



Motorcycle Art

RIVALE
800cc



MV AGUSTA RIVALE 800

Motorcycle Workshop Manual

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Motorcycle workshop manual

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Statement

This manual, to be used by the MV Agusta authorised workshops has been realised with the purpose of assisting authorised personnel in maintenance and repairs operations of the motorcycle. The knowledge of technical data herein noted, determines the complete professional training of the technician.

With purpose of making the reading of this manual immediately comprehensible, the paragraphs have been aligned with detailed illustrations that highlight the argument dealt with.

Useful advice

To prevent any problems and to reach an excellent final result, MV Agusta recommends keeping to the following guidelines:

- In the case of an eventual repair, evaluate the client's impressions who states that there is an abnormal functioning of the motorcycle and to formulate the right questions to clarify the symptoms of the problem.
- Clearly diagnose the cause of the abnormality. The basic fundamental theories can be absorbed by reading this manual that must necessarily be integrated to the personal experience and the participation of training courses that are periodically organised by MV Agusta.
- Rationally plan the repair to avoid slack periods, e.g. the collection of spare parts, the preparation of tools and equipment, etc.
- To reach the part to be repaired limiting the work to the essential operations. With regards to this, a valid help would be to consult this manual with regards to the sequences of removal demonstrated in this manual.

Informative note

MV Agusta Motor S.p.A. is committed to a policy of continuous improvement of their products. For this reason, there could be slight differences between that which is written here and the motorcycle on which repairs and/or maintenance are about to be carried out. MV Agusta models are exported to many countries where different norms in relation to the highway code and homologation procedures are valid. Hoping that you will comprehend these problems, MV Agusta Motor S.p.A. reserves the right to make modifications to its products and technical documentation at any moment and without prior announcement.



Respect and defend the environment

Everything that we do has repercussions on the entire planet and its resources.

MV Agusta, wanting to protect the interest of the people, would like to make the client and the technicians of the technical assistance centres aware and to adopt modalities of use of the motorcycle and the disposal of its parts in full respect of the norms in force in terms of environmental pollution, disposal and the recycling of waste.



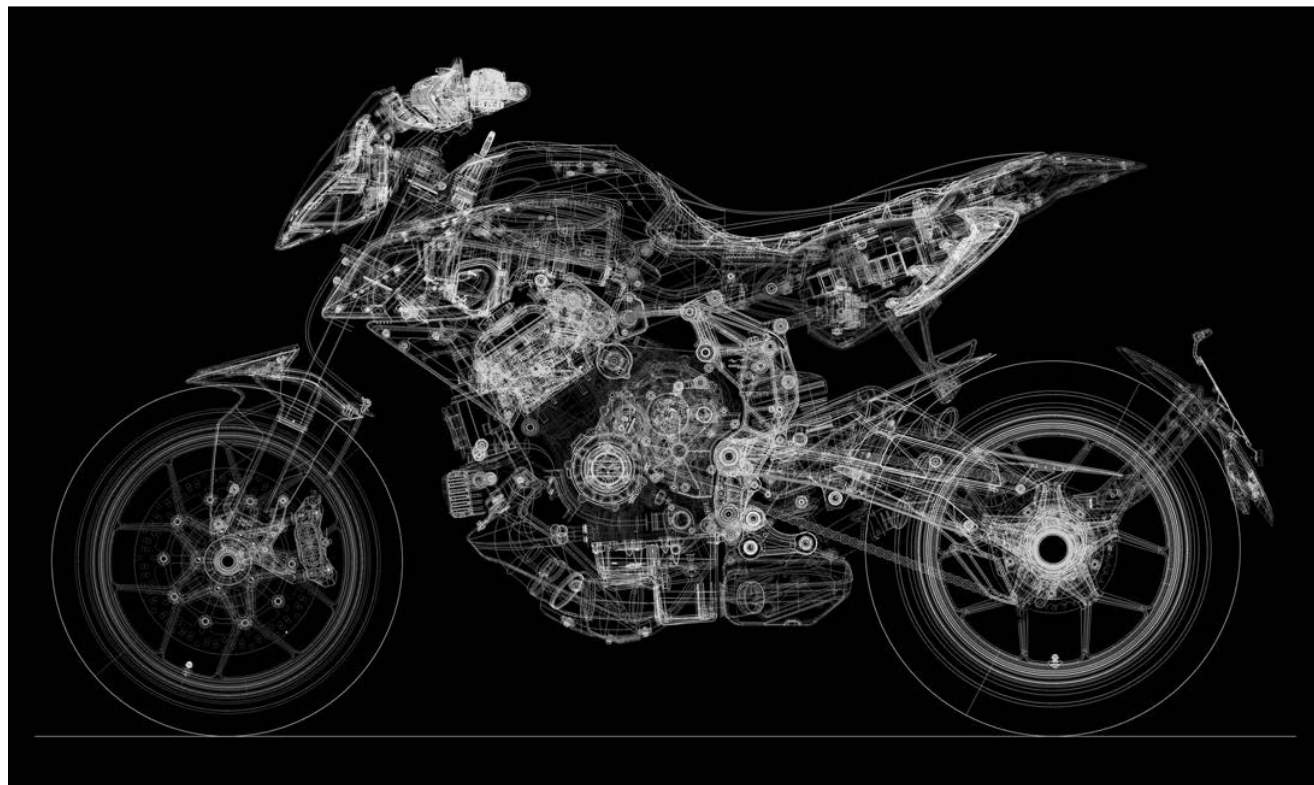
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General description

A



SECTION A

Revision 0



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HOW TO CONSULT THIS MANUAL

Order of the subjects

This manual is divided into chapters that deal with the sub-groups of the motorcycle.

To quickly find the chapter required, the pages of each chapter are marked with a reference mark aligned to the relative item in the general index.



A

Display of the operations

The operations of disassembly, assembly, removal and control are presented with the help of illustrations (designs and photographs).

The illustrations contain symbols that indicate the procedure, special tools and other information. See the symbols lists for their significance.

The procedures are described step after step.

EXAMPLE

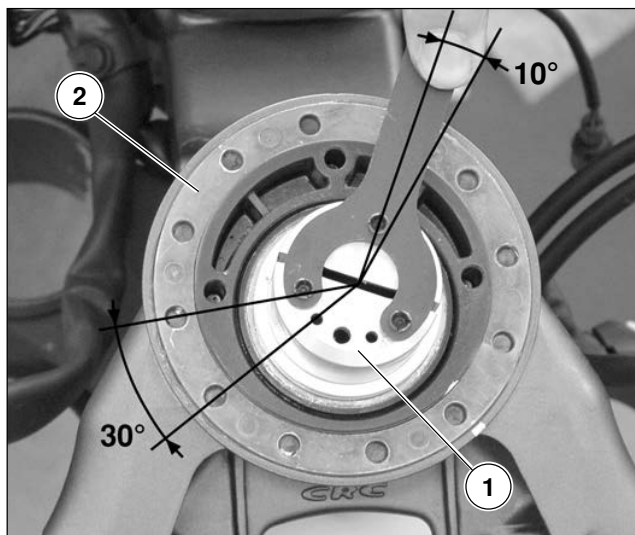
Steering pin tightening

Screw in the steering pin flange ring, without tightening.

This operation must be done manually.

Check that the steering base is at the end of its travel, to the right.

Using the special tool **N. 800091645**, tighten the ring (1) by rotating it 10° calculated approximately as one third of the movement between the two holes of the ring (2) of the steering head (see the figure).



PURPOSE OF THE MANUAL

Principally, this manual has been written for MV Agusta dealers and qualified mechanics.

It is not possible to document all the knowledge necessary for a mechanic in a manual. Those who utilise it must have a basic knowledge of mechanical concepts and the inherent procedures in the techniques of repairing motorcycles. Without this knowledge, The maintenance and repair operations can render the motorcycle unsafe for use.

Updates

MV Agusta Motor S.p.A. is committed to a policy of continuous updating of the models produced. The modifications and significant changes to the specifications and the procedures will be communicated to the official dealers and will appear in future editions of this manual.

All information, instructions and technical data included in this manual are based upon information on the product updated at the moment of going to print. MV Agusta Motor S.p.A. reserves the right to carry out changes at any moment without prior notice and without incurring any obligation.



General description

A

GLOSSARY AND SYMBOLS



ATTENTION

This signifies that the lack of or the incomplete observance of this advice can be gravely dangerous for your safety and for the safety of other persons.



WARNING

This signifies that the lack of observance of these instructions can bring the risk of damage to the motorcycle and the equipment.



Supplies key information for the best fulfilment of the operation.



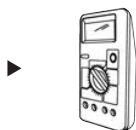
Utilise a specific tool or equipment for the correct carrying out of the operation described.



Tighten to the specified torque.



Tolerance or limit of use.



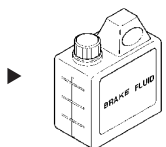
Utilise the tester.



Use the recommended oil.



Use the recommended grease.



Use the recommended brake fluid.



Use the recommended suspension fluid.



Use the recommended coolant.



Use the recommended thread-locking fluid.



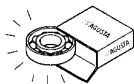
Use the recommended sealant.



Use the recommended adhesive.



Carry out accurate cleaning.



Use new components.



Substitute the component.

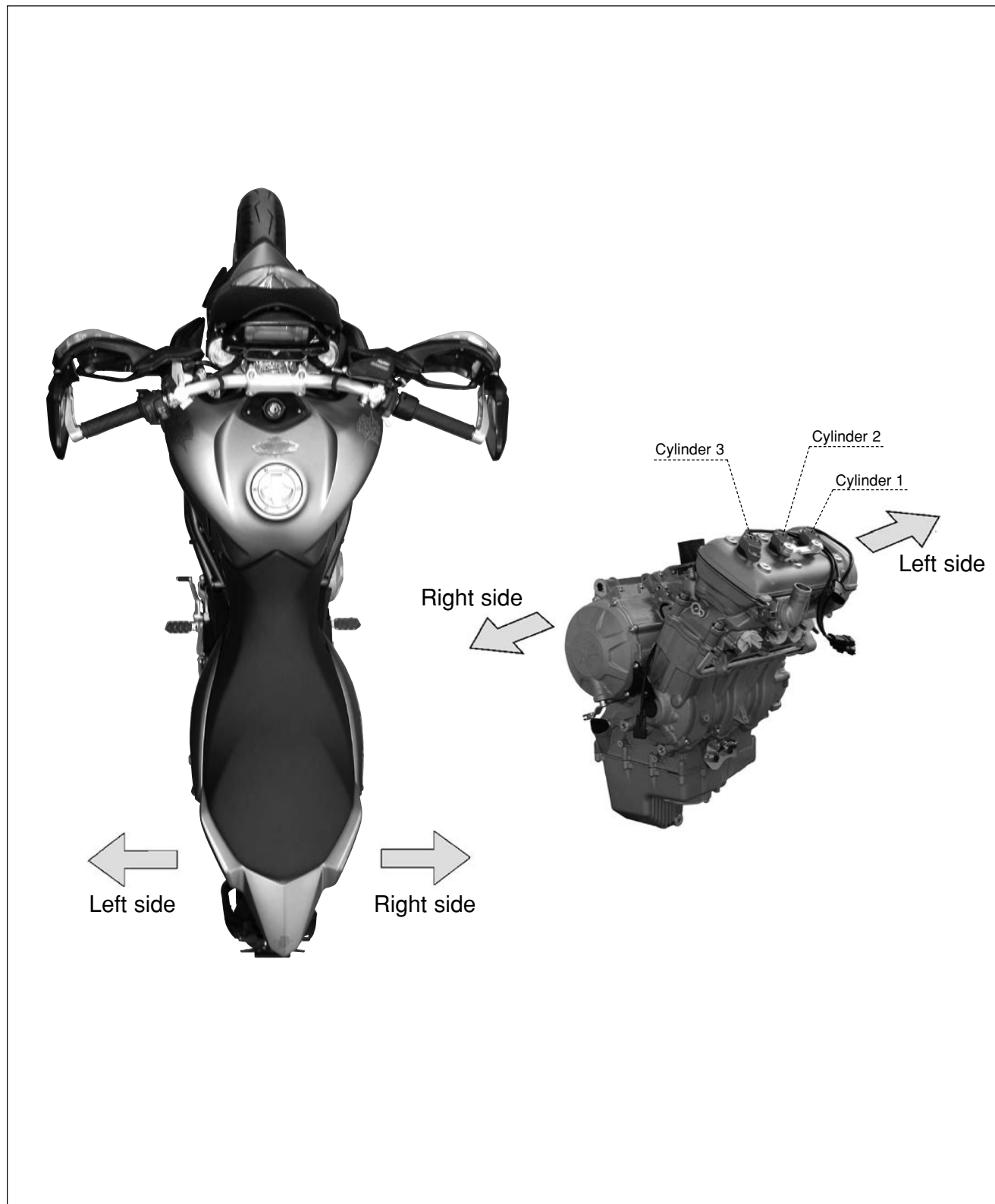


Do not leave litter about.

RIGHT HAND AND LEFT HAND STANDARD

A

To clarify the right hand and left hand standard that is used in this manual, herewith below is a diagram of the motorcycle and the engine against which are indicated the right and left sides.





General description

A

SAFETY



ATTENTION

The information contained in this paragraph is fundamental so that the operations carried out on the motorcycle can be conducted with minimum risk to the mechanic.

Carbon Monoxide

- Exhaust gases contain carbon monoxide (CO) that is poisonous. Carbon monoxide can cause the loss of consciousness and death.
- If it is necessary to switch on the engine, check that the environment is well ventilated. Never switch on the engine in an enclosed environment.
- Switching on the engine can only be carried out in an enclosed environment when there are the appropriate devices for the evacuation of exhaust gases.

Petrol

- Petrol is extremely inflammable and under certain conditions can be explosive.
- Keep sources of heat, sparks and flames away from the work area.
- Always work in a well-ventilated area.
- Never use petrol as a cleaning solvent. Generally, avoid handling it unless it is absolutely necessary.
- Do not use petrol for cleaning components by using compressed air.
- Keep petrol out of reach of children.

Engine oil

- Engine oil can cause skin illnesses if in constant and long contact with the skin.
- If the skin comes into contact with engine oil, wash the parts affected as soon as possible with soap and water.
- If engine oil comes into contact with the eyes, abundantly rinse with water and consult a doctor immediately.
- If engine oil is swallowed, do not provoke vomiting to avoid the aspiration of the product into the lungs. Transport the injured person immediately to hospital.
- Used oil contains dangerous substances and poisonous for the environment. To substitute oil, it is recommended to go to an authorised MV Agusta dealer who is equipped to deal with the collection of used oil in respect of the norms in force.
- Do not dispose of used oil in the environment.
- Keep used oil out of the reach of children.

Engine coolant

- Under certain situations, the ethylene glycol contained in the engine coolant is inflammable and its flame is invisible. Ethylene glycol would cause serious burns if ignited because it is invisible.
- Avoid bringing the engine coolant into contact with hot parts. Such parts could be sufficiently hot to ignite the coolant.
- The engine coolant (ethylene glycol) can cause irritation of the skin and is poisonous if swallowed.
- If the engine coolant comes into contact with the skin, immediately remove any contaminated clothing and wash with soap and water. If it comes into contact with the eyes, abundantly rinse with clean water and immediately consult a doctor. If swallowed, do not provoke vomiting to avoid the aspiration of the product into the lungs. Administer clean water and transport the injured person immediately to hospital and show the product to the doctor.
- If exposed to high concentrations of vapour, transport the injured person to a non-poisonous atmosphere and if necessary call a doctor.
- Do not remove the radiator cap when the engine is still hot. Being under pressure, the engine coolant can be violently ejected and therefore provoke burns.
- The engine coolant contains dangerous and poisonous substances and is therefore dangerous for the environment. To substitute used engine coolant, it is advisable to go to the authorised MV Agusta dealer who is equipped to deal with the collection of used engine coolant in respect of the norms in force.
- Do not dispose of engine coolant in the environment.
- Keep engine coolant out of reach of children.



General description

A

Brake fluid

- Brake fluid is extremely corrosive.
- Avoid any contacts with the eyes, skin and the mucous membrane.
- If brake liquid comes into contact with the skin, remove all contaminated clothing and wash immediately with soap and water.
- If brake fluid comes into contact with the eyes, abundantly rinse with water and call a doctor.
- If swallowed, do not provoke vomiting to avoid aspiration of the product into the lungs. Immediately call a doctor.
- Take the injured person immediately to hospital, if he has breathed brake fluid into the lungs.
- In the case of exposure to high concentrations of vapour, move the injured person to a non-poisonous atmosphere and if necessary call a doctor.
- In the case of accidental contact, rinse abundantly with water and call a doctor.
- Keep brake fluid out of reach of children.

Thread-locking fluid

- As it is not classified as dangerous, the prolonged contact with the skin, particularly with regards to abrasions can provoke sensitiveness and dermatitis. In the case of contact with the skin, rinse abundantly with running water.
- Move the injured person into the open air and call a doctor if the injured person feels ill after having breathed in the product.
- In the case of contact with the eyes, rinse abundantly with water for at least 15 minutes.
- If the thread-locking fluid has been swallowed, drink an abundant quantity of water or milk. Do not provoke vomiting to avoid the aspiration of the product into the lungs. Immediately call a doctor.
- Keep out of reach of children.

Nitrogen - rear shock absorber

- The rear shock absorber contains nitrogen under pressure.
- Before disposing of used shock absorbers, discharge the nitrogen via the depressurising valve.
- Utilise only nitrogen to pressurise the shock absorber. The use of unstable gases can cause explosions that could cause burns.
- Do not place the shock absorber near to flames or sources of heat as this could cause explosions with consequent burns.
- Keep out of reach of children.

Battery

- The battery produces explosive gases. Keep it away from sparks, flames or cigarettes. During recharging, adequately ventilate the environment.
- The battery contains a solution of sulphuric acid (electrolyte).
- Sulphuric acid is corrosive and it destroys many materials and clothing. On contact with small quantities of water it generates a violent reaction that manifests itself by creating large quantity of heat and spurts of hot acid. Sulphuric acid attacks many metals thereby liberating hydrogen: an inflammable gas that forms an explosive mixture when mixed with air.
- Contact with sulphuric acid can cause burns. In the case of contact, remove immediately all contaminated clothing and wash the skin with abundant quantities of water. Take the injured person to hospital if necessary.
- In the case of contact with the eyes, rinse immediately with abundant water. Call a doctor and continue with the treatment until the doctor arrives.
- If the electrolyte is swallowed, rinse the mouth with water without swallowing. Take the injured person immediately to hospital and explain to the doctor there what the injured person has swallowed.
- The battery contains dangerous substances that are poisonous for the environment. It is advisable to substitute it at an MV Agusta dealer that is equipped to dispose of this product in respect of the norms in force.
- Do not dispose of used batteries in the environment.
- Keep out of reach of children.

Hot parts

- The engine and the exhaust system become very hot and maintain this temperature for some time after the engine has been switched off. Wait for these parts to cool down before handling them or working on the motorcycle near to them. Use protective gloves.



General description

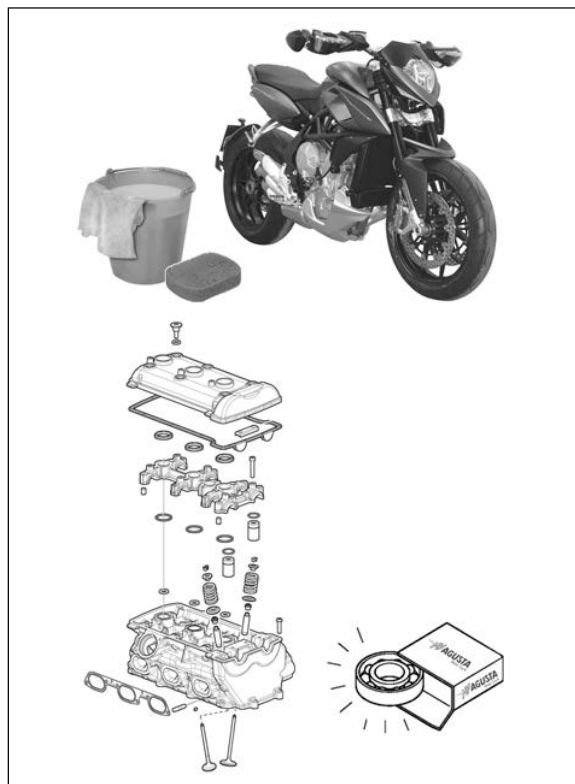
A WARNING



WARNING

The information contained in this paragraph is important so that the operations carried out on the motorcycle can be conducted without damaging the motorcycle.

- Thoroughly clean the motorcycle before disassembling it.
- During disassembly, clean all parts and place them in containers respecting exactly the order of disassembly.
- Always use the special utensils where necessary and each time where prescribed.
- Always use adhesives, sealants and lubricants where prescribed. Respect the instructions about their technical characteristics.
- Always substitute parts such as gaskets, O-rings, security washers with new parts.
- Slackening or tightening nuts or screws, always start with those of a greater dimension or from the centre. Always respect the torque values indicated.
- Utilise only MV Agusta spare parts.



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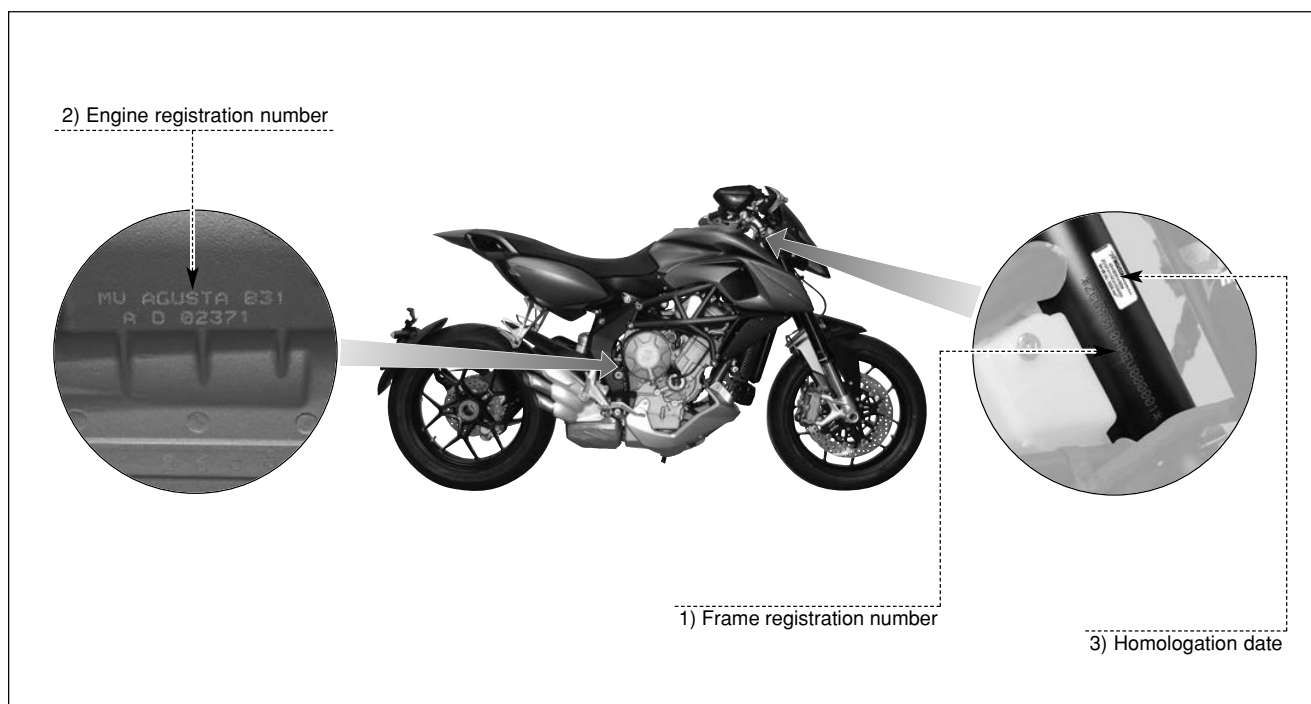
A

OPERATIVE TECHNICAL SPECIFICATIONS

MOTORCYCLE IDENTIFICATION

The registration number of the motorcycle is stamped on the right side of the steering head.

The engine registration number is stamped on the upper engine casing, near the swingarm.



Below is an example of the designation of the frame registration number:

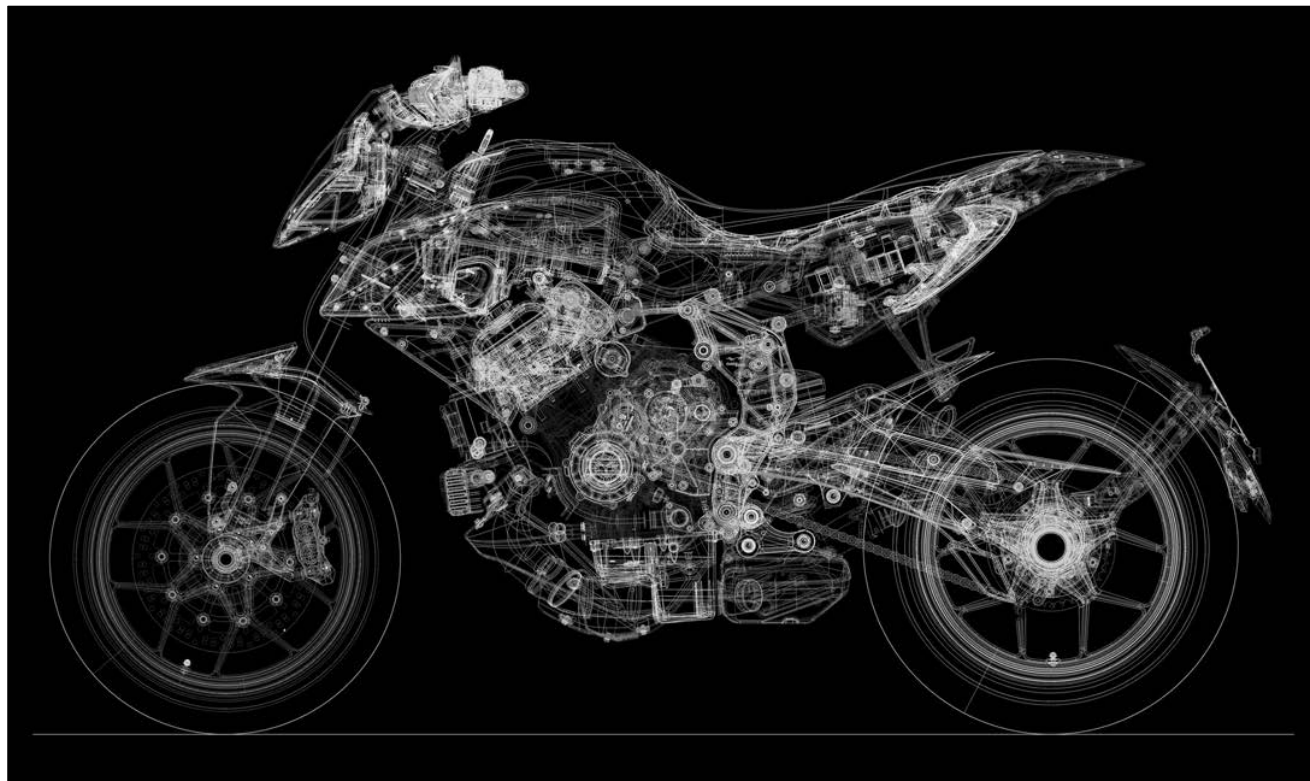
ZCG S3 10 AA E V 000011

Manufacturer identification ————
Vehicle model ————
Progressive frame number ————



General description

A



B

SECTION B

Revision 0



SUMMARY

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TECHNICAL INFORMATION

B



TECHNICAL DATA

Description	RIVALE 800
CHARACTERISTICS	
Wheelbase (mm) (*)	1410
Total length (mm) (*)	2070
Maximum width (mm)	885
Seat height (mm) (*)	881
Ground clearance (mm) (*)	142
Trail (mm) (*)	104.5
Dry weight (kg)	178
Fuel tank capacity (lt) (**)	12.88
Fuel reserve (lt) (**)	4
Sump oil quantity (kg)	2.5
ENGINE	
Type	Three-cylinder, four-stroke, 12 valves
Bore (mm)	79.0
Stroke (mm)	54.3
Displacement (cm ³)	798.5
Compression ratio	13.3 : 1
Starter system	Electrical
Cooling	Cooling with separate liquid and oil radiators
Cylinder head and cylinders	Chill-cast
Engine covers	Die-cast
Valves	Steel

* : The data declared are not binding. They are susceptible to variations due to riding conditions.

** : The data declared are not binding. They are susceptible to variations due to external temperature, engine temperature and the evaporation point of the petrol used.



Maintenance

TECHNICAL DATA

Description	RIVALE 800
TIMING	
Type	Double-overhead camshaft
LUBRICATION	
Type	Wet sump
IGNITION - FUEL FEED SYSTEM	
Type	Eldor EM2.0 "NEMO" integrated ignition-injection system with Mikuni Motorised throttle body; inductive discharge electronic ignition; "Multipoint" phased sequential electronic injection.
Spark plugs	NGK CR9 EIB-9
Spark gap (mm)	0.8 ÷ 0.9
CLUTCH	
Type	Multiple-disc in oil bath
PRIMARY DRIVE	
Number of teeth on countershaft gear	Z = 19
Number of teeth on clutch gear	Z = 36
Transmission ratio	1.895
SECONDARY DRIVE	
Number of teeth on front sprocket	Z = 16
Number of teeth on rear sprocket	Z = 41
Transmission ratio	2.563
TRANSMISSION	
Type	Removable, six-speed gearbox with constant-mesh gears
Gear ratios (total ratios)	
1 st	2.846 (13.819)
2 nd	2.125 (10.317)
3 rd	1.778 (8.632)
4 th	1.579 (7.666)
5 th	1.429 (6.936)
6 th	1.318 (6.400)
FRAME	
Type	ALS steel tubular trellis (MAG welded)
Fork fulcrum plates	Aluminium alloy
FRONT SUSPENSION	
Type	"Upside down" telescopic hydraulic fork with external and separated adjustment of rebound and compression damping and of spring preload
Ø stems (mm)	43
Telescopic movement (mm)	150
REAR SUSPENSION	
Type	Progressive, single shock absorber with extension, compression and spring preload adjustment
Wheel travel (mm)	130
Swingarm	Aluminium alloy
FRONT BRAKE	
Type	Dual floating disc with steel braking band
Ø Discs (mm)	320
Disc flanges	Steel
Calipers (Ø pistons mm)	Radial-type, with 4 pistons (Ø 32)
REAR BRAKE	
Type	Single steel disc
Ø Discs (mm)	220
Calipers (Ø pistons mm)	2-piston (Ø 34)
FRONT RIM	
Material	Aluminium alloy
Dimensions	3,50" x 17"
REAR RIM	
Material	Aluminium alloy
Dimensions	5,50" x 17"



Maintenance

TECHNICAL DATA

Description	RIVALE 800
TYRES	
Front	120/70 ZR 17 M/C (58 W) TL
Rear	180/55 ZR 17 M/C (73 W) TL
Brand and type	PIRELLI - Diablo Rosso Corsa
Tyre pressure (*)	
Front	2.3 bar (33 psi)
Rear	2.3 bar (33 psi)
ELECTRICAL SYSTEM	
System voltage	12V
Headlight bulb	H4 12V 60/55W
Front turn indicator	LED
Rear turn indicator	LED
Tail light bulb	LED
Brake, rear light	LED
Battery	12V - 8,6Ah
Alternator	350 W at 5000 r.p.m.
BODYWORK	
Side fairings	Thermoplastic material
Front fairing	Thermoplastic material
Front upper fairings	Thermoplastic material
Rear fairings	Thermoplastic material
Fuel tank	Thermoplastic material
Tail	Thermoplastic material
Tail cover	Thermoplastic material
Air-box	Thermoplastic material
Front mudguard	Thermoplastic material
Chain guards	Thermoplastic material
Exhaust pipe guard	Aluminium
Bulkhead under-seat	Thermoplastic material
License-plate holder	Thermoplastic material
Rear mudguard	Thermoplastic material
Handguards	Thermoplastic material

* : If tyre brands other than those recommended are used, refer to the tyre pressure indicated by the manufacturer on the tyre side wall.



Maintenance

PERIODICAL MAINTENANCE SCHEDULE

The table that follows indicates the recommended intervals between periodical maintenance operations. Periodical maintenance is necessary to keep the motorcycle in an optimum condition. The intervals are expressed in kilometres.

B



WARNING

For motorcycles used in particularly severe conditions, maintenance operations must be carried out more frequently.



We respect and defend the environment.

Everything that we do has repercussions on the whole planet and on its resources.

MV Agusta, to protect the interests of the everyone, ask clients and technical assistance operators to use the motorcycle and dispose of its used parts with respect to the norms in force in terms of environmental pollution, disposal and recycling of refuse.

Programmed maintenance schedule

Km (mi) covered		0	1000 (600)	6000 (3800)	12000 (7500)	18000 (11200)	24000 (14900)	30000 (18600)	36000 (22400)
Service		Pre-delivery	A	B	C	D	E	F	G
Description	Operation								
Engine oil	Substitution		•	•	•	•	•	•	•
		At least once a year							
Engine oil filter 	Substitution (utilise only original MV Agusta oil filters)		•	•	•	•	•	•	•
		At every substitution of engine oil							
Engine coolant	Check level and top-up	•	•	•	•	•	•	•	•
	Substitution	At least every two years							
Cooling system	Check for leakages	•	•	•	•	•	•	•	•
Electric fan	Check functioning	•	•	•	•	•	•	•	•
Valves 	Check / adjustment				•		•		•
Timing chain	Check				•		•		
	Substitution								•
Mobile timing chain guide	Check / Substitution				•		•		
	Substitution								•
		At least every substitution of the timing chain							
Timing chain tensioner	Check / Substitution				•		•		•
Spark plugs	Check / Substitution			•		•		•	
	Substitution				•		•		•
Fuel filter	Check / Substitution				•		•		•
Throttle body 	Check and adjust		•	•	•	•	•	•	•
Air filter	Check / Substitution			•	•	•	•	•	•
Brake fluid	Check level	•	•	•	•	•		•	•
	Substitution						•		
		At least every two years							
Brakes and clutch	Check functioning	•	•	•	•	•	•	•	•
	Check circuit	•	•	•	•	•	•	•	•
Brake pads (front and rear)	Check / Substitution		•	•	•	•	•	•	•
Fuel tubes	Check for defects and leakages		•	•	•	•	•	•	•
	Substitution	At least every three years							
Throttle control	Check functioning	•	•	•	•	•	•	•	•
Engine start button	Check functioning	•	•	•	•	•	•	•	•



Maintenance

Programmed maintenance schedule

Km (mi)		0	1000 (600)	6000 (3800)	12000 (7500)	18000 (11200)	24000 (14900)	30000 (18600)	36000 (22400)
Service		Pre-delivery	A	B	C	D	E	F	G
Description	Operation								
Transmission and flexible controls	Check / adjust	●	●	●	●	●	●	●	●
Drive chain 	Check / adjust	●	●	●	●	●	●	●	●
	Lubricate		●	●		●		●	
	Substitution				●		●		●
Front sprocket / stop washer	Check		●	●		●		●	
	Substitution				●		●		●
At least at each substitution of the transmission chain									
Rear sprocket	Check		●	●		●		●	
	Substitution				●		●		●
At least at each substitution of the transmission chain									
Rear sprocket spring drive	Check / Substitution				●		●		●
Steering bearings 	Check		●		●		●		●
	Lubricate						●		
Tyres	Check pressure	●	●	●	●	●	●	●	●
	Check for wear		●	●	●	●	●	●	●
Wheel rims	Visual check		●	●	●	●	●	●	●
Every tyre substitution									
Front wheel bearings 	Check			●	●	●	●	●	
	Substitution								●
Every tyre substitution									
Side stand	Check functioning	●	●	●	●	●	●	●	●
Side stand switch	Check functioning	●	●	●	●	●	●	●	●
Rear wheel hub	Check / lubricate roller bearings				●		●		
	Substitution / lubricate roller bearings								●
Swingarm bearings 	Check / lubricate								●
Drive chain pads on swingarm	Check / substitution		●	●	●	●	●	●	●
Drive chain pads on frame plate	Check / substitution		●	●	●	●	●	●	●
Rear shock absorber 	Check / adjust		●		●		●		●
Front fork oil 	Substitution						●		
Battery connections	Check and clean		●	●	●	●	●	●	●
Electrical system	Check functioning	●	●	●	●	●	●	●	●
Instruments	Check functioning	●	●	●	●	●	●	●	●
Lights / visual signals	Check functioning / Lamp replacement	●	●	●	●	●	●	●	●
Horn	Check functioning	●	●	●	●	●	●	●	●
Front headlight	Check functioning	●	●	●	●	●	●	●	●
	Adjust								
At every variation of the riding set-up of the motorcycle									
Ignition switch	Check functioning	●	●	●	●	●	●	●	●
Locks	Check functioning	●	●	●	●	●	●	●	●
Torque settings - nuts and bolts	Check / tighten	●	●	●	●	●	●	●	●
Tube band fasteners 	Check / tighten	●	●	●	●	●	●	●	●
General lubrication		●	●	●	●	●	●	●	●
General check		●	●	●	●	●	●	●	●

B



Maintenance

Table of lubricants and fluids

Description	Recommended product	Specifications
Engine oil	eni i-Ride moto2 5W-40 (*)	SAE 5W/40 - API SL
Engine coolant	AGIP ECO - PERMANENT	Ethylene-glycol diluted with 50% distilled water
Brake and clutch fluid	Agip Brake 4	DOT4
Chain lubrication oil	D.I.D. CHAIN LUBE	-

*: To find the recommended product, MV Agusta suggests going directly to the authorised MV Agusta dealers. Eni i-Ride moto2 5W/40 has been manufactured for the Rivale 800 engine. If the described oil is not available, MV Agusta suggests using completely synthetic oils with characteristics equal or better than the ones prescribed in the following standards:

- Conforming to API SL
- Conforming to ACEA A3
- Conforming to JASO MA, MA2
- Grade SAE 5W-40

NOTE The above specifications indicated are marked either on their own or together with others on the container of the lubricating oil.



MAINTENANCE AND TUNING OPERATIONS

Each operation of periodical maintenance is described in this chapter.

ENGINE OIL AND OIL FILTER

Engine oil

Substitute:→ at the first 1000 kilometres and then every 6000 kilometres.

Oil filter

Substitute:→ at the first 1000 kilometres and then every 6000 kilometres (or at least every oil change).

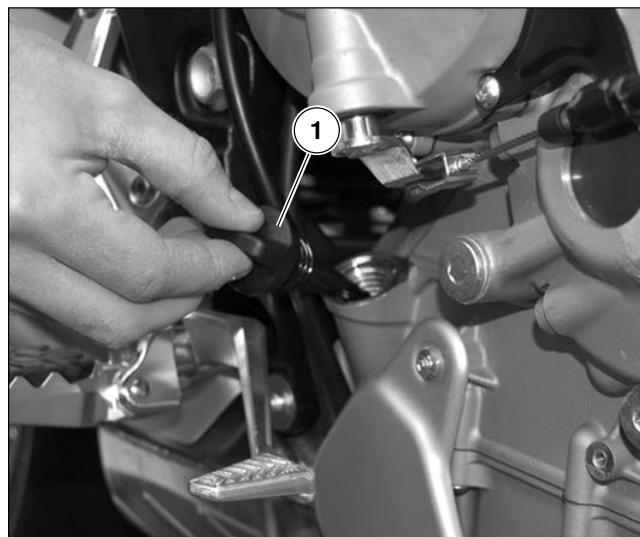
To accede to the oil filter and the discharge and filling holes of the engine oil, it is necessary to carry out certain operations beforehand:

- Position the motorcycle on the rear stand.

NOTE The substitution of the engine oil must be done with a hot engine as opposed to the oil-check that is done with a cold engine.

Remove filler cap (1) on the rh side of the vehicle so allow the oil to drain out (see figure).

To remove the filler cap, unscrew it anticlockwise.



Remove the exhaust aluminium bulkhead as described in chapter C "Superstructures".

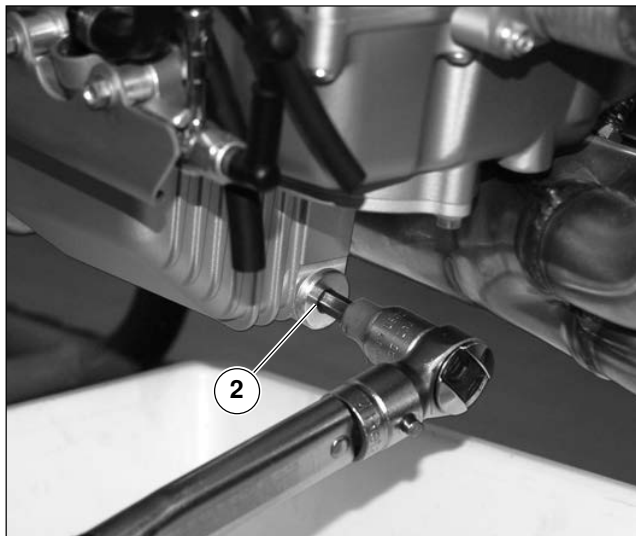
Place a container underneath the engine to collect the used oil.

Remove the oil discharge plug (2).



Recover the oil in an appropriate container. Do not scatter the drainage oil into the environment.

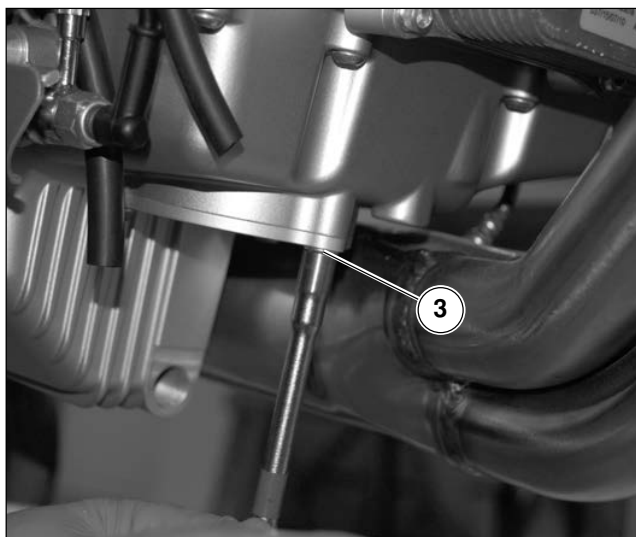
Allow the lubrication system to drain completely.



B

Substitution of the oil filter

Remove the 3 fixing screws (3) of the oil filter cover.



Remove the cover and take out the oil filter.

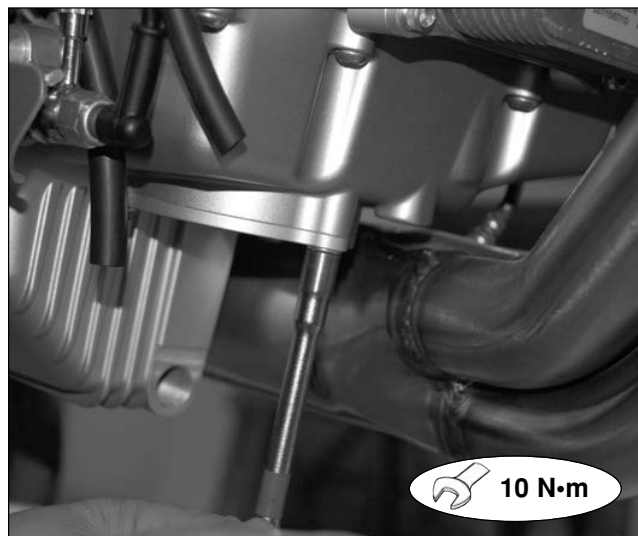


Replace the oil filter and put the cover back on.



**Torque pressure for cover oil filter screws:
10 N·m**

B



On the oil discharge plug there is a magnet to attract any metal residues that could form in the engine during rotation.

Before replacing the cap, make sure it is completely clean. Replace the sealing washer with a new one.

Screw in the oil discharge plug and tighten it to the specified torque.



Torque pressure oil discharge plug: 40 N·m

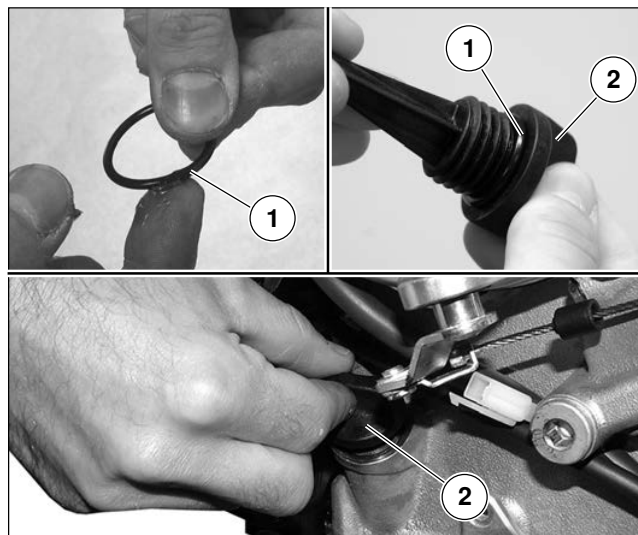


Pour around 2 kg of engine oil (as specified in the table on page B-8) into the filling hole.

Close the filler hole using the appropriate cap.

Before replacing the filler cap, grease the O-ring (1) with silicone grease (see figure).

Tighten the cap (2).



Switch on the engine for several minutes.
After switching off the engine, wait at least ten minutes and then check the oil level.
Ensure that the motorcycle is placed on level ground and is in a vertical position.
The level must be within the "MIN" and "MAX" references marked on the cap rod. Do not exceed the "MAX" marking. Check any oil leakages.



Avoid turning the engine over with the oil level lower than minimum. It could compromise the correct functioning of the engine. If the level after the topping-up, is over the "MAX" reference notch, correct it by emptying a little oil out of the engine.



B

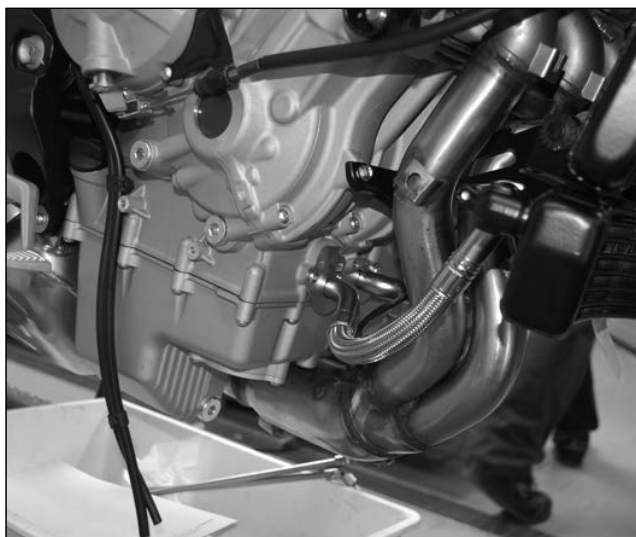
Oil pipes

During ordinary maintenance operations, ensure that the different components are properly fitted and that no oil is leaking from the parts involved in engine lubrication and in particular from:

- The crankcase.
- Seepage on heat exchanger.



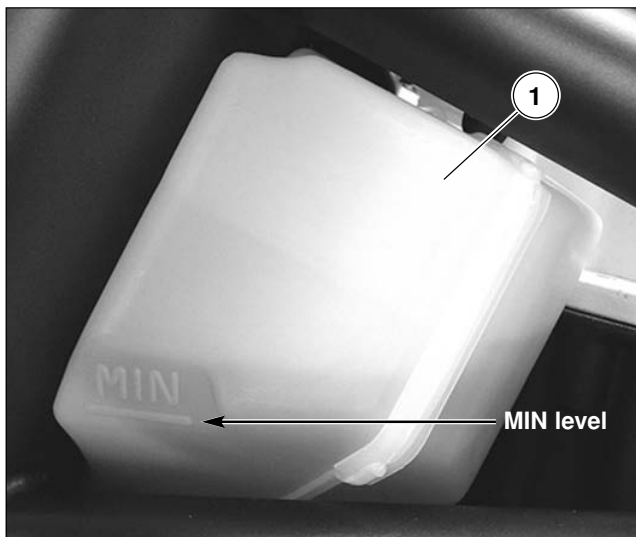
If even the slightest leakage is found, overhaul the components as described in the Rivale 800 engine workshop manual (Part. Code 8000B6231).



ENGINE COOLANT

Check / top-up level → At the pre-delivery, at the first 1000 kilometres and then every 6000 kilometres.

Keeping the motorcycle in a vertical position, check that the coolant liquid level is above the "MIN" level marked on the side of the expansion tank (1).



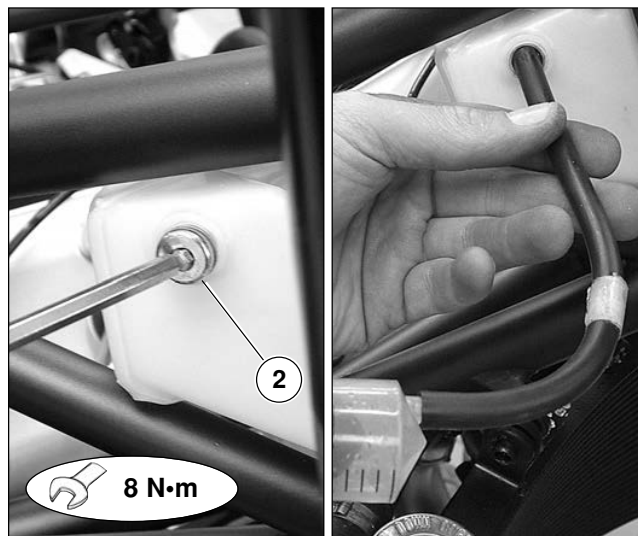
If the level is under the minimum line, proceed with topping-up as follows:

B

With the engine cold, unscrew and remove the coolant filler cap (2). Using a syringe, top up with the recommended coolant on page B-8.



Tightening torque of expansion vessel side cap: 8 N·m



Should the motorcycle have been disassembled for other interventions, it can also be restored by removing the top cap.



Open the expansion tank only when the engine is cold; the discharge of boiling liquid could cause burns.

If the liquid comes into contact with the skin or the eyes, rinse abundantly with water.



With the engine cold, restore the level through the expansion vessel filler as shown in the figure.



Engine coolant substitution

Substitution → every two years

Before emptying the plant, first perform the following operations:

- remove the tank left side panel (see figures to the side);
- place a container under the engine to collect the used coolant;
- remove the right aluminium bulkhead (1) by loosening the 4 screws;
- remove the liquid drain screw (2) letting the liquid flow out;
- open the remote cap on the radiator (3) positioned on the left side of the motorcycle.

Wait for the engine coolant to completely flow out.



Recover coolant in a specific container. Do not release used liquid into the environment.

Position the motorcycle on the side stand.

Tighten the coolant drain plug (2) once again at the specific tightening torque, using a newly supplied gasket.



Coolant drain plug tightening torque: 35 N·m

Fill the cooling system with a suitable liquid described in the table (see page B-8) until you reach the level of the bar of the radiator filler cap. Do this in stages to stabilise the liquid level.

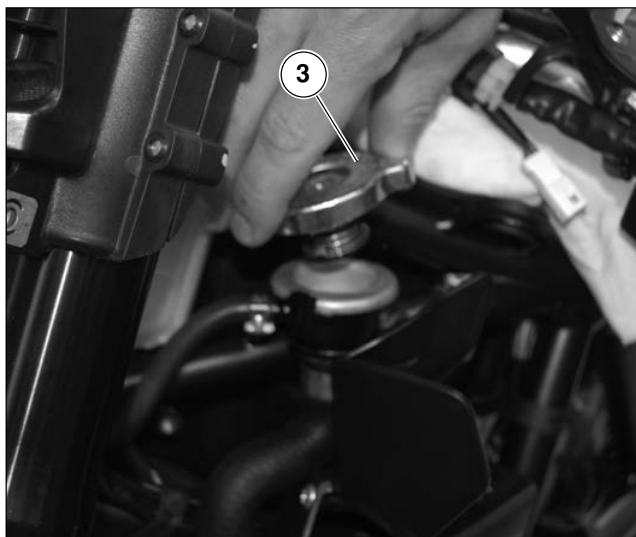
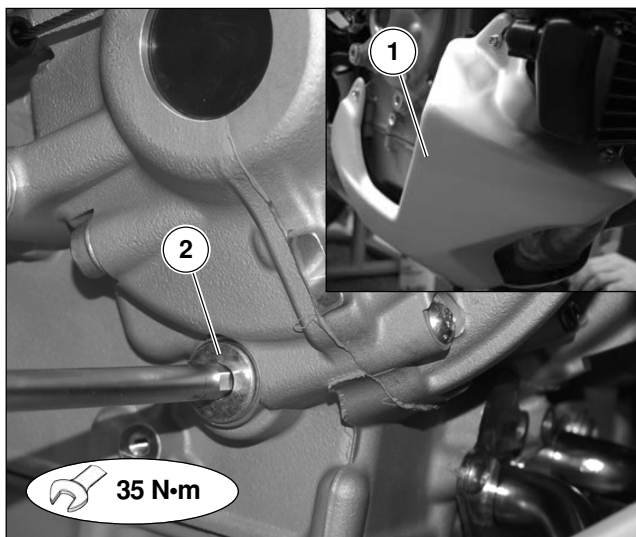
Close the cap and bring the motorcycle back to a vertical position on the rear stand.

Fill up the expansion tank until it exceeds the "MIN" level.

Switch on the engine and keep it running until the water becomes hot enough to automatically switch on the electric cooling fan. Switch off the engine. Repeat the operation at least once, then wait some minutes for the engine to cool down.



Carefully check for leaks, blow-bys, damaged tubing, etc. If there are leaks or damage in the cooling system, proceed with the overhaul as described in the chapter L "Cooling system".





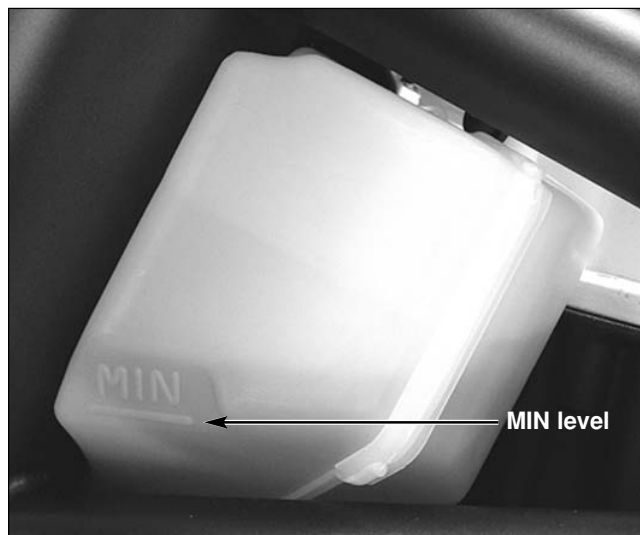
Maintenance

Check the level of the coolant in the radiator once again, keeping the expansion vessel pipe closed with relevant pincers for rubber pipes.

B



Should the level be too low, open the connection tube to the expansion vessel and let liquid flow out until the preset level.
Close the tube and tighten the radiator cap.
Restore the correct level in the expansion vessel.



Complete the assembly of the motorcycle.



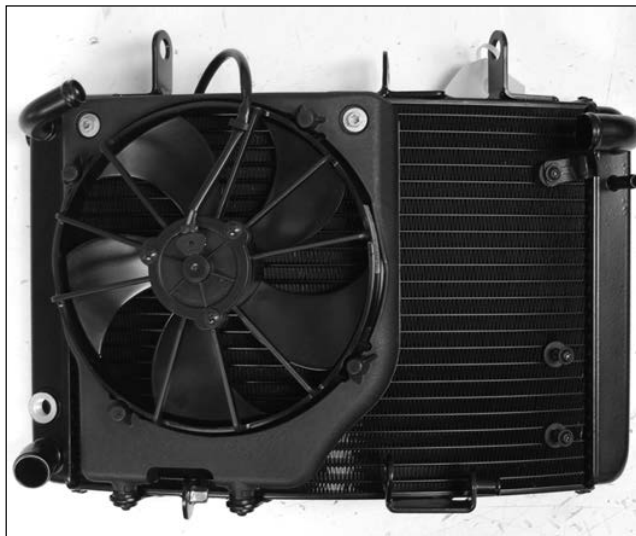
ELECTRIC COOLING FAN

Check → on pre-delivery and at the first 1000 kilometres and then every 6000 kilometres.

To carry out the check on the functioning of the electric cooling fan, switch on the engine and heat it up.

The electric fan must start up when the water temperature reaches the 5th or 6th notch on the dashboard.

If the electric cooling fan do not switch on, carry out the checks on the various components as described in chapter L "Cooling system".



B

VALVE MECHANISM ADJUSTMENT

Check and adjust Every 12000 kilometres



Tappet play must be adjusted with the engine cold.

Remove in order the following components to carry out the measuring of the play between the camshaft and the valve cups as described in sections C - "Superstructures" and G - "Frame":

- Saddle
- Fuel tank side panels
- Air inlet side panels (right and left)
- Saddle side panels
- Rear side panels (right and left)
- Side number holder
- Airbox
- Throttle body

NOTE: For all removal operations, including the relative attention notes, please refer to the specific sections in this manual.

An analogous reference is utilised for the reassembly of the parts after the maintenance operation.

After having removed the indicated components, the motorcycle is shown in the condition described by the photograph on side.

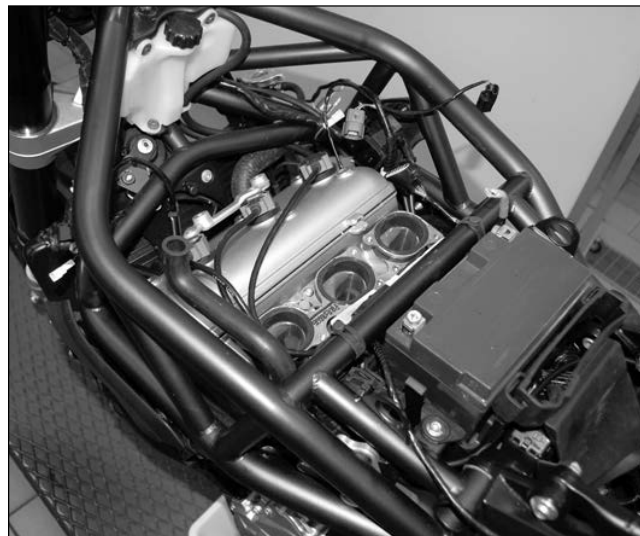
B

Before proceeding with the various maintenance operations, it is advisable to thoroughly wash and clean the motorcycle.

Place the motorcycle (now without the components listed above and clean) on a workstation as indicated in the figure.

Apply adhesive paper tape to the frame tubes.

This operation will protect the paintwork from knocks, scratches and abrasions that could occur during the work activity.



Ensure that all the surfaces of the frame are protected by the application of the adhesive tape.

Apply the same adhesive tape to the air intakes of the engine and on the oil vapour vent pipe.



Loosen the coil fixing screw and remove the main wiring connections.

Remove the coils from their seat.



Disconnect the coil connector in three phases:

a) move the "Secondary Lock" back.



B

b) press the retainer clip.



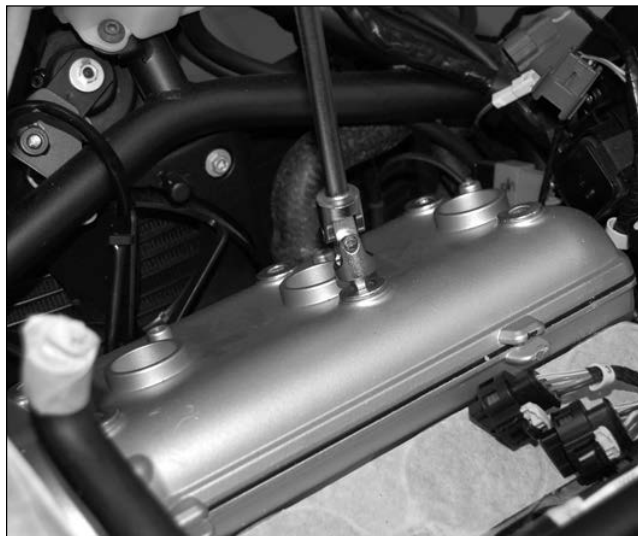
c) disconnect the connection.



The support remains connected with the three connectors linked to the coils.

B

Remove the tappet cover acting on the 6 screws.



Operating as shown in the figure, slightly lift up the cylinder head cover.

To carry out this operation, use *only* the work surfaces indicated.

Take care to not ruin or deteriorate the motorcycle parts in the proximity of the work area.



Remove the engine head cover.

Complete removal of the engine head cover by tilting it towards the right side of the vehicle.

To adjust the play of the tappets see the procedure in the Rivale 800 Engine Workshop Manual (Part. Code 8000B6231).



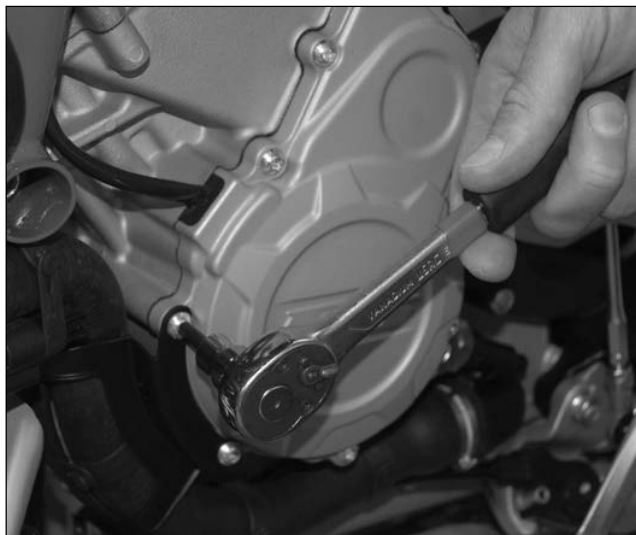
Remove the head cover gasket.



B

Now remove the cover of the phonic wheel by acting on the eight screws.

For further operations, see the Engine Workshop Manual (Part. Code 8000B6231).



Timing chain, mobile timing chain guide and timing chain tensioner

B

Timing chain and mobile timing chain guide:

Check → Every 12000 kilometres
Substitute → Every 36000 kilometres

Timing chain tensioner:

Check / substitute → Every 12000 kilometres

To disassemble these parts and not being a part of normal maintenance, it is necessary to proceed as described in the overhaul section of the Rivale 800 workshop engine manual (Part. Code 8000B6231).

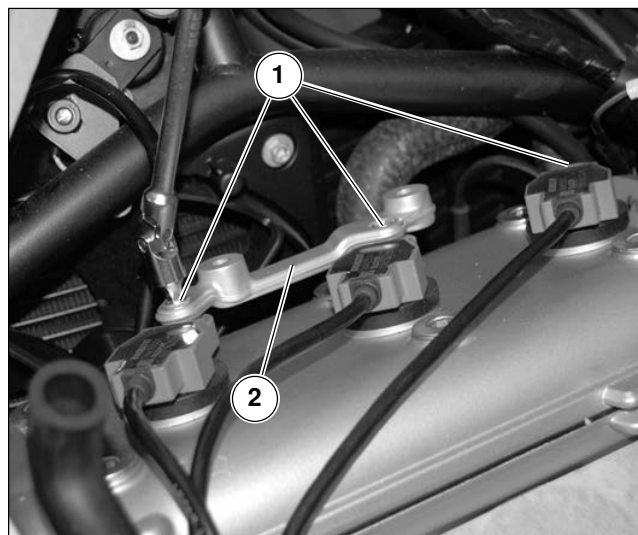
SPARK PLUGS

Check / substitute → Every 12000 kilometres

Substitute → Every 12000 kilometres

The following components must be removed to accede to the spark plugs:

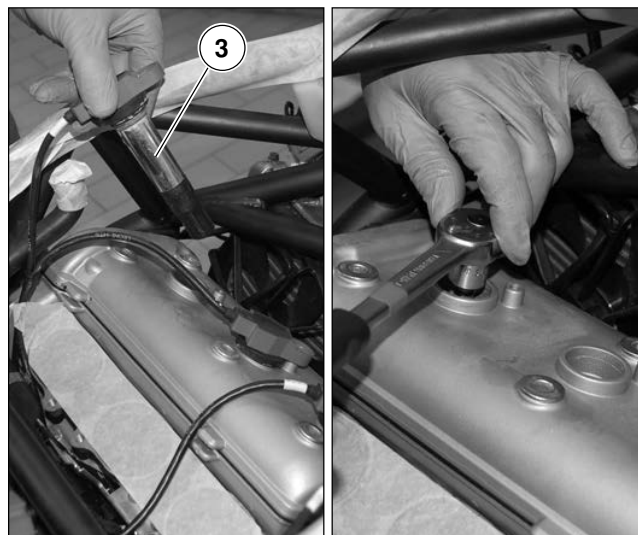
- Saddle
- Fuel tank side panels
- Saddle side panels
- Fuel tank
- Side number holder
- Airbox



Remove the 3 screws (1) and the clamping bracket (2) for the plug-top coils.

Take the 3 plug-top coils out (3).

Remove the spark plugs utilising the appropriate 16 mm hexagonal spark plug spanner.





Maintenance

Heat Grade

Check the heat grade of the spark plugs.

Sparks: - NGK CR9 EIB-9

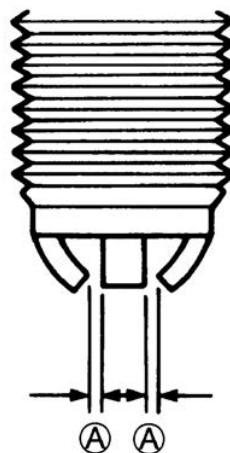


DO NOT use non-resistive spark plugs.

Spark plug gap

If appropriate (see Technical Data table), measure the spark gap with a thickness metre. Adjust the gap if necessary on the basis of the following information:

Sparks	Spark plug gap
NGK CR9 EIB-9	0.8 ÷ 0.9 mm



B

Electrode condition

Check the electrodes for wear or burning. If they are extremely used or burnt, substitute the spark plugs. Also substitute the spark plugs in the case of breakage of the ceramic isolation or damage to threading.



When the spark plugs are renewed, check the thread pitch size and the length of the thread. If the threading is too short, carbon deposits will be placed on the threading of the cylinder head plughole thereby risking damage to the engine.

Manually insert the spark plugs into their seats to avoid damage to the threading of the cylinder head. When completely screwed in by hand, tighten to the specified torque pressure.



Spark plugs torque pressure: 12 N·m



FUEL FILTERS

Substitute →

Every 50.000 km

B

For the substitution of the engine intake system filters (fuel filter, fuel pump filter), it is necessary to remove in sequence the following parts:

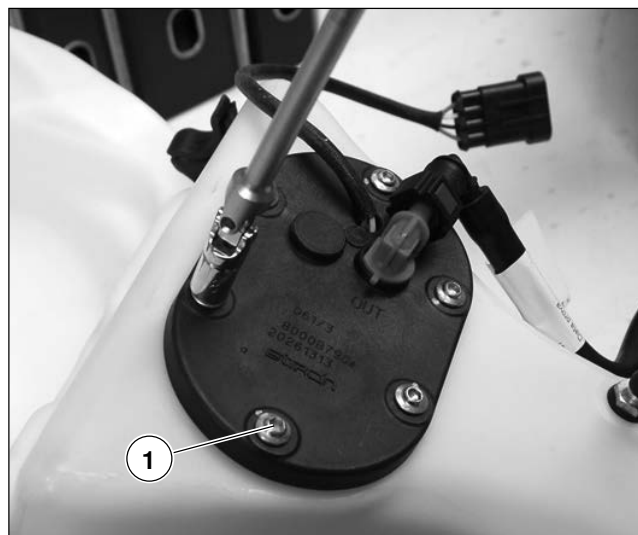
- Saddle
- Saddle side panels
- Fuel tank side panels
- Side number holder
- Fuel tank

NOTE: Consult chapter C "Bodywork".

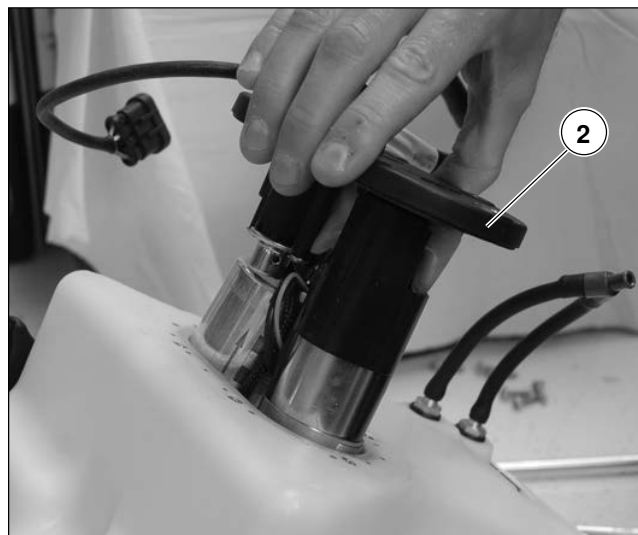


Removing the fuel pump unit

Lift the tank and proceed with the removal of the 6 screws (1) that hold down the retaining flange of the "Fuel pump" unit.



Extract the flange (2) complete with pump from its seat.



Check and replace the gasket

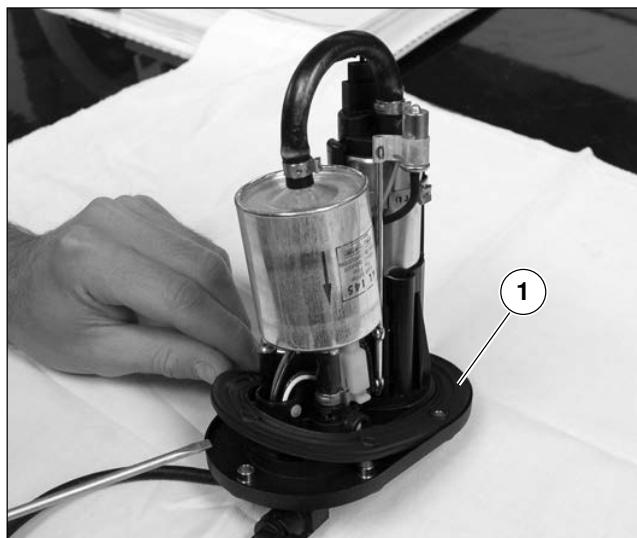
Check the state of the sealing gasket (1) on the petrol pump unit.

Make sure that the gasket is perfectly intact and lubricate it by applying silicone grease.

If it is damaged, change it for a new one.



Using a worn gasket can cause petrol to leak from the tank and therefore pose the risk of the vehicle taking fire.



B

Changing the thermistor (reserve probe) complete with cabling

Cut the band fastener (2) of the electric wiring connector.



Disconnect the thermistor connector.





Maintenance

Remove the two worm-screws (3) and slide the thermostat rod out completely for replacement.



B

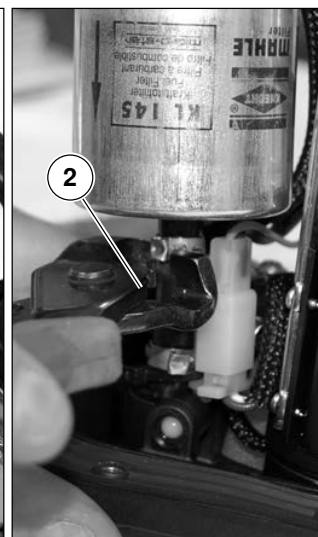
Replace with a new component and re-mount following the removal operations in reverse order.

Replacement the fuel filter

Open the two metal band fasteners, one upper (1) and one lower (2) using the specific tool.



Hand pliers Oetiker 1098i

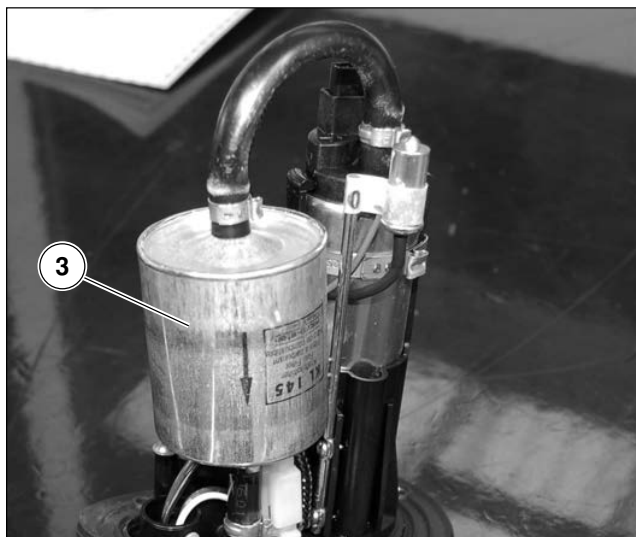


Disconnect the two small pipes and replace the filter (3) with a new one supplied.

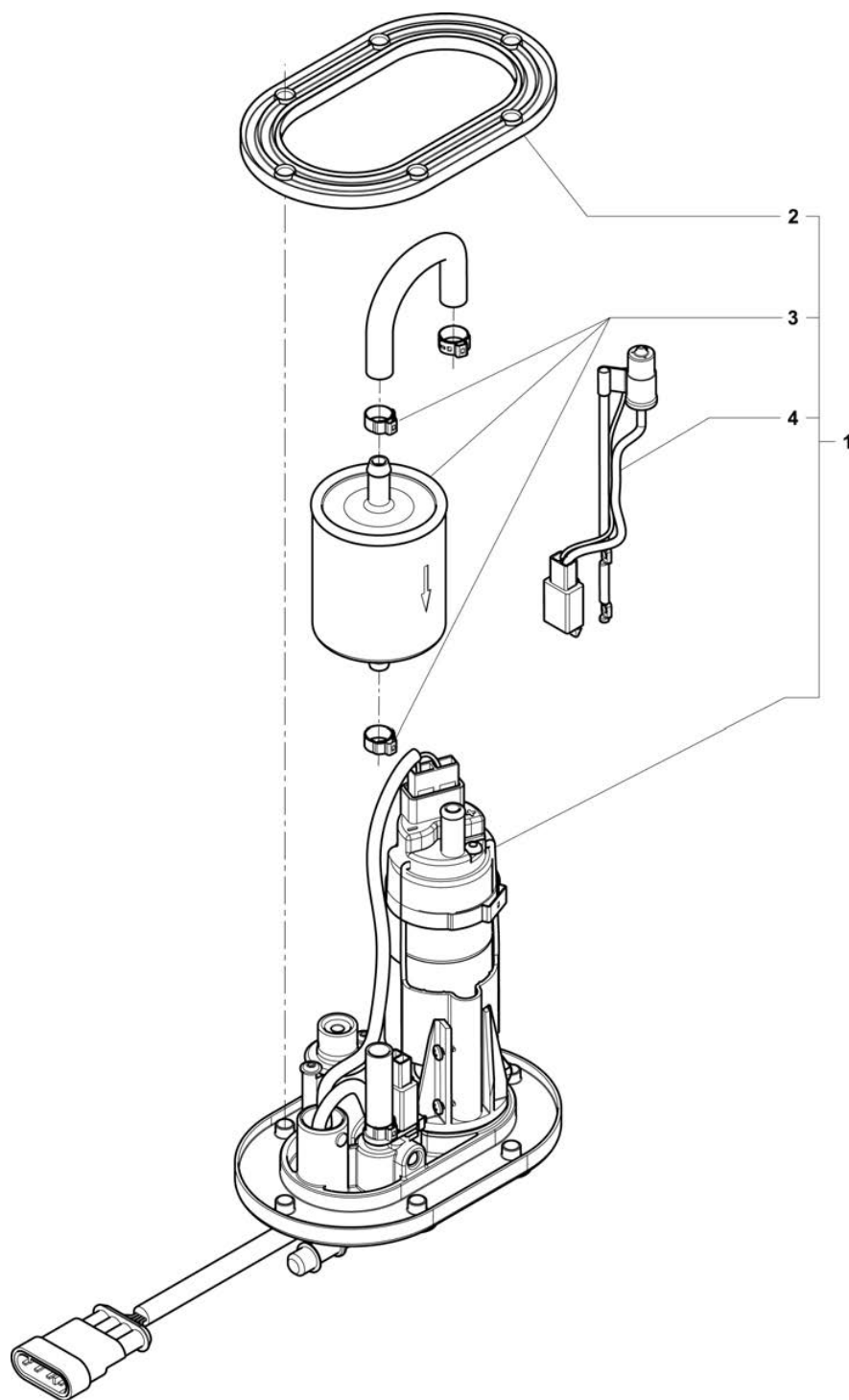
Fix the filter with new metal band fasteners using the specific tool.



Hand pliers Oetiker 1098i



FUEL PUMP ASSEMBLY



B

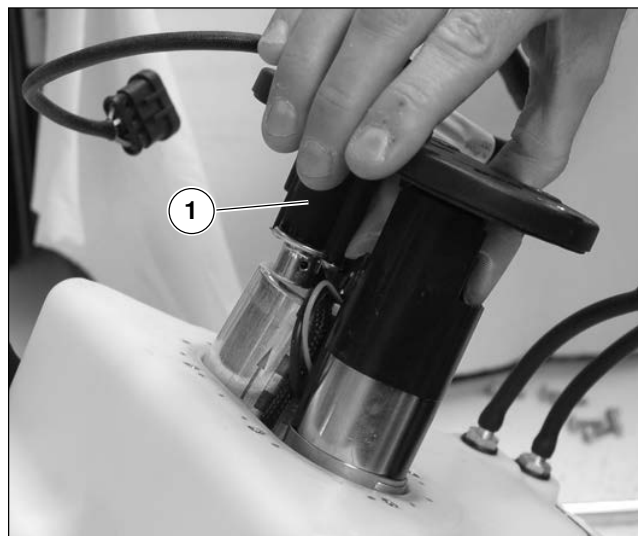
N.	Code	Q.ty	Note	RIVALE 800	►I FRAME I►	►I ENGINE I►
1	8000B7904	1		•		
2	8000B8612	1		•		
3	8000B8975	1		•		
4	8000B4278	1		•		

Installing the fuel pump unit

Position the fuel pump unit (1) inside the fuel tank.

B

N.B.: apply a thin layer of silicon grease on the gas-kets before introducing them into the fuel pump unit.



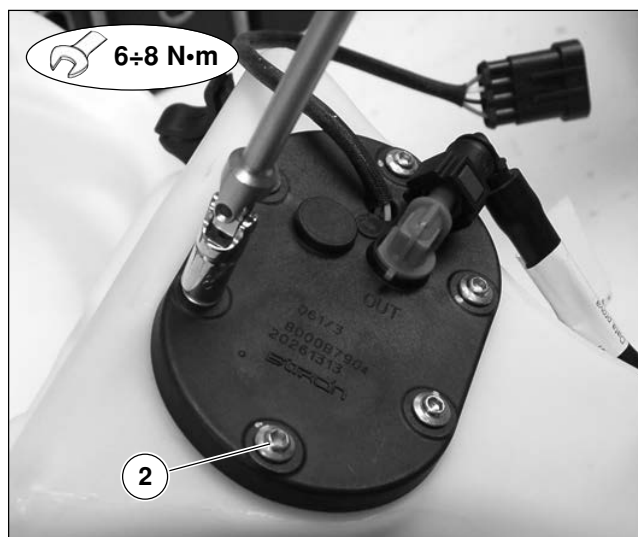
Screw on and tighten the 6 screws (2) through a repeated action.



Torque pressure for the fuel pump flange screws: 6÷8 N·m

Proceed with the re-assembly of the parts that have been removed following the operations in reverse order to disassembly, as described in chapter C "Bodywork".

- Fuel tank
- Side number holder
- Fuel tank side panels
- Saddle side panels
- Saddle



CHECK, DISASSEMBLY AND REASSEMBLY FUEL PIPE FITTINGS

Check for leaks → First 1000 kilometres and then every 6000 kilometres

Carry out a visual check for eventual leakages from the fuel feed tubing and the unions (see figure). Substitute damaged parts if leaks or evaporation are found.



Replacing fuel pipe in tank

Substitute → At least every three years

The procedure to follow in the case of substitution of the feed tubing is as follows:

Remove in this order:

- Saddle
- Saddle side panels
- Fuel tank side panels
- Side number holder
- Fuel tank
- Airbox

B

Press the two lateral green buttons and pull the pipe.



Replacing fuel pipe from throttle body

Press the two stop buttons simultaneously and pull the pipe off.

B



To reassemble the Airbox pipe, insert the fuel pipe in the fitting on the throttle body until you hear it lock.



UTILISE ONLY NEW PARTS.



To re-mount the tank pipe, press the two lateral green buttons at the same time and insert the pipe.





CHECKING ENGINE DURING IDLE

The engine control unit is designed to adjust the torque issued by the engine during idle.

Set up the connection between the control unit and the diagnostic software. With the engine warm and the fans on, in idle, in neutral, observing the following parameters through the diagnostic software within the recommended intervals, you are able to control the operation of the correct motor.

RIVALE 800:

Engine rpm	1400 ± 50 rpm	
Adaptive lambda check	min -0.08	max +0.08
Suction pressure	500 ± 50 mbar	
Engine load	25 ± 5 %	
Throttle capacity adaptability	min -1%	max +1%

Operation outside of the recommended intervals is a sign that the engine is not running correctly.

If the recommended intervals are not being maintained, it is a good idea to proceed with the following checks in order to find the cause that is making the engine operate outside of the intervals provided above:

- checking, with a diagnosis, the validated system errors;
- checking the petrol pressure and making sure the injectors are working;
- making sure the throttle body is working correctly;
- making sure the exhaust is working correctly (correct installation, holes, leaks, the state of the catalyst, etc);
- checking engine phase.

Air Filter

Check/substitute →

Every 6000 kilometres

B

To access the air filter, the left tank side panel must be removed (1) as shown in the figure.



Remove the left air conveyor (2) by removing the three screws.



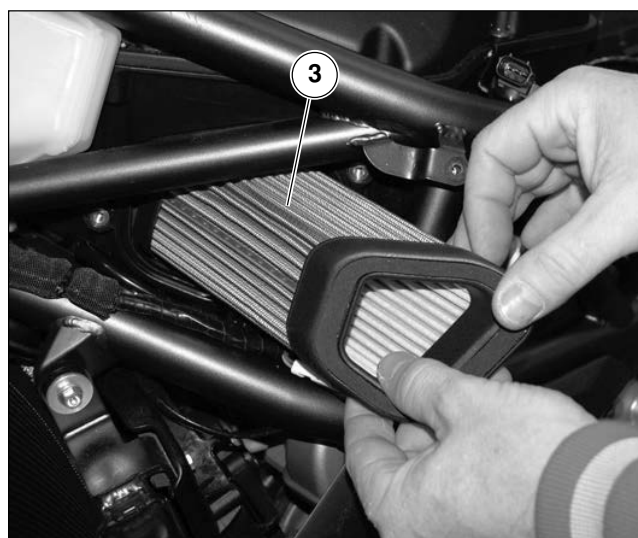
Remove the air filter (3) by sliding it out from the left air-box intake hole.

Check the condition of the air filter. If it is necessary to substitute it, proceed as follows:

Prepare a new air filter.

Check that the inside of the air filter compartment is clean and free from foreign bodies.

Insert the air filter, respecting the correct way of assembly, as shown in the figure.



BRAKES

Check the levels of fluid in the systems→

At pre-delivery, at first 1000 kilometres and then every 6000 kilometres.

Check for leakages→

At pre-delivery, at first 1000 kilometres and then every 6000 kilometres.

Substitute fluid→

Every 24000 kilometres or at least every two years.

Commands check→

At pre-delivery, at the first 1000 kilometres and then every 6000 kilometres.

Checking the front brake fluid level

The procedure described below must be followed for the front brake fluid tank.

Place the motorcycle in a vertical position with the handlebars straight.

Check the level of fluid in the brake tank by observing the level marking lines inside the tank itself.

Should the level be lower than the lower-level line, check wear of the brake pads.

If brake pad thickness is correct, add brake fluid compliant with the manufacturer's specifications according to the following procedure:

Remove the two screws (1) from the front brake fluid tank cover.



Remove the 3 elements of the front brake fluid tank cover.





Maintenance

Add brake fluid until the correct level is reached in the chamber.

B



Recommended brake fluid: AGIP Brake 4



Do not use brake fluid that comes from old containers, has already been used or does not come from a sealed container. Do not use brake fluid that is left over from previous maintenance or stored for long periods. Utilise only the recommended brake fluids.



Before completing the operation, clean and wash accurately with alcohol the three components of the fluid chamber cover and blow to dry them.

Clean the edge of the fluid chamber with a clean cloth.

Screw and tighten the two screws on the front brake reservoir cap with its components.



Imperfect cleaning of these parts could cause the discharge of small quantities of brake fluid during riding. Brake fluid has strong corrosive properties.



Check for any leakage or seepage of brake fluid from the fittings and pipes.

If any breakages are seen, substitute the damaged parts as described in chapter H "Brakes".



Brake fluid leakages are dangerous and immediately discolour painted surfaces. Before riding, check the tubes and joints of the brakes for damage and signs of leaks.



Checking the level of the rear brake fluid

No parts of the vehicle need to be removed from the vehicle to check the level of the rear brake fluid.

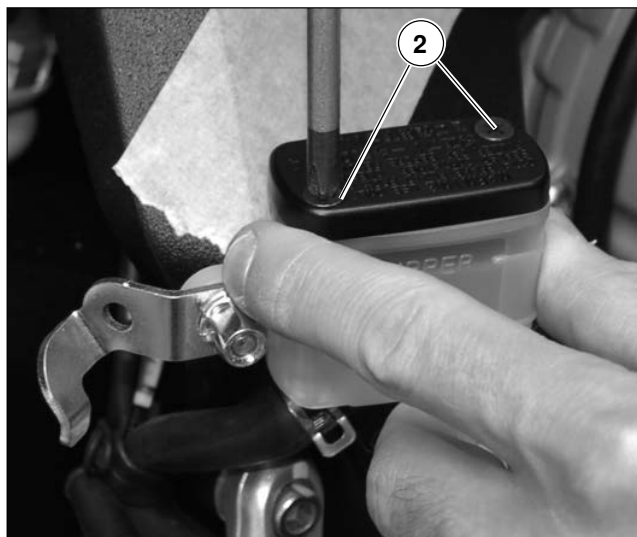
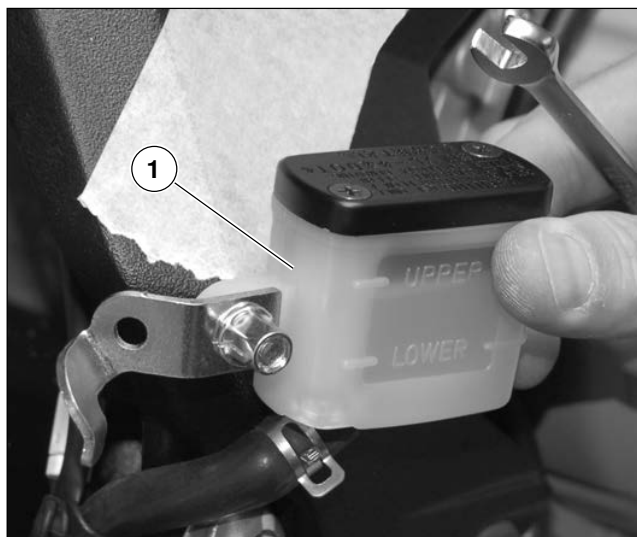
If the fluid is below the low level mark, follow these steps to top up with brake fluid complying with the specifications:

remove the oil tank (1) from the frame plate and take the pump out of the frame;

open the cover of the rear brake fluid tank, removing the 2 screws (2);



B



place the tank with a strap and a protective cloth, securing it to the plate of the frame;

B



The fluid in the braking circuit is highly corrosive.

Avoid any contact with eyes, skin and mucous membranes.

In case of accidental contact, wash thoroughly with water and consult a doctor.

During the following operations avoid dripping on painted areas.



fill the braking system by acting on the lever of the rear brake;



fill the rear brake fluid tank until it reaches the max level;



Recommended brake fluid: AGIP Brake 4



Do not use brake fluid that comes from old containers, has already been used or does not come from a sealed container. Do not use brake fluid that is left over from previous maintenance or stored for long periods. Utilise only the recommended brake fluids.

clean the entire edge of the brake fluid tank thoroughly, using a clean cloth;



Before closing the tank make sure its parts are intact.

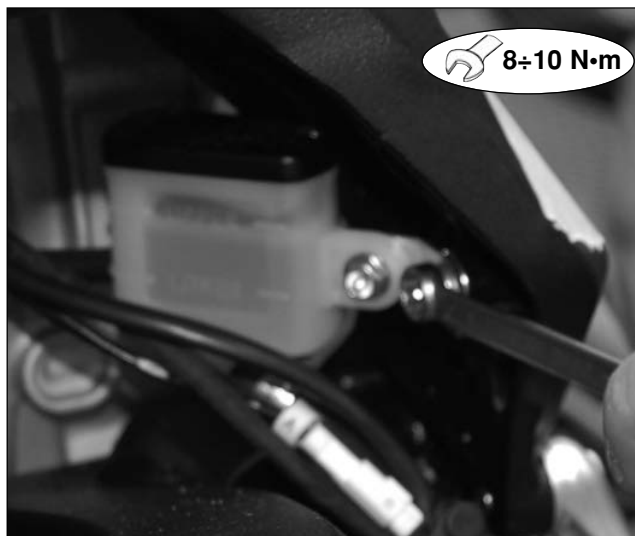
Secure the rear brake fluid tank to the plate and then to the frame plate applying the fluid thread lock on the threads of the fixing screw and the tightening torque indicated:



Torque pressure: $8 \div 10 \text{ N}\cdot\text{m}$



Apply Loctite 243



B

Substitution and bleeding of the brake fluid

The substitution of the brake fluid and the successive bleeding of the circuit are operations that require particular caution and precision.

To carry out these operations, it is therefore necessary to follow the procedure described in chapter H "Brakes" of this manual.



BRAKE / CLUTCH / GEARCHANGE COMMANDS CHECK

B

It is possible to adjust the position of the front brake lever, of the clutch and of the gear. Such adjustments have been created to optimise the grip and the movement of the commands with regards to the needs of the motorcyclist. The commands of the motorcycle are initially calibrated to a standard position, but can be altered as follows.

Front brake lever adjustment



Never carry out adjustments whilst riding the motorcycle.

Pull the lever to neutralise the push of the spring and at the same time, adjust the position by rotating the ring in a clockwise or anti-clockwise direction.

In a clockwise direction: The lever goes further away from the handgrip.

In an anti-clockwise direction: The lever comes closer to the handgrip.



Whenever the command levers do not function correctly or have excessive play, consult chapter H "Brakes" for the overhaul of the same.



Adjusting the clutch play

In normal conditions, when the engine is cold, the play of the clutch transmission must be ~3 mm at the point shown in the photo.



If the measurement differs by ± 1 mm it is possible to act on the register located on the handlebar control.

**B**

For greater differences set the register on the handlebar at the indicated measurement of 22 mm.



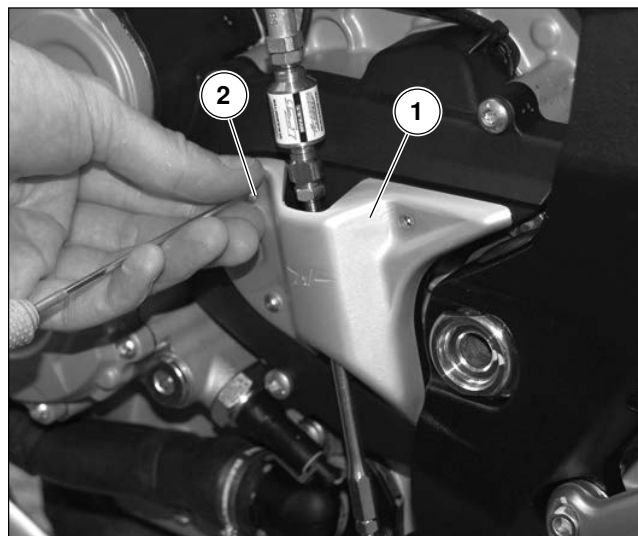
Adjust the main register sheltered by the clutch cover by acting on the two nuts, in order to restore the initial play of 3 mm measured on the lever.



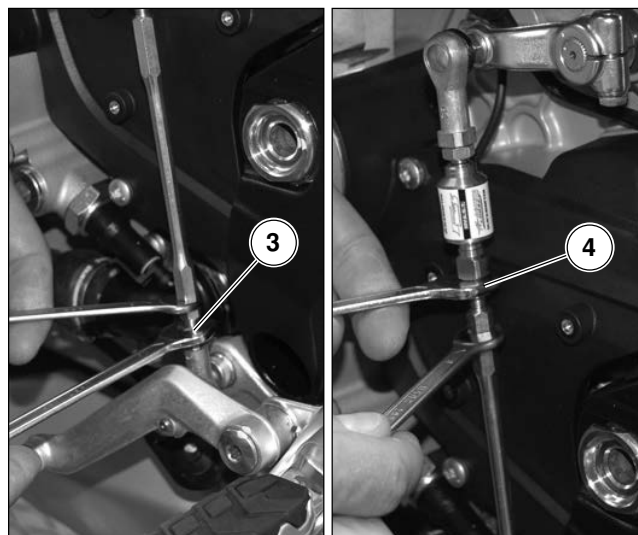
Adjusting the gear lever

To adjust the gear lever it is necessary to:

1) Remove guard (1) by removing the three screws (2).



2) Slacken the two counter nuts (3) (rh thread) and (4) (lh thread).



3) Screw/unscrew by hand the gearbox transmission rod (5) until the lever reaches the desired position.

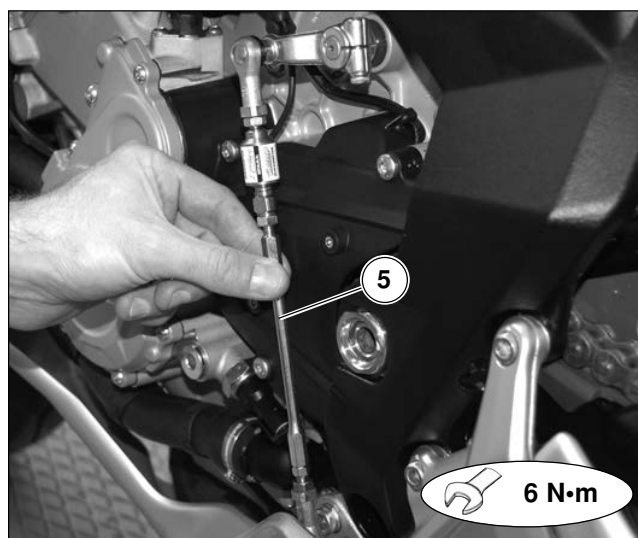
4) Tighten the locknuts and the protection.



Torque pressure: 6 N·m



Apply Loctite 243

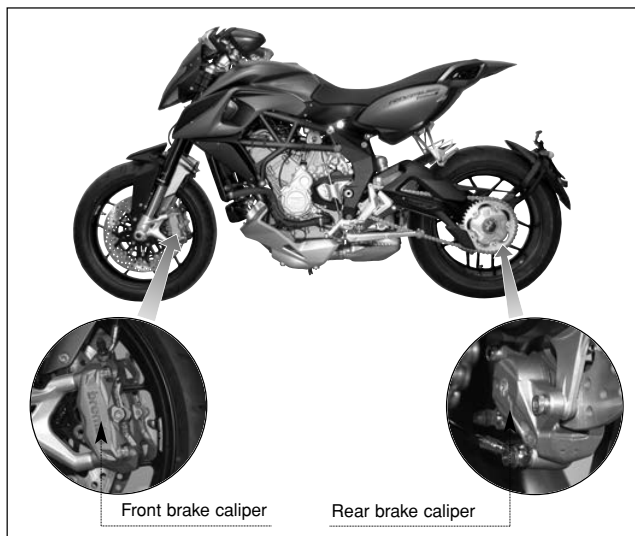


6 N·m

BRAKE PADS

Wear check / substitute → At the first 1000 kilometres and then every 6000 kilometres

Check the condition and thickness of the brake pads on the calipers.

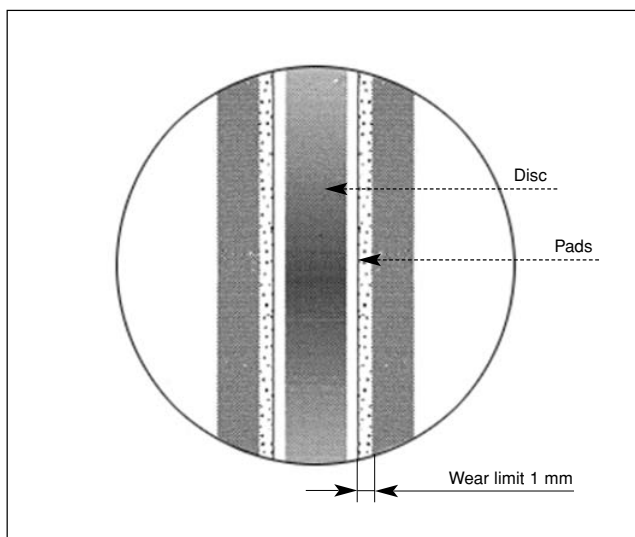


Measure the thickness of the pad linings. If the thickness of the linings is equal to or less than the wear limit shown below, replace the pads as described in chapter H "Brakes".

Wear limit: 1 mm.



If the brake pads are substituted, it is necessary to effectuate a proper running-in period before reaching an optimal braking efficiency.

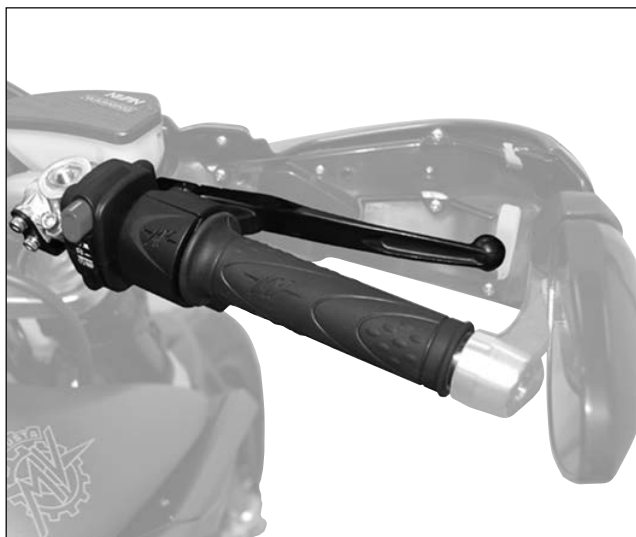


ACCELERATOR CONTROL

Operational Check → At pre-delivery and at the first 1000 Km; after that, every 6000 Km

The throttle must not have excessive play or delayed intervention.

Likewise its rotation must have as little play or friction as possible.





LOCKS

Check →

At the pre-delivery, at the first 1000 kilometres and then every 6000 kilometres.

B

Ignition/steering block switch

This switch has three operating positions.

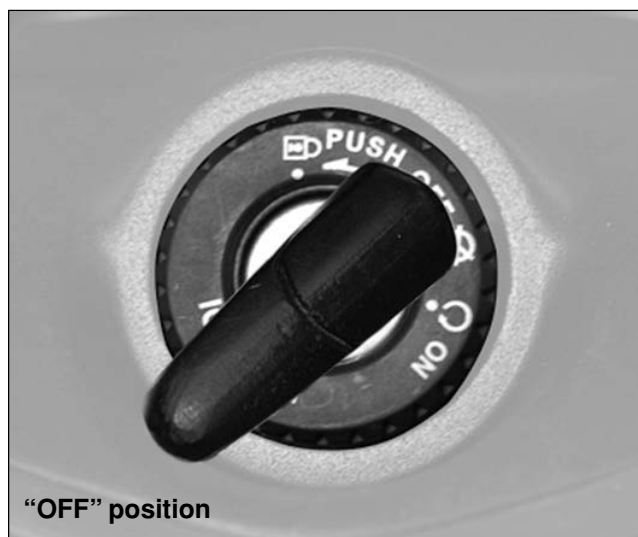


Do not attach key rings or other objects to the ignition key that could obstruct the rotation of the steering.

The ignition switch activates and deactivates the electrical system and the steering lock. The three control positions are as follows:

“OFF” position

All electrical circuits are deactivated. The key can be pulled out.



“OFF” position

“ON” position

All electrical circuits are activated, the instruments and warning lights carry out self-diagnosis and the engine can be switched on. The key cannot be pulled out.



Do not attempt to change the functions of the ignition switch whilst the motorcycle is being ridden. It could cause the rider to lose control of the machine.



“ON” position

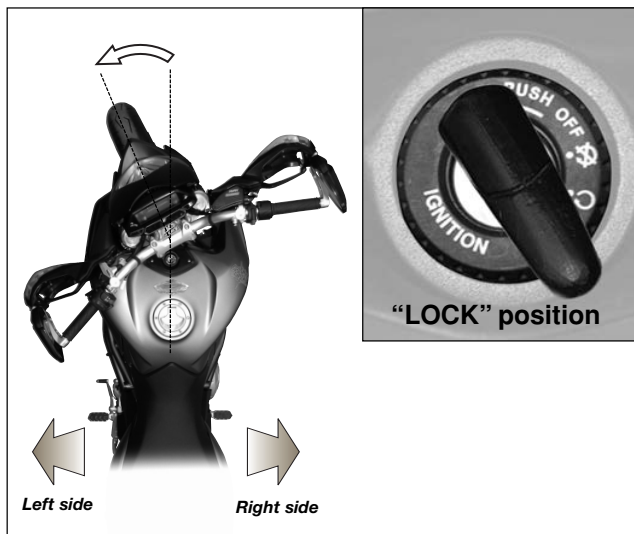


Maintenance

“LOCK” position

Turn the handlebar left or right. Press the key down and rotate it to the “LOCK” position.

All electrical circuits are deactivated and the steering is blocked. The key can be pulled out.



Fuel cap lock

Lift up the anti-dust cover.



Insert the key, rotating it in a clockwise direction and lift up the cap.





Maintenance

After refuelling, press the cap down and rotating the key contemporaneously to facilitate the closure. Let the key go free, bring it into a longitudinal position and pull it out.

B

If the fuel filler cap does not function (the cap does not close, the lock blocks, etc.) substitute it with a new one as described in chapter C “Bodywork”.



Personal compartment lock

Insert the key.

Push the seat downwards at the back and at the same time turn the key in a anticlockwise direction.

Lift up the seat at the back end, let it slide backwards and make it rotate as shown in the figure.



In order to reassemble the above mentioned part, you must perform the following operations:

- Rotate the key into the lock
- Press down the seat
- Release the key
- Press down the seat once more, so to make sure of its firm coupling to the frame.

If the seat lock is blocked, consult chapter C “Bodywork” for the substitution.



WARNING

Every time you remove and refit the seat and every time the vehicle is used, make sure that the above mentioned part is correctly placed and that it is firmly secured to the motorcycle framework.



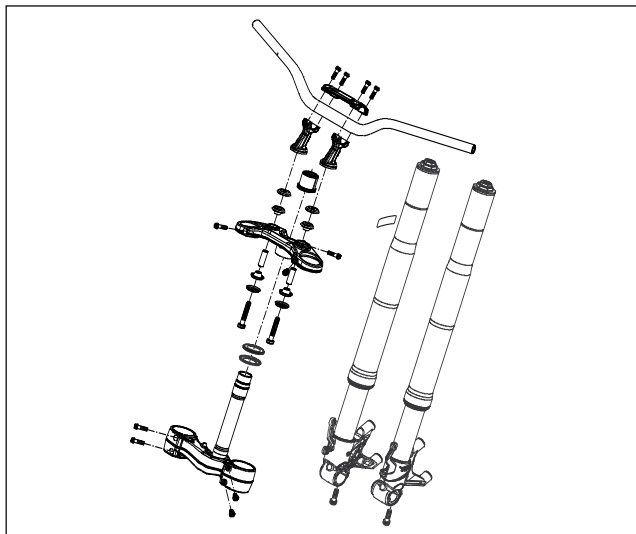
STEERING

Check and adjust →

At the first 1000 kilometres and then every 12000 kilometres.

Check the steering components regularly according to the above-mentioned intervals.

If it is necessary to carry out adjustments, operate as described in chapter F "Suspension and wheels".



B

TRANSMISSION CHAIN

Check →

At the pre-delivery, at the first 1000 kilometres and then every 6000 kilometres.

Substitute →

Every 12000 km.

Place the motorcycle on the rear stand.

The chain tension check should be effectuated with the motorcycle having a static set-up quota equal to the standard value (see chapter F "Suspension and wheels").

The axis of the chain lower portion must be **116 mm** from the lower chain guard.

Manually turn the rear wheel and perform the check at different points along the chain.

As the wheel is turned, the play should remain virtually the same. If, on the other hand, the play of the chain varies considerably, it means that some of the links are flattened, jammed or elongated.

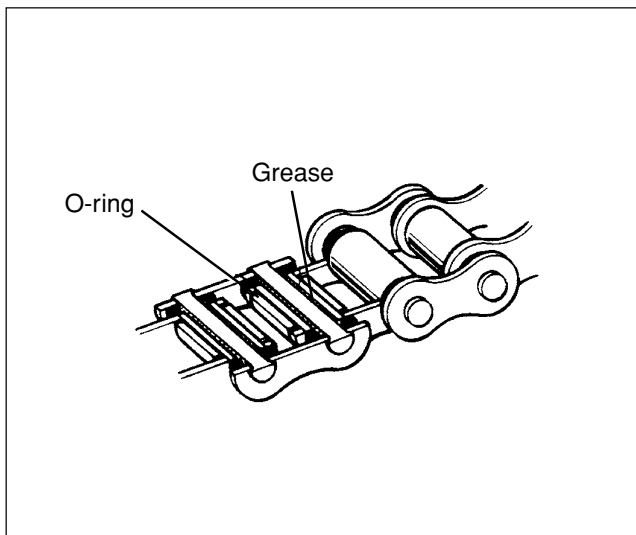
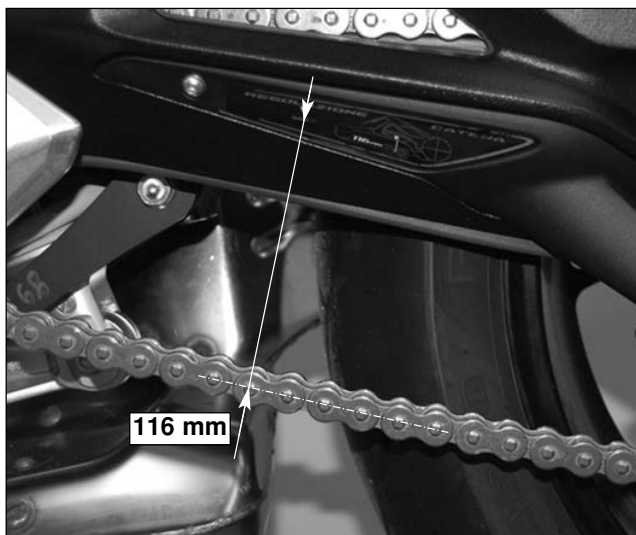
Visually check the transmission chain for the following defects:

- Slack pins
- Damaged rollers
- Dry and rusty links
- Bent or seized links
- Excessive use
- Incorrect chain adjustment
- Damaged O-rings

The chain must be substituted if any one of these defects is found.

When substituting the transmission chain, substitute also the crown and pinion wheel.

For the substitution of the chain, pinion, crown wheel and to check the wear of the chain guide, follow the sequence described in chapter F "Suspension and wheels".





Maintenance

Regulation → At the first 1000 kilometres and then every 6000 kilometres.

B

To adjust the chain tension, proceed as follows:
Loosen the 2 rear wheel hub screws.



Using the special spanner as indicated in the figure, move the eccentric adjuster nut backwards or forwards respectively slackening or tightening the chain, until the correct play is reached (as described previously).



Successively tighten the screws of the rear wheel hub to the torque pressure indicated as follows:

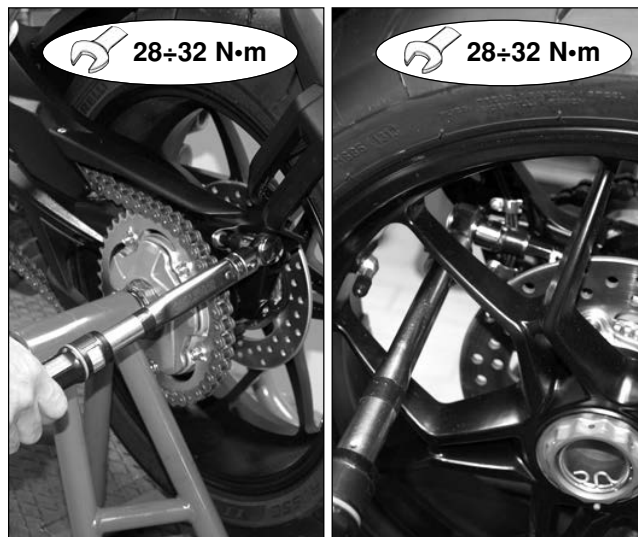
NOTE Tighten the screws to the specified torque in several steps and in an alternate pattern.



Rear hub eccentric adjuster screw torque pressure: $28 \div 32 \text{ N}\cdot\text{m}$



Grease only the first threads.



Chain lubrication

Lubricate → At the first 1000 kilometres and at 6000 kilometres and then at every 12000 kilometres.

The chain is of the O-ring type.

Clean the chain with a clean cloth and/or a jet of air.



B

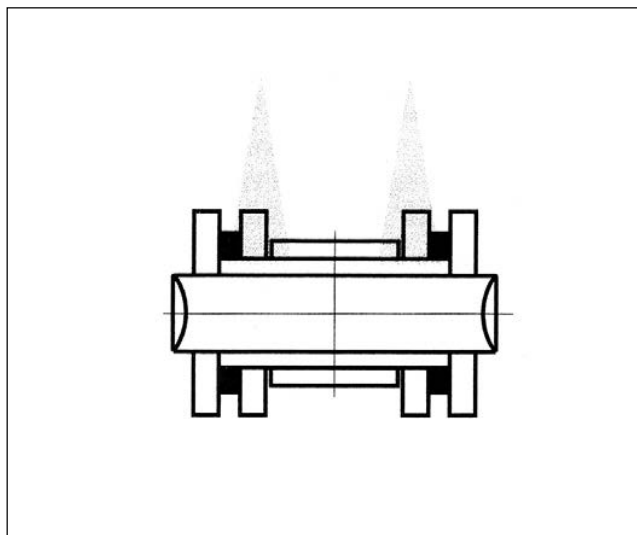
Apply the lubricant after cleaning.



Utilise only the recommended lubricants or the equivalent (see page B-8).



Aim the spray at the inner link, so it will lubricate the surface of the O-rings and penetrate into the chain roll.



TYRES

Check pressures → At the pre-delivery, at the first 1000 kilometres and then every 6000 kilometres.

B

Check wear → At the first 1000 kilometres and then every 6000 kilometres.

If the tyre pressures are too high or too low, the ride is affected and tyre life duration is accentuated.

Therefore maintain the correct tyre pressures to obtain better roadholding and the maximum wear from the tyres. The cold tyre pressures are indicated in the table.

Tyre pressures

Brand and type	PIRELLI - Diablo Rosso Corsa
Rear	2,3 bar (33 psi)
Front	2,3 bar (33 psi)

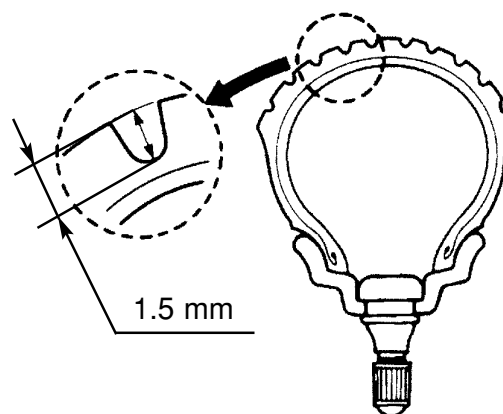


The use of the motorcycle with excessively worn tyres diminishes the roadholding and is therefore dangerous. It is highly recommended to change the tyres when the tyre tread reaches a minimum of 1.5 mm.



**Ride with extreme care during the initial kilometres after replacing the tyres.
Utilise exclusively the tyres recommended.**

Tyre tread minimum limit = 1.5 mm



FRONT WHEEL BEARINGS

Check → Every 6000 kilometres and at every tyre change.

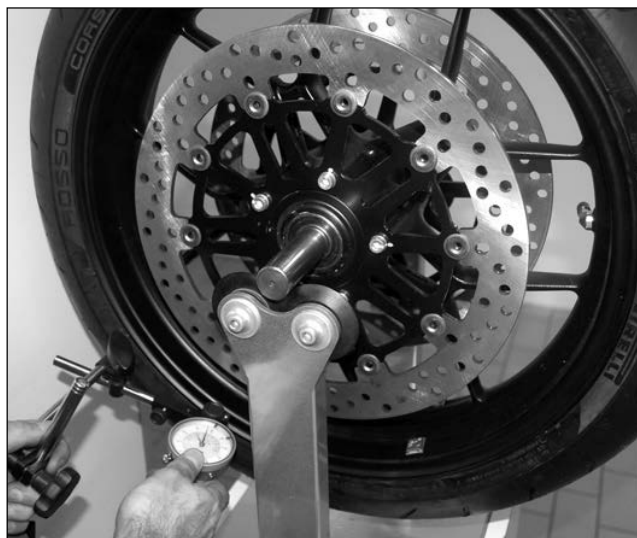
Substitute → Every 36000 kilometres.

If excessive play of the front wheel bearings is found during checks, then substitute them as indicated in chapter F "Suspension and wheels".

WHEELS

Visual check → At the first 1000 kilometres and then every 6000 kilometres (at least every tyre change).

After having visually checked or following even light collision damage, it is necessary to check the planarity, the eccentricity and the ovalisation of the wheel. See the control procedures described in chapter F "Suspension and wheels".

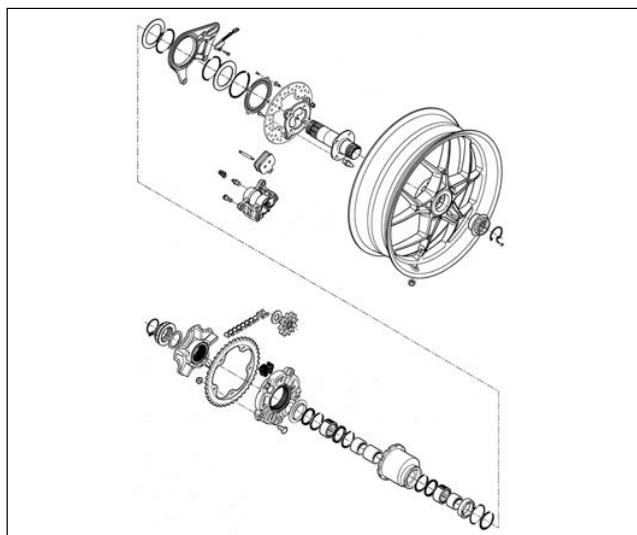


B

REAR WHEEL HUB

Check and lubricate bearings → Every 12000 kilometres
Substitute → Every 36000 kilometres

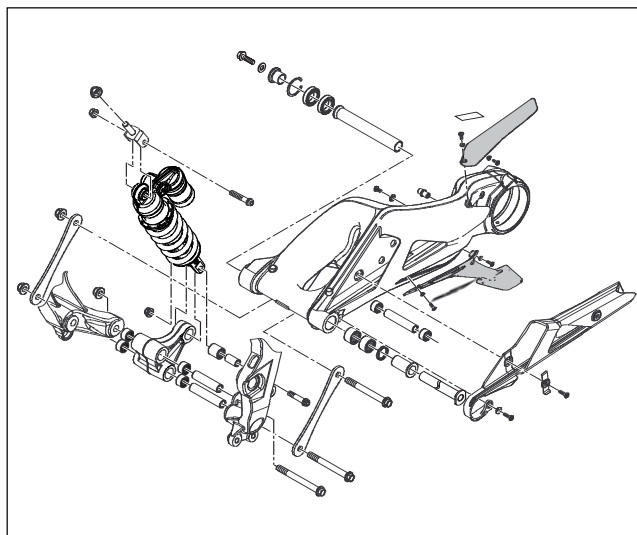
To check and overhaul the rear wheel hub unit, it is necessary to carry out certain preliminary operations by consulting the relative chapters.
 Remove the rear wheel (see chapter F "Suspension and wheels"). Lift up the motorcycle by utilising a mechanic's lift. Remove the Seeger ring of the crown wheel fixing nut (see chapter F "Suspension and wheels"). Slacken the fixing nut of the wheel axis (see chapter F "Suspension and wheels").
 Remove the brake caliper (see chapter H "Brakes").
 Check and overhaul the rear wheel hub unit (see chapter F "Suspension and wheels").



SWINGARM BEARINGS

Check and lubricate → Every 36000 kilometres

If excessive play is found on the swingarm, due to the bearings assembled on the central pin of the swingarm/frame, substitute them as described in chapter F "Suspension and wheels".



REAR SHOCK ABSORBER

Check and adjust →

At the first 1000 kilometres and then every 12000 kilometres.

B

Carry out a check on the length of the rear shock absorber spring; check for leakages and trickles of oil and also check the adjustment function.

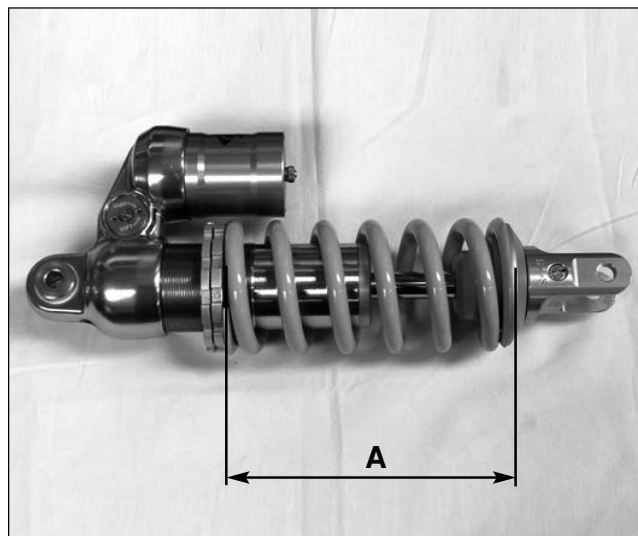
Spring adjustment standard A:

- RIVALE 800:

A = 160 mm



The shock absorber contains gas under high pressure. Do not touch the shock absorber valve. Do not attempt in any way to remove the shock absorber.



SIDE STAND

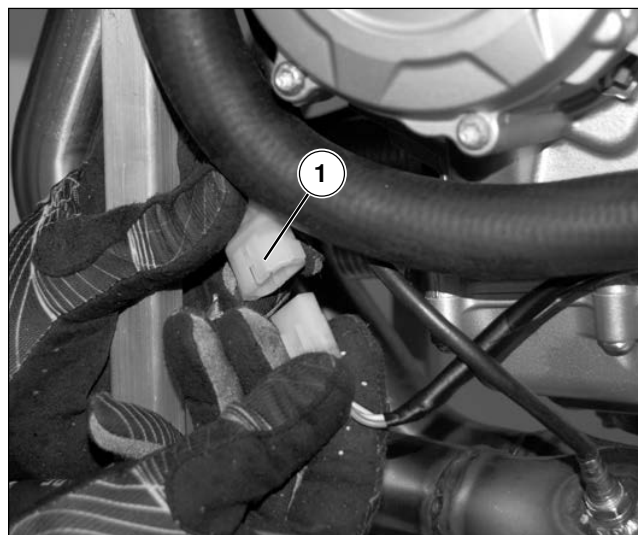
Functional check →

At the pre-delivery, first 1000 kilometres and then every 6000 kilometres.

Make sure the bike cannot be started when the stand is down and the bike is in gear. Also check that with the engine switched on, when the side stand is lowered and a gear is engaged, the engine switches off automatically.

If not, the cause could be a faulty switch mounted on the side stand. If this is the case, substitute the switch by carrying out the following procedure.

Disconnect the electrical connectors (1).



Remove the screw on the switch (2).

Remove the switch.

After having substituted the switch, tighten the screw to the prescribed torque.



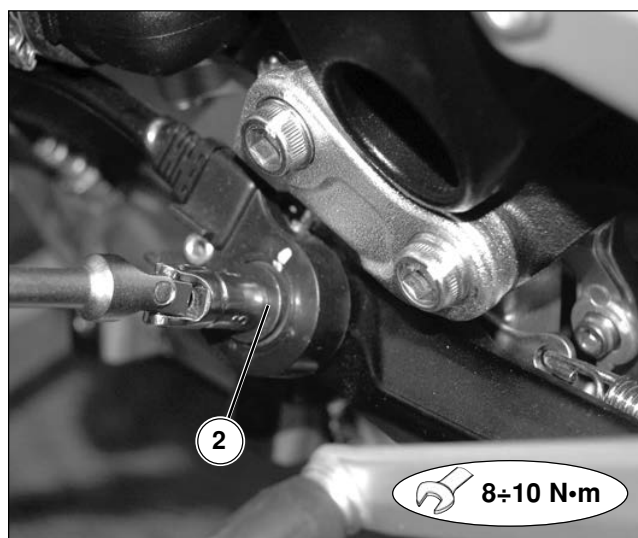
Torque pressure: 8 ÷ 10 N·m



Apply Loctite 243

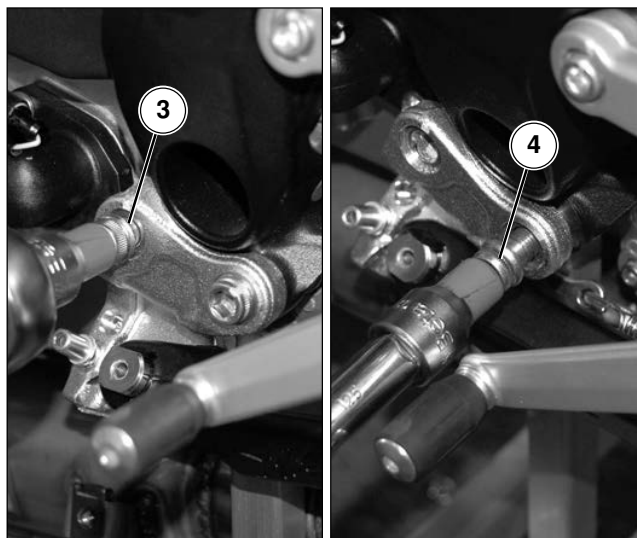
Reconnect the electrical connector.

Check that the side stand is not worn.



To remove the stand, follow these steps:

- after having removed the kickstand switch, remove the screw (3);
- remove screw (4).



To refit the stand, follow the same steps in reverse order, taking care to tighten the screws to the prescribed torque.



Tightening torque for stand plate screws:
 $40 \div 44 \text{ N}\cdot\text{m}$



Apply Loctite 243



To disassemble the side stand of the plate, proceed as follows:

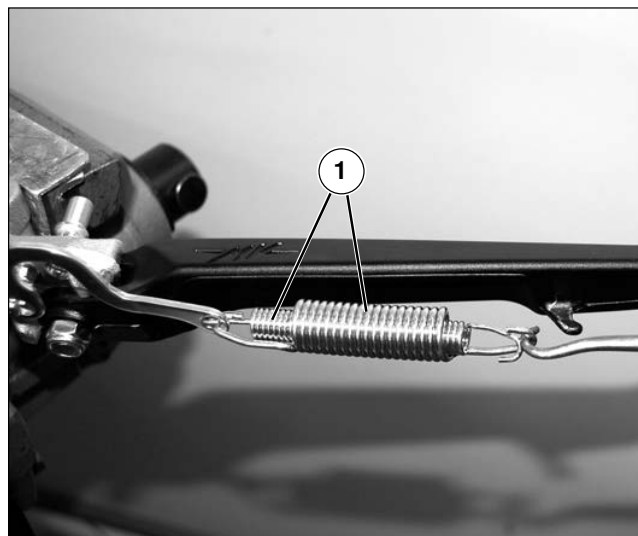
- place the whole stand in a vice grip as shown in the figure;



- using the specific tool, unhook the 2 springs (1);



The substitution of the springs must be carried out utilising the appropriate tool. Before reattaching the springs, ensure that the stand can swing freely (with no friction or sticking).



