

Introduction

Thank you

for choosing our product. We have compiled this manual to give you a comprehensive overview of the quality of this motorcycle. Please read it carefully before riding it for the first time. It contains information about the usage of the motorcycle, key points and precautions. It also specifies the features, details and equipment of the motorcycle to ensure that you can operate it properly. We believe that you can get to know your new motorcycle quickly and get a completely satisfying ride if you follow our advice.

The purpose of the instructions in this manual is to provide clear and concise guidance for your use of the motorcycle. Moreover, this manual describes the general maintenance procedures and regular inspection to be carried out at the officially designated dealer or repair shop. This manual also contains instructions for easy repair. Any operations not explicitly described in this manual require special tools and/or specific expertise: Please take your motorcycle to the officially designated dealer or repair shop for these operations.



Personal safety

Failure to fully comply with these instructions can result in a serious risk of personal injury



Environmental protection

The symbol indicates proper use of the motorcycle to prevent damage to the environment.



Good condition

Incomplete compliance with or complete failure to comply with these regulations will lead to risks of serious damage to the motorcycle and, in some cases, loss of the right to warranty.

The symbols shown above are very important. They are used to highlight the parts of the manual that should be read with special attention. Different symbols have been used in this manual to make the headings in the manual concise and convenient for quick search. Please read this manual carefully before starting the engine, especially the "Safe driving" section. The safety of yourself and others depends not only on your quick reaction and agility, but also on your understanding of the motorcycle, the maintenance of the motorcycle itself and your mastery of safe driving rules. For your safety, please get to know your vehicle well enough to be able to drive safely and manipulate it freely under any driving condition.

Important As an integral part of the motorcycle, this manual should be handed over to the new owner when the motorcycle is resold.

The 1st edition, February 2022

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Chapter 1

Overview



Warning/Attention/Remark

Please read this manual and grasp its essentials. In this manual, words such as "Warning", "Attention" and "Remark" are used to emphasize the degree of care. Please understand the meaning of each word carefully.

Warning

This word refers to something that has to do with the safety of drivers, and failure to comply with it may result in injury accidents.

Attention

This word denotes those operation instructions or precautions that must be followed to avoid damaging the motorcycle.

Remark

This is a special explanation added to facilitate maintenance or to make important statements more explicit.

User Notice

Accessory installation and precautions for guaranteeing safe driving

You can buy all kinds of accessories to assemble your motorcycle. However, additional, improper accessories are very likely to bring unsafe factors to your driving. ITALJET can not check the quality and suitability of all the accessories in the market one by one for you, but your ITALJET authorized service shop can help you select high-quality accessories, and install them properly for you.

Extreme care must be taken for selecting and installing accessories on the motorcycle. We have made the following rules that you must follow.

- (1) For all extra weight accessories, or accessories easy to produce wind resistance, their installation position should be as low as possible, and be attached to the body and close to the center of gravity.
- (2) Check the height above ground and proper roll angle of the accessories installed. Improper installation will reduce these two safety factors.
- (3) Any installation of the accessories on the steering handle or front suspension part will cause serious imbalance. Consequently, weight increase of the front end will reduce the steering agility, thus leading to the vibration of the front wheel, resulting in the instability of driving.
- (4) Wind deflectors, backrests, saddle bags and suitcases, etc., are accessories easy to produce wind resistance, easily causing driving instability. This is especially evident in case of crosswind or meeting of large vehicles.

If the accessories are not properly installed or the accessories with bad design are installed, the driving safety will be endangered . Therefore, the selection and installation of accessories should be especially careful .

- (5) Some accessories can cause the driver to deviate from the normal riding position, which not only limits the driver's range of motion, but also restricts his maneuvering capability.
 - (6) Additional electronic components can overload the existing electronic system. Severe overloading may damage wiring or lead to outage during riding, causing danger.
- If you want to install accessories, try to install them in a low position close to the body. In case of poor installation or higher center of gravity, driving is not only dangerous, but also hard to operate. The size of the mounting accessories can directly affect air resistance and maneuverability. Be sure to keep the balance on the left and right sides of the motorcycle, and firmly install the accessories.

Important Notes

Knowledge of motorcycle running-in

The first 1000km of motorcycle driving plays the most important role in the whole service life of the motorcycle. During this period, the correct running-in can not only ensure the longest service life, but also give full play to the performance of the new motorcycle. The parts of ITALJET motorcycles are made of high-quality materials and machined with precision. Correct running-in operation can eliminate the blocking force on the surface of the parts to reduce mechanical loss and prolong service life.

During the running-in period, careful and patient running-in can guarantee the reliability and performance of the motorcycle. It is particularly important not to perform operations that can cause engine parts to overheat.

For the specific running-in method, please refer to the section of running-in of new motorcycles.

Location of Batch Number

VIN (Vehicle Identification Number) and engine number are used to register the motorcycle. In the case of ordering parts or requesting special service information, these batch numbers are also useful for ITALJET authorized service shops.



The engine number ① is printed on the lower part of the left crankcase.



VIN (Vehicle Identification Number) ② is printed on the body near the front. Please fill the above two numbers in the box below for reference.

VIN (Vehicle Identification Number)

Engine number

Instructions for the Use of Fuel Oil and Engine Oil

Fuel oil

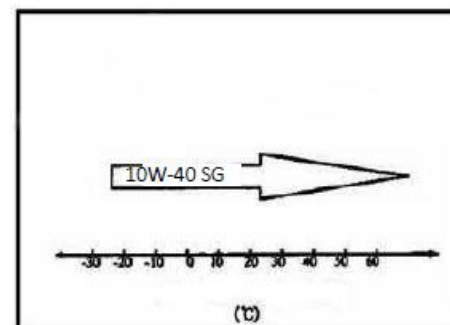
Choose GB17930 lead-free oil with octane number 95 or higher. The use of lead-free gasoline can prolong the service life of spark plugs, exhaust system components and machinery, and protect the environment and reduce air pollution.

Attention!

Spilled gasoline is harmful to the motorcycle and can damage the paint surface. During refueling, pay attention not to spill fuel oil. In case of any spill, clean it up immediately.

Engine lubrication oil

The following describes the range of use of lubrication oil of various grades for different temperatures.



The use of high-quality four-stroke engine oil can prolong engine life. Engine lubrication oil should be selected for crankcase oil in accordance with the national standard GB11121. According to API Classification Method, the oil should be at SG grade; the viscosity should be 10W-40. 10W-40 motorcycle oil is recommended for use.

75W-80 gearbox oil should be used as gearbox lubricating oil. Do not use ordinary oil, plant oil or castor oil.

In the process of your use of the motorcycle, in order to give full play to the performance of your motorcycle, and prolong its service life, please be sure to use the original dedicated gasoline and accessories, and to regularly replace the oil specified by our company (for crankcase lubricating oil, when the running-in mileage or period of the new motorcycle reaches 500km or half a year, the motorcycle must be driven to the authorized service shop for oil maintenance and replacement with designated special oil, and crankcase oil should also be checked and replaced every 1000km; for gearbox lubricating oil, when the running-in mileage or period of the new motorcycle reaches 2000km or half a year, the lubricating oil must be replaced (with designated special oil). Original accessories and engine oil are affixed with digital anti-counterfeiting marks. In purchasing accessories and engine oil, please identify the marks carefully to avoid counterfeiting.

Brake Fluid

Warning!

- Accidental ingestion of brake fluid or its contact with eyes or skin is harmful. At this time, immediately go to see a doctor for examination. In case of accidental ingestion, brake fluid should be spit out. In case of contact with eyes or skin, the eyes or skin should be rinsed with plenty of water.

- Check the amount of fluid stored in the front brake fluid cylinder. Without brake fluid of appropriate volume or type, the brakes will not work properly. This may cause an accident.

- Check the brake fluid level before each use. Only DOT3 or DOT4 brake fluid in sealed containers can be used. Do not use or mix different types of brake fluid. In case of rapid loss of brake fluid, it should be checked by an ITALJET dealer or a qualified technician.

Attention!

- Spilled brake fluid can damage paint and plastic parts.
- Brake fluid may not be spilled during injection. Any spills should be cleaned immediately.

Check the brake fluid level of the front and rear disc brake fluid storage tanks. If it is below the Lower mark, add DOT3 or DOT4 brake fluid and check brake lining shoes for any wear and brake fluid for any leakage.



Running-in

The preface explains the importance of proper running-in for the longest life and best performance of your motorcycle. The procedure for proper running-in is explained below.

Operation suggestions for the running-in period

The run-in period of the motorcycle is stipulated to be within the initial mileage of 1600km.

The following table shows the opening of the accelerator during running-in of the new motorcycle.

The initial mileage of 500km	Less than 1/4 accelerator
The mileage of 800km	Less than 3/4 accelerator

Engine speed change

Engine speed should vary rather than remain constant, which concentrates stress on parts. Changing speed regularly equalizes stress on parts and helps with the running-in process of parts. During the running-in period, it is necessary to expose the engine parts to certain stress. However, it is not allowed to overload the engine.

Running-in of new tyres

New tyres, like engines, require the proper running-in to ensure optimum performance. Within the mileage of 50km before the optimal performance, the turning angle should be gradually increased for tread running-in. Great acceleration, sharp turning and slamming on the brakes should be avoided.

Warning!

- Improper running-in of tyres can cause tyres to skid and run out of control.
- Be extra careful when you have new tyres. For proper running-in of tyres as described in this chapter, it is required to avoid great acceleration, sharp turning and slamming on the brakes during the first 50km.

Avoid driving at a constant low speed

Driving a motorcycle at a constant low speed (light load) will overwear and overheat parts and components and affect their running-in. To let the engine accelerate freely, the acceleration speed may not exceed the specified maximum. However, don't speed up the motorcycle to the maximum for the initial 1000km.

Let the oil warm up before driving

Before loading the engine, let the cold or hot engine idle for about 30 seconds to 1 minute, so that the lubricating oil has enough time to lubricate the engine parts.

Carry out the initial important maintenance

The initial 1000km maintenance is the most important maintenance a motorcycle should receive. During the running-in period, all the engine parts will run in and all the other parts will fit into place. All adjustments must be remade and all fasteners be tightened, and dirty oil should be replaced.

The initial 1000 km timely maintenance will guarantee the best performance and the longest life of the engine.

Remark:

The initial 1000km maintenance should be the most important maintenance in this manual. Special attention should be paid to the attentions and warnings in the maintenance schedule.

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Chapter 2

Maintenance and Service



Maintenance and Regular Inspection

Regular maintenance Regular inspection, adjustment and lubrication are required to keep the motorcycle in the best safe and efficient condition. The most important several points about the inspection, adjustment and lubrication of the motorcycle will be described in the following pages.

The maintenance intervals shown on the meters should only be considered as the general guide under normal driving conditions. However, depending on climatic conditions, topography, geographical location, and personal use, the maintenance intervals may need to be reduced.



Warning

Poor or improper maintenance of a motorcycle will increase the risk of injury or death during the use of the vehicle. Maintenance work should be done by Jincheng dealer or professional maintenance personnel.



Warning

Prior to performing any maintenance operation, check whether you have the necessary tools, parts, and technical skills.

- Shut down the engine, and park the motorcycle on a flat and solid surface.
- Wait for the cooling of the engine, the muffler and brake disc.



Warning

If you use your vehicle on dusty, muddy or very wet roads, it is necessary to shorten the maintenance intervals to clean/replace the air filter element. Please visit your Jincheng dealer for correct maintenance intervals.

<div> <div></div> <div>Maintenance time</div> <div>Item</div> </div>	Time or mileage											
	Time (months)	6	12	18	24	30	36	42	48	54	60	66
	Mileage (kilometer(s) ×1000)	1	6	12	18	24	30	36	42	48	54	60
Motor												
Front clutch movable disk bushing				L		L		L		L		L
Front clutch plastic feather key				R		R		R		R		R
Rear clutch drum			C	C	C	C	C	C	C	C	C	C
CVT belt				R		R		R		R		R
CVT chamber filter				I		I		I		I		I
Engine oil filter		R	R	R	R	R	R	R	R	R	R	R
Valve clearance				A		A		A		A		A
Hub oil		R		R		R		R		R		R
Crankcase oil (*)		R	R	R	R	R	R	R	R	R	R	R
CVT roller				R		R		R		R		R
Front clutch movable disk				I		I		I		I		I
Gearbox				L		L		L		L		L
Spark plug				R		R		R		R		R
Air filter			C	C	C	C	C	C	C	C	C	C

<div> <div></div> <div>Maintenance time</div> <div>Item</div> </div>	Time or mileage											
	Time (months)	6	12	18	24	30	36	42	48	54	60	66
	Mileage (kilometer(s)×1000)	1	6	12	18	24	30	36	42	48	54	60
EVAP (Evaporative System)												
Containers and pipes		I		I		I		I		I		I
Cooling system												
Coolant level (**)		I	I	I	I	I	I	I	I	I	I	I
Cooler				C		C		C		C		C
Fuel supply system												
Fuel filter				R		R		R		R		R
Fuel pipe (***)		I		I		I		I		I		I
Electric system												
Battery voltage		I		I		I		I		I		I
Headlight setting				A		A		A		A		A
Vehicle road test												
Vehicle road test		I		I		I		I		I		I

Item	Maintenance interval	Time or mileage											
		Time (months)	6	12	18	24	30	36	42	48	54	60	66
		Mileage (kilometer(s) × 1000)	1	6	12	18	24	30	36	42	48	54	60
Frame													
Safety fixture		I		I		I		I		I		I	
Brake		I	I	I	I	I	I	I	I	I	I	I	
Brake fluid (**)		I		I		I		I		I		I	
Suspension				I		I		I		I		I	
Wheels/tyres		I	I	I	I	I	I	I	I	I	I	I	
Steering system		I		I		I		I		I		I	
Exhaust system				I		I		I		I		I	
Idle speed control		A		A		A		A		A		A	

I: Inspection, cleaning, adjustment, and lubrication or (as required) replacement

C: Cleaning

R: Replacement

A: Adjustment

L: Lubrication

(*) Check the liquid level every 3000 km

(**) Replace every 2 years

(***) Replace every 4 years

Oil Level Check

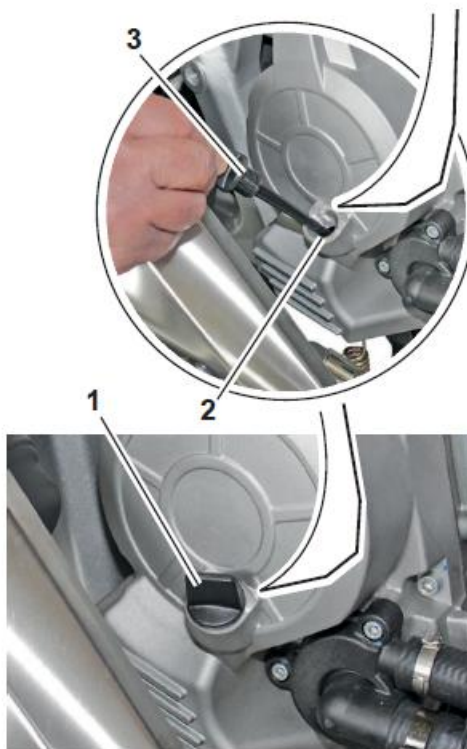
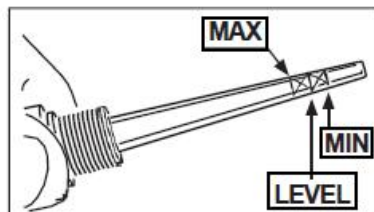
Note: The oil check must be checked while the engine is still hot just after flameout



Warning

At this time, the motorcycle exhaust pipe and muffler are at high temperature. Be careful not to be scalded.

- Keep the motorcycle in driving position (place the front and rear wheels on the same horizontal plane on the ground, and make them vertical on both sides) or park it with a central kickstand.
- Wait a few minutes for the crankcase oil to settle.
- Unscrew the oil dipstick (1) and take it out, wipe away the oil with non-woven cloth, and insert the oil dipstick into the hole (2) again; do not screw it in, and then take it out and check whether the oil level is between the minimum oil level mark "MIN" and the maximum oil level mark "MAX".
- When the oil level is lower than the minimum oil level mark "MIN", it is required to refill engine oil, and then check the oil level according to the above method. The oil level may not exceed the maximum oil level mark "MAX".
- Screw the oil dipstick (1) into the threaded hole again for assembly.



Replacement of Engine Oil and Oil Filter

Note: The engine oil must be changed while the engine is still hot just after flameout.



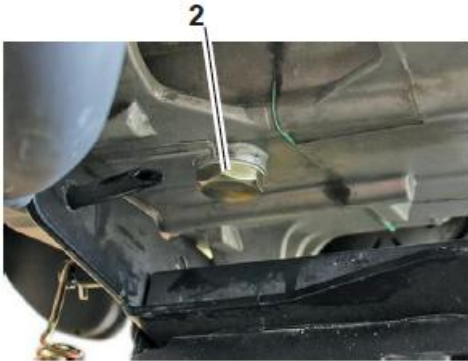
Warning

Be careful not to burn yourself with the hot oil.

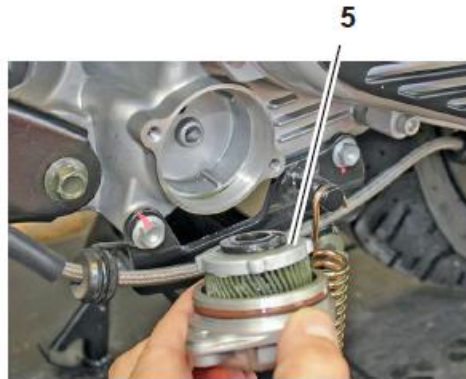
- Keep the motorcycle in driving position (place the front and rear wheels on the same horizontal plane on the ground, and make them vertical on both sides) or park it with a central kickstand.
- Remove the oil dipstick (1).



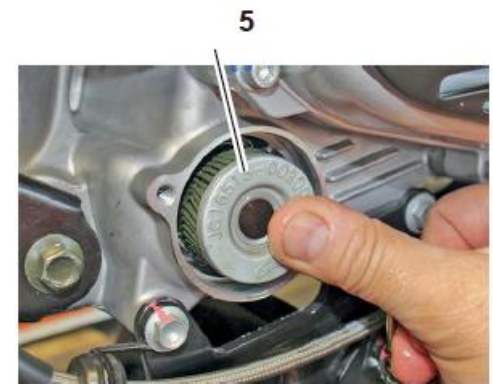
- Place the oil receiving tray under the drain plug (2).
- Unscrew the oil plug (2) to drain the oil.



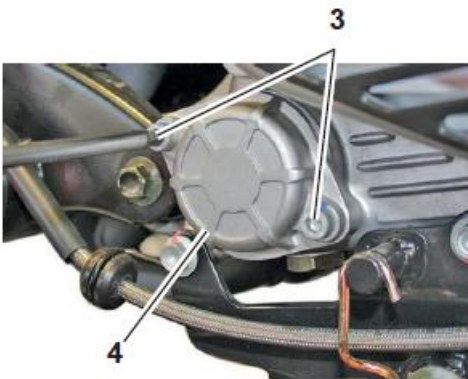
- Remove the oil filter (5) and check its condition. Replace it if necessary.



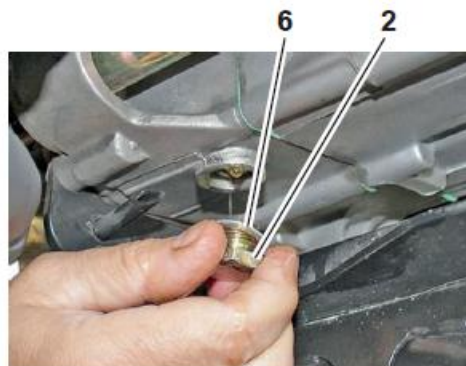
- Reinstall the filter (5) (pay attention to the direction of insertion).



- Unscrew the two screws (3) and remove the cover (4).



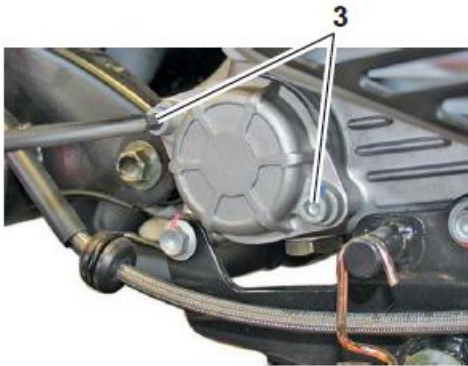
- Reinstall the drain plug (2) and replace the seal gasket (6).



- Mount the cover (4) again and check the O-ring (7). If it is damaged, replace it.



- Screw in the screw (3).

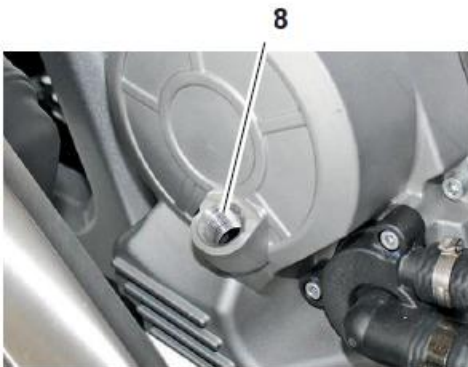


- Pour the engine oil into the tank through the hole (8)

Dosage: 1000 cm³(first injection)

950 cm³ (for replacing the engine oil and filter)

900 cm³ (only for replacing the engine oil)



Reassemble the dipstick by tightening it (1).

Note: For the type of oil to be used, see the “Oiling” section.

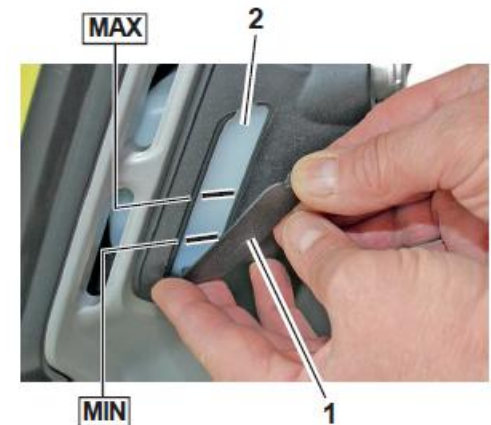
Note: After the engine and exhaust system are cooled, clean the parts with cleaning cloth.

- Start the engine and let it idle for a few minutes to check for oil leaks. In case of oil leaks, stop the engine immediately and find the cause.
- Shut off the engine, check the oil level and correct if necessary.
- Reset the maintenance intervals as described in the “Digital instruments”section.

Check Coolant Level

Note: Check coolant level after engine cooling.

- Keep the motorcycle in driving position (place the front and rear wheels on the same horizontal plane on the ground, and make them vertical on both sides) or park it with a central kickstand.
- Remove the observation cover (1) of the water storage tank (2).

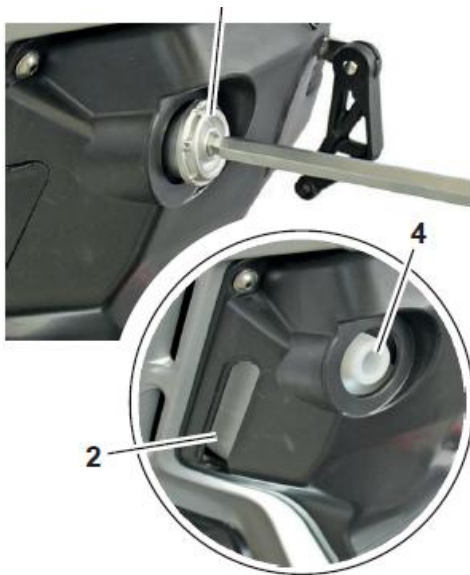


- Check whether the liquid level is between the minimum “MIN” and maximum “MAX” levels of the tank.

- If filling is required, remove the tank cover (3) and inject coolant from the hole (4) to check the level on the tank (2).

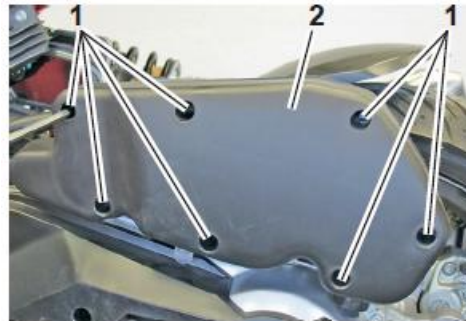
- Once the level has been restored, reinstall the tank cover (3) and tank observation cover (1).

Note: Coolant is corrosive. If there is any overflow during filling, please carefully clean the parts in contact with coolant.

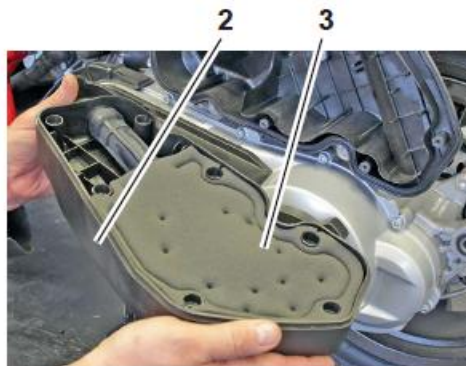


Clean the Air Filter Element

- Remove the screw (1) and remove the air filter (2).



- Remove the filter element (3) from the air filter (2).



- Clean the filter element (3) with appropriate filter element cleaning agent and make it completely dry.



Warning

Do not use gasoline or other flammable solvents to clean the filter element.

- Check whether the filter element is worn or damaged, and replace it if necessary.

- Apply the specific oil to the entire surface of the filter element (3) and then squeeze the filter to remove excess oil.

- Reinstall the filter element (3) on the air filter, and then replace the screen cover on the filter cover.

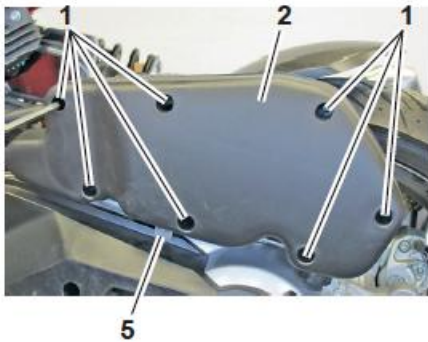
- Inspect the gasket (4) for good condition and replace it in case of any damage.



- Tighten the screw (1) and reinstall the air filter (2).

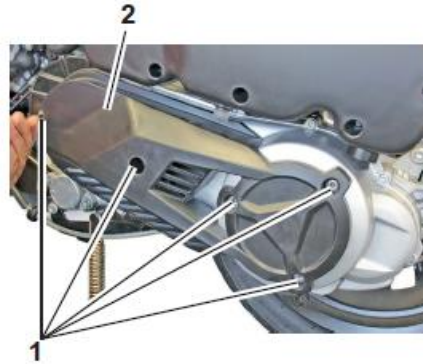


- Check the drain pipe cap (5) for dirt. If you see any dirt, remove the air filter bag, and clean it before reassembly.

