

FANTIC WANTS TO THANK YOU
for choosing one of its products.

We recommend that you read this manual before driving your vehicle. It contains information, advice and warnings on the vehicle maintenance and use. The instructions in this manual have been prepared to give you a simple and clear guide for use. We are sure that taking it into consideration you will gain confidence with your new vehicle, which you can use for a long time and with full satisfaction.

MANUFACTURER DATA AND EDITION

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Introduction

This manual was prepared by **Fantic Motor** for use by **Fantic Motor** dealers and their specialized personnel. It is assumed that those who use this documentation for repair and maintenance of **Fantic Motor** vehicles have a basic knowledge of the principles and mechanical procedures regarding vehicle repair techniques. In the absence of these notions, repair or maintenance may be inadequate or dangerous.

Fantic Motor is constantly committed in improving its production. Any significant modifications and changes introduced with regard to vehicle characteristics and repair procedures will be brought to the attention of all **Fantic Motor** dealers and will be published in future editions of the manual.

- ⓘ **Fantic Motor reserves the right to modify and make changes, at any time and without notice, to the models described, specifications and design data, guaranteeing the essential characteristics described and illustrated in this manual.**
- ⚠ **Operators have the obligation to read the manual and to scrupulously follow the instructions given. The manufacturer is not responsible for damages caused to people and/or things and is not responsible for damages to the product, if the instructions given in this manual are not observed.**
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1.1 WARNINGS

Carbon monoxide

- ⚠ The exhaust fumes contain carbon monoxide, a poisonous gas that can cause death. Therefore, for certain operations, make sure you are in an open space, or in a suitable and well-ventilated room, never in enclosed spaces. If operating in enclosed spaces, use an evacuation system for the exhaust fumes.

Fuel

- ⚠ The fuel used is extremely flammable and can become explosive under certain conditions. Refuelling and maintenance operations must be carried out in a ventilated area and with the vehicle switched off. Do not smoke during refuelling and near fuel vapours; avoid contact with open flames, sparks and any other source that could cause ignition or explosion.
- ⚠ Do not disperse in the environment and keep away from children.

Hot components

- ⚠ The engine and certain components become very hot and remain hot for a while even when the engine is off. Before carrying out any operation near the engine or exhaust system, wear insulating gloves or wait for their cooling.

Used engine and gearbox oil

- ⚠ Used engine and gearbox oil is harmful to health, whether it is inhaled or swallowed. It is also irritating and can cause serious consequences if it comes into contact with the skin.
- ⚠ Spreading and dispersion into the environment is prohibited.
- ⚠ If swallowed, do not induce vomiting, but go urgently to a first aid centre, indicating the cause and how the accident occurred.
- ⚠ In case of contact with the skin, immediately wash the affected part with soap and water, repeating the operation until the affected part is free from residues.
- ⚠ In case of contact with eyes and ears, immediately rinse the affected parts with plenty of water and urgently go to a first aid center, indicating the cause and how the accident occurred.
- ⚠ In case of contact with clothing, undress and wash thoroughly with soap and water. Change the dirty cloths which must be specifically washes as soon as possible.
- ⚠ Always use gloves suitable to protect your hands during the maintenance operations.
- ⚠ Keep out of the reach of children.
- ⓘ Used engine and gearbox oil must be collected in a sealed container, and delivered to the nearest service station or at a waste oil collection centre where you will find personnel authorized to dispose of it.

Brakes

- ⚠ Brake fluid may damage the vehicle painted, plastic or rubber surfaces. Protect these components with a clean rag when performing certain operations.
- ⚠ Always wear protective glasses and in case of accidental contact of the brake fluid with eyes, rinse immediately with plenty of clean, fresh water and consult a doctor immediately. Keep out of the reach of children.
- ⚠ Clean the brake pads in a ventilated environment, directing the compressed air jet so as not to inhale the dust produced by the wear of the friction material. Although the latter does not contain asbestos, inhaling dust is however harmful.

Electrolyte and hydrogen gas from the battery

- ⚠ The electrolyte of the battery is toxic and caustic. In contact with skin it can cause burns, as it contains sulphuric acid. Wear gloves and protective clothing.
- ⚠ If the electrolyte liquid comes into contact with the skin, wash it thoroughly with fresh water.
- ⚠ Protect your eyes, as battery fluid can cause blindness. If it comes into contact with the eyes, wash thoroughly with water for fifteen minutes and promptly contact an eye specialist.

 The battery emits explosive gases, it is advisable to keep away flames, sparks and any other source of heat. Provide adequate ventilation when servicing or recharging the battery.


 Keep out of the reach of children.


 The battery fluid is corrosive. Do not pour it or spread it, especially on plastic parts.

 Provide for regular disposal.


Coolant


 Under certain conditions, the ethylene glycol present in the engine coolant is combustible and its flame is not visible. If ethylene glycol is ignited, its flame is not visible but it is able to cause serious burns.

 Avoid pouring engine coolant to the exhaust system or on engine parts. These parts may be hot enough to ignite the liquid which then burns without visible flames. Coolant (ethylene glycol) can cause skin irritation and is poisonous if swallowed. Keep out of the reach of children. Do not remove the radiator cap when the engine is still hot. Coolant is under pressure and may cause burns.

 Keep hands and clothes away from the cooling fan as it starts automatically.


Precautions and general warnings


 The clothing of the operator performing the repair operations must be adequate to avoid the risk of injury when working on moving parts (for example, too wide clothes that can get caught).

 Do not wear personal items (e.g. rings, wristwatches, etc.) while performing repairs on the vehicle, and in particular on the electrical system.

 Keep the work area tidy, to avoid that elements left on the ground interfere with the repair operations.

 Clean the floors of the working areas from oil, grease or other residual fluids, to avoid slipping.

 Perform compression or decompression operations on the springs, using only suitable tools to prevent the operations from causing damage to the operator.

 Avoid inhalation of vapours from cleaning fluids: they can be highly toxic. Make sure the work area is properly ventilated.

 Use suitable cleaning products for each operation, making sure that they are approved.

 Wear eye protection when using electrical tools such as drills, grinders or milling machines.

1.2 SYMBOLS USED IN THE MANUAL

Within this manual there will be technical warnings and annotations preceded by the following symbols according to the reference topic:

- Warning regarding the procedure described and the specific safety rules: indicates procedures that must be followed to prevent damage to the vehicle or possible injuries to vehicle repairers.**
- Information note on the procedure described and on the characteristics of the vehicle: it provides useful information to make the procedure easier and clearer.**
- Tightening torque: note showing one or more tightening torques values referred to the procedure described.**
- Measurement data: note showing the values of one or more measurements to be complied with or verified for the procedure described.**
- Equipment: note that informs the user of the need to use particular tools for the procedure described.**
- Consumable: note that illustrates the names, types and/or quantities of consumables (such as oil, fuel, sealants, additives, etc.) to be used for the procedure described.**

All left or right indications refer to the direction of travel of the motorcycle.

This manual contains images illustrating some disassembling sequences, using the following symbols to identify the characteristics of the type of intervention.

- Apply and/or lubricate using engine oil.**
- Apply and/or lubricate using gear oil.**
- Apply and/or lubricate using molybdenum disulphide oil.**
- Apply and/or lubricate using brake fluid.**
- Apply a product that is not specified or specified separately.**
- Apply wheel bearing grease.**
- Apply lithium soap based grease.**
- Apply molybdenum disulphide grease.**
- Apply and/or lubricate using silicone grease.**
- Apply a threadlocker (LOCTITE®).**
- Replace with a new component.**

1.3 BEHAVIOUR AND DRIVING

Some safety tips are given below to avoid damage to people and/or things and to use your vehicle with an easier and safer drive.

Vehicle use

To use the vehicle it is necessary to meet all the law requirements.

It is advisable, in order to acquire a good knowledge of the vehicle, to use the vehicle in areas without traffic or unpopulated stretches of road.

It is advisable to always respect the highway code while driving, to avoid sudden or dangerous manoeuvres keeping both hands on the handlebar and always keeping your feet on the appropriate footrests. Pay close attention while riding.

⚠ Do not ride the vehicle while drunk, under the influence of drugs, after taking certain medicines or in a state of physical fatigue and drowsiness. Failure to comply with these rules is considered extremely dangerous and could cause serious damage to property and/or people.

Evaluate and keep in consideration the conditions of the road surface, visibility and weather. In a situation not suitable for safe driving, reduce the speed and drive carefully.

The braking effect in wet roads without ever having applied the brakes is initially less; under these conditions it is advised to periodically operate the brakes.

In case the vehicle is used on roads dirty with sand, mud, snow mixed with salt, we recommend checking and if necessary cleaning the brake discs with special non-aggressive detergents, so as to prevent the formation of abrasive agglomerates inside the holes and an early wear of the brake pads.

The getting on and off from the vehicle must be in complete freedom of movement and without impediments.

Go up and down only from the left side of the vehicle and with the kickstand down to prevent unbalancing or loss of balance, causing falls or overturns.

⚠ The rider is always the first to go on and the last to go down as he/she has to govern the stability of the vehicle.

Getting on

The passenger must make the movements to get on with the utmost caution, avoiding to unbalance the rider and the vehicle.

Place your feet on the ground and hold the vehicle in running position.

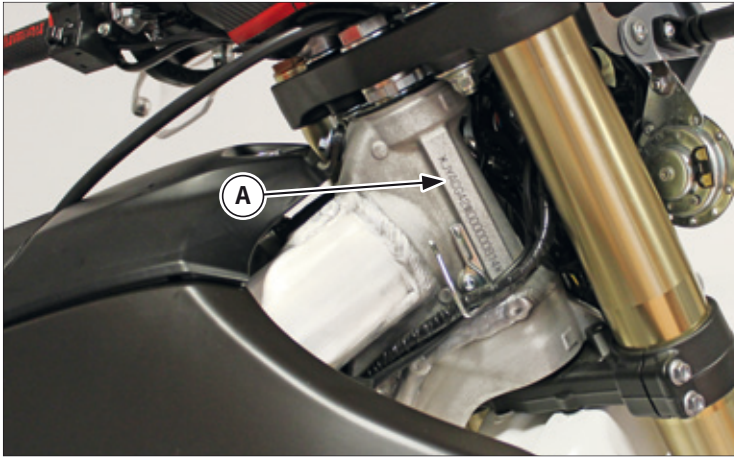
Getting off

Stop the vehicle in an area suitable for stopping or parking, ensuring that the ground is stable and free of obstacles. Fully extend the kickstand using the left foot.

Tilt the vehicle making the kickstand touch the ground. Get off the vehicle and turn the handlebar completely to the left.

⚠ Make sure that the vehicle is stationary and stable.

⚠ Do not lift the vehicle grasping the license plate holder frame, in order to avoid damage. Qui di seguito vengono elencati alcuni consigli sulla sicurezza al fine di evitare danni a persone e/o cose e per utilizzare il proprio veicolo con una guida più tranquilla e sicura.

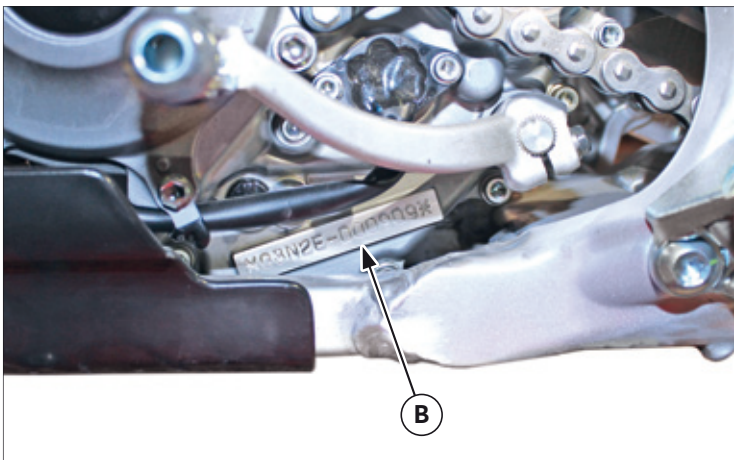


Fantic Motor vehicles are equipped with frame and engine identification numbers.

(i) These numbers that identify the motorcycle model must be mentioned for the request for spare parts.

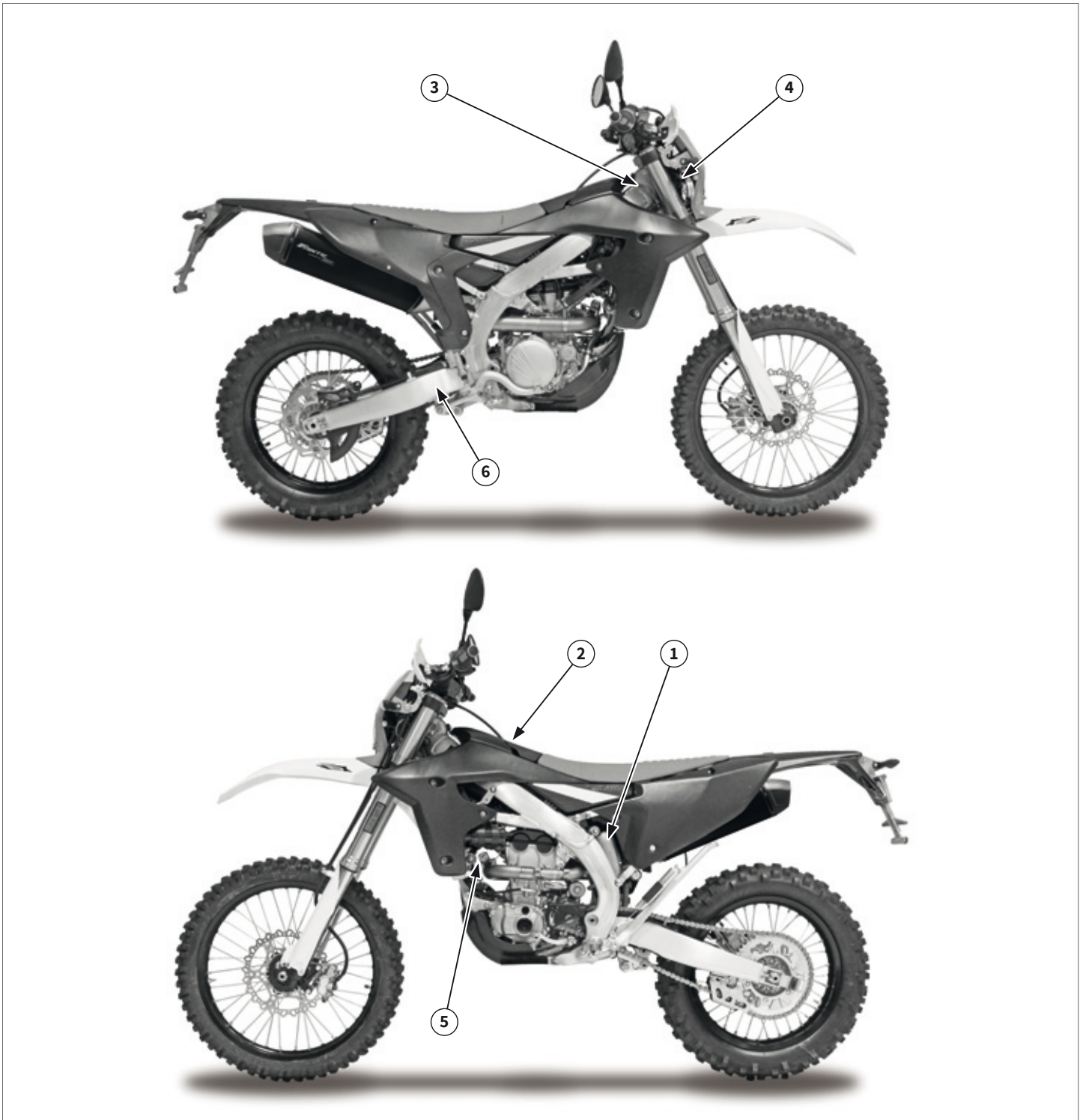
1.4 FRAME NUMBER

The frame number “A” is punched on the steering tube on the right side.



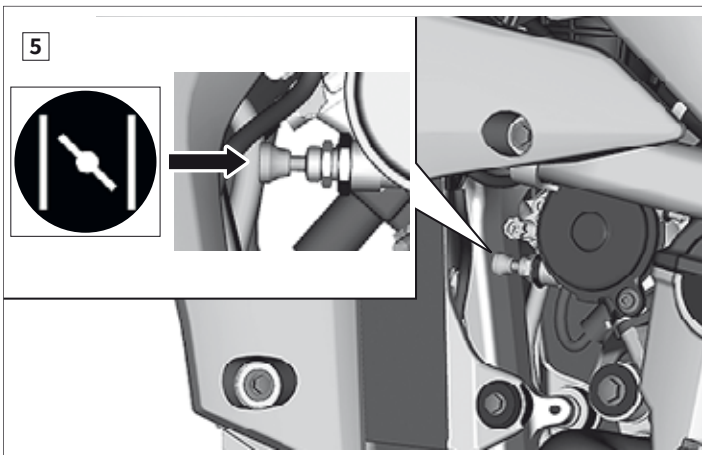
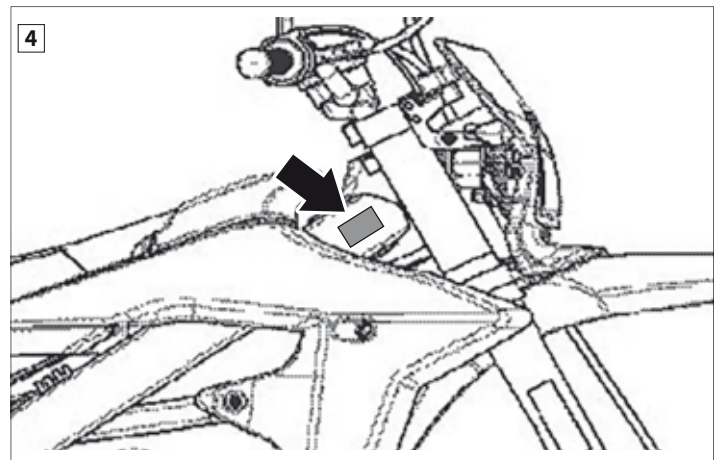
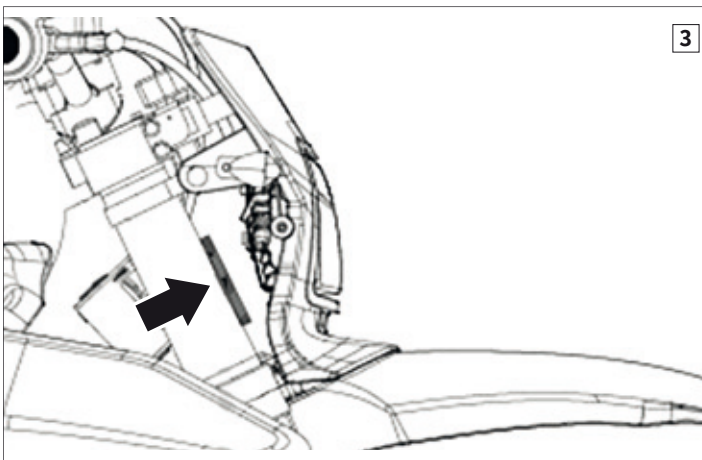
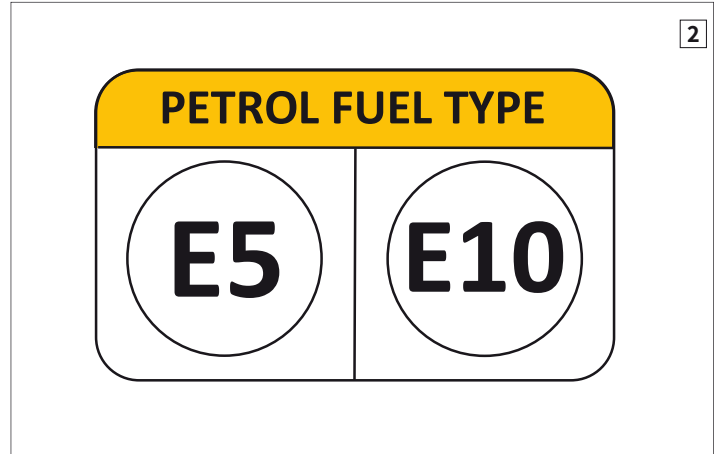
1.5 ENGINE NUMBER

The engine number “B” is punched on the left side of the engine crankcase.

1.6 LOCATION OF IMPORTANT LABELS

1. Pressurised gas hazard label
2. Usable petrol quality label
3. Chassis number punching
4. Vehicle data plate

5. "Choke" symbol
6. Tyre pressure label

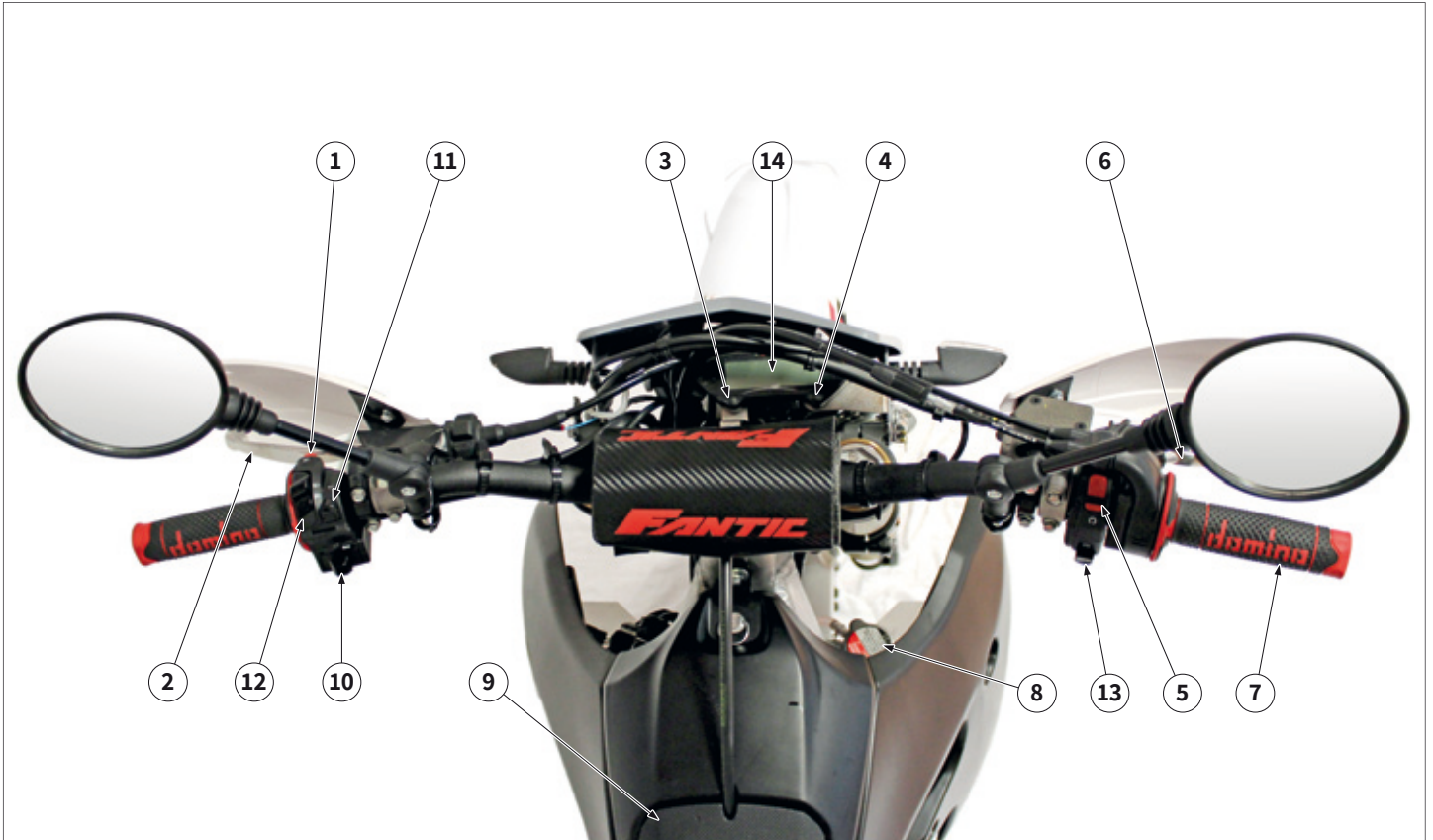


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FANTIC		PRESSURE [kPa]	
AXLE	SIZE	ON-ROAD USE	OFF-ROAD USE
Front	90/90-21	200	100
	80/100-21	200	100
Rear	140/80-18	220	100
	130/90-19	220	100
	120/90-18	220	100

1.7 VEHICLE COMPONENT LOCATION

Handlebar components



Ref.	Component
1	High beam flashing button
2	Clutch lever
3	“SELECT” button
4	“ADJUST” button
5	Engine stop switch
6	Front brake lever
7	Throttle grip
8	Radiator cap
9	Fuel tank cap
10	Speedlight switch
11	Horn button
12	Low beam/high beam light switch
13	Starter switch
14	Dashboard

Right and left side components

1



Ref.	Component
15	Headlight
16	Radiator
17	Rear brake pedal
18	Inspection window for oil level check
19	Coolant drain bolt
20	Front fork
21	Fuel tank

Ref.	Component
22	Air filter
23	Taillight
24	Shift pedal
25	Drive chain

1.8 TECHNICAL DATA

i All the values indicated refer to the approved version.

Technical data	Value(s)
Overall length:	2175 mm (85.6 in)
Overall width:	825 mm (32.5 in)
Overall height:	1270 mm (50.0 in)
Seat height:	955 mm (37.6 in)
Wheelbase:	1480 mm (58.3 in)
Minimum ground clearance:	320 mm (12.60 in)
Weight in running order:	116 kg (255.7 lb)
Weight at full load:	176 kg (388.0 lb)
Maximum allowable weight:	250 kg (551.2 lb)
Engine type	Liquid cooled, 4-stroke, gasoline
Cylinder arrangement	Single cylinder
Displacement	250 cm ³
Bore × stroke	77.0 x 53.6 mm (3.03 x 2.11 in)
Compression ratio:	13.8 : 1
Valve train	DOHC
Starting system	Electric starter
Lubrication system	Wet sump
Transmission oil:	
Recommended type	10W-40, 10W-50, 15W-40, 20W-50 API service SG type or higher, JASO standard Ma
Periodic oil change	0.73 L (0.64 Imp qt, 0.73 US qt)
With oil filter removal	0.75 L (0.66 Imp qt, 0.75 US qt)
Total amount	0.95 L (0.84 Imp qt, 1.00 US qt)
Oil filter:	
Oil filter type	Cartridge
Cooling system:	
Coolant quantity (including all routes)	0.93 L (0.82 Imp qt, 0.98 US qt)
Radiator cap valve opening pressure	107.9–137.3 kPa (1.08–1.37 kgf/cm ² , 15.6–19.9 psi)
Air filter oil	Air Filter Special Oil
Brake oil	Synthetic Brake Fluid DOT 4
Air filter	Wet element
Fuel:	
Type	Premium unleaded gasoline only
Tank capacity	7.9 L (1.70 Imp gal, 2.10 US gal)
Reserve amount	2.0 L (0.44 Imp gal, 0.53 US gal)
Fuel pump:	
Pump type	Electrical
Maximum consumption amperage	2.4 A
Fuel injector (resistance)	12.0 Ω
Throttle body	BAK1 00
Spark plug:	
Type/Manufacturer	NGK/LMAR8E-J
Gap	0.6–0.7 mm (0.024–0.028 in)
Clutch type	Wet, multiple-disc
Primary reduction system	Gear
Primary reduction ratio	3.353 (57/17)

Technical data	Value(s)
Final drive	Chain
Secondary reduction ratio	3.923 (51/13)
Transmission type	Constant mesh, 6-speed
Operation	Left foot operation
Gear ratio:	
1a	2.385 (31/13)
2a	1.813 (29/16)
3a	1.444 (26/18)
4a	1.143 (24/21)
5a	0.957 (22/23)
6a	0.815 (22/27)
Seats	1
Frame	Semi double cradle
Caster angle	27.2°
Trail	116 mm (4.6 in)
Wheels (original equipment):	
Front	90/90-21
Rear	130/90-18
Front inflation pressure (road use)	2 bar (200 kPa - 29 PSI)
Rear inflation pressure (road use)	2,2 bar (220 kPa - 32 PSI)
Front/rear inflation pressure ("Racing" use)	1 bar (100 kPa - 15 PSI)
Wheels (alternative sizes):	
Front	80/100-21
Rear	140/80-18, 120/90-18
Front inflation pressure (road use)	2 bar (200 kPa - 29 PSI)
Rear inflation pressure (road use)	2,5 bar (250 kPa - 36 PSI)
Front/rear inflation pressure ("Racing" use)	1 bar (100 kPa - 15 PSI)
Brake:	
Front brake type	Hydraulic single disc brake
Operation	Right hand operation
Rear brake type	Hydraulic single disc brake
Operation	Right foot operation
Suspension:	
Front suspension	Telescopic fork
Rear suspension	Swingarm (link suspension)
Shock absorber:	
Front shock absorber	Coil spring/hydraulic damper
Rear shock absorber	Coil spring/gas-hydraulic damper
Wheel travel:	
Front wheel travel	310 mm (12.2 in)
Rear wheel travel	317 mm (12.5 in)
Ignition system	TCI
Turn signals	12 V - 6 W
High/low beam light	Led
Position/brake light	Led
License plate light	Led
Fuses:	
Battery fuse	15.0 A
Electrical wiring fuse	5.0 A

1.9 TIGHTENING TORQUES

Engine tightening torques

i “◊” = marked portion shall be checked for torque tightening after break-in or before each race.

Item	Thread size	Quantity	Tightening torque	Remarks
Camshaft cap bolt	M6	8	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Spark plug	M10	1	13 Nm (1.3 kgf•m, 9.6 lb•ft)	
Cylinder head stud bolt (exhaust pipe)	M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Oil passage plug (cylinder head)	M6	1	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Cylinder head bolt	M9	4	See tip i at page 20.	
Cylinder head nut	M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Cylinder head cover bolt	M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Cylinder bolt	M6	1	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Oil pressure check bolt	M6	1	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Balancer weight plate screw	M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Balancer weight gear nut	M14	1	50 Nm (5.0 kgf•m, 37 lb•ft)	
Balancer nut	M10	1	38 Nm (3.8 kgf•m, 28 lb•ft)	
Timing chain guide stopper plate (exhaust side)	M6	1	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Timing chain tensioner cap bolt	M6	1	6 Nm (0.6 kgf•m, 4.4 lb•ft)	
Timing chain tensioner bolt	M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Coolant drain bolt	M6	1	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Radiator hose clamp screw	M6	8	1.5 Nm (0.15 kgf•m, 1.1 lb•ft)	
Radiator bolt	M6	4	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Radiator pipe joint bolt	M6	1	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Radiator fan bolt	M6	3	8 Nm (0.8 kgf•m, 5.9 lb•ft)	
Water pump housing cover bolt	M6	4	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Water pump impeller	M8	1	14 Nm (1.4 kgf•m, 10 lb•ft)	
Oil pump bolt	M5	2	5 Nm (0.5 kgf•m, 3.7 lb•ft)	
Oil pump cover screw	M4	1	2.0 Nm (0.20 kgf•m, 1.5 lb•ft)	
Oil strainer bolt	M6	1	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Throttle cable cover bolt	M5	1	3.5 Nm (0.35 kgf•m, 2.6 lb•ft)	
Throttle body joint bolt	M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Throttle body joint clamp screw	M5	1	3.0 Nm (0.30 kgf•m, 2.2 lb•ft)	
Air filter case joint clamp screw	M5	1	3.0 Nm (0.30 kgf•m, 2.2 lb•ft)	
Air filter case bolt	M6	3	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Clutch cable locknut (clutch cable adjuster)	M6	1	4.3 Nm (0.43 kgf•m, 3.2 lb•ft)	
Clutch cable locknut (engine side)	M8	1	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Exhaust pipe nut	M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Exhaust pipe protector screw	M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Exhaust pipe bracket bolt	M8	1	20 Nm (2.0 kgf•m, 15 lb•ft)	
Silencer bolt (front)	M8	1	30 Nm (3.0 kgf•m, 22 lb•ft)	
Silencer bolt (rear)	M8	1	30 Nm (3.0 kgf•m, 22 lb•ft)	
Exhaust pipe clamp bolt	M8	2	12 Nm (1.2 kgf•m, 8.9 lb•ft)	
Spark arrester bolt	M5	4	9 Nm (0.9 kgf•m, 6.6 lb•ft)	
Silencer cap screw	M5	6	5 Nm (0.5 kgf•m, 3.7 lb•ft)	

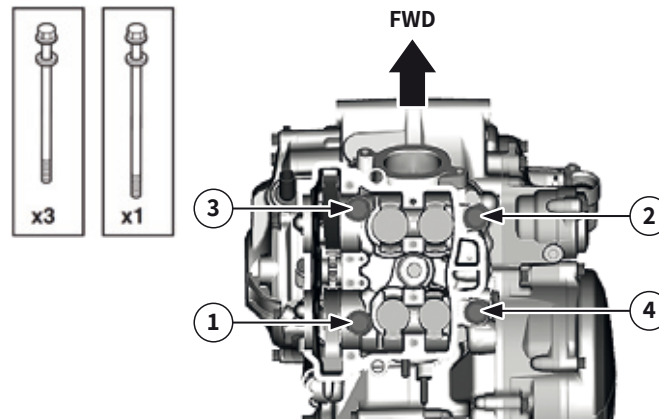
Item	Thread size	Quantity	Tightening torque	Remarks
Oil nozzle bolt	M5	1	5 Nm (0.5 kgf•m, 3.7 lb•ft)	
Engine oil drain bolt	M10	1	20 Nm (2.0 kgf•m, 15 lb•ft)	
Crankcase bolt	M6	12	12 Nm (1.2 kgf•m, 8.9 lb•ft)	
Clutch cable holder bolt	M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Crankshaft end accessing screw	M36	1	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Timing mark accessing screw	M14	1	6 Nm (0.6 kgf•m, 4.4 lb•ft)	
Drive sprocket cover bolt	M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Crankcase bearing cover plate screw	M8	4	22 Nm (2.2 kgf•m, 16 lb•ft)	
Bearing plate cover bolt (left side of the drive axle)	M6	2	12 Nm (1.2 kgf•m, 8.9 lb•ft)	
Plate bolt	M6	4	12 Nm (1.2 kgf•m, 8.9 lb•ft)	
Clutch cover bolt	M6	6	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Crankcase cover bolt (left)	M6	7	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Crankcase cover bolt (right)	M6	9	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Oil filter element cover bolt	M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Starter clutch screw	M6	8	12 Nm (1.2 kgf•m, 8.9 lb•ft)	
Primary drive gear nut	M16	1	105 Nm (10.5 kgf•m, 77 lb•ft)	
Clutch spring bolt	M6	6	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Clutch boss nut	M20	1	95 Nm (9.5 kgf•m, 70 lb•ft)	Stake.
Drive sprocket nut	M18	1	75 Nm (7.5 kgf•m, 55 lb•ft)	Use a lock washer.
Segment	M8	1	30 Nm (3.0 kgf•m, 22 lb•ft)	
Shift guide bolt	M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Stopper lever bolt	M6	1	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Shift pedal bolt	M6	1	12 Nm (1.2 kgf•m, 8.9 lb•ft)	
Generator rotor nut	M12	1	65 Nm (6.5 kgf•m, 48 lb•ft)	
Stator coil screw	M5	3	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Crankshaft position sensor bolt	M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Stator coil assembly lead holder bolt	M5	1	8 Nm (0.8 kgf•m, 5.9 lb•ft)	
Coolant temperature sensor	M10	1	14 Nm (1.4 kgf•m, 10 lb•ft)	
Gear position switch bolt	M5	2	3.5 Nm (0.35 kgf•m, 2.6 lb•ft)	
Rectifier/regulator bolt	M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
ECU bolt	M5	2	3.8 Nm (0.38 kgf•m, 2.8 lb•ft)	
Ignition coil bolt	M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Starter motor bolt	M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Nut (holder)	M6	1	8 Nm (0.8 kgf•m, 5.9 lb•ft)	
Throttle position sensor screw	M5	1	3.5 Nm (0.35 kgf•m, 2.6 lb•ft)	
Intake air pressure sensor screw	M6	1	3.5 Nm (0.35 kgf•m, 2.6 lb•ft)	

Tip ①: Cylinder head bolt

- Tighten all the cylinder head tightening bolts evenly in the tightening order to 30 Nm (3.0 kgf•m, 22 lb•ft).
- Remove the one bolt according to the tightening order. When doing so, do not remove the other bolts.
- Retighten the bolt to 15 Nm (1.5 kgf•m, 11 lb•ft), and then tighten it further to reach the specified angle (60°).
- Remove the remaining bolts one by one in the same manner and retighten them.
- Finally, tighten all the bolts to reach the specified angle (60°).

Total tightening angle: 60° + 60° = 120°.

The first and second time, be sure to apply molybdenum disulfide oil to the bolt threads and seats as well as to both sides of the lock washers.



Chassis tightening torques

“◇” = marked portion shall be checked for torque tightening after break-in or before each race.