- remove the hinge plate (2);



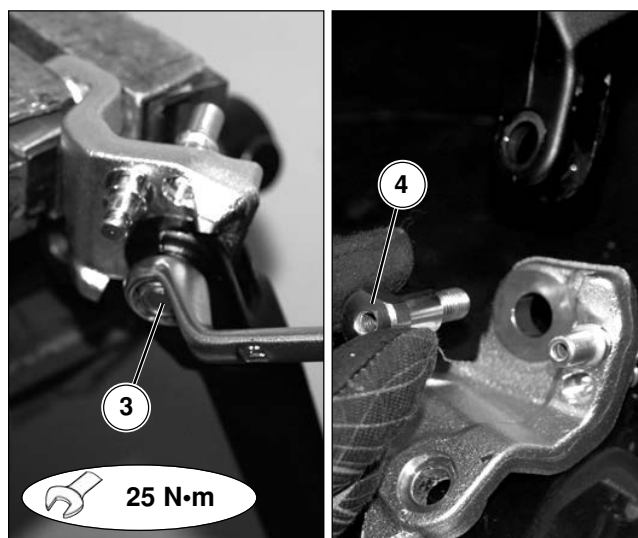
- remove the nut (3) and free the stand from the plate but pulling off the pin (4);

Proceed in the opposite order for reassembly, following the instructions below:

- move the stand pin (4) in support, with grease on the first threads;
- leave the stand free to move;
- tighten the nut (3);
- once again make sure the stand is free to move.



Stand nut tightening torque: 25 N·m



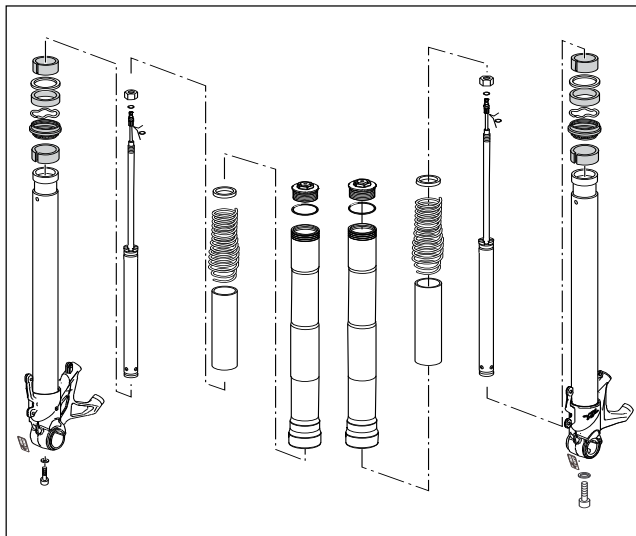
25 N·m

FRONT FORK

Substitute oil → every 24000 kilometres

The front fork is vitally important for the handling and stability of the motorcycle. It is therefore necessary to substitute the fork oil at the prescribed intervals.

To substitute the fork oil and to do a complete overhaul of the forks, carry out the described operations in chapter F "Suspension and wheels".



B

SCREWS AND NUTS

Check and tighten → At the pre-delivery, at the first 1000 kilometres and then every 6000 kilometres.

Carry out an accurate check of the tightness of the nuts and screws on the motorcycle at the intervals prescribed. Consult the table in chapter N "Torque pressures" for the correct values.

TUBE BAND FASTENERS

Check and tighten → At the pre-delivery, at the first 1000 kilometres and then every 6000 kilometres.

Carry out a general check on all tube band fasteners for their condition and tightness. Substitute damaged band fasteners by following the relative procedure delineated in the various sections.

ELECTRICAL SYSTEM

Check the functioning → At the pre-delivery, at the first 1000 kilometres and then every 6000 kilometres.

Carry out a detailed check on the various parts of the electrical system, the contacts between components and their good functioning. Consult chapter E "Electrical system" for these checks.

BATTERY

Check and clean connections → At the first 1000 kilometres and then every 6000 kilometres.

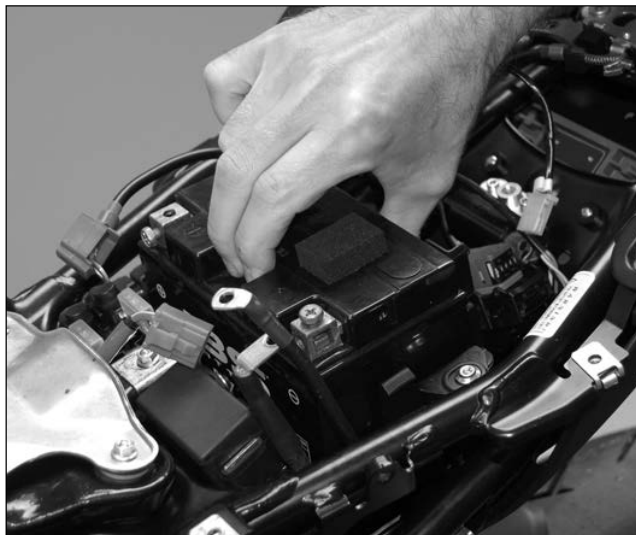
Consult chapter E "Electrical system" for the check on the battery condition.

If it is necessary to disconnect the battery and remove it during overhauls carried out on the motorcycle, following the steps below.

Insert the battery into the compartment.



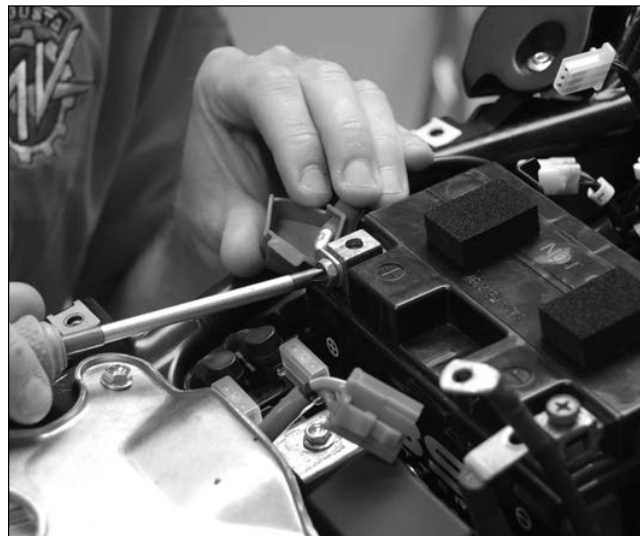
The initial battery charging operation must be performed before mounting it on the vehicle.



Mounting battery terminals

Mount the positive terminal (+) on the relative pole of the battery as shown in figure.

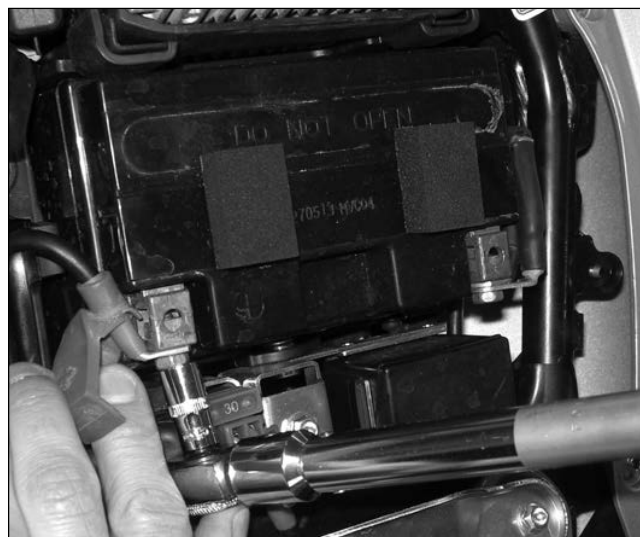
B



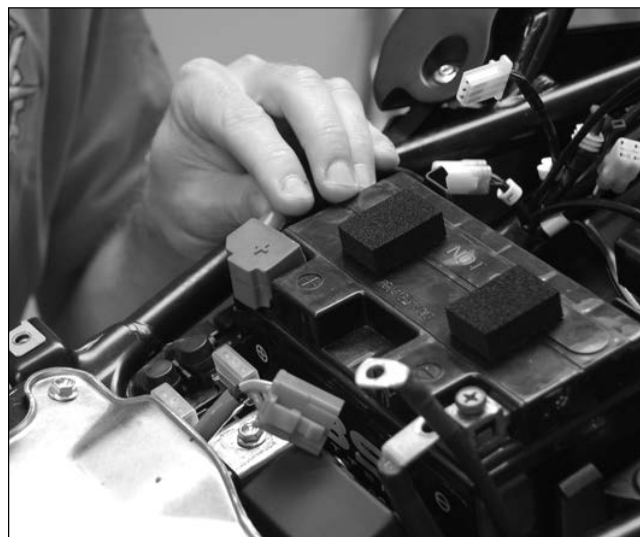
Turn the screw of the positive terminal and perform the prescribed tightening torque, using a torque wrench.



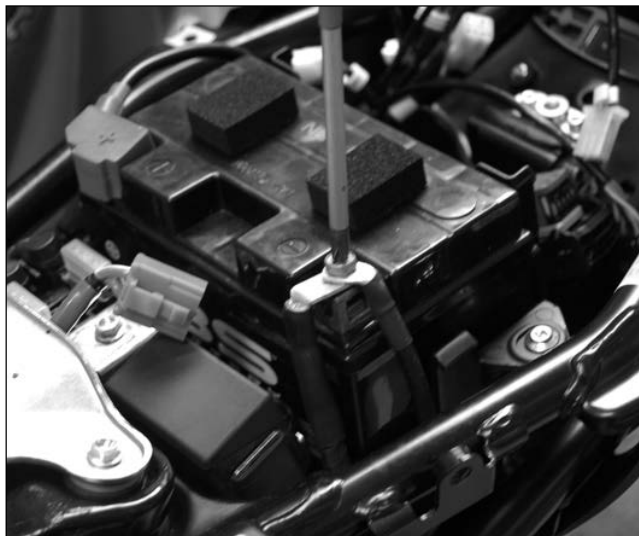
Tightening torque: $7 \div 8 \text{ N}\cdot\text{m}$



When it has been mounted, place the **protective cap** on the positive pole (see figure).



Mount the negative terminal (-) on the relative pole of the battery as shown in figure.



B

Turn the screw of the negative terminal and perform the prescribed tightening torque, using a torque wrench.



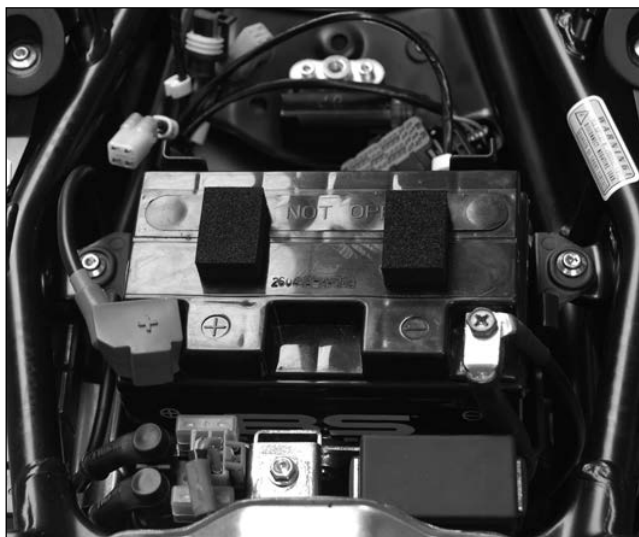
Tightening torque: $7 \div 8 \text{ N}\cdot\text{m}$



Before tightening, make sure the cables face the right way.



When mounting is finished, make sure the cable of the positive terminal is positioned on the inside of the structure (see figure).



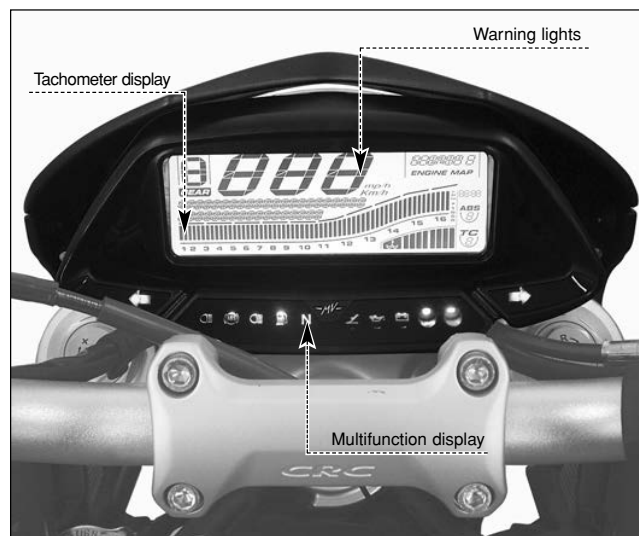
INSTRUMENTS AND WARNING LIGHTS

Check → At the pre-delivery, at the first 1000 kilometres and then every 6000 kilometres.

B

The instrumentation check must be carried out completely on all its functions as listed in the following list. If even one of the functions does not function correctly, consult chapter E “Electrical system” for complete details.

Turning the ignition key to the “ON” position activates the instruments and the warning lights. After an initial check-up (approximately seven seconds) the information received correspond to the general condition of the motorcycle at that moment.



Warning lights

1 High beam (blue)

It turns on when the high beam is on.

2 ABS warning light (orange) (only on certain models)

Lights up when the ABS system has a fault or is deactivated, or if the speed is lower than 5 km/h.



WARNING: If the warning light comes on while riding, stop the motorcycle immediately and check that the ABS system is activated.

3 Low beam (green)

It turns on when the low beam is on.

4 Reserve fuel indicator (orange)

Comes on when approximately 4 litres of fuel are left.

5 Neutral warning light (green)

It turns on when the gear is in “Neutral”.

6 Sidestand down warning light (red)

Lights up when the sidestand is down.

7 Engine oil pressure warning light (red)

Lights up when the oil pressure is insufficient.



WARNING: If the warning light comes on while riding, stop the motorcycle immediately. Check oil level and, if necessary, provide for topping up.

8 Battery charge indicator (red)

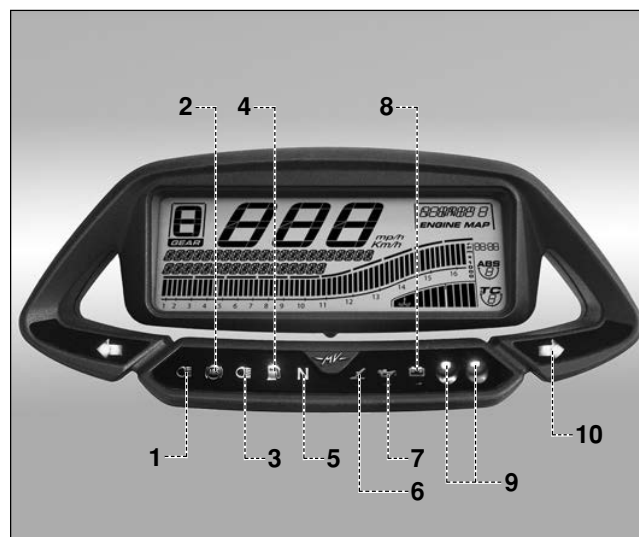
Lights up when the alternator does not supply enough current to charge the battery.

9 RPM limiter indicators (orange/red)

They switch on before the limiter intervention, at a number of turns dependent on the ratio of the inserted gear. The limiter intervenes at 13000 rpm.

10 Turn indicator lights (green)

They light up when the turn indicators are activated.



Multifunction display

11 Gear display

It displays the currently engaged gear. The "0" digit stands for "neutral".

12 Speedometer

It displays the speed of the motorbike. It can be given in kilometres per hour (Km/h) or in miles per hour (Mph). The full scale measures 300 Km/h (186 Mph).

13 Control unit mapping display

Indicates the control unit mapping currently selected.

14 Clock

Indicates the current time.

15 ABS display (only on certain models)

Indicates the activation state of the ABS function.

16 Traction control level display

Indicates the traction control level currently selected.

17 Thermometer

It displays the temperature of the coolant by turning on a variable number of segments on a graduated scale. When the temperature falls outside the normal operating range, it may display one of the following information:

- the display shows just one blinking segment; it means that the temperature is low;
- all segments are on, while the upper segment is blinking; it means that the temperature is high.



Danger - Notice: if the temperature is high, stop the motorbike and check the coolant level. If it needs to be filled up. If the warning light turns on even if the level is adequate, stop driving.

18 "TOTAL" odometer

It displays the total distance covered; from 0 to 999999 (Km or miles)

Trip counter 1, "TRIP 1"

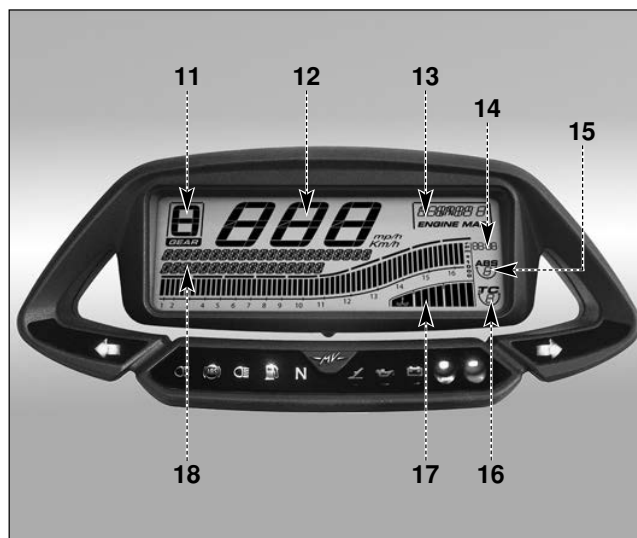
It displays the length of a trip; from 0 to 999.9 (Km or miles)

Trip counter 2, "TRIP 2"

It displays the length of a trip; from 0 to 999.9 (Km or miles)

Chronometer

It displays the time measured by the chronometer



B



Selecting and setting the display functions

Some of the main measurements of the instruments may be changed.

The available options include:

B

- Select an operating mode:

“RUN” (Odometer)
“SPEED LIMITER”
“TC” (Traction control)
“CHRONO” (Chronometer)
“ABS” (Antilock braking system)*
“QUICK SHIFT”
“CLOCK” (Clock)

- Reset the trip counter:

Trip counter 1	“TRIP 1”
Trip counter 2	“TRIP 2”

- Turn on the chronometer

- Clock settings

- Control unit mapping selection

Selecting the display functions

The following settings may be changed on the display:

- “RUN” (Odometer)
- “SPEED LIMITER”
- “TC” (Traction control)
- “CHRONO” (Chronometer)
- “ABS” (Antilock braking system)*
- “QUICK SHIFT”
- “CLOCK” (Clock)

To display the operating modes, press “SET” for less than three seconds. When pressed, the display shows all modes, in a sequence. Select the desired mode.



WARNING

The operation must be performed while the engine is not running, the gears are in neutral, the motorcycle is stationary, and with the feet on the ground. Do not set the display functions while riding, except where otherwise indicated.



(*): This function is present only on certain models



Maintenance

“RUN” mode

In addition to the speedometer, the display shows the following functions:

- Total odometer “TOTAL”
- Trip counter 1 “TRIP 1”

As an alternative:

- Total odometer “TOTAL”
- Trip counter 2 “TRIP 2”



B

“SPEED LIMITER” mode

This mode adjusts the maximum value of the vehicle speed to your driving requirements.



“TC” Mode

This mode adjusts the engine traction control level to your driving requirements.





Maintenance

“CHRONO” Mode

This mode turns on the Chronometer and saves the recorded information. The following is displayed:

B

- Chronometer Current lap “CURRENT LAP”
- Chronometer Fastest lap “BEST LAP”
- Chronometer Last lap “LAST LAP”
- Rev counter Total laps covered “N° LAP”



“ABS” mode *

This mode allows to activate or deactivate the antilock braking system (ABS).



(*): This function is present only on certain models

“QUICK SHIFT” mode

This mode allows to turn off or on the “quick shift” function of the gear change.



“CLOCK” Mode

The present function enables to change the time (hours and minutes) reported on the dashboard.



B

Trip reset

To reset “TRIP 1” and “TRIP 2”, proceed as follows.



WARNING

The display modes may be changed or set when the engine is off, the gear in neutral, the motorbike stationary with your feet on the ground. The display may not be changed while driving.



- Access the “RUN” mode; the total speedometer (“TOTAL”) and partial speedometer 1 (“TRIP 1”) will appear on the display.

- By pressing the “OK” key for more than three seconds, the “TRIP 1” value will be reset to zero.





Maintenance

- Press the "OK" key for less than three seconds until the partial speedometer 2 function ("TRIP 2") appears on the display.

B



- By pressing the "OK" key for more than three seconds, the "TRIP 2" value will be reset to zero.

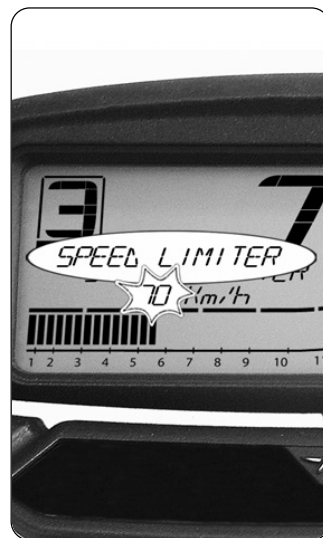


“SPEED LIMITER” mode

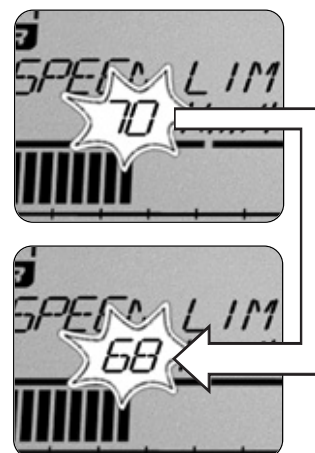
When starting the engine, the “SPEED LIMITER” function is disabled. In order to activate it, it is necessary to perform the following operations:

- Press “SET” in order to access to “SPEED LIMITER” mode. The maximum speed value shown on the display (equal to the current speed of the vehicle) starts blinking.

NOTE: The maximum speed may be changed or set even during the use of the vehicle.



- Press “SET” for less than three seconds: the maximum speed value is decreased of **2 km/h** with reference to the one shown on the display. On the other hand, if you press “OK” for less than three seconds, the maximum speed value is increased of **2 km/h** with reference to the one shown on the display.



- Press “OK” for over three seconds to confirm the selected maximum speed value. The displayed digit stops blinking and the display returns to “RUN” mode.

- On the other hand, if you press “SET” for over three seconds, the “SPEED LIMITER” function is disabled. The display shows the “OFF” caption. After three seconds, the display returns to “RUN” mode.





Maintenance

- If the “SPEED LIMITER” function has been enabled, when riding the vehicle the speed value shown on the odometer starts blinking when it reaches the set value of the maximum speed.

B

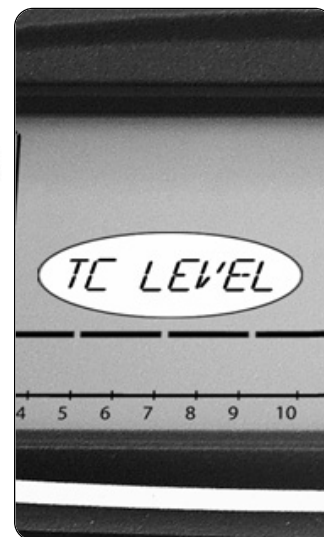


“TC” Mode

- Press “SET” in order to access to “TC” mode, then press “OK” for less than three seconds until “TC LEVEL” appears. The current traction control level is the same as the one shown on the display.

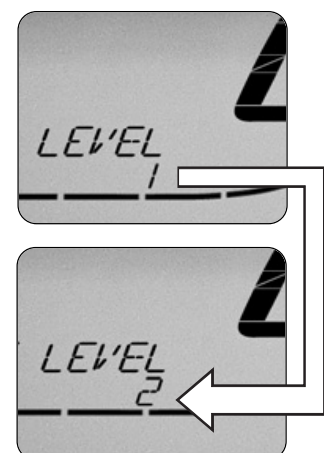
NOTE

The traction control level may be changed or set even during the use of the vehicle.



- Press “OK” for less than three seconds: the traction control level rises up to the next value. On the other hand, by pressing “SET” for less than three seconds, the traction control level decreases to the lower value. Such value may range between 0 and 8.

- Press “SET” for over three seconds to confirm the selected traction control level.



Chronometer

Lap time recording

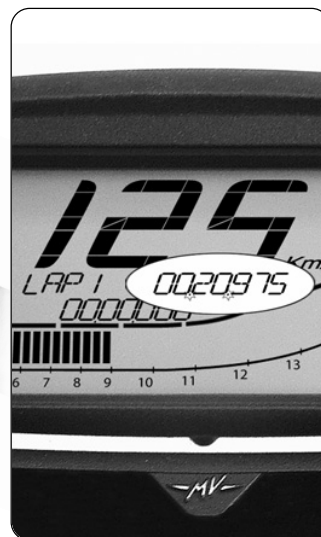
- Turn on the chronometer ("CHRONO" mode) to record the time taken to cover a lap.



B

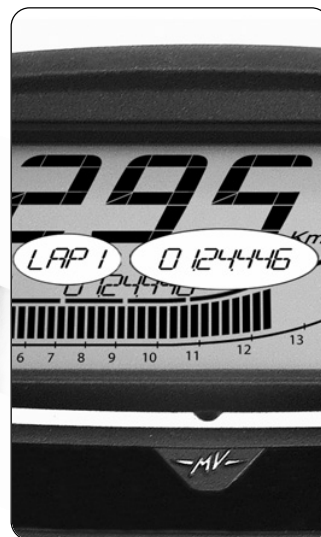
- Press the headlight button to start recording the time. The colon that separates the minutes from the seconds and from the tenths of a second will start blinking. Now, the instrument is recording the time.

NOTE: When the "CHRONO" mode is activated, the first pressing of the headlight button automatically enables the "TC" function. From this moment on, it is possible to immediately change the traction control level by properly operate the "SET" and "OK" buttons.



- Press the headlight button again to record the time taken to cover the 1st lap. At the same time, the instrument starts recording the time taken to cover the second lap.

The time measurement for the first lap is stored in the memory and is visualised on the display for ten seconds, after which the time measurement for the following lap appears.



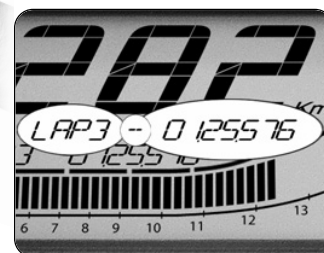
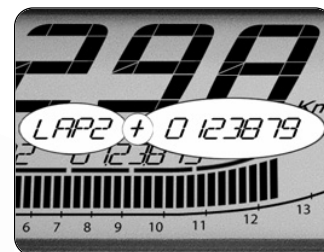


Maintenance

- If using the chronometer again, every time you press the headlight button, it records a time. The instrument can record up to 100 consecutive times.

B

When the time for the lap which has just concluded is displayed, the symbol “+” or “-” appears if the time recorded is respectively higher or lower than the time measured during the previous lap.



Data display

Once all times have been recorded, they may be displayed.

- Access the “CHRONO” mode; the time of the fastest lap (“BEST LAP”) and the time of the last lap (“LAST LAP”) appears on the display.

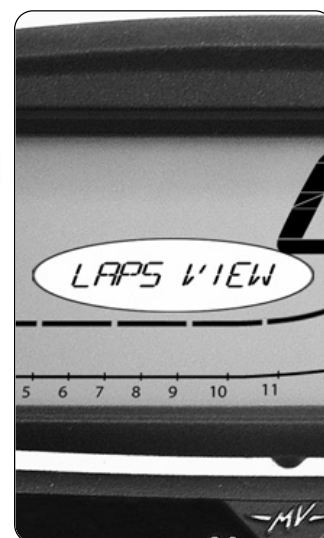


WARNING

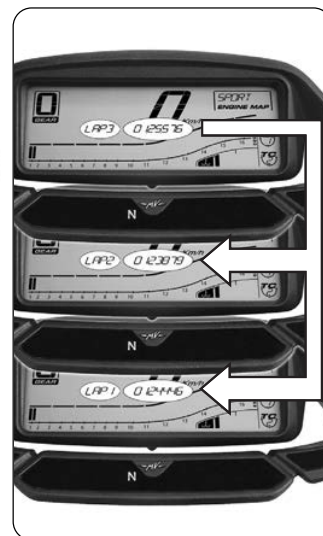
The display modes may be changed or set when the engine is off, the gear must be in neutral, the motorbike must be stationary with your feet on the ground. Do not change the display while driving.



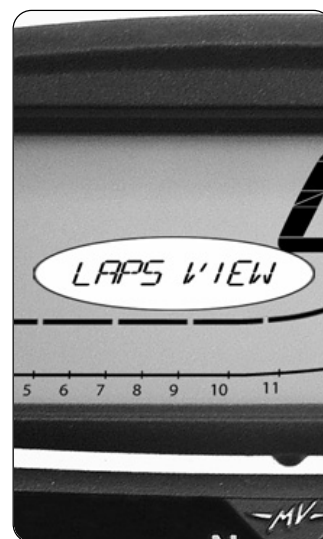
- Press “OK” for less than three seconds until “LAPS VIEW” appears.



- By repeatedly pressing the key of the flashing high beam headlight, all the times previously acquired starting from the last lap memorised can be displayed in sequence.



- Once all the data have been displayed, press the "SET" key to return to the "LAPS VIEW" mode and then to the following mode.



How to delete data

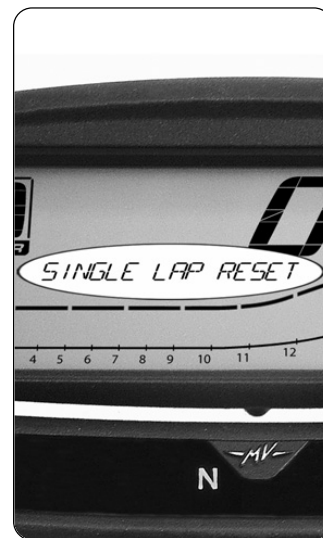
To delete the saved data, proceed as follows:

B



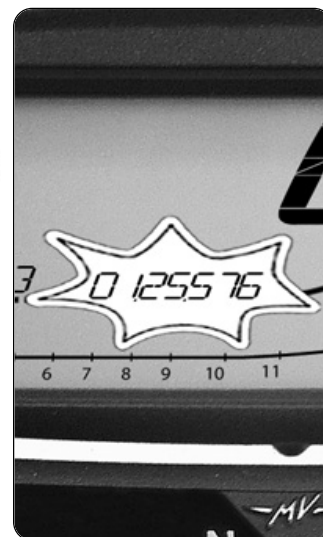
WARNING

The display modes may be changed or set when the engine is off, the gear in neutral, the motorbike stationary with your feet on the ground. Do not change the display while driving.

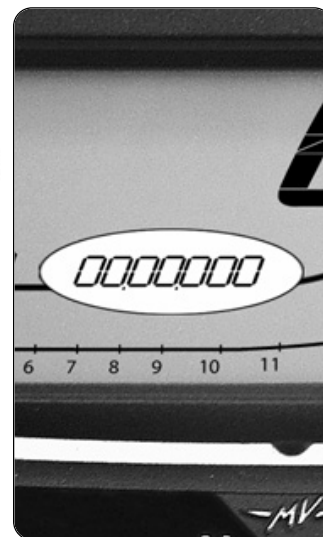


- *Resetting of individual time recordings:* Access the "CHRONO" mode and press the "SET" key for less than three seconds until the words "SINGLE LAP RESET" appear on the display.

- Press the "OK" key for less than three seconds; the value of the last lap time memorised will start flashing.



- Now, press "OK" for over three seconds to delete the value. Otherwise, press "SET" for less than three seconds to stop the deletion procedure.



- Subsequently, by pressing the flashing high beam headlight key followed by the "OK" key for more than three seconds, all the previously acquired times can be cancelled.
- Once all the data have been cancelled, press the "SET" key to return to the "SINGLE LAP RESET" mode and then to the following mode.



B

- *Resetting of best lap time:* Access the "CHRONO" mode and press the "SET" key for less than three seconds until the words "BEST LAP RESET" appear on the display.



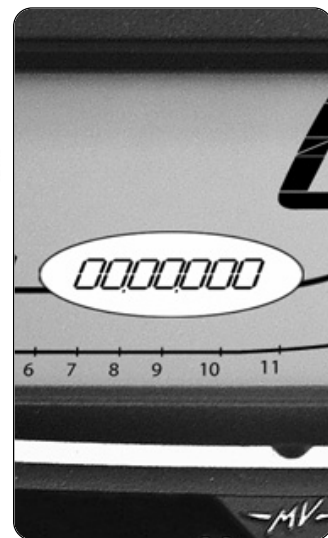
- Press the "OK" key for less than three seconds; the value of the fastest last lap time memorised will start flashing.



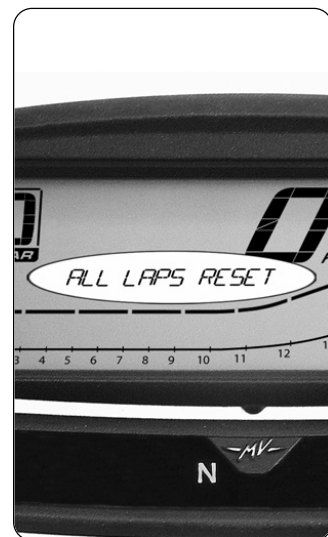
- Now, press "OK" for over three seconds to delete the value. Otherwise, press "SET" for less than three seconds to stop the deletion procedure.

B

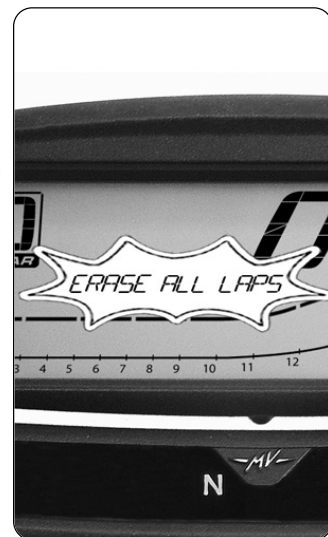
- Once all the data have been cancelled, press the "SET" key to exit the "BEST LAP RESET" mode and then pass to the following mode.



- *Resetting of all lap times recorded:* Access the "CHRONO" mode and press the "SET" key for less than three seconds until the words "ALL LAPS RESET" appear on the display.



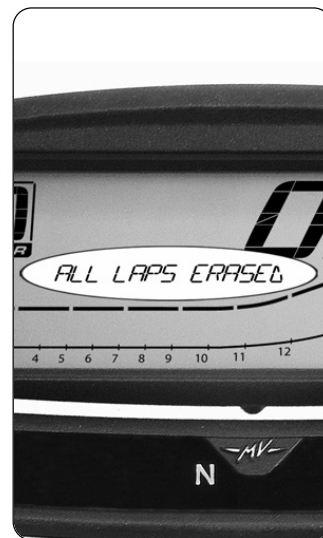
- Press the "OK" key for less than three seconds; the display will ask you to confirm cancellation of all the data present in the memory.





Maintenance

- By pressing the “OK” key for more than three seconds, all the previously acquired times will be cancelled. By pressing the “SET” key for less than three seconds, the cancellation procedure will be interrupted.
- Once all the data have been cancelled, press the “SET” key to exit the “ALL LAPS RESET” mode and to return to the “CHRONO” mode.



B

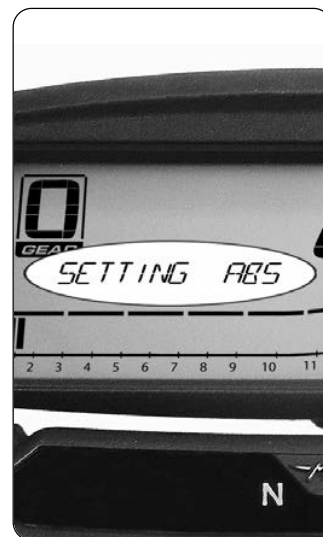
Selecting the ABS functions *

- Press “SET” in order to access to “ABS” mode; “SETTING ABS” appears on the display.



WARNING

The display modes may be changed or set when the engine is off, the gear in neutral, the motorbike stationary with your feet on the ground. Do not change the display while driving.



- Press “OK” for less than three seconds: “ABS ON” starts blinking on the display.

- If you do not press any button, after three seconds the “ABS ON” selection is confirmed; under this condition, the ABS system is activated. Press “SET” to exit the “ABS” mode.



(*): This function is present only on certain models

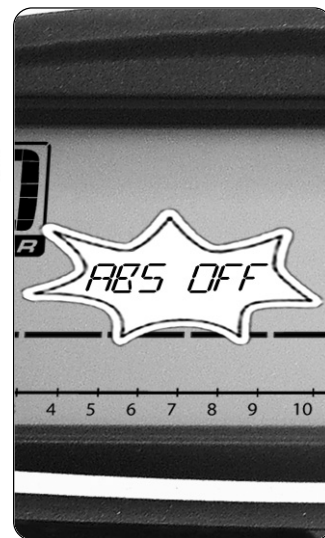
B

- Otherwise, by pressing "OK" while the caption is still blinking, "ABS OFF" appears on the display.
- If you do not press any button, after three seconds the "ABS OFF" selection is confirmed; under this condition, the ABS system is deactivated. Press "SET" to exit the "ABS" mode.



WARNING

When the ABS system is deactivated, the related warning light on the dashboard turns on. From this moment on, the antilock braking system is not available when braking. Adopt a cautious driving style and ride at low speed in order to avoid losing control of the vehicle during emergency brakings.



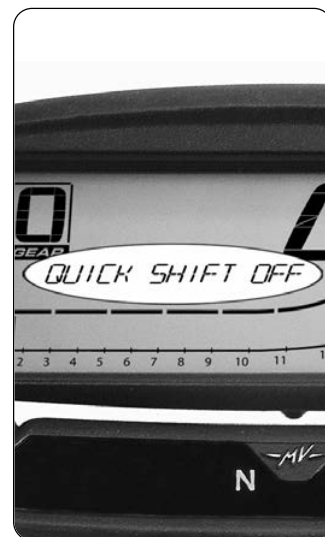
"QUICK SHIFT" mode

- Press "SET" in order to access to "QUICK SHIFT" mode. The display shows the current activation state of the "quick shift" function of the gear change ("ON": activated; "OFF": not activated).

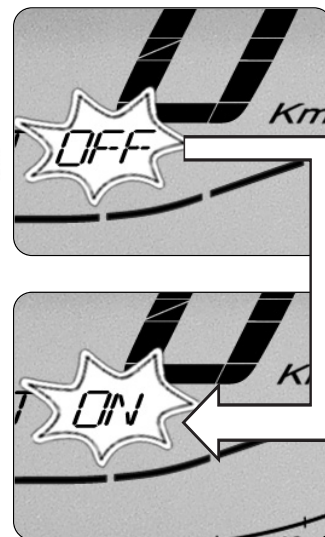


WARNING

The display modes may be changed or set when the engine is off, the gear in neutral, the motorbike stationary with your feet on the ground. Do not change the display while driving.



- Press the "OK" button for less than three seconds; the activation caption of the "quick shift" function begins to flash.
- By pressing the "OK" button for less than three seconds, the caption toggles from "OFF" to "ON" and inversely.
- Press "SET" to confirm the selected "quick shift" activation state.



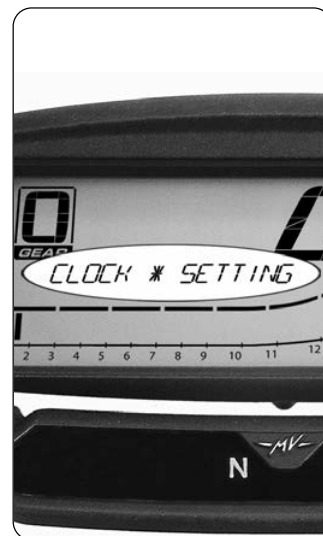
Clock settings

- To carry out clock settings, press the "SET" button until viewing the "CLOCK SETTING" caption.



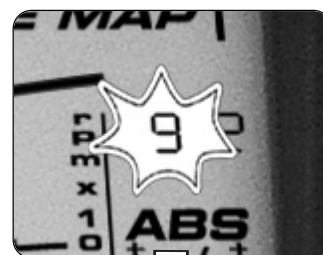
WARNING

The display modes may be changed or set when the engine is off, the gear in neutral, the motorbike stationary with your feet on the ground. Do not change the display while driving.

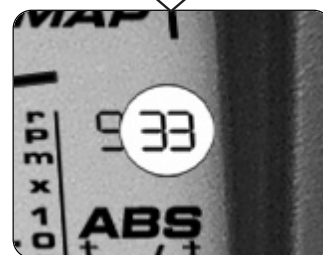


B

- Press the "OK" button for less than three seconds; the hour digit begins to flash.
- By pressing the "OK" button again for less than three seconds, the hour digit is increased by going to the following numeric value.
- Press the "OK" button for over three seconds; the selected hour digit is confirmed. If instead one presses the "SET" button for less than three seconds the setting procedure is interrupted.



- After having carried out the hour digit setting, the dashboard automatically switches to the minute digit setting. The minute digit begins to flash.
- By pressing the "OK" button for less than three seconds, the minute digit is increased by going to the following numeric value.
- Press the "OK" button for over three seconds; the selected minute digit is confirmed and the dashboard returns to "CLOCK" mode. If instead one presses the "SET" button for less than three seconds the setting procedure is interrupted.





How to select the mapping of the control unit

On the Rivale model is it possible to select different control unit mappings which allow to obtain variable power and performance characteristics based on the type of vehicle use.

NOTE

The mapping selection may be performed even during the use of the vehicle.

The mapping of the control unit can be selected by pressing the start button when the engine is switched on; this way the mapping switches to the following setting value. The corresponding mapping characteristics are listed in the following table.

Mapping	N	R	S	C
Mode	Normal	Rain	Sport	Customised



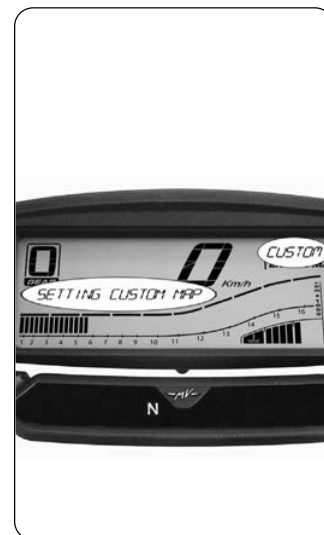
Setting of "Custom" mapping

- Press the start button when the engine is switched on until selecting the mapping "C" of the control unit ("Custom" mapping).



WARNING

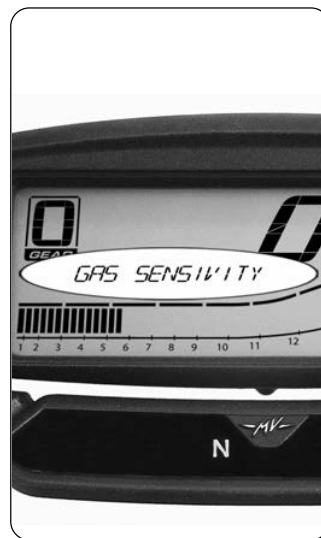
The "Custom" mapping setting operations must be performed when the gear is in neutral and the motorbike stationary with your feet on the ground. Do not change the display while driving.



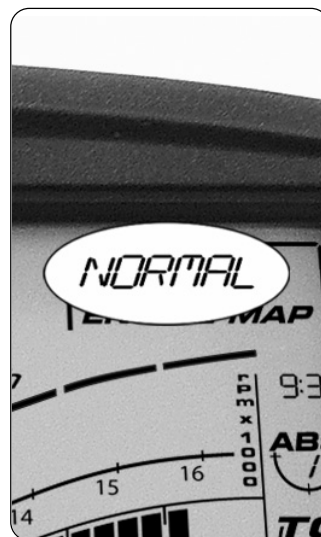
- Press "SET" until "SETTING C MAP" appears.

In order to adjust the "Custom" mapping parameters to your driving requirements, perform the following operations.

- *Throttle control sensitivity:* Press "OK" for less than three seconds until "GAS SENSITIVITY" appears.



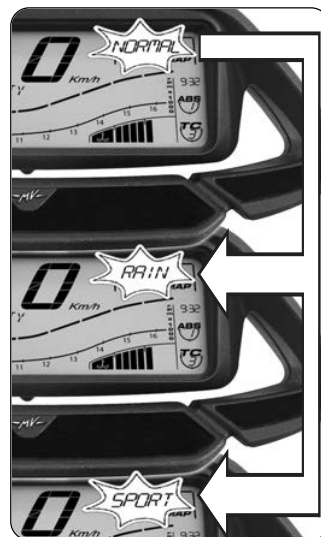
- Press "SET" for less than three seconds. The display shows the current setting for throttle control sensitivity.



- Press "OK" for less than three seconds; the displayed setting will start flashing.

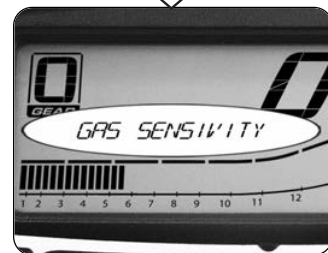
- By repeatedly pressing "OK" for less than three seconds, the following settings can be displayed in sequence:

- "NORMAL"
- "RAIN"
- "SPORT"

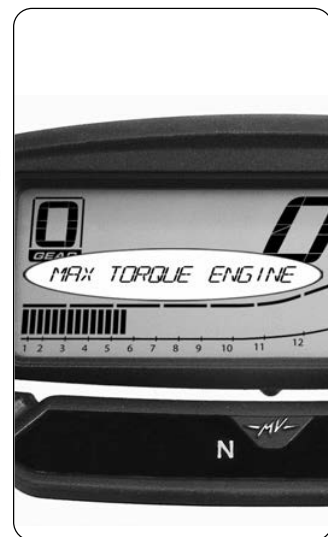


B

- Press "OK" for more than three seconds; the new setting will be confirmed. The displayed caption stops flashing and after a few seconds the display returns to "GAS SENSITIVITY" mode. It is now possible to proceed with the setting of the following parameter.



- *Maximum engine torque*: Press "OK" for less than three seconds until "MAX ENGINE TORQUE" appears.



- Press "SET" for less than three seconds. The display shows the current setting for maximum engine torque.



- Press "OK" for less than three seconds; the displayed setting will start flashing.

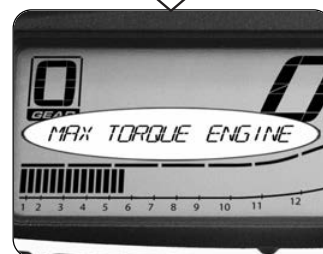
- By repeatedly pressing "OK" for less than three seconds, the following settings can be displayed in sequence:

- "RAIN"
- "SPORT"

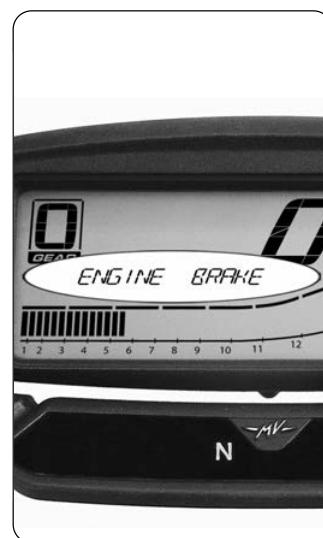


B

- Press "OK" for more than three seconds; the new setting will be confirmed. The displayed caption stops flashing and after a few seconds the display returns to "MAX TORQUE ENGINE" mode.

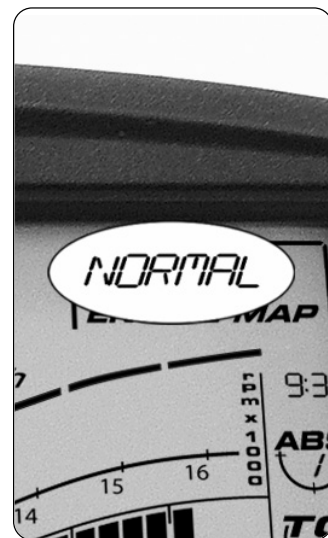


- *Engine brake*: Press "OK" for less than three seconds until "ENGINE BRAKE" appears.



- Press "SET" for less than three seconds. The display shows the current setting for engine brake.

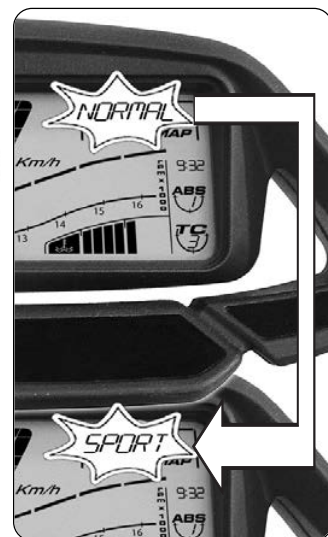
B



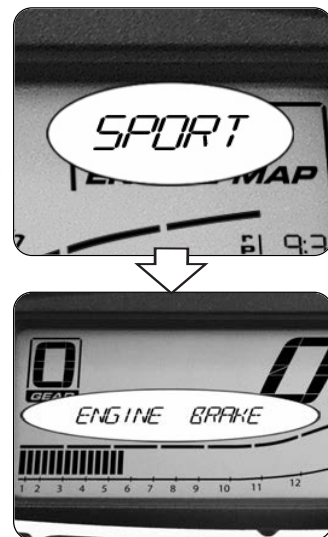
- Press "OK" for less than three seconds; the displayed setting will start flashing.

- By repeatedly pressing "OK" for less than three seconds, the following settings can be displayed in sequence:

- "NORMAL"
- "SPORT"



- Press "OK" for more than three seconds; the new setting will be confirmed. The displayed caption stops flashing and after a few seconds the display returns to "ENGINE BRAKE" mode.





Maintenance

- *Engine response*: Press "OK" for less than three seconds until "ENGINE RESPONSE" appears.

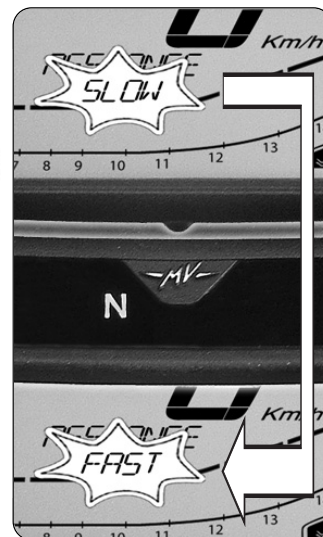


B

- Press "SET" for less than three seconds. The display shows the current setting for engine response.



- Press "OK" for less than three seconds; the displayed setting will start flashing.
- By repeatedly pressing "OK" for less than three seconds, the following settings can be displayed in sequence:
 - "SLOW RESPONSE"
 - "FAST RESPONSE"

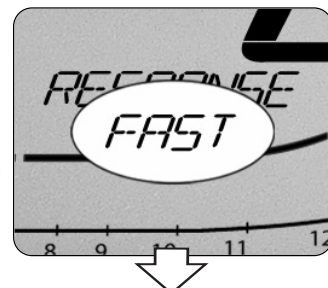




Maintenance

B

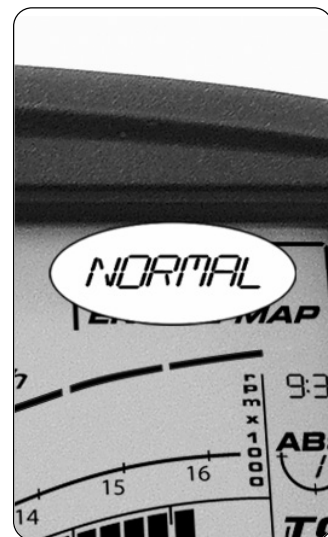
- Press "OK" for more than three seconds; the new setting will be confirmed. The displayed caption stops flashing and after a few seconds the display returns to "ENGINE RESPONSE" mode



- *Engine RPM limiter*: Press "OK" for less than three seconds until "RPM LIMITER" appears.



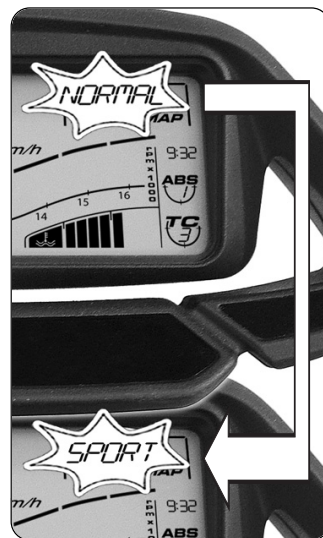
- Press "SET" for less than three seconds. The display shows the current setting for engine RPM limiter.



- Press "OK" for less than three seconds; the displayed setting will start flashing.

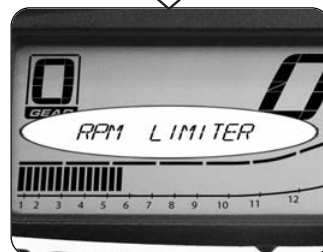
- By repeatedly pressing "OK" for less than three seconds, the following settings can be displayed in sequence:

- "NORMAL"
- "SPORT"

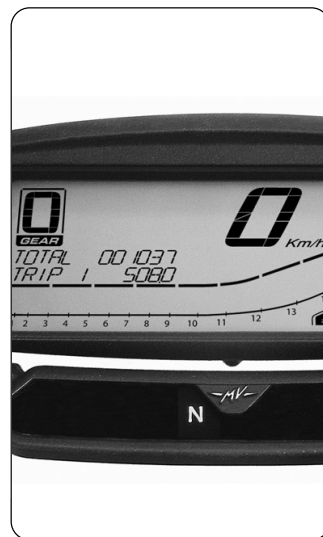


B

- Press "OK" for more than three seconds; the new setting will be confirmed. The displayed caption stops flashing and after a few seconds the display returns to "RPM LIMITER" mode.



- Press "OK" for less than three seconds until the display switches to the "RUN" mode. The setting of the "Custom" mapping is completed.



Warning / malfunction alerts

The dashboard may highlight the presence of a fault or a malfunction during different using conditions of the motorcycle.

B

- *Engine start:* As you turn the ignition switch to the ON position, the instruments and the warning lights will go through the self-diagnostic cycle. If the self-diagnostic cycle detects a fault in the vehicle, the display shows the warning alert shown in the picture. In particular, this message highlights the vehicle part or device on which the fault has been detected.

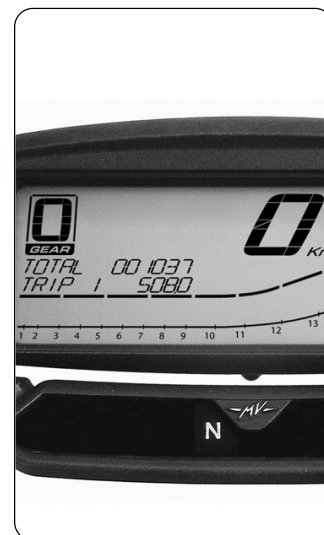


- Press “OK” button to access to “RUN” mode. The direction indicator emergency lights begin to flash.



WARNING

If a fault is detected on the vehicle when the engine is off, do not start engine.



- *Fault during vehicle riding:* If a fault is detected during riding, the lower portion of the display shows the warning alert shown in the picture. The direction indicator emergency lights begin to flash.



WARNING

If a fault is detected during riding, stop the vehicle.





Maintenance

- After the vehicle is stopped, the display shows the warning message highlighting the vehicle part or device on which the fault has been detected.



B

- *High coolant temperature:* If a high value of the coolant temperature is detected, the display shows the warning alert shown in the picture. This message may appear during every using condition of the vehicle.



WARNING

If the coolant temperature is high, stop the motorbike and check the coolant level. If it needs to be filled up. If the warning alert appears even if the level is adequate, stop driving.



Dealer Menu

The instrumentation provides the opportunity to operate on an additional set of parameters.

The auxiliary functions available are:

- “SERVICE” (Scheduled maintenance expiration)
- “UNIT CHANGE” (Changes unit of measurement)

Viewing and editing modes of operation is performed in accordance with the procedures outlined in the paragraphs below.



WARNING

The modification or adjustment of display functions must be carried out with the engine off and running on neutral, with the motorcycle stopped with the stands on the ground. Changing display settings while running is prohibited.





Maintenance

"SERVICE" Mode

This operating mode displays the mileage range with respect to expiration of the next scheduled maintenance.

B

NOTE

When the mileage range upon maintenance servicing is less than 1000 km, its relative value automatically appears after the start-up screen of the motorcycle.



"UNIT CHANGE" Mode

This function allows for simultaneous editing of the following units of measure:

- Speed
- Distance covered



"SERVICE" Mode

- Press the "SET" and "OK" buttons at the same time for more than ten seconds to access the "DEALER MENU".



WARNING

The modification or adjustment of display functions must be carried out with the engine off and running on neutral, with the motorcycle stopped with the stands on the ground. Changing display settings while running is prohibited.

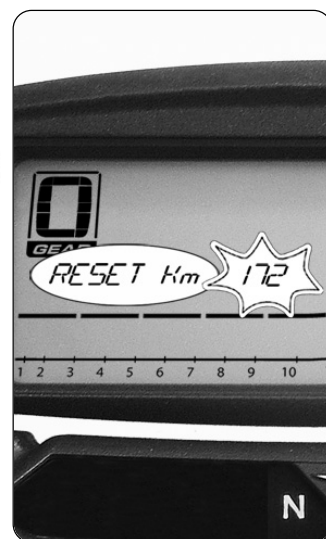


- Press the "OK " button for less than three seconds until the message "MV SERVICE KM" is displayed.
- Press the "OK " button for less than three seconds until the message "SERVICE" is displayed. The mileage range with respect to expiration of the next scheduled maintenance is shown on this screen.

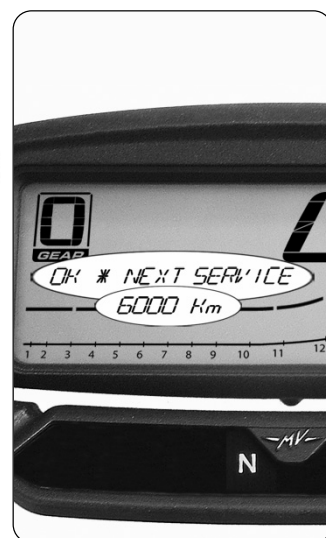


B

- *Mileage range resetting:* After performing scheduled maintenance, the mileage range must be reset using the following procedure.
- Access "SERVICE" mode and press the "OK" button for less than three seconds until the message "RESET Km" appears and the mileage range indicator light will begin to flash.



- Press the "OK " button for more than three seconds and the mileage range will be reset. The mileage range with respect to expiration of the next scheduled maintenance is shown on this screen.
- The next press of the "SET" button for less than three seconds will allow the user to return to the dashboard start screen.



Changing the unit of measurement

Allows for simultaneous editing of the following units of measure:

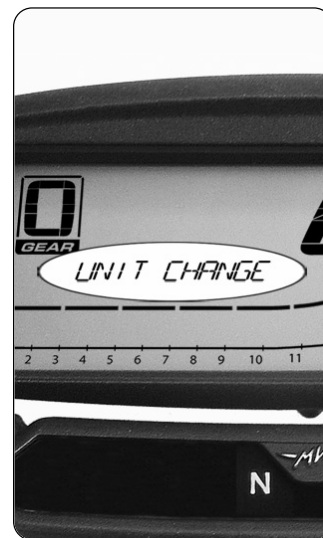
B

- Speed
- Distance covered



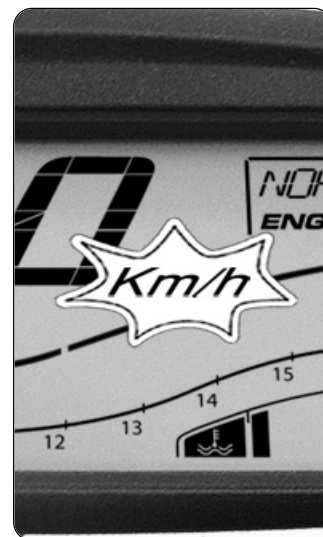
WARNING

The modification or adjustment of display functions must be carried out with the engine off and running on neutral, with the motorcycle stopped with the stands on the ground. Changing display settings while running is prohibited.



- Access the "SERVICE" mode as described in the preceding pages, and press the "SET" button for less than four seconds to until the message "UNIT CHANGE" appears.

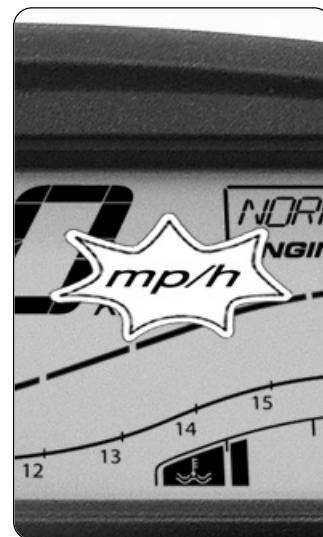
- Press the "OK" button for less than three seconds and the unit on the speedometer will begin to flash.



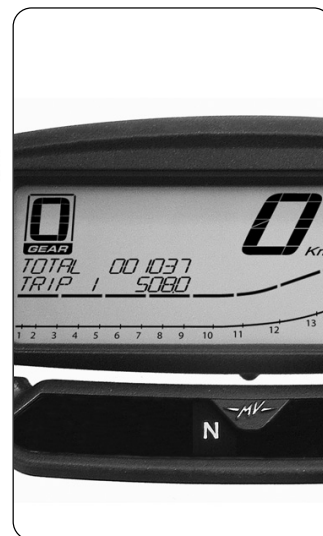
- Press the "SET" button to pass from Km/h to Mph and vice-versa. Changing the unit of measurement on the speedometer automatically varies the following sizes:

- Odometer (total and partial): Km → mi
- Setting hour: 0 ÷ 24 → 0 ÷ 12 (am / pm)

If you press the "OK" button for longer than three seconds, the modification procedure of the measurement units will be interrupted.



- Press the "OK " button for more than three seconds and the new unit of measurement configuration will be confirmed. The display returns to the "RUN" mode.



B

LIGHTS

Check →

At the pre-delivery, at the first 1000 kilometres and then every 6000 kilometres.

If any of the warning lights or the main lights are burnt out, replace them as follows.

Replacing the headlight bulb

- Loosen the screws of the headlight assembly on the right side of the bike without removing them.



- Remove the screws on the left side.

B



- Open the left clamp and rotate the headlight assembly as shown in the picture.



- Remove the protection cover.



- Release the retaining clips.

**B**

- Slide out the bulb.



CAUTION - Do not touch the bulb glass with bare hands. If you do, clean the bulb with an oil-free solvent.



- Unhook the connector.



B

- Replace the light bulb.
- Attach the light bulb to the connector.
- Reinsert the light bulb.
- Reconnect the retaining clips.
- Reinsert the protection cover.
- Remount the headlight assembly on the motorcycle going in reverse order to the disassembly. Before tightening the fastening screws, push the headlight assembly upwards until it is in abutment as shown in the picture.



FUSES

- The battery recharge fuse is located on the solenoid starter of the motorcycle. To expose it, remove the saddle of the motorcycle.



CAUTION

Turn the ignition key on the “OFF” position before checking or replacing the fuses, in order to avoid a short circuit with subsequent damage to other electric parts of the motorcycle.

- To make things easier remove the solenoid starter connector.



- To replace the fuse, you must swap the recharge fuse with the spare fuse.



WARNING

Never replace a fuse with a rating other than that prescribed, in order to avoid damage to the electrical equipment of the motorcycle which could lead to a fire.



B

- The services fuses are located under the saddle, near the battery.



- Release the two clamps and lift the fuse box cover.



CAUTION

Turn the ignition key on the "OFF" position before checking or replacing the fuses, in order to avoid a short circuit with subsequent damage to other electric parts of the motorcycle.



- Replace the blown fuse and refit the cover.

B

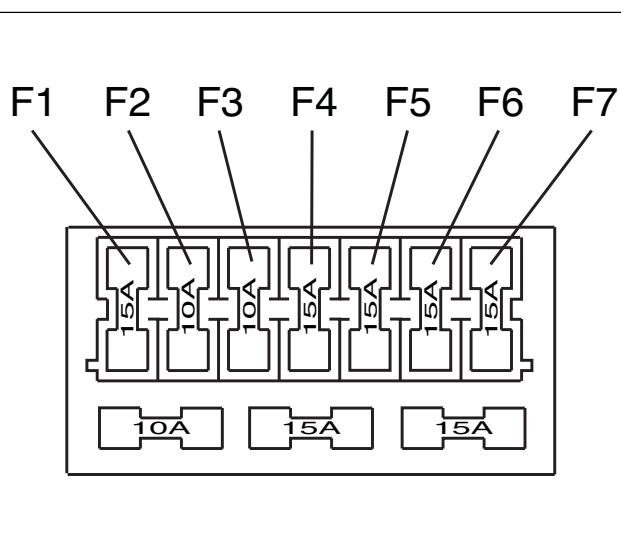


- To identify the position and function of the fuses, refer to the information shown in the enclosed electrical diagram. The reference letters in the figure correspond to those shown in the diagram. Remember that the fuse box contains three spare fuses.



WARNING

Never replace a fuse with a rating other than that prescribed, in order to avoid damage to the electrical equipment of the motorcycle which could lead to a fire.



FRONT HEADLAMP

Check adjustment → At every variation of the motorcycle set-up.

The headlight should be adjusted every time the geometry of the vehicle is altered and before carrying a pillion passenger. The motorcycle is not equipped with external adjusters and the front projector unit is fixed to the frame.

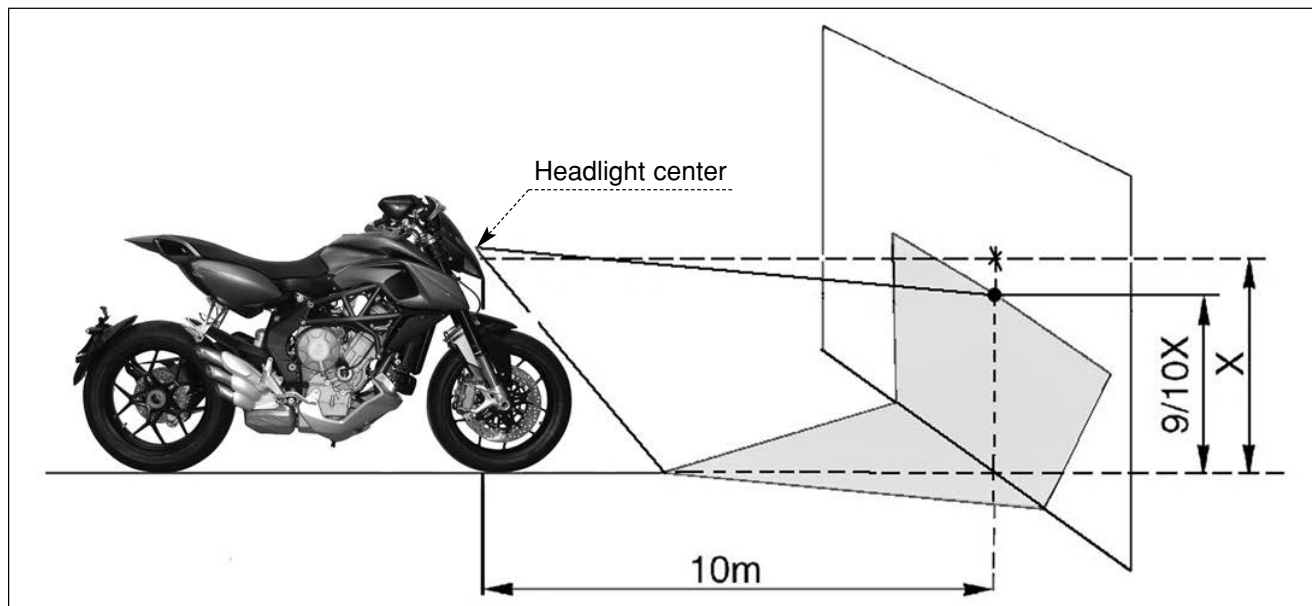
B

Headlight adjustment

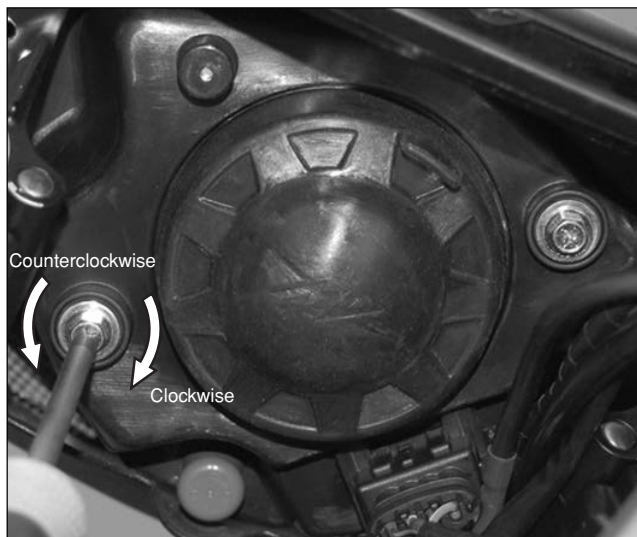
Place the vehicle at a distance of 10 m from a vertical wall. Make sure that the motorcycle is placed on an even horizontal surface, and that the headlight's optical axis is perpendicular to the wall.

The vehicle must be held in an upright position. Measure the "X" distance between the headlight center and the ground surface, then trace a small cross on the wall at the same height.

When you turn the headlight on, the upper boundary line between the dark area and the lighted area must be at an height equal or lower than the 9/10 of the headlight center height.



The light beam can be adjusted vertically by turning the screw illustrated. If turned in a clockwise direction: the optical unit tilts upwards. If turned in an anti-clockwise direction: the optical unit tilts downwards. It can be tilted up to an angle of $\pm 4^\circ$ from the standard position.

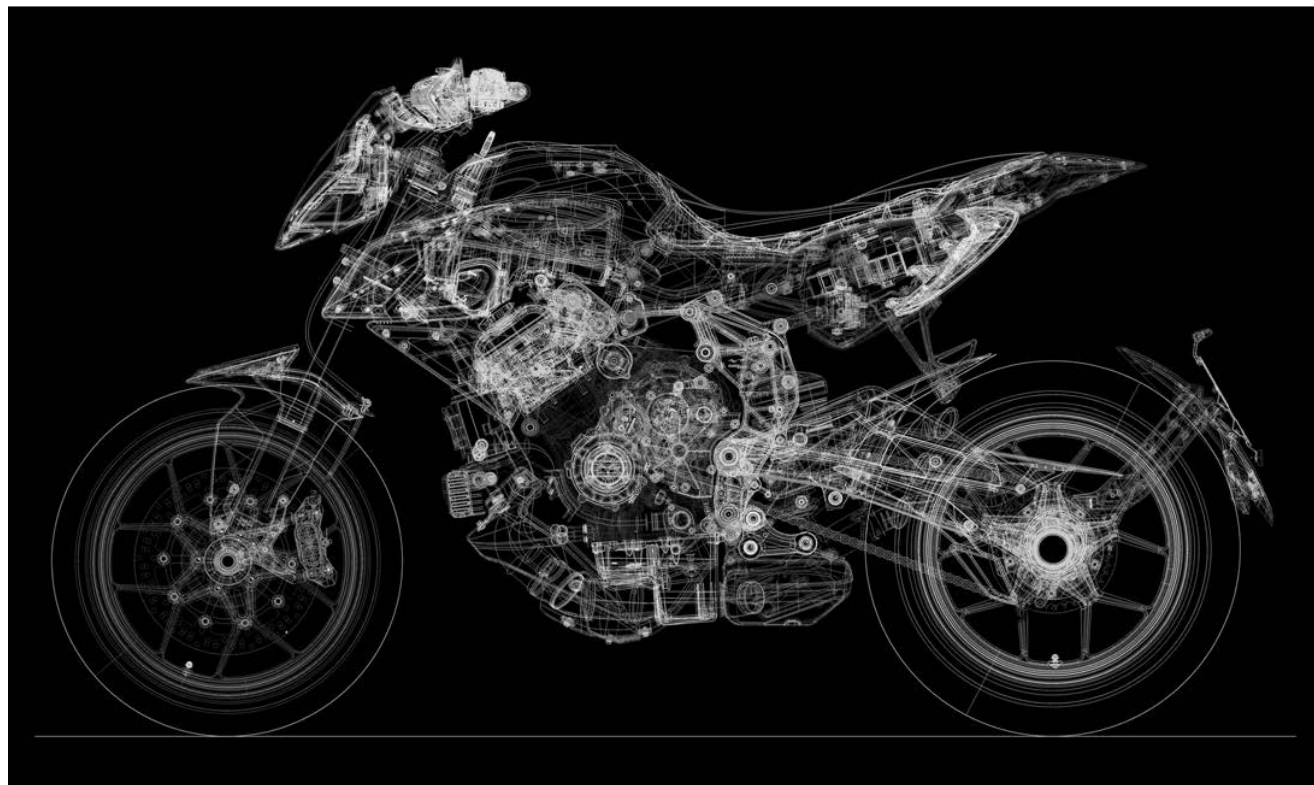




B



Superstructures



C

SECTION C

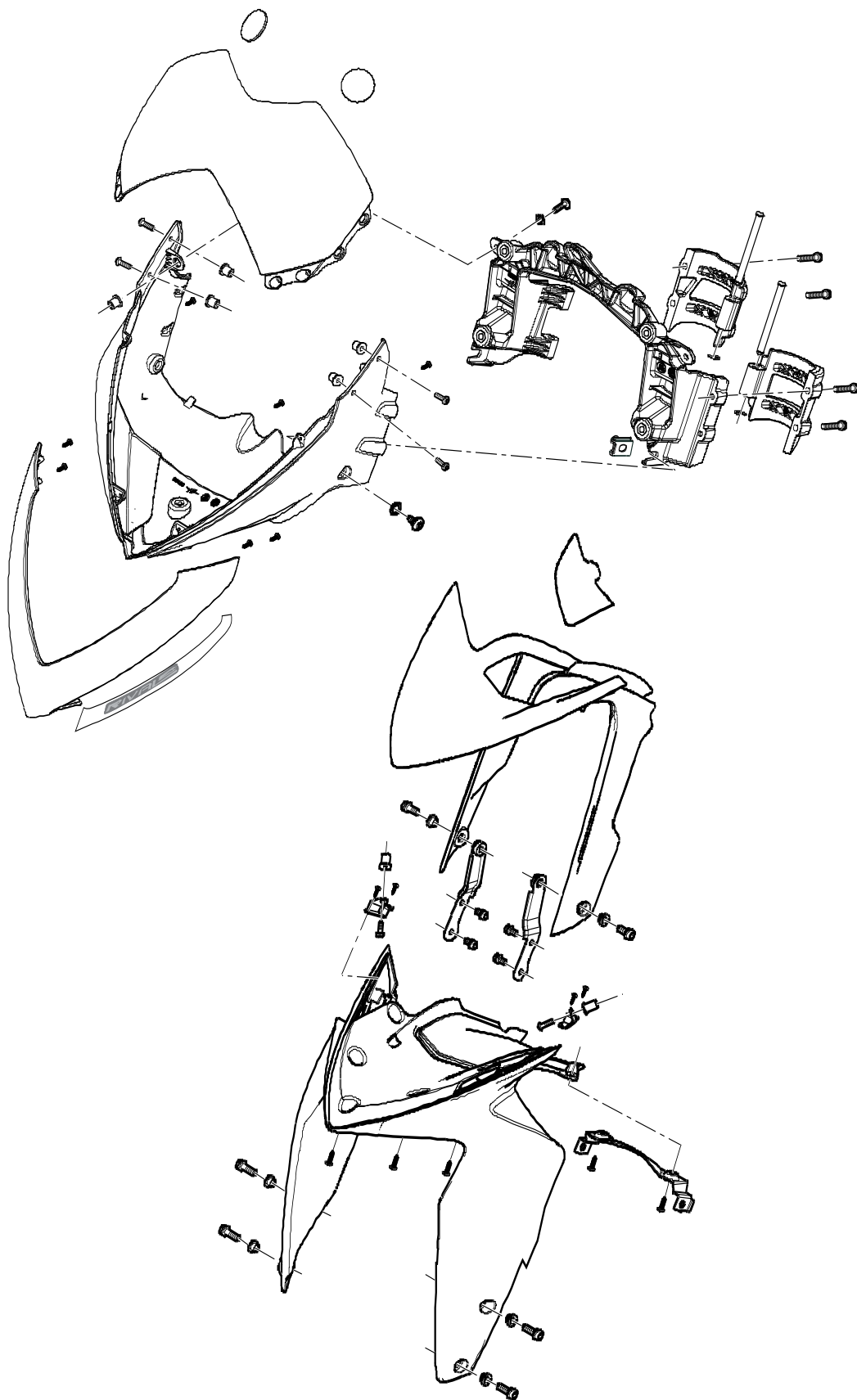
Revision 0



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FAIRINGS



C

REMOVING FRONT MUDGUARD

Remove the six screws of the mudguard as shown in figure (the screws are mounted with a socket key).

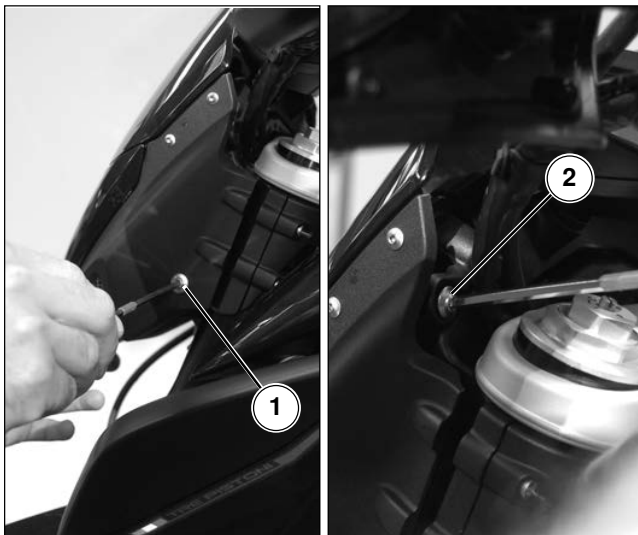


Remove the front brake hoses from the clamps mounted on the mudguard.
Pull off the mudguard towards the front.



FRONT HEADLIGHT COVER DISASSEMBLY

Remove the four fixing screws from the headlight, two frontal (1) and two lateral (2).



Slide the headlight cover out.

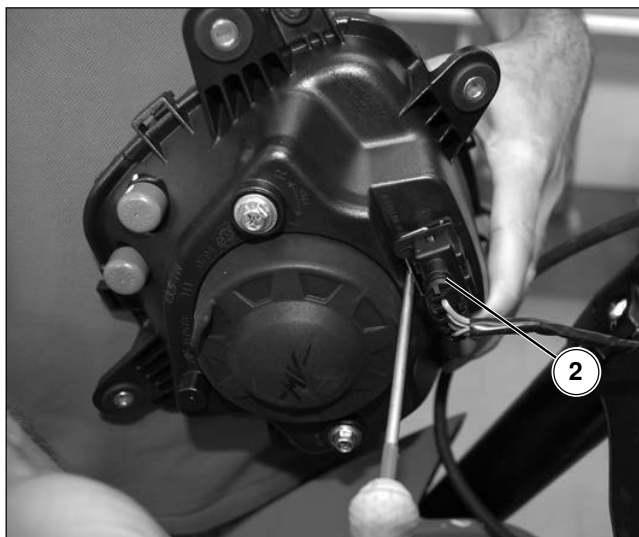


C

Remove the four fixing screws (1) of the headlight to the support.



Remove the headlight connector (2) using a screwdriver.



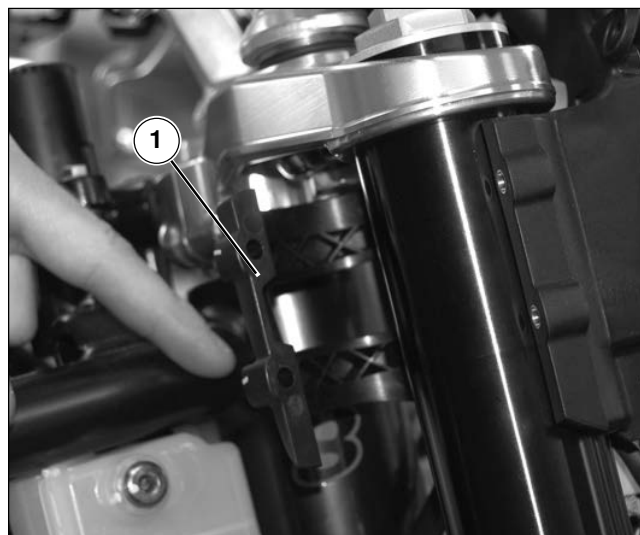
HEADLIGHT SUPPORT DISASSEMBLY

Remove the four fixing screws from the support (two per part).

C



Open the light support hatches.

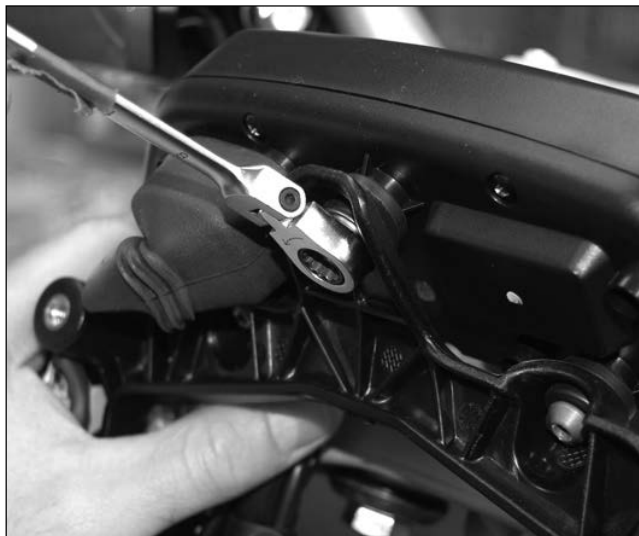


Extract the headlight support.



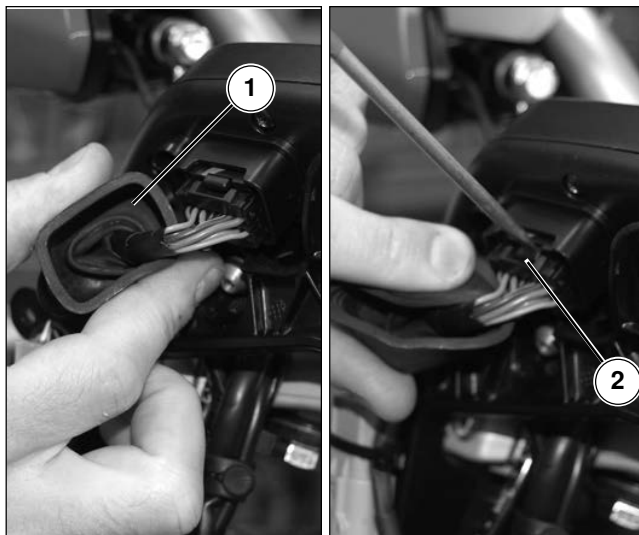
DASHBOARD DISASSEMBLY

Loosen the central fixing screw with relative washer.



C

Slide out the rubber hood (1) and release the connector (2) using a screwdriver.



Release the dashboard from the relevant rubber pads on the support.

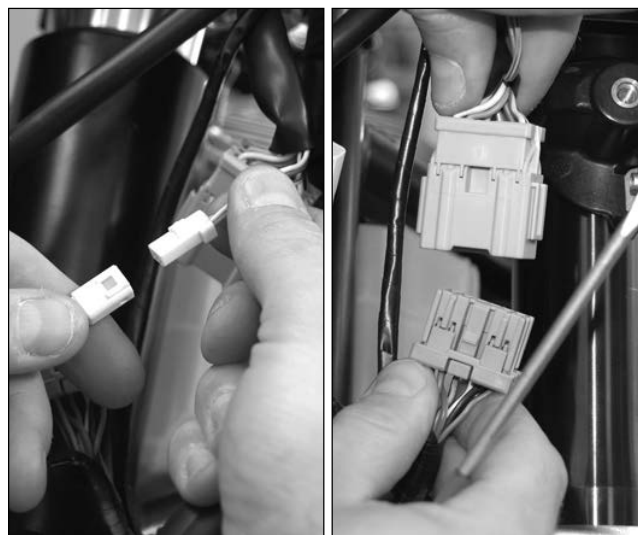
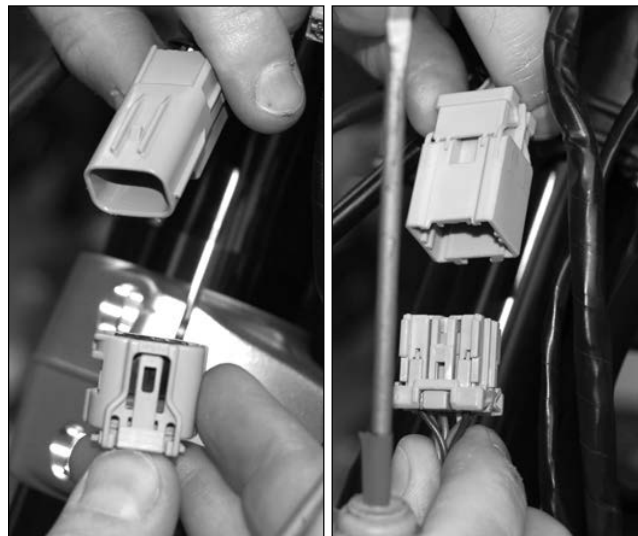


REMOVING HANDLEBAR

Before performing this operation, first disassemble the front low beam, the dashboard and the low beam support (optional) as described in the previous pages.

Disconnect the six (seven for vehicles with ABS) main connectors:

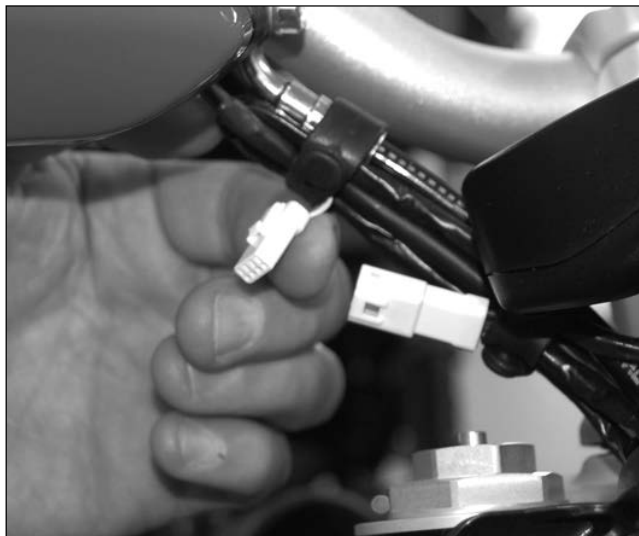
- n°4 situated in the front area of the vehicle;



- on vehicles with ABS, it is also necessary to disconnect the front wheel speed sensor connector.



- disconnect the 2 manifolds situated on the right and left sides under the handlebar (direction indicators).



C

Loosen the clutch on the handlebar side and engine side.

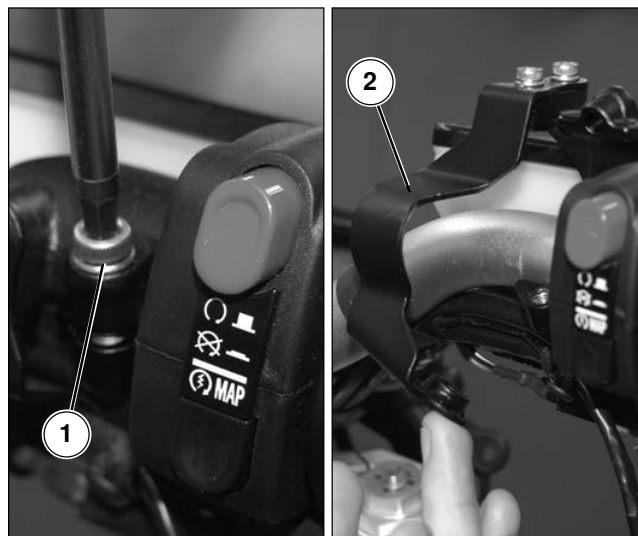


Slide out the clutch transmission cable from both sides.



Remove the front brake pump by operating on the screw (1) and open the hatch (2).

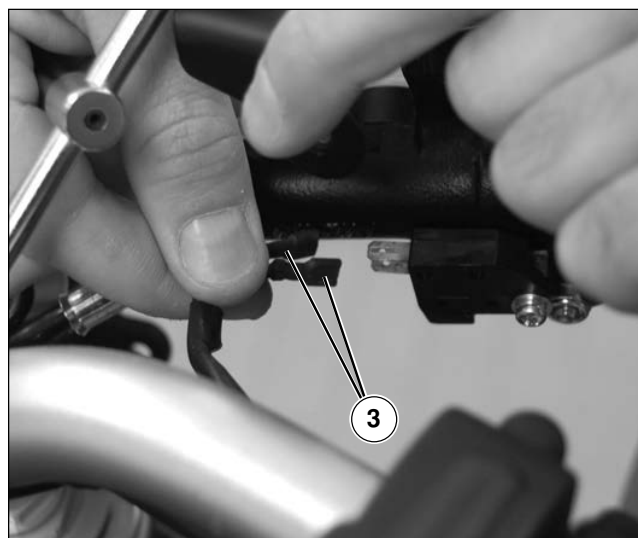
C



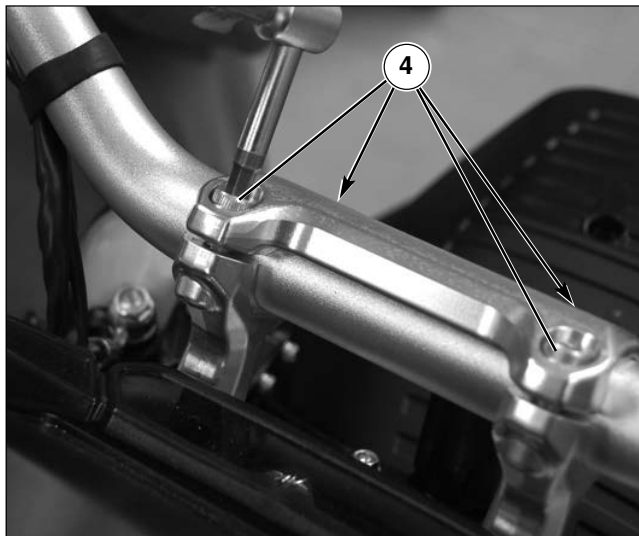
Slide the pump unit from the handlebar.



Disconnect the front brake stop light switch connectors (3).



Loosen the four fixing screws (4) of the handlebar stand (two screws per part) and remove the stand.



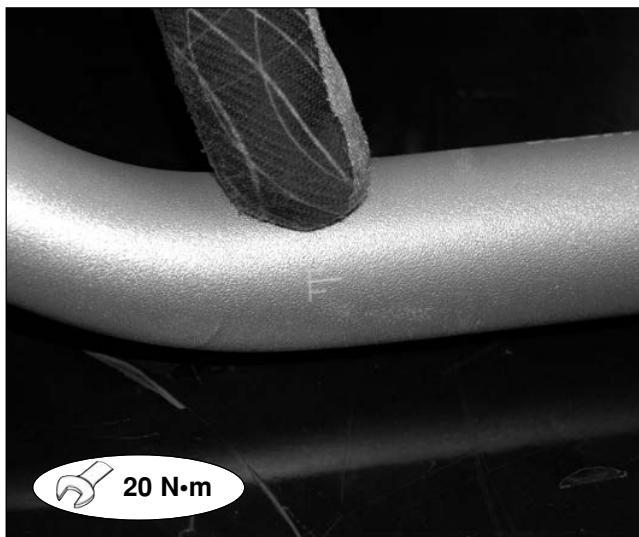
Remove the handlebar (5).



When reassembling the handlebar, pay attention to the correct positioning of the U-bolts respect to the handlebar. Refer to the timing signs on the sides of the handlebar.

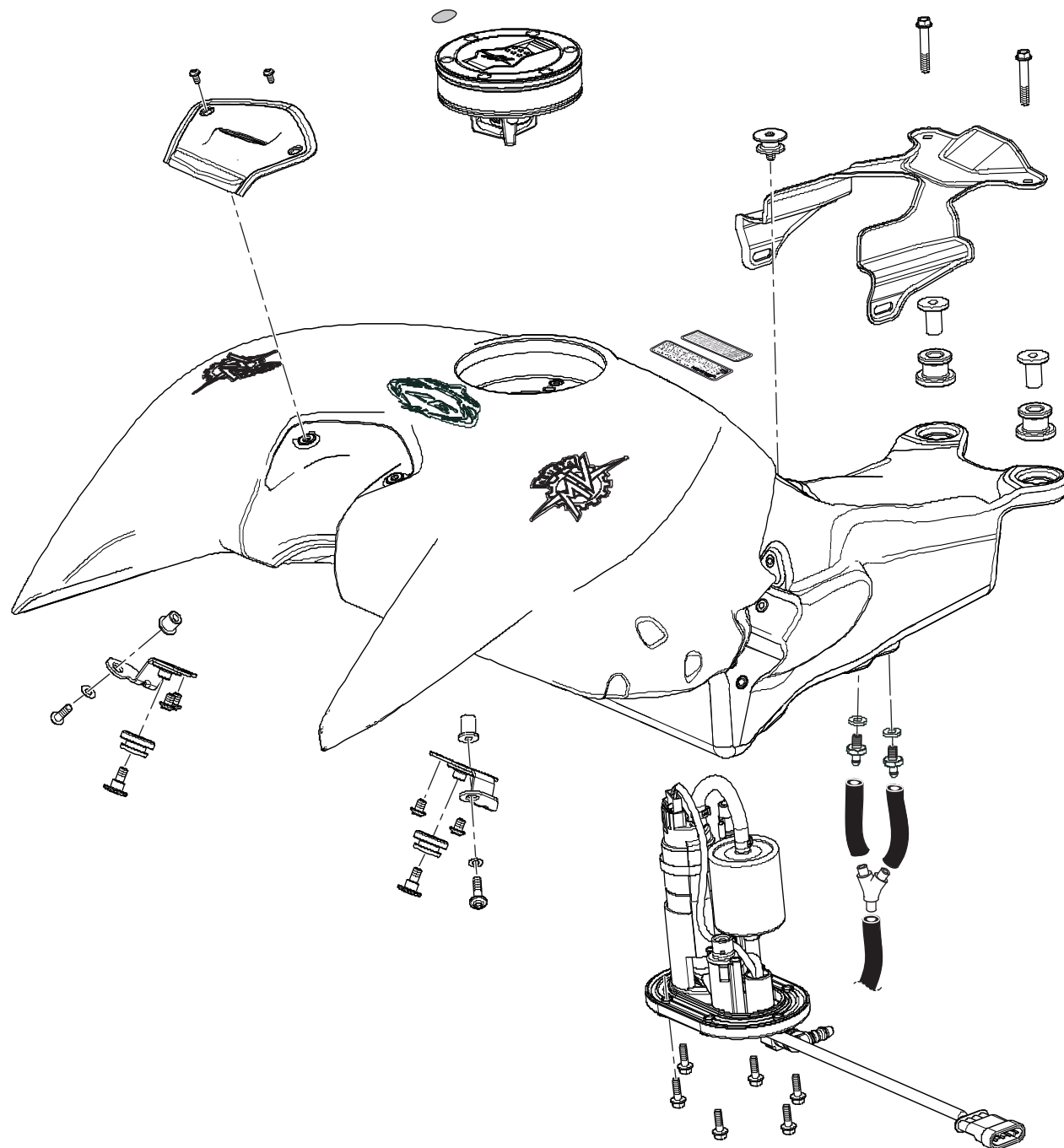


Handlebar U-bolt fixing screws tightening torque: 20 N·m



FUEL TANK

C



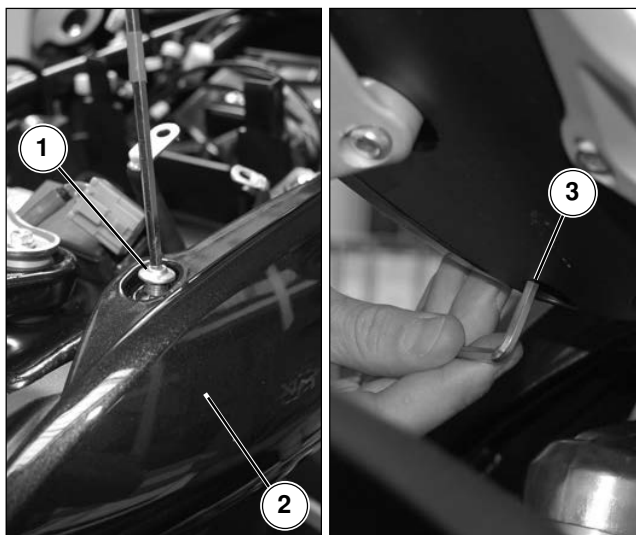
Before removing the fuel tank, the driver's seat must be removed beforehand.



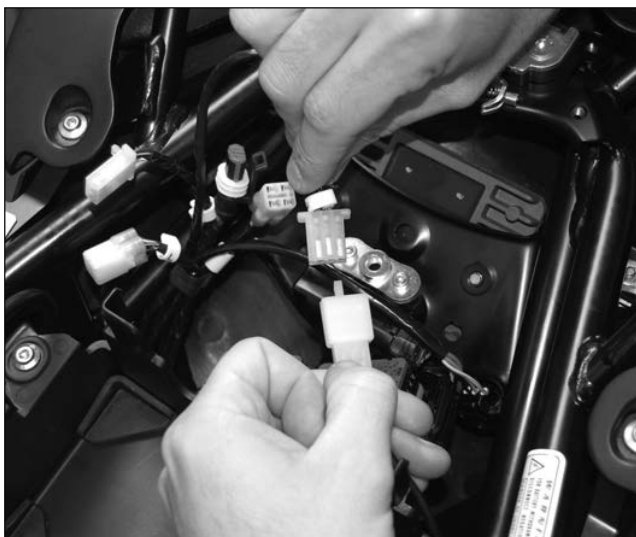
C

DISASSEMBLY OF NUMBER CARRIER SIDE PANELS AND SEAT RAIL SIDE PANELS

Remove the two upper screws (1) of the number carrier side panel (2) and one lower screw (3).



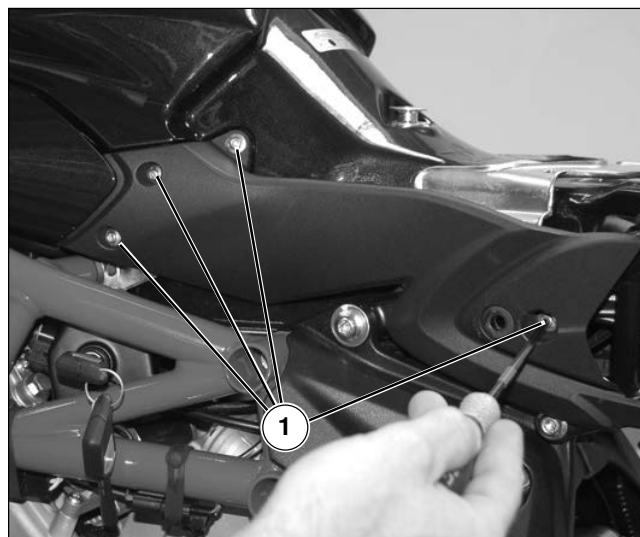
Disconnect the tail light connector.



Release the side panel from the pin and extract it.



Remove the five screws of the seat rail side panel.
- n°4 lateral (1);



- n°1 lower (2);



Release the tank side panel by loosening the five screws.



C



Remove the side panel as shown in the figure.



REMOVING FUEL TANK

Loosen and remove the four fixing screws from the tank upper plate and remove the plate.



Unscrew and remove the two front screws (1) fastening the fuel tank to the frame.



Two persons are required for the following operation.

Lift the fuel tank upwards.



Disconnect the fuel pipe on the left side, pressing both green buttons and pulling the quick coupling downwards.



Disconnect the electric connection on the pump.



Disconnect the overflow pipe on the bottom rear part.

NOTE To make disengaging fittings from the fuel pump flange easier, two operators are recommended, one to support the tank and the other to disconnect the quick couplings.



Pay attention to possible fuel leakage. Place a cloth to protect the parts below.



The fuel pipe will unhook when the button on the fitting is pressed.

Remove the fuel tank.

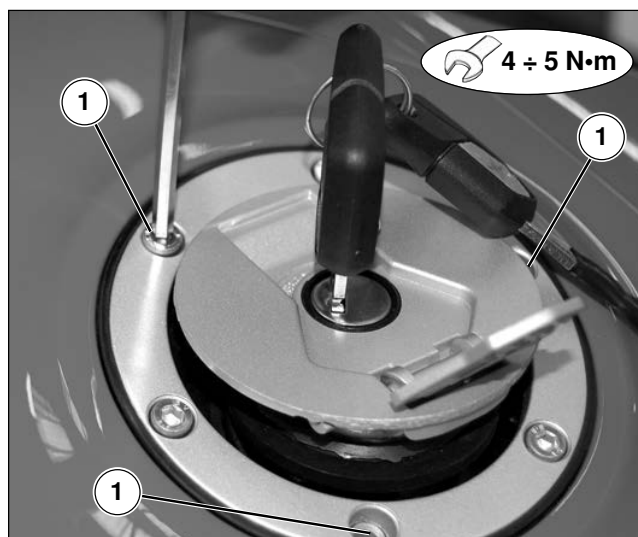


Removal of fuel tank cap

Insert the key supplied with the motorcycle in the fuel cap lock, turn it clockwise and open the cap.

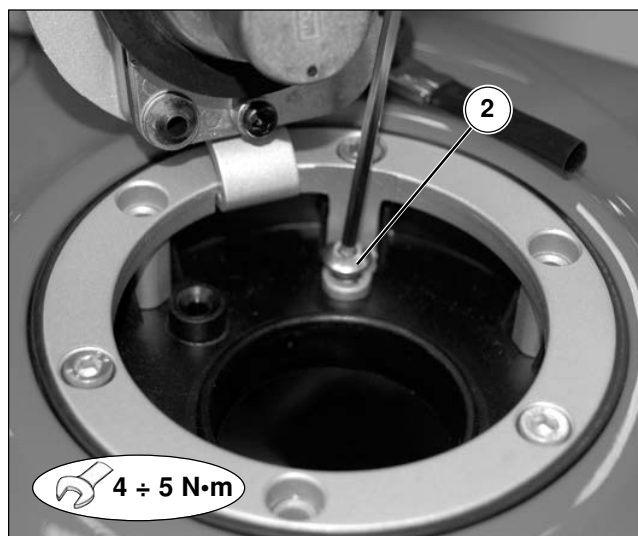


Unscrew and remove the three screws (1) at 120° (the other three screws are fake).



Remove the safety screw (2).

When putting the fuel tank cap back on, perform the same operations in the opposite order as when disassembling it, being careful to tighten it at the prescribed tightening torque and to apply the indicated thread-locker.



Remove the cap (3).



Fuel tank cap fixing screws tightening torque:

- n°3 external screws: $4 \div 5 \text{ N}\cdot\text{m}$

- Internal safety screw: $4 \div 5 \text{ N}\cdot\text{m}$

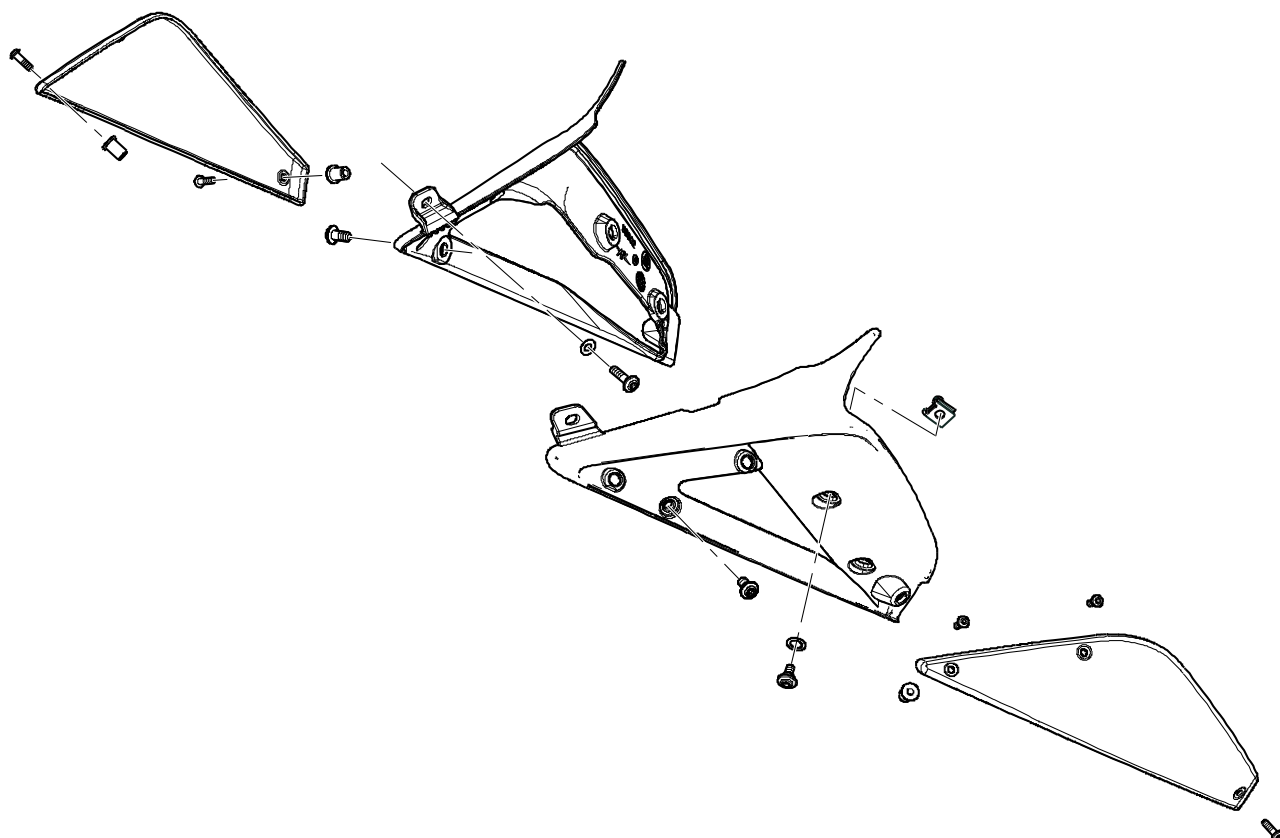


- Apply Loctite 243 and take it into position.



RADIATOR SIDE PANELS

C



Remove the three fixing screws (1) from the aluminium bulkhead.

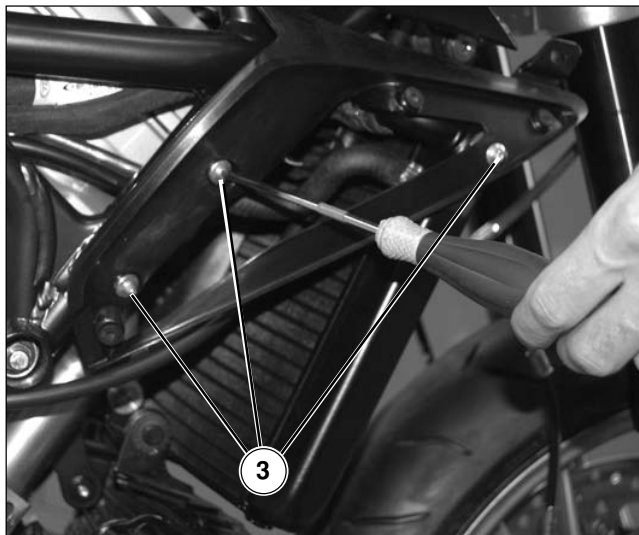


C

Remove the bulkhead (2).



Remove the three fixing screws (3) of the plastic support to the frame and the radiator and remove the support.





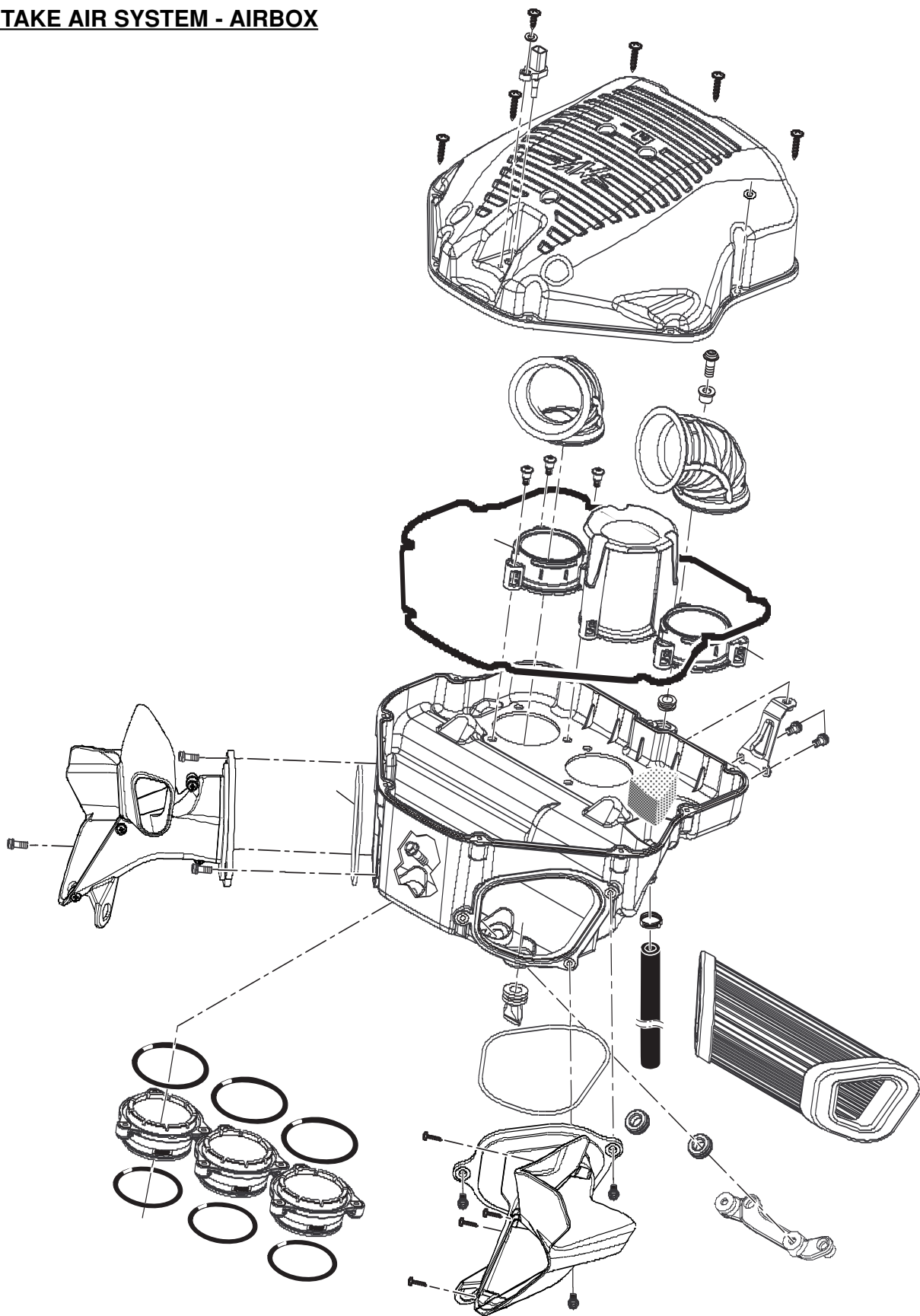
Superstructures

NOTE For USA version vehicles, insert the two spacers (4) shown in the photo (one per side).



C

INTAKE AIR SYSTEM - AIRBOX



C

REMOVING AIRBOX

Before removing the Airbox, you must first remove the fuel tank as described in this chapter.



Disconnect the air temperature sensor connector.



Disconnect the air pressure sensor and engine phase connector.



Remove the right and left air inlet duct, unscrewing three screws on the side.



C

Remove the air filter.



AIRBOX REMOVAL

Remove the nine fixing screws on the Airbox cover.





Superstructures

Remove the two front fixing screws.



Remove the rear fixing screw.



Disconnect the blow-by pipe.



Lift the lower airbox.



C

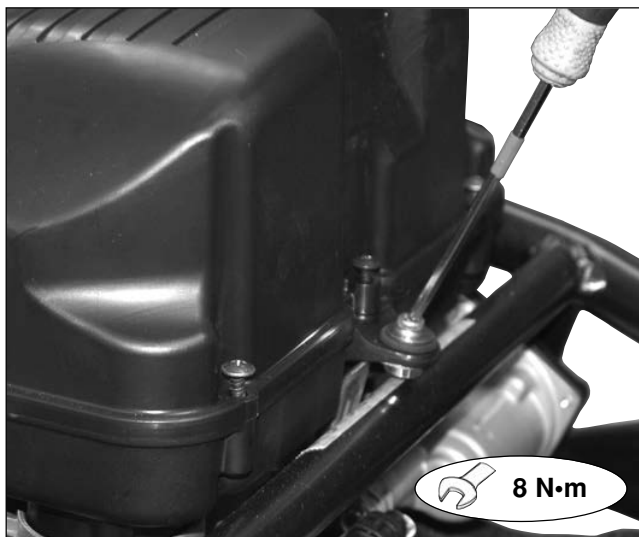
When reassembling it, perform the same operations carried out during disassembly.



2 front fixing screws tightening torque: 10 N·m

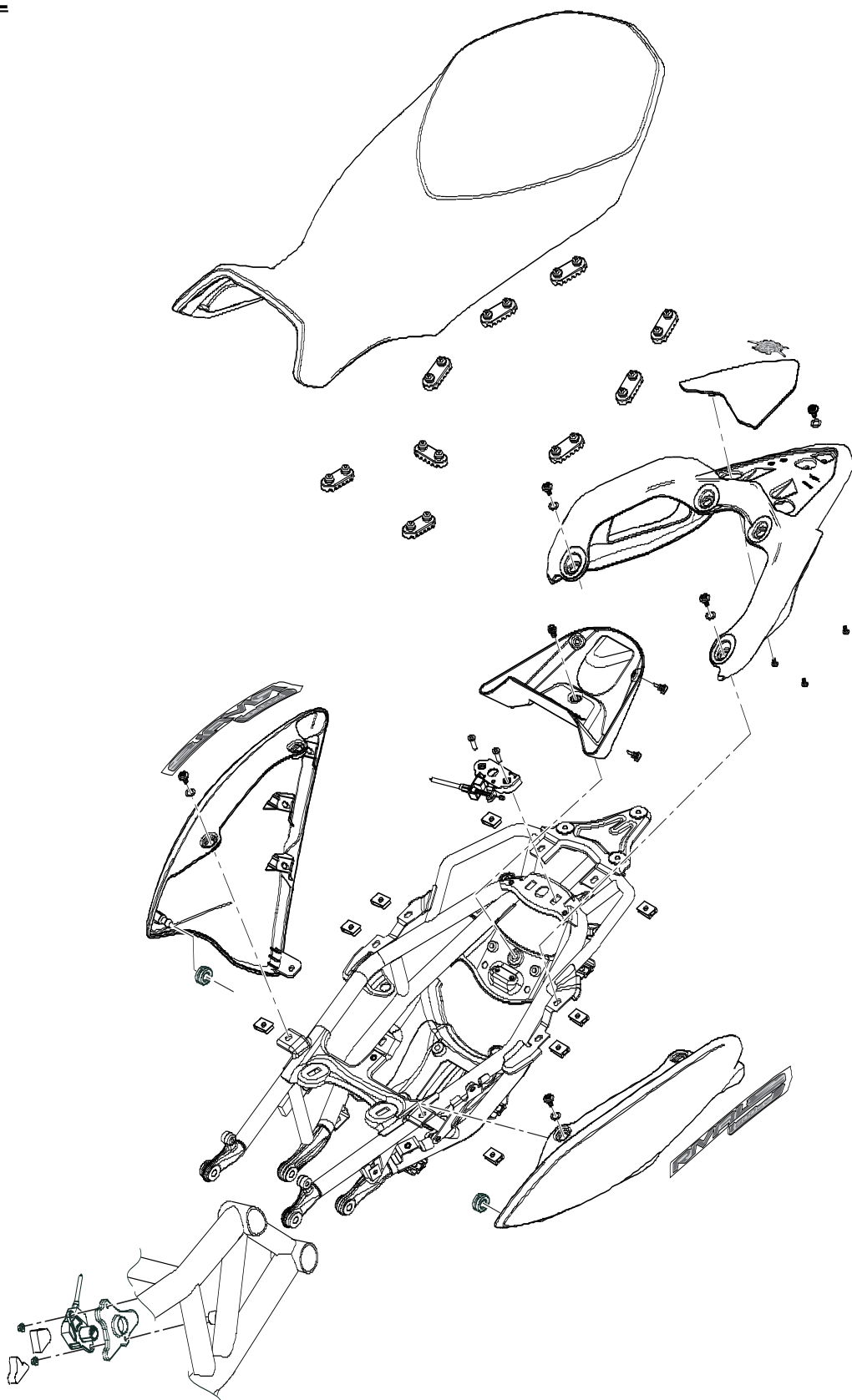


Rear fixing screw tightening torque: 8 N·m

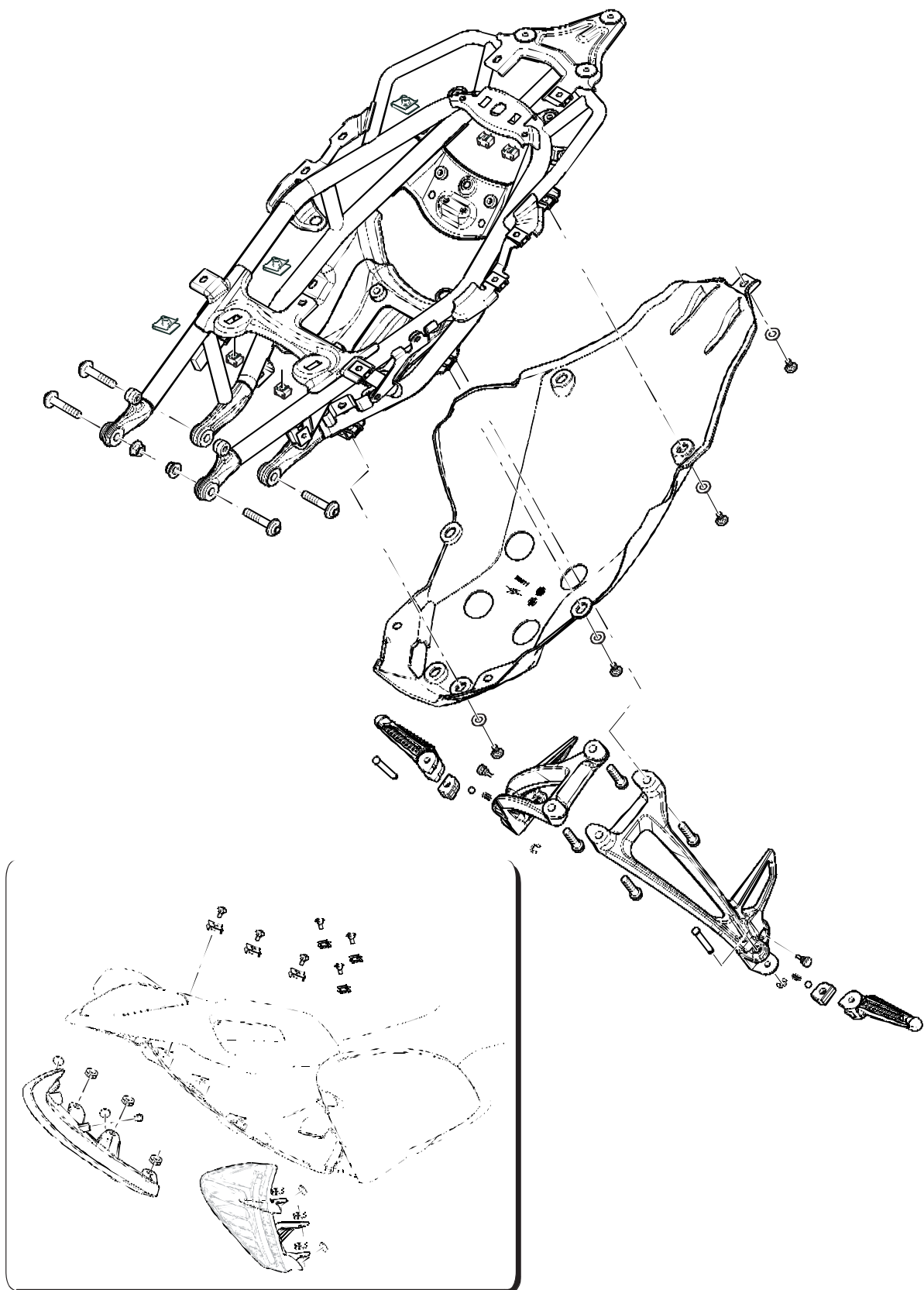


REAR TAIL

C



LOWER BULKHEAD AND TAIL LIGHT



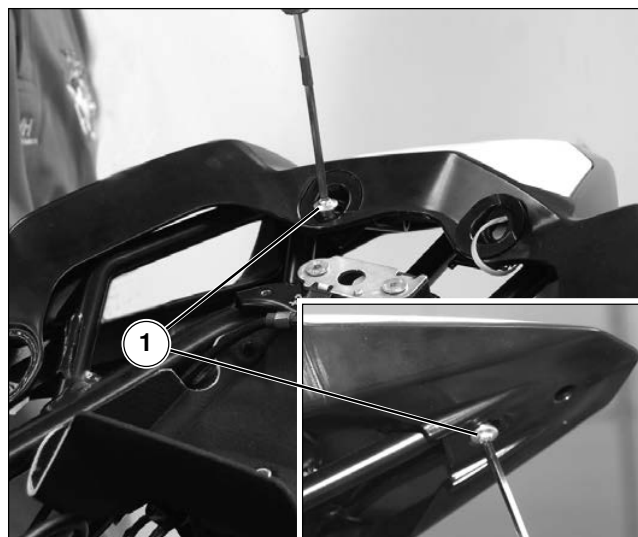
C

To remove the driver's seat, the fuel tank side panels, the side number holder and the underseat panels, refer to the paragraph "Fuel tank" in this chapter.

C

TAIL TIDY DISASSEMBLY

Remove the four upper screws and the lower screw (1).

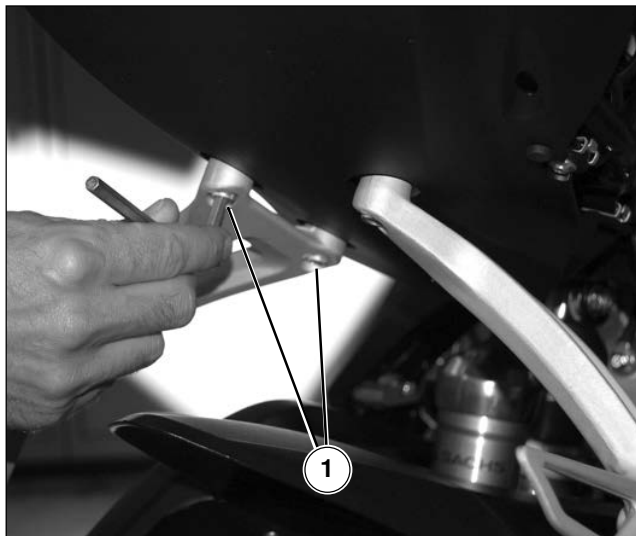


Slide the tail tidy towards the upper part.