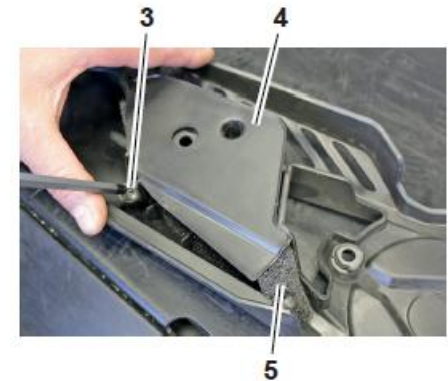


Clean the Transmission Air Filter

- Unscrew the screw (1) and remove the CVT outer cover (2).



- Unscrew the screw (3) fixing the upper screen cover (4) of the CVT air inlet filter element (5).



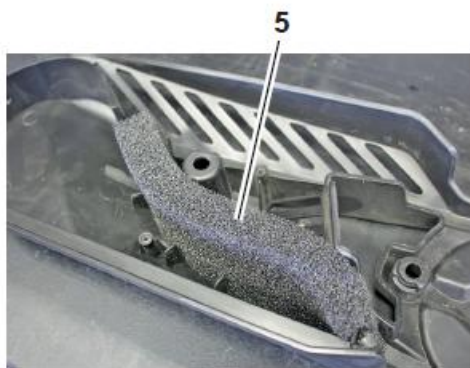
- Remove the CVT inlet filter element (5) and clean it with appropriate detergent.



Warning

Do not use gasoline or other flammable solvents to clean the filter.

- Check whether the air filter is worn or damaged, and replace it if necessary.
- Remove the air filter (5) in turn.



Spark Plug Check

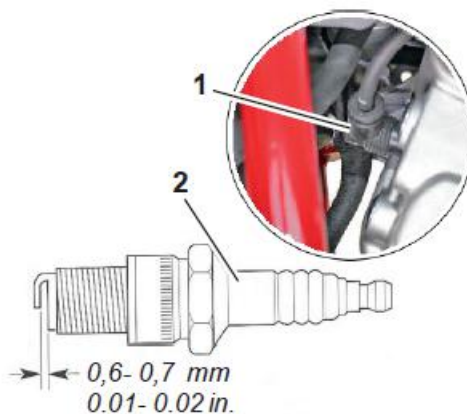


Warning

Wait for the engine to cool down before check, otherwise resulting in a risk of scalding.

The gap between the spark plug electrodes must be 0.6-0.7mm. Different distances can cause any malfunction of the motorcycle.

- Remove the spark plug cap (1) .
- Use the spark plug socket to remove the spark plug (2) .



Check Tyres and Relative Tyre Pressure

Always keep your tyres in good condition and at proper intervals. Tyres should be replaced in accordance with the relevant regulations.

Be sure to check tyre pressure before starting and adjust tyre pressure if necessary.



Warning

If the tyre pressure is not used correctly, the motorcycle may lose control, resulting in serious injury or death.

- Check and adjust tyre pressure in cold weather (i.e. when tyre temperature equals ambient temperature).
- Tyre pressure adjustment must be made according to the total weight of the rider, passenger, load and accessories approved for this model.

Check tyres

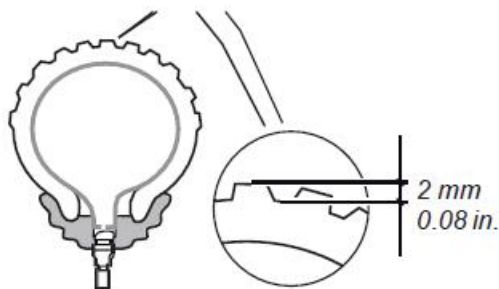
This motorcycle has tubeless tyres.

- Check the condition of tyres, to ensure that there should be no crack or wear etc. on the surface; use a special indicator to check tread wear.

The minimum height at which a tyre touches the ground

Front tyre	2 mm (0.08 in)
Rear tyre	2 mm (0.08 in)

- Check tyre pressure according to the instructions given in the section of technical parameters.



Warning

The brands and models of front and rear tyres must be the same. Using different types of tyres for front and rear tyres will affect the stability and mobility of the motorcycle.

Note: Even if any wear is observed, tyres will also be aging; Transverse cracking or deformation of casings is a sign of aging. You should have the tyres checked by the tyre dealer before using your motorcycle.

Cold tyre pressure:

1 person:

Front tyre: 190kPa (1.9Kgf/cm², 28psi)

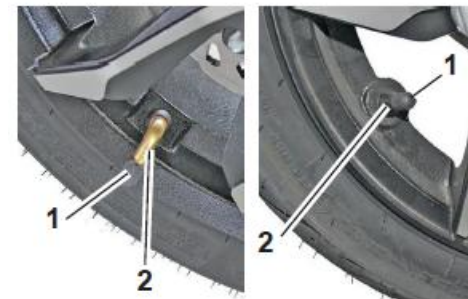
Rear tyre: 200kPa (2.00kgf/cm², 29psi)

2 persons:

Front tyre: 210kPa (2.10kgf/cm², 30psi)

Rear tyre: 250kPa (2.50kgf/cm², 36psi)

- To adjust tyre pressure, first remove the valve cap (1), and then connect the pressure gauge to the valve (2).





Warning

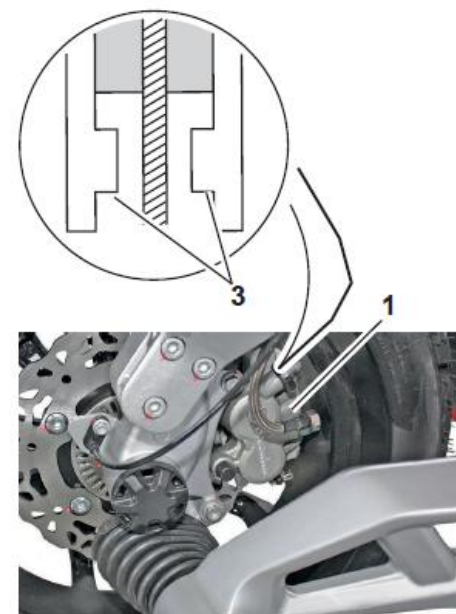
- **Replace excessively worn tyres through a tire dealer. Using vehicles with excessively worn tyres will reduce driving stability and can lead to loss of control.**
- **Drive the motorcycle at moderate speed after tyre replacement for “running-in” of the tyre surface, thus fully developing its characteristics.**

Note: To replace a tyre, it is required to balance the wheel.

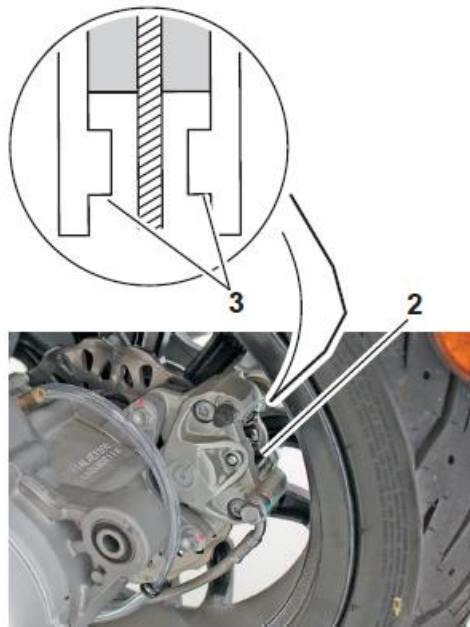
Always inspect the rim for any crack, bending, distortion or other damage before each use. If any damage is found, replace the wheel. Don't try to repair a wheel at the slightest extent. If deformation or cracking occurs, the wheel must be replaced.

Check the Wear of Brake Pads

Check the wear of the front brake pad (1) and rear brake pad (2).



- Brake pads are equipped with the wear indicator (3). To check for wear on the pads, check the position of the wear indicator (3) during braking. If the brake pads are worn to the point where the wear indicator almost touches the brake disk, replace a pair of brake pads.



Warning

To replace the brake pads, you must contact your Jincheng dealer.



Warning

After replacing the brake pads, you must be careful in driving, and braking step by step to make the brake pads fixed properly/match with the corresponding brake disks.

Check the Front and Rear Brake Fluid Level

- Secure the motorcycle so that the upper part of the brake reservoir is parallel to the ground.
- The liquid level in the pump box must be at the center of the rim (1). Once the liquid level is lowered, air will enter the system, prolonging the action of the joystick. If filling is necessary, please contact your Jincheng dealer.



If the brake lever is too “soft”, there is air in the pipe or a system defect. As it is dangerous to ride a motorcycle under these conditions, please have your Jincheng dealer check the braking system immediately.

Attention

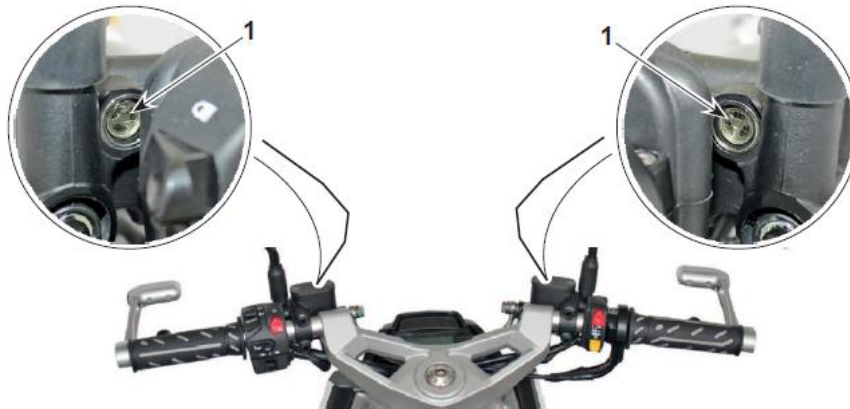
Do not pour brake fluid on plastic parts and lenses (i.e. headlights)



Do not mix two different types of brake fluid. If you choose to use the brake fluid of another brand, remove the existing brake fluid.



Brake fluid may cause irritation. Avoid contact with skin and eyes. In case of skin contact, clean the affected area completely, or contact your doctor in case of eye contact.





Warning

- Use only the brake fluid specified in the specification; otherwise, the rubber seal may break, leading to leakage.
- Fill with brake fluid of the same type. Adding brake fluid other than DOT4 can cause harmful chemical reactions
- When filling, avoid water or dust infiltration into the brake fluid storage reservoir. Water can significantly reduce the boiling point of the liquid and may cause “vapor locking”, and dirt can clog the valve of the ABS hydraulic unit.

Warning

Brake fluid may damage painted surfaces or plastic parts. Be sure to clean up any spills immediately.

With the wear of the brake pads, it is normal for the brake fluid level to decrease gradually. If the brake fluid level is low, the brake pads may be worn and/or the brake circuit may be leaking. Therefore, it is important to check the wear level of the brake pads and the brake circuit for leakage.

If the brake fluid level drops suddenly, have your *Jincheng* dealer inspect your motorcycle before continuing to use it.

Replace the Brake Fluid

Let your *Jincheng* dealer change the brake fluid every two years. In addition, the seals on the main cylinder and brake caliper, as well as the brake hoses, should be replaced at intervals listed below if damaged or leaked.

- Brake seals: replacement every 2 years
- Brake hose: replacement every 4 years

Check the CVT Belt

CVT belts must be inspected and/or replaced by your *Jincheng* dealer at the intervals specified in the regular maintenance schedule.

Regularly Check and Lubricate the Central kickstand or Side Kickstand (Optional)

Always check the operation of the central kickstand or side kickstand. If necessary, lubricate the guide pin (1) and metal butting surfaces.



Warning

If the central kickstand or side kickstand is not easy to lift or drop, please have it checked or repaired by your *Jincheng* dealer.

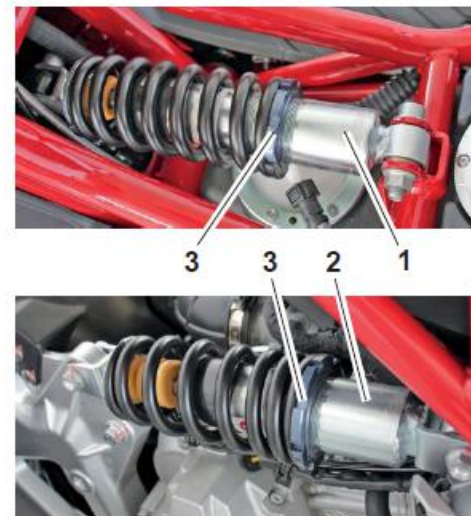


Pretension Force Adjustment of Shock Absorber Springs

Adjust the front shock absorber (1) and rear shock absorber (2) to adjust the pretension force of springs. Use the ring nut (3) for adjustment.

Tighten the screw to increase the pretension force and vice versa.

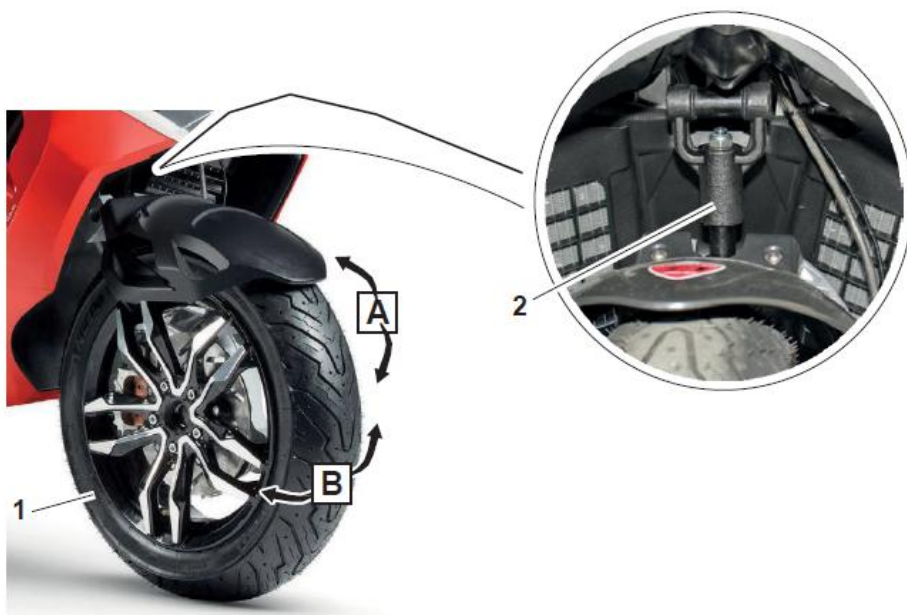
By tightening the ring nut, the spring is compressed, thus achieving hard damping. Unscrew the ring nut and loosen the spring to obtain softer cushioning effect.



Check the Front Steering System Periodically

The clearance of the front steering system should be checked periodically.

- By placing the motorcycle on the central kickstand, one person must hold the handlebar of the motorcycle and stabilize it, and the other person must try to move the wheel (1) in the direction of the arrow “A” and the arrow “B”.



If the clearance is found excessively large, please contact your **Jincheng** dealer to check the steering motion (2).

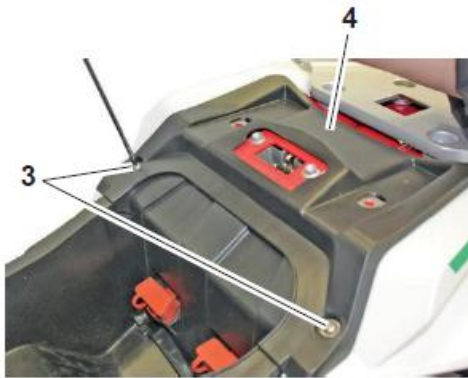
Check and Charge the Battery

To open the battery case, follow the following steps:

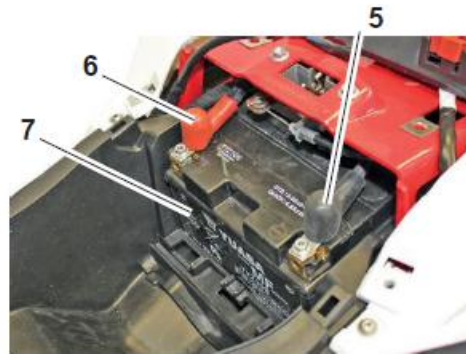
- Lift the seat cushion as described in the relevant paragraph.
- Unscrew the two screws (1) and remove the passenger seat (2).



- Remove the two screws (3) and remove the cover (4) of the battery case.

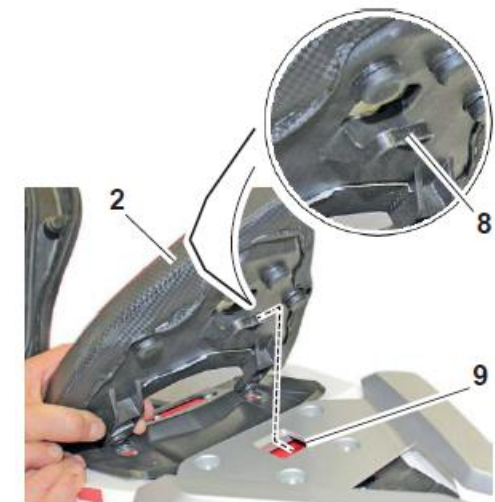


- First remove the black negative cable (5) first, and then remove the red positive cable (6) (first connect the red positive cable, and then connect the black negative cable for reassembly).
- Remove the battery from the battery case (7).



- Check the electric pressure to be no less than 12.5V with the help of the voltmeter. Otherwise, the battery needs to be charged.

- To use the DC voltage for the battery charger, connect the red positive cable to the positive terminal of the battery first, and then connect the black negative cable to the negative terminal of the battery.
- Always check the charging status of the battery before reassembly. The battery must be kept clean and the terminals must be coated with grease.
- Reassemble all parts in the reverse order of disassembly, taking care to insert the passenger seat hook (8) into the rear armrest (9).





Danger

The battery contains sulfuric acid. Avoid contact with skin, eyes and clothing.

Remedial measures:

Skin contact

Rinse thoroughly with water.

Eat by mistake

Drink plenty of water and milk.

Contact your doctor immediately. Don't vomit.

Eye contact

Rinse with water for at least 15 minutes and contact your doctor.

Attention

If the battery is not in use, it must be charged at least every 3 weeks in any case. (Charging method: charging current 0.9A, and charging duration 5~10 hours. Battery specifications, 12V 8.6A)



Warning

Battery charging can produce explosive gas. Keep ventilation when charging the battery indoors. When using a battery charger, connect the battery to the charger before opening it. This avoids the formation of any spark at the battery electrode tips, which will ignite the gas contained in the battery.

Check/Replace Fuses

The bicycle comes with two fuse boxes. One box is located under the seat and the other under the front panel.

Fuses under the seat

- Open the seat cushion to open the fuse box (1).

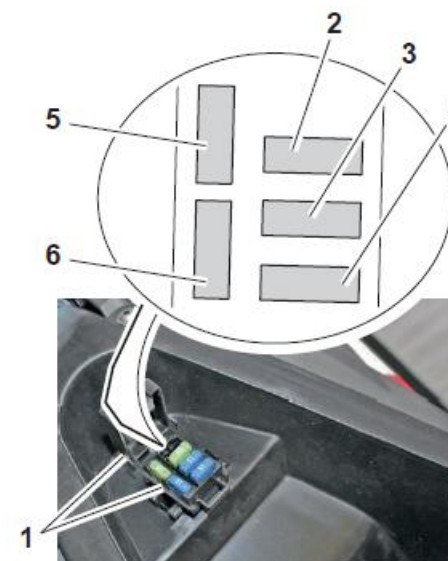
Fuse 2 (15A) =ABS motor

Fuse 3 (10A) =ABS valve

Fuse 4 (20A) = Main fuse

Fuse 5 (20A) =Spare fuse

Fuse 6 (15A) = Spare fuse



Fuses under the front panel

- Unscrew the screws (1) and remove the instrument mask (2).



- Lift the front panel (3) with both hands and pull outward until it is removed from the large lampshade.



- Pull the front panel (3) slightly outward to open from the top

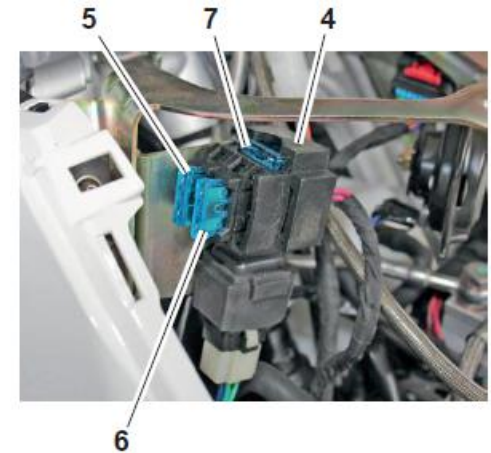


- The fuse box (4) is located on the upper right side of the motorcycle.

Fuse 5 (15A) = Lamp, rear registration plate lamp, direction indicator relay and horn

Fuse 6 (15A) = Ejector and starter motor

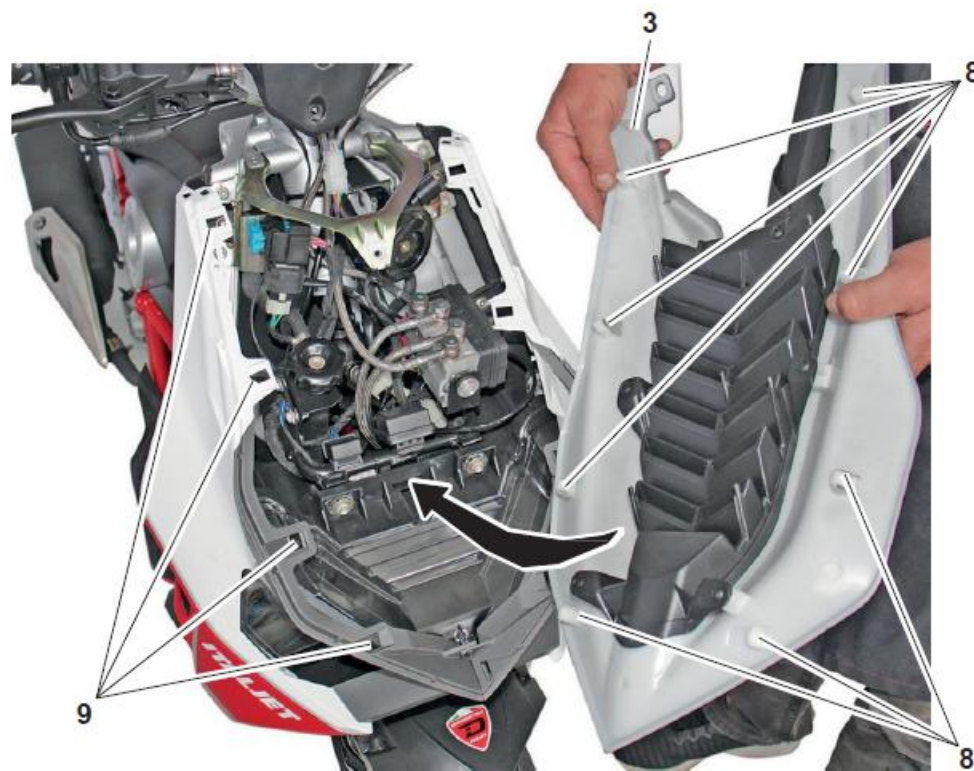
Fuse 7 (15A) = Spare fuse



- Reassemble all parts in the reverse order of the disassembly process. Carefully insert the plastic clips (8) on the front panel (3) into the square holes (9).

Attention

Do not use a fuse with the current bigger than the original fuse, or otherwise it may cause damage to the electrical system and cause fire.



Steering Column

Inspection should be carried out after 1000km first, and then every 10000km.

The steering column bearing should be adjusted properly to make the steering handle rotate flexibly and ensure safe driving. Too tight steering column will lead to inflexible rotation of the steering handle. If the steering column is too loose, it will cause vibration and damage the steering bearing. Check the steering column to make sure it does not move. If there is any movement, the steering column should be adjusted in time.

Front Shock Absorber

Inspection should be carried out after 1000km first, and then every 10000km.

Check the shock absorber for oil leakage, scratches, or external surface damage. If any parts are faulty, replace them immediately.

Rear Suspension

Inspection should be carried out every 10000km.

Check whether the rear shock absorber leaks oil and check whether the swing frame moves. If any parts are faulty, replace them immediately.

Exhaust Pipe Bolts and Muffler Bolts

Tighten these bolts after 1000km first, and then every 10000km.



Tighten the exhaust pipe nuts ① and muffler fixing bolts ②, and tighten the muffler fixing bolts ② and exhaust pipe connecting nuts ① to the specified torque.

Item	Exhaust pipe connecting nuts	Muffler fixing bolts
Torque (N·m)	23	23

Body Bolts and Nuts

Tighten them after 1000km first, and then every 5000km.

The following table lists the bolts and nuts for key parts, which must be of reliable quality to ensure safety. If necessary, tighten with a torque wrench according to the specified torque.

Item	Torque (N·m)
Steering column nut	65
Front fork lower plate clamping bolt	33
Front axle bolts	65
Handle pipe clamping bolt	16
Caliper mounting bolt	26
Front brake disc mounting bolt	18
Rear brake disc mounting bolt	23

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Chapter 3

Motorcycle Maintenance



Motorcycle Parts

Right side view

1. Rider foot pedal
2. Rider seat cushion
3. Passenger seat cushion
4. Passenger armrest
5. Passenger foot pedal
6. Rear shock absorber
7. Exhaust muffler
8. Storage compartment



Left side view

1. Front wheel
2. Front brake disc
3. Front brake caliper
4. Front swing arm
5. Front shock absorber
6. Seat cushion lock
7. Voltage regulator
8. Engine
9. Air filter
10. Central kickstand
11. Gearbox air filter
12. Rear brake disc and rear brake caliper
13. Rear wheel
14. Fuel tank cap
15. Fuel tank



Front and rear views

1. Right mirror
2. Left mirror
3. Right turn indicator lamp
4. Left turn indicator lamp
5. Headlamp
6. Right radiator
7. Left radiator
8. Tail lamp
9. Rear left turn indicator
10. Rear right turn indicator
11. Rear registration plate lamp
12. Rear fender



Controls and Instruments

1. Rubber cover for left handle
2. Left handle switch assembly
3. Rear brake lever
4. Rubber cover for accelerator handle
5. Right handle switch assembly
6. Front brake lever
7. Ignition switch
8. USB socket
9. Instrument and external indicator lamp



Instruments

Indicator lamps and alarm lamps

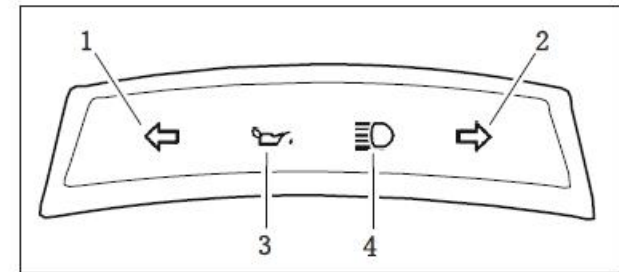
- 1 Left turn signal indicator lamp
- 2 Right turn signal indicator lamp
- 3 Engine oil pressure alarm lamp
- 4 High beam lamp
- 5 Coolant high temperature alarm lamp
- 6 Low fuel supply alarm lamp
- 7 ABS alarm lamp
- 8 EFI fault system indicator lamp

Left turn signal indicator lamp “←”

When the control switch of the left handle switch assembly is moved to the left, the indicator lamp blinks.

