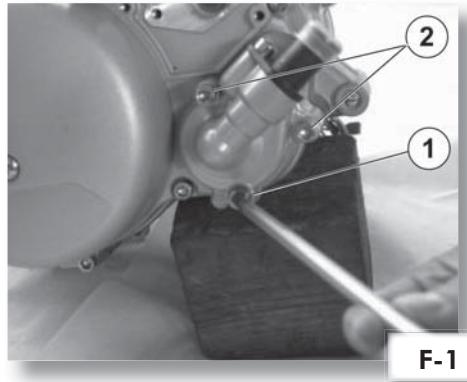
2.3 DISASSEMBLY OF THE ENGINE

After removing the spark-plug and carburettor proceed as follows:



I) DRAIN the engine oil by removing the relevant drain bolt.

2) UNSCREW the coolant drainage screw (I/F-1); remove the water pump cover by undoing the two fixing screws (2/F-1). **Pay attention to the dowel bolts** (I/F-2).

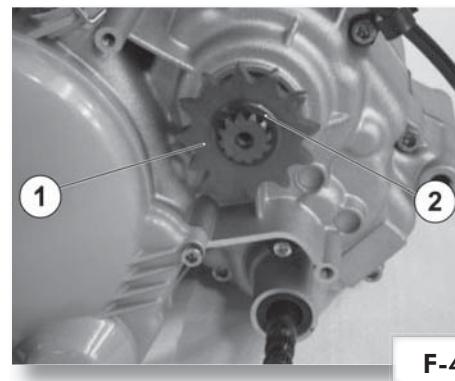
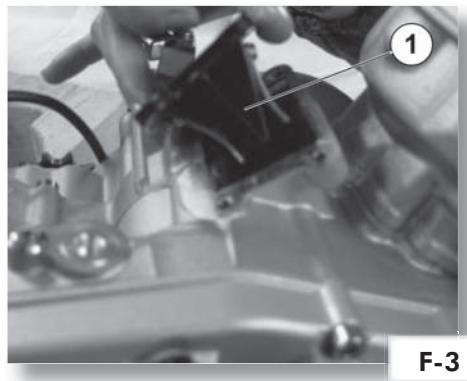


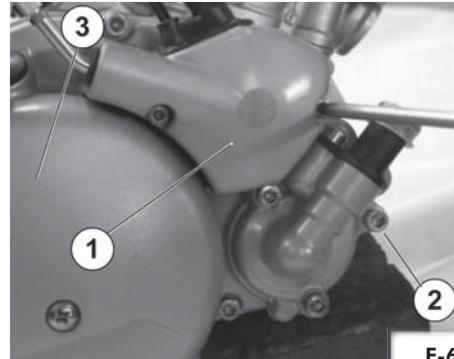
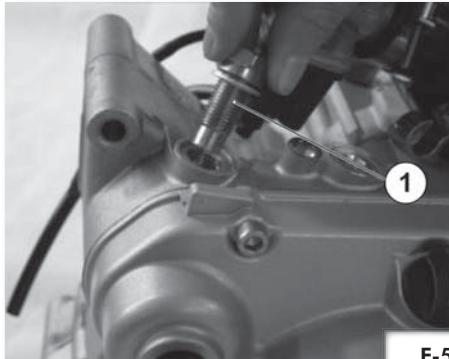
3) UNDO the fixing screws of the flywheel cover (left hand side) and remove it.

Remove the starter motor (if fitted) by removing the two screws on the crankcase and the screw on the support strap.

4) Take the carburettor out of its seat; remove the intake union and the relative clutch "bridge"; remove the plate group (I/F-3).

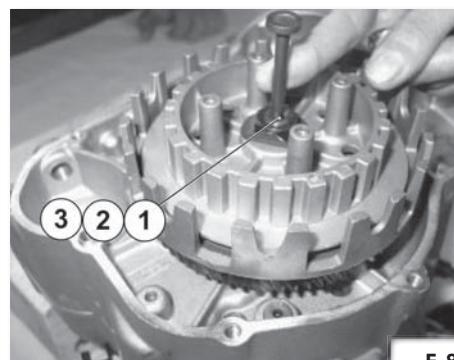
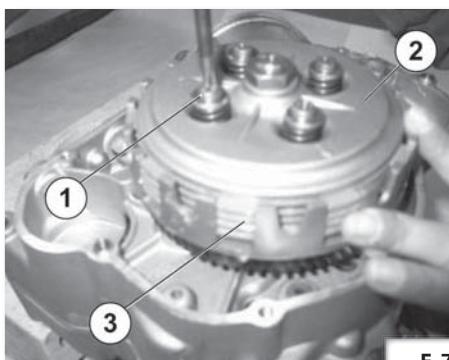
5) REMOVE the sprocket (I/F-4) by removing the snap ring (2/F-4); using ring pliers, remove the sprocket by hand and remove the other snap ring underneath the sprocket.





6) REMOVE the sliding stop screw for starting from clutch side (1/F-5).

7) REMOVE the fixing screws of the plastic oil pump cap (1/F-6). Undo the screws securing the oil pump to the cover; then remove the pump.



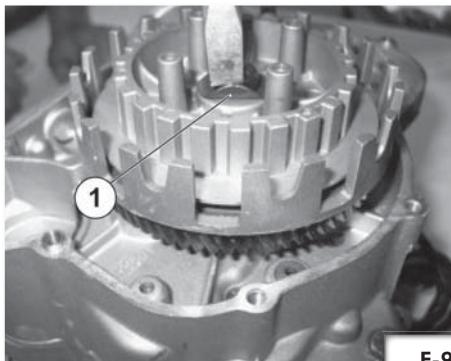
8) REMOVE the cover/crankcase fixing screws (of which one M6x55 (2/F-6), that secure the water pump cover and the relative clutch cover to the crankcase); now remove the cover (3/F-6) and its gasket.

9) TAKE the starter assembly OUT of its seat (only for versions with starter pedals), bearing in mind that the any shim washers must be put in the same position when the component is reassembled.

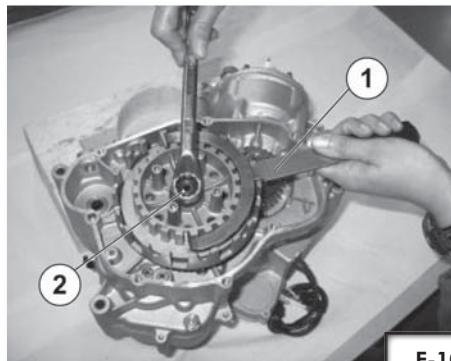


CAUTION: when disassembling this group, carefully check the position of the pieces so as to reassemble them correctly afterwards.

10) UNDO the screws compressing the clutch springs (1/F-7); then remove the clutch plate (2/F-7) and the entire set of discs (3 /F-7); remove the disc pusher, the ball and the clutch rod (1, 2, 3/F-8), which are housed in the centre hole of the change shaft.