FOOT PEG SUPPORT DISASSEMBLY

Remove the two screws (1) and slide the foot peg support out.



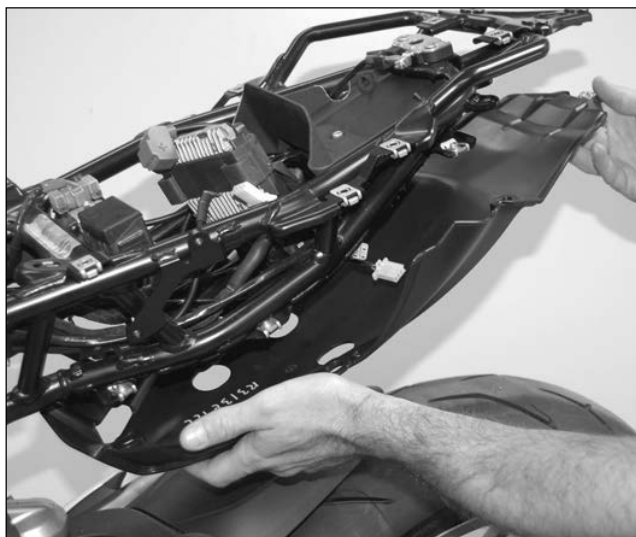
C

DISASSEMBLY OF THE FRAME LOWER BULK-HEAD

Remove the six fixing screws of the frame bulkhead (three per side).

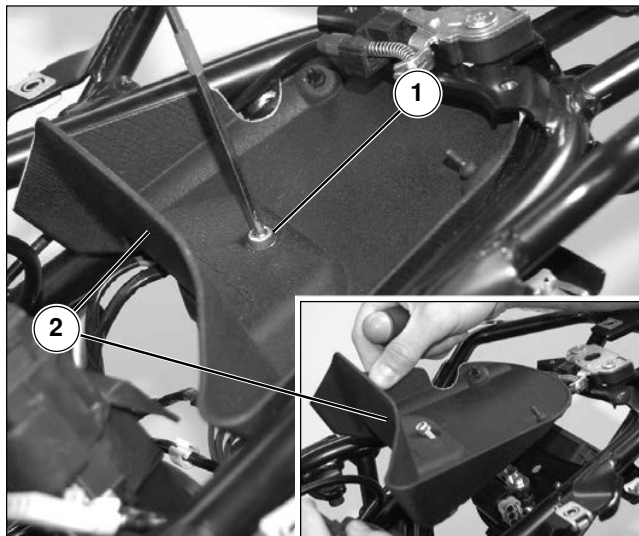


Slide the bulkhead from the lower part of the frame.



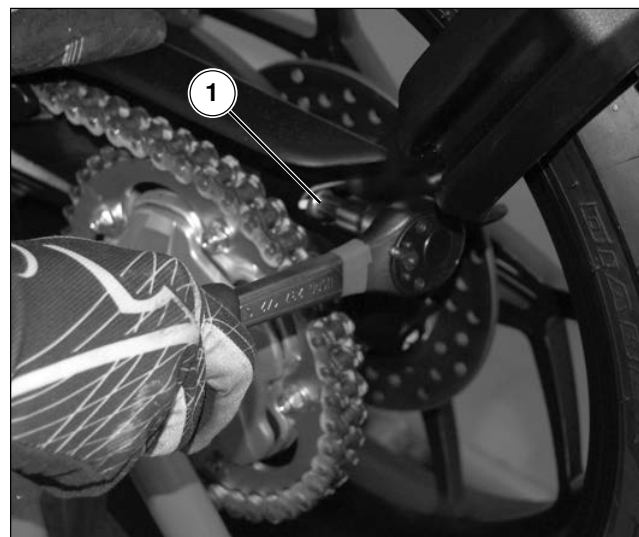
DISASSEMBLY OF THE GLOVE COMPARTMENT BULKHEAD

Remove the fixing screw (1) and remove the bulkhead (2).



REMOVING NUMBER PLATE SUPPORT

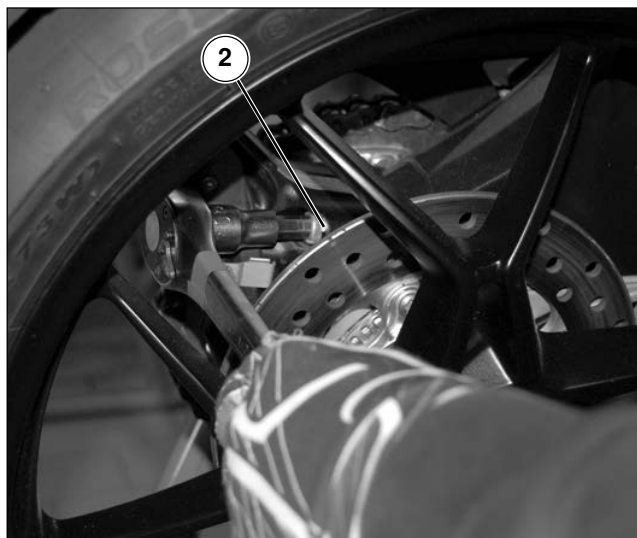
Loosen the left screw (1) of the hub.



Turn the wheel manually and insert the spanner in the space between the spokes.



Loosen the right screw (2) on the hub.



C

Continue to loosen the right screw manually, without removing it.

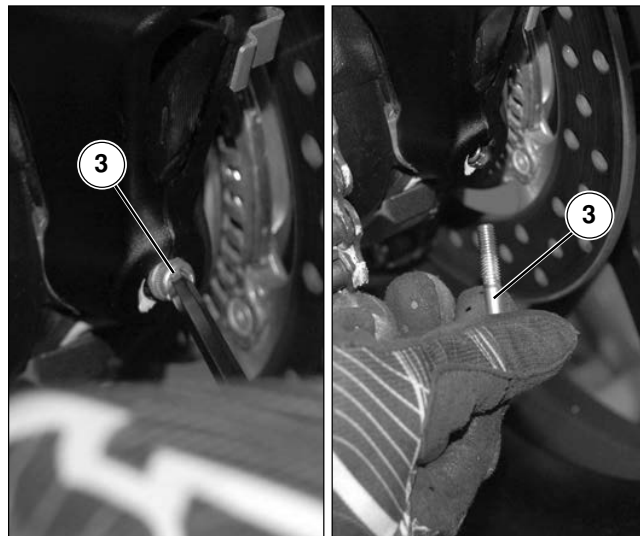


Remove the left screw.

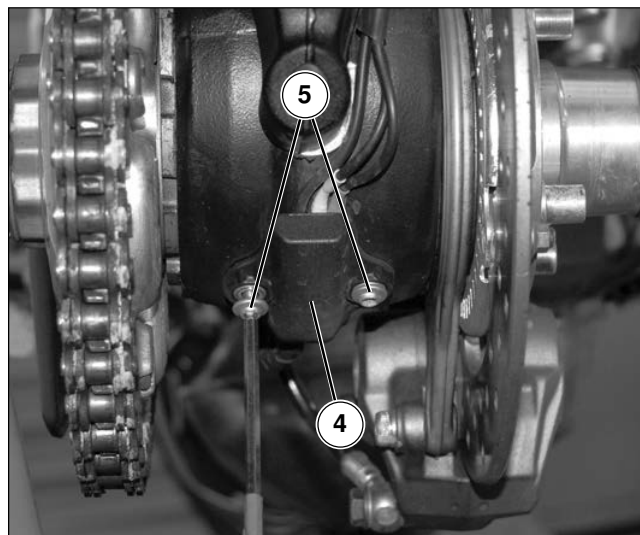
To facilitate sliding out the right screw, it is good practice to remove the rear wheel as described in Chapter F "Suspensions and wheels".



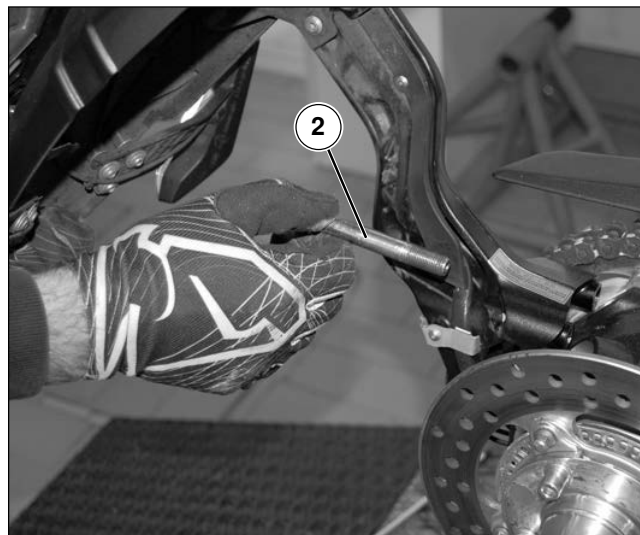
Loosen and remove the screw (3) of the rear third point attachment.



Remove the switch cover (4) by loosening the two M5 screws (5).



Slide the right screw of the hub out (2), supporting it with the other hand.

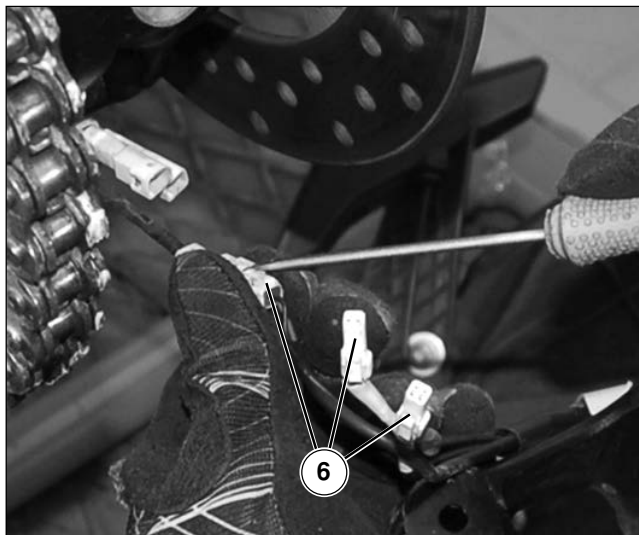


Rest the support on the surface.



C

Disconnect the three connectors (6) (to for the indicators and one for the number plate light) with the aid of a small screwdriver.



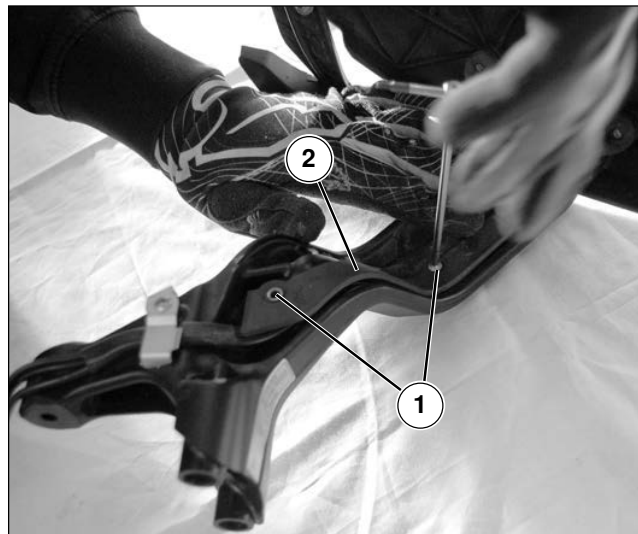
The support is disassembled at this point.



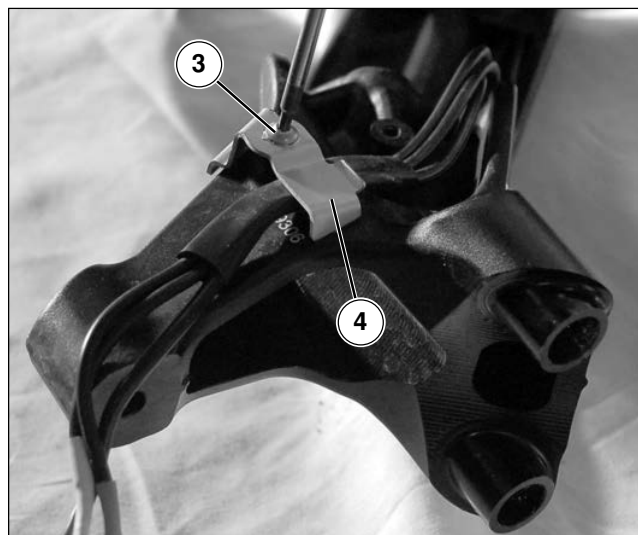
DISASSEMBLY OF THE COMPLETE MUDGUARD NUMBER PLATE CARRIER UNIT

Remove the two small plates that contain the electric wiring.

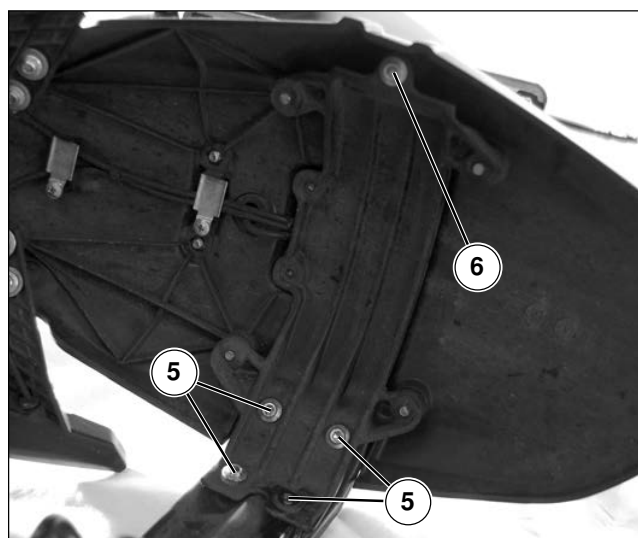
Loosen the two screws (1) on the largest plate (2).



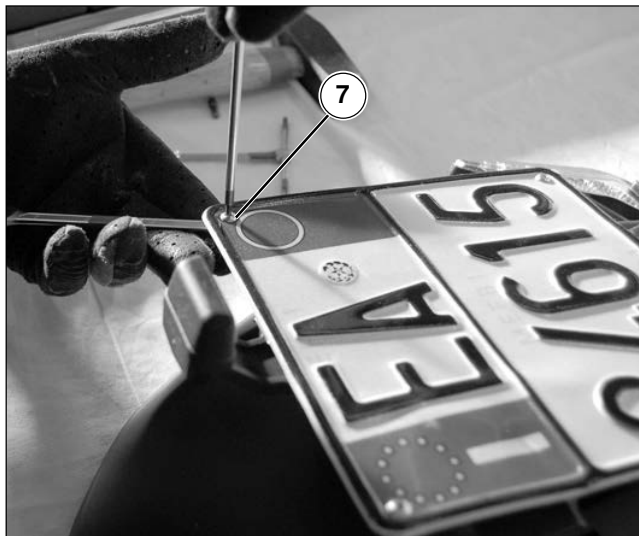
Loosen the screw (3) on the smallest plate (4).



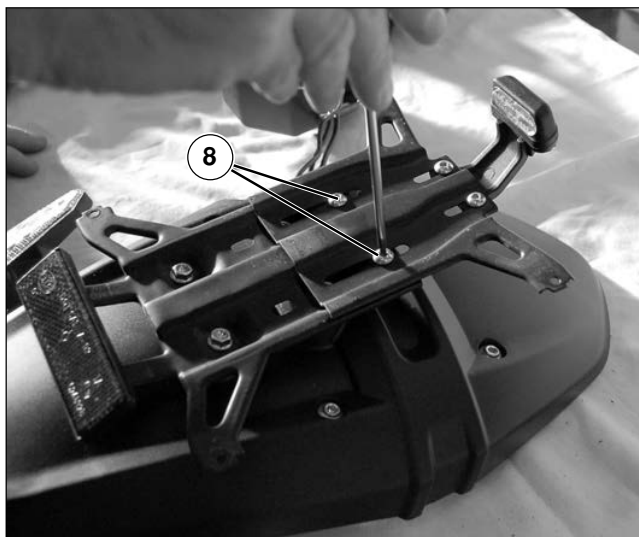
Remove the arm by taking out the five screws, four at the bottom (5) and one at the top (6).



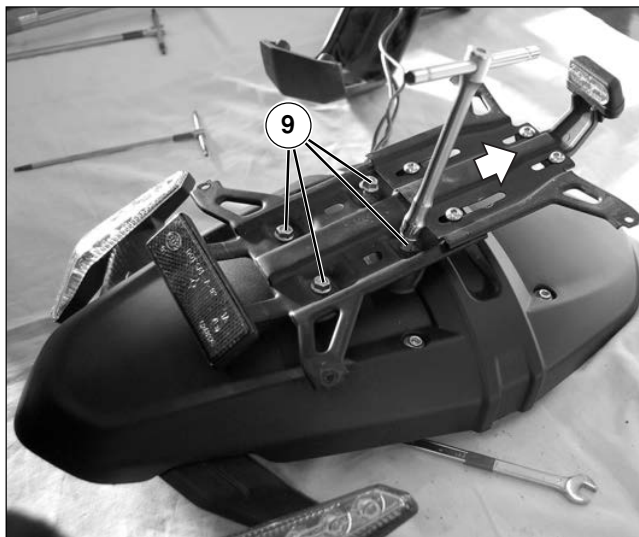
Disassemble the number plate by removing the four screws (7) with wrench and 2.5 screwdriver, as shown in the figure.



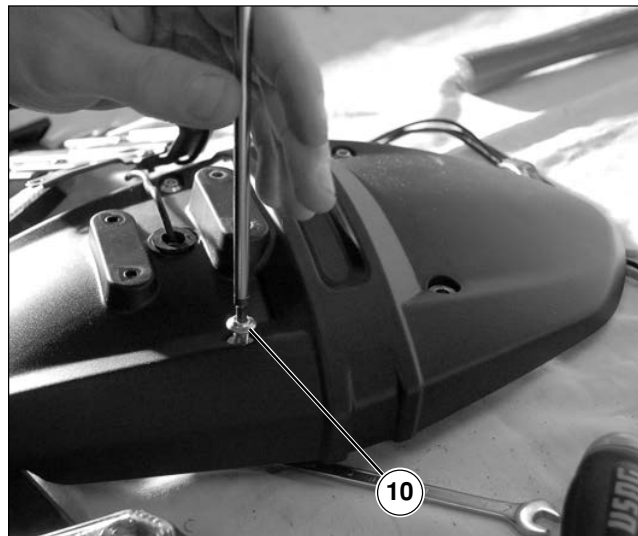
Loosen the two screws on the slide (8).



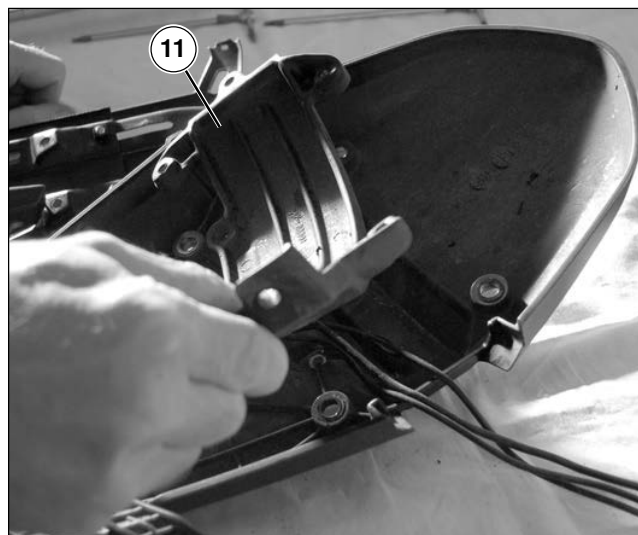
Push the slide upwards in a way to release the four M6 fixing screws (9) of the number plate carrier on the mudguard.



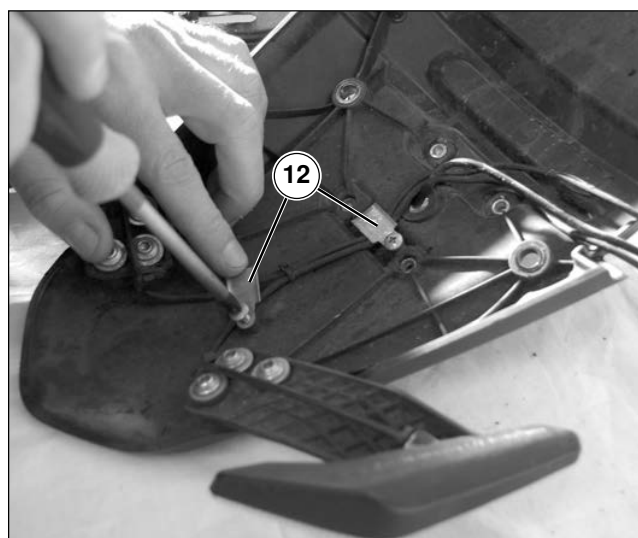
Loosen the four fixing screws (10) attaching the mudguard to the internal support and tilt the mudguard without internal support.



Remove the internal support (11) from the mudguard.

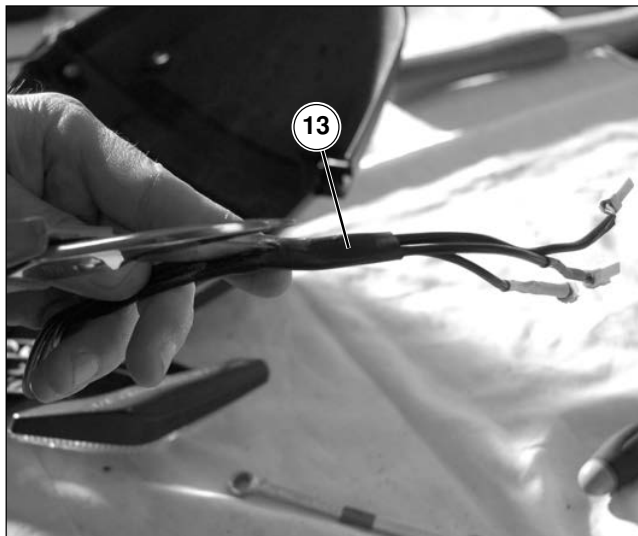


Remove the two small plates (12) holding the electric cables.



Cut the heat-shrinking material **(13)** on the electric cables.

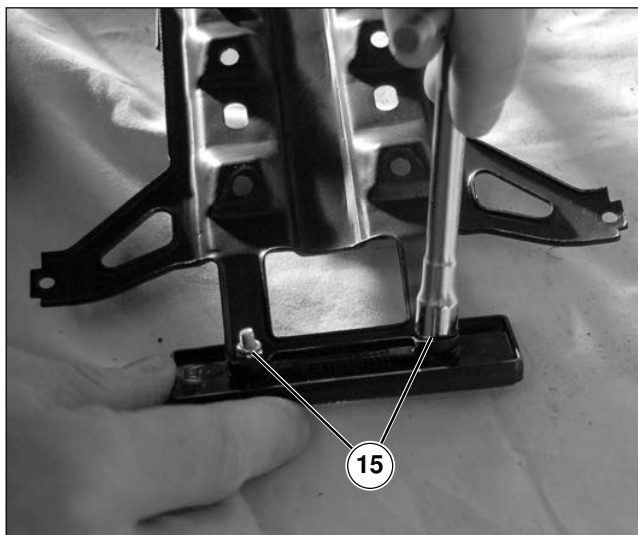
Release the number plate carrier unit from the mud-guard.



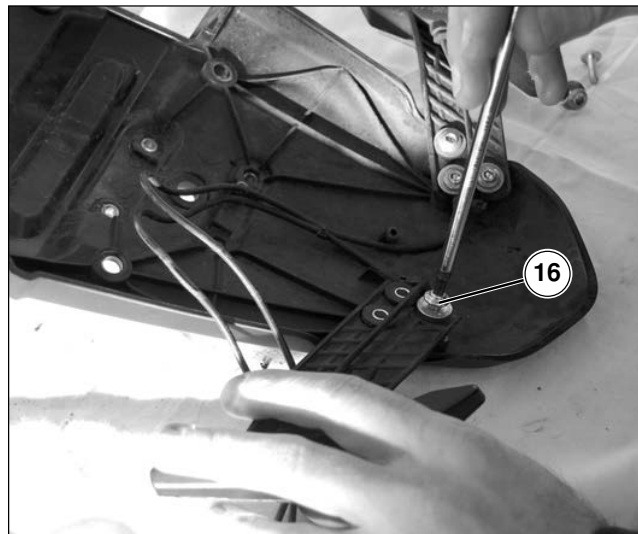
Loosen the two screws **(14)** and remove the number plate light.



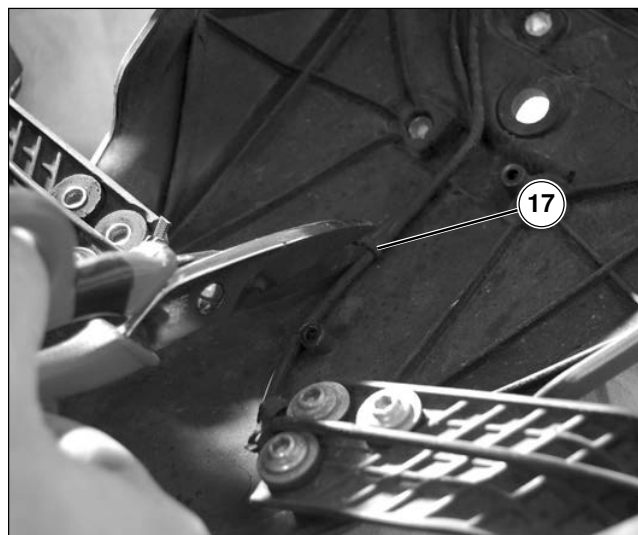
Loosen the two nuts **(15)** and remove the retro reflector.



Remove the six screws (16) with rear indicators fixing washer.



Cut the band fastener (17) joining the electric cables.



At this point, the indicators will be as in the figure (complete with spacers and rubber pads).

To re-assemble the unit, proceed in reverse order, following the layout (given below), which indicates the correct tightening torques and fixing where the thread-locker is to be applied.





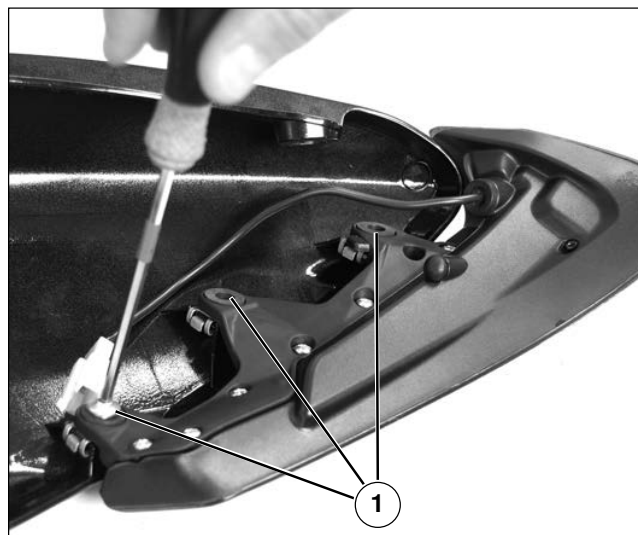
TAIL LIGHT DISASSEMBLY

Disassemble the number carrier side panel from the rear frame.

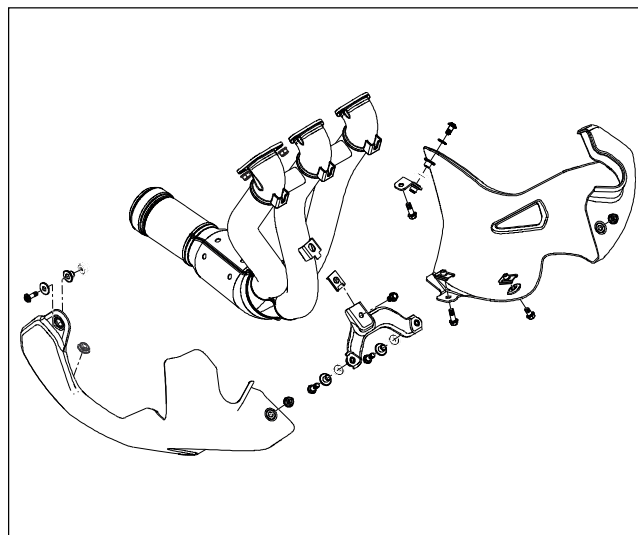
C



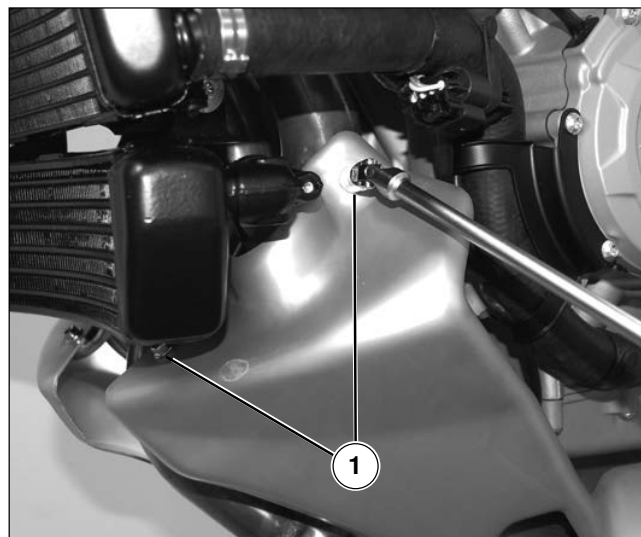
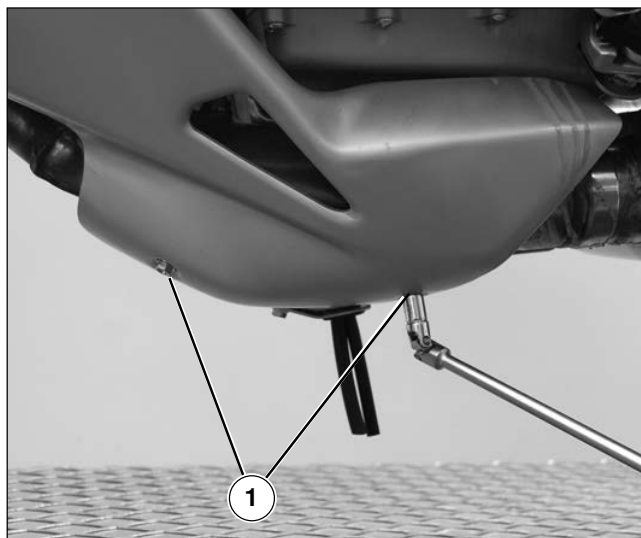
To remove the tail light, operate on the three screws (1), loosening them and releasing the tail light.



DISASSEMBLY OF EXHAUST GUARDS



Remove the eight screws (1) (4 per part as shown in the photo) and slide the two bulkheads downwards.



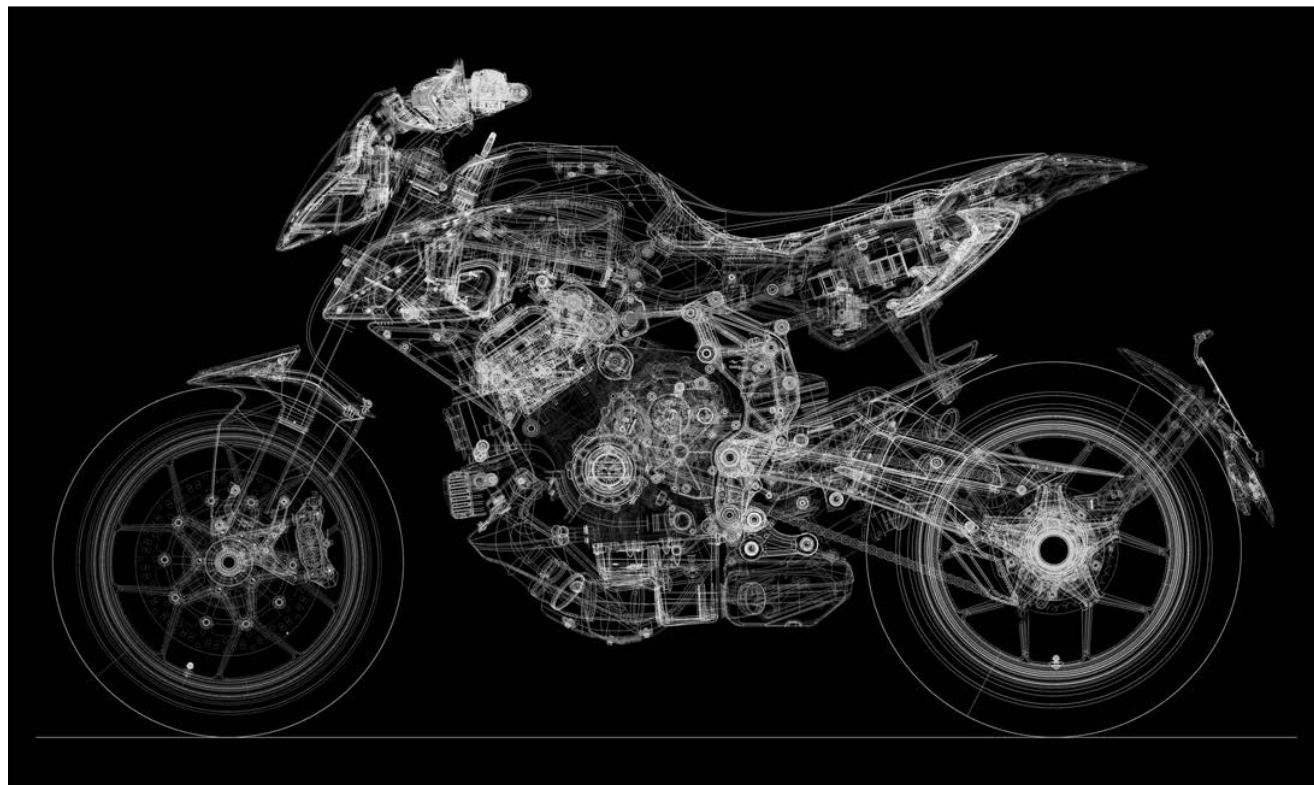


Superstructures

C



Air intake injection system



D

SECTION D

Revision 0



Air intake injection system

SUMMARY

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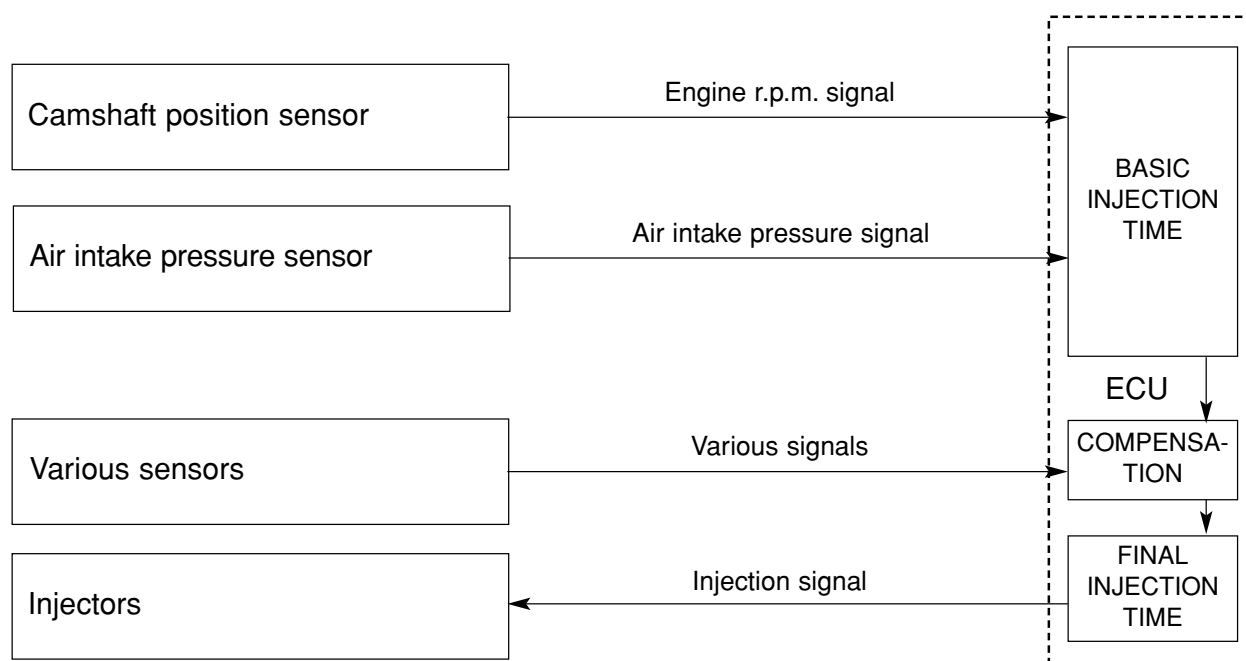


Air intake injection system

INJECTION SYSTEM TECHNICAL CHARACTERISTICS

INJECTION TIME (INJECTION VOLUME)

The factors for the determination of the injection time are the basic injection time that is calculated on the basis of the torque request, the r.p.m., the pressure of the intake duct and various compensations that are determined according to signals coming from various sensors that reveal the condition of the engine and the riding conditions.



D



Air intake injection system

INJECTION TIME COMPENSATION (VOLUME)

The various sensors allow the injection time (volume) compensations to be carried out on the basis of the following signals.

SIGNAL	DESCRIPTION
ATMOSPHERIC PRESSURE SENSOR SIGNAL	When the atmospheric pressure is low, the sensor sends a signal to the ECU to reduce the injection time (volume). In the starting phase the same sensor is used to adjust the timing between the injection and the spark in the 3 cylinder banks.
ENGINE COOLANT TEMPERATURE SENSOR SIGNAL	When the temperature of the engine coolant is low, the injection time (volume) is increased.
AIR INTAKE TEMPERATURE SENSOR SIGNAL	When the temperature of the intake air is low, the injection time (volume) is increased.
BATTERY VOLTAGE SIGNAL	The voltage of the battery is supplied to the ECU for the functioning of the ECU and this voltage is revealed and utilised as a signal for the compensation of the injection time (volume). A low voltage determines a longer injection time for the adjustment of the volume of the injection.
STARTER SIGNAL	When the engine is switched on, a greater volume of fuel is injected during the starting period.
ACCELERATION/DECELERATION SIGNAL	During acceleration, the injection time of the fuel (volume) is increased in proportion to the opening of the accelerator and the r.p.m. of the engine. During deceleration, the injection of fuel is diminished in proportion to the speed of closure of the accelerator handgrip and of the engine r.p.m.

INJECTION ARREST CONTROL

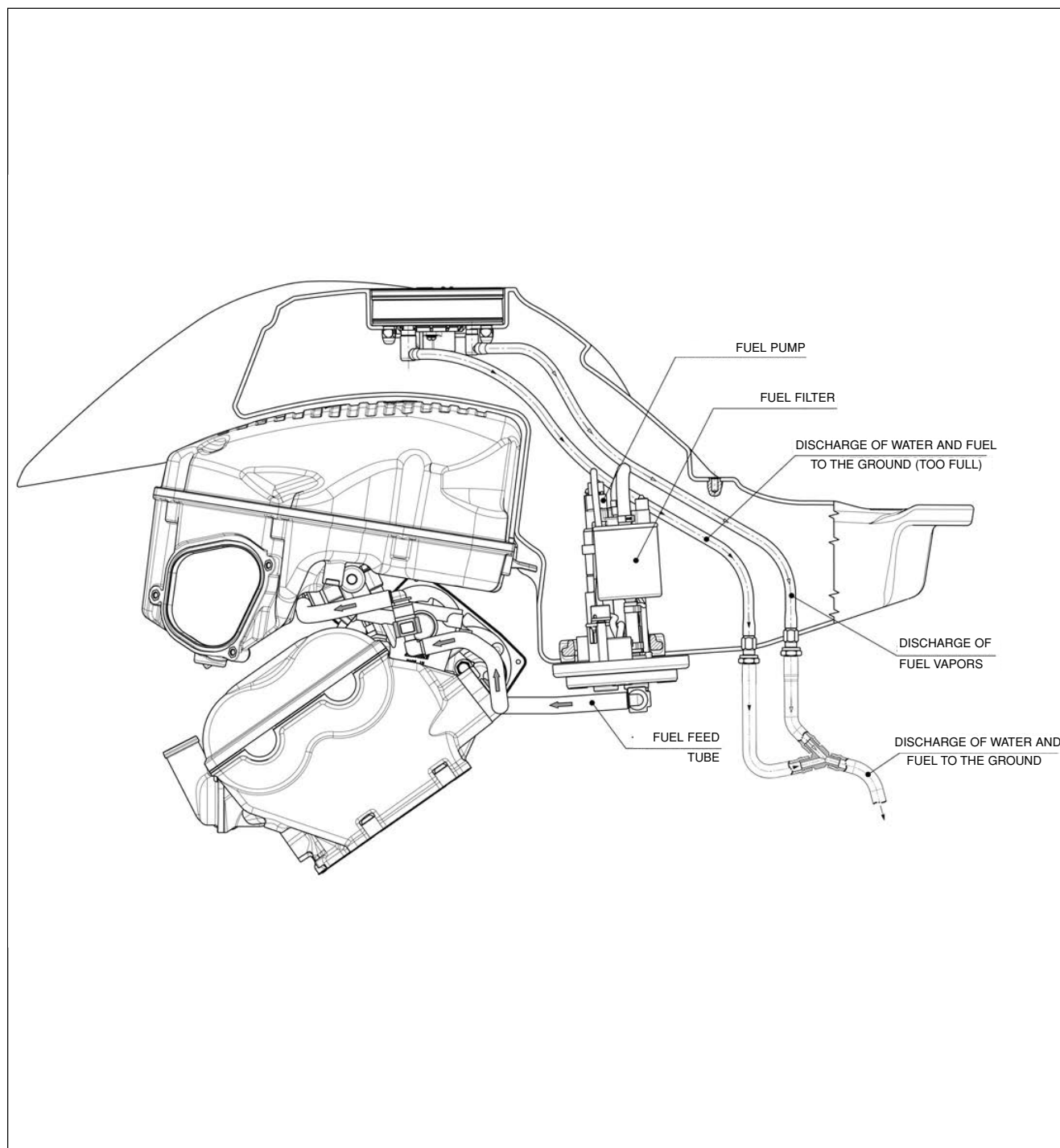
SIGNAL	DESCRIPTION
R.P.M. LIMITER SIGNAL	The functioning of the fuel injectors is interrupted when the level of engine r.p.m. reaches its limit. The r.p.m. limiter interrupts the ignition system and the interruption signal of the ignition is therefore sent to the ECU.
ENGINE CUT-OFF SIGNAL	The ECU stops fuel injector operation in the deceleration phase when the gas potentiometer reaches zero and the torque value falls below a given threshold. The injectors turn back on again when a given engine rpm threshold is reached.



Air intake injection system

FUEL FEED SYSTEM

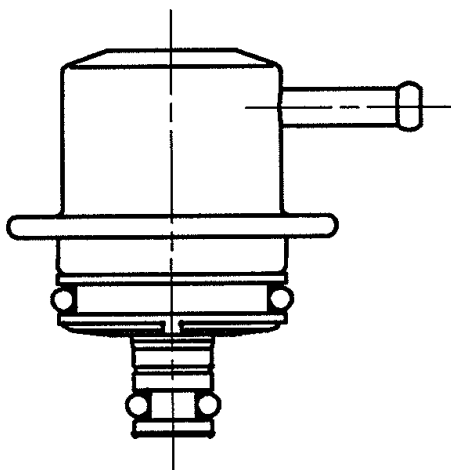
The fuel feed system consists of the tank, pump, filter, feed tube, feed tubes (including the fuel injectors) and the regulator of the pressure. The fuel in the tank is pumped into the feed tubing at a controlled pressure by the relative regulator and maintained at a certain constant value higher than the suction generated by the motor. The fuel is injected into the air intake conduit when the injector opens, following a law generated by the ECU.



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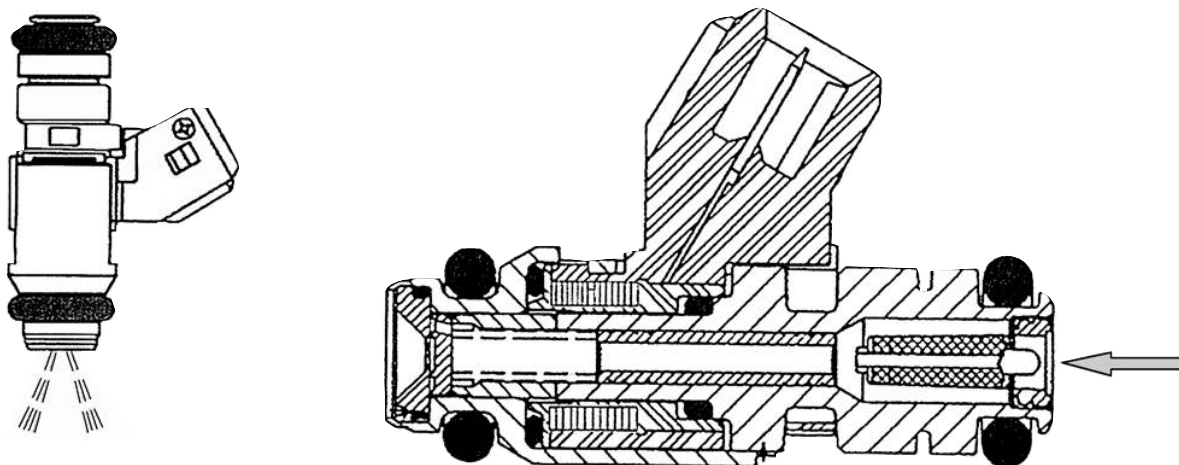
FUEL PRESSURE REGULATOR

The fuel pressure regulator is a diaphragm pressure release valve that consists of a diaphragm, spring and valve. It always maintains the pressure of the fuel sent to the injector at $3,5 \text{ kg/cm}^2$ (350 kPa). When the pressure of the fuel rises above $3,5 \text{ kg/cm}^2$ (350 kPa) the excess fuel opens the valve of the regulator and therefore can return to the fuel tank.



FUEL INJECTOR

The fuel injector consists of a solenoid, piston, needle valve and a filter. The injector is a small electromagnetic injection nozzle that injects fuel into the carburettor according to the signal coming from the ECU. When the solenoid is agitated by the ECU, it becomes an electromagnet and attracts the piston. At the same time, the needle valve incorporated in the piston opens and the injector, under pressure of the fuel, injects the fuel in a conical dispersion. Given that the opening of the needle valve is constant, the volume of fuel injected at any one time is dependent on the time that the solenoid is agitated (injection time).





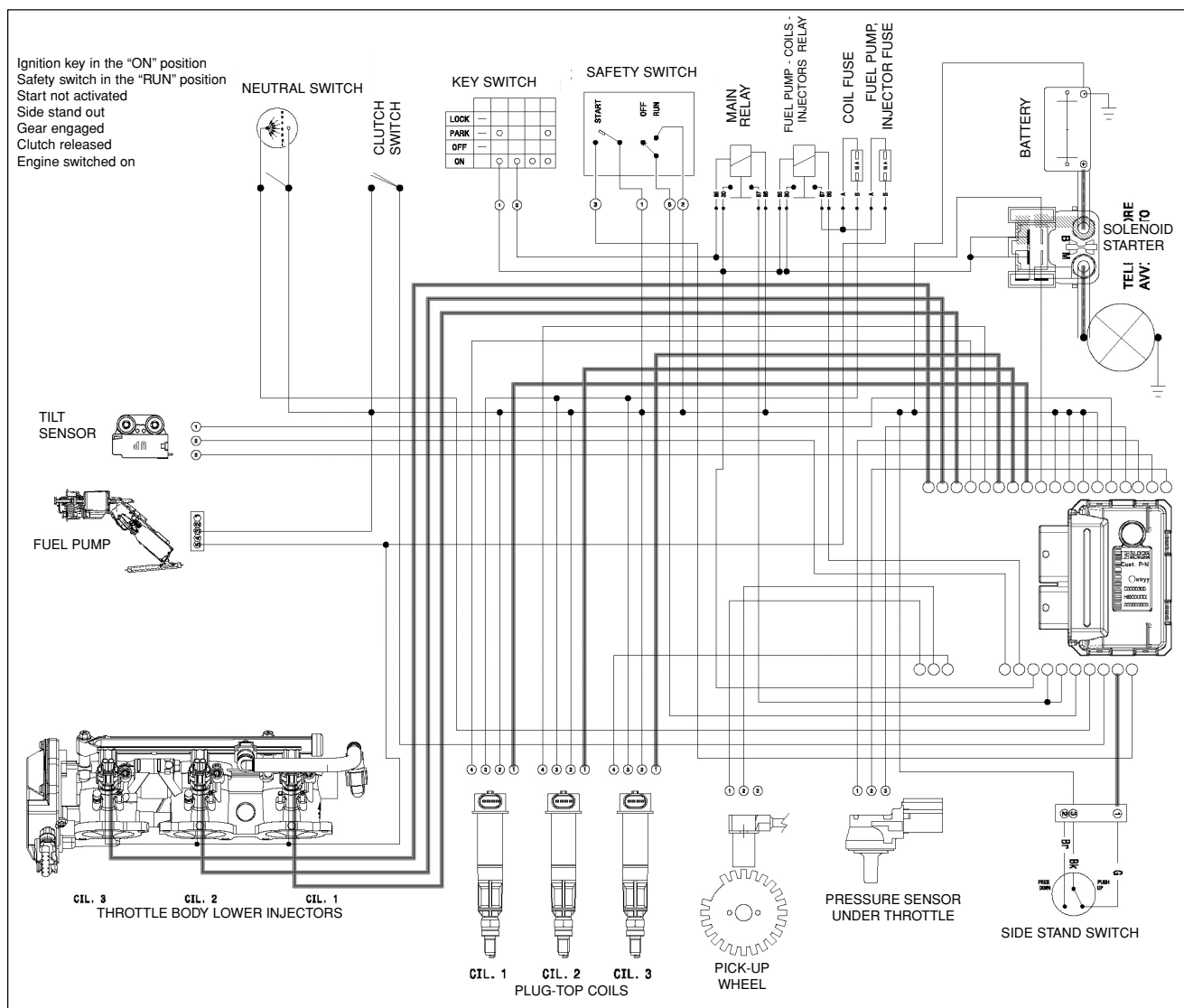
Air intake injection system

FUEL PUMP CONTROL SYSTEM

When the ignition switch is turned to the ON position, the fuel pump motor is started by the current supplied by the battery.

As the CPU possesses a timer function, the pump motor stops turning three seconds after the ignition switch has been brought to the "ON" position. If the starter motor turns the electric motor shaft during or after the three seconds, the motor rotation signal is sent to the CPU that, by controlling the pump relay, makes the pump motor function continuously.

When the ignition switch is switched to the "OFF" position, the control of the pump relay is interrupted and contemporaneously also the control of the injectors and the ignition coils, thereby causing the engine to switch off.

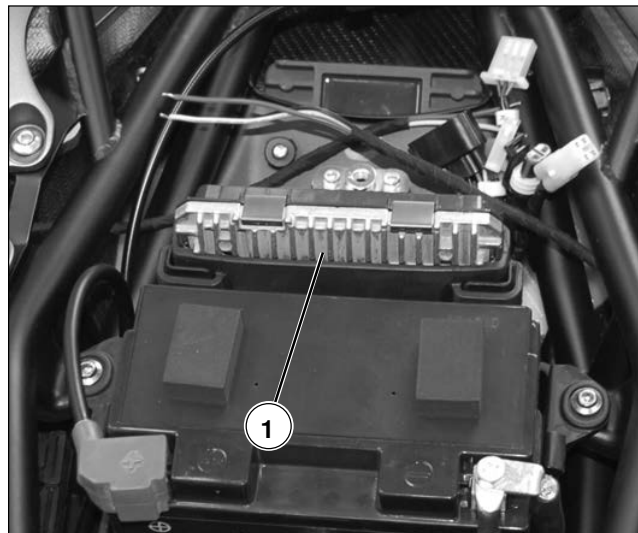


ECU

The ECU (1) is situated under the tank behind the battery.

The ECU consists of a CPU (Central Processing Unit), a memory unit and I/O sections (input/output).

The signal of each individual sensor is sent to the input section and then to the CPU. On the basis of the signals received, the ECU calculates the volume of fuel and the ignition advance necessary by utilising prepared schemes for the various conditions of the engine and sending them respectively to the injectors and the ignition coils.



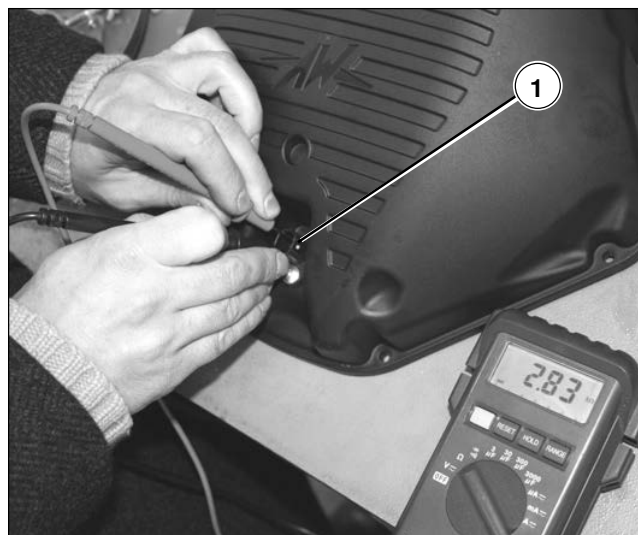
SENSORS

ATMOSPHERIC AIR TEMPERATURE SENSOR

The suction air sensor (1) is on the front of the filter box cover and provides the value of the air temperature.

Check

Connect the connector and measure the resistance value between the two contacts on the sensor, which must be $2.5 \text{ k}\Omega \pm 10\%$ at 20°C .



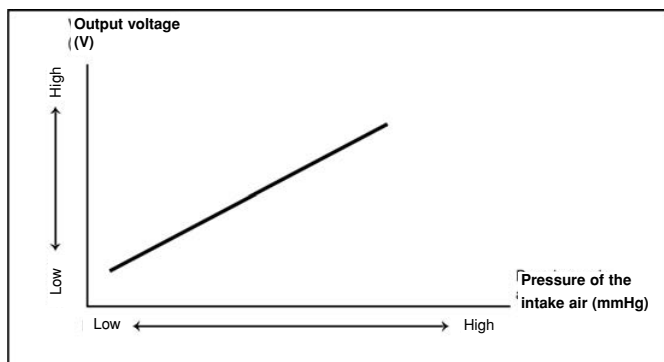
1 INTAKE AIR PRESSURE SENSOR

The sensor (2) reveals the pressure of the intake air and this pressure is therefore converted into voltage that is sent to the ECU.

The signal involved has a double purpose, one being that of phasing the injection and ignition of the cylinders and the second being that of adjusting the base fuel injection time (volume); this is in fact determined depending on the tension of the signal (output tension).

The voltage increases when the pressure of the intake air is high.

The sensor is checked by diagnostic software.



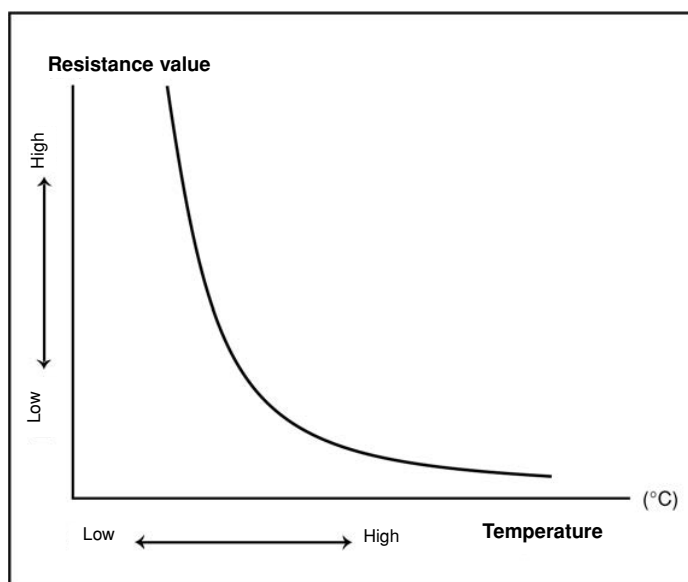


Air intake injection system

2 INTAKE AIR TEMPERATURE SENSOR

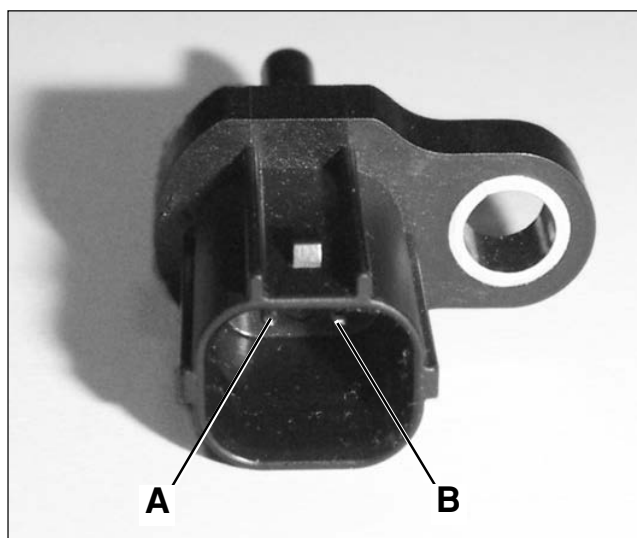
The temperature of the intake air is found by converting the resistance of the Thermistor into voltage and then sending it to the ECU. The volume of the injection increases when the air temperature is low.

The resistance of the Thermistor increases when the air temperature is low and diminishes when the temperature is high.



AIR TEMPERATURE → A - B

Air temperature sensor characteristics	
Temperature (°C)	Resistance (kΩ)
-10	9,5
0	6
10	3,8
20	2,5
30	1,7
40	1,2
60	0,6





Air intake injection system

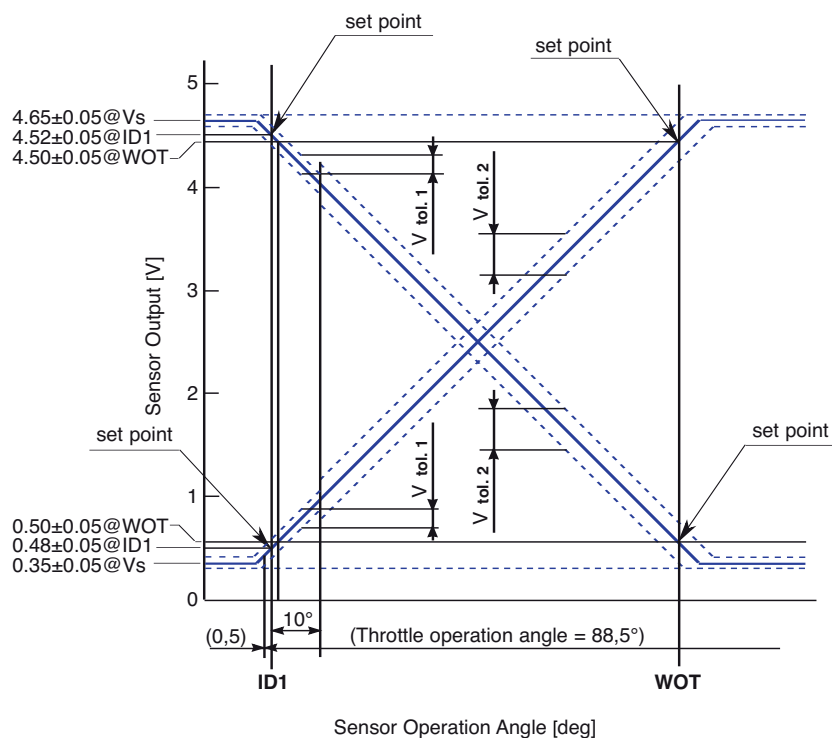
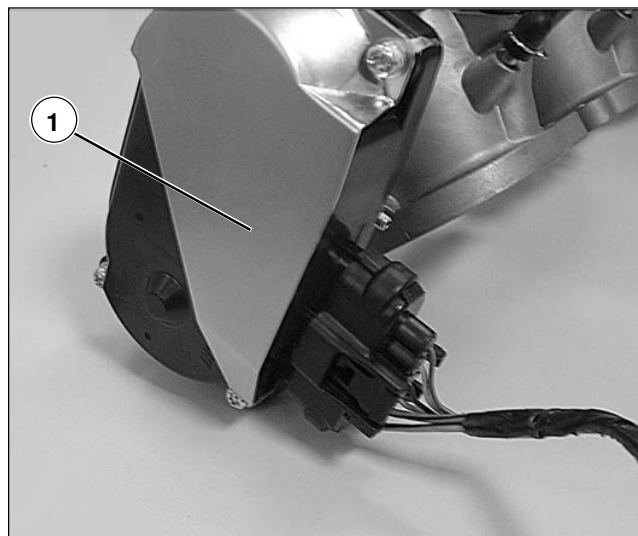
THROTTLE BODY POSITION SENSORS

The throttle position sensors are inside the motor of the throttle body (1).

These sensors are potentiometers with a variable resistance based on the opening angle of the accelerator and operate in a crossed fashion.

The sensors are powered by the ECU at the established voltage of 5V and provide, in output, a voltage proportional to the throttle angle.

The ECU reads the output values of the two sensors and based on the coherence of these values, it determines the throttle opening angle. If the two values are not coherent it will provide a fault alert.



Item		Specification
Output set	PS1	0.50[V]
@ID1	PS2	4.50[V]
Output set @WOT	PS1	4.50[V]
	PS2	0.50[V]
Output clamp	HI	4.65[V]
	LOW	0.35[V]
tolerance due to temperature		$\pm 0.05[V]$
Linearity	ID1~10[deg]	$\pm 0.10[V]$
tolerance	10[deg]~WOT	$\pm 0.15[V]$

The sensor is checked by diagnostic software.

INJECTOR CHECK

To check the injectors proceed as follows:

- Disconnect the connector on each injector.
- Proceed with checking the reel of each injector
- The contact must not be open between the two pins of the injector, also, the resistance value must be $11 \text{ Ohm} \pm 10\%$ at 20°C .

Otherwise, proceed with changing the faulty injector.



FUEL PUMP CHECK

Check the condition of the fuel pump fuse.

To check the condition of the fuel pump, proceed as follows:

- After having removed the fuel tank, proceed with the check of continuity between pin 2 and 5 on the connector of the pump as indicated in the figure.



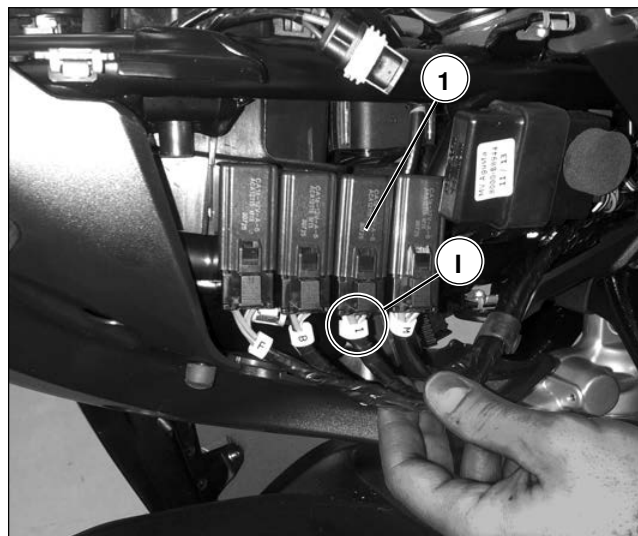
- proceed with checking the level probe operation
- connect pins 3 and 4 of the pump connector and make sure that the resistance value is $2 \text{ kOhm} \pm 10\%$ at 20°C





Air intake injection system

- If the fuel pump unit does not continue to function correctly after the above-described tests, proceed with relative relay control (1) located behind the right fairing of the motorcycle, identified by a ring marked with "I" located on the cable harness.



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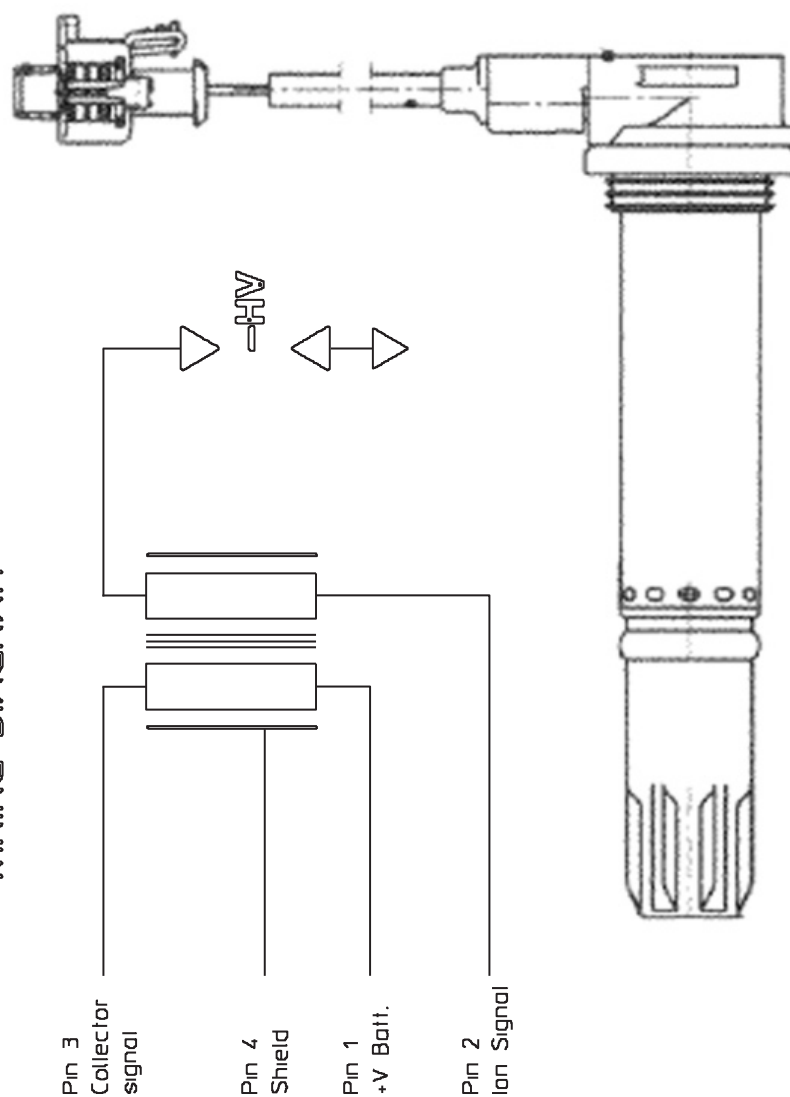


Air intake injection system

Ignition coils

The ignition coils are of the top plug type (they are assembled directly on the spark plugs. This avoids the use of the HT leads and enhance the overall system reliability..

WIRING DIAGRAM



D



Air intake injection system

DIAGNOSTICS SYSTEM

Ignition and injection system diagnostics

For the diagnosis of the ignition and injection system a TEXA diagnostic software is available which is capable of identifying and recording the faults present or that were present previously on the motorcycle. This software is equipped with a guide book for the use of the software itself to carry out checks on each individual component of the system.



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The IDC4 software allows to carry out the following operations:

- reading of engine parameters
- reading of faults and their deletion
- active diagnosis
- acquiring signals to HD





Air intake injection system

Eldor power unit fault codes (with TEXA diagnostic software)

IDN ATI	Component/Function [DTC Code]	[Fault Symptom]	Takeover	Cause	Fault detection rules
3	Exhaust Valve sensor Diagnosis P0027 [0027 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the Exhaust Valve sensor voltage > VEXHVMAX
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the Exhaust Valve sensor voltage < VEXHVMIN
60	Exhaust Valve Functional Diagnosis P0078 [0078 hex]	Plausibility [1000]	Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> The detection starts if there isn't an electrical fault on the pressure sensor and Rpm>0 <u>DETECTION:</u> It is recognized a fault if VOutExh > THOBVOUTEXHMIN for a time > TIMOBSEXHV-POSHIP/LOP & the percentage position of the exhaust valve does not move of THANGEXHVPO-SHIP/LOP at least
62	Hole in manifold diagnosis P0101 [0101 hex]	Plausibility [1000]	Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> The detection starts if there isn't an electrical fault on the pressure sensor and Rpm>0 (EnPresTest =1) <u>DETECTION:</u> It is recognized a fault if: - the difference between the pressure sensor reading MapSignal and the pressure rebuild through the throttle position 1/2:PresIntkF1/ PresIntkF2 is greater than a calibration: THRPREFSLOW in steady state THRPREFSHIGH in transitive condition and MapSignal > PresIntk0F and lambda sensor control is centred
4	Engine Phase diagnosis P0102 [0102 hex]	Plausibility [1000]	Ck, Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> Rpm>0 <u>DETECTION:</u> It is recognized a fault if the difference between the intake manifold air pressure captured in two different angular event is < DELTA-MAPPHASE
54	Intake manifold air pressure sensor diagnosis (Electrical test) P0105 [0105 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the intake manifold air pressure sensor voltage VMapSignal > VMAPMAX
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the intake manifold air pressure sensor voltage VMapSignal < VMAPMIN
61	Intake manifold air pressure sensor diagnosis (Functional test) P0106 [0106 hex]	Plausibility [1000]	Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> The detection starts if there isn't an electrical fault on the pressure sensor and Rpm>0 <u>DETECTION:</u> It is recognized a fault if: - the difference between the pressure sensor reading MapSignal and the pressure rebuild through the throttle position 1/2:PresIntkF1/ PresIntkF2 is greater than a calibration: THRPREFSLOW in steady state THRPREFSHIGH in transition condition, and: - MapSignal > PresIntk0F and lambda sensor control is saturated in leaning, or: - MapSignal < PresIntk0F and lambda sensor control is saturated in enrichment
0	Intake manifold air temperature sensor diagnosis P0110 [0110 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Open Circuit or Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the intake manifold air temperature sensor voltage VTAir > VTAIRMAX.
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the intake manifold air temperature sensor voltage VTAir < VTAIRMIN

IDN ATI: Diagnosis fault number - PO: Power On - Ck: Cranking - Er: Engine Run - Vr: Vehicle Run



Air intake injection system

Eldor power unit fault codes (with TEXA diagnostic software)

IDN ATI	Component/Function [DTC Code]	[Fault Symptom]	Takeover	Cause	Fault detection rules
1	Engine water temperature sensor diagnosis P0115 [0115 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Open Circuit or Short circuit to Supply vol- tage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the sensor voltage VTWater > VTWATERMAX.
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the sensor voltage VTWater < VTWATERMIN
		Plausibility [1000]	Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> Rpm>0 <u>DETECTION:</u> It is recognized a fault if: TwaterLin < (TwaterModel – THCOHWWATMOD) during a time TVALFTWFUNC [ms] where: TwaterLin is linearized engine water temperature TwaterModel is modelled engine water temperature THCOHWWATMOD and TVALFTWFUNC are cali- bration
41	Throttle 1 sensor diagnosis P0120 [0120 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Open Circuit or Short circuit to Supply vol- tage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the sensor voltage VangThrottle1 > VANGTHRMAX.
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the sensor voltage VangThrottle1 < VANGTHRMIN
42	Throttle 2 sensor diagnosis P0121 [0121 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Open Circuit or Short circuit to Supply vol- tage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the sensor voltage VangThrottle2 > VANGTHRMAX.
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the sensor voltage VangThrottle2 < VANGTHRMIN
75	Lambda Sensor 1 functional diagnosis P0130 [0130 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Signal stuck rich	<u>CONDITION FOR DETECTION:</u> If Rpm>0 e CutoffFlg=1 <u>DETECTION:</u> It is recognized a fault if the engine is cut-off condition for TDCCTOFFLAMRICH com- bustions and the lambda sensor always indicates a rich mixture
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Signal stuck lean	<u>CONDITION FOR DETECTION:</u> If Rpm>0 and WotFlg=1 <u>DETECTION:</u> It is recognized a fault if the engine is wide open throttle condition for TDCWOTLAM- POOR combustions and the lambda sensor always indicates a lean mixture
		Plausibility [1000]	Er, Vr	No activity	<u>CONDITION FOR DETECTION:</u> If FlgClosedLoopOnOff=1 that is RPMFMIN<Rpm<RPMFMAX & Twater>TWAF- MIN & LamObj>LAMMINCL & CntTdcCrk>VTDE- LAYCLCRK & VTLOADLAMMIN<Load<VTLOAD- LAMMMAX <u>DETECTION:</u> It is recognized a fault if there are no lambda sensor variations for TDCNOSCLAM com- bustions
74	Lambda Sensor 1 electrical diagnosis P0132 [0132 hex]	Over maximum Threshold [0001]	Er, Vr	Short circuit to Supply vol- tage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> Is recognized a fault if the sensor voltage Vlambda>VLAMMAX.

IDN ATI: Diagnosis fault number - PO: Power On - Ck: Cranking - Er: Engine Run - Vr: Vehicle Run



Air intake injection system

Eldor power unit fault codes (with TEXA diagnostic software)

IDN ATI	Component/Function [DTC Code]	[Fault Symptom]	Takeover	Cause	Fault detection rules
64	Lambda Sensor 1 heater diagnosis P0135 [0135 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
65	Lambda Sensor 2 heater diagnosis P0141 [0141 hex]	Under minimum Threshold [0010]	PO, Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
35	Injector 1 diagnosis (lower) P0201 [0201 hex]	Over maximum Threshold [0001]	Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
36	Injector 2 diagnosis (lower) P0202 [0202 hex]				
37	Injector 3 diagnosis (lower) P0203 [0203 hex]	Under minimum Threshold [0010]	Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
38	Injector 4 diagnosis (lower) P0204 [0204 hex]				
25	Injector 1 diagnosis (upper) P0205 [0205 hex]	Over maximum Threshold [0001]	Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
26	Injector 2 diagnosis (upper) P0206 [0206 hex]				
27	Injector 3 diagnosis (upper) P0207 [0207 hex]	Under minimum Threshold [0010]	Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
28	Injector 4 diagnosis (upper) P0208 [0208 hex]				
44	Gas 1 potentiometer sensor diagnosis P0220 [0220 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the sensor voltage VgasPos1 > THUPGASPOSDIA.
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the sensor voltage VgasPos1 < THLOWGASPOSDIA.
45	Gas 2 potentiometer sensor diagnosis P0221 [0221 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the sensor voltage VgasPos2 > THUPGASPOSDIA.
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if the sensor voltage VgasPos2 < THLOWGASPOSDIA.

IDN ATI: Diagnosis fault number - PO: Power On - Ck: Cranking - Er: Engine Run - Vr: Vehicle Run



Air intake injection system

Eldor power unit fault codes (with TEXA diagnostic software)

IDN ATI	Component/Function [DTC Code]	[Fault Symptom]	Takeover	Cause	Fault detection rules
46	Gas Idle Switch sensor diagnosis P0222 [0222 hex]	Plausibility [1000]	Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if THLOW2GASSWDIA<VGasIDLSw<THUPP1GASSWDIA.
		Over maximum Threshold [0001]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VGasIDLSw>THLUP2GASSWDIA.
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VGasIDLSw<THLOW1GASSWDIA .
33	Fuel pump relay command diagnosis P0230 [0230 hex]	Over maximum Threshold [0001]	Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG< Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
		Under minimum Threshold [0010]	Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG< Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
16	Knocking coherence diagnosis cyl1 P0325 [0325 hex]	Plausibility [1000]	Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> If Rpm>0 and lonKnockEnabled=1 <u>DETECTION:</u> It is recognized a fault if KnockState=ACTIVE_KNOCK or HEAVY_KNOCK for ... combustions
17	Knocking coherence diagnosis cyl2 P0326 [0326 hex]				
18	Knocking coherence diagnosis cyl3 P0327 [0327 hex]				
19	Knocking coherence diagnosis cyl4 P0328 [0328 hex]				
63	Engine speed sensor diagnosis P0335 [0335 hex]	Plausibility [1000]	Ck, Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> If there is no electrical fault on the intake manifold air pressure sensor <u>DETECTION:</u> It is recognized a fault if: MapSignalRipple> THMAPRIPPLE & Rpm = 0
50	Coil 1 command diagnosis P0351 [0351 hex]	Over maximum Threshold [0001]	Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG< Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
51	Coil 2 command diagnosis P0352 [0352 hex]				
52	Coil 3 command diagnosis P0353 [0353 hex]	Under minimum Threshold [0010]	Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG< Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
53	Coil 4 command diagnosis P0354 [0354 hex]				

IDN ATI: Diagnosis fault number - PO: Power On - Ck: Cranking - Er: Engine Run - Vr: Vehicle Run



Air intake injection system

Eldor power unit fault codes (with TEXA diagnostic software)

IDN ATI	Component/Function [DTC Code]	[Fault Symptom]	Takeover	Cause	Fault detection rules
32	Fan 1 relay command diagnosis P0480 [0480 hex]	Over maximum Threshold [0001]	Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> Is recognized a fault through the hardware component signal feedback check
		Under minimum Threshold [0010]	Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
5	Fan 2 relay command diagnosis P0481 [0481 hex]	Over maximum Threshold [0001]	Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
		Under minimum Threshold [0010]	Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> If Rpm >0 and THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
79	Vehicle speed sensor 1 diagnosis P0500 [0500 hex]	Plausibility [1000]	PO, Ck, Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if Rpm>THRPMVS & CmeDriver>THTORQUEVS for a time equal to NSAMPOBSVS with VehicleSpeed==0; if VehSpeed-VehSpeedOld > DELTAMAXSPEED for NSAMPOBSVS/INCV-SCNDWRONG
49	Vehicle speed sensor 2 diagnosis P0501 [0501 hex]	Plausibility [1000]	PO, Ck, Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if Rpm>THRPMVS & CmeDriver>THTORQUEVS for a time equal to NSAMPOBSVS with VehicleSpeed==0; if VehSpeed-VehSpeedOld > DELTAMAXSPEED for NSAMPOBSVS/INCV-SCNDWRONG
7	Battery voltage diagnosis P0560 [0560 hex]	Plausibility [1000]	PO, Ck, Er, Vr	ECU supply anomaly	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VBatteryIn < VBATINMIN
76	Voltage regulator diagnosis P0561 [0561 hex]	Plausibility [1000]	Ck, Er, Vr	ECU supply anomaly	<u>CONDITION FOR DETECTION:</u> If Rpm > THRPM-DIAGBAT & CntAbsTdc>THTDCDIAGVREG <u>DETECTION:</u> It is recognized a fault if VBattery > VBATMAX
		Under minimum Threshold [0010]	Ck, Er, Vr	ECU supply anomaly	<u>CONDITION FOR DETECTION:</u> If Rpm > THRPM-DIAGBAT & CntAbsTdc>THTDCDIAGVREG <u>DETECTION:</u> It is recognized a fault if VBattery < VBATMIN
70	Checksum EPROM diagnosis P0601 [0601 hex]	Plausibility [1000]	PO, Ck, Er, Vr	System error	<u>CONDITION FOR DETECTION:</u> In power on condition <u>DETECTION:</u> It is recognized a fault if there is a bad transfer data from RAM to EPROM
72	RAM diagnosis P0604 [0604 hex]	Plausibility [1000]	PO, Ck, Er, Vr	System error	<u>CONDITION FOR DETECTION:</u> In power on condition <u>DETECTION:</u> It is recognized a fault if there is no match between data read and write
69	ROM diagnosis P0605 [0605 hex]	Plausibility [1000]	PO, Ck, Er, Vr	System error	<u>CONDITION FOR DETECTION:</u> In power off condition <u>DETECTION:</u> It is recognized a fault if there is no checksum verification

IDN ATI: Diagnosis fault number - PO: Power On - Ck: Cranking - Er: Engine Run - Vr: Vehicle Run



Air intake injection system

Eldor power unit fault codes (with TEXA diagnostic software)

IDN ATI	Component/Function [DTC Code]	[Fault Symptom]	Takeover	Cause	Fault detection rules
71	CPU diagnosis P0606 [0606 hex]	Plausibility [1000]	PO, Ck, Er, Vr	System error	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if a reset occurs
58	Hardware Thermal Shut Down diagnosis P060F [060F hex]	Plausibility [1000]	PO, Ck, Er, Vr	System error	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
56	Load disable for safety diagnosis P0612 [0612 hex]	Plausibility [1000]	PO, Ck, Er, Vr	System error	<u>CONDITION FOR DETECTION:</u> In power on condition <u>DETECTION:</u> It is recognized a fault if there is no match between the command and the digital feedback
34	Starter Relay command diagnosis (LSD) P0615 [0615 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> If THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check but only when the driver is commanded
29	HBridge1 command diagnosis P0638 [0638 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Open Circuit or Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if HBridgeFSStatusA!=0 & HBCurrAFnew<=HBFB-MINNEW&FlgHBAActiveA=1
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if HBridgeFSStatusA==0
30	HBridge2 command diagnosis P0639 [0639 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Open Circuit or Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if HBridgeFSStatusA!=0 & HBCurrAFnew<=HBFB-MINNEW&FlgHBAActiveA=1
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if HBridgeFSStatusA==0
39	Sensor supply 1 P0641 [0641 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VSens1> VSENSMAX
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VSens1< VSENSMIN
40	Sensor supply 2 P0651 [0651 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VSens2> VSENSMAX
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VSens2< VSENSMIN

IDN ATI: Diagnosis fault number - PO: Power On - Ck: Cranking - Er: Engine Run - Vr: Vehicle Run



Air intake injection system

Eldor power unit fault codes (with TEXA diagnostic software)

IDN ATI	Component/Function [DTC Code]	[Fault Symptom]	Takeover	Cause	Fault detection rules
11	Gear sensor diagnosis P0915 [0915 hex]	Over maximum Threshold [0001]	Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Rpm > THRPM-GEARDIAG <u>DETECTION:</u> It is recognized a fault if VGearPos>VGearPosMAX for a time > TGEAR-SHIFT <u>Mark:</u> during a gear shift the gear sensor voltage goes to Vcc. As a voltage equal to Vcc means short circuit or open circuit it is necessary to use a timer (TGEARSHIFT) to discriminate the normal operation from the real fault
		Under minimum Threshold [0010]	Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Rpm > THRPM-GEARDIAG <u>DETECTION:</u> It is recognized a fault if VGearPos<VGearPosMIN
43	Throttle sensor consistency test P1120 [1120 hex]	Plausibility [1000]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply / Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VangThrottle1-VangThrottle2 > VANGTHRCOH
48	Throttle control diagnosis P1220 [1220 hex]	Plausibility [1000]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply / Open Circuit or Short Circuit to Ground / Mechanical Problems	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if AngIntErr>MAXANGINTERR where AngIntErr = AngThrObj - AngThrottle AngThrObj is throttle target AngThrottle is actual throttle position
47	Gas sensor consistency test P1222 [1222 hex]	Plausibility [1000]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply / Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VGasPos1-VGasPos2 > THGASPOSCOH
77	Gas idle Switch consistency Test P1223 [1223 hex]	Plausibility [1000]	PO, Ck, Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VGasIDLsw<THLOW1GASSWDIA; THLOW2GASSWDIA<VGasIDLsw<THUP1GASSWDIA; VGasIDLsw>THUP2GASSWDIA
10	ION acquisition diagnosis (IonBufferV) P1300 [1300 hex]	Over maximum Threshold [0001]	Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> If Rpm > 0 <u>DETECTION:</u> It is recognized a fault if IonBufferV > VIONMAX
		Under minimum Threshold [0010]	Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> If Rpm > 0 <u>DETECTION:</u> It is recognized a fault if IonBufferV < VIONMIN

IDN ATI: Diagnosis fault number - PO: Power On - Ck: Cranking - Er: Engine Run - Vr: Vehicle Run



Air intake injection system

Eldor power unit fault codes (with TEXA diagnostic software)

IDN ATI	Component/Function [DTC Code]	[Fault Symptom]	Takeover	Cause	Fault detection rules
12	ION 1 signal diagnosis (StPhase) P1301 [1301 hex]	Plausibility [1000]	Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> If Rpm >0 <u>DETECTION:</u> It is recognized a fault if StPhase ≠ TH_START_FOUND
13	ION 2 signal diagnosis (StPhase) P1302 [1302 hex]				
14	ION 3 signal diagnosis (StPhase) P1303 [1303 hex]				
15	ION 4 signal diagnosis (StPhase) P1304 [1304 hex]				
21	ION 1 peak diagnosis (VSparkPeak) P1305 [1305 hex]	Over maximum Threshold [0001]	Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> If Rpm >0 <u>DETECTION:</u> It is recognized a fault if VSparkPeakCyl > VSPEAKMAX
22	ION 2 peak diagnosis (VSparkPeak) P1306 [1306 hex]				
23	ION 3 peak diagnosis (VSparkPeak) P1307 [1307 hex]	Under minimum Threshold [0010]	Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> If Rpm >0 <u>DETECTION:</u> It is recognized a fault if VSparkPeakCyl < VSPEAKMIN
24	ION 4 peak diagnosis (VSparkPeak) P1308 [1308 hex]				
55	A/D Converter Diagnosis P1602 [1602 hex]	Plausibility [1000]	PO, Ck, Er, Vr	System Error	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if there is a difference between the throttle position read by the MMP (MainMicroProcessor) and the same one read by SMP (SafetyMicroProcessor)
9	Safety 3 diagnosis P1610 [1610 hex]	Plausibility [1000]	PO, Ck, Er, Vr	System Error	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if Safety Microcontroller does not match the computation performed by Main Microcontroller
57	Safety 2 diagnosis P1612 [1612 hex]	Plausibility [1000]	PO, Ck, Er, Vr	System Error	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if a software calculation error is detected and this error can cause a torque increase
31	Low Beam relay command P1655 [1655 hex]	Open circuit [0100]	PO, Ck, Er, Vr	Open Circuit	<u>CONDITION FOR DETECTION:</u> If THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
		Over maximum Threshold [0001]	PO, Ck, Er, Vr	Short circuit to Supply voltage or Vehicle supply	<u>CONDITION FOR DETECTION:</u> If THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> If THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check

IDN ATI: Diagnosis fault number - PO: Power On - Ck: Cranking - Er: Engine Run - Vr: Vehicle Run



Air intake injection system

Eldor power unit fault codes (with TEXA diagnostic software)

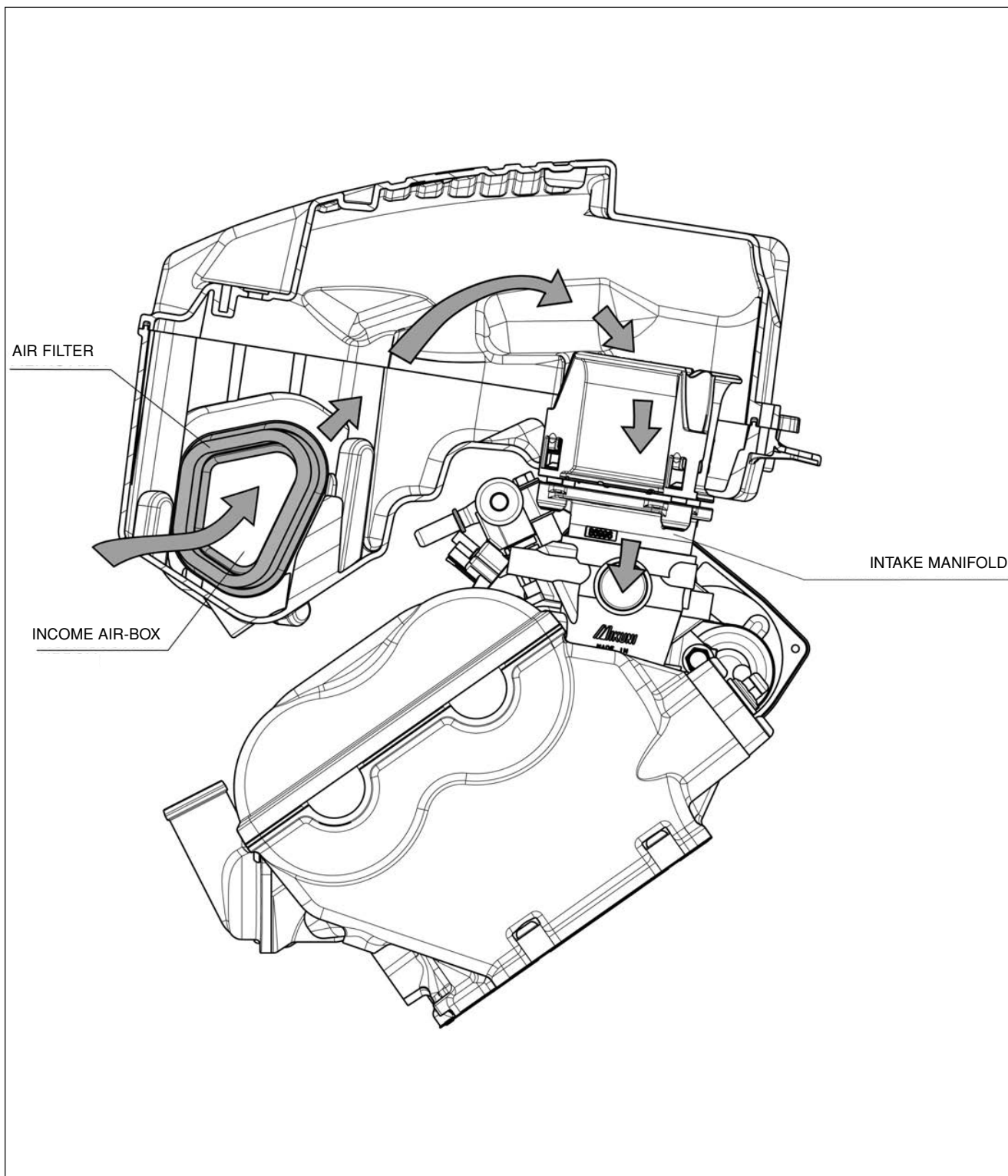
IDN ATI	Component/Function [DTC Code]	[Fault Symptom]	Takeover	Cause	Fault detection rules
6	Rear stop light command diagnosis (HSD) P1656 [1656 hex]	Plausibility [1000]	PO, Ck, Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> If THINFVBATDDIAG < Vbattery < HSUPVBATDDIAG <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
73	Tip over sensor diagnosis P1773	Plausibility [1000]	PO, Ck, Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VCrashSignal < ANDIAGLOWTIPOVER; ANDI- GLOTHTIPOVER < VCrashSignal < ANDIGHHTI- POVER; VCrashSignal > ANDIAGHIGHTIPOVER
59	TTS command diagnosis P2076	Plausibility [1000]	PO, Ck, Er, Vr	Signal is not plausible or not coherent	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault through the hardware component signal feedback check
2	Engine Water temperature sensor 2 diagnosis P2182 [2182 hex]	Over maximum Threshold [0001]	PO, Ck, Er, Vr	Short circuit to Supply volta- ge or Vehicle supply	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VTWater2 > VTWATER2MAX
		Under minimum Threshold [0010]	PO, Ck, Er, Vr	Open Circuit or Short Circuit to Ground	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if VTWater2 < VTWATER2MIN
8	CAN bus diagnosis U1600	Bus-Off [0100]	PO, Ck, Er, Vr	Short Circuit on CAN wires or hw problem	<u>CONDITION FOR DETECTION:</u> If VBattery > CANVBATTHRMIN & a time elapsed from Key-ON event is greater than TNOCANDIAGAFTKEYON <u>DETECTION:</u> It is recognized a fault if The CAN state is probed and if any error is detected, a punc- tual fault of type 'FAULT_CAN_BUSOFF' is gene- rated.
66	CAN Communication NCM - DASHBOARD U1701	No Signal [0100]	PO, Ck, Er, Vr	Electrical pro- blems on CAN wires or XXX Fault	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if there are no messages from the DASHBOARD
67	CAN Communication NCM - YRS U1706	No Signal [0100]	PO, Ck, Er, Vr	Electrical pro- blems on CAN wires or XXX Fault	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if there are no messages from the YRS
68	CAN Communication NCM - ABS U1706	No Signal [0100]	PO, Ck, Er, Vr	Electrical pro- blems on CAN wires or XXX Fault	<u>CONDITION FOR DETECTION:</u> Always <u>DETECTION:</u> It is recognized a fault if there are no messages from the ABS

IDN ATI: Diagnosis fault number - PO: Power On - Ck: Cranking - Er: Engine Run - Vr: Vehicle Run

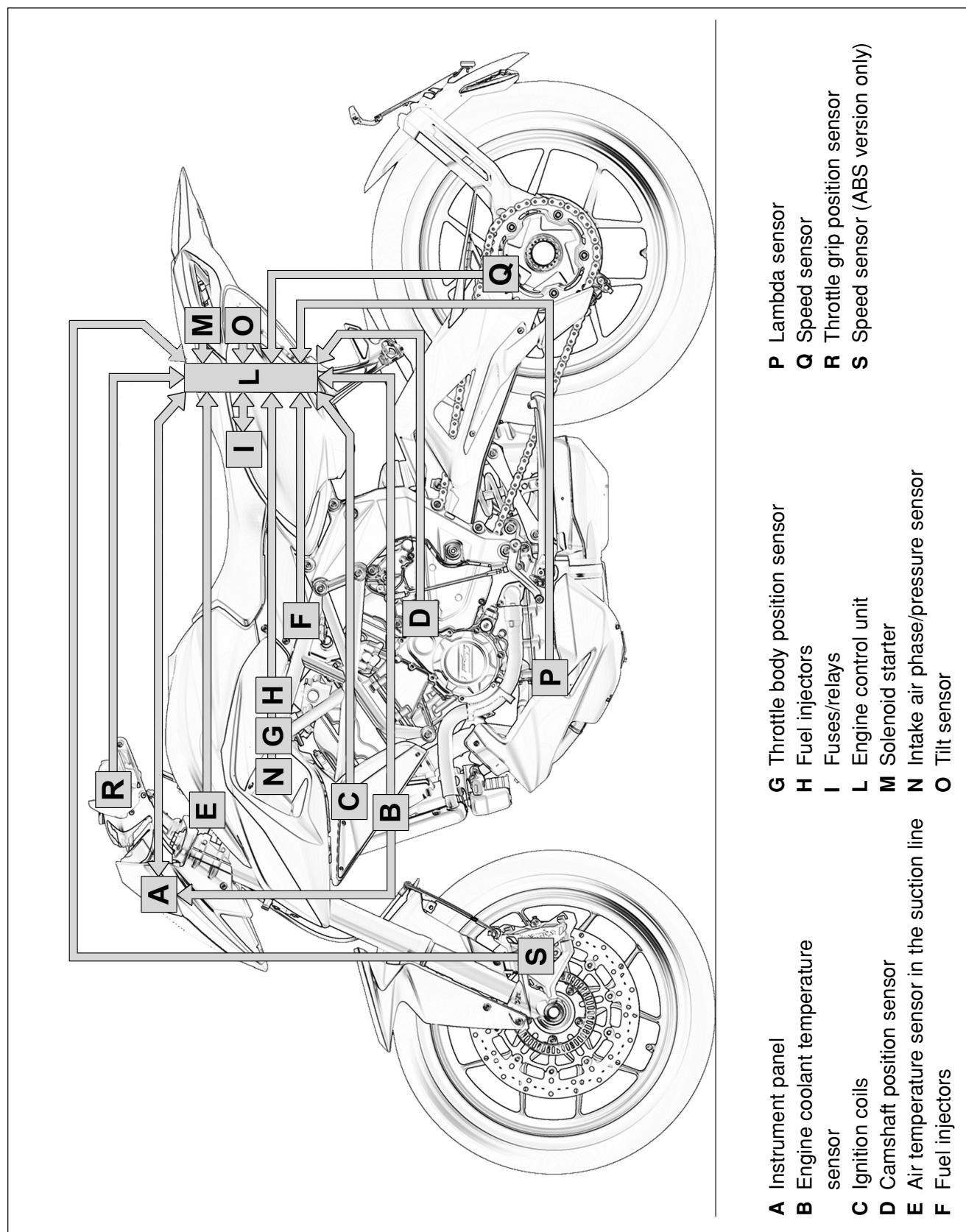
AIR INTAKE SYSTEM TECHNICAL CHARACTERISTICS

This motorcycle utilises direct induction in the air intake system. The frontal pressure of the air during normal riding conditions is conducted to the air filter compartment in such a way that the incoming air is pressurised thereby improving the air intake efficiency to obtain greater power from the engine.

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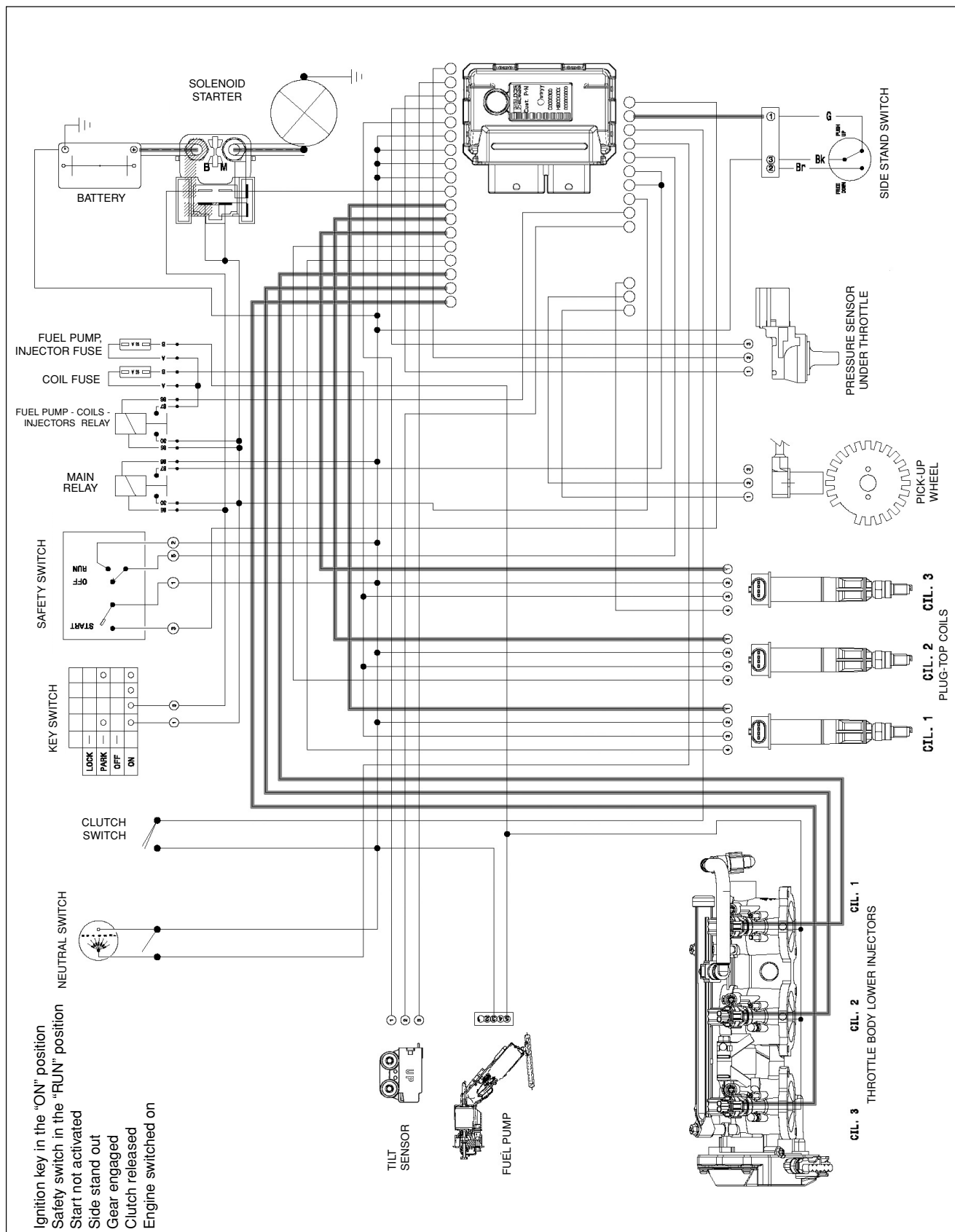
POSITIONS OF ENGINE-CONTROL SYSTEM PARTS





Air intake injection system

INJECTION SYSTEM ELECTRICAL DIAGRAM





Air intake injection system

Engine control unit pinout, MV Agusta Rivale 800			Connector	
Pin name	Description of associated function	Type	Vehicle Pin n°	Engine Pin n°
IN_REL+	INPUT CRANKSHAFT POSITION SENSOR +	VRS interface		A1
IN_REL-	INPUT CRANKSHAFT POSITION SENSOR -	VRS interface		A2
IN_CAMSHAFT		Pull Up (Vcc)		A3
IN_GEAR_POS	INPUT ANALOGIC SENSOR GEAR	Pull Up (Vcc)		A4
IN_THROTTLE_POS_1A	THROTTLE BODY THROTTLE POSITION INPUT (TPS)	Pull Up (Vcc)		B1
IN_THROTTLE_POS_2A	THROTTLE BODY THROTTLE POSITION INPUT (TPS)	Pull down		B2
IN_THROTTLE_POS_1B		Pull Up (Vcc)		B3
IN_THROTTLE_POS_2B		Pull down		B4
IN_LAMBDA_1	INPUT LAMBDA SENSOR (-) N°1	Pull down + Pull Up (Vcc)		C1
IN_LAMBDA_2		Pull down + Pull Up (Vcc)		C2
IN_INTAKE_PRES_1	INPUT SENSOR OF AIR PRESSURE COLLECTOR/BAROMETRIC	Pull down		C3
IN_INTAKE_PRES_2		Pull down		C4
IN_WATER_TEMP	INPUT WATER TEMPERATURE SENSOR SIGNAL	Pull Up (Vcc)		D1
IN_AIR_TEMP	INPUT AIR TEMPERATURE SENSOR SIGNAL	Pull Up (Vcc)		D2
IN_TSS_FKB	RADIATOR WATER TEMPERATURE SENSOR INPUT	Pull down		D3
IN_EXHAUST_FBK		Pull down		D4
IN_SEC_CURRENT	INPUT ION CURRENT COIL 1	ION Current interface		E1
IN_SEC_CURRENT	INPUT ION CURRENT COIL 2	ION Current interface		E2
IN_SEC_CURRENT	INPUT ION CURRENT COIL 3	ION Current interface		E3
IN_SEC_CURRENT		ION Current interface		E4
OUT_INJECTOR_1A		Low side		F1
OUT_INJECTOR_2A		Low side		F2
OUT_INJECTOR_3A		Low side		F3
OUT_INJECTOR_4A		Low side		F4
OUT_INJECTOR_1B	OUTPUT INJECTOR CONTROL 1 INJECTORS	Low side		G1
OUT_INJECTOR_2B	OUTPUT INJECTOR CONTROL 2 INJECTORS	Low side		G2
OUT_INJECTOR_3B	OUTPUT INJECTOR CONTROL 3 INJECTORS	Low side		G3
OUT_INJECTOR_4B		Low side		G4
OUT_H_LAMBDA_1	OUTPUT LAMBDA HEATER PWM CONTROL	Low side		H1
OUT_H_LAMBDA_2		Low side		H2
OUT_VVT_VALVE		Low side		H3
GND Analog	ANALOGIC MASS 1	Sensor Ground		H4
GND Analog	ANALOGIC MASS 2	Sensor Ground		J1
GND Analog	ANALOGIC MASS 3	Sensor Ground		J2
GND Analog	ANALOGIC MASS 4	Sensor Ground		J3
GND Analog	ANALOGIC MASS 5	Sensor Ground		J4
VREF_1	OUTPUT VREF1 +5V, FOR TPS	5V Sensor Supply		K1
VREF_1		5V Sensor Supply		K2
VREF_2	VREF2 +5V, OUTPUT, FOR ATMOSPHERIC PRESSURE SENSOR	5V Sensor Supply		K3
VREF_2		5V Sensor Supply		K4
OUT_BRIDGE_A1	OUTPUT TPS ENGINE DC POSITIVE CONTROL	H-Bridge		L1
OUT_BRIDGE_A2		H-Bridge		L2
OUT_IGN_COIL_1	OUTPUT COIL CONTROL N° 1	Low side		L3
OUT_IGN_COIL_2	OUTPUT COIL CONTROL N° 2	Low side		L4
OUT_BRIDGE_B1	OUTPUT TPS ENGINE DC NEGATIVE CONTROL	H-Bridge		M1
OUT_BRIDGE_B2		H-Bridge		M2
OUT_IGN_COIL_4		Low side		M3
OUT_IGN_COIL_3	OUTPUT COIL CONTROL N° 3	Low side		M4
IN_SPD_FRONTW		Pull Up (Vcc)	A1	
IN_SPD_REARW	INPUT REAR WHEEL SPEED HALL SENSOR	Pull Up (Vcc)	A2	
IN_START_SW	INPUT SWITCH "START ENGINE"	Pull down	A3	
IN_SIDE_STAND	INPUT SWITCH SIDE-STAND	Pull down	A4	
IN_CLUTCH_SW	INPUT CLUTCH SENSOR SWITCH	Pull down	B1	
IN_RUN_STOP	INPUT SWITCH "ENGINE STOP"	Pull down	B2	
IN_TIP_OVER	INPUT TILT SWITCH SENSOR	Pull down + Pull Up (Vcc)	B3	
IN_GAS_POS_1	INPUT GRIP POSITION SENSOR 1	Pull down	B4	
IN_GAS_POS_2	INPUT GRIP POSITION SENSOR 2	Pull Up (Vcc)	C1	
OUT_PUMP_RELAY	OUTPUT FUEL PUMP RELAY CONTROL	Low side	C2	

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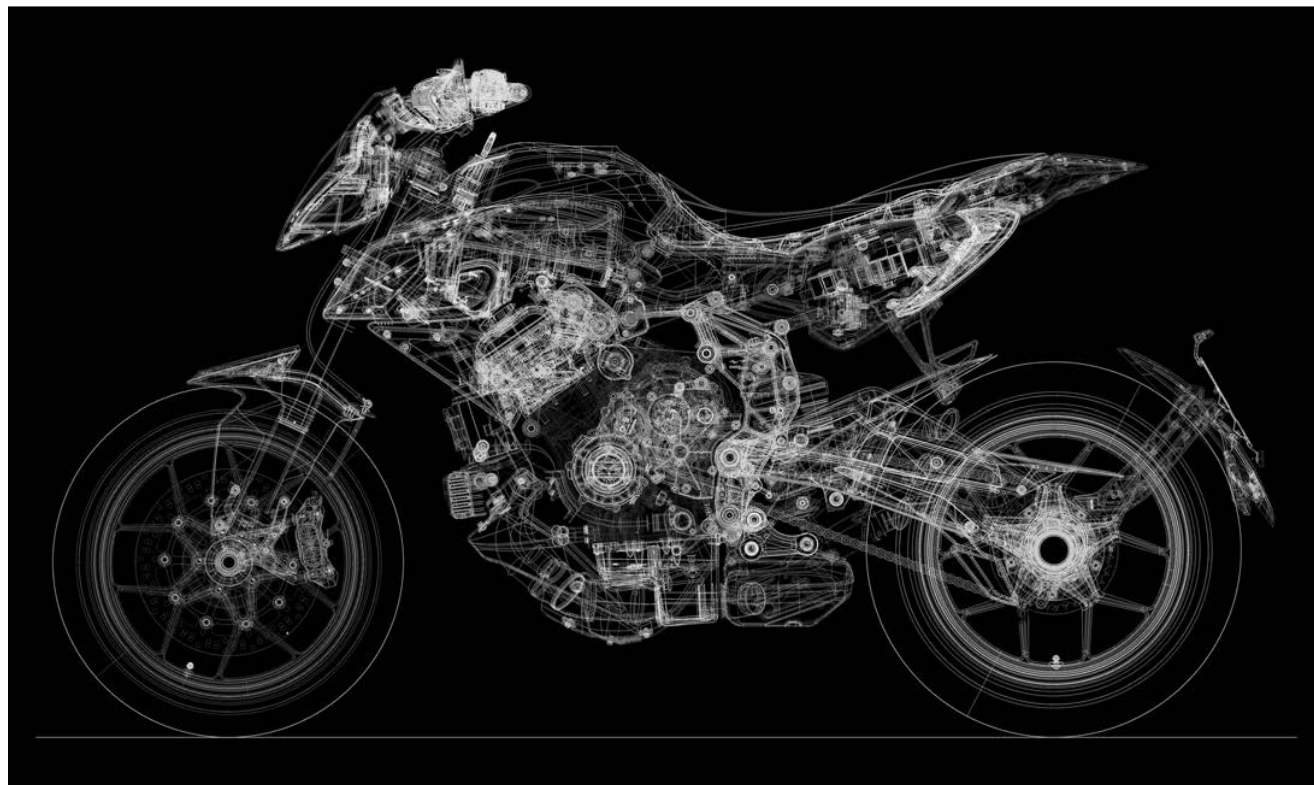


Air intake injection system

Engine control unit pinout, MV Agusta Rivale 800			Connector	
Pin name	Description of associated function	Type	Vehicle Pin n°	Engine Pin n°
OUT_LOW_BEAM	OUTPUT LOW BEAM LIGHT RELAY MANAGEMENT CONTROL	Low side	C3	
OUT_FAN_RELAY_1	OUTPUT ELECTRIC FAN RELAY MANAGEMENT CONTROL 1	Low side	C4	
OUT_FAN_RELAY_2	OUTPUT ELECTRIC FAN RELAY MANAGEMENT CONTROL 2	Low side	D1	
GND Analog		Sensor Ground	D2	
OUT_WARNING_LAMP		Low side	D3	
MAIN_SWITCH_(KL15)	INPUT DASHBOARD KEY SWITCH	Pull down	D4	
GND Analog	ANALOGIC MASS 6	Sensor Ground	E1	
GND Analog	ANALOGIC MASS 7	Sensor Ground	E2	
VREF_1	OUTPUT VREF1 +5V, FOR GRIP POSITION SENSOR 1	5V Sensor Supply	E3	
VREF_2	OUTPUT VREF1 +5V, FOR GRIP POSITION SENSOR 2	5V Sensor Supply	E4	
VREF_1		5V Sensor Supply	F1	
COMM_K_LINE		K-line interface	F2	
COMM_CAN_H1	CAN Line H (HIGH SPEED)	CAN transceiver		
COMM_CAN_L1	CAN Line L (HIGH SPEED)	CAN transceiver	F4	
OUT_AIRCUT_VALVE		Low side	G1	
OUT_CANISTER		Low side	G2	
OUT_TSS		Low side	G3	
OUT_STARTER_RELAY	OUTPUT DIRECT COMMAND REMOTE CONTROL SOLENOID STARTER	Low side	G4	
OUT_REAR_STOP	OUTPUT STOP LIGHT CONTROL	High side	H1	
POWER_BATTERY_(KL30)	DIRECT POWER SUPPLY TO CONTROL UNIT	ECU Supply	H2	
Gnd Power (KL31)	MASS POWER	ECU Power Ground		
Gnd Power (KL31)	MASS POWER	ECU Power Ground	H4	



Electrical system



E

SECTION E

Revision 0



SUMMARY

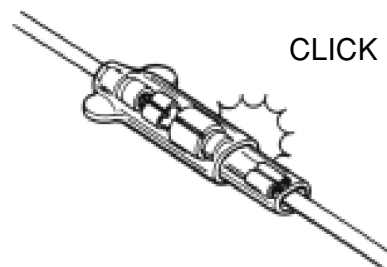
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Electrical system

CONNECTORS

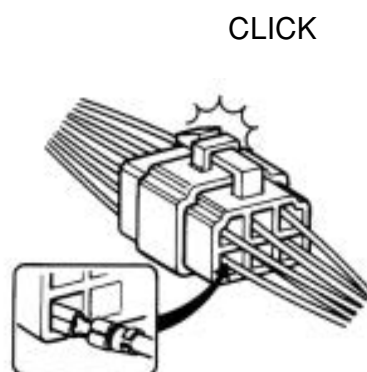
- When a connector is connected, check that it clicks into position.
- Check the connector for corrosion, dirt or a broken cover.



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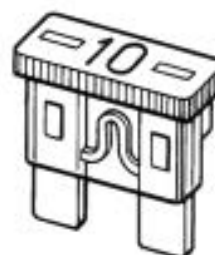
COUPLINGS

- Block couplings – ensure that the block is released before disconnecting it to push it completely home when connecting it.
- When disconnecting a coupling, ensure that the body of the coupling is gripped and do not pull it apart by the leads.
- Check that the terminals of the couplings are not slack or bent.
- Check that the terminals are not corroded or dirty.



FUSES

- When a fuse burns out, always investigate why the fuse has burnt out. Find the cause, repair and then substitute the fuse.
- Do not utilise a fuse of a different capacity from the original one.
- Do not utilise wire or any other substitute for the fuse.

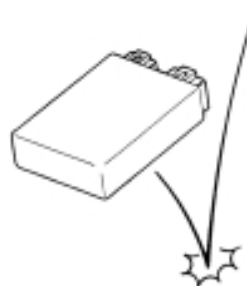




SEMICONDUCTOR PARTS

- Do not drop semiconductor parts such as those incorporated in the ECU.
- When checking these parts, carry out the instructions to the letter. The lack of using the correct procedure can cause grave damage.

INCORRECT

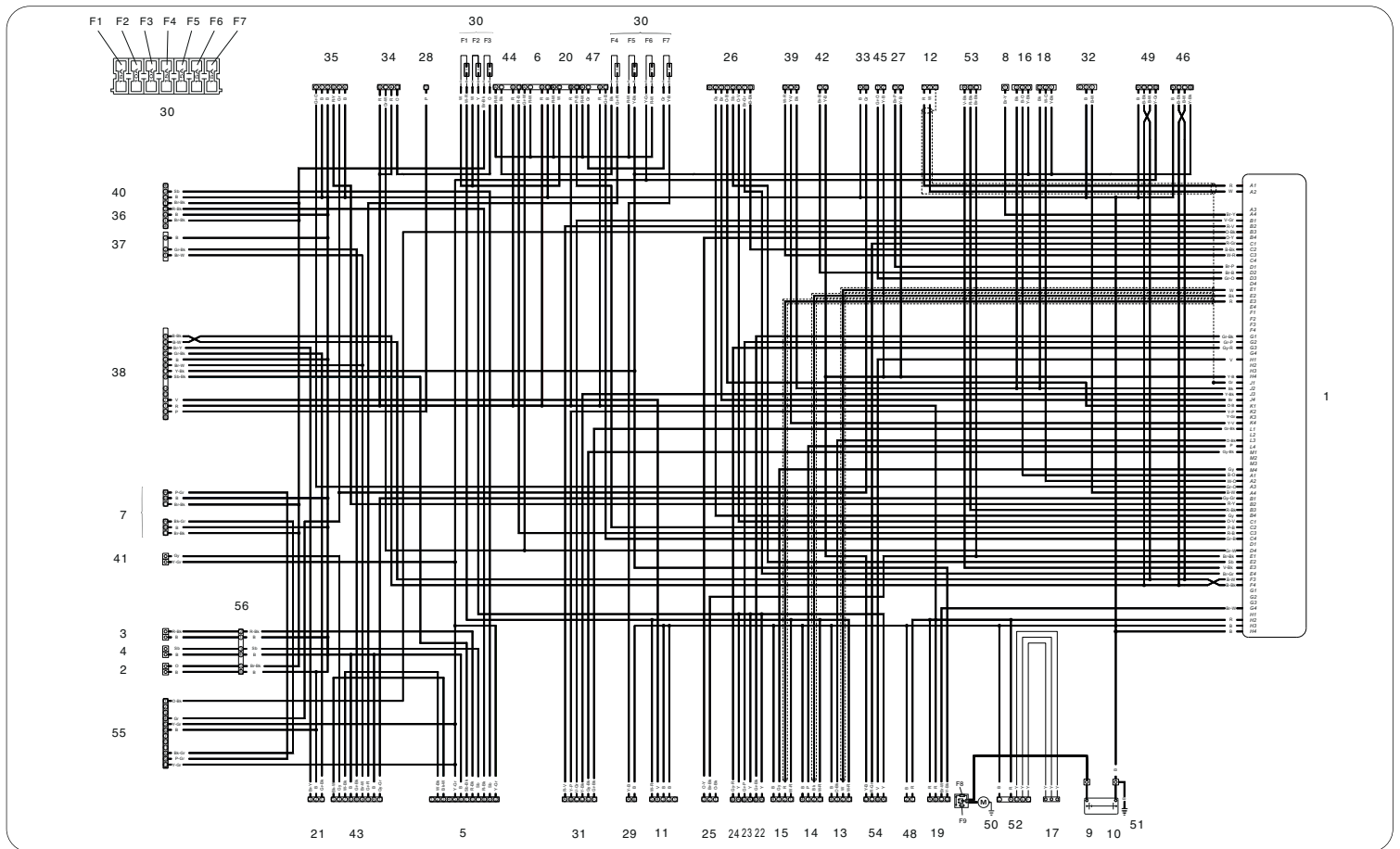




Electrical system

ELECTRICAL DIAGRAM

RIVALE 800





Electrical system

Parts list

Ref.	Description
1	Power unit
2	Plate light
3	Rear turn indicator, right hand
4	Rear turn indicator, left hand
5	Intermittence
6	Power relay
7	Brake light - Stop
8	Gearbox switch
9-10	Battery
11	Pump - Low fuel probe
12	Engine rpm sensor
13-14-15	Coils
16	Front speed sensor
17	Alternator
18	Rear speed sensor
19	Solenoid starter
20	Main relay
21	SET/OK button
22-23-24	Injectors
25	Quick shift
26	Throttle potentiometer
27	Water temperature sensor for power unit
28	Oil switch
29	Heater fan
30	Fuses
31	"Drive By Wire" Unit"
32	Side stand switch
33	Rear brake switch

Parts list

Ref.	Description
34	Key switch
35	Safety and front brake switch
36	Front turn indicator, right hand
37	Front light
38	Dashboard
39	Air pressure sensor
40	Front turn indicator, left hand
41	Horn
42	Air temperature sensor
43	Light switch
44	Light relay
45	Water temperature sensor for fan
46	Lean angle sensor
47	Heater fan relay
48	Battery recharge
49	CAN line
50	Starter motor
51	Engine ground
52	Voltage regulator
53	Angular switch
54	Lambda sensor
55	Tail lamp control
57	Rear lights sectioning

Wiring colour code

Letter(s)	Colour
R	Red
Y	Yellow
B	Blue
Gr	Green
W	White
Bk	Black
P	Pink
V	Violet
Sb	Sky blue
Gy	Grey
O	Orange
Br	Brown

In combined colors, background and marking colors have been pointed out. E.g.: Br/Bk.

Fuses list

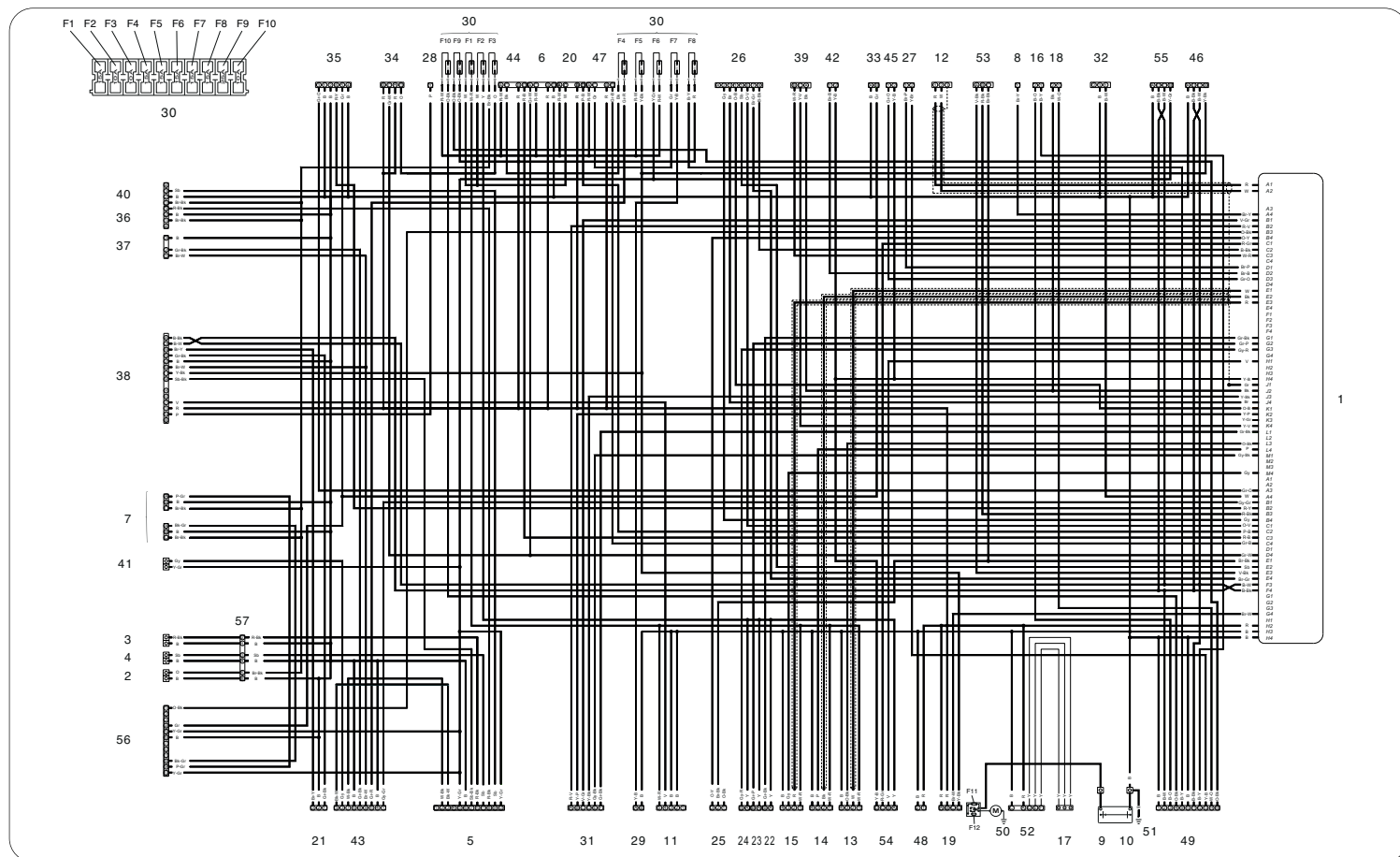
Ref.	Amps (A)	Use
F1	15	Fuel pump - Coils
F2	10	Lambda sensor - Injectors
F3	10	Position lights-License plate light
F4	15	High beam - Low beam
F5	15	Solenoid starter - Front speed sensor - Rear speed sensor - Dashboard - Lean angle sensor
F6	15	Intermittence - Horn - Stop light - Diagnostics
F7	15	Electric fan
F8	30	Battery recharge
F9	30	Battery recharge supply



Electrical system

ELECTRICAL DIAGRAM

RIVALE 800 (VERSION WITH ABS)





Electrical system

Parts list

Ref.	Description
1	Power unit
2	Plate light
3	Rear turn indicator, right hand
4	Rear turn indicator, left hand
5	Intermittence
6	Power relay
7	Brake light - Stop
8	Gearbox switch
9-10	Battery
11	Pump - Low fuel probe
12	Engine rpm sensor
13-14-15	Coils
16	Front speed sensor
17	Alternator
18	Rear speed sensor
19	Solenoid starter
20	Main relay
21	SET/OK button
22-23-24	Injectors
25	Quick shift
26	Throttle potentiometer
27	Water temperature sensor for power unit
28	Oil switch
29	Heater fan
30	Fuses
31	"Drive By Wire" Unit"
32	Side stand switch
33	Rear brake switch

Parts list

Ref.	Description
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35	Safety and front brake switch
36	Front turn indicator, right hand
37	Front light
38	Dashboard
39	Air pressure sensor
40	Front turn indicator, left hand
41	Horn
42	Air temperature sensor
43	Light switch
44	Light relay
45	Water temperature sensor for fan
46	Lean angle sensor
47	Heater fan relay
48	Battery recharge
49	ABS unit
50	Starter motor
51	Engine ground
52	Voltage regulator
53	Angular switch
54	Lambda sensor
55	CAN line
56	Tail lamp control
57	Rear lights sectioning

Wiring colour code

Letter(s)	Colour
R	Red
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B	Blue
Gr	Green
W	White
Bk	Black
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Fuses list

Ref.	Amps (A)	Use
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F4	15	High beam - Low beam
F5	15	Solenoid starter - Front speed sensor - Rear speed sensor - Dashboard - Lean angle sensor
F6	15	Intermittence - Horn - Stop light - Diagnostics
F7	15	Electric fan
F8	15	ABS unit
F9	25	ABS unit
F10	10	ABS unit
F11	30	Battery recharge
F12	30	Battery recharge supply



Electrical system

BATTERY

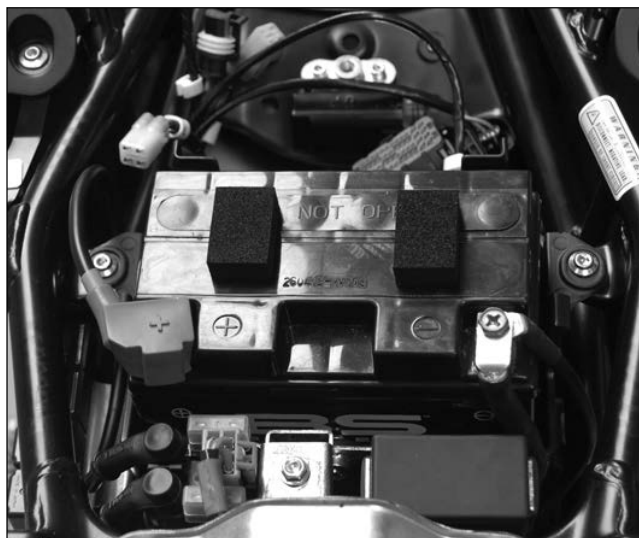
The battery mounted on this motorcycle is a sealed battery therefore no maintenance is required.