Right turn signal indicator lamp “→”

When the control switch of the right handle switch assembly is moved to the right, the indicator lamp blinks.



Engine oil pressure alarm lamp “”

Turn the ignition key to the "On" position, and the alarm lamp should be on. After the engine is started, the lamp should be off. If the lamp is still lit or in an on status during the running of the engine, please turn off the engine, and check the oil level as specified in (5.1 b) or contact your dealer to check failure.

Warning

Do not use the motorcycle for lack of oil pressure, which may cause engine failure

High beam lamp “”

When the high beam lamp is turned on by use of the appropriate control located on the left handle switch assembly, the lamp is lit.

Coolant high temperature alarm lamp “”

When the coolant temperature reaches its maximum limit, the lamp will be lit.

Warning

Stop driving the motorcycle and turn off the engine. Do not use the motorcycle when the coolant temperature is too high. It may cause engine failure.

- Wait for the cooling liquid to cool, then check the liquid level as described in the relevant paragraph (5.1.d) or contact your trustworthy dealer to check the fault.

Low fuel supply alarm lamp “”

Turn on the ignition key; the lamp will be lit for a few seconds, and then go off. If the lamp is lit when the motorcycle is used, it indicates that the fuel level has reached the reserve level (about 2 liters), indicating that the driving range is limited. Please refuel as soon as possible.

ABS alarm lamp “”

When you turn the ignition key, the ABS control unit will diagnose itself and the ABS lamp will be on until the motorcycle runs normally.

On the other hand, if the motorcycle is running at a speed higher than 5 km/h, the lamp continues to light up, indicating that the ABS braking system is faulty;

- Stop and turn off the engine;

- Please wait a few minutes and then reignite. If the ABS lamp lights up again, contact the nearest **Jincheng** dealer to check the ABS system.

EFI fault system indicator lamp “”

Turn on the ignition switch. The EFI fault system indicator lamp remains on after self-checking. When the engine is working, the indicator lamp is off. If the EFI fault indicator lamp remains on when the engine is working, it indicates that the EFI system is faulty. Stop and turn off the engine.

- Please wait a few minutes and then reignite. If the EFI fault system indicator lamp is still on, contact the nearest **Jincheng** dealer for a self-diagnostic system check.

Digital Instruments

1 Speed indicator (speedometer) km/h - Mph.

2 Clock.

3 Fuel gauge.

4 Km/mile partial or total travel/total or partial hour display.

5 Service reminder indicator.

6 “Mode” button.


7 “Set” button.



Clock (2)

Display time; you can set 24-hour or 12-hour system time.

Fuel gauge (3)

Display the fuel level in the tank. (3a) Full level shows the highest fuel level; zero level indicates the lowest oil level, and the indicator lamp “ ” lights up.

Km/mile partial or total travel/total or partial hour display (4)

In this part of the display, you can view partial km/mile travel (Travel A or Travel B) and relative travel time, i.e. total km/mile travel.

Service reminder indicator (5)

When the total mileage reaches 100km before the maintenance value, the indicator lamp will be lit. When the km/mile travel of maintenance intervals is exceeded, the warning light will remain on until being reset.

After maintenance, total mileage is displayed. Press the “Mode” button (6) for more than 10 seconds to turn off the service reminder indicator.

Mode button (6)

The mode button allows you to scroll through information.

Set button (7)

The “Set” button allows you to set units of measurement and clear subtotal mileage.

Adjust and Display Settings



All adjustments must be made while the motorcycle is stationary.

Kilometer/mile setting and 24-hour / 12-hour system clock

- Press the “Mode” button until the total kilometers/miles are displayed.
- Press the “Set” button for at least 10 seconds. You can switch from the measurement unit km (kilometer) + 24-hour system clock to the mi (mile) + 12- hour system clock, and vice versa; Some counters are reset.

Set time

- Hold the “Mode” and “Set” buttons at the same time for more than two seconds and the hour and minute indicator lamps start flashing.
- Press “Mode” to increase the number of hours, and press “Set” to increase the number of minutes.
- Hold the “Mode” and “Set” buttons at the same time for more than two seconds to confirm the time setting.

Set km/mile and partial time “Travel A or Travel B”

- Press the “Mode” button until “Travel A” or “Travel B” is displayed. By quickly pressing the “Set” button, you can switch between displaying partial travel km/mile readings.
- To reset the partial travel km/mile readings and partial time, press the “Set” button for more than two seconds and these readings will be reset and the count will restart.



Control

Ignition switch

The ignition switch has three positions

🔄 Start position of the motorcycle (Do not remove the key);

🔒 Key removal position;

“**lock**” Steering lock position (You can remove the key)

- Key removal position “🔒”

By turning the key into the “🔒” position, turn off the engine and lamps, and then remove the key from the ignition switch.


- Startup Position

From the “🔒” (key removal) position clockwise turn the key(1) to the “🔄” position lamp, and then the instrument lamp is lit until the motorcycle can be started.

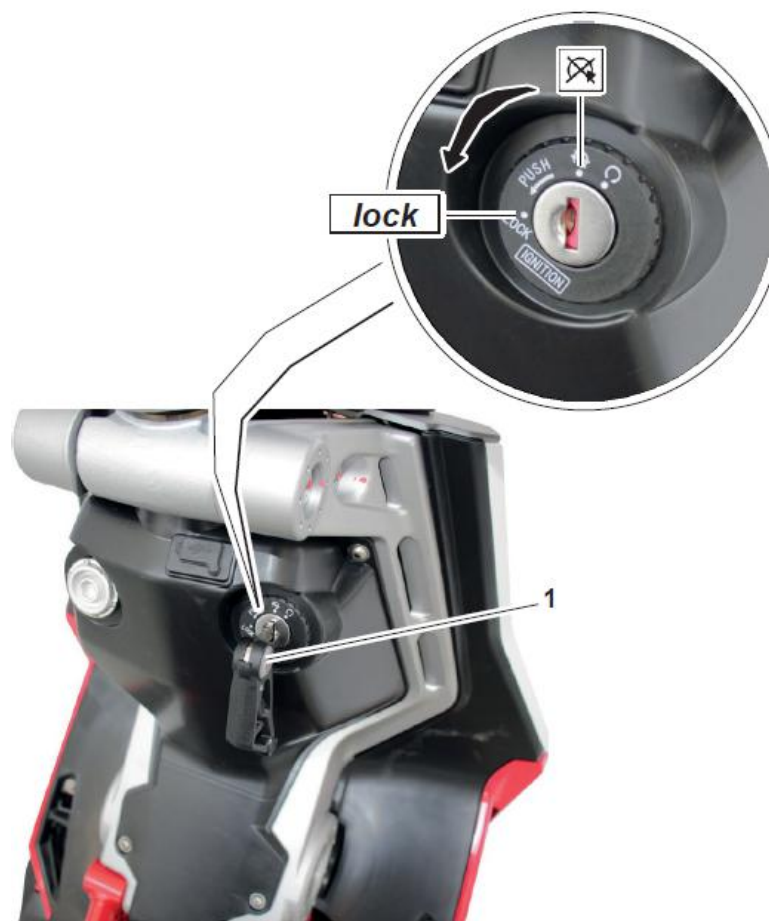


“Lock”the steering lock

The operation of locking the steering gear is as follows:








- Turn the handlebar to the far left
- Insert the key (1) into the position  of the ignition switch (2), press the key (1), and turn counterclockwise to the "lock" position.
- Remove the key (2) .

To unlock the steering gear, execute the operation in a reverse way.



Left Handle Switch Assembly

The left handle switch assembly contains the following commands:

1.  Passing lamp switch
2.  /  Dimmer switch
3.  Emergency switch
4.  Horn button
5.  /  Direction indicator switch

High beam “ ”


Press the button (1) to light up the high beam.




Low beam/high beam switch



“ /  ”

Depending on the position of the switch (2), the low beam/high beam is lit.

 Low beam lighting.

 High beam lighting.

Emergency switch “ ”



If you press the switch (3), all direction indicator lamps will flash simultaneously, and the "left turn (symbol)"  and "right turn (symbol)"  indicator lamps on the instrument panel will also flash.

Note: Use the hazard lamp only when it is necessary to warn other vehicles that your motorcycle is stationary. Using the emergency lamp when the engine is off may drain the battery.

Horn “ ”



Press the button (4) to sound the horn.

Direction indicator switch “ / ”

Move the switch (5) to “ ” to turn on the left turn indicator lamp, and move the switch (5) to “ ” to turn on the right turn indicator lamp: Once enabled, the switch will return to the center position. To turn off the direction indicator, press the switch when the switch is in the center position.

Right Handle Switch Assembly

The right handle switch assembly contains the following commands:


1.  Emergency flameout switch
2.  Engine start button




Emergency flameout switch



Warning

Press the switch (1) to turn off the engine. Please turn off the engine only under true emergency.

When the switch is pressed in the “” position, engine startup and operation will be disabled.

When the switch is pressed in the “” position, the engine can run and start.

Engine start button

When the key is in the “” position and the switch (1) is in the “” position, press the button (2), and meanwhile press the brake handle to start the engine.

Accelerator control

The accelerator handle (1) is located on the right side of the handlebar.



Front brake control

Handle (1) is located on the right side of the handlebar. When braking, the brake switch will cause the tail lamp to light up. To activate the brake pull the control lever towards the accelerator handle.

Loosen the two fixing screws (2) to adjust the position of controls on the handlebar.



Don't forget to tighten the screws (2) after adjustment.

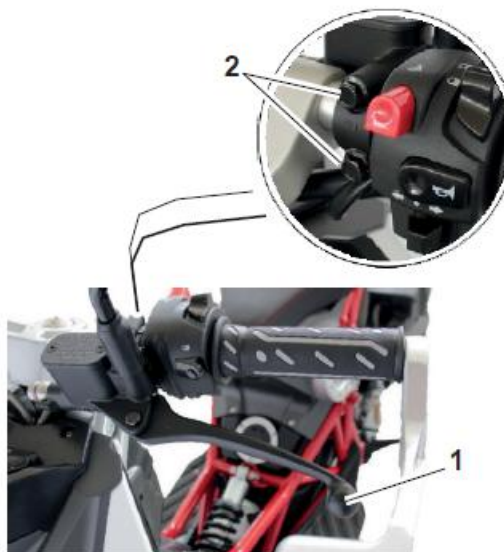


Rear brake control

The brake handle (1) is located on the left side of the handlebar. When braking, the brake switch will cause the tail lamp to light up.

To start the brake, turn the brake handle towards the left handlebar.

Loosen the two fixing screws (2) to adjust the position of the controller on the handlebar.



Don't forget to tighten the screws (2) after adjustment.

Exhaust system

The exhaust system includes catalytic converters to reduce harmful exhaust emissions.



Warning

The exhaust system temperature rises after the motorcycle runs. To prevent the risk of fires or burns:

- Do not park near materials that may pose a fire hazard, such as grass or other flammable materials.
- Park the vehicle out of the reach of pedestrians or children of hazards of thermal exhaust system

- Check that the exhaust system is cooled before maintenance.
- Never run the engine without driving the motorcycle, even for a few minutes. Idling for long periods of time may cause heat buildup.

Accessory parts and USB socket

Warning

Do not connect accessories to the USB socket after the engine is turned off, and the load should not exceed 12 watts (1 amp), otherwise the fuse will be blown and the battery cannot be charged.

Use the USB socket

- Open the dust cover (1).
- Connect the accessories to the socket (2).
- Put the dust cover back properly when the socket is not in use.



Storage compartment under the seat cushion

- Prop up the side kickstand or central kickstand of the motorcycle.
- Insert the key (1) into the lock (2) and turn until the seat cushion lock is removed.



- Lift the seat cushion (3) to open the storage compartment (4).
- Close the seat cushion, lower and push it down, and hook it to the corresponding lock.



Note: After opening the storage compartment under the seat cushion, you can remove the key from the lock.

Side kickstand (optional)

Attention

The side kickstand is designed to support only the weight of the motorcycle. Do not sit on the motorcycle with the side kickstand as a support. Any damage to the kickstand may result in serious personal injury.

Attention

The motorcycle must be placed on the side kickstand only after the rider has left it.

Attention

The motorcycle is provided with a safety sensor. The motorcycle may not be started on the side kickstand. When the side kickstand is lowered while the motorcycle is running, the engine will stop.

The side kickstand is located on the left side of the frame. When keeping the motorcycle upright, you can raise or lower the side kickstand with your foot (1).



Danger

Do not use the motorcycle with the side kickstand lowered. If the side kickstand does not remain high, it is necessary to contact the nearest *Jincheng* dealer for repair.

Regularly check whether the side kickstand works properly, and whether the safety sensor that prevents the motorcycle from starting when the side kickstand is lowered works properly.

Central kickstand

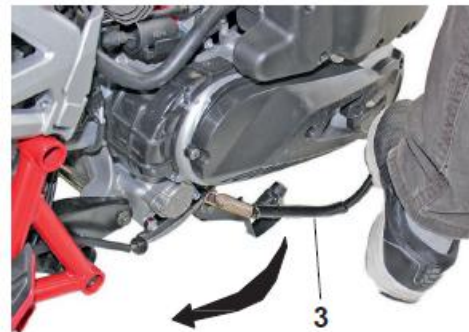
- Hold the left handlebar (1) and the left passenger armrest (2).
- Press the lever (3) of the central kickstand (4) with your right foot and lift the motorcycle upward and backward at the same time until it is fully erected on the central kickstand.

Attention

It is dangerous to sit on the motorcycle when it is parked on the central kickstand, thus placing its weight on the parking bracket.

To lay down the motorcycle from the central kickstand, do the following operations.

- Grab the left handlebar (1) and the left passenger armrest (2).
- Put your feet in front of the central kickstand and push the motorcycle to the front until it comes off the central kickstand; the central kickstand will be lifted automatically.



Check before use

Check the vehicle before use every time to ensure safe operation.

Always comply with the inspection and maintenance procedures and intervals as described in the *Manual for Use and Maintenance*.



Failure to properly inspect or maintain the motorcycle will increase the likelihood of an accident or damage to the vehicle. If you encounter a problem, do not use the motorcycle. If the instructions provided in this manual do not eliminate the fault, please have the vehicle inspected by the Italjet dealer.

Before using this vehicle, please check the following items:

Component	Control
Fuel	<ul style="list-style-type: none">- Check fuel level in the fuel tank.- Refuel if necessary.- Check the fuel circuit for leaks.
Crankcase oil	<ul style="list-style-type: none">- Check the oil level in the engine.- If necessary, add the recommended oil to the specified oil level.- Check the engine for any oil leakage.
Gearbox oil	<ul style="list-style-type: none">- Check the transmission for any oil leakage.
Coolant	<ul style="list-style-type: none">- Check to ensure the coolant in the coolant reservoir should be between MIN and MAX scale lines.- Fill coolant if necessary.- Check for leaks in the cooling system.
Wheels and tyres	<ul style="list-style-type: none">- Check for any damage.- Check tyre condition and tread depth.- Check tyre pressure.

Component	Control
Brakes	<ul style="list-style-type: none"> - Check the operation of brakes. - If you feel them soft and pliable, please have the safety system checked at your Jincheng dealer. - Check the wear of brake pads. - Replace them when necessary (please contact your Jincheng dealer for replacement). - Check the liquid level in the oil tank and refill oil if necessary (please contact your Jincheng dealer for oiling). - Check the hydraulic system for leaks.
Side kickstand and central kickstand	<ul style="list-style-type: none"> - Ensure their smooth movement. - Lubricate pivot points if necessary.
Instruments, lamps, signal indicators and switches	<ul style="list-style-type: none"> - Check the working condition of lamps and direction indicators.
Central kickstand switch	<ul style="list-style-type: none"> - Check the operation of the ignition circuit interruption system. - If the system does not work properly, please have the vehicle checked at your Jincheng dealer.

Instructions on the Use of Motorcycles

Running-in instructions

In the first 1000km, the following rules must be strictly followed. They can be used to determine the service life and performance of the motorcycle:

- Preheat the engine to low RPM before using the vehicle.
- Avoid fast start and do not run the engine at high RPM.
- Run at moderate speed until the engine heats up.
- Use both brakes repeatedly on the brake pad and brake disc.
- Avoid maintaining the same speed for long periods of time.
- Avoid long trip without stopping.

Identification of operational problems

A list of any of the following operational problems is generally used to identify the source of the problem and implement remedial action.

Slow engine start

- Spark plug fouling or poor condition: replacement

The engine is started but fails to operate properly

- Spark plug fouling or poor condition: replacement

Spark plug fouling

- Low spark plug ignition power, and changed engine lack of power
- Dirty air filter element: cleaning.

Brake failure

- Brake pad wear: replacement at a professional repair shop.

Attention

For all other questions, please contact your *Jincheng* dealer.

Oxygen Sensor

Notes for disassembly:

Do not allow grease, oil or other substances into the oxygen sensor.

The oxygen sensor may be damaged if it is dropped. In such case, replace the oxygen sensor with a new one

Be careful with the oxygen sensor.

The oxygen sensor may not be repaired at high temperature

Disassembly procedures:

1. 1. Remove ① counterclockwise using a tool



2. Manually pull out ① from ② upward



3. Gently separate ① to manually pull out ② downward



Catalytic Converter

Removal/installation

1. Remove the screws ①② and hoop ③ using tools.



2. Remove the nuts ①② and oxygen sensor ③ using tools.



Canister Purge Solenoid

Disassembly/Assembly

EVAP purge control solenoid

Disconnect the following parts:

- EVAP purge control solenoid 2P plug [1]
- Detachment hose [2]
- Hose from the canister to the EVAP purge control solenoid [3]

Remove the EVAP purge control solenoid [5] from the bracket [4]. Assemble it in the reverse order of disassembly.

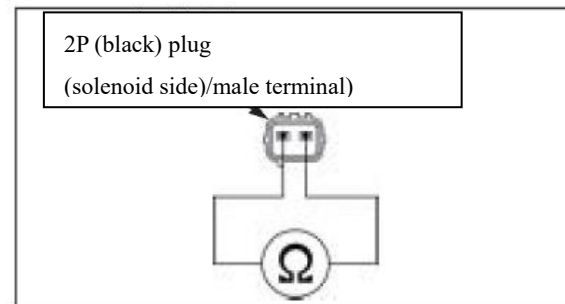
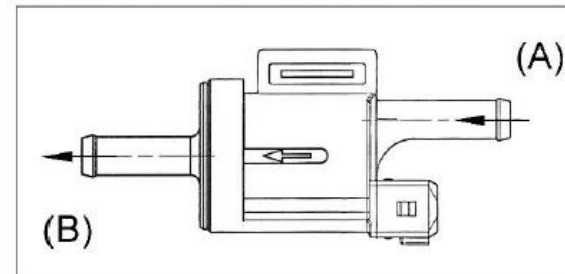
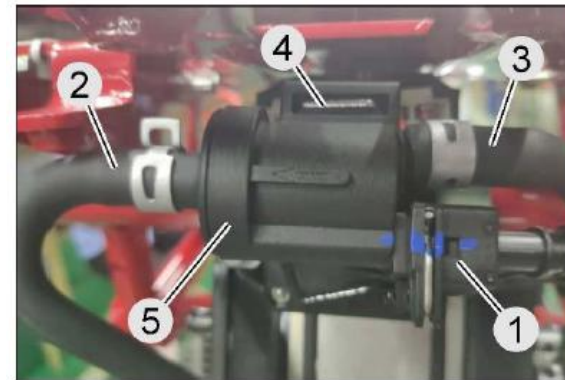
Test

Remove the EVAP purge control solenoid.

Check that air should flow from (A) to (B) when only the 12V battery is connected to the EVAP purge control solenoid terminal.

Measure the resistance on the solenoid side of the EVAP purge control solenoid 2P plug. Standard resistance 15 – 19 Ω (20°C/68°F)

If the resistance exceeds the technical specification, replace the EVAP purge control solenoid.



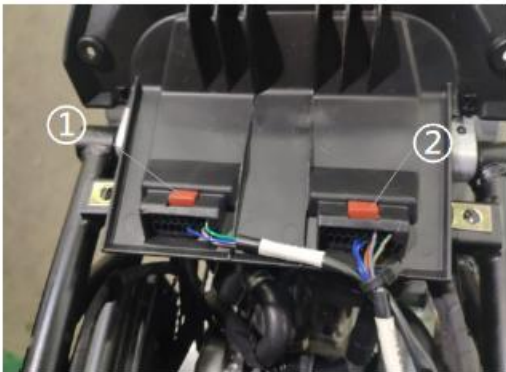
On-board Diagnostics

Removal/installation

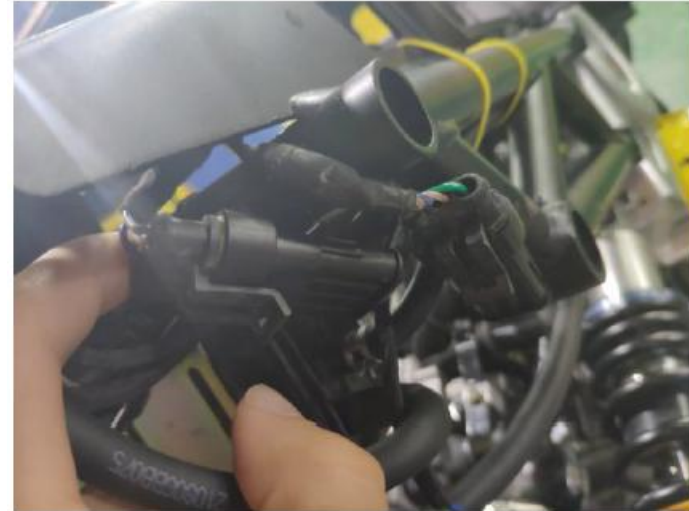
1. Open the seat cushion to expose ABS and OBD



2. Remove the cover parts and pull out ① and ② from behind

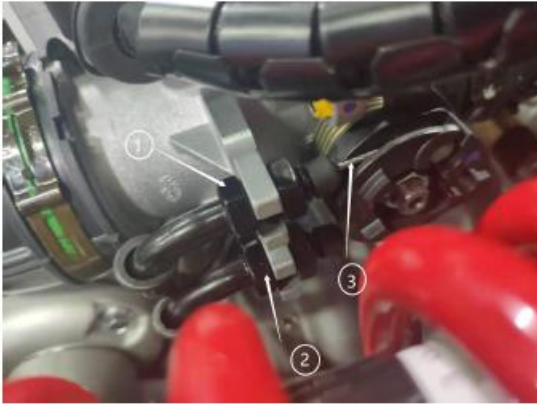


3. Pull the other sides of ABS and OBD out from the rear of the frame



Electronic Control Unit (ECU)

1. Remove ① and ②, and remove the accelerator cable ③ before pull-out



2. Remove the hoops ① and ②

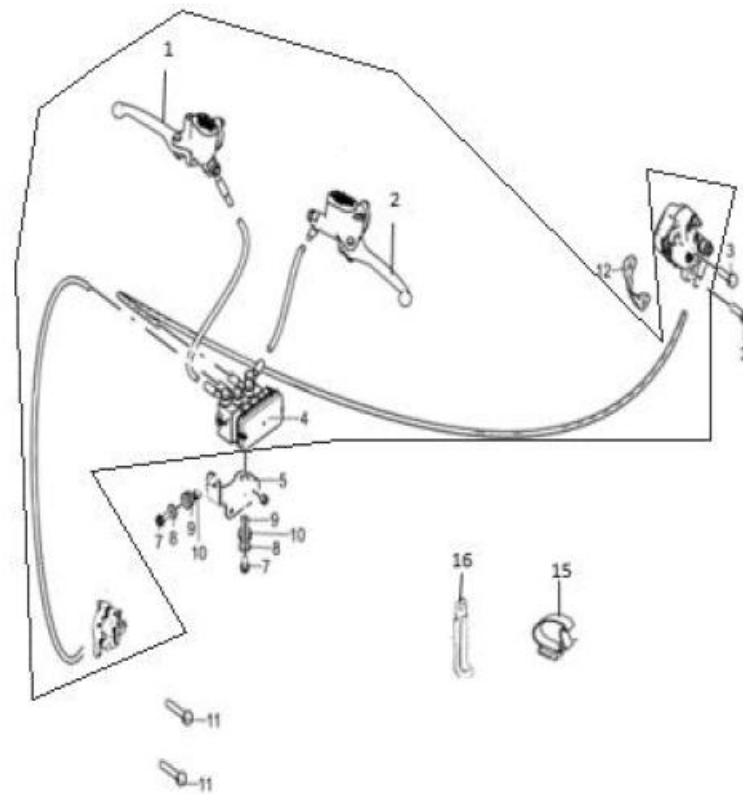


3. Remove the rubber cover and pull out the ECU



Brake System

Schematic Diagram



Main parts:

1	Front brake lever	7	Bolt	13	Front and rear brake system assembly
2	Rear brake lever	8	Washer	14	Half-covered bolt
3	Bolt	9	Rubber mat	15	Starting motor lead wire clamp
4	ABS unit	10	Bushing	16	Clip
5	ABS unit mounting support ABS	11	Bolt	17	
6	Bolt	12	Rear brake caliper mounting support	18	

Rear Brake Disc**Disassembly**

- Remove the muffler.
- Remove the muffler support
- Remove the rear wheel
- Remove rear brake clamp
- Remove the rear hub (connecting the brake disc)
- Remove the rear brake disc)

**Warning**

During reassembly, use the recommended threadlocker onto the brake disc bolt threads.

Inspection of Brake Discs

- Visually check the surface of brake discs. Replace the brake disc if it is scratched or damaged.
- Check for disc wear by measuring the minimum thickness at different points with a dial indicator. If the minimum thickness (even at a single point on the brake disc) is less than the minimum value, replace the brake disc.

Warning

The brake disc must be mounted on the wheel before operation.

Performance parameter

Minimum brake disc thickness:

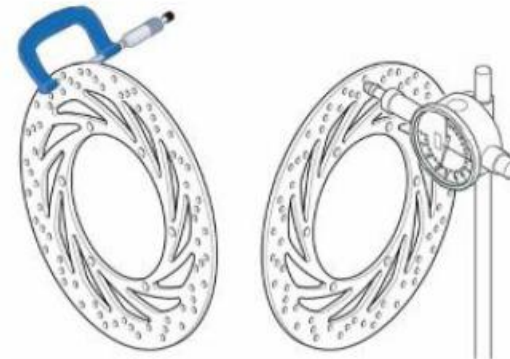
3.5mm

- Use a dial indicator to check whether the disc vibration exceeds the tolerance; if so, please replace the disc.

Performance parameter

Runout limit of brake discs:

0.3mm



Front Brake Disc

Disassembly

- Remove the front wheel.
- Remove the front hub.
- Remove the brake disc.