F-9

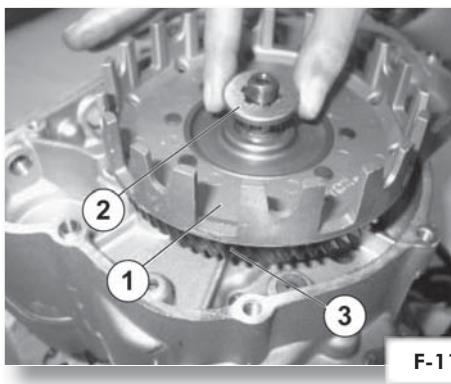


F-10

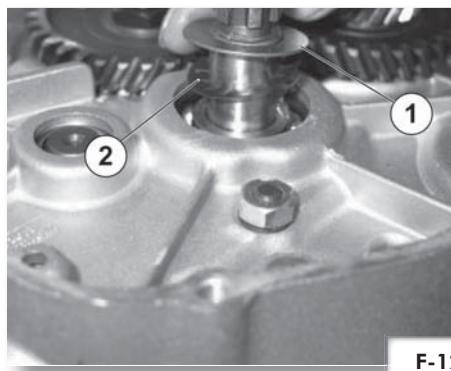


I1) DISENGAGE the nut from its fixing tab (1/F-9); using the appropriate wrench (1/F-10), unscrew and remove the fixing nut (2/F-10) of the clutch boss.

I2) REMOVE the following pieces in this order: clutch boss (1/F-11), spacer (2/F-11), clutch gear (3/F-11), shim washer (1/F-12), tapered washer (2/F-12), paying attention to the direction in which they are assembled so as to reassemble them correctly afterwards.



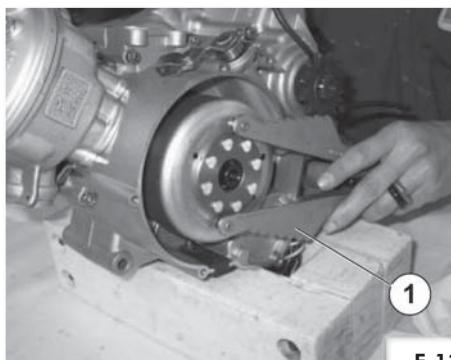
F-11



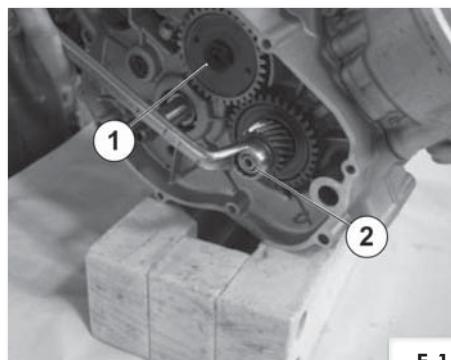
F-12

I3) USING the magneto flywheel locking wrench (1/F-13), lock the flywheel and slacken the retaining nut of the gear on the countershaft with the wrench (1/F-14).

I4) REMOVE the gear on the countershaft (1/F-14) and the key.



F-13

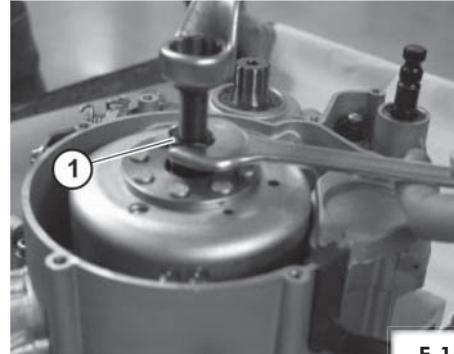
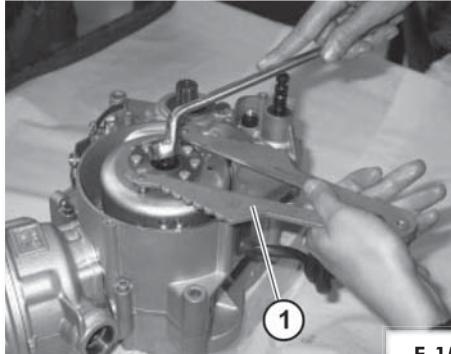


F-14



15) UNSCREW the nut (2/F-14) with a 19 mm wrench, whilst holding the flywheel in place with the special wrench; then remove the following parts in this order: drive pinion, countershaft drive gear, key, spacer bushing and O-ring.

16) BLOCKING the rotor of the magneto flywheel with the special locking wrench (1/F-15), unscrew the rotor retaining nut with a 15 mm wrench.



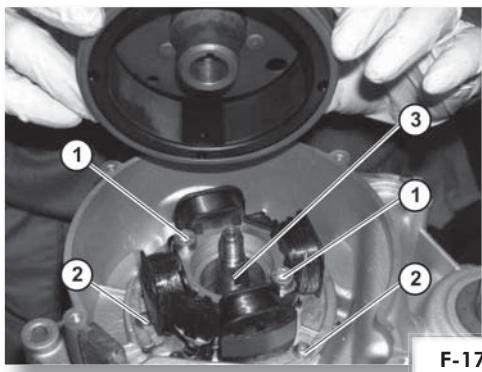
F-15

F-16

17) REMOVE the rotor of the magneto flywheel by means of the appropriate puller (1/F-16), which must be screwed into the threaded seat of the rotor; whilst holding the latter in place with a wrench, turn the centre screw.

18) REMOVE the stator by undoing the screws that secure it to the plate (1/F-17).

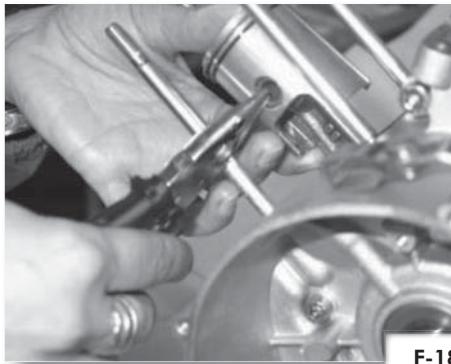
19) TAKE the stator plate OUT of its seat by removing the 3 screws that secure it to the crankcase (2/F-17), and remove the key (3/F-17).



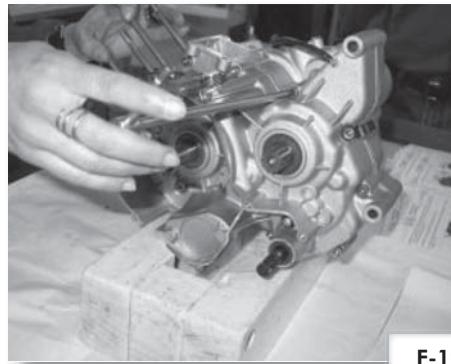
F-17

20) DISASSEMBLING the thermal section:

- a) unscrew the 4 cylinder head holding nuts and remove the relevant washers; remove the head, its O-ring, the cylinder, the cylinder gasket and the four O-ring on the stud bolts.



F-18



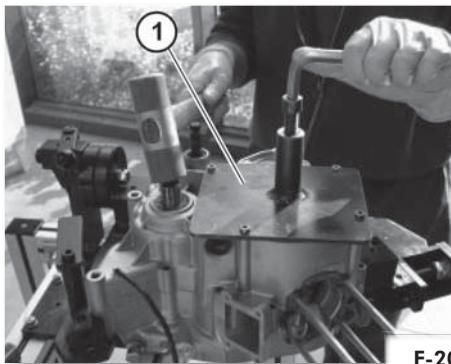
F-19



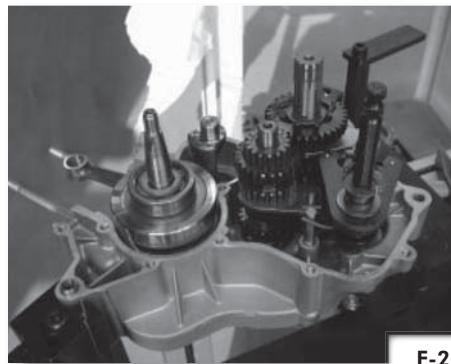
CAUTION: before removing the circlips of the piston pin, put a clean cloth into the opening on the crankcase, to prevent the circlips dropping into the engine.