Item	Thread size	Quantity	Tightening torque	Remarks
Upper bracket pinch bolt	◇ M8	4	21 Nm (2.1 kgf•m, 15 lb•ft)	
Lower bracket pinch bolt	◇ M8	4	21 Nm (2.1 kgf•m, 15 lb•ft)	
Steering stem nut	◇ M24	1	145 Nm (14.5 kgf•m, 107 lb•ft)	
Upper handlebar holder bolt	◇ M8	4	28 Nm (2.8 kgf•m, 21 lb•ft)	
Lower handlebar holder nut	◇ M10	2	40 Nm (4.0 kgf•m, 30 lb•ft)	
Engine stop switch screw	M3	1	0.5 Nm (0.05 kgf•m, 0.37 lb•ft)	
Start switch	M3	1	0.5 Nm (0.05 kgf•m, 0.37 lb•ft)	
Mode switch (Except for Canada)	M3	1	1.3 Nm (0.13 kgf•m, 0.95 lb•ft)	
Lower ring nut	◇ M28	1	See tip ② at page 22.	
Damper assembly (front fork)	M51	2	30 Nm (3.0 kgf•m, 22 lb•ft)	
Inner tube and Adjuster	M22	2	55 Nm (5.5 kgf•m, 41 lb•ft)	
Base valve (front fork)	M42	2	28 Nm (2.8 kgf•m, 21 lb•ft)	
Adjuster (damper assembly)	M12	2	29 Nm (2.9 kgf•m, 21 lb•ft)	
Bleed screw (front fork)	M5	2	1.3 Nm (0.13 kgf•m, 0.95 lb•ft)	
Front fork protector bolt	◇ M6	6	5 Nm (0.5 kgf•m, 3.7 lb•ft)	
Speed sensor bolt	M6	1	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Plate bolt	◇ M5	2	3.8 Nm (0.38 kgf•m, 2.8 lb•ft)	
Throttle grip cap screw	M5	2	3.8 Nm (0.38 kgf•m, 2.8 lb•ft)	
Clutch lever holder bolt	M5	2	3.8 Nm (0.38 kgf•m, 2.8 lb•ft)	
Clutch lever nut	M6	1	4.0 Nm (0.40 kgf•m, 3.0 lb•ft)	
Front brake master cylinder holder bolt	◇ M6	2	9 Nm (0.9 kgf•m, 6.6 lb•ft)	
Front brake master cylinder reservoir cap screw	M4	2	1.5 Nm (0.15 kgf•m, 1.1 lb•ft)	
Front brake lever pivot bolt	M6	1	6 Nm (0.6 kgf•m, 4.4 lb•ft)	
Front brake lever pivot nut	M6	1	6 Nm (0.6 kgf•m, 4.4 lb•ft)	

Item	Thread size	Quantity	Tightening torque	Remarks
Locknut (front brake lever position)	M6	1	5 Nm (0.5 kgf•m, 3.7 lb•ft)	
Front brake hose union bolt	◇ M10	2	30 Nm (3.0 kgf•m, 22 lb•ft)	
Front brake caliper bolt	◇ M8	2	28 Nm (2.8 kgf•m, 21 lb•ft)	
Front brake pad pin	M10	1	17 Nm (1.7 kgf•m, 13 lb•ft)	
Front brake pad pin plug	M10	1	2.5 Nm (0.25 kgf•m, 1.8 lb•ft)	
Front brake caliper bleed screw	◇ M8	1	6 Nm (0.6 kgf•m, 4.4 lb•ft)	
Front wheel axle nut	◇ M18	1	115 Nm (11.5 kgf•m, 85 lb•ft)	
Front wheel axle pinch bolt	◇ M8	4	21 Nm (2.1 kgf•m, 15 lb•ft)	
Front brake disc bolt	◇ M6	6	12 Nm (1.2 kgf•m, 8.9 lb•ft)	
Rear brake disc bolt	◇ M6	6	12 Nm (1.2 kgf•m, 8.9 lb•ft)	
Footrest bracket bolt	M10	4	55 Nm (5.5 kgf•m, 41 lb•ft)	
Sidestand bolt	M10	1	35 Nm (3.5 kgf•m, 26 lb•ft)	
Rear brake pedal bolt	◇ M8	1	26 Nm (2.6 kgf•m, 19 lb•ft)	
Rear brake pedal adjusting locknut	M6	1	6 Nm (0.6 kgf•m, 4.4 lb•ft)	
Rear brake master cylinder bolt	◇ M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Rear brake master cylinder reservoir cap bolt	M4	2	1.5 Nm (0.15 kgf•m, 1.1 lb•ft)	
Rear brake hose union bolt	◇ M10	2	30 Nm (3.0 kgf•m, 22 lb•ft)	
Rear brake caliper bleed screw	◇ M8	1	6 Nm (0.6 kgf•m, 4.4 lb•ft)	
Rear brake pad pin	M10	1	17 Nm (1.7 kgf•m, 13 lb•ft)	
Rear brake pad pin plug	M10	1	2.5 Nm (0.25 kgf•m, 1.8 lb•ft)	
Rear wheel axle nut	◇ M20	1	125 Nm (12.5 kgf•m, 92 lb•ft)	
Drive chain puller locknut	M8	2	21 Nm (2.1 kgf•m, 15 lb•ft)	
Rear wheel sprocket nut	◇ M8	6	50 Nm (5.0 kgf•m, 37 lb•ft)	
Nipple (spoke)	◇ —	72	2.5 Nm (0.25 kgf•m, 1.8 lb•ft)	
Bolt (rear brake disc cover)	◇ M6	2	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Rear brake caliper protector bolt	◇ M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Engine mounting bolt (upper side)	◇ M10	2	45 Nm (4.5 kgf•m, 33 lb•ft)	
Engine mounting bolt (front side)	◇ M10	1	55 Nm (5.5 kgf•m, 41 lb•ft)	
Engine mounting bolt (lower side)	◇ M10	1	53 Nm (5.3 kgf•m, 39 lb•ft)	
Engine bracket bolt (upper side)	◇ M8	4	34 Nm (3.4 kgf•m, 25 lb•ft)	
Engine bracket bolt (front side)	◇ M8	4	34 Nm (3.4 kgf•m, 25 lb•ft)	
Rear frame bolt	◇ M8	4	38 Nm (3.8 kgf•m, 28 lb•ft)	
Engine guard bolt	◇ M6	3	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Pivot shaft nut	◇ M16	1	85 Nm (8.5 kgf•m, 63 lb•ft)	
Rear shock absorber assembly upper nut	◇ M10	1	56 Nm (5.6 kgf•m, 41 lb•ft)	
Rear shock absorber assembly lower nut	◇ M10	1	53 Nm (5.3 kgf•m, 39 lb•ft)	
Locknut (rear shock absorber lock- nut)	M60	1	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Relay arm nut (swingarm side)	◇ M14	1	70 Nm (7.0 kgf•m, 52 lb•ft)	
Connecting arm nut (relay arm side)	◇ M14	1	80 Nm (8.0 kgf•m, 59 lb•ft)	
Connecting arm nut (frame side)	◇ M14	1	80 Nm (8.0 kgf•m, 59 lb•ft)	
Brake hose holder screw	◇ M5	4	3.5 Nm (0.35 kgf•m, 2.6 lb•ft)	
Drive chain tensioner bolt (upper side)	M8	1	16 Nm (1.6 kgf•m, 12 lb•ft)	
Drive chain tensioner bolt (lower side)	M8	1	16 Nm (1.6 kgf•m, 12 lb•ft)	
Bolt (drive chain support)	M6	1	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Drive chain support nut	M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Drive chain guide bolt	M5	3	4.0 Nm (0.40 kgf•m, 3.0 lb•ft)	

Item	Thread size	Quantity	Tightening torque	Remarks
Bolt (rear frame cover) (left)	◇ M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Fuel tank bolt (front side)	◇ M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Fuel tank bolt (boss)	◇ M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Fuel tank bolt (rear side)	M6	1	9 Nm (0.9 kgf•m, 6.6 lb•ft)	
Fuel tank bracket bolt	M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Fuel pump bolt	◇ M5	5	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Screw (fuel inlet pipe)	M5	2	3.5 Nm (0.35 kgf•m, 2.6 lb•ft)	
Bolt (fuel tank cap cover)	M6	2	4.0 Nm (0.40 kgf•m, 3.0 lb•ft)	
Seat set bracket screw	M6	1	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Seat bolt	◇ M8	2	22 Nm (2.2 kgf•m, 16 lb•ft)	
Side cover bolt (left)	◇ M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Side cover bolt (right)	◇ M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Air scoop bolt (frame)	◇ M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Air scoop bolt (fuel tank)	◇ M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Air scoop bolt (radiator guard)	◇ M6	4	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Front fender bolt	◇ M6	4	10 Nm (1.0 kgf•m, 7.4 lb•ft)	
Rear fender bolt (front side)	◇ M6	4	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Rear fender bolt (rear side)	◇ M6	2	16 Nm (1.6 kgf•m, 12 lb•ft)	
Headlight body and headlight stay bolt	M6	2	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Multi-function meter nut	M5	2	3.8 Nm (0.38 kgf•m, 2.8 lb•ft)	
Multi-function meter bracket bolt	M6	1	7 Nm (0.7 kgf•m, 5.2 lb•ft)	
Front brake hose guide and head light stay bolt	M5	1	3.8 Nm (0.38 kgf•m, 2.8 lb•ft)	
Screw (mud flap)	◇ —	2	1.3 Nm (0.13 kgf•m, 0.95 lb•ft)	
Frame ground bolt (negative battery lead)	M5	1	7 Nm (0.7 kgf•m, 5.2 lb•ft)	

Tip ②: Lower ring nut

- First, tighten the lower ring nut approximately 38 Nm (3.8 kgf•m, 28 lb•ft) by using the steering nut wrench, then loosen the lower ring nut one turn.
- Retighten the lower ring nut 7 Nm (0.7 kgf•m, 5.2 lb•ft).

Electrical tightening torques

Item	Thread size	Quantity	Tightening torque	Remarks
Stator	M5	3	10 Nm (1.0 m•kg, 7.4 ft•lb)	
Rotor	M12	1	65 Nm (6.5 m•kg, 48 ft•lb)	
Ignition coil	M6	2	7 Nm (0.7 m•kg, 7.2 ft•lb)	

1.10 MAINTENANCE LIMITS

Engine

Item	Standard	Limit
Cylinder head: Warp limit	-	0.05 mm (0.0020 in)
Cylinder: Bore size	77.000-77.010 mm (3.0315-3.0319 in)	77.060 mm (3.0339 in)
Camshaft: Camshaft cap inside diameter Camshaft journal diameter Camshaft-journal-to-camshaft-cap clearance Camshaft lobe dimensions: Lobe height (Intake) Lobe height (Exhaust) Camshaft runout limit	22.000-22.021 mm (0.8861-0.8670 in) 21.959-21.972 mm (0.8645-0.8650 in) 0.028-0.062 mm (0.0011-0.0024 in) 32.230-32.330 mm (1.2689-1.2728 in) 33.850-33.950 mm (1.3327-1.3366 in) -	- - 0.080 mm (0.0032 in) 32.130 mm (1.2650 in) 33.750 mm (1.3287 in) 0.030 mm (0.0012 in)
Valve, valve seat, valve guide: Valve clearance (cold): Intake Exhaust Valve dimensions: Valve seat contact width (intake) Valve seat contact width (exhaust) Valve stem diameter (intake) Valve stem diameter (exhaust) Valve guide inside diameter (intake) Valve guide inside diameter (exhaust) Valve-stem-to-valve-guide clearance (intake) Valve-stem-to-valve-guide clearance (exhaust) Valve stem runout	0.12-0.19 mm (0.0047-0.0075 in) 0.17-0.24 mm (0.0067-0.0094 in) 0.90-1.10 mm (0.0354-0.0433 in) 0.90-1.10 mm (0.0354-0.0433 in) 4.975-4.990 mm (0.1959-0.1965 in) 4.460-4.475 mm (0.1756-0.1762 in) 5.000-5.012 mm (0.1969-0.1973 in) 4.500-4.512 mm (0.1772-0.1776 in) 0.010-0.037 mm (0.0004-0.0015 in) 0.025-0.052 mm (0.0010-0.0020 in) -	- - 1.6 mm (0.06 in) 1.6 mm (0.06 in) 4.945 mm (0.1947 in) 4.430 mm (0.1744 in) - - 0.080 mm (0.0032 in) 0.100 mm (0.0039 in) 0.010 mm (0.0004 in)
Valve spring: Free length (intake) Free length (exhaust)	36.78 mm (1.45 in) 35.60 mm (1.40 in)	34.94 mm (1.38 in) 33.82 mm (1.33 in)
Piston: Piston-to-cylinder clearance Diameter Measuring point (from piston skirt bottom)	0.030-0.055 mm (0.0012-0.0022 in) 76.955-76.970 mm (3.0297-3.0303 in) 4.0 mm (0.16 in)	- - -
Piston pin: Piston pin bore inside diameter Piston pin outside diameter Piston-pin-to-piston-pin-bore clearance	16.002-16.013 mm (0.6300-0.6304 in) 15.991-16.000 mm (0.6296-0.6299 in) 0.002-0.022 mm (0.0001-0.0009 in)	16.043 mm (0.6316 in) 15.971 mm (0.6288 in) -
Piston ring (top ring): End gap (installed) Ring side clearance (installed)	0.15-0.25 mm (0.0059-0.0098 in) 0.030-0.065 mm (0.0012-0.0026 in)	0.50 mm (0.0197 in) 0.115 mm (0.0045 in)
Crankshaft: Crank assembly width Runout limit	55.93-56.00 mm (2.202-2.205 in) -	- 0.030 mm (0.0012 in)

Item	Standard	Limit
Clutch:		
Clutch lever free play	7.0–12.0 mm (0.28–0.47 in)	–
Friction plate 1 thickness	2.70–2.90 mm (0.106–0.114 in)	2.60 mm (0.102 in)
Plate quantity	2 pcs	–
Friction plate 2 thickness	2.72–2.88 mm (0.107–0.113 in)	2.62 mm (0.103 in)
Plate quantity	6 pcs	–
Clutch plate thickness	1.50–1.70 mm (0.059–0.067 in)	–
Plate quantity	7 pcs	–
Warpage limit	–	0.10 mm (0.004 in)
Clutch spring free length	44.00 mm (1.73 in)	41.80 mm (1.65 in)
Push rod bending limit	–	0.30 mm (0.012 in)
Transmission:		
Main axle deflection limit	–	0.08 mm (0.0032 in)
Drive axle deflection limit	–	0.08 mm (0.0032 in)
Shifter:		
Shifting type	Cam drum and guide bar	–
Guide bar bending limit	–	0.050 mm (0.0020 in)
Kickstarter type:		
Kick clip friction force	Kick and mesh P=7.80–11.80 N (0.80–1.20 kg, 1.75–2.65 lb)	–
Air filter oil grade (oiled filter)	Foam air filter oil or other quality foam air filter oil	–
Idling condition:		
Engine idling speed	1900–2100 r/min.	
Exhaust gas sampling point	Sampling port on the exhaust pipe	
Coolant temperature	70–80°C (158–176°F)	
Fuel line pressure (at idle)	300–390 kPa (3.0–3.9 kgf/cm ² , 43.5–56.6 psi)	
CO%	4.0–5.0 %	
Intake vacuum	43.7 kPa (328 mmHg, 12.9 inHg)	
Throttle grip free play	3.0–6.0 mm (0.12–0.24 in)	
Cooling:		
Radiator core size:		
Width	107.8 mm (4.24 in)	–
Height (left)	240.0 mm (9.45 in)	–
Height (right)	220.0 mm (8.66 in)	–
Thickness	32.0 mm (1.26 in)	–
Radiator cap opening pressure	93.3–122.7 kPa (0.93–1.23 kg/cm ² , 13.5–17.8 psi)	–
Radiator capacity (total)	0.56 L (0.49 Imp qt, 0.59 US qt)	–
Water pump:		
Type	Single suction centrifugal pump	–

Chassis

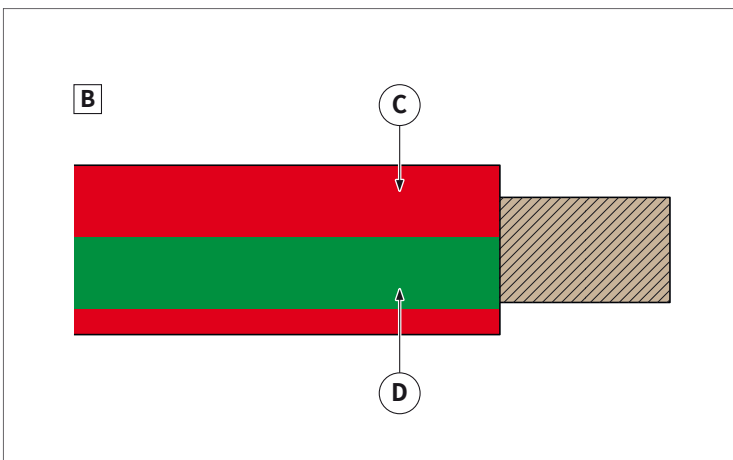
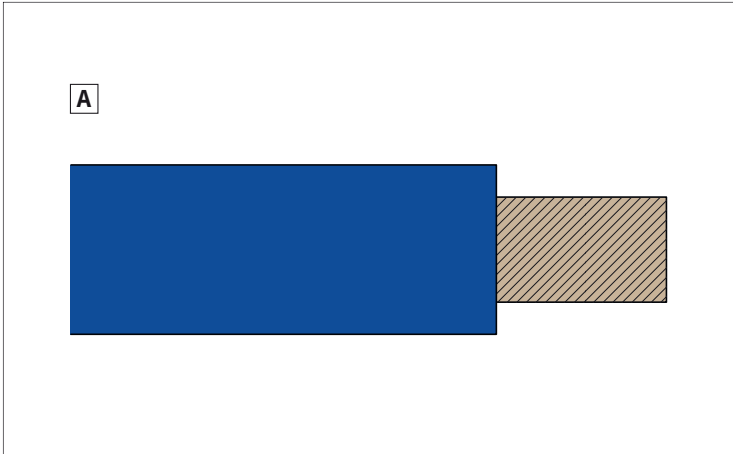
Item	Standard	Limit
Steering system:		
Steering bearing type	Taper roller bearing	–

Item	Standard	Limit
Front suspension: Front fork travel Fork spring free length Optional spring Oil capacity Oil grade Inner tube bending limit	310.0 mm (12.2 in) 497.0 mm (19.57 in) Si 501.0 cm ³ (16.94 Imp oz, 17.67 US oz) Yamaha Suspension Oil S1 -	- 492.0 mm (19.37 in) - - - 0.2 mm (0.01 in)
Rebound damping: Adjusting system Unit for adjustment Adjustment value from the start position (Soft) Adjustment value from the start position (STD) Adjustment value from the start position (Hard)	Mechanical adjustable type Click 20 8 0	- - - -
Compression damping: Adjusting system Unit for adjustment Adjustment value from the start position (Soft) Adjustment value from the start position (STD) Adjustment value from the start position (Hard)	Mechanical adjustable type Click 20 11 0	- - - -
Rear suspension: Spring preload: Adjusting system Adjustment value (Soft) Adjustment value (STD) Adjustment value (Hard)	Mechanical adjustable type 1.5 mm (0.06 in) 7.0 mm (0.28 in) 18.0 mm (0.71 in)	- - -
Rebound damping: Adjusting system Unit for adjustment Adjustment value from the start position (Soft) Adjustment value from the start position (STD) Adjustment value from the start position (Hard)	Mechanical adjustable type Click 30 11 0	- - -
Compression damping: Adjusting system Fast compression damping: Unit for adjustment Adjustment value from the start position (Soft) Adjustment value from the start position (STD) Adjustment value from the start position (Hard)	Mechanical adjustable type Turn 2 1 0	- - -

Item	Standard	Limit
Slow compression damping: Unit for adjustment	Click	
Adjustment value from the start position (Soft)	20	-
Adjustment value from the start position (STD)	8	-
Adjustment value from the start position (Hard)	0	-
Swingarm:		
Swingarm end free play limit (radial)	-	1.0 mm (0.04 in)
Swingarm end free play limit (axial)	-	0.2–0.9 mm (0.01–0.04 in)
Wheel:		
Front wheel type	Spoke wheel	-
Rear wheel type	Spoke wheel	-
Front rim size/material	21 × 1.60/Aluminium	-
Rear rim size/material:	18 × 2.15/Aluminium	-
Rim runout limit:		
Radial	-	2.0 mm (0.08 in)
Lateral	-	2.0 mm (0.08 in)
Front wheel axle bending limit	-	0.50 mm (0.02 in)
Rear wheel axle bending limit	-	0.50 mm (0.02 in)
Drive chain:		
Type	DID520MXV5-114LL	-
Number of links	114	-
Chain slack	58.0–68.0 mm (2.28–2.28 in)	-
Chain length (15 links)	-	239.3 mm (9.42 in)
Front brake:		
Front brake lever free play	2.7–11.1 mm (0.11–0.44 in)	-
Disc outside diameter × thickness	270.0 × 3.0 mm (10.63 in × 0.12 in)	-
Brake disc thickness limit	2.5 mm (0.10 in)	-
Brake disc runout limit (as measured on wheel)	0.15 mm (0.0059)	1.0 mm (0.04 in)
Master cylinder inside diameter	9.52 mm (0.37 in)	-
Caliper cylinder inside diameter (Left)	22.65 mm, 22.65 mm (0.89 in, 0.89 in)	-
Specified brake fluid	DOT 4	
Rear brake:		
Brake pedal position	5.0 mm (0.20 in)	-
Disc outside diameter × thickness	245.0 × 4.0 mm (9.65 in × 0.16 in)	-
Brake disc thickness limit	3.5 mm (0.14 in)	-
Brake disc runout limit (as measured on wheel)	0.15 mm (0.0059)	1.0 mm (0.04 in)
Master cylinder inside diameter	11.0 mm (0.43 in)	-
Caliper cylinder inside diameter	25.40 mm (1.00 in)	-
Specified brake fluid	DOT 4	

Electrical

Item	Standard	Limit
Tensione impianto	12 V	-
Ignition system:		
Ignition system	TCI	-
Ignition timing (B.T.D.C.)	7.0–13.0 gradi/2000 giri/min.	-
Ignition coil:		
Primary coil resistance	2.16–2.64 Ω	-
Secondary coil resistance	8.64–12.96 Ω	-
Spark plug cap:		
Resistance	7.50–12.50 k Ω	-
Lean angle sensor:		
Operating angle	45°	-
Charging system:		
Charging system	AC magneto	-
Standard output	14.0 V, 10.0 A at 5000 r/min.	-
Stator coil resistance	0.368–0.552 Ω	-
Rectifier / regulator:		
Regulator type	Single-phase	-
Regulated voltage (DC)	14.0–14.8 V	-
Indicator light:		
Fuel level warning light	1.7 W	-
Engine trouble warning light	1.7 W	-
Starter motor:		
Brush overall length	7.0 mm (0.28 in)	3.5 mm (0.14 in)
Brush spring force	3.92–5.88 N (400–600 gf, 14.11–21.17 oz)	-
Mica undercut (depth)	-	1.50 mm (0.06 in)
Fuel injection sensor:		
Crankshaft position sensor resistance	228–342 Ω	-
Intake air temperature sensor resistance	5400–6600 Ω a 0°C (5400–6600 Ω a 32°F)	-
Intake air temperature sensor resistance	289–391 Ω a 80°C (289–391 Ω a 176°F)	-
Coolant temperature sensor resistance	2513–2777 Ω a 20°C (2513–2777 Ω a 68°F)	-
Coolant temperature sensor resistance	210–221 Ω a 100°C (210–221 Ω a 212°F)	-



1.11 ELECTRICAL SYSTEM DIAGRAM

Cables colour coding

i The colour of a cable can be an “A” colour or two “B” colours.

i The cable which has two colours is identified by the first colour code (primary “C” or colour of the sheath) followed by the second colour code (secondary “D”): the codes are separated by a dash “-”.

i Examples:
 • case “A” : Blue = L ;
 • case “B” : Red (primary) and Green (secondary) = RV.

The following table shows the codes used in the wiring diagram to identify the colour of the cable.

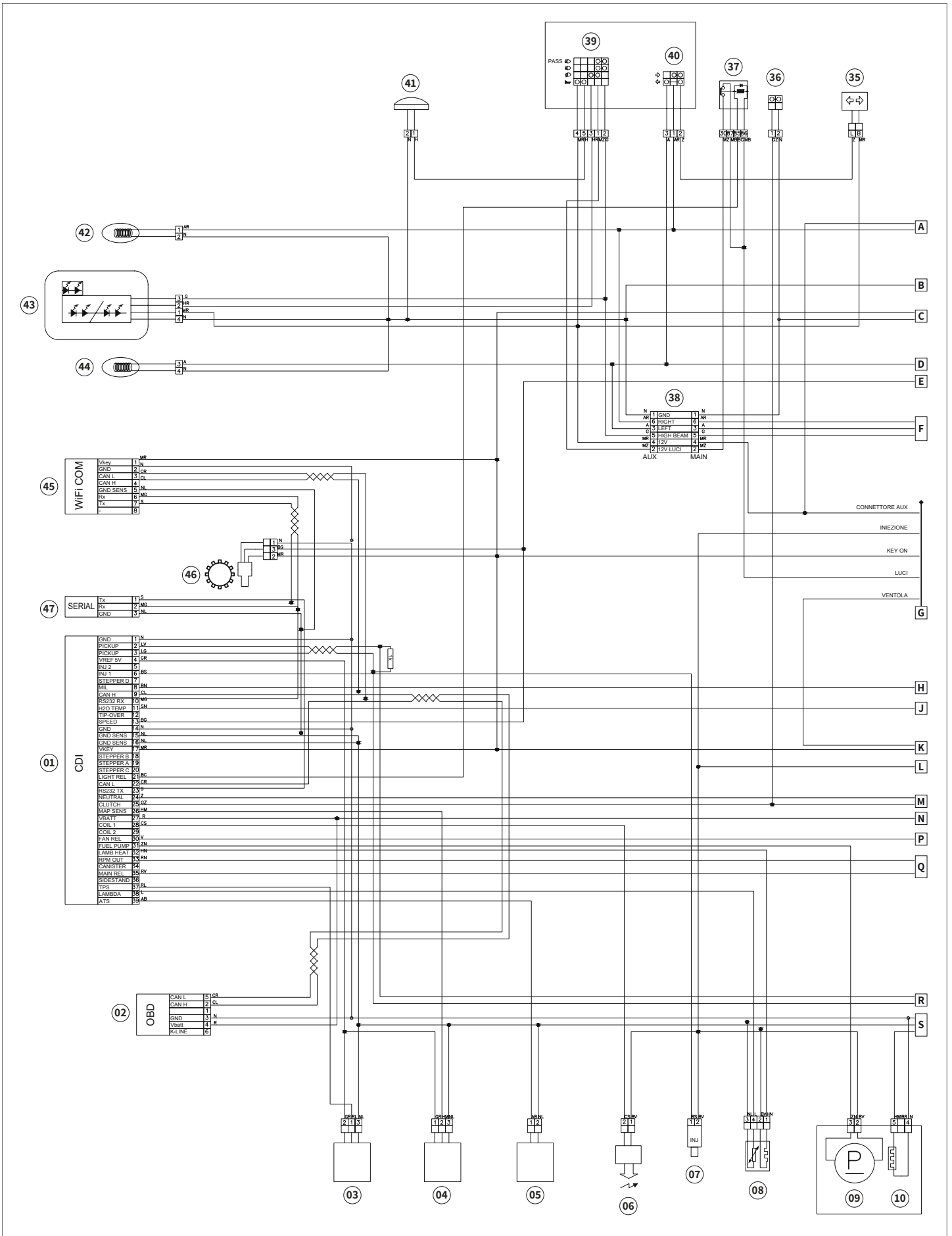
Codice	Colore dei cavi
A	SKY BLUE
B	WHITE
C	ORANGE
G	YELLOW
H	GREY
L	BLUE
M	BROWN
N	BLACK
R	RED
S	PINK
V	GREEN
Z	PURPLE

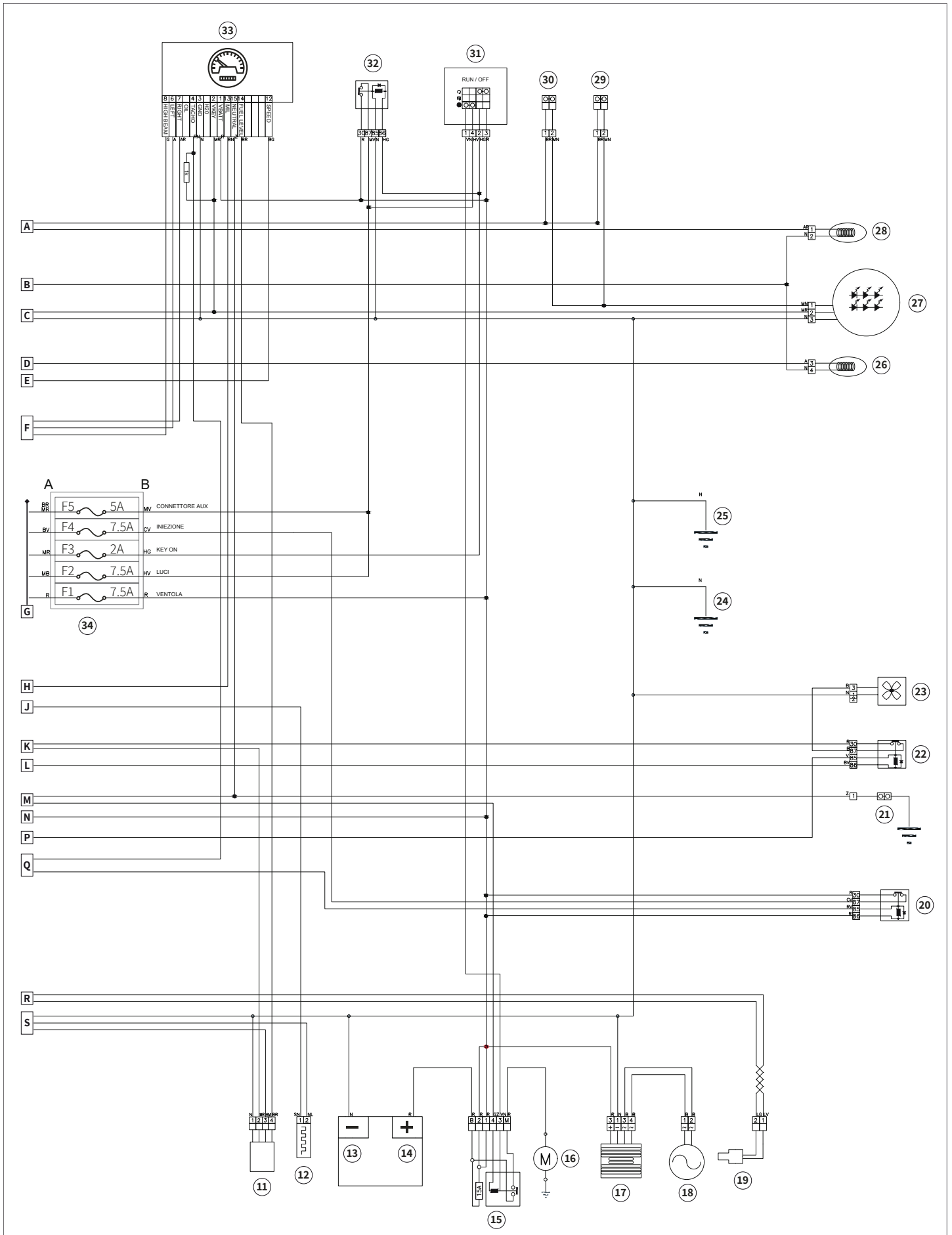
Key to the wiring diagram components

The following table lists all the components in the wiring diagram and their numbering.

Number	Description of the electrical component
1	Engine control unit (CDI)
2	OBD diagnosis connector
3	TPS sensor
4	MAP sensor
5	ATS sensor
6	Ignition coil
7	Fuel injector
8	Oxygen sensor
9	Fuel pump
10	Fuel level sensor
11	Fuel reserve interface
12	Water temperature sensor
13	Negative battery pole
14	Positive battery pole
15	Starter remote control switch
16	Starter motor
17	Voltage regulator
18	Magnet flywheel
19	Pick-Up
20	Engine control remote control switch
21	Neutral gear switch
22	Fan remote control switch
23	Radiator fan
24	Engine ground point
25	Frame ground point
26	Rear left turn signal
27	Tail light
28	Rear right turn signal
29	Rear brake light switch
30	Front brake light switch
31	Right light stalk
32	Main control switch
33	Dashboard
34	Fuse box
35	Intermittent light
36	Gearshift position switch
37	Lights remote control switch
38	Handlebar devices wiring harness interconnection
39	Left light stalk
40	Left light stalk - secondary connector
41	Horn
42	Front right turn signal
43	Front headlight
44	Front left turn signal
45	Wi-Fi interface
46	Speed sensor
47	Serial communication interface

Wiring diagram



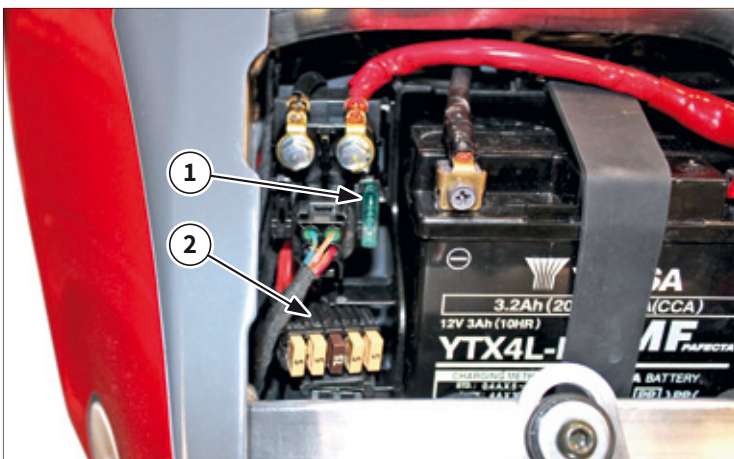
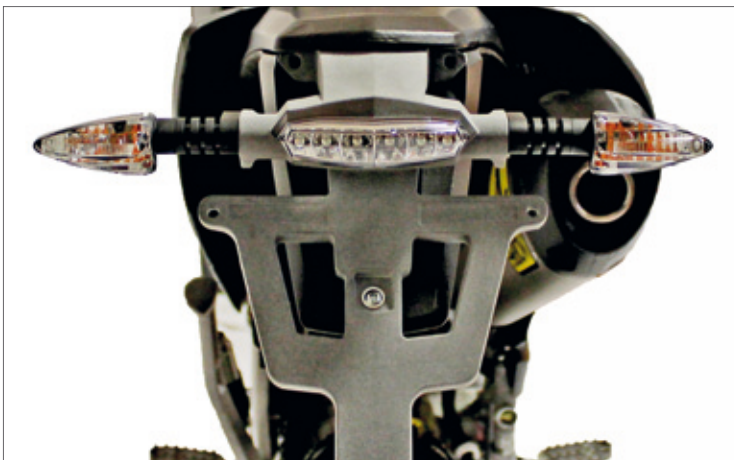




1.12 LAMPS


 **The front and rear lights are LED type, therefore they do not require maintenance.**

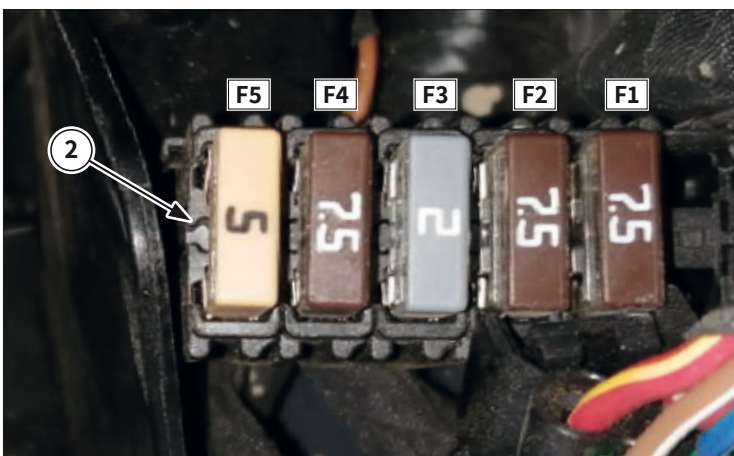
The front and rear turn indicators are equipped with 12V - 6W halogen lamps.



1.13 FUSES

The battery fuse "1" is accessible by removing the seat and the protective cover of the starter remote control switch.

 **Battery fuse: 15 A**



The fuse box "2" is accessible by removing the seat.

1.14 RECOMMENDED LUBRICANTS AND LIQUIDS

⚠ Use lubricating and fluid products that meet the equivalent specifications, or higher than those prescribed. These same indications are also valid for topping up.

1

Product	Characteristics	Remarks				
2-stroke gear engine oil	10W-40, 10W-50, 15W-40, 20W-50 API service SG type or higher, JASO standard Ma	Do not use mineral oils.				
Grease for bearings, joints, articulations and linkage	Lithium grease					
Coolant	Antifreeze liquid based on ethylene glycol with organic additives	Do not dilute with water.				
Fork oil	Fork oil gradation 15W or equivalent					
Transmission chain lubricant	Spray grease for transmission chains					
Brake oil	Synthetic Brake Fluid DOT 4					
Olio per filtro aria	Air Filter Special Oil					
Cleaner for electrical contacts	Contact cleaner					
Fuel	95 or 98 octane super lead-free petrol	<table border="1"> <thead> <tr> <th colspan="2">PETROL FUEL TYPE</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: middle;">E5</td> <td style="text-align: center; vertical-align: middle;">E10</td> </tr> </tbody> </table>	PETROL FUEL TYPE		E5	E10
PETROL FUEL TYPE						
E5	E10					
Paste for carter and engine covers coupling	Three Bond N. 1215®					
Safety lock medium tightening	Medium threadlocker					
Safety lock strong tightening	Strong threadlocker					
Lubricant for bolts unlocking	Unblocking protective lubricant					
Anti-friction lubricant for screw tightening torques	Generic engine oil					
Oil seals and O-rings lubricant for rubber parts	Lithium soap grease					
Battery terminals	White vaseline grease					
Vehicle wash	Low pressure water at room temperature Ecological neutral liquid soap	Avoid aggressive detergents.				
External cleaning of the brake system (brake discs and seats)	Spray Disc Brake Cleaner	Do not use to clean brake pads and plastic parts.				

1.15 MAINTENANCE INTERVALS

From 7000 km (4200 mi) or 9 months, repeat the maintenance intervals starting from 3000 km (1800 mi) or 3 months.

Items marked with an asterisk (*) should be performed by a FANTIC dealer as they require special tools, data and technical skills.