Note

Manually tighten all bolts.

Warning

After reassembly, use the recommended product onto the brake disc bolt threads.

Inspection of Brake Discs

- Visually check the surface of brake discs. Replace the brake disc if it is scratched or damaged.



- Check for disc wear by measuring the minimum thickness at different points with a dial indicator. If the minimum thickness (even at a single point on the brake disc) is less than the minimum value, replace the brake disc.

Warning

The brake disc must be mounted on the wheel before operation.

Performance parameter

Minimum brake disc thickness:

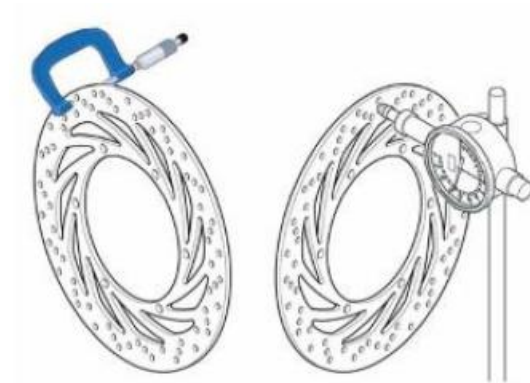
3.5mm

- Use a dial indicator to check whether the disc vibration exceeds the tolerance; if so, please replace the disc.

Performance parameter

Runout limit of brake discs:

0.3mm



Front Brake Pad

Disassembly

·Unscrew the two bolts «1» to remove the front brake caliper.

Tightening torque (N * m)

Tightening torque of the front brake caliper bolt «1» 25N*m



·Unscrew and remove the thread cap«2».



- Unscrew and remove the brake pad to check the pin.
- Remove the brake pad.

Warning



Do not operate the brake handle after removing the brake pad. Otherwise, the caliper plunger may detach from its plunger bore, thus resulting in the leakage of brake fluid.

Warning

Replace both brake pads at the same time and make sure they are properly placed in the slots.

For refitting, follow the reverse steps.

Rear Brake Pad

Disassembly

- Remove the muffler
- Remove the muffler holder
- Remove the rear wheel
- Unscrew the two bolts «1» to remove the rear brake caliper.



Tightening torque (N * m)

Tightening torque of M8 screws fastening the rear brake caliper 25N*m

·Remove the clasp.



·Slide down the pin



·Remove the spring



Warning

The arrow printed on the spring must always turn in the direction of travel.

·Slide down the brake pad.

- Insert two new brake discs.
- Mount the spring.
- Remount the pin.
- Insert the clasp.

Warning



Do not operate the brake handle after removing the brake pad. Otherwise, the caliper plunger may detach from its plunger bore, thus resulting in the leakage of brake fluid.

Warning



Always replace both brake pads and make sure they are properly placed in the slots.

Brake System Air Removal

Warning

In consideration of any hazard to the vehicle and passengers, it is absolutely necessary to exhaust the hydraulic circuit after the braking device is readjusted and the braking system is restored to normal operating conditions.



Front brake

- Remove the rubber protective cover of the vent valve «1».
- Insert the transparent plastic hose into the exhaust valve “1” of the front brake caliper for emptying and insert the other end of the hose into the container to collect the brake fluid.
- Quickly and repeatedly press the brake handle, and then press it down completely.
- Loosen the vent valve 1/4 turn to allow the brake fluid to flow into the container.
This will release the tension on the brake handle and pull it to the end of the travel.
- Repeat until the brake fluid is drained into the container without bubbles.



Note

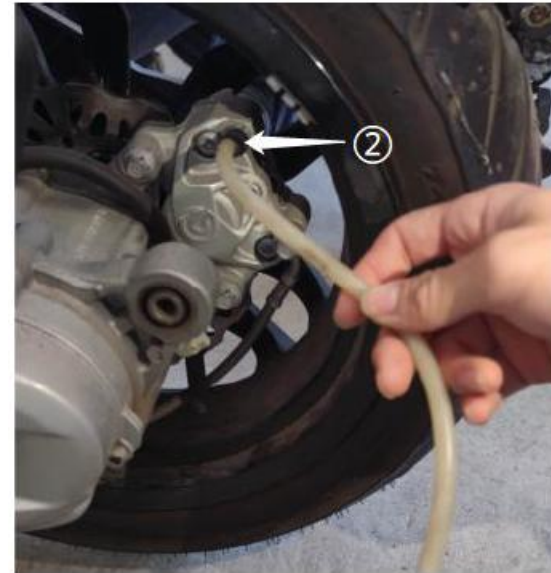
When filling the hydraulic system, inject the required amount of brake fluid into the brake fluid.

Check whether brake fluid is always present in the liquid storage tank during operation.

- Tighten the vent valve and remove the transparent hose.
- Fill with brake fluid until the correct brake fluid level is obtained.
- Remount the rubber protective cover.

Rear brake

- Remove the rubber protective cover of the vent valve «2».
- Insert the transparent plastic hose into the exhaust valve "2" of the rear brake caliper for emptying and insert the other end of the hose into the container to collect the fluid.
- Quickly and repeatedly press the brake handle, and then press it down completely.
- Loosen the vent valve 1/4 turn to allow the brake fluid to flow into the container. This will release the tension on the brake handle and pull it to the end of the travel.
- Repeat until the brake fluid is drained into the container without bubbles.



Note

When filling the hydraulic system, inject the required amount of brake fluid into the brake fluid. Check whether brake fluid is always present in the liquid storage tank during operation.

- Tighten the vent valve and remove the hose.
- Fill with brake fluid until the correct brake fluid level is obtained.
- Remount the rubber protective cover.

Replacement of brake fluid

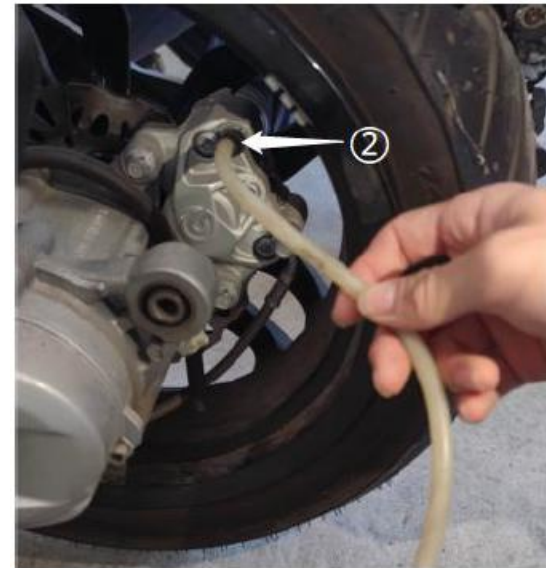
- Remove the rubber protective cover.
- Insert the transparent plastic hose into the exhaust valve《1》 of the caliper and insert the other end of the hose into the container to collect the fluid.
- Loosen the vent valve 《1》 about 1/4 turn.

Note

Check whether brake fluid is always present in the liquid storage tank during operation. Otherwise, the air must be blown out at the end of the operation.

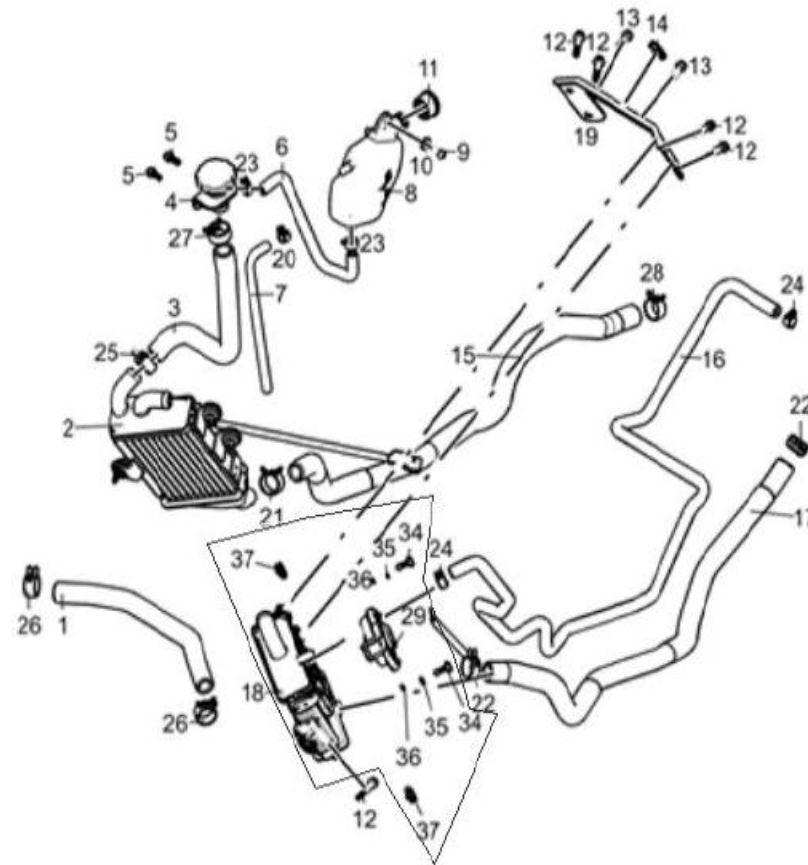


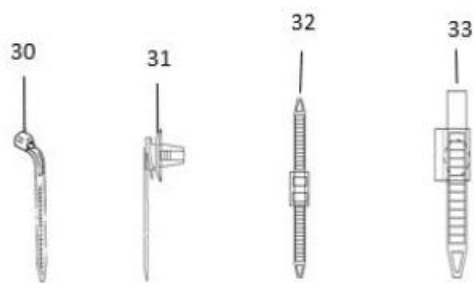
- Check whether brake fluid is flowing out of the liquid storage tank, and close the vent valve 《2》 before emptying the tank.
- Fill up with brake fluid.
- Loosen the exhaust valve 《2》 about half turn again.
- Check brake fluid from the hose
When the brake fluid color changes (from dark to light), it is required to tighten the exhaust valve 《2》 and remove the transparent plastic hose.
- Remount the rubber protective cover.
- Fill the tank with brake fluid to the correct level.



Cooling System

Schematic Diagram





Keys:

1	Radiator connecting pipe	11	Water storage tank cover component	21	Hoop	31	Wire bundle fixing clip
2	Right water-cooled radiator assembly	12	Radiator mounting screw	22	Hoop	32	Self-locking double buckle tie strap
3	Water filling nozzle connecting pipe	13	Bolt	23	Hoop	33	Hoop strap
4	Water injection nozzle component	14	Spring nut	24	Hoop	34	Bolt
5	Bolt	15	Water inlet rubber tube	25	Hoop	35	Spring washer
6	Water storage tank inlet pipe	16	Coolant bypass pipe	26	Hoop	36	Flat washer
7	Overflow pipe	17	Water outlet rubber tube	27	Hoop	37	Locking plate
8	Water storage tank	18	Left water cooled radiator assembly	28	Hoop		
9	Screw	19	Radiator attachment bracket assembly	29	Cooling fan		
70	Seat cushion mounting bushing	20	Retainer ring	30	Wire bundle fixing strap		

Replacement of Cooling Liquid

Exhaust

Care should be taken to use containers of appropriate capacity to collect coolant that may leak during operation.

- Loosen the pipe clamp.
- Pull out the water hose.
- Drain the coolant.

Note

Remove the tank cover to facilitate the discharge of coolant.

Warning

The line should be completely disconnected and the front wheel lifted at least 55 cm (21.65 in) off the ground.

Filling

- Remount the coolant delivery line and tighten it with a pipe clamp.
- Fill the cooling tank with coolant until the level reaches the “MAX” reference mark.
- Fill the radiator with coolant until it is full, and then close the snap-on tank cover.
- Start the vehicle and idle the engine until the fan is activated.
- Shut down the engine and let it cool down for 12 hours.



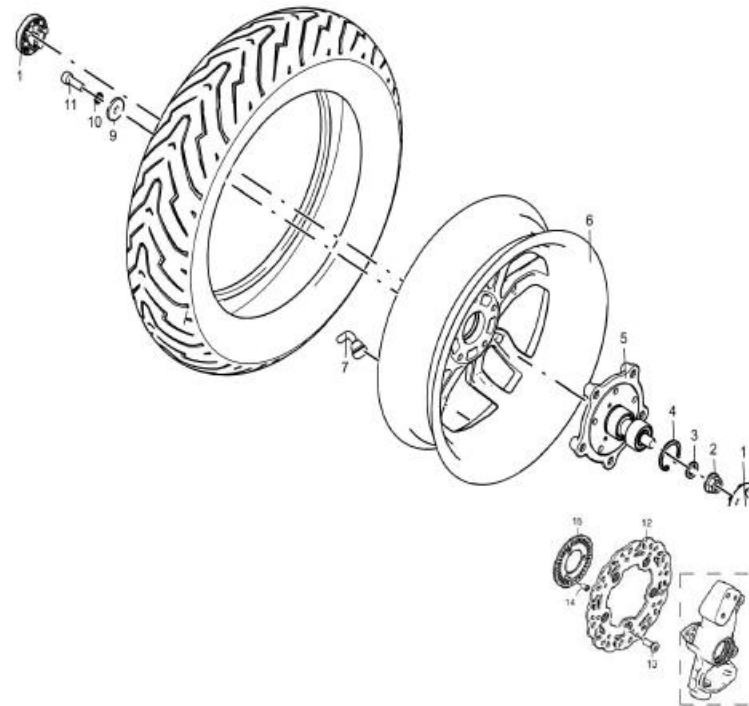
- Check the water level of water storage tank and radiator; fill them with water to the correct level if necessary.
- Remount the front baffle.

Tightening torque (N * m)

Coolant water pipe hoop: 3N * m

Suspension

Schematic Diagram of Front Wheel Removal



Keys:

1	Steering knuckle center trim cover	7	Cycle valve	13	Front gear ring
2	Self-locking nut	8	Front tyre	14	Balancing weight
3	Washer	9	Bolt	15	Needle bearing
4	Retainer ring	10	Front brake disc	16	Front hub assembly
5	Front hub	11	Screw		
6	Front wheel rim	12	Screw		

Warning

The support device under the vehicle is provided so that the front wheel has free space to move and the vehicle can be safely released from the fall.

Park the vehicle on its center bearing bracket.

- Place a support under the chassis.
- Loosen the five fixing screws 《1》 .

Warning

After disassembly/modification, please be careful not to damage the brake line, disc and brake pad.

Warning

Do not step on the brake after removing the wheel. Otherwise, the caliper plunger may detach from its valve seat, resulting in the leakage of brake fluid.

- Remove the wheel carefully.
- Collect gaskets.

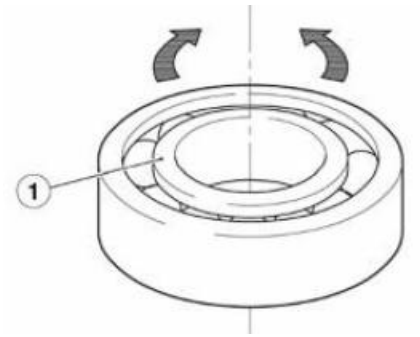


Bearing

Manually rotate the inner ring « 1 » . The inner ring **must** rotate smoothly without obstacles and/or noise. No axial clearance is allowed. The bearings with these problems must be replaced.

Warning

Check whether all parts are in good condition, especially the objects below.



Rim

Use a dial indicator to check whether the **radial runout “A”** and **axial runout “B”** of the rim «3» do not exceed the **limit**.

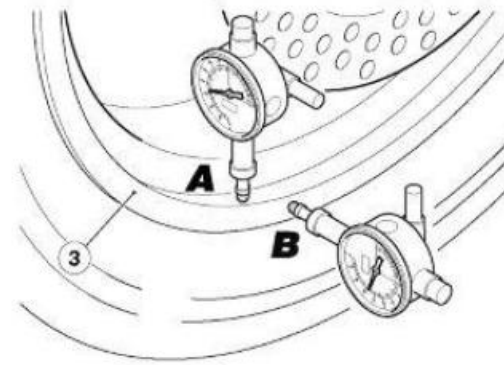
Eccentricity is usually caused by bearing wear or damage.

If the value is not within the specified range **after** replacing the bearing, please replace the rim «3».

Performance parameter

Maximum radial and axial eccentricity:

2mm

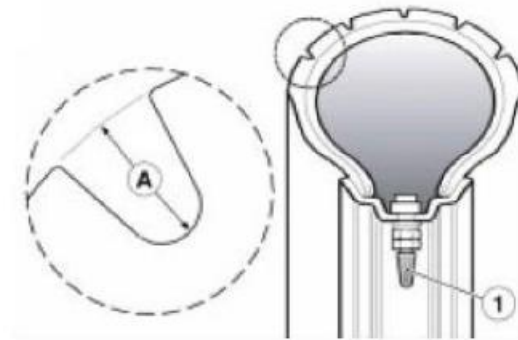


Check tire condition.

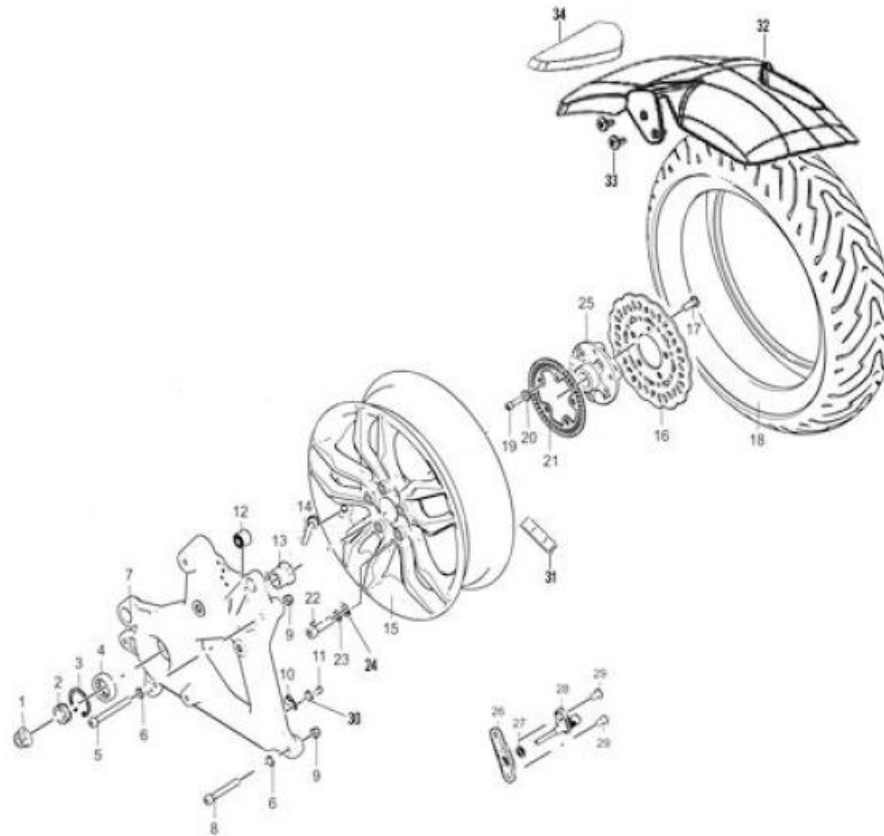
Warning

Check the wear condition of tires. Severely worn tires can damage traction and maneuverability of the vehicle. Replace the tire when it is worn or the worn tread diameter is greater than 5 mm. Some tire types have been homologized for the vehicle's characteristic wear indicator. Check whether the charging valve «1» has its bayonets set in sequence to avoid accidental flat tires.

The balance of the tire after repair.



Schematic Diagram of Rear Wheel Removal



1	Nut	11	Screw	22	Rear gear ring	31	Balancing weight
2	Outer bushing	12	Buffer bushing	23	Screw	32	Engine fender
3	Retainer ring	13	Inner bushing	24	Spring washer	33	Hexagon socket stepped screw
4	Bearing	14	Cycle valve	25	Gasket	34	Buffer strip
5	Bolt	15	Rear rim	26	Rear hub	35	Muffler hanger bracket assembly
6	Flat washer	16	Rear brake disc	27	Speed sensor rear mounting plate		
7	Muffler hanger bracket	17	Screw	28	Screw		
8	Bolt	18	Rear tyre	29	Corrugated elastic washer (rear)		
9	Nut	19	Screw	30	Wheel speed sensor		
10	Metal wire clip	20	Bushing		Bolt		

The steps for removing the rear wheel are described below:

- Remove the muffler.



- Unscrew and remove the bolts holding the rear shock absorber and collect the nuts.



- Operate the rear brake with the help of the second operator; loosen and remove the rear axle nuts, and then collect bushings.



- Unscrew and remove bolts from the muffler bracket and the rear fender bracket 《1》 《2》 《3》 《4》 《5》 , and collect nuts and washers.
- Remove the muffler bracket.
- Collect wheel bushings.
- Unscrew 5 rear wheel nuts 《6》 .
- Remove the entire rear wheel.



Shock Absorber

Rear suspension inspection

Check the shock absorber for any leakage. Check the fastening of all components and correct operation of rear suspension joints.



Disassembly

To remove the shock absorber, follow these steps:

- Remove the helmet box
- Operate from the right side of the vehicle to loosen the upper screw «1» holding the shock absorber.



Tightening torque (N * m)

Shock absorption after bolt fixation 50N * m

- Operate from the right side of the vehicle to loosen the lower crew 《1》 holding the shock absorber.
- Remove the shock absorber.



Tightening torque (N * m)

Shock absorption after bolt fixation 50N * m

Muffler hanger bracket

To remove the muffler plate, follow these steps:

- Remove the muffler.
- Remove the bolts holding the rear fender support and then remove the rear fender support.



- Unscrew and remove the bolts holding the right shock absorber, and then collect nuts.

Tightening torque (N * m)

Shock absorption after bolt fixation 50N * m



- Operate the rear brake with the help of the second operator; loosen and remove the rear nuts of fixing plates, and then collect gaskets.

Tightening torque (N * m)

M14 rear wheel 110 N * mfixing nut



- Unscrew and remove mounting plate bolts «1» «2» «3», and collect nuts and washers.
- Remove the right suspension plate.



Central Kickstand

Warning

Make sure the engine and exhaust muffler are cooled.

Make sure the vehicle is completely safe and has no side frame.

To remove the center bearing bracket and its support, follow these steps:

- Ensure that the vehicle can be supported without the help of the center bearing bracket.
- Loosen and remove two screws «1» from both sides.
- Remove the center bearing bracket and its support.



Tightening torque (N * m)

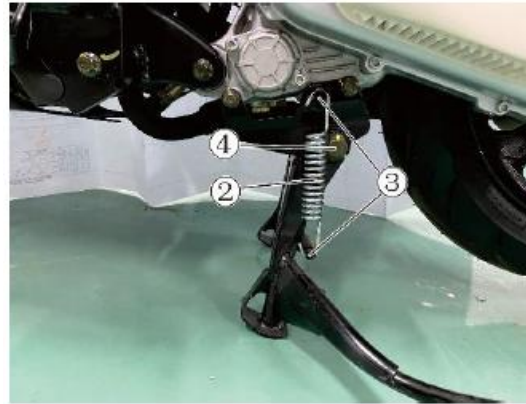
Engine 25N * m M8 screw fixing screw bracket support

To remove the center bearing bracket from the bracket, follow these steps:

- Ensure that the vehicle can be supported without the help of the center bearing bracket.
- Remove the spring «2» from the central kickstand, and spring connecting pins on both sides.
- Loosen and remove the screws on both sides «4».
- Remove the bracket.

Tightening torque (N * m)

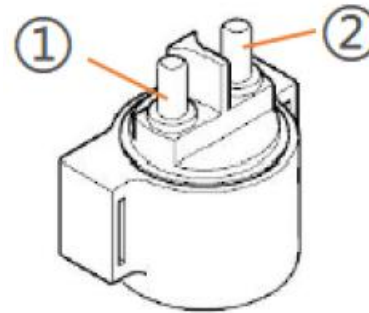
M10 screw fixing bracket to bracket support 50N * m



Electronic System

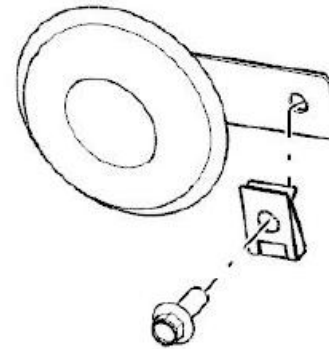
1. Starting relay

- Starting relay resistor, power-on: terminals 1 and 2 connected
- Starting relay resistor, power-off: terminals 1 and 2 disconnected



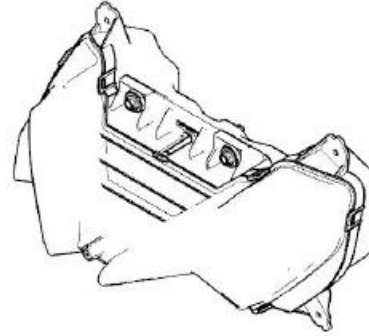
2. Horn

- Horn activated voltage: battery voltage
- Horn disabled voltage: 0 volt



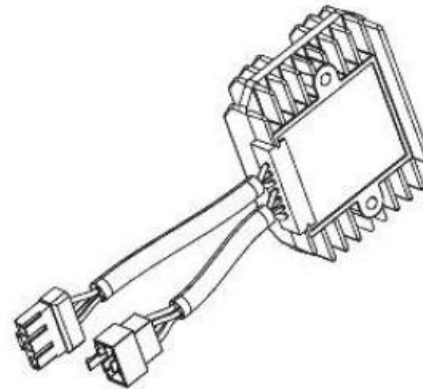
3. Headlamp

- Front position lamp: 12V-4.6W
- High beam/low beam: 12V-66W / 38W
- Front turn indicator lamp: 12V-4.6 W



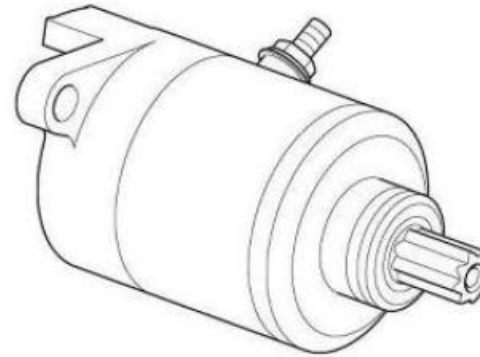
4. Voltage regulator

- Output voltage: 13V to 15 V



5. Starting motor

- Relay voltage supply: battery voltage
- Resistance: 0.5 Ω

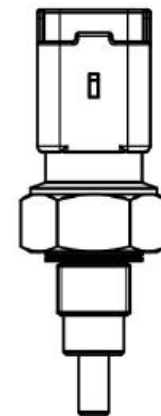


6. Tail lamp

- Rear position lamp/brake lamp: 12V-5.9W / 7.5W
- Rear turn indicator lamp: 12V-1.9 W
- Registration plate lamp: 12V-0.7W



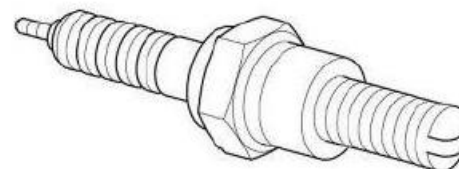
7. Engine coolant temperature sensor



<u>Coolant temperature °C/resistance OHM</u>		
Coolant temperature	Characteristic injection exposure value	Dashboard exposure value
50°	807	820
120°	105	80.6

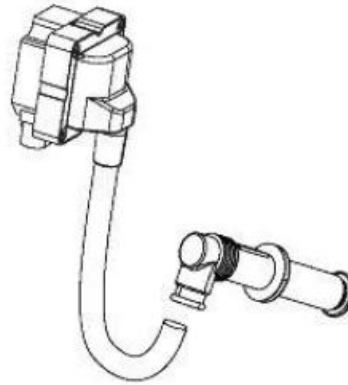
8. Spark plug

Standard: NGK PMR9B



9. High-tension coil

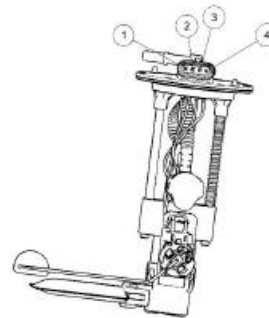
- Primary resistance: 0.5 Ω
- Secondary resistance: 3.1 k Ω



10. Fuel level sensor

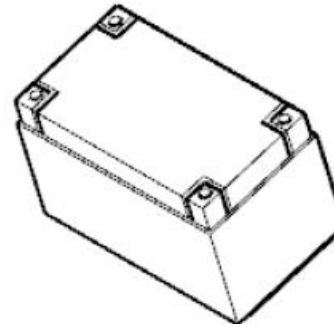
Operational check of the fuel level sensor (removed from the vehicle).