21) REMOVE the two circlips (F-18), remove the piston pin and, if you intend to use a 2-diameter plug, knock gently taking care to hold the piston on the opposite side in order to avoid damaging the connecting rod.

22) REMOVE the 13 screws joining the two crankcases (F-19) and take the clutch pin out of its seat.



F-20



F-21

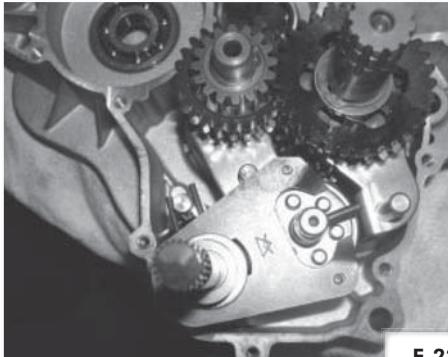
23) SEPARATE the 2 crankcases by gently tapping the secondary shaft and shift shaft with a wooden mallet.

IMPORTANT: if you need to take the crankshaft out of its seat, use the special tool (I/F-20).

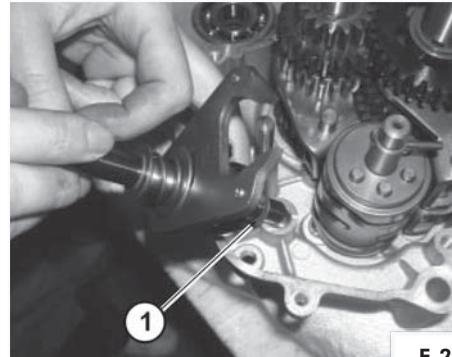
24) Once the crankcases have been separated, CHECK that the shim washers are on the shafts and not on the crankcase that has just been removed (F-21).



25) PUT the neutral signal pin in the position shown in the photo (F-22), hence remove the shift shaft and its relevant lower shim washer (I/F-23).

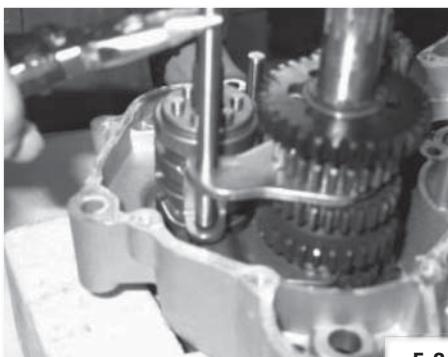


F-22

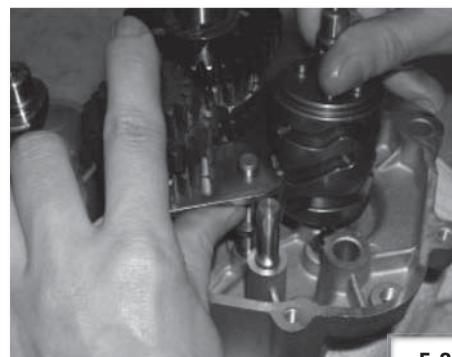


F-23

26) PULL OUT the fork guiding rod and remove the top fork (F-24); to take the fork out of its seat, remove the desmodronic shaft (F-25) and raise the gear on the secondary shaft carrying the forks.



F-24



F-25

27) PUT the following components **TOGETHER**: output shaft, secondary shaft and remaining fork and raise (F-26), paying attention to the shim washer under the secondary shaft.



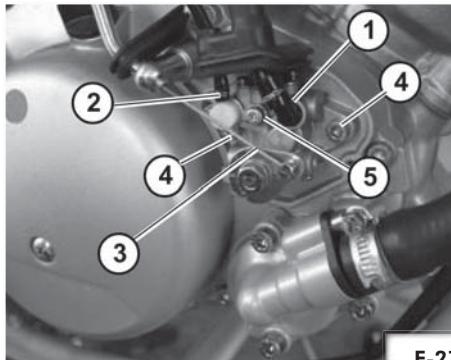
F-26

28) REMOVE the equaliser countershaft: pull the connecting rod from the crankcase on clutch side; if necessary tap gently with a plastic or rubber mallet, paying attention not to damage the thread.

N.B.: as far as the clutch crankcase side is concerned, the crankshaft and countershaft do not interfere with each other.

29) Bearings should only be **REMOVED** if they need to be replaced, i.e. they are worn or their service life has ended.

30) IF the oil pump needs to be replaced, proceed as follows (F-27):



F-27

- a) Detach the oil pump supply pipe (1) and put a plug into it to prevent oil leaks.
- b) Detach the oil delivery pipe leading from the pump to the carburettor (2).
- c) Disconnect the control cable fastened to the pump's lever (3).
- d) Undo the pump fixing screws (4) and remove the pump.
- e) Fit the new pump in its seat and replace the O-ring.
- f) Plug the oil delivery pipe (2) into the new pump.
- g) Plug the oil supply pipe (1) into the pump.
- h) Take the purge screw and gasket off the pump (5) and let the oil containing air bubbles leak out. Wait until only oil is leaking out. Purging can thus be considered accomplished. You can now refit the screw in place.
- i) Reconnect the control cable (3) to the pump lever, making sure that the idle position of the throttle grip on the handlebar corresponds to the idle position of the lever; otherwise, make any necessary adjustments by means of the adjustment screw.



2.4 MAINTENANCE



GENERAL WARNINGS

Before reassembling the engine either totally or partially, thoroughly clean the parts by washing them with petrol, drying them with compressed air and making sure that they are sufficiently oiled and in perfect working order.

It is always advisable to replace the gaskets because old ones may be leaky. We recommend you always replace the engine oil seals: they may have been damaged during disassembly and this could adversely affect engine operation. Always use the special plugs to ensure correct assembly of the oil seals.

A) Secondary gear shaft oil seal:

- Secondary gear shaft oil seal assembly plug.

B) Connecting rod oil seal:

- Connecting rod oil seal assembly plug, clutch side.
- Connecting rod oil seal assembly plug, flywheel side.

C) Clutch lever oil seal:

- Clutch lever oil seal assembly plug.

D) Shift shaft oil seal:

- Shift shaft oil seal assembly plug.

E) Water pump oil seal:

- Water pump oil seal assembly plug.



Check carefully that the pieces are whole and arrange all the various groups of gears in such a way that assembly may be carried out correctly.

PREVENTIVE CARE



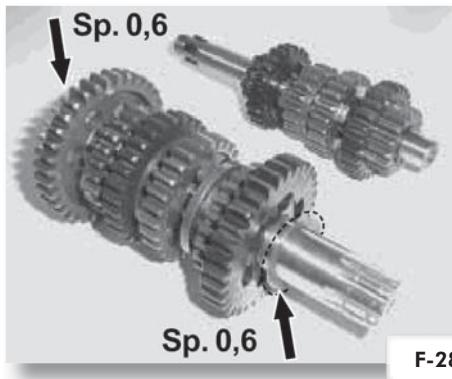
1) WASH the two crankcases and the bearings with petrol and blow them with compressed air, checking that the bearings run freely and noiselessly.