Periodic maintenance chart for the emission control system

No.	Item	Checks and maintenance jobs	Initial / 1000 km (600 mi) or 1 month	3000 km (1800 mi) or 3 months	5000 km (3000 mi) or 6 months
1	*	Fuel line – Check fuel hoses for cracks or damage. – Replace if necessary.	√	√	√
2		Spark plug – Check condition. – Adjust gap and clean.	√	√	√
3	*	Valve clearance – Check and adjust valve clearance when engine is cold.	√		√
4	*	Air filter element – Clean with solvent and apply quality foam air filter oil. – Replace if necessary.	√	√	√
5	*	Breather system – Check ventilation hose for cracks or damage and drain any deposits. – Replace.	√	√	√
			Every 2 years		
6	*	Fuel injection – Adjust engine idling speed.	√	√	√
7		Exhaust system – Check for leakage. – Tighten if necessary. – Replace gasket(s) if necessary.	√	√	√
8		Engine oil – Change (warm engine before draining).	√	√	√
9		Engine oil filter element – Replace.	√	√	√
10		Engine oil strainer – Clean.	√	√	√

General maintenance and lubrication chart

No.	Item	Checks and maintenance jobs	Initial / 1000 km (600 mi) or 1 month	3000 km (1800 mi) or 3 months	5000 km (3000 mi) or 6 months
1		Clutch – Check operation. – Adjust or replace cable.	√	√	√
2	*	Cooling system – Check hoses for cracks or damage. – Replace if necessary. – Replace with ethylene glycol anti-freeze coolant.	√	√	√
			Every 4 years		
3	*	Spark arrester – Clean.			√
4	*	Front brake – Check operation, fluid level, and for fluid leakage. – Replace brake pads if necessary. – Replace brake fluid every 1 year.	√	√	√
			Every 1 year		
5	*	Rear brake – Check operation, fluid level, and for fluid leakage. – Replace brake pads if necessary. – Replace brake fluid every 1 year.	√	√	√
			Every 1 year		
6	*	Brake hoses – Check for cracks or damage and replace if necessary.		√	√
7	*	Wheels – Check runout, spoke tightness and for damage. – Tighten spokes if necessary.	Every 30 hours		

No.	Item	Checks and maintenance jobs	Initial / 1000 km (600 mi) or 1 month	3000 km (1800 mi) or 3 months	5000 km (3000 mi) or 6 months
8	* Tires	<ul style="list-style-type: none"> - Check tread depth and for damage. - Replace if necessary. - Check air pressure. - Correct if necessary. 	√	√	√
9	* Wheel bearings	<ul style="list-style-type: none"> - Check bearings for smooth operation. - Replace if necessary. 	√	√	√
10	* Swingarm pivot bearings	<ul style="list-style-type: none"> - Check bearing assemblies for looseness. - Moderately repack with lithium-soap-based grease. 	√	√	√
11	Drive chain	<ul style="list-style-type: none"> - Check chain slack/alignment and condition. - Adjust and lubricate chain with a special O-ring chain lubricant thoroughly. 	Every ride		
12	* Steering bearings	<ul style="list-style-type: none"> - Check bearing assemblies for looseness. - Moderately repack with lithium-soap-based grease every 1200 mi (2000 km) or 12 months (whichever comes first). 	√	√	√
13	Brake and clutch lever pivot shafts	<ul style="list-style-type: none"> - Apply lithium-soap-based grease (all-purpose grease) or silicone grease lightly. 	Every 30 hours		
14	Brake pedal pivot shafts	<ul style="list-style-type: none"> - Apply lithium-soap-based grease (all-purpose grease) lightly. 	Every 30 hours		
15	Sidestand pivot	<ul style="list-style-type: none"> - Check operation. - Apply lithium-soap-based grease (all-purpose grease) lightly. 	√	√	√
16	* Front fork	<ul style="list-style-type: none"> - Check operation and for oil leakage. - Replace if necessary. 		√	√
17	* Shock absorber assembly	<ul style="list-style-type: none"> - Check operation and for oil leakage. - Replace if necessary. 		√	√
18	* Rear suspension link pivots	<ul style="list-style-type: none"> - Apply molybdenum disulfide grease lightly. 		√	√
19	* Control cables	<ul style="list-style-type: none"> - Apply chain and cable lube or engine oil 10W-30 thoroughly. 	√	√	√
20	* Throttle grip housing and cable	<ul style="list-style-type: none"> - Check operation and free play. - Adjust the throttle cable free play if necessary. - Lubricate the throttle grip housing and cable. 	√	√	√
21	* Chassis fasteners	<ul style="list-style-type: none"> - Check all chassis fitting and fasteners. - Correct if necessary. 	√	√	√
22	Battery	<ul style="list-style-type: none"> - Check terminal for looseness and corrosion. 		√	√

The air filter needs more frequent service if you are riding in unusually wet or dusty areas.

Hydraulic brake service:
After disassembling the brake master cylinders and calipers, always change the fluid. Regularly check the brake fluid levels and fill the reservoirs as required.
Every two years replace the internal components of the brake master cylinders and calipers, and change the brake fluid.
Replace the brake hoses every four years and if cracked or damaged.

Maintenance intervals for competition use

⚠ The following schedule is intended as a general guide to maintenance and lubrication. Bear in mind that such factors as weather, terrain, geographical location, and individual usage will alter the required maintenance and lubrication intervals. If you are a doubt as to what intervals to follow in maintaining and lubricating your machine, consult your FANTIC dealer.

⚠ Periodic inspection is essential in making full use of the machine performance. The service life of the parts varies substantially according to the environment in which the machine runs (e.g., rain, dirt, etc.). Therefore, earlier inspection is required by reference to the list below.

ⓘ Items marked with an asterisk (*) should be performed by a FANTIC dealer as they require special tools, data and technical skills.

No.	Item	Checks and maintenance jobs	After break-in	Every race	Every third race (or 500 km)	Every fifth race (or 1000 km)	As required
1	Engine oil	- Replace.	√			√	
2	* Valve	- Check the valve clearances.	√		√		
		- Check the valve seats and the valve stems for wear.				√	
		- Replace.					√
3	* Valve spring	- Check the free length.				√	
		- Replace.					√
4	* Valve lifter	- Check for scratches and wear.				√	
		- Replace.					√
5	* Camshaft	- Inspect the camshaft surface.				√	
		- Inspect the decompression system.					
		- Replace.					√
6	* Camshaft sprocket	- Check for wear on the teeth and for damage.				√	
		- Replace.					√
7	* Piston	- Inspect crack.				√	√
		- Inspect carbon deposits and eliminate them.					√
		- Clean.					√
8	* Piston ring	- Replace. (It is recommended that the piston pin and ring are also replaced at the same time.)					√
		- Check the ring end gap.				√	
		- Replace.				√	√
9	* Piston pin	- Inspect.				√	
		- Replace.					√
10	* Cylinder head	- Inspect carbon deposits and eliminate them.				√	
		- Change gasket.					
11	* Cylinder	- Inspect score marks.				√	
		- Inspect wear.					
		- Replace.					√
12	* Clutch	- Inspect housing, friction plate, clutch plate and spring.	√	√			
		- Replace.					√
13	* Transmission	- Inspect.					√
		- Replace bearings.					√
14	* Shift fork, shift cam, guide bar	- Inspect wear.					√

No.	Item	Checks and maintenance jobs	After break-in	Every race	Every third race (or 500 km)	Every fifth race (or 1000 km)	As required		
15	*	Generator rotor nut	- Retighten.	√		√			
16	*	Muffler	- Inspect and retighten.	√	√				
			- Clean.				√		
			- Replace.					√	
17	*	Crank	- Inspect and clean.			√	√		
18	*	Throttle body	- Inspect.				√		
19		Spark plug	- Inspect and clean.	√		√			
			- Replace.					√	
20		Drive chain	- Lubricate and check slack/alignment.	√	√				
			- Replace.					√	
21	*	Cooling system	- Check coolant level and leakage.	√	√				
			- Check radiator cap operation.					√	
			- Replace coolant.	Every two years					√
			- Inspect hoses.		√				
22		Outside nuts and bolts	- Retighten.	√	√				
23		Air filter	- Clean and lubricate.	√	√				
			- Replace.					√	
24		Oil filter	- Replace.	√		√			
25	*	Engine guard	- Replace.				√		
26	*	Frame	- Clean and inspect.	√	√				
27	*	Fuel tank, fuel pump	- Clean and inspect.	√		√			
28	*	Fuel hose	- Inspect.				√		
			- Replace.	Every four years				√	
29	*	Brake(s)	- Adjust lever position and pedal height.	√	√				
			- Lubricate pivot point.	√	√				
			- Check brake disc surface.	√	√				
			- Check fluid level and leakage.	√	√				
			- Retighten brake disc bolts, caliper bolts, master cylinder bolts and union bolts.	√	√				
			- Replace pads.					√	
			- Replace brake fluid.	Every one year					√
30	*	Front fork(s)	- Inspect and adjust.	√	√				
			- Replace oil.	√			√		
			- Replace oil seal.					√	
31	*	Front fork oil seal and dust seal	- Clean and lubricate.	√	√				
32		Protector guide	- Replace.				√		
33	*	Rear shock absorber	- Inspect and adjust.	√	√				
			- Lubricate. (After rain ride.)			√		√	
			- Retighten.	√	√				
34	*	Chain and roller slider	- Inspect.	√	√				
35	*	Drive chain stopper	- Inspect.				√		
36	*	Swingarm	- Inspect, lube and retighten.	√	√				
37	*	Relay arm, connecting rod	- Inspect, lube and retighten.	√	√				

No.	Item	Checks and maintenance jobs	After break-in	Every race	Every third race (or 500 km)	Every fifth race (or 1000 km)	As required
38	Sidestand	- Lubricate.					√
39	* Steering head	- Inspect free play and retighten.	√	√			
		- Clean and lubricate.				√	
		- Replace bearings.					√
40	* Tire, wheels	- Inspect air pressure, wheel runout, tire wear and spoke looseness.	√	√			
		- Retighten sprocket bolt.	√	√			
		- Inspect bearings.			√		
		- Replace bearings.					√
		- Lubricate.			√		
41	Throttle, control cable	- Check routing and connection.	√	√			
		- Lubricate.	√	√			

2.1 PRE-OPERATION INSPECTION AND MAINTENANCE

Before riding for break-in operation, practice or a race, make sure the machine is in good operating condition.

Before using this machine, check the following points.

Item	Routine	Page
Coolant	Check that coolant is filled up to the radiator cap. Check the cooling system for leakage.	page 62
Fuel	Check that a fresh mixture of oil and gasoline is filled in the fuel tank. Check the fuel line for leakage.	page 40
Engine oil	Check that the oil level is correct. Check the crankcase for leakage.	page 60
Gear shifter and clutch	Check that gears can be shifted correctly in order and that the clutch operates smoothly.	page 51
Throttle grip/Housing	Check that the throttle grip operation and free play are correctly adjusted. Lubricate the throttle grip and housing, if necessary.	page 52
Brakes	Check the play of front brake and effect of front and rear brake.	page 50
Drive chain	Check drive chain slack and alignment. Check that the drive chain is lubricated properly.	page 86
Wheels	Check for excessive wear and tire pressure. Check for loose spokes and have no excessive play.	page 82
Steering	Check that the handlebar can be turned smoothly and have no excessive play.	page 81
Front forks and rear shock absorber	Check that they operate smoothly and there is no oil leakage.	page 82
Cables (wires)	Check that the clutch and throttle cables move smoothly. Check that they are not caught when the handlebars are turned or when the front forks travel up and down.	-
Muffler	Check that the muffler is tightly mounted and has no cracks.	-
Rear wheel sprocket	Check that the rear wheel sprocket tightening bolt is not loose.	page 86
Lubrication	Check for smooth operation. Lubricate if necessary.	-
Bolts and nuts	Check the chassis and engine for loose bolts and nuts.	-
Settings	Is the machine set suitably for the condition of the racing course and weather or by taking into account the results of test runs before racing? Are inspection and maintenance completely done?	page 58

2.2 RUNNING IN

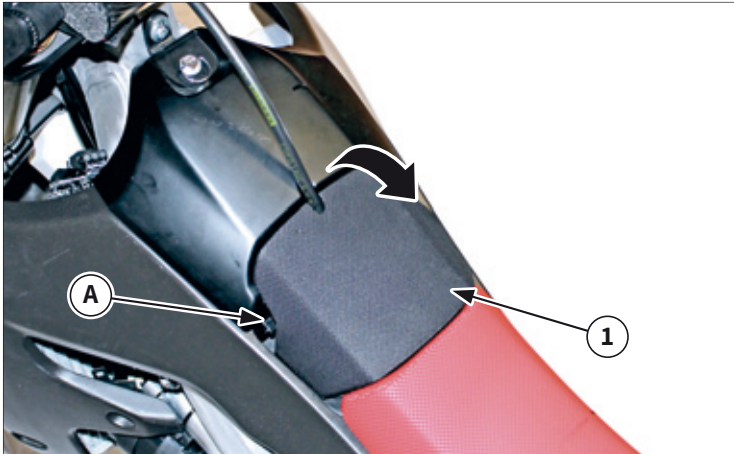
Running-in is important to allow the assembled rotating parts and sliding surfaces to combine with each other, as well as to allow the driver to become familiar with the vehicle:

- Warm up the engine and drive for about 20 minutes with a throttle valve opened by 1/2 or less;
- Stop and check: fixings, possible leakage of liquids and/or other problems;
- Then drive for another 40 minutes with a throttle valve opened by 3/4 or less;
- Stop again and check thoroughly: fixings, possible leakage of liquids and/or other problems. In-depth checks and adjustments are particularly necessary for cable paths, brake clearance, chain tensioning, spokes loosening and fixing points of the various vehicle components.

Repeat the procedures described each time they are replaced: piston, piston rings, valves, cylinder, crankshaft bearings. Piston, piston rings and valves: run in for 30 minutes with a throttle valve opening of 1/2 or less. Cylinder, crankshaft and bearings: run in one hour with a throttle valve opening of 1/2 or less

This vehicle is equipped with an automatic engine stop system, which stops it if it is left idle for 7 minutes. If the engine stops, press the starter switch to restart it.

After the first 3 hours or 15 litres of fuel, change the engine oil and replace the engine oil filter.

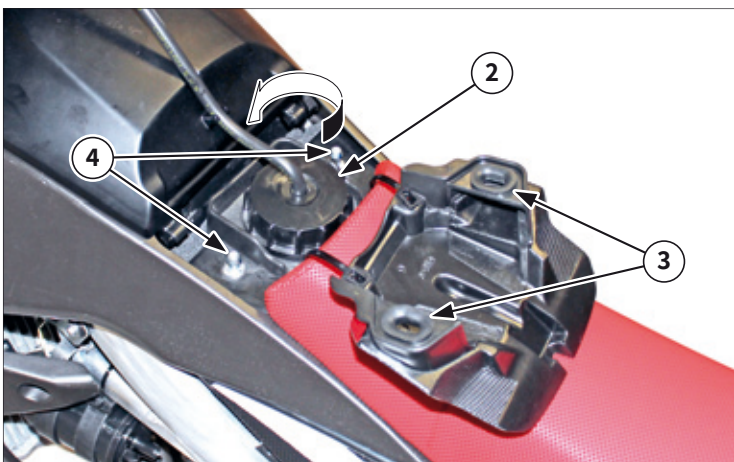


2.3 REFUELLING

The tank cap is located underneath the initial part of the seat. To refuel, remove the initial part of the seat “1”, then unscrew the cap “2” counter-clockwise.

To remove the initial part of the seat, insert your fingers into the opening “A” and lift it towards the rear of the vehicle. When reassembling, make sure that the grommets “3” are correctly engaged in the relevant supports “4”.

⚠ Do not smoke or use naked flames when refuelling. Avoid using electrical devices or any source that can trigger sparks or ignition. Failure to comply with these rules could result in a danger of fire or explosion, causing serious damage to property and/or persons.

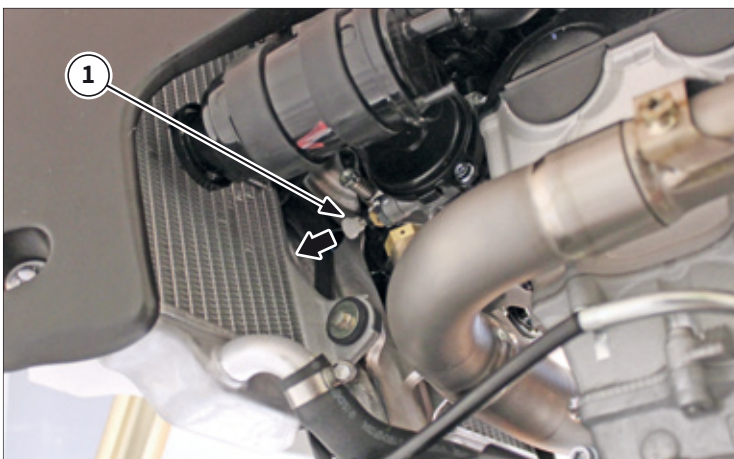


⚠ Do not add additives or other substances to the fuel during refuelling.

⚠ Avoid fuel leakage during refuelling. If you use a funnel, make sure that it is perfectly clean.

⚠ It is recommended to use the type of fuel indicated in the technical specifications of this manual. Do not use different fuels, they could damage the fuel system and compromise the operation of the engine.

⚠ Make sure that the tank cap is closed.



2.4 STARTING THE ENGINE

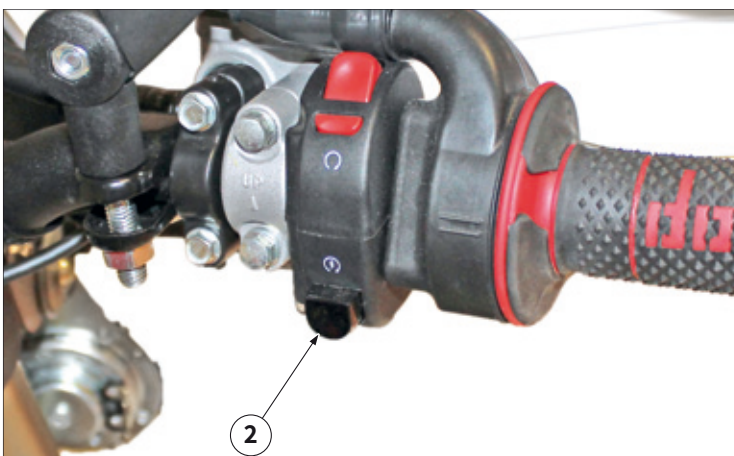
Starting a cold engine

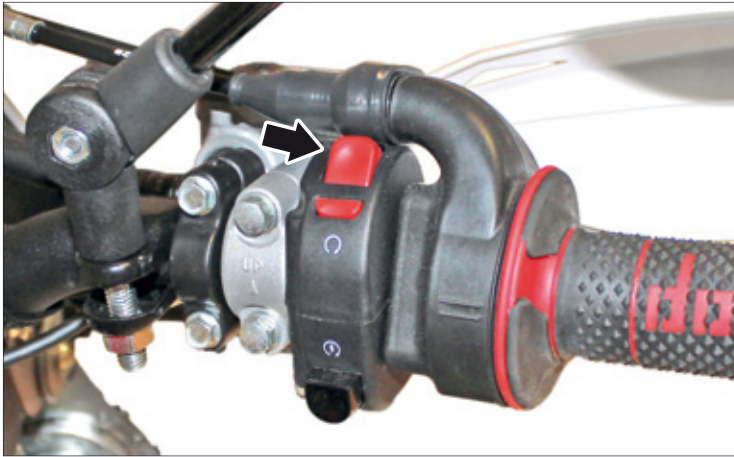
1. Shift the transmission into neutral.
2. Open the starter knob “1” (AIR VALVE) completely.
3. With the throttle valve fully closed, start the engine by pressing the start button “2”.
4. Run the engine at idle or slightly higher until it warms up: this usually takes about one or two minutes.
5. The engine is warmed up when it responds normally to the throttle with the starter knob (CHOKE) turned off.

⚠ Do not warm up the engine for extended periods of time.

Starting a warm engine

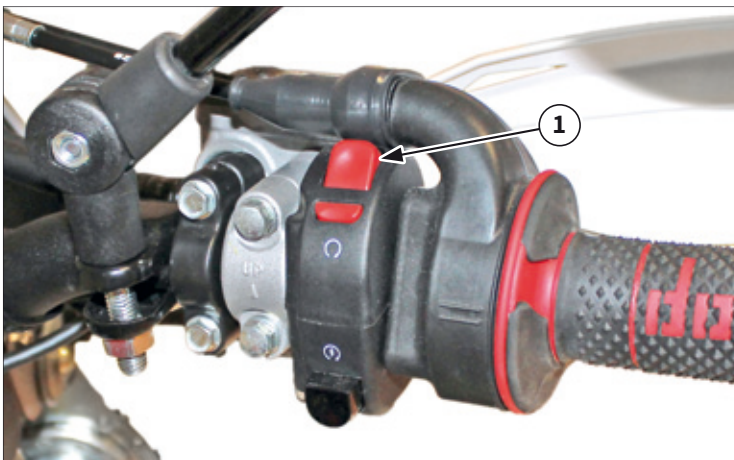
DO NOT operate the starter knob (AIR VALVE). Open the throttle valve slightly and start the engine by pressing the start button.





2.5 STOP THE ENGINE

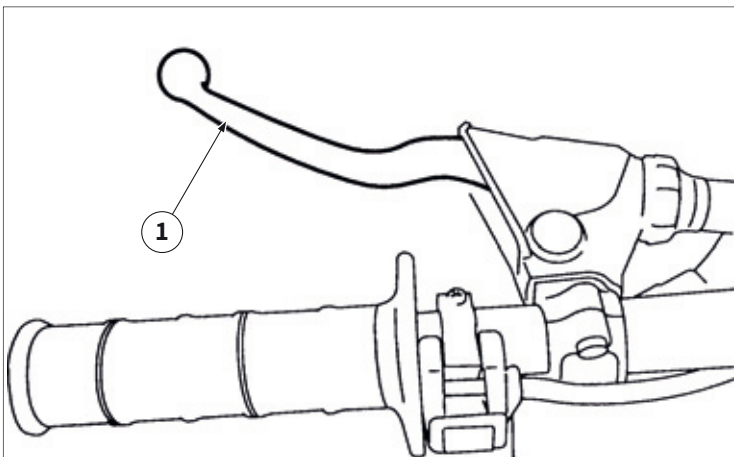
With the throttle valve completely closed, press the “ENGINE STOP” button on the right handlebar.



2.6 MAIN COMPONENTS

Engine stop switch

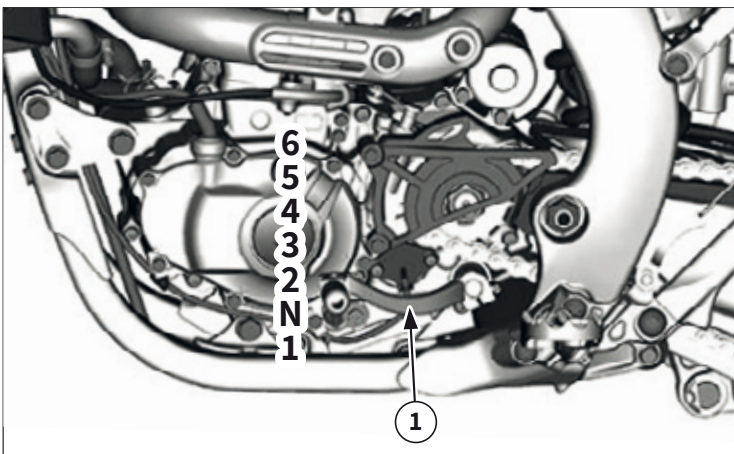
The engine stop switch “1” is located on the right handlebar. Press the engine stop switch until the engine stops.



Clutch lever

The clutch lever “1” is located on the left handlebar; it disengages or engages the clutch. Pull the clutch lever to the handlebar to disengage the clutch, and release the lever to engage the clutch.

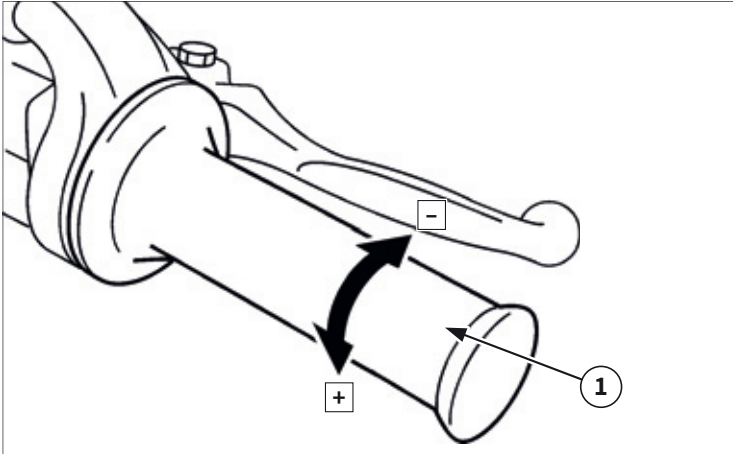
The lever should be pulled rapidly and released slowly for smooth starts.



Shift pedal

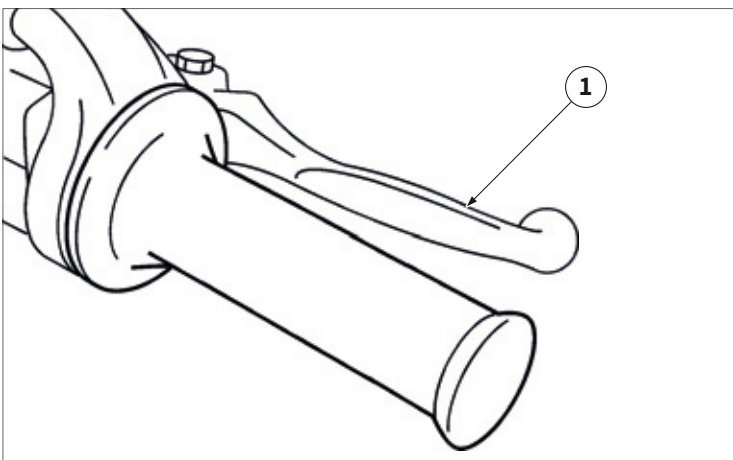
(i) The gear ratios of the constant-mesh 6 speed transmission are ideally spaced.

The gears can be shifted by using the shift pedal “1” on the left side of the engine.

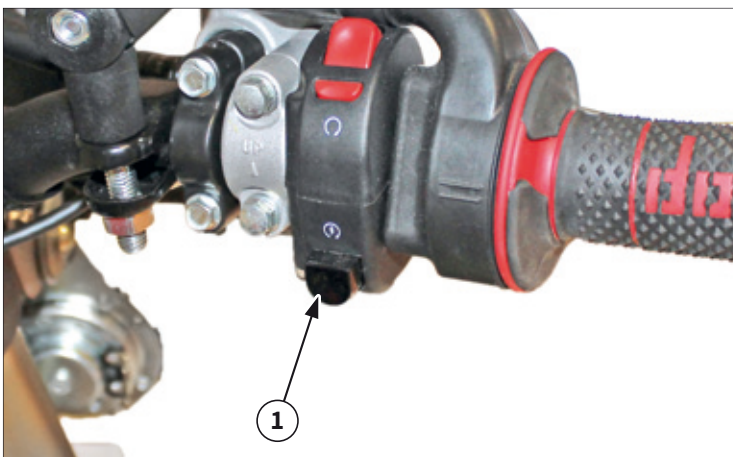
**Throttle grip**

The throttle grip “1” is located on the right handlebar; it accelerates or decelerates the engine. For acceleration, turn the grip toward you; for deceleration, turn it away from you.

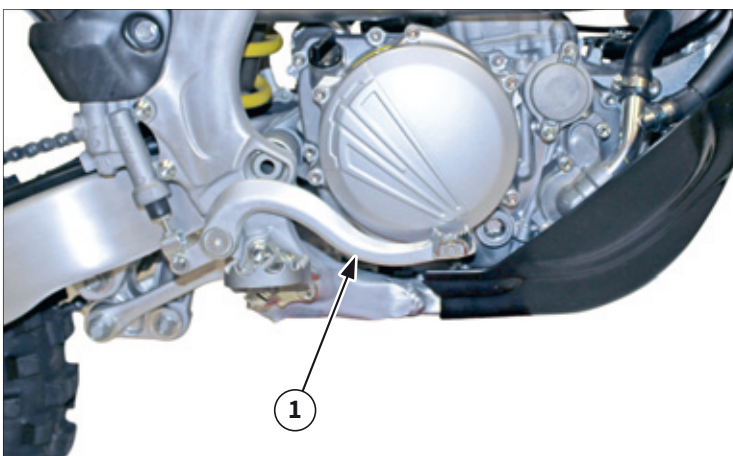
- i** “+” : accelerate
“-” : decelerate

**Front brake lever**

The front brake lever “1” is located on the right handlebar. Pull it toward the handlebar to activate the front brake.

**Start button**

The start button “1” is positioned on the right handlebar. Press this button to start the engine using the starter motor.

**Rear brake pedal**

The rear brake pedal “1” is located on the right side of the machine. Press down on the brake pedal to activate the rear brake.

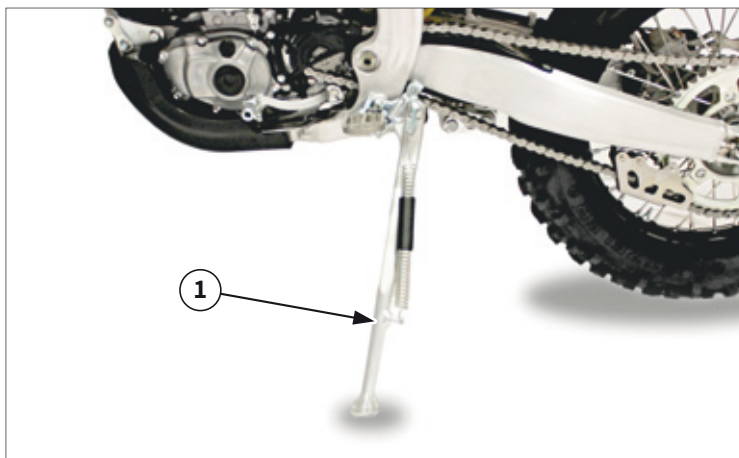


Start knob (air valve)

Starting a cold engine requires more air input, which is provided by the starter knob "1".

Pulling out the knob activates the starter, which increases the opening of the throttle valve. When the engine has warmed up, push it in to close the circuit

⚠ When operating the starter knob, be careful not to burn yourself with the exhaust pipe.



Sidestand

This sidestand "1" is used to support only the machine when standing or transporting it.

⚠ Never apply additional force to the sidestand.

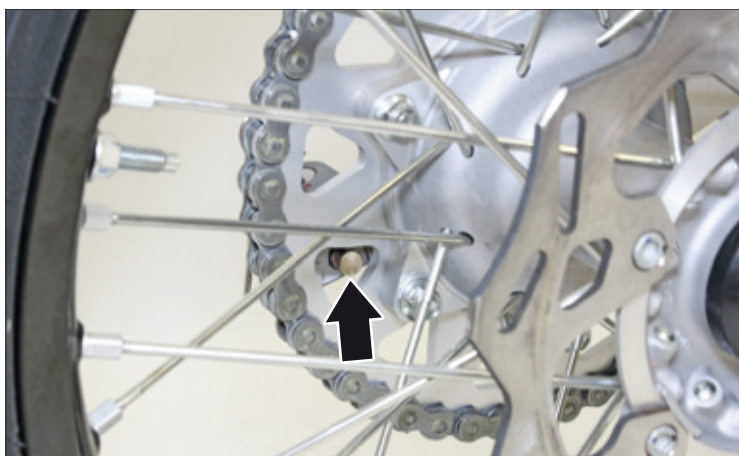
⚠ Hold up the sidestand before starting out.



Locking device

This device "1", operated by the vehicle keys, allows the rotation of the rim so it can be mechanically locked.

i It is recommended to use the device if the vehicle is left parked unattended.



2.7 DASHBOARD: BASIC FUNCTIONS

Maximum speed record
● Display range :
0 ~ 360 km/h (0 ~ 225 mile)

Maximum RPM record
● Display range : 0 ~ 15,000 RPM

Speedometer
● Display range :
0 ~ 360 km/h (0 ~ 225 mile)

Indication light
● Neutral (green light)
● Right indication light (green light) →
● Water temperature (red light) ̳
● Motor oil (red light) *
● Engine (yellow light)
● Fuel (yellow light) *
● Left indication light (green light) ←
● High beam light (blue light) ̳

* : **Attention!** The warning lights on this vehicle are not active.

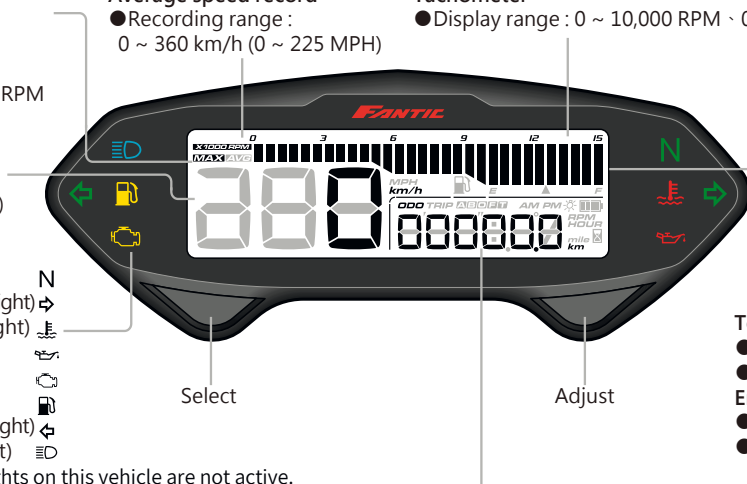
Average speed record
● Recording range :
0 ~ 360 km/h (0 ~ 225 MPH)

Tachometer
● Display range : 0 ~ 10,000 RPM · 0 ~ 12,000 RPM · 0 ~ 15,000 RPM

Fuel Level
● Setting range :
100Ω · 250Ω · 270Ω · 510Ω ·
1200Ω · SWITCH · USER

Low fuel warning
● Setting range : 10 ~ 50%,
when lower than (including)
setting value, fuel level
symbol will blink.

Total engine operating time
● Display range : 0~99,999.9 hours
● Display unit : 0.1 hour
Engine operating time A,B
● Display range : 0~9,999.9 hours
● Display unit : 0.1 hour



Odometer
● Display range : 0 ~ 99999.9 km (mile),
return to zero upon exceed.
● Display unit : 0.1 km (mile)

Trip meter A · B
● Display range : 0 ~ 999.9 km (mile),
return to zero upon exceed.
● Display unit : 0.1 km (mile)

Tachometer
● Display range : 0 ~ 15,000 RPM
● Display unit : 10 RPM

Voltmeter
● Display range : DC 8.0 V ~ 16.0 V
● Display unit : 0.1 V

Motor oil maintenance millage
● Display range : Metric Unit :500 (~ 8,000 km, user adjustable) ~ -999 km, automatic decrease according to the increase of total mileage.
● Display range : Imperial Unit :300 (~ 5,000 km, user adjustable) ~ -999 km, automatic decrease according to the increase of total mileage.
● Display unit : 1 km (mile)

Internal ODO
● Display range : 0 ~ 99,999.9 km (mile), user unadjustable.
● Display range : 0.1 km (mile)

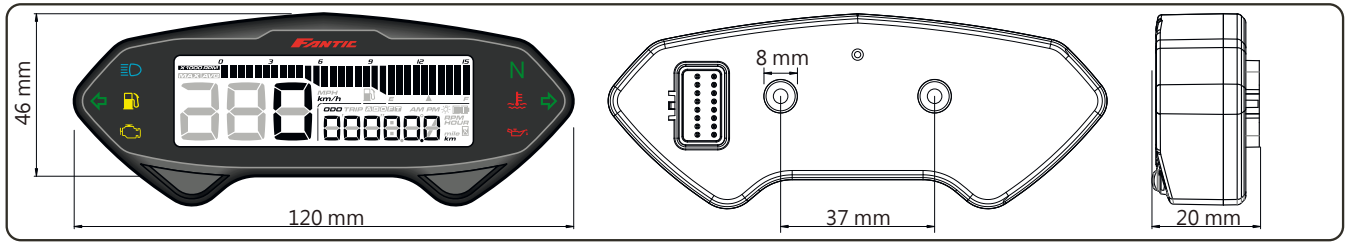
External ODO
● Setting range : 0 ~ 99,999 km (mile)
● Setting unit : 1 km (mile)

Function, setting instructions

● Speedometer	Display range : 0 ~ 360 km/h (0 ~ 225 MPH) Will blink when exceed range. Display unit : 1 km (mile)	● Total hour meter	Display range : 0 ~ 99 ,999.9 hour Display unit : 0.1 hour
○ Display internal	<0.5 second	○ Hour meter A · B	Display range : 0 ~ 9 ,999.9 hour Display unit : 0.1 hour
○ Odometer	Display range : 0 ~ 99,999.9 km (mile), return to zero upon exceed. Display unit : 0.1km (mile)	● Fuel level	Setting range : 100Ω · 250Ω · 270Ω · 510Ω · 1200Ω · SWITCH · USER
○ Trip meter A · B	Display range : 0 ~ 999.9 km (mile), return to zero upon exceed. Display unit : 0.1km (mile)	○ Staged fuel gauge	Setting range : 10 stage display Warning range : Fuel level warning stage below (including) setting value, fuel level symbol will blink.
● Motor oil maintenance millage	Display range : Metric Unit :500 (~ 8,000 km, user adjustable) ~ -999 km, automatic decrease according to the increase of total mileage. Display range : Imperial Unit :300 (~ 5,000 km, user adjustable) ~ -999 km, automatic decrease according to the increase of total mileage. Display unit : 1 km (mile)	○ Digital fuel gauge	Setting range : 0 ~ 100 % Setting unit : 10 %
○ Maximum speed record	Display range : 0 ~360 km (0 ~ 225 mile) Display unit : 1 km (mile)	○ Low fuel warning	Setting range : 10 ~ 50 %, when lower than (including) setting value, fuel level symbol will blink. Setting unit : 10%
○ Average speed record	Recording range : 0 ~ 360km/h (0 ~ 225 MPH)	● Volt meter	Display range : DC8.0 V ~ 16.0 V Display unit : 0.1V
○ Tire circumference	Setting range : 300 ~ 2,500 mm Setting unit : 1 mm	● Internal ODO	Display range : 0~99999.9 km (mile), user unadjustable Display unit : 0.1 km (mile)
○ Sensitive point	Setting range : 1 ~ 20 points Setting range : 1 point	● External ODO	Setting range : 0~99999 km (mile) Setting unit : 1km (mile)
● Tachometer	Display range : 0 ~ 15,000 RPM Display unit : 10 RPM	● Backlight color	Display range : white
○ Display internal	<0.5 second	● Effective voltage	DC 12 V
○ Stage tachometer	Display range : 0 ~ 10,000 RPM · 0 ~ 12,000 RPM · 0 ~ 15000 RPM Display unit : 0 ~ 10,000 RPM (333 RPM each stage) 0 ~ 12,000 RPM (400 RPM each stage) 0 ~ 15,000 RPM (500 RPM each stage)	● Effective temperature range	-10 ~ +60 °C
○ MAX RPM record	Display range : 0 ~ 15,000 RPM Display unit : 10 RPM	● Meter standard	JIS D 0203 (S2)
○ The RPM input signal number setting	Setting range : P-0.5,P-1~P-25	● Meter size	120 x 46 x 20 mm
○ The RPM input pulse	Setting range : lo-Act, Hi-Act	● Meter weight	Around 240 g
		● Indicator light	Neutral (green light) N Right indication light (green light) → Water temperature (red light) ̳ Motor oil (red light) * High beam light (blue light) ̳ Left indication light (green light) ← Fuel (yellow light) ̳ Engine (yellow light) ̳

NOTE Any design and specification changes will not be notify.