- ①: Fuel pump black (-)
- ②: Fuel pump red (+)
- ③: Sensor black (-)
- ④: Sensor red (+)



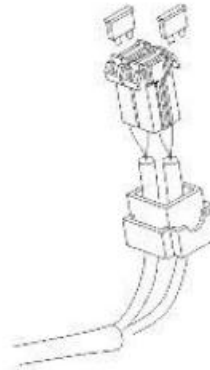
11. Battery

12V-8.6Ah



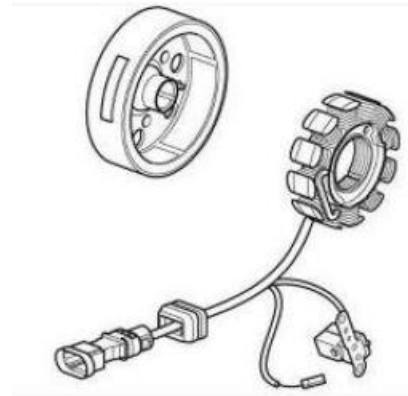
12. Auxiliary fuse

- 15A fuse: from the ignition switch to all light loads, registration plate lamp, direction indicator lamps and horns.
- 15A fuse: Ignition/injection and starting power source.
- 15A fuse: spare parts.



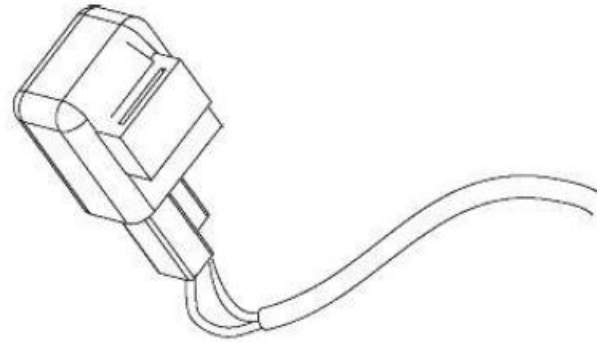
13. Generator

- Permanent magnet: battery voltage 12 V-300 W, 6000 rpm.
- Rated power: 300 W
- Resistance: 0.36-0.44 Ω
- Resistance between cable and stator bracket: infinite
- Crankshaft angle sensor resistance: 129 +/- 10% Ω

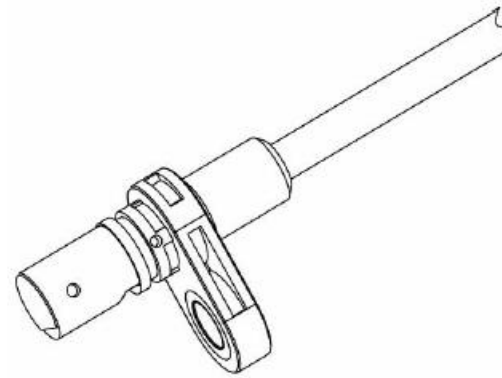


14. Flasher assembly

- Voltage: 13.5V(DC)
- Current: 13.5V I=0.15A+0.12A

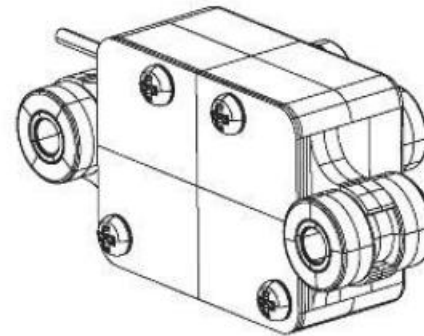


15. Velocity transducer

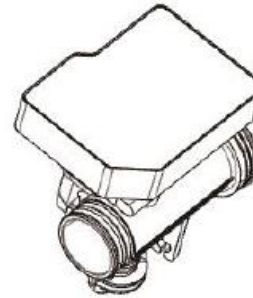


16. Dumping switch

- Horizontal position: $61.9 \text{ k}\Omega$
- Tilt position $> 45^\circ$: $0 \text{ }\Omega$

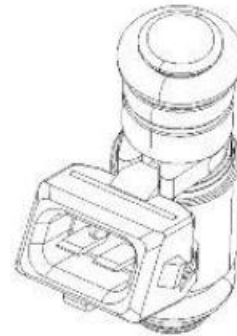


17. Control unit/accelerator body



18. Injection nozzle

Resistance at ambient temperature: 14.5 Ω



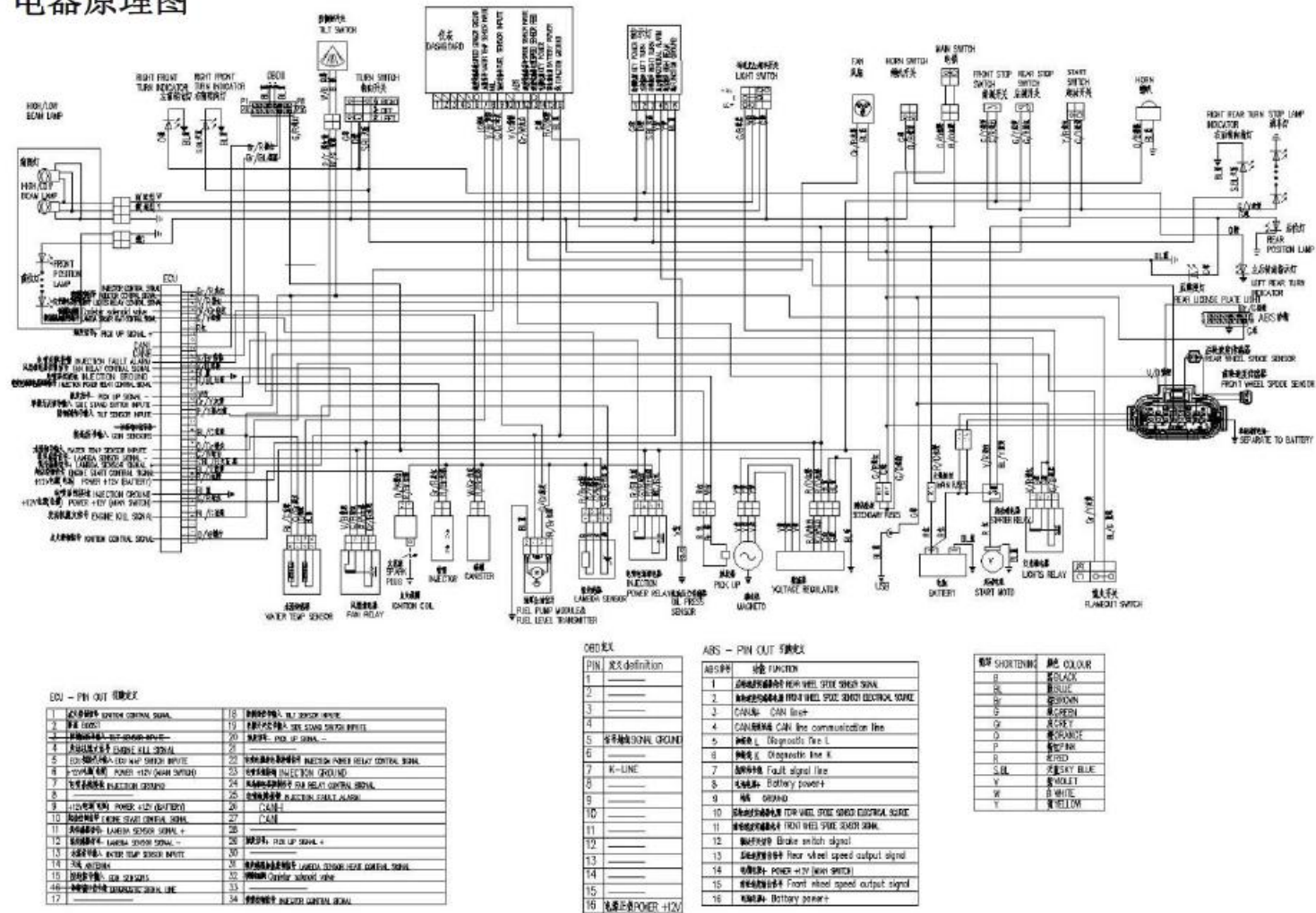
19. Relay

- Cooling fan
- Electronic fuel injection system (EFI)



Electrical Diagram

电器原理图



Summary Table of Torque (unit N*m)

No.	Process name	Torque value	Gluing
1	Front brake disc assembly	25-30	Loctite 243
2	Front gear ring mounting		Loctite 243
3	Rear brake disc assembly	25-30	Loctite 243
4	Central kickstand assembly	50-60	
5	Rear wheel speed sensor platen		Loctite 243
6	Rear wheel speed sensor		Loctite 243
7	Rear gear ring		Loctite 243
8	Frame connector assembly	25-30	Loctite 243
9	Engine pylon assembly	60-72	
10	Front hub and steering knuckle mounting	75-90	
11	Front swing arm subassembly (gluing the front axle combined end face)		Loctite 243
12	Steering knuckle and front swing arm mounting (stud)	25-30	Loctite 243
13	Steering column and steering yoke assembly	50-60	
14	Old head tube mounting	60-72	Loctite 243
15	Frame front and rear assembly	50-60	Loctite 243
16	Steering column mounting	50-60	
17	Front swing arm connecting rod mounting	80-96	

Summary Table of Torque (unit N*m)

18	Front swing arm mounting (gluing the front swing arm connecting rod combined end face)	25-30	Loctite 243
19	Front shock absorber mounting	50-60	
20	Central kickstand and engine mounting		Loctite 243
21	Oxygen sensor mounting	50-60	
22	Engine hanger mounting	80-96	
23	Engine hanger buffer bushing mounting	50-60	
24	Engine mounting	50-60	
25	Rear disc brake clamp mounting	25-30	Loctite 243
26	Rear wheel mounting	50-60	Loctite 243
27	Rear wheel fastening	90-108	Loctite 243
28	Muffler hanger bracket mounting	25-30	
29	Rear cushion mounting	50-60	Loctite 243
30	Front disc brake clamp fastening	25-30	Loctite 243
31	Knuckle and knuckle arm mounting	25-30	Loctite 243
32	Front wheel mounting	25-30	Loctite 243
33	Upper yoke plate	50-60	Loctite 243

Note: torque tolerance: (-0%·+20%)

ITALJET

Chapter 4

Engine Maintenance



This section describes the operations to be carried out on the engine and the tools required.

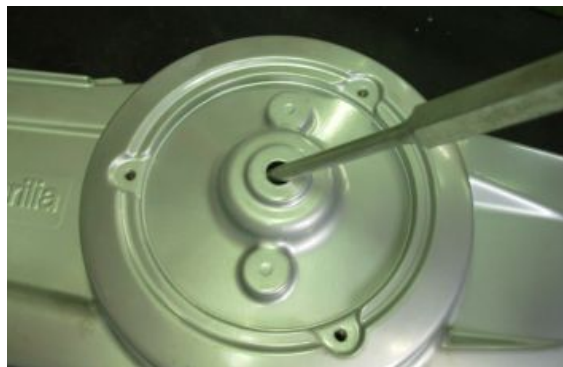
Automatic transmission

Transmission cover

- Remove the air duct.
- Undo and remove the twelve external screws of the cover.
- Remove the transmission cover.



- Remove the bushing from the supporting bearing of the driven pulley shaft on the transmission cover by placing a screwdriver in the slot on the transmission cover.



Air duct

- Unscrew and remove the two screws (1).
- Undo and remove the three screws (2).
- Remove the air duct.



Air duct filter

- Remove the air duct.
- Undo and remove the screw of the air-box cover.



- Remove the air-box cover.
- Remove the air filter.
- Proceed to clean or replace the air filter.



Removing the driven pulley shaft bearing

- Remove the transmission cover.
- Remove the bearing using the specific extractor.



Refitting the driven pulley shaft bearing

- Slightly heat the crankcase from the inside so as not to damage the coated surface.
- Insert the bearing in its housing.

CAUTION

REST THE COVER ON A SUITABLE SURFACE TO AVOID DAMAGING THE COVER COAT.

NOTE

ALWAYS REPLACE THE BEARING WITH A NEW ONE AT EVERY REFIT



Specific tooling

020703Y Clutch shaft support bearing punch (15x35x11) on crankcase cover

Removing the driven pulley

- Remove the transmission cover.
- Remove the fixed driving half-pulley.



- Lock the clutch bell with a calliper spanner.
- Unscrew and remove the clutch nut.
- Remove the clutch bell.



- Remove the driven pulley and the driving belt.

CAUTION

CLEAN THE CLUTCH BELL AS INDICATED IN THE SCHEDULED MAINTENANCE TABLE.



Inspecting the clutch drum

- Make sure that the clutch bell is not worn or damaged.
- Measure the clutch bell inside diameter.

Characteristic

Clutch bell max. value

Max. value: Ø 135 mm

Clutch bell standard value

Standard value: Ø 134 to 134.2 mm



Checking the bell working surface eccentricity

- Fit the bell on a driven pulley shaft with 2 bearings (inside diameter: 15 and 17 mm).
- Lock with the original spacer and nut.
- Place the bell/shaft assembly on the support to check the crankshaft alignment.



- Using a dial gauge and the magnetic base, measure the bell eccentricity.
- Repeat the measurement at 3 positions (Central, internal, external).
- In case of faults, replace the bell.



Specific tooling

020074Y Support base for checking crankshaft alignment

020335Y Magnetic mounting for dial gauge

Characteristic

clutch bell check: Limit eccentricity.

Admissible limit eccentricity: 0.15 mm

Inspecting the clutch

- Check the thickness of the clutch mass friction material.
- The masses must not show traces of lubricants; otherwise, check the driven pulley unit seals.

NOTE

UPON RUNNING-IN, THE MASSES MUST EXHIBIT A CENTRAL FAYING SURFACE AND MUST NOT BE DIFFERENT FROM ONE ANOTHER. VARIOUS CONDITIONS CAN CAUSE THE CLUTCH TO TEAR.

CAUTION

DO NOT OPEN THE MASSES USING TOOLS TO PREVENT A VARIATION IN THE RETURN SPRING LOAD.

Characteristic

Check minimum thickness

1 mm



Removing the clutch

Fit the special driven pulley spring compressor tool:

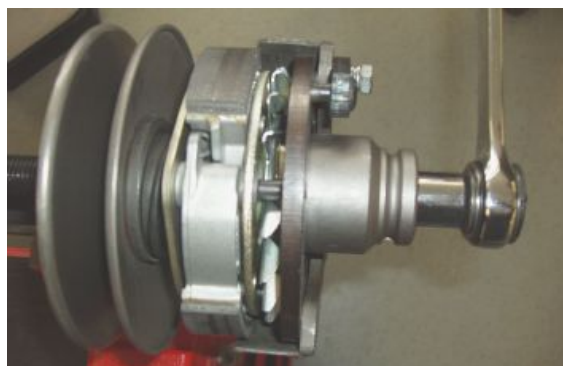
- Fit the driven pulley assembly on the tool by inserting the three pins in the ventilation holes in the ground holder support.
- Make sure that the clutch is perfectly inserted into the adapter ring before proceeding to tighten the clutch nut.
- Use the special multipurpose wrench to remove the nut fixing the clutch.
- Disassemble the driven pulley into its components (Clutch and spring with plastic fitting).

CAUTION

THE TOOL MUST BE FIRMLY FIXED IN THE VICE AND THE CENTRAL SCREW MUST TOUCH THE TOOL. EXCESSIVE TORQUE MAY DEFORM THE SPECIFIC TOOL.

Specific tooling

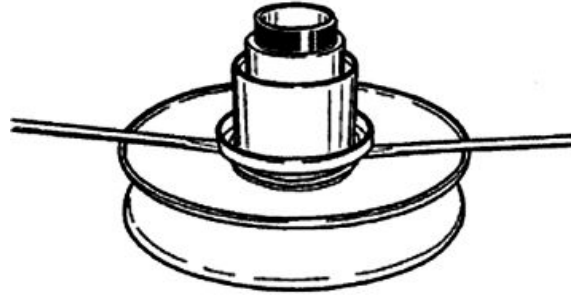
AP8140259 Universal tool for clutch assemblies



AP8140665 Adapter for clutch assembly removal

Pin retaining collar

- Remove the collar with the aid of 2 screwdrivers.
- Remove the 3 guide pins and the movable half-pulley.



Removing the driven half-pulley bearing

- Remove the retainer ring using two flat blade screwdrivers.
- Using a hammer and pin, knock the ball bearing out as shown in the figure.
- Remove the bearing and the rollers with the specific extractor.

NOTE

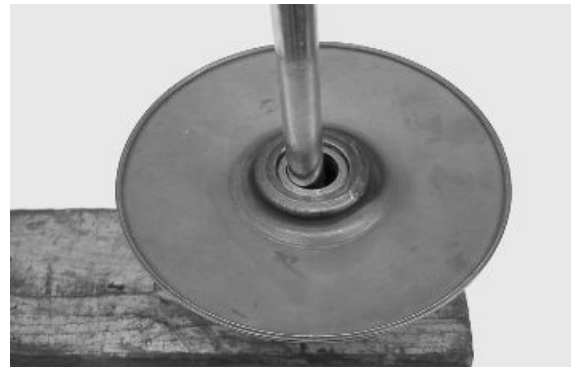
REST THE HALF-PULLEY ON A WOODEN SURFACE TO AVOID DAMAGING ITS THREADED BUSHING. ALSO DO THIS UPON REMOVAL.

Specific tooling

020375Y 28 x30 mm Punch

020376Y Adapter handle

020439Y 17-mm guide for oil seal



Inspecting the driven fixed half-pulley

- Measure the inside diameter of the pulley bushing.

Characteristic

Minimum diameter admitted

Ø 40.96 mm

Standard diameter

Ø 40.965 mm



Inspecting the driven sliding half-pulley

- Remove the 2 inner sealing rings and the 2 O-rings.
- Measure the inside diameter of the movable half-pulley bushing.

Characteristic

Minimum diameter allowed:

Ø 41.08 mm

Standard diameter

Ø 41.035 mm



Refitting the driven half-pulley bearing

- Fit the new roller bearing using the specific punch, fit the bearing with the label facing outward and insert it completely up to the punch stop on the half-pulley.

NOTE

REST THE HALF-PULLEY ON A WOODEN SURFACE TO AVOID DAMAGING ITS THREADED BUSHING. ALSO DO THIS UPON REMOVAL.

Specific tooling

AP8140662 Punch for roller casing



-
- To assemble the new ball bearing, insert it fully down in its seat with the specific punch and finally fit the seeger ring.

Specific tooling

020375Y 28 x30 mm Punch

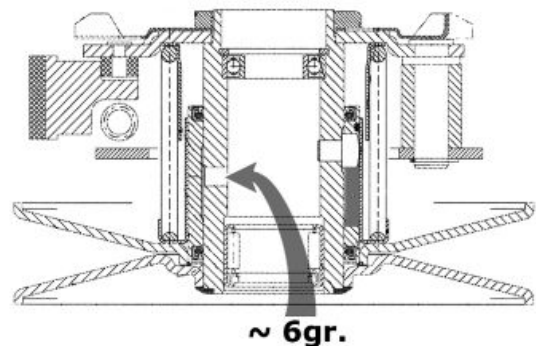
020376Y Adapter handle

020439Y 17-mm guide for oil seal



Refitting the driven pulley

- Check that the faying surfaces of the 2 half-pulleys and the belt do not show any signs of wear, scoring or grease.
- Insert the new oil seals and O-rings on the movable half-pulley.
- Fit the half-pulley on the bushing with the appropriate protection sheath.
- Make sure the pins and collar are not worn, refit the pins and the collar.
- Using a curved-spout grease gun, lubricate the driven pulley unit with approximately 6 g of grease. Apply the grease through one of the holes in the bushing until grease comes out through the hole on the opposite side. This procedure is necessary to prevent the presence of grease beyond the O-rings.



Specific tooling

AP8140664 Guide to mount the movable driven pulley

Recommended products

AGIP GREASE SM2 Lithium grease with molybdenum for bearings and other points needing lubrication

NLGI 2

Inspecting the clutch spring

- Measure the length of the movable driven half-pulley spring, when unloaded.

Characteristic

Standard length:

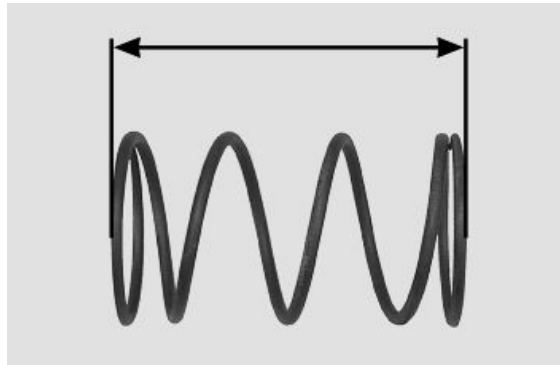
(125 cm³) 112.7 mm

(200 cm³) 122.7 mm

Limit after use:

(125 cm³) 108 mm

(200 cm³) 118 mm



Refitting the clutch

- Assemble the spring, clutch and driven pulley.
- Fit the clutch body on the appropriate tool with the adaptor
- Insert the lever pin in the hole of the adaptor ring.
- Tighten the fixing nut to the prescribed torque.

NOTE

WHEN PRELOADING THE SPRING, BE CAREFUL NOT TO DAMAGE THE PLASTIC STOP OF THE SPRING AND THE BUSHING THREADING.

NOTE

FOR DESIGN REASONS, THE NUT IS SLIGHTLY ASYMMETRIC; THE FLATTEST SURFACE SHOULD BE MOUNTED CONTACTING THE CLUTCH.



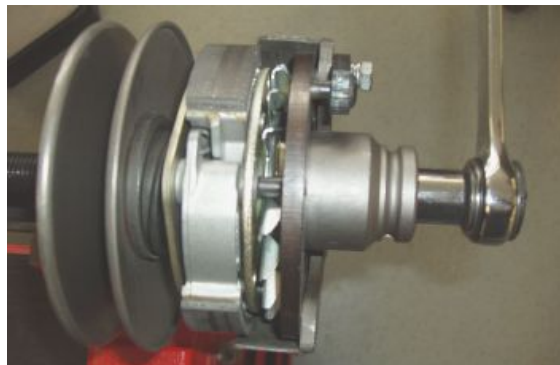
Specific tooling

AP8140259 Universal tool for clutch assemblies

AP8140665 Adapter for clutch assembly removal

Locking torques (N*m)

Rear CVT pulley fixing flanged nut - M12x1 (1)
60 Nm (44.25 lbf ft) - Loctite 243



Refitting the driven pulley

- Place the driven pulley assembly in its position.
- Open the driven pulley and insert the belt according to the correct direction of rotation.
- Fit the driven pulley plus the belt in their position.



- Fit the clutch bell.
- Lock the clutch bell.
- Tighten the clutch nut.

Locking torques (N*m)

Rear CVT pulley fixing flanged nut - M12x1 (1)
60 Nm (44.25 lbf ft) - Loctite 243



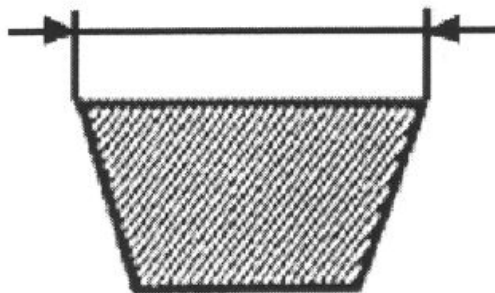
Drive-belt

- Make sure that the driving belt is not damaged.
- Check belt for correct width.

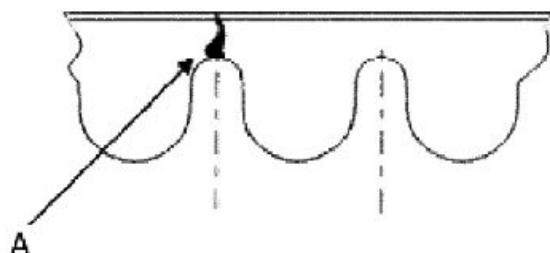
Characteristic

Driving belt width (125 - 200)

- minimum: 21.0 mm (0.827 in)
- standard: 22.0 +/- 0.2 mm (0.8661 +/- 0.0079 in)



During the wear checks foreseen in the scheduled maintenance services, check that the rim bottom of the toothing does not show signs of incisions or cracking (see figure): the rim bottom of the tooth must not have incisions or cracking; if it does, change the belt.

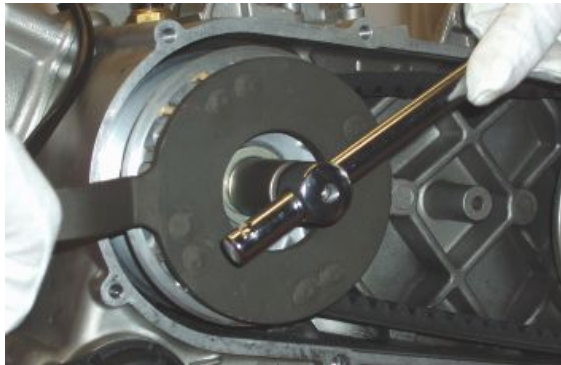


Removing the driving pulley

- Remove the transmission cover.
- Unscrew the fixing nut with the specific tool.

Specific tooling

AP8140535 driving pulley lock wrench



- Remove the fixing nut and collect the washer.