CAUTION: if it should be necessary to replace a bearing, the seat must be heated before installing the new bearing.

2) MAKE SURE the connecting rod is in perfect working order and check for faults, especially in the bearing seats. Make sure assembly on flywheel side has been properly accomplished. Using a comparator, check the eccentricity of the two connecting rod axle shafts. The maximum eccentricity value must not exceed 0.04 mm. On the contrary, centre accordingly. Make sure the connecting rod is perpendicular.

3) MAKE SURE the transmission is in perfect working order and fit the shim washers in the right positions. If you have replaced components, make sure that they are put in the same positions as the parts removed and that the end float does not exceed 0.1 mm. To obtain this condition, measure the distance of the shim washers on the crankcase and components, and fill any gaps with other shim washers, as shown in the photo (F-28).

4) CHECK the distance of the shim washer of the desmodronic shaft both on the crankcase and on the part, and fill any gaps with other shim washers, as shown in the photo (F-29). The end float must be less than 0.1 mm.

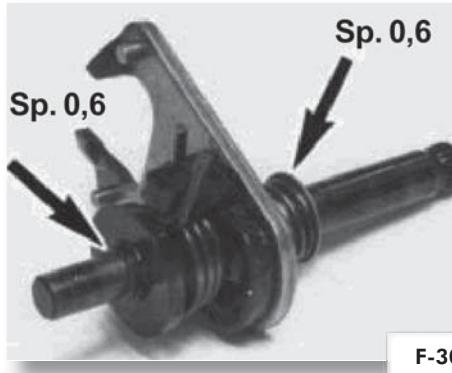


F-28

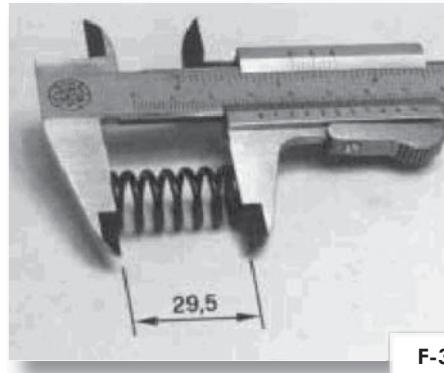


F-29

5) CHECK the distance of the shim washers of the shift shaft both on the crankcase and on the part, and fill any gaps with other shim washers, as shown in the photo (F-30). The end float must be less than 0.1 mm.



F-30



F-31



6) ENSURE that the clutch assembly is in working order.

To do so, ensure that the iron discs are in good condition, that the notches on the cork discs are not too deformed and that their coating is not burnt. Check that the grooves on the clutch boss are not too deeply marked; perform the same check on the slots of the clutch housing. Also check that the **clutch springs are not shorter than the permissible threshold of 29.5 mm** (F-31); if they are shorter replace them.

7) CAREFULLY clean the carbon crust from the piston top by means of a common scraper, taking care not to damage the piston itself. Check the piston skirt for streaks or seizing. Check that it is firmly mated to the lubricated piston pin, the surface of which must be in perfect condition. Make sure that the piston pin can be fitted by manual pressure and that it does not yield under its own weight.

8) CHECK the piston rings for faults of any type and make sure that the clearance between the two ends is within the values shown in the chart.

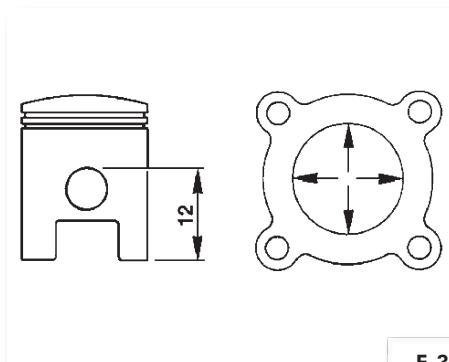
RINGS	DISTANCE
New	0,15 ÷ 0,30 mm
Used	Up to 1,2 mm

The checks must be carried out using a feeler gauge. The piston ring must be placed in the cylinder in a horizontal position (F-32).

9) CHECK that the cylinder water jacket does not have seizing notches or wear and that there is no scoring of any kind. By means of a bore gauge, check the cylinder bore in two directions at 90° the one from the other (one parallel and the other perpendicular to the axis of the piston pin) (F-33). The maximum permissible ovalisation is 0.03 mm, exceeding which the cylinder must be replaced.



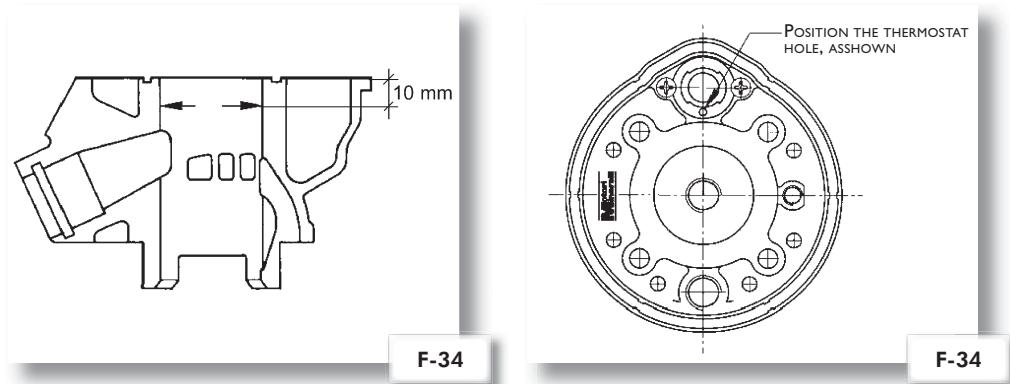
F-32



F-33

Repeat the measurements in several positions along the cylinder jacket, between the top face of the cylinder and the exhaust gap (F-34).

Then check the diameter of the piston and compare it with that of the cylinder (F-33).



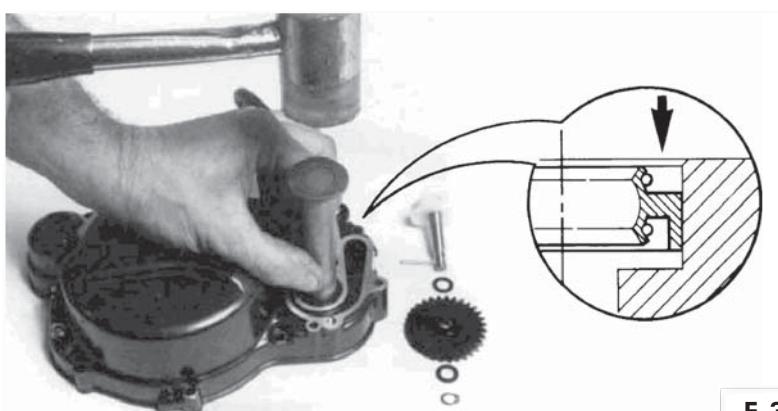
The maximum end float is 0.10 mm, exceeding which, the piston should be replaced. See the chart below.