Meter size



Select button function instruction



- In the volt screen, press the **Select** button one time to enter the fuel level screen.
- In any screen, press and hold the **Select** buttons for **3 seconds** to switch between rpm and fuel bar screen.



- In the fuel level screen, press the **Select** button one time to go back to the volt screen.



- In the volt screen.

Adjust button function instruction



- In the ODO screen, press the **Adjust** button to enter the Trip A screen.
- In the ODO screen, press the **Select+Adjust** buttons for **3 seconds** to enter settings (Please refer to 4).



- In the Trip A screen, Press the **Adjust** button to enter the Trip B screen.
- Press and hold the **Adjust** button for **3 seconds** to reset Trip A screen.



- In the Trip B screen, press the **Adjust** button to enter the oil maintenance mileage screen.
- Press and hold the **Adjust** button for **3 seconds** to reset Trip B screen.



- In the oil maintenance mileage screen, press the **Adjust** button to enter the total hour meter screen.
- Press and hold the **Adjust** button for **3 seconds** to reset oil maintenance mileage screen.



- In total hour meter screen, press the **Adjust** button to enter the hour meter A screen.



- In the hour meter A screen, press the **Adjust** button to enter the hour meter B screen.
- Press and hold the **Adjust** button for **3 seconds** to reset hour meter A screen.



- In the hour meter B screen, press the **Adjust** button to enter the Max. record screen.
- Press and hold the **Adjust** button for **3 seconds** to reset hour meter B screen.



- In the Max. record screen, press the **Adjust** button one time to enter the Average speed record screen.
- Press and hold the **Adjust** button for **3 seconds** to reset Max. record screen.

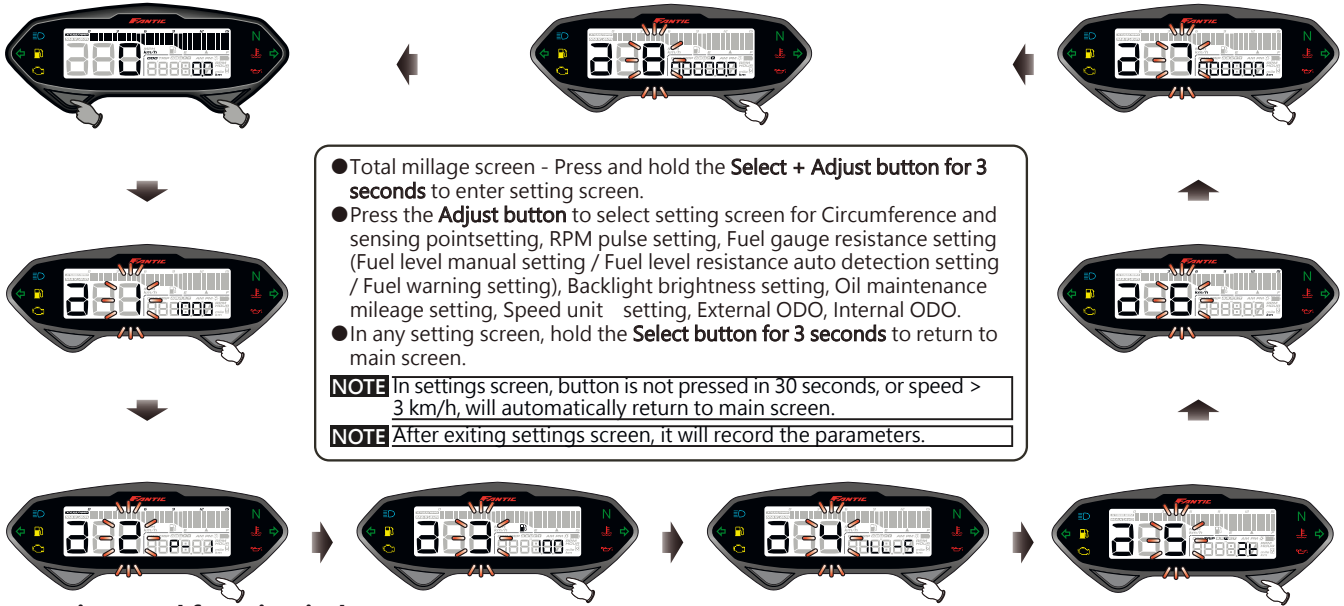


- In the Average speed record screen, press the **Adjust** button one time to enter the ODO screen.
- Press and hold the **Adjust** button for **3 seconds** to reset Average speed record screen.



- In the ODO screen.

The settings screen description

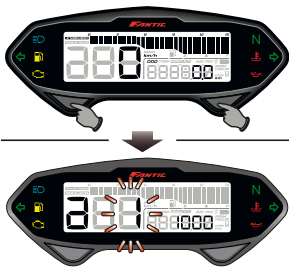


- Total millage screen - Press and hold the **Select + Adjust** button for **3 seconds** to enter setting screen.
- Press the **Adjust** button to select setting screen for Circumference and sensing point setting, RPM pulse setting, Fuel gauge resistance setting (Fuel level manual setting / Fuel level resistance auto detection setting / Fuel warning setting), Backlight brightness setting, Oil maintenance mileage setting, Speed unit setting, External ODO, Internal ODO.
- In any setting screen, hold the **Select** button for **3 seconds** to return to main screen.

NOTE In settings screen, button is not pressed in 30 seconds, or speed > 3 km/h, will automatically return to main screen.

NOTE After exiting settings screen, it will record the parameters.

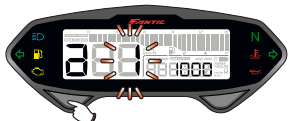
Enter settings and function index menu



- Press and hold the **Select + Adjust** button for **3 seconds** to enter setting screen.

- Function index
 1. Circumference and sensing point setting
 2. RPM pulse setting
 3. Fuel gauge resistance setting
 4. Backlight brightness setting
 5. Oil maintenance mileage setting
 6. Speed unit setting
 7. External ODO
 8. Internal ODO

Circumference and sensing point setting

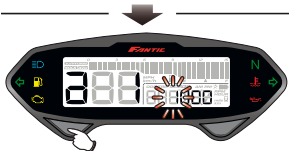


- Press the **Select** button to enter the circumference and sensing point setting screen.

CAUTION!

- Please measure the tire circumference (The tire you will install the sensor on) and make sure the number of magnet sensor point (You could install the magnet into the disc screw or the sprocket screw.)
- The speed displayed on the meter will be affected by the setting, please make sure the setting number is correct before you make the setting.

⚠ Please reset this setting value when you change a different size tire.



- Example : If the tire circumference is **1,300 mm**.
- Press the **Select** button to choose the setting number.
- Ex. Now the tire circumference is setting from 1,000 mm.

⚠ Now the digit in thousands setting number is flashing!

NOTE Setting range : 300 ~ 2,500 mm
Setting unit : 1 mm

P.S.

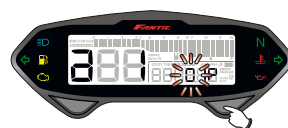
- You could define the valve as the starting point and the terminal point to measure the wheel circumference with a measuring tape.



- Press the **Adjust** button to choose the setting number.



- Press the **Select** button to enter the sensor point setting.
- Ex. The circumference setting is changed from **1,000 mm** to **1,300 mm**.



- Example : If the sensor point is setting **6P**.
- Press the **Adjust** button to choose the setting number.
- Ex. Now the sensor point is setting from **1P**.

⚠ Now the setting value is flashing!
NOTE Sensitive point : 1 ~ 20



- Press the **Select** button to go back to the circumference and sensing point setting screen.
- Ex. Now the sensor point is setting from **1P** to **6P**.



- Press the **Adjust** button to enter next operation setting.

RPM pulse setting



- Press the **Select** button to enter the RPM pulse setting screen.



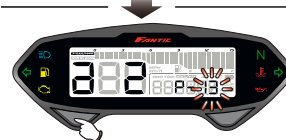
- EX. You want to connect the RPM signal wire to the pick up signal and there are 13 flywheel signals per turn.
- Press the **Adjust** button to choose the setting number.

⚠ Currently setting value will blink.

NOTE Setting range: 0.5 ~ 1 ~ 25

⚠ **CAUTION!** Most of the 4-cycle bikes with one single piston are igniting every 360 degree once, so the setting should be the same as the bike with 2-cycle and one piston engine.

The setting value	The corresponding stroke and pistons number.	The corresponding RPM signal number per ignition.
0.5	4C-1P	2 RPM signals per 1 ignition.
1	2C-1P 4C-2P	1 RPM signal per 1 ignition.
2	2C-2P 4C-4P	1 RPM signal per 2 ignition.
3	2C-3P 4C-6P	1 RPM signal per 3 ignition.
4	2C-4P 4C-8P	1 RPM signal per 4 ignition.
5	4C-10P	1 RPM signal per 5 ignition.
6	2C-6P 4C-12P	1 RPM signal per 6 ignition.



- Press the **Select** button to enter waveform setting screen.
- EX. Setting engine ignition angle from P-1 to P-13.



- Example : To set waveform to high waveform (Hi-Act).
- Press the **Adjust** button to choose the setting number.

NOTE During RPM signal detection, if there is any bad sensing or interference, please select another RPM sensing waveform.

⚠ Currently setting value will blink.

NOTE Setting range : Hi-Act ~ Lo-Act



- Press the **Select** button to enter rpm stage setting screen.
- EX. Setting from high wave (Hi-Act) to low wave (Lo-Act).



- Example : To set rpm stage value as 10,000 RPM.
- Press the **Select** button to choose the setting number.

- EX. Current rpm stage value is 15,000 RPM.

⚠ Currently setting value will blink.

NOTE Setting range : 10,000 ~ 12,000 ~ 15,000 RPM



- Press the **Adjust** button to choose the setting number.



- Press the **Select** button to return to rpm stage setting screen.
- EX. Setting rpm stage value form 15,000 RPM to 10,000 RPM.



- Press the **Adjust** button to enter next operation setting.

Funzioni non attive

⚠ **CAUTION!**

Fuel gauge resistance setting
Fuel level manual setting
Fuel level resistance auto detection setting
Fuel warning setting

All Functions related to the fuel are disabled in this vehicle

Fuel level Setting range : SWITCH
SWJ

Backlight brightness setting



- Press the **Select** button to enter the backlight brightness setting screen.



- Example : You want to set the brightness at 60 % (3).
- Press the **Adjust** button to choose the setting number.

⚠ Currently setting value will blink.

NOTE Setting range : 1 (Darkest) ~ 5 (Brightest), 5 different levels available. Setting unit : 20% per level. The backlight brightness will change immediately after you set the value.



- Press the **Select** button to go back to the backlight brightness setting screen.
- EX. The backlight brightness setting is changed from 5 (100%) to 3 (60%).



- Press the **Adjust** button to enter next operation setting.

Oil maintenance mileage setting



- Press the **Select** button to enter the oil maintenance mileage setting screen.

NOTE

- 2-stroke motor oil millage is indicated by external signal warning (motor oil indicator will lit).
- 4-stroke motor oil millage is internally set by the chronograph.



- **Example** : To set motor oil millage value as 4T.
 - Press the **Adjust** button to choose the setting number.
 - EX. Current motor oil millage is 2T.
- ⚠ Currently setting value will blink.
- NOTE** Setting range : 2T / 4T



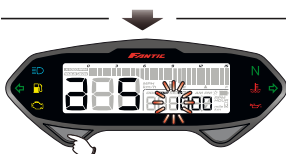
- Press the **Adjust** button to choose the setting number.



- Press the **Select** button to enter 4T motor oil millage setting main screen.
- EX. Setting motor oil millage value from 2T to 4T.



- Press the **Select** button to go back oil maintenance mileage setting screen.
- EX. Setting motor oil millage parameter from 1,000 to 1,500.



- **Example** : To set motor oil millage parameter as 1,500.
 - Press the **Select** button to choose the setting number.
 - EX. Current motor oil millage parameter is 1,000.
- ⚠ Currently setting value will blink.



- Press the **Adjust** button to enter next operation setting.

Speed unit setting



- Press the **Select** button to enter the speed unit setting screen.



- Press the **Select** button to go back speed unit setting screen.
- EX. The speed unit setting is changed km/h · km to MPH · mlie.

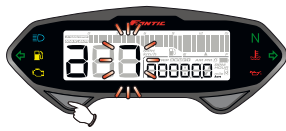


- Press the **Adjust** button to choose the setting number.



- Press the **Adjust** button to enter next operation setting.

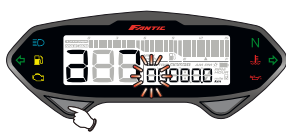
External ODO



- Press the **Select** button to enter the external ODO setting screen.



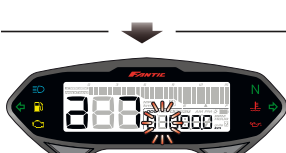
- Press the **Select** button to the external ODO setting screen.
- EX. The external ODO is changed 0 to 12,500 km.



- **Example** : To set external total millage value to 12,500 km.
 - Press the **Select** button to choose the setting number.
- ⚠ Currently setting value will blink.
- NOTE** Setting range : 0 ~ 99,999 km (mile)

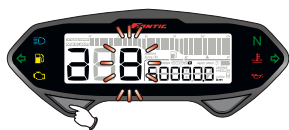


- Press the **Adjust** button to enter next operation setting.



- Press the **Adjust** button to choose the setting number.

Internal ODO



- Example : Current internal ODO is 50,000 km.
- Press the **Select** button three seconds to go back to ODO screen.

△ User unable to adjust and clear internal ODO.

NOTE Setting range :
99999.9 km (mlie).



- The main screen.

Trouble shooting

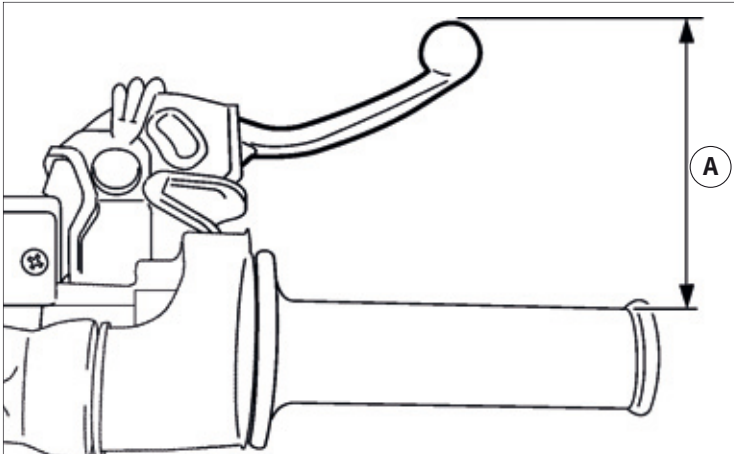
The following situation do not indicate malfunction of the meter. Please check the following before taking it in for repair.

Trouble	Check item	Trouble	Check item
The meter doesn't work when the power is on.	<ul style="list-style-type: none"> ● The power doesn't supply to the meter. → Please make sure the wiring is connected. The wiring and fuse are not broken. → The battery is broken or the battery is too old to supply enough power (DC 8 V) to make the meter work. ● Check the voltage of your battery, and make sure the voltage is over DC 8 V. 	Tachometer does not appear or appear incorrectly.	<ul style="list-style-type: none"> ● Please check the RPM sensor wiring is connected correctly. ● Please check the spark plug is R type or not. If not, please replace the spark plug with the R type spark plug. ● Please check your setting. → Please refer to the manual 4-2 RPM pulse setting.
The meter shows wrong information. Speed does not appear or appear incorrectly.	<ul style="list-style-type: none"> ● Make sure the speed sensor is connected properly. → Please check if speed sensor is connected and working properly. Also check whether the cable of speed sensor has broken or lose or not. ● Check the tire-size setting. → Refer to the manual 4-1 circumference and sensing point setting. 	The odometer and trip meter is not accumulated or accumulated wrong data. Fuel gauge does not appear or appear incorrectly.	<ul style="list-style-type: none"> ● It is possible that the permanent power wire is not connected well. → Please check the red positive wire is connect well or not. ● Check your fuel tank. ● Check the wiring harness. → Is the wire connected properly. ● Check the tire-size setting. → Refer to the manual 4-3 fuel gauge resistance setting.
The odometer and trip meter are not accumulated or accumulated the wrong data.	<ul style="list-style-type: none"> ● It is possible that the permanent power wire is not connected properly. → Check if the red positive wire is connect properly. 		

* If the problem is not resolved after following the steps shown above, please contact your local distributor for assistance.

Dashboard setting values


Dashboard setting	Version	Standard value
Wheel circumference	-	2210
Sensitive point	-	P16
RPM pulse	-	HI-ACT
Fuel reserve	-	SWITCH
RPM number of pulses setting	-	P01

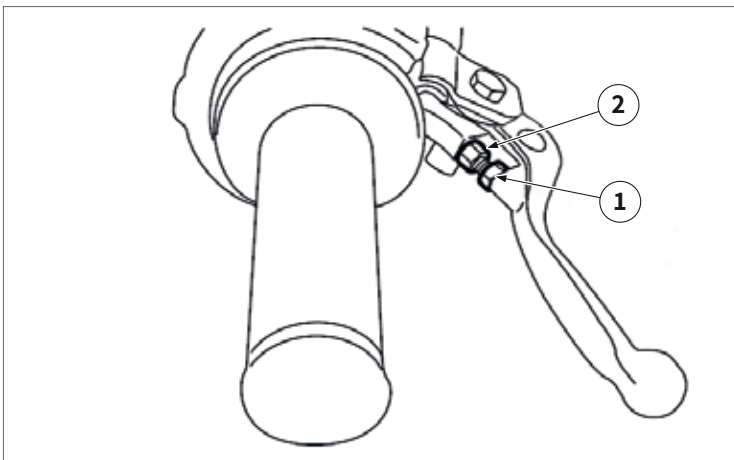


3.1 BRAKES

Front brake adjustment


Check brake lever position "A". If it is different from the standard value, adjust it.


-  **Brake lever position "A":**
Standard position: 100 mm (3.94 in)
Adjustment point: 86-105 mm (3.39-4.13 in)

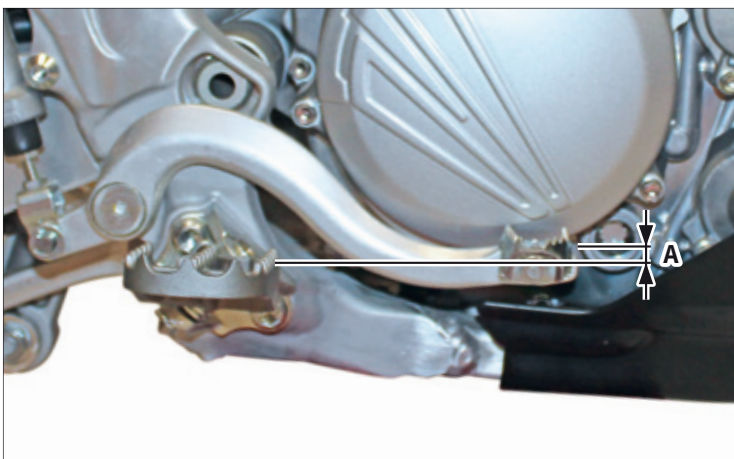


Adjust the brake lever position as described below:

- Remove the brake lever cover;
- Loosen the locknut "1";
- Turn the adjusting bolt "2" until the lever position "A" is within specified position;
- Tighten the locknut "1";
- Reinstall the brake lever cover.

 **Be sure to tighten the locknut, as it will cause poor brake performance.**

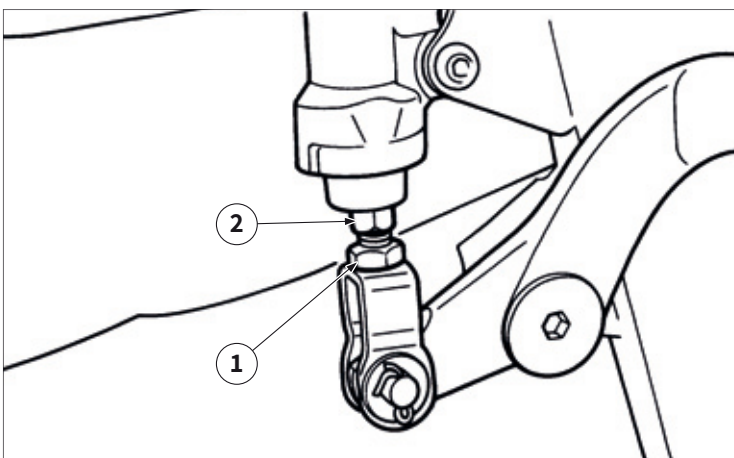
 **Locknut: 5 Nm (0.5 m•kg, 3.6 ft•lb)**



Rear brake adjustment

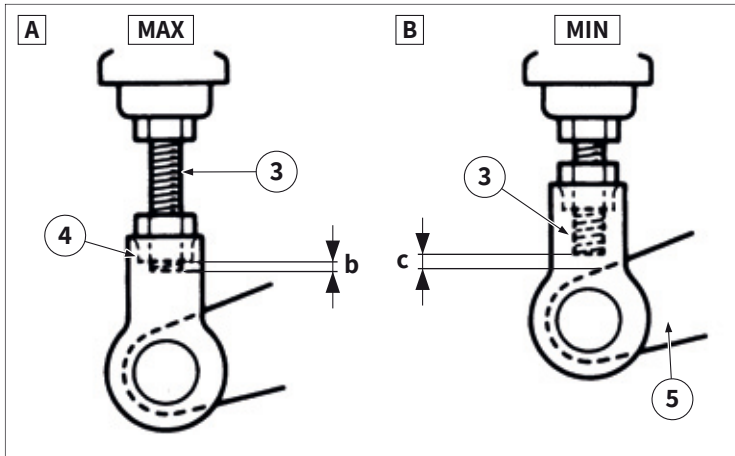
Check the height of brake pedal "A". If it is different from the standard value, adjust it.

-  **Brake pedal height "A": 0.0 mm (0.00 in)**

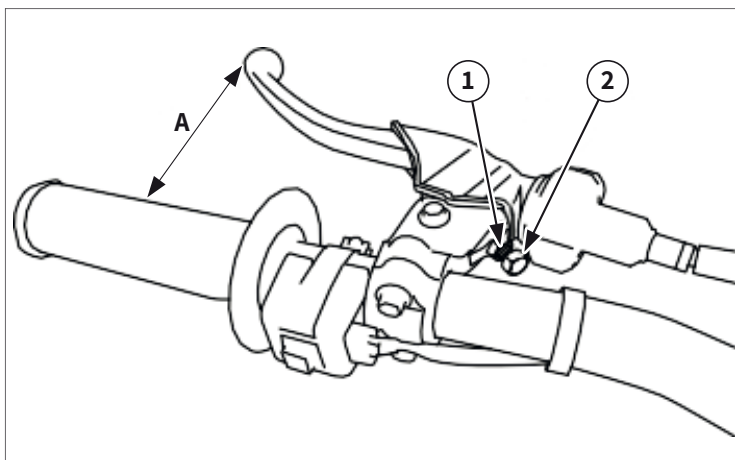


Adjust the brake pedal height as described below:

- Loosen the locknut "1";
- Turn the adjusting nut "2" until the pedal height "A" is within specified height;
- Tighten the locknut.



- ⚠ • Adjust the pedal height between the maximum “A” and the minimum “B” as shown. (In this adjustment, the bolt “3” end “b” should protrude out of the threaded portion “4” but not be less than 2 mm (0.08 in) “c” away from the brake pedal “5”).
- After the pedal height adjustment, make sure that the rear brake does not drag.

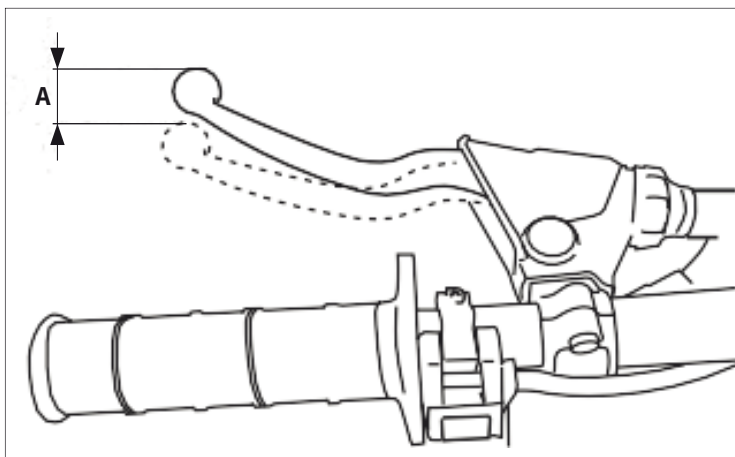


3.2 CLUTCH

Adjusting the clutch lever position

- Loosen the locknuts “1”;
- Turn the adjusting bolt “2” until the clutch lever position “A” is in the desired position;
- Tighten the locknuts.

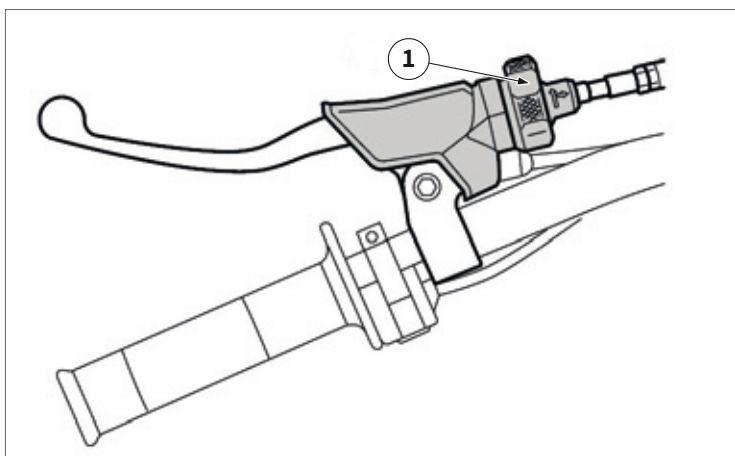
🔧 Locknut: 5 Nm (0.5 m•kg, 3.6 ft•lb)



Adjusting the clutch lever clearance

Check the clutch lever clearance “A”. If it is different from the standard value, adjust it.

🔧 Clutch lever clearance “A”:
7.0–12.0 mm (0.28–0.47 in)



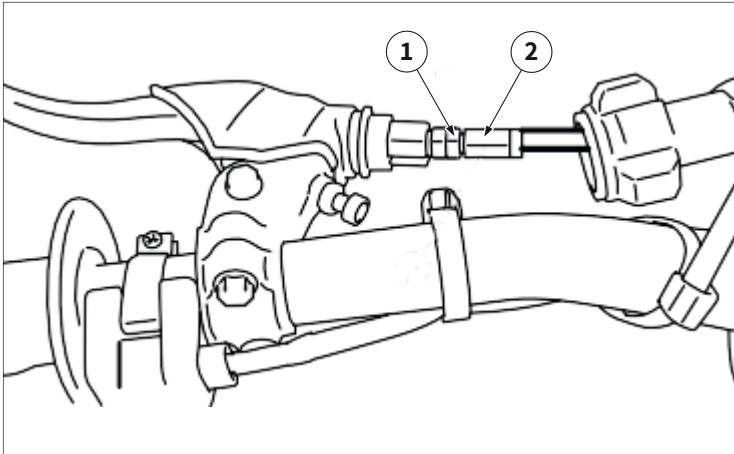
Adjust the clutch lever clearance as described below:

Handlebar side

- Turn the adjuster “1” until the specified clutch lever free play is obtained.

ⓘ Turning clockwise increases the clearance, turning counter-clockwise decreases it.

⚠ If the clutch lever free play cannot be obtained on the handlebar side, use the adjuster on the clutch cable side.

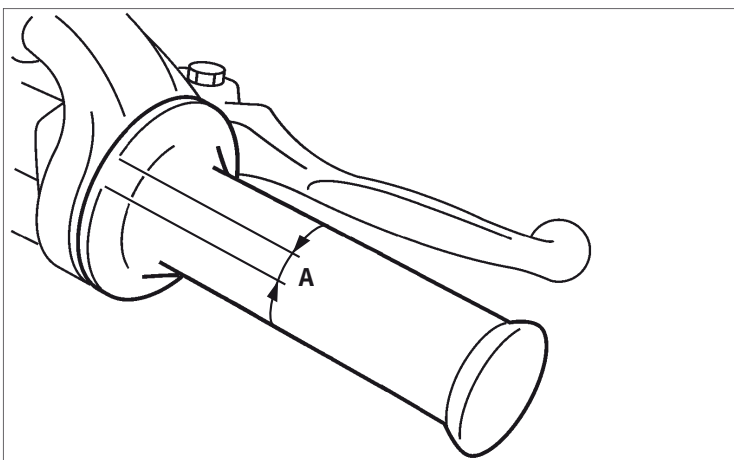


Clutch cable side

- Slide the clutch cable cover;
- Loosen the locknut "1";
- Turn the adjuster "2" until the specified clutch lever free play is obtained;
- Tighten the locknut;

 **Locknut: 4.3 Nm (0.43 m·kg, 3.2 ft·lb)**

- Return the clutch cable cover to its original position.



3.3 THROTTLE CONTROL

Adjusting the throttle grip clearance

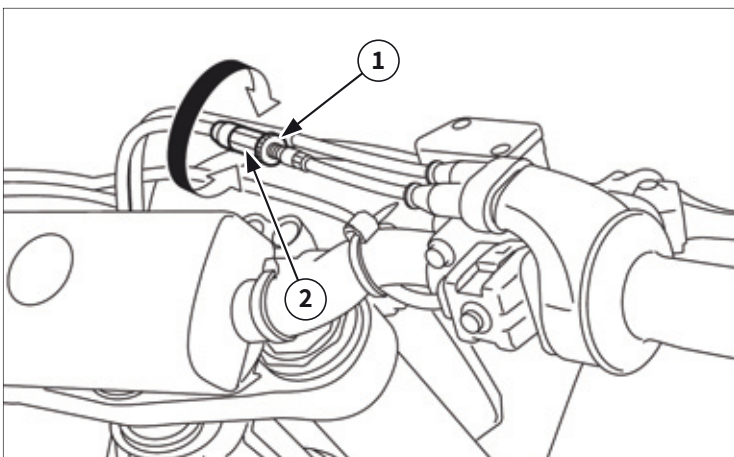
Check the throttle control knob clearance "A".

If it is different from the standard value, adjust it.


 **Throttle grip clearance "A":**
3.0-6.0 mm (0.12-0.24 in)

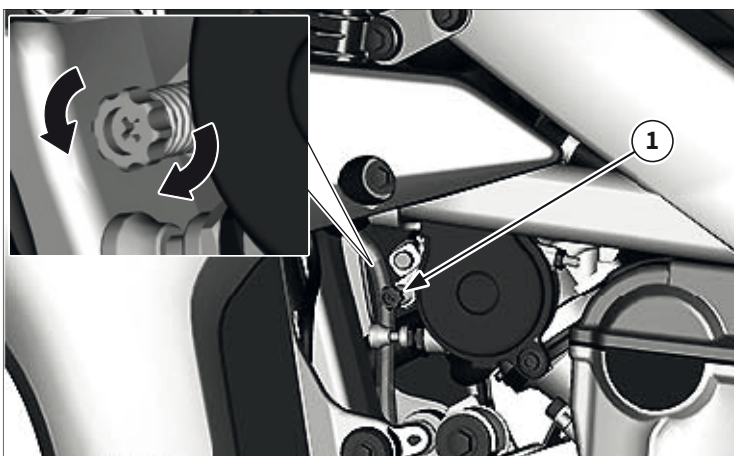
Adjust the throttle control knob clearance as described below:

- Loosen the locknut "1";
- Turn the adjuster "2" until the specified free play is obtained;
- Tighten the locknut.




 **Prior to adjusting throttle grip free play, the engine idling speed should be adjusted.**

 **Prior to adjusting throttle grip free play, the engine idling speed should be adjusted. After adjusting the throttle grip free play, turn the handlebar to the right and to the left to ensure that this does not cause the engine idling speed to change.**



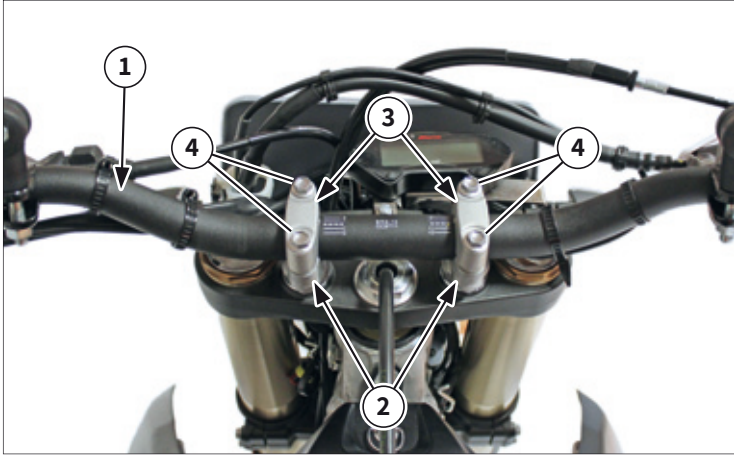
3.4 ADJUSTING THE ENGINE IDLING SPEED

- Start the engine and warm it up well;
- Install a digital tachometer on the spark plug cable;
- Adjust the idle speed by turning the adjustment screw "1" until it reaches a value that meets the specifications;

 **By screwing it in, the idle speed increases, by unscrewing it in, the idle speed decreases.**

- Once the speed has been adjusted, remove the digital tachometer from the vehicle.

 **Idle speed: 1900-2100 rpm**

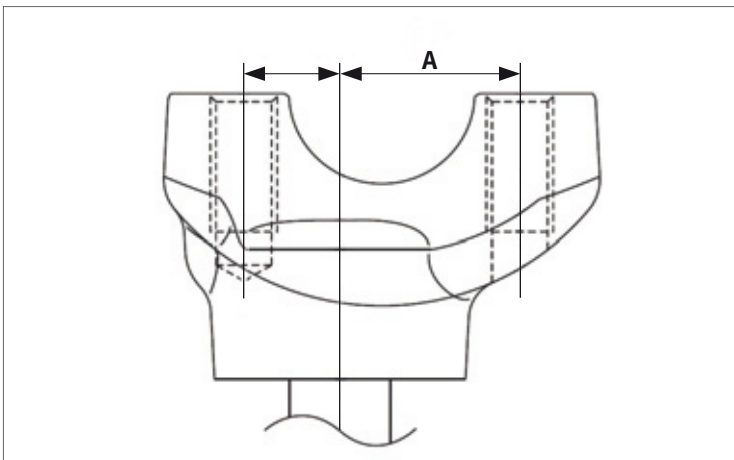


3.5 HANDLEBAR ADJUSTMENT

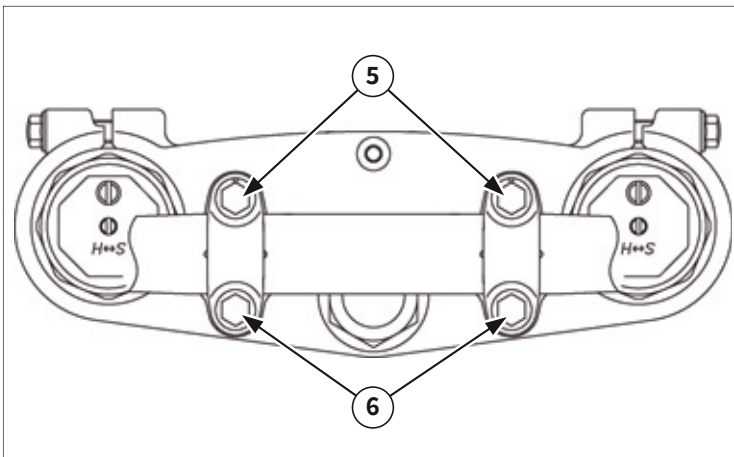
Handlebar installation and adjustment

Install handlebar "1" on lower supports "2";

Install upper supports "3" and fastening bolts "4", without tightening them definitively.



⚠ Install the handlebar so that the projection "A" of the upper handlebar holders is positioned at the mark on the handlebar as shown.



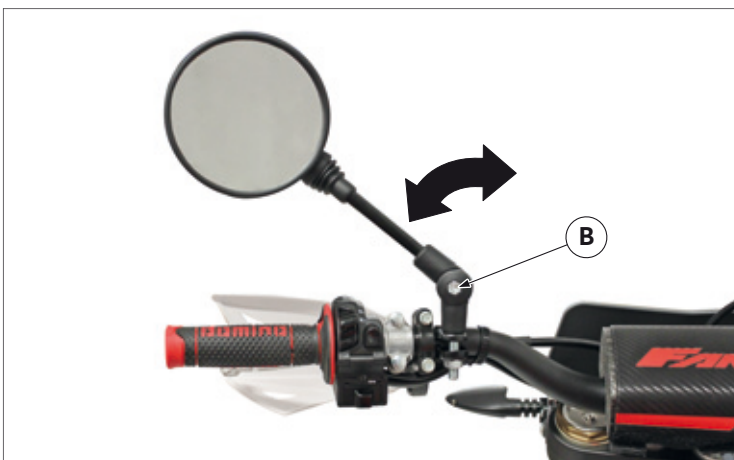
First tighten the bolts on the front side "5" of the upper handlebar holder, and then tighten the bolts "6" on the rear side.

🔧 Upper handlebar support bolt:
28 Nm (2.8 m•kg, 20 ft•lb)



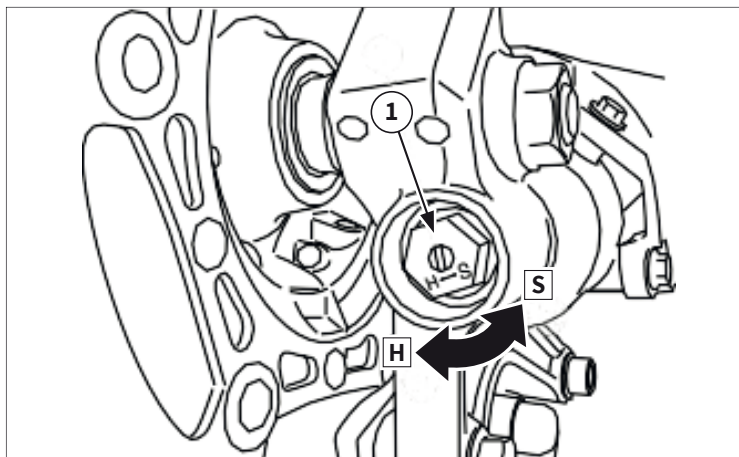
3.6 REAR-VIEW MIRRORS

- ⓘ The operations described below apply to both rearview mirrors.
- Place the vehicle on the kickstand and on a flat and stable surface.
- Loosen the lock nut “A”, turn the left-hand mirror counter-clockwise and remove it, then turn the right-hand mirror clockwise and remove it.
- ⓘ During reassembly, before tightening the nut, check that the mirror support rod is aligned with the handlebar.