The following battery is used: **BS BTZ 10S**

This is a sealed battery with breather valve. No electrolyte level checking is required.

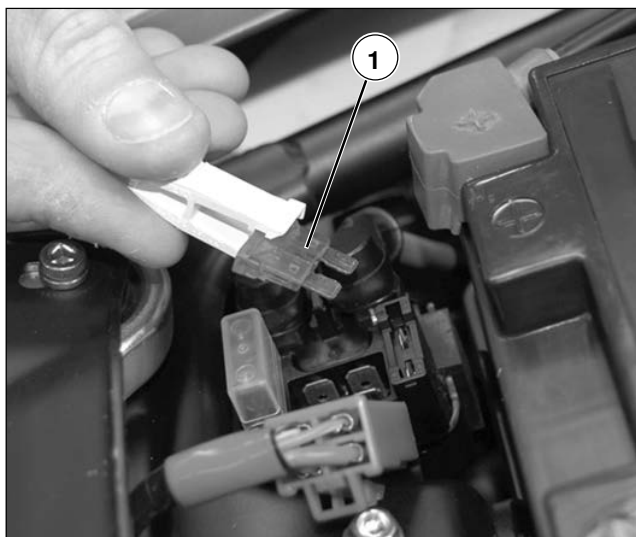


Never remove the battery seal caps nor block the breather opening.



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During vehicle downtime (e.g. the winter season) it is not necessary to take the battery out. To store the battery simply remove the charger fuse (1) from the remote ignition switch; accordingly, the battery is disconnected from the system.

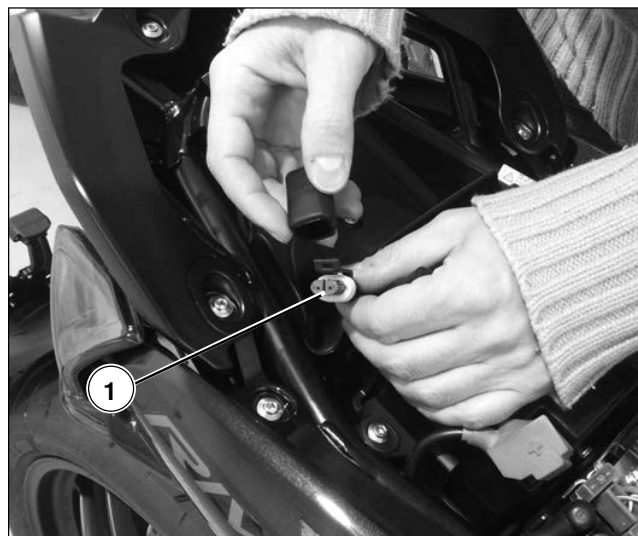




Electrical system

CHARGING THE BATTERY

The battery is charged by connecting the supplied battery charger to the connector located under the passenger seat. If the battery is charged after a period of vehicle downtime, make sure that the charger fuse is placed inside its housing on the remote ignition switch. Put the motorcycle key inside the rear lock. Turn the key clockwise and at the same time turn the seat. Take out the rubber cap (1) for the charger connector.



Before charging, connect the battery charger to the connector of the vehicle as shown in the figure. Then connect the battery charger to the AC outlet.

The amber light will go on indicating that it has started charging, and will last between 0 and 12 hours depending on the battery conditions.

When charging is complete the green light will come on.

The supplied battery charger is equipped with a safety system that produces voltage in output only if the polarities of the cables are correct and the battery that you intend to charge has a voltage of at least 3V.

When connected, the battery charger automatically detects the battery conditions, delivering optimal voltage values and current intensity to maximise performance and increase the duration of the service life of the battery.

If the supplied battery charger is not available, it is possible to use other types of battery chargers with a constant voltage charging method to avoid overcharging the batteries, as shown in the table on the side.

Overcharging the battery or charging it rapidly may lower the level of the electrolyte, thus making the battery unusable.

NOTE Voltages lower than 11.8V shorten the life and impair the operation of the battery. Checking stored batteries once a month prolongs their life while keeping them in perfect working order for future use.

Method	V (voltage)	C (temperature)	A (charging current)	Charging time (hours)
Normal	14,4	20	0,25xC	12-24
Fast	14,4	20	1xC	6-8

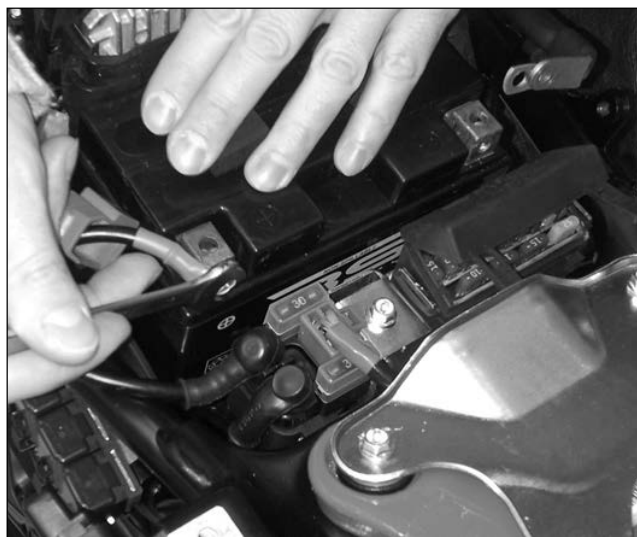
REMOVAL OF THE BATTERY

To carry out this operation it is necessary to remove the seat, the sides and the tank as described in sec. C (Superstructures).

1) Remove the negative pole (-) cable screw first.

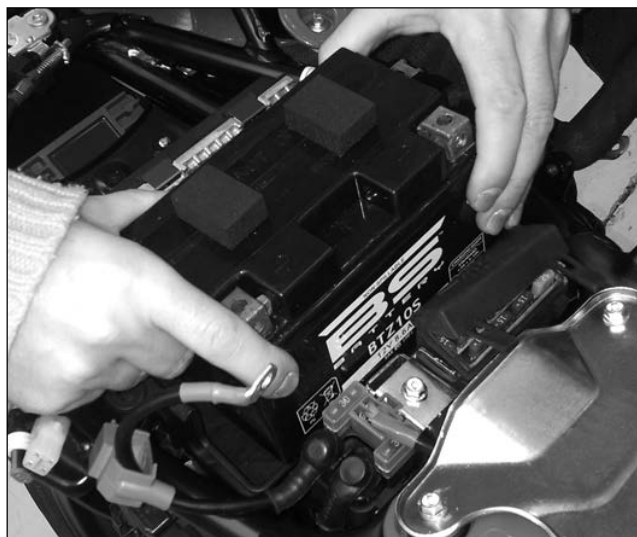


2) Remove the positive pole (+) cable screw first.



3) Remove the battery by lifting it from its housing.

To install the battery carry out the disassembly operations in reverse order beginning by connecting the positive terminal (+) on the relative pole of the battery, tightening the screw with a torque of $7 \div 8$ Nm. Then set up the protective cover on the positive pole. Install the 2 negative terminals (-) on the relative battery pole observing the set up shown in the figure and tightening the screw with a torque of $7 \div 8$ Nm.





Electrical system

- Check the voltage charge after about thirty minutes at the battery terminals.
Voltage $\geq 12,5$ Volt.



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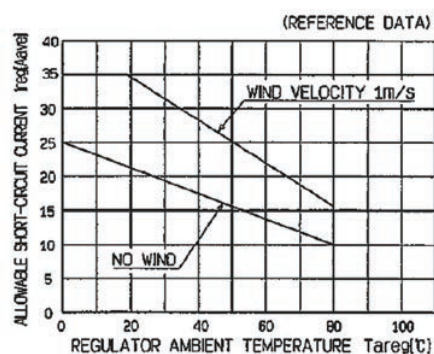
CHARGING SYSTEM

Warning function

Conditions of abnormal operation of the battery charging function (voltage $\geq 10V$) is indicated by the warning lamp and the voltage value displayed on the dashboard.

As shown in the figure, the temperature influences the characteristics of the regulator with steps of variation of the regulated voltage.

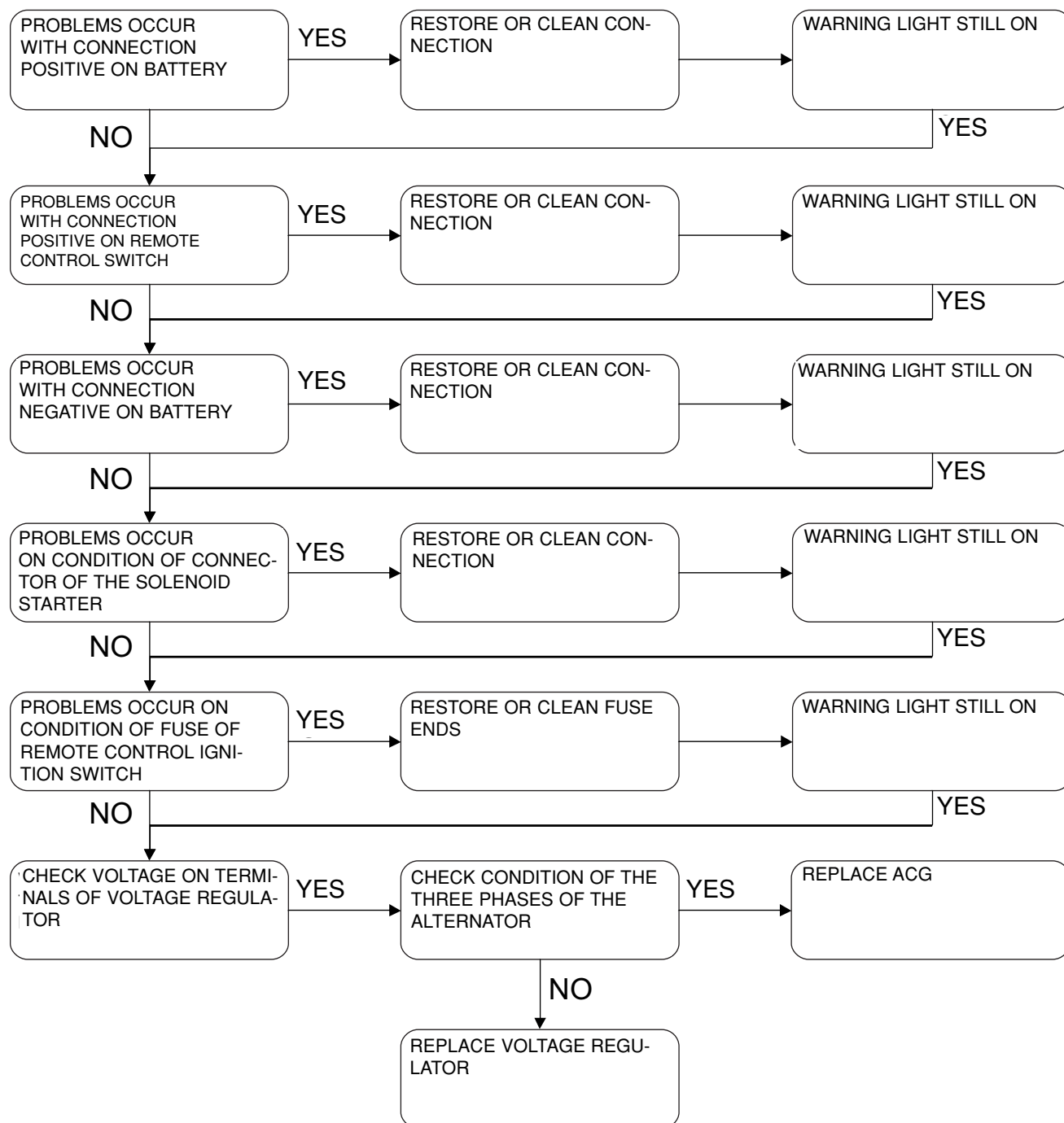
8. Tareg-Ireg CHARACTERISTIC DIAGRAM



※Heat radiation depends on the model and the ambient condition. So please check the temperature with actual vehicle and the condition.



A list of possible problems that could occur when the warning light is switched on.



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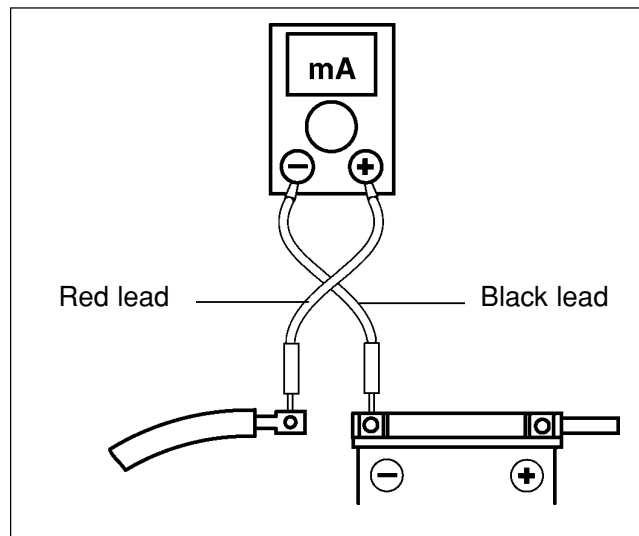
BATTERY EFFICIENCY CHECK

Battery current loss check

- Remove the seat as described in chapter C "Superstructures".
- Turn the ignition switch to the "OFF" position.
- Disconnect the cable from the negative (-) pole of the battery.
- Connect the multi-tester between the negative (-) terminal and the negative (-) cable of the battery.

Losses are indicated if the tester measures more than 2÷2.5mA.

Battery current loss: less than 1mA.



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First of all when using an ammeter, utilise a high range of the multi-tester because the current losses in the case of malfunctioning could be elevated

Do not turn the ignition switch to the ON position while measuring the current.

If losses are found, search for the part where the tester measures less than 2÷2.5mA by removing couplings and connectors one at a time.

Charge feed check

- Remove the seat as described in chapter C "Superstructures".
- Start the engine and let it idle.
- Make sure that between one of the two red ignition relay wires and the engine earth the voltage is greater than 12,8 V.





Electrical system

Measure the DC voltage between the positive (+) and the negative (-) terminals of the battery with a multi-tester. If the tester indicates less than 12.6V or more than 14.5V the cause will be found in the generator.

NOTE When carrying out this check, ensure that the battery is fully charged.

Feed charge

Standard: 13,5 - 14,5V at 2000 r.p.m.

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STARTER SYSTEM

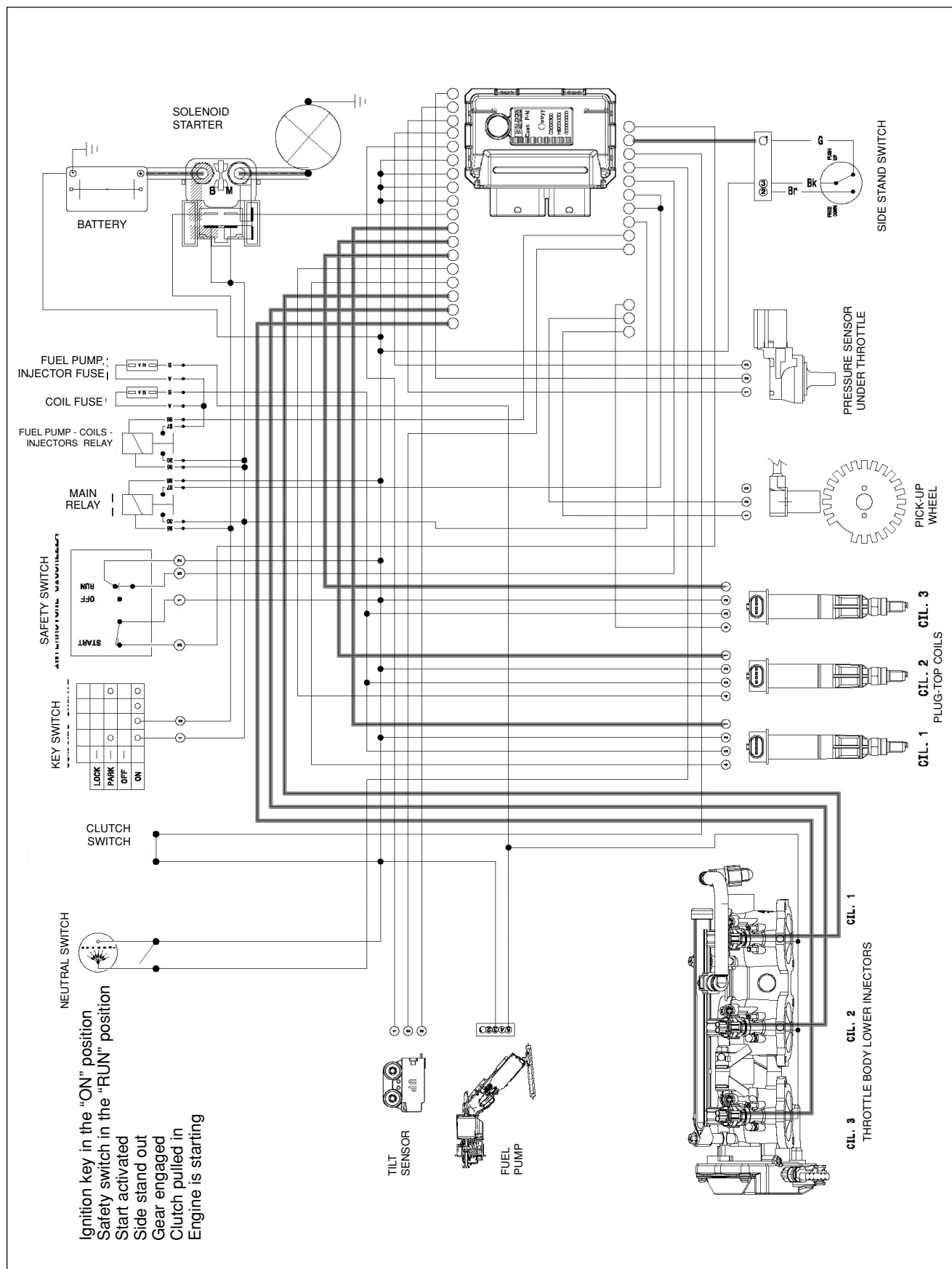
The diagram below represents the starter system.

START SWITCH	CLUTCH LEVER	GEAR POSITION	STAND POSITION
RUN	PULLED	NEUTRAL	UP
RUN	PULLED	NEUTRAL	DOWN
RUN	PULLED	ANY	UP





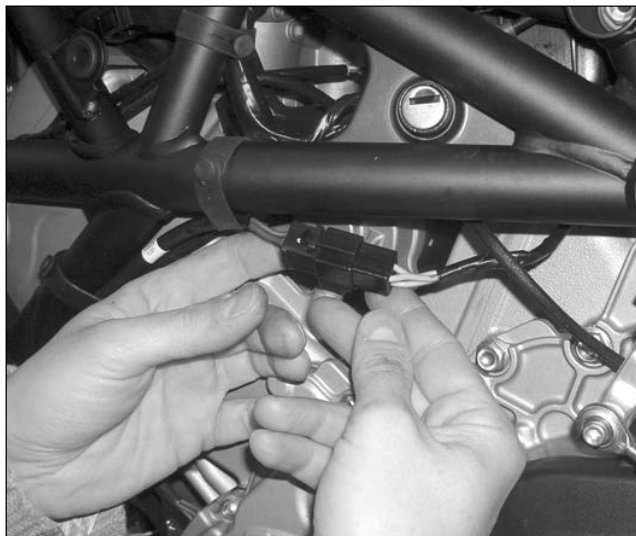
Electrical system



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CHECKING THE GENERATOR

- Disconnect the generator connector.



- Make sure that there is a resistance of 0.3 Ohm $\pm 10\%$ at 20°C between each of the contacts of the 3 pins (generator line).

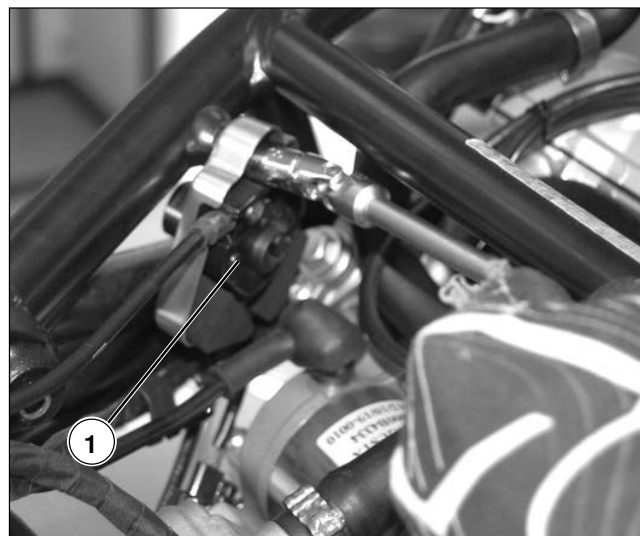


- Make sure that there is NO continuity between each of the 3 pins and the engine earth.



STARTER MOTOR REMOVAL

- Remove the fuel tank (see chapter C “Superstructures”).
- Remove the seat lock plate (1).
- Remove the blow-by tube.
- Disconnect the cable of the starter motor.



- Remove the two fixing screws (2) of the starter motor.



- Remove the motor by sliding it out from the ignition cover and taking it out from the battery compartment.

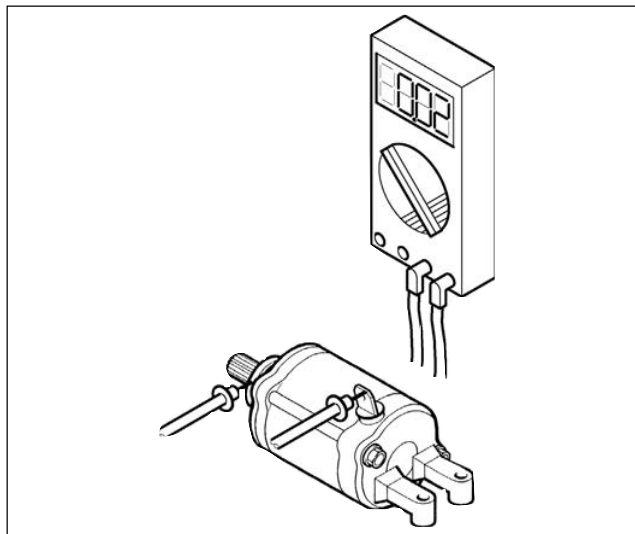




STARTER MOTOR CHECK

If a fault has been diagnosed in the starter motor, it is necessary to proceed as follows with the check:

- Connect a tester between earth and the starter motor terminal.
- Check that there is continuity between the positive pole and the engine earth. If there is no continuity, substitute the starter motor.



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STARTER MOTOR ASSEMBLY

Assemble the starter motor in the reverse order of removal. Pay attention to the following points:

 **Substitute the O-ring with a new one to avoid oil leakage and the ingress of humidity.**

- Apply grease to the oil seal lip.
- Apply a small quantity of MOLYKOTE to the rotor shaft.
- Apply a small quantity of LOCTITE 243 to the bolts of the starter motor.

STARTER RELAY CHECK

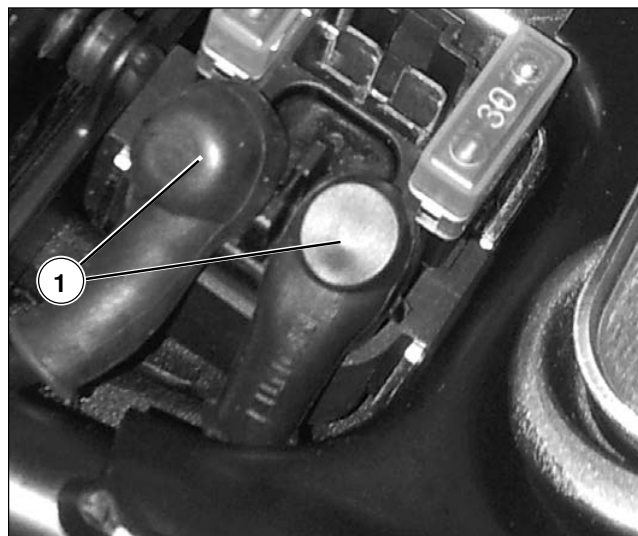
- Disconnect the start-up relay connector.





Electrical system

- Disconnect the cables (1) of the starter motor and the positive cable of the battery from the relay .



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Apply 12 volts to the terminals (1) and (2) of the relay and check the continuity between terminals B-M.



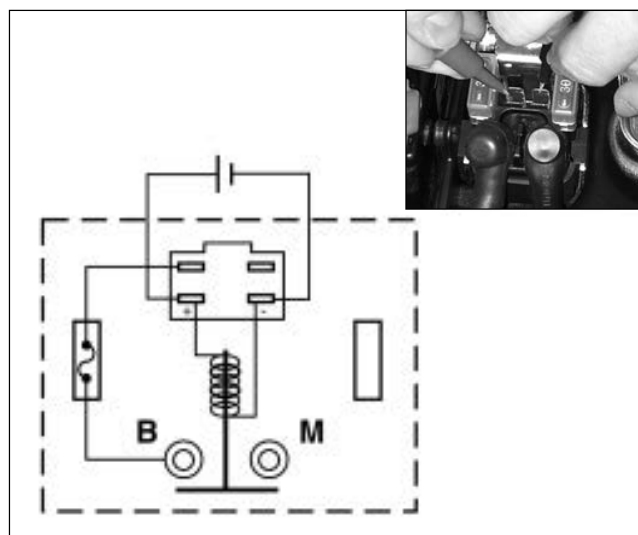
Do not apply the battery voltage to the starter relay for more than five seconds to avoid overheating and therefore damaging the winding.

- Using a multi-tester, check that the winding is on open circuit or if a resistance is present. The winding is in good condition if the value of the resistance revealed is as indicated.

Multi-tester dial indication: ohm Ω

Starter relay resistance

Standard: 5 Ohm $\pm 10\%$ 20°C



TILT SENSOR

The fall sensor (1) acts on the engine control unit, interrupting power when a vehicle tilt of more than $60^\circ \pm 10^\circ$ for more than 3 seconds.



GEARCHANGE POSITION SWITCH

The connector (1) of the gear position sensor is located on the left beneath the tank.

The check is made using the diagnostics instrument.



Whenever the instrument should detect an anomaly, with the key in ON that there is a voltage of 5 V between pins 1 and 3 on the plant side of the gear position sensor connector.

If the condition is met, the problem is originating from the sensor.



SIDE STAND SWITCH

The connector for the lateral stand switch is mounted on a support under the pinion wheel transmission casing on the left side of the motorcycle.

- Remove the left fairing.
- Disconnect the connector of the side stand switch and check continuity as described in the table:

	Green	Yellow/Black
ON (Raised)	○ — ○	○ — ○
OFF (Lowered)	○	○

After the tests described above, whenever it is necessary to replace the switch, proceed as indicated in chapter B Maintenance.





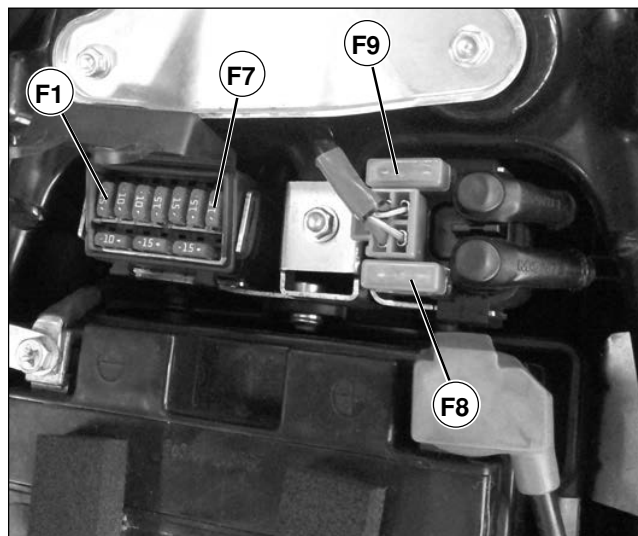
Electrical system

FUSES RIVALE 800

The fuses are found under the saddle in front of the battery compartment.

Lift the rubber cover.

The fuses for the services are numbered from 1 to 7 starting from the left; there are three spare fuses on the part underneath.



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To avoid damage to the electrical system, before changing a fuse, turn the ignition key to OFF.

Replace the burnt fuse with the provided tweezers and then close the cover back up.

To identify the position and function of the fuses, refer to the table.



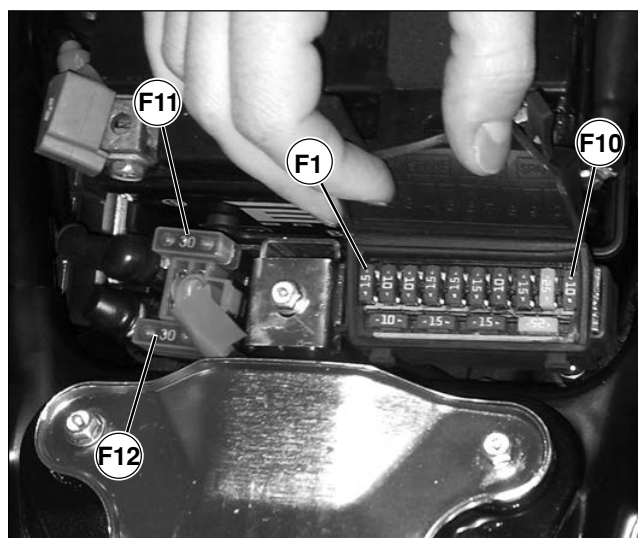
IMPORTANT! Be careful to restore the correct fuse amperage. Using an amperage that differs from the required one could damage the electrical parts of the vehicle causing a fire hazard.

Fuse	Amp. (A)	Application	Position
F1	15	Fuel pump - Coils	Fuse Box
F2	10	Lambda sensor - Injectors	Fuse Box
F3	10	Position lights - License plate light	Fuse Box
F4	15	High Beam/Low Beam	Fuse Box
F5	15	Solenoid Starter - Dashboard - Front speed sensor - Rear speed sensor - Lean angle sensor	Fuse Box
F6	15	Intermittence - Stop light - Horn - Diagnostics	Fuse Box
F7	15	Electric fan	Fuse Box
F8	30	Battery recharge	Solenoid starter
F9	30	Battery recharge supply	Solenoid starter

FUSE RIVALE 800 ABS

The fuses are found under the saddle in front of the battery compartment.

Remove the saddle.





Electrical system

The service fuses are numbered from 1 to 10 starting from the left the four reserve fuses are found in the underlying part.

The recharge fuse **F11** and the reserve fuse **F12** are found on the solenoid starter.

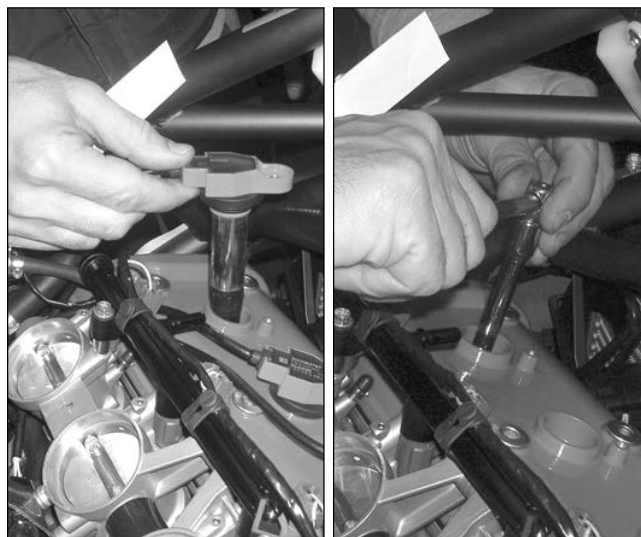
ABS version			
Fuse	Amp.(A)	Application	Position
F1	15	Fuel pump - Coils	Fuse Box
F2	10	Lambda sensor - Injectors	Fuse Box
F3	10	Position lights - License plate light	Fuse Box
F4	15	High Beam/Low Beam	Fuse Box
F5	15	Solenoid Starter - Dashboard - Front speed sensor - Rear speed sensor - Lean angle sensor	Fuse Box
F6	15	Intermittence - Stop light - Horn - Diagnostics	Fuse Box
F7	15	Electric fan	Fuse Box
F8	15	ABS module	Fuse Box
F9	25	ABS module	Fuse Box
F10	10	ABS module	Fuse Box
F11	30	Battery recharge	Solenoid starter
F12	30	Battery recharge supply	Solenoid starter

SPARK PLUGS

Remove the components of the motorcycle to remove the spark plugs as described in chapter B "Maintenance".



Remove the spark plugs utilising the appropriate 16mm hexagonal spark plug spanner.





Electrical system

Check the resistance between the electrode and the screw cap of the spark plug as shown in the figure.

Permitted resistance: $4,5 \div 5,5 \text{ K}\Omega$

Carry out the test on all the spark plugs.



Do not use non-resistive spark plugs.

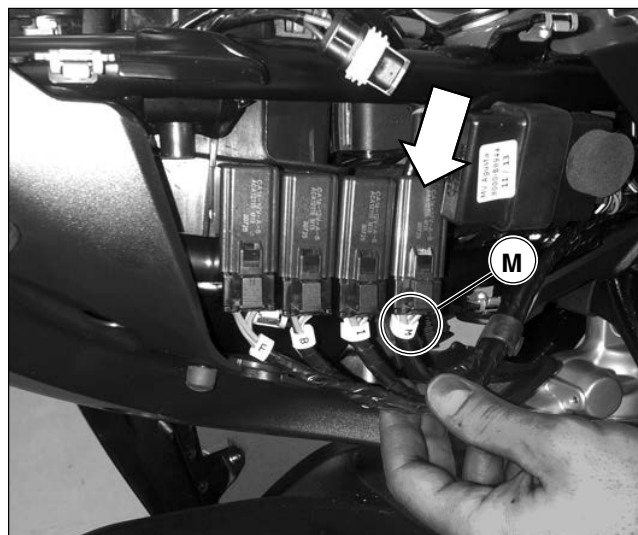


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MAIN RELAY

The main relay is under the right side panel.
The side panel must be removed in order to operate on the relay.

The main relay can be identified by a label with the letter "M".



Take the general relay out (**M**) from the connector and check that there is a resistance of $82 \text{ Ohm} \pm 10\%$ at 20°C between pins 1 and 3.



ENGINE PICK-UP

The engine pick-up is situated on the left side of the motorcycle. To check this component it is necessary to identify the relative connector positioned as shown in the figure, inside the frame on the left side of the motorcycle.



After having disconnected the pick-up connector, measure the resistance between the two points identified by a (+) and a (-) that are indicated on the connector.

Pick-up resistance value: ~ 680 – 700 Ω

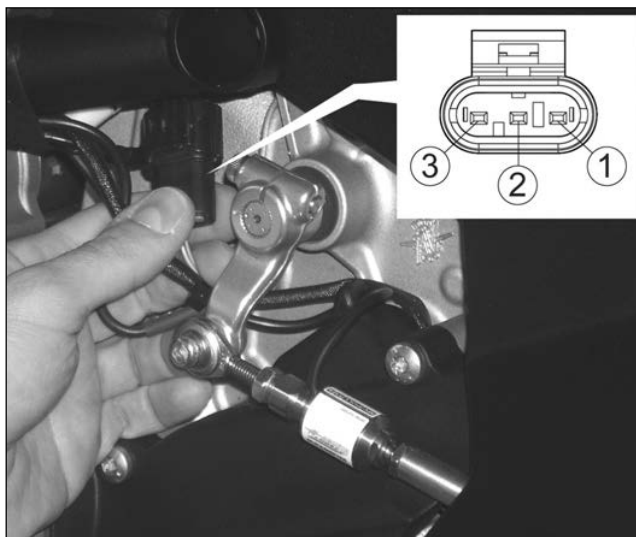


E.A.S. (electronically-assisted gear shift)

E.A.S. mode, which can be selected from the menu, is used to change gear without using the clutch and without closing the gas knob.

Installed on the gear change rod, this device detects the pressure exerted on the gear lever and sends the information to the ECU, which blocks the supply of electric current to the reels by lowering the torque value of the gear for the amount of time required to engage the next gear.

Remove the connector and check continuity between pins 2 and 3 through the pressure sensor (gear lever raised).

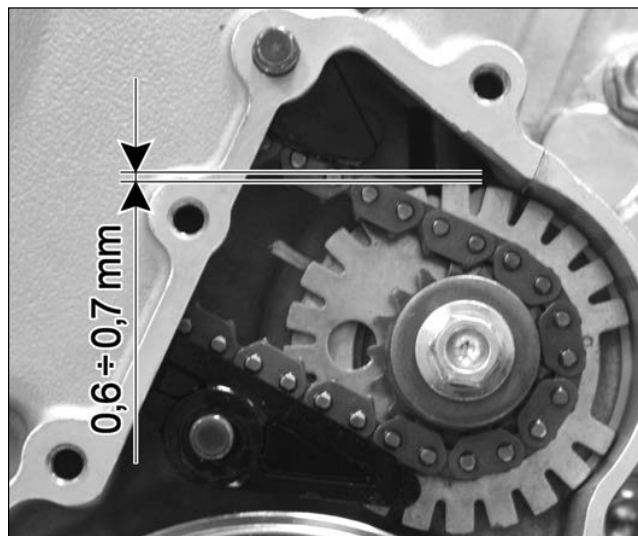


TIMING WHEEL GAP

To guarantee the correct functioning of the pick-up it is necessary to measure the gap between the pick-up and the timing wheel by utilising a feeler gauge as shown in the figure.

Gap width: 0.6 – 0.7 mm

To carry out this check it is necessary to remove the cover of the timing wheel by consulting the Workshop Engine Manual.



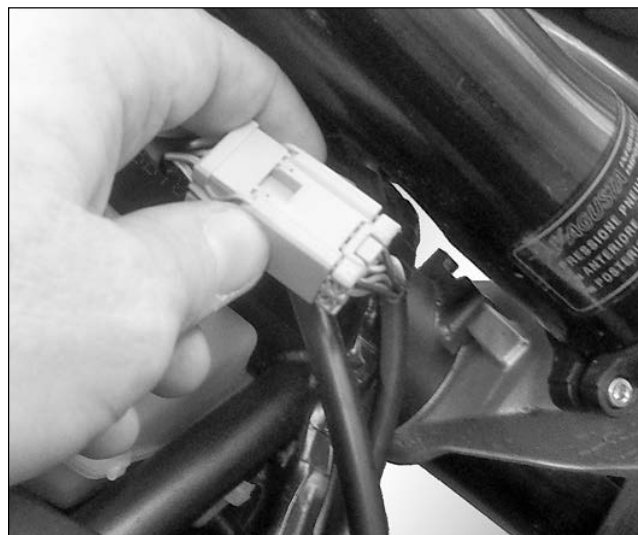
E

RUN OFF SAFETY SWITCH

The “RUN OFF” switch (1) is located on the right controls.



Remove the relative connector to the right hand control group as indicated in the figure.





Electrical system

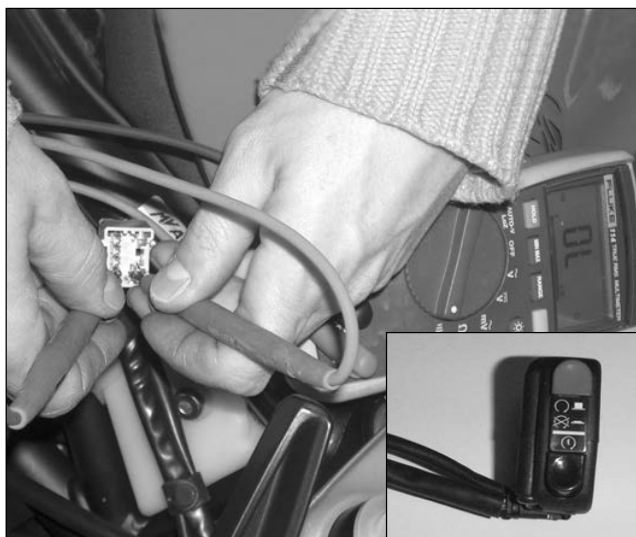
Remove the connector holding device.



E

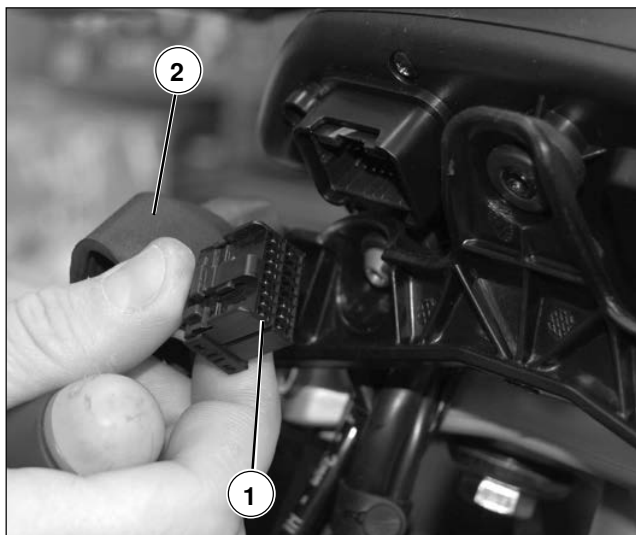
With the switch in the RUN position make sure there is continuity between the Y/R (yellow/red) and Y/W (yellow/white) wires.

Holding the START button down, make sure there is continuity between the Y (yellow) and W/R (white/red) wires.



INSTRUMENTATION

If faults are found in the instrumentation, it is necessary to check the main wiring and the various components assisted by the same instrumentation. To carry out the various checks after having removed the headlamp and the dashboard as described in chapter C “Superstructures”, it is necessary to remove the rubber cap (1) and then the connector (2) situated behind the instrumentation.



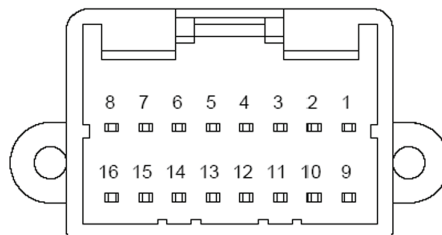


Electrical system

Consult the diagram below to identify the contacts of the various components:

1	Supply	9	Turning led
2	Gnd	10	Oil pressure
3	+ CAN	11	Ignition key
4	- CAN	12	-
5	SET SWITCH	13	-
6	High beam	14	-
7	Fuel warning led	15	-
8	-	16	OK SWITCH

16 pin AMP 174975-2



E

OIL PRESSURE SENSOR

To check the good functioning of this component with the engine switched off, it is necessary to find the continuity between the contact of the sensor and the earth of the motorcycle as shown in the figure.

With the engine switched on, the contact must be interrupted.



FUEL LEVEL WARNING LIGHT CHECK SWITCH

After having checked the breakdown of the fuel reserve warning light, check that there is continuity between terminal 4 of the tank flange and terminal 7 of the dashboard.





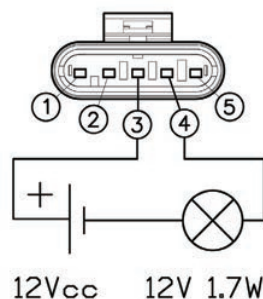
Electrical system

Having ascertained the good condition of the fuses in question, proceed as follows:

With the fuel tank removed from the motorcycle and empty of fuel, connect a small circuit composed of 12V battery and a light bulb of 12V – 1.7W to the connector of the fuel level indicator as shown in the diagram.

If the switch is in a good condition, the light bulb should light up after several seconds.

Pour some fuel into the fuel tank and confirm that the light bulb switches off after having poured more fuel into the tank than the maximum required for the reserve



E

WATER SENSOR

Verify sensor operation by measuring resistance between the pin by means of a tester.

$U_b = 5 \text{ V} \pm 10 \%$

$R_v = 2000 \text{ Ohm} \pm 1 \%$

TEMP. °C	RESIST. Ω	TEMP. °C	RESIST. Ω
-40	104442,9	60	703,8
-35	74642,1	65	589,9
-30	53932,5	70	496,7
-25	39383,0	75	420,1
-20	29050,7	80	356,9
-15	21637,5	85	304,4
-10	16266,4	90	260,7
-5	12338,0	95	224,1
0	9439,2	100	193,3
5	7281,6	105	167,6
10	5661,8	110	145,6
15	4436,0	115	127,0
20	3501,9	120	111,1
25	2806,8	125	97,5
30	2264,5	130	85,9
35	1837,7	135	75,8
40	1500,7	140	67,1
45	1231,7	145	59,6
50	1016,9	150	53,1
55	843,9		





Electrical system

KEY SWITCH

Whenever the dashboard, with the switch on the ON position, is not powered, first check the conditions of the fuse located on the starter relay and, if this should be in good condition, check the conditions of the fuse located in position 5 on the fuse box.

Check these two conditions, if the fault persists perform the continuity test according to the following table:

Key Position	Cables colour			
	R	G\W	Br\W	Br\Bk
ON	O — O			
			O — O	
OFF e PARK	O	O		
			O	O



TURN INDICATORS

If the blinker warning lights do not work, continuity must be checked on the cable R-B between terminal 7 of the switch connector and terminal 9 of the dashboard connector.

Check continuity between the G (green) - Bk/W (black/white) wires for the Lh indicator and between the G (green) - Y/W (yellow/white) wires for the Rh indicator



R.P.M. SENSOR

Engine rev information on the dashboard arrives by means of a CAN line; therefore, if this information is not displayed and the message CAN ERROR appears on the dashboard, the problem can be attributed to the dashboard.



Electrical system

SPEED SENSOR

Whenever the speed is not indicated on the dashboard and the message SPEED SENSOR appears, proceed as follows:



E

RIVALE 800

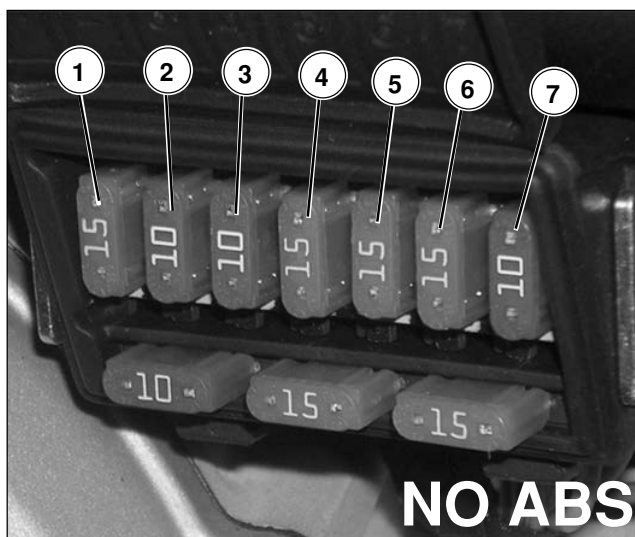
- Check the conditions of the fuse in position **5** on the fuse box.

RIVALE 800 ABS

- The vehicles with ABS are checked using the diagnostics tool.

If the fuse in question is in good condition, proceed with the check of the speed sensor as follows:

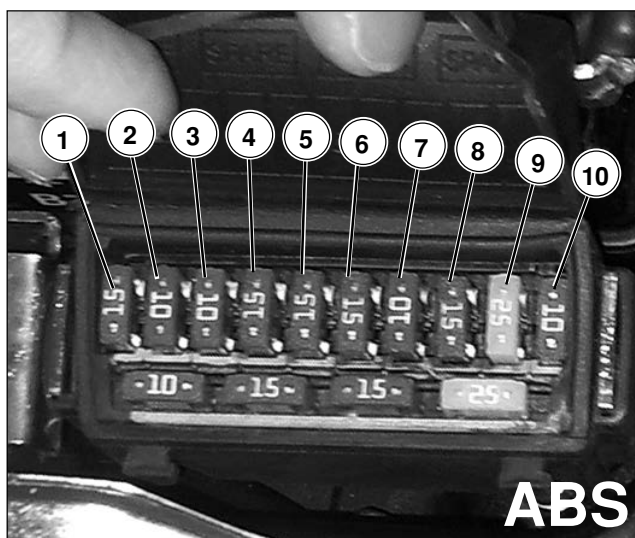
Keeping the sensor connected to the system and with the key ON, use a Tester to make sure that when the sensor is placed in front of a tooth of the phonic wheel, between terminal **3** and terminal **2** of the connector, that the voltage is close to zero, whilst when it is not placed in front of one of the nuts, the voltage is close to that of the battery.



DIPPING BEAM

In the event that the dipping beam does not work, check the conditions of fuse **4** on the fuse box. If this fuse is ok, check the conditions of the relay situated on the left side of the motorcycle, with the label "B".

If this condition is also met, check the continuity of the R/B cable, which goes from relay "B" to terminal **C3** of the motor control unit vehicle connector.





Electrical system

HIGH BEAM HEADLIGHT

In the event that the driving beam does not work, check the conditions of fuse 4.



E

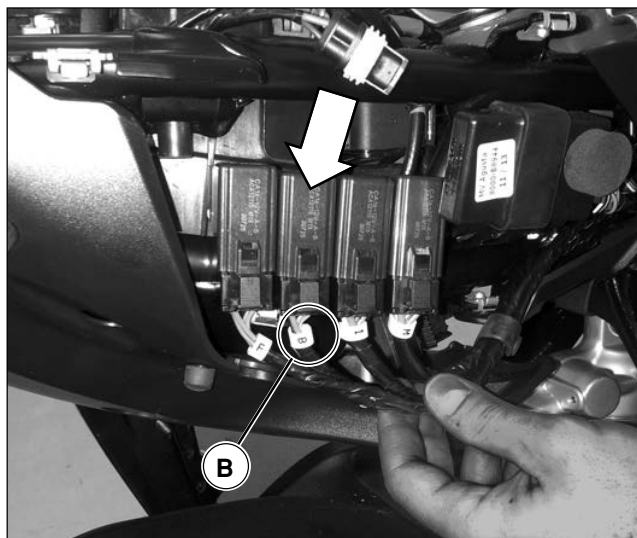
If the fuse is ok, check the continuity of the left handlebar control connector between positions between the Y\B (yellow/blue) and the Y (yellow) wires with the driving beam function selected.



If this is also ok, the problem can be attributed to the headlight unit.



After having checked the bulbs of the headlight, the relative fuses and the controls as described herewith, proceed with checks of the relay **B** under the right side panel of the motorcycle.

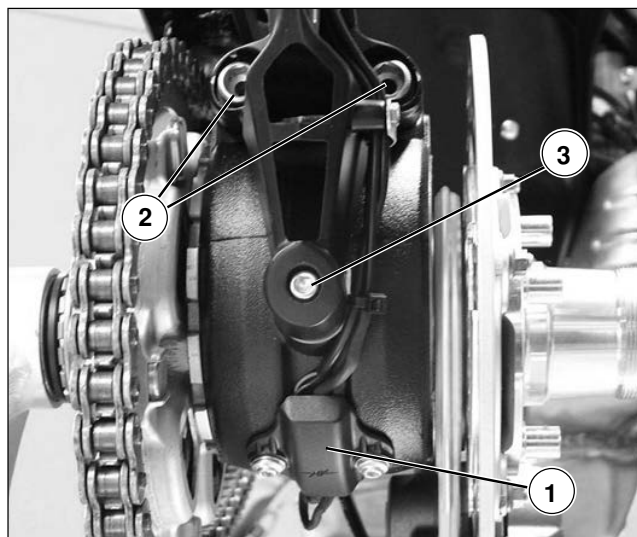


E

LICENCE PLATE LIGHT

If the number plate light does not work, check the integrity of fuse **3** in the fuse box; if these are ok, replace the bulb.

- The number plate carrier must be removed to operate easily.
Remove the two screws from the cover (**1**) and disconnect the indicator and number plate lighting cables. Remove the screws (**2**) and (**3**) and remove the number plate carrier.



- Remove the fixing devices and slide the number plate carrier out from the supports.





Electrical system

- Remove the two fixing screws and the number plate bulb that is to be replaced.

Re-assemble operating in reverse order with respect to disassembly.



E

REAR TAIL LIGHTS AND BRAKE LIGHTS

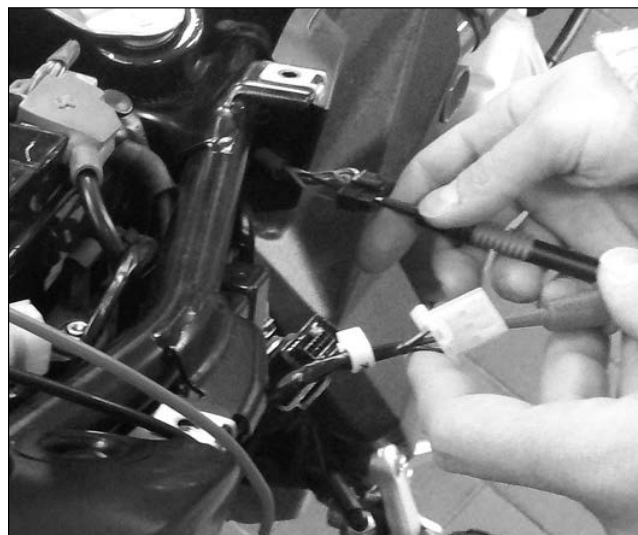
The stop lights are controlled by the stop lights control unit positioned under the right side panel every time the key in the ignition block is put in the **ON** position. Any anomaly is indicated on the instrument with the wording "TAIL LIGHTS".

In the event that tail lights and brake lights do not work, check the conditions of fuse 3.



If the condition is met, check the side and stop lights control unit connector positioned under the right side panel.

Remove the side and stop lights control unit connector and, with the key in the ON position, check that there is battery voltage between pins 6 and 12 and between 6 and 5. Check the continuity between the pins 6 and 4 of the connector.





Electrical system

Now check the continuity between the Green/Black cable of the right lights connector and the Green/Black cable of the control unit connector. Operate in the same way on the left side between the Pink/Blue cable of the lights connector and the Pink/Blue cable of the control unit connector. If these conditions should also occur, the problem originates from the light units.



E

To replace the side and stop lights, remove the three screws (1) inside the side panel.



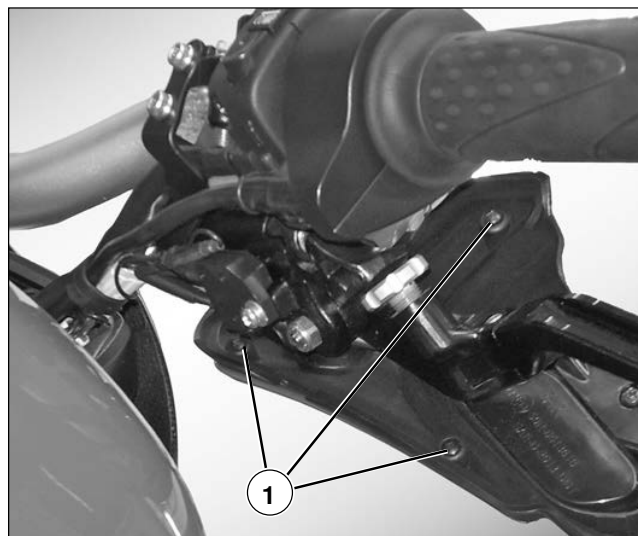
FRONT TURN INDICATORS INDICATOR AND SIDE LIGHTS

In the event that turn indicators do not work, check the conditions of fuse 6 on the fuse box.

If the condition is met, check the intermittence control unit connector positioned under the right side panel. Remove the intermittence control unit connector and, with the key in **ON** position, check that there is battery voltage between pins 6 and 12 and between 6 and 5. Now, holding the left indicator command, check the continuity between pins 6 and 3; operate in the same way on pins 6 and 2 with the right indicator command. If the condition is also met, the problem originates from the indicators.

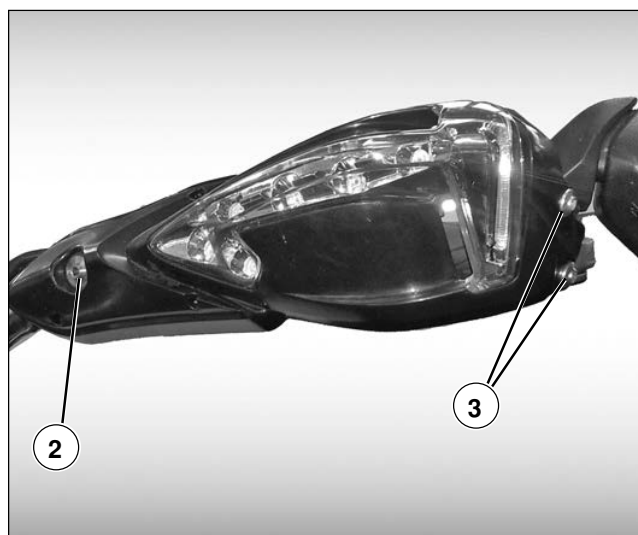


Remove the protection by operating on the three screws (1).



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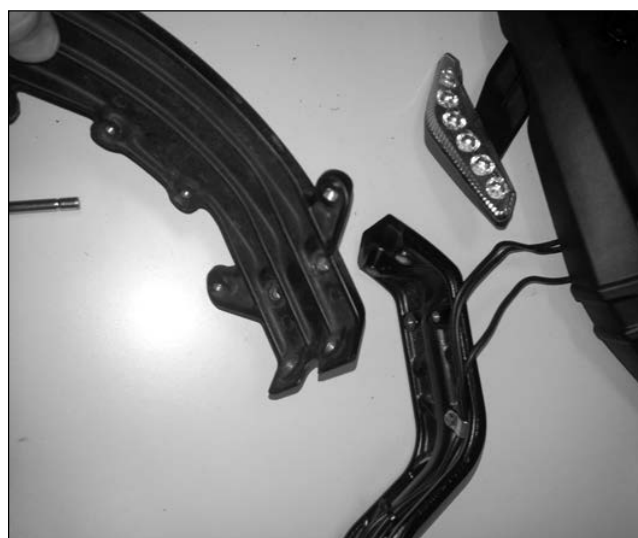
Remove the indicator by operating on the screw (2) and on the two screws (3).



REAR TURN INDICATOR LIGHTS

If they do not work, the controls to be performed are identical to those of the front indicators.

If an indicator must be replaced, remove the licence plate carrier as indicated in page 35 for removal of the number plate light and release the indicator cable by removing the number plate carrier fixing brackets.

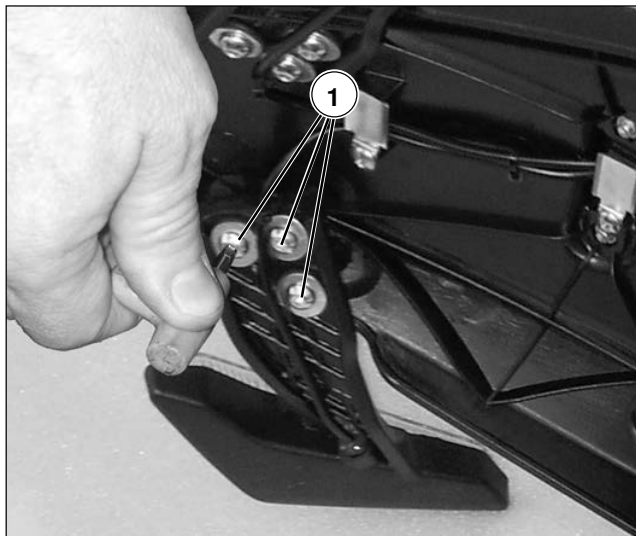




Electrical system

Remove the three screws (1) proceed with the replacement of the turn signal.

Re-assemble operating in reverse order with respect to disassembly.



E

COOLING FAN SYSTEM

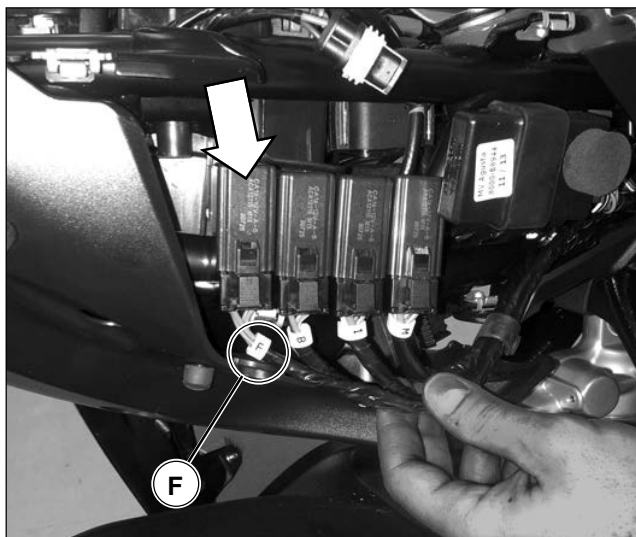
If there is a fault in the functioning of the cooling fan, proceed with the following check:

- Check the condition of fuse 7;



- If the fuse is in good condition, check the cooling fan relay mounted on the right side of the battery compartment, marked with the letter "F".

If the relay is in good condition but is not energised aboard the vehicle, check the temperature sensor, located on the radiator.



HORN

A fault in the horn system should be checked at various points:

- Check the condition of fuse **6** in the fuse box.
- If the fuse is in good condition, disconnect the connector of the left control and check the continuity between contact **3-4** of the control with the horn button pressed as in the following page under "Switches".
- Check the continuity of the winding of the horn.



E

ECU DISASSEMBLY

To carry out this operation it is necessary to disconnect the battery cables. Take the ECU out of its housing and remove the engine connector first (red, right side) pressing the hook and turning the safety bracket. Repeat this operation on the vehicle connector (blue, left side).

To re-install it perform the disassembly steps in reverse order.



ENGINE CONTROL UNIT REPLACEMENT/ PROGRAMMING

When replacing the engine control unit, after the assembling of the new control unit it is necessary to perform the engine mapping introduction procedure. This operation must be performed by using the diagnosis software (see page D-14) and following the instructions enclosed with the new control unit.



REPLACEMENT OF THE ABS UNIT (Present only on model Rivale ABS)

When replacing the ABS unit, it is necessary to perform the operations described as follows.

- Remove the following components as described in chapters C - "Superstructures" and G - "Frame":
 - Saddle
 - Fuel tank side panels
 - Number carrier side panels
 - Fuel tank
 - Passenger footrests supports
 - Battery
 - Engine control unit
 - Battery support
- Place a clean cloth under the ABS system pipes in order to preserve the surrounding components from brake fluid leaks during the following disassembling operations.

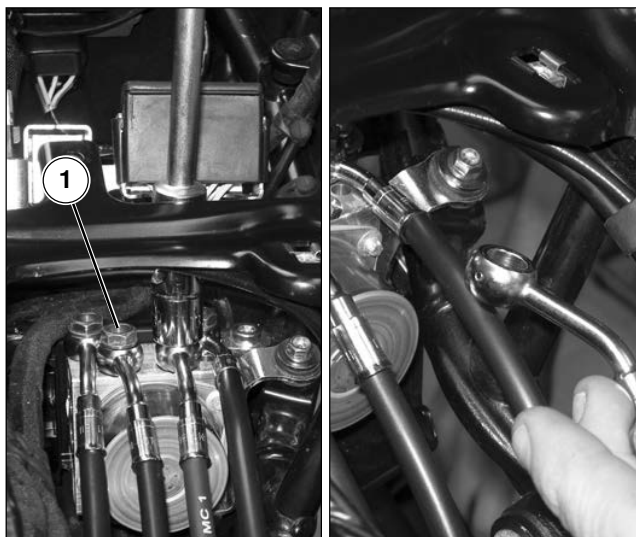
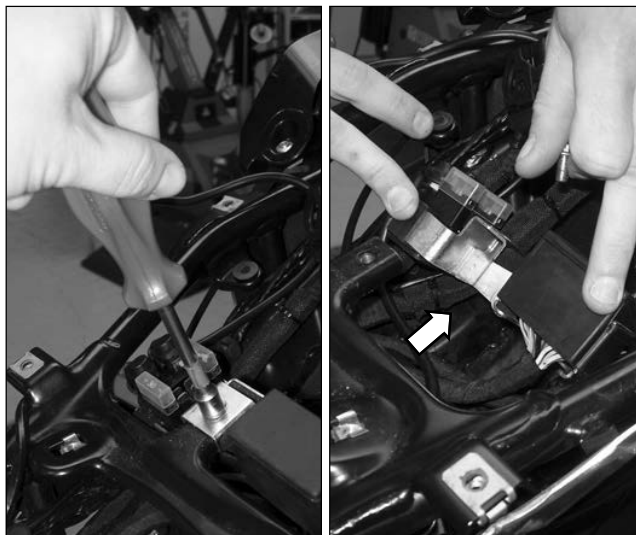


Brake fluid has a strong corrosive power. Be careful not to spill the fluid on surrounding parts. If the fluid is spilt, clean immediately with industrial alcohol and dry with compressed air.

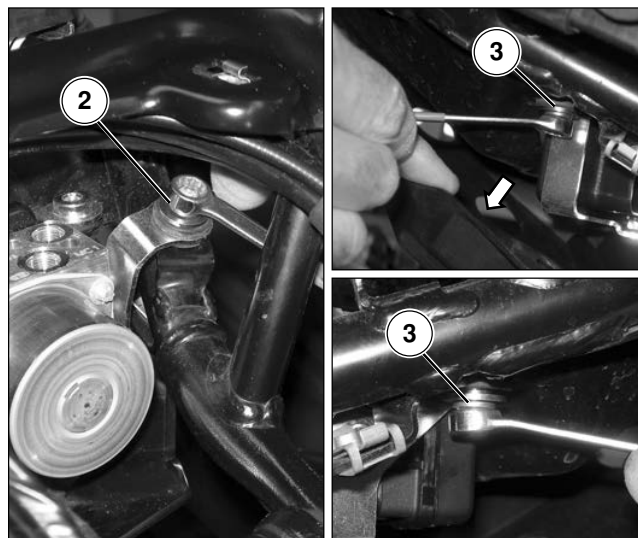
- Remove the fixing screw of the electrical devices support.
- Remove the support complete with solenoid starter and fuse box by displacing it towards the rear side of the motorcycle.
- Remove the four screws (1) fixing the brake pipes to the ABS unit.
- Remove the brake pipes unions, being careful not to spill brake fluid on the surrounding parts.



E



- Remove the upper fixing screw (2) of the ABS unit support.
- Lower the front part of the undersaddle fairing and remove the two fixing screws (3) of the ABS unit support.



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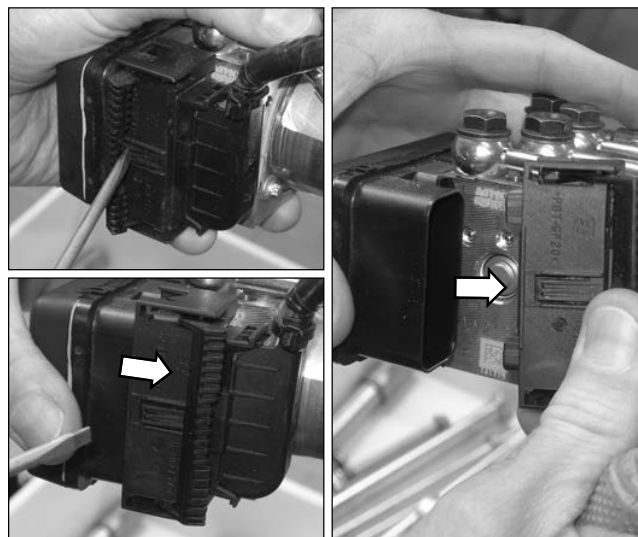
- Lean the electric devices support over the rear frame and extract the ABS unit with its support, by pulling it towards the rear side of the motorcycle.



Before removing the ABS unit from the motorcycle, detach the connector by performing the following operations:

- Unfasten the connector lock with a screwdriver.
- Rotate the blocking lever of the connector.
- Detach the connector from the ABS unit.

It is now possible to remove the ABS unit from the motorcycle.



- Remove the two screws (4) fixing the ABS unit to its support.
- Remove the ABS unit.
- Assemble the new ABS unit on the support.
- Insert the two fixing screws of the ABS unit and tighten them to the prescribed torque.



ABS unit fixing screws (4) tightening torque:
8 ÷ 10 N·m



- Insert the connector to the ABS unit and rotate the blocking lever.
- Place the ABS unit with its support on the motorcycle.
- Insert the three fixing screws of the ABS unit support and tighten them by hand.

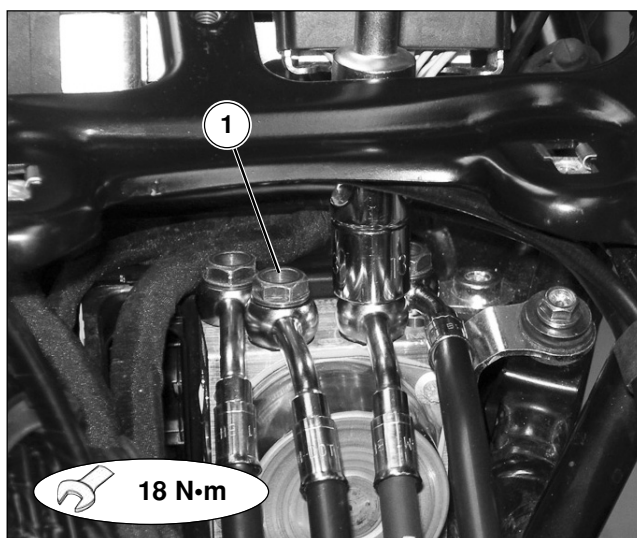


- Insert the four screws (1) fixing the brake pipes unions to the ABS unit and tighten them at the prescribed torque.



Brake pipes unions screws tightening torque (1): 18 N·m

- Execute the bleeding of the front and rear braking system as described in chapter H - "Brakes".





Electrical system

ABS unit activation

Once the assembling operations have been completed, it is necessary to perform the activation procedure of the new ABS unit by using the TEXA diagnosis software as described below.

- Start from the “Self-diagnosis” display, then press the button shown in the picture to enter the “Adjustments” mode.

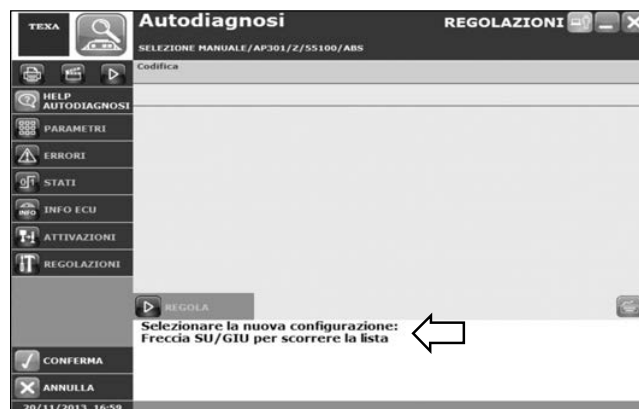


E

- Press the “Codification” button in the upper portion of the display; with this command, it is possible to assign the identification number to the ABS unit.
- In the lower portion of the display, it is shown the current configuration sent by the ECU.



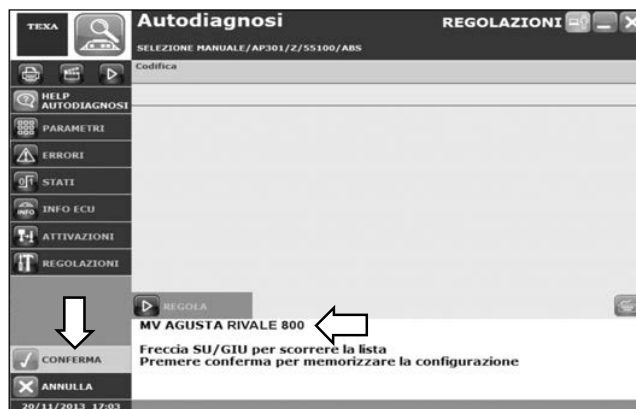
- Use the button “Arrow UP/DOWN” to view the list of the possible configurations.



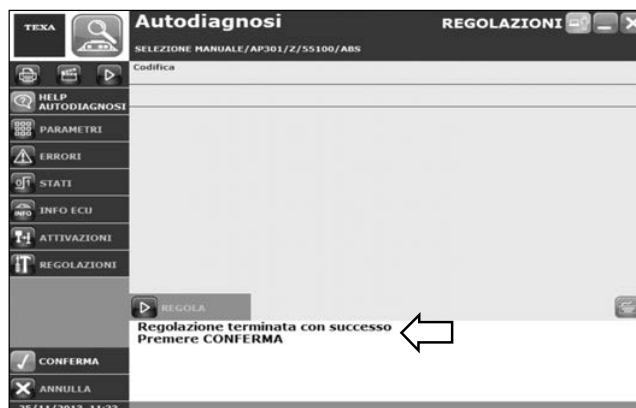


Electrical system

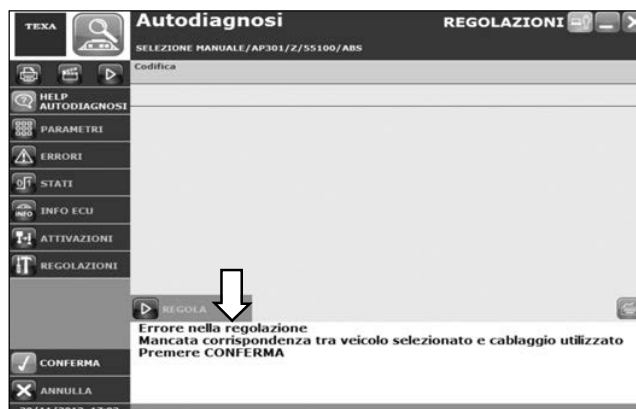
- Once you have identified the model of the vehicle, press the “CONFIRM” button in order to proceed with the activation of the ABS unit.



- If you selected the correct vehicle model, when the activation procedure has been completed, a confirmation message appears in the lower portion of the display.
- In this case, press the “CONFIRM” button in order to exit the “Adjustment” mode.



- If you selected the wrong vehicle model, when the activation procedure has been completed, a warning message appears in the lower portion of the display.
- In this case, press the “CONFIRM” button to repeat the activation procedure. Select the correct vehicle model and perform again the previously described operations until you receive the confirmation of the activation of the ABS unit.





Electrical system

SWITCHES

Check the continuity of each switch with a tester. If there is any anomaly, substitute the respective switch unit with a new one.

R.H. switch

START SWITCH		
WIRE COLOUR POSITION	W/R	Y
FREE	☐	☐
PUSH	☐	☐

ENGINE STOP SWITCH		
WIRE COLOUR POSITION	Y/W	Y/R
KILL	☐	☐
RUN	☐	☐

L.H. switch

BLINKER SWITCH			
WIRE COLOUR POSITION	Bk/W	G	Y/W
N	☐	☐	☐
LEFT	☐	☐	☐
RIGHT	☐	☐	☐

HORN SWITCH		
WIRE COLOUR POSITION	Gy	W
FREE	☐	☐
PUSH	☐	☐

PASSING SWITCH		
WIRE COLOUR POSITION	Y	Y/B
OFF	☐	☐
ON	☐	☐

DIPPER SWITCH			
WIRE COLOUR POSITION	W/R	Y/B	Y
LOW	☐	☐	☐
HI	☐	☐	☐

(JST 3P CONNECTOR)

MODE SWITCH			
WIRE COLOUR POSITION	P/Br	W	Y/Br
OK	☐	☐	☐
SET	☐	☐	☐



Electrical system

POSITIONING OF ELECTRICAL SYSTEM WIRE CLAMPS RIVALE 800

LIST OF FASTENING CLAMPS FOR RIVALE 800 ELECTRICAL SYSTEM CABLES

Code	Qty.	Length	Name
800092248	12	L = 82 mm	Rubber clamp L 82
800092247	11 *	L = 62 mm	Rubber clamp L 62
800053724	18	L = 39 mm	Rubber clamp L 39
800092668	7	L = 25 mm	Rubber clamp L 25
800092661	16	L = 92 mm	Plastic clamp for cables
800056783	3	L = 142 mm	Plastic clamp for cables
800056444	6	L = 188 mm	Plastic clamp for cables

(*) Add q.ty 1 clamp Cod. 800092247 - L = 62 for wire harness up to Rev. B

To correctly position the electric wiring on the motorcycle, first position the initial node of the wiring in correspondence with the fixed right plate of the frame, as shown in fig. 01.

For the position of the clamps for fastening electrical system Rivale 800 cables, refer to the layout shown below (see figs. 02-35).

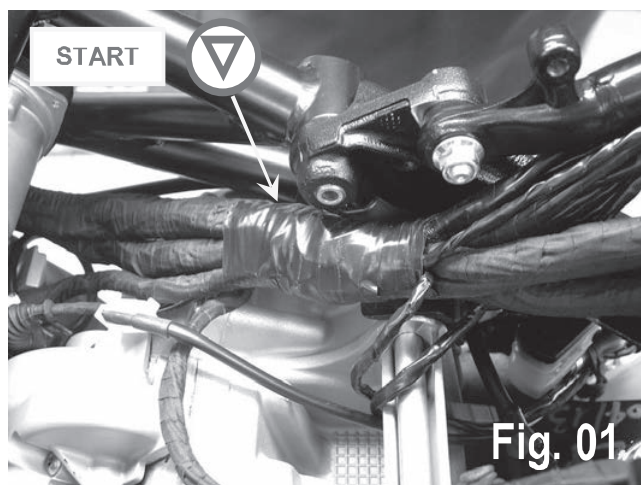


Fig. 01

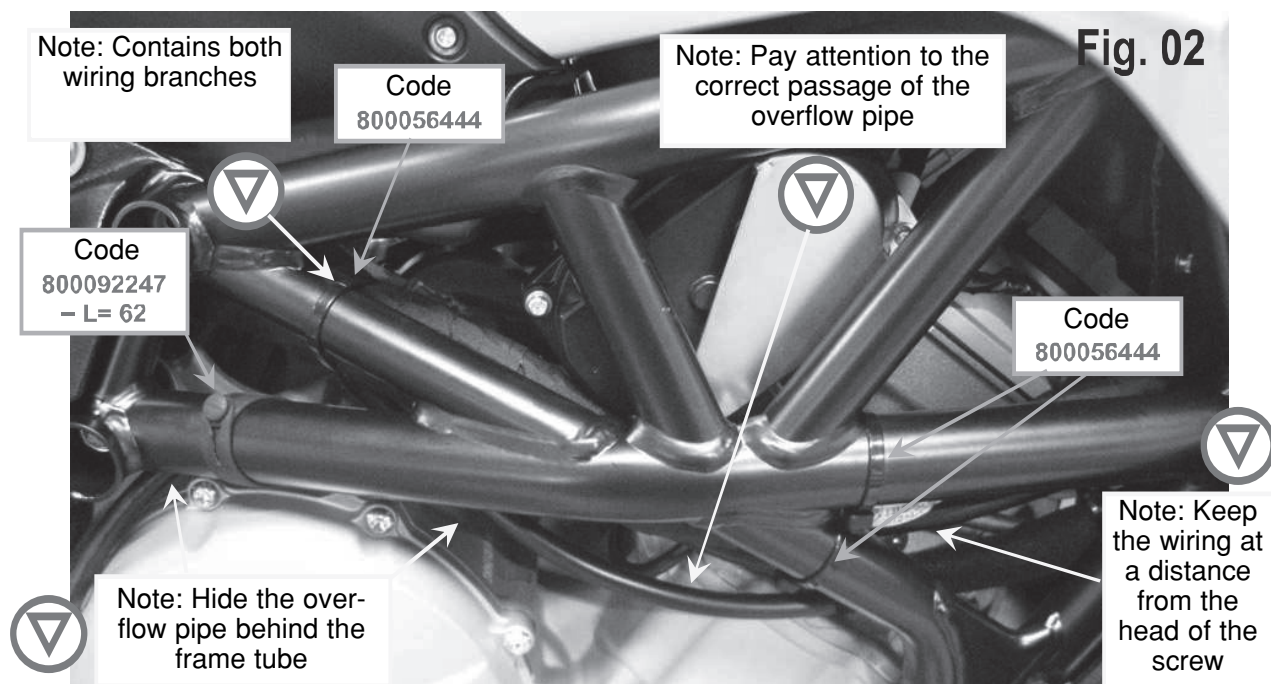
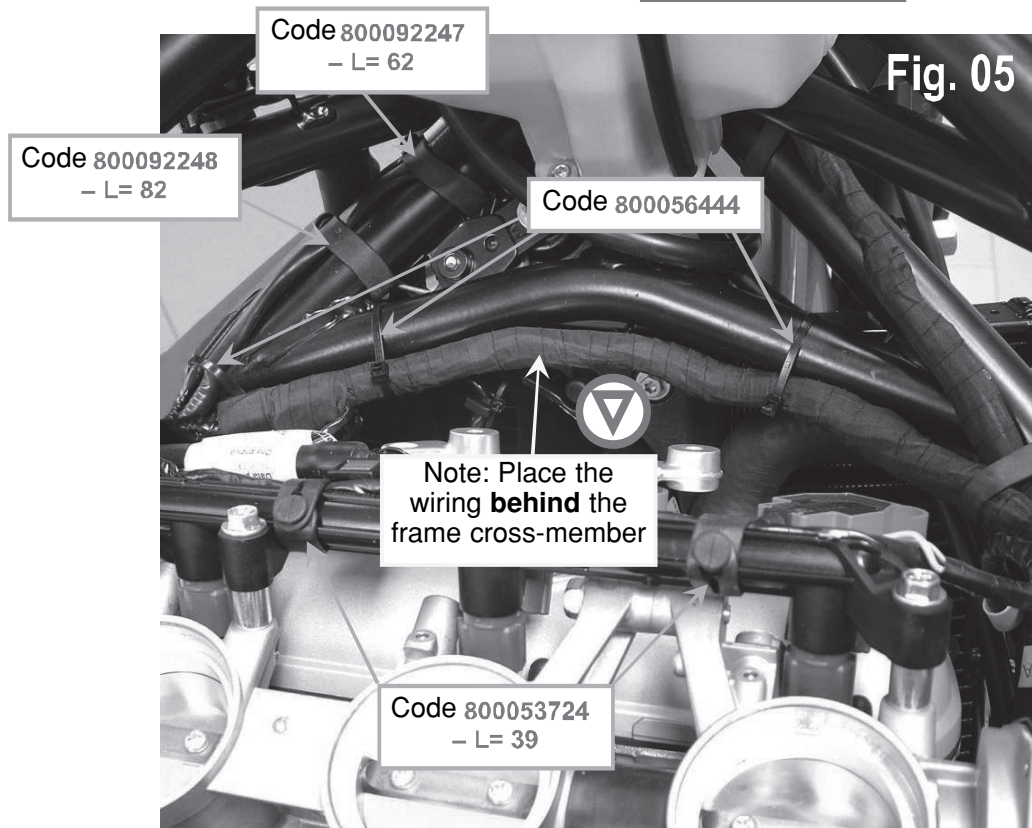
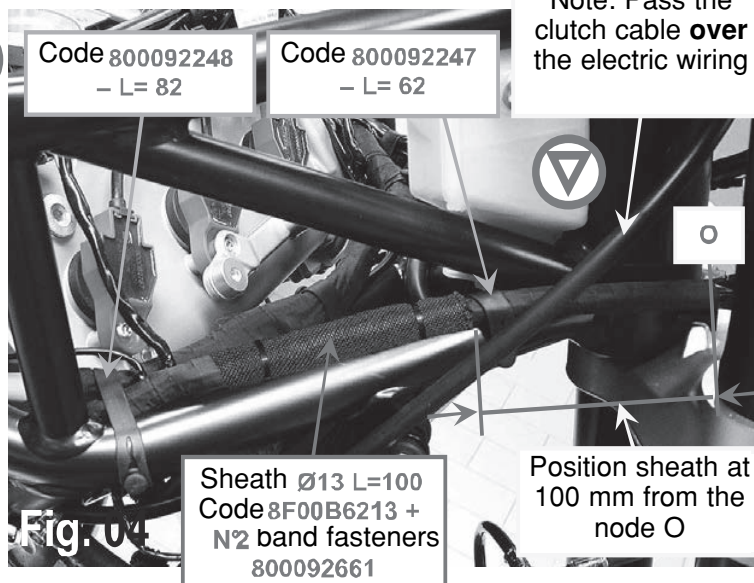
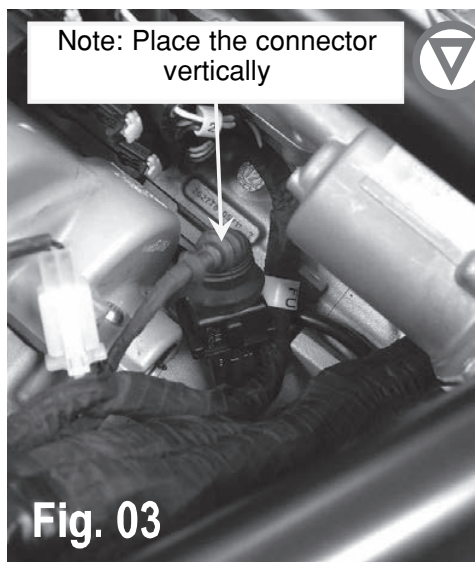


Fig. 02

E



Note: attention to the correct passage of the On/Off cable

Code 800092247
– L= 62

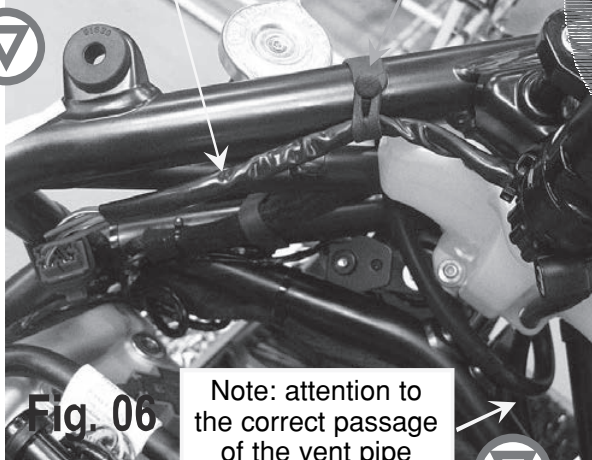


Fig. 06

Note: attention to the correct passage of the vent pipe

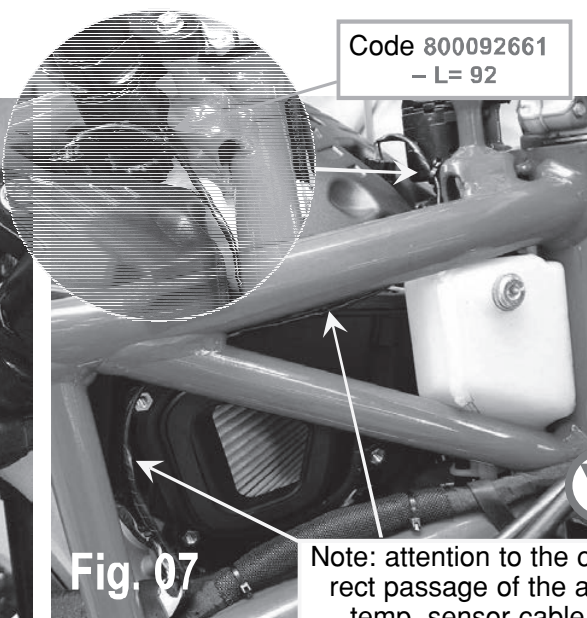


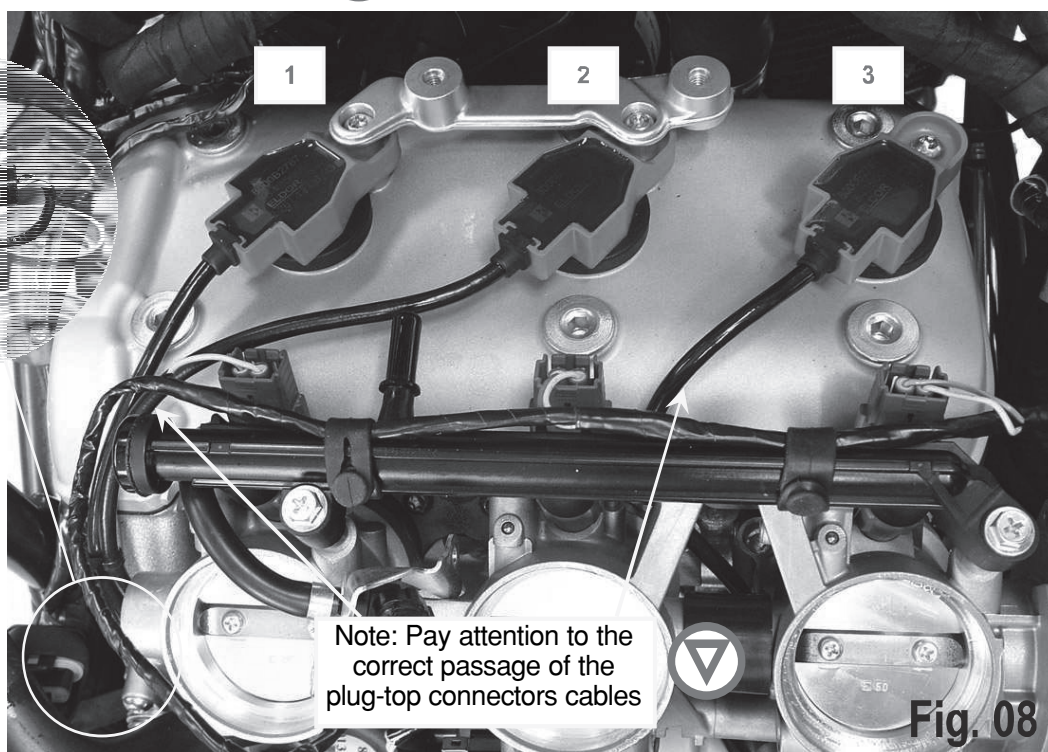
Fig. 07

Note: attention to the correct passage of the air temp. sensor cable

Code 800092661
– L= 92



Code 800092661
– L= 92



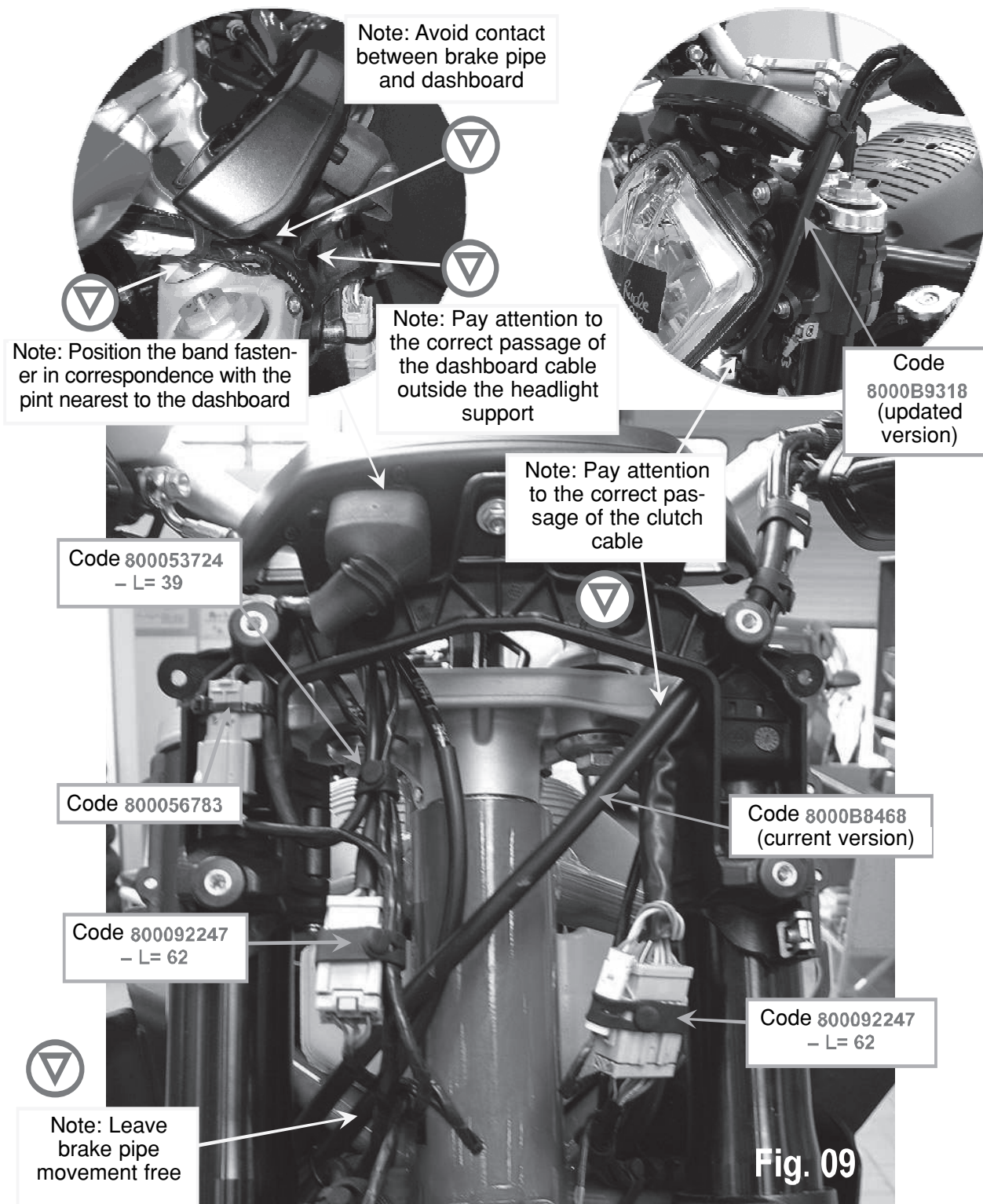
Note: Pay attention to the correct passage of the plug-top connectors cables

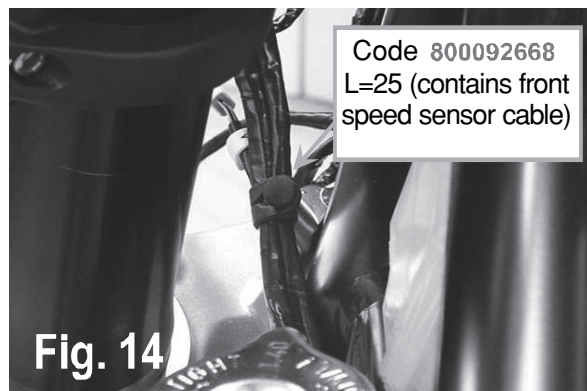
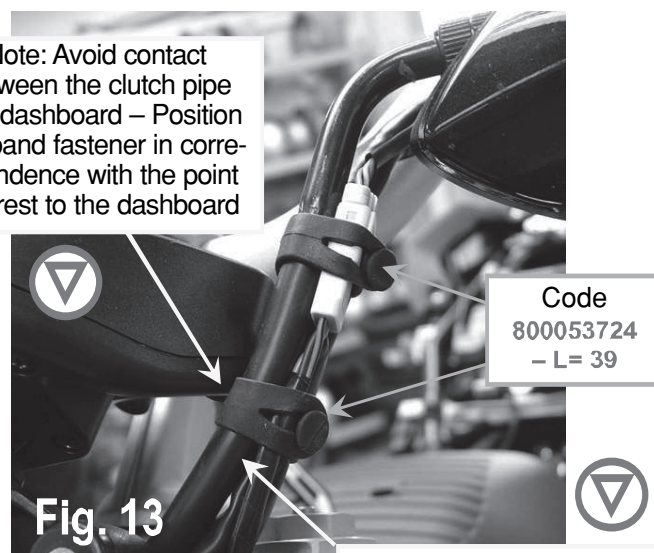
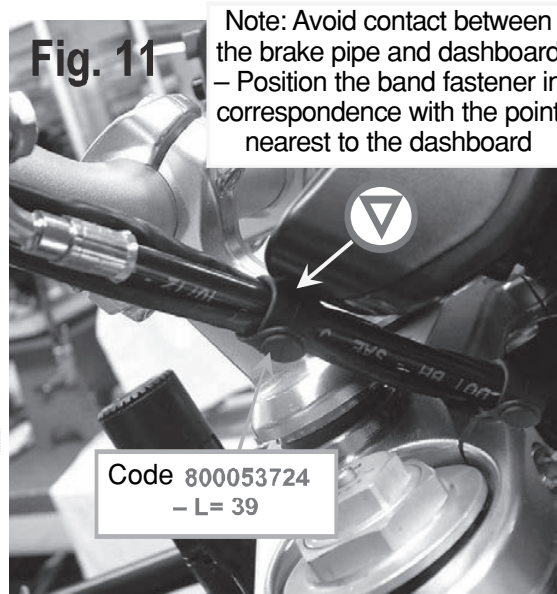
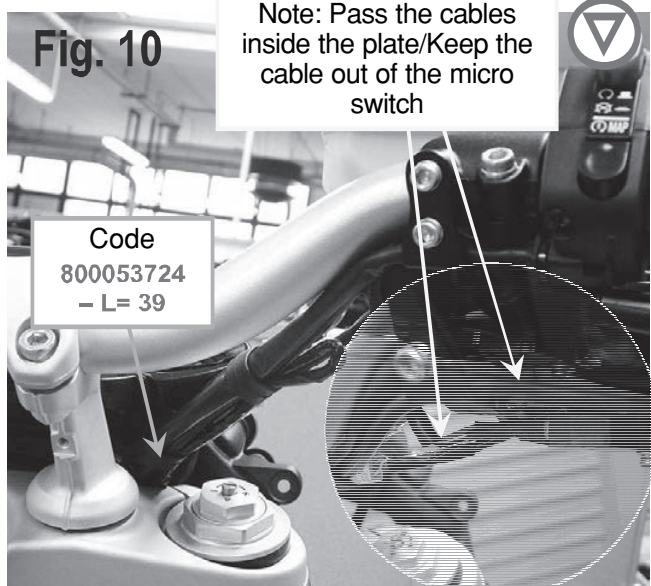


Fig. 08

E

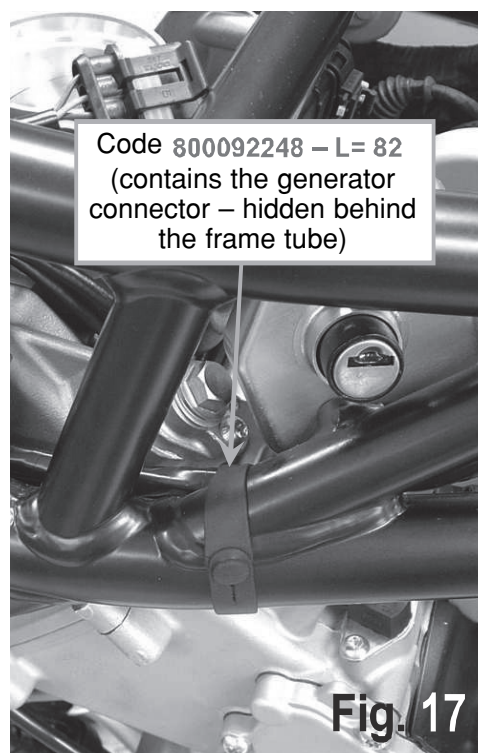
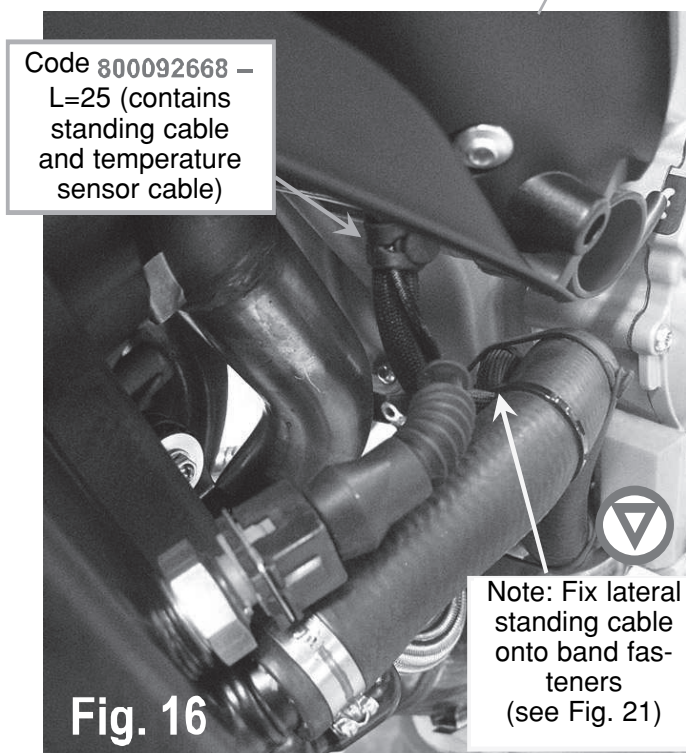
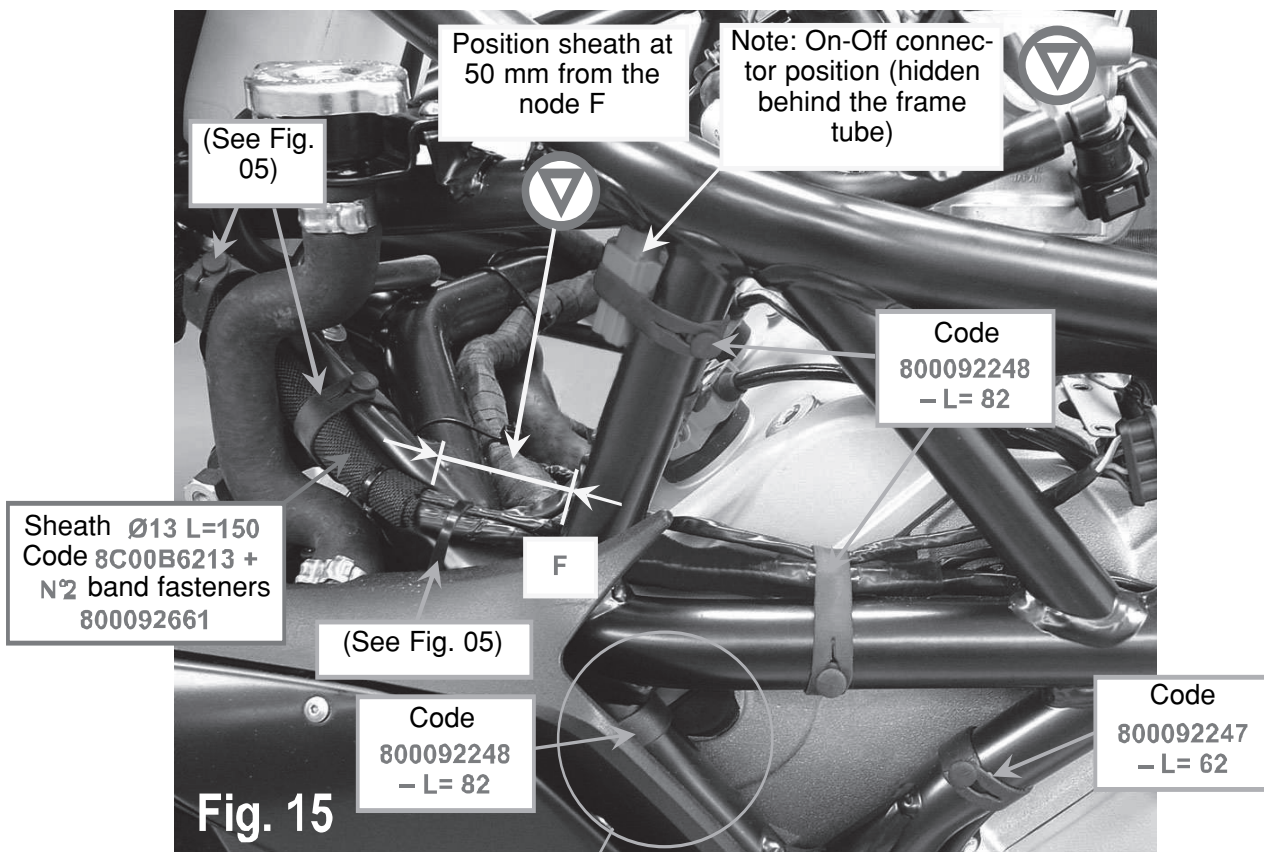
E

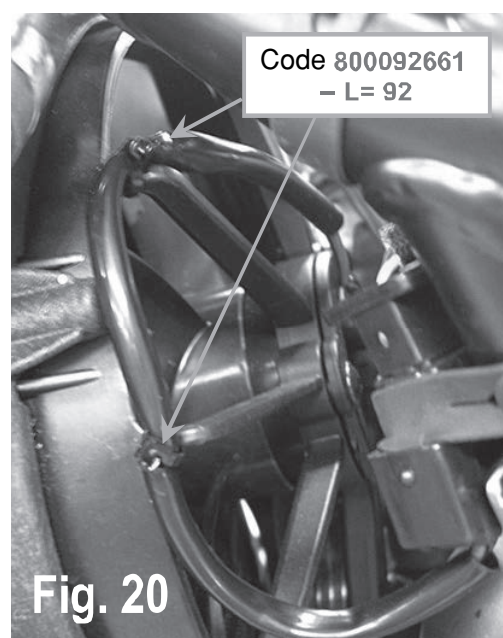
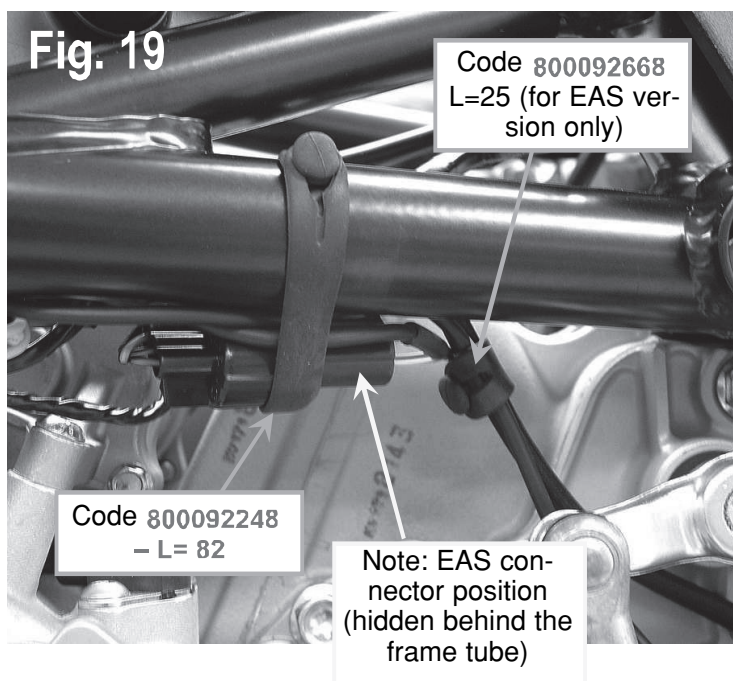
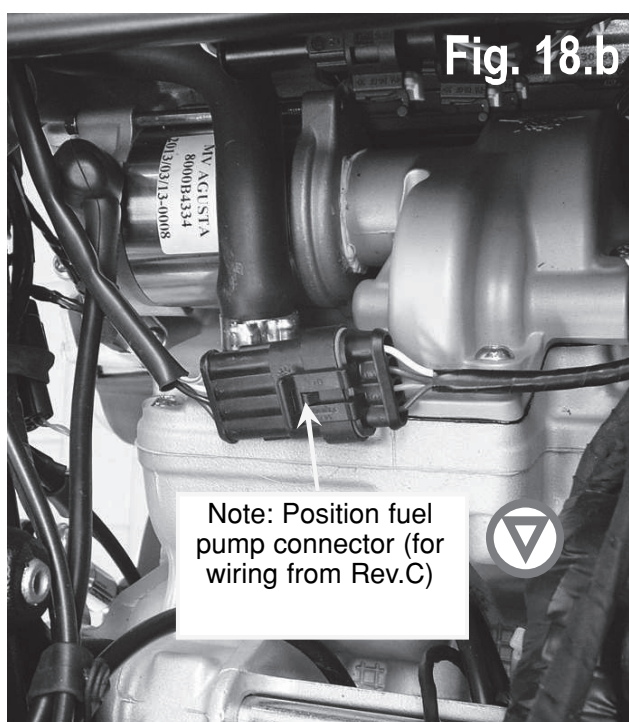
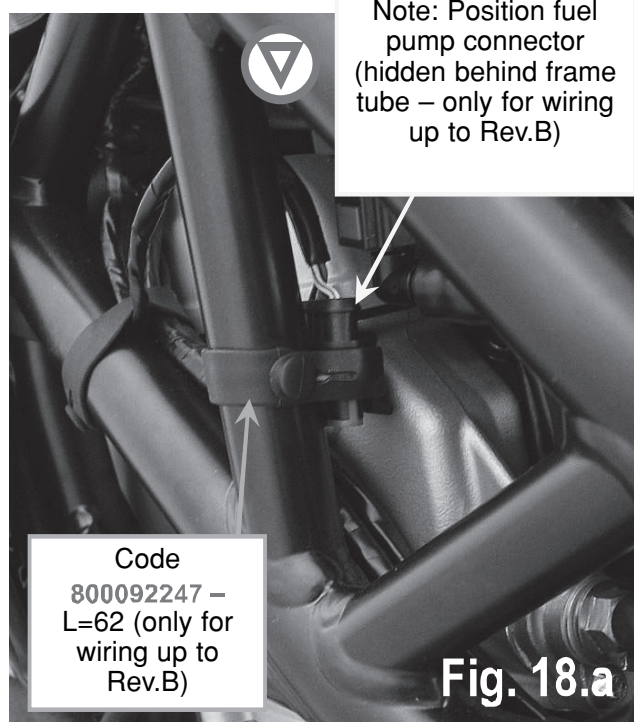




Note: Activate the clutch command to check that the movement of the cable does not make the dashboard move; if this is not the case, re-position the clutch cable

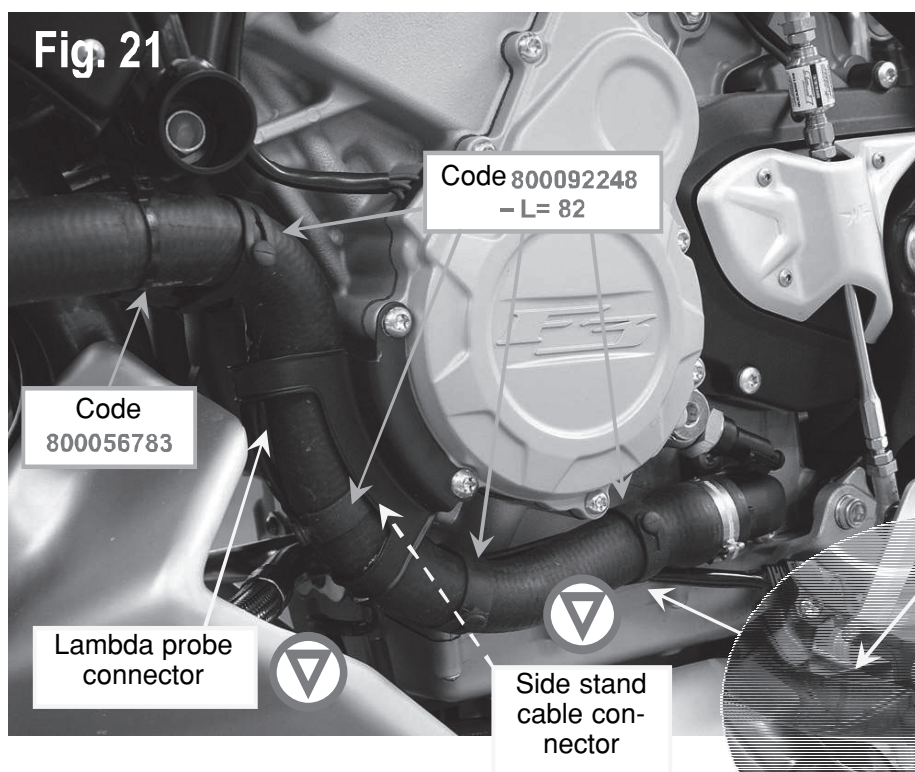
E



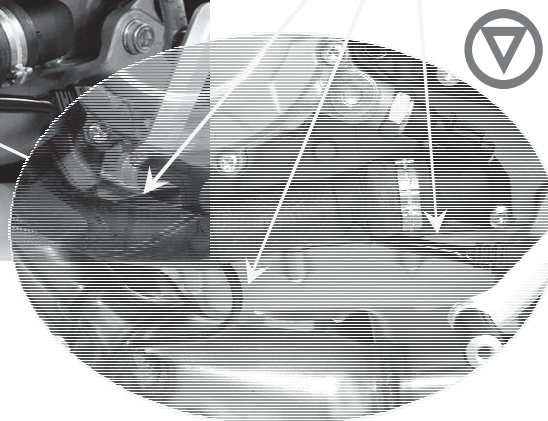


E

Fig. 21



Note: Pay attention to the correct passage of the cables



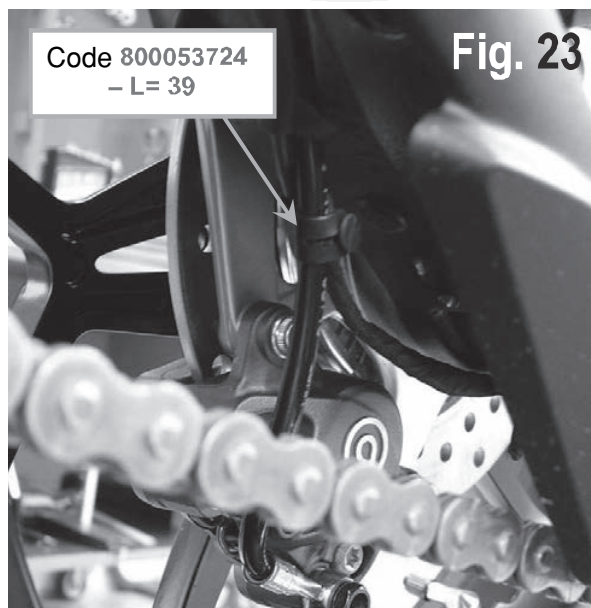
Pay attention to the correct direction of assembly of the starter motor connector

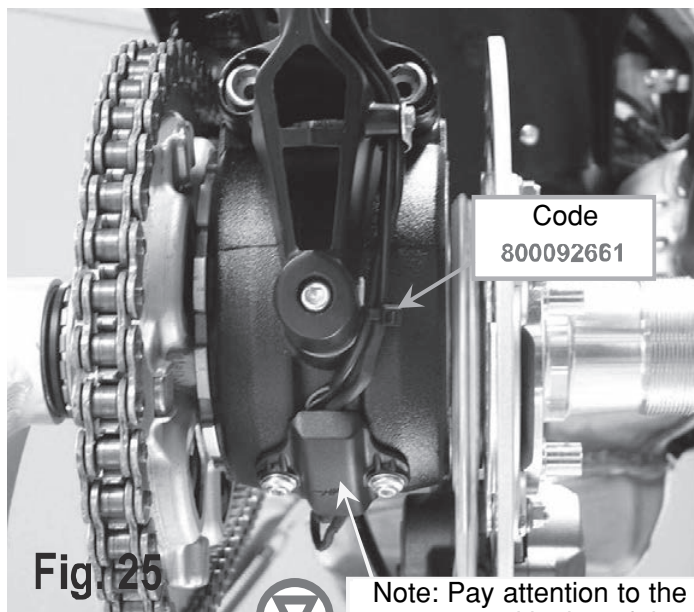
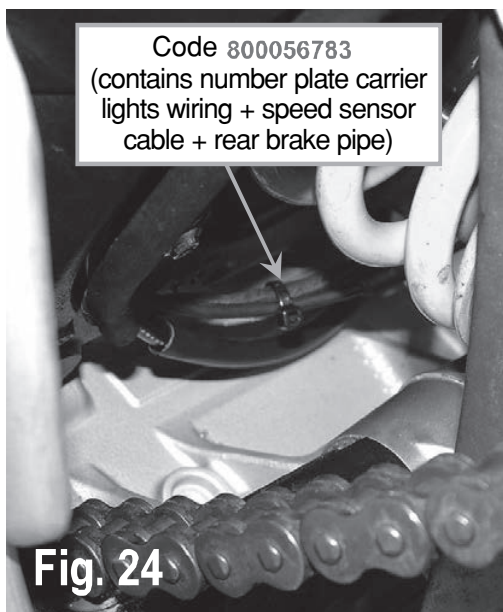


Fig. 22

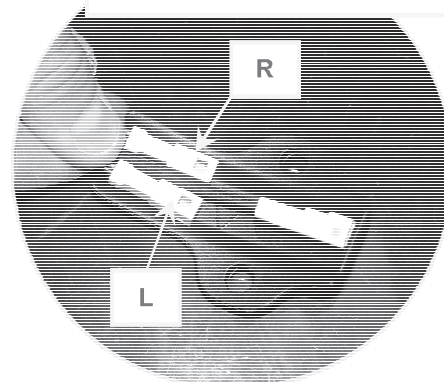
Code 800053724
- L= 39

Fig. 23





Note: Pay attention to the
correct positioning of the
connectors on the cover



E

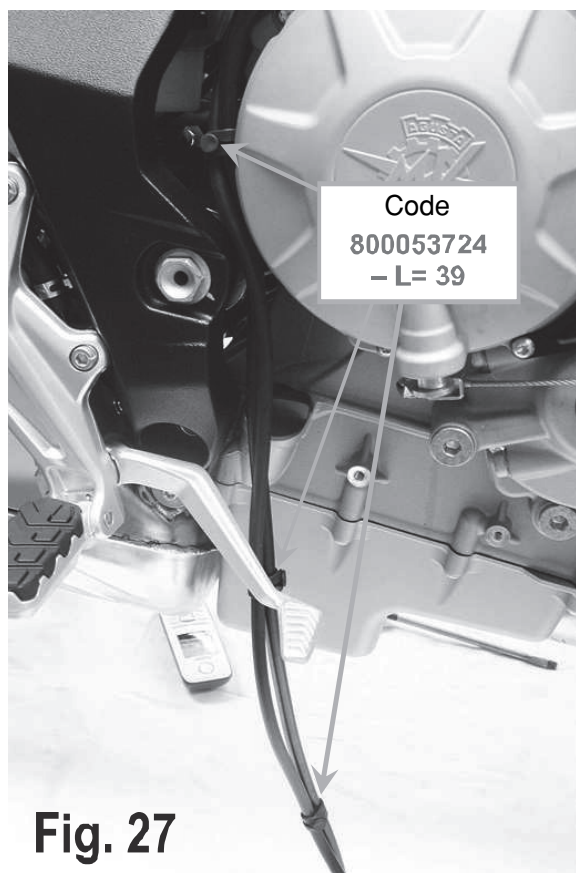


Fig. 27

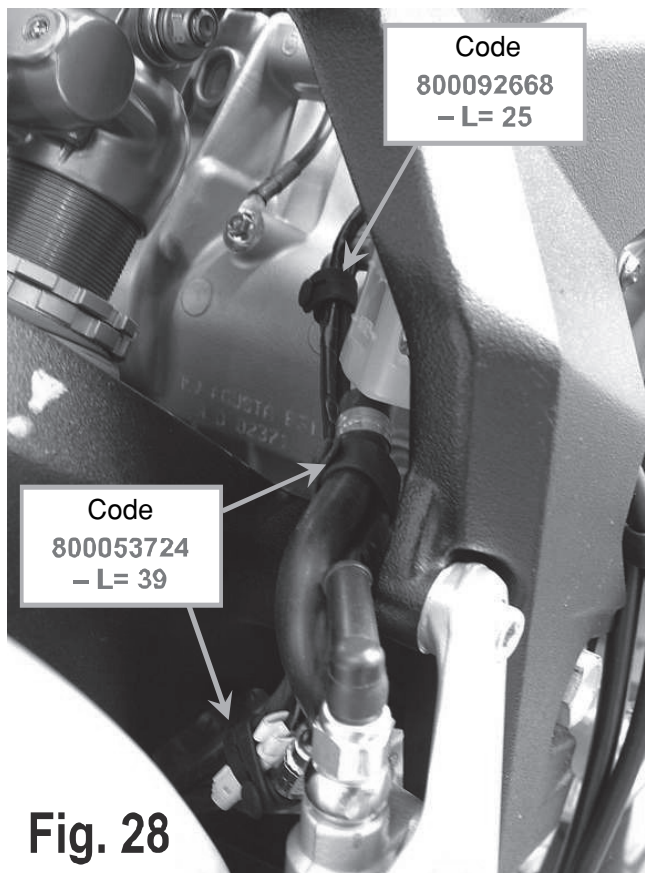


Fig. 28

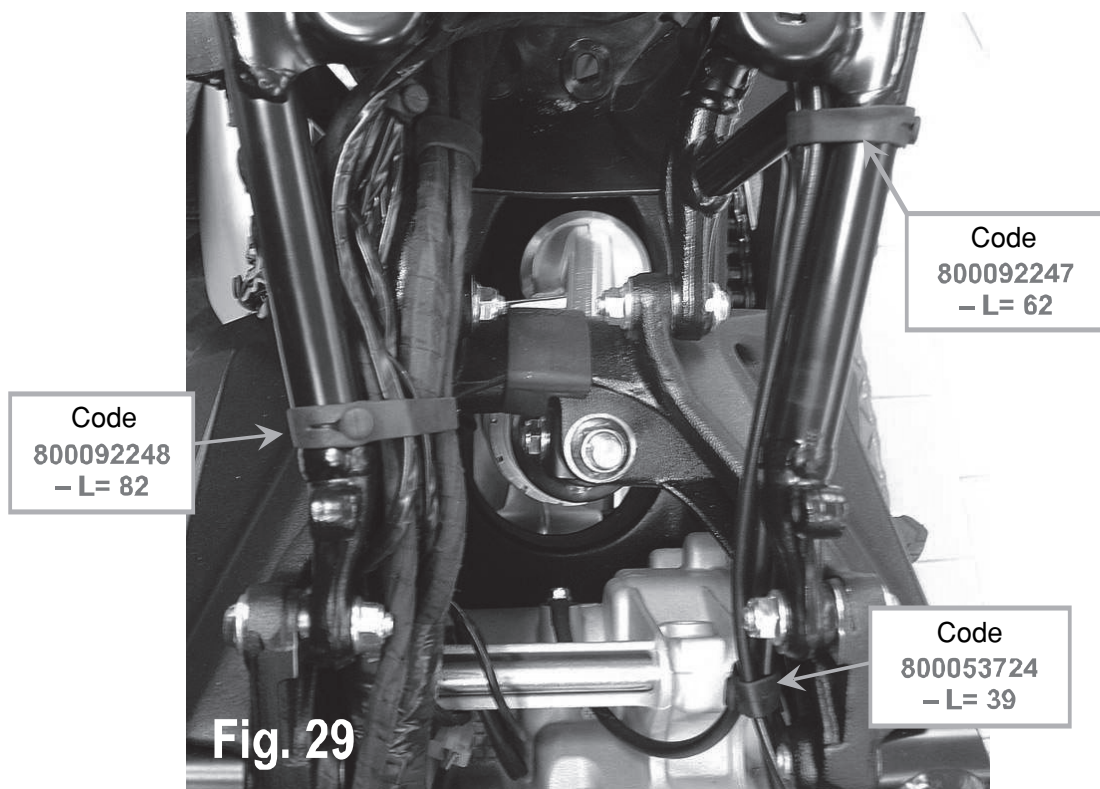
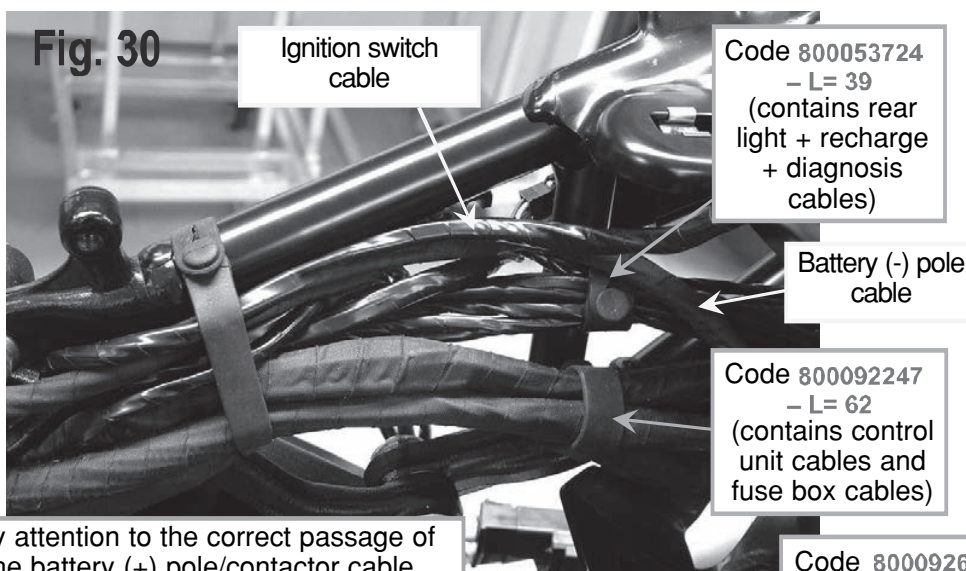


Fig. 29

Fig. 30



Note: Pay attention to the correct passage of the of the battery (+) pole/contactor cable



Note: Pay attention to the correct passage of the starter motor/contactor cable

Note: Pay attention to the correct passage of the contactor cable



Code 8000B3109
(updated version)

Code 8000B8097
(current version)

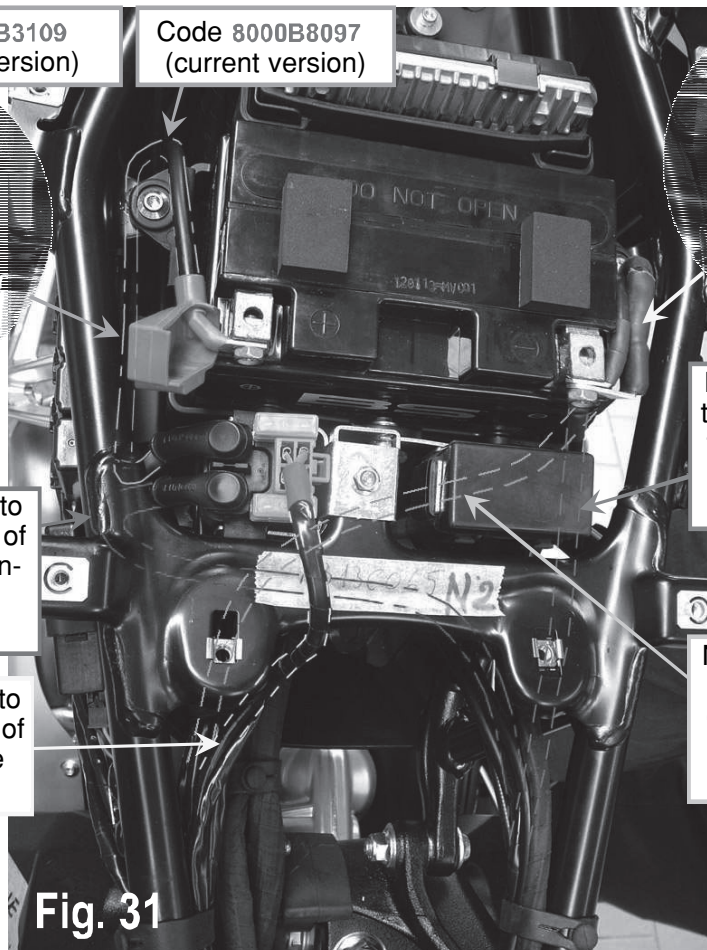


Fig. 31

Code 800092668 -
L=25 (contains N°2 earth cables)

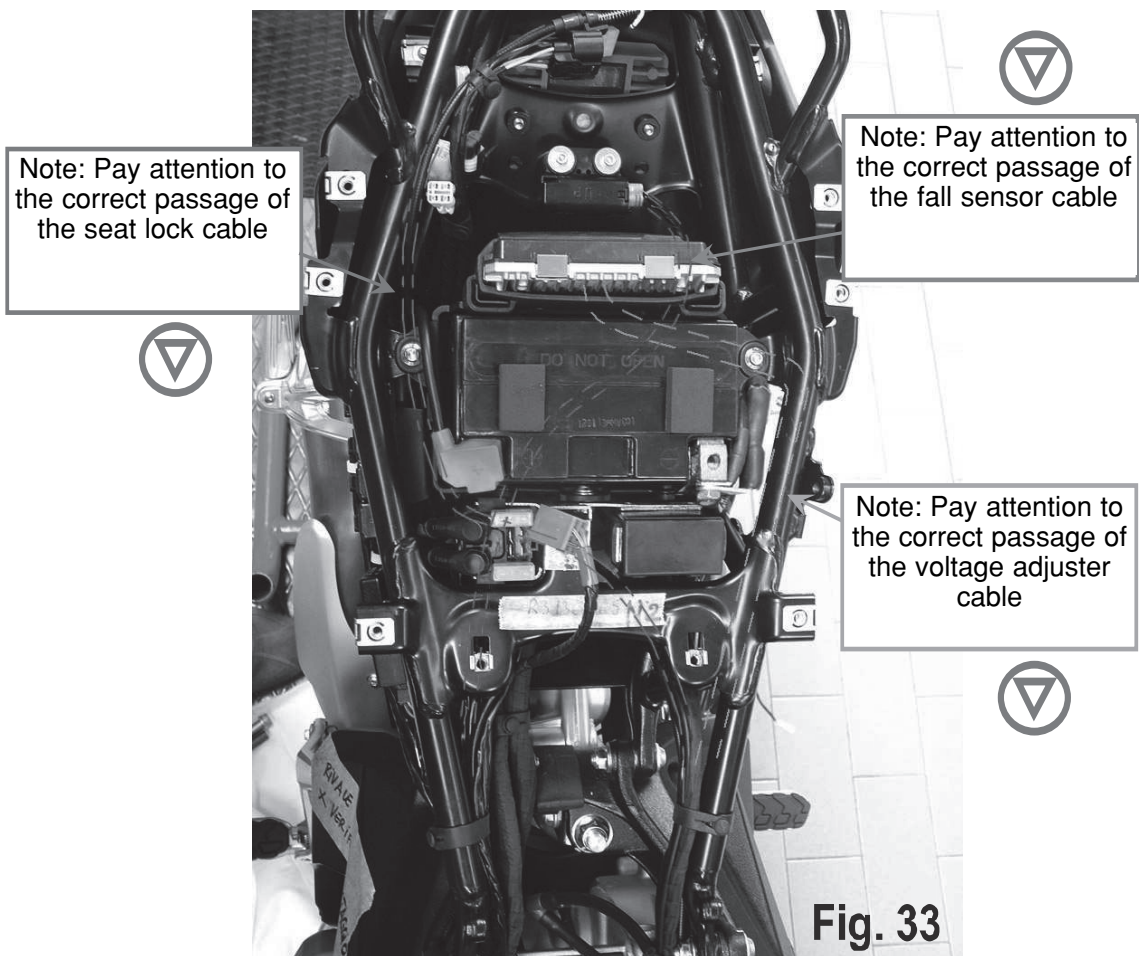
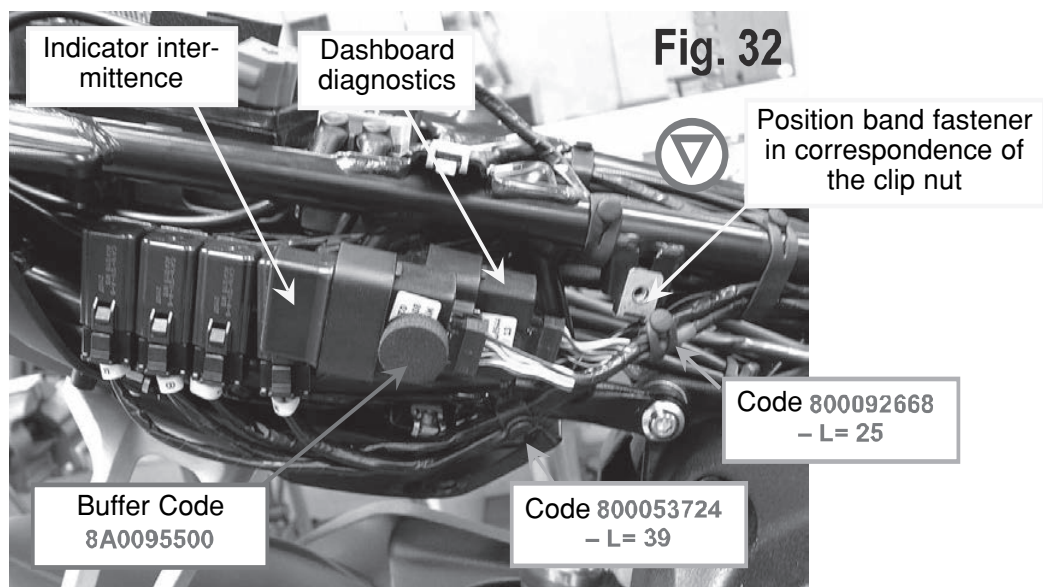
Note: Pay attention to the correct passage of the motor earth cable



Note: Pay attention to the correct passage of the battery (-) pole cable



E



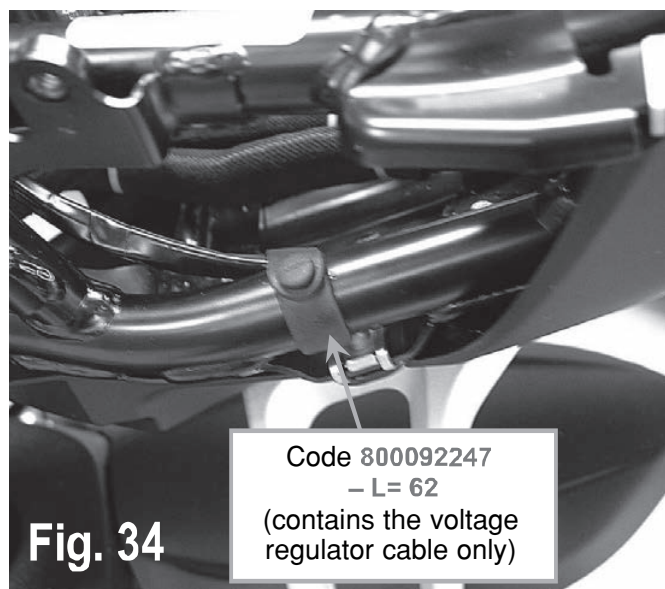


Fig. 34

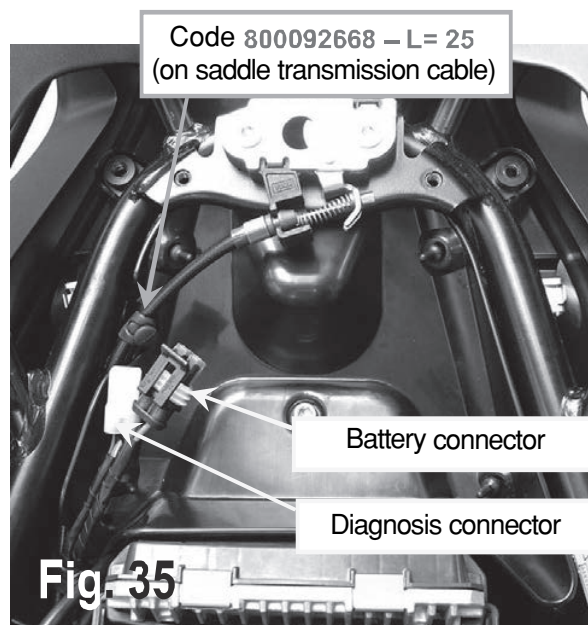


Fig. 35

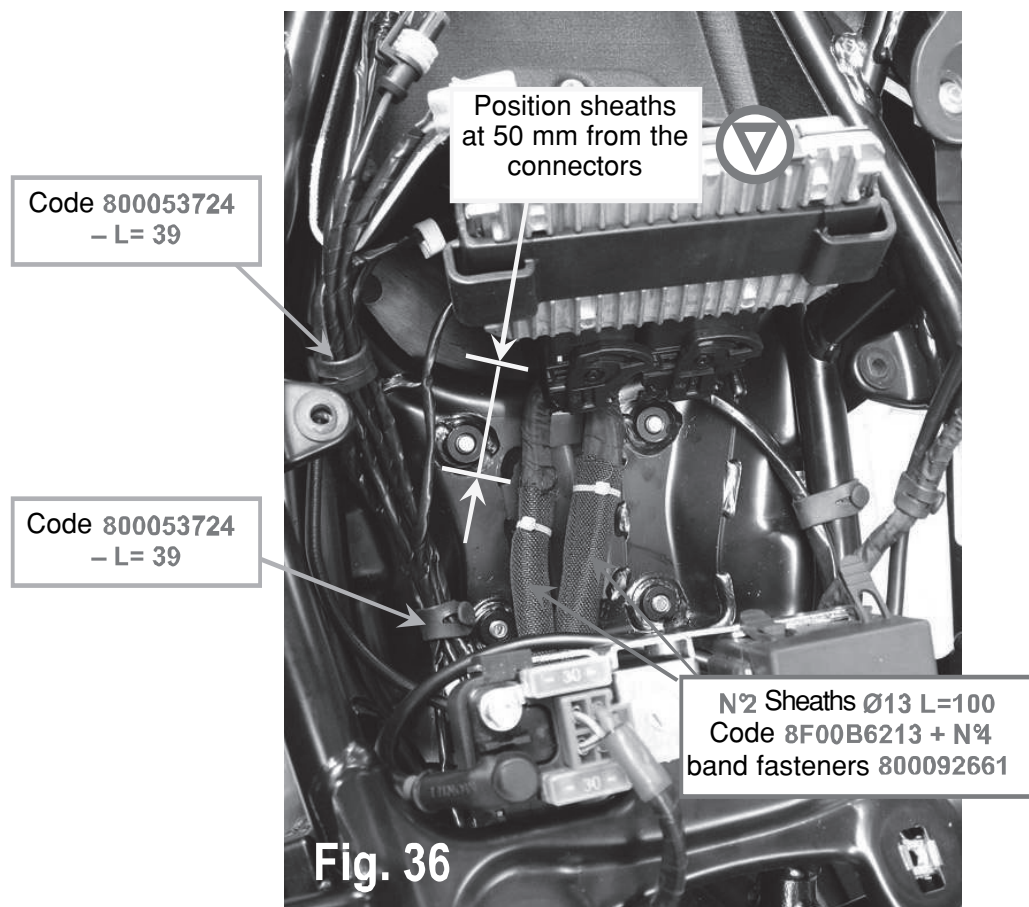


Fig. 36

POSITIONING OF ELECTRICAL SYSTEM WIRE CLAMPS RIVALE 800 ABS

LIST OF FASTENING CLAMPS FOR RIVALE 800 ABS CABLES

Code	Qty.	Length	Name
800053724	3	L = 39 mm	Rubber clamp L 39
800092668	2	L = 25 mm	Rubber clamp L 25
800056783	4	L = 142 mm	Plastic clamp for cables
800092661	11	L = 92 mm	Plastic clamp for cables
8E00B6213	6	Ø19 - L = 100 mm	Protective sheath for cables
8E00B4536	1	-	Frame tube protection



Before performing the installation of the brake hoses on the motorcycle, apply the adhesive protection code 8000B4536 on the connection hose between front brake calipers/ABS module (code 8000B8623) at a distance of **200 mm** from the sectioning junction on the connecting tubes to the brake calipers (see fig. 01).