ENGINE TYPE	COUPLING CHART			
	MIN/MAX PLAY	TOLE. PISTON	TOLE. CYLINDER	SELECTION
AM6 50 (WATER COOLED)	0.049	-0,063 -0,057	-0,007 -0,002	Y
(CYLINDER IN GHISA)		-0,056 -0,050	-0,001 -0,006	Z
(CAST IRON CYLINDER)	0.062	-0,049 -0,043	-0,007 -0,012	V

Important: maintain the same identification letters on the cylinder and piston. The cylinder identification letter can be found on the flat surface of the oiler.

10) WATER PUMP

- Place the clutch crankcase (right hand side) on a flat surface.
- Fit the oil seal in the right direction, as shown (F-35).
- Fit the impeller, gasket, dowels and water pump cover.



F-35



2.5 ENGINE REASSEMBLY

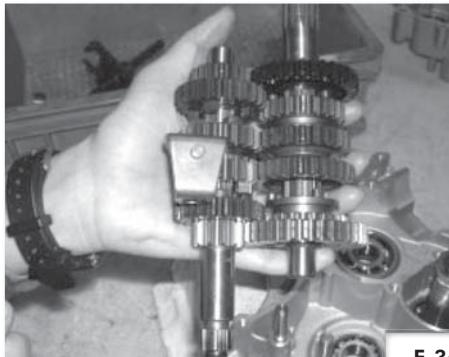
1) PLACE the clutch crankcase (right hand side) on a flat surface. Then, fit the spring and the gear selection poppet ball in their seats and apply **grease** to prevent them falling out.

2) PREPARE the transmission assembly (primary/secondary) keeping all components together (F-36). Put a 0.6 mm shim washer under the 1st speed gear and position the fork in the 3rd and 4th primary gear (F-36).

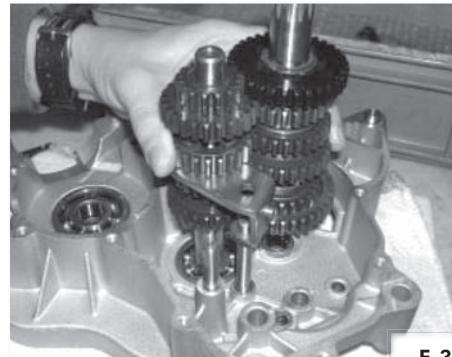
LOWER the assembly thus formed into its seats (F-37).

Raise the 5th speed gear on the secondary shaft and insert the fork (F-38).

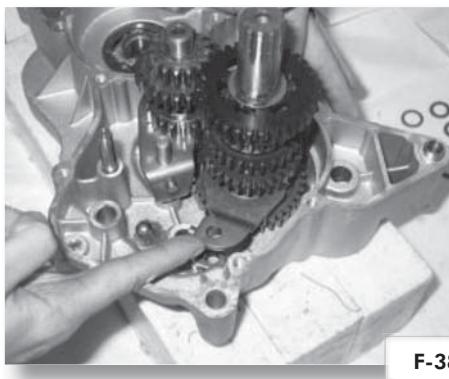
Fit the other fork (6th speed gear) into its seat (F-39).



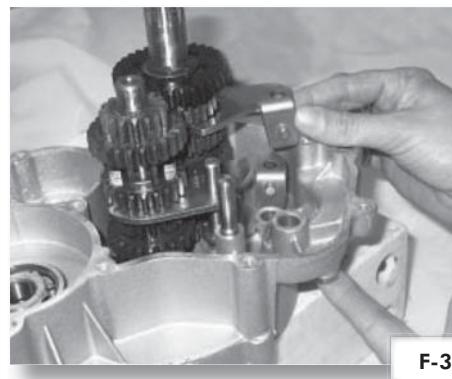
F-36



F-37



F-38



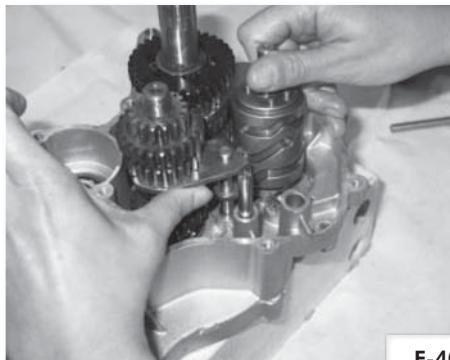
F-39

3) **FIT** the desmodronic shaft (F-40). Insert the fork guide pins into the desmodronic shaft (F-41).

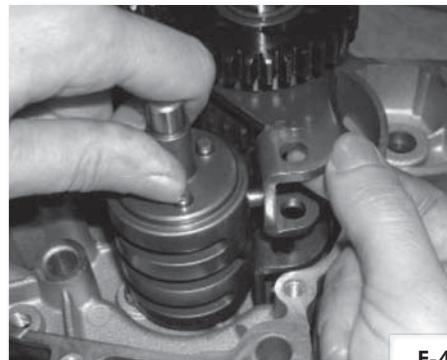
Fit the fork guide rod into its seat (F-42).

Turn the desmodronic shaft until it reaches the position shown in the figure (F-43).

N.B.: these operations must be effected without forcing (with a hammer or other tools).



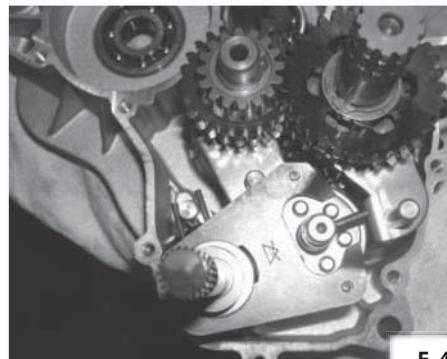
F-40



F-41



F-42

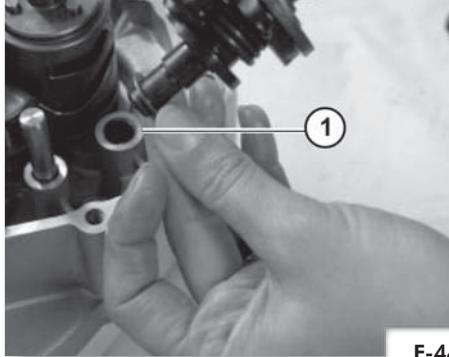


F-43



4) INSERT the shift shaft with the lower washers (0.6 mm thick) (I/F-44) and insert the return spring hooks in the relevant anchoring bridge (F-45) then check that:

- By putting the desmodronic shaft in 3rd speed, make sure the rollers of the cam are at an equal distance from the fork hooks. On the contrary, slightly bend the ends of the spring until obtaining the requested condition.



F-44



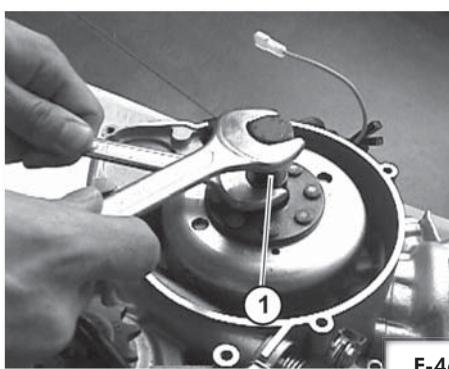
F-45

5) FIT the countershaft in the clutch crankcase.