Rear-view mirror adjustment

To adjust the rear-view mirrors, get on the vehicle in the driving position and turn the rear-view mirror according to your needs. It is also possible to adjust the inclination of the rear-view mirror support rod. To carry out this operation, loosen the screw “B” and move the support rod sideways. Adjust and tighten screw “B”.



3.7 FORK ADJUSTMENT

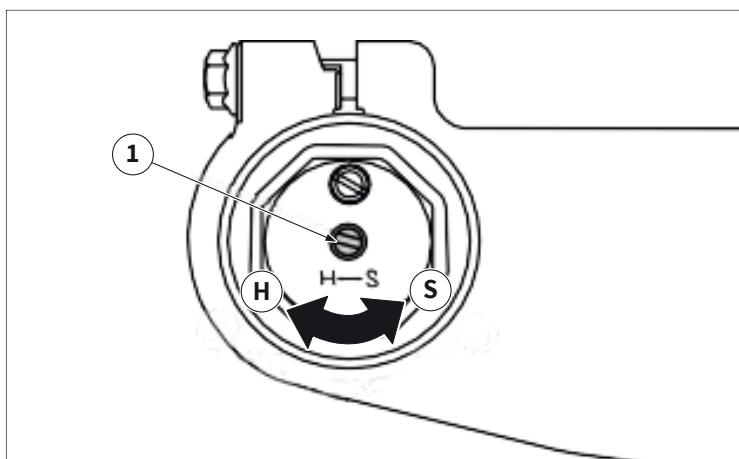
Rebound damping adjustment (return)

- To adjust the rebound damping force of the fork, turn the adjustment device "1". The device has a range of action of 20 clicks;
- To increase the rebound damping force (slower return) rotate the device clockwise, following the letter "H";
- To decrease the rebound damping force (faster return) rotate the device counter-clockwise, following the letter "S".

Standard adjustment:
 From all closed, open by 8 clicks by turning to "S".

Do not force the adjuster past the minimum or maximum extent of adjustment. The adjuster may be damaged.

Always adjust each front fork to the same setting. Uneven adjustment can cause poor handling and loss of stability.



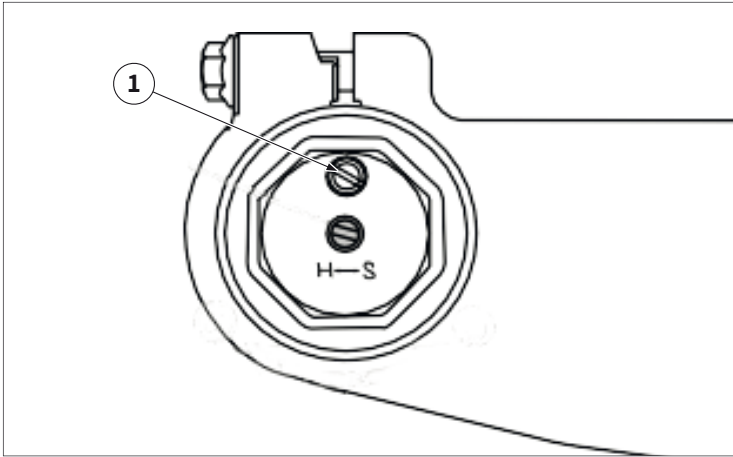
Compression damping adjustment

- To adjust the compression damping force of the fork, turn the adjustment device "1". The device has a range of action of 20 clicks;
- To increase the compression damping force (harder thrust) rotate the device clockwise, following the letter "H";
- To decrease the compression damping force (softer thrust) rotate the device counter-clockwise, following the letter "S".

Standard adjustment:
 From all closed, open by 11 clicks by turning to "S".

Do not force the adjuster past the minimum or maximum extent of adjustment. The adjuster may be damaged.


Always adjust each front fork to the same setting. Uneven adjustment can cause poor handling and loss of stability.



Relieving the front fork internal pressure

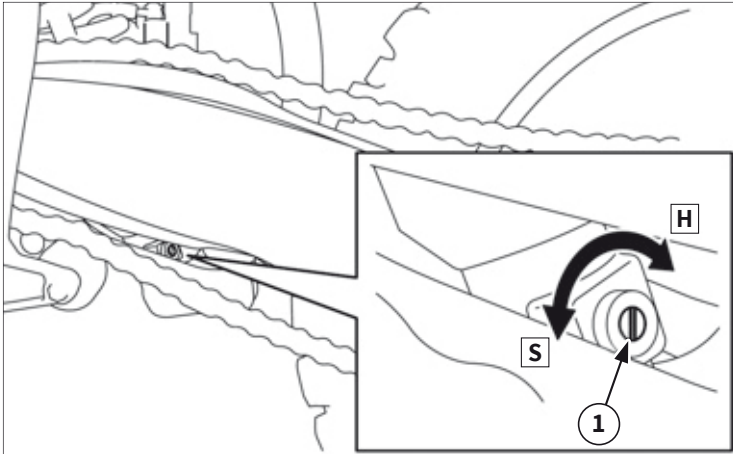
i If the front fork initial movement feels stiff during a run, relieve the front fork internal pressure.

- Elevate the front wheel by placing a suitable stand under the engine;
- Remove the air bleed screw “1” and release the internal pressure from the front fork;
- Reinstall air purge screw “1”.

 **Air bleed screw: 1.3 Nm (0.13 m•kg, 0.95 ft•lb)**

i To improve the front fork performance, and adapt it to different road conditions, driving style and rider’s weight, Fantic features springs with different load coefficients which can be purchased from authorized dealers.

Load factor	Part number
4.1 N/mm	07154005
4.2 N/mm	07155005
4.3 N/mm	07156005
4.4 N/mm	07157005
4.5 N/mm	07148005
4.6 N/mm	07015005
4.7 N/mm	07149005
4.8 N/mm	07150005
4.9 N/mm	07151005
5.0 N/mm	07152005
5.1 N/mm	07153005



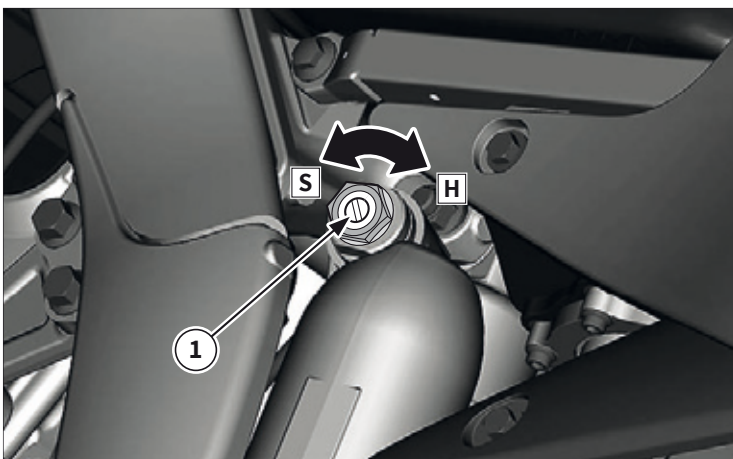
3.8 REAR SHOCK ABSORBER ADJUSTMENT

Rebound damping adjustment (return)

- To adjust the rebound damping force of the rear shock absorber, turn the adjustment device "1". The device has a range of action of 30 clicks;
- To increase the rebound damping force (slower return) rotate the device clockwise, following the letter "H";
- To decrease the rebound damping force (faster return) rotate the device counter-clockwise, following the letter "S".

Standard adjustment:
From all closed, open by 11 clicks by turning towards "S".

Do not force the adjuster past the minimum or maximum extent of adjustment. The adjuster may be damaged.

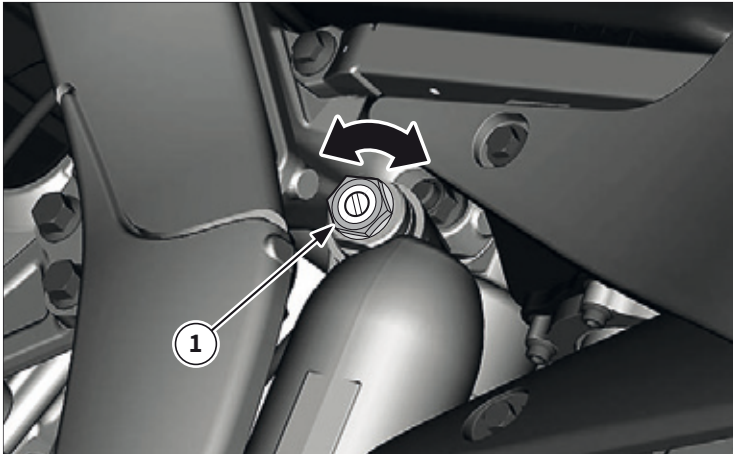


Compression damping adjustment (low speed)

- To adjust the compression damping force at low speed, turn the adjustment device "1". The device has a range of action of 20 clicks;
- To increase the compression damping force (harder thrust) rotate the device clockwise, following the letter "H";
- To decrease the compression damping force (softer thrust) rotate the device counter-clockwise, following the letter "S".


Standard adjustment:
From all closed, open by 8 clicks by turning towards "S".

Do not force the adjuster past the minimum or maximum extent of adjustment. The adjuster may be damaged.



Compression damping adjustment (high speed)

- To adjust the compression damping force at high speed, turn the adjustment device "1". The device has a range of action of 2 turns, from fully closed, rotating counter-clockwise;
- To increase the compression damping force (harder thrust) rotate the device clockwise;
- To decrease the compression damping force (softer thrust) rotate the device counter-clockwise.

 **Standard adjustment:**
From all closed, open the register of 1 turn.

 **Do not force the adjuster past the minimum or maximum extent of adjustment. The adjuster may be damaged.**



3.9 SETTING THE SAG

Rear shock absorber sinking adjustment (SAG)

- Place a stand or block under the engine to put the rear wheel above the floor, and measure the length "A" between the rear wheel axle center and the rear fender holding bolt;



- Remove the kickstand or retainer from the engine and, WITHOUT the driver on the vehicle, measure the sinking "B" between the centre of the rear wheel axle and the rear mudguard locking bolt.

 **Standard value: 15-40mm**



- With the vehicle on the ground, hold it and get the driver on board, making sure he/she is wearing all the protective clothing available. Then measure the sinking "C" between the centre of the rear wheel axle and the rear mudguard locking bolt.

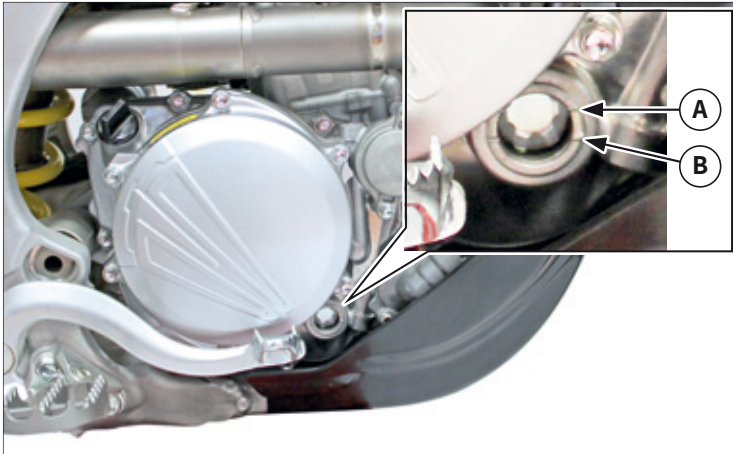
Standard value: 90-100mm

(i) Before adjusting, make sure to remove all mud and dirt around the ring nut and lock nut.

(i) If the vehicle is new and has run-in, the same spring length set may vary due to initial spring fatigue. Therefore be sure to perform a new evaluation.

(i) To improve the rear shock absorber performance, and adapt it to different road conditions, riding style and rider's weight, Fantic features springs with different load coefficients that can be purchased from authorized dealers.

Load factor	Part number
48 N/mm	07147005
50 N/mm	07146005
52 N/mm	07141005
54 N/mm	07142005
56 N/mm	07143005
58 N/mm	07144005
60 N/mm	07145005

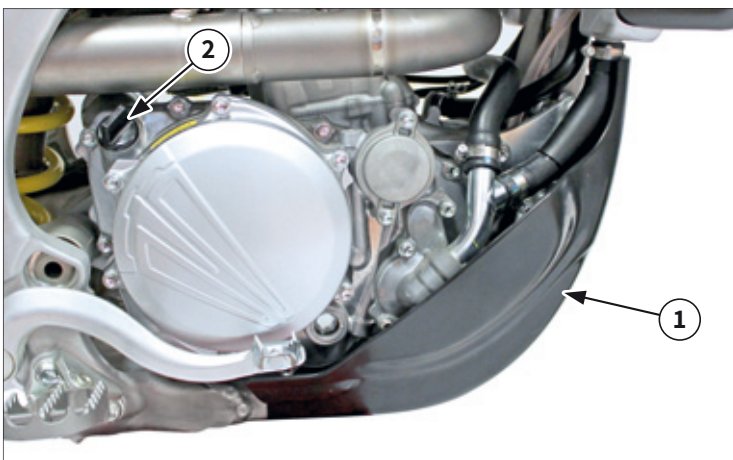


4.1 ENGINE OIL

Engine oil level check

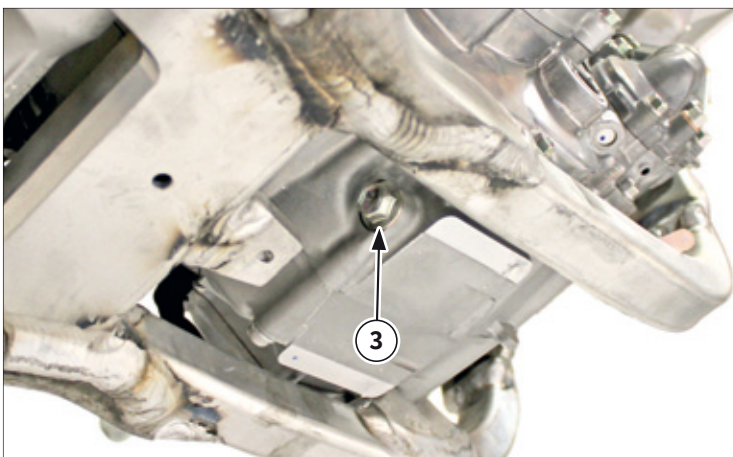
- Place the vehicle on a flat surface, in a vertical position by placing a suitable stand under the engine.
- Start the engine and warm it up for 1-2 minutes, then stop it and wait 1 minute for the engine oil to settle.
- Check that the engine oil level is between min. reference "A" and max. reference "B". If it is below the reference "A", add the engine oil indicated in the "RECOMMENDED PRODUCTS TABLE" section.

⚠ Engine oil also lubricates the clutch, so wrong types of oil or additives can cause the clutch to slip. Use only types of oil that meet the specifications and do not add additives.

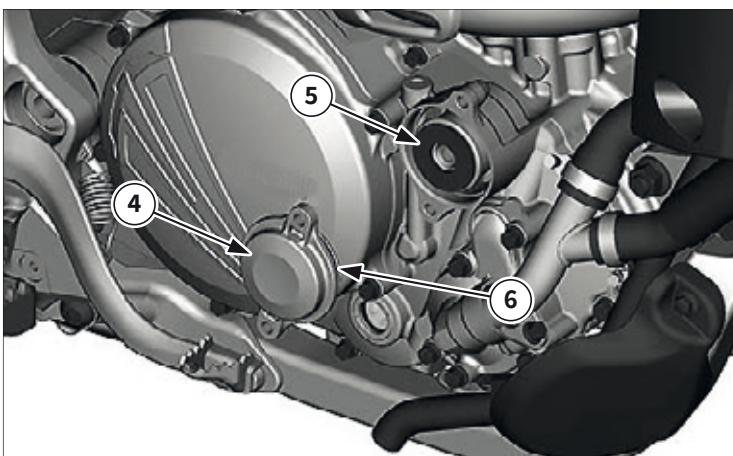


Engine oil change and engine oil filter replacement

- Remove the motor guard "1";
- Place the vehicle on a flat surface, in a vertical position by placing a suitable stand under the engine;
- Place a container under the engine;
- Start the engine, warm it up for several minutes then stop it and wait five minutes;
- Remove the filler cap "2";



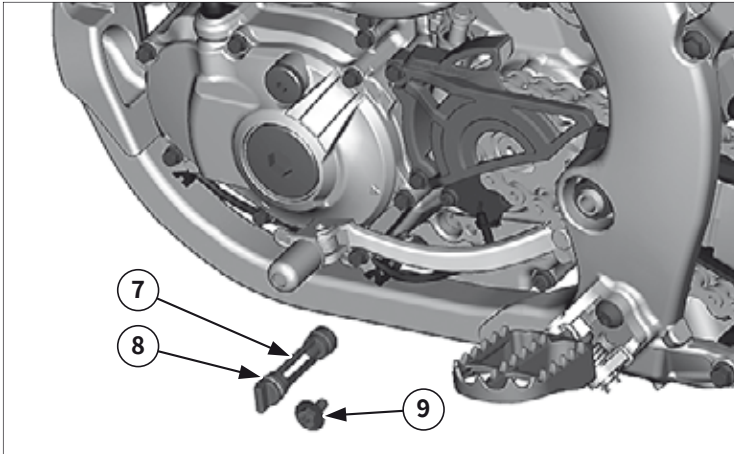
- Drain the engine oil by removing the drain bolt "3";
- Once all the engine oil in the crankcases has drained, replace the copper gasket with a new one and install the drain bolt "3".



If necessary, replace the oil filter:

- Remove cover "4" and oil filter cartridge "5";
- Install a new oil filter cartridge "5" and a new O-Ring "6";
- Then refit the cover "4".

🔧 Cover bolt: 10 Nm (1.0 m•kg 7.4 ft•lb)



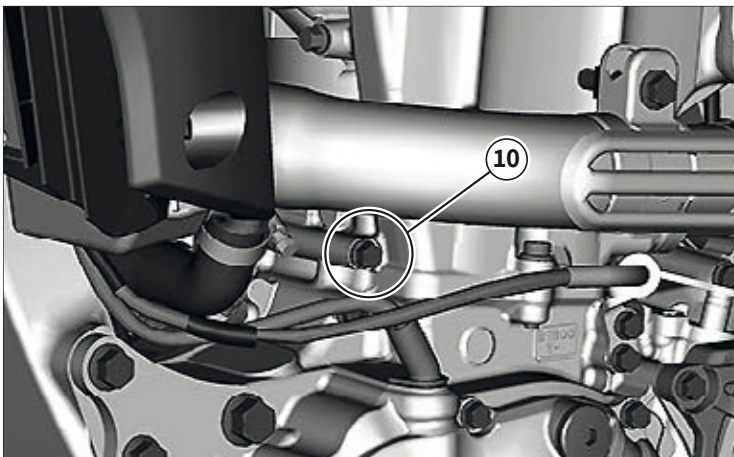
- Check the secondary oil filter “7” removing screw “8”.
- Remove the secondary oil filter “7”.
- (i) Clean it with Kerosene if it is clogged with dirt, replace if damaged.**
- Replace the O-Ring “9” with a new one then replace the secondary oil filter “7”.

Oil filter bolt: 10 Nm (1.0 m•kg 7.4 ft•lb)



- Pour the engine oil through the oil filler cap hole until the correct level is reached, then install the filler cap.

Engine oil quantity:
Oil change: 0.73 L (0.77 US qt, 0.64 Imp.qt)
Oil change and filter cartridge replacement:
0.75 L (0.79 US qt, 0.66 Imp.qt)
Filling after crankcase assembly:
0.95L (1.00 US qt, 0.48 Imp.qt)



- Check the engine oil pressure by loosening the control bolt “10” slightly;

(!) **Always loosen the control bolt “10” before starting the engine.**

- Start the engine and let it idle until the engine oil filters through the control bolt “10”;

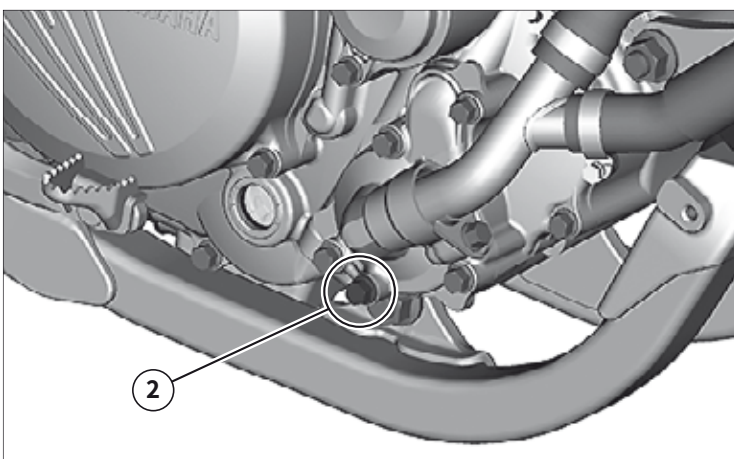
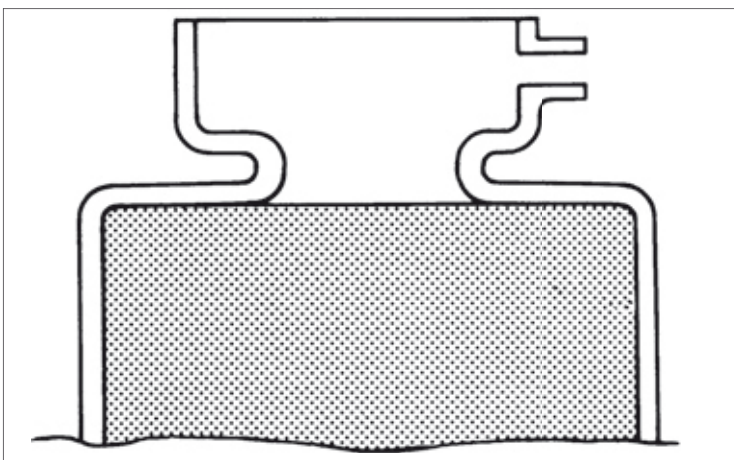
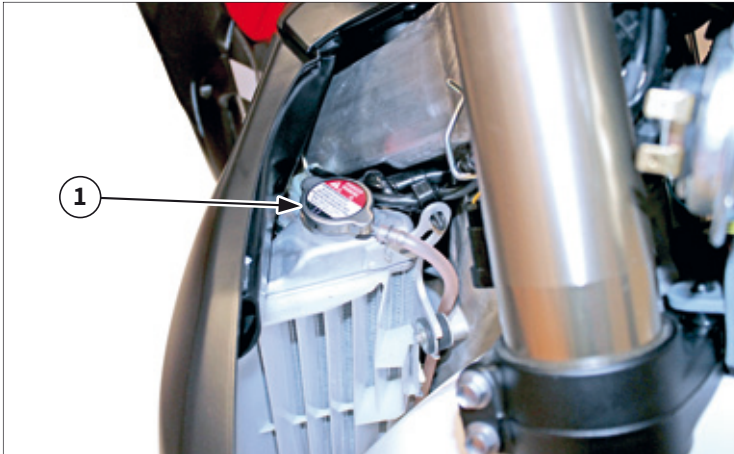
(!) **Always keep the engine at idle speed only during the check.**

(!) **If there is no engine oil leakage after one minute, switch off the engine immediately to avoid seizing.**

- If there is no engine oil leakage, check the engine oil line and oil pump for leaks and ensure that the engine oil line and oil pump are not damaged;
- Check the oil pressure again, if present tighten control bolt “10”.

Control bolt: 10 Nm (1.0 m•kg 7.4 ft•lb)

- Check the correct engine oil level and reinstall the engine guard.



4.2 COOLANT

Checking the coolant level

⚠ Do not remove the radiator cap “1”, drain bolt and hoses when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled, place a thick towel over the radiator cap, slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.

⚠ Hard water or salt water is harmful to the engine parts. You may use distilled water, if you can't get soft water.

- Place the machine on a level place, and hold it in an upright position;
- Remove the radiator cap “1” and check the coolant level. Add coolant if the coolant level is low.

Coolant replacement

⚠ Do not remove the radiator cap “1”, drain bolt and hoses when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled, place a thick towel over the radiator cap, slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.

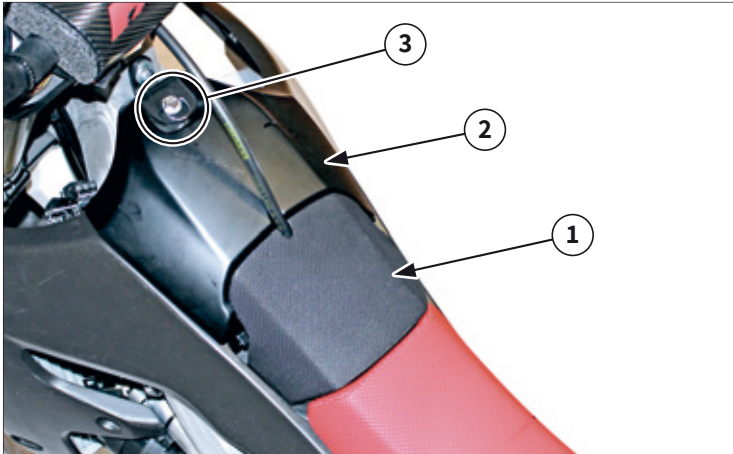
- Remove the engine guard.
- Place the vehicle on a flat surface, in a vertical position by placing a suitable stand under the engine.
- Remove the radiator cover “1” and the coolant drain plug “2”, then drain the coolant completely by collecting it in the container under the engine;
- Install a new washer on the drain plug “1” and install it in its housing;
- Fill the engine and the radiator with “ETHYLENE GLYCOL WITH ANTICORROSIVE FOR ALUMINIUM ENGINES”, up to the level previously indicated.

🔧 Coolant quantity:
0,93 L (0.98 US qt, 0.82 Imp.qt)

⚠ Do not add additives or other substances and use the products recommended in the “RECOMMENDED PRODUCTS TABLE” section.

⚠ Do not mix more than one type of ethylene glycol antifreeze containing corrosion inhibitors for aluminum engine.

⚠ Do not use water containing impurities or oil.

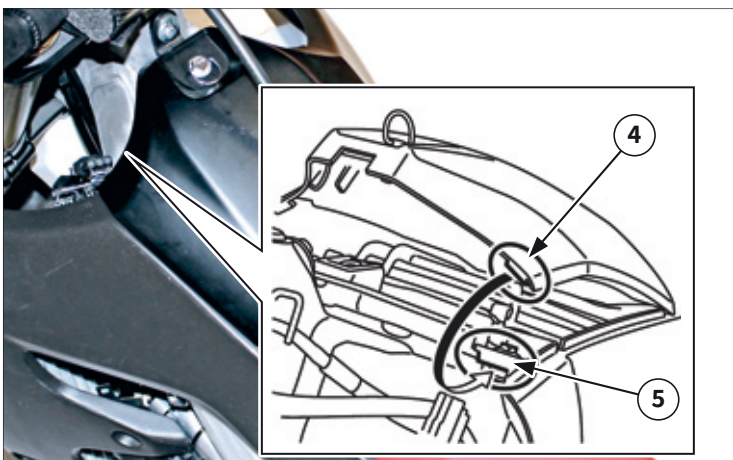


4.3 AIR FILTER

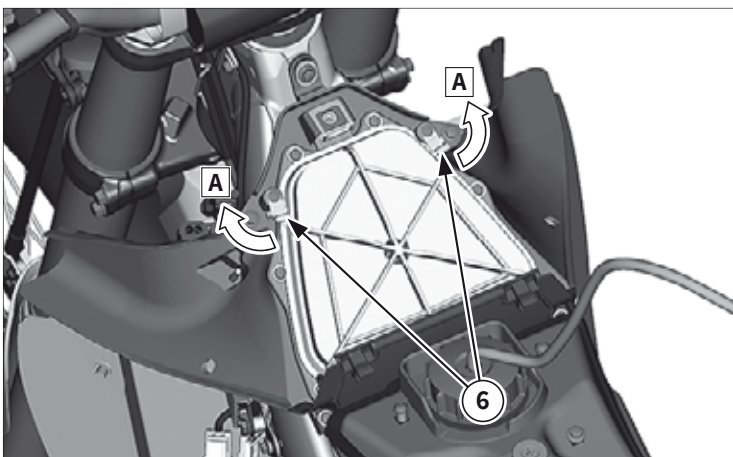
(i) Proper air filter maintenance is the biggest key to preventing premature engine wear and damage.

(!) Never run the engine without the air filter element in place; this would allow dirt and dust to enter the engine and cause rapid wear and possible engine damage.

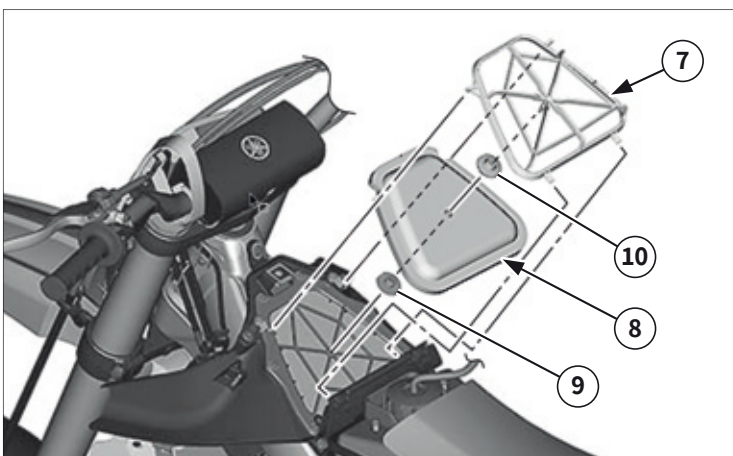
- Remove the initial part of the seat "1";
- Loosen the quick fastener screw "3" and remove the air filter case cover "2";



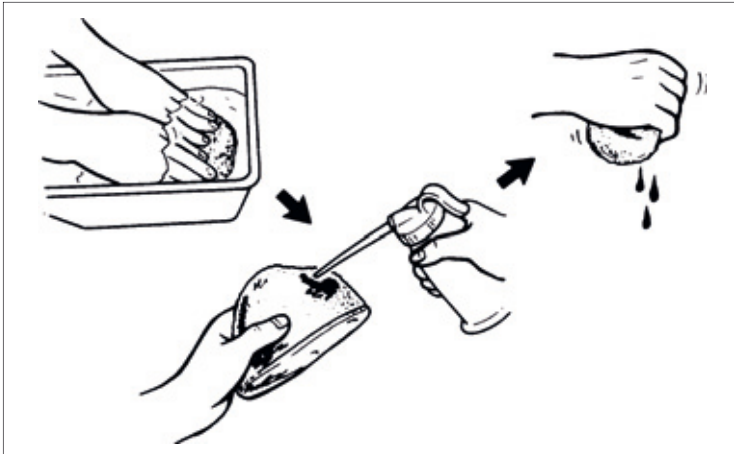
- Remove the two ribs "4" located on the left and right sides of the projections "5" on the air scoop, and slide the air filter case cover toward the front of the vehicle to remove it.



- Turn the plates "6" in direction "A".

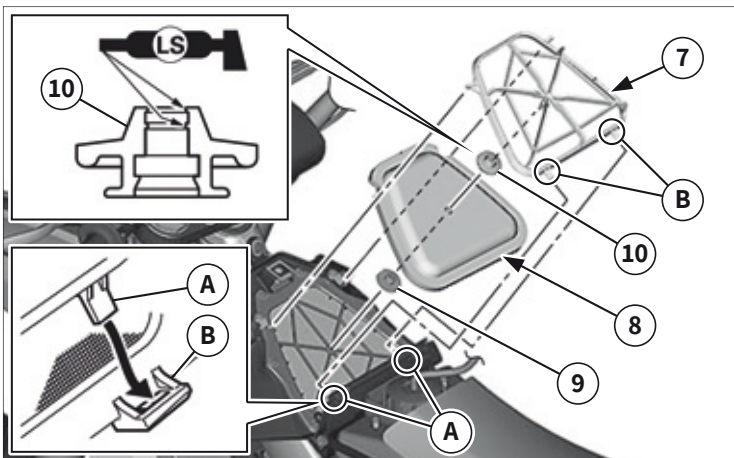


- Remove the air filter guide "7";
- Remove the filtering element "8" from the air filter guide;
- Remove the guide "9" from the filtering element;
- Remove the gasket "10" from the filtering element.



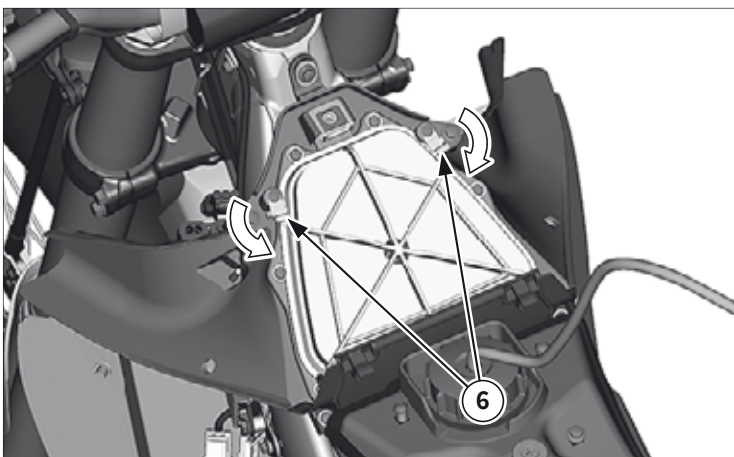
- Check that the filtering element is not damaged, if it is, replace it;
- Clean the filtering element with a dedicated solvent, after cleaning remove the solvent by squeezing the filtering element and blowing it with compressed air;
- Apply air filter oil to the filtering element, squeeze it to remove excess oil.

⚠ The cartridge must be damp, but not wet.

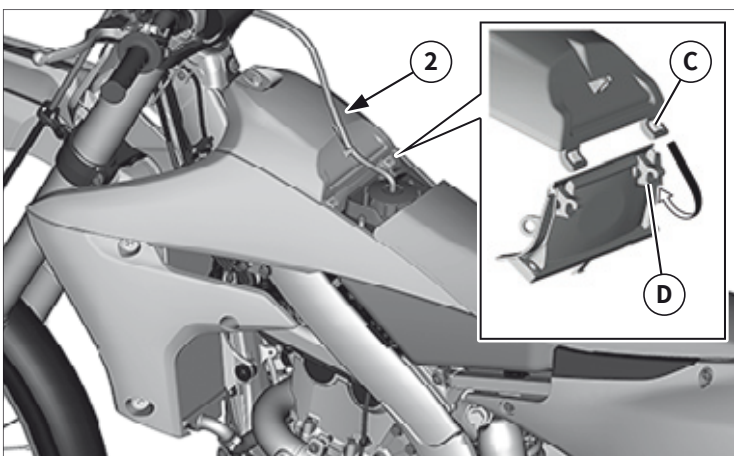


- Install gasket "7" on the filtering element;
- Install guide "8" on the filtering element;
- Install filtering element "9" on guide "10";
- Then install the guide/air filter assembly on the vehicle.

i Make sure that the two projections "A" at the rear side of the vehicle on the air filter guide are securely fitted into the two slots "B" in the air filter case.



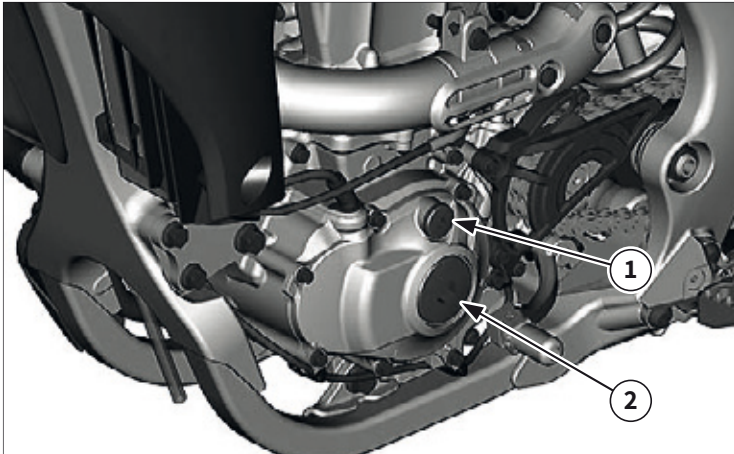
- Turn the plates "6" to the original position.



- Install the filter casing cover "2" making sure that the two housings "C" on the cover are correctly inserted on the protrusions "D" of the filter casing.

⚠ Also make sure that the two ribs, located on the right and left side of the cover, are correctly aligned with the protrusions on the intake ducts of the filter casing.

- Install the initial part of the seat.

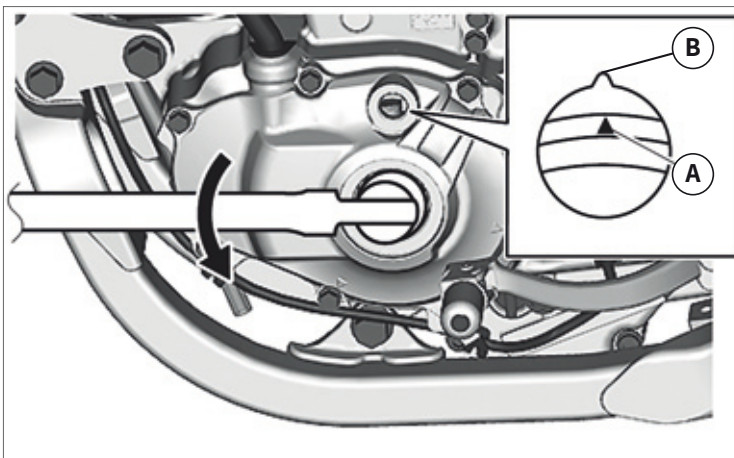


4.4 CAMSHAFTS

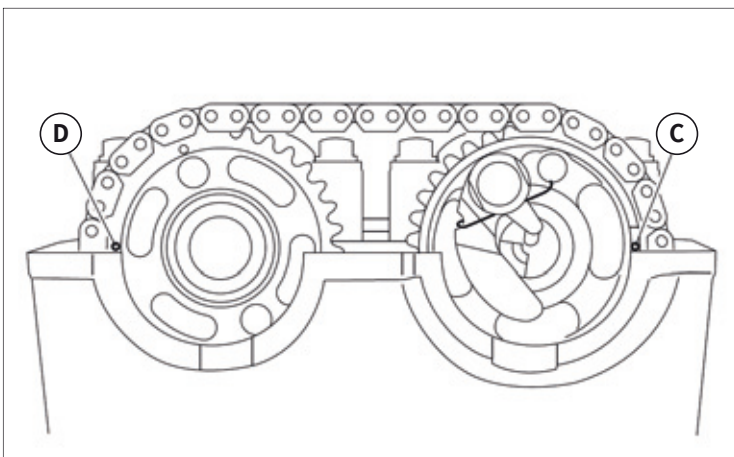
Removal

Remove:

- Seat, left and right conveyors, air filter casing, fuel tank;
- Remove the spark plug and valve cover;
- Remove timing reference cap "1" and crankshaft access cap "2".