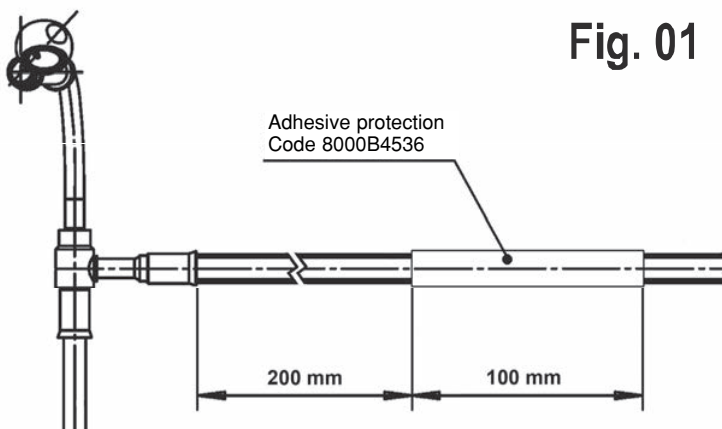
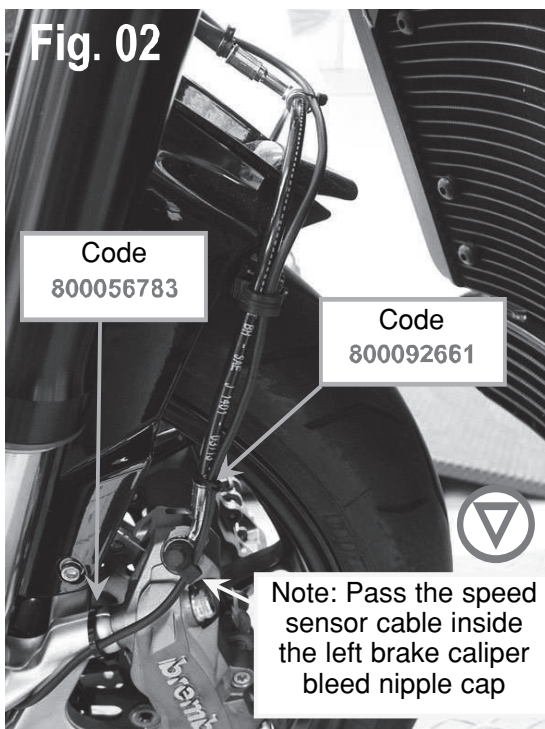
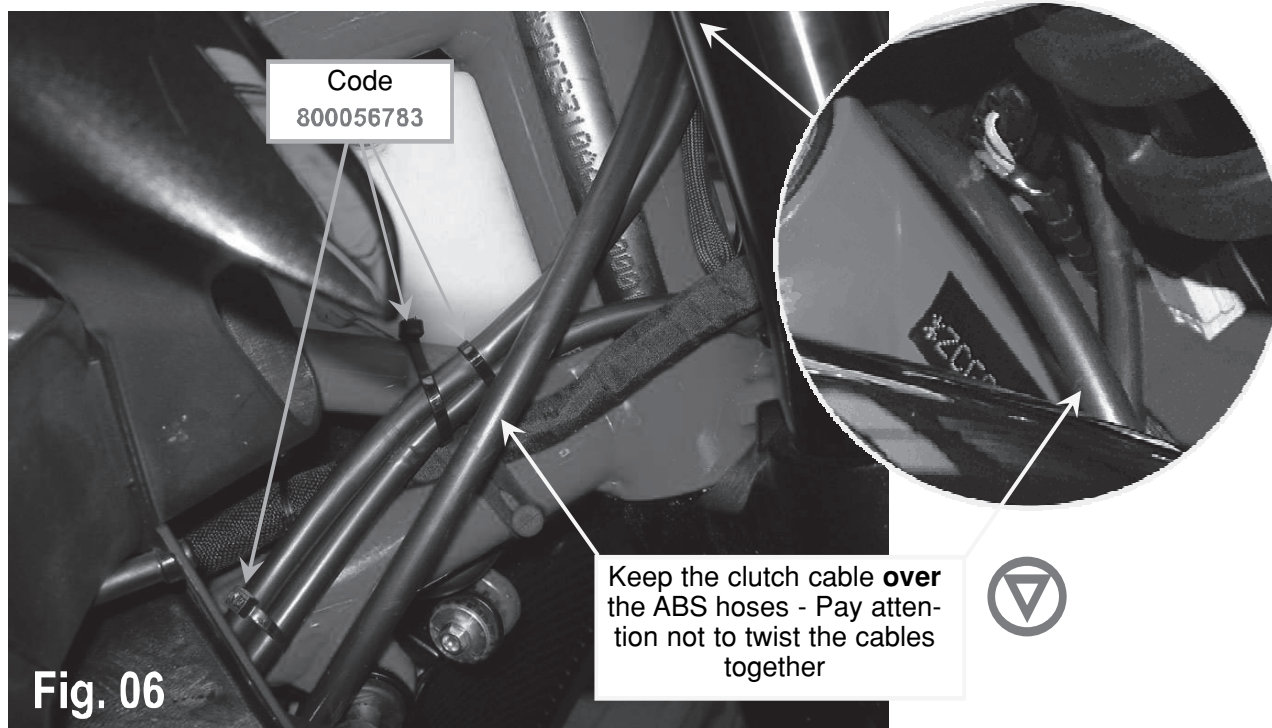
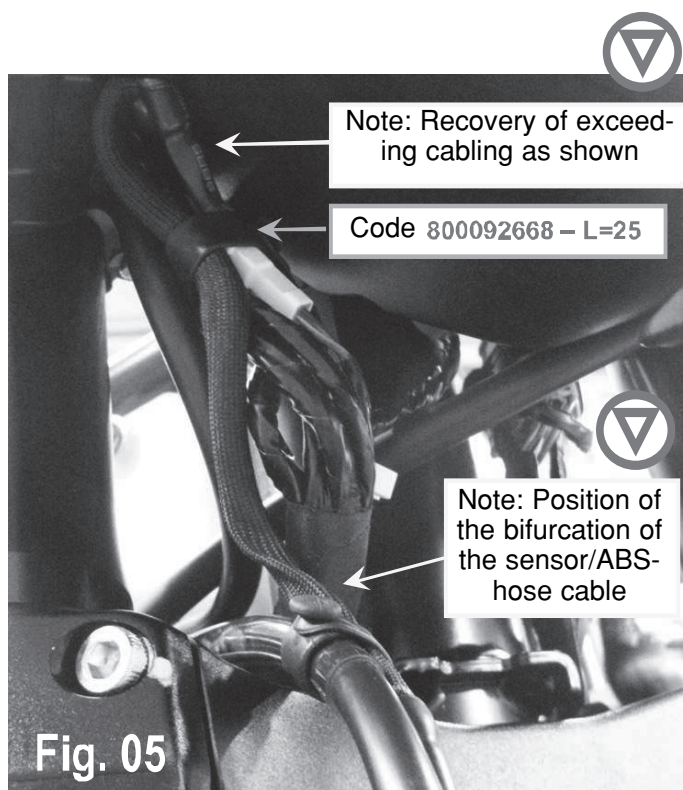
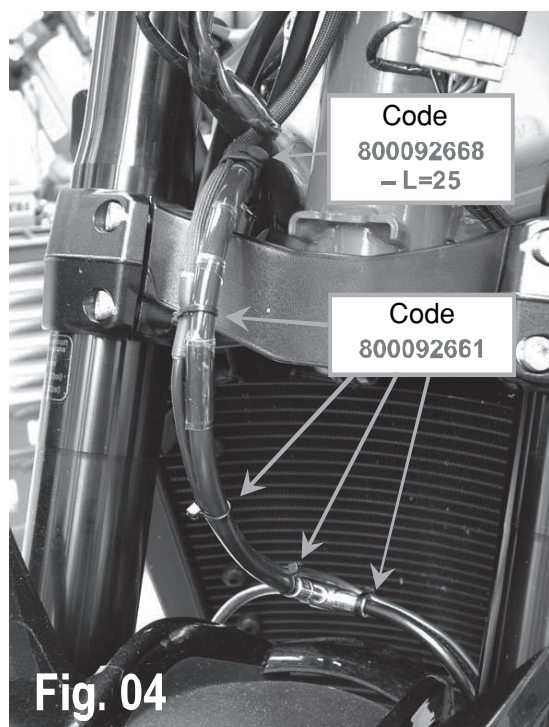


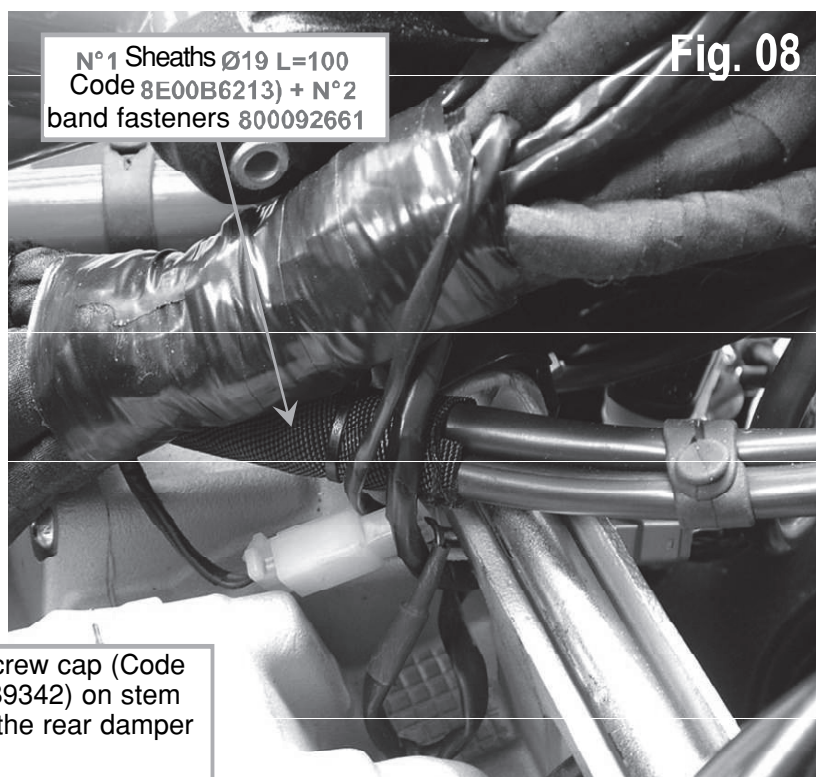
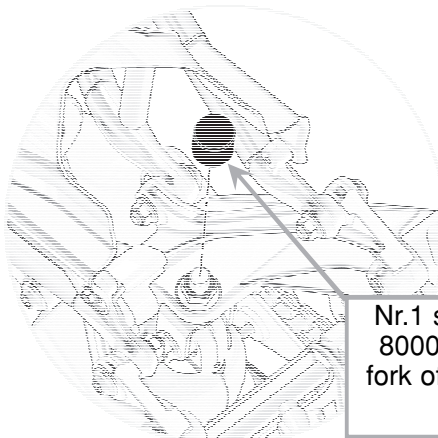
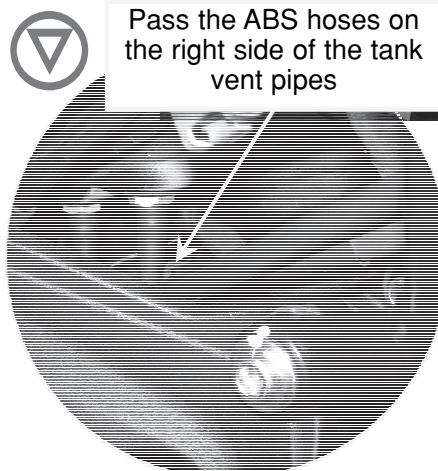
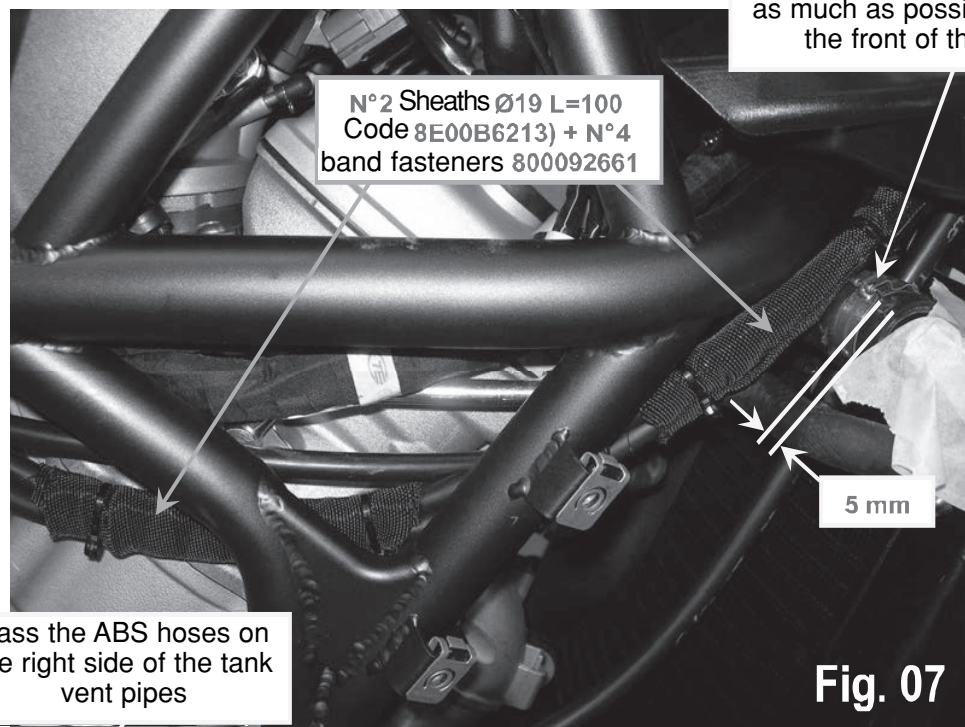
Fig. 01

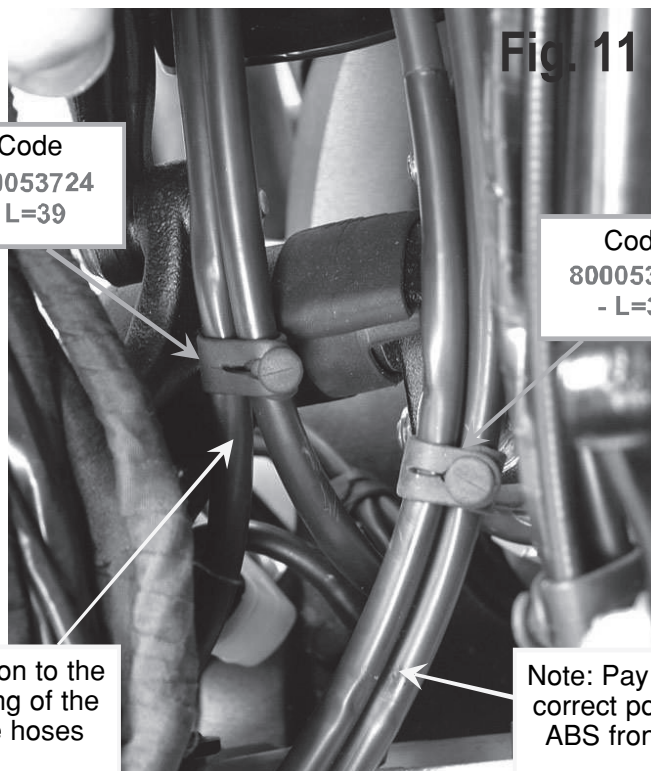
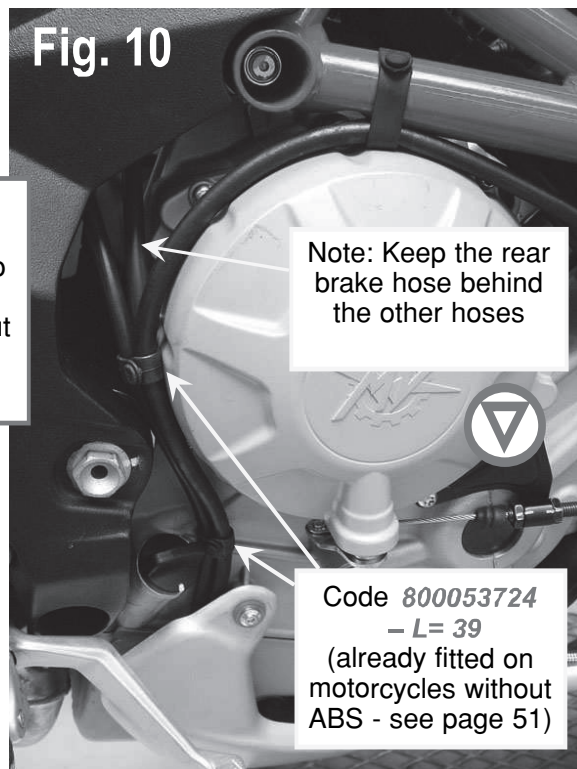
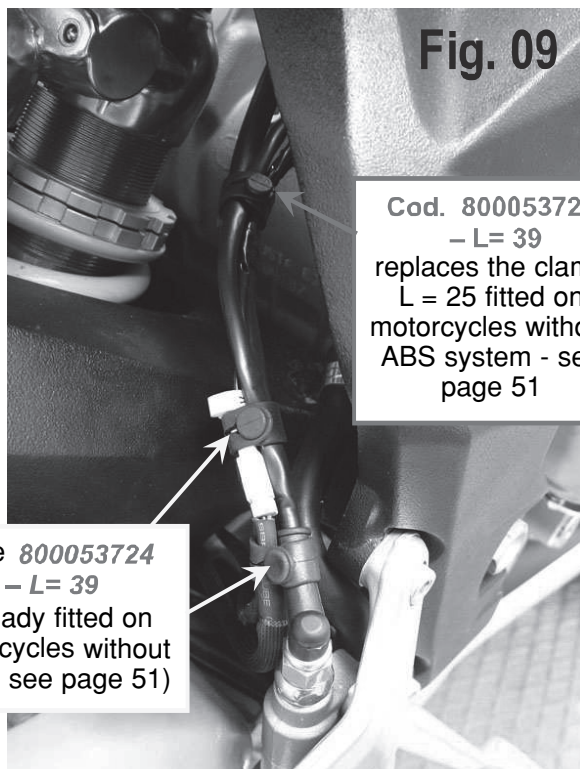
For the position of the clamps for fastening the Rivale 800 ABS system hoses, refer to the layout shown below (see figs. 02-11).





E

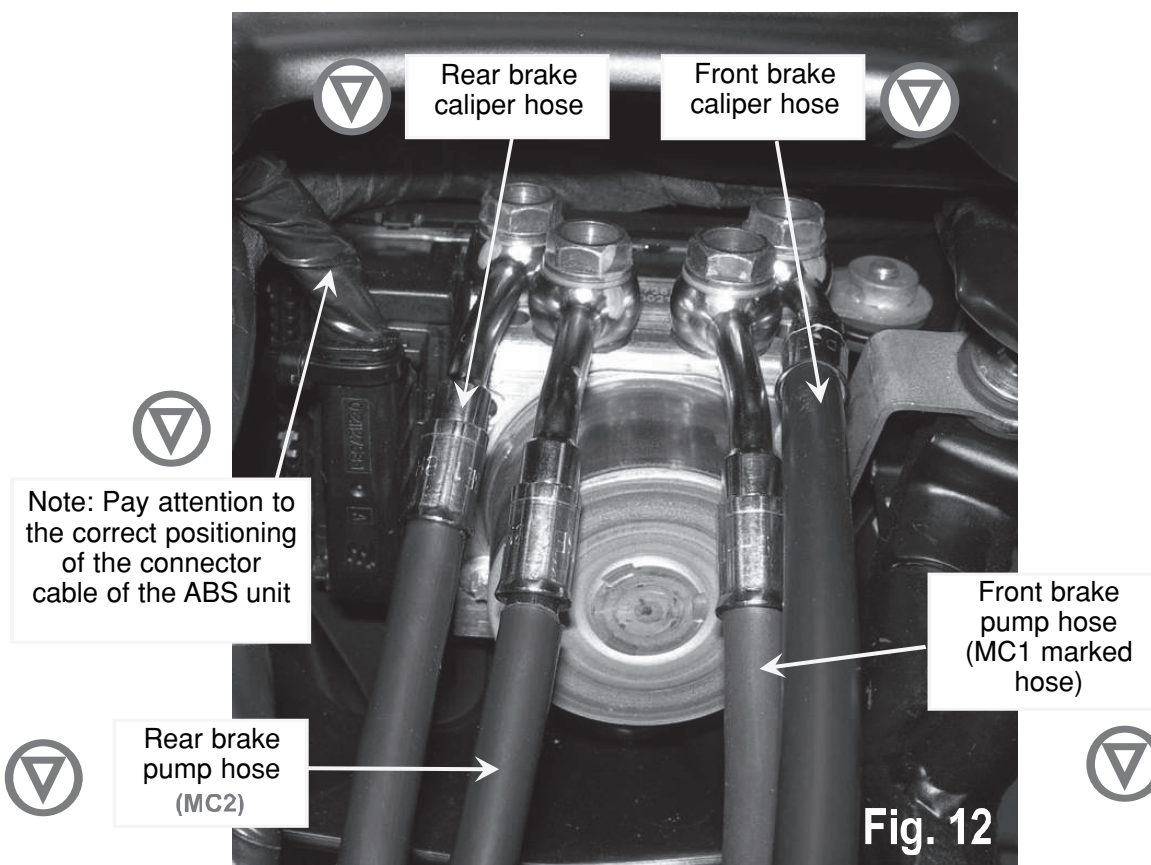




Note: Pay attention to the
correct positioning of the
ABS rear brake hoses

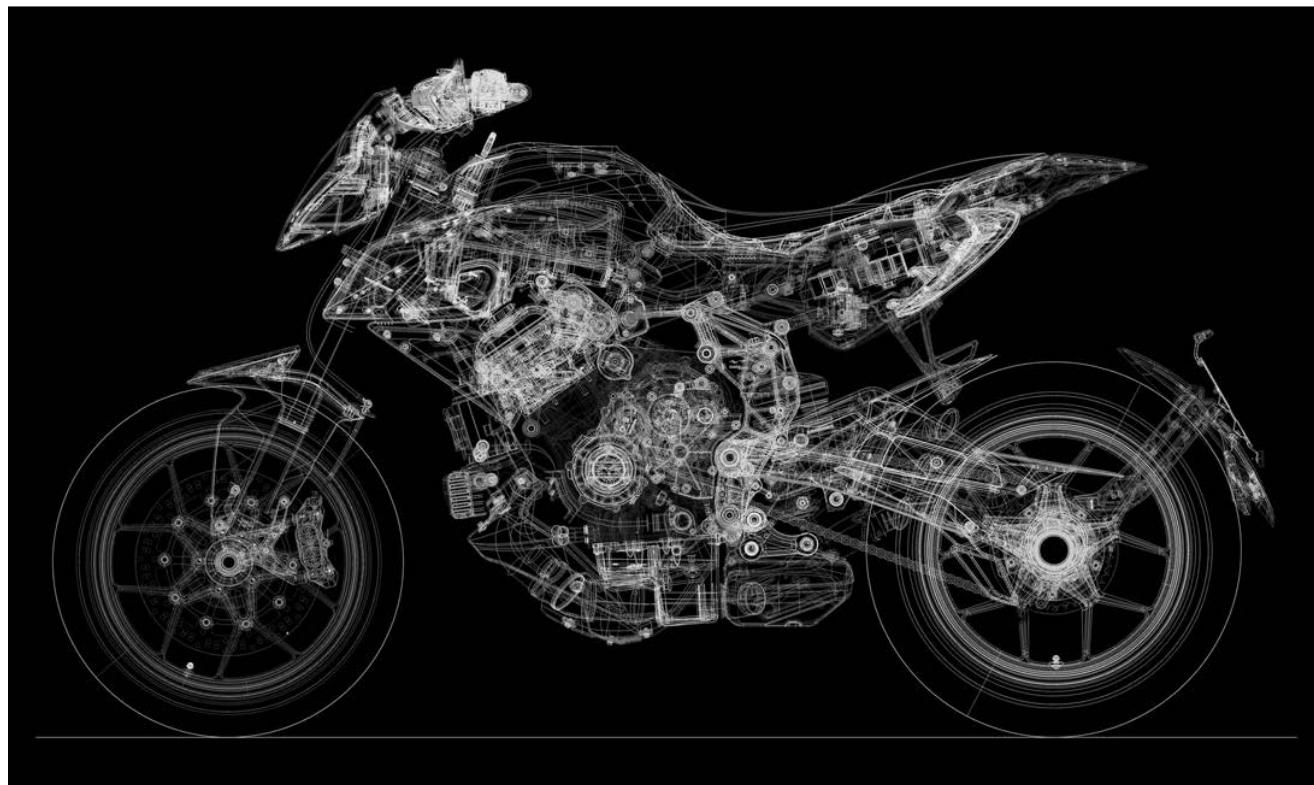
Note: Pay attention to the
correct positioning of the
ABS front brake hoses

On completion of the positioning and clamping of pipes, fix the terminals to the ABS module mounted on the holder on the rear subframe as shown in Figure 12. Tighten the couplings of the terminals to a torque of 18 Nm





Suspension and wheels



F

SECTION F
Revision 0

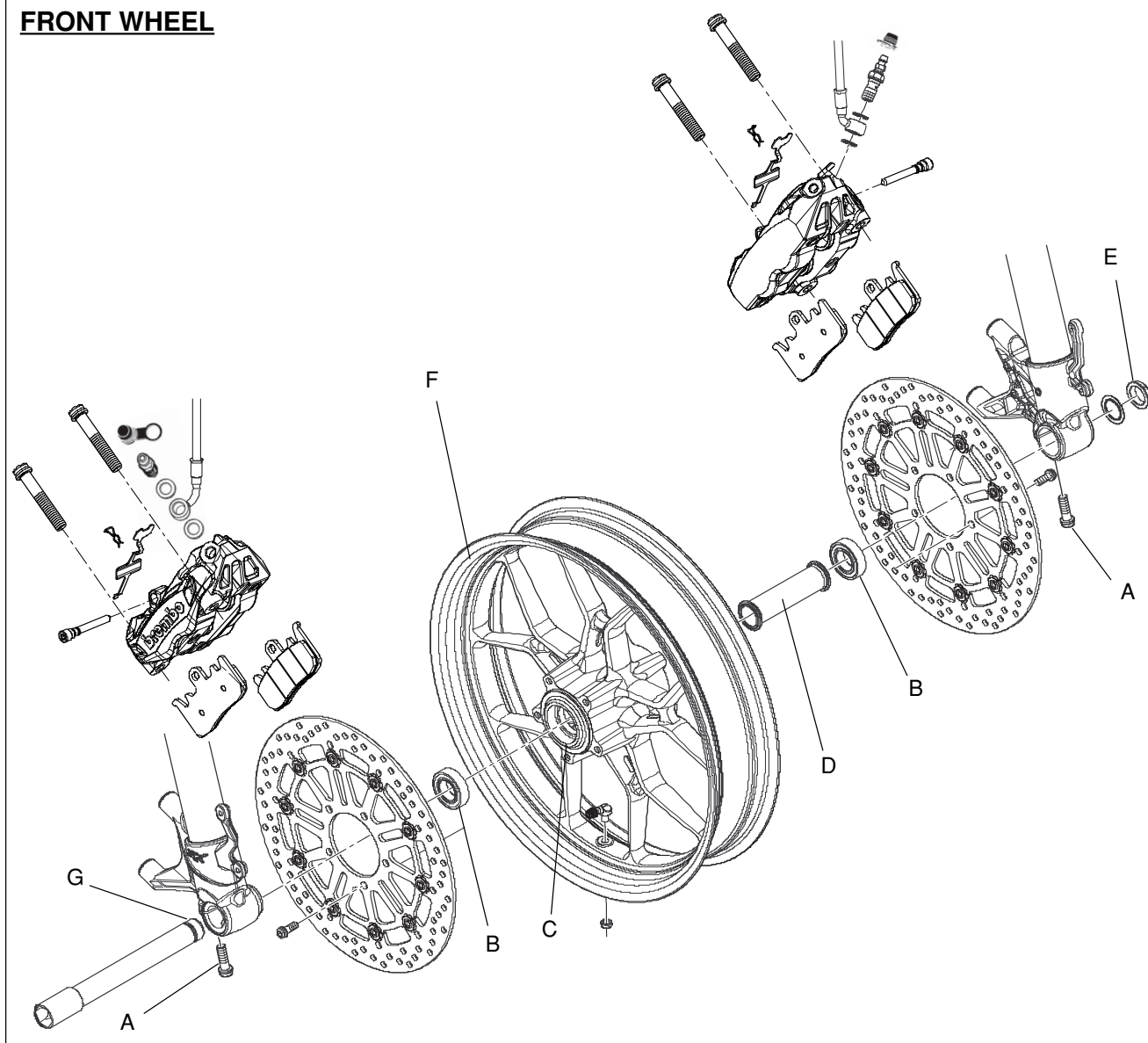


SUMMARY

FRONT WHEEL	PAGE 3
FRONT FORKS	PAGE 10
STEERING ASSEMBLY	PAGE 25
REAR SUSPENSION AND SWINGARM	PAGE 31
CHAIN REMOVAL	PAGE 40
REAR WHEEL HUB	PAGE 49
MOTORCYCLE SET-UP ADJUSTMENT	PAGE 66
WHEELS - CHECK AND BALANCING	PAGE 68

F

FRONT WHEEL



		A	B	C	D	E	F	G			
Torque pressure	N·m	16 ÷ 18				60					
	Kg·m ft·lb										
Operation											

Description	Rivale 800
FRONT WHEEL	
Material	Aluminium alloy
Dimensions	3.50" x 17"
FRONT TYRE	
Dimensions	120/70-ZR 17 M/C (58 W) TL
Brand and type	PIRELLI - Diablo Rosso Corsa
Front tyre pressure:	2.3 bar (33 psi)

Before proceeding with the removal and overhaul of the components relative to the front suspension, it is advisable to remove beforehand the front mudguard as described in detail in chapter C "Bodywork".

Place the motorcycle on the rear stand.



Special tool No. 8000B9312



F

FRONT WHEEL REMOVAL

Unscrew the two fixing screws of both front calipers and remove the calipers.



Torque pressure: 42 ÷ 46 N·m

NOTE To allow the wheel to be removed, turn it so as to move the inflating valve away from the calipers.

NOTE Position the removed calipers so that they do not hamper subsequent operations.



Protect the disassembled calipers with protective material thereby avoiding possible damage to the wheel rim. Hold the calipers appropriately, to not charge the brake tubes. Pay attention to not bend the brake tubes to avoid any damages.



Lift the motorcycle up at the front end. Mount the special tool that is supplied with a pin on the lower part of the steering base as shown in the figure. Lift the motorcycle until the wheel raise from the ground.

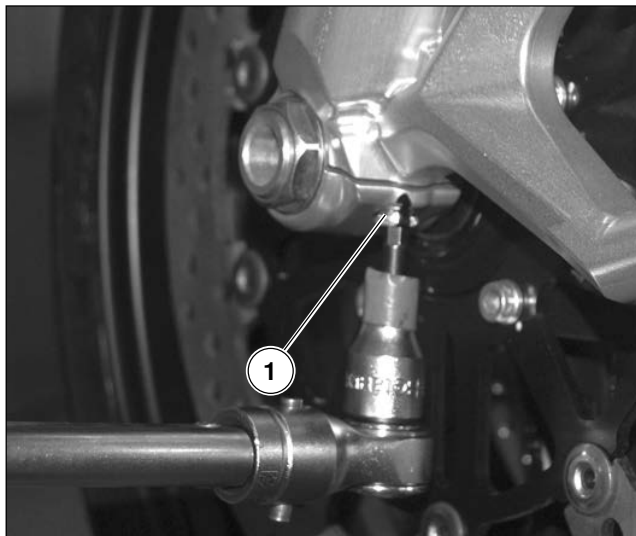


Special tool No. 8000B7340

NOTE To facilitate the removal of the wheel it is advisable to tape the brake tubing to the special tool.

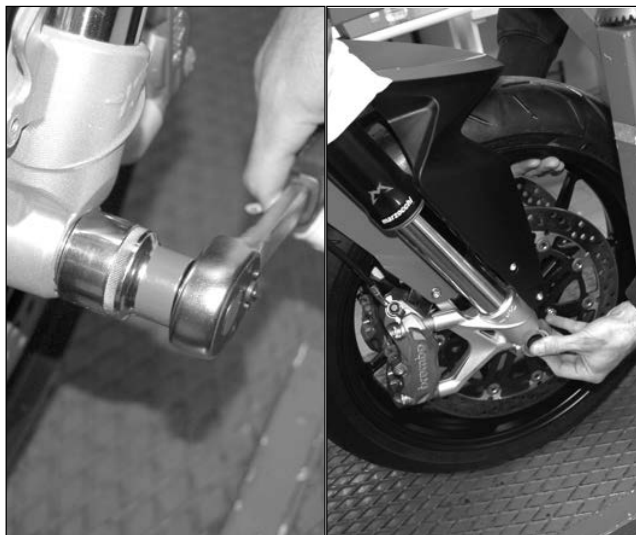


Remove the screw (1) on both front wheel/fork attachments.



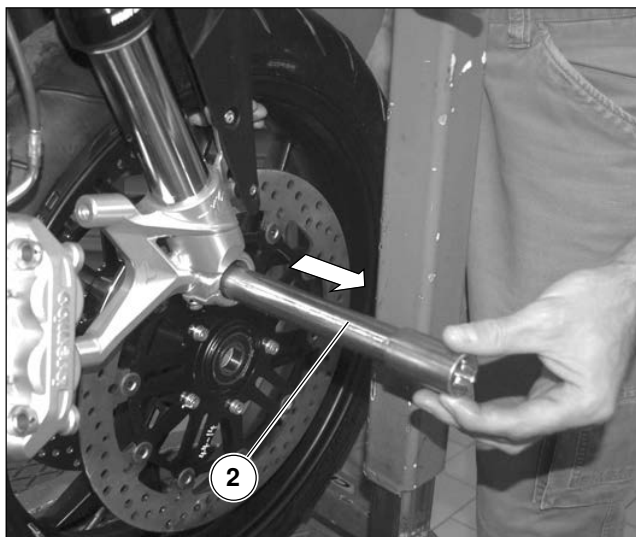
Unscrew the nut from the left side.

Holding the wheel up with your left hand, use your right hand to push the pin towards the right part of the motorcycle.



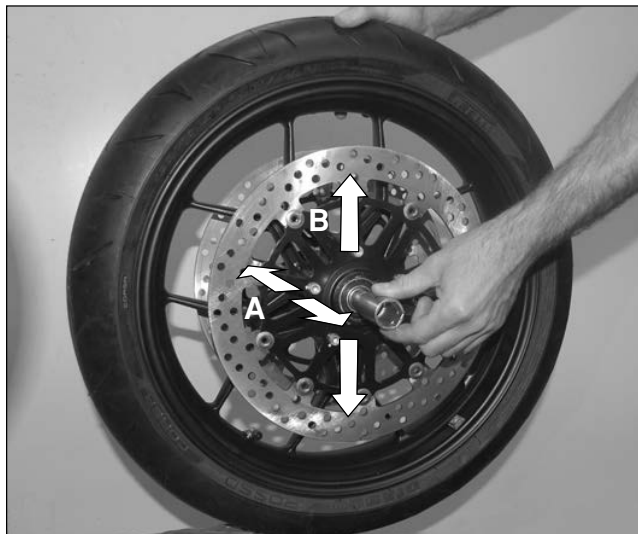
F

Take the wheel pin out (2) from the right side, freeing up the wheel.



Front wheel bearing check

With the wheel spindle still mounted to the wheel, rotate the wheel to check that the bearings are not pitted and rotate with a smooth action. Check also for axial (A) and/or radial (B) movement. If either condition is verified, substitute the bearings.



Front wheel bearing replacement

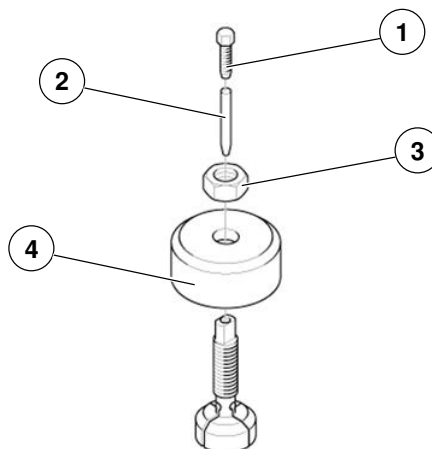
F Utilise the special tool to extract the bearings. To assemble the tool, it is necessary to remove the screw (1) and extract the wheel spindle (2). Remove the nut (3) and then the flange (4).



Before substituting the bearings as indicated above it is advisable to remove the brake discs as indicated in chapter H "Brakes" to avoid damaging them.



Special tool No. 8000B4416



Introduce the extractor until the internal ring of the bearing is hooked up. Introduce the wheel spindle screw and **block them by means of two 14 mm wrenches.**



Mount the flange, spacer ring and nut utilising a 14 mm spanner and a 27 mm spanner and extract the bearing as shown in the figure.

NOTE Operate in the same way on both bearings.



Check that the ends of the aluminium spacer and the seats of the bearings on the wheels are not scored or marked.



F

Reassembly – front wheel bearings

Before proceeding with the reassembly, accurately clean the bearing seats in the wheel hub. Lubricate the outer ring of both bearings with special grease.

Mount the bearing on the specific tool and insert it in the rim housing.



Recommended product: Agip Grease 30

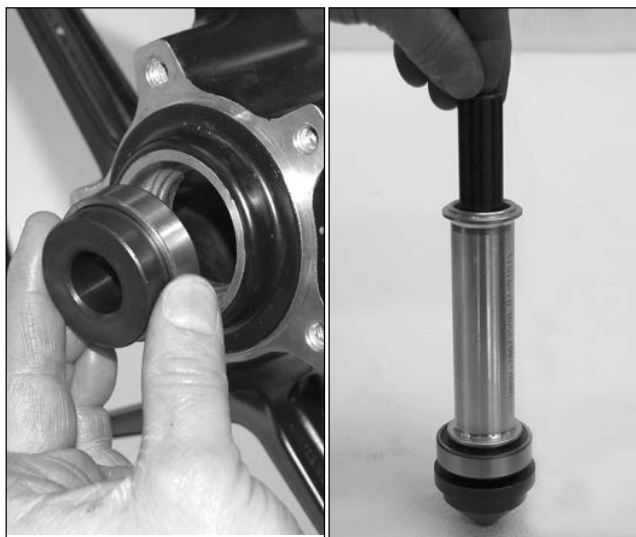


Special tool No 8000B4421

Mount the bearing and a spacer on the specific tool.



Special tool No. 8000B4421



Insert it on the opposite part, keeping the rim in a vertical position.



F

Insert the guide spacer and utilising a press, squeeze down the bearings.

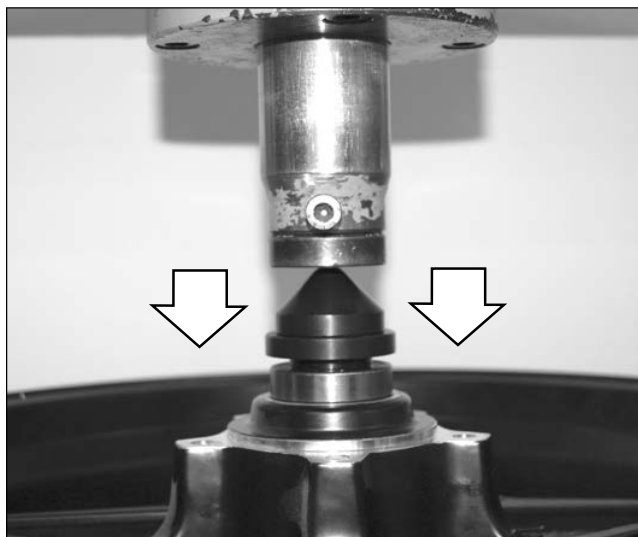


Proceed as illustrated in the figure.



Attention: the wheel bearings should be mounted with little interference but should the action of the press be blocked in any way, release the press.

Having completed the assembly, check that the aluminium spacer does not have axial play. Assemble the wheel spindle and carry out again the rolling check by rotating the wheel.





Suspension and wheels

Wheel spindle check

Place the wheel spindle on two v-prisms on a flat surface.



Utilising a dial gauge, check that the **eccentricity in the central part does not exceed 0.05 mm.**



Wheel assembly



If the front tyre is substituted, before assembling the wheel it is necessary to balance the wheel following the indications in page 68.

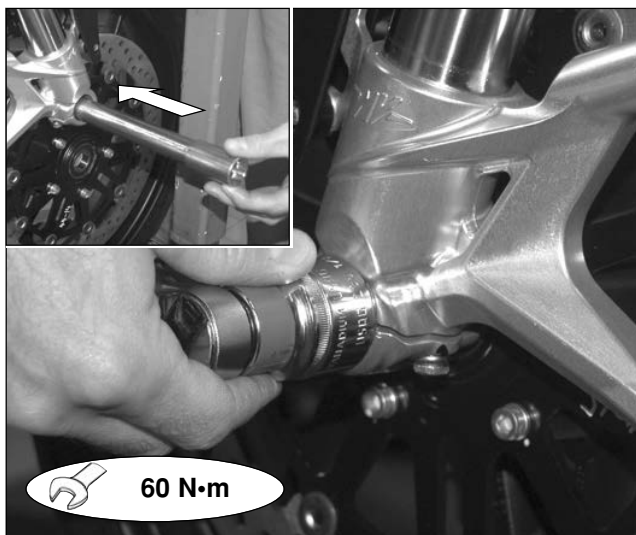
After having carried out the check on the parts of the front wheel, accurately clean the wheel spindle and assemble it from right to left. Once the wheel has been put back on the vehicle, re-install the nut with washer and tighten it to the required torque.



Apply grease only to the first threads.



Torque pressure: 60 N·m



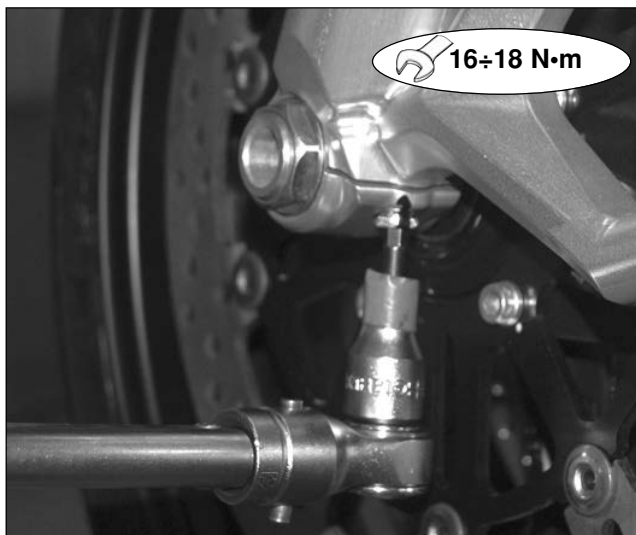
F

Tighten the 2 screws of the fork feet to the required torque.

Mount the two brake calipers as described in chapter H "Brakes".

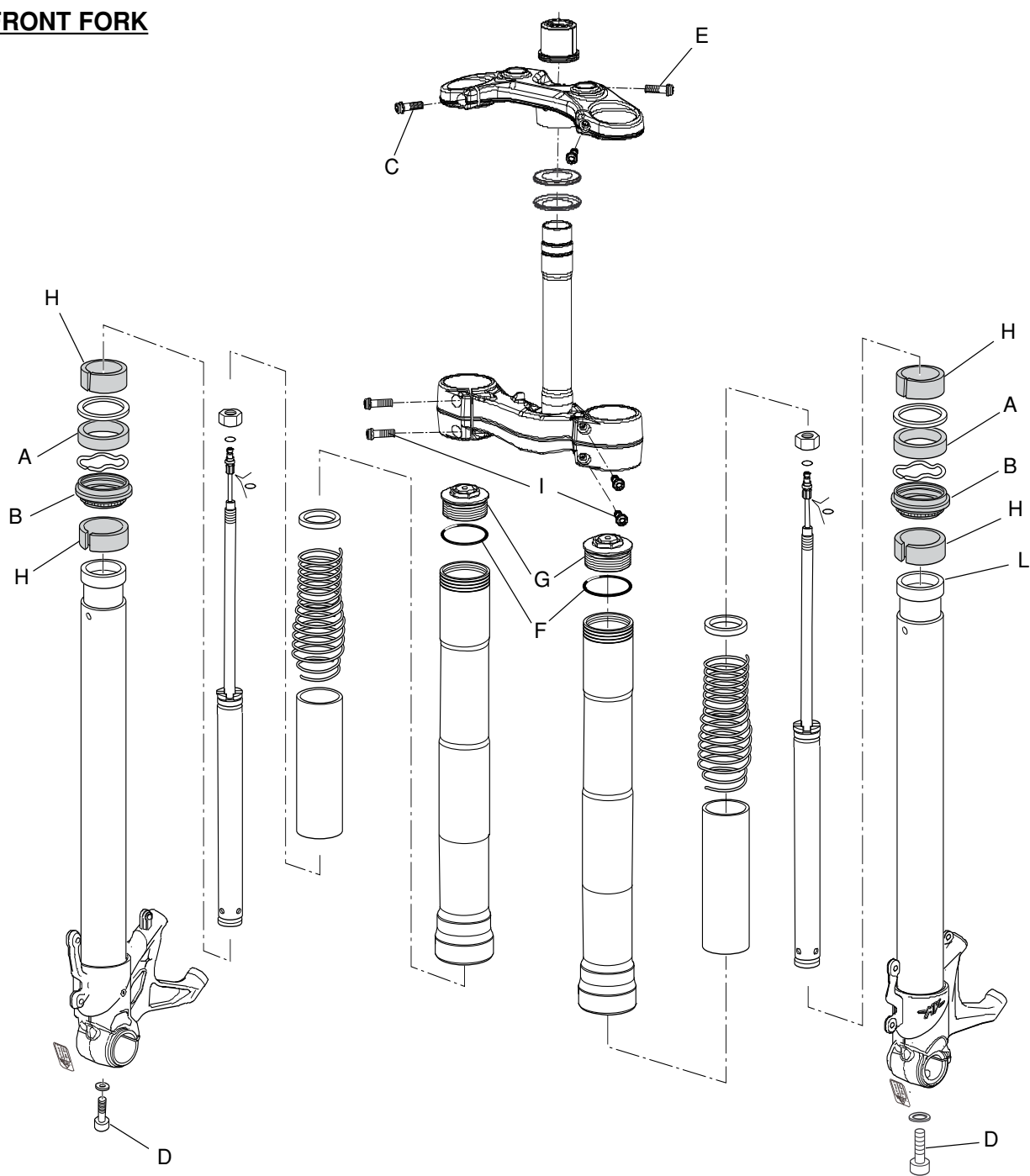


Torque pressure: 16 ÷ 18 N·m



FRONT FORK

F



		A	B	C	D	E	F	G	H	I	L			
Torque pressure	N·m			16 ÷ 18	35	22 ÷ 24		20		18	40			
	Kg·m													
	ft·lb													
Operation														

Description	Rivale 800
FRONT SUSPENSION	
Type	"Upside down" telescopic hydraulic fork with external and separated adjustment of rebound and compression damping and of spring preload
Ø stems (mm)	43
Telescopic movement (mm)	150

FRONT FORK OVERHAUL

Remove the front wheel as described in the paragraph "Front wheel removal" of this Chapter.

Support the motorcycle by the rear stand with special tool.



Special tool No. 8000B9312



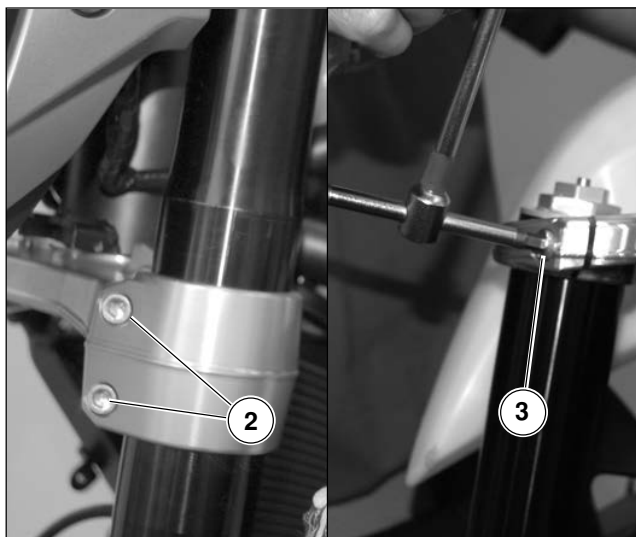
Stem removal

Loosen the 2 screws (2) from the steering base and the screw (3) from the steering head.

During this phase, support the stem.

Slide out the stem, supporting it with both hands and operating with caution so as not to drop it.

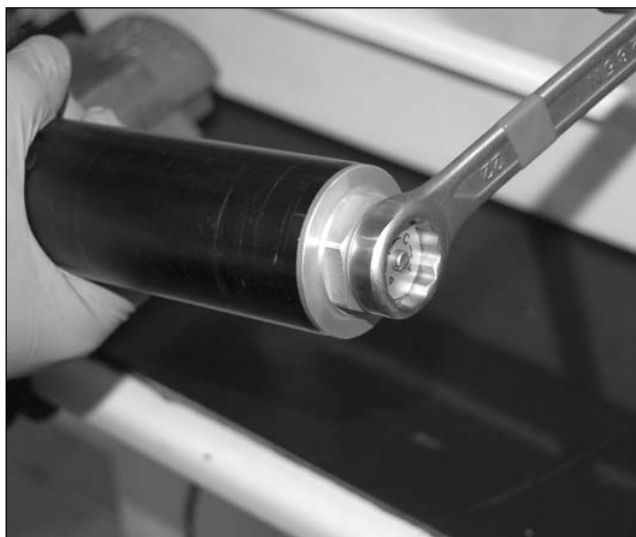
Proceed with the same operation for both stems.



F

Fork tube exploding

Loosen the spring pre-load adjuster until you feel it reach the end.





Suspension and wheels

Loosen the cap by approximately 1 turn.



F

Place the fork leg in a vice, in a vertical position taking care to protect its surface against possible damage.



Completely unscrew the plug and lower the sheath as shown in the figure. Perform this operation while holding the leg in a vertical position.



Unscrew the plug. Using the spanner, adjust the spring preload while locking the nut on the damping piston rod.



Remove the plug (1).



F

Remove the spring.





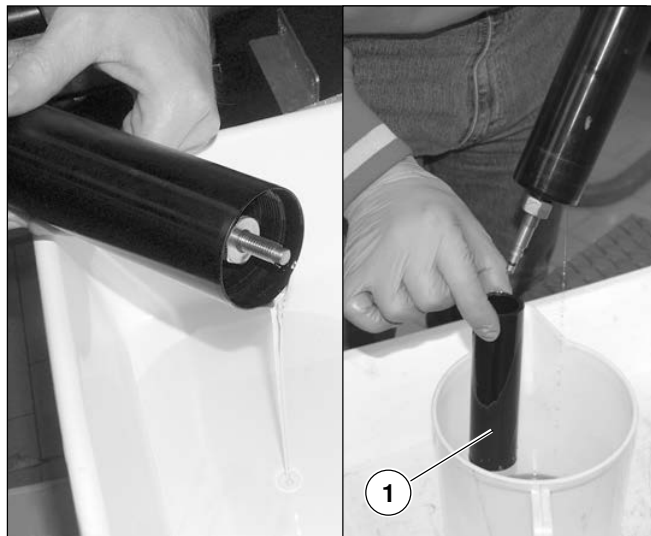
Suspension and wheels

Turn the stem upside down and completely pour out the oil into a suitable container.



Recover the oil in an appropriate container. Do not dispose of the used oil in the environment.

During this phase also take the spring pre-load spacer out (1).

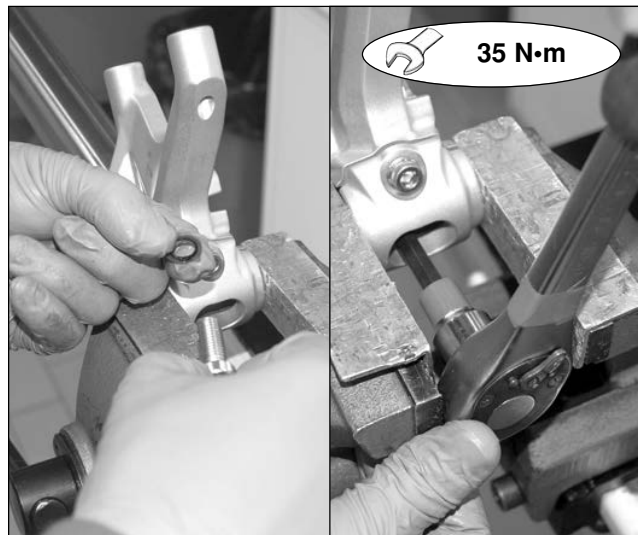


F

Remove the central lower screw that fixes the damping piston. Keep the sealing washer underneath.



When refitting, tighten at 35 N·m.



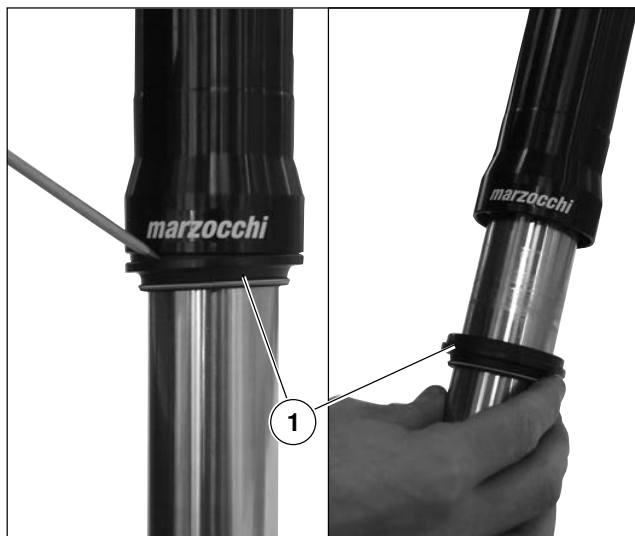
Pull out the damping piston.

Take care not to reverse the pumping elements on the fork while fitting it back in, and configure as follows:

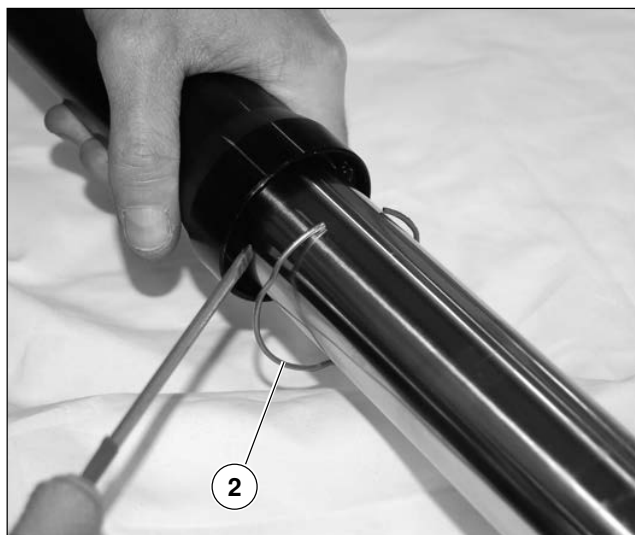
- Brake-pressing pumping element: fit on left leg.
- Brake-releasing pumping element: fit on right leg.



Lower dust cap (1), taking care not to damage the seat on the sheath.



Remove the retaining ring (2) with a screwdriver, taking care to not scratch the stem.



F

Extract the sleeve from the stem by repeated blows at the end.





Suspension and wheels

Fork assembly check

Check that the sleeve does not have marks on the external part that could have repercussions inside the assembly. Ensure that the inside is completely smooth, without any scratches.

If necessary, substitute with a new part.

Check for marks or scratches on all surfaces of the stem and check the condition of the chroming.



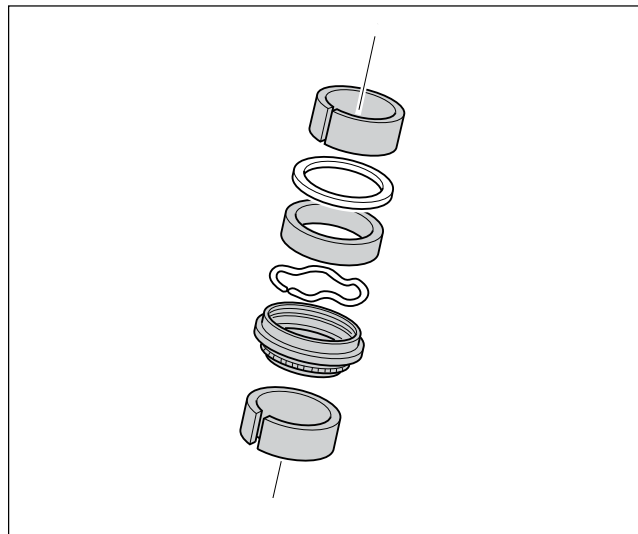
Measure the length of the spring and compare with the following values:

- **Rivale 800:** **330 mm**

To replace the bushings inside the sleeve, operate using the required tool in accordance with the method described in the diagram.



Special tool No. 8000B6785



F

Assembly oil seal and anti-dust seal

After having carefully checked all components, substitute those damaged and/or deteriorated.

Grease the lips of the new anti-dust seal (1) and the new oil seal (2) with the appropriate grease.



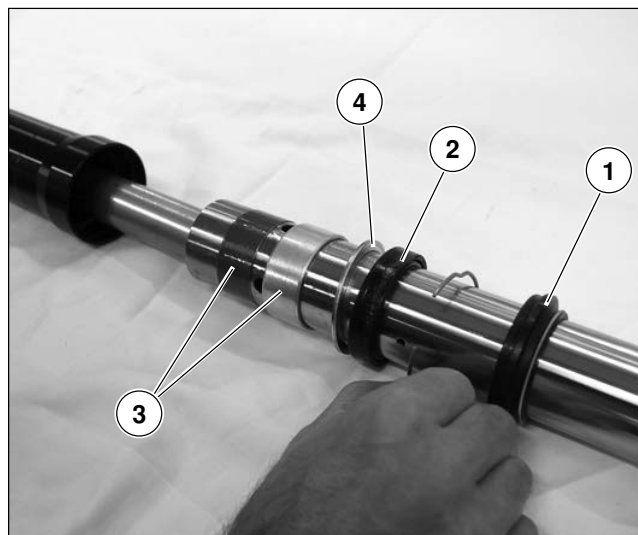
Recommended grease: MOLYKOTE 55M

Make sure that the bushings (3) and washer (4) placed against the oil seal are inside the sleeve. Proceed with re-assembly of the oil seal using the required tools.



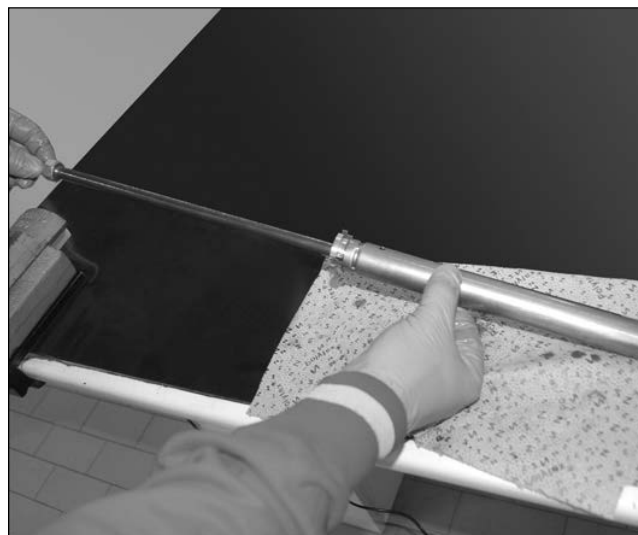
Special tool No. 8000B6785

Install the dust seal and oil seal on the stem.



Visually check for scratches and marks on the pump rod and check that it slides smoothly inside the pump unit without chamfering.

Substitute if necessary.





Suspension and wheels

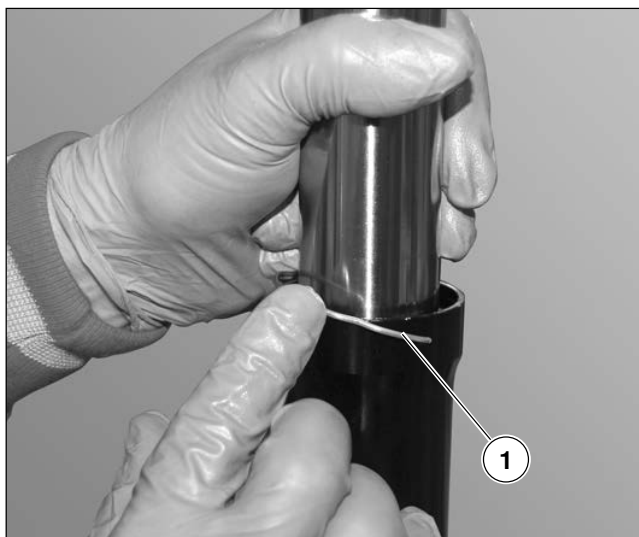
Mount the rod in the lining taking the bushing into the seat with the respective washer; use the specific tool. Mount the oil retainer using the same technique.



Special tool No. 8000B6785

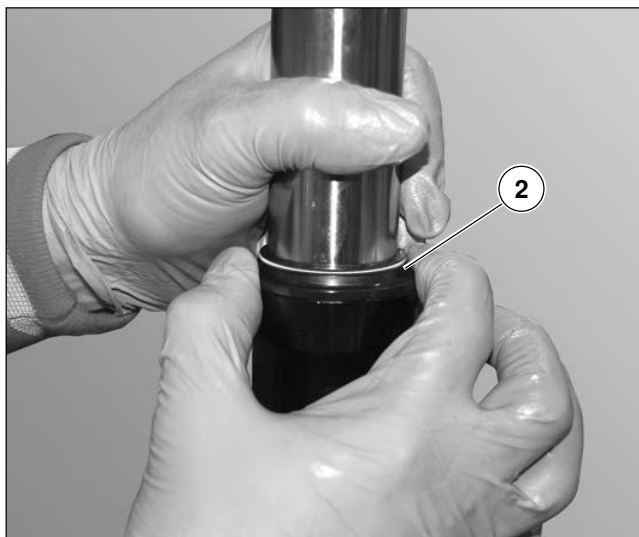


Insert the clamping ring (1) in place.



F

Then, put the dust seal in (2) by hand.



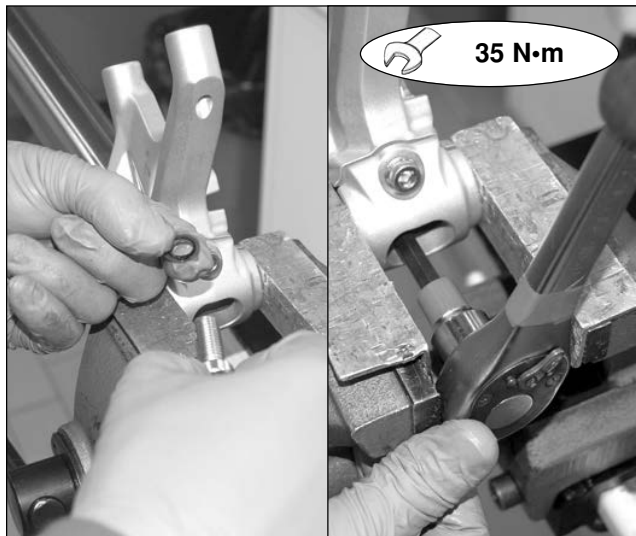


Suspension and wheels

Insert the pump into the stem and fasten it on with the relative screw.



Tighten at 35 N·m.



F

While holding the sheath in an upright position, insert the spring press spacer; pour in the following oil quantities:

- Rivale 800: 470 cc(*)

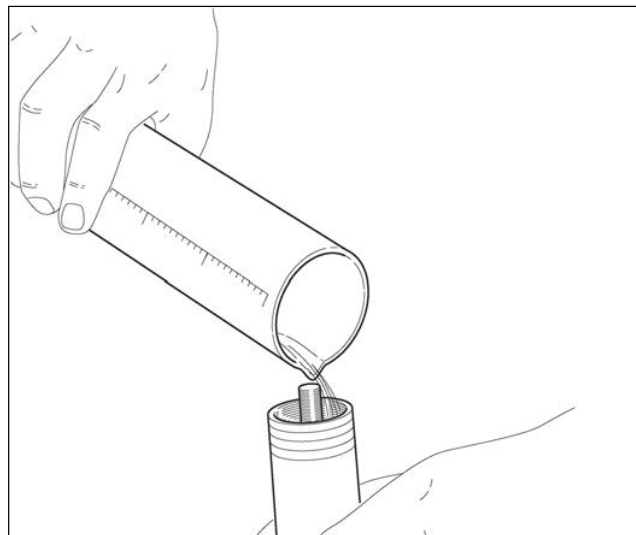
(*): *approximate quantity calculated in relation to the actual maintenance level.*

Repeatedly move the damping piston rod up and down until the it slides smoothly.



Oil type used: SAE 7,5

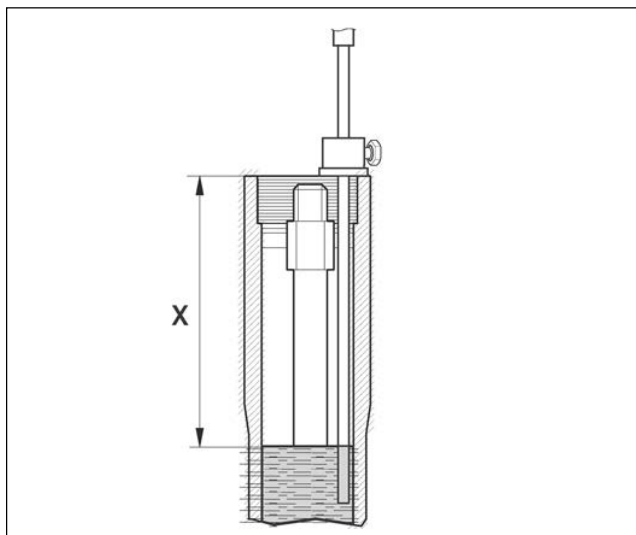
Recommended oil: Marzocchi EBH16 SAE 7,5



Check that the oil is at level "X" with reference to the upper sheath rim, measured when the sheath is completely compressed.

- Rivale 800: X = 100 mm()**

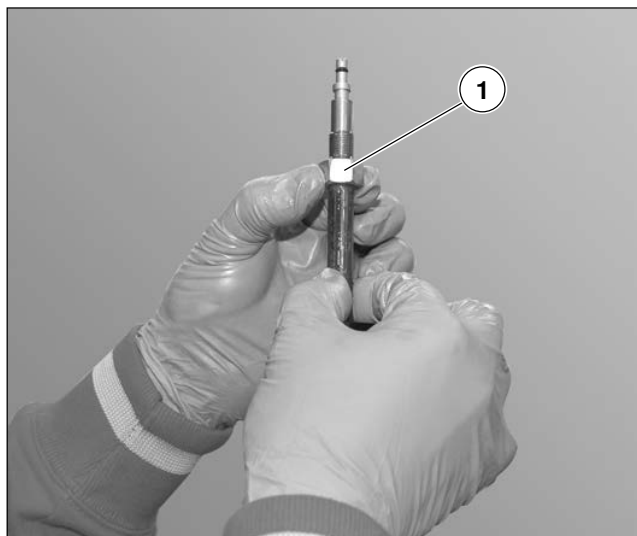
(**): **N.B.: Measurement taken with the inside rod and the spacer in place.**





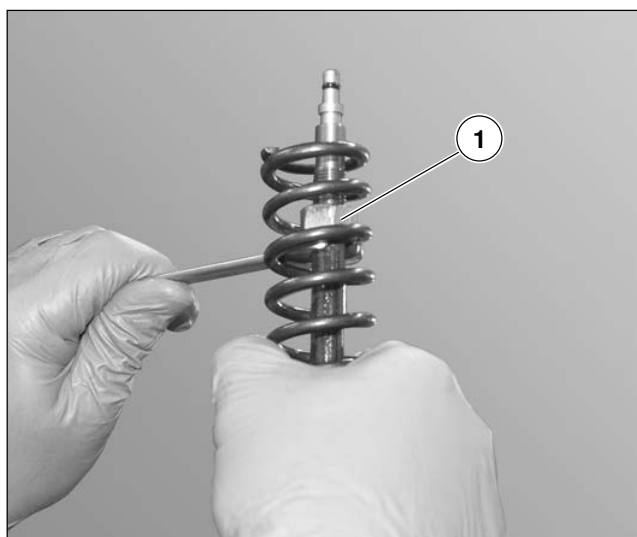
Suspension and wheels

Lift the plunger and manually turn the conternut (1) in to the end of the threaded portion.



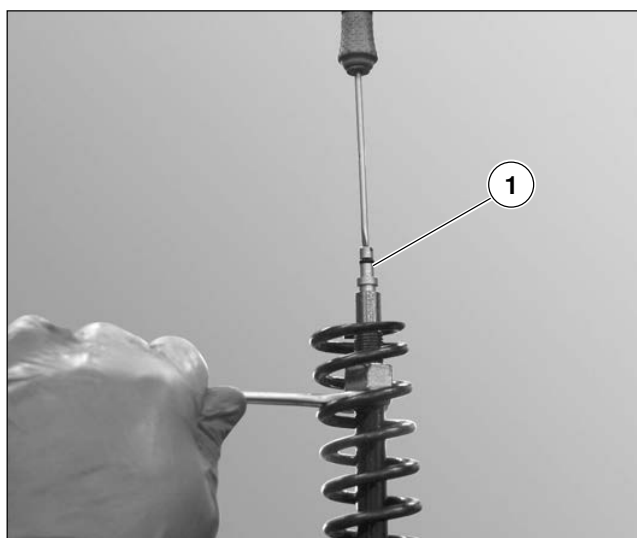
Put the spring in by holding the pump rod in an extended position outside of the sleeve.

Insert the 13 mm wrench under the pump nut (1) to stop the rod from falling out.



F

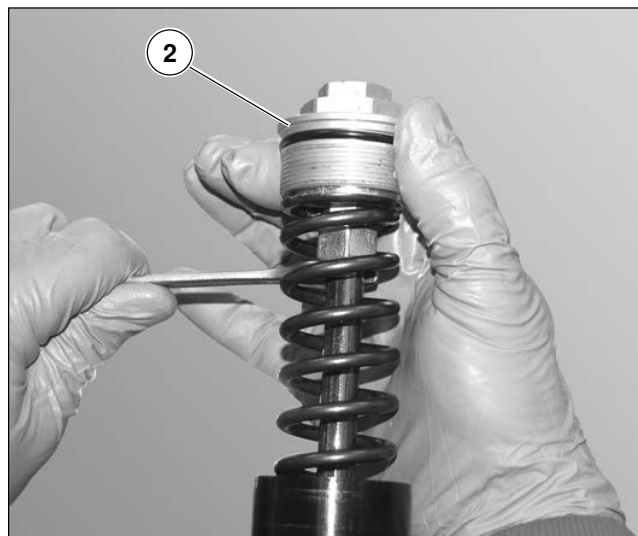
Screw the hydraulic brake adjuster (1) on as far as it will go.





Suspension and wheels

Install the cap (2) complete with new o-ring, by hand, and screw it on until it hits the rod and not the nut.

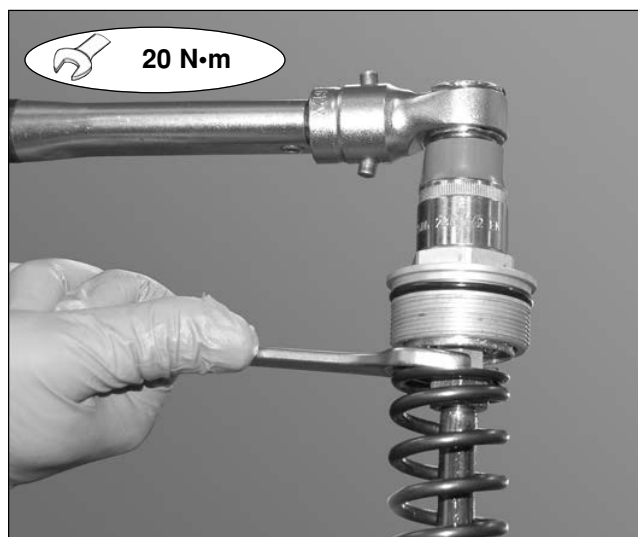


Tighten the plug with the prescribed torque.

F



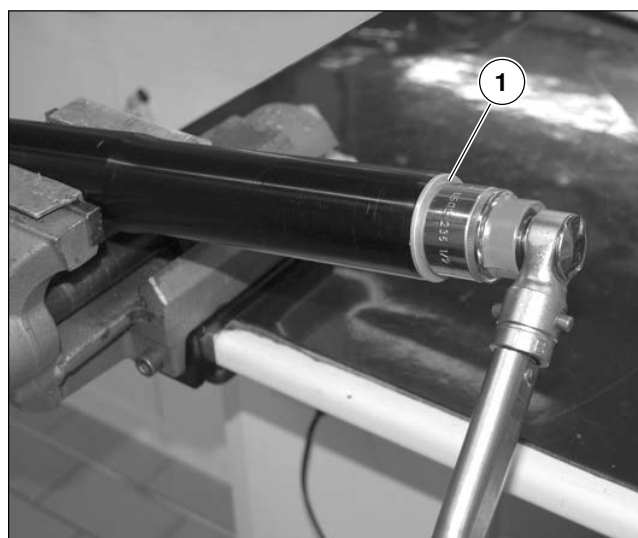
Fork leg plug tightening torque: 20 N·m



Insert and screw in the complete cap (1) on the fork slider at the required torque.



Sleeve cap torque pressure: 20 N·m



Fitting the fork legs

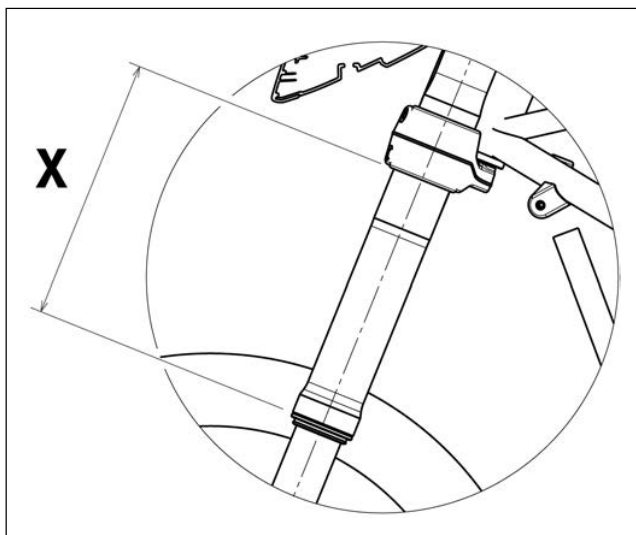
Reassemble the stem taking care to pass the electrical wiring, the clutch tube and the brake pipe as shown in the picture.



To ensure proper positioning of the rods, refer to the figure at right, taking care to observe fitting dimension "X":

- Rivale 800:

$X = 239 \text{ mm}$



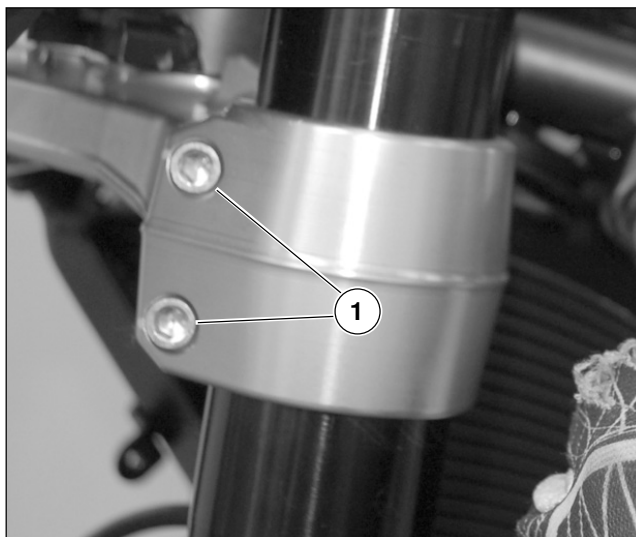
F

Bring the two screws (1) into contact at the base of the steering.



Carry out this assembly correctly. A casual or inexact assembly could compromise the stability and steering of the motorcycle.

Fit the right-hand leg following a similar procedure.





Suspension and wheels

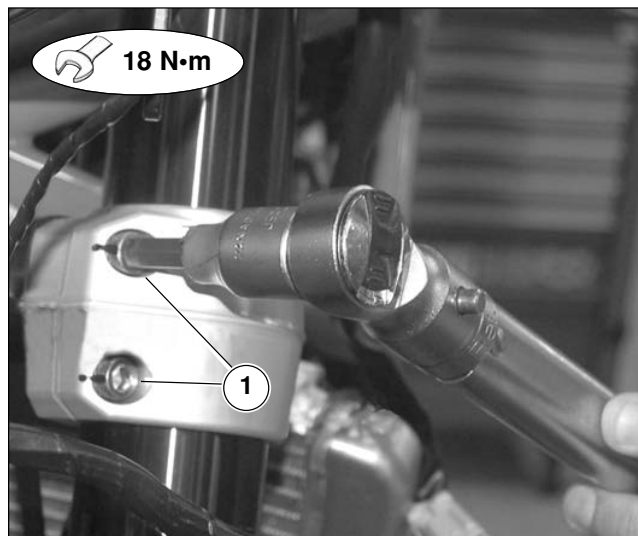
Tighten the two screws (1) at the base of the steering. **Effectuate the operation several times until the torque wrench does not turn the screw any more.** This operation must be carried for both stems.



Grease only the first threads.



Torque pressure: 18 N·m



F

Re-install the steering head making sure that it fits perfectly in place.

Tighten the three screws (2) of the steering head/stems to the prescribed torque pressure.



Torque pressure steering head (2):
16 ÷ 18 N·m

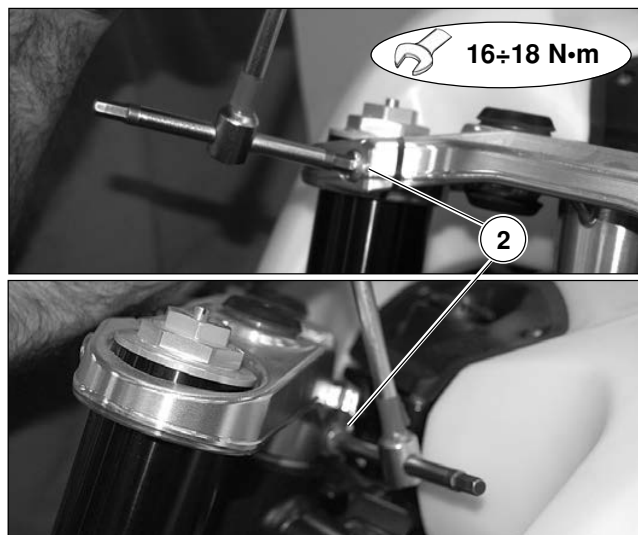


Grease only the first threads.



This check is necessary for the correct positioning of the stems even if the steering head has not been removed. This check guarantees the standard set-up of the motorcycle.

Mount the front wheel and brake callipers according to procedures contained in the page 9.





Suspension and wheels

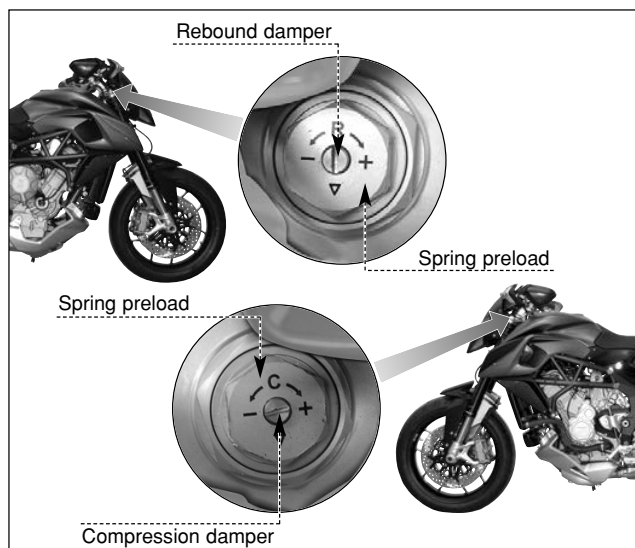
Adjusting the front suspension

After having correctly mounted the entire fork unit, it is necessary to re-establish the correct adjustments if the front suspension in order to guarantee the best set-up of the motorcycle.

To adjust the front suspension, refer to the values given in the following table.

Rivale 800	<i>Type of geometry (On road)</i>
Spring preload	4,5 turns
Rebound damper	2 turns
Compression damper	2 turns

NOTE The adjustment of the suspensions must be preferably performed with the fuel tank full.



Spring preload

The adjustment is obtained from the reference position, which is found by fully turning the adjusting nut counterclockwise; from this position, turn the screw clockwise until you reach the standard position (see table). Rotate clockwise to increase the spring preload or counterclockwise to decrease it.



F

Rebound damper

The adjustment is obtained from the reference position, which is found by fully turning the screw clockwise and then counterclockwise until you reach the standard position (see table). Rotate clockwise to increase the damping action or counterclockwise to decrease it.





Suspension and wheels

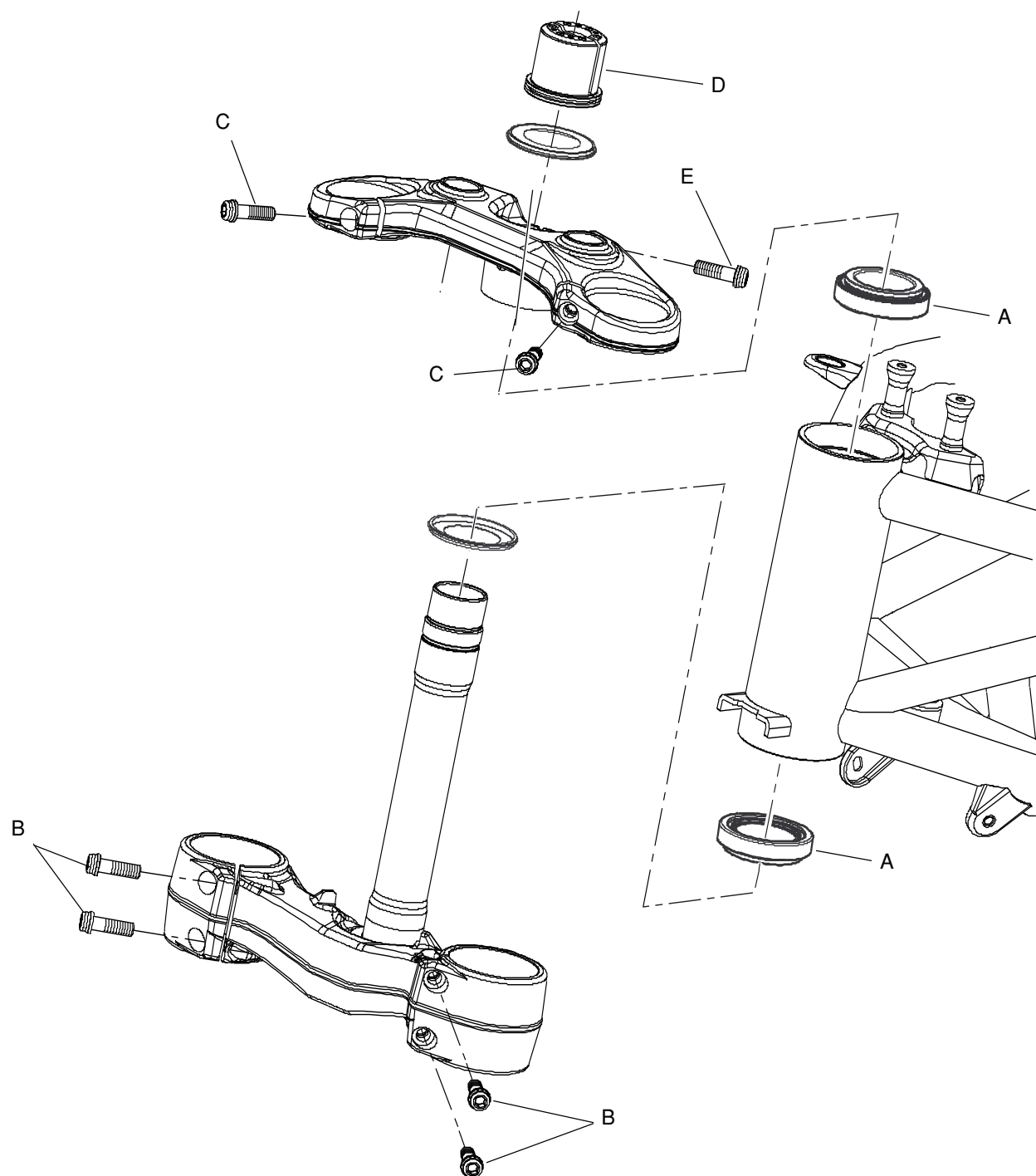
Compression damper

The adjustment is obtained from the reference position, which is found by fully turning the screw clockwise and then counterclockwise until you reach the standard position (see table). Rotate clockwise to increase the damping action or counterclockwise to decrease it.



F

STEERING ASSEMBLY



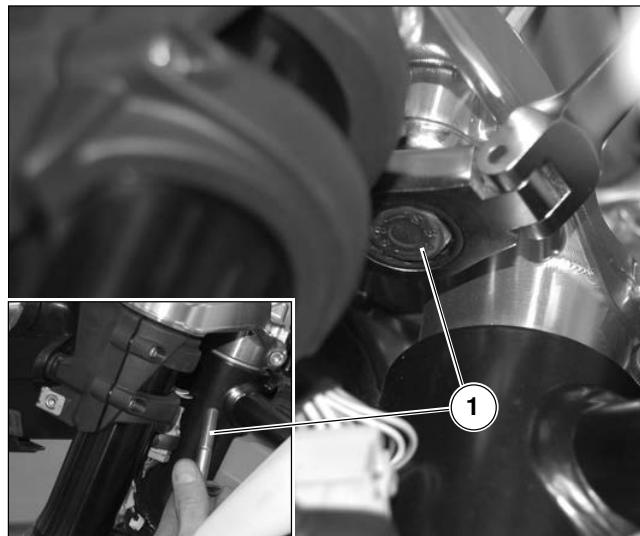
		A	B	C	D	E	F	G	H	I
Torque pressure	N·m		18	16 ÷ 18	Into contact +10°	22 ÷ 24				
	Kg·m									
	ft·lb									
Operation										



Suspension and wheels

STEERING ASSEMBLY OVERHAUL

In order to operate on the steering unit, the first handlebar unit must be removed by loosening the two screws (1) and sliding them out.



F

Fold the handlebar over the headlight, protecting it with a cloth.



Remove the spacers (2).



To operate on the steering assembly, it is necessary to remove the fork stems as described in this chapter, in the paragraph "Front fork overhaul", or lift the front wheel using the specific kickstand.



Special tool No. 800095807 and No. 8000B7340

Then remove the components according to the following order:

- front headlight;
- instrument panel;
- handlebars;
- headlight support;

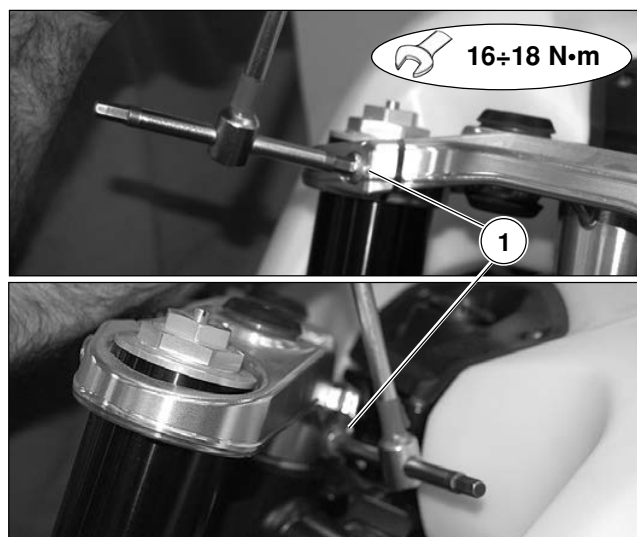
as described in chapter C "Bodywork".

The vehicle is as shown in the photo.



Steering head removal

Slacken the three fixing screw (1) of the steering head.



F

Successively, extract it from the steering pin, which has been previously tuned to the left. Use a rubber mallet, if necessary.





Suspension and wheels

Steering base removal

Utilising the special tool, slacken the screw ring of the steering pin.

Support the motorcycle sufficiently enough so that the front stand can be removed. Ensure that the brake calipers are securely placed.



Special tool No. 800091645

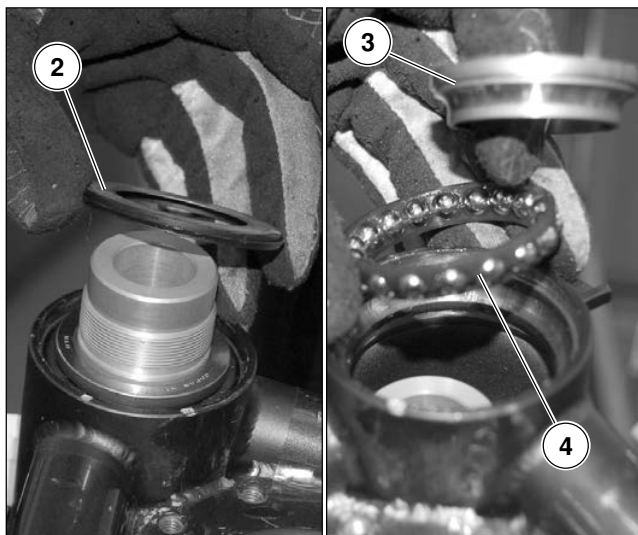


F

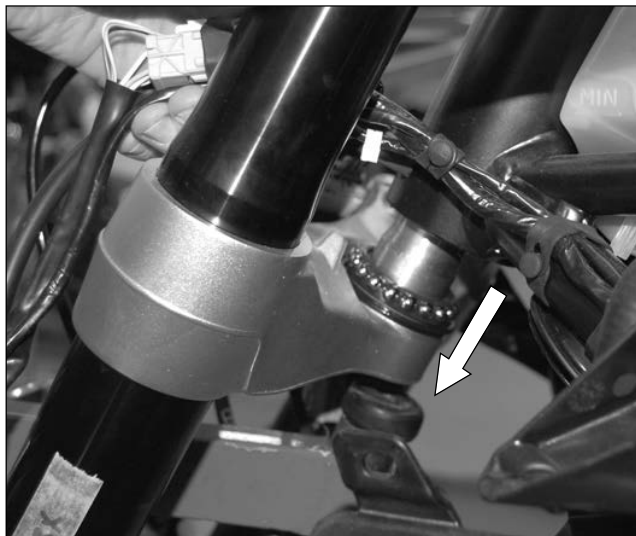
Remove the screw ring (1) previously slackened.



Remove the anti-dust seal (2), the internal bearing ring (3) and the ball bearing ring (4).



Remove the steering base from the lower part.



Assembly steering base

Accurately clean all the parts and check the general condition.

Before reassembly, grease the internal ring of the bearing and the ball bearing ring on the steering pin with **Agip Grease 30**.



Recommended grease Agip Grease 30



F

Refit the steering base to the frame tube.
 Assemble the upper ball bearing ring already greased.
 Assemble the internal ring of the bearing, the anti-dust seal and the screw ring of the steering pin.



Steering pin tightening

Screw down, without tightening, the screw ring of the steering pin.

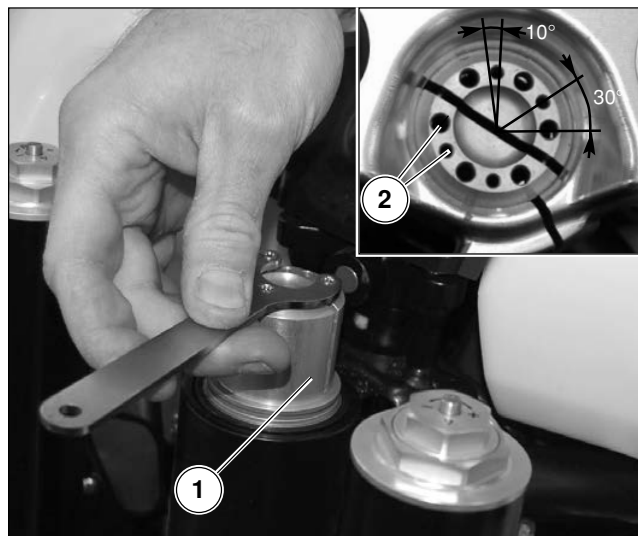
This operation must be done manually.

Ensure that the steering base is at the end of stroke, completely steered to the right.

Utilising the special tool, tighten the screw ring (1) by rotating it 10° (see figure), calculable as **one-third** distance between the two holes of the steering head screw ring (2).



Special tool No. 800091645



F

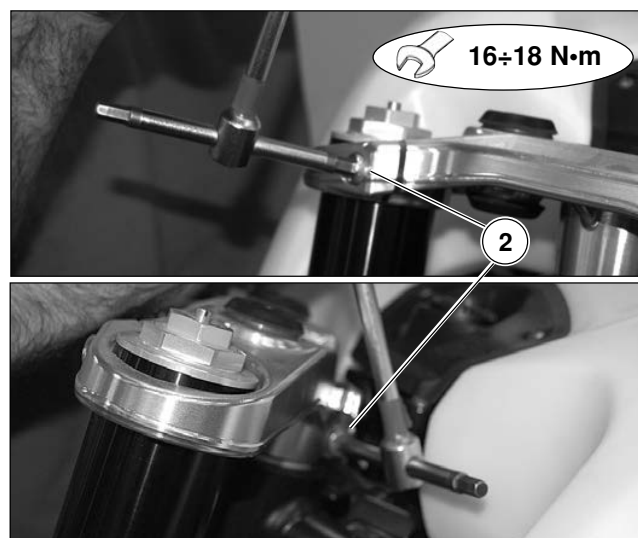
Steering head assembly

Position the steering head in its seat.

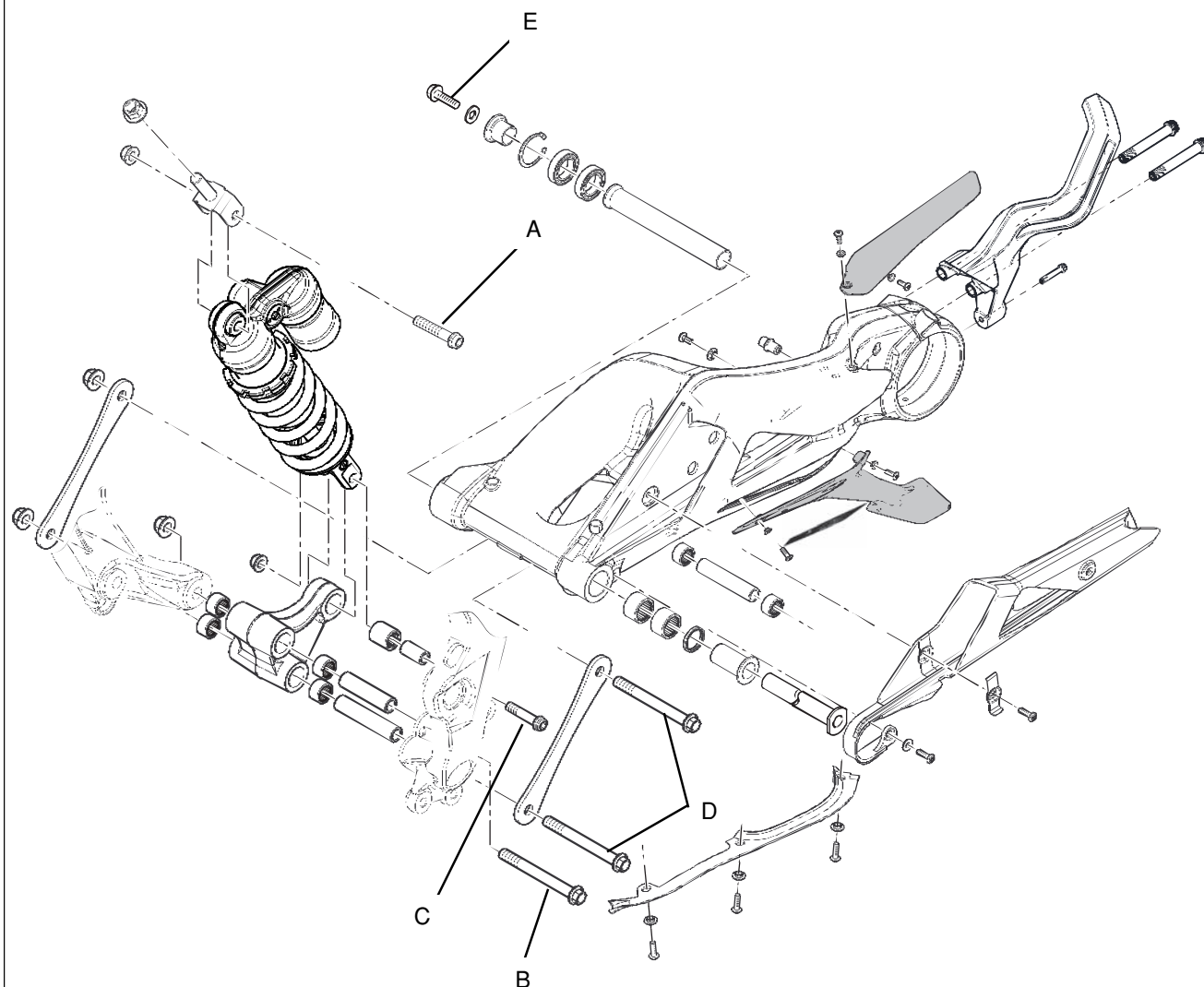
Reposition the fork stems (if removed) as described previously in this chapter.

Tighten the three screws of the steering head as described previously.

NOTE Check the exact position of the fork stems.



REAR SUSPENSION AND SWINGARM



F

		A	B	C	D	E					
Torque pressure	N·m	40 ÷ 44	55 ÷ 60	40 ÷ 44	55 ÷ 60	70 ÷ 75					
	Kg·m										
	ft·lb										
Operation		243									

Description	Rivale 800
REAR SUSPENSION	
Type	Progressive, single shock absorber with extension, compression and spring preload adjustment
Swingarm	Aluminium alloy
Wheel travel (mm)	130

During the disassembly and check of the rear suspension assembly, it is advisable to disassemble the fuel tank, as described in chapter C “Bodywork” and the silencer as described in chapter H.

Rear shock absorber disassembly

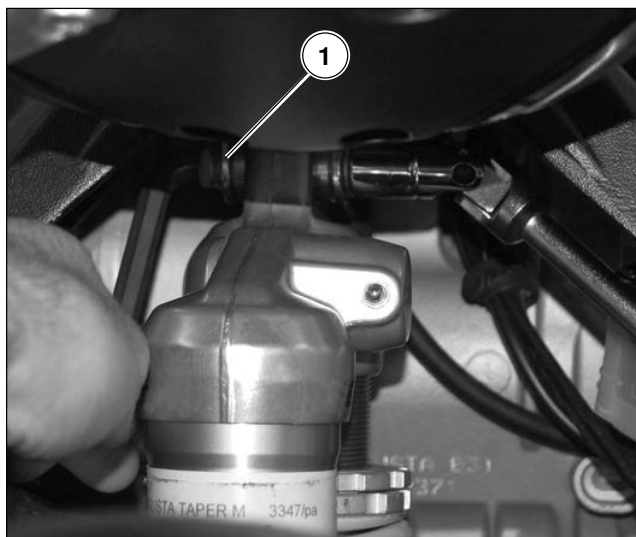
Remove the saddle, the passenger foot peg supports, the number carrier side panels with the headlights and the under-saddle bulkhead, as described in Chapter C "Fairing".

Lift up the rear part of the motorcycle with the specific lifter.



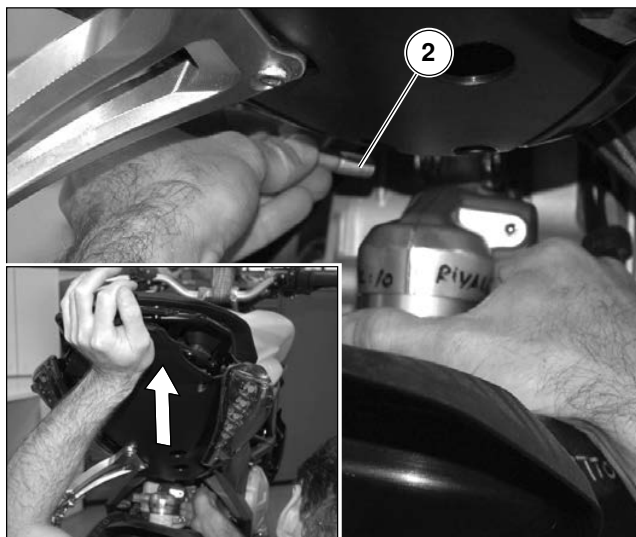
F

Slacken the upper nut (1) of the shock absorber.

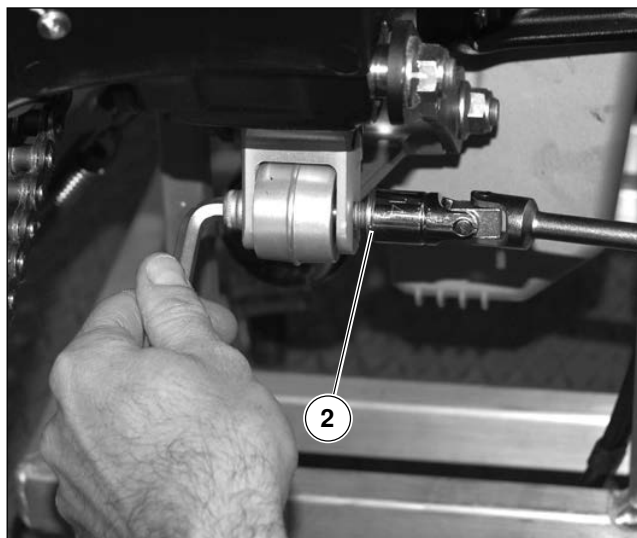


Push the screw (2) outwards.

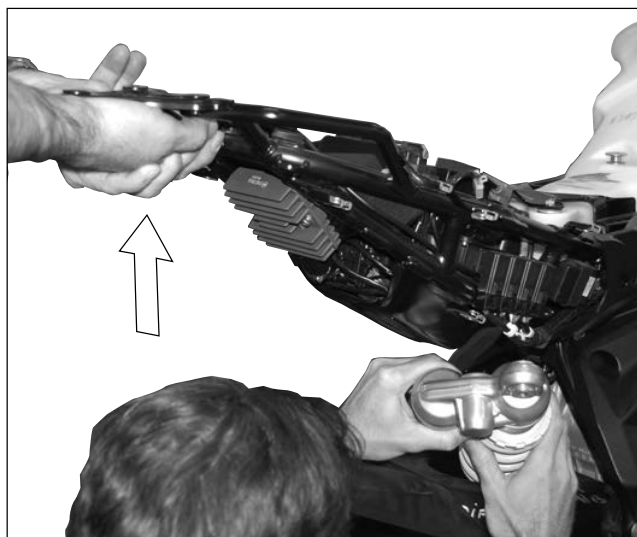
Unload the weight onto the damper and remove the screw as shown in the picture.



Remove the bottom nut (2) of the damper and slide the screw out, discharging the weight of the shock absorber.



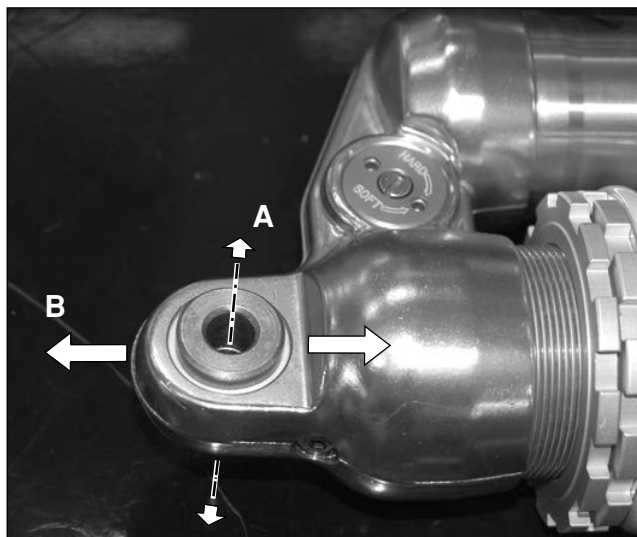
Extract the complete shock absorber, discharging the weight of the same.



F

Rear shock absorber test

Make sure that the top connection of the damper (ball joint) does not have any axial (A) or radial (B) play.





Suspension and wheels

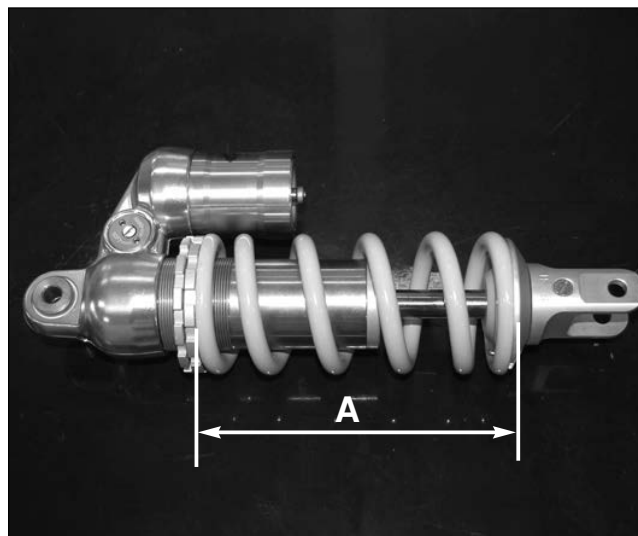
Check the length of the rear shock absorber spring.
Standard spring adjustment (**A**):

- **Rivale 800:** **A = 160 mm**

Check the functioning of the adjusters.



The shock absorber contains high-pressure gas. Do not touch the valve of the shock absorber tank. Do not try to disassemble the shock absorber.



Adjusting the rear suspension

F



To evaluate the rear suspension calibration do not in any way act on the tail. It would surely be subject to damage.