- Remove the fixed driving half-pulley.



- Remove the spacer.

125 cm³ 1.5 mm

200 cm³ 1.8 mm



-
- Detach the driving belt.
 - Remove the bushing.



- Remove the movable half-pulley, take care that the free rollers fitted on it do not come off.



- Remove the support plate and the relative guide sliders.



- Remove the spacer.



Inspecting the rollers case

- Check that the internal bushing shown in the figure is not abnormally worn and measure its inside diameter.
- Measure the outside diameter of the pulley sliding bushing shown in the figure.
- Check that the rollers are not damaged or worn.
- Check that the guide sliders for the roller contrast plate are not worn.
- Check that the roller housings or the surfaces in contact with the belt on both half-pulleys are not worn.
- Check that fixed driving pulley does not show signs of abnormal wear on the grooved edge and on the surface in contact with the belt.



CAUTION

DO NOT LUBRICATE OR CLEAN SINTERED BUSHINGS

Characteristic

Movable pulley bushing (125 - 200)

- maximum diameter: 26.121 mm (1.028 in)
- standard diameter: 26.000 (+0/0.121) mm (0.8661 (+0/+ 0.0047 in))

Pulley sliding bushing (125 - 200)

- minimum diameter: 25.95 mm (1.022 in)
- standard diameter: 26.00 (-0.02/-0.041) mm (1.0236 (-0.0008/+ 0.0016 in))

VARIABLE SPEED ROLLER

- minimum diameter (125): 18.50 mm (0.73 in)
- minimum diameter (200): 20.1 mm (0.79 in)
- standard diameter (125): 19.0 +/- 0.1 mm (0.748 +/- 0.004 in)
- standard diameter (200): 20.6 +/- 0.1 mm (0.811 +/- 0.004 in)



Refitting the driving pulley

- Install the spacer.



- Preassemble the movable half-pulley with the roller contrast plate by placing the rollers in their housings with the larger support surface touching the pulley according to the direction of rotation.
- Check that the roller contact plate does not show flaws or is damaged on the grooved edge.
- Fit the entire bushing assembly on the crank-shaft.
- Fit the driven pulley/Clutch/belt assembly to the engine.



- Fit the driving belt.
- Install the spacer.



-
- Fit the fixed driving half-pulley.



WHEN FITTING THE FIXED DRIVING HALF-PULLEY, IT MUST BE TOTALLY FREE SO THAT IT IS NOT INCORRECTLY TAUTENED.



- Fit the washer and tighten the nut.

CAUTION

CHECK THAT THE WASHER IS ADEQUATELY FITTED BEFORE TIGHTENING THE NUT.

NOTE

REPLACE THE NUT WITH A NEW ONE AT EVERY REFIT



- Prevent fixed driving half-pulley rotation using the specific tool. Tighten the fixing nut to the prescribed torque.

Specific tooling

AP8140535 driving pulley lock wrench

Locking torques (N*m)

Front CVT pulley fixing flanged nut - M12x1
(1) 80 Nm (59 lbf ft) - Loctite 243



Refitting the transmission cover

- Fit the bushing to the shaft and add the nut hexagon.



- Fit the transmission cover and press it until it stops.
- Operating diagonally, tighten the cover external screws (11 screws for 200 cm³ - 12 screws for 125 cm³).
- Fit the air duct.

Locking torques (N*m)

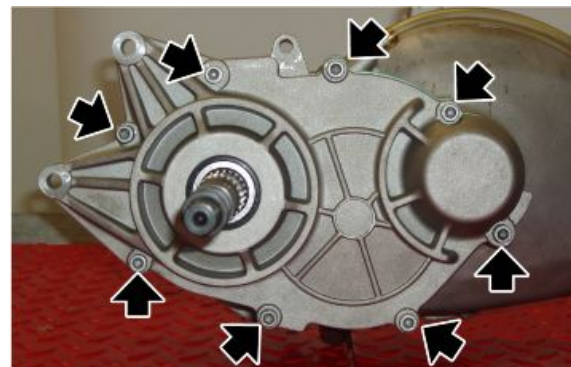
CVT cover EI fixing screws - M6x35 10 Nm (7.38 lbf ft)



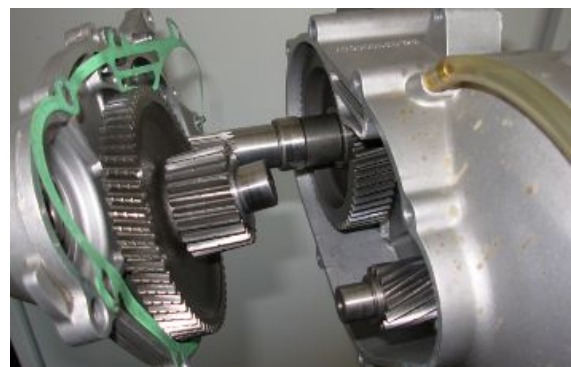
End gear

Removing the hub cover

- Drain the rear hub oil through the oil drainage plug located at the bottom of the crankcase.
- Remove the eight screws shown in the figure.



- Remove the hub cover and the relevant gasket.



Removing the wheel axle

- Remove the hub cover.
- Remove the intermediate gear.



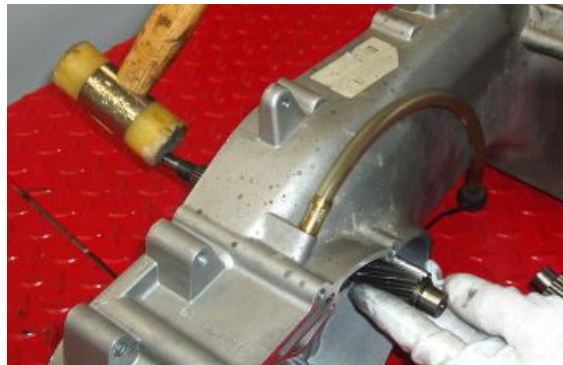
- Remove the two shim washers from the intermediate gear.



- Remove the wheel axle with the gear.



- Extract the driven pulley shaft from the bearing.



See also

[Removing the hub cover](#)

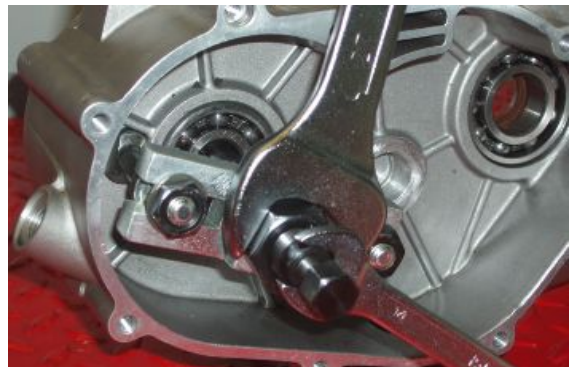
Removing the hub bearings

- Check the status of the bearings being examined (wear, clearance and noise).



Removing the wheel axle bearings

- Warm up the crankcase.
- Remove the bearing using the specific extractor.



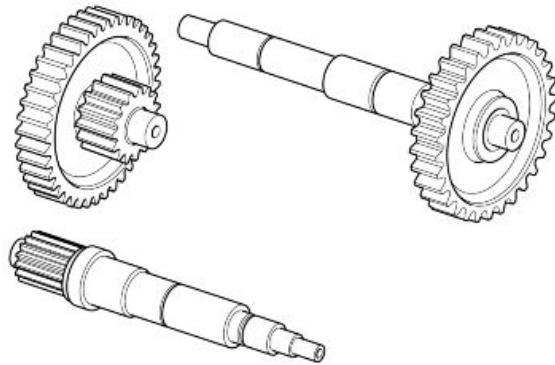
Removing the driven pulley shaft bearing

- Remove the driven pulley shaft.
- Remove the oil seal using a screwdriver; working from inside the bearing and being careful not to damage the housing, make it come out on the belt transmission side.
- Remove the bearing using the specific extractor.



Inspecting the hub shaft

- Check the three shafts for wear or distortions on the toothed surfaces, on the bearing housings and the oil seal positions.
- In faults are found, replace the damaged parts.



Inspecting the hub cover

- Check that the coupling surfaces are not dented or distorted.
- Check the capacity of both the bearings and the wheel oil seal.
- In case of faults, replace the damaged parts.

Refitting the driven pulley shaft bearing

- Heat the parts with the specific heat gun.
- Refit the bearing using the specific tool.

Specific tooling

020702Y Main shaft bearing punch (15 x 42 x 13) on transmission cover



- Fit a new oil seal on the transmission side of the belt, using the specific tool.
- Insert the driven pulley shaft.

Specific tooling

020376Y Adapter handle

020359Y 42 x 47-mm adaptor

020364Y 25 mm Adaptor

Refitting the wheel axle bearing

- Heat up the crankcase using the thermal gun.
- Place the wheel axle bearing on the crankcase and fit it correctly using the specific tool.

Specific tooling

020376Y Adapter handle

020359Y 42 x 47-mm adaptor

020439Y Shaft 2 oil seal punch 17 mm



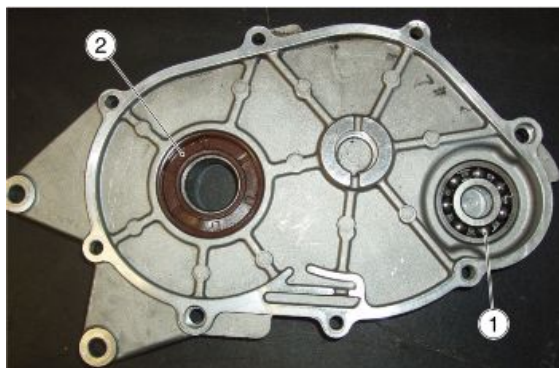
Refitting the hub cover bearings

- In order to fit the hub housing bearings, the parts must be heated with the specific heat gun.
- Fit the bearing in its position (1) on the cover of the hub housing on the driven pulley shaft, using the specific tool.

Specific tooling

020702Y Main shaft bearing punch (15 x 42 x 13) on transmission cover

- Fit the bearing in its position (2) on the cover of the hub housing on the driven pulley shaft, using the specific tool.
- Fit a new oil seal in the position (2), using the specific tool.



Specific tooling

020376Y Adapter handle

020360Y 52 x 55-mm adaptor

020364Y 25 mm Adaptor

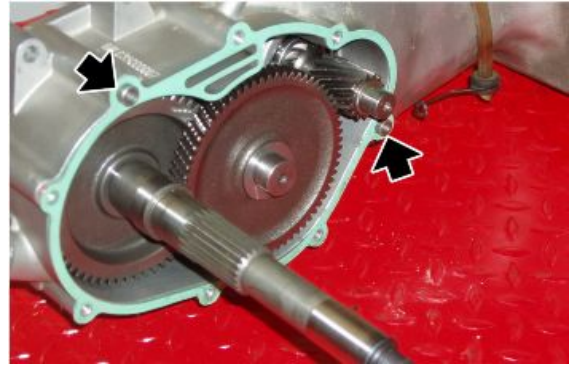
Refitting the hub bearings

- Assemble the 3 shafts in the engine crankcase as shown in the figure.



Refitting the ub cover

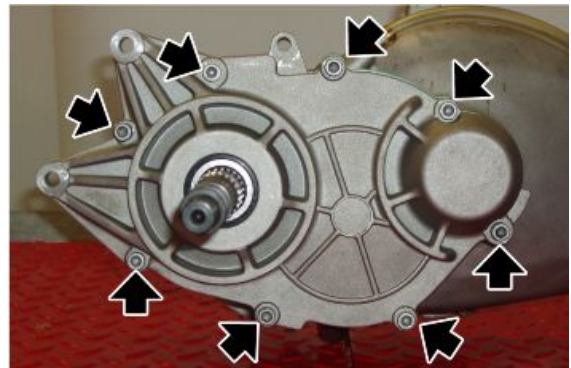
- Fit a new gasket.
- Check that the two alignment dowels are adequately positioned.
- Place the hub cover.



- Tighten the eight screws operating diagonally.
- Fill with hub oil.

Locking torques (N*m)

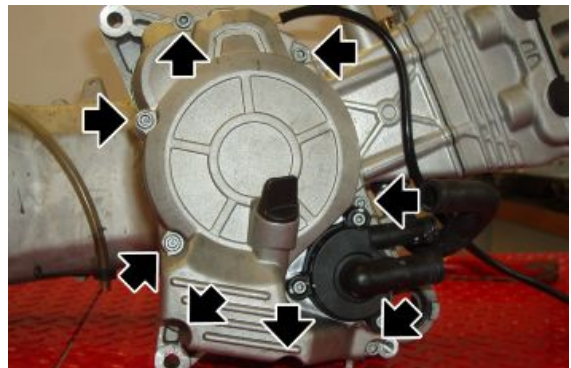
**Transmission cover El fixing screws - M6x30
(8) 10 Nm (7.38 lbf ft)**



Flywheel cover

Removing the hub cover

- Detach the water pipe.
- Undo and remove the eight screws.



-
- Remove the flywheel cover.



- Remove the gasket.

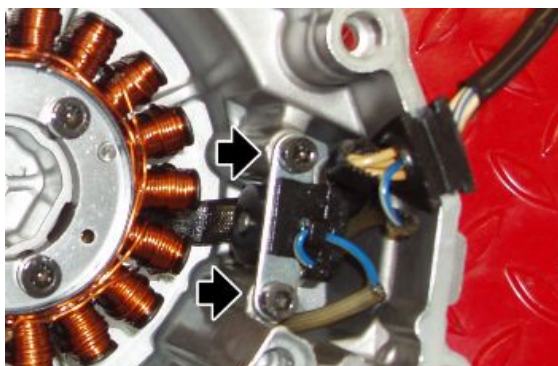
WARNING

UPON REFITTING, REPLACE THE GASKET WITH A NEW ONE OF SIMILAR TYPE. FOLLOW THE REMOVAL STEPS BUT IN REVERSE ORDER.

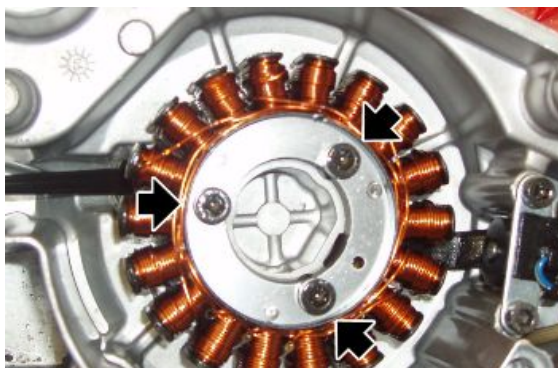


Removing the stator

- Remove the flywheel cover.
- Undo and remove the two pick-up screws.



- Undo and remove the three screws fixing the stator and remove it together with the wiring.



See also

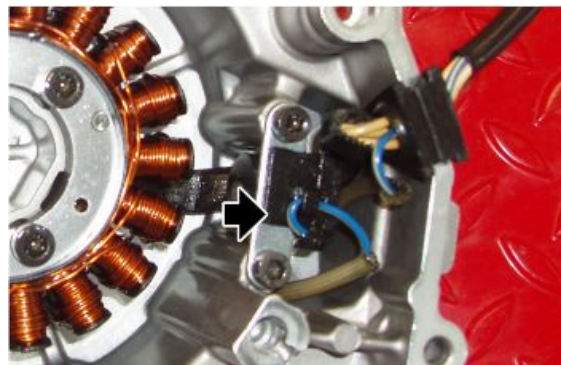
[Removing the hub cover](#)

Refitting the stator

- Install the stator following the removal steps but in reverse order.
- Place the pick-up cable as indicated.

WARNING

FIT THE PICK-UP FIXING PLATE WITH THE SENSOR FACING THE STATOR.



- Refit the stator and the flywheel carrying out the removal steps but in reverse order; tighten the retainers to the specified torque.

Locking torques (N*m)

Stator EI fixing screws - M6x25 (3) 10 Nm (7.38 lbf ft) - Loctite 243



See also

[Removing the hub cover](#)

Refitting the flywheel cover

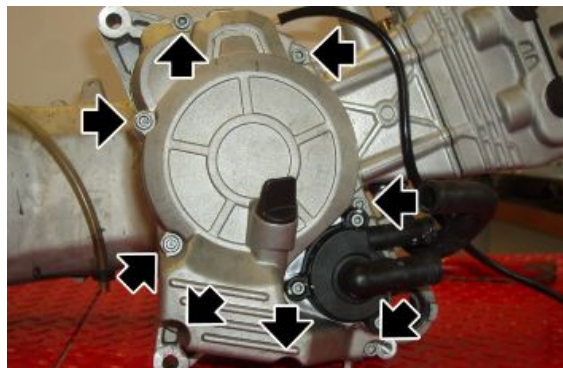
- Place the oil pump shaft in the direction indicated by the reference arrow of the internal plate.



- Place the water pump shaft with its grooves facing the reference point on the cover.



- Refit the cover on the engine taking care the centring pins are adequately positioned.



Locking torques (N*m)

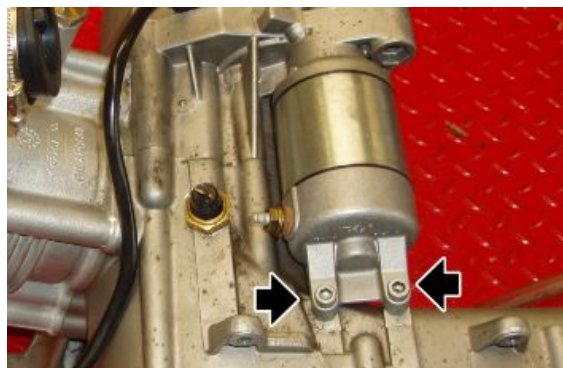
Ignition cover fixing screws - M6x110 (5) 11 Nm (8.11 lbf ft)
Ignition cover fixing screws - M6x140 (1) 11 Nm (8.11 lbf ft)
Ignition cover fixing screws - M6x170 (1) 11 Nm (8.11 lbf ft)
Ignition cover EI screws - M6x25 (1) 11 Nm (8.11 lbf ft)

Removing the starter motor

- Unscrew and remove the nut.
- Remove the power cable.



- Unscrew and remove the two screws.



-
- Remove the starter motor by sliding it off from one side.



Removing the flywheel magneto

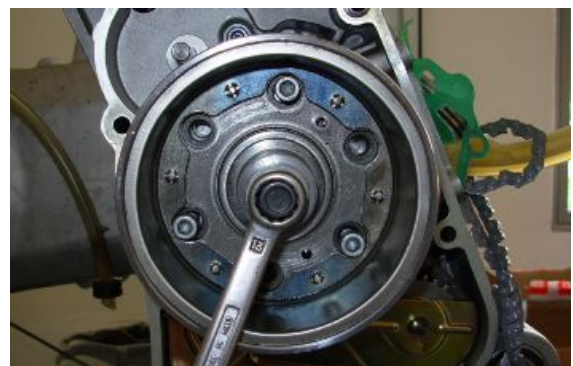
- Remove the flywheel cover.
- Lock the crankshaft with the specific special tool.

Specific tooling

0240880 Threaded bolt for locking crankshaft at TDC



- Undo and remove the screw.
- Collect the washer.

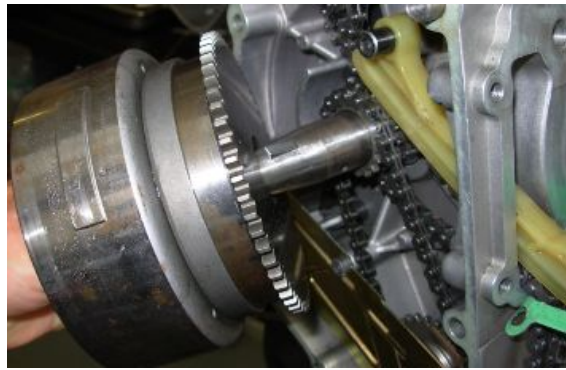


- Extract the flywheel using the specific tool.

Specific tooling

020707Y Flywheel extractor





- Remove the cotter.



Intermediate gear

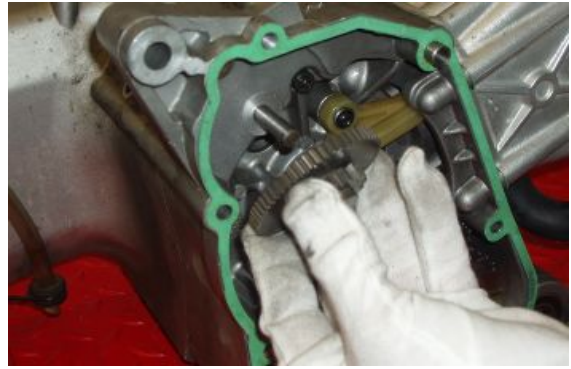
FITTING

- Fit the intermediate gear.



REMOVAL

-
- Remove the flywheel, the cotter and the freewheel.
 - Slide off the intermediate gear.

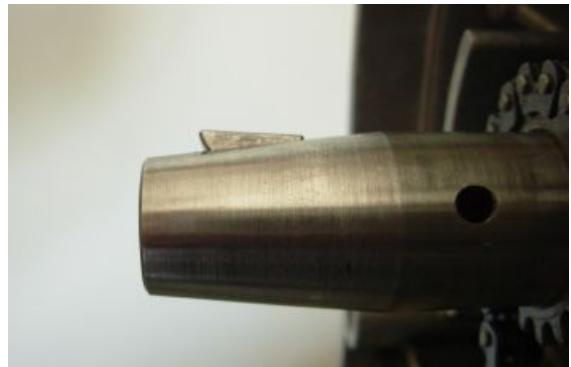


See also

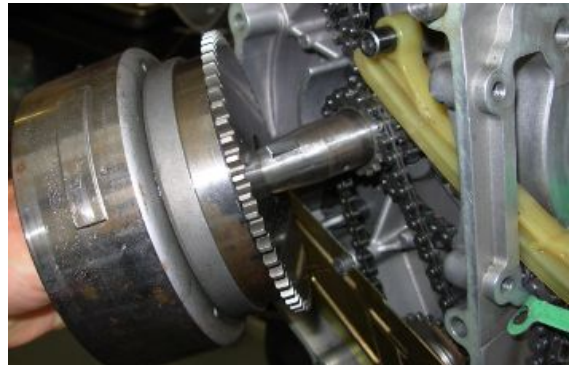
[Removing the flywheel magneto](#)

Refitting the free wheel

- Fit the cotter in its seat, be careful to position it as indicated in the photograph.



- Fit the gear plus the pre-assembled freewheel, carefully check the coupling with the crankshaft by means of the cotter.



Refitting the flywheel magneto

- Fit the flywheel paying attention to insert the cotter adequately.
- Lock the flywheel nut to the prescribed torque.

Locking torques (N*m)

Rotor TEF fixing screw - M8x25 (1) 25 Nm (18.44 lbf ft) - Loctite 243



Refitting the starter motor

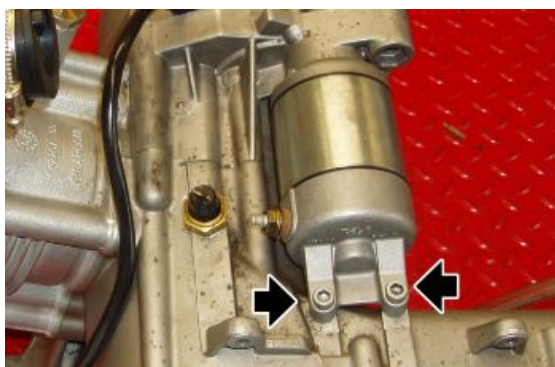
- If the O-ring is damaged, fit a new one on the starter motor and lubricate it.
- Fit the starter motor on the crankcase and tighten the 2 screws.

CAUTION

ADEQUATELY COUPLE THE MOTOR GEAR WITH THE STARTER DOUBLE GEAR.

Locking torques (N*m)

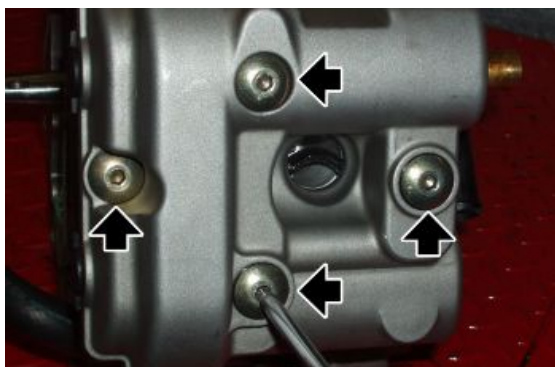
Starter motor EI fixing screws - M6x25 (2) 10 Nm (7.38 lbf ft)



Cylinder assy. and timing system

Removing the rocker-arms cover

- Undo and remove the four screws.
- Remove the tappet cover.



Removing the timing system drive

- Remove the tappet cover.
- Remove the flywheel.
- Rotate the crankshaft until the front cylinder piston reaches the top dead centre (TDC).
- Undo and remove the screw on the crankcase and screw the specific tool to prevent crankshaft rotation.



Specific tooling

0240880 Threaded bolt for locking crankshaft at TDC

- Get two Ø 6.3 mm (0.25 in) pins.
- Place the pins in their positions on the overhead camshafts.

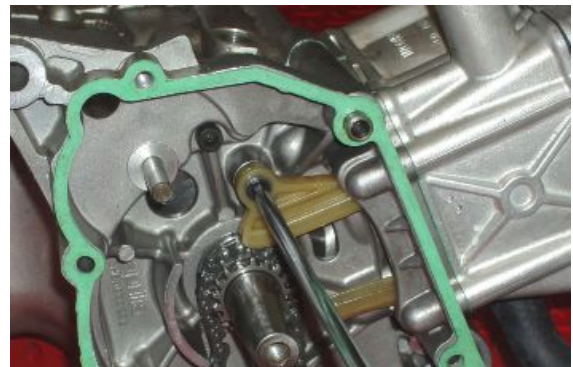


- Undo and remove the screw (1) and collect the spring.
- Remove the screws (2) and take out the chain tensioner with relevant gas-ket.



- Remove the internal plate.
- Remove the oil pump and the relevant chain.
- Unscrew and remove the screw.
- Remove the tensioner slider.
- Remove the timing chain.

IT IS ADVISABLE TO MARK THE CHAIN IN ORDER TO ENSURE THAT THE DIRECTION OF ROTATION IS MAINTAINED.





See also

[Removing the rocker-arms cover](#)

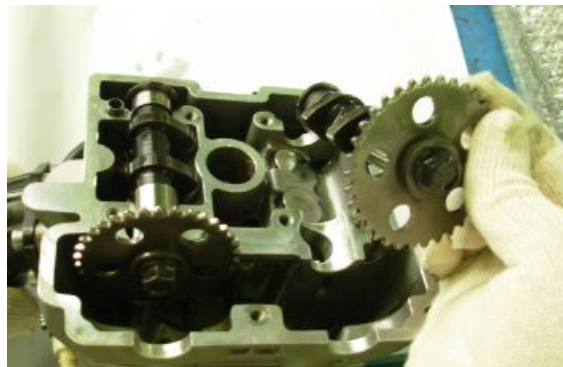
[Removing the flywheel magneto](#)

Removing the cam shaft

- Remove the timing system control.
- Remove the chain tensioner.
- Undo and remove the eight screws.
- Remove the cam tower cap.