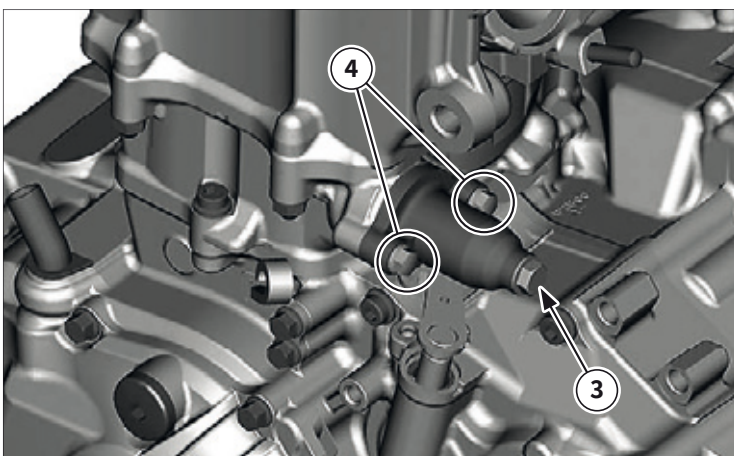


- Turn the crankshaft counter-clockwise with a spanner, using the appropriate access hole on the crankcase cover;
- Align the top dead centre notch (TDC) "A" on the flywheel with the reference "B" on the left crankcase cover.

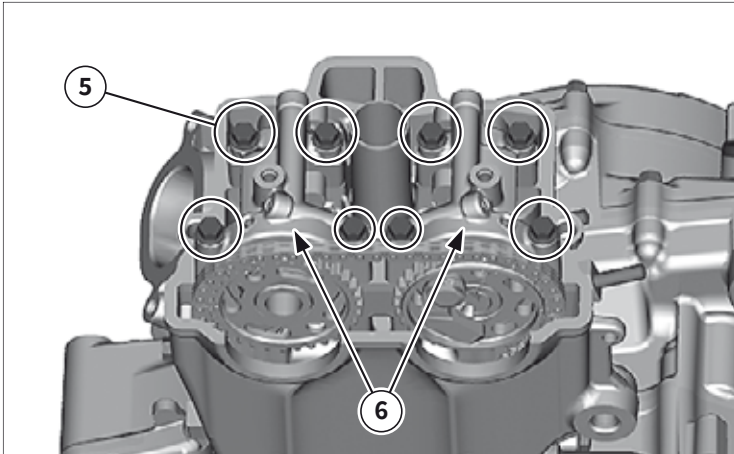


- Align the notch "C" of the exhaust camshaft and the notch "D" of the intake camshaft with the cylinder head plane.

⚠️ Align the crankshaft and camshaft references simultaneously. It is possible to be in a situation where the crankshaft is aligned with the references, while the camshafts are not. In this case it is necessary to make the crankshaft move one more complete revolution.

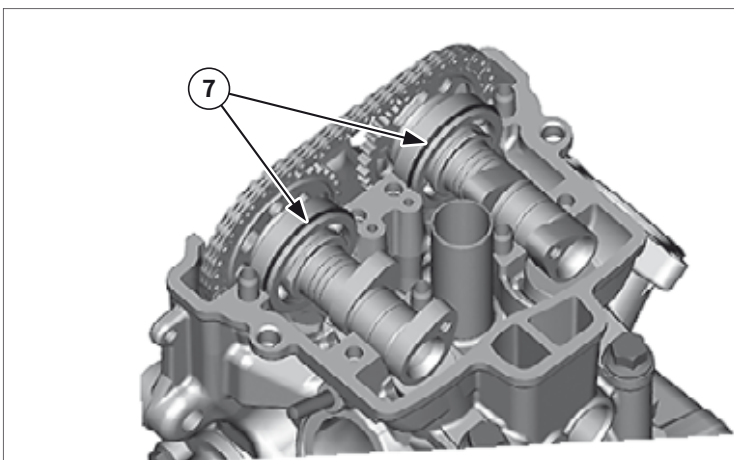


- Remove the timing chain tensioner cap "3";
- Remove the timing chain tensioner fixing screws "4", then remove the timing chain tensioner from the vehicle.

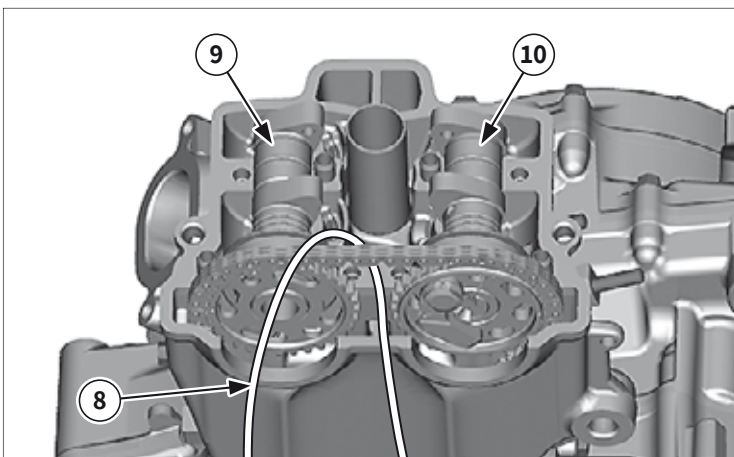


- Remove bolts "5" of the camshaft supports following a crossed pattern, starting from the outside to the inside;
- Remove the camshaft supports "6" from the head.

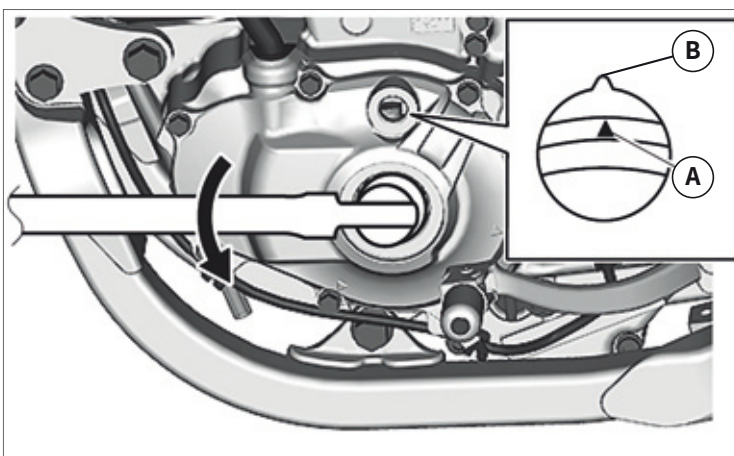
⚠ The camshaft cap bolts must be removed evenly to prevent damage to the cylinder head, camshafts or camshaft caps.



- Recover the guides "7" of the camshaft bearings, taking care not to drop them inside the engine.

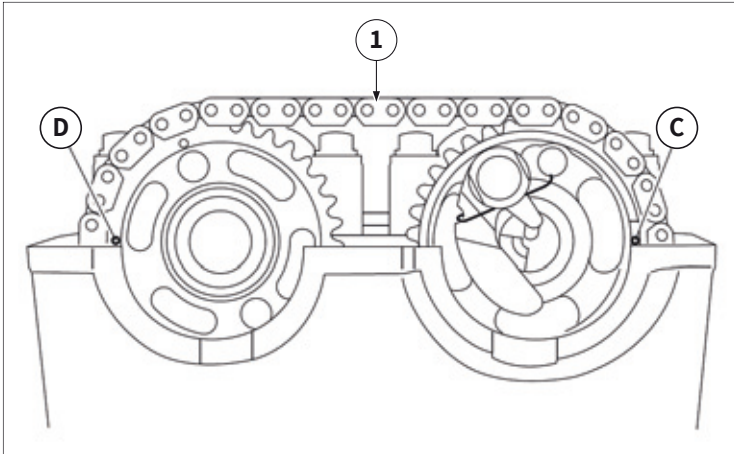


- Connect a metal wire "8" to the timing chain to prevent it from falling inside the engine, then pull it off the camshaft sprockets and tie it to the frame using the metal wire;
- Remove camshafts "9" and "10" from the head.

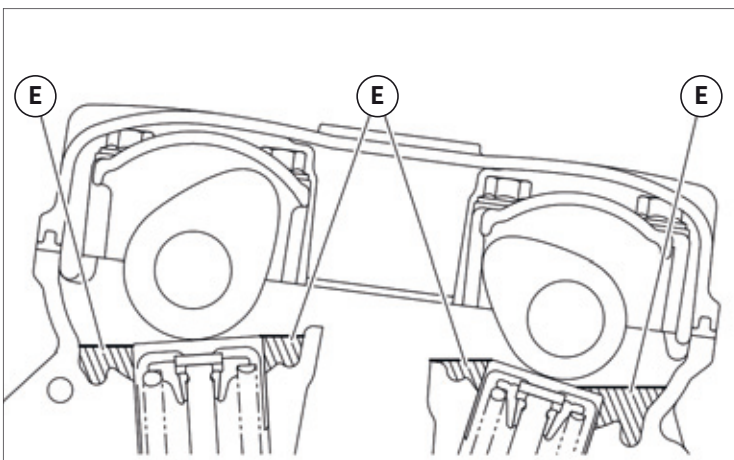


Installation

- Check that the top dead centre notch (TDC) "A" on the flywheel is aligned with the reference "B" on the left crankcase cover. If not, align it by turning the crankshaft counter-clockwise.

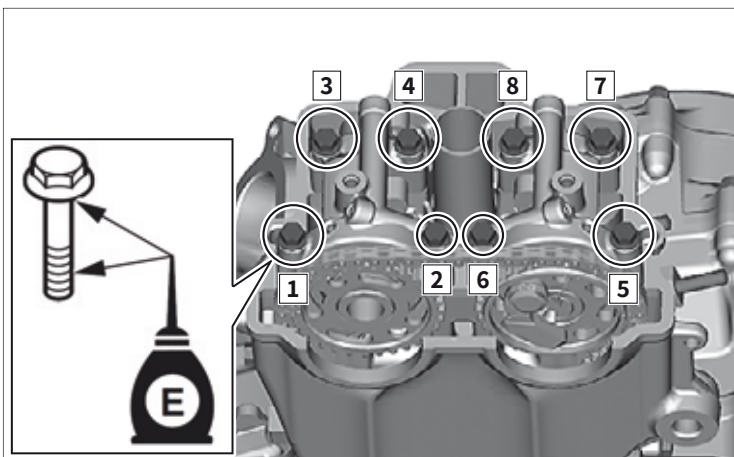


- Install the intake and exhaust camshafts in the head.
- Install the timing chain "1" on the sprockets of both camshafts. Make sure that the notch "C" of the exhaust camshaft and the notch "D" of the intake camshaft are aligned with the head plane.



- Apply molybdenum disulphide grease to the sliding surfaces of the camshafts;
- Apply the engine oil on the decompression system.
- Fill the cylinder head with engine oil up to the tops "E" of the valve lifters.

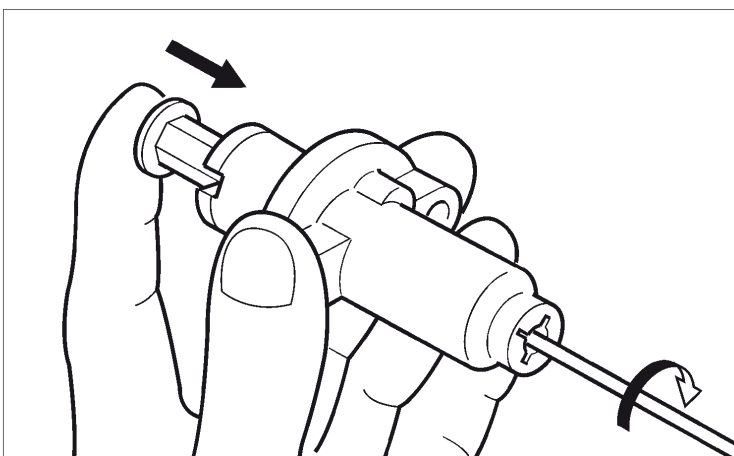
⚠ When installing the camshafts and timing the engine, do not rotate the crankshaft. Damage and/or incorrect engine timing may occur.



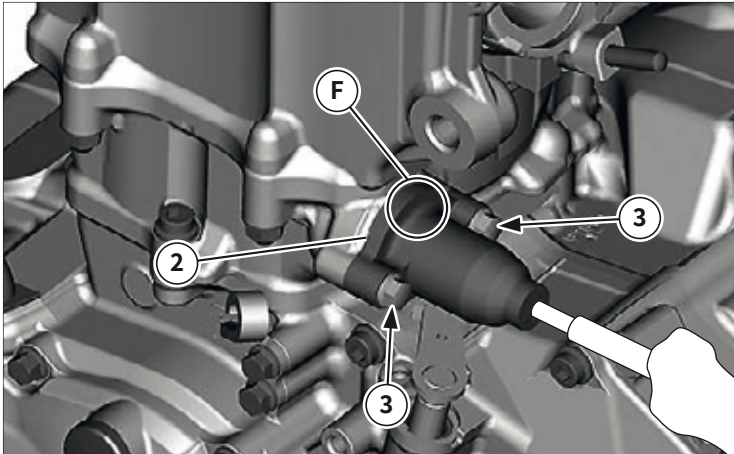
- Install the camshaft bearing guides and camshaft supports;
- Apply engine oil to the threads and contact surfaces of the camshaft support bolts, install them and tighten them to the specified torque. Perform the tightening operation in two/three steps, following the diagram shown in the figure.

⚠ The bolts of the camshaft supports must be tightened evenly to prevent damage to the camshaft head or camshaft supports.

**🔧 Camshaft support bolt:
 10 Nm (1.0 m•kg 7.4 ft•lb)**

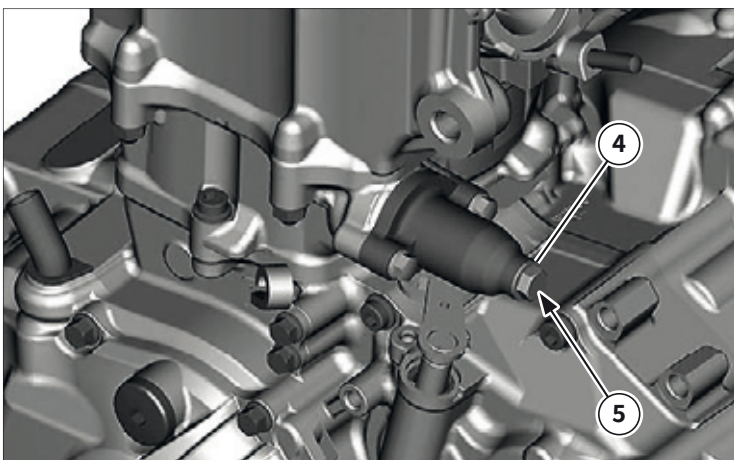


- Install the timing chain tensioner, operating as described below;
- Press the tensioner rod with your fingers at the same time, using a flat, thin-blade screwdriver, turn the rod clockwise until it is in the fully closed position.



- Install a new gasket "2" in the housing on the cylinder;
- Keeping the rod completely closed, install the tensioner on the cylinder making sure that the UP reference "F" is facing upwards, then tighten the fastening bolts "3".

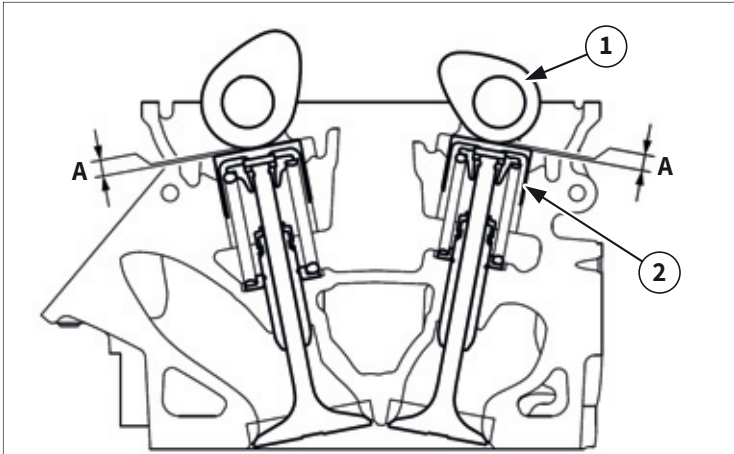
 **Timing chain tensioner bolt:**
 10 Nm (1.0 m•kg 7.4 ft•lb)



- Release the screwdriver and check that the tensioner rod comes out smoothly and easily;
- Install the gasket "4" and the timing chain tensioner cap "5".

 **Timing chain tensioner cap:**
 6 Nm (0.6 m•kg 4.4 ft•lb)

- Rotate the crankshaft counter-clockwise for several turns, checking that the movement is smooth and free of interference;
- Check that the crankshaft and camshaft references are correctly aligned with the references on the left crankcase cover and cylinder head;
- Refit the spark plug and valve cover.
- Reassemble: Fuel tank, air filter casing, right and left conveyors, seat.

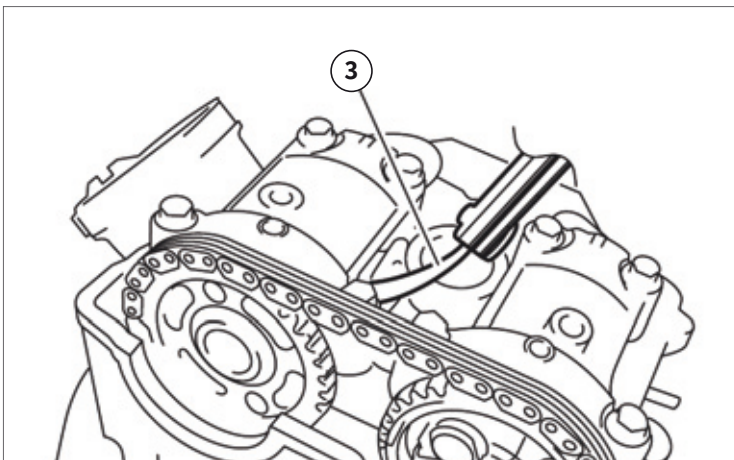


4.5 VALVE CLEARANCE

- ⚠ Make sure that the valve clearance is controlled and/or adjusted when the engine is cold (ambient temperature).
- ⚠ While the valve clearance is checked and/or adjusted, ensure that the piston remains at the top dead centre (TDC).

Check

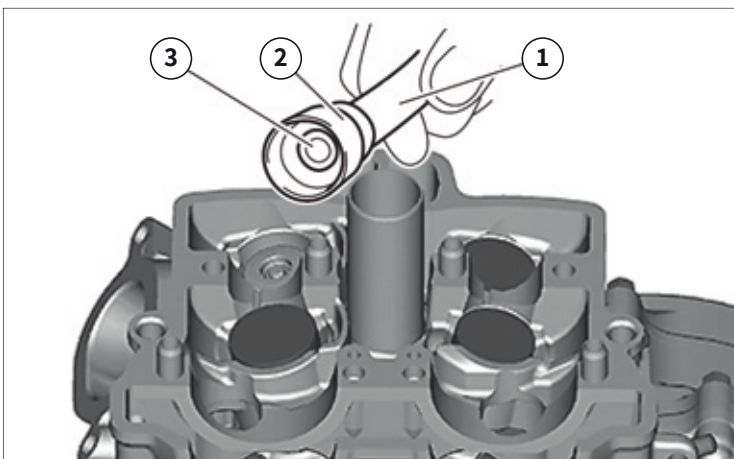
- Remove: Seat, left and right conveyors, air filter casing, fuel tank;
- Remove spark plug and valve cover;
- Perform the engine timing operation (refer to chapter “4.4 Camshafts” on page 65).



- Measure the valve clearance “A” between the camshaft lobes “1” and the valve lifters “2”, using a thickness gauge “3”.
- If the clearance value of one or more valves is not within the standard values, proceed with the adjustment.

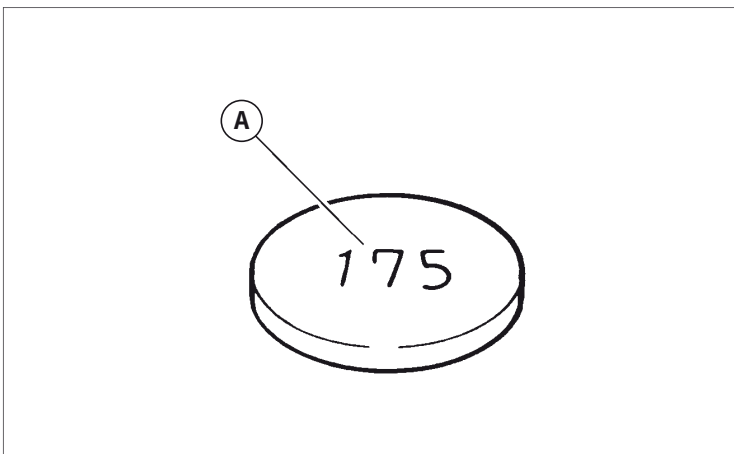
Intake valve clearance :
0.12 - 0.19mm (0.0047 - 0.0075 in)

Exhaust valve clearance :
0.17 - 0.24mm (0.0067 - 0.0094 in)



Adjustment

- Check that the crankshaft and camshaft references are correctly aligned with the references on the left crankcase cover and cylinder head;
- Remove the camshafts (refer to chapter “4.4 Camshafts” on page 65);
- Remove the valve lift “2” and the adjustment plate “3”, relative to the valve to be adjusted, using a magnet “1”.



- Check the thickness of the adjustment plate by checking the value “A” on the upper wall of the plate. If the value “A” cannot be read, measure the thickness of the plate with a micrometer.
- Choose the thickness of the new plate to be installed according to the following formula:

$$A=(B-C) + D$$

- A. New plate thickness;
- B. Valve clearance detected;
- C. Valve clearance specified;
- D. Old plate thickness.

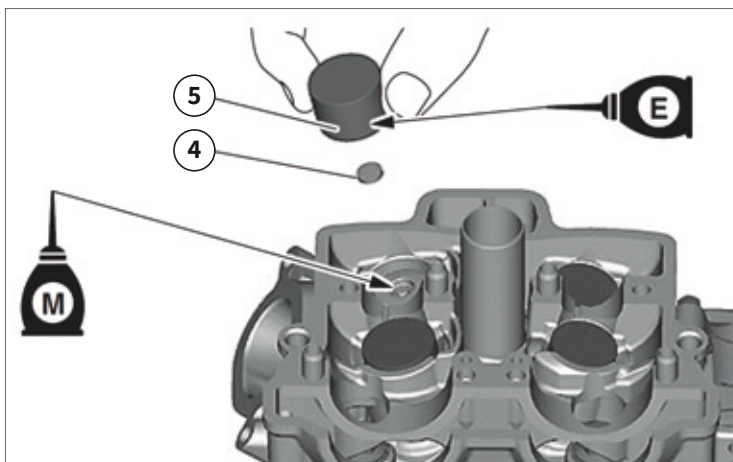
Last digit of pad number	Rounded value
0	0
1	0
2	0
4	5
5	5
6	5
8	10
9	10

i There are 25 types of adjusting pads, ranging from 1.20 mm (0.0472 in) to 2.40 mm (0.0945 in), in increments of 0.05 mm (0.0020 in).

i For the value of the originally installed plates, convert the last digit of the value according to the following table.

Example:

Plate number = 148 / Rounded value =150



- Install the new adjustment plates “4” and valve lifters “5” on the relevant valves.

! **DO NOT** force plates and/or valve lifters into their housings during installation.

i Apply molybdenum disulphide grease on the end of the valve stems and related plates.

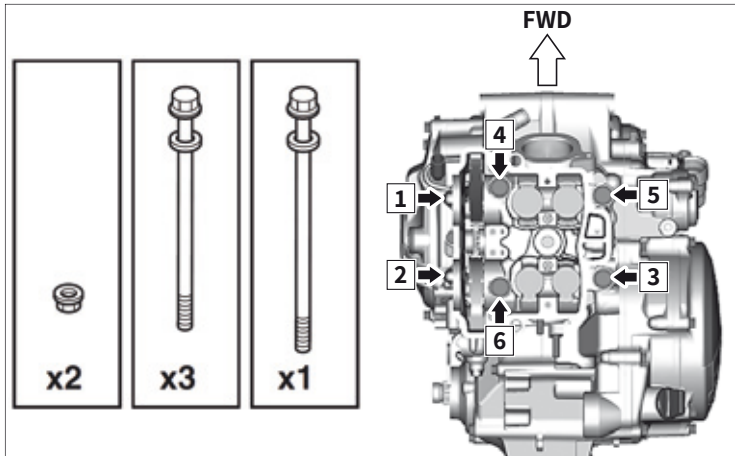
i Install the plates with the values facing upwards.

i Apply engine oil to the valve lifters and check that they move freely when rotated.

- Install the camshafts (refer to chapter “4.4 Camshafts” on page 65);

- Reassemble the spark plug and valve cover;

- Reassemble: Fuel tank, air filter casing, right and left conveyors, seat.



4.6 CYLINDER HEAD

Removal

- Remove: Seat, left and right conveyors, air filter casing, fuel tank;
- Remove the spark plug and valve cover;
- Remove the camshafts (refer to chapter "4.4 Camshafts" on page 65);
- Remove the nuts and bolts securing the head to the cylinder;

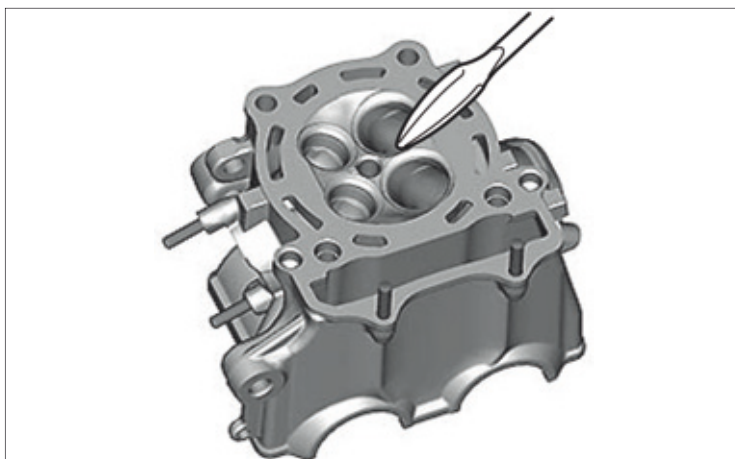
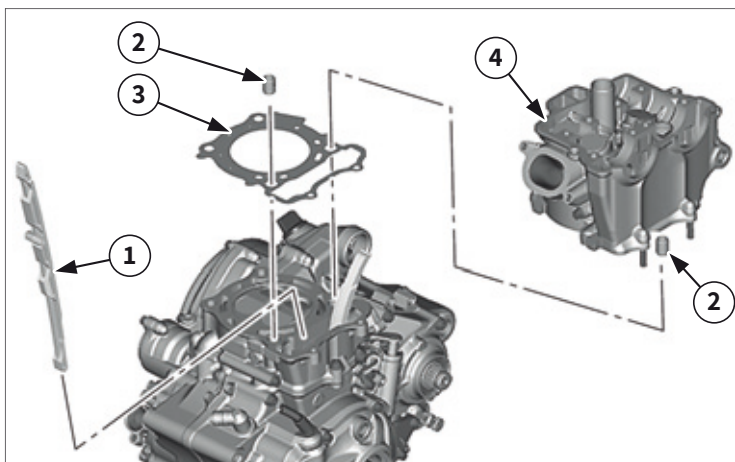
(i) Loosen the bolts ½ turn at a time, following the sequence shown in the figure.

- Remove the bolts after having completely loosened each one.

M9 x 135mm (5.31 in): "4", "5", "6"

M9 x 145mm (5.71 in): "3"

- Remove head "1" from the cylinder, gasket "2", centering pins "3" and timing chain guide "4";



Check

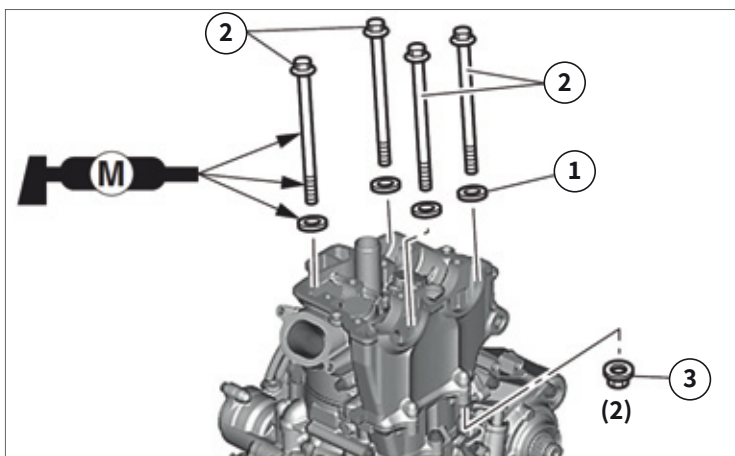
- Remove carbon deposits using a rounded scraper;
- ⚠ Take care to avoid damaging the spark plug threads. Do not use a sharp instrument. Avoid scratching the aluminum.**
- Check the head for damage and/or cracks, if any, replace the head;
- Check the water circuit, if there is encrustation and/or rust replace the head;
- Measure the deformation of the head, if it does not conform to specifications, level the head.

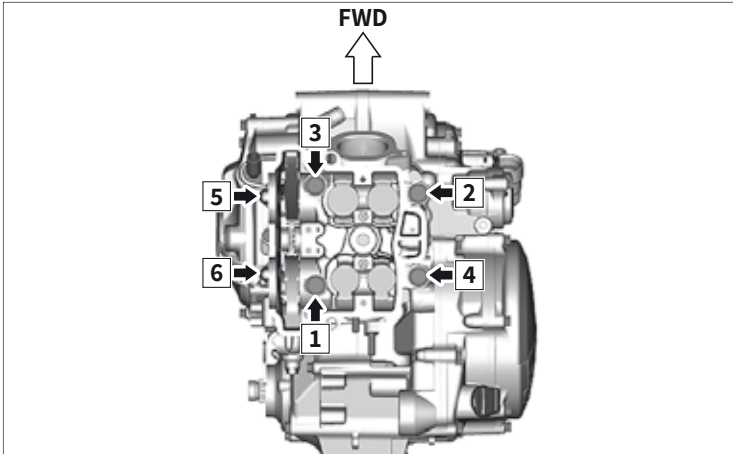
**🔧 Maximum permissible deformation:
 0.05 MM (0.0020 in)**

(i) If it is necessary to replace the head, the valves must also be replaced.

Installation

- Wash the threads and contact surfaces of bolts, washers, head/cylinder contact surface and crankcase threads;
- Install the gasket, centering pins, timing chain guide and head;
- Apply molybdenum disulphide grease to the threads and contact surfaces of the bolts and washers;
- Install washers "1", bolts "2" and nuts "3".





The head bolts tightening must be completed in four steps, as described below:


1st Phase

- Tighten the head bolts to the specified torque by performing the operation in two/three steps, following the diagram shown in the figure.

 **Head bolts “1” - “4”:**
30 Nm (3.0 m•kg, 22 ft•lb)

2nd Phase

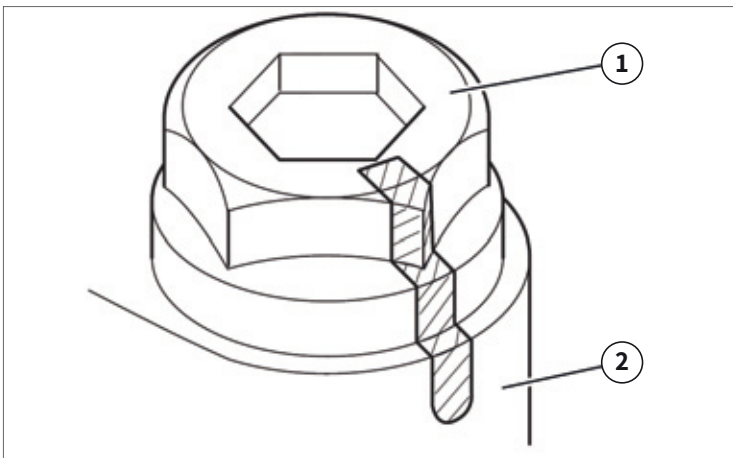
- Remove a single bolt, following the tightening order;
- Apply molybdenum disulphide grease again to the thread and contact surface of the bolt and washer;
- Tighten the bolt to the specified torque;

 **Head bolts “1” - “4”:**
15 Nm (1.5 m•kg, 11 ft•lb)

i Perform the 2nd Phase operations one bolt at a time. Remove the bolts in the order used for tightening, then tighten them according to the new tightening torque.

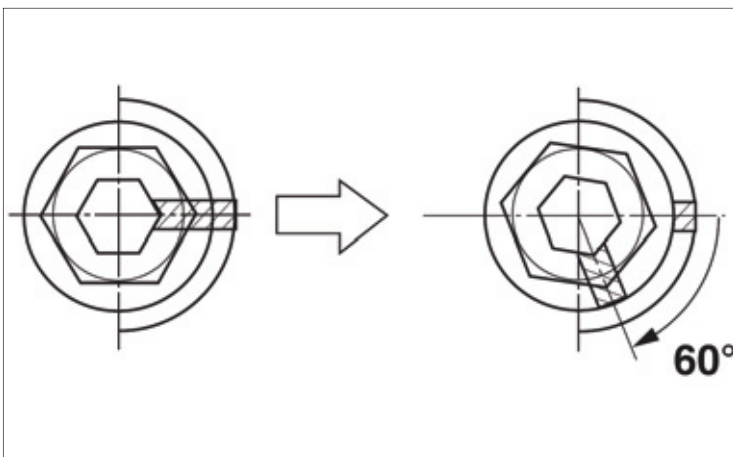
3rd Phase

- Using a marker pen, mark a reference between bolt “1” and head “2”;



- Tighten each bolt by turning it 60° with respect to the initial reference, following the 1st Phase tightening order;

 **Head bolts “1” - “4”:**
Specified angle = 60°




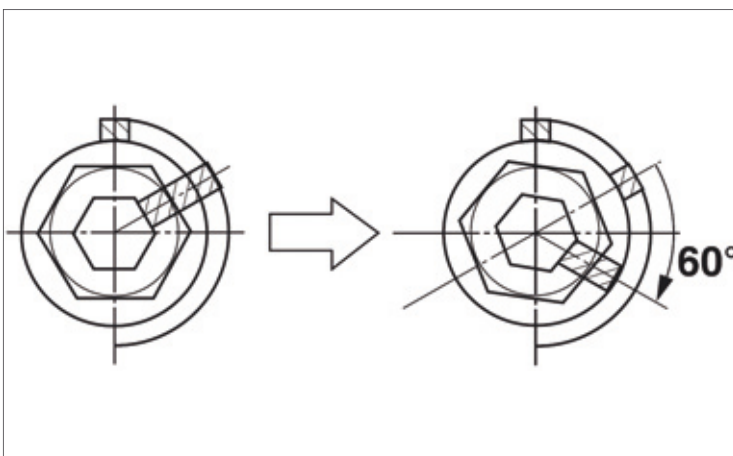
4th Phase

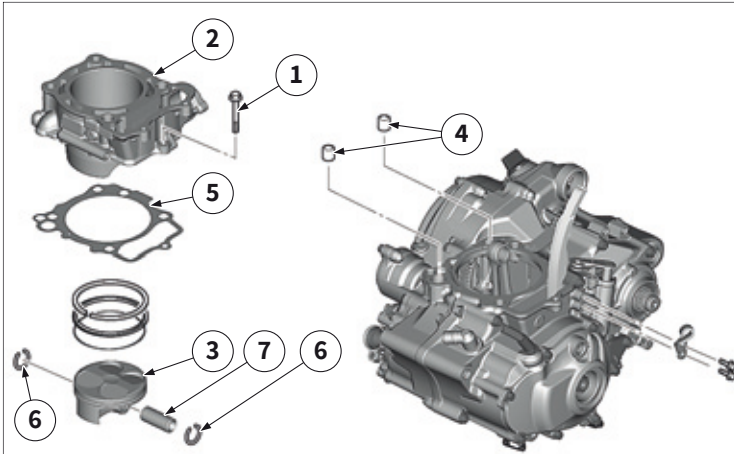
- Mark a second reference between the bolt and the head, then tighten each bolt by a further 60° following the tightening order of the 1st Phase;

 **Head bolts “1” - “4”:**
Specified angle = 60°

- Tighten the nuts “5” and “6” to the specified torque.

 **Nuts “5” - “6”:**
10 Nm (1.0 m•kg, 7.4 ft•lb)





4.7 CYLINDER AND PISTON

Removal

- Remove the head (refer to chapter "4.6 Cylinder head" on page 71);
- Remove cylinder bolts "1" on the timing chain side, then remove cylinder "2" from piston "3" and remove it from the vehicle. Retrieve the centring bushings "4" and remove the gasket "5".
- Remove seeger "6", pin "7" and piston "8" from the connecting rod.

(i) Before removing the seeger, cover the crankcase with a clean cloth to prevent it from falling into it.