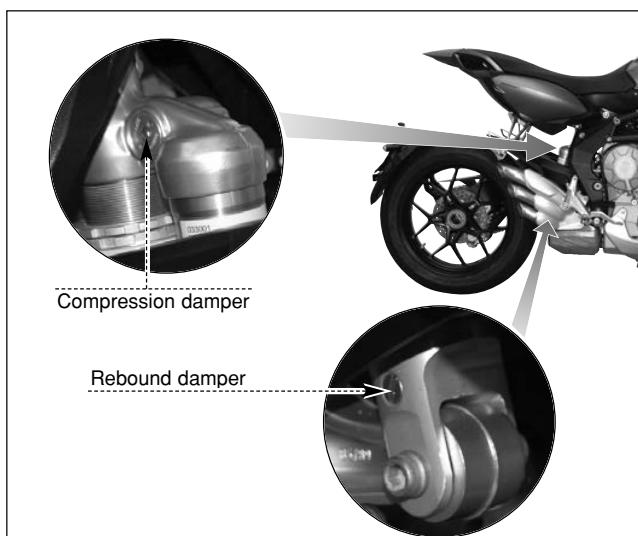
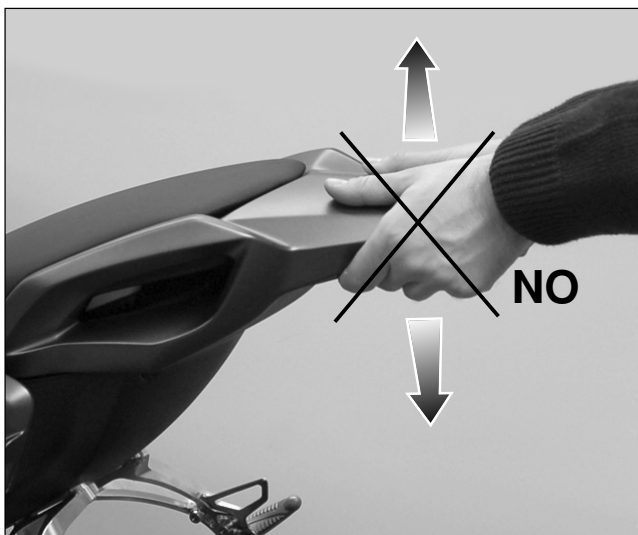
To adjust the rear suspension, refer to the values given in the following table.

Rivale 800	<i>Type of geometry (On road)</i>
Rebound damping	2,5 turns
Compression damping	2,5 turns

The adjustments given in the table must be made starting from the relative initial reference positions. These positions must be determined via the following procedures:

- Rebound damping: turn clockwise until fully home and then turn anti-clockwise to the standard position (see table).
- Compression damping: turn clockwise until fully home and then turn anti-clockwise to the standard position (see table).

NOTE The adjustment operations can be performed also with the rear shock absorber mounted on the vehicle.
For further checks on the ball joints of the rear shock absorber attachments it is necessary to follow the disassembly phases described in this chapter.





Suspension and wheels

Rear shock absorber assembly

Accurately clean all parts. Grease the screws with Agip Grease 30 before reassembly.

Insert the shock absorber from above and lightly screw in the lower screw of the shock absorber using the relative nut.

Insert the shock absorber into the compensator assembly and lightly screw in the screw using the relative nut.



Lower the motorcycle to the ground, remove the lift and safety straps.

This operation is necessary to recover the play between the shock absorber/compensator assembly/swingarm.



Recommended grease: Agip Grease 30

Tighten the bottom (1) and top (2) damper nut holding the screw on the opposite side still.



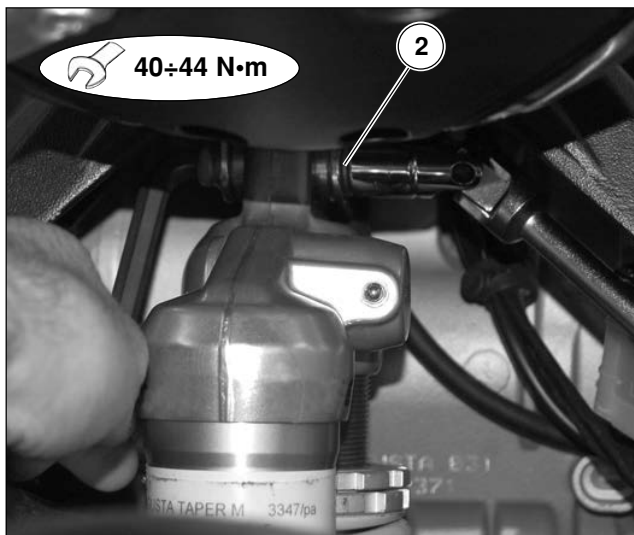
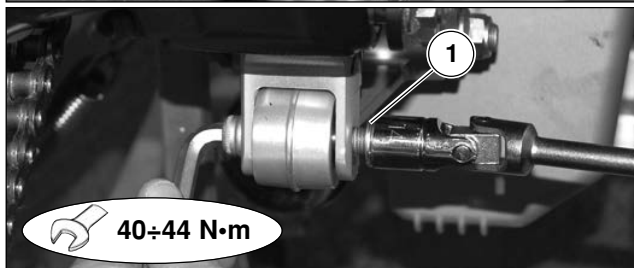
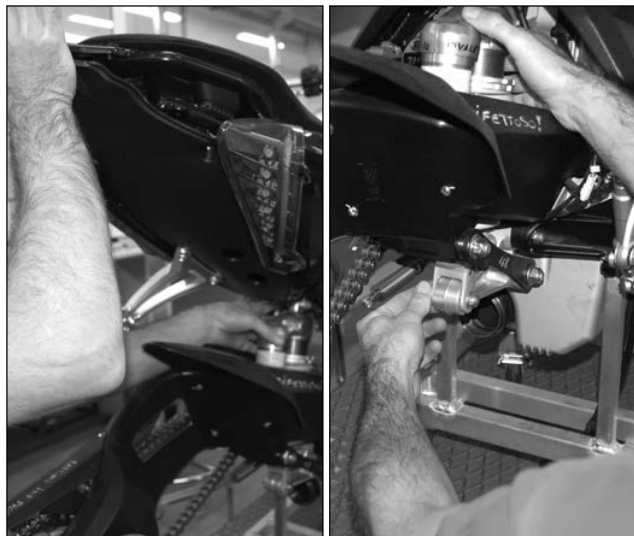
Grease only the screw thread.



Recommended grease: Agip Grease 30



Shock absorber torque pressure 40 ÷ 44 N·m



F

SWINGARM REMOVAL AND OVERHAUL

Remove the rear damper as described in the previous pages.

Rear wheel removal

Remove the rubber and the safety spring clip (1) and unscrew the screw ring of the wheel.



Attention! The screw ring has a left-handed thread.



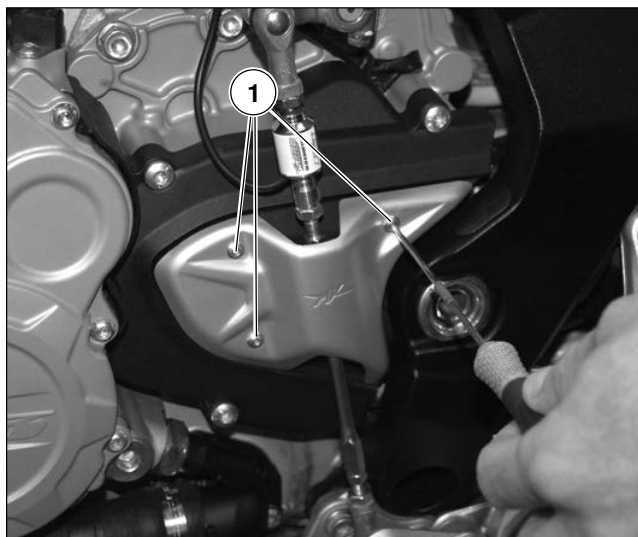
F

To remove the wheel in presence of the number plate carrier, it is necessary to remove the tyre as shown in the figure.



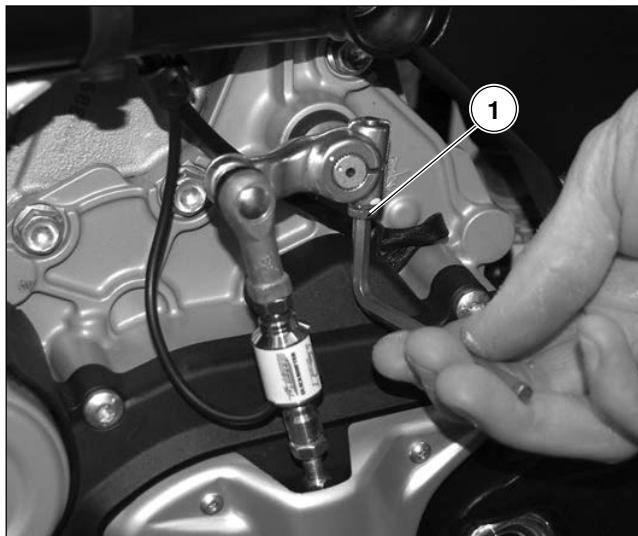
Pinion cover removal

Remove the fixed cover on the pinion lid by loosening the three fixing screws (1).

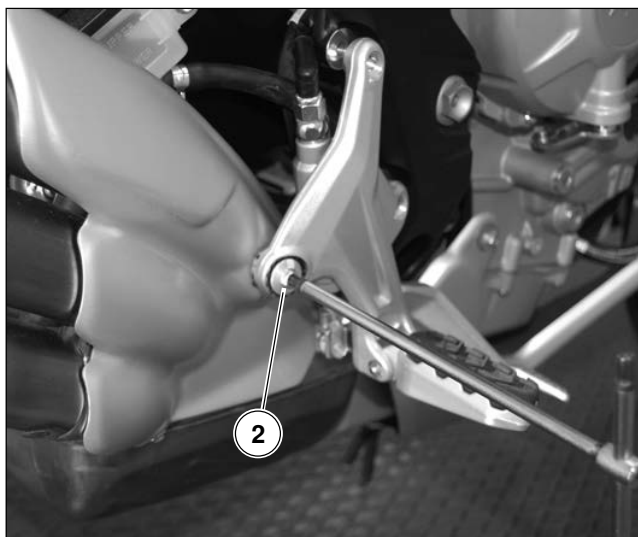


Footrest removal

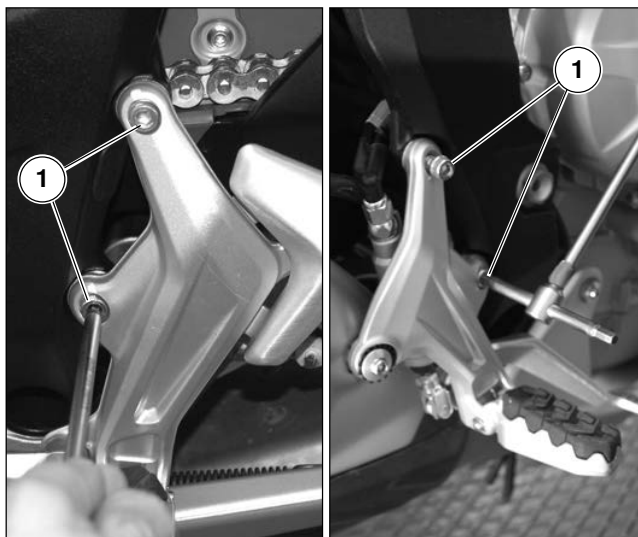
Before disassembling the left foot peg remove the clamping screw (1) from the gear extension.



On the right foot peg, also remove the silencer clamping screw (2).



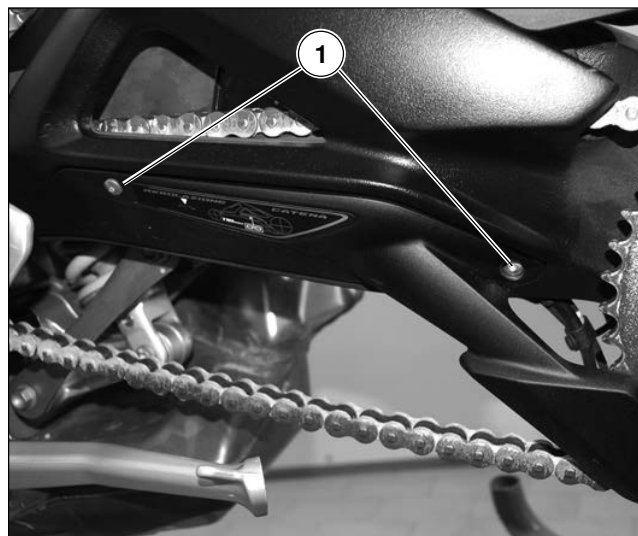
Operate on the two screws (1) of both the right and left foot peg supports and remove them. Pay attention to the rear brake pump fixed onto the left support.



Lower chain guard removal

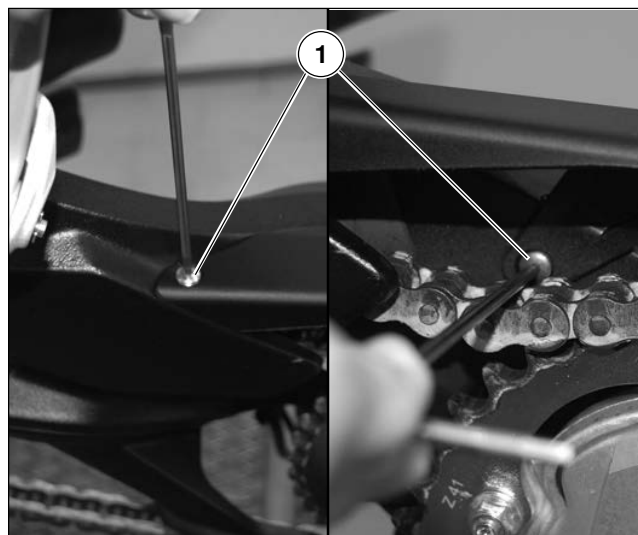
Remove the two socket head screws (1) of the lower chain guard.

Remove the lower chain guard, taking care to recover the internal bushes.



Top chain guard removal

F Remove the two top chain guard screws (1).



Silencer disassembly

Remove the clamping screw on the lh side.



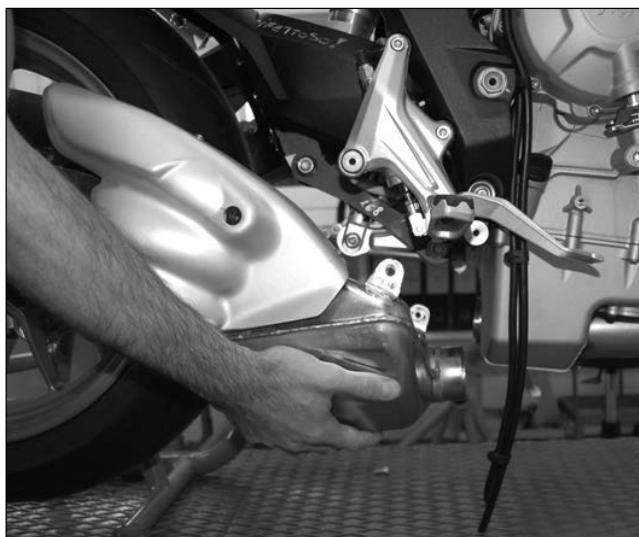


Suspension and wheels

Remove the socket head screw on the right side.



Remove the silencers unit from the exhausts.



F



Suspension and wheels

CHAIN REMOVAL

Remove the chain utilising the special tool.



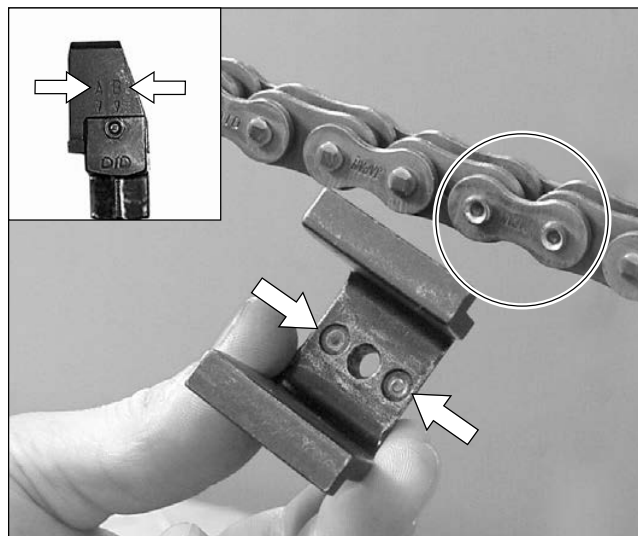
Special tool No. 800095389.

Identify the connecting link.

The part of the tool being indicated must operate on the internal part of the crown wheel.

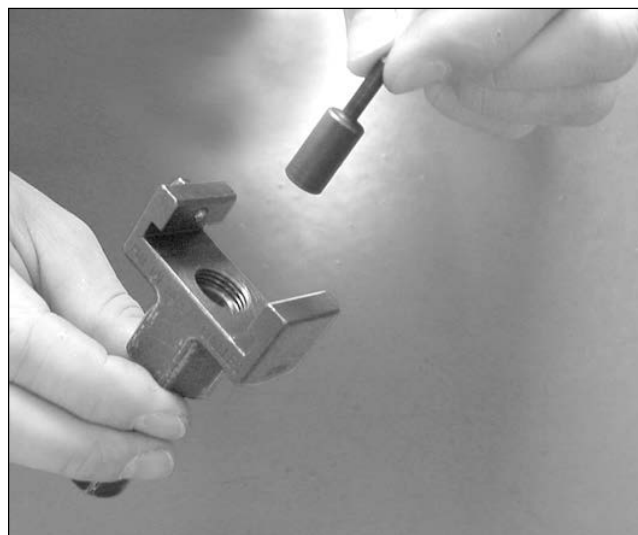
NOTE The tool has three functions:

- As a chain cutter: with a punch mounted aligned at A.
- Press fitting of connecting link plate: with a raised punch aligned at A.
- As an anvil: with a raised punch aligned at B.

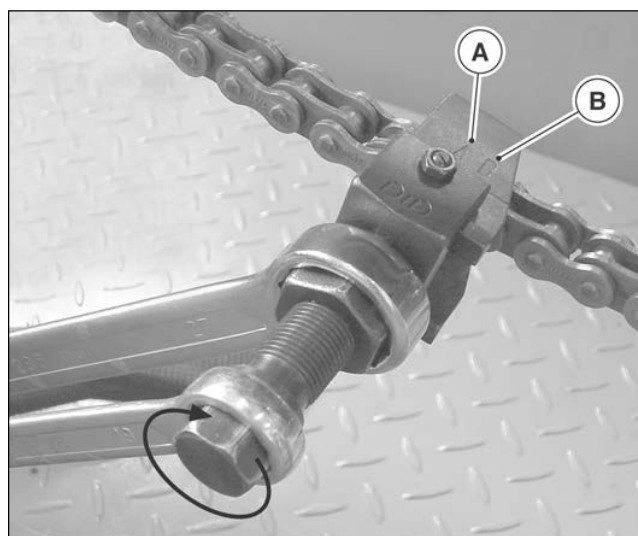


F

Pre-assemble the tool as shown in the figure.
Align a pin with the central hole of the tool.



Mount the tool onto the chain as shown in the figure and align the punch on «A».
Operate as shown in the figure, removing both pins from the connecting link.





Suspension and wheels

REASSEMBLING CHAIN

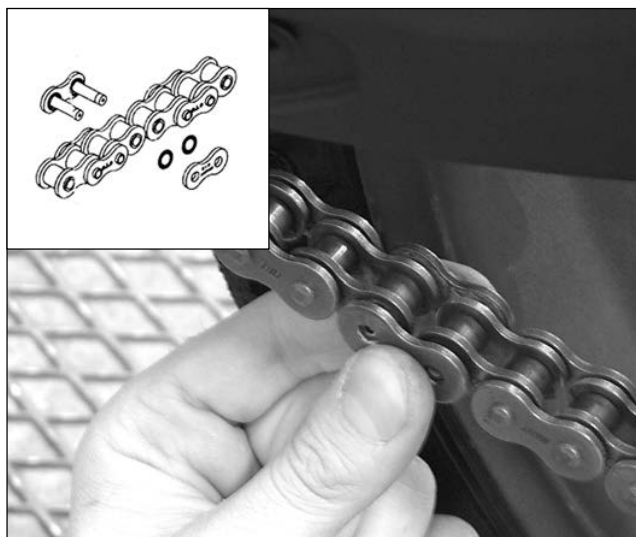
Before reassembling the chain, grease the connecting pins and the O-Rings as shown in the figure, by using the special grease supplied with the chain kit.



Utilise only new links.

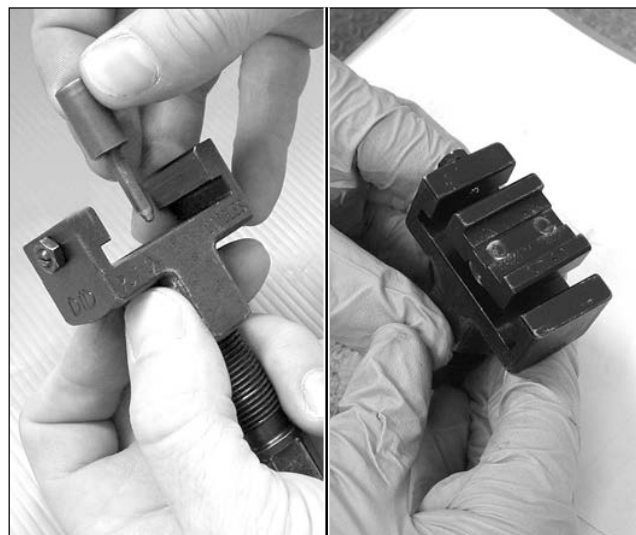


Connect both ends of the chain with the connecting link, and press the connecting plate into the connecting pins by hand.



F

Fit the punch and the plate holder on the tool as shown in the figure.





Suspension and wheels

Mount the tool onto the chain as shown in the figure and align the punch on «A».

Turn the pin holder by hand until the plate holder contacts with the connecting link plate.

Tighten at the specified torque.



Connecting link plate press fitting torque pressure: $30 \div 35 \text{ N}\cdot\text{m}$



Riveting of pin

F

Pull out the plate holder from the tool, keeping the punch in the position used in the previous operation.

Mount the tool onto one of the pins of the connecting link as shown in the figure and align the punch on «B».

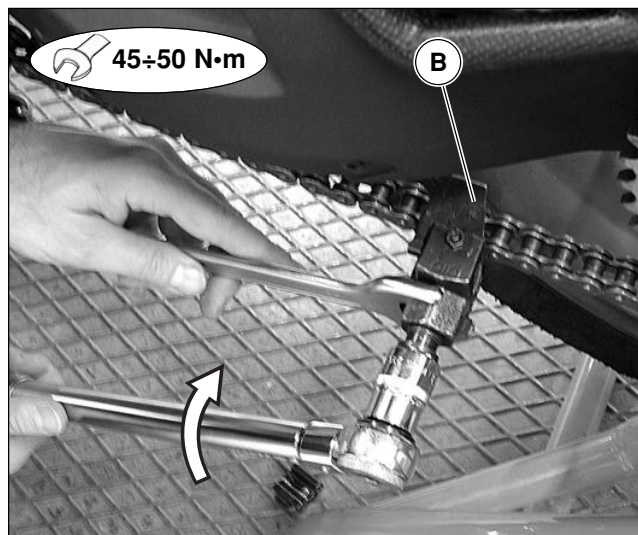
Turn the pin holder by hand until the punch contacts with the pin. Check that the punch and the pin are correctly aligned.

Tighten at the specified torque.



Pin riveting torque pressure: $45 \div 50 \text{ N}\cdot\text{m}$

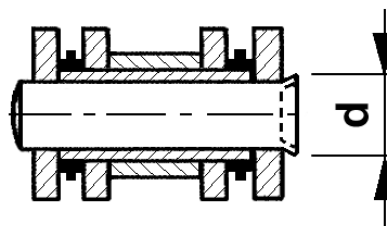
Repeat the above operations for the second pin of the connecting link.



When the riveting is over, check if the diameter of the head of both pins is between the following range:

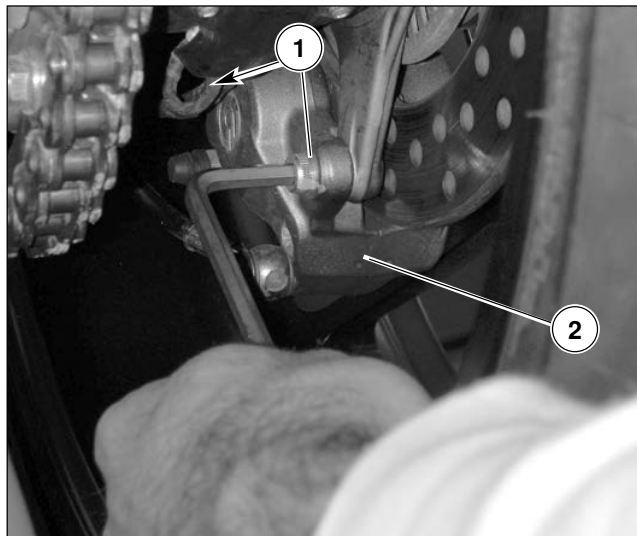
- **Pin head diameter after riveting:**

$d = \varnothing 5.5 \text{ mm}$



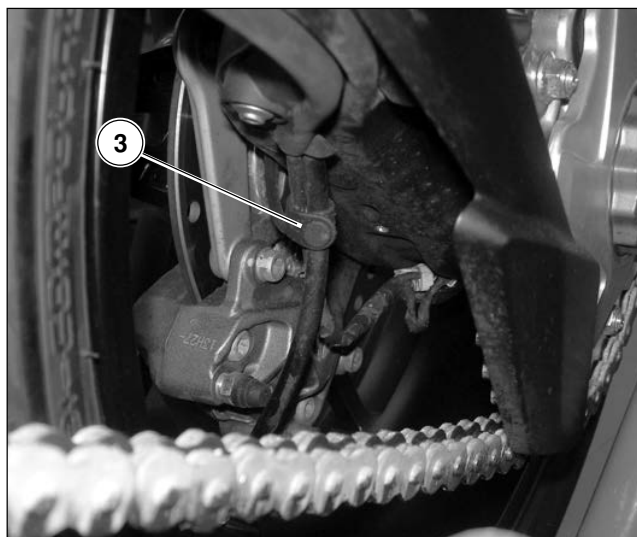
Removing the rear brake caliper

Loosen the two screws (1) and remove brake caliper (2).



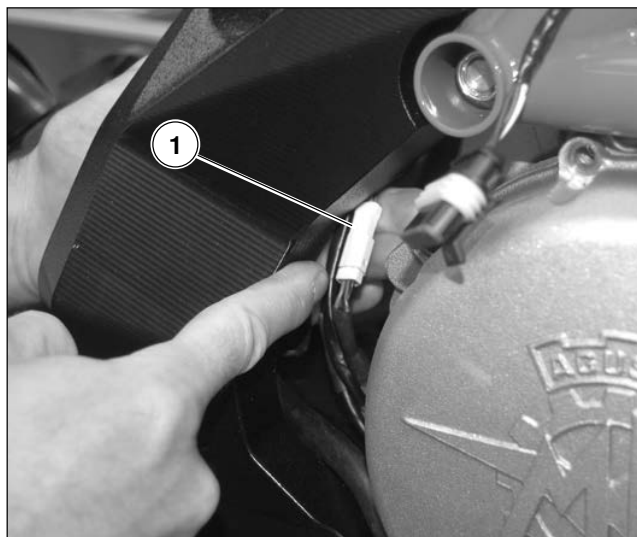
Speed sensor cable disassembly

Remove the speed sensor cable holding clamp (3).



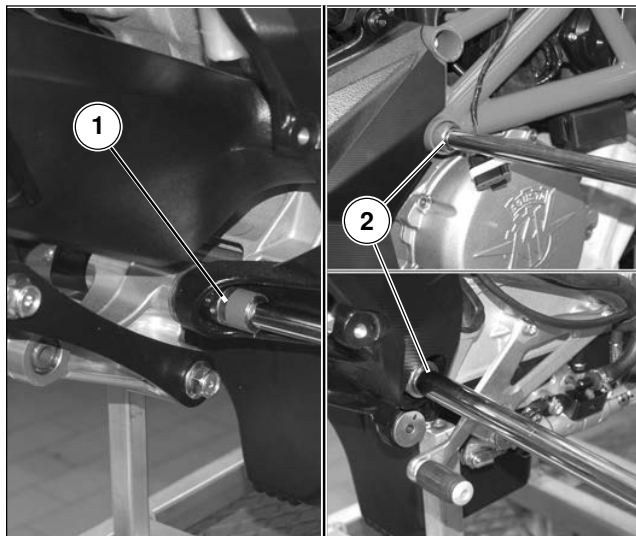
F

Disconnect the speed sensor cable connector (1).



Swingarm pin removal

Before removing the swingarm pin, loosen the suspension rocker pin (1) and the two engine pins (2). (See chapter G "Frame").

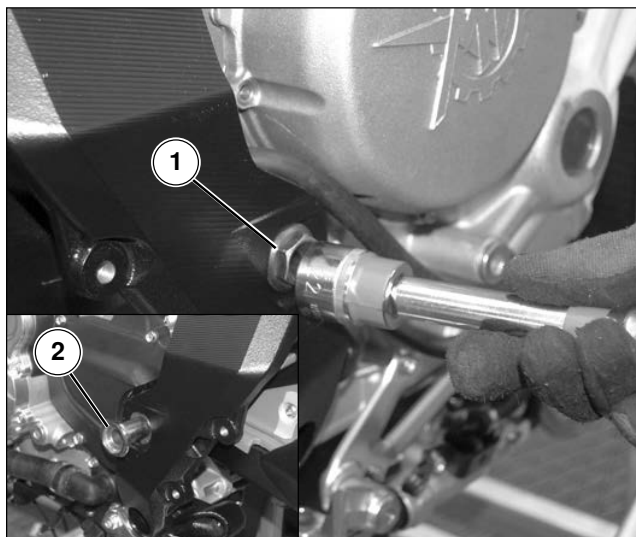


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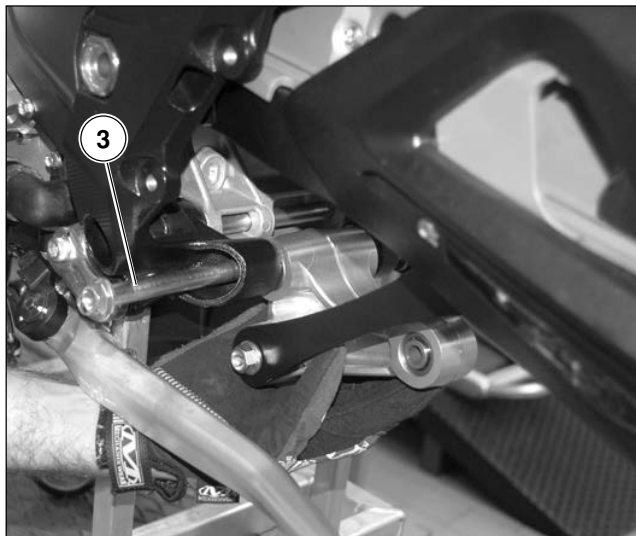
Also loosen the pin for the pads.



Remove the screw (1) on the left side of the vehicle. Remove the washer and push out the pin (2) **manually**.

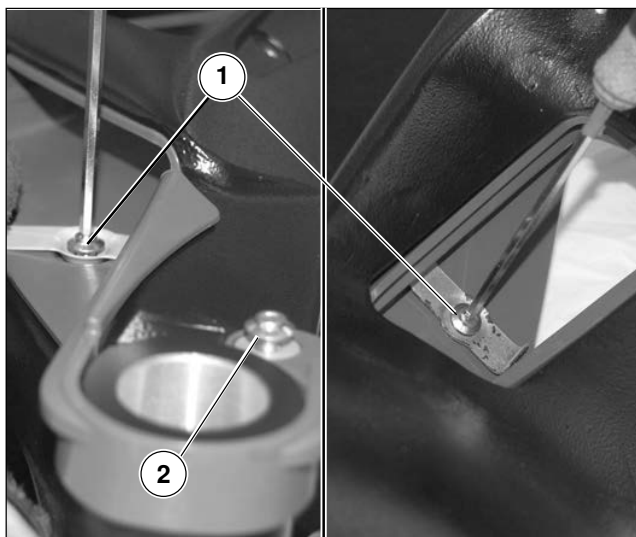


At this point slide out the rocker arm pin (3). Support the swing arm to avoid it from falling on the ground and slide it towards the rear part of the motorcycle.



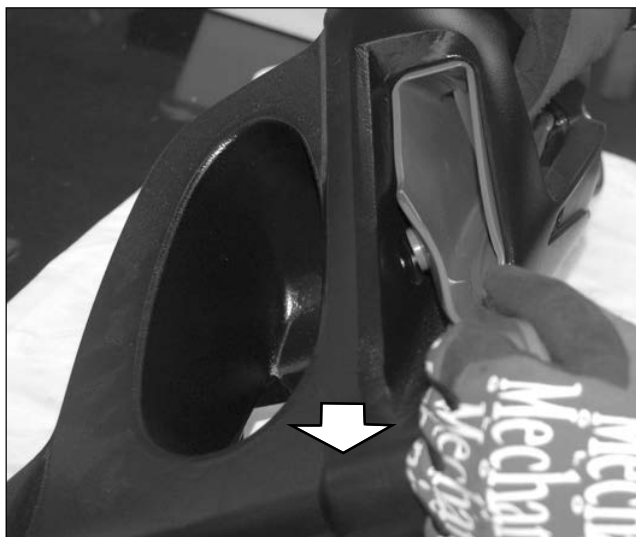
Upper chain guide removal

Remove the 2 screws (1) and relative plates and the screw (2) on the front.



F

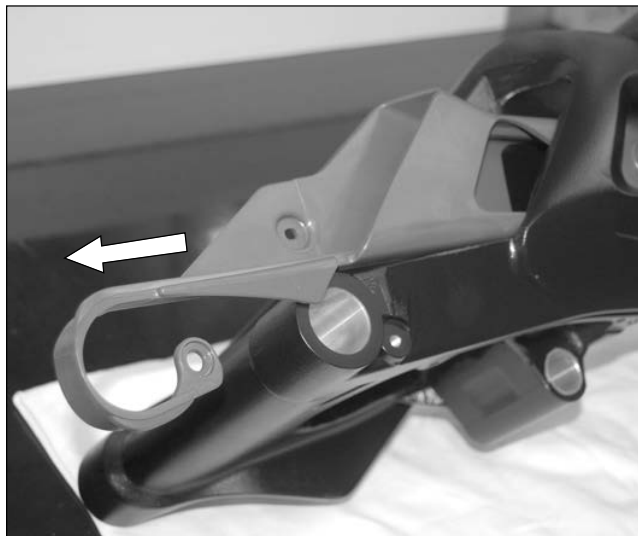
Lift up the front part of the chain guide to remove it from the swingarm (see figure).





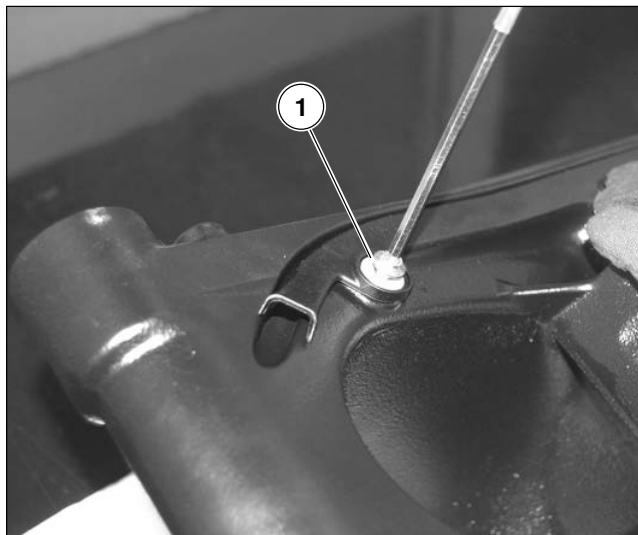
Suspension and wheels

Slide out in a forward position as shown in the figure. During re-assembly, proceed in reverse order making sure that the two front and rear reference elliptical elements are in the correct position.



Lower chain guide removal

F Remove the 3 screws (1) with their relative spacers.



Bearings overhaul

If it is necessary to substitute the bearings of the swingarm because of excessive play, operate as follows:

Remove the right and left spacer.

Remove the Seeger retaining ring on the right side of the swingarm.

Remove the anti-dust seal on the left side.

Utilising the special tool, remove the two roller bearing units.



Special tool No. 800092860 LEFT SIDE



Mount the tool so that both roller bearings are removed.





Suspension and wheels

Utilising the special tool press on both ball bearings and extract them.
Operate in the same way for the bearings on the left side.



Special tool No. 800092860 RIGHT SIDE



Extract the spacer from the right side.

Check the condition of both bearing seats and the seat of the spacer.

If the spacer is in good condition, reinsert it onto the fork from the right side.



F

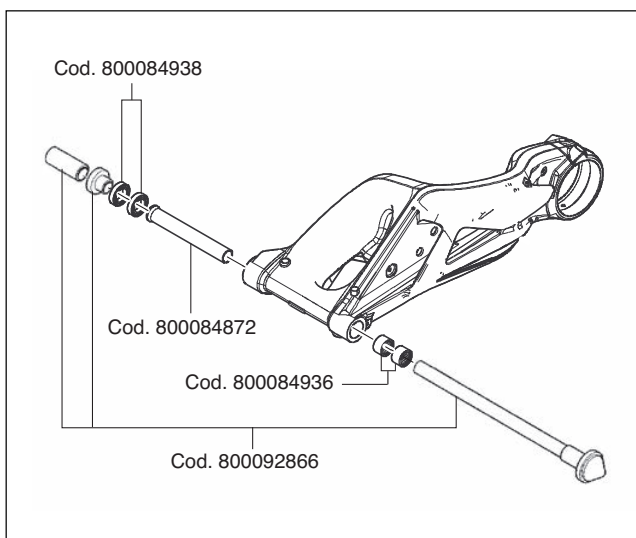
Fitting the bearings and the roller cases on the rear swingarm.

Take two new roller cases (Part No. 800084936) and two new ball bearings (Part No. 800084938).

Preassemble the 2 roller cases (Part No. 800084936) on specific tool **Part No. 800092866** (see figure).

Fit the assembly to the left side of the swingarm.

Assembly the inner bearing spacer (Part No. 800084872) and the two ball bearings (Part No. 800084938) on the tool Part No. 800092866 on the right side of the swingarm (see figure).





Suspension and wheels

Complete the assembly by fitting the two bushings relating to the tool **Part No. 800092866** on the right side of the swingarm.

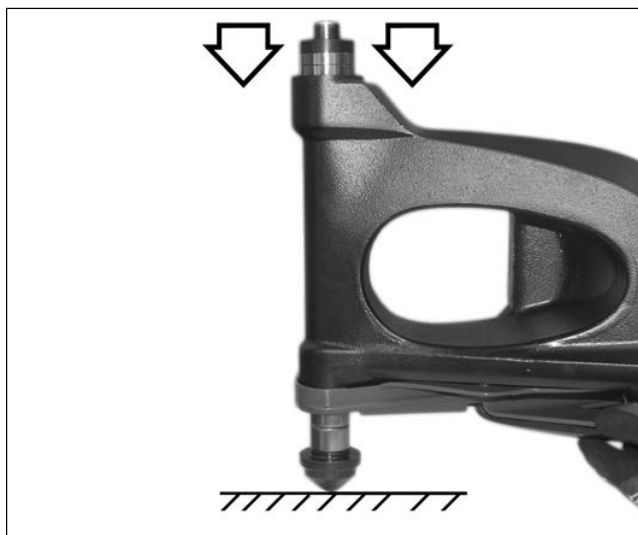


Special tool No. 800092866

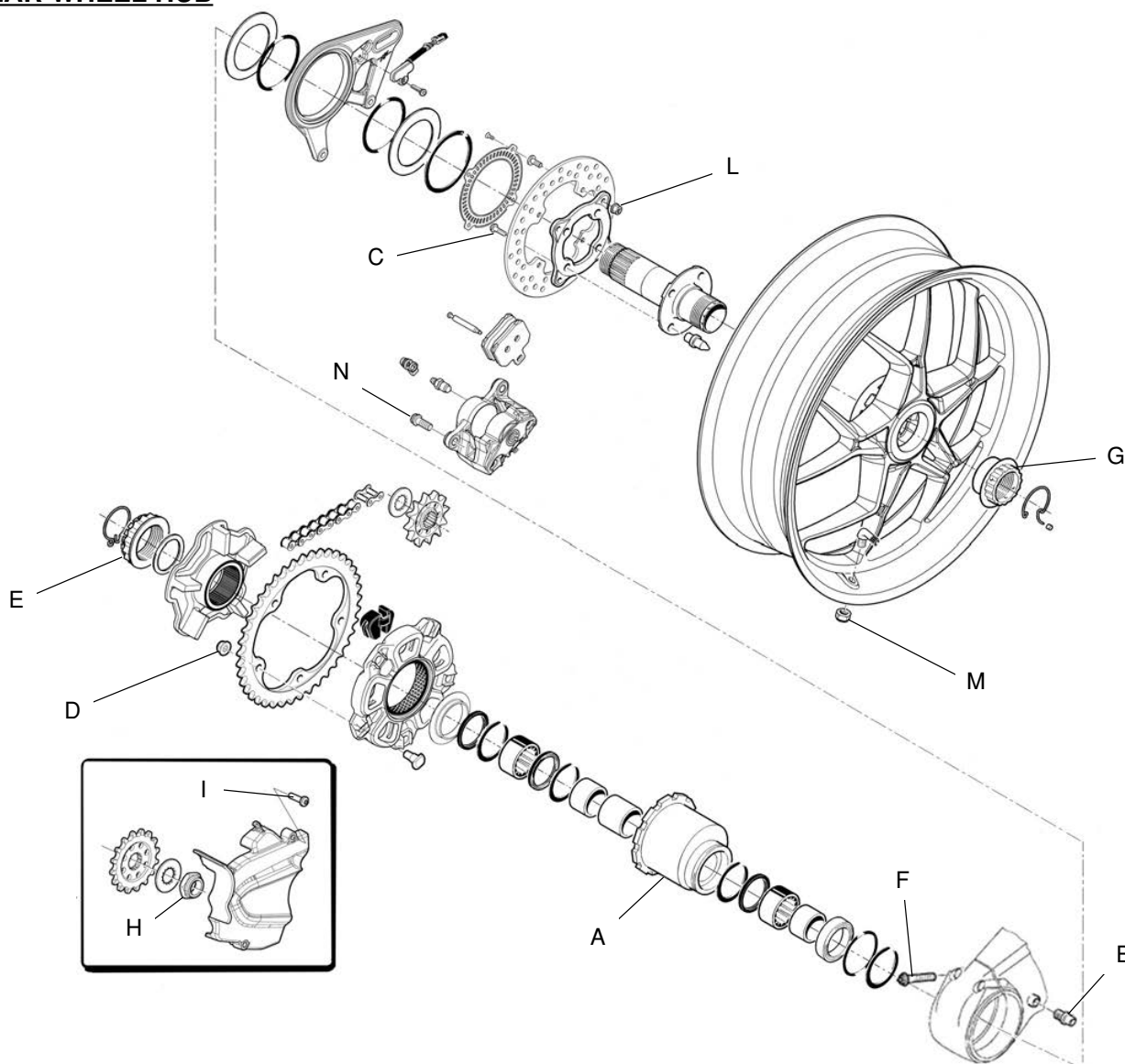


F

Utilising a press fit the bearings and the roller bearing units (see figure).



REAR WHEEL HUB



		A	B	C	D	E	F	G	H	I	L	M	N			
Torque pressure	N·m		30÷35	20÷22	25	200÷220	28÷32	220÷240	140	10	18÷20	5÷7	18			
	Kg·m															
	ft·lb															
Operation			243	270					270		270		243			

Description	Rivale 800
REAR WHEEL	
Material	Aluminium alloy
Dimensions	5.50" x 17"
REAR TYRE	
Dimensions	180/55 ZR 17 M/C (73W)
Brand and type	PIRELLI - Diablo Rosso Corsa
Rear tyre pressure:	2.3 bar (33 psi)

Before checking and overhauling the rear wheel hub assembly it is necessary to carry out the following preliminary operations:

Place the motorcycle on the rear stand.



Special tool No. 8000B9312

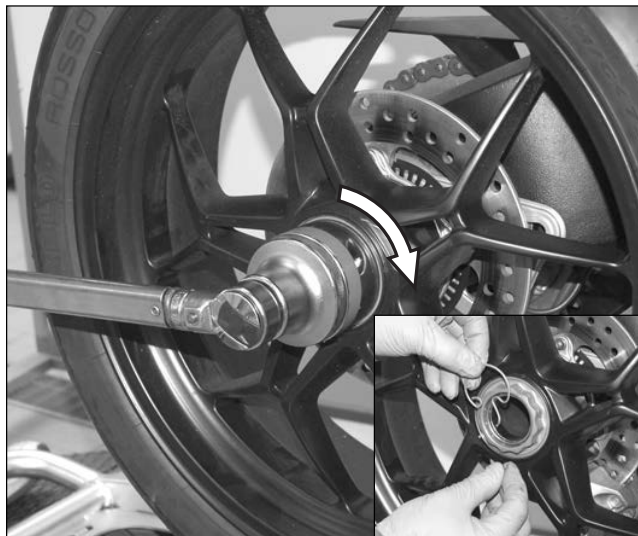
Remove the number plate carrier-mudguard unit (as described in chapter C) and the rear wheel by removing the polygonal nut. Utilise the following tools:



• **Torque wrench 55 mm polygonal spanner**



The polygonal fixing nut of the rear wheel has a left hand thread. To effectuate the removal it is therefore necessary to turn the torque wrench in a clockwise direction as shown in the figure.

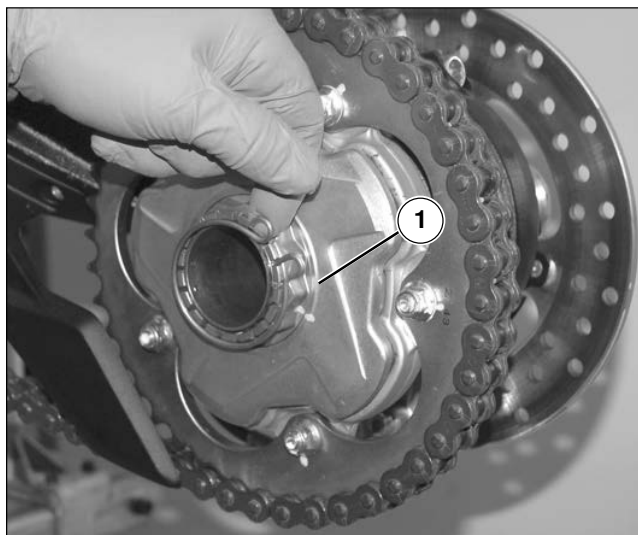


F

After having effectuated the rear wheel removal, support the motorcycle with a lift as shown in the figure. Remove the rear stand.

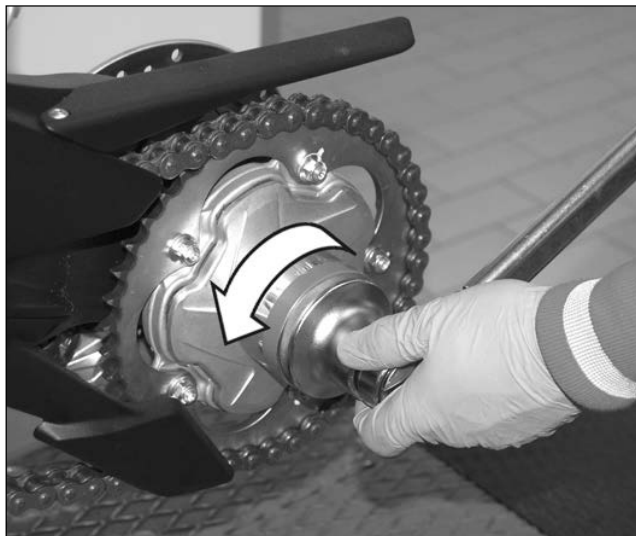


Remove the safety ring (1) of the crown flange-fixing nut.

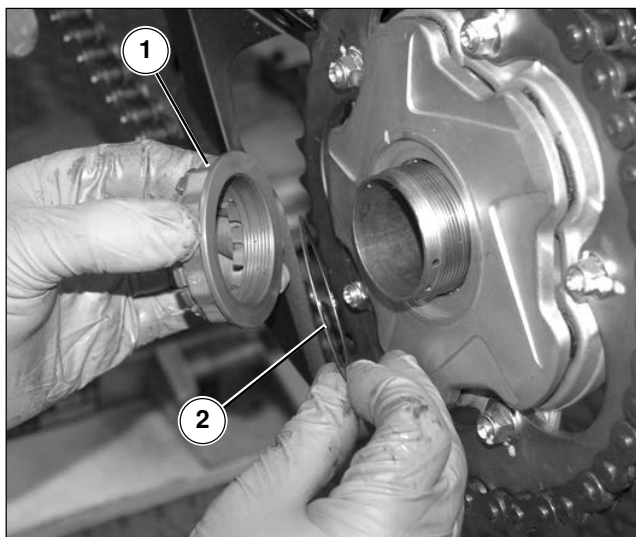


Slacken the nut of the flange by rotating it in an anti-clockwise direction as shown in the figure. Utilise the following tools:

-  **Torque wrench**
- **55 mm polygonal spanner**



Remove the nut (1) with the shim (2) underneath.



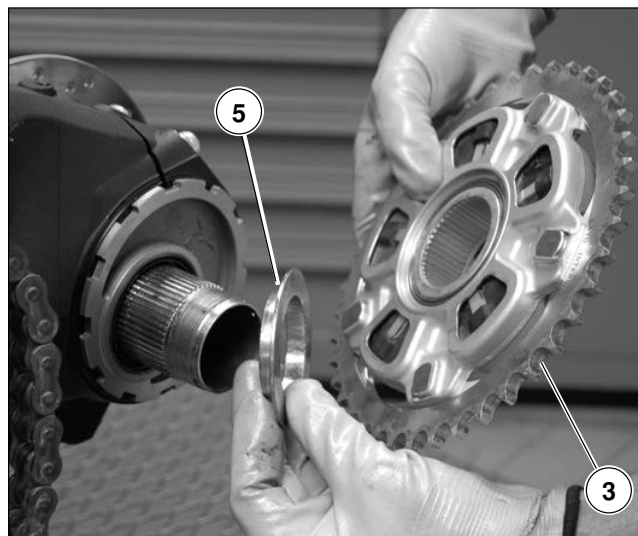
F

With the special spanner mounted on the extension tube, pull forward the eccentric adjuster and slacken the chain.

-  **Special tool:**
- **Eccentric adjuster spanner** N. 800092854
- **Spanner extension** N. 800092855

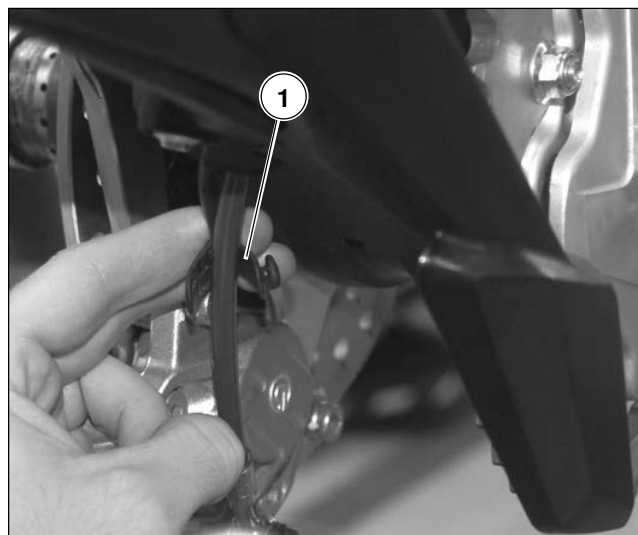


Remove the rear sprocket unit (3) and the spacer ring (5) underneath.

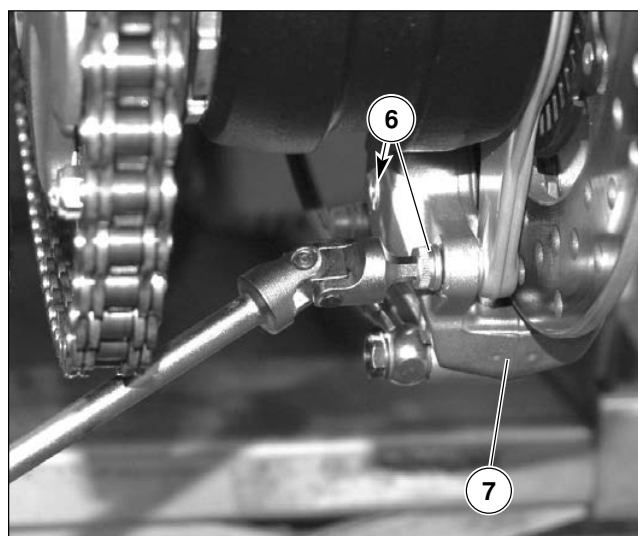


F

Remove the rubber clamp (1) around the rear brake pipe.



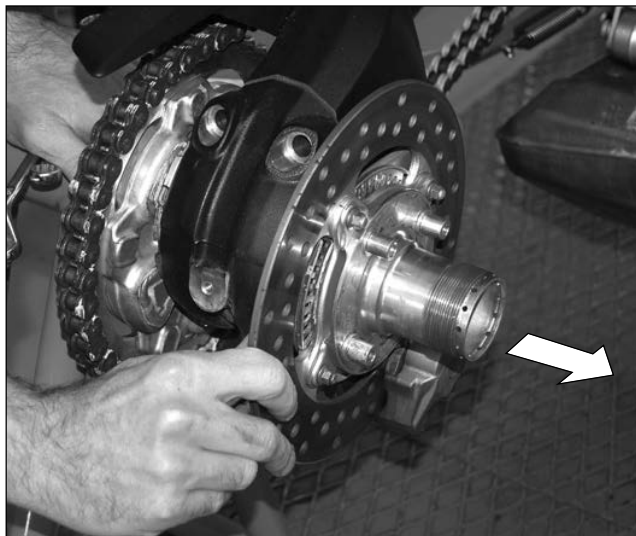
Slacken the two screws (6) and remove the brake caliper (7).



Disassembly of the wheel pin

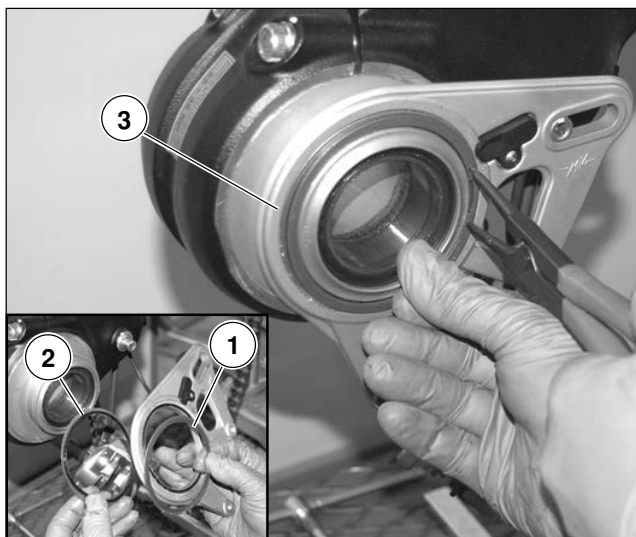
Remove the wheel spindle complete with the brake disc, extracting it from the right side of the motorcycle as shown in the figure.

At the same time, support the ring gear unit with one hand.



Brake caliper support flange removal

Remove the Seeger retaining ring (1), the spacer ring (2), the flange (3) and the spacer ring underneath.





Suspension and wheels

Wheel hub disassembly

Extract the wheel hub from the left side of the fork.

Carefully wash all parts.

Check the condition of the roller bearing and the ball bearing.

If there is excessive play (even only one of the bearings) or chamferings during rotation, substitute the wheel hub, complete with bearings with a new unit.



If only one bearing is worn, substitute the complete unit. Never substitute one bearing only.



F

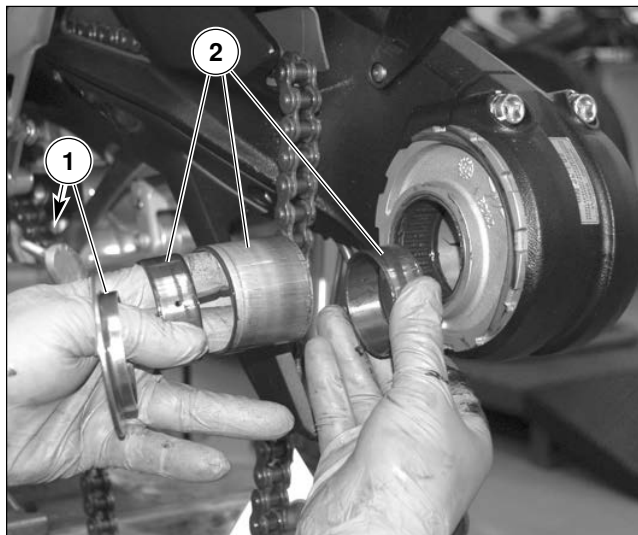
For normal maintenance, the ring gear spacer (1) and the three internal spacers (2) (wheel spindle seat), wash the roller bearing units, dry them and grease them.

Check the condition of the ball bearings.



The grease used must have the following characteristics:

- Lithium soap grease with a mineral oil base
- Consistency NLGI: 2
- Dripping point: 181° C
- Viscosity at 37.8°C: 140 cSt
- Temperature field: from -25°C to +120°C



Caliper holder pin

NOTE Unscrew the caliper holder pin (1) only if it is damaged.

When reassembling apply the prescribed type of Loctite and tighten to the prescribed torque pressure.



Recommended thread-locking fluid: Loctite 243



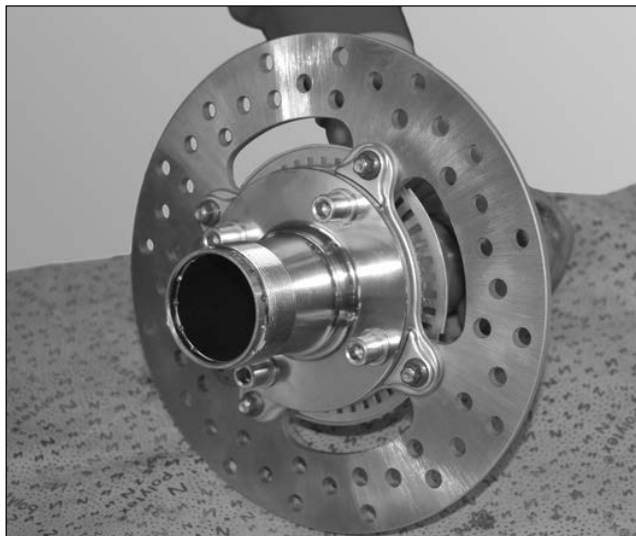
**Caliper holder pin torque pressure:
30 ÷ 35 N•m**



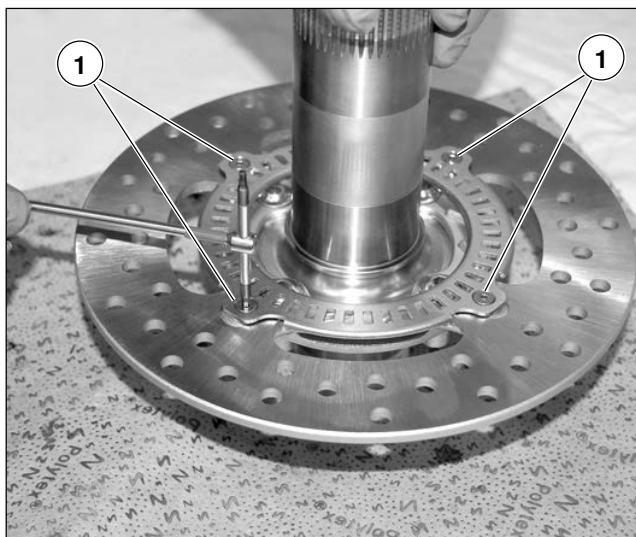
Wheel spindle unit check

Check the condition of the wheel drive engagement splines.

If it is worn, substitute as follows.



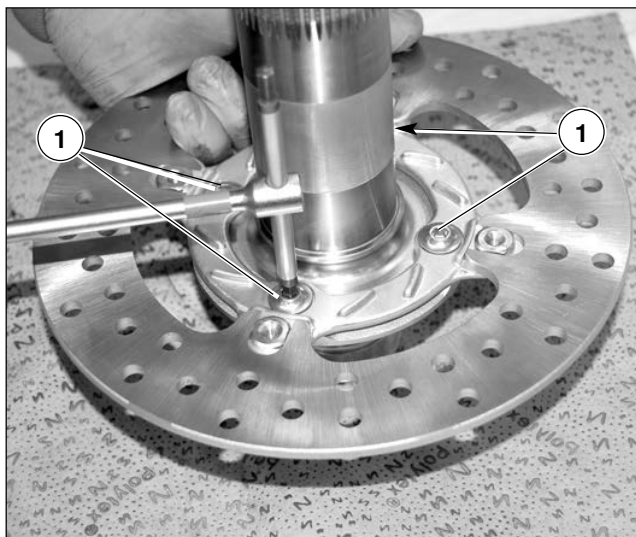
Disassemble the phonic wheel by acting on the 4 screws (1).



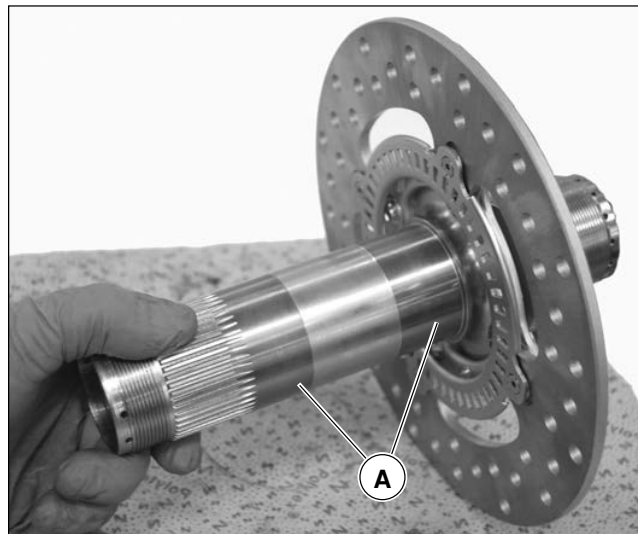
F

Remove the four clamping screws (1) of the brake disc holder flange, as they are usually assembled with threadlocker fluid, after having heated them with a heat gun.

Remove the flange itself.



Check the extra-smooth parts of the wheel spindle for wear (A).



F

Utilising a press with an adequate punch for both the removal and assembly of the pins of the wheel drive engagement.

When assembling, apply force on the crown of the peg not on the point. (see figure).

Assemble the brake disc carrier plate by tightening the screws to the prescribed torque pressure and the recommended type of threadlocker fluid.



Recommended thread-locking fluid: Loctite 270



Brake disc carrier plate screw torque pressure: 20 ÷ 22 Nm



Crown wheel assembly check

Remove the driving flange (1) by pulling it upwards.





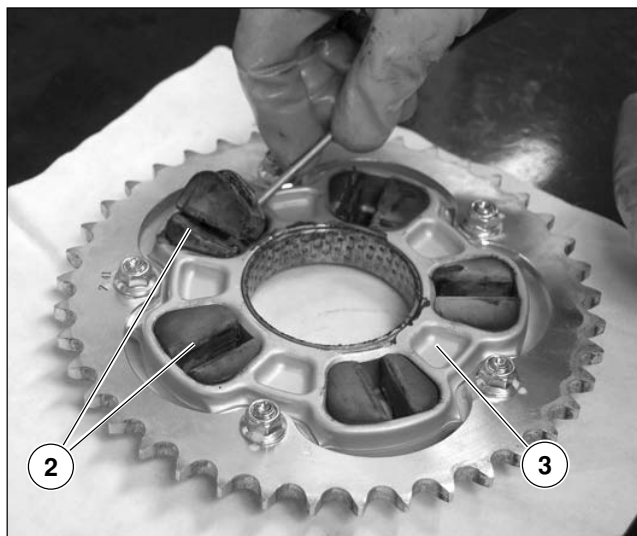
Suspension and wheels

Evaluate the state of wear of the ring gear. If it appears to be too worn, proceed as described in the following operation.

Flexible coupling check

Extract the 5 spring drives (2) from the gear flange support (3) and assess its condition.

If the spring drives are worn, replace with new ones.



Remove the 5 nuts (3) to free the crown (1) from the crown flange (2).

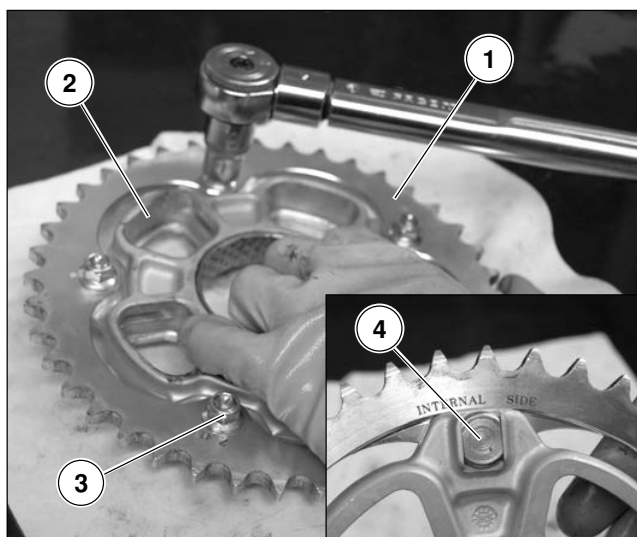
Replace the crown.

Remount the new crown on the crown flange, making sure the pins (4) enter the holes.

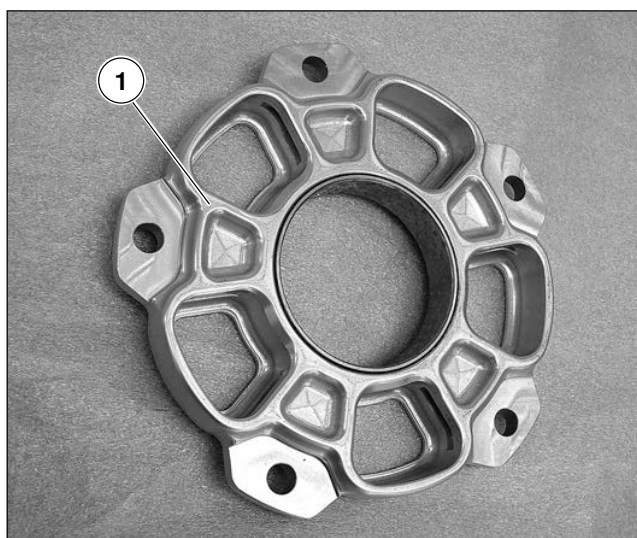
Screw the nuts back on to the required torque pressure.



Ring gear nuts torque pressure: 25 N·m



Check that the coupling bushes of the gear flange support (1) and the driving flange (2) do not show any signs of excessive or uneven wear.





Suspension and wheels

If the bushes are excessively worn, replace the entire set of flanges.



F

When the ring gear unit is being re-assembled with the drive flange unit, grease the coupling areas.



Bushes coupling area (1):

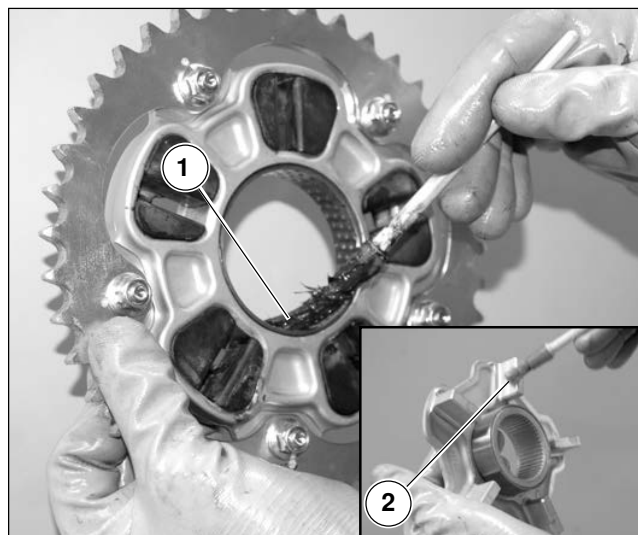
Grease AGIP GR SM

Bushes coupling area (2):

Grease AGIP GREASE 30



Do not apply grease to the threads of the pins.



Reassembly wheel hub

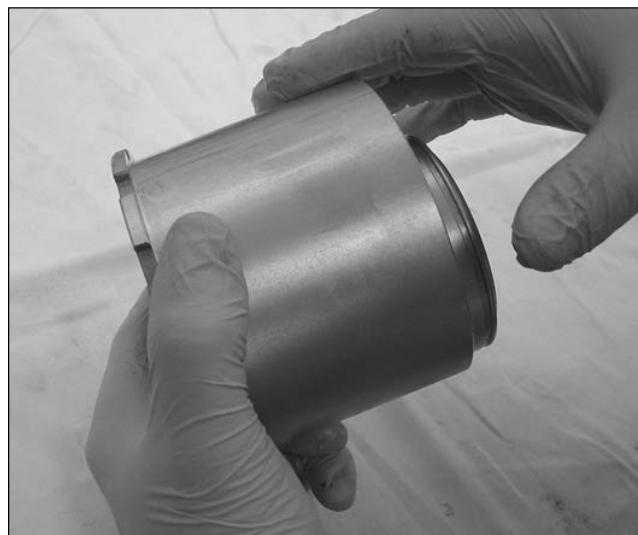
Lightly grease the wheel hub.

Introduce the hub to the swingarm from the left side of the motorcycle and push it in.

Screw in the two screws on the swingarm without tightening.



Recommended grease: Agip Grease 30

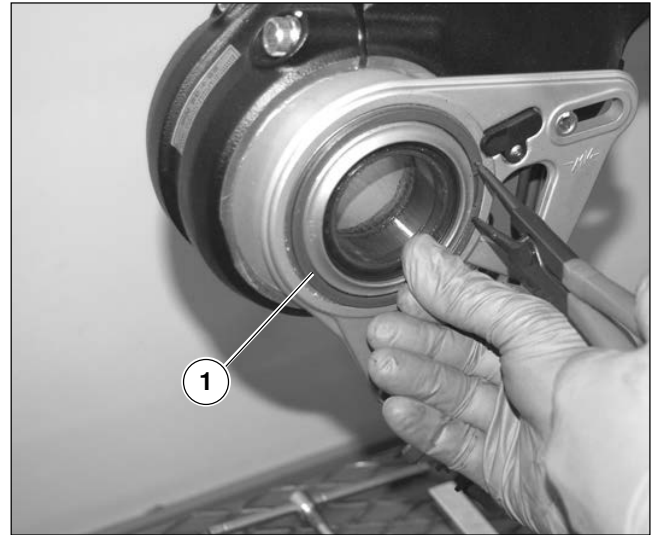


To assemble the brake caliper-carrying flange, carry out the following operations:

Grease the O-rings and insert them into their respective seats on the flange.

Assemble the rear spacer ring in contact with the hub, then the brake caliper-carrying flange, the second spacer ring and the Seeger retaining ring (1).

It is important to ensure that the Seeger retaining ring is inserted around the whole circumference of the seat.



Grease the rollers bearings.

Introduce the first bush, the spacer and then the second bush and successively the gear rim spacer.



The grease used must have the following characteristics:

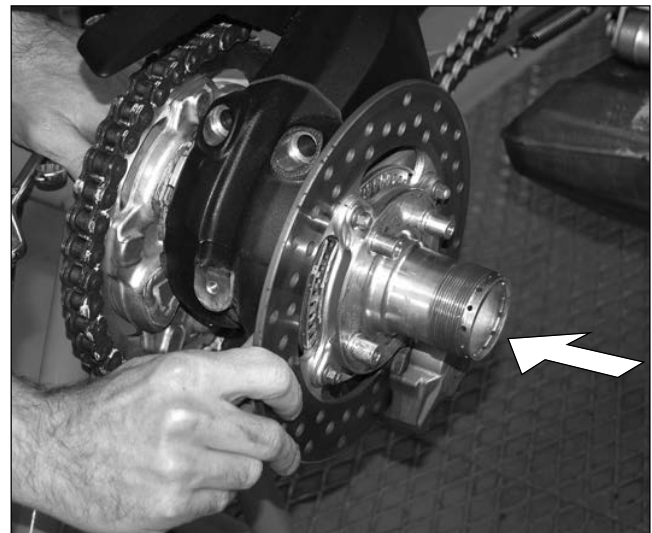
- Lithium soap grease with a mineral oil base
- Consistency NLGI: 2
- Dripping point: 181° C
- Viscosity at 37.8°C: 140 cSt
- Temperature field: from -25°C to +120°C



F

Reassembly rear wheel pin

Grease the wheel pin in the two tracks where the bearings slide and gently insert it into the hub; at the same time, from the left side, position the ring gear unit that is already engaged on the chain. Finish inserting the wheel pin until you feel it reach the end.





Suspension and wheels

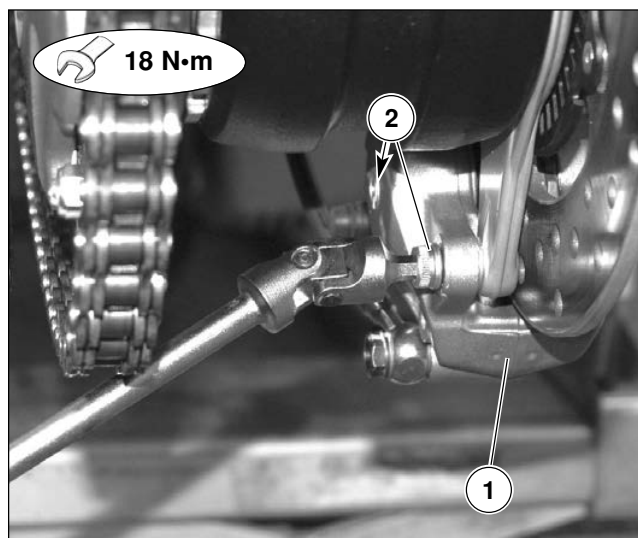
Reassemble the brake caliper (1) and tighten the fixing screws (2) at the specified torque.



Special product: Loctite 243

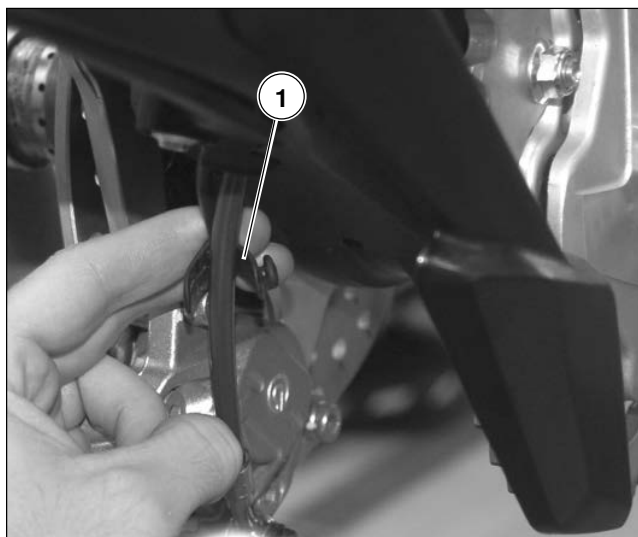


Torque pressure: 18 N·m

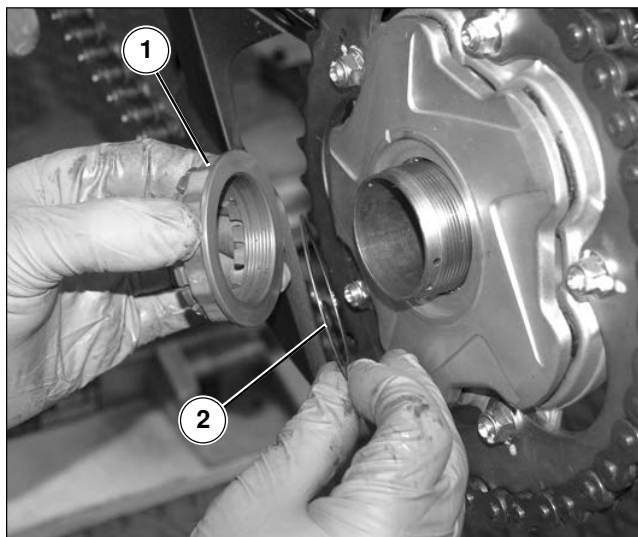


F

Reinsert the rubber clamp (1) around the rear brake pipe.



Reposition the nut of the flange (1) with the relative washer (2) without tightening.



Using the special spanner, bring the eccentric back into position by rotating in an anti-clockwise direction to tighten the chain.



Special tool:

Spanner for eccentric hub

N. 800092854

Extension for spanner

N. 800092855



Tighten the wheel pin fixing nut by rotating it clockwise as shown in the figure, by using the following tools:



• **Torque wrench**

• **55 mm polygonal socket wrench**



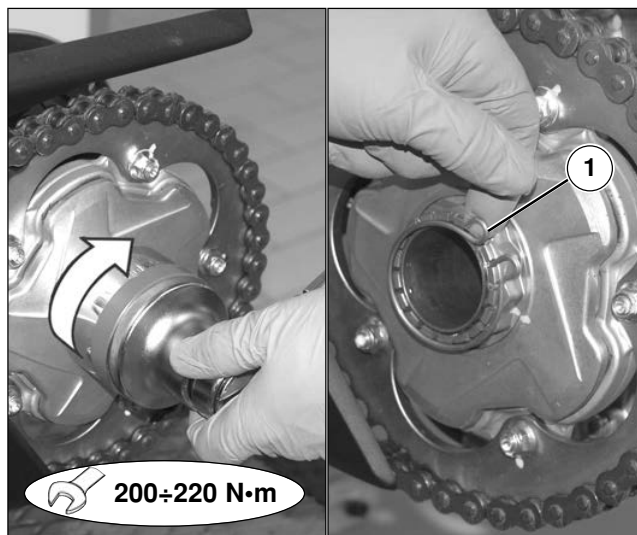
Slip flange nut coupling torque:

200 ÷ 220 N·m



Apply grease only on the threaded part

Assemble the retaining ring (1).



F

Rear wheel assembly



In the case of substitution of the rear tyre it will be necessary to effectuate the balancing of the wheel before assembling it. Follow the instructions indicated in page 68.

Insert 1st gear. Reassemble the rear wheel.

Tighten the wheel axis nut to the prescribed torque pressure.



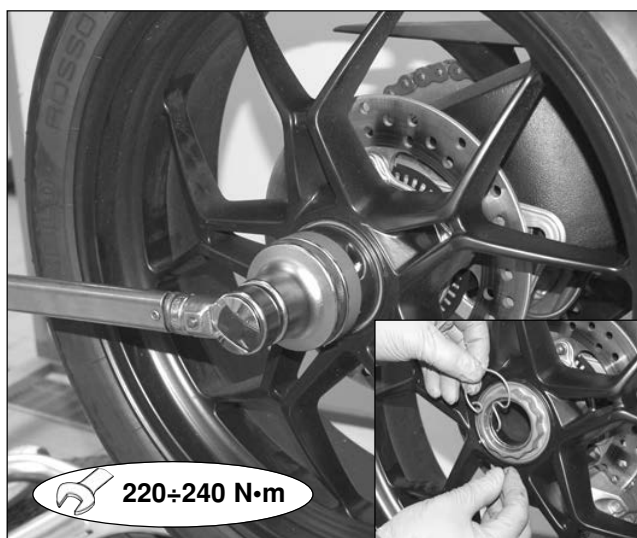
Torque pressure: 220 ÷ 240 N·m



Apply grease only on the threaded part

Insert the retaining ring (1).

At the end of the re-assembly procedure, restore the tension in the chain.

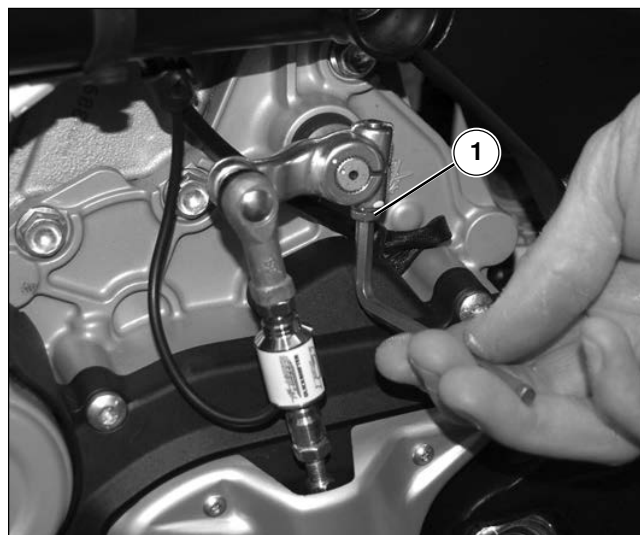


Remount the number plate carrier unit as described in chapter C.

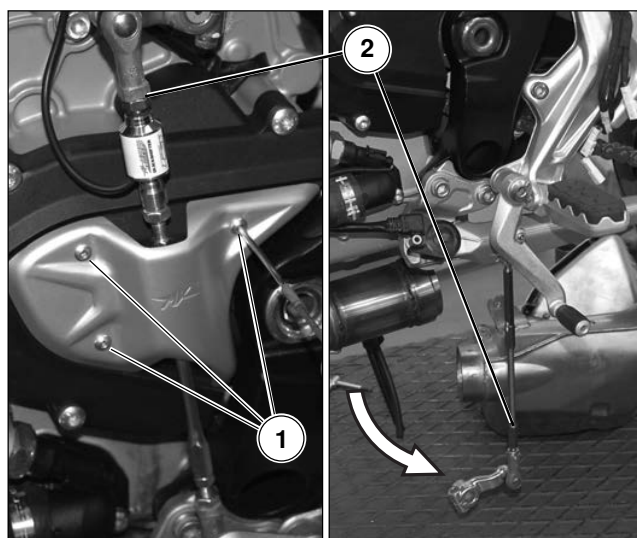


Pinion disassembly

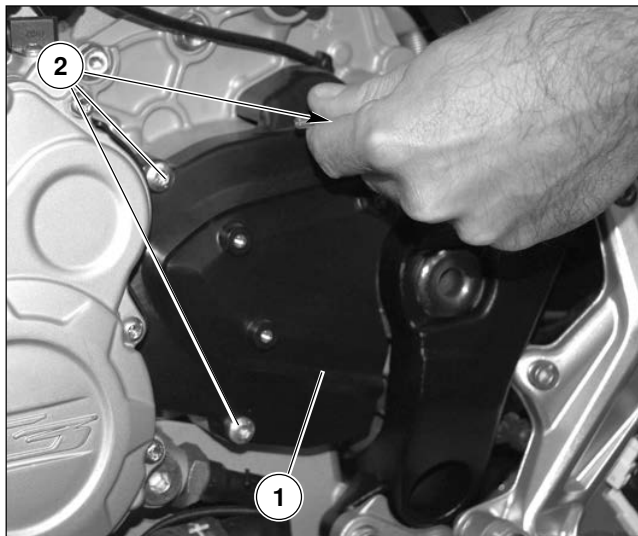
F Remove the gear shift fixing (1).



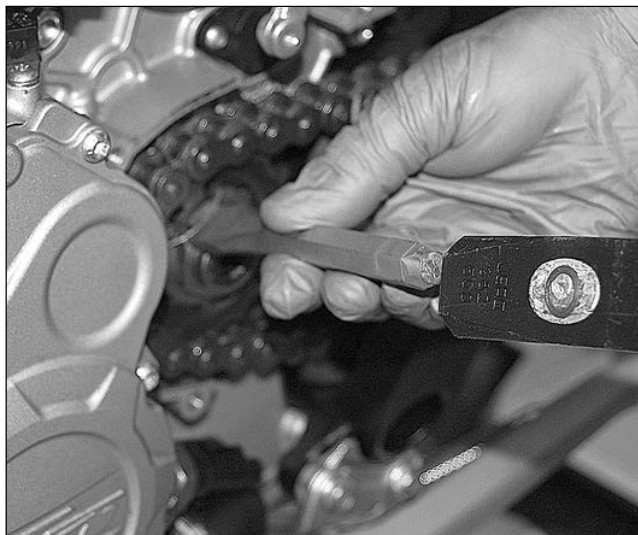
Remove the covering on the pinion lid by loosening the three screws (1) and allow the gear shift rod to disengage from the work area (2).



Remove the 3 clamping screws (2) and remove the pinion cover (1).



Straighten the metal tongue with a flat-head drift and hammer.



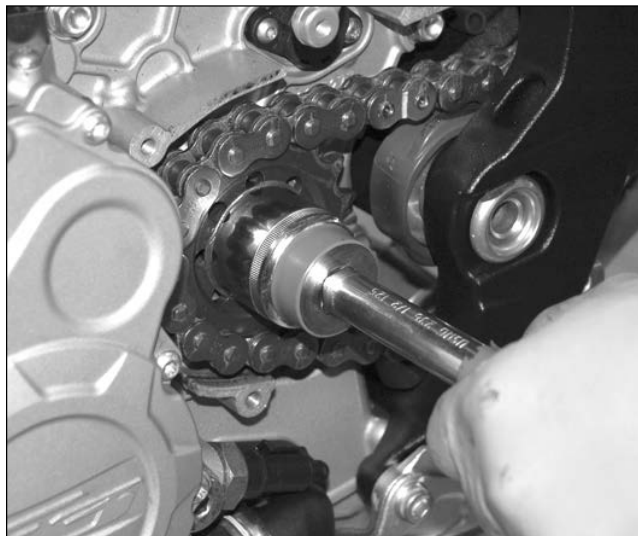
F

Put it in first gear by moving the lever clockwise by hand.
Heat the nut with a heat gun.



Unscrew the pinion wheel retaining nut.

Now cut and remove the chain as described on page 40.



F

Using the specially designed spanner, remove nut (1) and washer (2).

Remove the pinion and replace it with a new pinion.



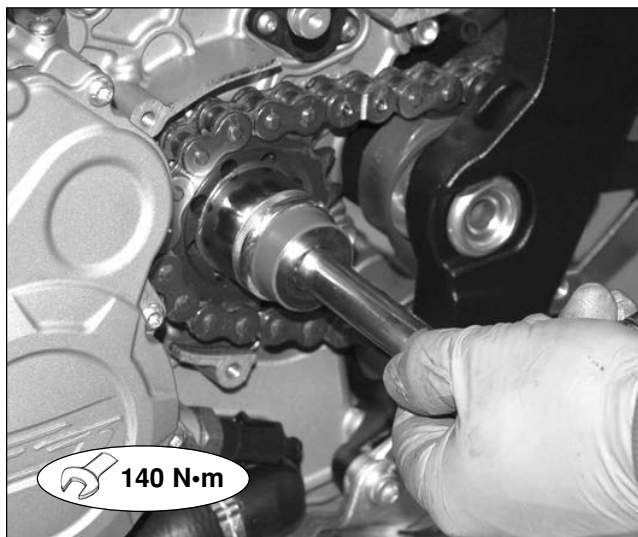
For reassembly, insert the pinion to end stroke. Take a new washer, assemble it with the nut and tighten to the prescribed torque pressure utilising Loctite thread-locking fluid.



Torque pressure: 140 N·m



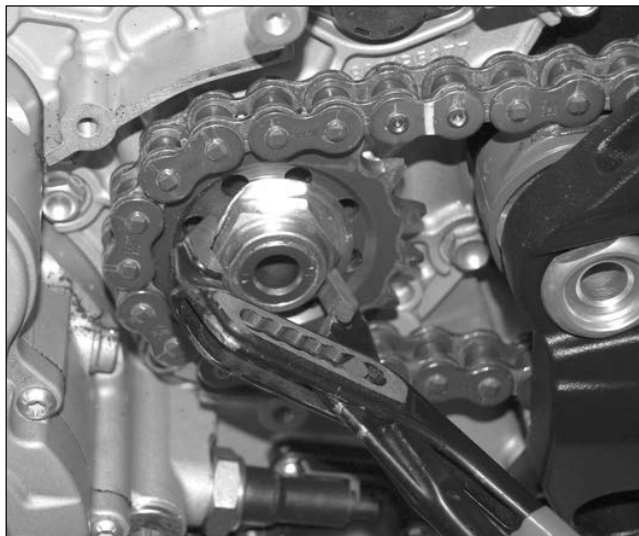
Recommended thread-locking fluid: Loctite 270



140 N·m

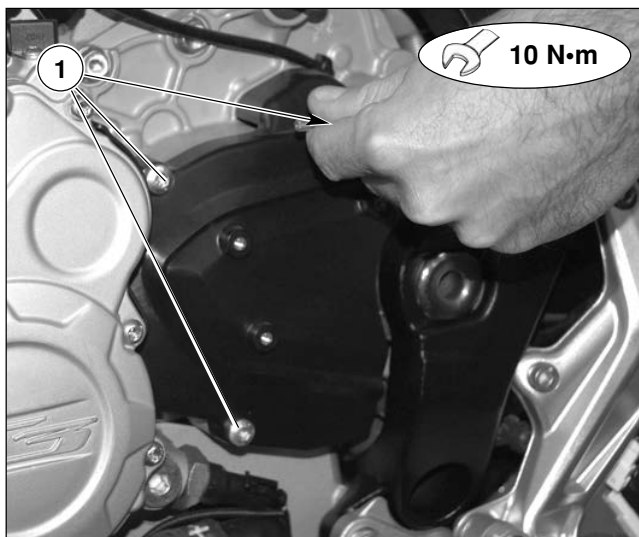
Hammer the new washer down onto the two opposite faces of the hexagon.

Remove the chain as described on pages 41-42.



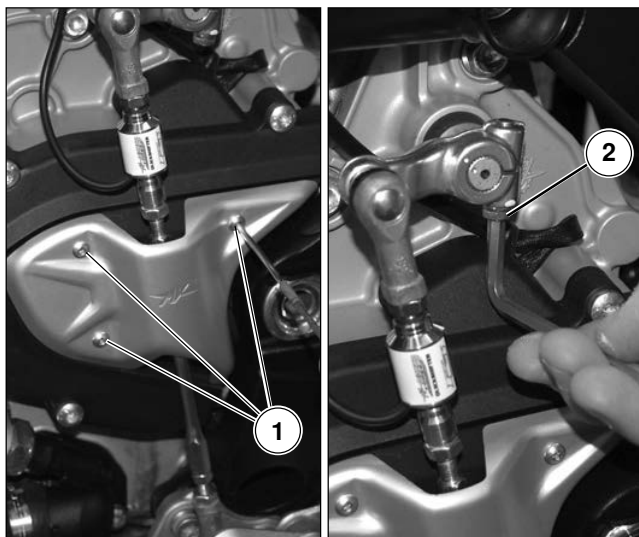
Reassemble the pinion wheel cover after having cleaned the support base.
Proceed with the tightening, screwing down respectively on the three screws M6 (1).

Torque pressure (M6 Screws): **10 N·m**



Re-position the gear shift rod.
Re-position and fix the cover on the pinion lid with the three screws (1).

Re-insert the gear lever arm onto the shaft and tighten the screw (2).



MOTORCYCLE SET-UP ADJUSTMENT

Place the motorcycle on the rear stand.



Special tool No. 8000B9312

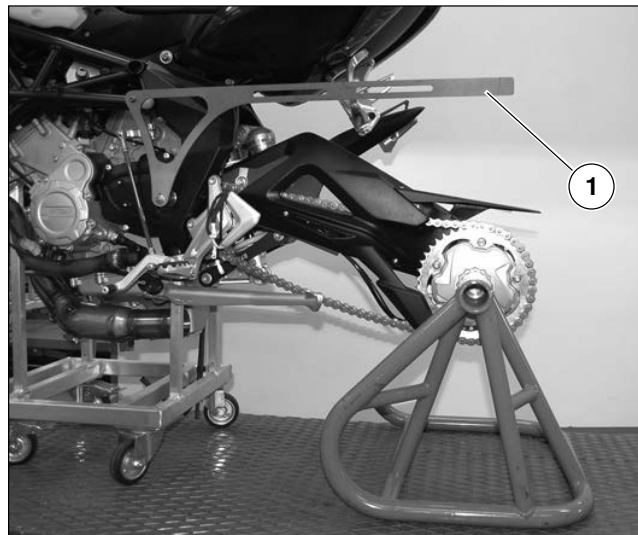


WARNING: The following adjustments must be made when the fuel tank is full.

Insert the setting-up arm (1) of the rear suspension (special tool) in its appropriate seats as shown in the figure.



Special tool No. 8000B6787



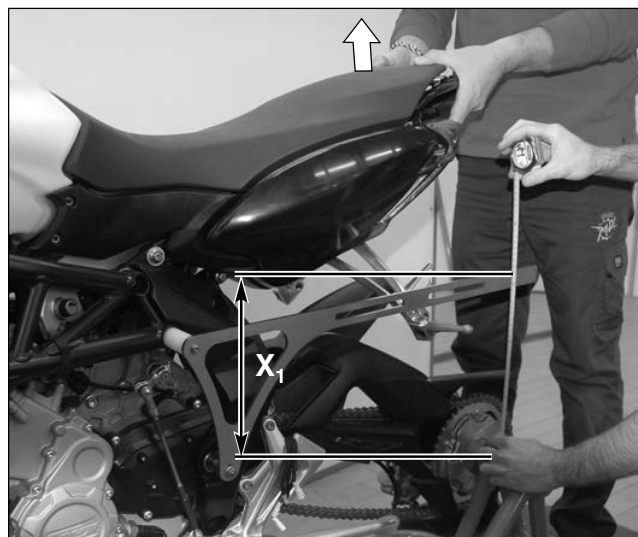
F

Raise the rear part of the motorcycle until the full extension of the rear shock absorber is reached. Contemporaneously measure the distance X_1 between the upper extremity of the rear stand and the point on the setting-up arm shown in the figure.

NOTE Two persons must carry out this operation.

Check that dimension X_1 is equal to:

Rivale 800: $X_1 = 312 \text{ mm}$



Press down the saddle to compress the rear shock absorber, then allow the vehicle to spring back to its rest position.





Suspension and wheels

Measure the distance X_2 between the upper end of the stand tube and the point on the setting rod indicated by an arrow (see figure).

Calculate static settling Δ using the following formula:

$$\Delta = X_1 - X_2$$

The static settling value should be:

Rivale 800: $\Delta = 16 \text{ mm}$

If the value differs, act on the spring pre-load adjustment ruing nut using the required tool, in either one direction or the other depending on the calculated value of Δ static sag.

- **Rivale 800:**



Special tool: 75 mm hook wrench No. 80000B7038

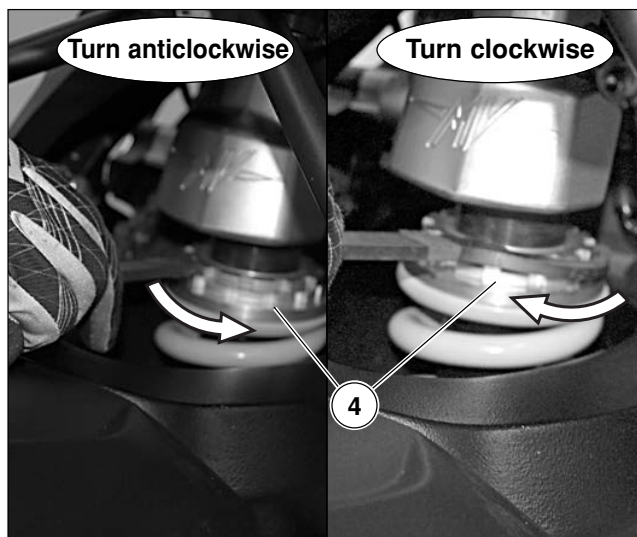
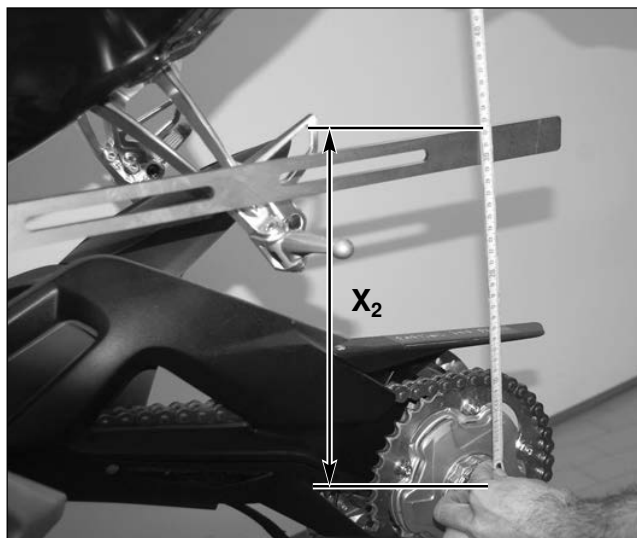
$\Delta < 16 \text{ mm}$: **Turn anticlockwise**

$\Delta > 16 \text{ mm}$: **Turn clockwise**

After having completed the adjustment of the motorcycle set-up, it is necessary to adjust the tension of the chain.

Check also the orientation of the front headlight and if necessary effectuate the necessary adjustments.

Both these operations are described in chapter B "Maintenance".



F



Suspension and wheels

WHEEL BALANCE CHECK

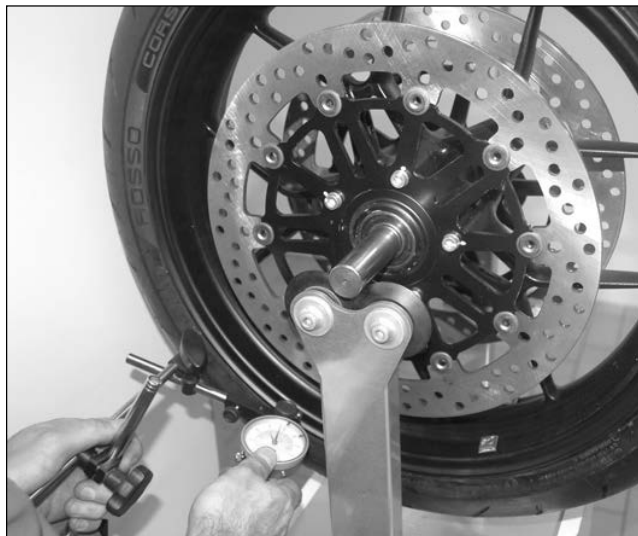
If the tyres are substituted, it is necessary to effectuate the following operations balancing and checking the wheels.

Front wheel balancing

Mount the wheel onto an adequate support similar to that shown in the figure, utilising a ground pin of **35 mm** diameter. Check the wheel. Utilising a dial gauge, check the following tolerances:



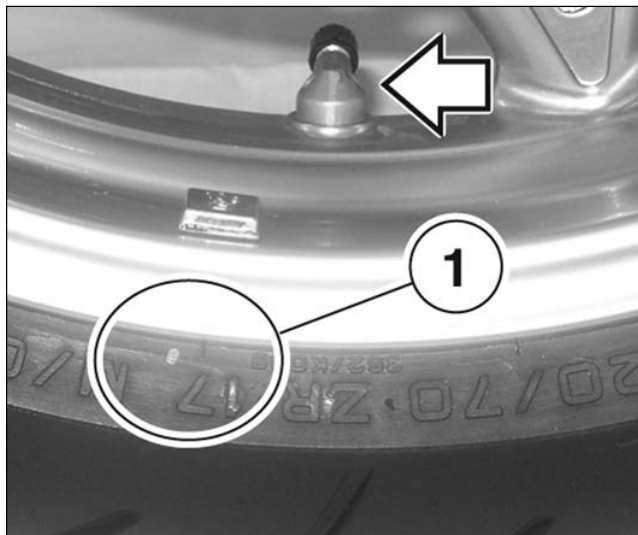
Ovalization and maximum eccentricity must not exceed **0.5 mm**.
Flatness must not exceed **0.5 mm**.



F



When effectuating balancing on certain makes of tyres, it is necessary to refer to the yellow mark (1) present on the side of the tyre as shown in the figure. It indicates the lightest point of balancing and must be situated close to the tyre valve when the tyre is mounted onto the wheel rim.



Rear wheel balancing

Before mounting the rear wheel on the appropriate tool, insert the balancing tool into the central hole of the wheel.



Special tool No. 800092865



Insert the polygonal nut of the balancing tool from the opposite side and screw it onto the threaded part of the tool so that the tool can be fixed to the wheel.



Mount the wheel onto an adequate support similar to that shown in the figure, utilising the special tool cod. **8000A1953**. Check the wheel utilising a micrometer gauge and check the following tolerances:



Ovalization and maximum eccentricity must not exceed **0,5 mm**.



Special tool No. 8000A1953



F

Place the dial gauge as shown in the figure, and check the flatness.



Flatness must not exceed: 0,5 mm.

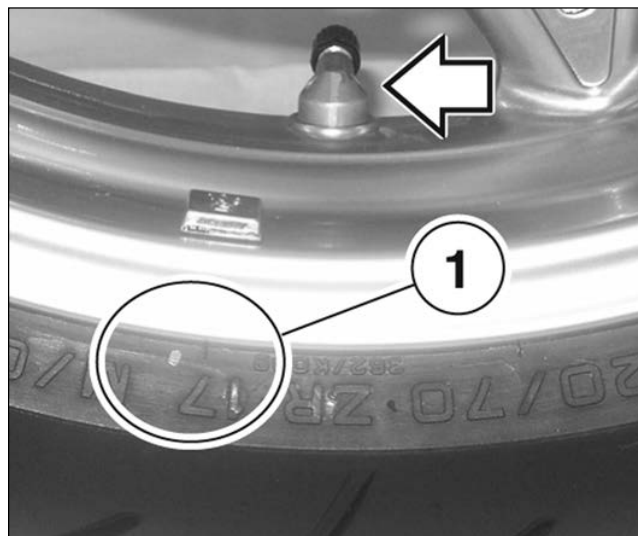




Suspension and wheels



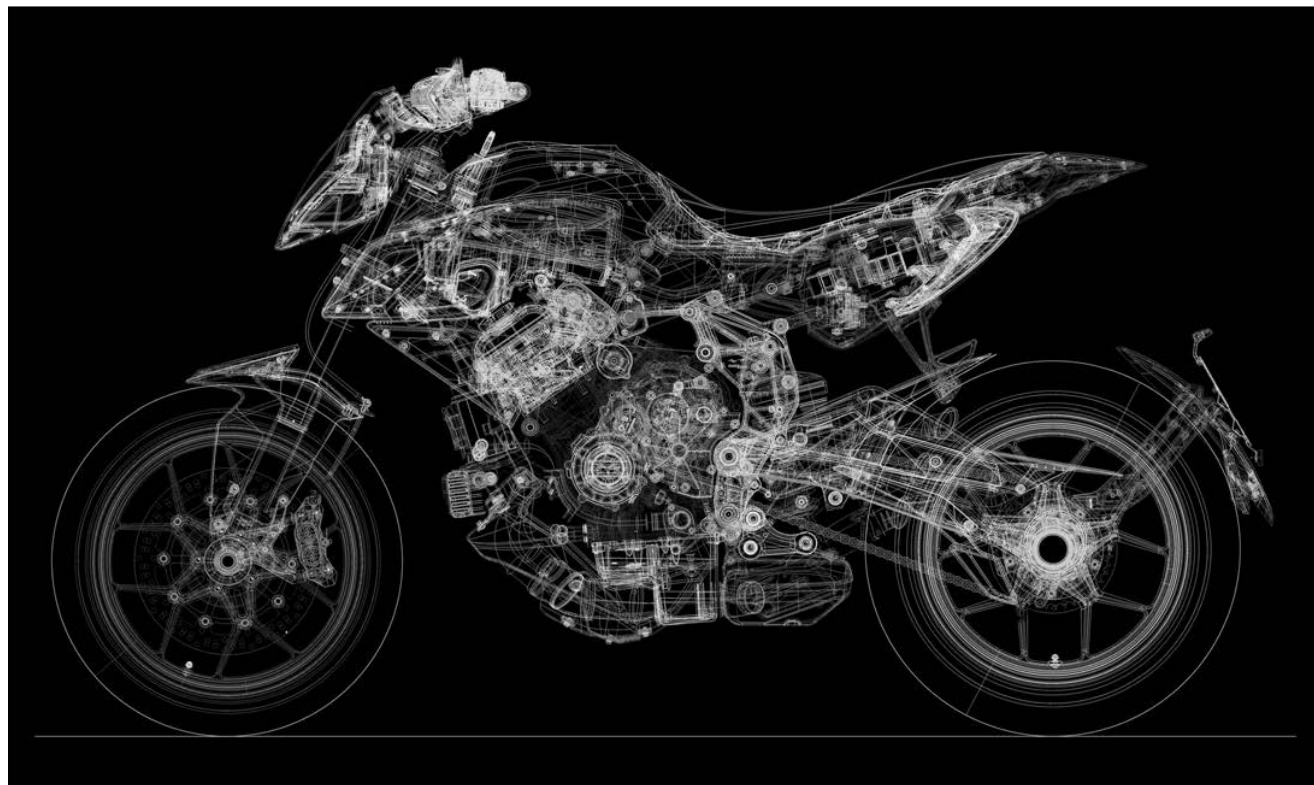
When effectuating balancing on certain makes of tyres, it is necessary to refer to the yellow mark (1) present on the side of the tyre as shown in the figure. It indicates the lightest point of balancing and must be situated close to the tyre valve when the tyre is mounted onto the wheel rim.



F



Frame



G

SECTION G

Revision 0



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EXHAUST MANIFOLDS REMOVAL.....	PAGE 7
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RE-ASSEMBLY OF THE VEHICLE.....	PAGE 46



PRELIMINARY OPERATIONS

To perform the interventions on the frame, the following must be removed previously in sequence:

- Saddle
- Saddle side panels
- Fuel tank side panels
- Side number holder
- Fuel tank
- Airbox

BATTERY CABLES

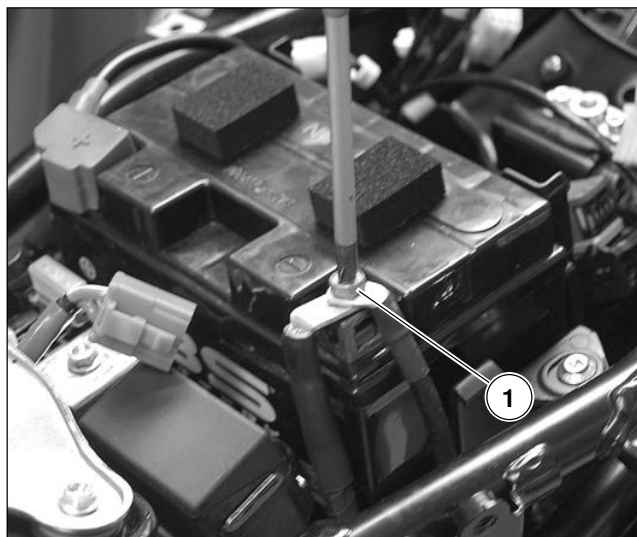
 **It is a good rule to disconnect the battery cables before removing components from the motorcycle.**

Remove the saddle as described in chapter C "Superstructures".

G

Remove the screw (1) indicated in the figure. Disconnect the negative pole of the battery.

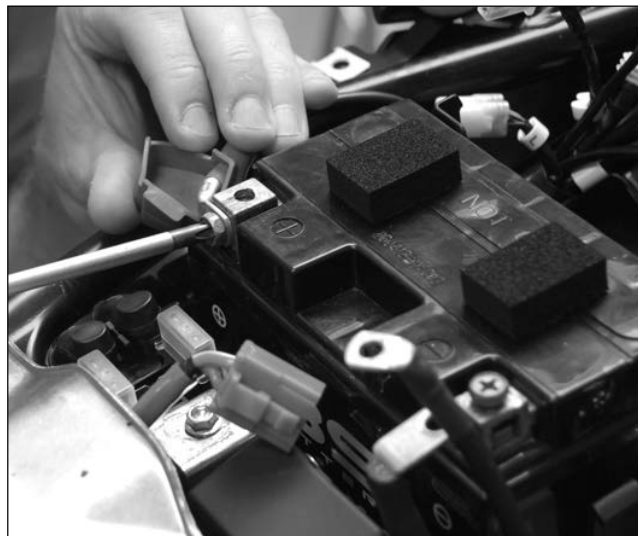
 **When removing the battery, it is necessary to remove the negative pole cable first and then the positive pole cable. When reassembling, proceed in the reverse order.**



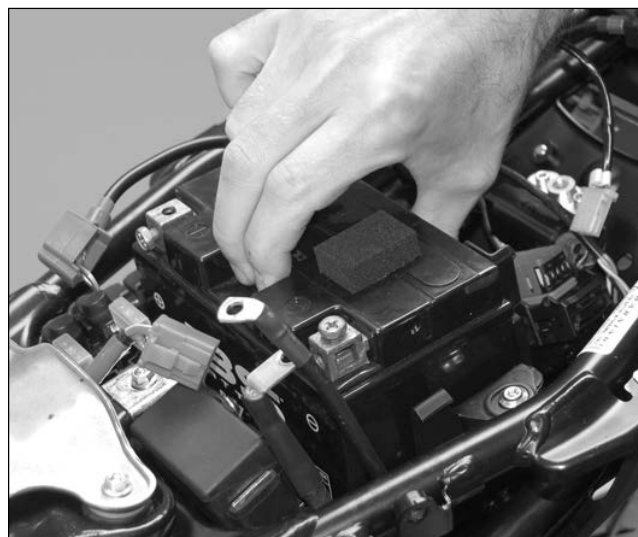


Frame

Disconnect the positive pole of the battery.



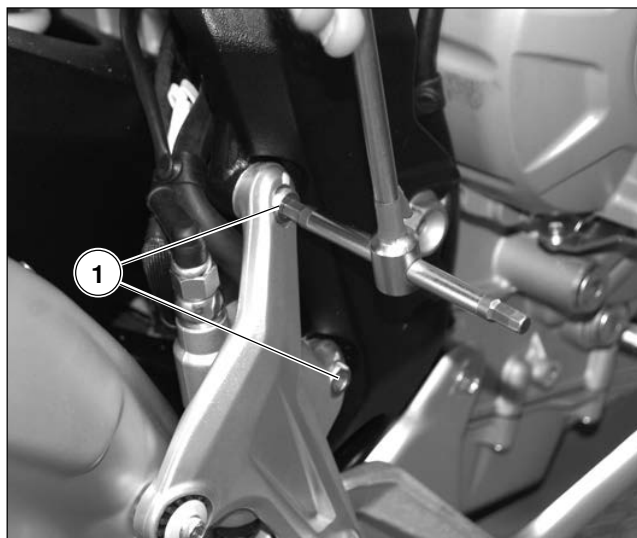
Remove the battery from its compartment.



G

FOOT PEG REMOVAL

Act on the 2 screws (1) of both foot peg mountings and remove them.



On the right foot peg, also remove the silencer clamping screw (2).



EXHAUST SILENCER DISASSEMBLY

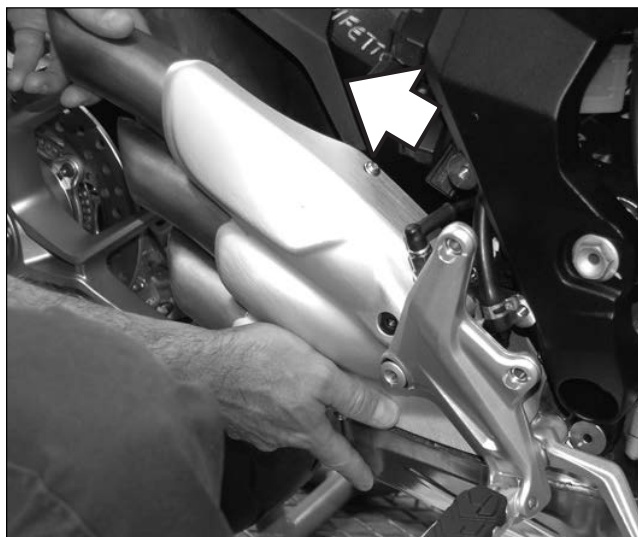
Remove the clamping screw (1) on the left side.



Remove the socket head screw (2) on the right side.



Slide the silencer unit out from the exhausts towards the rear part of the motorcycle.



EXHAUST MANIFOLDS REMOVAL

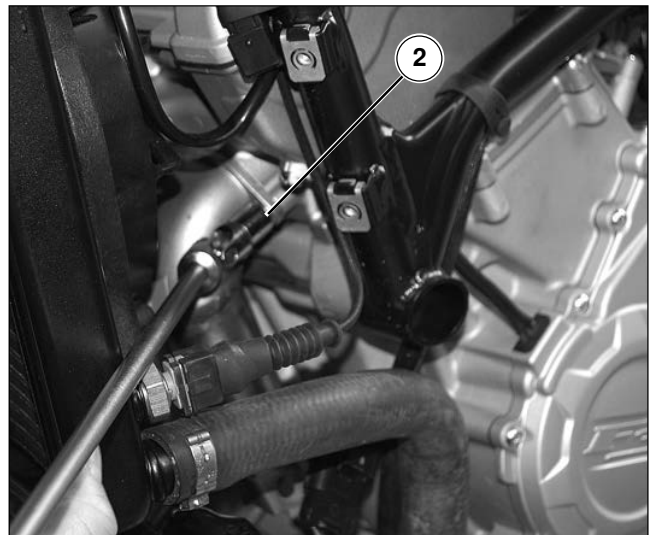
NOTE This operation is not necessary for disassembly of the engine or frame. Proceed as described below for exhaust manifold replacement.

Disassemble the water radiator and oil radiator beforehand, as described in chapter L "Cooling system".

Slide off the Lambda probe connector (1) and lift.



Unscrew the 6 nuts (2) relative to the manifold (set of the three tubes) pull off the manifold.





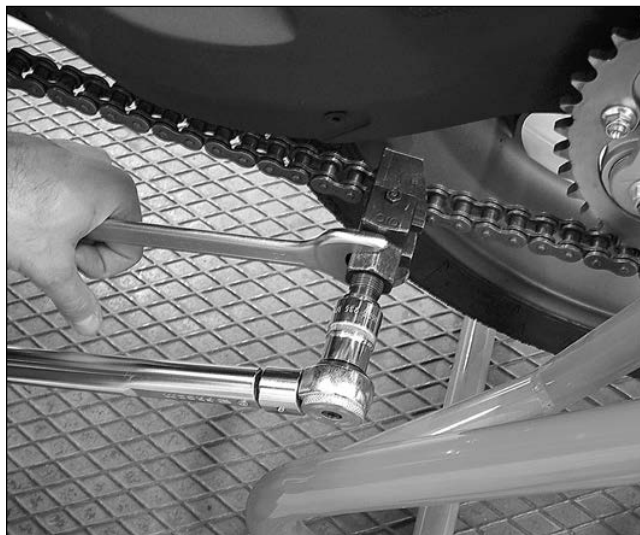
Frame

Disassemble the metal sealing gasket (3) in the head.

Apply sufficiently adequate wadding to the exhaust ports to stop the entry of dirt and dust into the cylinders.



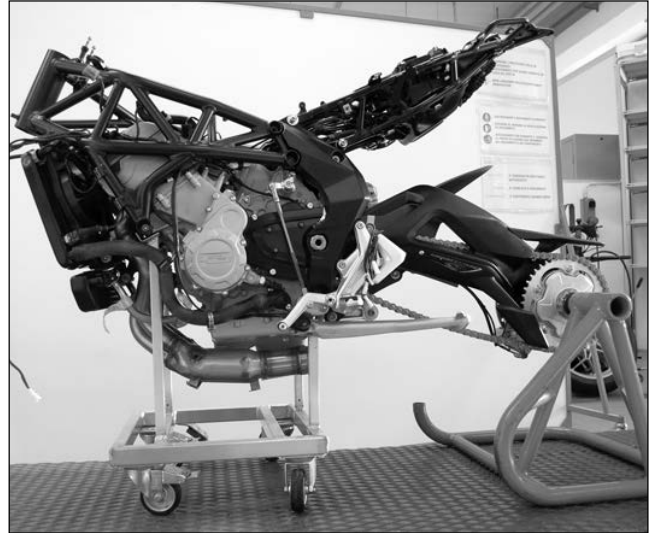
If the engine has to be removed from the frame, it will be necessary to remove the chain as described in chapter F "Suspension and wheels".



FRAME REMOVAL PRELIMINARY OPERATIONS

Support the motorcycle with the aid of the following stands:

- Code 8000B9312: Rear stand
- Code 800095807: Front stand
- Code 8000B7340: Front stand pin
- Code 8000B6789: Engine support



Remove the following components in order:

- Front mudguard;
 - Front brake callipers;
 - Front wheel and front end:
- as described in chapters F - "Suspension and Wheels" and C "Superstructures".



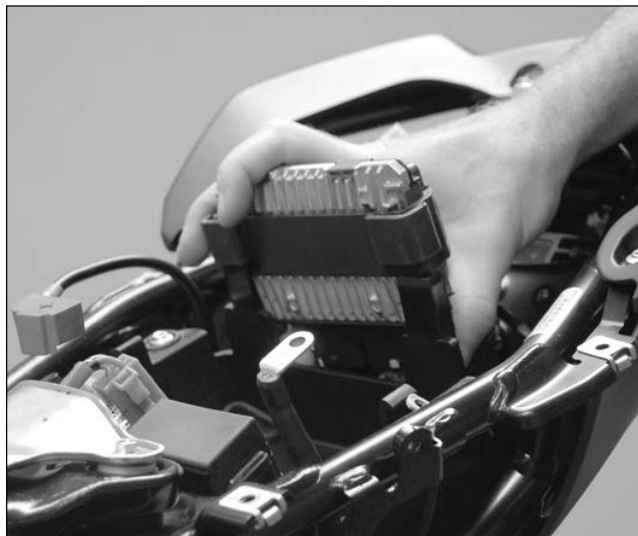


Frame

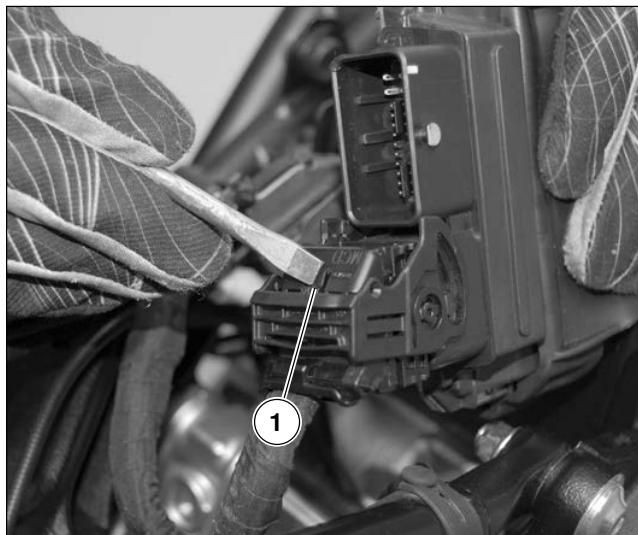
CONTROL UNIT REMOVAL

NOTE This operation is not necessary to disassemble the frame.

Slide the control unit complete with rubber support from the battery holder seat.



Disconnect the two connections acting on the safety flaps with a flat screwdriver.



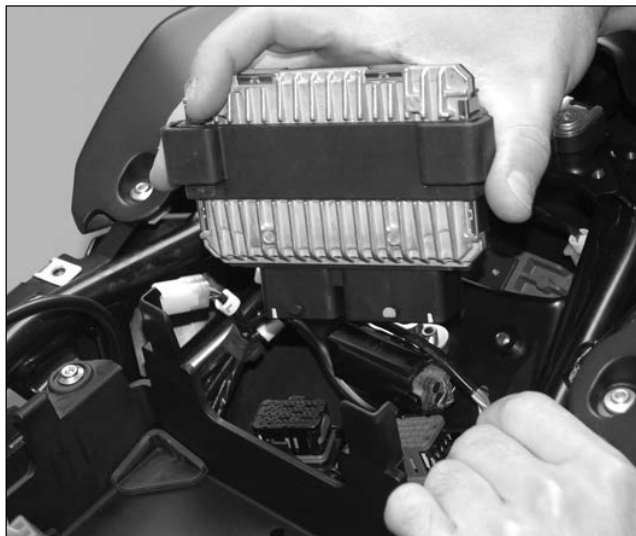
Turn the bayonet connector anti-clockwise to remove wiring from the control unit.





Frame

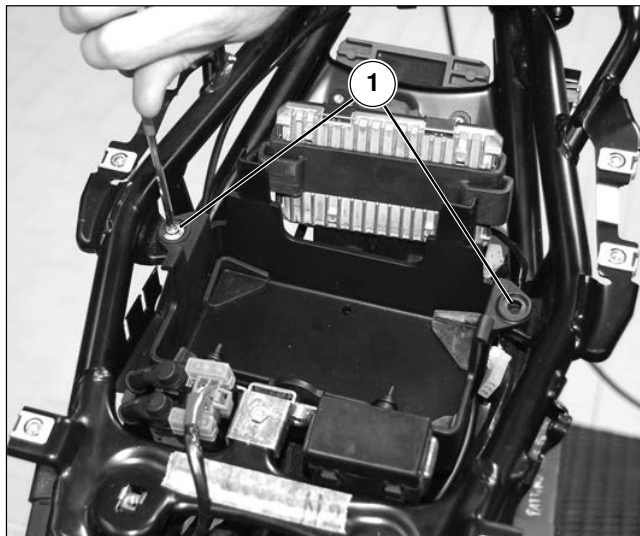
Remove the control unit from the motorcycle.



If the battery has not yet been removed, do so as described in the “Maintenance” chapter.

BATTERY BOX REMOVAL

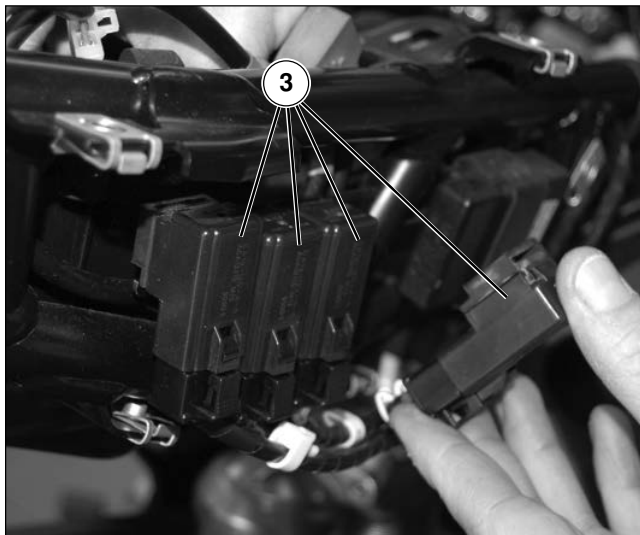
Remove the two lateral screws (1).



Remove the central screw (2).



Remove the four relays (3).

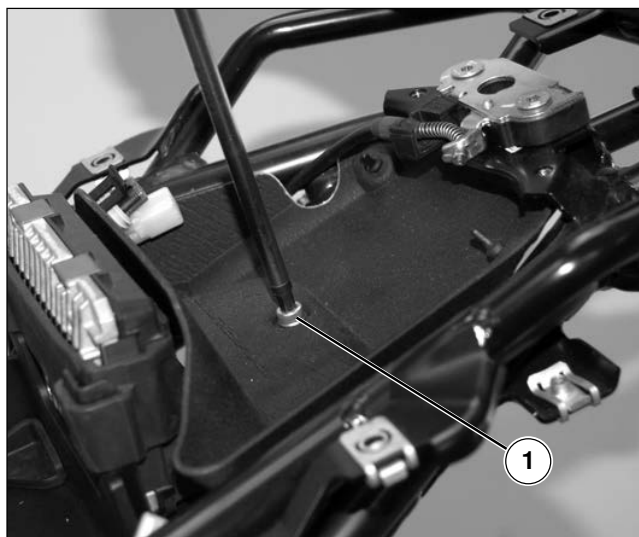


Remove the battery box.