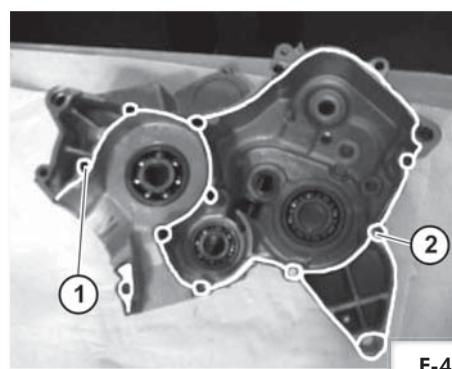
N.B.: assembly of the countershaft in its seat implies no interference.

6) If it has been removed, FIT the connecting rod in the **crankcase on flywheel side** using the tool (I/F-46); keep the connecting rod at the T.D.C. whilst tightening the screw, until the connecting rod touches the bearings.

7) FIT the dowel bolts (I-2/F-47), apply gasket paste on the mating sides of the crankcases (F-47) and oil all shafts. Place the crankcase (flywheel side) over the other crankcase and tap gently all over with a wooden, leather or plastic mallet until the crankcases are joined.



F-46



F-47

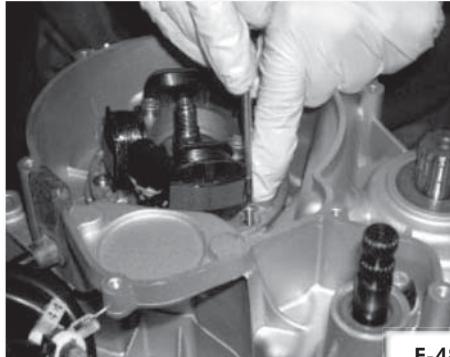
8) FIT the 13 fixing screws and tighten in place (**Cs** 1.0 ÷ 1.2 kg*m). Make sure all shafts can turn freely. Make sure that none of the shafts feature excessive end play, in which case, separate the crankcases and replace the top shim washer with another having a more suitable thickness.

9) FIT the new oil seals, using the specific plug for each.

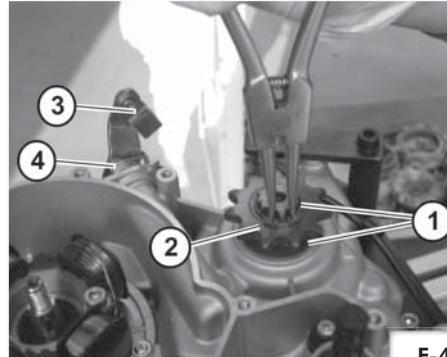


I0) FIT the key for the magneto flywheel; put the stator in its seat and fasten in place with the fixing screws (**Cs** 0.25 ÷ 0.3 kg*m). Fit the rotor and tighten the nut (**Cs** 4.3 ÷ 4.5 kg*m), using the usual wrench (F-48).

I1) FIT the sprocket: snap ring (1/F-49) - sprocket (2) - snap ring (1) - fit the clutch control pin (3/F-49) with its return spring (4/F-49).



F-48



F-49

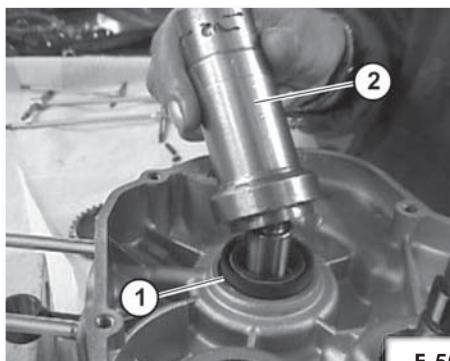
I2) CHECK operation of the sprocket and gear wheel pair.

If any of the gears needs to be replaced, it is recommended to replace the pair since this will ensure smoother and quieter operation.

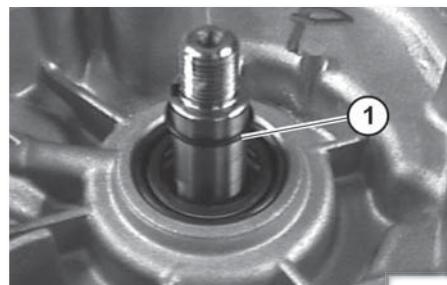
I3) FIT the crankshaft (clutch side) in the following order:

- 1) The **overturned oil seal** (1/F-50), using the special plug (2/F-50)
- 2) The O-ring (1/F-51)
- 3) The spacer (2/F-51), with the bevelled side facing the crankshaft. Push in place until it stops.

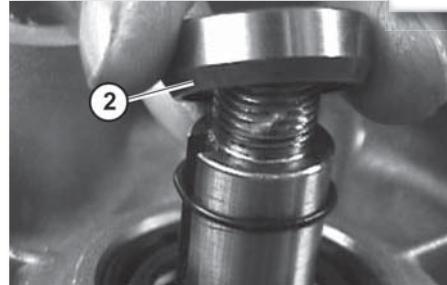
Now fit the key (1/F-52), the countershaft drive gear (2/F-52), the drive sprocket and the nut (**Cs** 6.7 ÷ 7.5 kg*m). Fit the key and driven gear on the countershaft (2/F-53), making sure that the reference notches on the two gears match (F-53). Tighten the nut (**Cs** 4.5 ÷ 5.0 kg*m) (**apply Loctite 242**).

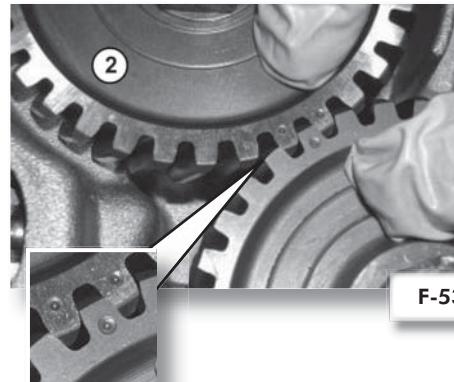
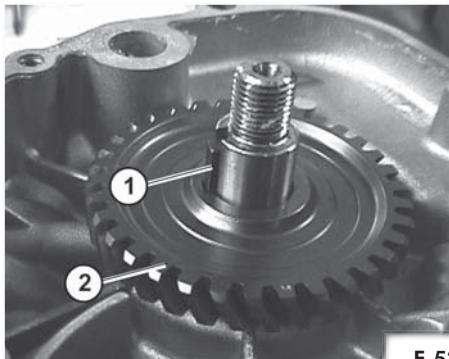


F-50



F-51





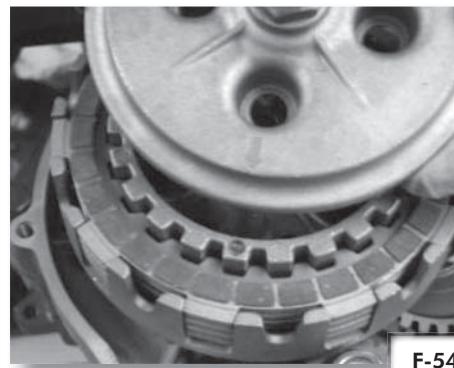
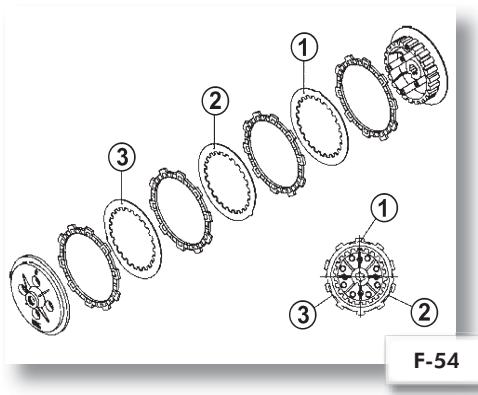
F-53

F-52

14) PROCEED in reverse order. Refit the clutch assembly and remember to replace the nut fixing washer with a new one; fit the clutch boss fixing nut (**Cs** 5.5 ÷ 6.0 kg*m) and bend the tab.