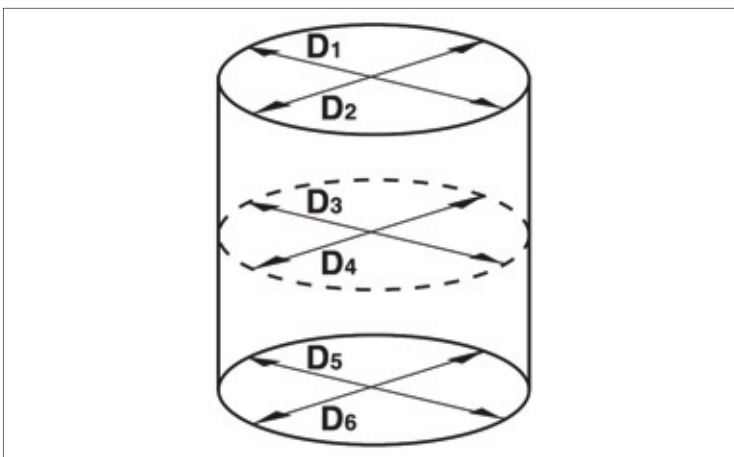
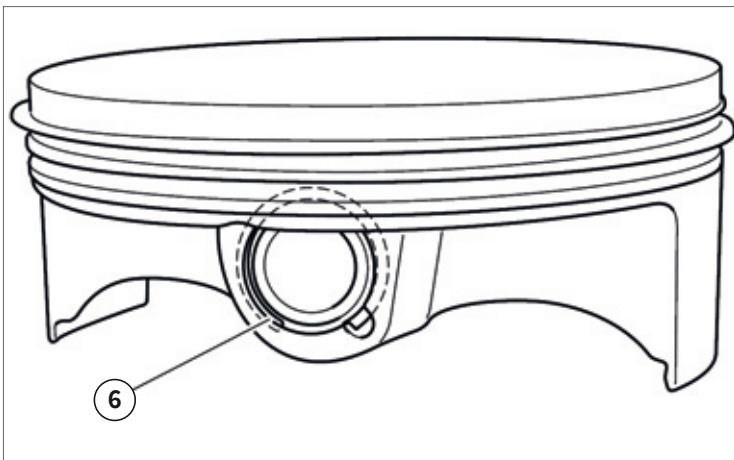
(!) Do not use a hammer to pull out the pin, in case the operation is difficult to use a special puller.

Cylinder check

- Remove carbon deposits using a rounded scraper;

(!) Do not use a sharp instrument. Avoid scratching the aluminum.

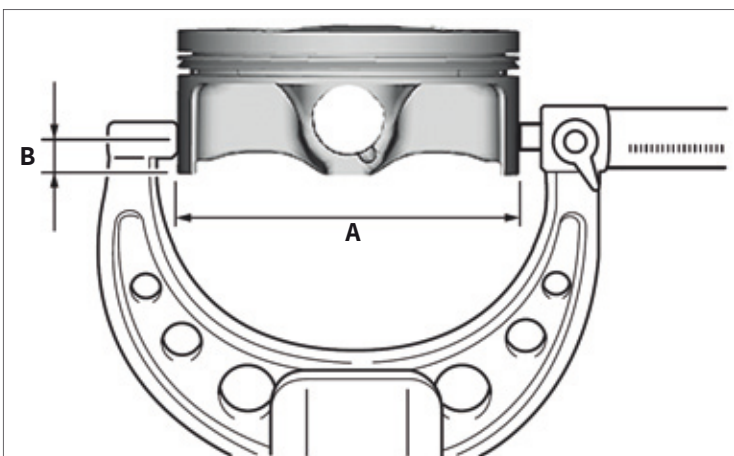
- Check the internal surface of the cylinder, if damaged, grind or replace;



- Measure the cylinder bore in parallel (D1, D3, D5) to and at right angles to the crankshaft (D2, D4, D6).
- Then, find the average of the measurements.

(!) Bore:
Standard = 77.000 - 77.010mm (3.0315 - 3.0319 in)
Wear limit = 77.60mm (3.0339 in)

(i) If the bore does not comply with the specifications, re-measure or replace the cylinder, piston and piston rings all together.



Piston check

- Measure the outside diameter of piston "A" in measuring position "B" using the micrometer.

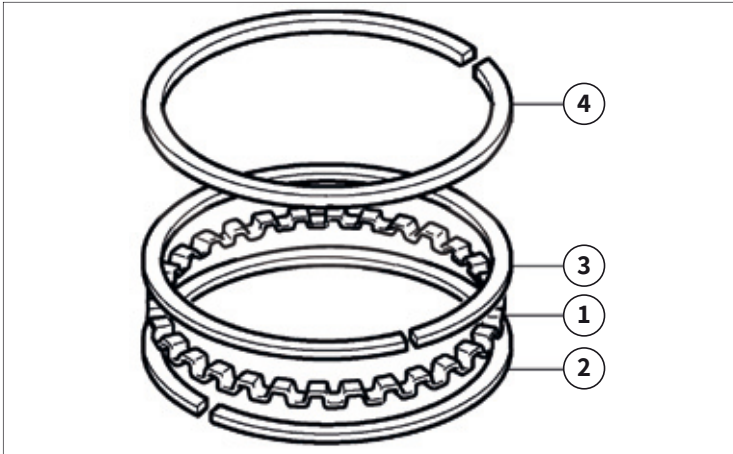
(!) Piston diameter:
76.955 - 76.970mm (3.0297 - 3.0303 in)

(!) Measuring point "B" (from the lower side of the piston skirt): 4.0mm (0.16 in)

(i) If the diameter does not comply with the specifications, replace the cylinder, piston and segments all together.

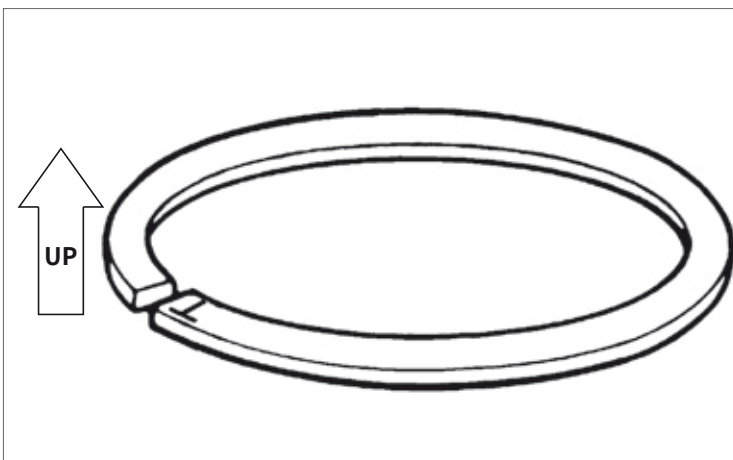
- Finally, calculate the clearance between cylinder and piston:
Clearance = Cylinder "C" bore - Piston diameter

(!) Clearance between piston and cylinder:
0.30 - 0.055mm (0.0012 - 0.0022 in)

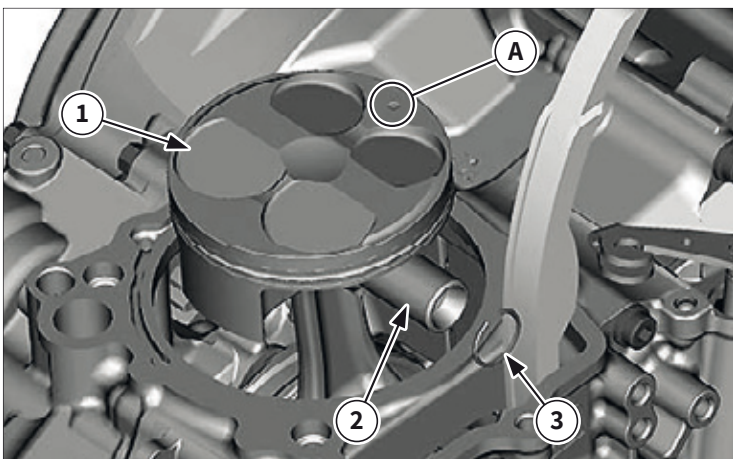


Installation

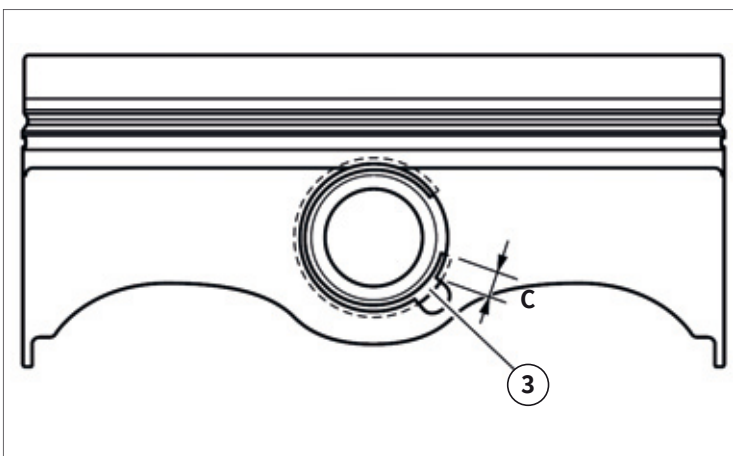
- Install in the lower piston housing: scraper ringband expander "1", lower scraper ring band light "2", scraper ring band light "3";
- Install segment "4" in the upper housing of the piston;



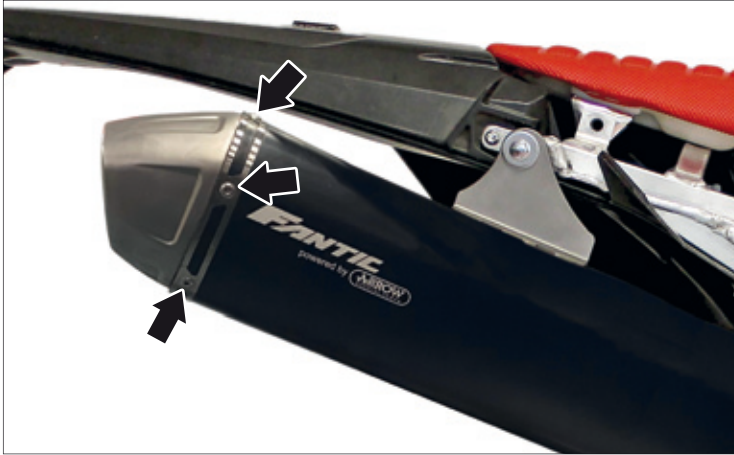
- (i)** Make sure to install the segment so that the reference, or manufacturer's numbers, are facing upwards.



- Lubricate piston "1" and pin "2" then install them on the connecting rod. Make sure that the piston reference "A" is facing the exhaust (rear side of the vehicle).



- Install seeger "3" in the relative housings on the piston;
- (i)** Make sure that the end of the seeger "C" is not near the notches in the piston.
- Install the centering pins, gasket and cylinder previously lubricated with engine oil;
- Install the cylinder bolt on the timing chain side;
- Cylinder bolt: 10 Nm (1.0 m•kg, 7.4 ft•lb)**
- (i)** While compressing the piston rings with one hand, install the cylinder with the other hand.
- Pass the timing chain and its slider (exhaust side) through the timing chain housing.



4.8 SOUNDPROOFING

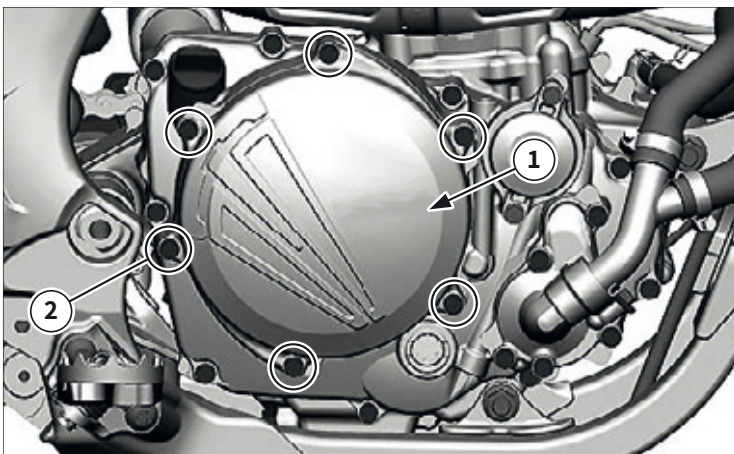
- Remove the fixing rivets (no. 6) of the bottom cover, then remove the cover from the silencer;



- Remove the end cap from the silencer and remove the soundproofing cartridge inside it;

- Insert a new cartridge, then replace the end cap on the silencer;
- Refit the cover and secure the cover/end cap/silencer assembly with new breakstem rivets.

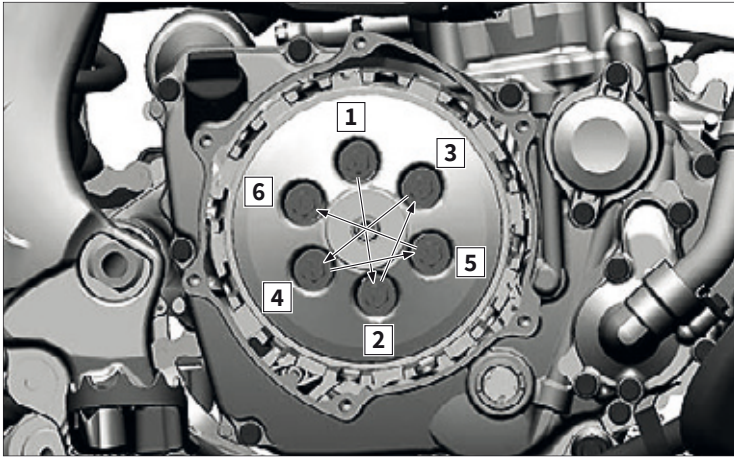
i A correct and regular maintenance of the soundproofing element guarantees the best performance of the vehicle and allows it to be driven on the road and/or in approved circuits.



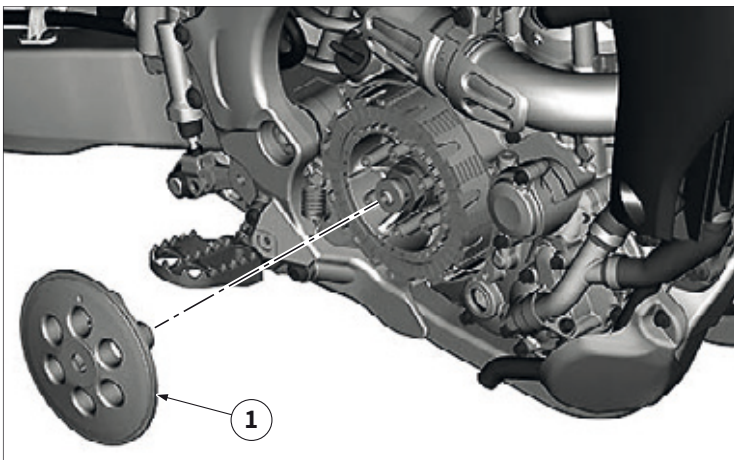
4.9 CLUTCH

Clutch removal

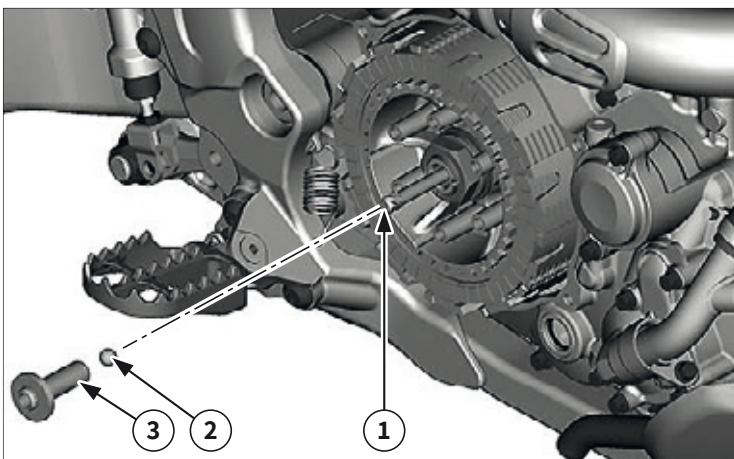
- Remove the clutch crankcase bolts "2" following a cross pattern, then remove the crankcase "1";



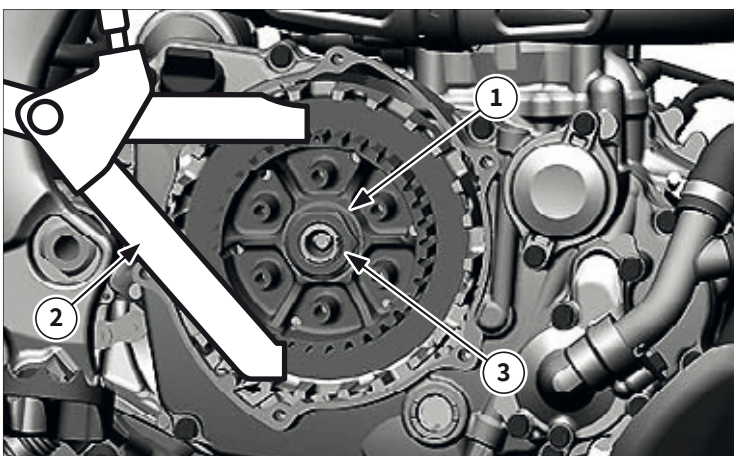
– Remove the clutch bolts and springs following a cross pattern;



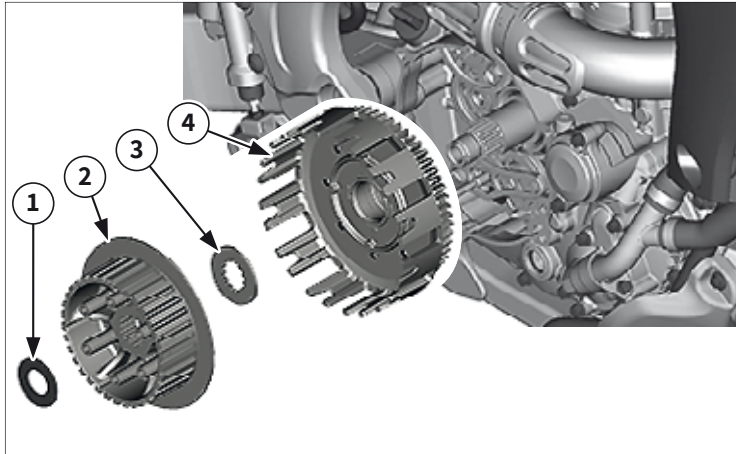
– Remove the pressure plate “1”;



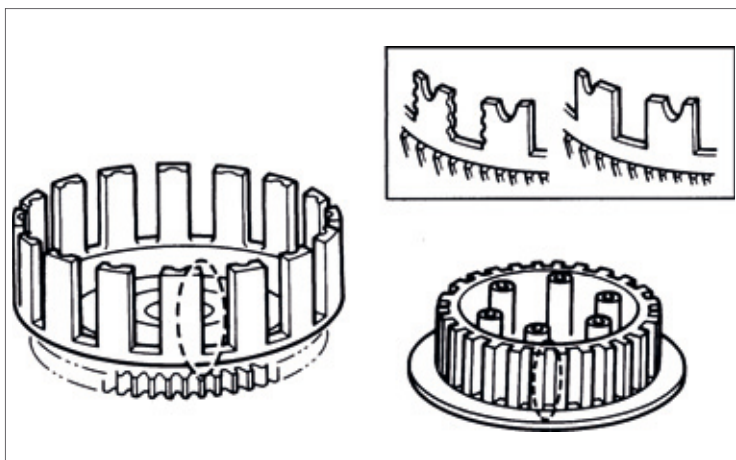
– Remove the thrust bearing “1”, the ball “2” and the thrust rod “3”;



– Lock the clutch hub “1” with the universal locking tool “2” and unscrew the nut “3”;

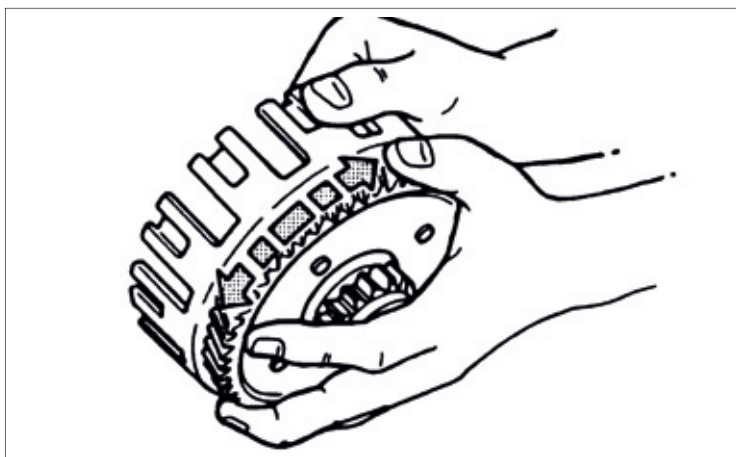


- Remove the conical washer "1", the hub "2", the spacer "3" and the clutch housing "4".

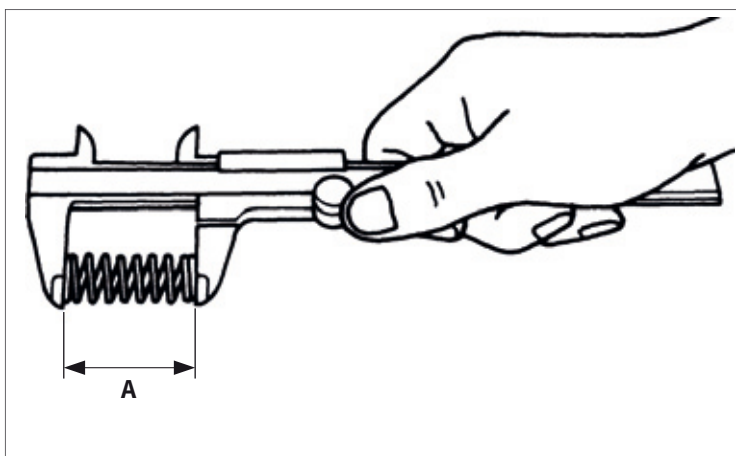


Check the clutch elements

- Check the clutch housing and clutch hub for wear/cracks/damage, replace them;

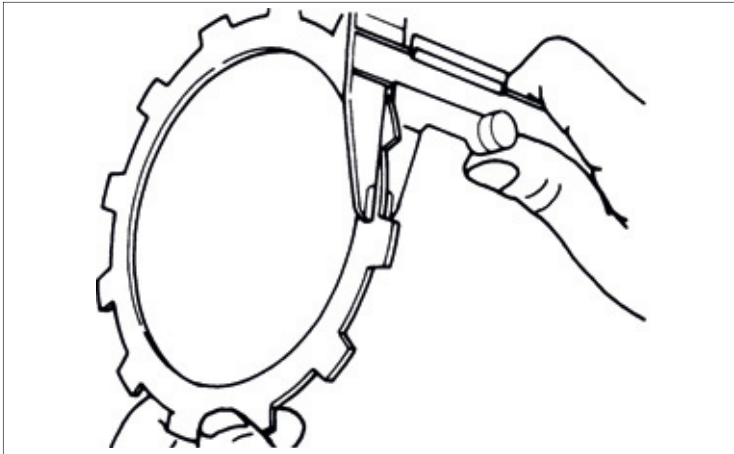


- Check the driven gear of the primary transmission for circumferential clearance and/or damage to the teeth. If it has one or both defects, replace it;



- Measure the free length "A" of the clutch springs. If not in accordance with the specifications, replace the spring;

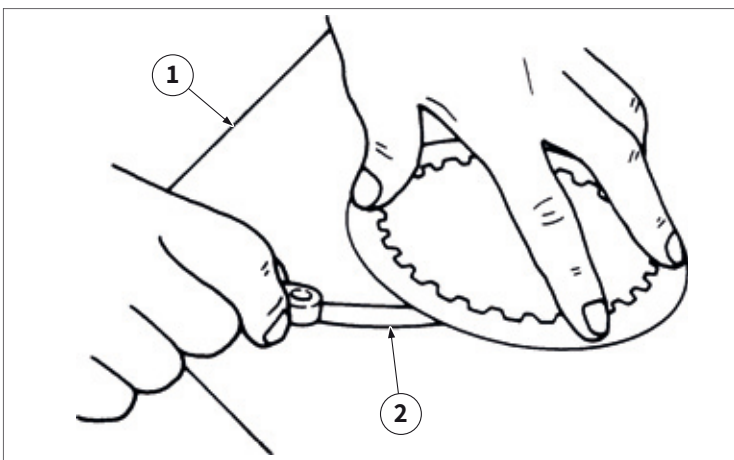
Clutch spring free length:
 44.00 mm (1.73 in)
 Minimum limit: 41.80 mm (1.65 in)



- Measure the thickness of friction discs 1 and 2. If not in accordance with specifications, replace the disc;

Friction disc 1 thickness:
 2.70-2.90mm (0.106-0.114 in)
 Minimum limit: 2.60 mm (0.102 in)

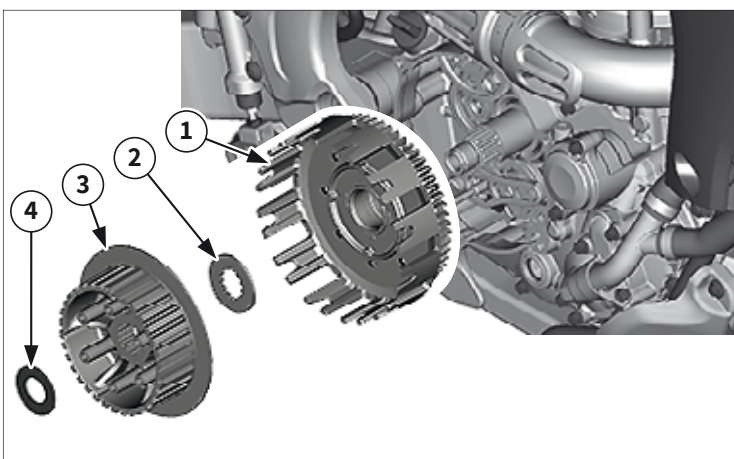
Friction disc 2 thickness:
 2.72-2.88mm (0.107-0.113 in)
 Minimum limit: 2.62 mm (0.103 in)



- Measure the distortion and thickness of the clutch disc, using a reference plane "1" and a thickness gauge "2";
 - If not in accordance with specifications, replace the disc.

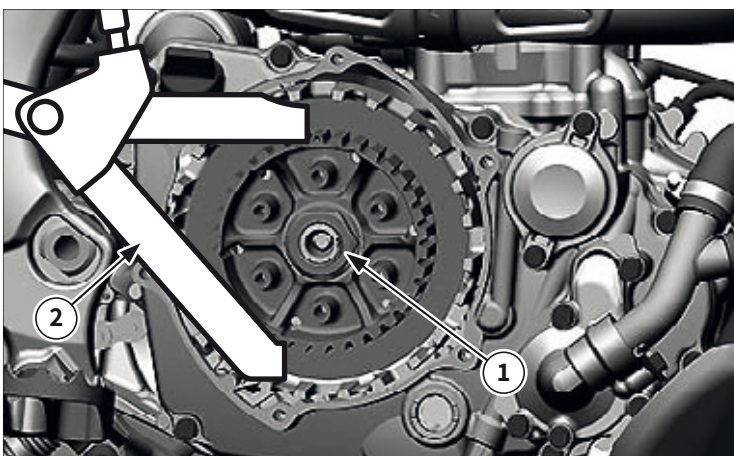
Distortion limit: 0.20 mm (0.008 in)

Clutch disc thickness:
 1.50-1.70mm (0.059-0.067 in)



Clutch installation

- Install the clutch housing "1", the spacer "2", the hub "3" and the conical washer "4";

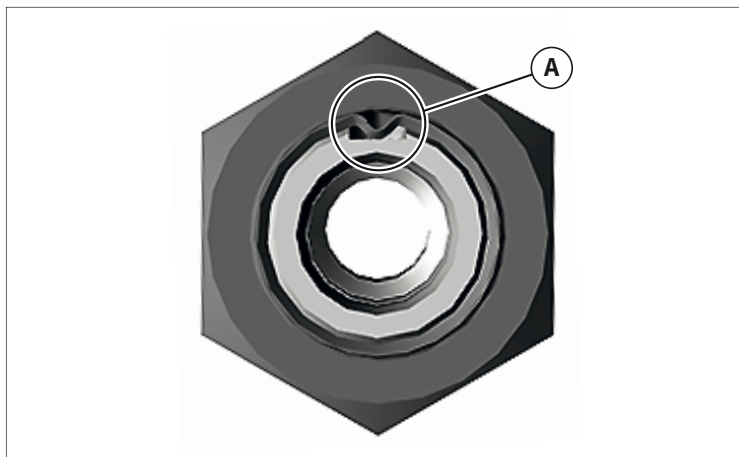


- Install nut "1", lock the clutch hub with universal locking tool "2" and tighten the nut to the specified torque;

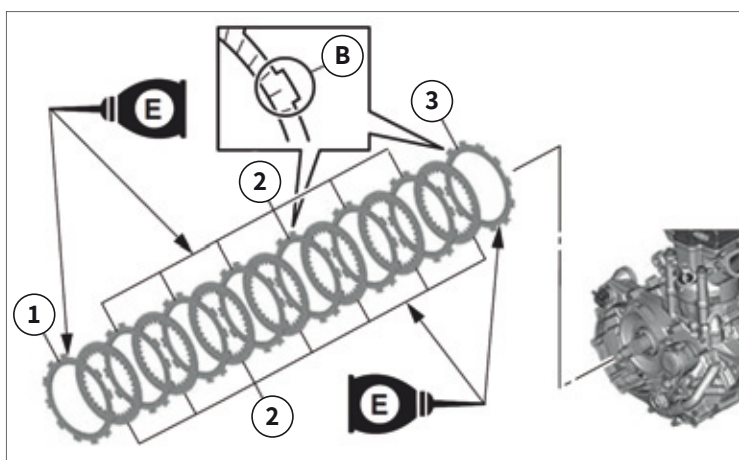
Nut (clutch boss):
 95 Nm (9.5 m•kg, 70 ft•lb)

Apply engine oil to the thread and contact surfaces of the clutch hub nut.

Install the conical washer with the "OUT" reference facing outwards.

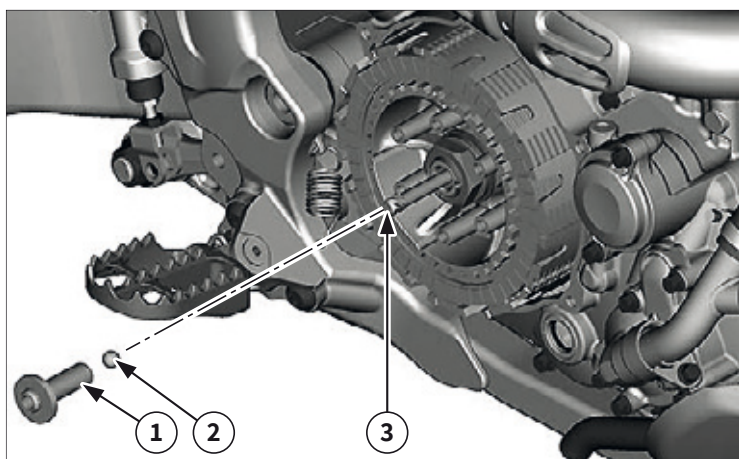


i Lock the clutch hub nut at notch “A” of the primary shaft.

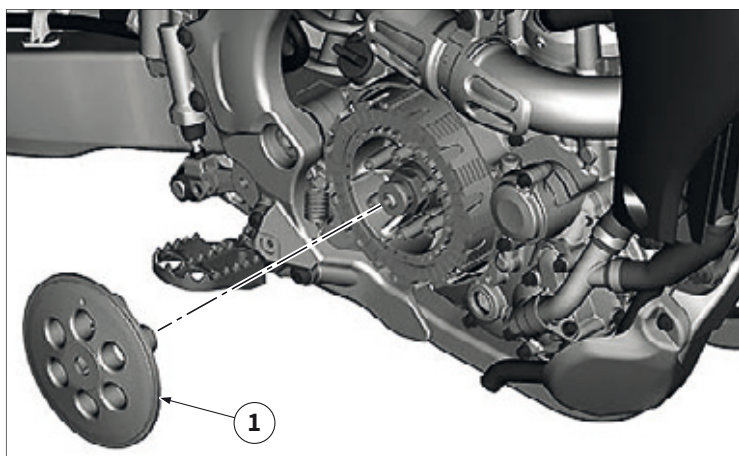


- Install friction discs and clutch discs alternately on the clutch hub, starting and ending with a friction disc.
- Install friction discs in this order:
 1. friction disc 1 (identification colour “B”: black) x1;
 2. friction disc 2 (identification colour “B”: orange) x6;
 3. friction disc 1 (identification colour “B”: black) x1.

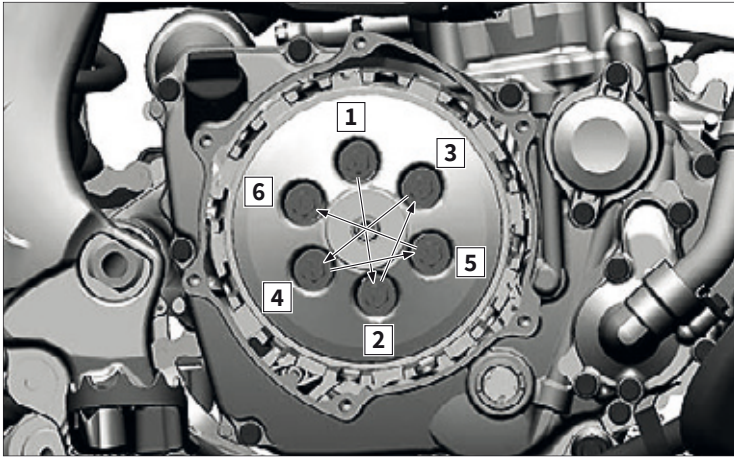
i Apply engine oil to the friction and clutch discs.



- Install thrust rod “1”, the ball “2” and thrust bearing “3”;

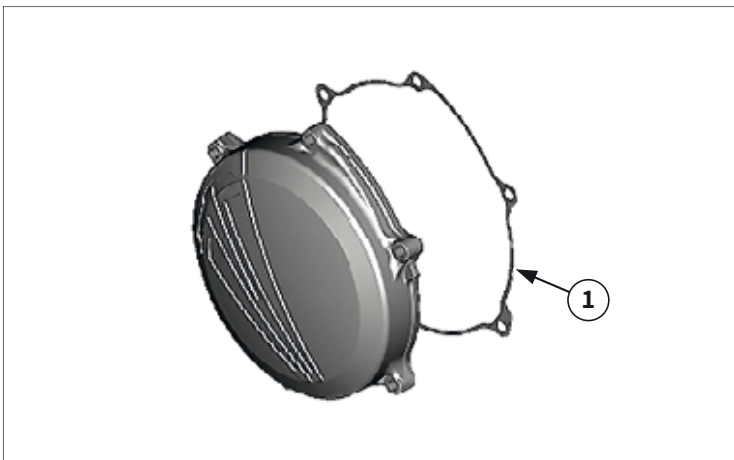


- Install the thrust plate “1”;

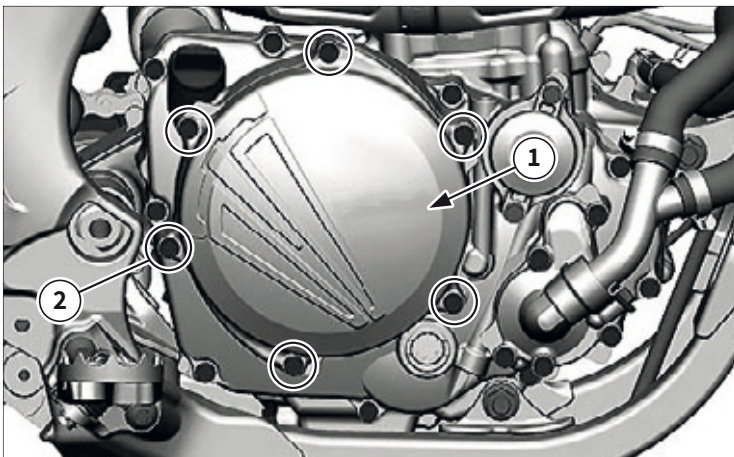


- Install the springs and bolts of the clutch and tighten them following a cross pattern;

 **Bolt (clutch spring):**
10 Nm (1.0 m•kg, 7.2 ft•lb)

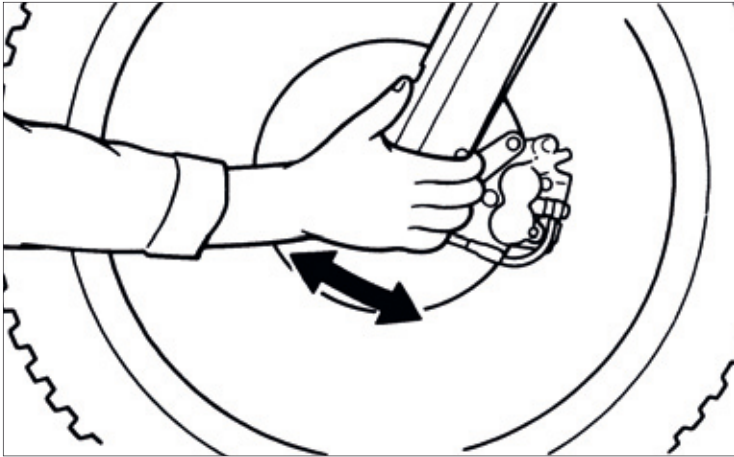


- Install a new gasket "1";



- Install the clutch crankcase "1" and bolts "2". Tighten them following a cross pattern.

 **Bolt (clutch cover):**
10 Nm (1.0 m•kg, 7.2 ft•lb)

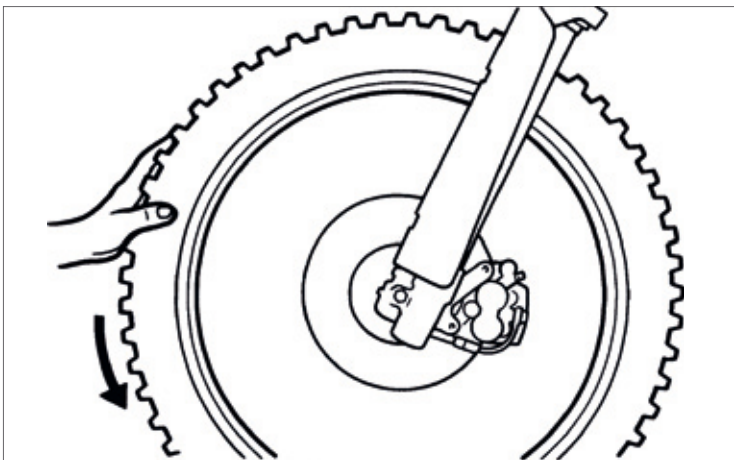


4.10 STEERING PLAY CONTROL AND ADJUSTMENT

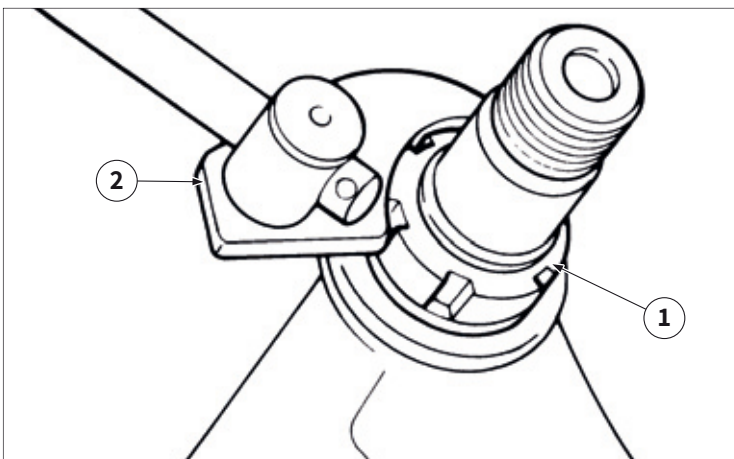
Steering play control

- Place a stand under the engine to raise the front wheel off the ground;

Securely support the vehicle so that there is no danger of it falling over.