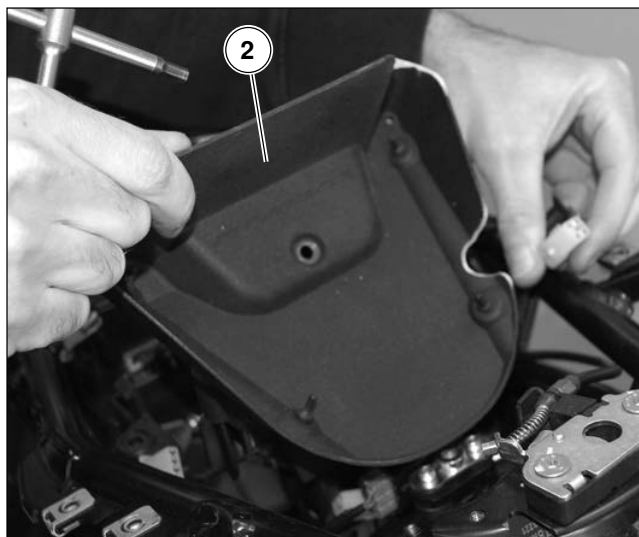


GLOVE COMPARTMENT REMOVAL

Remove the glove compartment fixing screw (1).

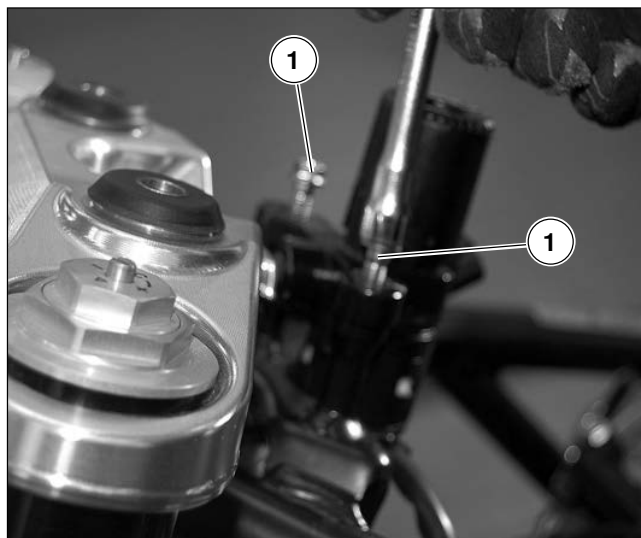


Slide the glove compartment (2) from the upper part.

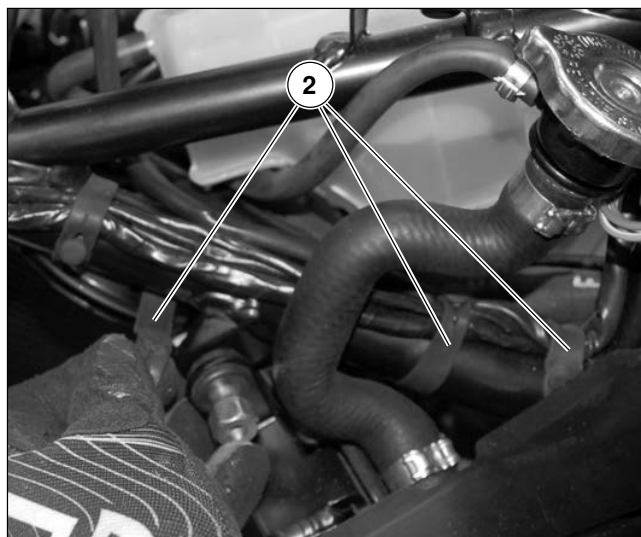


REMOVAL OF IGNITION SWITCH

Remove the two M6 screws fixed with Loctite (1).



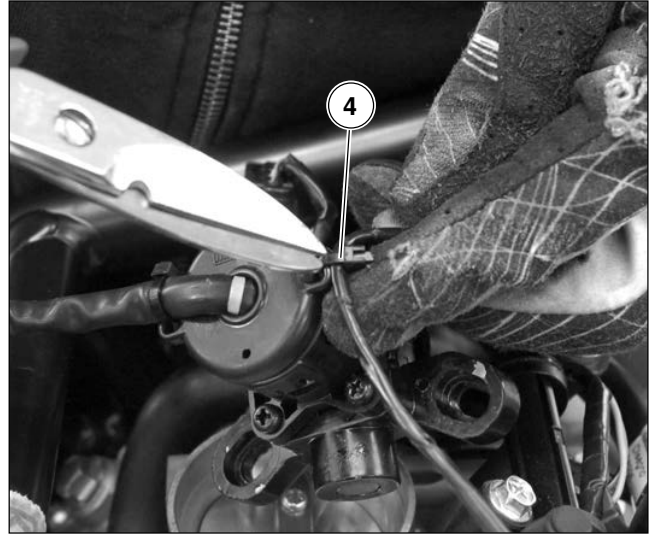
Remove the three rubber band fasteners (2).



Disconnect the connector (3).



Cut the safety band fastener on the temperature sensor (4).

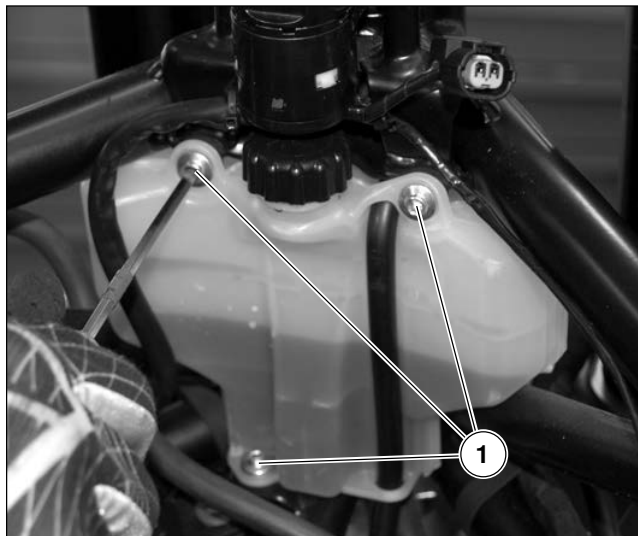


Remove the complete ignition switch (5).

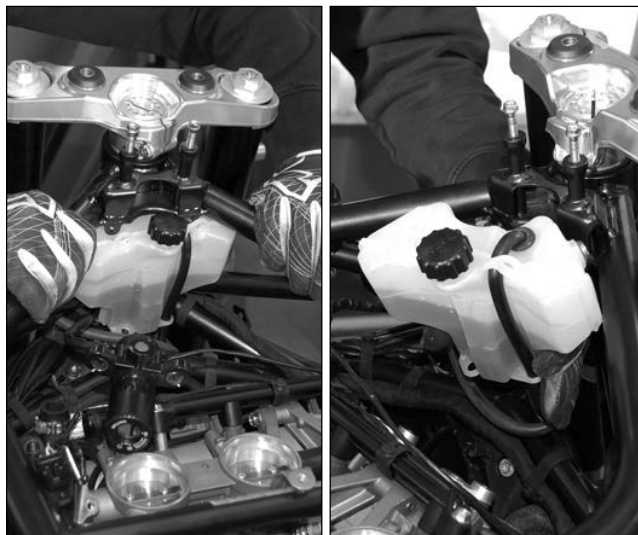


EXPANSION TANK REMOVAL

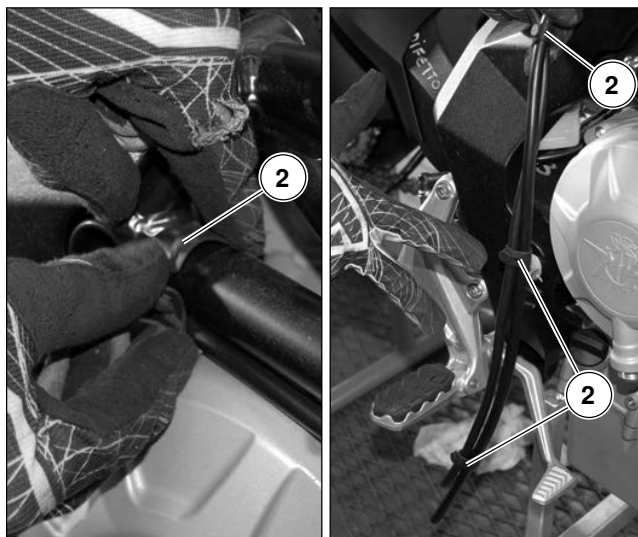
Remove the three fixing screws (1) of the expansion tank.



Push the expansion tank out of the frame and remove it from the vehicle.



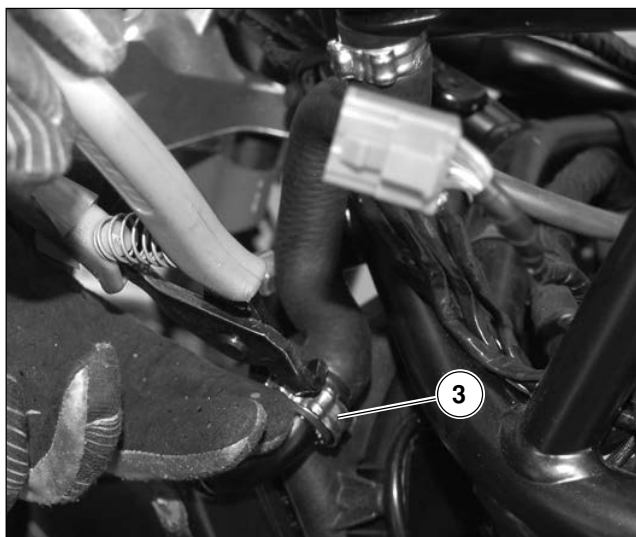
Remove the four rubber band fasteners of the vent pipes (2).



Pull the vent pipe from the upper part of the frame.



Remove the click band fastener (3) on the pipe from the radiator cap to the radiator.



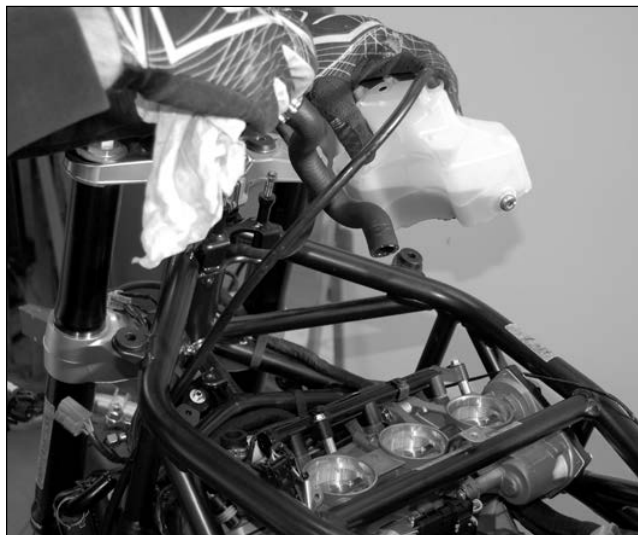
Remove the pipe from the radiator.



Slide the pipe out from inside the frame.



Slide the pipe and the expansion vessel out from the upper part of the motorcycle.



Empty the liquid from the expansion vessel completely into a basin.



DISCONNECTING THE HORN

Disconnect the 2 connectors (1) from the horn.

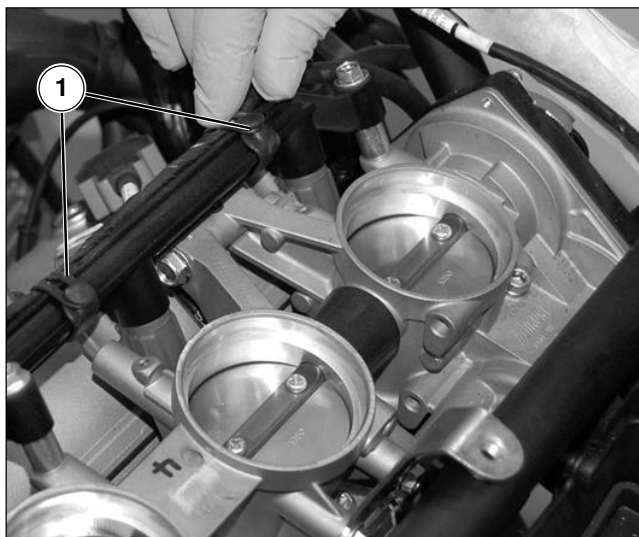


THROTTLE BODY REMOVAL

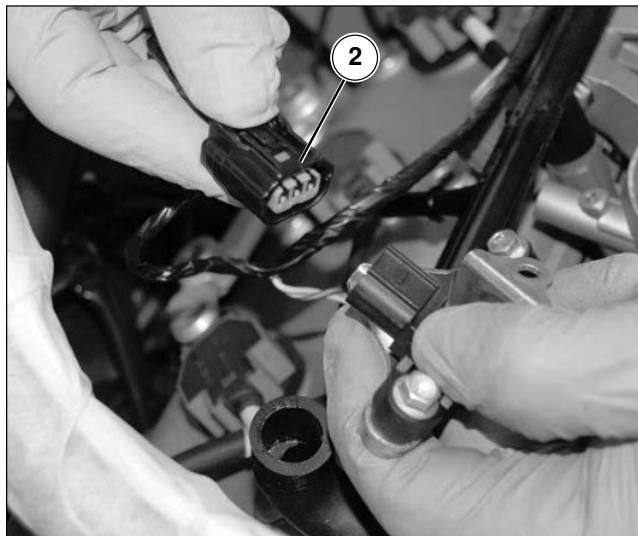
Protect the frame by applying adhesive tape as shown in figure.



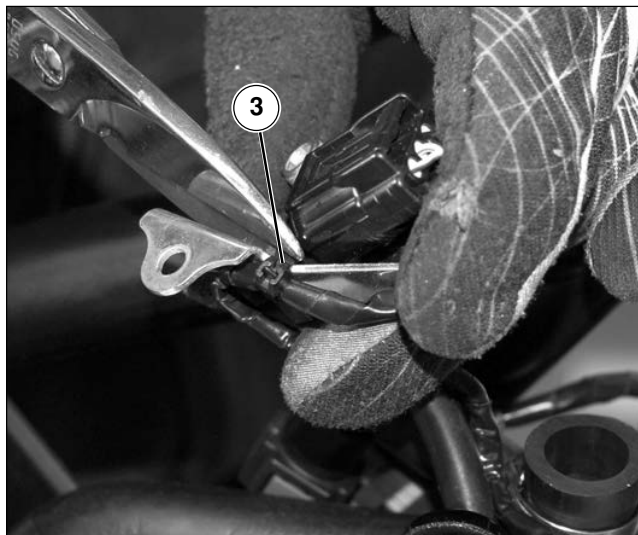
Remove the 2 cable-retaining clamps (1).



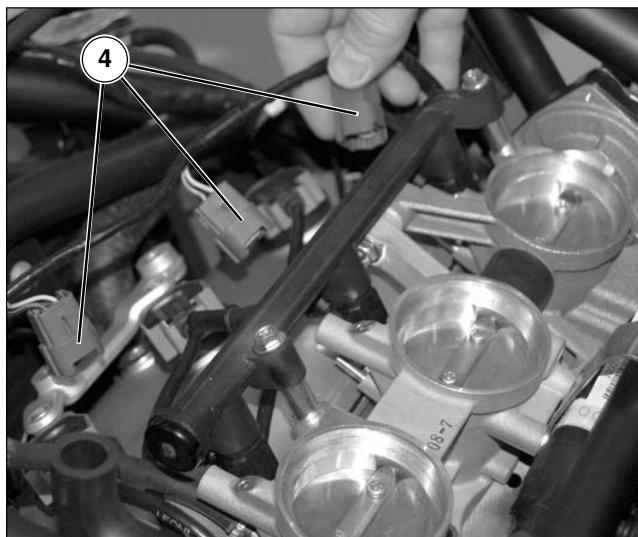
Disconnect the pressure sensor (2).



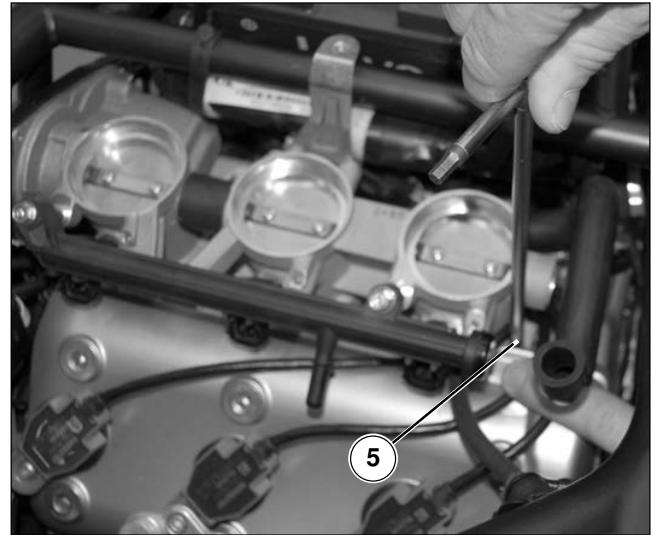
Remove the safety band fastener (3).



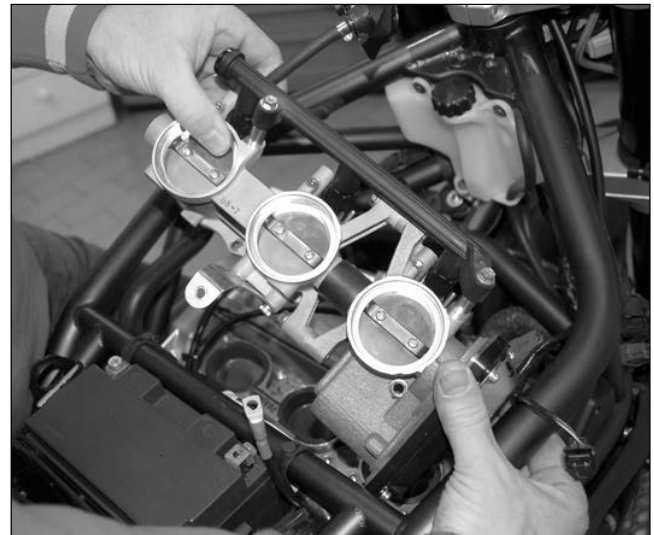
Disconnect the 3 injector connectors (4).



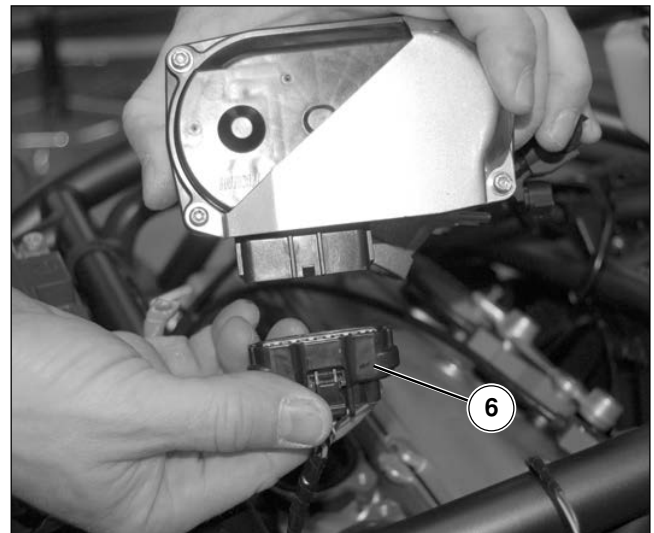
Disconnect the 6 clamping screws (5) of the throttle body to the intake flange.



Remove the throttle body first lifting it from the left as shown in figure.



Disconnect the DBW control connection (6).





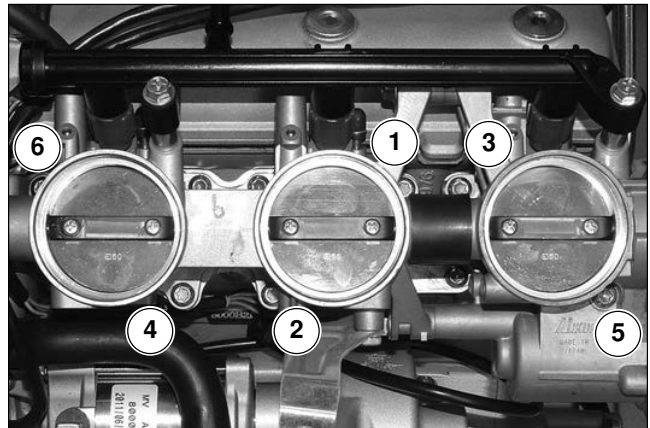
Frame

Protect the air intake lines using adhesive tape in order to avoid dirt from getting into the cylinders.



For reassembly proceed the opposite order as disassembly, applying the following procedure to tighten the throttle body screws:

- Tighten the 6 fixing screws of the throttle body at a tightening torque of **10 Nm**, respecting the tightening sequence shown in the figure.
- Loosen the 6 fixing screws in the opposite order.
- Tighten the 6 fixing screws of the throttle body once again at a tightening torque of 10 Nm, respecting the tightening sequence shown in the figure.



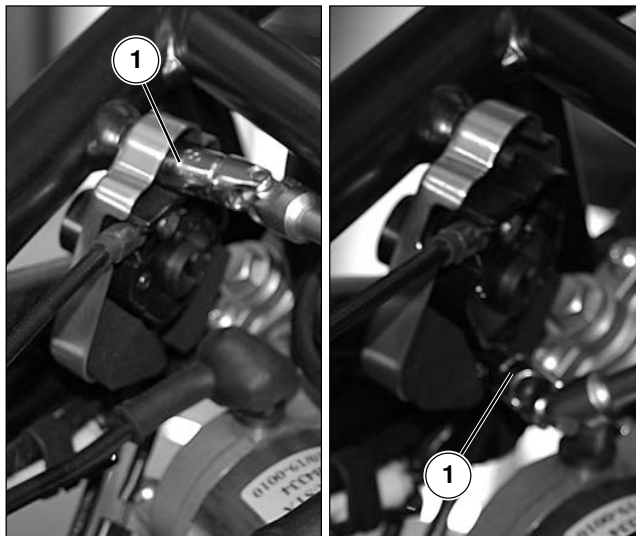
Remove the following components in order:

- Steering head
- Handlebar
- Right/left front forks
- Steering base

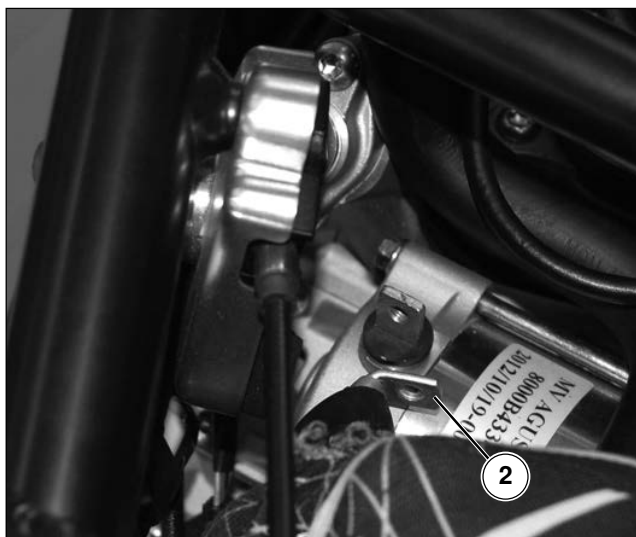
as described in chapter F - "Suspension and Wheels".

REMOVING THE SEAT LOCK

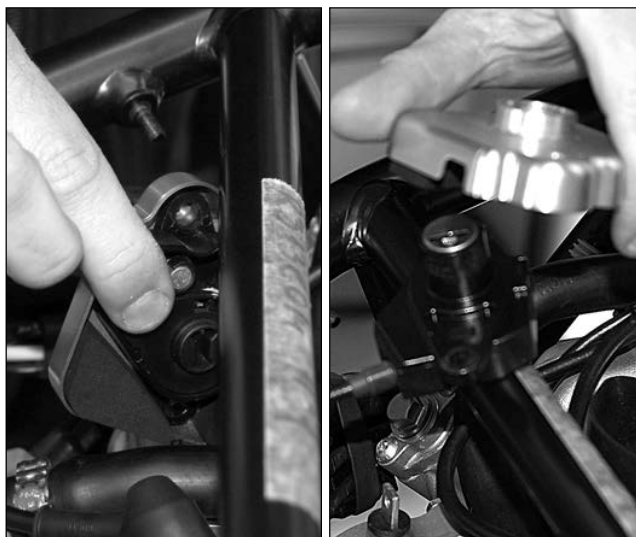
Remove the two M5 nuts (1) fixing the lock support to the frame.



To remove the nut at the bottom, the starter cable nut with screw must also be disassembled (2) and the nut must be removed manually.



Slide the lock complete with support from inside the motorcycle.

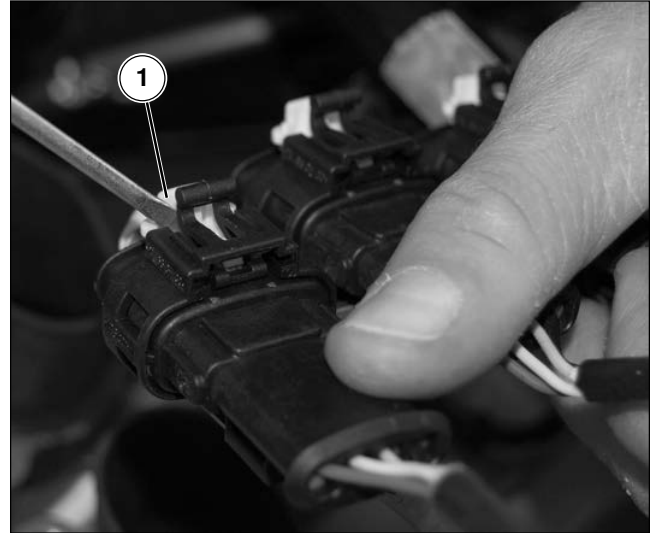


REMOVING THE MAIN CABLING

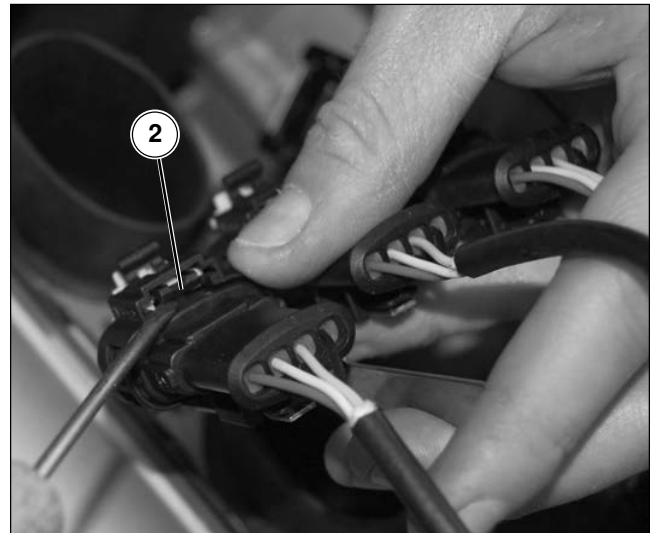
To remove the main cabling it is necessary to disconnect all of the connections and remove all the rubber clamps.

Disconnect the three plug-top connectors.

Disengage the yellow tab (1).



Lift the black tab (2).



At the same time as lifting the black flap, release the connector (3).



Remove the engine rpm pick-up.



Remove the current generator connection.



Remove the gear position sensor.





Frame

Remove the engine coolant temperature sensor.



Remove the rear wheel speed sensor (operation not essential).

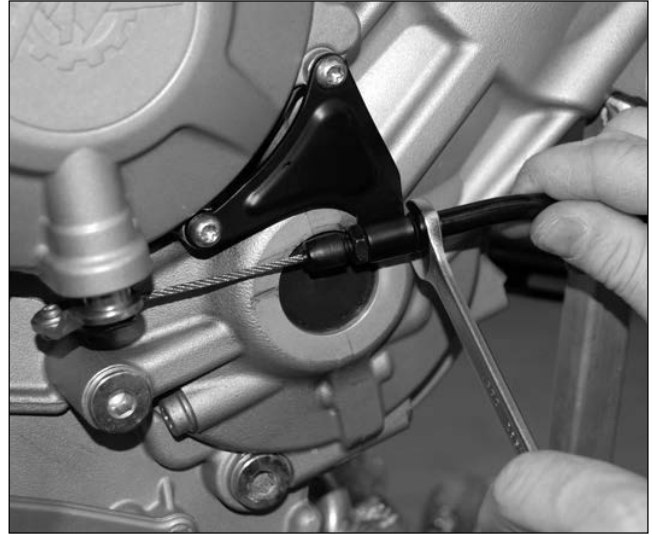


Position all of the wiring on the small frame.



REMOVING CLUTCH CONTROL TRANSMISSION

Loosen the nut on the clutch cable.



Unhook the transmission from the lever.

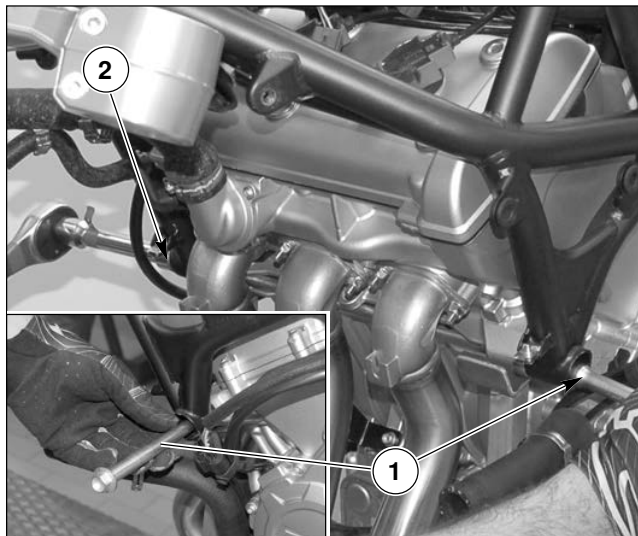


Unscrew the counter-nut to free up the transmission from the plate.



FRAME REMOVAL FROM THE ENGINE

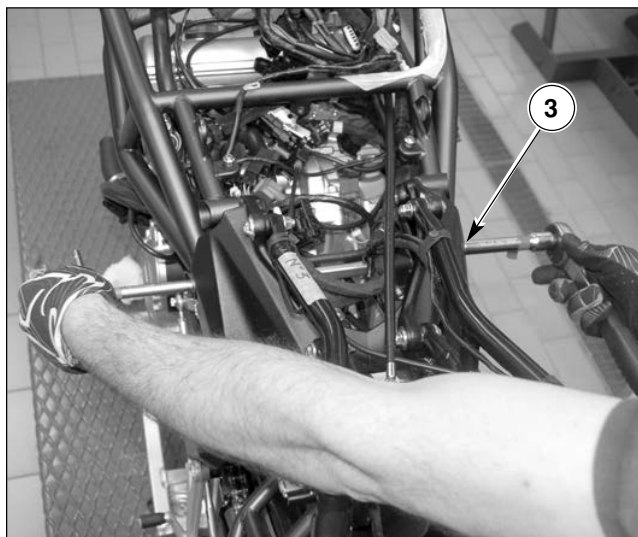
Operating as shown in the figure, unscrew and remove the front screw (1) fixing the engine to the frame from the left side, recovering the nut and spacer (2) from the right side.



Unscrew and remove the upper screws fixing the frame to the plate from both sides.



Unscrew and remove the engine fixing nut (3) from the right side of the frame.



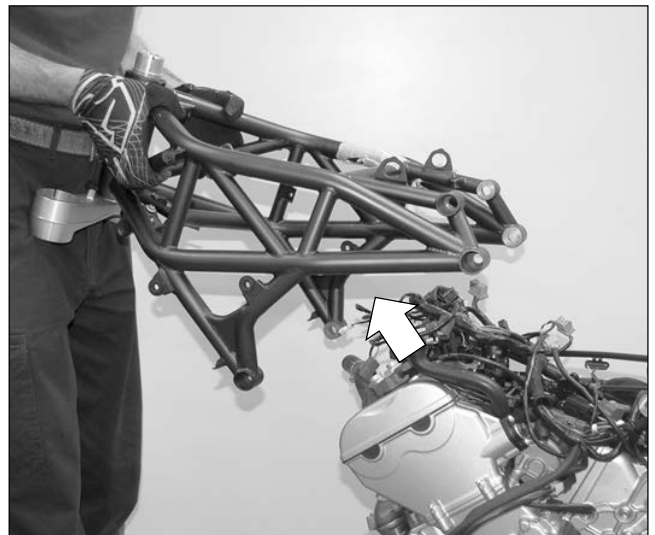
Take the engine clamping pin out from the left side of the frame.



Supporting the front part of the frame, shift it towards the front.



Remove the frame from the engine by lifting.



FRAME CHECKS AND INSPECTION

Clean thoroughly and check the housings of the steering bearings.



Make sure that none of the surfaces of the housings have signs of impact or dents.



Using a bore meter, check circularity of the housing of the bearing in the marked cylindrical area.





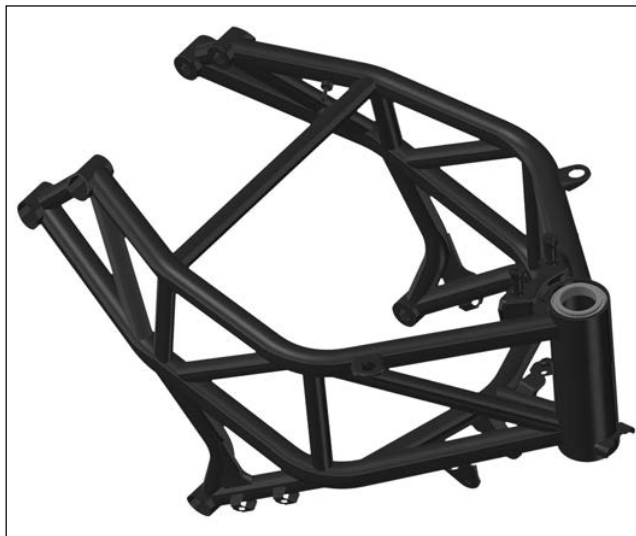
Frame

Check that there are no dents or evident breakage on frame tubes.

Replace frame if any damage is detected.

In this case, remove the following components:

- Rubber elements and springs

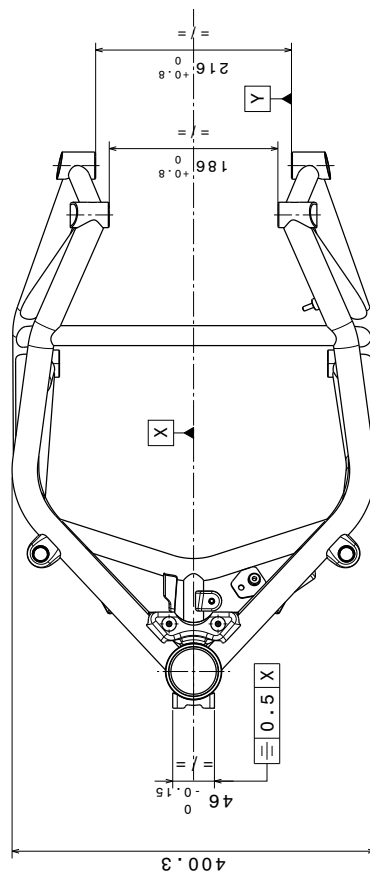
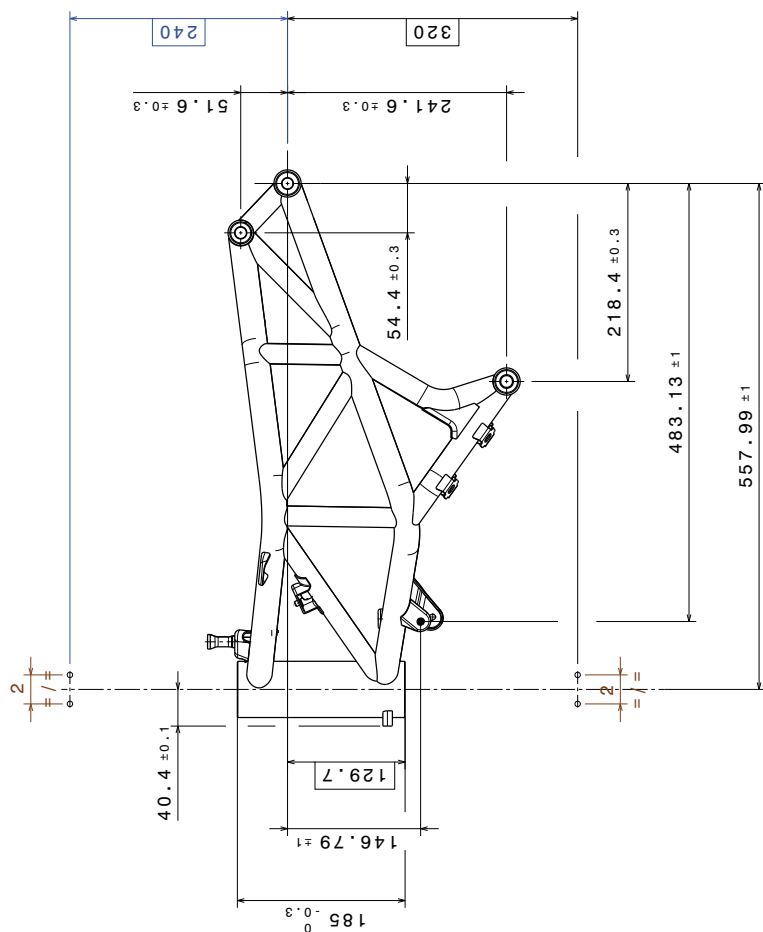


ATTENTION: in all cases where damage occurs to the structure of the motorcycle, MV Agusta recommends the immediate replacement of the frame, not advising and, in all cases, not authorising any type of intervention, except repainting, which implies, as an example, the straightening and/or welding of the frame. This procedure is recommended by MV Agusta in order to guarantee the motorcycle's safety for the final customer and third parties in general. Failure to comply with the instructions and recommendations of the aforesaid excludes all liability of MV Agusta.



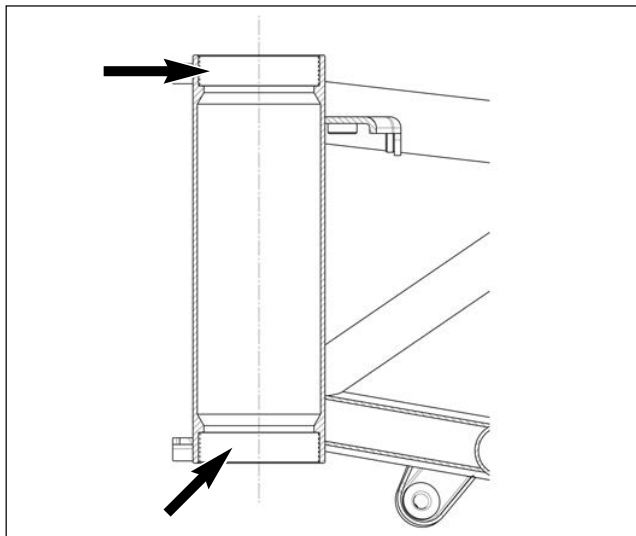
Technical drawing of a 4-wheeled mobile robot. The drawing shows a top-down view of the robot with its four wheels and internal frame. Key dimensions and tolerances are indicated:

- Overall Width:** 240 mm (tolerance: ± 0.5 mm).
- Overall Length:** 320 mm (tolerance: ± 0.5 mm).
- Wheel Diameter:** $\phi 55$ P7.
- Distance between wheel centers (left to right):** 193.65 ± 1 mm (tolerance: ± 0.5 mm).
- Distance between wheel centers (front to back):** 295.8 $^{+0.8}_0$ mm (tolerance: ± 0.5 mm).
- Distance from center to wheel center (left to right):** 119 mm (tolerance: ± 1.5 mm).
- Distance from center to wheel center (front to back):** 147.9 mm (tolerance: ± 1.5 mm).
- Mounting Points:** Labeled A and B, indicating the locations of the wheels.

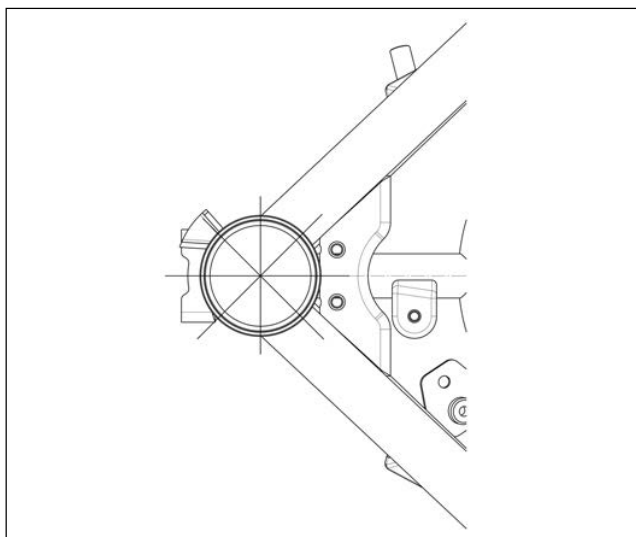


STEERING BEARINGS HOUSING CHECK

Check the diameter and for any ovalisation on the steering bearings as shown in the drawing here to the side.



Measure ovalisation in different points as shown in the diagram.



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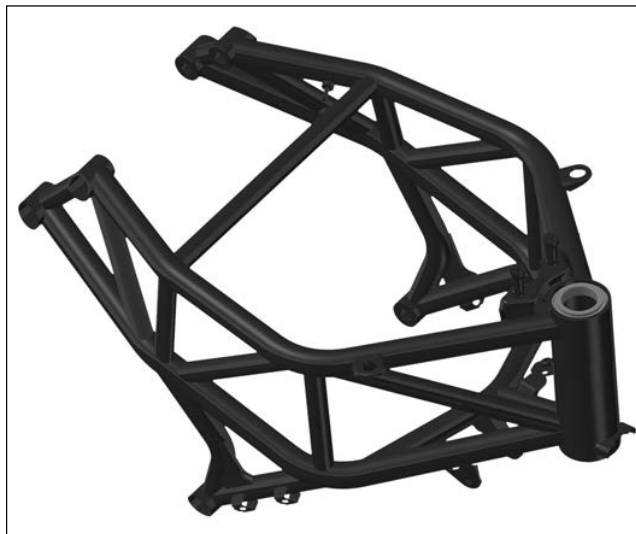


Frame

FRAME ASSEMBLY ON THE VEHICLE

If frame replacement should be necessary, you can recover components from the old frame, in particular the fairing attachment plates and threaded caps. These components can be assembled on the new frame after having carried out a careful inspection.

Contact MV AGUSTA spare parts service for approval punching and decals on the new frame.



Carefully clean the frame-engine head and frame- rear suspension plates coupling planes.





Frame



Once the frame has been re-installed, re-install the electrical cabling.

See Chapt. E - Electrical System regarding the positioning and passage of cables, clamps and wiring.

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Frame

Carry out the sequence of operations of assembly in reverse order to removal for the correct assembly of the frame to the motorcycle.

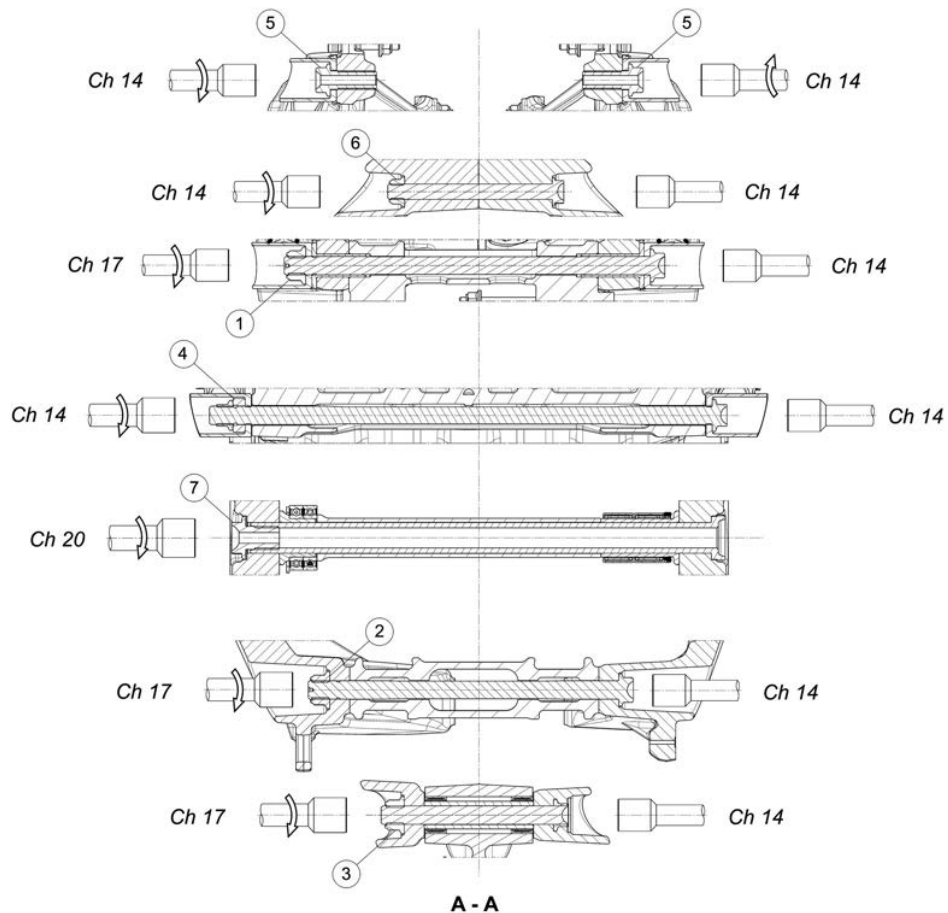
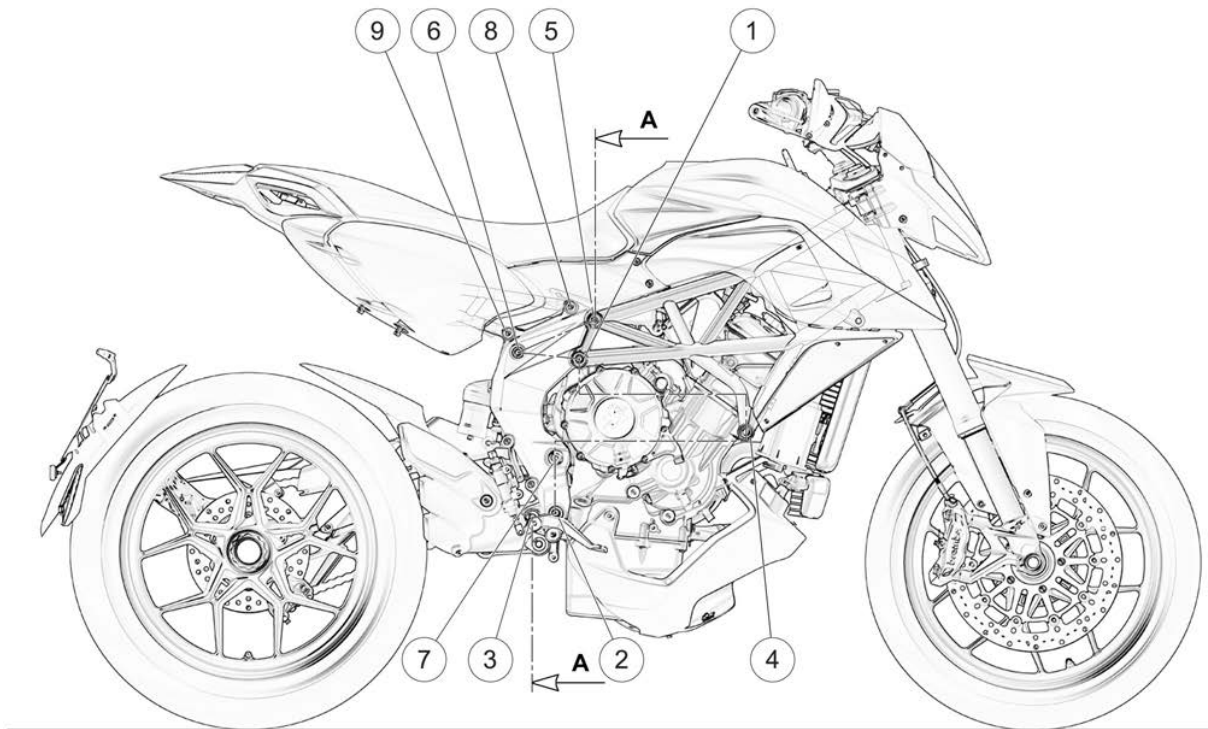
Tighten the various fixings to the torque pressure shown in the following diagram.

PART.	DESIGN NO.	DESCRIPTION	DIM.	TORQUE PRESSURE	
				N·m	Kgm
①	8B00B5645	Lower frame-engine fixing screw	M12x1,25	55/60	5,5/6,0
②	8A00B5645	Lower plates-engine fixing screw	M12x1,25	55/60	5,5/6,0
③	8000B5645	Rocker arm pin screw	M12x1,25	55/60	5,5/6,0
④	8C00B5645	Rocker arm-plate fixing screw	M12x1,25	55/60	5,5/6,0
⑤	8000B7165	Front frame-engine fixing screw	M12x1,25	55/60	5,5/6,0
⑥	8000B2750	Upper frame-engine fixing screw	M12x1,25	55/60	5,5/6,0
⑦	8A00B2755	Plates fixing screw	M10x1,25	45/50	4,5/5,0
⑧	8000B2751	Rear fork pin screw	M15x1,25	70/75	7,0/7,5
⑨	8000B5650	Plate – upper sub-frame fixing screw	M8x1,25	24/28	2,4/2,8
⑩	8000B5650	Plate – lower sub-frame fixing screw	M8x1,25	24/28	2,4/2,8

The tightening of the engine mounting screws and the plates ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ is effectuated with the motorcycle resting on its wheels and the engine hanging from the frame.

The tightening of the rear sub-frame screws ⑨ ⑩ is carried out by letting the sub-frame drop into position by its own weight.

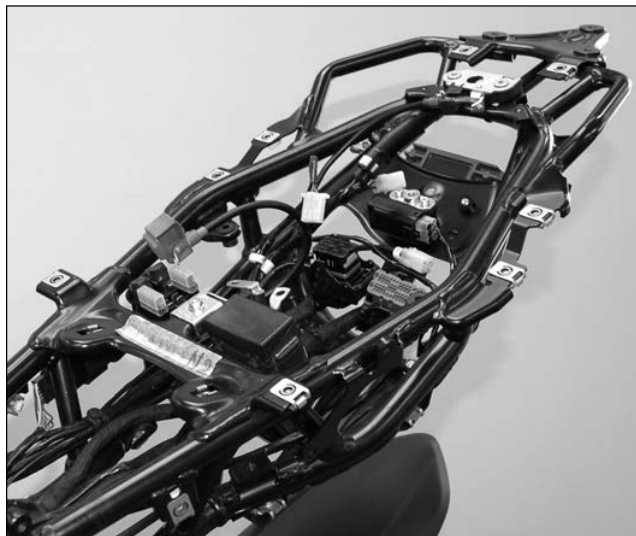
Utilise AGIP GREASE 30 for the screws.



REAR FRAME DISASSEMBLY

After having carried out the removal of all the necessary components described in the previous paragraph, perform the following operations.

Remove all rubber band fasteners holding the wiring until the frame appears as in the photo.



Disconnect the voltage regulator connector.

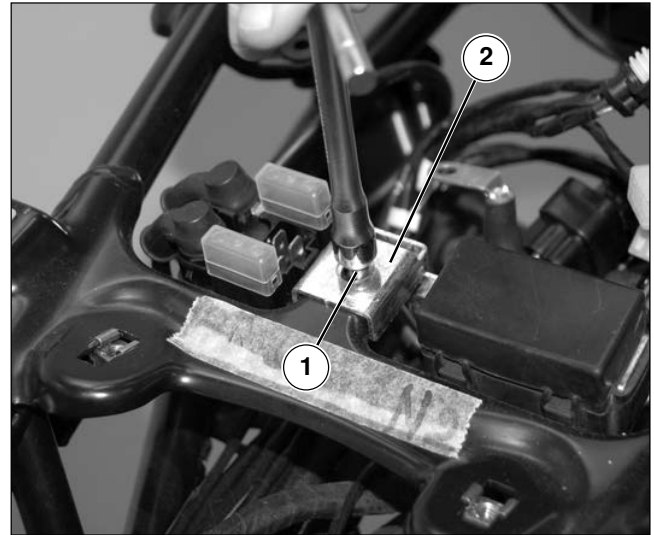


Disconnect the fall sensor connector.

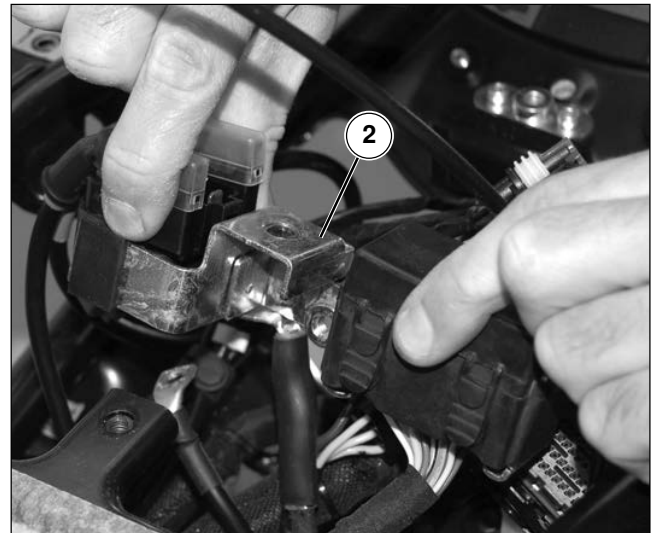


REMOVAL OF THE STARTER CONTACTOR AND FUSE BOX

Remove the fixing screw (1) of the contactor protection (2).



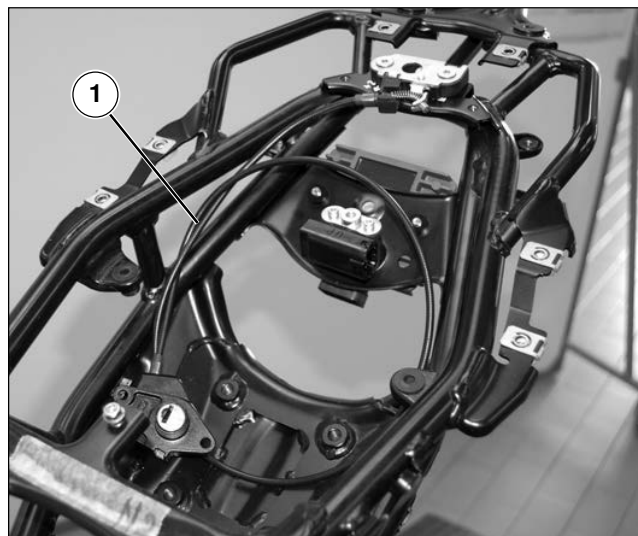
Remove the contactor protection (2) towards the rear part.



Slide the double control unit out on the right side (3) (intermittence and tail light diagnosis).



Rewind the saddle lock cable (1) onto the rear frame.



Unscrew and remove on both sides the two lower screws fixing the rear sub-frame to the union plates taking care to recuperate the nuts.



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Unscrew and remove the two upper fixing screws taking care, in this case also, to support the sub-frame and recuperate the nuts.

At this point it is possible to remove the complete sub-frame assembly from the motorcycle.

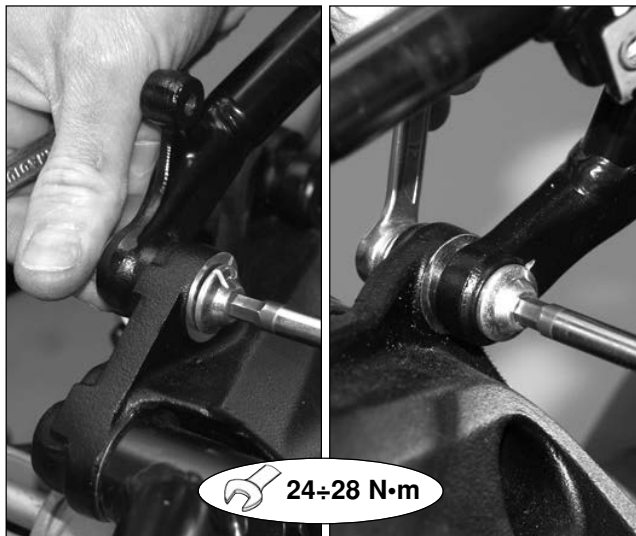


REAR FRAME UNIT ASSEMBLY

Carry out the operation of reassembling the rear sub-frame on the motorcycle in the reverse order of removal, taking care to tighten the fixing screws to the prescribed torque pressure.



Rear sub-frame fixing screw torque pressure: 24÷28 N·m



ENGINE REMOVAL

Cut the chain as described in chapter F "Suspension and Wheels."

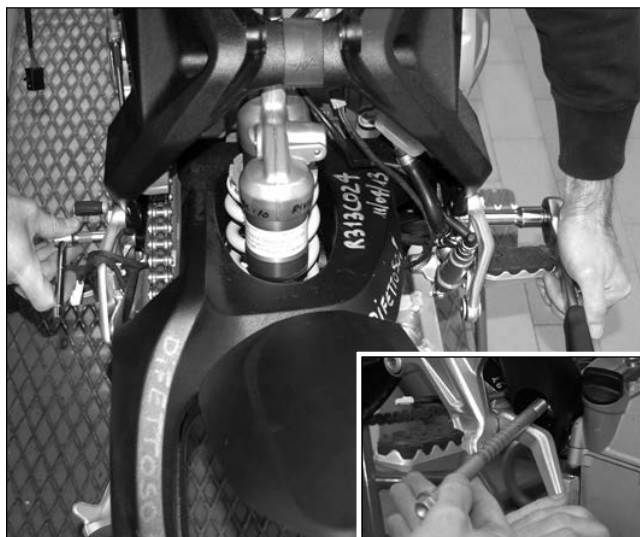
Remove the brake oil tank in the inside of the right plate.



Operating as shown in the figure, remove the plate fixing screw from the left side.



Remove the lower screw fixing the plates to the engine from the left side.



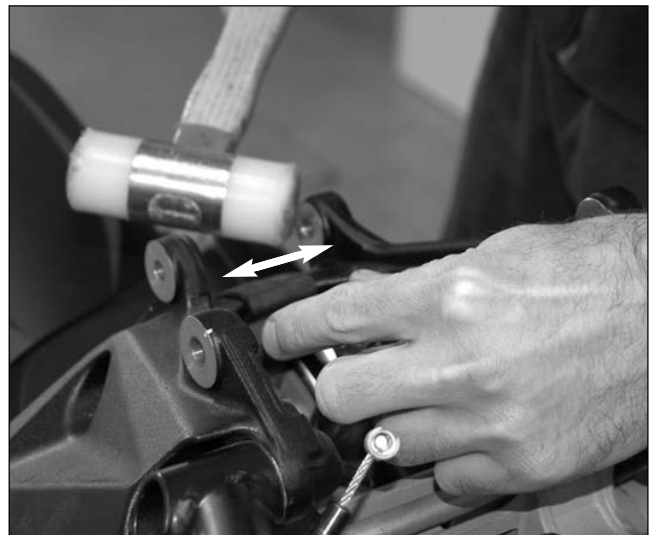
Loosen the swing arm pin to widen the plates respect to the engine.



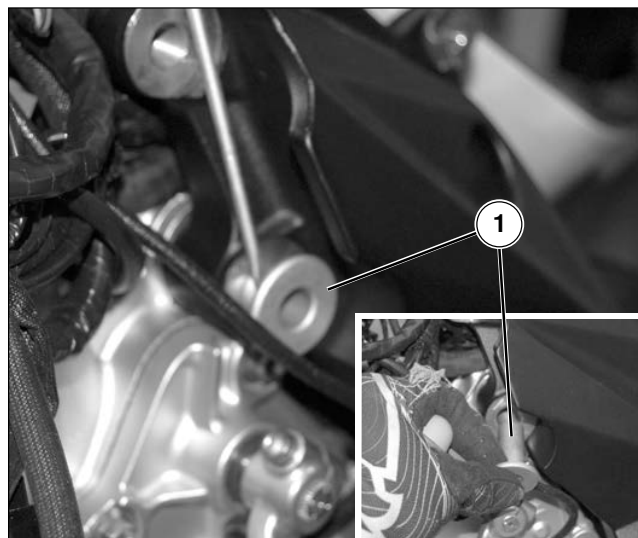
Operating as shown in the figure, loosen the lower screw fixing the plates to the rocker arm to widen the plates respect the engine.



Using a rubber mallet, slightly widen the plates as shown in the figure to be able to push the engine towards the front part.



Using a flat screwdriver, move aside the centring bushes (1) between the plates and engine (one on each side) and remove them by hand.

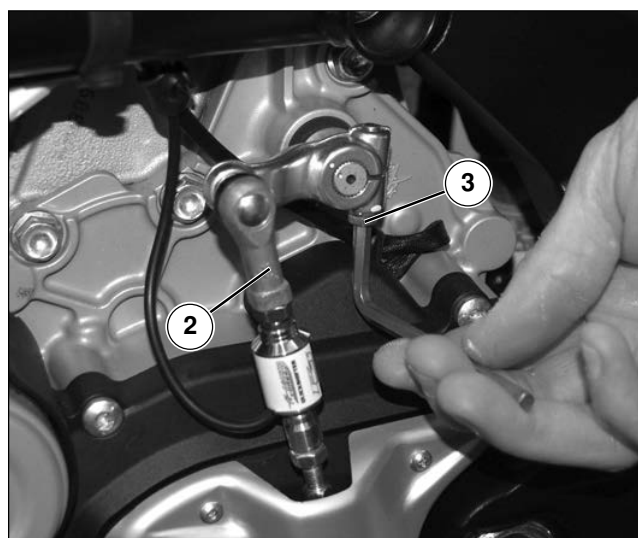


Insert a support to bear the plates.

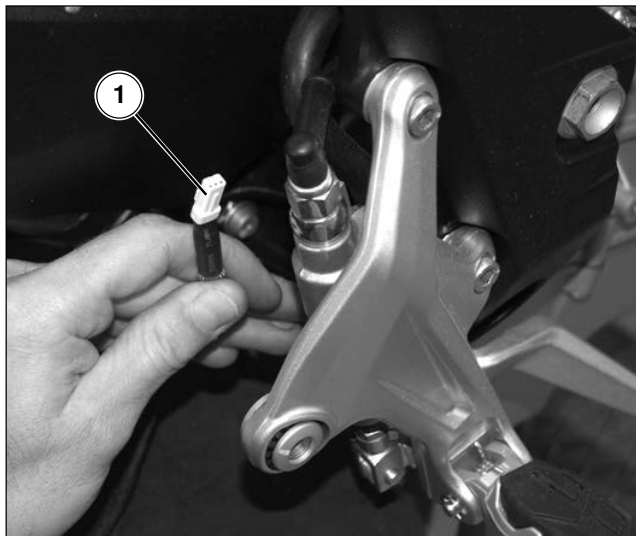


Disconnect the gear rod (2) removing the screw of the gearshift transmission (3).

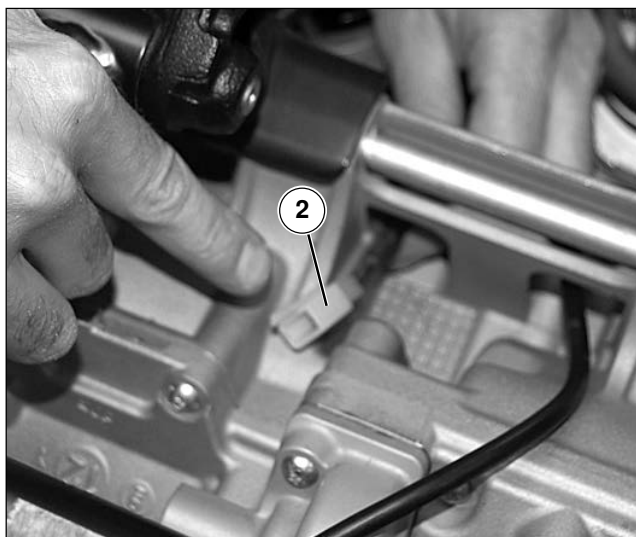
Disassemble the chain and the pinion sump as described in Chapter F "Suspensions and wheels".



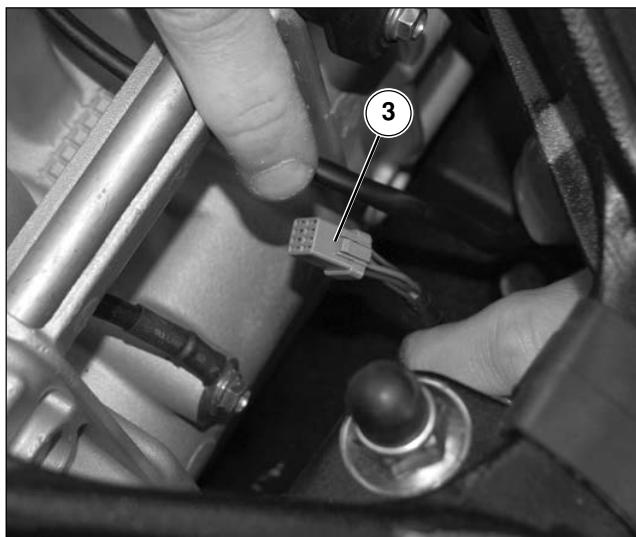
Disconnect the rear wheel speed sensor connector (1).



Disconnect the hydrostop sensor connector (2).



Disconnect the number plate carrier group (3) connector.



Slip the engine forwards.



RE-ASSEMBLY OF THE VEHICLE

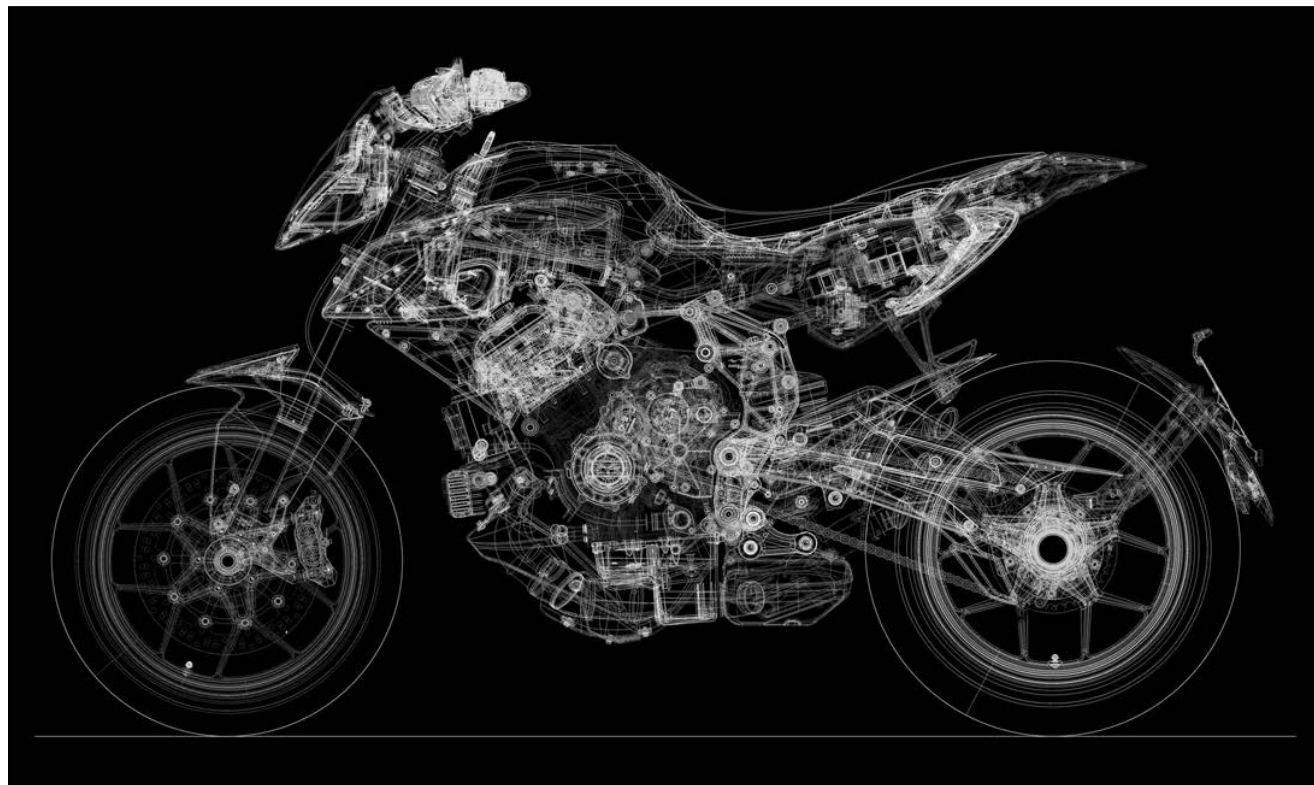
To re-assemble the vehicle in an easy fashion, do the following:

- position the engine on tool 8000B6789
- assemble the following parts:
 - 1) engine earth cable
 - 2) electrical system protection
 - 3) engine oil vapour vent pipe
- proceed in the reverse order of the engine removal.





Brakes



H

SECTION H

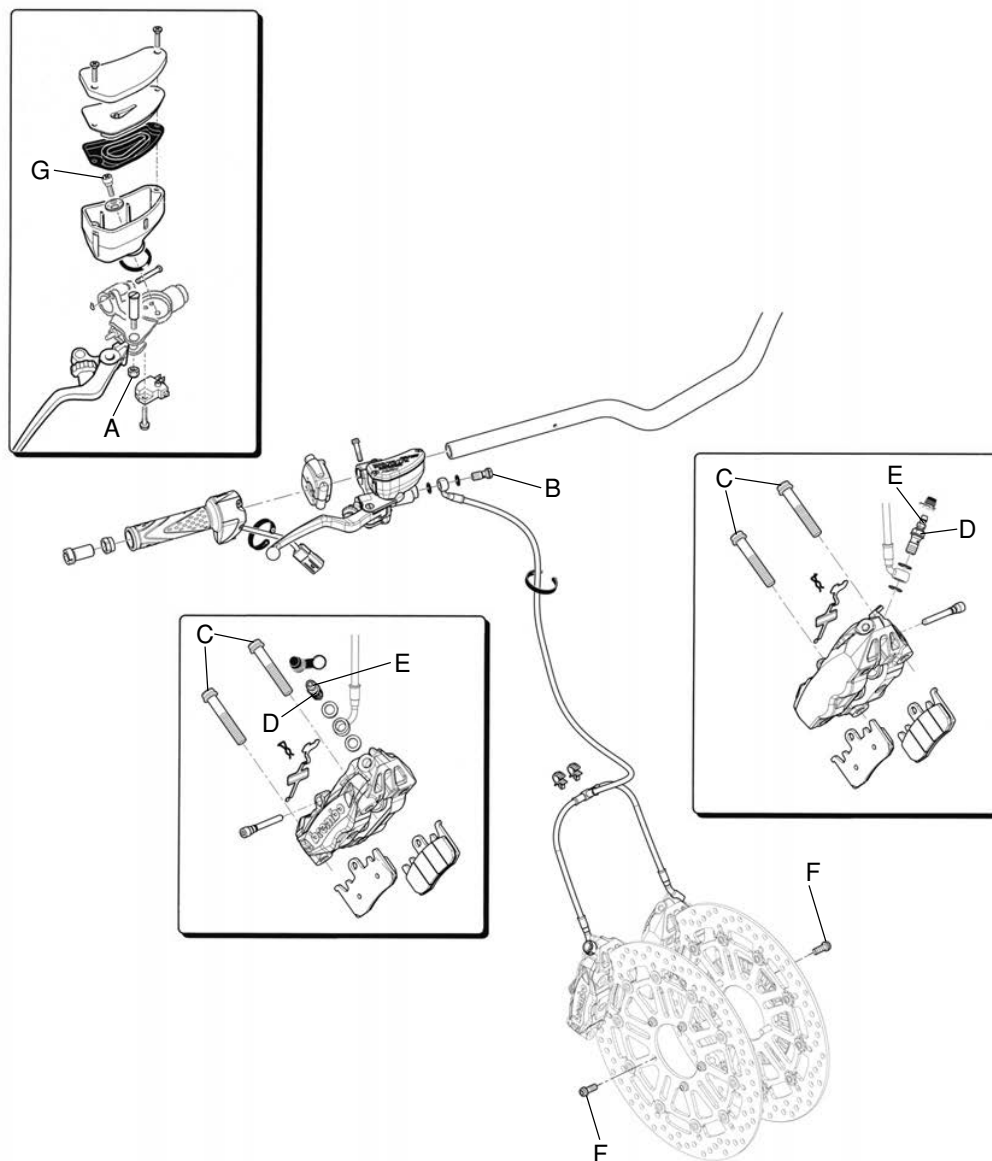
Revision 0



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SUBSTITUTION AND BLEEDING OF THE FRONT BRAKE FLUID	PAGE 6
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FRONT BRAKE SYSTEM



		A	B	C	D	E	F	G					
Torque pressure	N·m	8 ÷ 10	16 ÷ 18	42 ÷ 46	23 ÷ 26	6	23 ÷ 25	2					
	Kg·m												
	ft·lb												
Operation													

Description

RIVALE 800

FRONT BRAKE

Type	Dual floating disc with steel braking band
Ø discs (mm)	320
Disc flanges	Steel
Calipers (Ø pistons mm)	Radial-type, with 4 pistons Ø 32
Front disc thickness (mm)	5
Min. pad thickness (mm)	1

REMOVING FRONT MUDGUARD

To facilitate replacement of the front brake pads, remove the front mudguard as described in Chapter C "Superstructures".

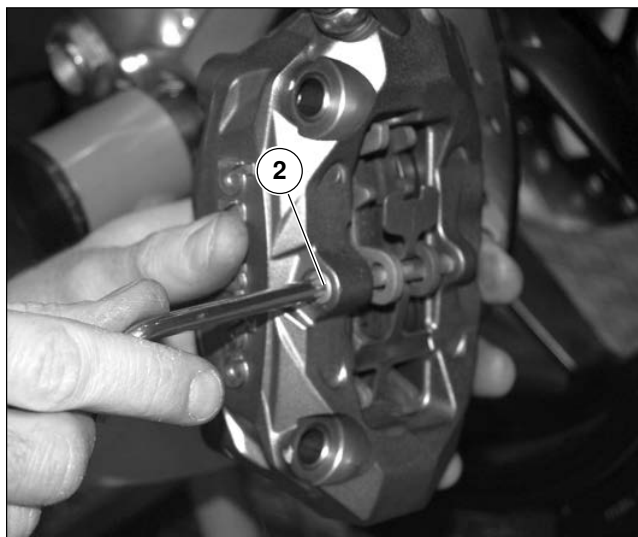


FRONT BRAKE PADS SUBSTITUTION

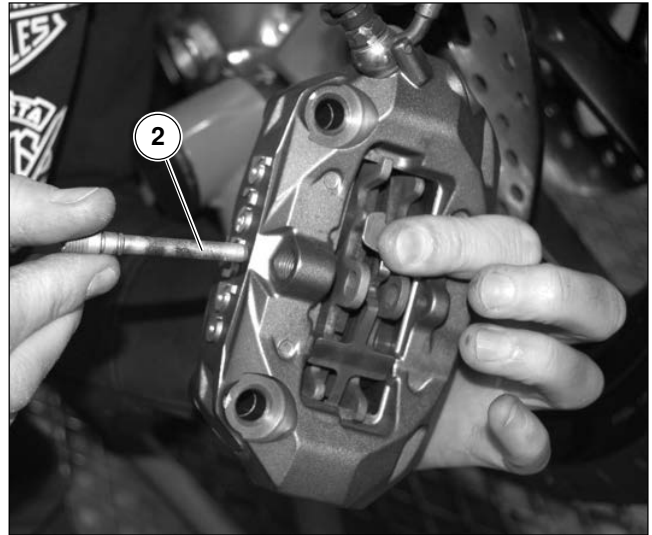
Remove the safety catch (1).



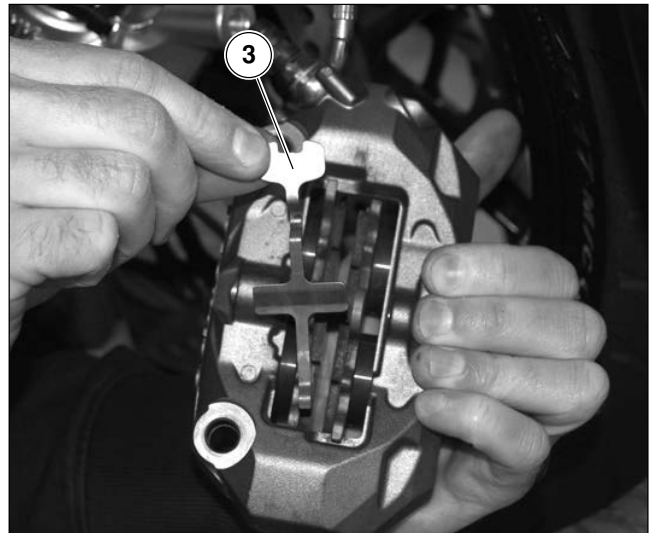
Loosen the pads pin (2).



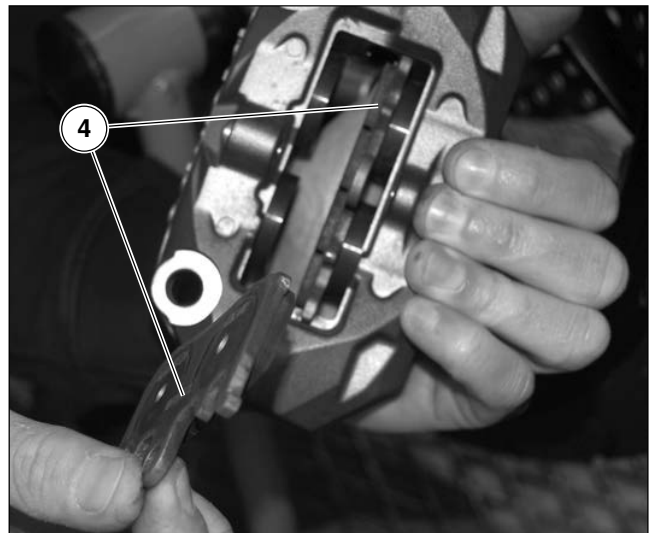
Remove the pads pin (2).



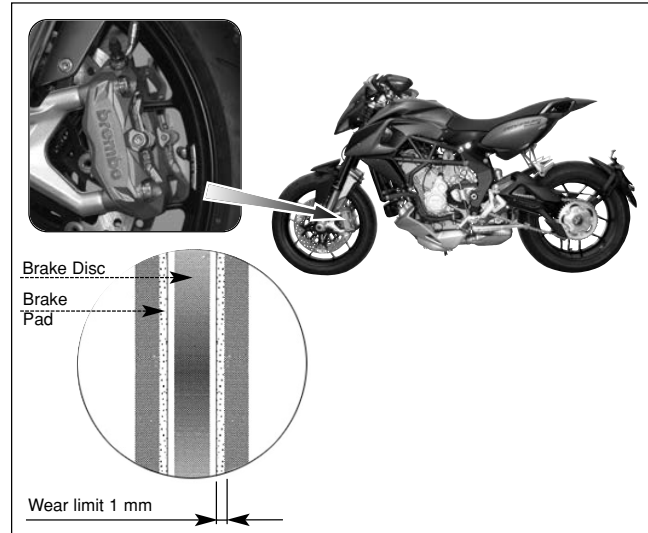
Slide the safety plate out (3).



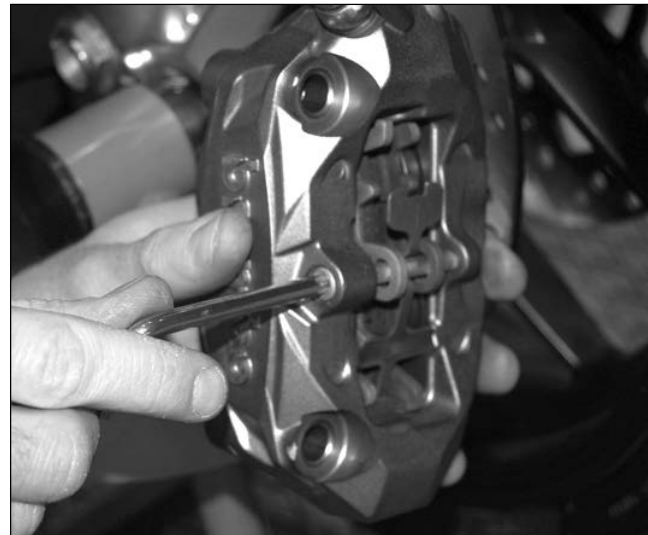
Remove the two pads (4).



Every 6000 kilometres, check the wear of the pads. The pad thickness must not be less than **1 mm**. If the pads are excessively worn, substitute them.



For setting up front brake pads, carry out the operations described above in reverse order.



SUBSTITUTION AND BLEEDING OF THE FRONT BRAKE FLUID

Place the motorcycle on a horizontal surface with the steering in a straight line.

Protect the zone with a cloth.

Remove the two screws from the front brake fluid tank cover.



Brake fluid has a strong corrosive power. Be careful to not spill the fluid on surrounding parts. If the fluid is spilt clean immediately with industrial alcohol and dry with compressed air.



Remove the protection cap of the bleed valve of the front right caliper.



Apply a rubber tube to the bleed valve (the valve is placed on the summit of the brake caliper). Put the other end of the rubber tube in a suitable container.



Pull the brake lever without releasing it. Slacken the bleed valve and empty the brake system.

Tighten again the bleeding screw.



Fill the system by pulling the front brake lever 3-4 times (see figure).

Repeat the above drain operations until the fluid reaches the minimum level in the reservoir. Top up with fresh fluid and carry on with the operation until fluid of a different colour (fresh) flows out.

The quantity of brake fluid necessary for this operation is approximately ≈ 250 cc.

NOTE Repeat this operation on both calipers.



Brake fluid: AGIP Brake 4

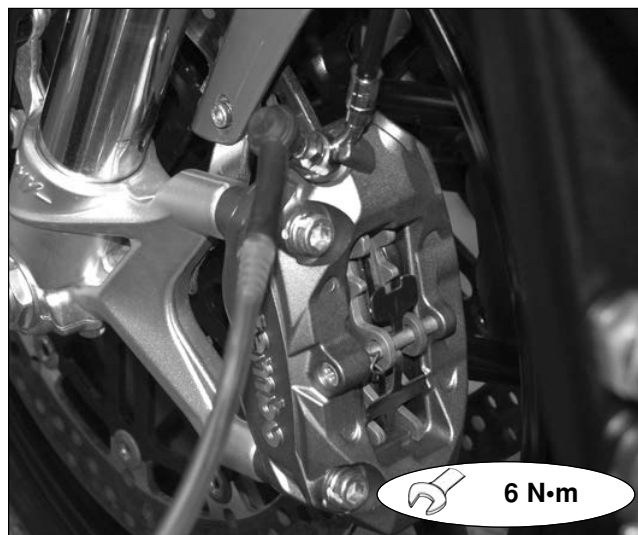


Utilise only the prescribed brake fluid from sealed containers. NEVER use old or used brake fluid.

Tighten the bleed screw, remove the rubber tube, carefully clean the screw with alcohol, blow it dry and put the protective cap back on.



Bleed screw tightening torque: 6 Nm



Slowly squeeze the brake lever to bring the pads in contact with the disc and also checking that there is no sponginess in the action of the lever. Air bubbles should not rise in the chamber.

If bleeding has been carried out correctly, the stroke of the lever will be short and will not have an elastic effect.

Otherwise, repeat the bleeding operations illustrated in the points above.



Pour new brake fluid into the chamber until it reaches the maximum level.



Brake fluid: AGIP Brake 4



Utilise only the prescribed brake fluid from sealed containers. NEVER use old or used brake fluid.



Top-up the level of the fluid until it reaches the maximum mark (upper).



Carefully clean around the edge of the brake fluid chamber utilising a clean cloth.



Imperfect cleaning of this component could cause the loss of small quantities of brake fluid whilst riding.



Accurately clean the three elements of the brake fluid chamber cap with alcohol and dry with compressed air.



Use a clean cloth to clean also after having positioned the membrane.



Position and screw on the top brake fluid tank cap and tighten the two lateral fixing screws.



FRONT BRAKE CALIPERS SUBSTITUTION

Slightly move the front brake lever towards the right handgrip and hold it in position with a strap to limit the outflow of brake fluid during subsequent operations.



Unscrew the fitting with a 12mm key, being careful to avoid spilling any brake fluid.



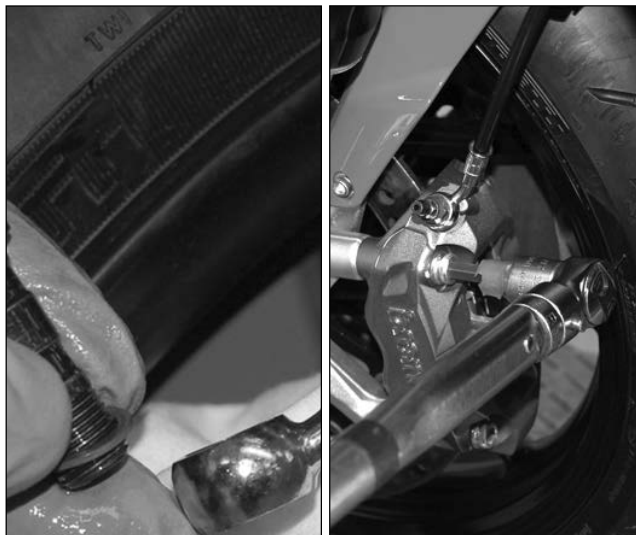
Brake liquid can corrode painted surfaces. Clean immediately any spilt brake fluid with ethyl alcohol.



H

Remove the sealing washer, and replace them in the assembly phase with new one.

Remove the two caliper fixing screws indicated in the figure.



Remove the brake caliper.

NOTE The removal operation is identical for both calipers.



To fit the front brake calipers, follow these steps:

- Insert the caliper fixing screws and turn them until they make contact.



Only grease the first threads of the brake caliper fixing screw.

- Refit the caliper connection after replacing the sealing washers.

H



Torque pressure caliper union: 23÷26 N·m

- Fill the system with brake fluid.
- Bleed the system as described on page 6.
- Keep the brake lever pulled back with a strap and tighten the brake caliper fixing screws.



Torque pressure calipers screws: 42÷46 N·m

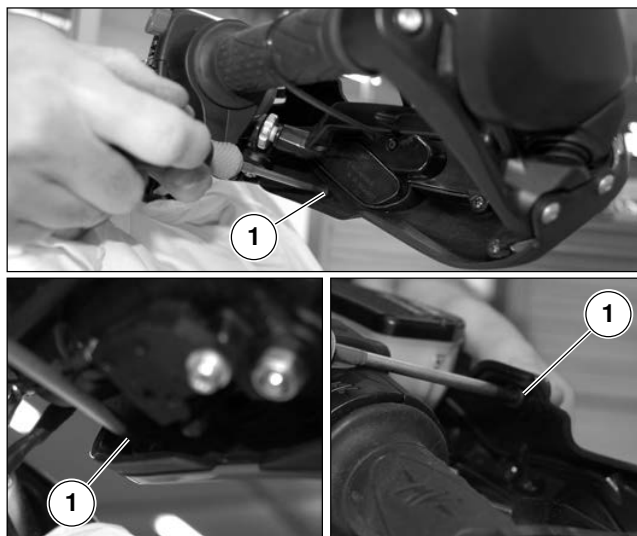


FRONT BRAKE PUMP REMOVAL

Remove the cap from the front brake fluid reservoir and drain the reservoir with a syringe.



Remove the three fixing screws (1) of the cover.



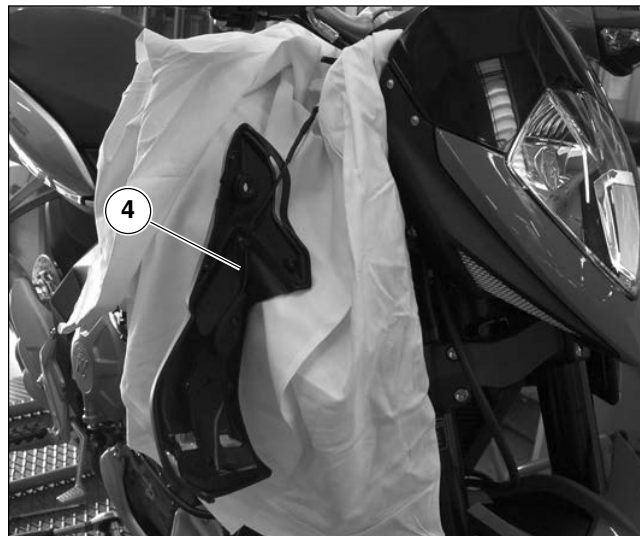
Remove the hand guard front fixing (2).



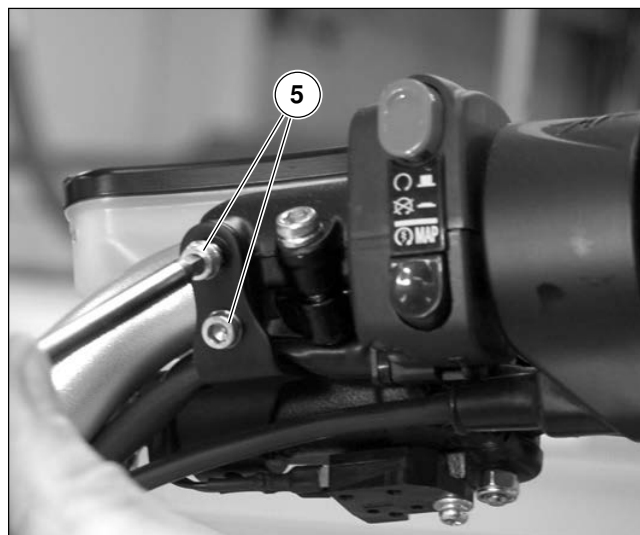
Remove the two hand guard lateral fixing screws (3).



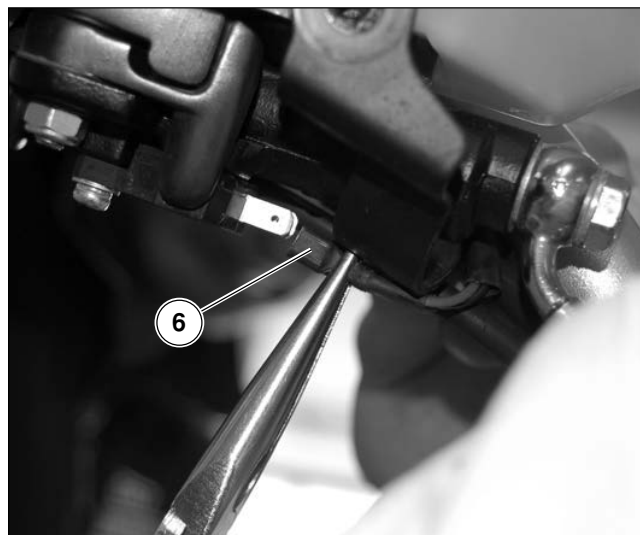
Leave the hand guard hanging as indicated (4).



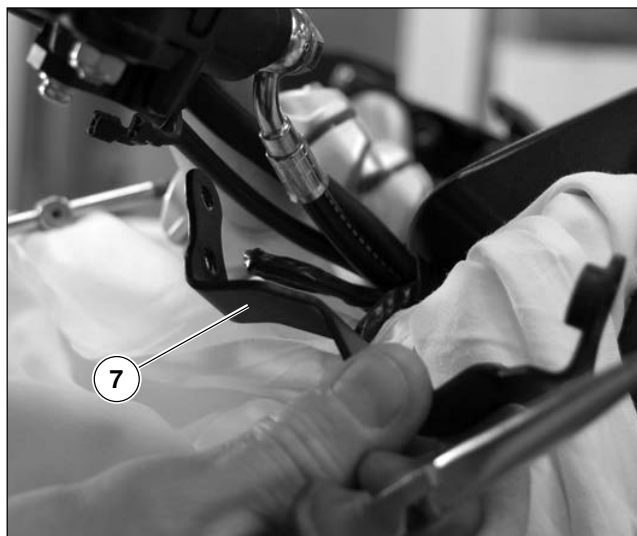
Remove the two hand guard plate fixing screws (5).



Remove the two clips of the front brake stop (6).



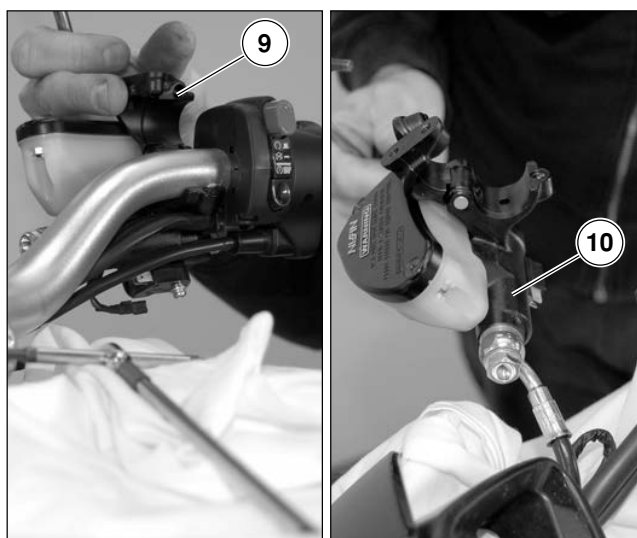
Remove the hand guard fixing plate (7).



Remove the pump bar clamp fixing screws (8).



Open the bar clamp (9) and extract the pump (10) from the handlebar.



Remove the union (11) indicated in the figure.



Brake fluid is extremely corrosive. Avoid contact with the eyes, skin and nose. Wash abundantly with water and call a doctor if accidental contact occurs.



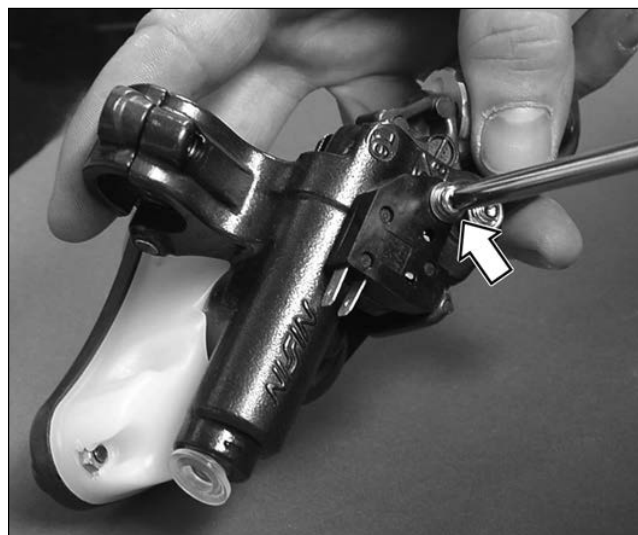
During the following operations, avoid contact with painted surfaces.



To replace the front brake switch, remove the screw shown in the figure.



After having carried out the overhaul of the front brake pump assembly, carefully wash and bleed the front brake system as previously described in this chapter.



H

When reassembling, pay attention to the position of the brake hose fitting and use two newly supplied washers.



Brake hose fitting torque pressure: 16÷18 N·m



FRONT BRAKE LEVER REMOVAL

Unscrew the blocking nut.



Unscrew the pin and remove it; then remove the brake lever.



When reassembling take care to insert the lever into its seat.

Grease the pin:

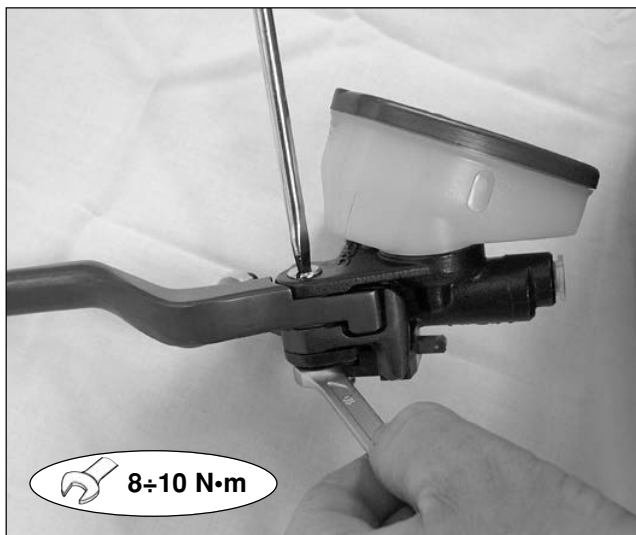


Recommended grease: Agip Grease 30

Insert the pin into the seat and screw it in until the beat is reached, then tighten the nut by using a screwdriver.



Front brake lever nut torque pressure: 8÷10 N•m



FRONT BRAKE DISCS

Check the thickness of the front discs utilising a micrometer gauge and measure three points at least with 120° between them as shown in the figure.



Use a micrometer gauge for this check.

- Minimum allowable thickness: 4.5 mm

This operation just be carried out on both front discs.



If the measurements are below the minimum, substitute the component with a new one.



FRONT BRAKE DISC REMOVAL

Take down the front wheel as described in chapter F "Suspensions and Wheels".

Place the wheel in a horizontal position and remove the five screws of each disc proceeding in a star-like mode for the removal.

Visually check the discs for lines or score marks.



H

Place the brake disc on a level surface with the milled side face down and utilising a micrometer gauge check that the maximum oscillation of the disc reached during a rotation of 360° does not exceed **0.3 mm**.

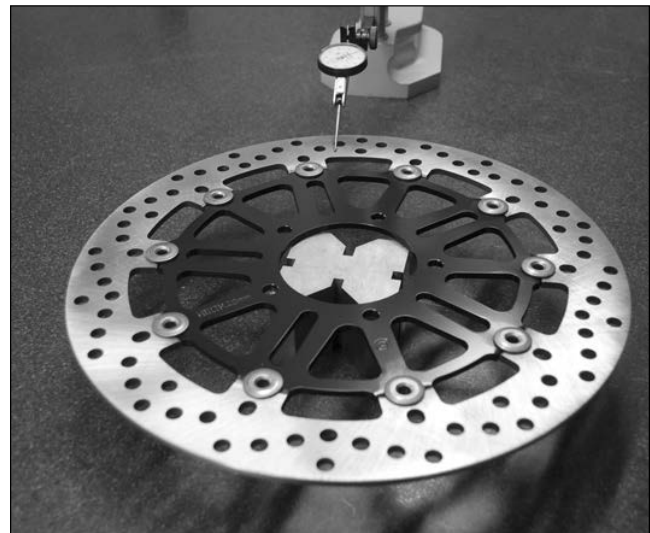


Utilise a micrometer gauge for this check.



If the measurements are below the minimum, substitute the component with a new one.

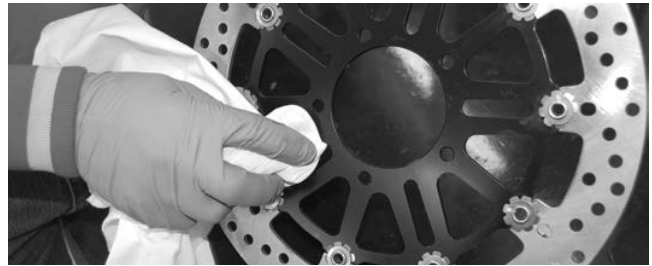
This operation must be carried out on both front discs.



Front disc assembly

Thoroughly clean the contact surfaces of the discs and the wheel.

Accurately grease all relative surfaces of the disc before reassembling.



The following operation is to be carried out on all models.

If newly supplied screws are being used they already have threadlocker on them.

Apply thread-locking fluid to the five fixing screws of the disc.



Recommended thread-locking fluid: Loctite 243



H

Screw in the screws lightly, proceeding in a star-like mode.

Continuing in a star-like mode, tighten the screws to the prescribed torque pressures.



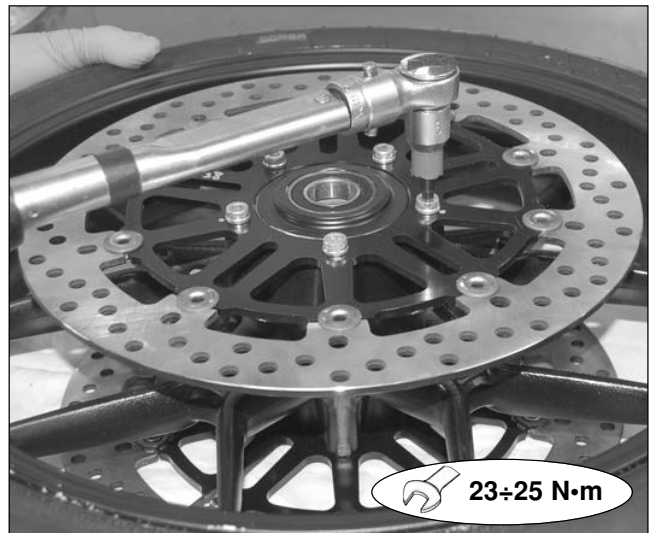
Torque pressures: 23 ÷ 25 N·m

Be careful to reassemble the discs in the original positions (it is advisable to mark them by applying an adhesive label).



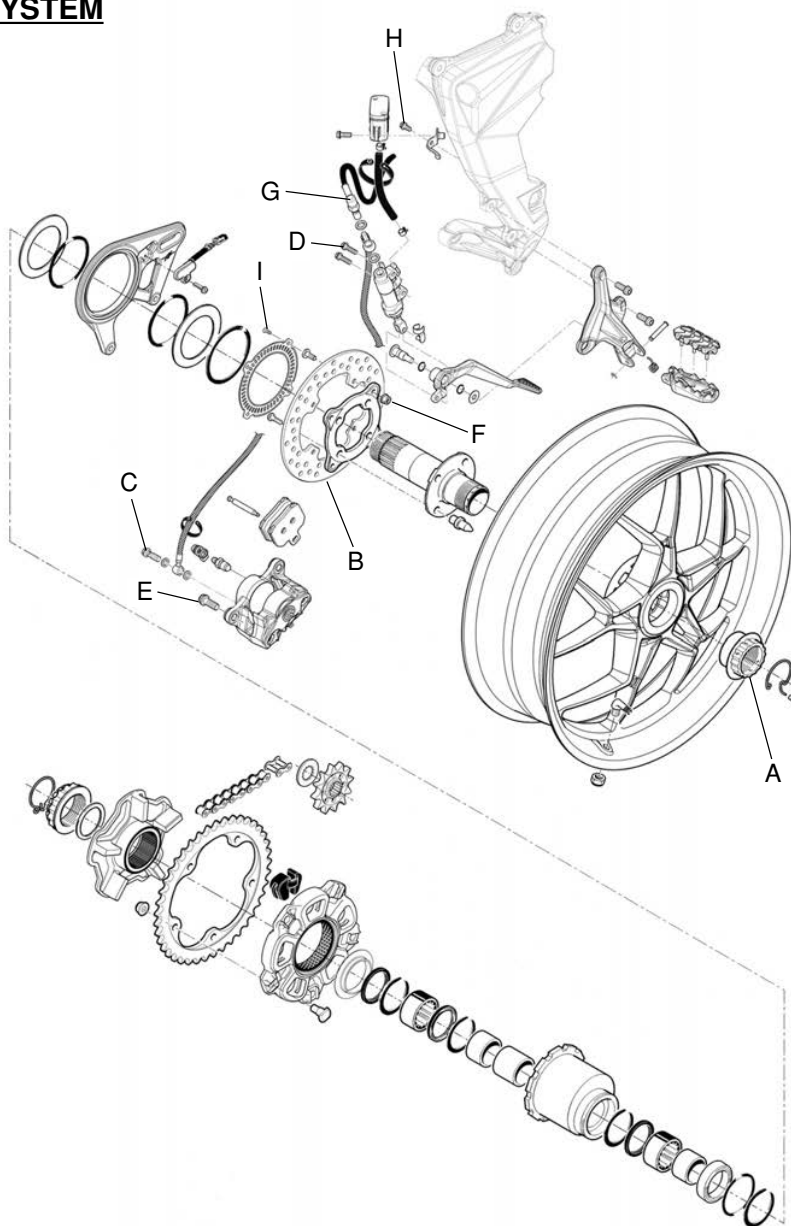
This operation is important so that a good contact between the brake discs and the relative pads.

Proceed by reassembling the parts in the reverse order of removal. Consult chapter F "Suspension and wheels".



23÷25 N·m

REAR BRAKE SYSTEM



H

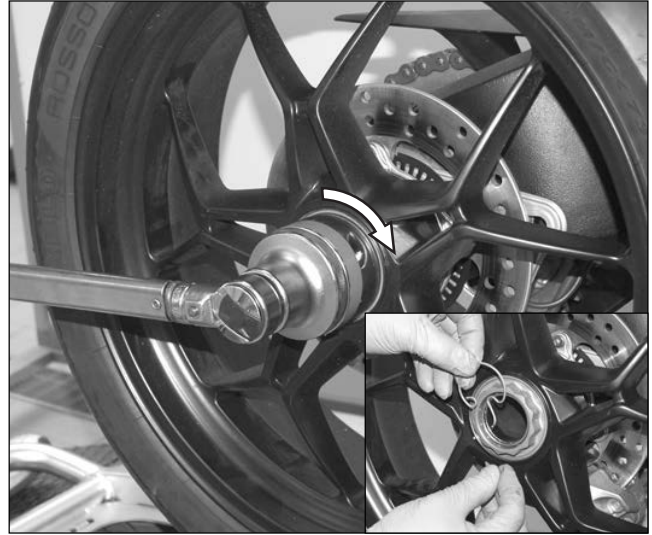
		A	B	C	D	E	F	G	H	I	
Torque pressure	N·m	220 ÷ 240		23 ÷ 26	8 ÷ 10	18	18 ÷ 20	16 ÷ 18	8 ÷ 10	3	
	Kg·m										
	ft·lb										
Operation											

Description	RIVALE 800
REAR BRAKE	
Type	Single steel disc
Ø discs (mm)	220
Caliper (Ø pistons mm)	With 2 pistons Ø 34
Rear disc thickness (mm)	5
Min. pads thickness (mm)	1

REAR BRAKE PADS SUBSTITUTION

Remove the safety retainer and unscrew the rear ring nut by turning it clockwise (see figure).

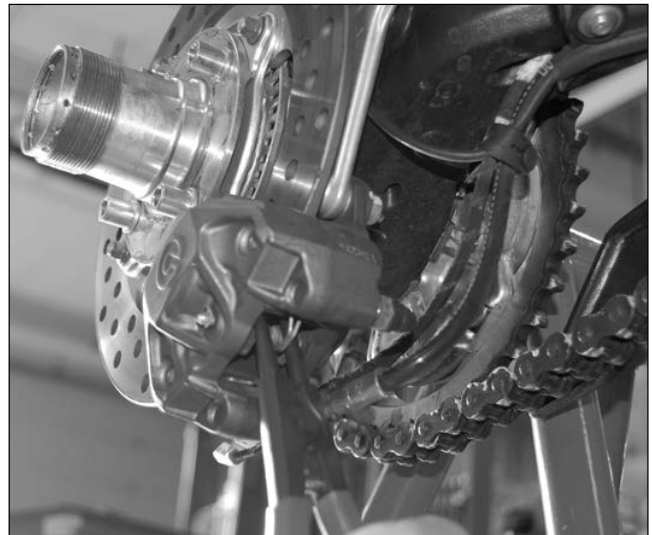
Remove the wheel.



Utilising circlip pincers as shown in the figure, widen the pads so that the pistons are pushed back into their seats.



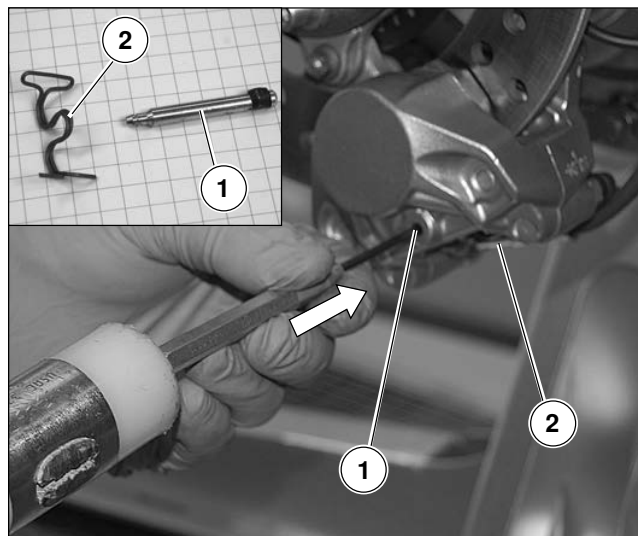
The outward movement of the brake pads provokes the retraction of the pistons in their relative seats, with a consequent increase in the level of the brake fluid in the brake fluid chamber.



Take the locking ring off, as shown in the figure.

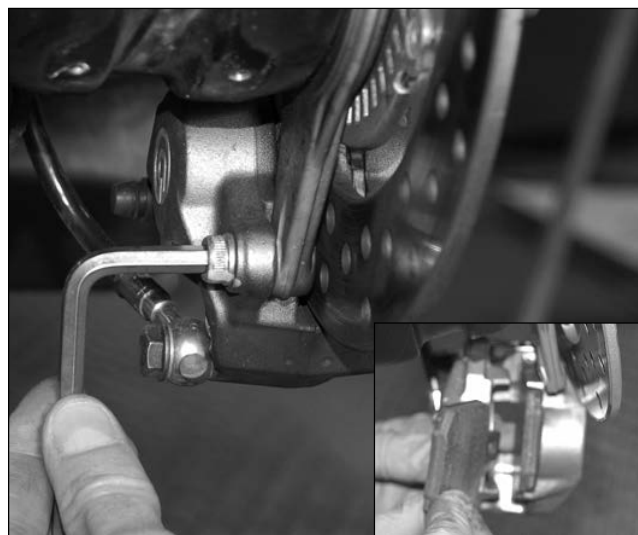


Slide the pad supporting pin (1) off with a screwdriver until it comes out from the opposite side, freeing up the circlip as well (2).



Remove the caliper from the support by removing the 2 fixing screws.

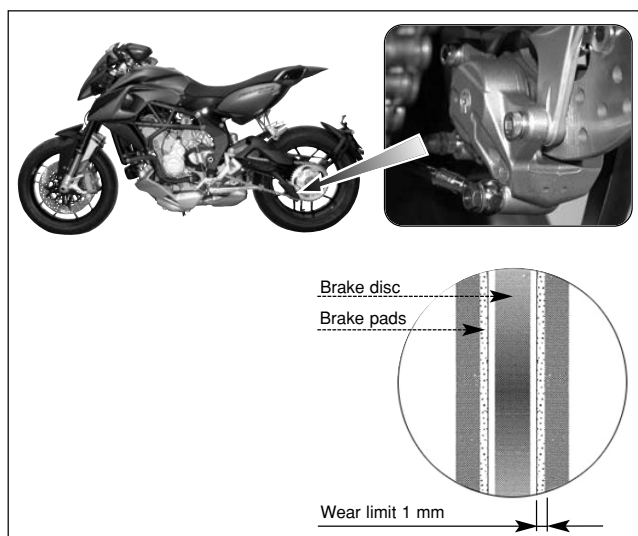
Remove the brake pads.



Carry out the check every 6000 kilometres.

Check the condition of the rear braking system and its components.

Proceed with re-assembly following the operations for disassembly in reverse order.

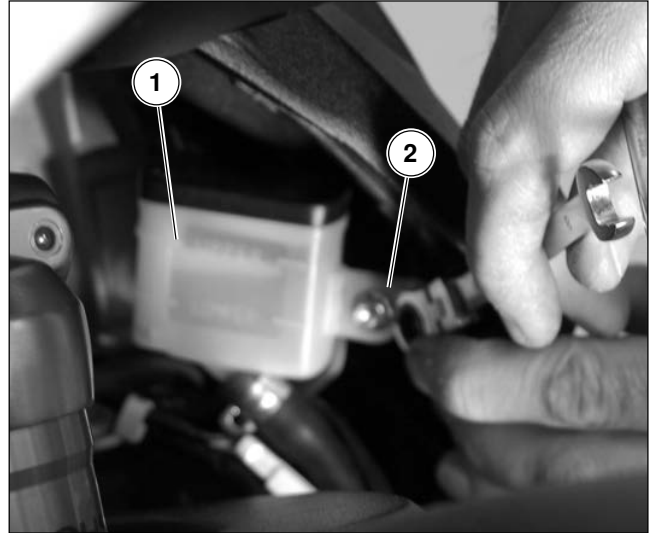


SUBSTITUTION AND BLEEDING OF THE REAR BRAKE FLUID



The operation described herewith must be carried out with the engine cold because of the nearness of the exhaust tubes that could cause grave burns.

To perform this operation, the tank must be removed (1) complete with support bracket (2) from the frame plate.

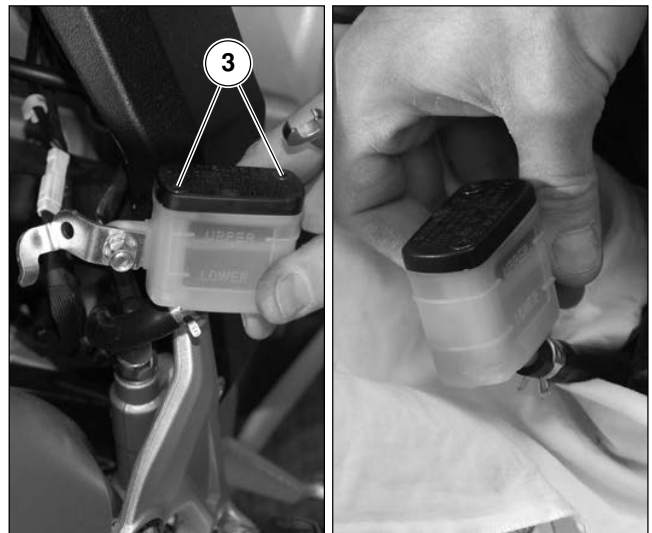


Remove the rubber band fastener..



Open the cover of the rear brake fluid reservoir by removing the two screws (3).

Position the tank using a clamp and a protective cloth, and fasten it to the plate of the frame.





Be careful to not spill the fluid from the reservoir during these operations. Brake fluid is extremely corrosive. Avoid contact with the eyes, skin and nose. Wash abundantly with water if contact is accidentally made and consult a doctor. During the successive operations, avoid spilling the fluid onto painted surfaces.

Fill the braking system by operating the rear brake lever.



Connect a rubber tube to the bleed valve, empty the system in an appropriate container by slackening the bleed valve as shown in the figure.



Be careful not to let the liquid fall below the minimum level before topping it up with new brake oil, to avoid getting air into the system.



H

Tighten the fitting as described above. Fill the rear brake fluid reservoir until the fluid reaches the maximum level.



Brake fluid: AGIP Brake 4



Utilise exclusively the prescribed brake fluid. Use only new brake fluid from sealed containers. NEVER utilise old or used brake fluid.

Carefully clean around the edge of the brake fluid tank using a clean cloth.



Before closing the fluid reservoir, check the condition of the components.
Carry out bleeding also on the front brakes (see the paragraph in this chapter).

During tank re-assembly apply the required torque pressure to the screw (1) that clamps the supporting bracket to the plate of the frame.

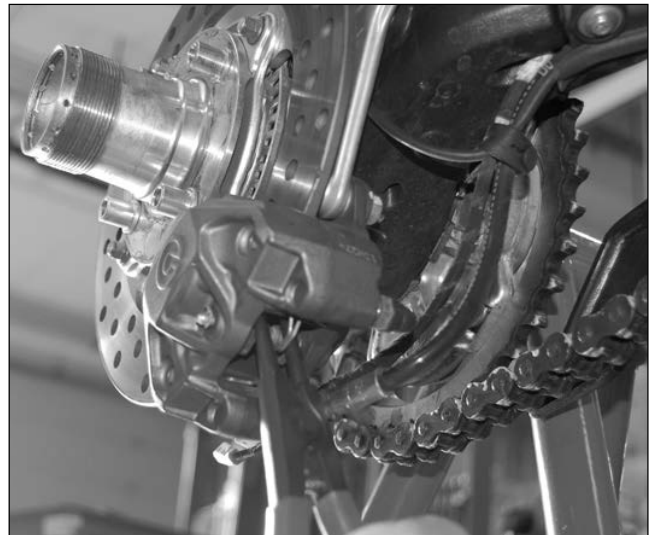


Torque pressure: $8 \div 10 \text{ N}\cdot\text{m}$



REAR BRAKE CALIPER SUBSTITUTION

To facilitate the operation, remove the brake pads as described previously.



Empty the rear brake system as previously described in the paragraph "Substitution and bleeding of the rear brake fluid".
Loosen the tubing by unscrewing the union indicated in the figure.

Pay attention to the fluid left in the caliper and the tube.



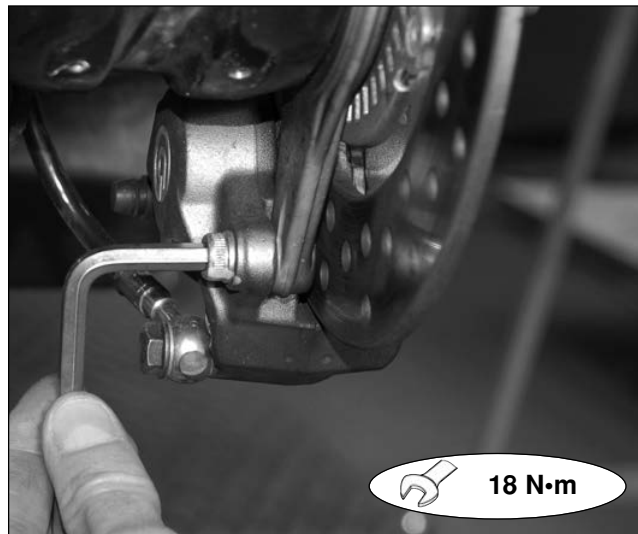
Remove the 2 screws indicated in the figure and take off the caliper.
Remove the fitting to disconnect the caliper.
For caliper reassembly, tighten the two screws to the prescribed torque pressure.



Recommended threadlocking product:
Loctite 243



Torque pressure: 18 N·m



Assemble the union tightening to the prescribed torque.

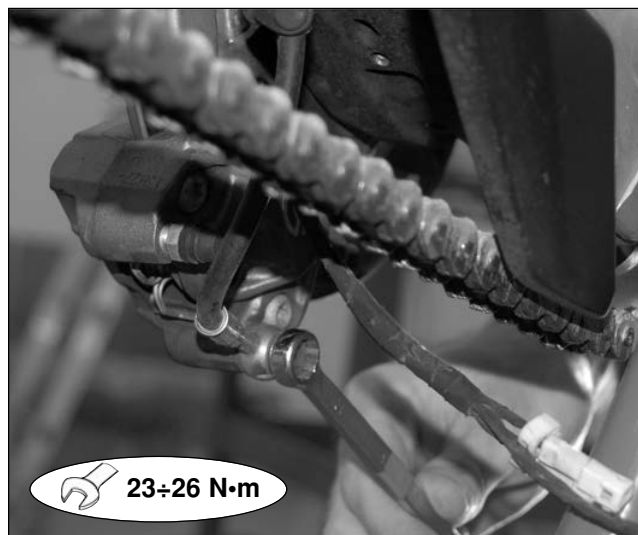


Torque pressure: 23 ÷ 26 N·m

NOTE Substitute the gaskets with new ones.

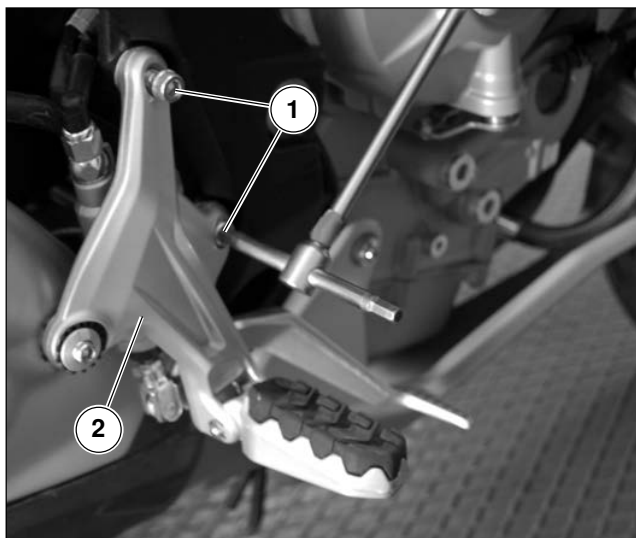
H

Proceed with the filling and bleeding of the rear brake system (see page 23).

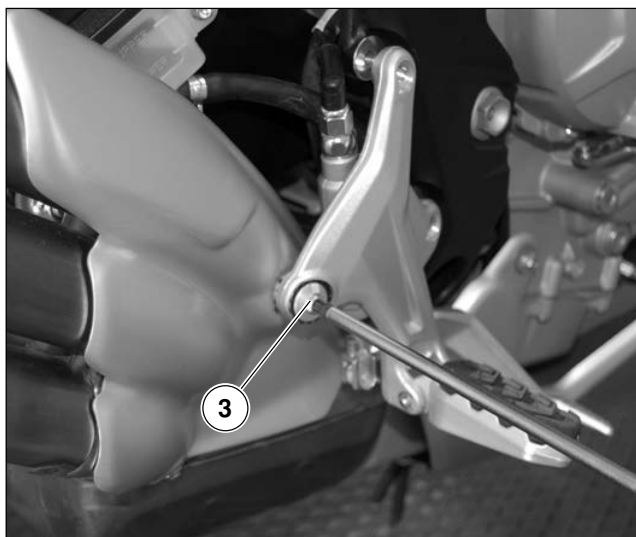


Rear brake pump removal

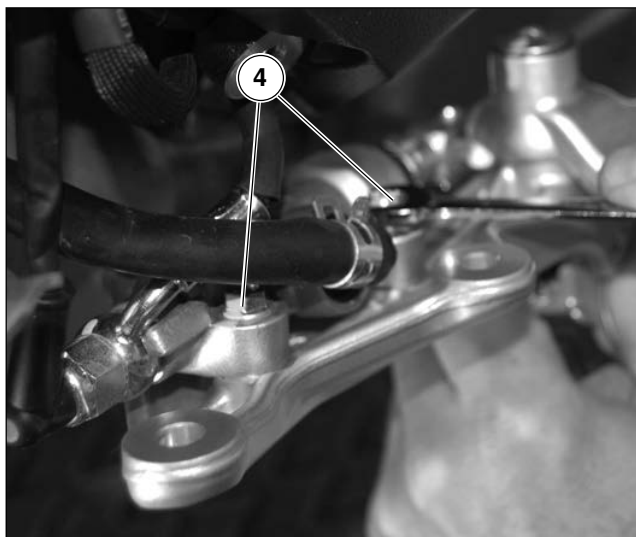
Loosen the two fixing screws (1) of the front right foot peg support (2).