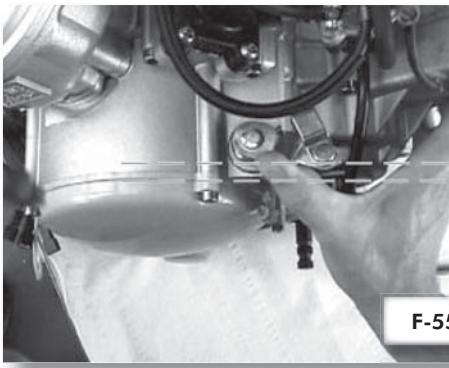
15) FIT the following components on the output shaft, in the order given: clutch rod (**grease** beforehand), ball and disc pusher.

16) FIT the clutch disc assembly in the order shown in (F-54); the iron discs (1-2-3/F-54) should be fitted with the notch, highlighted by the arrows, at 120° the one from the other, starting from the notch facing upwards on the first disc. Fit the last clutch disc, making sure it is timed with the boss (F-54b).



F-54b

F-54



F-55

17) FIT the springs and fixing screws and tighten (**Cs** 0.3 ÷ 0.5 kg*m).

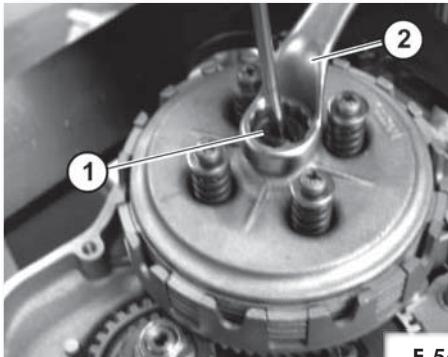
18) Correct operating position of the clutch is obtained when the lever, in the position indicated by the arrow (F-55), is parallel to the cover resting surface.

To obtain this condition, turn the adjustment screw (I/F-56) on the last disc, using the special wrench (2/F-56). Tighten the nut (**Cs** 2.6 ÷ 2.8 kg*m) .

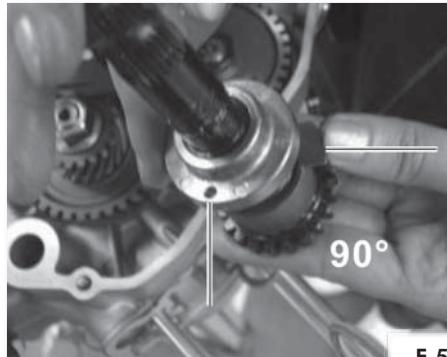


19) BEFORE fitting the starter assembly (version without an electric starter), make sure that the phase between the pawl on the sliding rod and the hole for fixing the spring is the same as before disassembly (90° - F-57).

20) FIT the starter assembly, whilst hooking the spring to the hub on the cover.



F-56



F-57

21) FIT: the dowel bolts and a new gasket on the crankcase; the clutch cover; if necessary, this operation can be made easier by turning the impeller of the water pump. Secure in place with screws (**Cs** 1.0 ÷ 1.2 kg*m).

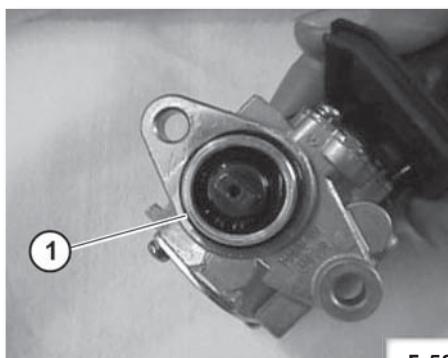
If you have disassembled it, refit the oil pump, making sure that the O-ring is in working order (I/F-58a).



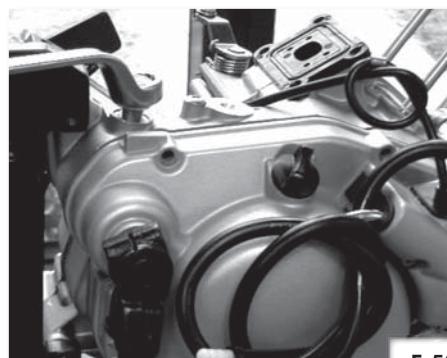
When refitting, take care not to damage the oil pump gear.

Whilst fitting the starter lever on its shaft, turn it 180° counter-clockwise and secure in place with the fixing screws (**Cs** 2.9 ÷ 3.0 kg*m) (F-58b).

This operation must be performed to pre-load the return spring.



F-58a



F-58b



22) Before assembly, **CHECK** the condition of the cage on the piston pin and its rollers. Fit the piston, making sure that the arrow marked **on the top is facing towards the exhaust side** (F-59), and therefore towards the piston pin and its circlips.



F-59



F-60

23) In the order indicated, **FIT** the piston rings, making sure that the ends are correctly positioned in the seats on the piston; a new cylinder gasket; the cylinder; the centre cylinder O-ring in the stud bolts; the O-ring on the cylinder head; the head (clean beforehand). Tighten the nuts evenly and diametrically (**Cs** 1.4 ÷ 1.6 kg*m); check the position and tightness of the O-ring on the cylinder head.

24) FIT the reed valve (F-60), followed by the exhaust manifold, tightening the four screws evenly and diametrically (**Cs** 0.9 ÷ 1.1 kg*m).

25) **REFIT** the flywheel cover, a new gasket and its fixing screws, which must be tightened (**Cs** 0.1 ÷ 0.2 kg*m).

26) REFIT the oil drainage bolt, replace the gasket and secure firmly in place (**Cs** 1.7 ÷ 1.8 kg*m).

27) POUR oil into the engine (0.750 kg) through the hole at the top.