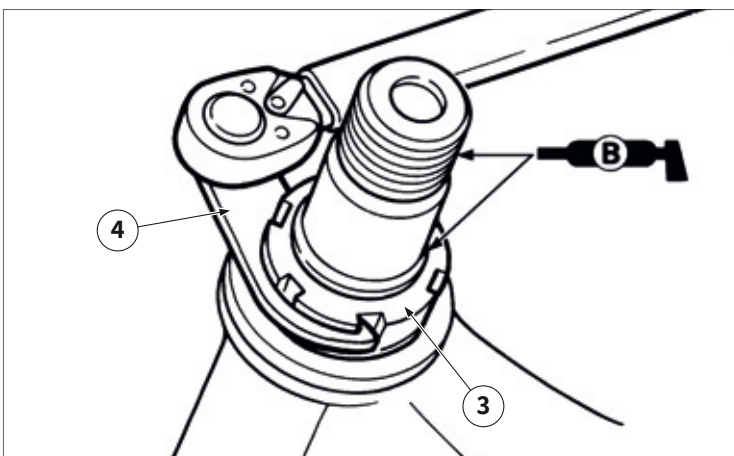


- Grasp the bottom of the forks and gently rock the fork assembly back and forth. If free play is present adjust the steering head;
- Check that the steering is working evenly by turning it fully to the right and left. If play is present, adjust the steering head.



Steering play adjustment

- Remove the front number plate, the upper fork plate and the handlebar;
- Loosen the lock nut "1" of the steering ring nut with a ring nut spanner "2";

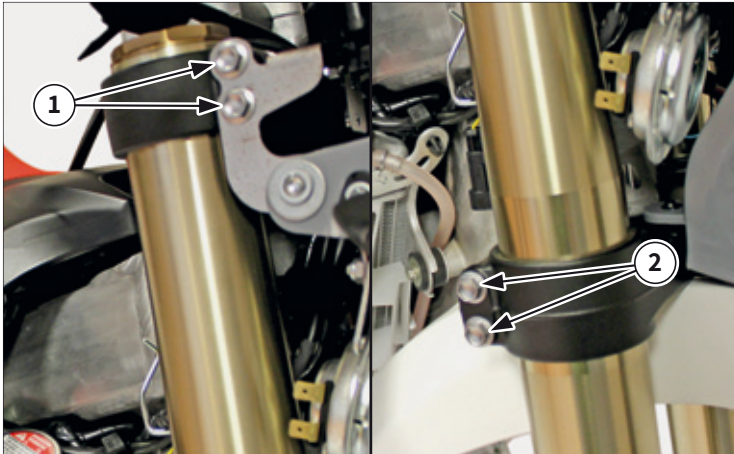


- Start tightening the steering ring nut "3", with a ring nut spanner and a torque spanner "4", to the specified torque;

Initial clamping of the handlebar ring nut:
38 Nm (3.8 m•kg, 27 ft•lb)

- Then loosen the handlebar ring nut "3" by one turn and tighten it to the specified torque.

Handlebar ring nut final tightening:
7 Nm (0.7 m•kg, 5.1 ft•lb)



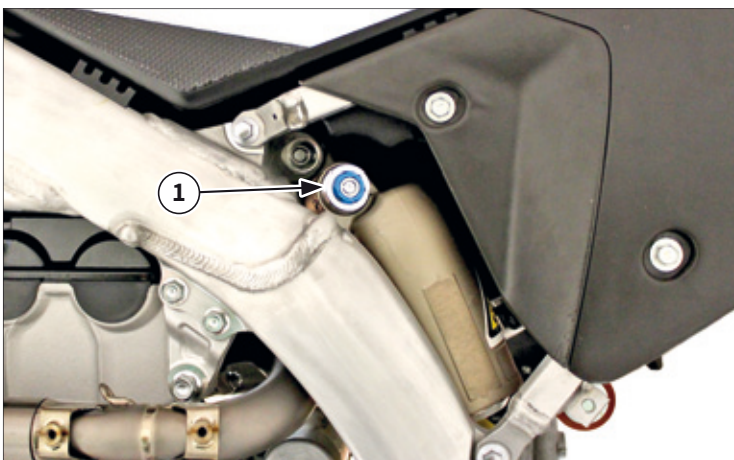
4.11 FORK

⚠ For the maintenance of hydraulic components, contact an authorised Fantic workshop.

– Regularly check the upper “1” and lower “2” fastening screws of both stems. If they are loose, tighten them to the specified torque.

🔧 Nut “1”: 21 Nm (2.1 m•kg, 15 ft•lb)

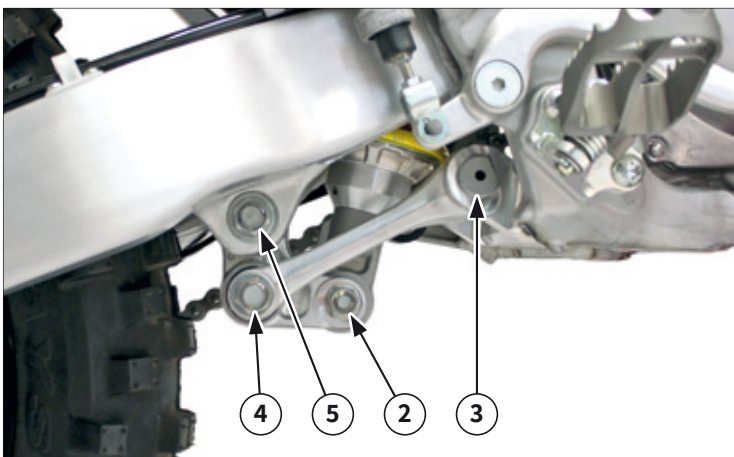
🔧 Nut “2”: 21 Nm (2.1 m•kg, 15 ft•lb)



4.12 SHOCK ABSORBER

– Regularly check the upper fastening screw of the shock absorber “1”. If it is loose, tighten it to the specified torque.

🔧 Nut “1”: 56 Nm (5.6 m•kg, 41 ft•lb)



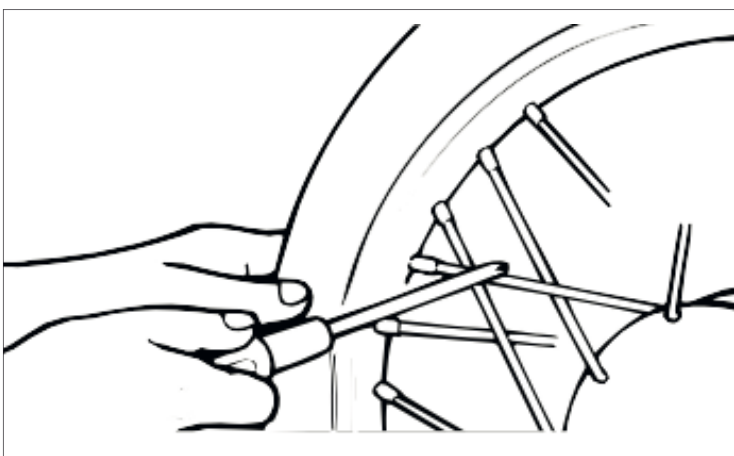
– Regularly check the shock absorber lower fastening screw “2” and linkage fastening screws “3”, “4” and “5”. If they are loose, tighten them to the specified torque.

🔧 Nut “2”: 53 Nm (5.3 m•kg, 41 ft•lb)

🔧 Nut “3” - “4”: 80 Nm (8.0 m•kg, 59 ft•lb)

🔧 Nut “5”: 70 Nm (7.0 m•kg, 52 ft•lb)

(i) To ensure the best operation and durability of the rear shock absorber linkage, it is recommended to check, clean and grease the linkage bearings periodically.



4.13 WHEELS

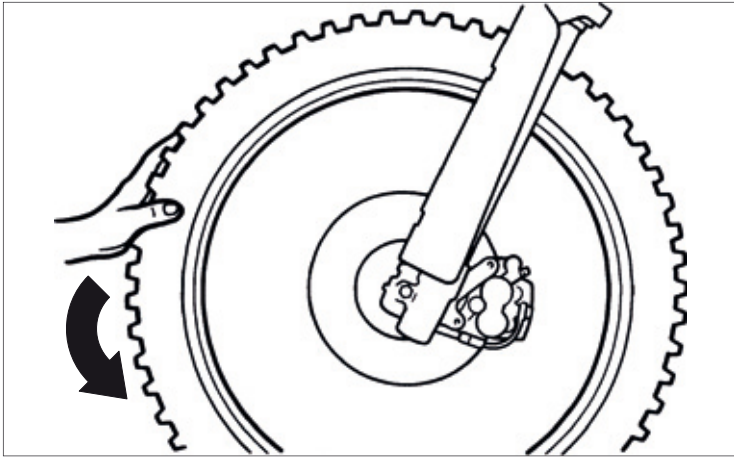
Spokes check and tightening

(i) The following procedure applies to all spokes of both wheels.

– Check that the spokes are not broken or deformed, if they are, they must be replaced;
– Check the tension of the spokes by tapping on them with a screwdriver. A well tightened spoke will emit a light, tinkling tone, while a loose one will emit a deaf tone. In the case of a loose spoke, tighten it with a spoke wrench to the specified torque;

🔧 Spokes: 3 Nm (0.3 m•kg, 2.2 ft•lb)

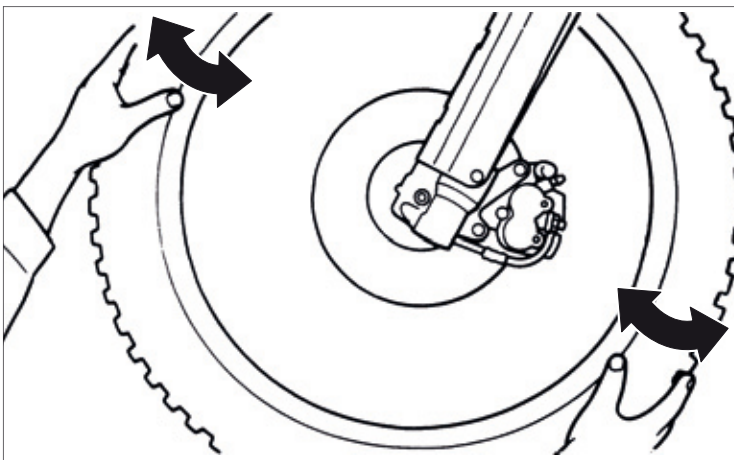
⚠ Be sure to tighten the spokes before and after the running-in.



Wheel check

i The following procedure applies to both wheels.

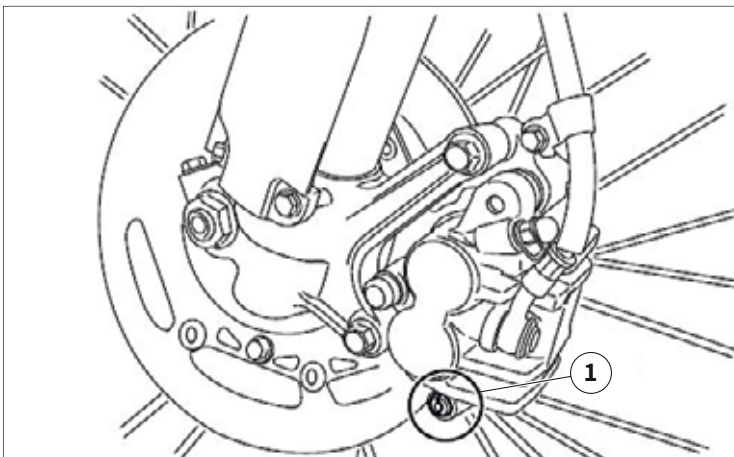
- Place a stand under the engine, lift the wheel and turn it. Check the centering and alignment of the rim channel with respect to the wheel hub. If there are any anomalies, proceed with the correction by pulling the spokes;



- Check that the wheel bearings do not have axial clearance. If there is, change the bearings.

! If there are cracks or splits in the rim channels, it is necessary to replace them.

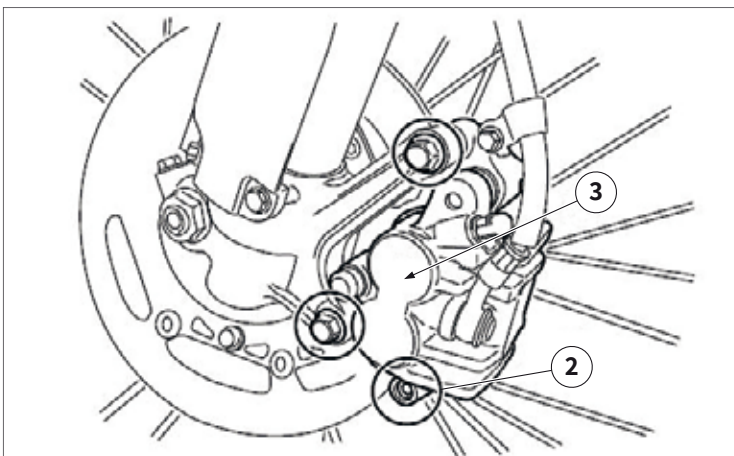
! Never try to repair the wheel rims.



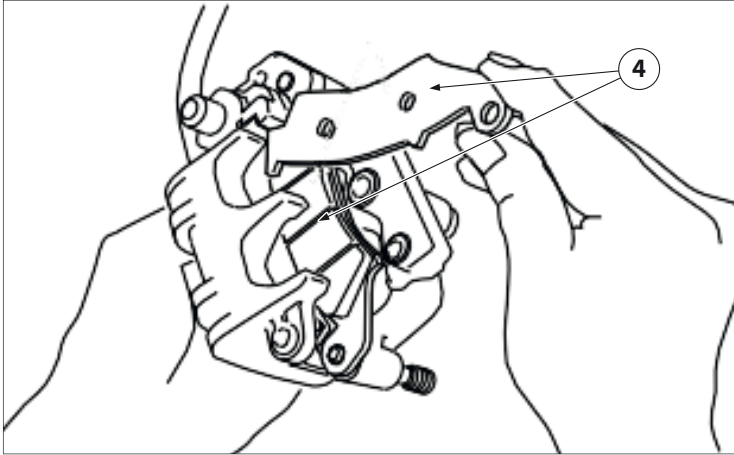
4.14 BRAKE PADS

Replace the front brake pads

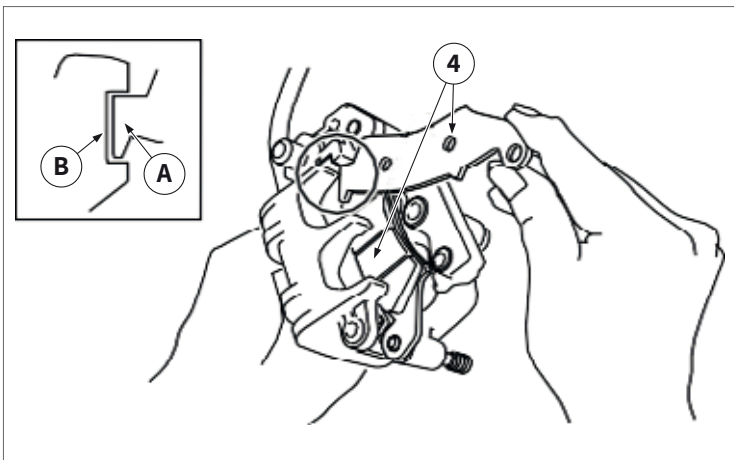
- Remove the pad pin plug "1";



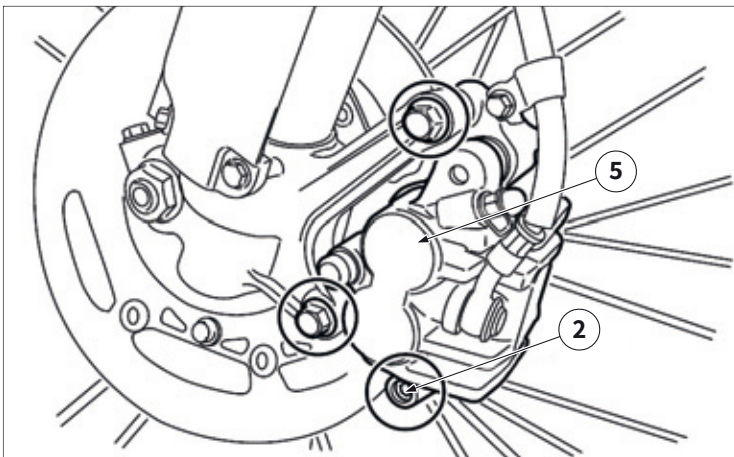
- Loosen the pad pin "2" then remove the brake calliper "3" from the fork;




- Remove the pad pin and brake pads "4";

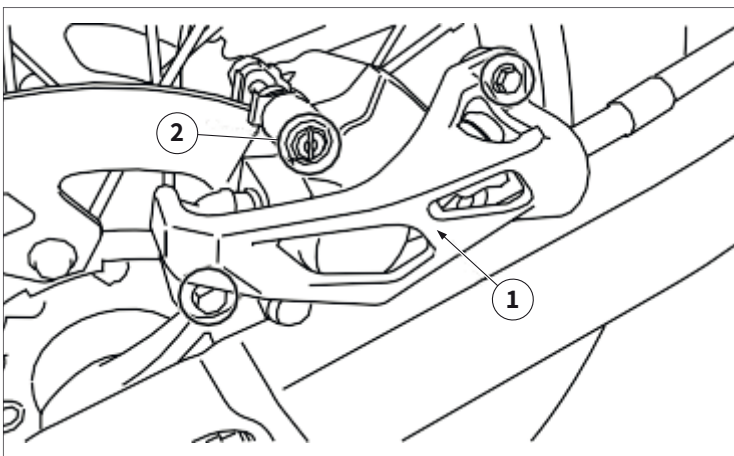


- Install the brake pads "4" with their protrusions "A" in the recesses of the brake caliper "B". Temporarily tighten the pads pin "2";



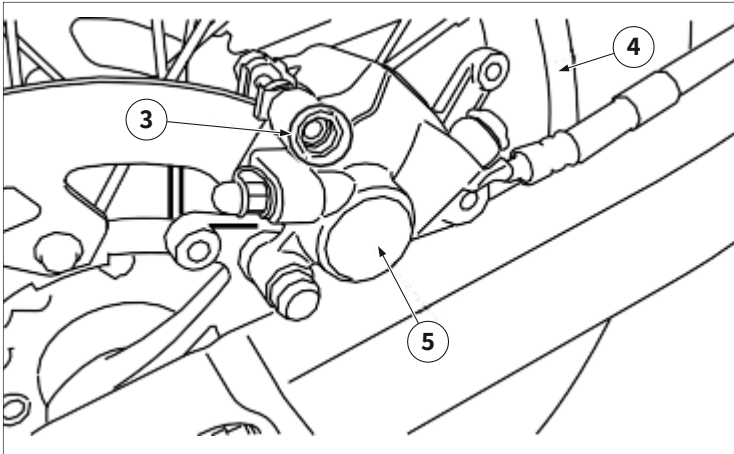
- Install the brake caliper "5" and tighten the relevant bolts to the specified torque. Tighten the pad pin "2" and insert the relative cap previously removed;

 **Bolt (brake caliper):**
28 Nm (2.8 m•kg, 20 ft•lb)

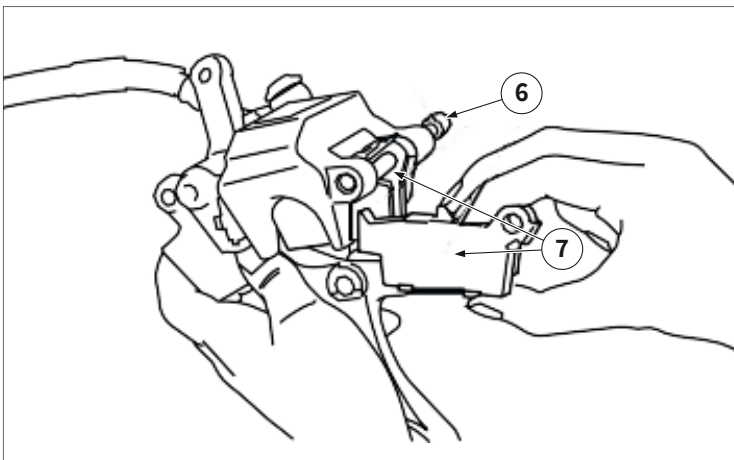


Replace the rear brake pads

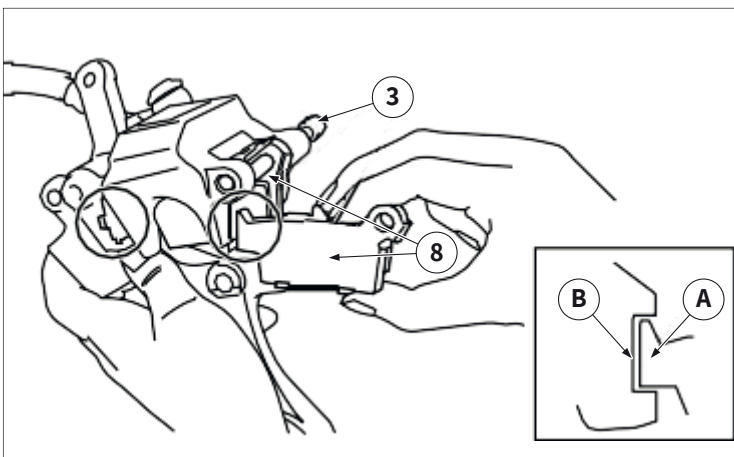
- Remove the protection "1" and the pad pin plug "2";



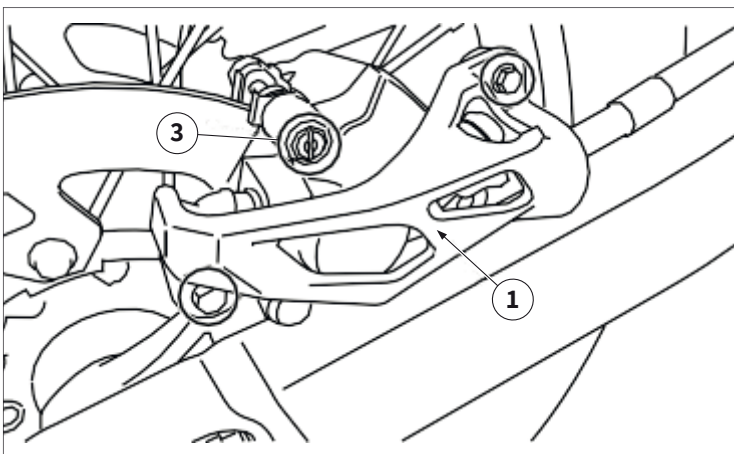
- Loosen the pad pin "3", remove the rear wheel "4" and the brake calliper "5";



- Remove the pad pin "6" and brake pads "7";



- Install the brake pads "8" with the relative protrusions "A" in the recesses "B" of the brake calliper. Temporarily tighten the pads pin "3".



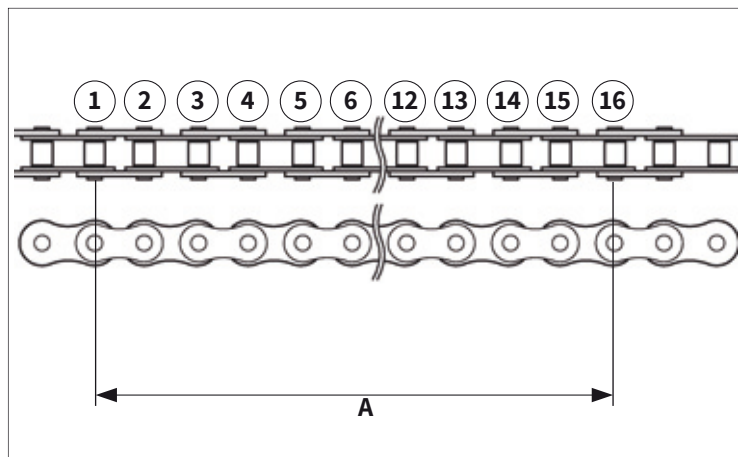
- Install the brake caliper "5" and rear wheel "4". Tighten the pad pin "3" and install the pad pin plug. Install the protector "1".

4.15 TYRES

- Check the tire while it is cold;

Model/version	Front tyre standard pressure	Rear tyre standard pressure
XEF 250 with race use configuration	100 kPa (1.00 kgf/cm ² , 15 psi)	100 kPa (1.00 kgf/cm ² , 15 psi)
XEF 250 with road use configuration	200 kPa (1.00 kgf/cm ² , 30 psi)	250 kPa (1.00 kgf/cm ² , 36 psi)

- Loose bead stoppers allow the tire to slip off its position on the rim when the tire pressure is low;
- A tilted tire valve stem indicates that the tire slips off its position on the rim;
- If the tire valve stem is found tilted, the tire is considered to be slipping off its position. Correct the tire position.



4.16 CHAIN, CROWN AND SPROCKET

Chain check

- Measure the length of 15 joints “A” of the transmission chain, if the length “A” is longer than the service limit, replace the chain.

i While measuring the drive chain length, push down on the drive chain to increase its tension.

i Measure the length between drive chain roller “1” and “16” as shown.

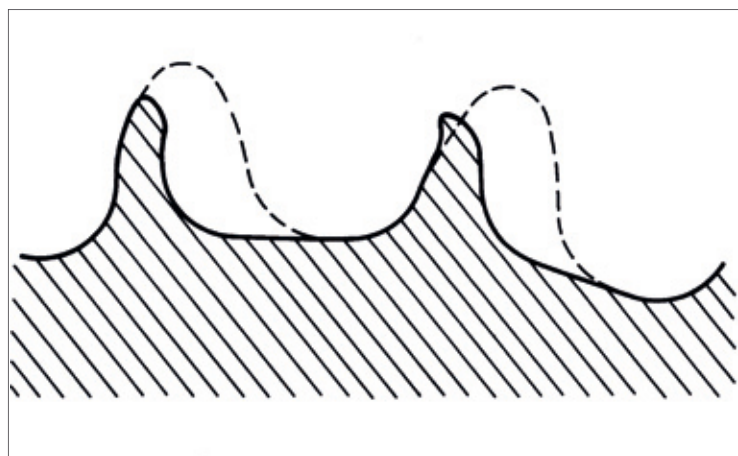
! Perform this measurement at two or three different places.

✂ Service limit:
239.3 mm (9.42 in)

Pinion and crown check

- Check the pinion and crown teeth. If they are damaged and/or excessively worn, replace them.

! Always replace chain, rim and pinion all together. This will ensure uniform wear of the components and a longer service life of the components.



4.17 CLEANING AND VEHICLE STORAGE

Frequent cleaning of your machine will enhance its appearance, maintain good overall performance, and extend the life of many components.

1. Before washing the machine, block off the end of the exhaust pipe to prevent water from entering. A plastic bag secured with a rubber band may be used for this purpose.
2. If the engine is excessively greasy, apply some degreaser to it with a paint brush. Do not apply degreaser to the chain, sprockets, or wheel axles.
3. Rinse the dirt and degreaser off with a garden hose; use only enough pressure to do the job.

 **Do not use high-pressure washers or steam-jet cleaners since they cause water seepage and deterioration seals.**

4. After the majority of the dirt has been hosed off, wash all surfaces with warm water and a mild detergent. Use an old toothbrush to clean hard-to-reach places.
5. Rinse the machine off immediately with clean water, and dry all surfaces with a soft towel or cloth.
6. Immediately after washing, remove excess water from the chain with a paper towel and lubricate the chain to prevent rust.
7. Clean the seat with a vinyl upholstery cleaner to keep the cover pliable and glossy.
8. Automotive wax may be applied to all painted or chromed surfaces. Avoid combination cleanerwaxes, as they may contain abrasives.
9. After completing the above, start the engine and allow it to idle for several minutes.

4.18 LONG TIME VEHICLE INACTIVITY

 **If your machine is to be stored for 60 days or more, some preventive measures must be taken to avoid deterioration.**

After cleaning the machine thoroughly, prepare it for storage as follows:

1. Remove the spark plug, pour a tablespoon of motor oil in the spark plug hole, and reinstall the plug. With the engine stop switch pushed in, kick the engine over several times to coat the cylinder walls with oil.
2. Remove the drive chain, clean it thoroughly with solvent, and lubricate it. Reinstall the chain or store it in a plastic bag tied to the frame.
3. Lubricate all control cables.
4. Block the frame up to raise the wheels off the ground.
5. Tie a plastic bag over the exhaust pipe outlet to prevent moisture from entering.
6. If the machine is to be stored in a humid or salt-air environment, coat all exposed metal surfaces with a film of light oil. Do not apply oil to rubber parts or the seat cover.

 **Make any necessary repairs before the machine is stored.**

i It is a dealer's responsibility to activate the warranty coverage at FANTIC MOTOR on the portal www.fantic-store.com within one week from its sale and/or registration.

To activate the vehicle, it is necessary to input the data requested on the dedicated form and **enclose the Circulation Document of the vehicle together with the delivery certificate** duly filled and signed by the dealer and the customer.

⚠ If the activation is not done or not done properly, the warranty coverage on the vehicle is to be considered lost.

WARRANTY

In case the warranty conditions reported in this manual are not respected by the customer, FANTIC MOTOR is to be considered relieved from all liabilities and duties coming from this agreement.

Terms and conditions of this agreement shall not be modified by any person or company without prior written authorization from FANTIC MOTOR.

Warranty period

The warranty period starts from the date of sale of the vehicle and from the date of registration and delivery of the vehicle from the authorized FANTIC MOTOR Dealer to the final user; the date of the registration, reported on the Registration Document will be considered as reference.

The dealer is in charge of the non-compliances reported in the initial period (six months) in accordance with the 1999/44/CE for the European Community. For the States not belonging to the EU, the warranty period shall be defined in accordance with the local laws. If the non-compliance is reported during the first six months after the sale and registration of the vehicle, it shall be considered as already existing at the delivery of the motorbike. After the sixth month the final user is must demonstrate that the defect or non-compliance was not generated by an improper or wrong use of the product.

During the first six months after the delivery of the repaired vehicle, the seller will guarantee the non-conformities that gave rise to the repair. Defects and non-compliances shall be reported to an Authorized FANTIC MOTOR Dealer strictly before the end of the warranty period. If the last warranty day happens to be on Sunday or other holiday, the last valid warranty day is to be considered the first available working day after the holiday.

All vehicles produced by FANTIC MOTOR are guaranteed without technical and production defects for the warranty period of 24 months with no limitation on mileage or operation hours.

- This manual is provided in one copy for each vehicle;
- The warranty covers only the cost of the non-compliant parts replaced and the related labor costs;
- If during the repair it turns out that the requested intervention is not among those covered by the warranty, the cost hitherto incurred must be entirely covered by the owner of the vehicle.

Model	Warranty period
XEF 250 (standard configuration)	2 years
XEF 250 (with Fantic racing kit installed)	3 months

Warranty conditions

FANTIC MOTOR reserves the right to refuse the performance of warranty claims in the event that:

- A. The vehicle has not been subjected, during the warranty period, to the periodic checks required by the User Manual. As proof of this, the user shall keep the coupons at the end of this manual correctly filled and endorsed by the authorized workshop, together with the proof of payment of each check performed. Failure to comply with the periodic checks coupons will invalidate the warranty!
- B. Inspection, maintenance and repair work has been carried out by a workshop not authorized or recognized by FANTIC MOTOR, or has been performed not in accordance with the manufacturer's technical requirements, standards and regulations or by using non-FANTIC MOTOR spare parts.
- C. The vehicle has been modified or altered in any way with or without the use of original FANTIC MOTOR parts. The only exceptions are cases in which the damage has not been caused by such parts and accessories.
- D. For the use and maintenance of the vehicle fuels, lubricants, or technical liquids (also cleaning products) that do not correspond to the specifications indicated in the user manual have been used.

⚠ The use of fuels with grade different from RON 95 will cause the end of the warranty coverage.

- E. The vehicle has been transported or stored inadequately.
- F. The vehicle was used as a test or demonstration vehicle.
- G. The vehicle has been used in any agonistic event of any kind, speed test, durability tests, i.e. all vehicles subject to improper use.

Exclusions from the warranty

The following cases are not included in the warranty coverage:

- A. Cracks, breakages or damages resulting from overheating, frost, rust or corrosion, from external influences such as stone bumps, snow pans, industrial exhaust gases and other environmental influences, or from inappropriate cleaning or use of inappropriate products.
- B. Signs of aging such as the fading of surfaces.
- C. Components not original or not approved by FANTIC MOTOR.
- D. Failures or deterioration deriving from wear and tear.
- E. Wear parts such as spark plugs and caps, battery, fuel filters, oil filter, transmission chains, crowns, sprockets, air filter, brake discs, brake pads, clutch plates, light bulbs, fuses, tires, footrests, belts, tires, air chambers, hoses, control cables and other rubber parts.
- F. Consumables such as: fuel additives, anti-freeze cooling fluids, hydraulic fluids, battery electrolyte, greases and lubricants.
- G. Inspection and adjustment work or other periodic maintenance work and also all cleaning of the vehicle or of its parts.
- H. Any aesthetic or acoustic phenomenon that does not or only irrelevantly compromise the usability of the vehicle.
- I. All damages incurred in the event of a defect and all costs incurred directly and indirectly by a warranty case (such as for phone calls, rental vehicle, public transport, recovery costs, road assistance, accommodation, etc.) and other economic disadvantages (such as failure to use, loss of profit, loss of time or similar).
- J. All and any injury to persons or damage to properties, caused by accident or impact both on the road or of other nature and origin, or in any case resulting from damage covered by this warranty.

Additional warranty provisions

FANTIC MOTOR decides at its discretion whether to repair and / or replace any defective parts. Ownership of replaced parts passes to FANTIC MOTOR without any right to compensation. The FANTIC MOTOR Dealer in charge of eliminating the defect has no power to issue legally binding declarations on behalf of FANTIC MOTOR.

In case of doubts about the presence of the defect, or if a visual check or material test proves necessary, FANTIC MOTOR has the right to request the dispatch of the protested parts or to appoint a competent person. There is no further warranty obligation for parts replaced free of charge or warranty services performed free of charge. For components that have been replaced within the warranty period, the warranty ends when the vehicle warranty expires.

Other forms of warranty established by the user with the dealer will not be recognized by FANTIC MOTOR.

In case of sale of the vehicle during the warranty period, the warranty coverage will be transferable to the buyer until the end of the period defined by the first registration without any prejudice to the provisions of this warranty certificate.

Request for intervention under warranty

Should any defect appear on your vehicle, please contact your FANTIC MOTOR Dealer immediately. After confirming that the part or parts causing the failure are covered by the warranty, the dealer must report the problem to the FANTIC MOTOR After-Sales Service requesting authorization to perform the warranty intervention.

No warranty service may be performed unless previously authorized by FANTIC MOTOR.

Warnings for maintenance and care

It is under the User responsibility to ensure that the maintenance work is carried out in the intervals provided and documented through the coupons filled in, stamped and proven by the proof of purchase.

- Always inspect your motorcycle before each use. This control is essential in particular for your safety.
- Before starting maintenance work let the motorcycle cool down to avoid burns.
- Once self-locking nuts are removed they must be replaced by new nuts.
- When screws and nuts secured with threaded brake fluid are removed, they must be reassembled and secured in the same way.
- Do not use a high-pressure cleaner to wash the motorcycle, as water may enter the bearings, carburetor, electrical connectors, etc.
- Dispose of oils, greases, filters, fuels, detergents, brake oil, etc. in a regular way, respecting the regulations in force in your country. Also comply with the safety regulations regarding the handling of these substances. Under no circumstances allow used oil to enter drains or watercourses or to penetrate the subsoil.

⚠ Any modification of the engine or other components designed to increase the speed or power of the vehicle will cause the expiration of the warranty coverage. Note also that these changes are prohibited by law. Any modification that alters the characteristics of the vehicle subject to authority approval will invalidate the existing approval, making the vehicle illegal. This will cause the expiration of the warranty coverage in addition to the expiration of the insurance coverage.

WARRANTY DATA

VEHICLE DATA

Vehicle Type (PRODUCT CODE)

Engine Type (DISPLACEMENT)

VEHICLE IDENTIFICATION NUMBER (V.I.N.)

ENGINE NUMBER

INVOICE DATE AND NUMBER

FIRST REGISTRATION DATE

REGISTRATION PLATE NUMBER

USER DATA

Name and Surname (or Business Name)

Address


Zip Code - City - Country


Phone Number

E-Mail Address

Variation of User name/address

TIMBRO DEL RIVENDITORE

 **Keep the data in this handbook up to date. Fill in any changes of address or change of user or owner of the vehicle.**


 **If all the spaces are already used, ask your Dealer for a new Warranty Manual.
Filled and verified before the delivery of the vehicle by:**

Date

Sign for Acceptance

SERVICE

Registration of service

 Give the handbook to your dealer at each service.

 It is the responsibility of the user to inform the Dealer of any maintenance carried out so that it is not repeated unnecessarily.

Next service	
<h1>1</h1> Dealer's stamp	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>2</h1> Dealer's stamp	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>3</h1> Dealer's stamp	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>4</h1> Dealer's stamp	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>5</h1> Dealer's stamp	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>6</h1> Dealer's stamp	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>7</h1> Dealer's stamp	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>8</h1> <p>Dealer's stamp</p>	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>12</h1> <p>Dealer's stamp</p>	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>9</h1> <p>Dealer's stamp</p>	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>13</h1> <p>Dealer's stamp</p>	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>10</h1> <p>Dealer's stamp</p>	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>14</h1> <p>Dealer's stamp</p>	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>11</h1> <p>Dealer's stamp</p>	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

Next service	
<h1>15</h1> <p>Dealer's stamp</p>	
Hours	Date
Invoice No.	
Routine maintenance <input type="checkbox"/>	Main maintenance <input type="checkbox"/>
Spark plug <input type="checkbox"/>	Air filter <input type="checkbox"/>