- Remove both camshafts.

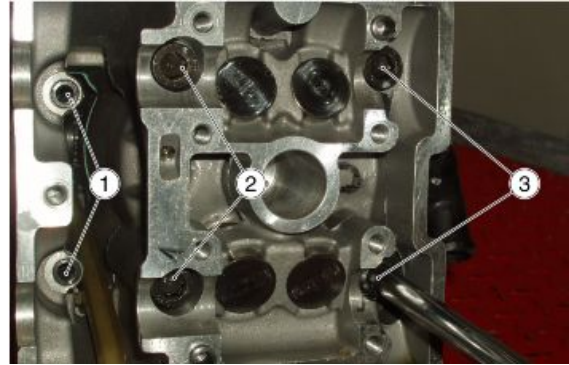


See also

[Removing the timing system drive](#)

Removing the cylinder head

- Remove the camshafts.
- Undo and remove the two side screws (1).
- Loosen the screws (2- 3) operating diagonally.
- Undo and remove both central short screws (2) and collect the washers.
- Undo and remove both central long screws (3) and collect the washers.



- Remove the head.
- Collect the lower chain slider.



See also

[Removing the cam shaft](#)

Removing the valves

- Remove the head.
- Place the head on supporting surface.
- Number the valves and their bucket tappets in order to position them correctly upon refitting.



-
- Remove the valve bucket tappets.



-
- Compress the valve spring using the specific tool.

Specific tooling

AP8140179 Valve spring compressor

AP9100838 Tool for valve pressure plate



-
- Remove both cotter pins.



-
- Release the valve springs.
 - Remove the cap and the valve spring.



-
- Remove the valves.



- Remove the oil seals with a pair of pliers.



See also

[Removing the cylinder head](#)

Removing the cylinder - piston assy.

- Remove the head.
- Remove the water delivery sleeve.
- Remove the two dowels and the gasket between the cylinder and the head.



- Slide off the cylinder.
- Remove the gasket between the cylinder and the crankcase.

CAUTION

TO AVOID DAMAGING THE PISTON, KEEP IT FIRM WHILE REMOVING THE CYLINDER.



-
- Remove the retainer rings from the pin.



- Slide off the pin.
- Remove the piston.
- Remove the three piston rings.



See also

[Removing the cylinder head](#)

Inspecting the small end

- Measure the inside diameter of the connecting rod small end using a specific micrometer.

NOTE

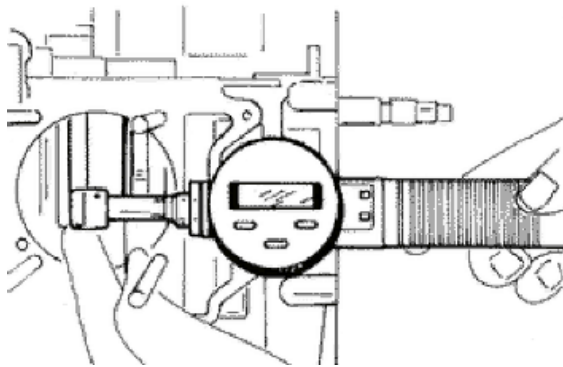
IF THE DIAMETER OF THE CONNECTING ROD SMALL END EXCEEDS THE MAXIMUM DIAMETER ALLOWED, SHOWS SIGNS OF WEAR OR OVERHEATING REPLACE THE CRANKSHAFT AS DESCRIBED IN THE "CRANKCASE AND CRANKSHAFT" CHAPTER".

Characteristic

Connecting rod small end (125 - 200)

Maximum diameter: 15.023 mm (0.591 in)

Standard diameter: 15.010 - 15.018 mm (0.5910 - 0.5912 in)



Inspecting the wrist pin

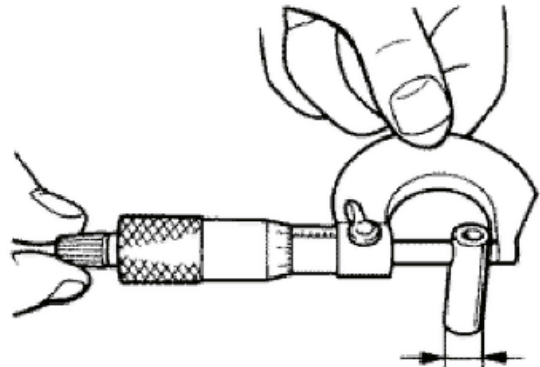
- Check the pin outside diameter.

Characteristic

Pin (125 - 200)

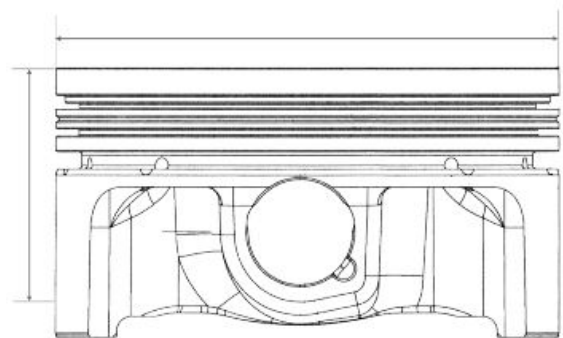
Minimum diameter: 14.995 mm (0.590 in)

Standard diameter: 15.0000 +0/-0.0030 mm (0.00012 in)



Inspecting the piston

- Measure the pin seat diameter on the piston.
- Calculate the pin - piston coupling clearance.
- Measure the piston outside diameter, perpendicular to the pin axis.
- Take the measurement at 6 mm (0.24 in) from the base, at the position shown in the figure.
- Carefully clean the sealing rings housings.
- Measure the sealing rings - grooves coupling clearance using suitable sensors, as shown in the diagram
- If clearances measured exceed the limits specified in the table, the piston should be replaced by a new one.



NOTE

MEASURE CLEARANCE BY INSERTING THE BLADE OF THE FEELER GAUGE FROM THE 2nd SEALING RING SIDE.

Characteristic

Piston / cylinder (125/200)

Piston pin hole - standard: 15.003 - 15.008 mm
(0.5907 - 0.5908 in)



Maximum piston / cylinder coupling clearance after use (125/200)

- top ring: 0.075 mm (0.0029 in)

- middle ring: 0.065 mm (0.0025 in)

- oil scraper: 0.25 mm (0.0098 in)

Standard piston / cylinder coupling clearance (125/200)

- top ring: +0.03 / 0.062 mm (0.0012 / 0.0024 in)

- middle ring: +0.02 / 0.052 mm (0.0008 / 0.0020 in)

- oil scraper: +0.01 / 0.19 mm (0.0004 / 0.007480 in)

Inspecting the cylinder

- Using a bore meter, measure the cylinder inside diameter at three different points according to the directions shown in the figure.
- Check that the coupling surface with the head is not worn or misshapen.



CAUTION

THE MARKING IS LOCATED ON THE PISTON CROWN.

Characteristic

Maximum run-out allowed:

0.05 mm

CYLINDER - PISTON COUPLING CLEARANCE 125 CM³

Coupling categories with cast-iron cylinder

NAME	ABBREVIATION	CYLINDER		PISTON		FITTING CLEARANCE	
		min	max	min	max	min	max
Cylinder/Piston	M	58,010	58,017	57,963	57,970	0,040	0,054
Cylinder/Piston	N	58,017	58,024	57,970	57,977	0,040	0,054
Cylinder/Piston	O	58,024	58,031	57,977	57,984	0,040	0,054
Cylinder/Piston	P	58,031	58,038	57,984	57,991	0,040	0,054

CYLINDER - PISTON COUPLING CLEARANCE 200 CM³

Coupling categories with cast-iron cylinder

NAME	ABBREVIATION	CYLINDER		PISTON		FITTING CLEARANCE	
		min	max	min	max	min	max
Cylinder/Piston	M	63,010	63,017	62,958	62,965	0,045	0,059
Cylinder/Piston	N	63,017	63,024	62,965	62,972	0,045	0,059
Cylinder/Piston	O	63,024	63,031	62,972	62,979	0,045	0,059
Cylinder/Piston	P	63,031	63,038	62,979	62,986	0,045	0,059

Inspecting the piston rings

SEALING RINGS (125 / 200)

Specification	Desc./Quantity
Compression ring (top)	0.2 / 0.35 mm (0.0079 / 0.014 in)
Compression ring (middle)	0.2 / 0.35 mm (0.0079 / 0.014 in)
Oil scraper ring	0.2 / 0.7 mm (0.0079 / 0.027 in)
Top ring maximum value	0.45 mm (0.18 in)
Middle ring maximum value	0.45 mm (0.18 in)

Removing the piston

- Install piston and pin onto the connecting rod, with the piston arrow aligned facing the exhaust.
- Fit the pin retainer ring on the appropriate tool.

Specific tooling

020705Y Piston seeger ring fitting

- With the opening in the position indicated on the tool, set the retainer ring into position with the punch.
- Fit the pin stop ring using the plug as shown in the figure.

NOTE

THE TOOL FOR INSTALLING THE RETAINER RINGS MUST BE USED MANUALLY.

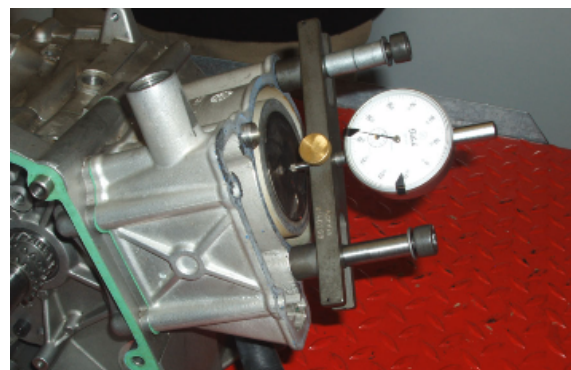
CAUTION

USING A Mallet to set the rings in position may damage the ring seats.



Choosing the gasket

- Temporarily, fit the piston to the cylinder, without base or head gasket.
- Fit a dial gauge on the specific tool.
- Zero set the dial gauge on the cylinder top surface and fit it on the two adjacent stud bolts.
- Remove the dial gauge and refit it on the two stud bolts on the opposite angles. Now measure again.



Specific tooling

AP8140266 Comparator door

- Rotate the crankshaft up to the TDC (the reversal point of the dial gauge rotation).
- Lock the crankshaft at TDC using the specific tool.
- Calculate the difference between the two measurements: using the chart below, identify the thickness of the cylinder base gasket to be used upon refitting. By correctly identifying the cylinder base gasket thickness, an adequate compression ratio can be maintained
- Remove the specific tool and the cylinder.



Specific tooling

0240880 Threaded bolt for locking crankshaft at TDC

Characteristic

Compression ratio (125)

12: 1

Compression ratio (200)

11.6: 1

BASE GASKET SELECTION (125)

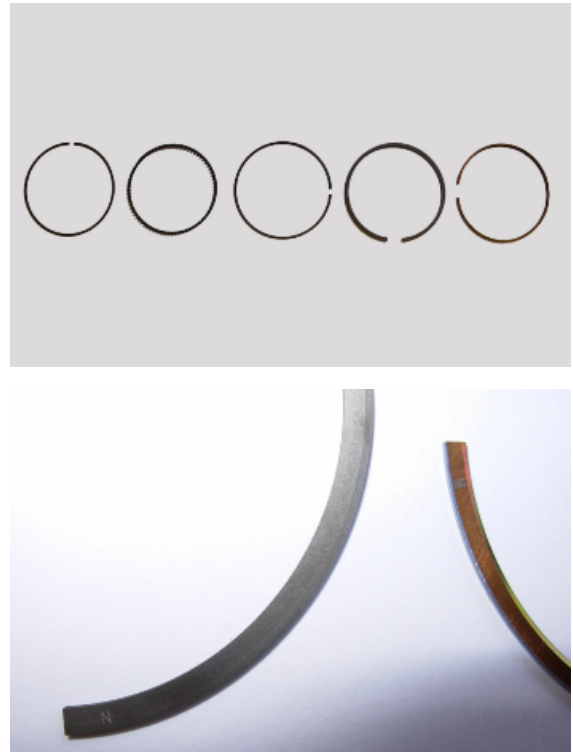
Specification	Desc./Quantity
Size measured: (1.05) - (1.20) mm ((0.041) - (0.047) in)	Gasket: 0.3 mm (0.012 in)
Size measured: (1.20) - (1.40) mm ((0.047) - (0.055) in)	Gasket: 0.4 mm (0.016 in)
Size measured: (1.40) - (1.55) mm ((0.055) - (0.061) in)	Gasket: 0.5 mm (0.019 in)

BASE GASKET SELECTION (200)

Specification	Desc./Quantity
Size measured: (-1.35) - (-1.20) mm ((-0.053) - (-0.047) in)	Gasket: 0.3 mm (0.012 in)
Size measured: (-1.20) - (-1.00) mm ((-0.047) - (-0.039) in)	Gasket: 0.4 mm (0.016 in)
Size measured: (-1.00) - (-0.85) mm ((-0.039) - (-0.033) in)	Gasket: 0.5 mm (0.019 in)

Refitting the piston rings

- Place the oil scraper spring on the piston.
- Fit the oil scraper ring keeping the gap opposed to the spring union.
- Fit the middle piston ring with the identification letter T facing the piston crown. In any case, the tapered side of the ring must be facing opposite the piston crown.
- Fit the top piston ring with the identification letter T facing the piston crown.
- Offset the piston ring gaps on the three rings by 90° as shown in the figure.
- Lubricate the components with engine oil.



Refitting the cylinder

- Fit a new cylinder base gasket of the chosen thickness.
- Refit the cylinder as indicated in the figure.

NOTE

BEFORE FITTING THE CYLINDER, CAREFULLY BLOW AIR INTO THE LUBRICATION DUCT AND LUBRICATE THE CYLINDER LINER.



- Fit a new gasket between the cylinder and the head.
- Place the two dowels.
- Install the head.



Inspecting the cylinder head

- Using a trued bar, check that the head surface is not worn or distorted.
- Check that the camshaft bushings are not worn.
- Check that the head cover surface, the intake manifold and the exhaust manifold are not worn.

Inspecting the timing system components

- Check that the guide slider and the tensioner pad are not excessively worn.
- Check that the chain assembly, the camshaft driving pulleys and the sprocket wheel are not worn.
- Replace the parts if signs of wear are found.



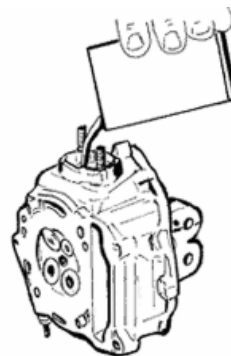
CHAIN TENSIONER

- Remove the central screw with the washer and the tensioner spring. Check that the one-way mechanism is not worn.
- Check the condition of the tensioner spring.
- If signs of wear are found, replace the whole assembly.

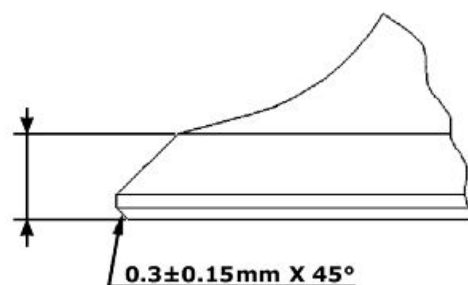


Inspecting the valve sealings

- Fit the valves into the cylinder head.
- Alternatively test the intake and exhaust valves.
- This test should be carried out by filling the manifold with petrol and checking that the head does not excessively ooze through the valves.



-
- Measure the sealing surface width on the valve seats.



VALVE SEALING SURFACE

Specification	Desc./Quantity
Intake valve - sealing surface (125)	2.30 +/- 0.15 mm (0.0905 +/- 0.0059 in)
Intake valve - sealing surface (200)	1.97 +/- 0.15 mm (1.0776 +/- 0.0059 in)
Exhaust valve - sealing surface (125/200)	2.95 +/- 0.15 mm (0.1161 +/- 0.0059 in)
Valve chamfering (all valves)	0.2 +/- 0.1 mm x 45° (0.0079 +/- 0.0039 in x 45°)

Inspecting the valve housings

- Remove any carbon deposits from the valve guides.
- Measure the inside diameter of each valve guide.
- Measure according to the thrust direction at three different heights.

Characteristic

Intake guide - standard diameter

4.012 mm (0.1579 in)

Intake guide: Wear limit

4.020 mm (0.1582 in)

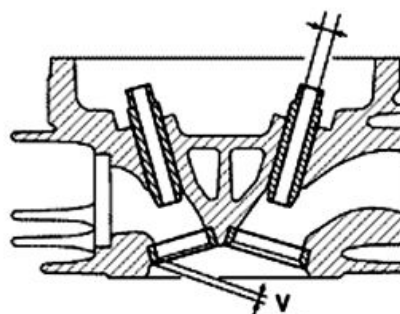
Discharge guide - standard diameter

4.012 mm (0.1579 in)

Discharge guide: Wear limit

4.020 mm (0.1582 in)

-
- Replace the head if the values corresponding to the width of the mark on the valve seat or the valve guide diameter exceed the specified limits.
 - Check the width of the mark on the valve seat «V».



Characteristic

Wear limit for the width of the mark on the valve seat "V"

- Intake (125): 1.6 mm (0.0630 in)
- Exhaust (125): 1.8 mm (0.0708 in)
- Intake (200): 1.6 mm (0.0630 in)
- Exhaust (200): 2.0 mm (0.0787 in)

Inspecting the valves

- Measure the width of the sealing surface on the valve seats and on the valves themselves.
- If the sealing surface on the valve is wider than the specified limit, damaged in one or more points or curved, replace the valve with a new one.

CAUTION

DO NOT CHANGE THE VALVE FITTING POSITION (RH - LH).

Characteristic

Minimum diameter allowed - Intake

3.96 mm (0.1559 in)

Minimum diameter allowed - Exhaust:

3.95 mm (0.1555 in)

Standard clearance - Intake:

0.015/0.042 mm (0.00059/ 0.0016 in)

Standard clearance - Exhaust:

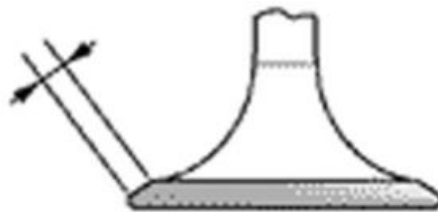
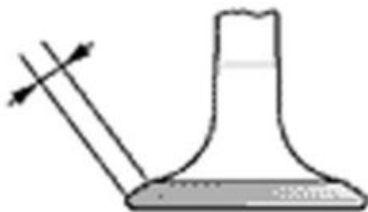
0.025/0.052 mm (0.00098/ 0.00204 in)

Maximum clearance admitted - Intake:

0.060 mm (0.0023 in)

Maximum clearance admitted - Exhaust:

0.070 mm (0.0027 in)



- Remove the head cover.
- Cause the engine to reach the top dead centre and lock it at that position using the specific tool.

NOTE

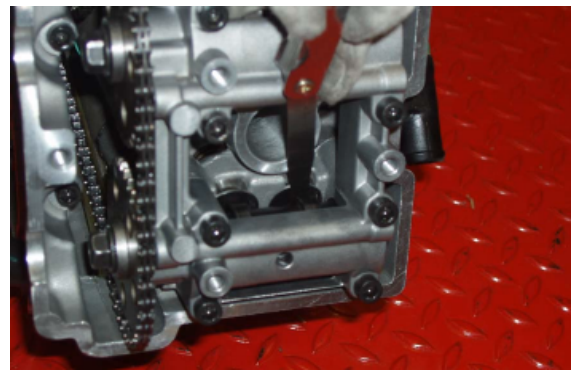
FOR AN EASY REFIT, MARK TWO REFERENCES ON THE TIMING CHAIN AND THE GEARS OF THE TIMING SYSTEM IN THE COUPLING AREA.

Specific tooling

0240880 Threaded bolt for locking crankshaft at TDC



- Use a feeler gauge to check clearance on the four valves.
- If the values measured differ from the values specified, record the difference between MAXIMUM ALLOWED CLEARANCE e CLEARANCE MEASURED.



- Remove the chain tensioner.
- Undo and remove the eight screws and remove the cam tower.

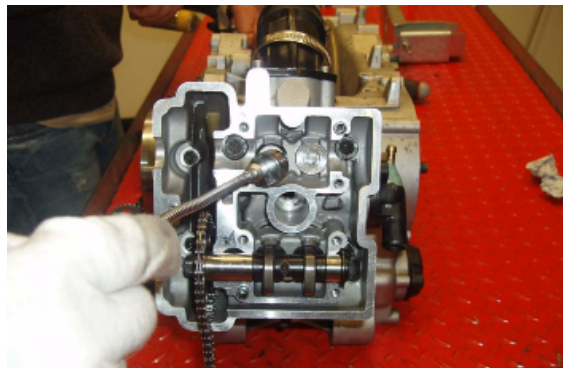


- Remove the timing chain and the gears of the camshaft of the valves in question.





- Remove the bucket tappet of the valve in question and read the calibration value for that bowl, found inside the bucket tappet itself.
- Replace the bucket tappet with new one of a size suitable to restore the correct clearance.



- Fit the camshaft, the gears and the chain in their correct positions, using the references marked when these parts were removed.
 - Fit the cam tower and tighten the eight screws to the prescribed torque.
 - Fit the chain tensioner.
 - Use two $\varnothing 6.3$ mm (0.248 in) timing pins to check the camshafts are correctly timed.
 - Check for correct valve clearance.
 - Fit the head cover.
-

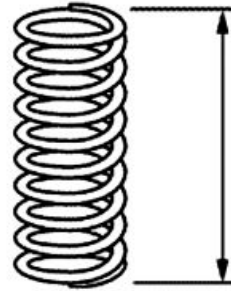
Inspecting the springs and half-cones

- Check that the spring upper supporting caps and the cotters show no signs of abnormal wear.
- Check the unloaded spring length.

Characteristic

Valve spring length:

33.24 +/- 0.25 mm (1.3086 +/- 0.0098 in)

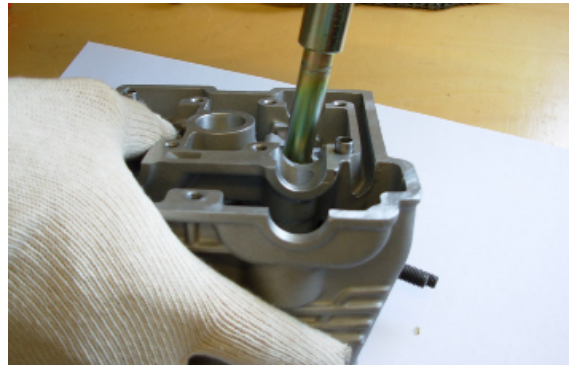


Refitting the valves

- Lubricate the valve guides with engine oil.
- Place the two oil seals on the head using a punch.

Specific tooling

AP0277512 Fitting buffer



- Fit the valves, the springs and the caps. Using the appropriate tool, compress the springs and fit the cotters in their seats.

Specific tooling

AP9100838 Tool for valve pressure plate

AP8140179 Valve spring compressor

Inspecting the cam shaft

- Check the camshaft bearings for signs of abnormal wear.

Characteristic

Standard diameter - Bearing A

19.980 - 19.959 mm (0.7866 - 0.7858 in)

Minimum diameter allowed - Bearing A

19.95 mm (0.7854 in)

Intake cam height (125/200)

31.488 mm (1.23968 in)

Exhaust cam height (125/200)



30.864 mm (1.21511 in)

- Check that the holes used for timing and their shoulders are not worn.
- If values measured are not within the specified limits or there are signs of wear, replace the defective components with new ones.

Characteristic

Maximum axial clearance allowed:

0.4 mm (0.0157 in)

Refitting the head and timing system components

- Screw the specific tool so that the crankshaft does not rotate at TDC.

Specific tooling

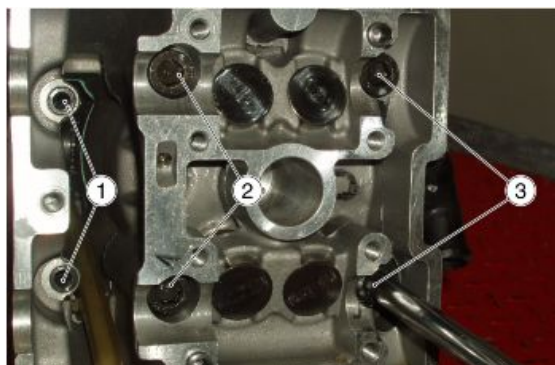
0240880 Threaded bolt for locking crankshaft at TDC



- Fit the chain guide slider onto the cylinder.
- Fit the head gasket and the alignment dowels
- Fit the head.



- Screw but do not tighten both central long screws (3) and position the washers.
- Screw but do not tighten both central long screws (2) and position the washers.
- Screw but do not tighten the two side short screws (1).



NOTE

BEFORE INSTALLING THE HEAD, MAKE SURE THAT THE LUBRICATION CHANNEL IS CLEAN AS WELL AS THE REST OF THE ASSEMBLY; USE A JET OF COMPRESSED AIR FOR CLEANING.

- Tighten the four central screws (2 - 3) crosswise.

Locking torques (N*m)

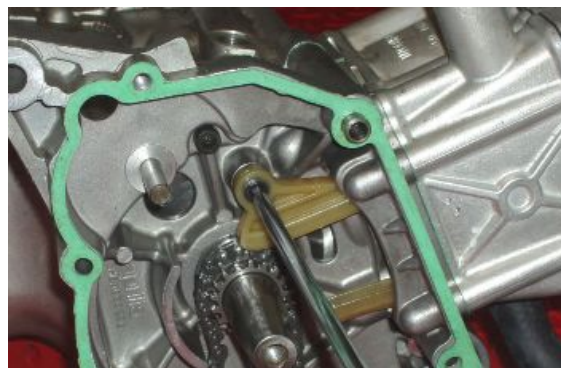
Head EI fixing screws - M8x166 (4) 25 Nm + 90° (18.44 lbf ft + 90°)

- Lastly, tighten the two side screws (1).

Locking torques (N*m)

Head EI fixing screws (chain side) - M6x130 (2) 11 Nm (8.11 lbf ft)

- Insert the timing control chain on the crankshaft.
- Insert the chain tensioner pad of the head and lock it with the fixing screw.



Locking torques (N*m)

Chain tensioner guide slider EI fixing screws - M6 (1) 10 Nm (7.38 lbf ft) - Loctite 243

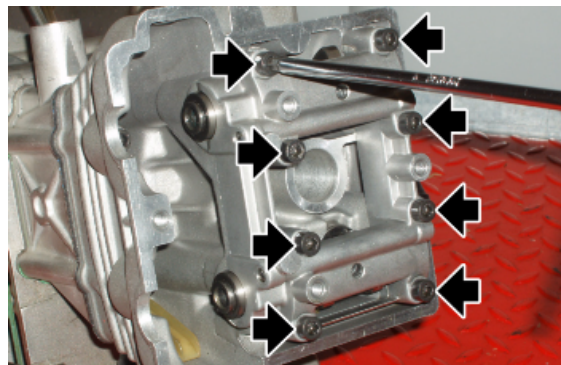
- Insert the camshafts in their seats on the head, remember to position the camshaft marked with the letter (A) on the intake side and the camshaft marked with the letter (S) on the exhaust side.