2.6 ENGINE SERVICING AND COMMISSIONING SCHEDULE



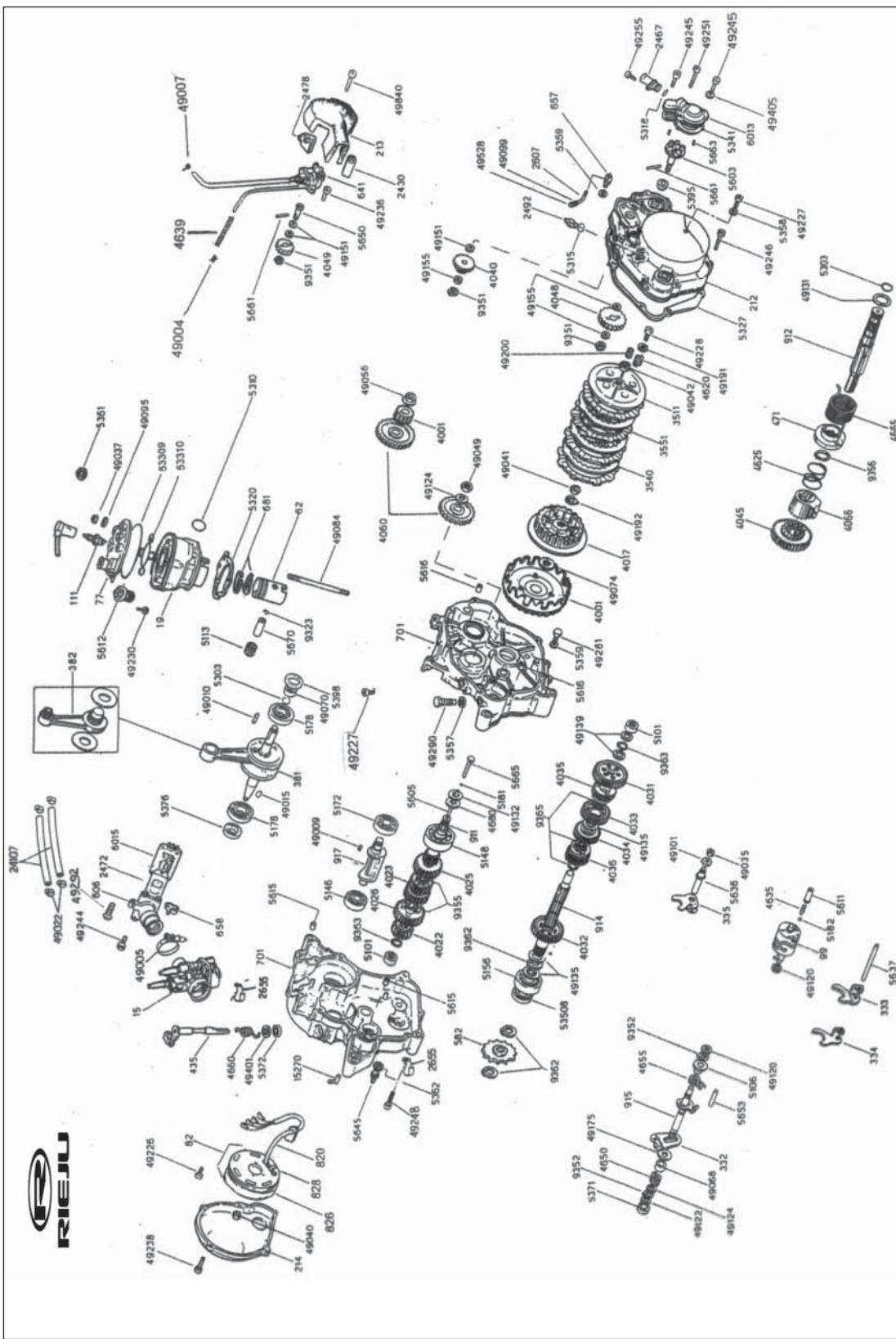
Maintenance Operations	AFTER 1000 KM OR 3 MONTHS	EVERY 5000 KM
Check		
Adjustment of engine idling speed	X	X
Gas and oil pump control	X	X
Front and rear brake control	X	X
Operation of the electrical equipment	X	X
Petrol ducts	X	X
Oil ducts	X	X
Front and rear brake liquid ducts	X	X
Coolant duct	X	X
Fuel heating duct	X	X
Tire pressure	X	
Tire condition, pressure and wear		X
Level of front and rear brake liquid	X	X
Level of coolant	X	X
Level of battery electrolyte	X	X
Screw tightness	X	X
Battery charge level		X
Replace		
Air filter filtering element		X
Front and rear brake pads		X
Gearbox oil		X
Chain - pinion - gear wheel	X	X
Clutch discs		X
Spark plug		X
Check and/or replace		
Piston		every 10.000km
Cylinder head		every 10.000km
Discharge gap		every 10.000km
Check and lubricate		
Chain tightness and condition	X	X
Check and adjust		
Clutch control	X	X
Oil pump control	X	X
Headlight height	X	X
Clean and adjust		
Carburettor		X
Vehicle test		
Road test	X	X



2.7 PARTS AND THEIR TORQUE WRENCH SETTINGS

	PART POSITION	PART NAME	SCREWS	TORQUE SETTING		QTY.
				N*m	Kg*m	
1	Spark plug	Spark plug	M4 x 1.25	20÷25	2÷2,5	1
2	Cylinder head	Nut	M7 x 1	14÷16	1,4÷1,6	4
3	Cylinder head	Pipe fitting	M8 x 1.25	24÷26	2,4÷2,6	1
4	Cylinder head	Temperature probe	M14 x 1.25	16÷20	1,6÷2,0	1
5	Countershaft	Hex. nut	M12 x 1	45÷50	4,5÷5,0	1
6	Water cooling (head)	T.C.B. screw	M4 x 0.7	2,5÷3,5	0,25÷0,35	2
7	Water pump body	T.C.C.E. screw	M6 x 1	4÷6	0,4÷0,6	1
8	Pipe coupling	T.C.C.E. screw	M6 x 1	4÷6	0,4÷0,6	1
9	Water pump body	T.C.C.E. screw	M6 x 1	4÷6	0,4÷0,6	1
10	Water pump body	T.C.B. screw	M6 x 1	4÷6	0,4÷0,6	1
11	Oil pump	T.C.C.E. screw	M5 x 0.8	6÷8	0,6÷0,8	2
12	Oil pump lid	T.C.C.E. screw	M5 x 0.8	3÷4	0,3÷0,4	2
13	Intake manifold	T.C.C.E. screw	M6 x 1	9÷11	0,9÷1,1	4
14	Crankcase	Stud bolt	M7 x 1	10÷12	1,0÷1,2	4
15	Cover, clutch side	T.C.B. screw	M6 x 1	2÷4	0,2÷0,4	1
16	Crankcase, flywheel side	T.C.C.E. screw	M6 x 1	10÷12	1,0÷1,2	13
17	Crankcase, clutch side	Hex. screw	M8 x 1.25	17÷18	1,7÷1,8	1
18	Crankcase, flywheel side	Neutral indicator light	M10 x 1.25	1÷2	0,1÷0,2	1
20	Crankcase, clutch side	Hex. screw	M12 x 1.25	24÷26	2,4÷2,6	1
21	Cover, clutch side	T.C.C.E. screw	M6 x 1	10÷12	1,0÷1,2	7
22	Cover, flywheel side	T.C.C.E. screw	M5 x 0.8	1÷2	0,1÷0,2	5
23	Primary gear (Clutch side)	Nut	M12 x 1.25	65÷75	6,5÷7,5	1
24	Clutch boss	Hex. screw	M12 x 1.25	55÷60	5,5÷6,6	1
25	Disc boss (clutch)	T.C.C.E. screw	M5 x 0.8	3÷5	0,3÷0,5	4
26	Disc pusher (clutch)	Hex. nut	M14 x 1.25	26÷28	2,6÷2,8	1
27		Clutch adj. screw	M14 x 1.25	turn until it stops		1
28	Selector	Hex. nut	M7 x 1	14÷16	1,4÷1,6	1
29	Magneto flywheel	Screw	M4 x 0.7	3÷4	0,3÷0,4	3
30	Magneto flywheel	Hex. nut	M10 x 1.25	43÷45	4,3÷4,5	1

2.8 EXPLODED VIEW OF THE ENGINE AM6 EURO2





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