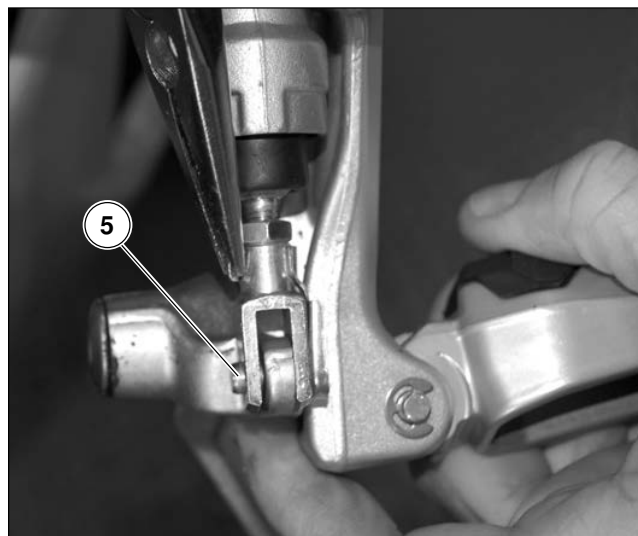
Loosen the exhaust foot peg support fixing screw (3).



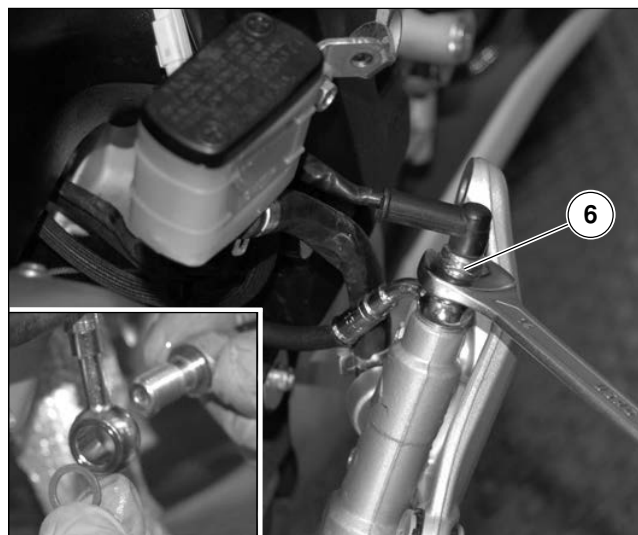
Loosen the two M6 screws (4) that hold the foot peg support fixed to the pump.



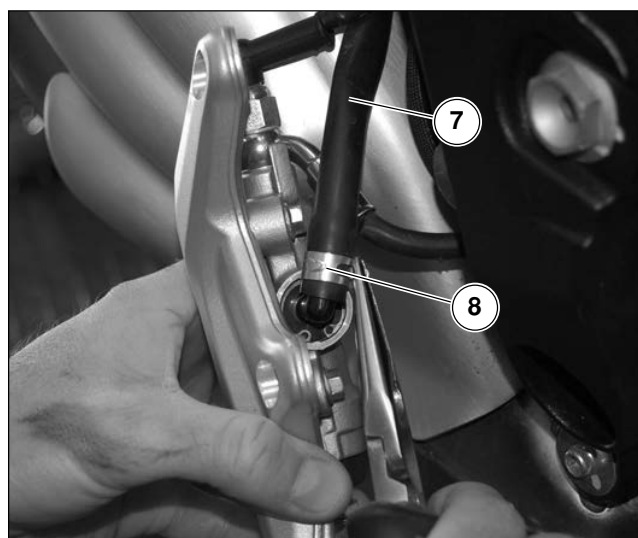
Disassemble the clips complete with pin (5).



Unscrew connection (6) as shown in the figure so as to disengage the pump from the brake line.



Loosen the retaining clamp (7) sliding it off the work zone upward and slip off the brake fluid hose (8).



After having carried out a check on all components and substituted those used, damaged or defective proceed with the assembly by following the procedure in reverse order of removal.

NOTE Substitute the gaskets of the pump/caliper hoses.

Tighten the fixings to the prescribed torque pressure.



Torque pressure pump union: 16÷18 N·m

Conclude the operations by filling the system with brake fluid and successively bleeding the system (see page 23).



REAR BRAKE DISC

Check the thickness of the rear brake disc. Substitute the disc if the measurements are less than the minimum value allowed. Effectuate the substitution as hereby described.

- Minimum thickness allowed: 4.7 mm



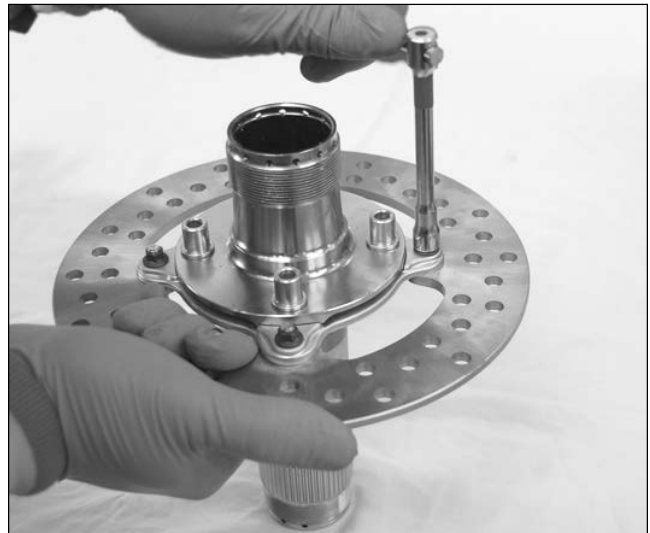
REAR BRAKE DISC REMOVAL

Before proceeding with the removal of the rear brake disc, it is necessary to carry out certain operations described below:

- Remove the rear wheel.
- Remove the rear wheel pin from the motorcycle (See chapter F).
- Remove the phonic wheel.



- Remove the four nuts fastening the disc to the flange.

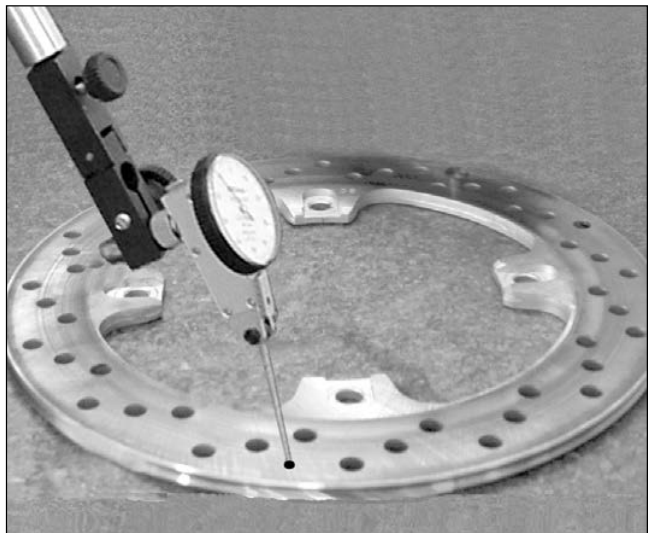


Check the planarity of the rear brake disc by utilising a micrometer gauge and placing the disc on a level work surface. Utilise the same procedure adopted for the front wheel discs.

The planarity value must not exceed 0.3 mm.



Utilise a micrometer gauge with support to carry out this check.



Check the thickness of the rear brake disc by utilising a micrometer gauge and measuring at least at three points with 120° between them.

The minimum thickness of the disc must not be less than 4.7 mm.



Utilise a micrometer gauge for this check.



Before fitting the rear brake disc, check the condition of the four pins.

Replace the four special nuts with new ones.

Proceed with tightening of the nuts.



Turn in the nuts until they make contact, then tighten them in a crosswise pattern.



Recommended threadlocking product: Loctite 270



Torque pressure: 18÷20 N·m.

Conclude the reassembly operations of the various components by following the procedures previously described in the chapter.



H

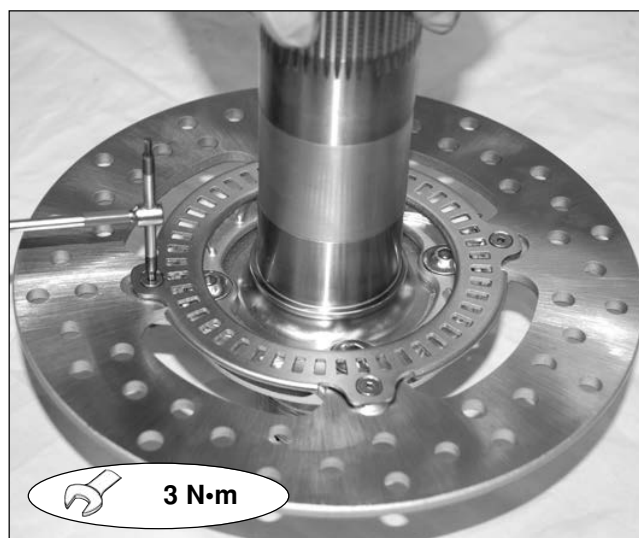
Use the following tightening torque to reassemble the phonic wheel:



Recommended threadlocking product: Loctite 243



Torque pressure: 3 N·m



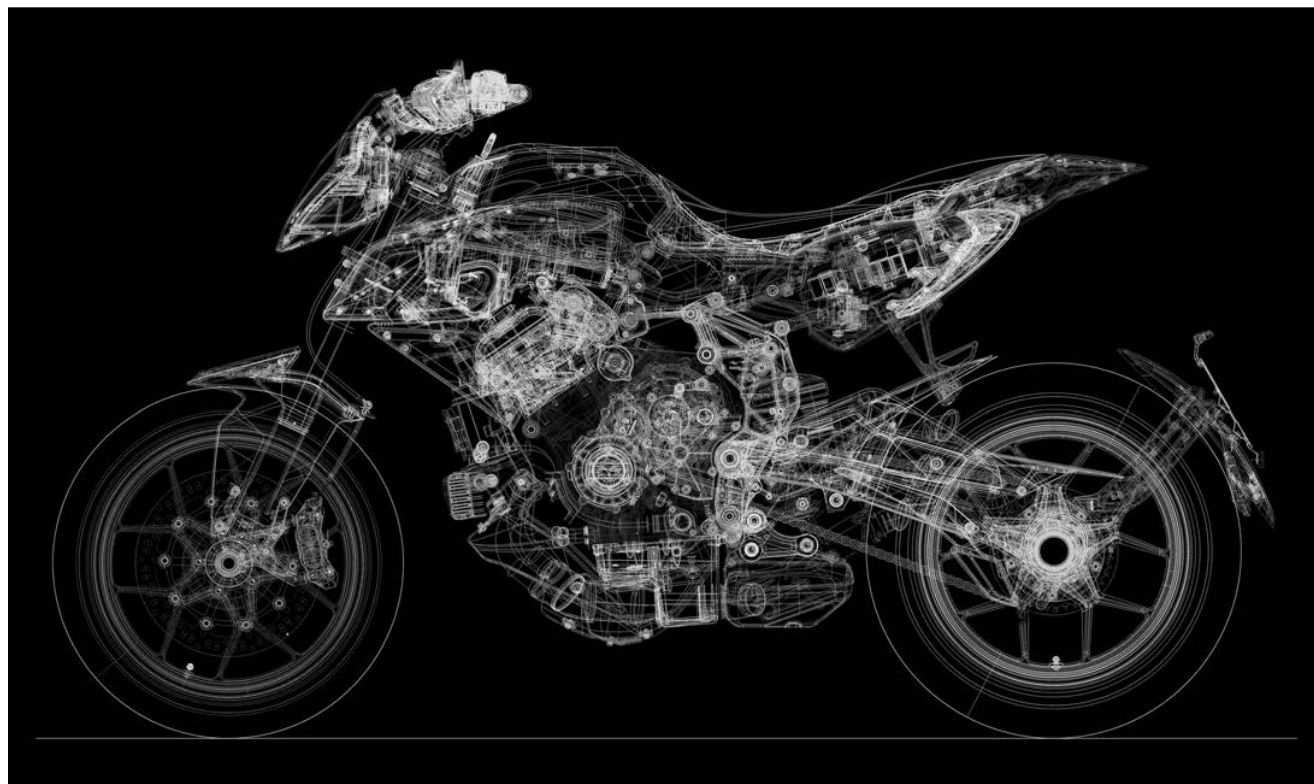


Brakes

H



Cooling system



L

SECTION L

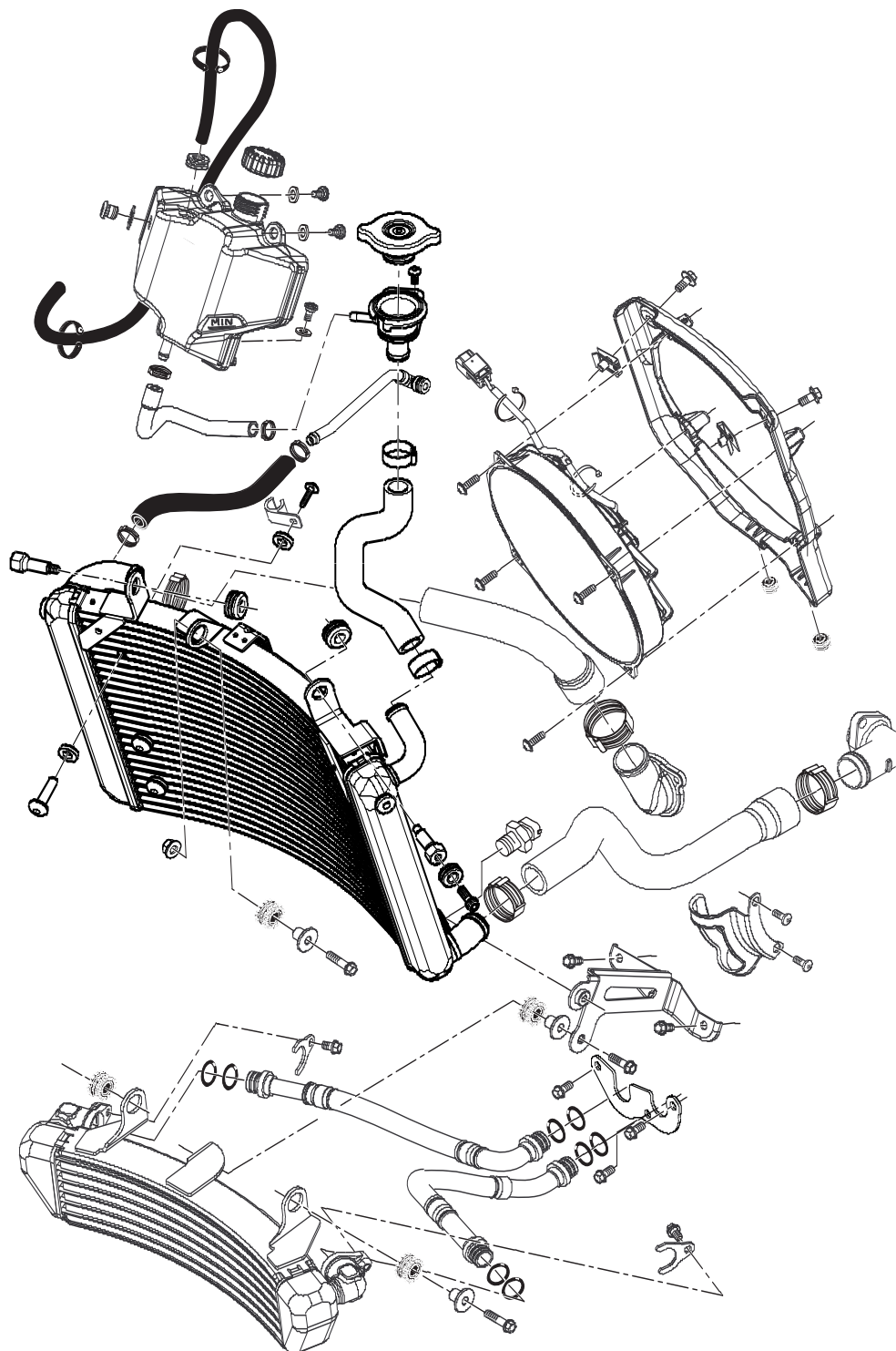
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SUMMARY

COMPLETE COOLING SYSTEM ASSEMBLY	PAGE 3
COOLING SYSTEM LEAKAGE CHECK	PAGE 4
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REMOVING EXPANSION TANK	PAGE 7
WATER RADIATOR DISASSEMBLY	PAGE 9
WATER RADIATOR COMPONENT DISASSEMBLY	PAGE 15
WATER RADIATOR GROUP ASSEMBLY	PAGE 20
THERMOSTATIC VALVE REMOVAL	PAGE 22
THERMOSTATIC VALVE ASSEMBLY	PAGE 24
WATER RADIATOR VEHICLE UNIT ASSEMBLY	PAGE 25
OIL RADIATOR DISASSEMBLY	PAGE 26
OIL RADIATOR COMPONENT DISASSEMBLY	PAGE 29
OIL RADIATOR ASSEMBLY	PAGE 30
FILLING THE COOLING SYSTEM	PAGE 35
MOTOR OIL SYSTEM FILLING	PAGE 37
SYSTEM FUNCTION VERIFICATION	PAGE 38

COMPLETE COOLING SYSTEM ASSEMBLY



Before proceeding with the disposal or overhaul of any component relative to the cooling system, carry out certain preliminary operations:

- 1) Let the engine cool down.
- 2) Remove the side fairings, the underfairing, the fairings push rod, the headlight fairing, the suction duct covers and suction ducts as described in the chapter "Superstructures."

COOLING SYSTEM LEAKAGE CHECK

Before removing the radiator and discharging the engine coolant, check that the cooling system does not have leakages.

Remove the fuel tank, the airbox, the seat and the underseat panels (see chap. C "Upper structures").

Remove the water radiator cap and connect the tester (of the type shown in the diagram) to the filler hole.

 **Do not open the radiator cap whilst the engine is hot.**

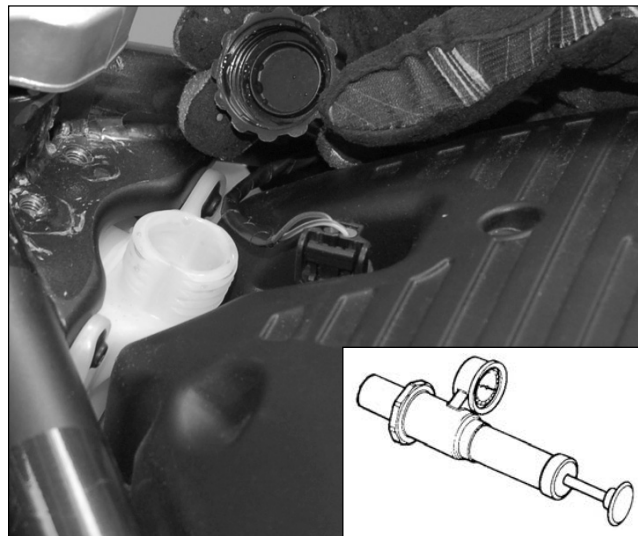
Apply a pressure of approximately 120 kPa (1.2 kg/cm²) and check that the system maintains the pressure for at least 10 seconds.

If the pressure diminishes within ten seconds means that there is a leak in the system.

If so, check the entire system and substitute the defective/damaged parts.

 **When removing the tester from the filler hole, wrap a cloth around the filler hole to avoid spurts of engine coolant.**

 **Do not exceed the recommended pressure to avoid damaging the radiator.**



CHECKING EXPANSION TANK CAP

Check the perfect conditions of the rubber sealing gasket of the expansion tank cap. Should it be damaged, replace it with a newly supplied one.



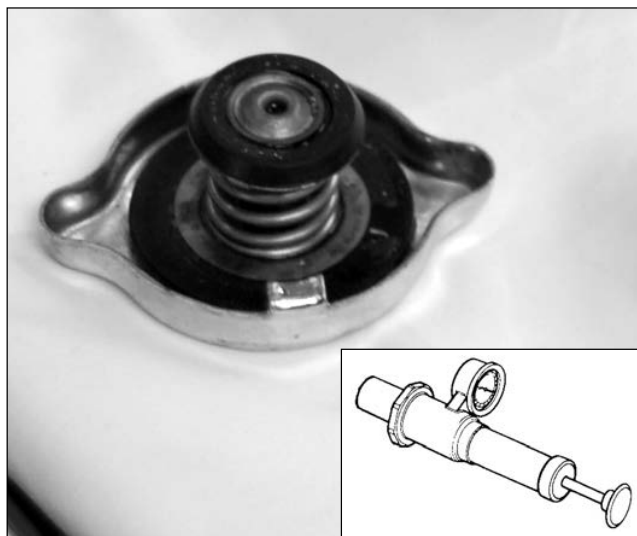
WATER RADIATOR CAP CHECK

Check the release pressure of the radiator cap by utilising the appropriate tester as follows:

Apply the cap to the tester as indicated and slowly create a pressure by activating the tester.

Make sure that the increase in pressure is interrupted at 110 ± 15 kPa (1.1 ± 0.15 kg/cm²) and check that with the tester held steady, the pressure is maintained for at least ten seconds. Substitute the cap if the pressure is not maintained for ten seconds.

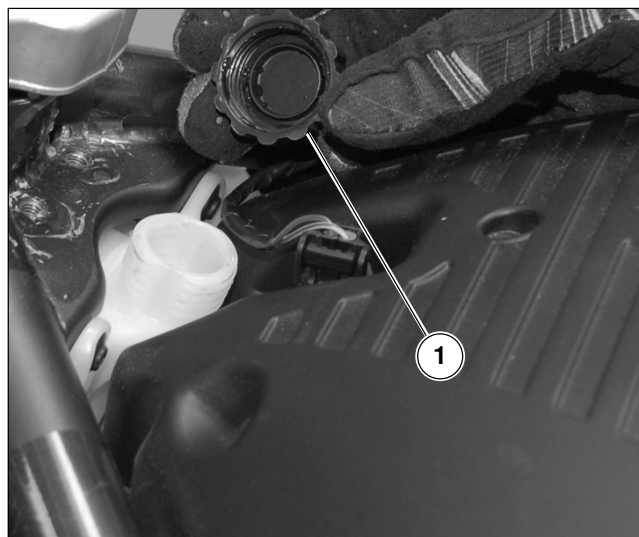
Radiator cap release pressure: 110 ± 15 kPa (1.1 ± 0.15 kg/cm²).



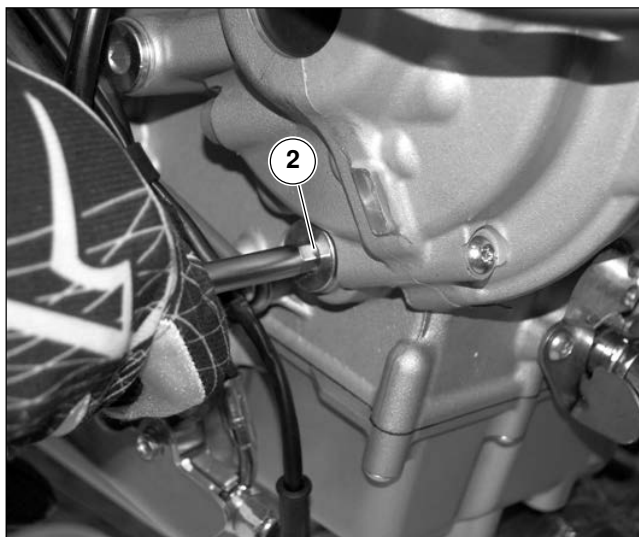
DRAINING THE COOLANT

Remove the expansion tank cap (1).

To empty fluid from the cooling system, proceed as follows:



- Place a collection container underneath the engine;
- Remove the fluid drain screw (2) on the bottom right-hand side of the engine and the washer;





Cooling system

- Tilting the motorcycle $\sim 30^\circ$ on its right side, let the liquid flow out paying attention to where it pours;



- Using a funnel and tilting the motorcycle further, have all the coolant empty into the collection container;



- To make sure coolant has completely emptied, remove the radiator plug.

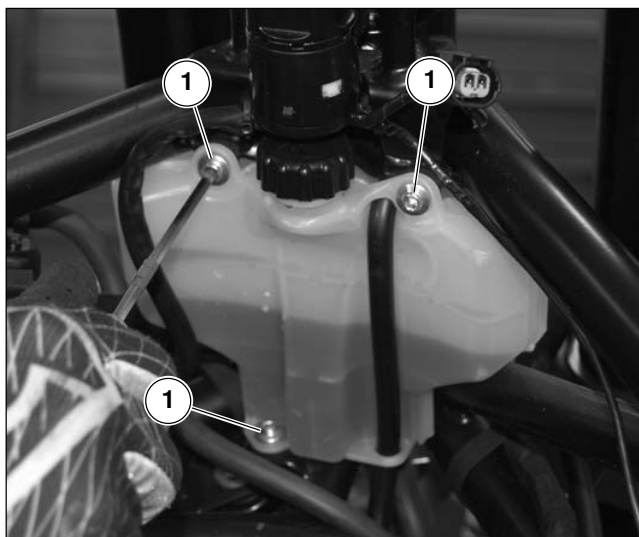


REMOVING EXPANSION TANK

After having emptied the cooling system, as described in the previous paragraph, in order to remove the expansion tank you must first remove the seat, the tank panels, the fuel tank, the right and left intake ducts, the air filter, the airbox and the radiator panels (right and left) as described in Chapter C "Upper structures".



Remove the three screws (1) fixing the expansion tank to the frame.



Release the expansion tank from the frame.





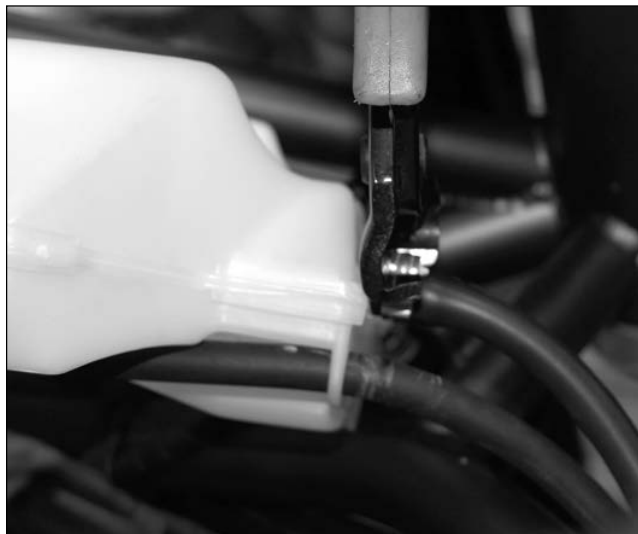
Cooling system

Operating on the right side of the vehicle, remove the CLIC R 66-100 clamp connecting the water radiator vent hose to the expansion tank using the special pliers CLIC R 205.

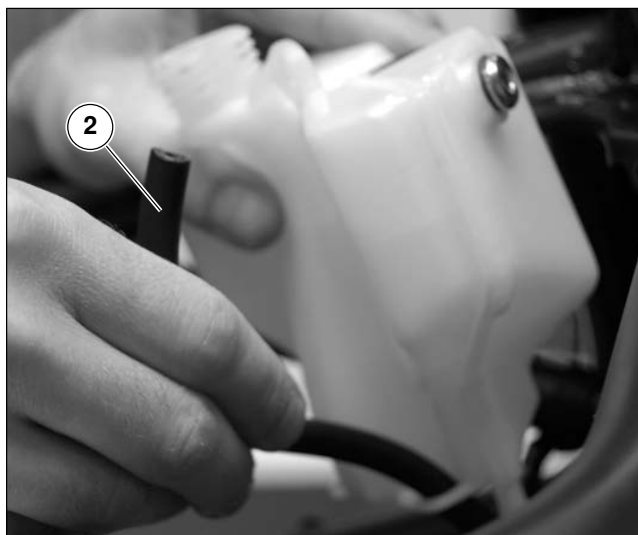


Special CLIC R 205 pliers tool.

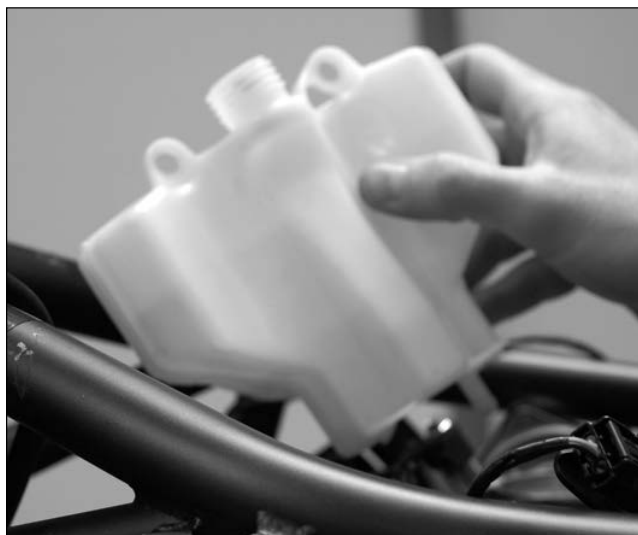
NOTE When performing reassembly, check the conditions of the clamp and replace it if it shows evident damage.



Disconnect the overflow pipe (2) from the expansion tank. Check both hoses which were just removed, making sure they have no cuts or bends which obstruct passage; replace them if necessary.



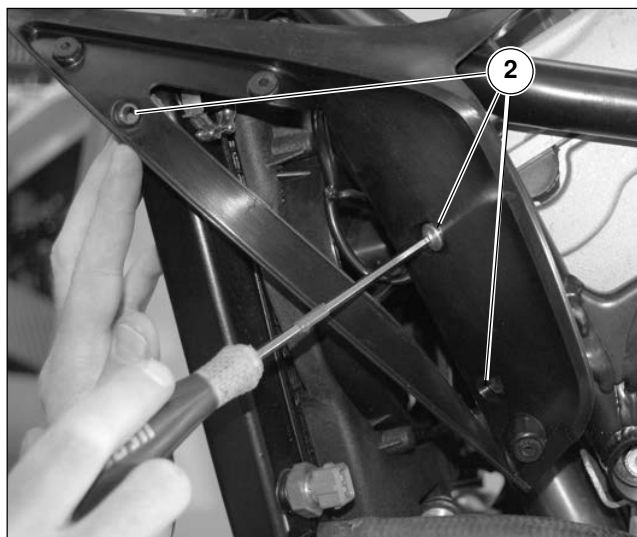
Remove the expansion tank from the vehicle.



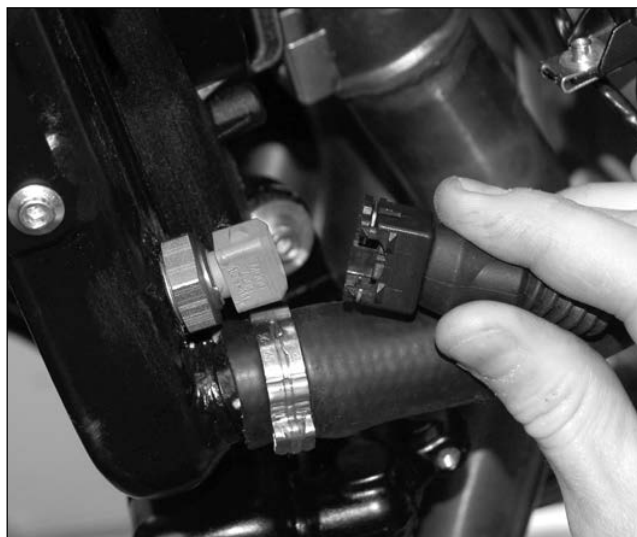
WATER RADIATOR DISASSEMBLY

After having emptied the cooling system, proceed as follows to remove the radiator:

- 1) Remove the right and left radiator side panels, removing the three M4 screws (1) and the three M5 screws (2) with collar.



- 2) Disconnect the water temperature sensor.





Cooling system

3) Disconnect the radiator fan connector.



4) Operating on the left side of the vehicle, remove the sleeve clamp of the hose from the radiator to the pump using the special pliers CLIC R 205.



Special CLIC R 205 pliers tool.



5) Slip the hose from the sleeve leaving a collection container underneath the vehicle to recover any liquid left in the hose.



6) Operating on the right side of the vehicle, disconnect the sleeve clamp of the hose from the radiator to the head using the special pliers CLIC R 205 and pull the hose off.



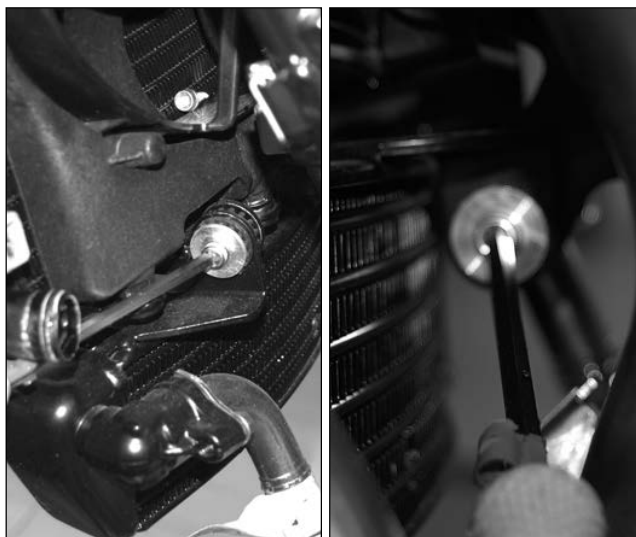
Special CLIC R 205 pliers tool.



Successively, disconnect the vent pipe band fastener (radiator side).



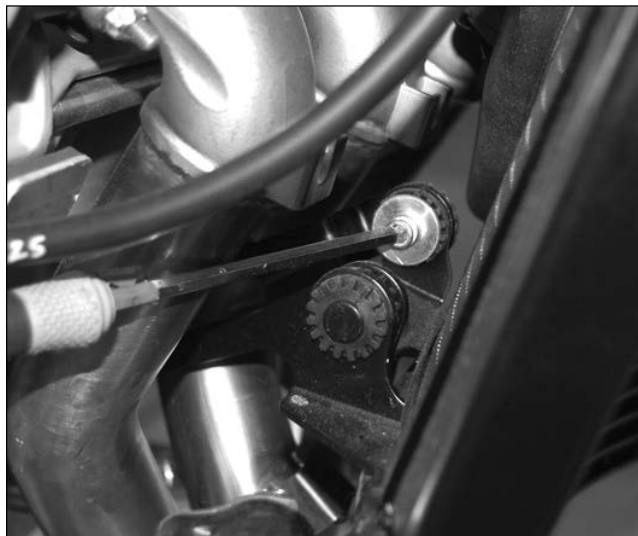
7) Remove the three screws fixing the water radiator to the oil radiator. Two screws located on the left side of the motorcycle.





Cooling system

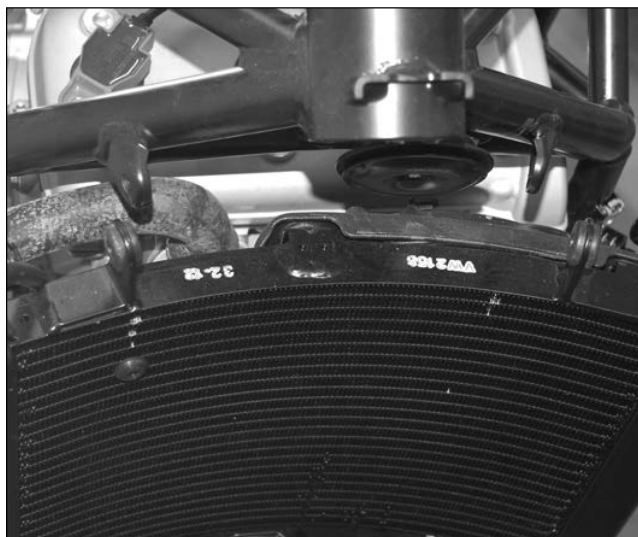
One screw is placed on the right side of the vehicle.



- 8) Release the water radiator from the frame by removing the two special screws positioned on the left and right side of the vehicle.



- 9) At this point, the water radiator is disengaged from the frame.



- 10) Release the clutch hose from the clip on the water radiator.



- 11) Disengage the water radiator from the oil radiator, releasing it from the seat of the pin located on the oil radiator, pushing the water radiator from right to left.



- 12) Remove the water radiator from the vehicle, pulling it out from the right part.





Cooling system

- 13) The vehicle remains in the conditions shown in the figure to the side with the oil radiator suspended on the engine pipes.

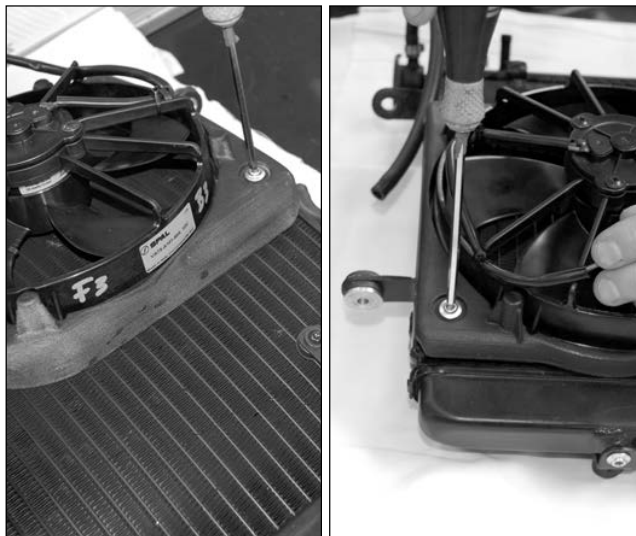


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DISASSEMBLY OF THE WATER RADIATOR PARTS

Disassembly of the electric fan

Remove the 2 screws that clamp the conveyor to the radiator.



Lift the conveyor and slide it from the retaining pins.



Turn the conveyor by 180° and unscrew the 4 screws that clamp the fan to the conveyor.





Cooling system

Remove the fan.



Disassembly of the radiator clamping elements



Slide off the 2 threaded circlips.



Pull the spacer from the lower support bracket.



Remove the silent block from the lower fixing bracket.



Remove the 2 silent blocks from the fan conveyor bracket.





Cooling system

Slide the spacer off of the top left supporting bracket.



Slide the anti-vibration elements off of the 2 top supporting brackets.



Disassembly of the liquid temperature sensor

Whenever it is necessary to check whether the liquid temperature sensor is operating efficiently proceed as described below.





Cooling system

Remove the coolant liquid temperature sensor.



Check

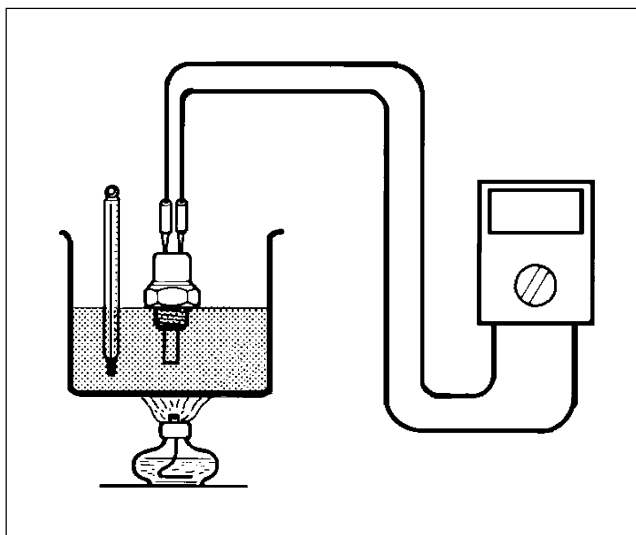
Check that the resistance of the coolant liquid temperature sensor varies with the temperature, as specified. Carry out the control in accordance with the instructions below:

connect the coolant liquid temperature sensor to an ohmmeter and immerse it in the oil contained in a heated recipient;

heat the oil so as to slowly increase the temperature and observe the readings provided by the thermometer and ohmmeter. If the resistance of the coolant liquid temperature sensor does not change as indicated in the table, the sensor must be replaced.



Special tool 09900-25008: Multitester



Temperature	Resistance standard
20 °C	About 3,747 Kohm
50 °C	About 1,150 Kohm
80 °C	About 0,377 Kohm
110 °C	About 0,153 Kohm
125 °C	About 0,102 Kohm

If the resistance is infinite or nevertheless differs considerably from the indicated value, the coolant liquid temperature sensor must be replaced.



Cooling system

Assembly of the liquid temperature sensor

Before assembly apply the stated type of threadlocker fluid to the threaded section of the sensor.



Types of applicable threadlocker: Loctite 577

Tighten the coolant liquid temperature sensor to the specified torque pressure.



Torque pressure for the coolant temperature sensor: 18 N·m



Be very careful when inserting the coolant liquid temperature sensor. It can be damaged if subject to impact.

Make sure that once it has been tightened the container is set up along a horizontal axis, with the rear stud set up in the vertical or horizontal position closest to the torque condition.



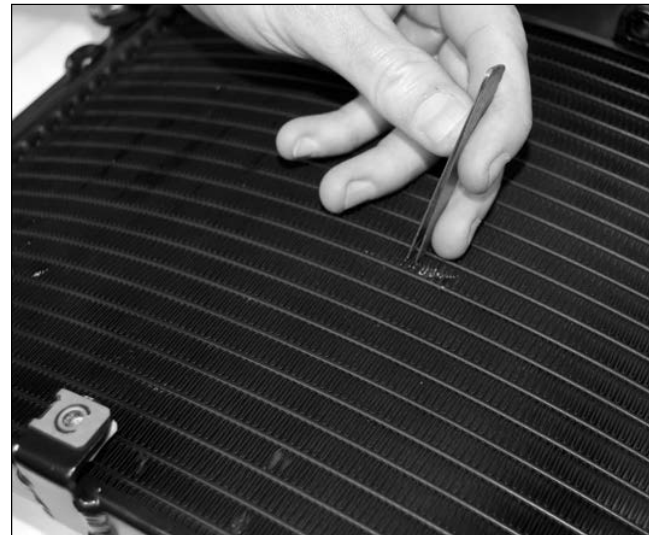
WATER RADIATOR GROUP ASSEMBLY

Before reassembling, check the correct rotation of the fan, the condition of all components and all connections.

Radiator check and clean

The dirt and extraneous material embedded in the radiators must be removed.

It is recommended to use compressed air for the cleaning of the radiator.



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Bent fins can be straightened by utilising a small screwdriver.

Cooling fan motor check

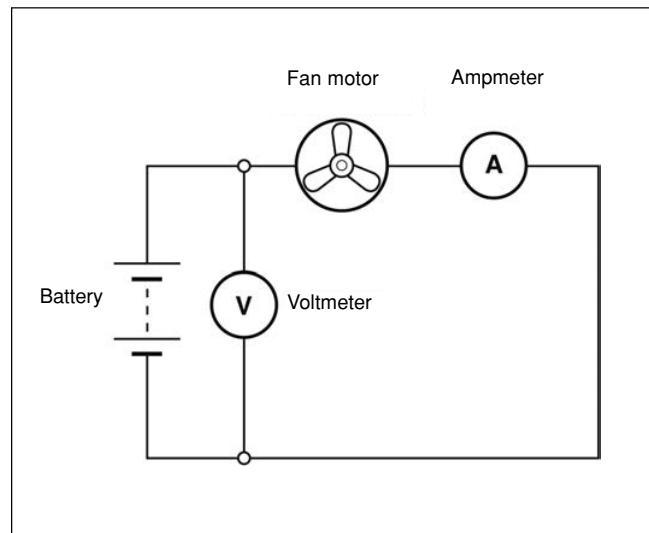
To make sure that the electric fan motor is operating efficiently, it must be connected as shown in the figure, through a voltmeter and ammeter.

The motor must be powered for the test.

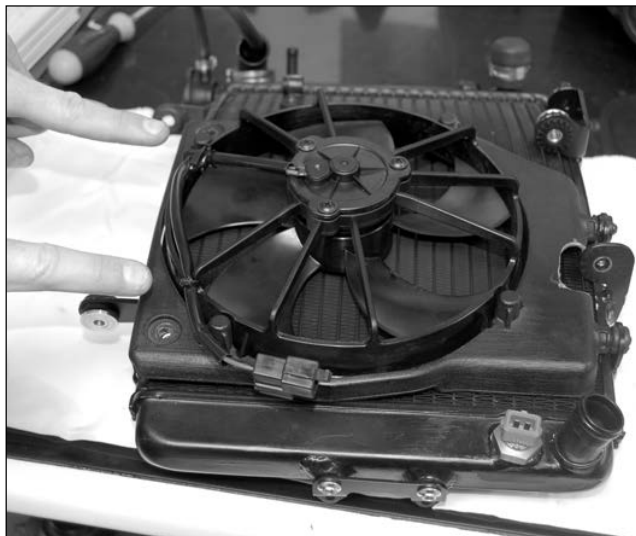
This test can be carried out on a work surface (connecting a 12V–9Ah battery) or on board the motorcycle. The voltmeter is to check that the battery feeds the motor at 12V. When the fan turns at maximum speed the ammeter should indicate not more than $7 \div 8$ ampere.

If the motor does not turn, substitute the fan motor with a new one.

NOTE To carry out the above-indicated test it is not necessary to remove the fan motors from the vehicle.



Position the complete electric fan on the radiator. Position the electric fan wiring as indicated in the figure, verifying the correct positioning of the anchoring clamps.



Tighten the 2 screws to the prescribed tightening torque.



Torque pressure: 5 ÷ 6 N·m

Replace the previously removed components following the disassembly procedures inversely.

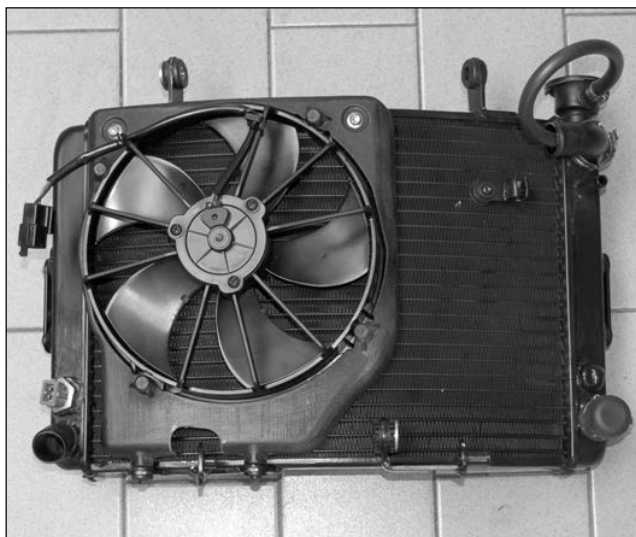


 **5÷6 N·m**

The assembly of the new radiator group has been completed.

At the end of the assembly operation, the radiator group should look like the group indicated in the figure.

The radiator group can be mounted onto the motorcycle.





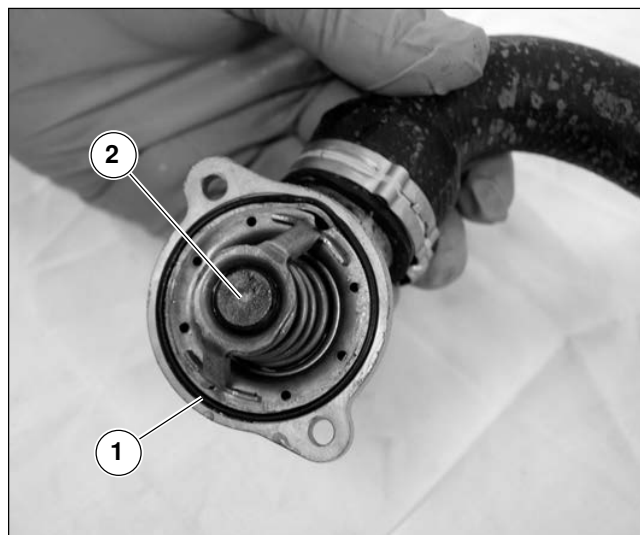
Cooling system

THERMOSTAT REMOVAL

Remove the 2 fixing screws of the thermostat cover.



Remove the cover of the thermostat (1).
Remove the thermostat (2).





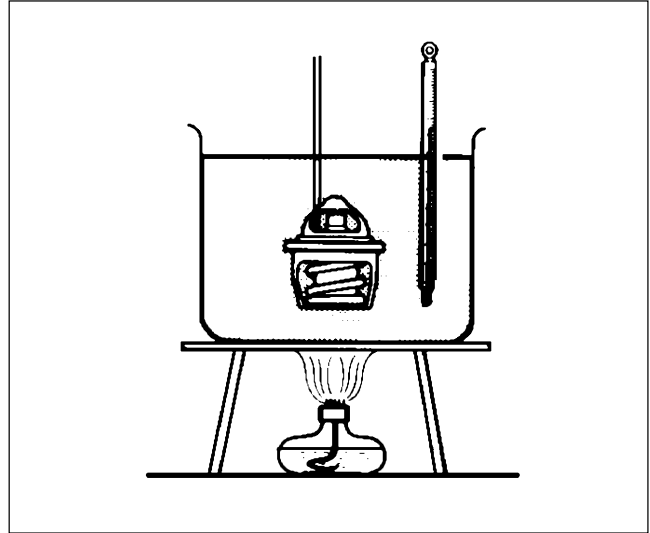
Cooling system

Check

Check to see if the thermostat pad is damaged.

Check the functioning of the thermostat as follows:

- Suspend the thermostat by a piece of string threaded through the flange as indicated in the figure.
- Immerse the thermostat in water contained in a laboratory glass as indicated in the figure. Ensure that the thermostat is maintained in suspension. Heat the water with a heat source and observe the increase in temperature of the thermometer.
- Observe the temperature at the moment of opening of the thermostat. The temperature at which the thermostat commences to open should be between the indicated values.



Standard

Thermostat opening temperature:
60°C

- Continue to heat the water to increase the temperature.
- When the temperature of the water reaches the specified value, the thermostat should be raised up by at least 7 mm.

Standard

Raising up of the thermostat:
More than 7.0 mm at 90°C.

- If the thermostat does not satisfy only one of the requisites (opening temperature and raising up of the thermostat), it must be substituted.

THERMOSTAT ASSEMBLY

Insert the O-ring (1) in its appropriate seat on the cover of the thermostat.
Check the condition of the O-ring previously utilised.

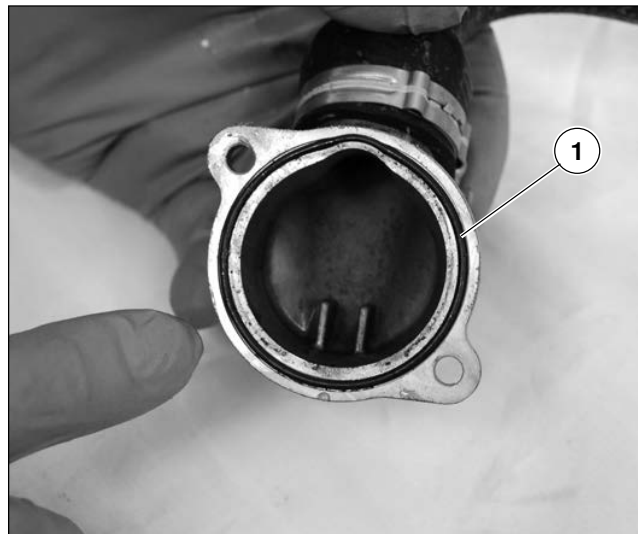


If the O-ring is not in good condition, substitute it with a new one.

Apply a thin layer of silicone grease.



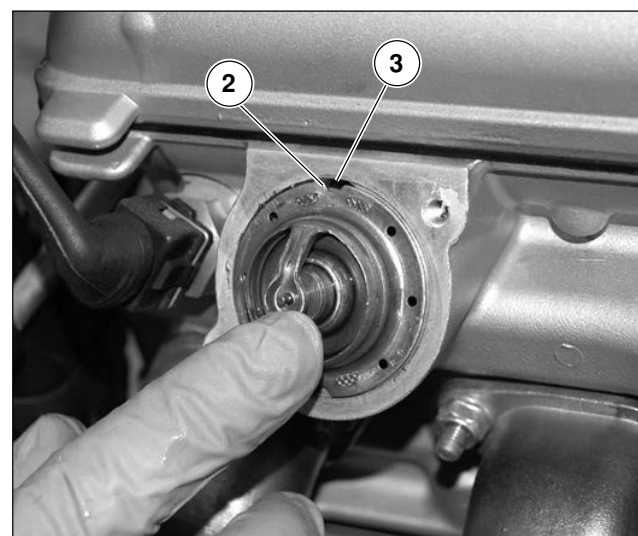
Recommended grease: Silicone Grease.



Apply grease on the outer flange of the thermostatic valve on the inlet side of the engine.



Insert the thermostatic valve in its housing on the engine.
During thermostatic valve assembly, ensure that the notch (2) present on the outer flange of the valve is positioned near the machining (3) on the engine.





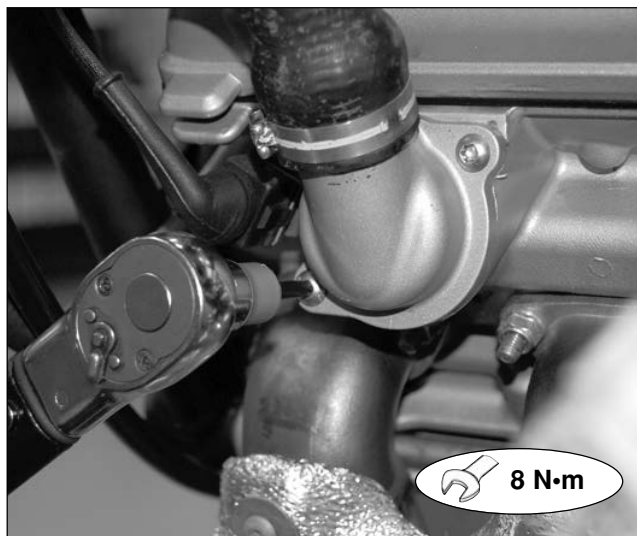
Cooling system

Insert the thermostat cover on the engine.

Tighten the 2 fixing screws to the prescribed torque pressure.

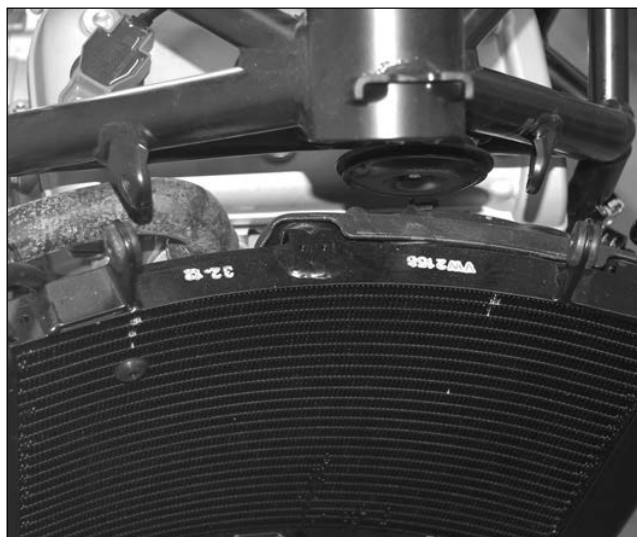


Torque pressure: 8 N·m



WATER RADIATOR VEHICLE UNIT ASSEMBLY

Reassemble the radiator unit in the opposite order of disassembly.



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Cooling system

OIL RADIATOR DISASSEMBLY

To disassemble the oil radiator together with the hoses, the water radiator must be disassembled as well.

To avoid oil leakage during disassembly, lift the motorcycle with specific tools.



Specific tool front stand: 800095807



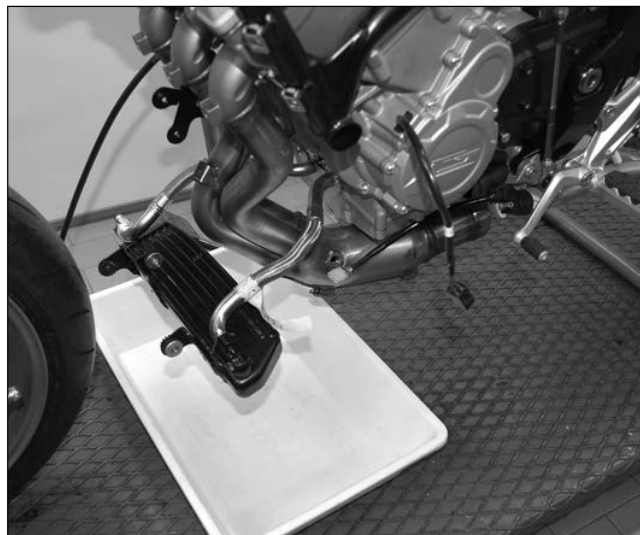
Specific tool pin: 8000B7340



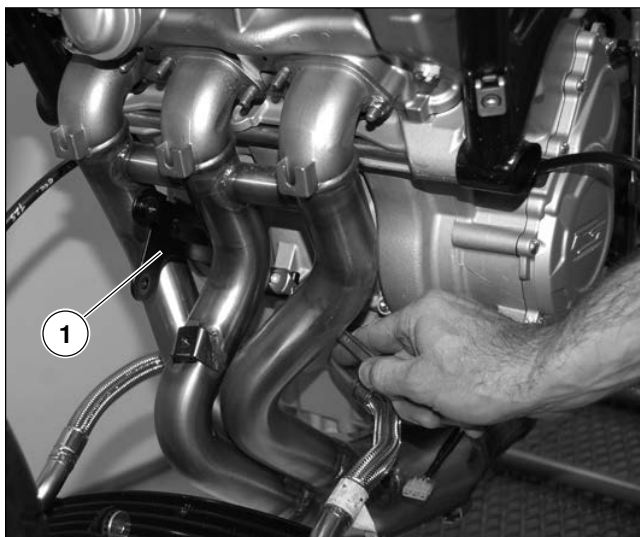
Specific tool rear stand : 8000B9312



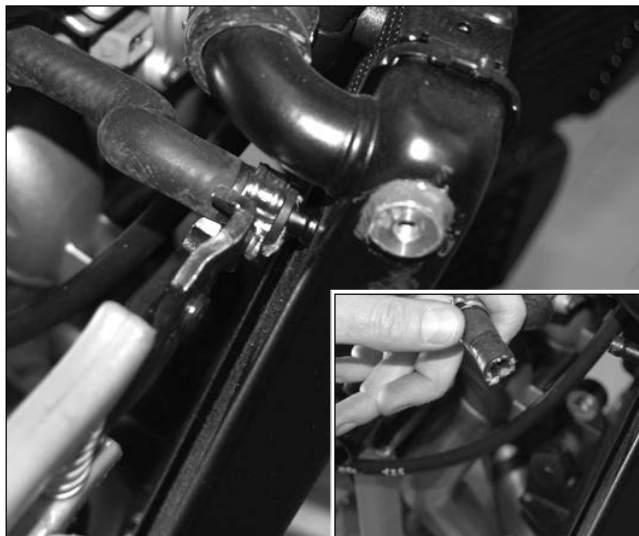
Position an oil collecting basin under the pipes.



Unscrew the two screws and remove the oil radiator plate (1) from the engine block.



Successively, disconnect the vent pipe band fastener (radiator side).



Remove the three fixing screws TORX TX 27 of the hose support plate and pull it downwards.



Pull off the connection pipes from the engine block one at a time and let leftover oil empty into the tray.





Cooling system

Remove the oil radiator.



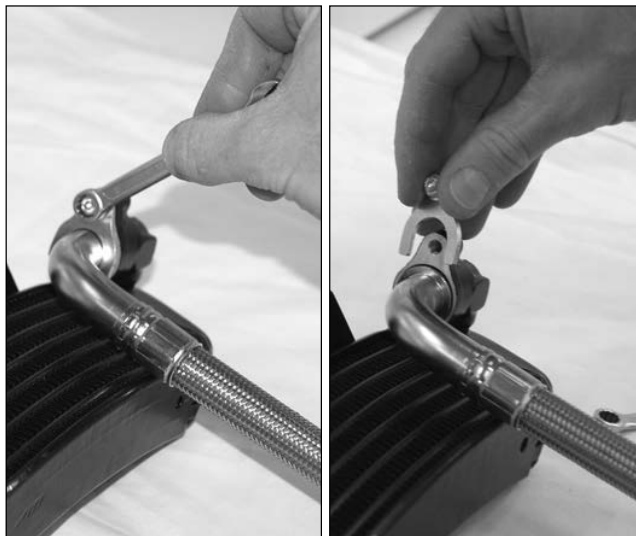
Check the integrity of the component and if needed straighten the bent fins using a screwdriver or tweezer.



OIL RADIATOR COMPONENT DISASSEMBLY

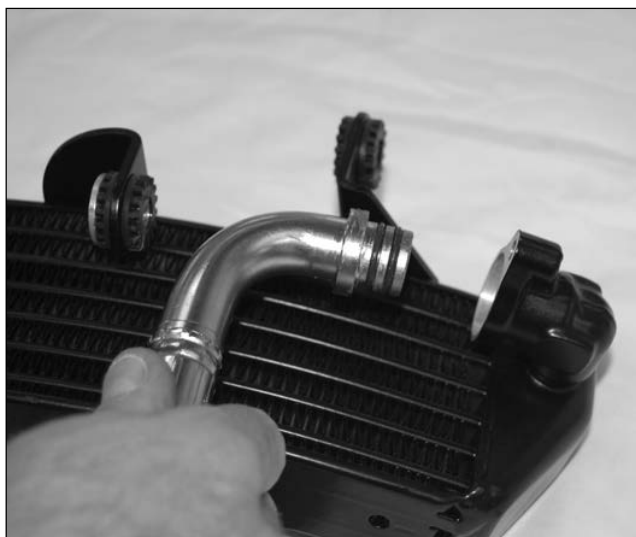
Removing the connecting pipes

Take the retaining screw off of the plate.



Slide the pipe out, making sure not to ruin the O-Rings.

Do the same with the other one.



Removal of spacers and silent blocks

Pull the two spacers from the upper support brackets anchoring the water radiator.





Cooling system

Slip the three silent blocks from the three upper support brackets.



OIL RADIATOR ASSEMBLY

Before reassembly, check the integrity of the oil tubes and replace if necessary.
Change the sealing rings for the oil pipe fittings every time they are disassembled.

Grease O-rings with silicone grease.



Proceed to re-assemble the previously removed parts following the disassembly instructions described below, being careful not to put the pipes in backwards, confusing right with left and one end with the other.
To facilitate re-assembly, it is recommended to identify the two pipes on disassembly.



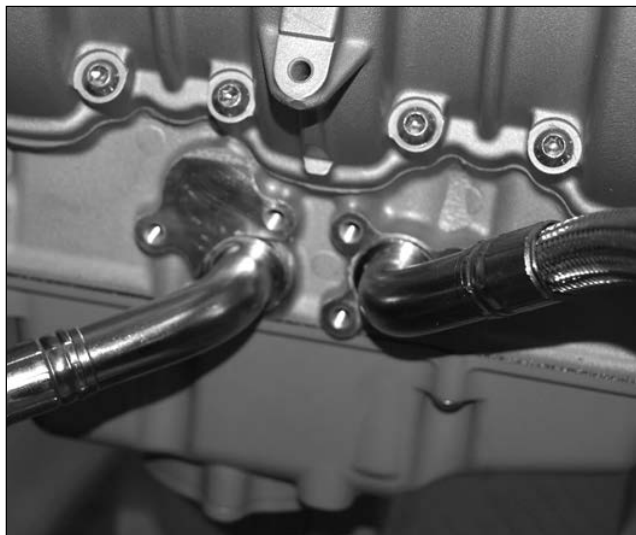


Cooling system

Insert the fixing screws of the supply and return radiator hose retaining plate but do not tighten them.



Insert the supply and return pipes in their housing on the motor block.



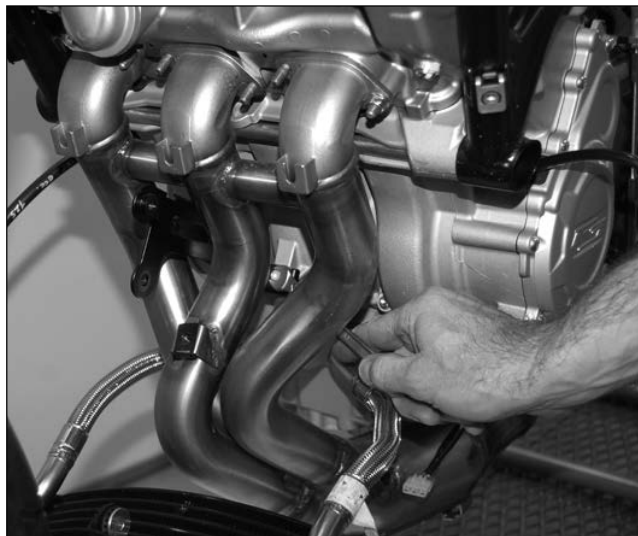
Position the hose support plate and insert the three fixing screws without tightening them.





Cooling system

Put the oil support plate back in place inserting the two screws without tightening them.

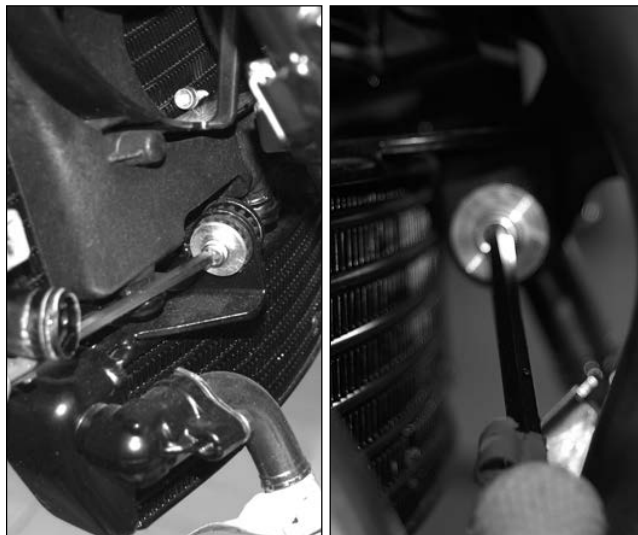


Before tightening the entire unit, wait for the oil radiator to be mounted on the water radiator in order to provide the right orientation at the oil tubes.

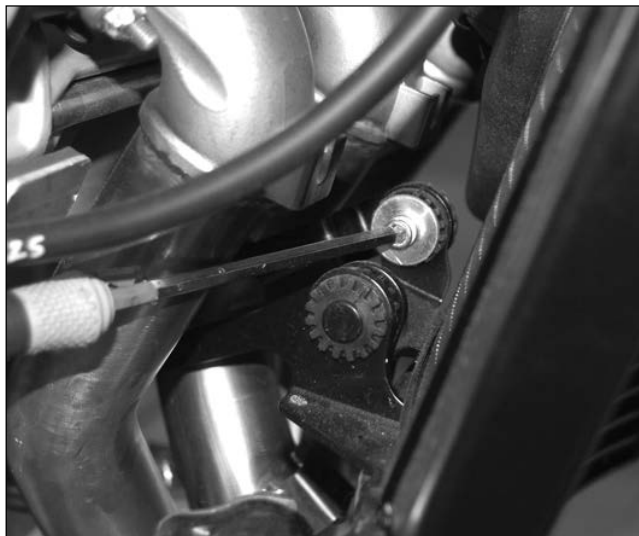


If the hoses are not deformed in this position, tighten the screws in the following order:

- tighten the three screws fixing the water radiator to the oil radiator. Two screws are located on the left side of the motorcycle;



One screw is placed on the right side of the vehicle;



-tighten the three fixing screws of the hose support plate;



-tighten the two screws fixing the supply and return pipe retaining plate to the oil radiator;





Cooling system

- tighten the two screws fixing the radiator support plate to the engine;



When you have finished tightening the unit, make sure the hoses respect the orientation shown in the figure.



ATTENTION: The oil hoses must be the right distance from the drain pipes to keep oil from overheating.



WARNING: Do not turn the pipes once the screws have been tightened.



NOTE The radiators that have just been assembled must include the items shown in the diagram on page 3 of this chapter. Carry out a final control before continuing with the following operations. If you need to code and define the quantity of items, consult the parts catalogue.





Cooling system

FILLING THE COOLING SYSTEM

Position the motorcycle on the side stand.

Fill the cooling system with the required liquid described in the table (see page B-8) up to the level of the radiator fill cap. Carry out the operation several times until the level of the liquid is stable.

NOTE If possible tilt the motorcycle to the right to take the radiator cap into the highest position to facilitate the escape of the air.

Close the cap and bring the motorcycle back to a vertical position on the central stand.

Fill the expansion tank up to the "MIN" level.



If filling must be performed on the motorcycle with the tank mounted, this operation is easier using a syringe through the side loading hole.

Turn the handlebar to the left to free the loading zone.

Remove the side loading screw-on cap.



Insert the hose connected to the syringe in the loading hole and load the required amount of coolant.



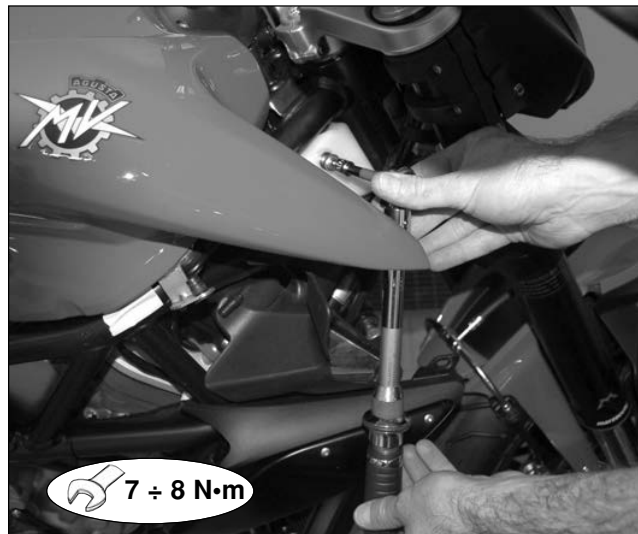


Cooling system

Close the loading hole with the screw-on cap and tighten it at the prescribed tightening torque.



Torque pressure: $7 \div 8 \text{ N}\cdot\text{m}$



Start the engine, keeping it running long enough to heat the fluid until the cooling fan begin operating, then turn the engine off. Repeat the operation at least once, then wait a few minutes for the engine to cool.

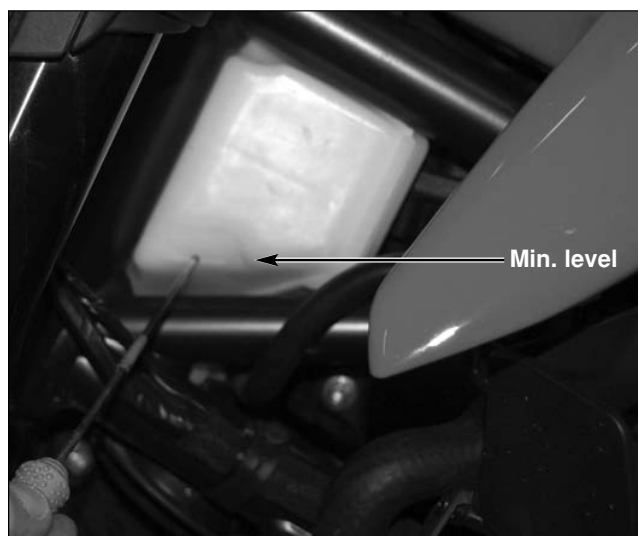


Check thoroughly for leaks, seepage, damaged pipes, etc in the cooling system. If necessary overhaul the system following the steps described in this chapter.



Check the coolant liquid level inside the expansion tank again. It must be above the "MIN" level marking on the expansion tank.

If the level is below the "MIN" mark, top it up by adding new liquid through the fill cap.





Cooling system

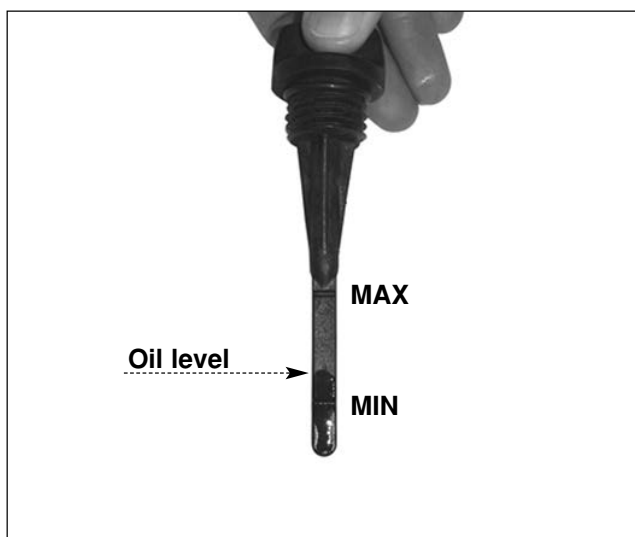
MOTOR OIL SYSTEM FILLING

Unscrew the oil fill cap.

Pour in the required quantity of oil.

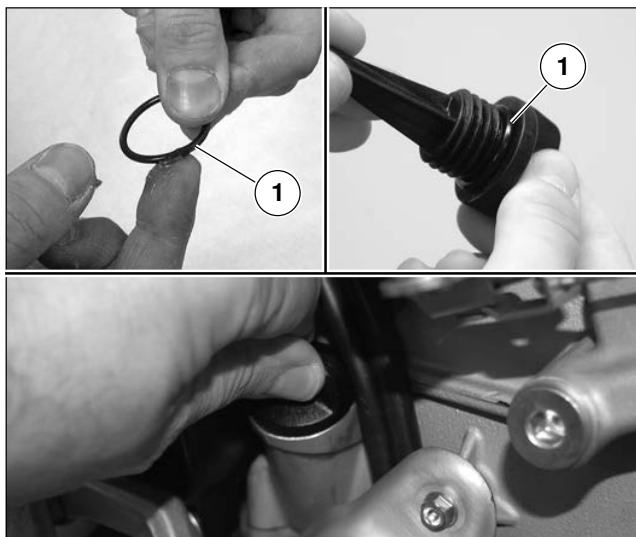


Make sure that the oil level is between the MIN and MAX level markings on the fill cap control rod.



Before replacing the filler plug, grease O-ring (1) with silicone grease, then reinsert it into its seat (see figure).

Tighten the cap.





SYSTEM FUNCTIONING CHECK

Assemble the following components in order:

- Airbox.
- Fuel tank.
- Rear side panels (n°2 items for each side).
- Radiator side panels.
- Air intake ducts.
- Air outlet side panels.
- Saddle.

For the assembly operations, assemble in reverse order of removal.

Cooling system

Insert the ignition key and start up the vehicle engine. Keep it running until it warms up and wait until fan enter into operation at least twice. Switch off the engine and wait for the temperature to cool down. Then do a final check of the cooling liquid level and top up if necessary.

Carefully check that there is no leakage from the cooling system or.

Motor oil system

Start the engine for some minutes.

After having shut off the engine, wait for at least 10 minutes and check the oil level. Ensure that the ground is flat and keep the motorcycle standing as much as possible.

The level must be near the “MAX” reference on the timing case as much as possible. Do not exceed this limit. Check any oil leakages.



Avoid making the engine turn with the oil level lower than the minimum level; this can impair the operation of the different parts of the engine.

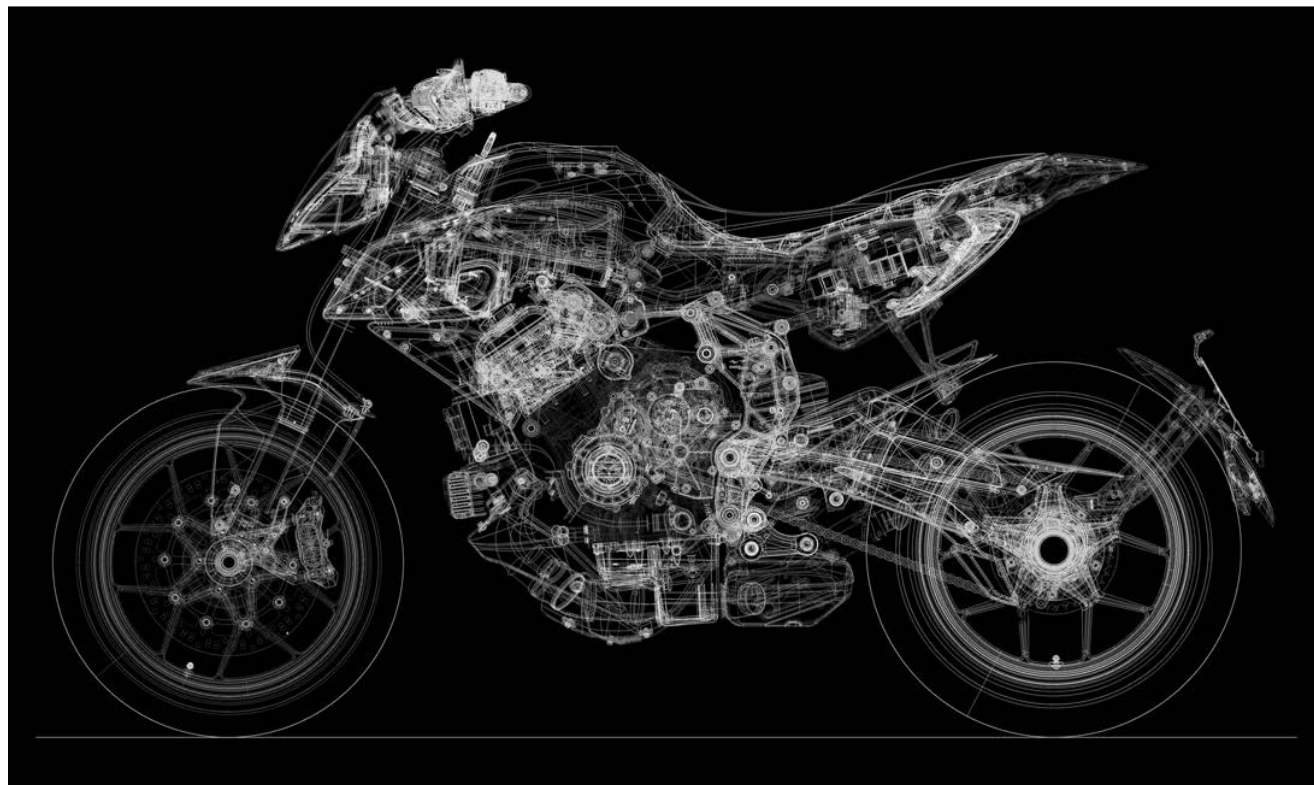
If the oil level, after the reset, is upper than the “MAX” reference, correct it by emptying the system.

Complete the assembly of the motorcycle.





Special tools



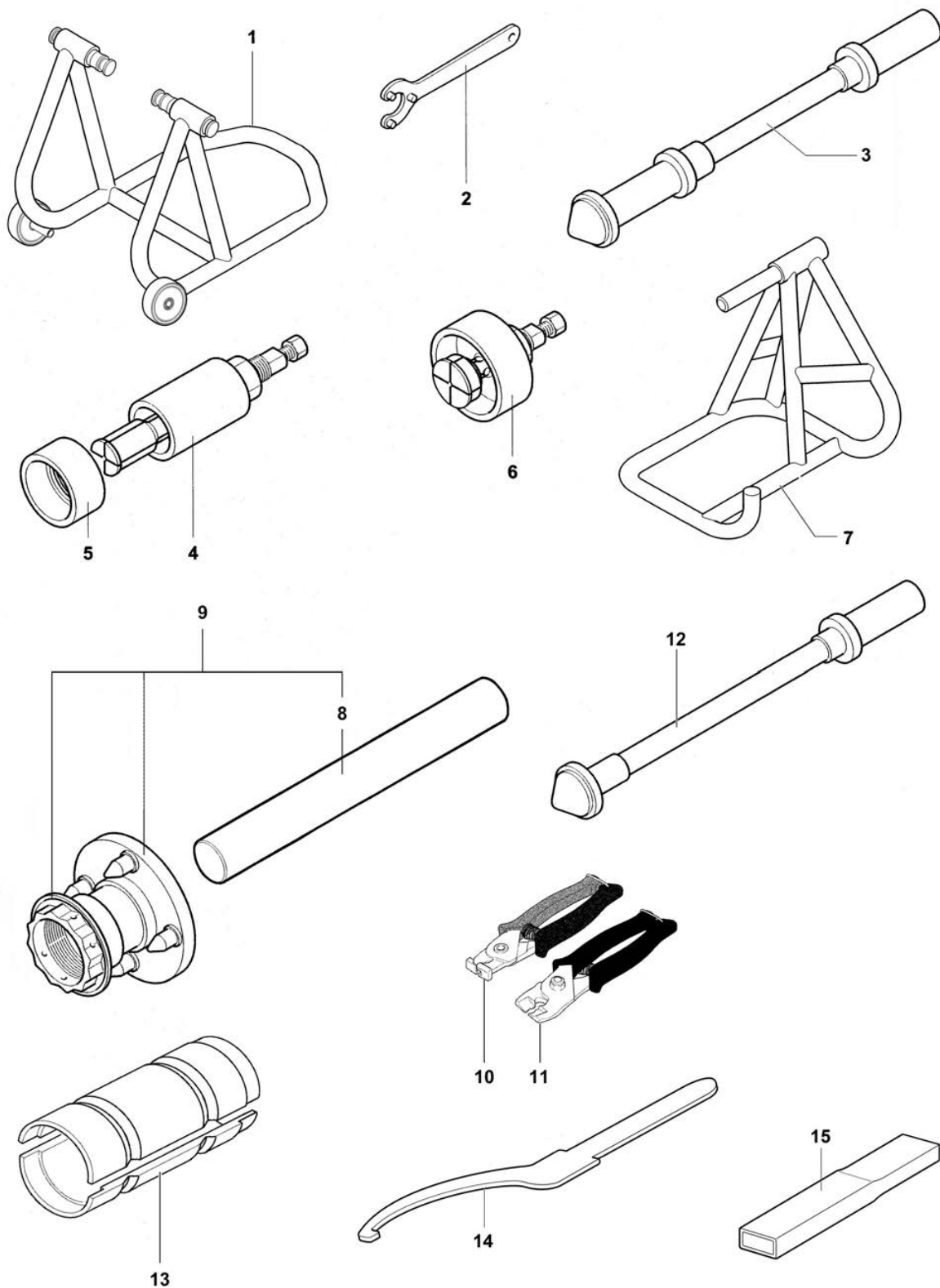
M

SECTION M

Revision 0

MAINTENANCE TOOLS

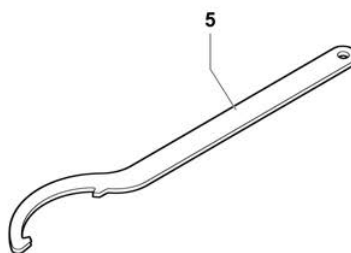
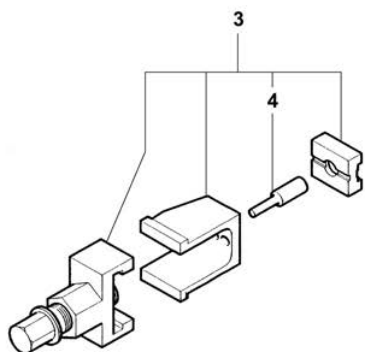
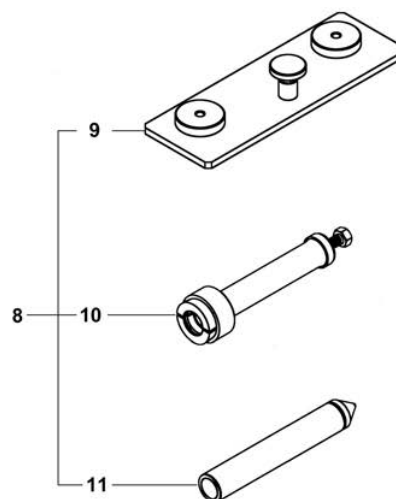
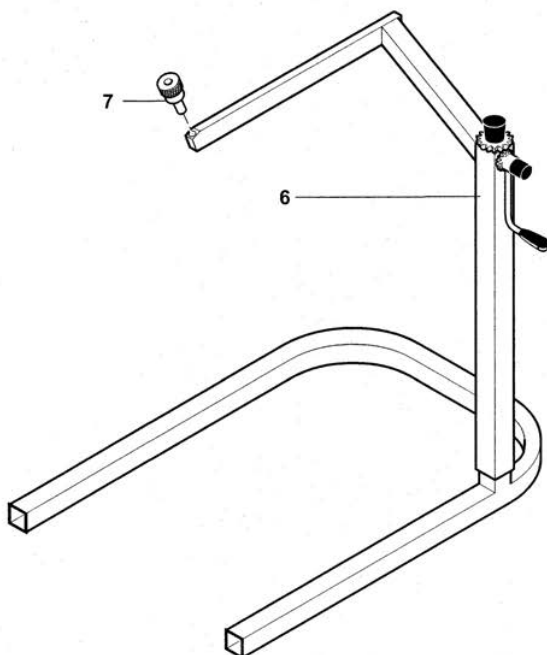
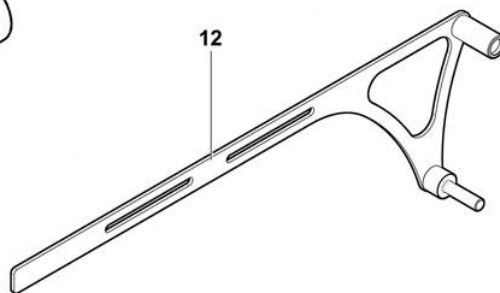
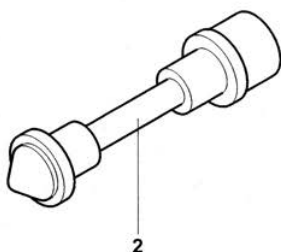
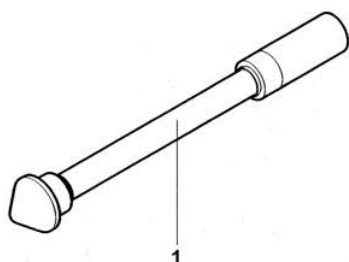
The special tools shown in the following chapter are indispensable for a correct carrying out of the described maintenance operations.
To order the special tools, refer to the spare parts catalogue.





Special tools

N.	Code	Q.ty	Note	Rivale 800	Descrizione	Description
1	800095830	1		•	Cavalletto anteriore	Front stand
2	800091645	1		•	Chiave ghiera cuscinetti di sterzo	Steering bearing pin wrench
3	8000B6920	1		•	Attrezzo montaggio cuscinetti tiranti sospensione post	Rear suspension tie rod bearings mounting tool
4	800092860	1		•	Estrattore cuscinetti forcellone	Fork bearings puller
5	800092861	1		•	Boccola estrattore cuscinetti forcellone	Fork bearing puller bushing
6	8000B4416	1		•	Estrattore cuscinetti ruota anteriore	Front wheel bearings puller
7	8000B9312	1		•	Cavalletto posteriore	Rear stand
8	8000A1953	1		•	Perno per albero di centraggio	Pin for centering shaft
9	800092865	1		•	Attr. bilanciamento ruota posteriore	Rear wheel balancing tool
10	800095850	1		•	Pinza montaggio/smontaggio fascette clic R	Pliers for clic R clamps assembly/disassembly
11	800098321	1		•	Pinza inclinata monta fascette clic R	Clic R clamp fitting pliers
12	800092866	1		•	Attrezzo montaggio pacco forcellone	Fork pack assembly tool
13	8000B6785	1		•	Attrezzo parapolvere e paraolio	Dust cover and oil splash guard tool
14	800092854	1		•	Chiave per mozzo eccentrico	Wrench adjustment eccentric hub
15	800092855	1		•	Prolunga per chiave mozzo eccentrico	Extension for wrench adjustment eccentric hub



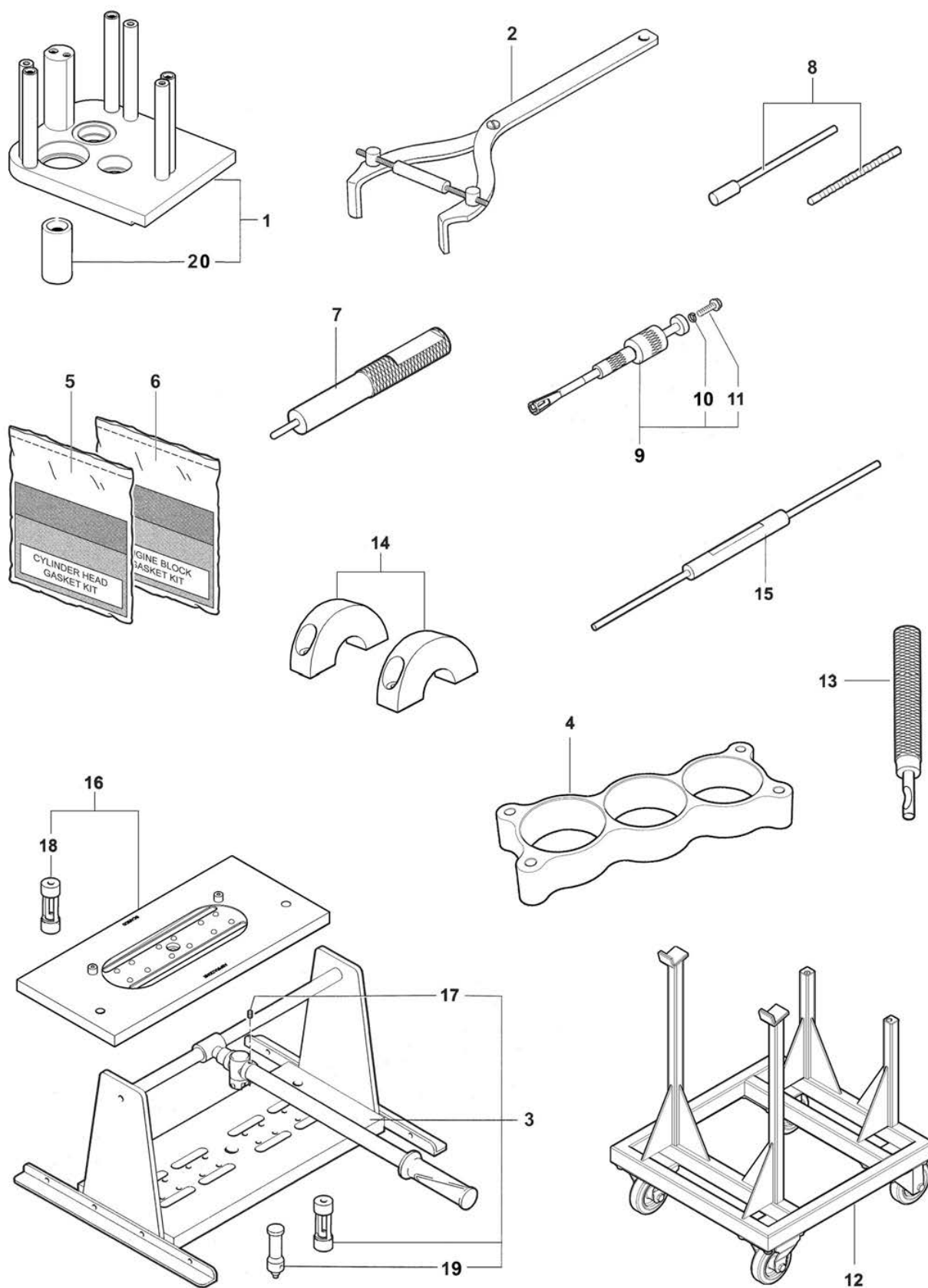


Special tools

N.	Code	Q.ty	Note	Rivale 800	Descrizione	Description
1	8000B6782	1		•	Attrezzo montaggio pacco bilanciante	Equaliser pack tool
2	8000B4421	1		•	Attrezzo cuscinetti ruota anteriore	Front wheel bearings tool
3	800095389	1		•	Attrezzo catena	Chain tool
4	800095390	1		•	Perno taglio e ribaditura	Cutting and riveting pin
5	8000B7038	1		•	Attrezzo regolazione ammortizzatore posteriore	Rear damper adjusting tool
6	800095807	1		•	Cavalletto anteriore	Front stand
7	8000B7340	1		•	Perno cavalletto anteriore	Front stand pin
8	8000B6779	1		•	Attrezzo cuscinetto perno di sterzo	Steering pin bearing tool
9	8000B6780	1		•	Piastra di riscontro base di sterzo	Steering base plate
10	8000B6781	1		•	Estrattore cuscinetto perno di sterzo	Steering pin bearing extractor
11	800097890	1		•	Attrezzo montaggio cuscinetto perno di sterzo	Steering pin bearing assembly tool
12	8000B6787	1		•	Asta settaggio sospens. posteriore	Rear suspension setting rod



Special tools





Special tools

N.	Code	Q.ty	Note	Rivale 800	Descrizione	Description
1	8000B7177	1		•	Attrezzo montaggio cambio	Gear change mounting tool
2	800079015	1		•	Attrezzo bloccaggio frizione	Clutch blocking tool
3	800094796	1		•	Piastra montaggio/smontaggio valvole	Valves installation/removal plate
4	8000B7207	1		•	Piastra montaggio pistoni	Piston assembling tool
5	8000B7295	1		•	Kit guarnizioni testa	Cylinder head gasket kit
6	8000B7296	1		•	Kit guarnizioni basamento	Engine block gasket kit
7	800095581	1		•	Punzone montaggio tenute valvola	Valve seals mounting punch
8	8000A2625	1		•	Broccia per guida valvole	Broach for valve guide
9	800094798	1		•	Attrezzo smontaggio gommini valvola	Valve rubber caps removal tool
10	62N115538	1		•	Rosetta elastica	Spring washer
11	8C0069056	3		•	Vite M8x30	Screw M8x30
12	8000B6789	1		•	Supporto smontaggio/montaggio motore	Engine removal/installation support
13	8000B7299	1		•	Attrezzo montaggio perno ingranaggio rinvio avviamento	Mounting tool for starter motor idler gear pin
14	8000B7214	2		•	Attrezzo montaggio/smontaggio albero motore	Crank shaft installation/removal tool
15	800095429	1		•	Tampone controllo	Gauge pad
16	8000B7254	1		•	Piastra di base	Base plate
17	800051521	2		•	Vite M4x6	Screw M4x6
18	8000B7255	1		•	Attrezzo smontaggio semiconi	Half-cones removal tool
19	800095179	1		•	Attrezzo montaggio semiconi	Half-cones installation tool
20	8A00B2859	1		•	Tubo	Pipe

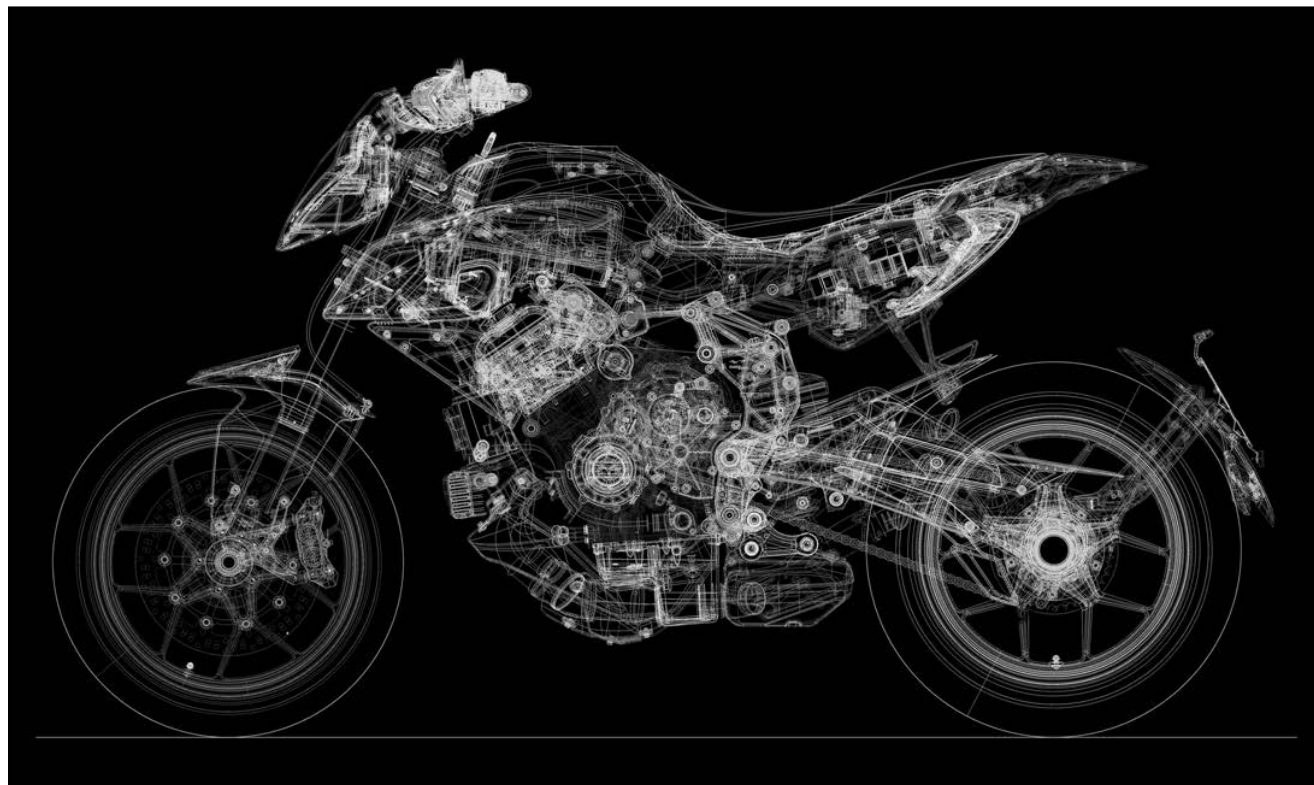


Special tools

M



Tightening torques



SECTION N
Revision 0

Frame tightening torques for MV Agusta Rivale 800

Key to colours and symbols	Tightening torque	1	Tightening sequence	Key Characteristic	No lubrication required	Lubrication required	With threadlocking fluid



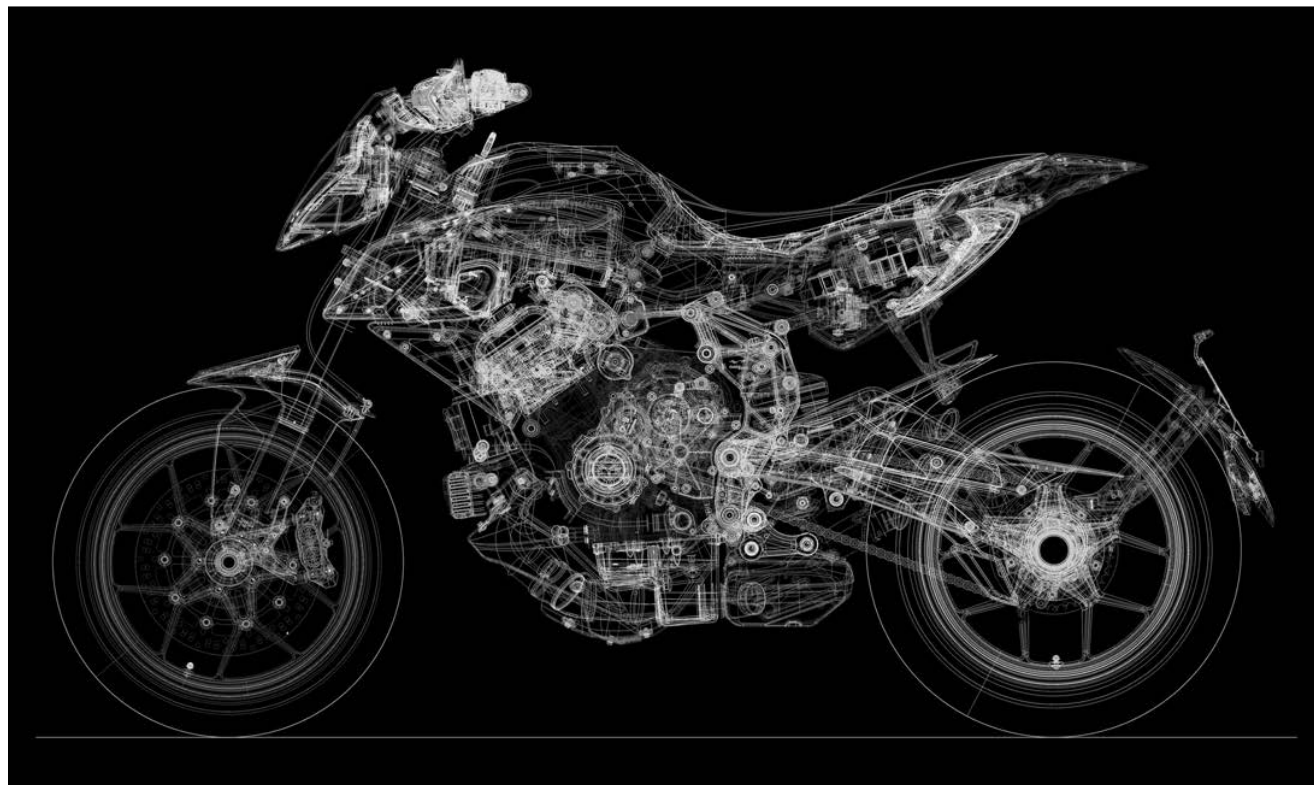


Tightening torques

N



Diagnostic



SECTION 0

Revision 0





Diagnostic

ELECTRICAL COMPONENTS

BATTERY CHARGING SYSTEM

Battery warning light on

Check the condition of the fuse on the remote switch	Replace
Faulty fuse connection on remote switch	Deoxidize/Repair
Faulty remote switch connection	Deoxidize/Repair
Battery connection defective	Deoxidize/Repair
Battery faulty	Replace
Alternator broken	Replace
Alternator connection defective	Deoxidize/Repair

POWER SUPPLY FOR 12V SERVICES

No function enabled

Check the condition of the fuse on the remote switch	Replace
Ignition switch broken	Replace
Ignition switch connection defective	Deoxidize/Repair
Main relay broken	Replace
Main relay connection defective	Deoxidize/Repair
Check condition of fuse 5	Replace
Fuse 5 connection faulty	Deoxidize/Repair

ELECTRIC STARTER

Electric starter does not work

Faulty engine earth connection	Deoxidize/Repair
Faulty power cable connection	Deoxidize/Repair
Faulty battery power cable connection	Deoxidize/Repair
Faulty or dead battery	Replace
'On off' button on right switch on 'off'	Turn on
Right-hand switch faulty	Replace
Right-hand switch unit connection faulty	Deoxidize/Repair
Starting relay broken	Replace
Starting relay connection faulty	Deoxidize/Repair
Starter motor broken	Replace
Faulty starter cable connection	Deoxidize/Repair
Clutch pump switch broken	Replace
Faulty clutch switch connection	Deoxidize/Repair
Fall detection sensor failure	Replace
Faulty fall detection sensor connection	Deoxidize/Repair
Side stand switch failure	Replace
Faulty side stand switch connection	Deoxidize/Repair
Check condition of fuse 5	Replace
Fuse 5 connection faulty	Deoxidize/Repair

COOLING SYSTEM

Electric fan do not work

Electric fan broken	Replace
Electric fan connection faulty	Deoxidize/Repair
Check condition of fuse 7	Replace
Fuse 7 connection faulty	Deoxidize/Repair
Failure of the water sensor in the radiator	Replace
Faulty connection for water sensor in the radiator	Deoxidize/Repair
Fan relay connection faulty	Deoxidize/Repair
Fan relay broken	Replace
ECU failure	Replace
Faulty ECU connection	Deoxidize/Repair

LIGHTS/INDICATORS

Position lights not working

Front light failure	Replace
Faulty front light connection	Deoxidize/Repair
Tail light failure	Replace
Faulty front light connection	Deoxidize/Repair
Check condition of fuse 3	Replace
Fuse 3 connection faulty	Deoxidize/Repair
Ignition switch broken	Replace
Ignition switch connection faulty	Deoxidize/Repair
Bulb burnt out	Replace
Bulb connection faulty	Deoxidize/Repair
Faulty front light connection	Deoxidize/Repair
Check condition of fuse 4	Replace
Fuse 4 connection faulty	Deoxidize/Repair
Lights switch broken	Replace
Lights switch connection faulty	Replace
Lights switch broken	Replace
Lights switch connection faulty	Replace

High beam does not work

High beam flashing light not working
(with steady high beam function working)

Front light failure	Replace
Faulty front light connection	Deoxidize/Repair
Tail light failure	Replace
Faulty front light connection	Deoxidize/Repair
Check condition of fuse 3	Replace
Fuse 3 connection faulty	Deoxidize/Repair
Ignition switch broken	Replace
Ignition switch connection faulty	Deoxidize/Repair
Bulb burnt out	Replace
Bulb connection faulty	Deoxidize/Repair
Faulty front light connection	Deoxidize/Repair
Check condition of fuse 4	Replace
Fuse 4 connection faulty	Deoxidize/Repair
Lights switch broken	Replace
Lights switch connection faulty	Replace
Lights switch broken	Replace
Lights switch connection faulty	Replace



Diagnostic

Low beam does not work

Bulb burnt out	Replace
Bulb connections faulty	Deoxidize/Repair
Faulty front light connection	Deoxidize/Repair
Check condition of fuse 4	Replace
Fuse 4 connection faulty	Deoxidize/Repair
Lights switch broken	Replace
Lights switch connection faulty	Deoxidize/Repair

The stop light does not work or always stays on

Stop light bulb burnt out	Replace
Bulb connections faulty	Deoxidize/Repair
Rear brake lever switch broken	Deoxidize/Repair
Rear brake lever switch connection faulty	Replace
Front brake lever switch connection faulty	Deoxidize/Repair
Lights switch broken	Replace
Lights switch connection faulty	Deoxidize/Repair
Rear brake lever switch broken	Replace
Rear brake lever switch connection faulty	Deoxidize/Repair
Check condition of fuse 6	Replace

Indicators do not work

Fuse 6 connection faulty	Deoxidize/Repair
Check condition of fuse 6	Replace
Fuse 6 connection faulty	Deoxidize/Repair
Lights switch broken	Replace
Lights switch connection faulty	Deoxidize/Repair
Flasher unit broken	Replace
Flasher unit connection faulty	Deoxidize/Repair

E. A. S. ELECTRONICALLY ASSISTED SHIFT

Check whether it is enabled from the dedicated dashboard page	Turn on
Shift sensor failure	Replace
Faulty shift sensor connection	Deoxidize/Repair
Faulty ECU connection	Deoxidize/Repair

TRACTION CHECK

Check whether it is enabled from the dedicated dashboard page	Turn on
Check for faults relative to the speed sensor, indicated on the dashboard	Replace
ECU failure	Replace
Faulty ECU connection	Deoxidize/Repair

SPEED LIMITER

Check whether it is enabled from the dedicated dashboard page	Turn on
Check for faults relative to the speed sensor, indicated on the dashboard	Replace
ECU failure	Replace
Faulty ECU connection	Deoxidize/Repair

HORN

Horn does not work

Horn broken	Replace
Horn connection faulty	Deoxidize/Repair
Check condition of fuse 6	Replace
Fuse 6 connection faulty	Deoxidize/Repair
Lights switch broken	Replace
Lights switch connection faulty	Deoxidize/Repair

INSTRUMENT PANEL

The dashboard does not turn on

(while the other functions of the motorcycle are working)

Check condition of fuse 5	Replace
Fuse 6 connection faulty	Deoxidize/Repair
Instrument panel broken	Replace
Instrument panel connection faulty	Deoxidize/Repair

Oil light with the engine off does not switch on

Oil pressure sensor broken	Replace
Oil pressure sensor connection faulty	Deoxidize/Repair
Instrument panel broken	Replace
Instrument panel connection faulty	Deoxidize/Repair

Oil light with the engine running stays on

Check the engine oil level	Repair
Oil pressure sensor broken	Replace
Oil pressure sensor connection faulty	Deoxidize/Repair
Instrument panel broken	Replace
Instrument panel connection faulty	Deoxidize/Repair

Side stand warning light does not work

Side stand switch broken	Replace
Side stand switch connection faulty	Deoxidize/Repair
Instrument panel broken	Replace
Instrument panel connection faulty	Deoxidize/Repair
ECU failure	Replace
Faulty ECU connection	Deoxidize/Repair



Diagnostic

Battery warning light does not work

Instrument panel broken
Instrument panel connection faulty
ECU failure

Replace
Deoxidize/Repair
Replace

ABS system warning light does not work

Faulty ECU connection
Instrument panel broken
Instrument panel connection faulty
ECU failure

Deoxidize/Repair
Replace
Deoxidize/Repair
Replace

The idle light does not come on

Faulty ECU connection
Gear position sensor broken
Gear position sensor connection faulty
Instrument panel broken

Deoxidize/Repair
Replace
Deoxidize/Repair
Replace

Indicator warning light does not work (with the indicators working)

Instrument panel connection faulty
Problem with diodes in the electric cabling
Instrument panel broken
Instrument panel connection faulty

Deoxidize/Repair
Replace the cabling
Replace
Deoxidize/Repair

Low fuel warning light does not work

Fuel level sensor broken
Fuel pump connection faulty
Instrument panel broken
Instrument panel connection faulty

Replace
Deoxidize/Repair
Deoxidize/Repair
Deoxidize/Repair

High beam warning light does not work (with the high beams working)

Instrument panel broken
Instrument panel connection faulty
Instrument panel broken
Instrument panel connection faulty

Replace
Deoxidize/Repair
Replace
Deoxidize/Repair

Rev limiter light does not come on

Instrument panel broken
Instrument panel connection faulty
ECU failure

Replace
Deoxidize/Repair
Replace

CAN line error

Faulty ECU connection
Instrument panel broken
Instrument panel connection faulty
ECU failure

Deoxidize/Repair
Replace
Deoxidize/Repair
Replace

Error messages

Faulty ECU connection
See diagnostic messages

Deoxidize/Repair
Replace

Page management not possible

Handlebar controls left side broken
Faulty accident control connection
Instrument panel broken
Instrument panel connection faulty

Replace
Deoxidize/Repair
Replace
Deoxidize/Repair

INJECTION

Any errors reported to the dashboard

No injection due to lack of fuel pump

See diagnostic
Check condition of fuse 1
Fuse 1 connection faulty
Injection relay broken
Injection relay connection faulty
Fuel pump broken
Fuel pump connection faulty
ECU failure

Replace
Deoxidize/Repair
Replace
Deoxidize/Repair
Replace

Injector does not inject fuel

Faulty ECU connection
Check condition of fuse 2
Fuse 1 connection faulty
Injection relay broken
Injection relay connection faulty
ECU failure

Replace
Deoxidize/Repair
Replace
Deoxidize/Repair
Replace

No injection due to lack of high injector operation

Faulty ECU connection
Faulty high injector cabling connection
Check condition of fuse 2
Fuse 2 connection faulty
Injection relay broken
Injection relay connection faulty
ECU failure
Faulty ECU connection

Deoxidize/Repair
Deoxidize/Repair
Replace
Deoxidize/Repair
Replace
Deoxidize/Repair
Replace

IGNITION SYSTEM

Any errors reported to the dashboard

No sparks at the plugs

See diagnostic
Engine earth connection faulty
Check condition of fuse 1
Fuse 2 connection faulty
Faulty single reel connection
Injection relay broken
Injection relay connection faulty
ECU failure
Faulty ECU connection

Deoxidize/Repair
Replace
Deoxidize/Repair
Deoxidize/Repair
Replace
Deoxidize/Repair
Replace
Deoxidize/Repair



Diagnostic

ABS SYSTEM (Perform testing using TEXA diagnostic software)

ABS system warning light on	Faulty front/rear speed sensor connection	Deoxidize/Repair
	Front/rear speed sensor damaged	Replace
	Broken or damaged phonic wheel	Repair/Replace
	Gap between sensor and phonic wheel not as specified	Replace
	Fuse 25A connection faulty	Deoxidize/Repair
	Blown 25A fuse	Replace
	Fuse 15A connection faulty	Deoxidize/Repair
	Blown 15A fuse	Replace
	Fuse 10A connection faulty	Deoxidize/Repair
	Blown 10A fuse	Replace

DIAGNOSTICS

DASHBOARD INSTRUCTIONS

PRESSURE SENSOR

Faulty pressure sensor connection	Deoxidize/Repair
Rubber fitting pipe damaged or not connected	Repair/Replace
Pressure sensor damaged	Replace
Faulty ECU connection	Deoxidize/Repair
ECU failure	Replace
Problem with the electrical system	Repair/Replace

PHASE ERROR

AIR TEMP

See above	
Faulty air temperature sensor connection	Deoxidize/Repair
Air temperature sensor failure	Replace
Faulty ECU connection	Deoxidize/Repair
ECU failure	Replace
Problem with the electrical system	Repair/Replace

H2O SENSOR

Using a diagnostic instrument check which if the two sensors is faulty	
Faulty engine water temperature sensor connection	Deoxidize/Repair
Engine coolant temperature sensor broken	Replace
Faulty engine coolant temperature sensor connection	Deoxidize/Repair
Radiator coolant temperature sensor broken	Replace
Faulty ECU connection	Deoxidize/Repair
ECU failure	Replace
Problem with the electrical system	Repair/Replace

THROTTLE POSITION

Faulty throttle body connection	Deoxidize/Repair
Throttle body position sensor failure	Change throttle body
Faulty ECU connection	Deoxidize/Repair
ECU failure	Replace

LAMBDA SENSOR

Problem with the electrical system	Repair/Replace
Faulty lambda probe connection	Deoxidize/Repair
Lambda probe failure	Replace
Faulty ECU connection	Deoxidize/Repair
ECU failure	Replace

INJECTOR N (N=1, 2, 3)

Problem with the electrical system	Repair/Replace
Injector N connection faulty	Deoxidize/Repair
Injector N broken	Replace
ECU failure	Replace
Faulty ECU connection	Deoxidize/Repair
Problem with the electrical system	Repair/Replace

GAS POSITION

Faulty gas control connection	Deoxidize/Repair
Gas control failure	Replace
ECU failure	Replace
Faulty ECU connection	Deoxidize/Repair
Problem with the electrical system	Repair/Replace

FUEL PUMP RELAY

Injection relay broken	Replace
Injection relay connection faulty	Deoxidize/Repair
ECU failure	Replace
Faulty ECU connection	Deoxidize/Repair
Fuel pump connection faulty	Deoxidize/Repair

RPM SENSOR

Problem with the electrical system	Repair/Replace
Faulty engine rev sensor connection	Deoxidize/Repair
engine rev sensor failure	Replace
ECU failure	Replace
Faulty ECU connection	Deoxidize/Repair
Problem with the electrical system	Repair/Replace



Diagnostic

COIL N	Faulty specified reel connection	Deoxidize/Repair
	Specified coil broken	Replace
	ECU failure	Replace
	Faulty ECU connection	Deoxidize/Repair
FAN RELAY	Problem with the electrical system	Repair/Replace
	Faulty fan relay connection	Deoxidize/Repair
	Fan relay failure	Replace
	ECU failure	Replace
SPEED SENSOR	Faulty ECU connection	Deoxidize/Repair
	Problem with the electrical system	Repair/Replace
	Faulty speed sensor connection	Deoxidize/Repair
	Speed sensor failure	Replace
BATTERY VOLTAGE	Broken or damaged phonic wheel	Repair/Replace
	Gap between sensor and phonic wheel not as specified	Repair
	Faulty voltage adjuster connection	Deoxidize/Repair
	Voltage adjuster failure	Replace
ECU	Problem with the electrical system	Repair/Replace
	Faulty ECU connection	Deoxidize/Repair
	Update the software with the latest available version	Repair
	ECU failure	Replace
STARTER RELAY	Faulty relay starter connection	Deoxidize/Repair
	Relay starter failure	Replace
	Problem with the electrical system	Repair/Replace
	Faulty ECU connection	Deoxidize/Repair
DBW	ECU failure	Replace
	Faulty throttle body connection	Deoxidize/Repair
	Throttle body sensors failures	Change throttle body
	Throttle body locked	Repair/Replace
SENSOR SUPPLY	Problem with the electrical system	Repair/Replace
	Faulty ECU connection	Deoxidize/Repair
	ECU failure	Replace
	Faulty connection to the clutch switch	Deoxidize/Repair
CLUTCH SWITCH	Clutch switch out of place	Deoxidize/Repair
	Faulty clutch switch	Replace
	Problem with the electrical system	Repair/Replace
	Update the software with the latest available version	Replace
SAFETY	ECU failure	Replace
LOW BEAM RELAY	Faulty light relay connection	Deoxidize/Repair
	Light relay failure	Replace
	Problem with the electrical system	Repair/Replace
	Faulty ECU connection	Deoxidize/Repair
TIP OVER	ECU failure	Replace
	Faulty tilt sensor connection	Deoxidize/Repair
	Tilt sensor failure	Replace
	Problem with the electrical system	Repair/Replace
GEAR SENSOR	Faulty ECU connection	Deoxidize/Repair
	ECU failure	Replace
	Faulty gear sensor connection	Deoxidize/Repair
	Gear sensor failure	Replace
	Problem with the electrical system	Repair/Replace
	Faulty ECU connection	Deoxidize/Repair
	ECU failure	Replace



Diagnostic

FRAME

STEERING

Steering stiff

Steering bearings damaged	Replace
Steering bearings overtightened	Adjust
Steering pin bent	Replace
Steering damper action excessive	Adjust
Steering damper joints damaged	Replace
Tyre pressure low	Adjust

Vehicle tends to steer or does not travel on a straight line

Fork bent	Replace
Frame bent	Replace
Swingarm bent	Replace
Steering damper joints damaged	Replace
Steering bearings damaged	Replace
Wheel spindle bent	Replace
Swingarm bearings damaged	Replace

FRONT WHEEL

Front wheel wobbles/vibrates

Wheel rim bent	Replace
Wheel unbalanced	Balance
Tyre faulty	Replace
Tyre unsuitable	Replace
Wheel bearings damaged	Tighten
Spindle fixing screws loose	Tighten
Spindle ring nut loose	Tighten

Front wheel hardly turns

Wheel bearings damaged	Replace
Wheel spindle bent	Replace
Brake pad friction on discs excessive (see brakes)	Check
Brake discs bent	Replace
Wheel spindle ring nut overtightened	Use prescribed torque

FRONT SUSPENSION

Front suspension soft

Fork oil deteriorated	Renew
Spring preload low	Adjust
Fork oil level low	Top up
Tyre pressure low	Adjust
Fork damaged	Repair
Spring preload excessive	Adjust
Tyre pressure high	Adjust

Front suspension stiff

REAR WHEEL

Rear wheel wobbles/vibrates

Wheel rim bent	Replace
Wheel unbalanced	Balance
Tyre faulty	Replace
Tyre unsuitable	Replace
Wheel bearings damaged	Replace
Locknut loose	Tighten
Suspension screws loose	Tighten
Suspension bearings damaged	Replace

Rear wheel hardly turns

Wheel bearings damaged	Replace
Wheel hub circlip displaced	Check
Brake pad friction on discs excessive	Check
Brake disc bent	Replace
Drive chain damaged	Replace

REAR SUSPENSION

Rear suspension soft

Spring preload excessive	Adjust
Tyre pressure low	Adjust
Shock absorber damaged	Replace
Spring preload excessive	Adjust
Tyre pressure high	Adjust

Rear suspension stiff

Swingarm bearings damaged	Replace
Swingarm rocker bearings damaged	Replace
Shock absorber joints damaged	Replace
Suspension linkage joints damaged	Repair
Swingarm pin bent	Replace



Diagnostic

BRAKES

Brake lever and pedal soft ("spongy")

Air bubbles in hydraulic circuit
Leaks in hydraulic circuit
Caliper seals damaged
Pump seals damaged
Caliper pistons do not slide freely
Brake fluid level low
Brake discs distorted
Brake lever or pedal bent

Bleed
Repair
Replace
Replace
Check
Top up
Replace
Replace

Brake lever or pedal stiff

Braking action insufficient

Disks dirty
Air bubbles in hydraulic circuit
Leaks in hydraulic circuit
Caliper seals damaged
Pump seals damaged
Caliper pistons do not slide freely
Brake fluid level low
Brake discs distorted
Brake pad springs damaged
Brake discs distorted
Caliper pistons do not slide freely
Brake fluid level too high
Brake pads worn down

Clean
Bleed
Repair
Replace
Replace
Check
Top up
Replace
Replace
Replace
Check
Adjust
Replace

Brake pads rub against brake disks

EXHAUST SYSTEM

Exhaust noise excessive

Exhaust pipe damaged
Exhaust pipe fasteners loose
Exhaust pipe damaged
Exhaust pipe fasteners loose

Replace
Tighten
Replace
Tighten

Engine performance poor

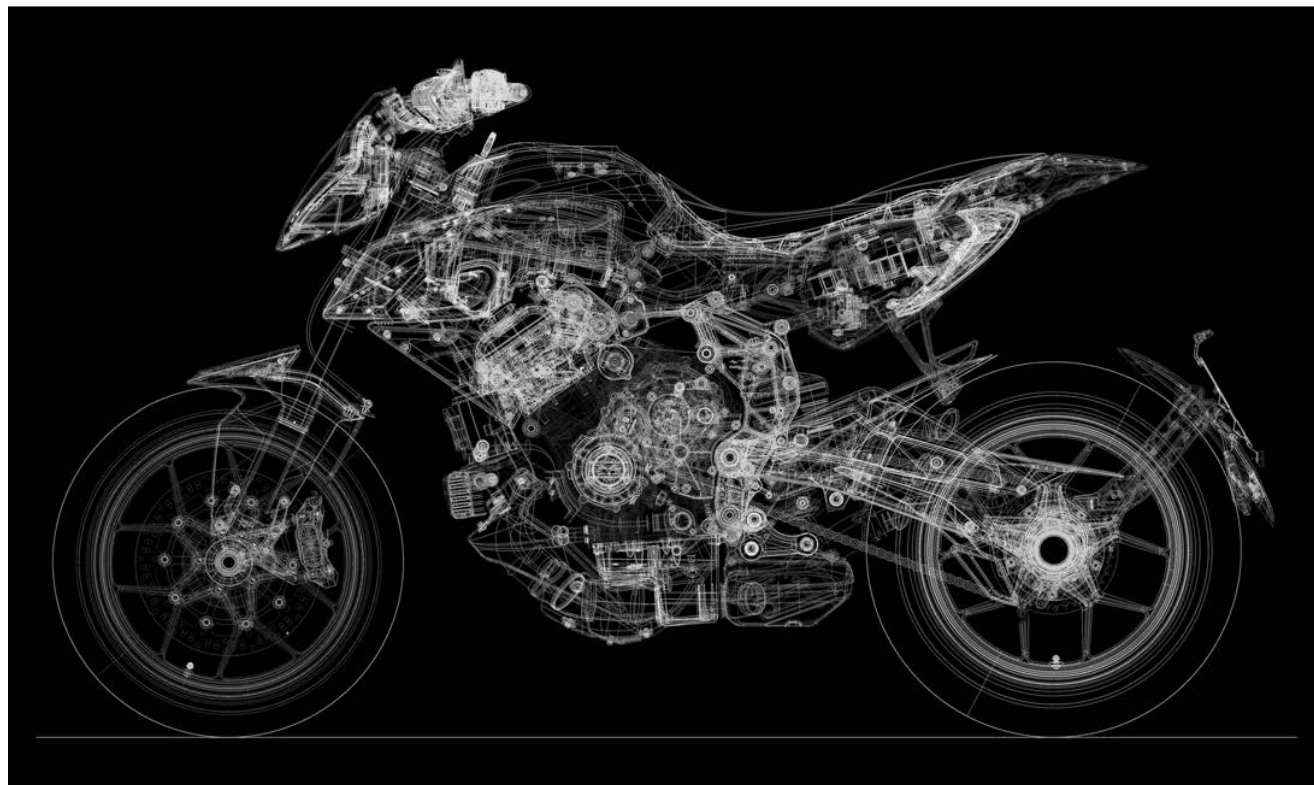
COOLING SYSTEM

Engine temperature high

Coolant level low
Cooling fan faulty
Expansion tank cap faulty
Instrument temperature sensor faulty
Thermostat locked in closed position
Radiator fins bent or obstructed
Radiator scaly
Water pump damaged
Injection/ignition system faulty
Fuel unsuitable
Engine cooling circuit faulty
Spark plug heat grade unsuitable
Carbon formation in cylinder head/piston
Thermostat locked in open position

Top up
Replace
Replace
Replace
Replace
Repair/Clean
Clean
Replace
Check
Change
Check
Replace
Clean
Replace

Engine temperature low



SECTION P
Revision 0

P



Analytical index

ANALYTICAL INDEX - RIVALE 800 WORKSHOP MANUAL

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