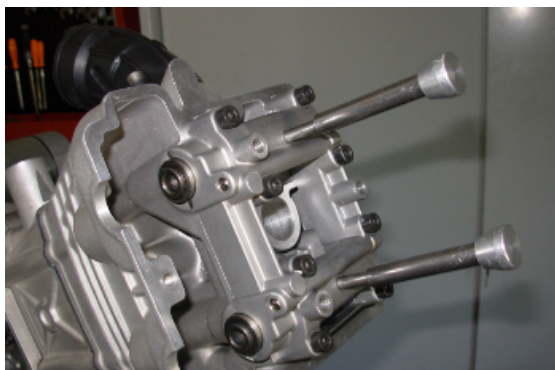
WARNING

POSITION THE CAMS OF BOTH SHAFTS FACING OUTWARDS.

- Position the cam tower cap.
- Screw but do not and tighten the eight screws.



- Get two Ø 6.3 mm (0.25 in) pins.
- Place the pins in their positions on the overhead camshafts.

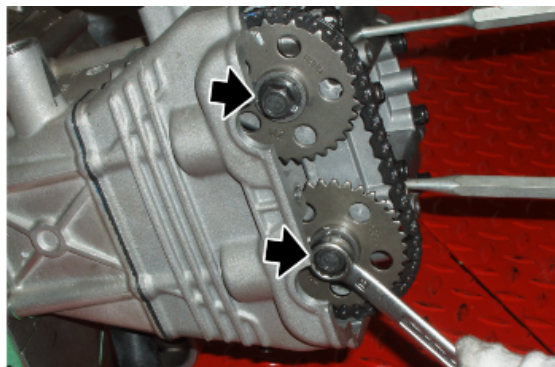
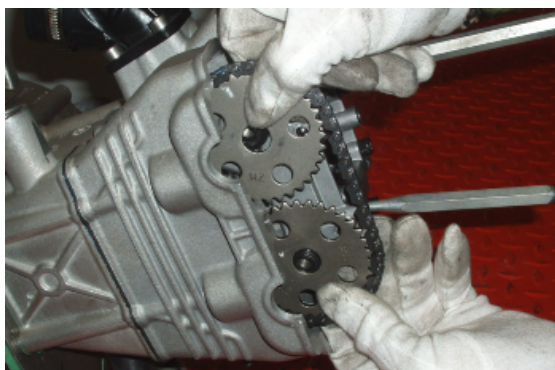


- Tighten the eight screws of the cam tower cap crosswise.

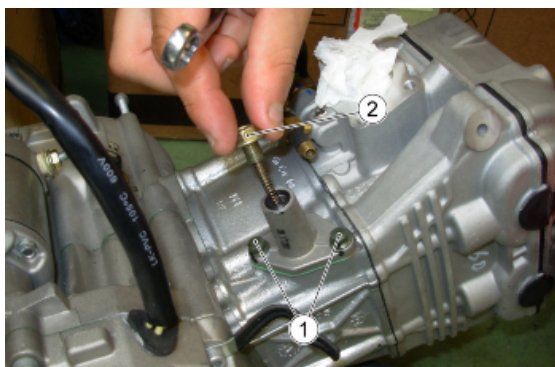
Locking torques (N*m)

Camshaft support EI fixing screws - M6x40 (8) 10 Nm (7.38 lbf ft)

- Place the camshaft gears on the chain, be careful not to invert the original direction of rotation.
- Keep the camshafts locked with the pins and screw but do not tighten the screws fixing the gears using Loctite 243.



- Fit the chain tensioner on the cylinder using a new gasket, and tighten the two screws (1) to the prescribed torque.
- Insert the spring with the central screw (2) and o-ring, and tighten the cap to the prescribed torque.



Locking torques (N*m)

Chain tensioner retainer - M6x16 (2) 12 Nm (8.85 lbf ft)
Chain tensioning cover - M8 (1) 6 Nm (4.43 lbf ft)

- Tighten the screws fixing the camshaft gears to the prescribed torque.

-
- Remove the pins on the camshafts.
 - Remove the special crankshaft locking tool.
 - Tighten the screw on the crankcase.
 - Check the valve clearance and adjust it if required.
 - Refit the tappet cover.

Specific tooling

0240880 Threaded bolt for locking crankshaft at TDC

Locking torques (N*m)

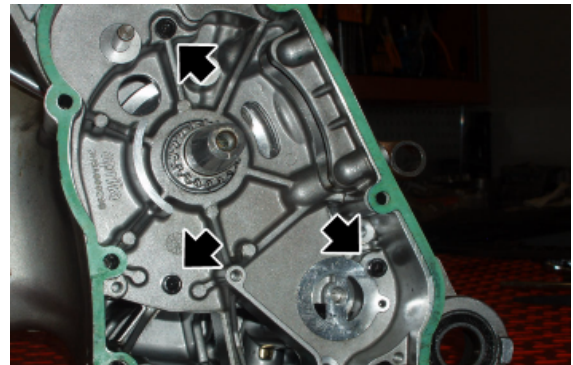
Transmission gear timing fixing screw - M8x20x1 (2) 27 Nm (19.91 lbf ft) - Loctite 243

Crankcase - crankshaft

Splitting the crankcase halves

- Before opening the crankcase, drain out all engine oil, remove the driving pulley, the starter motor, the flywheel, the freewheel and the intermediate gear.
- Remove the thermal group.
- Remove the oil pump.

-
- Unscrew and remove the three screws.



- Separate the crankcase halves by giving short taps with a rubber hammer.

CAUTION

PAY ATTENTION THAT THE TOOTHING OF BOTH THE TIMING CHAIN GEARS AND THE OIL PUMP GEARS DO NOT DAMAGE THE BUSHING.



Removing the crankshaft

- Slide off the crankshaft from the fly-wheel side by giving short taps with a rubber hammer.



See also

[Removing the flywheel magneto](#)

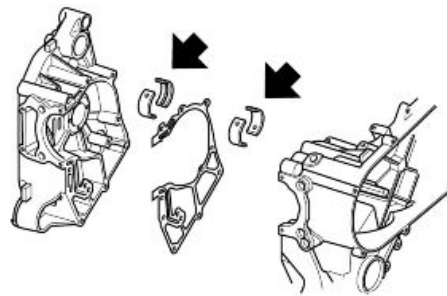
Intermediate gear

Removing the crankshaft bearings

- Remove the main bushing oil seal.
- Using the suitable special tool, remove the main bushings.

Specific tooling

020704Y Extractor for bushings



Refitting the crankshaft bearings

- Using the suitable tool, fit the new bushings on both crankcase halves.

Use bushings:

- blue

This coupling almost always meets the diametral clearance specifications

It should be checked that the diametral clearance is between 0.02 - 0.06 mm for both sides.

If this condition is not fulfilled, the bushing should be replaced with another of a different thickness.

These are the thickness for the half-bearings:

- red type: 2.005 - 2.010

- blue type: 2.010 - 2.015

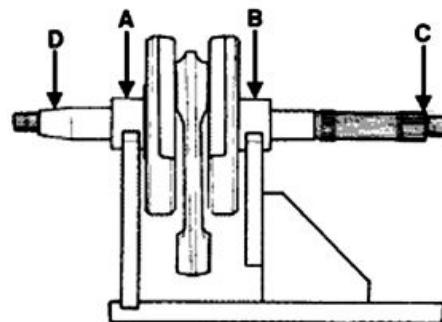
yellow type: 2.015 - 2.020

Specific tooling

020701Y Punch for bushings

Inspecting the crankshaft alignment

- Install the crankshaft on the support and measure the misalignment at the two points indicated in the figure.
- Check that the crankshaft cone, the tab fitting, the oil seal flow, the knurling and the threaded tangs are in good working order.
- In case of failure, replace the crankshaft.
- The crankshaft spare part has a sole code (there are no different types to select from).
- It should be checked that the diametral clearance is between 0.02 mm (0.00079 in) and 0.06 mm (0.0024 in) for both sides.
- If this condition is not fulfilled, the half-bearings should be replaced.



The big end bushings cannot be replaced.

Therefore, the connecting rod cannot be replaced either. When cleaning the crankshaft, be very careful that no impurities get in through the shaft lubrication hole.

In order to prevent damaging the connecting rod bushings, do not attempt cleaning the lubrication duct with compressed air.

- The wrong installation of a buffer can seriously affect the bushing lubrication pressure.

NOTE

CRANKCASE BEARINGS ARE NOT GRINDABLE.

Specific tooling

020074Y Support base for checking crankshaft alignment

Characteristic

Maximum off-line allowed:

A = 0.01 mm

B = 0.01 mm

C = 0.10 mm

D = 0.06 mm

Inspecting the crankcase halves

- Before checking the crankcase halves, thoroughly clean all the surfaces and the oil pipes.
- For the crankcase half on the transmission side, take particular care when handling the housing and hoses for the oil pump, the duct with the by-pass valve and the main bushings.
- As already described in the lubrication chapter, it is especially important that the by-pass valve housing shows no wear that may impair the proper sealing of the lubrication pressure adjustment ball.
- <DIV class=CNT_SUMMARY title="Testo Breve (<4000 car.)">Check that the surfaces are free from dents or deformations, with special attention to both the crankcase coupling and the cylinder-crankcase surfaces.
- <DIV class=CNT_SUMMARY title="Testo Breve (<4000 car.)">Defects in the crankcase coupling gasket or the surfaces indicated in the figure can cause a drop in the oil pressure and affect the lubrication pressure for the main bushings and the connecting rod.
- <DIV class=CNT_SUMMARY title="Testo Breve (<4000 car.)">Check that the surfaces that limit crankshaft axial clearance show no signs of wear. To measure and check sizes follow the procedure described previously for checking crankshaft axial clearance and dimensions.

Inspecting the crankshaft plain bearings

- In order to correctly lubricate the bushings, it is necessary to have both optimal lubricating pressure and a good oil flow rate; this implies that the bushings must be positioned correctly so as not to obstruct the oil supply ducts.
- The main bushings comprise two half-bearings. The two half-bearings for the left crankcase bushing (variator side) are plain with holes. The two half-bearings for the right crankcase bushing (flywheel side) have holes and a central groove.
- The oil supplying channel section is also influenced by the depth to which the bushings are driven compared with the crankshaft axial clearance of the limiting surface.

CAUTION

THE MAIN BUSHINGS SHOULD BE FITTED WITH THE COUPLING AREA FOR BOTH HALF-BUSHINGS PARALLEL TO THE CYLINDER SUPPORTING SURFACE AND WITH THE HOLES OF THE LUBRICATION GROOVE PERFECTLY CENTRED.

- Measure the bushings diameter at the 3 positions indicated in the figure.
- Bushings are divided into 3 categories according to their thickness.

RED TYPE: 2.005 - 2.010

BLUE TYPE: 2.010 - 2.015

YELLOW TYPE: 2.015 - 2.020

NOTE

DO NOT TAKE THE MEASUREMENT ON THE TWO HALF-SHELLS COUPLING SURFACE SINCE THE ENDS ARE RELIEVED TO ALLOW BENDING DURING THE DRIVING OPERATION.

Characteristic**Ideal lubrication pressure**

4 atm

Driving depth

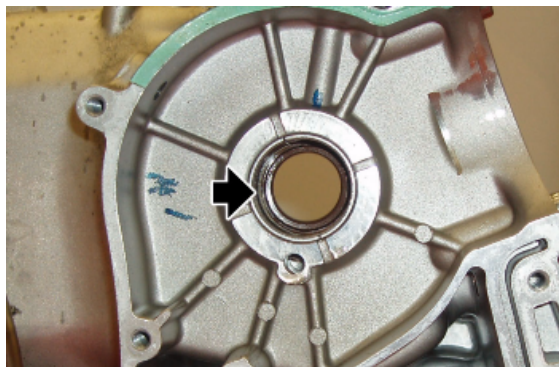
0.5 +/-0.1 mm from internal stop

Refitting the crankshaft

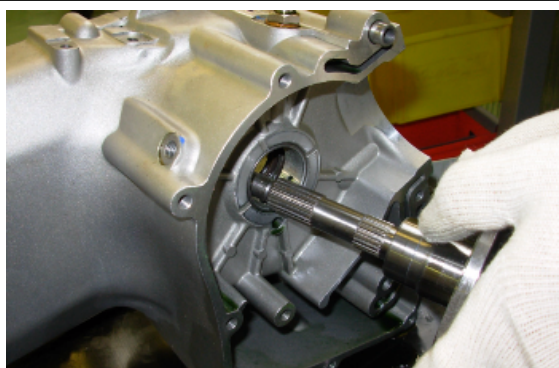
- Using the suitable special tool, fit the main bushings.
- Fit the new oil seal using a commercially available punch.

Specific tooling

020701Y Punch for bushings

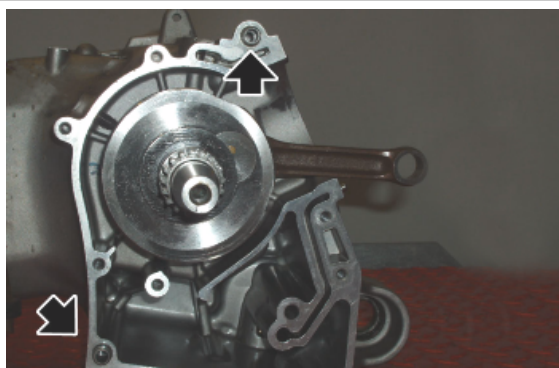


- Fit the crankshaft operating from the variator side.

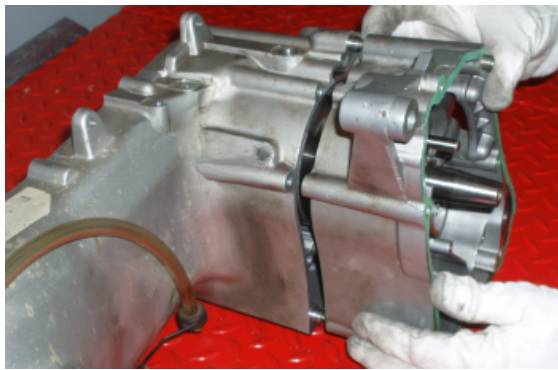


Refitting the crankcase halves

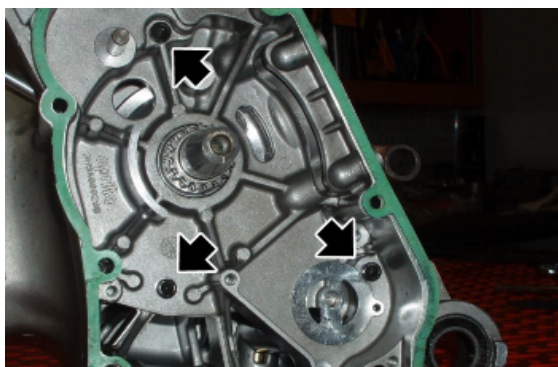
- Fit the crankshaft.
- Place the two dowels and a new gasket between both crankcase halves.



- Place the crankshaft half by giving short taps with a rubber hammer.



- Tighten the three screws to the prescribed torque.
- Trim the gasket protruding from the cylinder plane.



Locking torques (N*m)

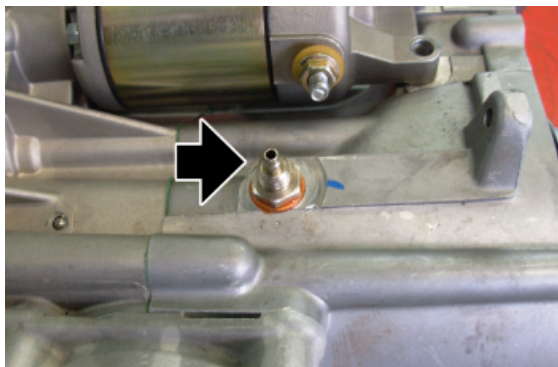
Crankcase EI fixing screws - M6x70 (1) 11 Nm (8.11 lbf ft)
Crankcase EI fixing screws - M6x50 (2) 11 Nm (8.11 lbf ft)

See also

[Refitting the crankshaft](#)

Oil pressure check

- Disconnect the electrical connection of the minimum oil pressure switch and then remove the switch.
- Check that the oil pressure reading is 1.8 atm minimum with engine idling at 1700 +/- 100 rpm and oil at the required temperature (wait for at least one electric ventilation).
- Check that the oil pressure reading is between 3.5 and 6.5 atm with engine idling at 6000 rpm and oil at the required temperature.
- Remove the specific tools on the engine once the measurement is complete. Refit the oil pressure switch and washer, tightening it to the prescribed torque, and fit the flywheel cover.
- If oil pressure reading are not within the specified limits, check in the following order: the oil filter, the



oil by-pass valve, the oil pump and the crankshaft seals.

NOTE

THIS CHECK MUST BE CARRIED OUT WITH OIL AT THE CORRECT LEVEL AND WITH AN OIL FILTER IN GOOD CONDITION.

Characteristic

Oil pressure

Minimum pressure admitted at 6000 rpm: 3.5 atm.

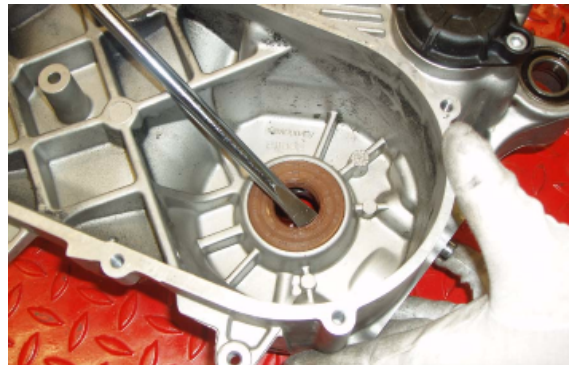
Crankshaft oil seals

Removal

- Remove the crankshaft.
- Remove the main bushing oil seal working from the transmission side.

CAUTION

BE CAREFUL NOT TO DAMAGE THE SEAT OF THE MAIN BUSHING OIL SEAL.



Refitting

- Thoroughly clean the seat of the oil seal.
- Fit the new main bushing oil seal using a commercially available punch of suitable size.

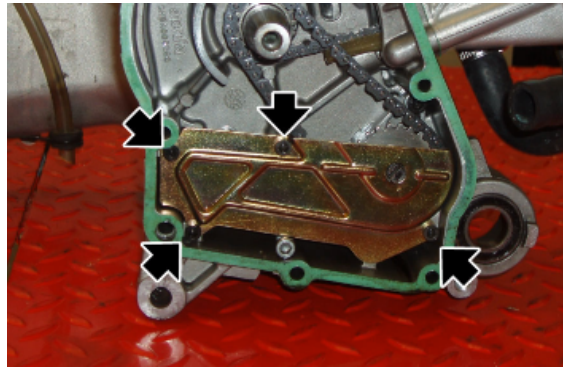
CAUTION

PREPARE THE NEW OIL SEAL BY LUBRICATING ITS SEALING LIP. DO NOT LUBRICATE THE KEYING SURFACE ON THE ENGINE CRANKCASE

Oil pump

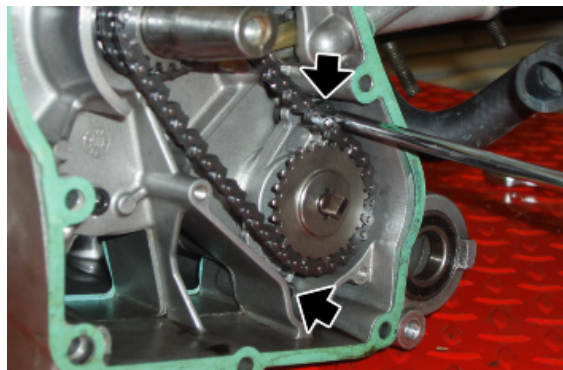
Removal

- Drain the engine oil.
- Remove the flywheel cover.
- Remove the flywheel.
- Undo and remove the four screws and remove the plate.



- Unscrew and remove the two screws.
- Slide off the gears, the oil pump and the chain.

IT IS ADVISABLE TO MARK THE CHAIN IN ORDER TO ENSURE THAT THE DIRECTION OF ROTATION IS MAINTAINED.



See also

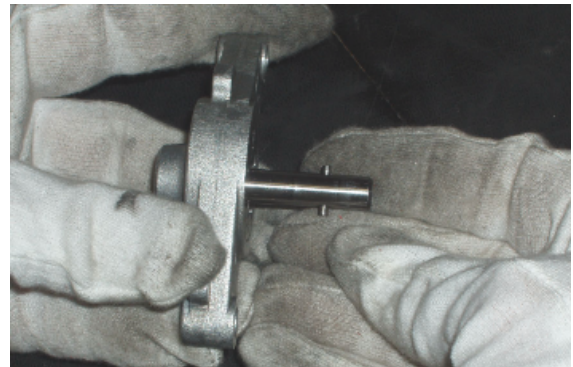
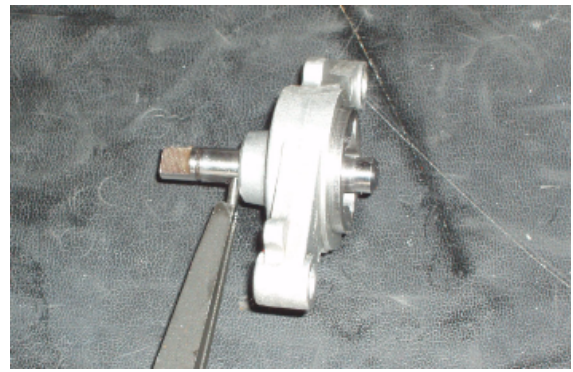
[Removing the flywheel magneto](#)

Inspection

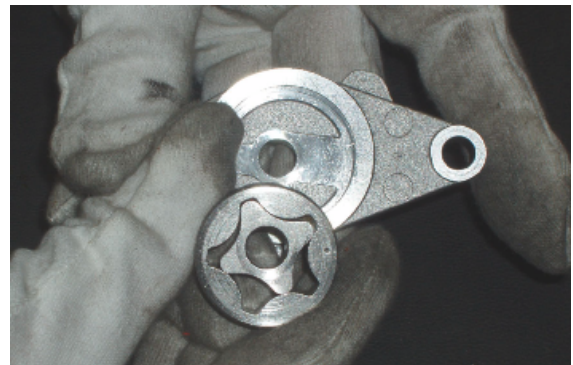
- Remove the oil pump.
- Remove the seeger ring and slide off the gears from the oil pump.



-
- Remove the external driving pin from the oil pump shaft.
 - Detach the shaft and remove the second external driving pin as well.



- Take out the shaft and collect the components.

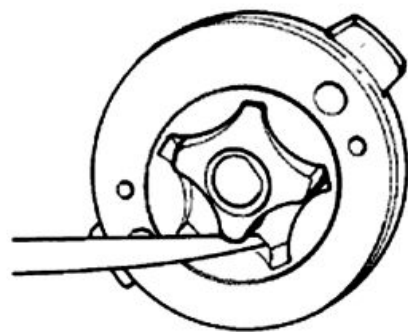


- Measure distance between rotors with a feeler gauge at the position shown in the picture.

Characteristic

Limit clearance allowed:

0.12 mm

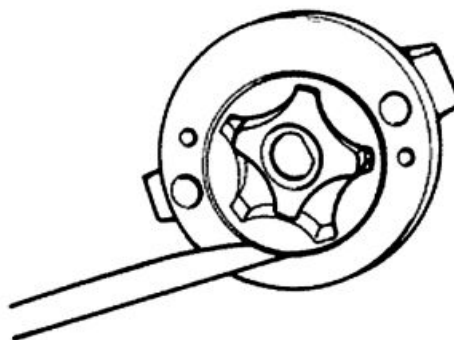


Measure the distance between the outer rotor and the pump body.

Characteristic

limit clearance allowed:

0.18 mm

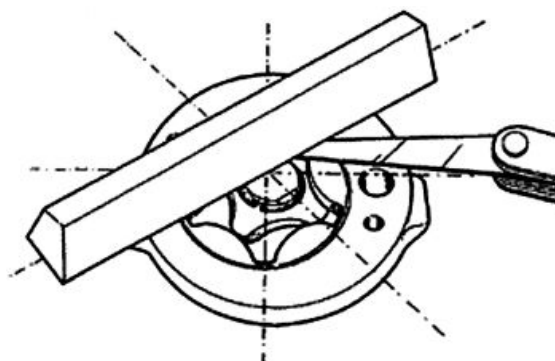


Check the rotor axial clearance using a trued bar as reference plane, as shown in the figure.

Characteristic

Limit value allowed:

0.09 mm

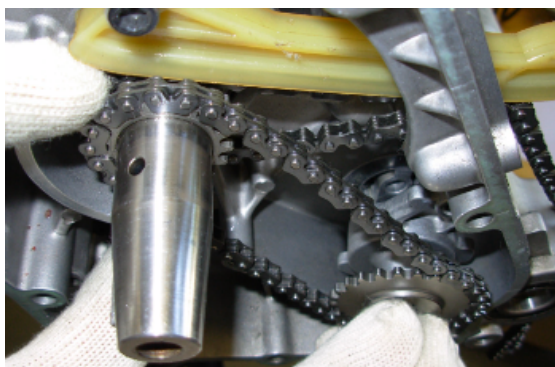


See also

[Removal](#)

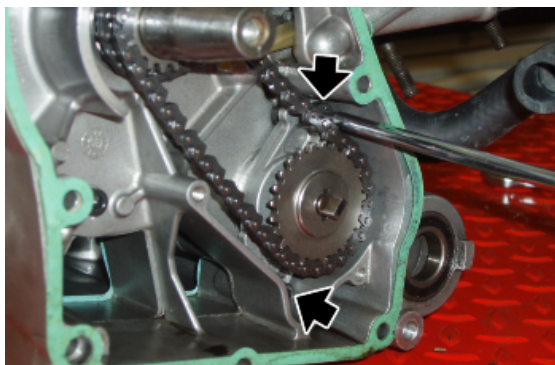
Refitting

- Preassemble the entire oil unit, the chain (observing the direction of rotation marked when fitting) and the crankshaft driving gear.
- Insert the oil pump spindle in its position and fit the oil pump in its housing.
- Tighten the two screws with Loctite 243.



Locking torques (N*m)

Oil pump housing EI fixing screws - M6x25 (2)
10 Nm (7.38 lbf ft) - Loctite 243



-
- Place the plate and tighten the four screws with Loctite 243
 - Fit the flywheel and tighten the nut with Loctite 243
 - Refit the flywheel cover.

Locking torques (N*m)

Oil pump plate EI screws - M5x12 (4) 6 Nm (4.42 lbf ft) - Loctite 243

